ZW310-7 WHEEL LOADER OPERATOR'S MANUAL

PART NO. ENMNFQ-NA1-3A

HITACHI

Reliable Solutions

Operator's Manual

ZW 310-7

Wheel Loader

Hitachi Construction Machinery Co., Ltd.
URL:https://www.hitachicm.com/global/

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ENMNFQ-NA1-3A

Serial No. 010101 and up

INTRODUCTION

Read this manual carefully to learn how to operate and service your machine correctly. Failure to do so could result in personal injury or machine damage.

This standard specification machine can be operated under the following conditions without being modified.
Atmospheric Temperature: -20 °C to 40 °C (-4 °F to 104 °F)
Altitude: 0 m to 2000 m (0 ft to 6600 ft)

In case the machine is used under conditions other than described above, consult a dealer authorized by Hitachi Construction Machinery ("Authorized Dealer")

This manual should be considered a permanent part of your machine and should remain with the machine when you sell it.

This machine is of metric design. Measurements in this manual are metric. Use only metric hardware and tools as specified.

Right-hand and left-hand sides are determined by facing in the direction of forward travel.

Write product identification numbers in the Machine Numbers section. Accurately record all the numbers to help in tracing the machine should it be stolen. Authorized Dealer also needs these numbers when you order parts. If this manual is kept on the machine, also file the identification numbers in a secure place off the machine.

Use only diesel fuel with quality specified in JIS K-2204, EN-590 or ASTM D-975 which contents 15 ppm or lower sulfur.
Also use fuel that complies with solid contamination level of class 18/16/13 of ISO4406-1999 (solid contamination includes dust). If the fuel specified above is not used, exhaust gas that exceeds the regulation values may be discharged, causing serious problem on the engine. Consult Authorized Dealer.

Warranty is provided as a part of Hitachi Construction Machinery's support program for customers who operate and maintain their equipment as described in this manual. The warranty is explained on the warranty certificate which you should have received from Authorized Dealer.

This warranty provides you with the assurance that Hitachi Construction Machinery will back its products where defects appear within the warranty period. In some circumstances, Hitachi Construction Machinery also provides field improvements, often without charge to the customer, even if the product is out of warranty.
Should the equipment be abused, or modified to change its performance beyond the original factory specifications, the warranty will become void and field improvements may be denied.
Setting fuel delivery above specifications or otherwise overpowering machines will result in such action.

Only qualified, experienced operators officially licensed (according to local law) should be allowed to operate the machine. Moreover, only officially licensed personnel should be allowed to inspect and service the machine.

PRIOR TO OPERATING THIS MACHINE, INCLUDING COMMUNICATION SYSTEM, IN A COUNTRY OTHER THAN A COUNTRY OF ITS INTENDED USE, IT MAY BE NECESSARY TO MAKE MODIFICATIONS TO IT SO THAT IT COMPLIES WITH THE LOCAL REGULATORY STANDARDS (INCLUDING SAFETY STANDARDS) AND LEGAL REQUIREMENTS OF THAT PARTICULAR COUNTRY. PLEASE DO NOT EXPORT OR OPERATE THIS MACHINE OUTSIDE OF THE COUNTRY OF ITS INTENDED USE UNTIL SUCH COMPLIANCE HAS BEEN CONFIRMED. PLEASE CONTACT HITACHI CONSTRUCTION MACHINERY CO., LTD. OR ANY OF OUR AUTHORIZED DISTRIBUTOR OR DEALER IF YOU HAVE ANY QUESTIONS CONCERNING COMPLIANCE.

In this manual, urea water is indicated as DEF/AdBlue®. "DEF" stands for the Diesel Exhaust Fluid. AdBlue® is a registered trademark of the Verband der Automobilindustrie e.V. (VDA).

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CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

All information, illustrations and specifications in this manual are based on the latest product information available at the time of publication. The right is reserved to make changes at any time without notice.

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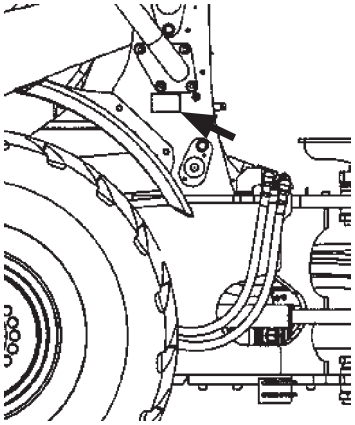
MACHINE NUMBERS

The manufacturing Nos. explained in this group is the individual number (serial No.) given to each machine and engine components. These numbers are requested when inquiring any information on the machine and/or components. Fill these serial Nos. in the blank spaces in this group to immediately make them available upon request.

Machine

TYPE : _____

PRODUCT IDENTIFICATION NUMBER : _____



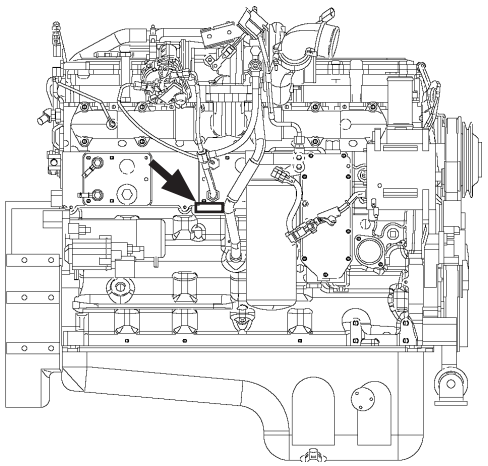
MNFQ-00-010

MACHINE NUMBERS

Engine

TYPE : _____

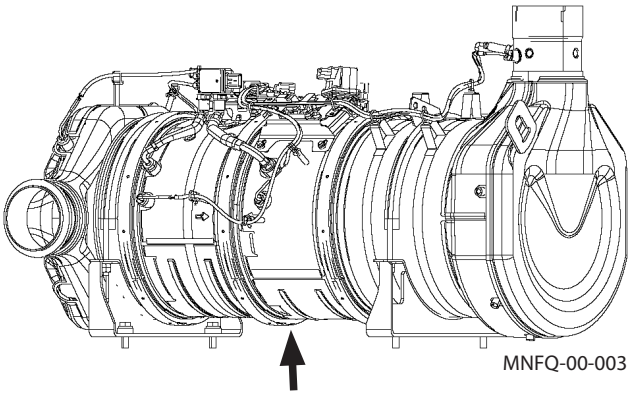
MFG. NO. : _____



MNFQ-00-002

Aftertreatment Device

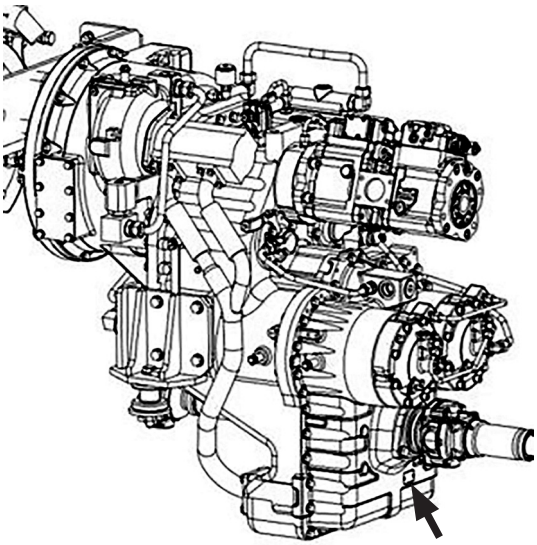
MFG. NO. : _____



MNFQ-00-003

Transmission Device

MFG. NO. : _____

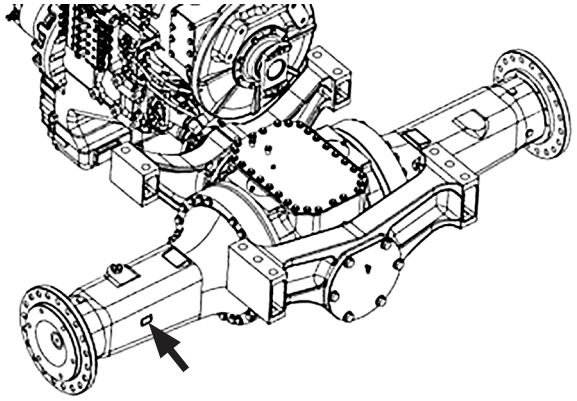


MNFQ-00-005

Rear Axle

TYPE : _____

MFG. NO. : _____

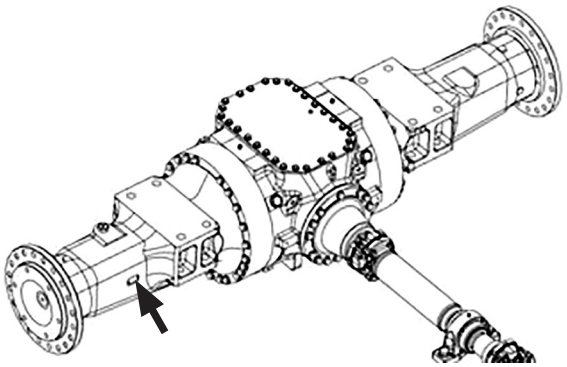


MNFQ-00-006

Front Axle

TYPE : _____

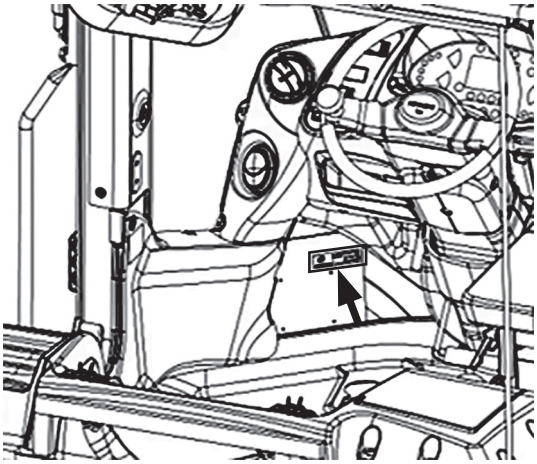
MFG. NO. : _____



MNFQ-00-007

Cab

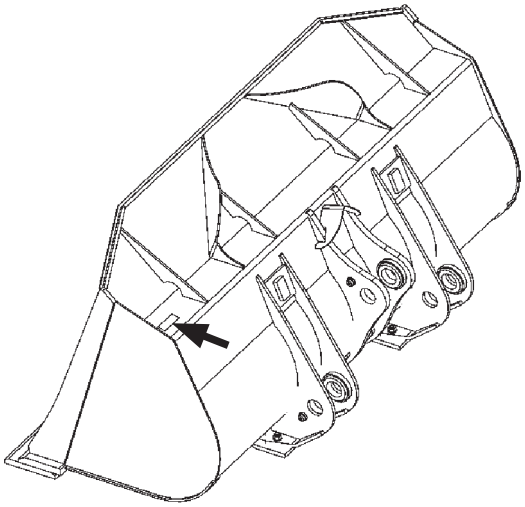
MFG. NO. : _____



MNFQ-00-008

Bucket

MFG. NO. : _____



MNTK-00-002

INTENDED USE

Intended Use

This machine is designed and intended to be used for loading and carrying material with a bucket or working with tools/ attachments described in this manual or approved in writing by the manufacturer.
Risk assessment related to the specific application and working conditions of the machine may require additional safety measures such as protective guards, filtration of cabin air, etc. to be installed, enabling the machine to be operated safely under the specific conditions. Consult Authorized Dealer for further information on possibilities to adapt the machine accordingly.
Local regulations and instructions must be respected when using the machine. Using this machine and its equipment for operations other than those intended or approved by the manufacturer, are prohibited.

Modifications

No modification affecting the intended use or structural integrity and therefore safety of the machine should be made without written approval of the manufacturer. Modifications which are not approved include the use of unauthorized accessories, assemblies, parts or attachments, including but not limiting to those connected with a coupling device.
Any legal or natural person performing unapproved modifications to the machine assumes all liability directly or indirectly related to the modification.
The manufacturer reserves the right to reject any warranty claim arising from or related to unapproved modifications.

MEMO

Recognize Safety Information

- These are the **SAFETY ALERT SYMBOLS**.
  - When you see these symbols on your machine or in this manual, be alert to the potential for personal injury.
  - Follow recommended precautions and safe operating practices.



SA-2644

Understand Signal Words

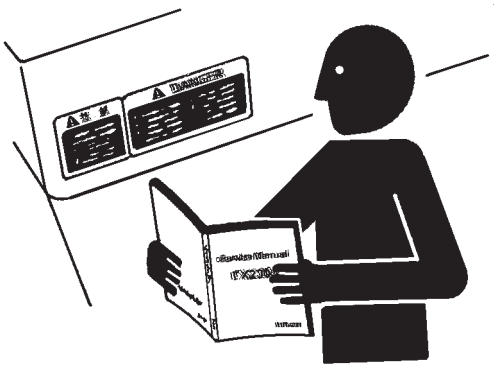
- On machine safety signs, signal words designating the degree or level of hazard - DANGER, WARNING, or CAUTION - are used with the safety alert symbol.
  - **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
  - **WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
  - **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
  - **DANGER or WARNING safety signs** are located near specific hazards. General precautions are listed on **CAUTION safety signs**.
  - Some safety signs are occasionally used on this machine that do not use any of the designated signal words mentioned above after the safety alert symbol.
- To avoid confusing machine protection with personal safety messages, a signal word **IMPORTANT** indicates a situation which, if not avoided, could result in damage to the machine.
- ***NOTE*** Indicates an additional explanation for an a piece of information.



SA-1223

Follow Safety Instructions

- Carefully read and follow all safety signs on the machine and all safety messages in this manual.
- Safety signs should be installed, maintained and replaced when necessary.
  - If a safety sign or this manual is damaged or missing, order a replacement from Authorized Dealer in the same way you order other replacement parts (be sure to state machine model and serial number when ordering).
- Learn how to operate the machine and its controls correctly and safely.
- Allow only trained, qualified, authorized personnel to operate the machine.
- Keep your machine in proper working condition.
  - Unauthorized modifications of the machine may impair its function and/or safety and affect machine life.
  - Do not modify any machine parts without authorization. Failure to do so may deteriorate the safety, function, and/or service life of the machine and may void Hitachi Construction Machinery Warranty.
    Modifying machine without authorization may deteriorate the safety, function, performance, service life of the machine, and/or void Hitachi Construction Machinery Warranty Policy.
  - Never attempt to modify or disassemble the inlet/exhaust parts and the aftertreatment device. Avoid shocks to the element of the aftertreatment device, such as striking or dropping objects onto the elements. Failure to do so may affect the exhaust gas purifying device, possibly damaging it or lowering its performance.
  - Do not use attachments and/or optional parts or equipment not authorized by Hitachi Construction Machinery. Failure to do so may deteriorate the safety, function, and/or service life of the machine. In addition, personal accident, machine trouble, and/or damage to material caused by using unauthorized attachments and/or optional parts or equipment will void Hitachi Construction Machinery Warranty Policy.
- The safety messages in this SAFETY chapter are intended to illustrate basic safety procedures of machines. However it is impossible for these safety messages to cover every hazardous situation you may encounter. If you have any questions, you should first consult your supervisor and/or Authorized Dealer before operating or performing maintenance work on the machine.



SA-003

Prepare for Emergencies

- Be prepared for a fire or an accident.
  - Keep a first aid kit and fire extinguisher on hand.
  - Thoroughly read and understand the label attached on the fire extinguisher to use it properly.
  - To ensure that a fire extinguisher can be always used when necessary, check and service the fire extinguisher at the recommended intervals as specified in the fire extinguisher manual.
  - Establish emergency procedure guidelines to cope with fires and accidents.
  - Keep emergency numbers for doctors, ambulance service, hospital, and fire department posted near your telephone.



SA-437

Wear Appropriate Clothing

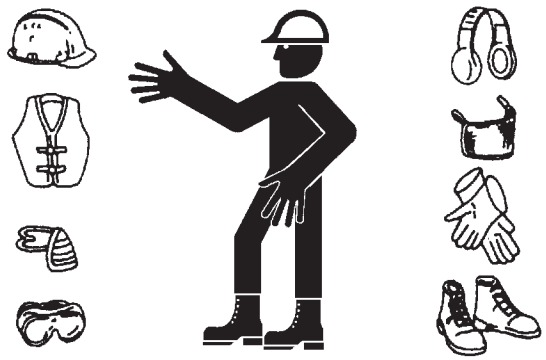
- Wear close fitting clothing and safety equipment appropriate to the job.

  You may need:
  - A hard hat
  - Safety shoes
  - Safety glasses, goggles, or face shield
  - Hand protection
  - Personal fall protection equipment
  - Hearing protection
  - Reflective clothing
  - Wet weather gear
  - Respirator or filter mask

  Be sure to wear the correct equipment and clothing for the job.

  - Avoid wearing loose clothing, jewelry, or other items that can catch on steering wheel, control levers or other parts of the machine.

- Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating the machine.



SA-438

Inspect Machine

- Inspect your machine carefully each day or shift by walking around it before you start it to avoid personal injury.
  - In the walk-around inspection, be sure to cover all points described in the "Inspect Machine Daily Before Starting" section in the operator's manual.



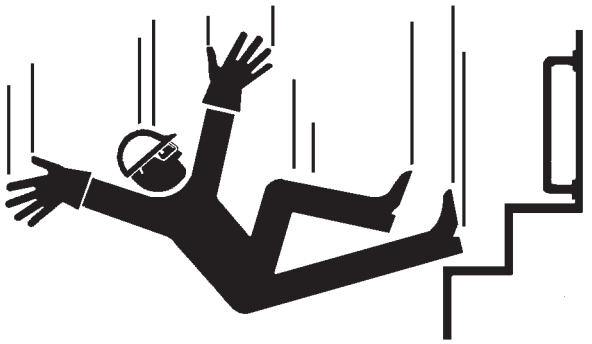
SA-435

General Precautions for the Cab

- Before entering the cab, thoroughly remove all dirt and/or oil such as mud, grease, soil or stones from the soles of your work boots. If any controls such as a pedal is operated while with dirt and/or oil on the soles of the operator's work boots, the operator's foot may slip off the pedal, possibly resulting in a personal accident.
- Do not make a mess around the operator's seat with parts, tools, soil, stones or other, obstacles that may fold up or turn over such as cans or lunch box. The levers or pedals become inoperable if an obstacle jams during the operation stroke of the accelerator pedal, brake pedals, control lever lock switch or control levers, which may result in serious injury or death.
- Avoid storing transparent bottles in the cab. Do not attach any transparent type window decorations on the windowpanes as they may focus sunlight, possibly starting a fire.
- Refrain from listening to the radio, or using music headphones or mobile telephones in the cab while operating the machine.
- Keep all flammable objects and/or explosives away from the machine.
- After using the ashtray, always cover it to extinguish the match and/or tobacco.
- Do not leave cigarette lighters in the cab. When the temperature in the cab increases, the lighter may explode.
- Using floor mat non-suitable for machine may be displaced and interfere with pedal movement during operation, potentially resulting in serious injury or death. Hitachi Construction Machinery Genuine Floor Mat is specially designed and tested to suit with the machine, hence it is recommended to use the Genuine Floor Mat.

Use Handrails and Steps

- Falling is one of the major causes of personal injury.
  - When you get on and off the machine, always face the machine and maintain a three-point contact with the steps and handrails.
  - Do not use any controls as handholds.
  - Never jump on or off the machine. Never mount or dismount a moving machine.
  - Before getting on or off the machine, check the condition of the steps and handrails for sticking of slippery material like grease or mud. Thoroughly remove such material if stuck. In addition, repair the damage to the steps and/or handrails. Retighten loose bolts.
  - Never get on and off the machine with tools in your hands.



SA-439

Never Ride Attachment

- Never allow anyone to ride on attachment or the load. This is an extremely dangerous practice.

Adjust Operator's Seat

- A seat which is poorly adjusted for the individual operator, or the work to be undertaken, may quickly fatigue the operator leading to misoperation.

  - The seat should be adjusted whenever the operator of the machine changes.
  - The operator should be able to fully depress the pedals and to correctly operate the control levers with his back against the seat back.
  - If not, move the seat forward or backward, and check again.
  - Adjust the rear view mirror position so that the best rear visibility is obtained from the operator's seat. If the mirror is broken, immediately replace it with a new one.



SA-462

Ensure Safety Before Leaving or Standing up from Operator's Seat

- Before leaving the Operator's Seat, be sure to first lower the front attachment to the ground and move the FNR lever to the neutral position (N), turn ON the parking switch, move the control lever lock switch or the lever locks to the LOCK position. Turn the key switch OFF to stop the engine. Leaving the Operator's Seat without stopping the engine may allow the machine to unexpectedly move when a body part unintentionally comes in contact with a steering wheel, control lever and/or pedal, resulting in serious injury or death.
- Before standing up from the operator's seat to open or close a window or to adjust the seat position and so on, be sure to first lower the front attachment to the ground and move the FNR lever to the neutral position, turn ON the parking switch, move the control lever lock switch or the lever locks to the LOCK position. Failure to do so may allow the machine to unexpectedly move when a body part unintentionally comes in contact with a steering wheel, control lever and/or pedal, potentially resulting in serious injury or death.
- Before leaving the machine, close all windows, doors, and access covers and lock them.

Fasten Your Seat Belt

- If the machine should overturn, the operator may become injured and/or thrown from the cab. Additionally the operator may be crushed by the overturning machine, resulting in serious injury or death.
  - Prior to operating the machine, thoroughly examine webbing, buckle and attaching hardware. If any item is damaged or worn, replace the seat belt or component before operating the machine.
  - Be sure to remain seated with the seat belt securely fastened at all times when the machine is in operation to minimize the chance of injury from an accident.
  - We recommend that the seat belt be replaced every three years regardless of its apparent condition.



SA-237

Move and Operate Machine Safely

- Bystanders can be run over.

  - Take extra care not to run over bystanders. Confirm the location of bystanders before moving, or operating the machine.
  - Always keep the travel alarm and horn in working condition (if equipped). It warns people when the machine starts to move.
  - Use a signal person when moving, or operating the machine in congested areas. Coordinate hand signals before starting the machine.
  - Use appropriate illumination. Check that all lights are operable before operating the machine. If any faulty illumination is present, immediately repair it.
  - Ensure the cab door, windows, doors and covers are securely locked.
  - Check the mirrors and the monitor in the cab for problems.
    If there is any problem, replace the problem part(s) or clean the mirrors, camera and the monitor.
    Refer to Mirrors, Rear View Monitor, and Aerial Angle sections for information on cleaning the mirrors, camera lens and the monitor display.



SA-398

Handle Starting Aids Safely

Starting fluid:

- Starting fluid is highly flammable.

  - Keep all sparks and flame away when using it.
  - Keep starting fluid well away from batteries and cables.
  - Remove container from machine if engine does not need starting fluid.
  - To prevent accidental discharge when storing a pressurized container, keep the cap on the container, and store it in a cool, well-protected location.
  - Do not incinerate or puncture a starting fluid container.



SA-293

Operate Only from Operator's Seat

- Inappropriate engine starting procedures may cause the machine to runaway, possibly resulting in serious injury or death.

  - Start the engine only when seated in the operator's seat.
  - Never start the engine while standing on the tire or on ground.
  - Do not start engine by shorting across starter terminals.
  - Before starting the engine, confirm that all control levers are in neutral.
  - Before starting the engine, confirm the safety around the machine and sound the horn to alert bystanders.



SA-431

Jump Starting

- Battery gas can explode, resulting in serious injury.

  - If the engine must be jump started, be sure to follow the instructions shown in the "OPERATING ENGINE" chapter in the operator's manual.
  - The operator must be in the operator's seat so that the machine will be under control when the engine starts. Jump starting is a two-person operation.
  - Never use a frozen battery.
  - Failure to follow correct jump starting procedures could result in a battery explosion or a runaway machine.

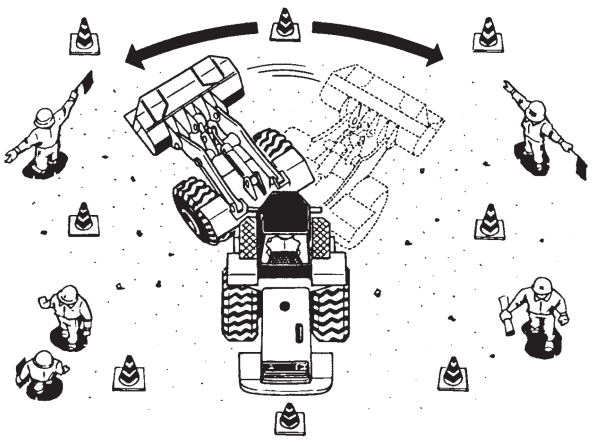


SA-032

Precautions for Operations

- Investigate and perform job site risk assessment before starting operations.

  - Be sure to wear close fitting clothing and safety equipment appropriate for the job, when operating the machine.
  - Keep bystanders and obstacles clear from the area of machine operation. Keep bystanders away from areas where there is risk of, such as flying objects.
  - Always be aware of the surroundings while operating.



SA-2868

Investigate Job Site Beforehand

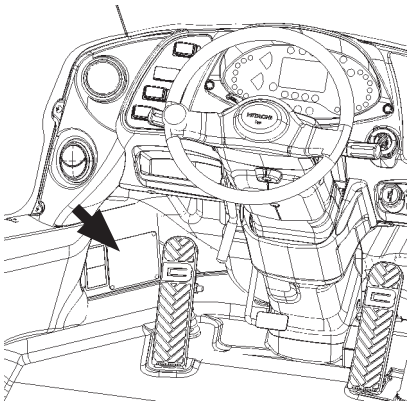
- When working at a slope, the edge of an excavation or on a road shoulder, the machine could tip over, possibly resulting in serious injury or death.
- Investigate the configuration and ground conditions of the job site beforehand to prevent the machine from tipping over and to prevent the ground, stockpiles, or banks from collapsing.
- Perform a job site risk assessment and make a work plan to perform the work in a safe way. Use machines suitable for the work and job site.
- Reinforce ground, edges, and road shoulders as necessary. Keep the machine away from the edges of excavations and road shoulders.
- Ensure that the safety provisions installed on the machine are in good condition and sufficient for the work to be performed.
- Analyze the result of job site risk assessment considering the performance limitations of the machine's operator protective structures. In case potential residual risks are foreseen in a job site, take appropriate measures to mitigate the risks.
- When the ground footing is weak, reinforce the ground before starting work.
- When working on frozen ground, be on extreme alert. As ambient temperatures rise, the ground footing becomes loose and slippery.
- Beware of the possibility of fire when operating the machine near flammable objects such as dry grass.



SA-447

Precautions about Operator's Seat Protections in Case of Falling Objects or Overturning

The cab incorporates the structure to protect the operator from falling objects (Falling Object Protective Structure (FOPS)) and the structure to protect the operator by absorbing the impact energy when the machine rolls over (Roll-Over Protective Structure (ROPS)).
However, when modifying the machine or installing a special attachment causing the machine mass to exceed the maximum operating mass described in the ROPS certification, the cab cannot fulfill its protective function, possibly causing serious injury or death.



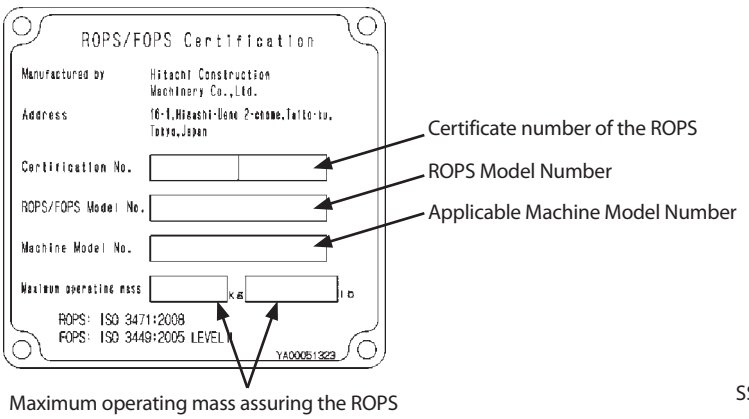
SA-2865

In order to safeguard the protective structure, follow the instructions below.

- Consult Authorized Dealer before welding parts or drilling a hole on the cab, which possibly reduces the cab strength.
- Be sure to always fasten the seat belt when operating the machine. If the machine rolls over without operator fastening the seat belt, the operator may become injured, may be thrown out from the cab and/or may become crushed under the machine even though the cab has the protective structure.

The ROPS certificate and FOPS certificate are valid under the following conditions.

- The machine mass is lower than the maximum operating mass described in the ROPS certification.
- The ROPS is properly installed.
- No modification is made to the ROPS.
- The ROPS is free from damage.



SSYA00051323

Provide Signals for Jobs Involving Multiple Machines

- For jobs involving multiple machines, provide signals commonly known by all personnel involved. Also, appoint a signal person to coordinate the job site. Make sure that all personnel obey the signal person's directions.



SA-481

Keep Riders Off Machine

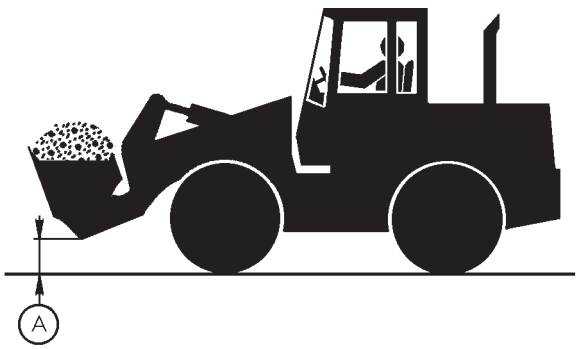
- Riders on the machine are subject to injury such as being struck by foreign objects and being thrown off the machine.
  - Only the operator should be on the machine. Keep riders off.
  - Riders also obstruct the operator's view, resulting in the machine being operated in an unsafe manner.



SA-427

Drive Safely

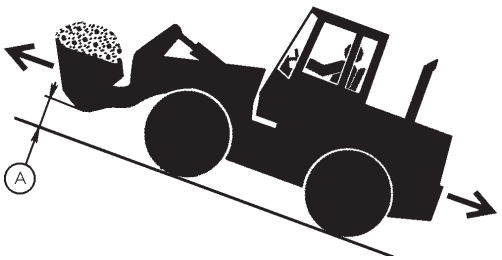
- Beware of the possibility of the machine slipping and/or turning over when driving on a slope.
  - When driving on level ground, hold the bucket at mark (A) 500 mm (20 in) above the ground as illustrated.
  - Avoid traveling over any obstacles.
  - Drive the machine slowly when driving on rough terrain.
  - Avoid quick direction changes. Failure to do so may cause the machine to turn over.
  - If the engine stops while driving, the steering function becomes inoperative. Immediately stop the machine by applying the brake to prevent personal accident.



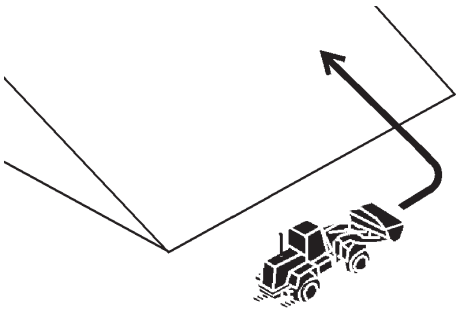
SA-448

Drive Machine Safely (Work Site)

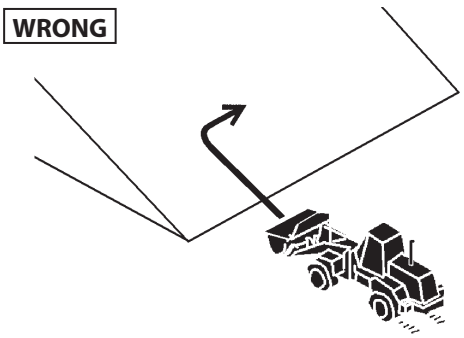
- Before driving the machine, always confirm that the steering wheel / and forward / reverse lever (switch) direction corresponds to the direction you wish to drive.
  - Be sure to detour around any obstructions.
- Driving on a slope may cause the machine to slip or overturn, possibly resulting in serious injury or death.
  - When driving up or down a slope, keep the bucket facing the direction of travel, approximately 500 mm (20 in) above the ground.
  - If the machine starts to skid or becomes unstable, immediately lower the bucket to the ground and stop.
- Driving across the face of a slope or steering on a slope may cause the machine to skid or overturn. If the direction must be changed, move the machine to level ground, then, change the direction to ensure safe operation.



SA-449



SA-450



SA-451

Drive Safely with Bucket Loaded

- If the machine is incorrectly operated while driving with the bucket loaded, turning over of the machine may result. Be sure to follow all the instructions indicated below.

  - When driving the machine on a job site with the bucket loaded, hold the bucket as low as possible to keep the machine balanced and to have good visibility.
  - Do not exceed the rated load capacity. Always operate the machine within the rated load capacity.
  - Avoid fast starts, stops, and quick turns. Failure to do so may result in personal injury and/or death.
  - Avoid rapid drive direction changes which could possibly cause personal injury and/or death.

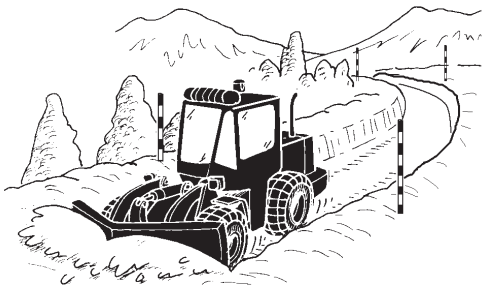


SA-400

Drive on Snow Safely

- Beware of the possibility of slipping or turning over the machine when driving on frozen snow surfaces.

  - The machine may slip more easily than expected on frozen snow surfaces even if the inclination is small. Reduce speed when driving. Avoid fast starts, stops and quick turns.
  - Road shoulder and/or set-up utilities covered with snow are difficult to locate. Make sure of their location before removing snow.
  - Be sure to use tire chains when driving on snow.
  - Avoid applying the brake for quick stops on snow. If a quick stop is required, lower the bucket to the ground.

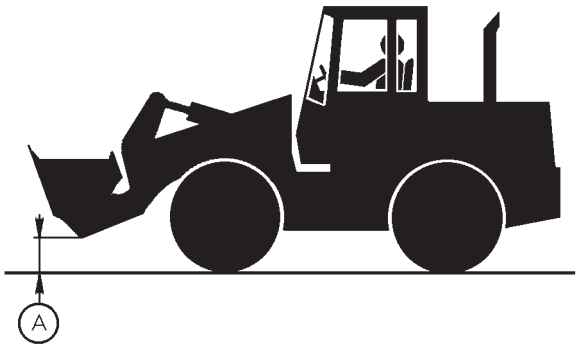


SA-452

Travel on Public Roads Safely

- This machine is not allowed to drive on public roads with the bucket loaded.

  - Be sure to empty the bucket.
  - Hold the bucket at mark (A) 500 mm (20 in) above the road surface as illustrated.



SA-453

Avoid Injury from Roll Away Accidents

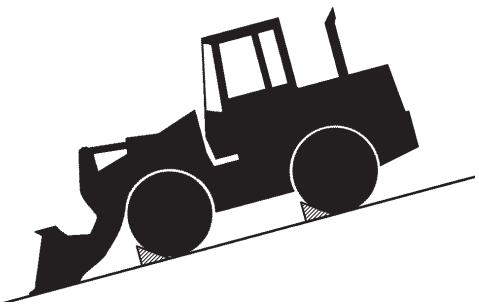
- Death or serious injury may result if you attempt to mount or stop a moving machine.

To avoid roll away accidents:

- Select level ground when possible to park machine.
- Do not park the machine on a grade.
- Lower the bucket to the ground.
- Put the forward / reverse lever (switch) in neutral, and pull up the parking brake switch (lever) in the ON (parking brake) position.
- Run the engine at low idle speed without load for 5 minutes to cool down the engine.
- Stop the engine and remove the key from the key switch.
- Turn the control lever lock switch to the lock (🔒) position.
- Block both tires and lower the bucket to the ground.
- Position the machine to prevent rolling.
- Park at a reasonable distance from other machines.



SA-457



SA-458

Avoid Accidents from Backing Up and Turning

- Make sure no one is working under or close to the machine before backing up or turning the machine to avoid personal injury and/or death by being run over or entangled in the machine.
  - Keep all personnel away from the machine by sounding the horn and/or using hand signals. Use extra care to be sure no one is in the articulation area before turning the machine.
  - Keep windows, mirrors, and lights in good condition.
  - Reduce travel speed when dust, heavy rain, fog, etc., reduce the visibility.
  - If good visibility is not obtained, use a signal person to guide you.



SA-383



SA-312

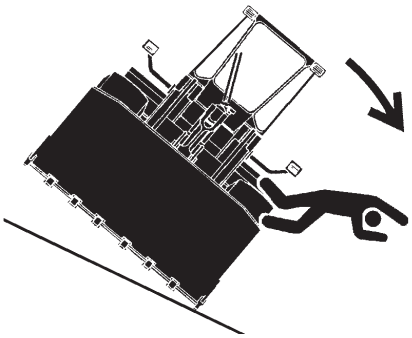
Avoid Positioning Bucket or Attachment Over Anyone



SA-518

- Never allow the bucket or attachment to pass over co-workers and/or the dump truck operator's cab. Falling soil from the bucket or contact with bucket or attachment may cause serious personal accidents and/or damage to the machine.
  - Avoid carrying the bucket or attachment over the co-workers to ensure safe operation.

Avoid Tipping



SA-463

DO NOT ATTEMPT TO JUMP CLEAR OF A TIPPING MACHINE. MACHINE WILL TIP OVER FASTER THAN YOU CAN JUMP FREE, POSSIBLY RESULTING IN SERIOUS PERSONAL INJURY OR DEATH. IF TIPPING OVER OF THE MACHINE IS EXPECTED, SECURELY HOLD THE STEERING WHEEL TO PREVENT YOUR BODY FROM BEING THROWN OUT OF THE MACHINE.

MACHINE WILL TIP OVER FASTER THAN YOU CAN JUMP FREE

FASTEN YOUR SEAT BELT

- The danger of tipping is always present when operating on a grade, possibly resulting in serious injury or death.

To avoid tipping:

- Be extra careful before operating on a gradient.
  - Prepare machine operating area flat.
  - Keep the bucket low to the ground and close to the machine.
  - Reduce operating speeds to avoid tipping or slipping.
  - Avoid changing direction when traveling on gradients.
  - If crossing the gradient is unavoidable, never attempt to travel across a gradient steeper than 5 degrees.
  - Reduce swing speed as necessary when swinging loads.
- Be careful when working on frozen ground.
  - Temperature increases will cause the ground to become soft and make ground travel unstable.

Never Undercut a High Bank

- The edges could collapse or a land slide could occur causing serious injury or death.

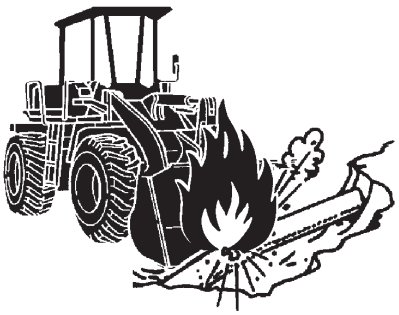


SA-519

Dig with Caution

- Accidental severing of underground cables or gas lines may cause an explosion and/or fire, possibly resulting in serious injury or death.

  - Before digging, check the location of cables, gas lines, and water lines.
  - Keep the minimum distance required by law, from cables, gas lines, and water lines.
  - If a fiber optic cable is accidentally severed, do not look into the end. Doing so may result in serious eye injury.
  - Contact your local "diggers hot line" if available in your area , and/or the utility companies directly. Have them mark all underground utilities.



SA-396

Perform Truck Loading Safely

- Do not operate the machine involuntarily. Unexpected machine movement may cause personal injury and/or death.

  - Do not lower the bucket with the lift arm control lever in the FLOAT position. The bucket may free fall, possibly causing personal injury and/or death.
  - Always select a level surface for truck loading.

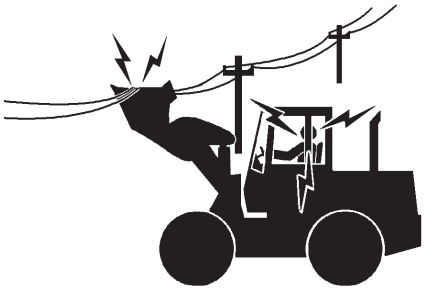


SA-397

Avoid Power Lines

Serious injury or death can result from contact with electric lines.

When operating near an electric line, never move any part of the machine or load to within 3 m (10 ft) plus twice the line insulator length of overhead wires.



SA-455

Caution with an Overhead Obstacle

- If the front attachment or any part of the machine comes in contact with an overhead obstacle, both the machine and the overhead obstacle may become damaged, and personal injury may result.

  - Take care to avoid coming in contact with overhead obstacles with the bucket or arm during operation.

Precautions for Lightning

- Lightning may strike the machine.

  If lightning comes close, immediately stop the operation, and take the following action.
  - When you are around the machine or operating cab-less machine, evacuate to a safe place far away from the machine.
  - When you are in the cab, stay in the cab until lightning has passed and safety is secured. Close the cab doors and windows. Lower the bucket to the ground, and stop the engine. Put your hands on your lap to avoid contact with any metal surfaces. Never go out of the cab.

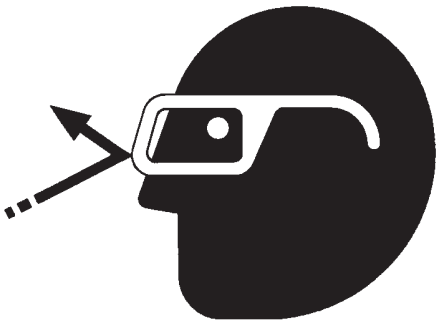
  If lightning strikes the machine or near the machine, check all of the machine safety devices for any failure after lightning has passed and safety is secured. If any trouble is found, operate the machine only after repairing it.



M4GB-0S-001

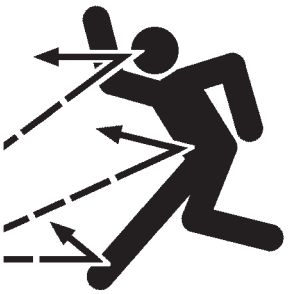
Protect Against Flying Debris and Falling Object

- During hammer operation, debris from earth, rock or metal may fly in all directions, resulting in a serious personal injury or death.
  - When driving the connecting pins in or out, wear goggles or safety glasses, hard hat and face shield.



SA-432

- During machine operation, debris from earth, rock or metal may fly off from the tire and bucket, resulting in a serious personal injury or death.
  - Ensure nobody presents in or around the work area while machine is operating.



SA-344

- Falling of accumulated earth or dirt onto people may result in a serious personal injury or death.
  - Before performing maintenance, remove accumulated debris.



SA-527

Object Handling

CRANING OPERATION USING THE MACHINE IS NOT ALLOWED.

- If a lifted load should fall, any person nearby may be struck by the falling load or may be crushed underneath it, resulting in serious injury or death.

  Never attach a sling or chain to the bucket teeth or to the attachment (fork or grapple for example). They may come off, causing the load to fall.



SA-132

Park Machine Safely

To avoid accidents:

- Park the machine on a firm, level surface.
- Lower bucket to the ground.
- Put the forward / reverse lever (switch) in neutral, and turn the parking brake switch (lever) ON (parking brake) position.
- Run the engine at low idle speed without load for 5 minutes.
- Turn key switch to OFF to stop engine.
- Remove the key from the key switch.
- Turn the control lever lock switch to the lock (🔒) position.
- Close windows, roof vent, and cab door.
- Lock all access doors and compartments.

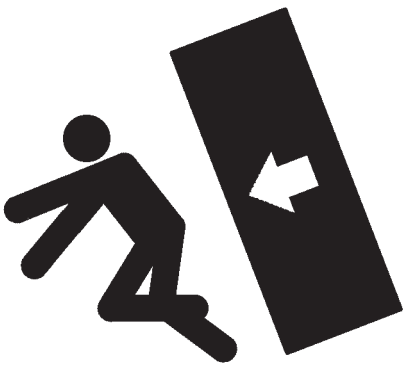


SA-456

Store Attachments Safely

- Stored attachments such as buckets, hydraulic hammers, and blades can fall and cause serious injury or death.

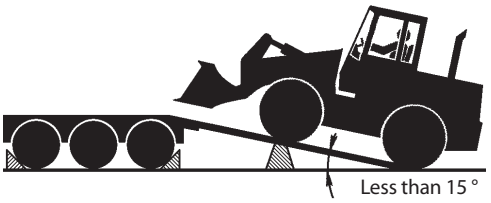
  - To avoid possible injury from attachment falling accident, use a platform when replacing an attachment.
  - Securely store attachments and implements to prevent falling. Keep children and bystanders away from storage areas.



SA-034

Transport Safely

- Take extra care when loading or unloading the machine onto or from a truck or trailer as the machine may turn over.



SA-454

  - Observe the related regulations and rules for safe transportation.
  - Confirm length, width, height and weight of the machine and select an appropriate truck or trailer for the machine to be transported.
  - Be sure to use a signal person.
  - Always follow the following precautions for loading or unloading:

1. Place machine and truck or trailer on solid and level ground.
2. Always use a ramp or deck strong enough to support the machine weight to drive on or from a truck or trailer.
3. Fasten operator's seat belt before starting driving the machine.
4. Use the low speed gear.
5. To avoid instability, never load or unload the machine onto or off a truck or trailer using the front attachment functions when driving up or down the ramp.
6. Never steer the machine while on the ramp. If the traveling direction must be changed while on the ramp, unload the machine from the ramp, reposition the machine on the ground, then try loading again.
7. At the top end of the ramp where it meets the flatbed, there is a change in angle. Take care when traveling over it.The machine will tip forward or backward.
8. After loading, install the lock bar to securely hold the articulation mechanism.
9. Place blocks in front of and behind the tires of the machine, if applicable. Securely fasten the machine to the truck or trailer deck with wire ropes.

Be sure to further follow the details described in the "TRANSPORTING" section.

Handle Fluids Safely–Avoid Fires

- Handle fuel with care; it is highly flammable. If fuel ignites, an explosion and/or a fire may occur, possibly resulting in serious injury or death.
  - Do not refuel the machine while smoking or when near open flame or sparks.
  - Always stop the engine before refueling the machine.
  - Fill the fuel tank outdoors.



SA-018

- All fuels, most lubricants, and some coolants are flammable.
  - Store flammable fluids well away from fire hazards.
  - Do not incinerate or puncture pressurized containers.
  - Do not store oily rags; they can ignite and burn spontaneously.
  - Securely tighten the fuel and oil filler caps.



SA-019

Practice Safe Maintenance

To avoid accidents:
- Understand service procedures before starting work.
- Keep the work area clean and dry.
- Do not spray water or steam inside cab.
- Never lubricate or service the machine while it is moving.
- Keep hands, feet and clothing away from power-driven parts.



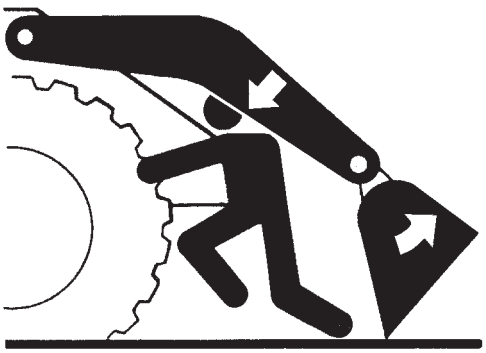
SA-028

Before servicing the machine:
1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Run the engine at low idle speed without load for 5 minutes.
4. Turn the key switch to OFF to stop engine.
5. Relieve the pressure in the hydraulic system by moving the control levers several times.
6. Remove the key from the key switch.
7. Attach a "Do Not Operate" tag on the control lever.
8. Turn the control lever lock switch to the lock (🔒) position.
9. Lock bar connects the front and rear frames.
10. Allow the engine to cool.



SA-312

- If a maintenance procedure must be performed with the engine running, do not leave machine unattended.
- Never work under a machine raised by the lift arm.
- Inspect certain parts periodically and repair or replace as necessary. Refer to the section discussing that part in the "MAINTENANCE" chapter of this manual.
- Keep all parts in good condition and properly installed.
- Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.
- When cleaning parts, always use nonflammable detergent oil. Never use highly flammable oil such as fuel oil and gasoline to clean parts or surfaces.
- Disconnect battery ground cable (-) before making adjustments to electrical systems or before performing welding on the machine.



SA-134



SA-527

- Sufficiently illuminate the work site. Use a maintenance work light when working under or inside the machine.
- Always use a work light protected with a guard. If the light bulb is broken, spilled fuel, oil, antifreeze fluid, or window washer fluid may catch fire.



SA-037

Warn Others of Service Work

- Unexpected machine movement can cause serious injury.
  - Before performing any work on the machine, attach a "Do Not Operate" tag on the control lever. This tag is available from Authorized Dealer.



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Support Machine Properly

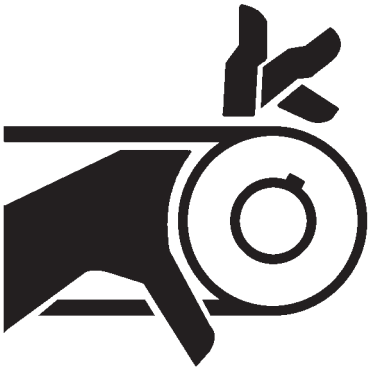
- Never attempt to work on the machine without securing the machine first.
  - Always lower the attachment to the ground before you work on the machine.
  - If you must work on a lifted machine or attachment, securely support the machine or attachment. Do not support the machine on cinder blocks, hollow tires, or props that may crumble under continuous load. Do not work under a machine that is supported solely by a jack.



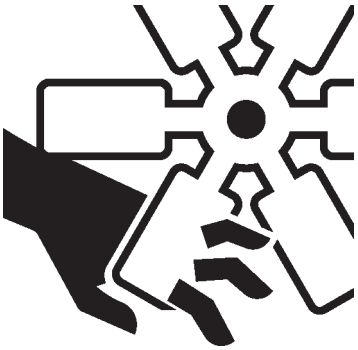
SA-527

Stay Clear of Moving Parts

- Entanglement in moving parts can cause serious injury.
  - To prevent accidents, care should be taken to ensure that hands, feet, clothing, jewelry and hair do not become entangled when working around rotating parts.



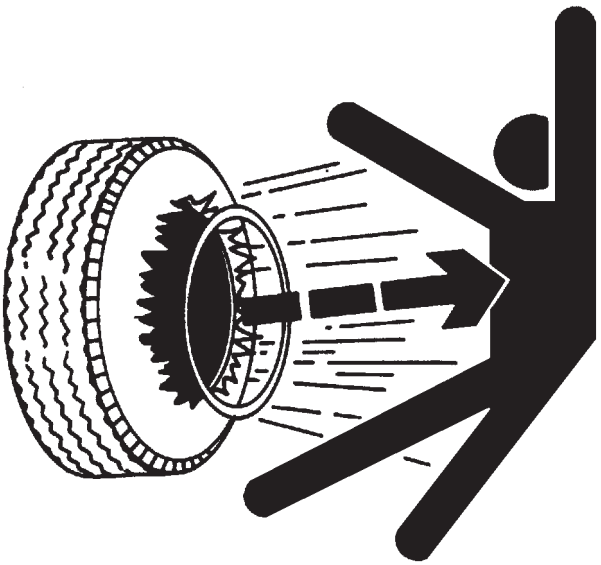
SA-026



SA-2294

Support Maintenance Properly

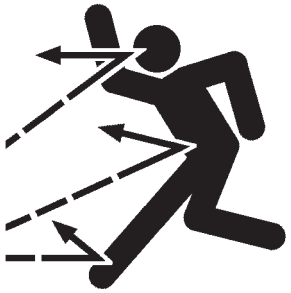
- Explosive separation of a tire and rim parts can cause serious injury or death.
  - Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job. Have it done by Authorized Dealer or a qualified repair service.
  - Always maintain the correct tire pressure. DO NOT inflate tire above the recommended pressure.
  - When inflating tires, use a chip-on chuck and extension hose long enough to allow you to stand to one side and not in front of or over the tire assembly. Use a safety cage if available.
  - Inspect tires and wheels daily. Do not operate with low pressure, cuts bubbles, damaged rims, or missing lug bolts and nuts.
  - Never cut or weld on an inflated tire or rim assembly. Heat from welding could cause an increase in pressure and may result in tire explosion.



SA-249

Prevent Parts from Flying

- Travel reduction gears are under pressure.
  - As pieces may fly off, be sure to keep body and face away from AIR RELEASE PLUG to avoid injury.
  - GEAR OIL is hot. Wait for GEAR OIL to cool, then gradually loosen AIR RELEASE PLUG to release pressure.



SA-344

Prevent Burns

Hot spraying fluids:

- After operation, engine coolant is hot and under pressure. Hot water or steam is contained in the engine, radiator and heater lines.
  Skin contact with escaping hot water or steam can cause severe burns.
  - Avoid possible injury from hot spraying water. DO NOT remove the radiator cap until the engine is cool. When opening, turn the cap slowly to the stop. Allow all pressure to be released before removing the cap.
  - The hydraulic oil tank is pressurized. Again, be sure to release all pressure before removing the cap.



SA-039

Hot fluids and surfaces:

- Engine oil, gear oil and hydraulic oil also become hot during operation.
  The engine, hoses, lines and other parts become hot as well.
  - Wait for the oil and components to cool before starting any maintenance or inspection work.



SA-225

Replace Rubber Hoses Periodically

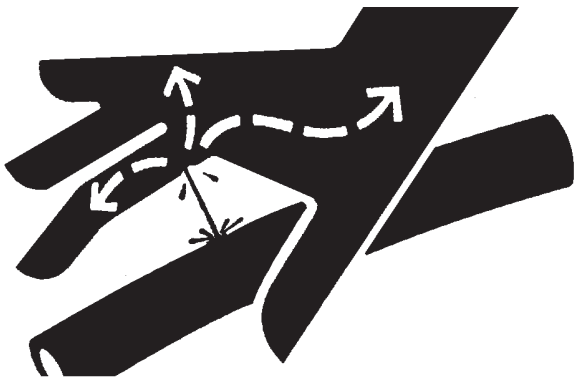
- Rubber hoses that contain flammable fluids under pressure may break due to aging, fatigue, and abrasion. It is very difficult to gauge the extent of deterioration due to aging, fatigue, and abrasion of rubber hoses by inspection alone.
  - Periodically replace the rubber hoses. (See the page of "Periodic replacement of parts" in the operator's manual.)
- Failure to periodically replace rubber hoses may cause a fire, fluid injection into skin, or the front attachment to fall on a person nearby, which may result in severe burns, gangrene, or otherwise serious injury or death.



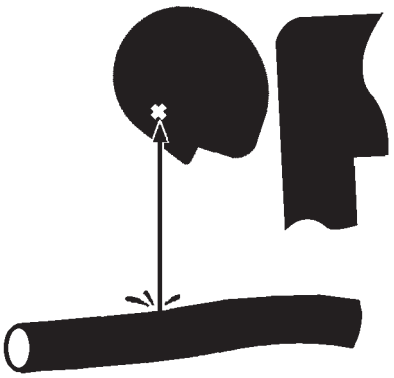
SA-019

Avoid High-Pressure Fluids

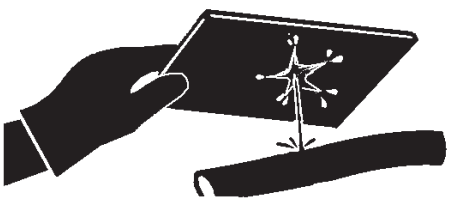
- Fluids such as diesel fuel or hydraulic oil under pressure can penetrate the skin or eyes causing serious injury, blindness or death.
  - Avoid this hazard by relieving pressure before disconnecting hydraulic or other lines.
  - Tighten all connections before applying pressure.
  - Search for leaks with a piece of cardboard; take care to protect hands and body from high-pressure fluids. Wear a face shield or goggles for eye protection.
  - If an accident occurs, see a doctor familiar with this type of injury immediately. Any fluid injected into the skin must be surgically removed within a few hours, or gangrene may result.



SA-031



SA-292



SA-044

Prevent Fires



SA-019

Check for Oil Leaks:

- Fuel, hydraulic oil and lubricant leaks can lead to fires.
  - Check for oil leaks due to missing or loose clamps, kinked hoses, lines or hoses that rub against each other, damage to the oil-cooler, and loose oil-cooler flange bolts.
  - Tighten, repair or replace any missing, loose or damaged clamps, lines, hoses, oil-cooler and oil-cooler flange bolts.
  - Do not bend or strike high-pressure lines.
  - Never install bent or damaged lines, pipes, or hoses.
  - Replace fuel hoses and hydraulic hoses periodically even if there is no abnormality in their external appearance.

Check for Shorts:

- Short circuits can cause fires.
  - Clean and tighten all electrical connections.
  - Check before each shift or after eight (8) to ten (10) hours operation for loose, kinked, hardened or frayed electrical cables and wires.
  - Check before each shift or after eight (8) to ten (10) hours operation for missing or damaged terminal caps.
  - DO NOT OPERATE MACHINE if cable or wires are loose, kinked, etc.
  - Never attempt to modify electric wiring.

Clean up Flammable Materials:

- Spilled fuel and oil, and trash, grease, debris, accumulated coal dust, and other flammable materials may cause fires.
  - Prevent fires by inspecting and cleaning the machine daily, and by removing adhered oil or accumulated flammable materials immediately. Check and clean high temperature parts such as the exhaust outlet and mufflers earlier than the normal interval.
  - Do not wrap high temperature parts such as a muffler or exhaust pipe with oil absorbents.
  - Do not store oily cloths as they are vulnerable to catching fire.
  - Keep flammable materials away from open flames.
  - Do not ignite or crush a pressurized or sealed container.
  - Wire screens may be provided on openings on the engine compartment covers to prevent flammable materials such as dead leaves from entering. However, flammable materials which have passed through the wire screen may cause fires. Check and clean the machine every day and immediately remove accumulated flammable materials.

Clean up Flammable Materials:
Check Key Switch:

- If a fire breaks out, failure to stop the engine will escalate the fire, hampering fire fighting.
  Always check key switch function before operating the machine every day:
  1. Start the engine and run it at low idle.
  2. Turn the key switch to the OFF position to confirm that the engine stops.
  - If any abnormalities are found, be sure to repair them before operating the machine.

Check Heat Shields:

- Damaged or missing heat shields may lead to fires.
  - Damaged or missing heat shields must be repaired or replaced before operating the machine.
  - If hydraulic hoses are broken while the engine cover is open, splattered oil on the high temperature parts such as mufflers may cause fire. Always close the engine cover while operating the machine.

Evacuating in Case of Fire

- If a fire breaks out, evacuate the machine in the following way:
  - Stop the engine by turning the key switch to the OFF position if there is time.
  - Use a fire extinguisher if there is time.
  - Exit the machine.
- In an emergency, if the cab door can not be opened, break the front or rear window panes with the emergency evacuation hammer to escape from the cab. Refer to the explanation pages on the Emergency Evacuation Method.



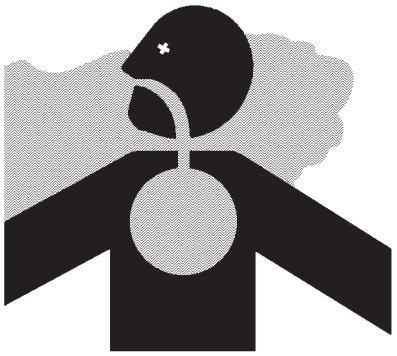
SA-393



SS-1510

Beware of Exhaust Fumes

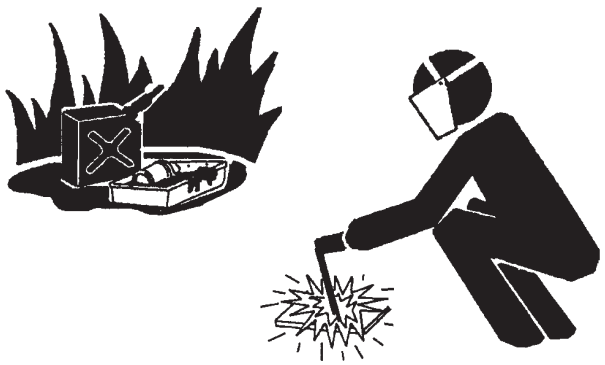
- Prevent asphyxiation. Engine exhaust fumes can cause sickness or death.
  - If you must operate in a building, be sure there is adequate ventilation. Either use an exhaust pipe extension to remove the exhaust fumes or open doors and windows to bring enough outside air into the area.
  - PM (Particle Matter) combustion may generate white smoke during aftertreatment device regeneration. Do not attempt to perform aftertreatment device manual regeneration in a badly ventilated indoors.



SA-016

Precautions for Welding and Grinding

- Welding may generate gas and/or small fires.
  - Be sure to perform welding in a well ventilated and prepared area. Store flammable objects in a safe place before starting welding.
  - Only qualified personnel should perform welding. Never allow an unqualified person to perform welding.
  - Turn the battery disconnect switch to the OFF position before performing welding on the machine.
- Grinding on the machine may create fire hazards. Store flammable objects in a safe place before starting grinding.
- After finishing welding and grinding, recheck that there are no abnormalities such as the area surrounding the welded area still smoldering.



SA-818

Avoid Heating Near Pressurized Fluid Lines

- Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders.
  - Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials.
  - Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area. Install temporary fire-resistant guards to protect hoses or other materials before engaging in welding, soldering, etc.



SA-030

Avoid Applying Heat to Lines Containing Flammable Fluids

- Do not weld or flame cut pipes or tubes that contain flammable fluids.
- Clean pipes and tubes thoroughly with non-flammable solvent before welding or flame cutting.

Precautions for Handling Accumulator and Gas Damper

High-pressure nitrogen gas is sealed in the accumulator and the gas damper. Inappropriate handling may cause explosion, possibly resulting in serious injury or death.

Strictly comply with the following items:

- Do not disassemble the unit.
- Keep the units away from open flames and fire.
- Do not bore a hole, do not cut by torch.
- Avoid giving shocks by hitting or rolling the unit.
- Before disposing of the unit, sealed gas must be released. Consult Authorized Dealer.

Precautions for Diesel Exhaust Fluid (DEF)

- Diesel exhaust fluid (DEF), commonly referred to as DEF is an aqueous urea solution used as a consumable in selective catalytic reduction (SCR) to lower NOx concentration in the exhaust emissions from the engine.
  It is a non-flammable and non-hazardous solution, and harmful effects are not expected under normal conditions of use.
- In case of a fire, DEF would decompose and generate ammonia gas when heated to 160 °C (320 °F) or higher. Ammonia gas may cause lung injury and potentially is fatal if inhaled. It is a corrosive gas and the liquefied gas can cause frostbite and corrosive injury to eyes and skin.
  In case of contact, immediately flush skin with plenty of water at least 15 minutes while removing contaminated clothing. Get medical attention if symptoms occur.
- DEF is corrosive to steel, aluminium, copper and brass, etc. If DEF is spilled on your vehicle, wipe off and rinse with water.
- For the handling of DEF, follow handling precautions on Material Safety Data Sheet. Have suitable emergency equipment for fires, spills and leaks readily available. Practice good housekeeping. Maintain handling equipment. Comply with applicable regulations.

Remove Paint Before Welding or Heating

- Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch. If inhaled, these fumes may cause sickness.

  - Avoid potentially toxic fumes and dust.
  - Do all such work outside or in a well-ventilated area. Dispose of paint and solvent properly.
  - Remove paint before welding or heating:

  1. If you sand or grind paint, avoid breathing the dust.

     Wear an approved respirator.

  2. If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.



SA-029

Beware of Asbestos and Silica Dust and Other Contamination

- Take care not to inhale dust produced in the work site. Inhalation of asbestos fibers may be the cause of lung cancer.
  Inhalation of silica dust and other contamination may cause sickness.

  - Depending on the work site conditions, the risk of inhaling asbestos fiber, silica dust or other contamination may exist. Spray water to prevent asbestos fibers, silica dust or other contamination from becoming airborne. Do not use compressed air.
  - When operating the machine in a work site where asbestos fibers, silica dust or other contaminations might be present, be sure to operate the machine upwind, and wear a mask rated to prevent the inhalation of asbestos, silica dust or other contaminations.
  - Keep bystanders out of the work site during operation.
  - Asbestos might be present in non-genuine parts. Use only genuine Hitachi Construction Machinery Parts.



SA-029

Prevent Battery Explosions

- Battery gas can explode.
  - Keep sparks, lighted matches, and flame away from the top of battery.
  - Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.
  - Do not charge a frozen battery; it may explode. Warm the battery to 16 °C (60 °F) first.
  - Do not continue to use or charge the battery when electrolyte level is lower than specified. Explosion of the battery may result.
  - Loose terminals may produce sparks. Securely tighten all terminals.
  - Connect terminals to the correct electrical poles. Failure to do so may cause damage to the electrical parts or fire.
- Battery electrolyte is poisonous. If the battery should explode, battery electrolyte may be splashed into eyes, possibly resulting in blindness.
  - Be sure to wear eye protection when checking electrolyte specific gravity.



SA-032

Service Air Conditioning System Safely

- If air conditioner refrigerant contacts your eyes or skin, it could potentially cause blindness or frostbite.
  - Refer to the instructions described on the container for proper use when handling the refrigerant.
  - Use a recovery and recycling system to avoid leaking refrigerant into the atmosphere.
  - Never touch the refrigerant.



SA-405

Handle Chemical Products Safely

- Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with your machine include such items as lubricants, coolants, paints, and adhesives.

  - A Safety Data Sheet (SDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques.
  - Check the SDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and use recommended equipment.
  - See Authorized Dealer for SDS's (available only in English) on chemical products used with your machine.

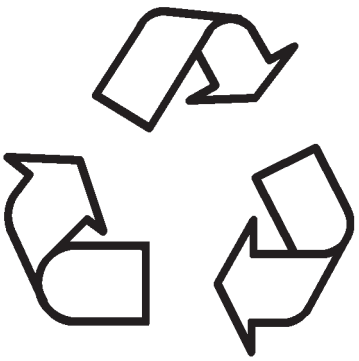


SA-2579

Dispose of Waste Properly

- Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with Hitachi Construction Machinery equipment includes such items as oil, fuel, coolant, DEF, brake fluid, filters, and batteries.

  - Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.
  - Do not pour waste onto the ground, down a drain, or into any water source.
  - Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.
  - Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from Authorized Dealer.



SA-226

Notes on Aftertreatment Device

About Aftertreatment Device

The aftertreatment device removes particulate matter (PM) and NOx (Nitrogen Oxide) from the exhaust gas. Follow the instructions below to prevent the aftertreatment device from being damaged.

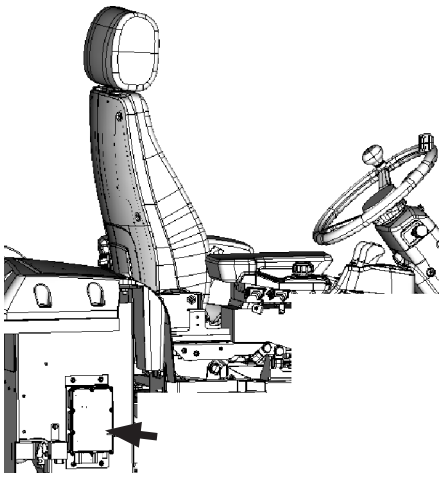
WARNING: Exhaust gas from the aftertreatment device, muffler, exhaust piping and tail piping becomes hot during and right after engine running and regeneration of aftertreatment device. Keep away from the exhaust system or hot gas from the exhaust piping during regeneration. Be careful to avoid skin contact with exhaust gas. It may cause severe burns.

- White smoke may be generated during aftertreatment device regeneration. Do not attempt to perform aftertreatment device manual regeneration in a badly ventilated area.
- Do not touch water coming directly out of the aftertreatment device. The water is mildly-acidic by oxidation catalyst mounted in the aftertreatment device. If filter water spills on your skin, immediately flush it out with clean water.

Precautions for Communication Terminal

Electrical wave transmitted from the communication terminal may cause malfunction of other electronic devices.
Inquire to the device manufacturer for information on electrical wave disturbance when using an electronic device near the communication terminal.

Precaution for Communication Terminal Equipment



MNUD-00-005

This machine is installed with a communication terminal emitting radio waves behind the operator's seat. There is a possibility that a medical device, including an implantable device such as a cardiac pacemaker, could be affected and malfunction due to the electrical waves emitted from the communication terminal.

For those who uses medical devices as above should adjust the operator's seat position to keep the distance between medical device and the communication terminal are at least 15 centimeters (6 inches) at all times. If this condition cannot be met, please contact Authorized Dealer and have the person in charge stop the communication terminal from functioning completely and confirm that no radio waves are emitted before operating the machine.

The effect of radio waves from communication terminal on the human body can be evaluated by measuring Specific Absorption Rate ("SAR"), which is a measure of the amount of radio frequency energy absorbed by the body when using a wireless application such as a mobile phone.
All communication terminal installed in this machine comply with technical standards and international guidelines regarding the absorption of radio waves by the human body.

There are two SAR measurement method and the safety standards, 2.0 W/kg (measured by 10 g per unit) and 1.6 W/kg (measured by 1 g per unit), either one is adopted depending on the country.

This machine is equipped with a communication terminal model HPRO-100, HPRO-4G, HPRO-4G V2 or QConnect. Consult Authorized Dealer for the model of communication terminal.

Specific Absorption Rate ("SAR") of communication terminal.
The values in () are based on Taiwanese regulations.

	HPRO-100	HPRO-4G*	HPRO-4G V2	QConnect *
1.6 W/kg (3.5 W/lb) (1 g (0.04 oz)/unit)	0.51 W/kg (1.12 W/lb)	0.91 W/kg (2.0 W/lb)	0.74 W/kg (1.63 W/lb)	-
2.0 W/kg (4.4 W/lb) (10 g (0.35 oz)/unit)	0.12 W/kg (0.26 W/lb)	0.50 W/kg (1.1 W/lb)	0.44 W/kg (0.97 W/lb)	-
		(0.31 W/kg (0.68 W/lb))		(0.25 W/kg (0.55 W/lb))

This data was measured by having each type of communication terminal used with this machine, and a human body set apart by 3 centimeters (1.18 inches).

Precautions in Taiwan*: Under the Taiwanese regulations, the maximum SAR value is set as the standard value 2 W/kg.
The actual measurement value is 0.25 W/kg using QConnect, and 0.31 W/kg using HPRO-4G.

- Never attempt to disassemble, repair, modify or displace the communication terminal, antennas or cables. Failure to do so may result in damage and/or fire to the base machine or to the communication terminal. (When required to remove or install the communication terminal, consult Authorized Dealer.)
- Do not pinch or forcibly pull cables, cords or connectors. Failure to do so may cause short circuit or broken circuit that may result in damage and/or fire to the base machine or to the communication terminal.

Precaution for Joystick Steering System

When operating with steering wheel (3), disable the joystick steering system (JSS) and turn off joystick steering selector switch (5). If part of the driver's body should touch the JSS lever or switch, it could result in the machine moving unexpectedly and result in a serious personal injury.

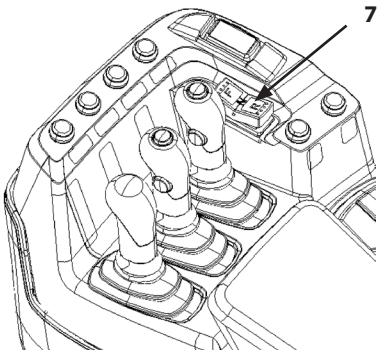
WARNING:

- **Accidental movement of joystick steering lever (2) while getting on or off the machine may cause unexpected movement of the machine resulting in an accident, injury, or death. Always stop, and properly park the machine and turn off the joystick steering system while getting on or off the machine.**
- **When leaving the operator's station, lift up left console (1) to the disabled position. Once left console (1) is lifted up to the disabled position, it is locked.**

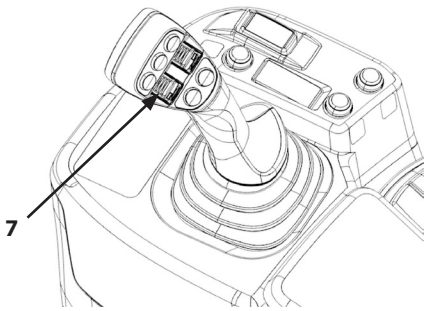
IMPORTANT: Left console (1) is not locked when in the operating position. When the console is lifted 30° (type A) / 10° (type B) above the operating position, the joystick steering function is disabled.

To turn OFF:

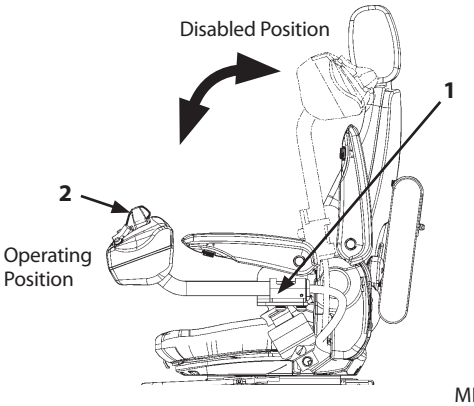
1. Make sure forward/reverse lever (4) and forward/reverse switches (right)(7) and (left)(6) are all in the neutral (N) position.



Fingertip Control Type MNUD-05-003

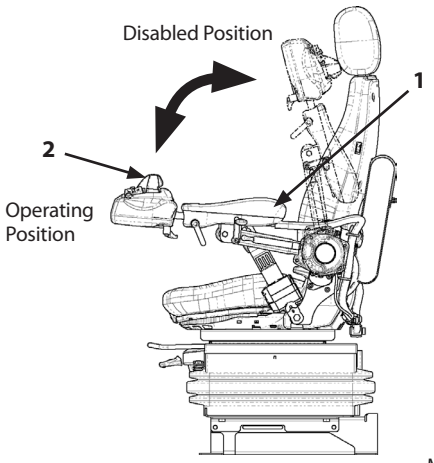


Multi-Function Joystick Type MNUD-05-004



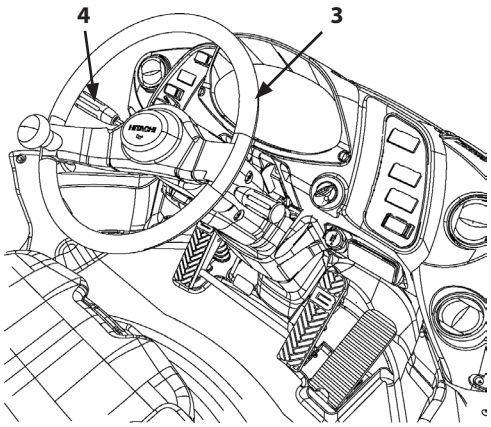
MNEK-13-005

Type A

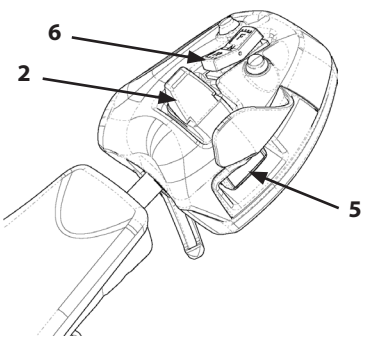


MNFQ-01-022

Type B

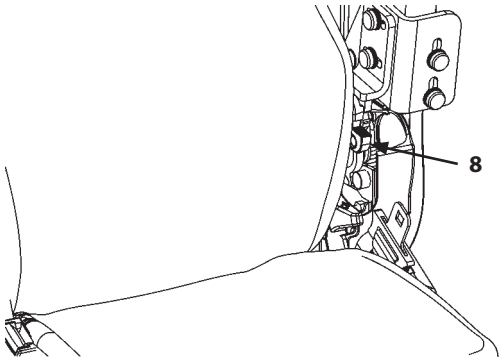


MNUD-01-010



MNFQ-01-023

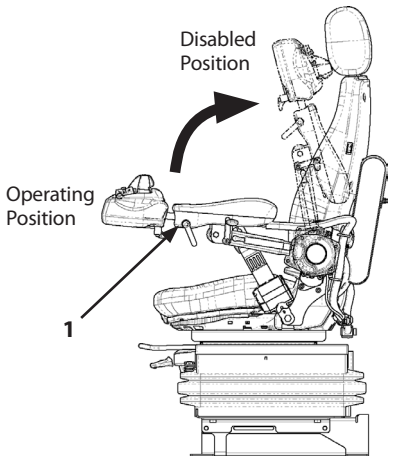
2. Push down lock lever (8)(Type A only).



MNEK-13-003

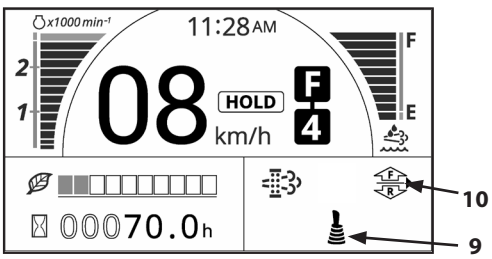
Type A

3. Hold the pipe of left console (1) and lift to the fully raised position.
   When left console (1) is fully raised, the joystick steering system is turned off automatically.



MNFQ-01-022

4. Joystick steering indicator (9) and forward/reverse selector switch indicator (10) are not displayed on the main monitor.



MNUD-01-018

Precautions for Aerial Angle (If Equipped)

WARNING:

- **The aerial angle is a system that assists in checking obstacles. Do not operate the machine only by looking at the aerial angle images, but check the surroundings with your own eyes.**
- **Some areas cannot be displayed on the monitor by the camera, and the monitor image has a blind spot. Also, the actual appearance may differ from the images displayed on the monitor.**
- **Do not operate the monitor while driving or operating the machine.**

If you do not properly understand this nature of the aerial angle images, you may cause serious property damage or personal injury.

Precautions for Rear Obstacle Detection System (If Equipped)

WARNING:

- **Do not rely on the rear camera and radar object detection system to determine if personnel are behind the machine.**
- **The system has limitations due to maintenance practices, environmental conditions, and operating range.**

The obstacle detection system is designed to enhance the operator's awareness of the machine surroundings. Use of this system does not replace basic safety precautions and procedures for operating the machine.

IMPORTANT: Perform operational check of radar object detection (ROD) system properly. Inspect and clean camera lens and ROD system sensor face. Refer to "MAINTENANCE" section for the procedures.

Please be noticed that detection area shape, size, relative location, and composition varies according to operational and external factors, such as weather, interference, presence of other systems.

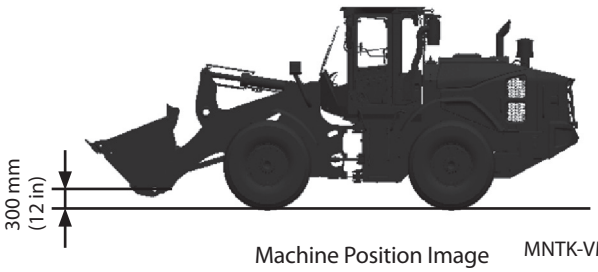
Visibility Map for Machine Model ZW310-7 Personal Hazard

This machine complies with the essential health and safety requirements for visibility set out by Machinery Directive 2006/42/EC. The map shows the residual masking (blind spots) observed by a seated operator (wearing the recommended seat restraint) in the cab using direct vision and the standard visual aids supplied with the machine. Additionally, operators are encouraged to adjust the mirrors provided to the machine to show the area as shown below.

This map shows an approximation of the residual masking. This can be used as a guide when conducting a site risk assessment, utilized for site management and to consider additional visual aids.

Conditions: Driver's visibility on 1mRB and VTC are evaluated under ISO 5006.

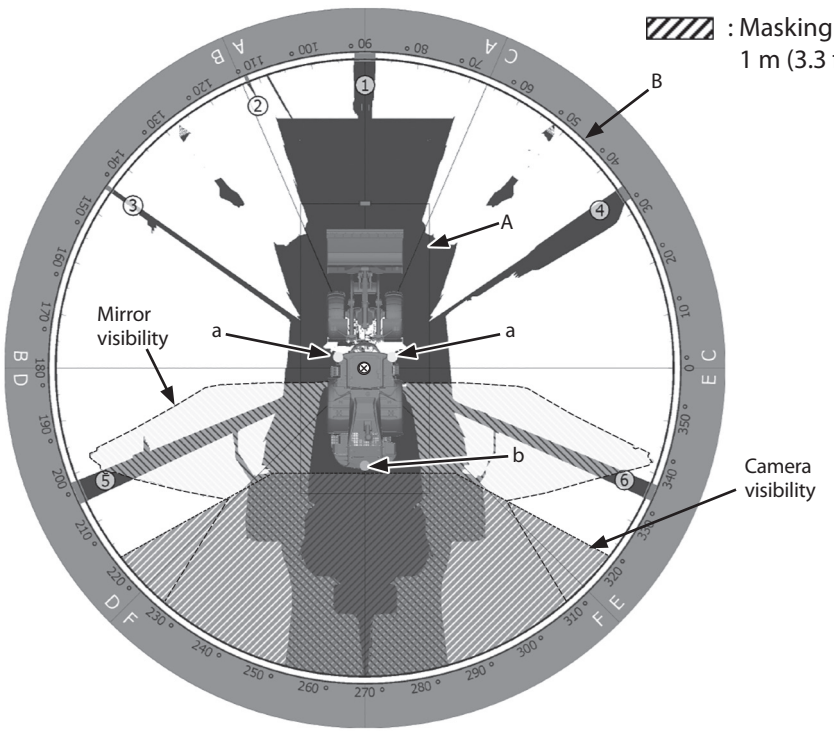
Test Height (on 1 m (3.3 ft) RB):	1.2 m to 1.5 m (4 ft to 5 ft)
(1 m (3.3 ft) RB to VTC/on VTC):	Ground Level
Operator eye Height:	1.2 m (4 ft) from the cab
Machine Configuration:	Standard/High lift arm
Machine Position:	Travel Position (For the detail position, see the image below)
Applicable visual aids:	1. Standard mirror (s) 2. Standard rear view camera



Machine Position Image MNTK-VM-001

⊗ : Operator's eye point
A : 1 m (3.3 ft) Rectangular Boundary (1 m (3.3 ft) RB)
B : 12 m (39.4 ft) Visibility Test Circle (VTC)
a : Standard Mirror (s)
b : Standard rear view camera

: Masking area
: Mirror visibility
: Camera visibility
: Masking on 1 m (3.3 ft) RB/VTC



Visibility Map MNFQ-VM-005

Visibility Map for Machine Model ZW310-7 Aerial Angle (Surround View) (Optional)

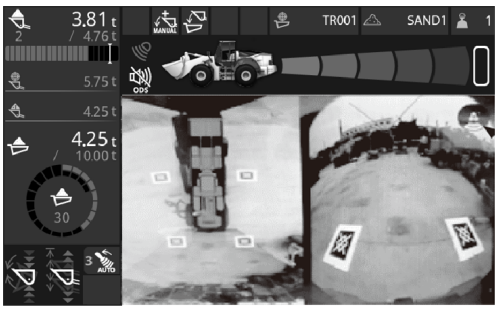
This map shows the area where a person 1.6 m (6 ft) tall is displayed on the monitor screen in a recognizable size, minimal 7.0 mm (0.28 in) according to ISO 16001. This map can be used as a guide when conducting a site risk assessment.

NOTE: local circumstances, contrast between colors, light intensity etc. may affect Visibility performance.

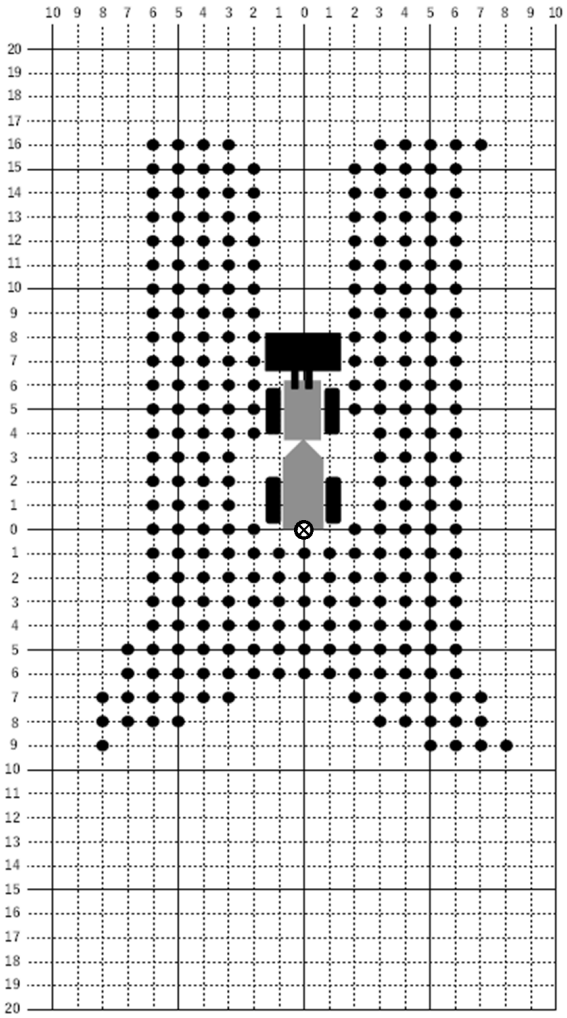
Area where a person is recognizably displayed on the monitor

⊗ : measurement center point

- : location where 1.6 m (6 ft) person shown as minimal 7.0 mm (0.28 in) on the monitor

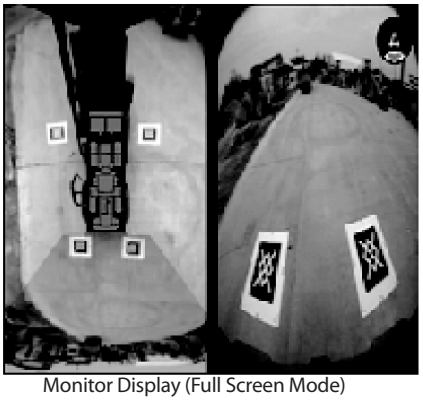


Monitor Display (Basic Mode)

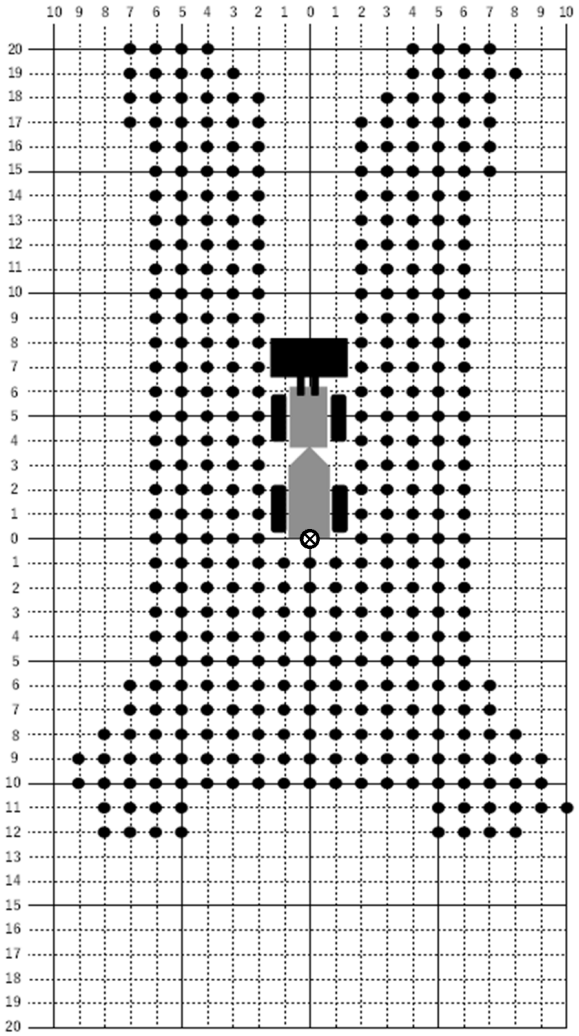


Aerial Angle Visibility Map
"Surrounding Image + Image to Rear"

MNFQ-VM-003



Monitor Display (Full Screen Mode)



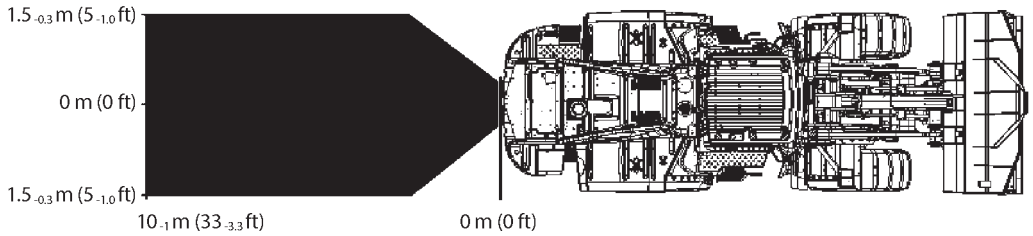
Aerial Angle Visibility Map
"Surrounding Image + Image to Rear"

MNFQ-VM-002

Visibility Map for Machine Model ZW310-7 Rear Obstacle Detection Sensor (Optional)

The rear obstacle detection (ROD) system can detect most objects within the detection zone.
However, there are factors such as object size, shape, relative location, and composition that could cause an object to go undetected by the system.

ROD Sensor Detection Zone

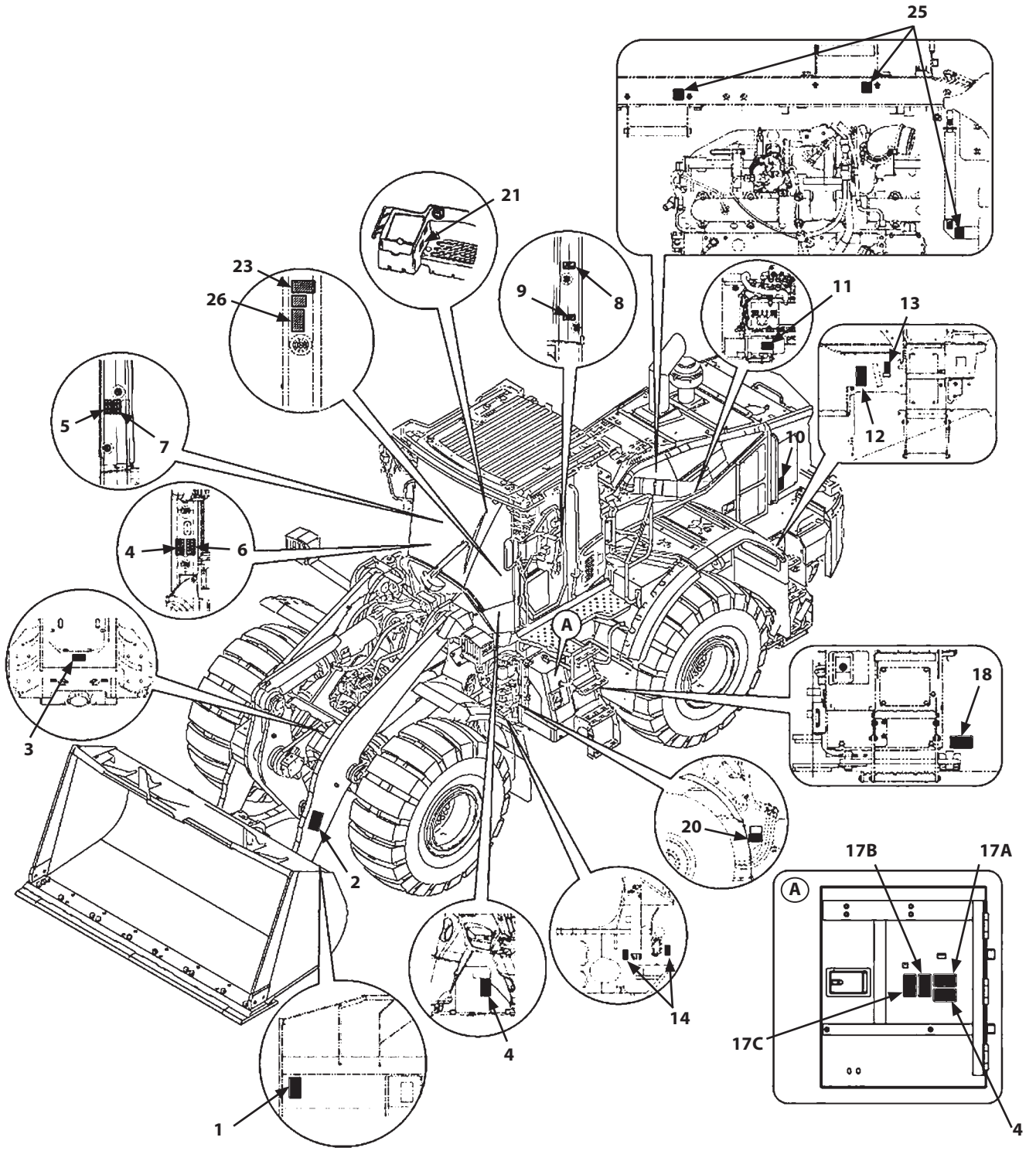


*15dBSM Reflector is used for checking the detection zone

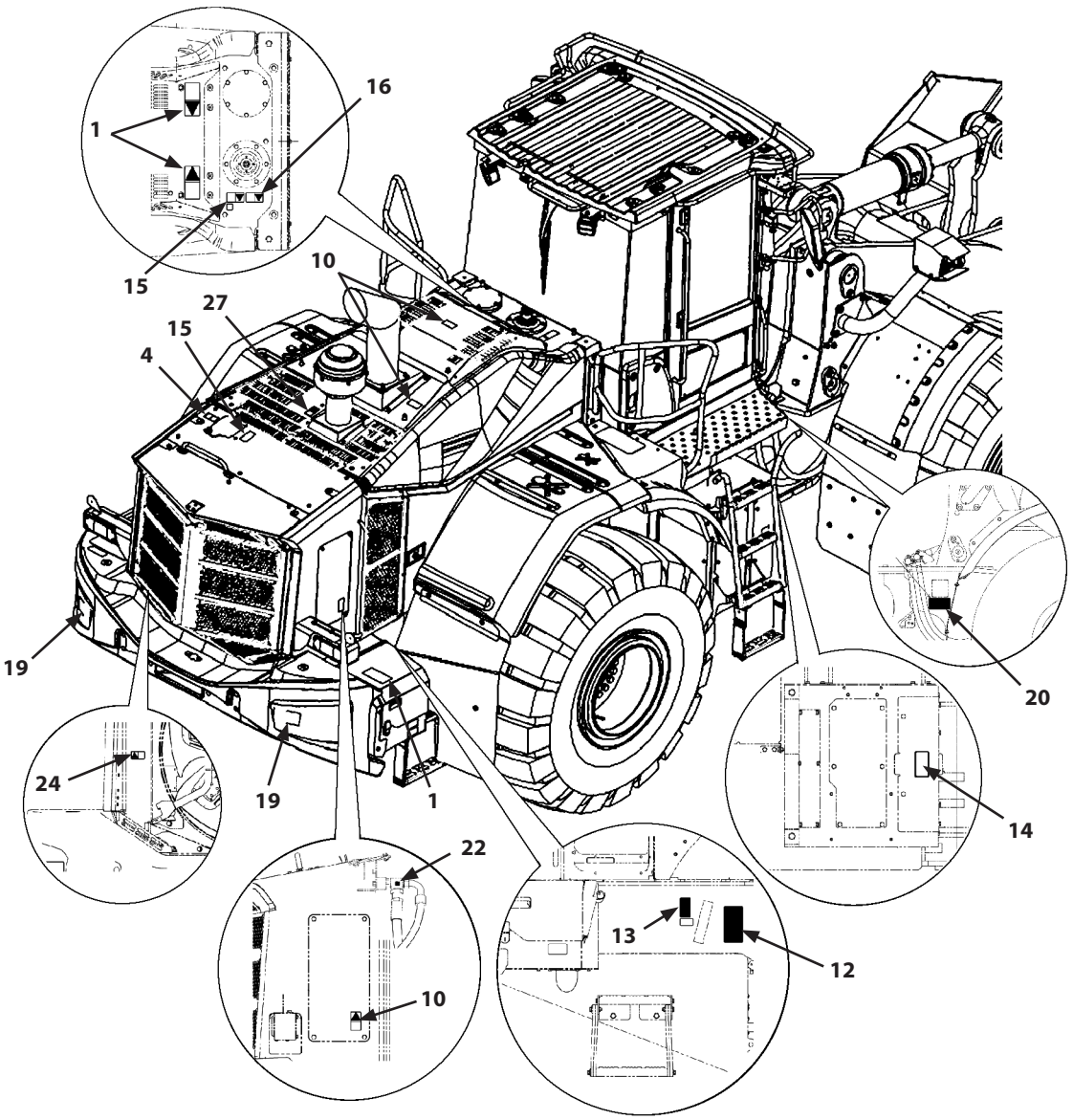
MNFQ-VM-004

Safety Signs

All safety signs and their locations affixed on the machine are illustrated in this section. Make sure of the contents described in the safety signs by reading the actual signs affixed on the machine, to ensure safe machine operation. Always keep the safety signs clean. If a safety sign is broken or lost, immediately, obtain a new replacement and affix it again in position on the machine. Use the part number indicated under the right corner of each safety sign illustration when placing an order of it to the Authorized Dealer.



SS-4711



SS-4562

1. Bucket, Hood, Tool Box

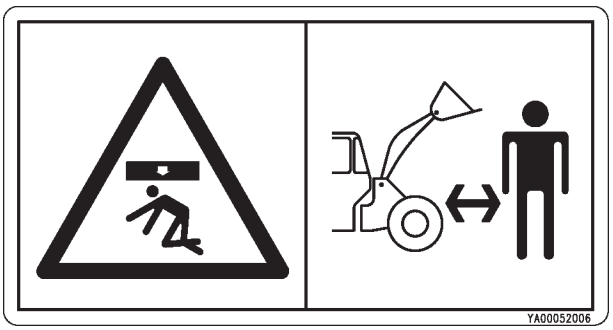
Sign indicates a hazard of falling. Do not stand on this place.



SS3092126-2

2. Both Sides of Lift Arm

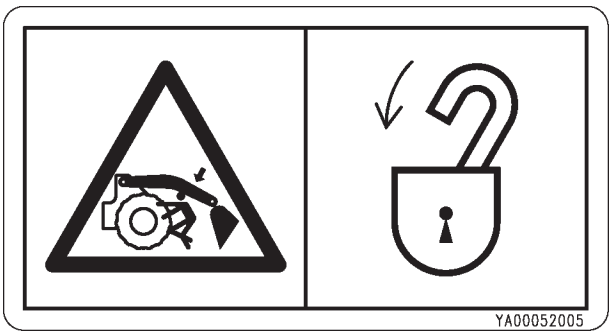
During operation, loads may spill from the bucket and/ or the bucket may suddenly fall.
Keep everyone far away from the machine during operation.



SSYA00052006

3. Front Maintenance Access Cover for Front Frame

The front attachment may automatically be lowered, possibly resulting in personal injury. Lower the front attachment to the ground before inspecting/maintaining the machine.
If inspection and/or maintenance work must unavoidably be performed with the front attachment raised, lock the front attachment control levers in position. Securely, support the front attachment with safety stays and/or blocks.

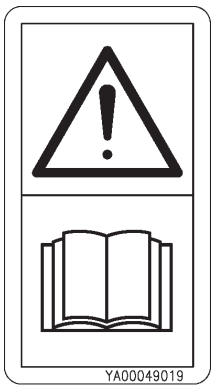


SSYA00052005

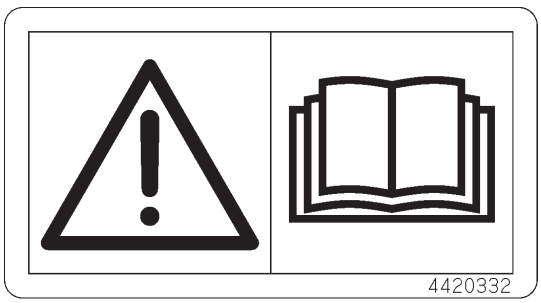
4. Cab Inside Right Front Column, Front Console Lower Left

   Inside Battery Box

Prior to operation, maintenance, disassembling, and transportation of the machine, be sure to read and understand the Operator's Manual.



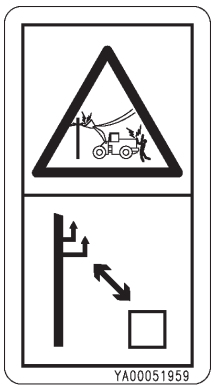
SSYA00049019



SS4420332-2

5. Cab Inside Right Rear Column

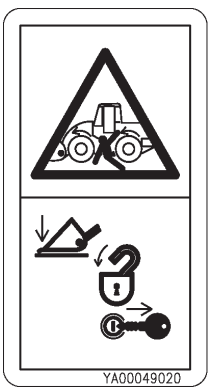
Sign indicates an electrocution hazard if machine is brought too near electric power lines. Keep a safe distance from electric power lines.



SSYA00051959

6. Cab Inside Right Front Column

If the parked machine starts moving unexpectedly, personal injury or death due to entanglement in moving parts or running over by the machine may result. Before leaving the machine, lower the front attachment to the ground, lock the control levers, and remove the key from the key switch.



SSYA00049020

7. Cab Inside Right Rear Column

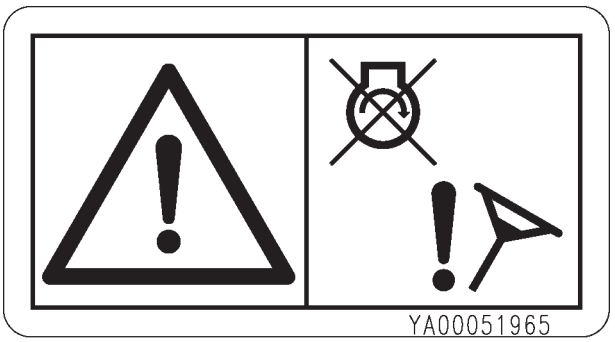
To minimize the injury due to an overturning accident, be sure to fasten the seat belt prior to operating the machine.



SSYA00049023

8. Cab Inside Left Rear Column

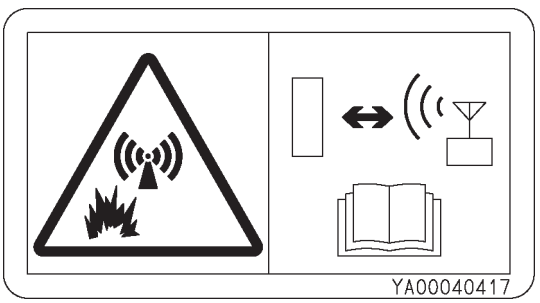
If the steering system is abnormal, the emergency steering system is activated so that steering operation can be achieved on a temporary basis. The steering wheel will become hard to rotate but it is operable. Immediately park the machine in a safe location.
If the machine is operated with an abnormal steering system, a serious accident may result.



SSYA00051965

9. Cab Inside Left Rear Column

Communication terminal can cause accidental bombing at the blasting site. Keep the machine apart from the blasting site and an electric detonator to maintain a safe distance.



SSYA00040417

10. Both Sides of Side Cover, Hood

25. Inside of Left Side Cover at Handrails

Avoid skin contact with highly heated parts such as the engine, muffler, etc. immediately after operation of the machine. Severe burns may result.
Do not touch until cool.

10.



SSYA00051986-1

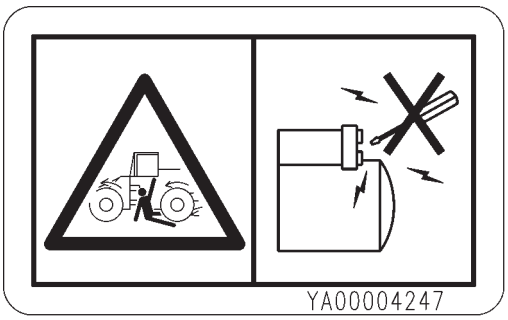
25.



SSYA00080644

11. Side of Engine Starter

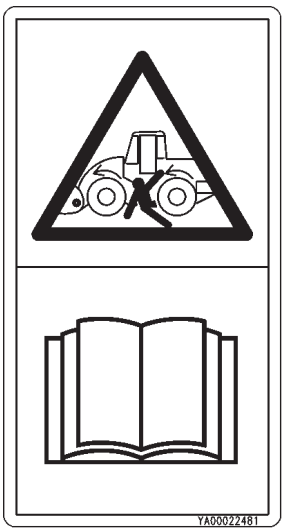
If the engine is started following an incorrect method, the machine suddenly may start to move.
Start the engine from the operator's seat only.



SSYA00004247-1

12. Both Sides of Rear Frame under Side Cover

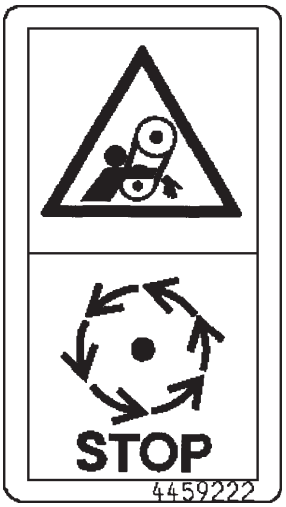
If the engine is started following an incorrect method, the machine suddenly may start to move.
Start the engine from the operator's seat only.



SSYA00022481-2

13. Both Sides of Rear Frame under Side Cover

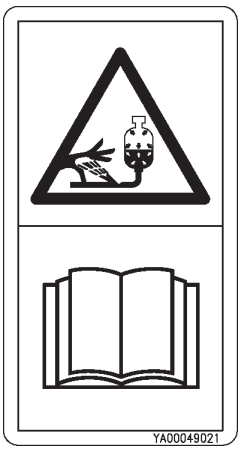
Sign indicates a hazard of rotating parts, such as belt. Turn off before inspection and maintenance.



SS4459222-1

14. Beside Each Accumulator

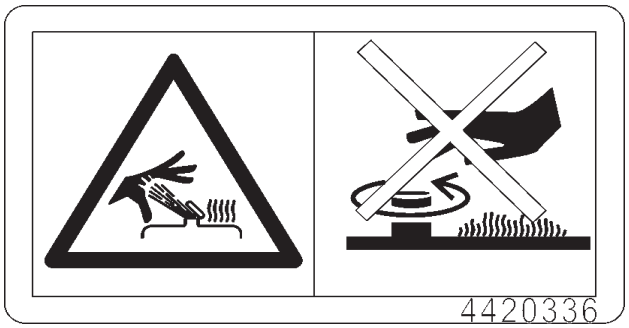
The accumulator has been charged with high-pressure nitrogen gas. lnappropriate handling may cause explosion, possibly resulting in serious injury or death. Read operator's manual for safe and proper handing.



SSYA00049021

15. Top of Hydraulic Oil Tank and Coolant Replenishment Port

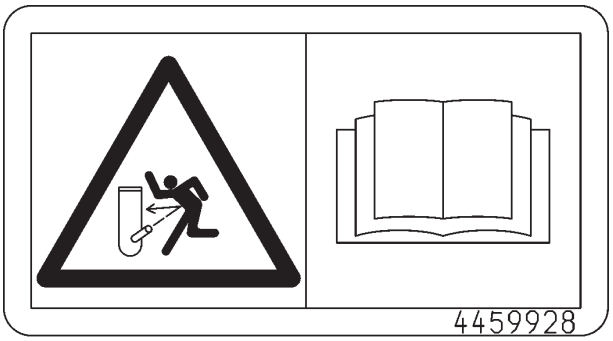
Sign indicates a burn hazard from spurting hot water or oil if radiator or hydraulic tank is uncapped while hot.
Allow radiator or hydraulic tank to cool before removing cap.



SS4420336-3

16. Top of Hydraulic Oil Tank

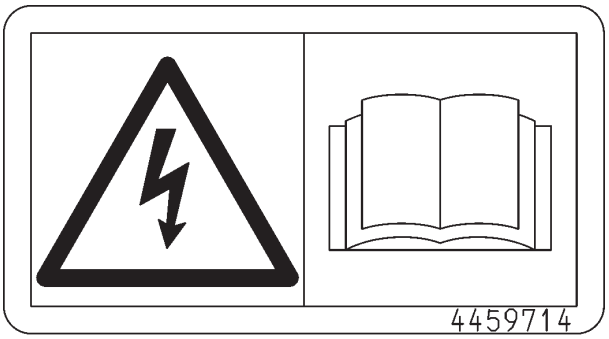
Sign indicates a burn hazard from compressed air and spurting hot oil if the oil inlet is uncapped during or right after operation.
Read manual for safe and proper handling.



SS4459928-1

17. Inside Battery Box

A.
Sign indicates an electrical hazard from handling the cable. Read manual for safe and proper handling.



SS4459714-1

B.
Sign indicates an explosion hazard. Keep fire and open flames away from this area.



SS4460067-2

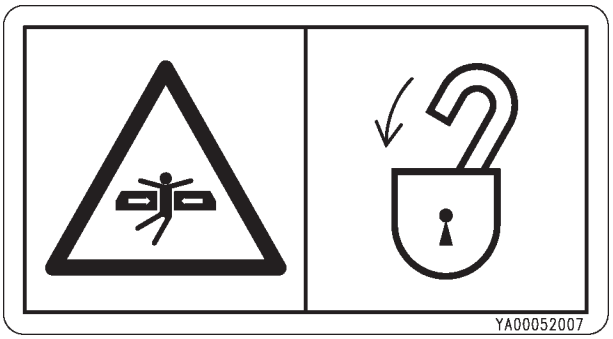
C.
Skin contact with electrolyte will cause burns. Splashed electrolyte into eyes will cause blindness. Take care not to touch electrolyte.



SS4460056-2

18. Articulate Lock Bar

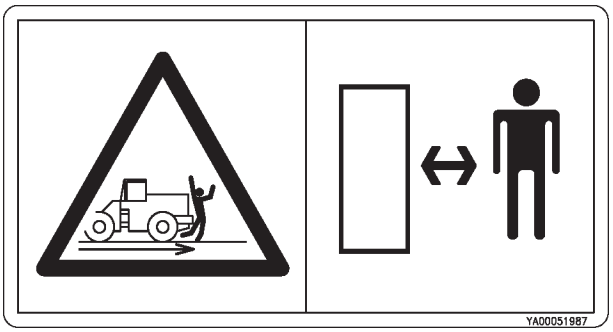
The articulation area becomes a pinch point when steering the machine.
Keep all personnel away from the articulation area during operation of the machine.



SSYA00052007

19. Both Sides of Counterweight

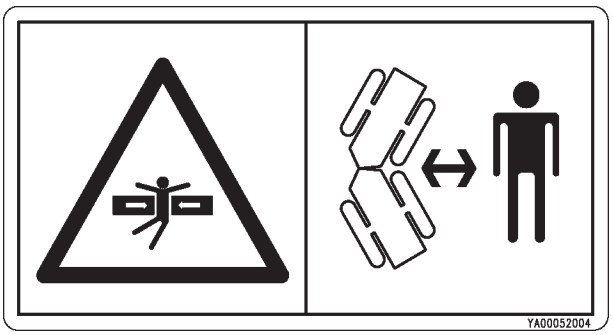
Avoid injury from backing-over accident.
Keep everyone far away from the machine during operation.



SSYA00051987

20. Both Sides of Articulation Area

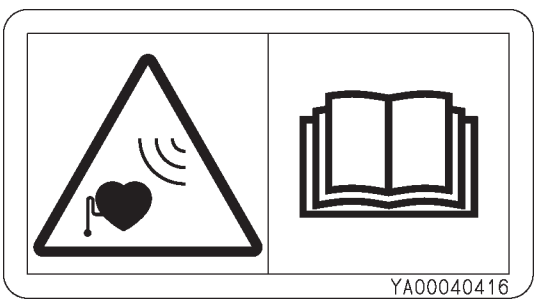
The articulation area becomes a pinch point when steering the machine.
Keep all personnel away from the articulation area during operation of the machine.



SSYA00052004

21. Cab Inside Right Rear Console

To those persons fixed with any medical device. Including implantable device such as a cardiac pacemaker. Please read the instruction manual carefully and follow the instructions before using this machine.



SSYA00040416

22. Oil Cooler and Oil Cooler Hoses

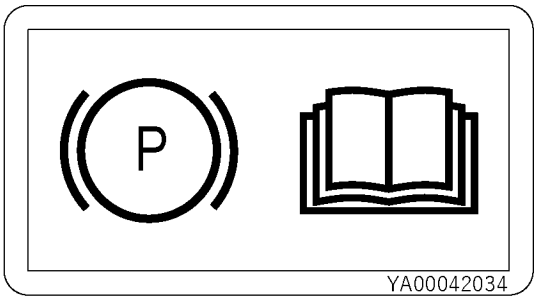
Avoid skin contact with highly heated parts such as the hydraulic hose, etc. immediately after operation of the machine. Severe burns may result.



SS263G912601-1

23. Cab Inside Left Front Column

Do not use the parking brake and do not turn off the key switch when operating the loader, except in an emergency; otherwise, it may cause a damage to the brake.



SSYA00042034

24. Inside of Rear Grill at Fan

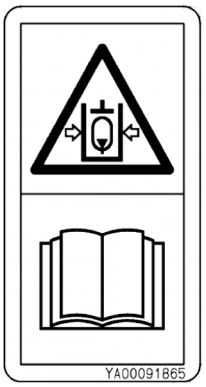
Contact with moving fan could result in death or serious injury.
Keep all guards in place. Keep hands away from fan area.



SS4672424-2

26. Cab Inside Left Front Column

The accumulator has been charged with high-pressure nitrogen gas. Inappropriate handling may cause explosion, possibly resulting in serious injury or death.
Read operator's manual for safe and proper handing.



SSYA00091865

27.

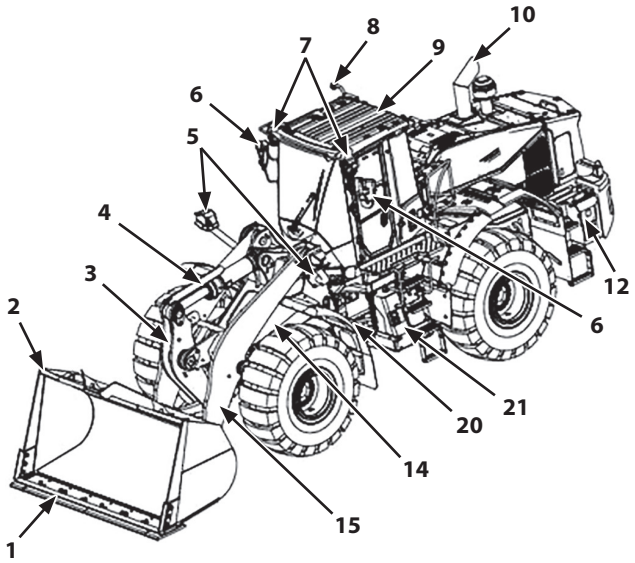
Explosion Hazard
Do not use ether. This engine is equipped with electric heater starting aid.
Use of ether could cause explosion and could result in death or serious injury.



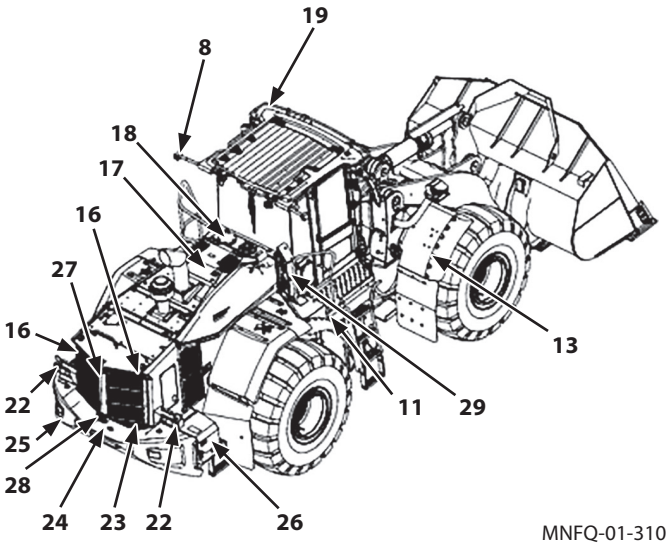
YA00097770

Name of Components

1- Cutting Edge (BOC)
2- Bucket
3- Bell Crank
4- Bucket Cylinder
5- Front Combination Light
(Headlight/Turn Signal/Clearance Light/Hazard Light)
6- Outside Rear View Mirror
7- Front Work Light
8- Side Camera (Optional)
9- ROPS Cab
10- Exhaust Pipe
11- Rear Fender
12- DEF Tank
13- Front Fender
14- Lift Arm Cylinder
15- Lift Arm
16- Rear Work Light
17- Aftertreatment Device (Inside)
18- Hydraulic Oil Tank
19- Cab Top Rail
20- Articulation Lock Bar
21- Battery Box
22- Rear Combination Light
(Turn Signal/Hazard Light/Tail Light/Brake Light)
23- Fan/Radiator/Cooling Unit
24- Towing Pin
25- Counterweight
26- Tool Box/Fuel Filler Port (Inside)
27- Rear View Camera
28- Rear Obstacle Detection Sensor (Optional)
29- Axle Oil Cooler (Optional)



MNFQ-01-309



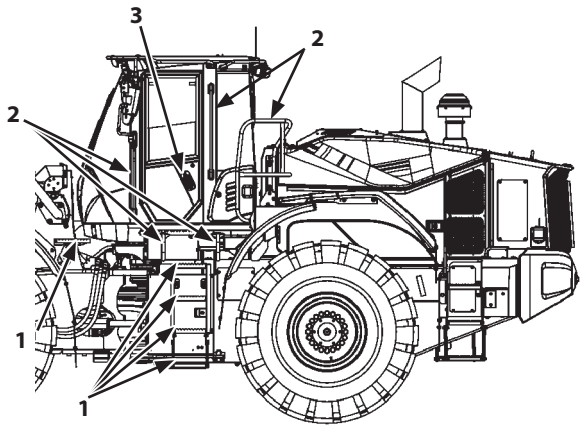
MNFQ-01-310

Getting ON and OFF the Machine

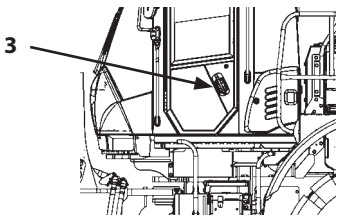
Footholds (1) and handrails (2) are provided around the machine for safe entry and exit to the cab.
These are used to get on and off the cab safely as well as to do inspection and maintenance.
Never jump on or off the machine, it is very dangerous.

WARNING:

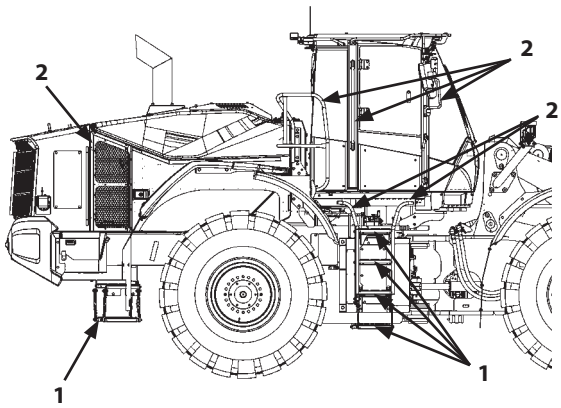
- **When lifting the cab/main body or transporting the machine, never attach wire to footholds (1) or handrails (2).**
- **Do not hold the steering wheel, forward/reverse lever or control levers when getting on and off the machine.**
- **The door handle (3) is not a handrail. Do not hold the door handle (3) as a handrail when getting on and off the machine.**



MNFQ-01-326



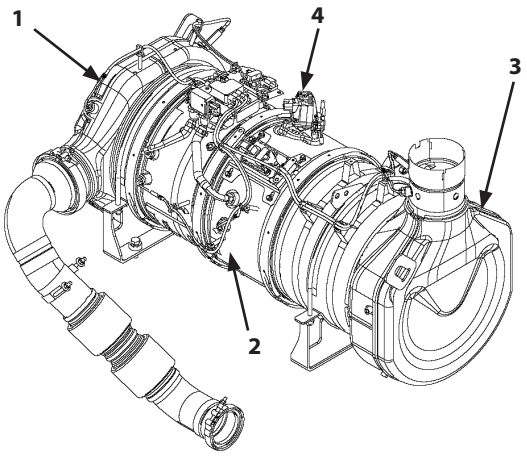
MNFQ-01-324



MNFQ-01-325

Aftertreatment Device

The machine is equipped with the aftertreatment system combining Diesel Oxidation Catalyst (DOC) block (1), Diesel Particulate Filter (DPF) block (2), and with Selective Catalytic Reduction (SCR) block (3), as one unit, to remove particulate matter (PM) and nitrogen oxide (NOx) from the exhaust gas in order to meet governmental emissions regulations.



MNFQ-01-006

The DOC reduces harmful substances in exhaust gas by chemical reaction, then DEF is injected in dosing module (injection chamber) (4) and mixed into the exhaust stream. DEF decomposed to ammonia and CO_2.
SCR catalyst converts NOx into harmless nitrogen gas and water vapor by accelerating chemical reaction with the ammonia. The remaining ammonia is decomposed into nitrogen and water in SCR block (3).

Follow the instructions below to prevent the aftertreatment device from being damaged.

WARNING:

- **Exhaust gas from the aftertreatment device, muffler, exhaust piping and tail piping becomes hot during and right after engine running and regeneration of aftertreatment device. Be careful not to let your skin contact any part of exhaust system or hot gas from the exhaust piping, as it may cause severe burns.**
- **If flammable materials such as dead leaves or paper scraps are around the aftertreatment device, they may cause a fire.**
- **Before maintaining the machine, stop the engine and make sure the engine has cooled down sufficiently to prevent burns.**

IMPORTANT:

- **Be sure to use fuel that complies with JIS K-2204, EN-590 or ASTM D-975 which contains 15 ppm or lower sulfur. If the fuel described above is not used, exhaust gas that exceeds regulation values may be discharged and serious engine problems may arise on the engine.**
- **Refill DEF which meets JIS (Japanese Industrial Standards) or ISO (International Organization for Standardization). If improper liquid (diesel oil, kerosene or gasoline) is refilled in the DEF tank, fire or system failure may result.**
- **Using non-suitable engine oil may result in malfunction of the aftertreatment device. Hitachi Construction Machinery Genuine Engine Oil is specially designed and tested to suit with the machine, hense it is highly recommended to use the genuine engine oil. In case the failure of the machine occured or is deemd to have occured by non-suitable engine oil, the failure will not apply to Hitachi Construction Machinery Warranty Policy.**

IMPORTANT:

- **Do not mix poor quality diesel fuel, drainage agents, fuel additives, gasoline, kerosene, alcohol, or any other type of lubricating oil with specified diesel fuel. Improper fuel usage may deteriorate performance of fuel filters, can cause problems in the lubricated parts of the injector. It can also affect the engine parts and aftertreatment device, leading to malfunction.**
- **Do not modify the machine without authorization. Never attempt to modify the air inlet and exhaust parts such as the air duct, aftertreatment device and the exhaust outlet. Also never attempt to disassemble the aftertreatment device.**
- **Avoid giving shocks on the aftertreatment device by hitting elements with other objects or dropping the device. Failure to do so may affect the aftertreatment device, possibly damaging it or lowering its performance.**
- **It is normal to see white smoke appear during regeneration. It is not caused by a malfunction. Do not attempt to perform aftertreatment device manual regeneration indoors in an area that is not well ventilated or free from flammable materials.**
- **Consult Authorized Dealer for checking or repairing the aftertreatment device.**

NOTE:

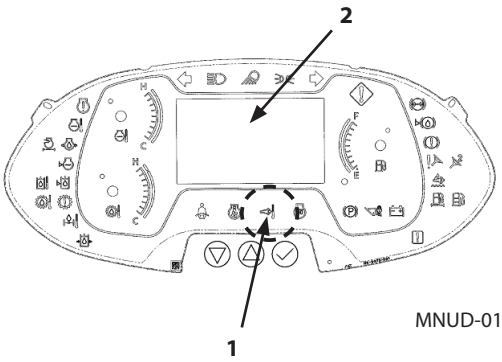
- *White smoke and PM (particulate matter) may accumulate inside the aftertreatment device. The aftertreatment device regenerates automatically to remove deposits at regular intervals. This is called auto-regeneration. Autoregeneration may start during operation of the machine; the machine can continue to be used as-is.*
- *Do not stop the engine during regeneration unless absolutely necessary.*
- *The auto-regeneration may be terminated depending on the machine operating condition.*
- *Usually, auto-regeneration starts in the specified time period after the previous regeneration (either auto or manual).*
- *If auto regeneration did not complete, an aftertreatment device regeneration request will blink on the monitor. Perform manual regeneration following the specified procedure. (Refer to page 1-7.)*
- *When the machine is operated without performing manual regeneration, the aftertreatment device may be damaged. Immediately move the machine to a safe area and perform manual regeneration.*
- *Both auto and manual regenerations restore aftertreatment device function. It is not a malfunction.*
- *White smoke may be emitted for several minutes after the engine starts, this is not a malfunction.*

Aftertreatment Device Condition Display

Aftertreatment device indicator (1) displays the condition of the aftertreatment device.



This mark indicates that the exhaust temperature is high during the aftertreatment device regeneration. It is lit while auto or manual regeneration is in process.

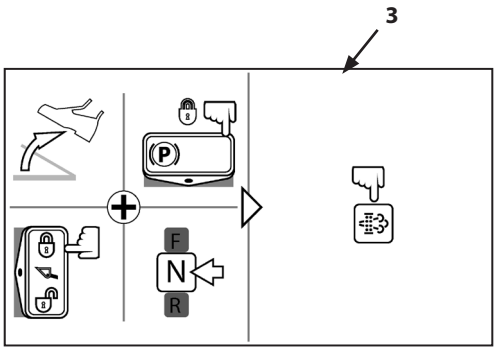


MNUD-01-030

NOTE:

- *The auto-regeneration is performed at random times. The auto-regeneration may start during operation of the machine; you can continue to operate the machine.*
- *Do not stop the engine during regeneration unless absolutely necessary.*
- *The manual regeneration switch does not function if pushed during the auto-regeneration process.*

Depending on the operating conditions of the machine, the regeneration may not be completed. In this case, an aftertreatment device regeneration request (3) will be displayed on the monitor. Immediately perform manual regeneration following the procedure.



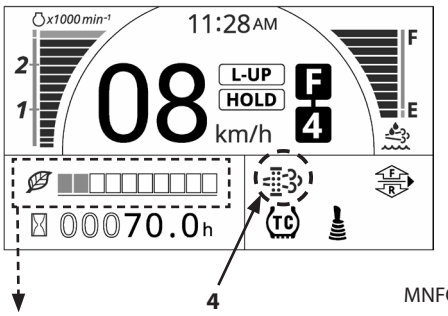
MNUD-01-033

The main monitor displays an indicator at position (4) or (5) according to the aftertreatment device condition as follows. See the next page for this indicator when the manual regeneration is requested.

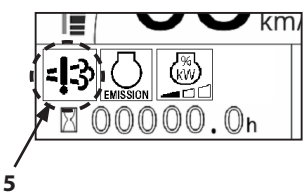
(4)  (Yellow) This mark indicates that the aftertreatment device (DPF) is abnormally clogged. Regeneration is necessary.

(4)  (Yellow) This mark indicates that the aftertreatment device regeneration is inhibited. Regeneration will not be performed while this mark is lit.

(5)  (Red, blink) This mark indicates that the aftertreatment device regeneration is impossible. Contact your service representative.



MNFQ-01-021



MNUD-01-088

IMPORTANT: Set the aftertreatment device regeneration to the inhibited position while operating the machine in an environment with materials that could be flammable. (Refer to page 1-52.)

Aftertreatment Device Manual Regeneration Request

The aftertreatment device needs regeneration. Usually, regeneration is performed automatically. However, manual regeneration is required depending on the conditions. The marks described below may be indicated on monitor (1). Also service indicator (2) will turn on.



(Yellow)

This mark indicates that the aftertreatment device manual regeneration is required. Perform manual regeneration following the below procedure.



(Yellow, blink)

This mark indicates that the aftertreatment device manual regeneration is "immediately" required. Perform manual regeneration following the below procedure. If failed, the regeneration is disabled and need to contact Authorized Dealer.



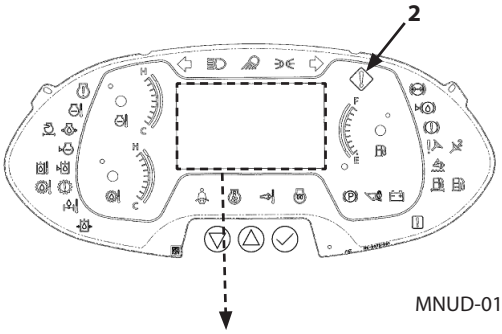
(Yellow)

This mark indicates that the aftertreatment device regeneration is inhibited. Displayed in yellow when the manual regeneration request arises while aftertreatment device regeneration is inhibited. Move the machine to a safe place. Perform manual regeneration following the below procedure.

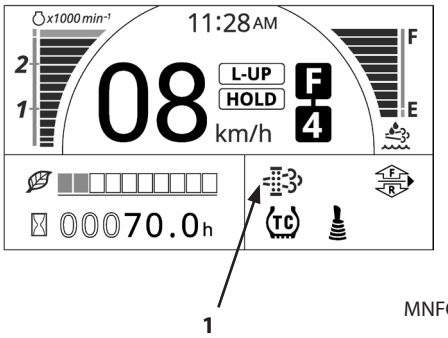
NOTE: In case where the manual regeneration is immediately necessary, this mark blinks.

IMPORTANT:

- **Manual regeneration performed when the aftertreatment device regeneration request is displayed restores aftertreatment device function. This is not a malfunction.**
- **If the machine is continuously operated despite the aftertreatment device regeneration request being displayed, aftertreatment device alarm and engine trouble alarm will be displayed, and the buzzer sounds. Consult Authorized Dealer.**



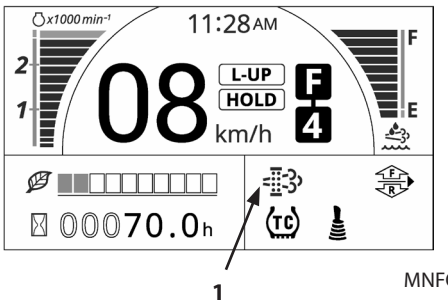
MNUD-01-030



MNFQ-01-021

Aftertreatment Device Manual Regeneration Procedure

When the manual regeneration is needed, indicator (1) as shown in the right will appear in yellow, and the service indicator will turn on. When indicator (1) is displayed, you need to perform manual regeneration.



MNFQ-01-021

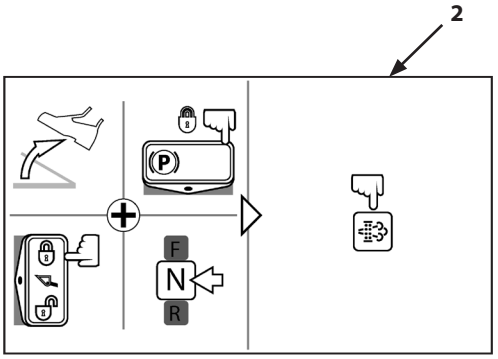
Before starting manual regeneration, be sure to check the following.

- No person is present around the machine.
- Keep flammable objects away from the muffler.
- Remaining fuel alarm is not lit.
- DEF alarm is not lit.

1. Park the machine in a safe place. Lower the front attachment onto the ground.

2. Set the accelerator pedal and switches to the following state. Aftertreatment device manual regeneration request screen (2) will be displayed on the main monitor.

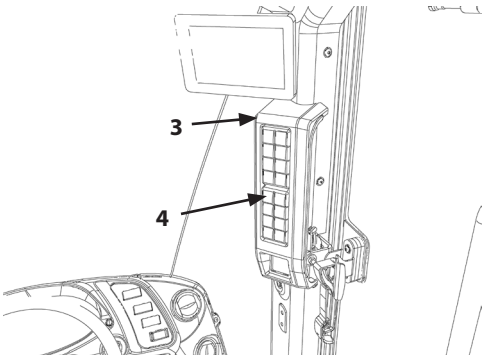
Accelerator Pedal	:	OFF
Forward/Reverse Lever	:	N (Neutral)
Parking Brake Switch	:	ON
Control Lever Lock Switch	:	Lock
Aftertreatment Device Regeneration inhibited Setting	:	OFF



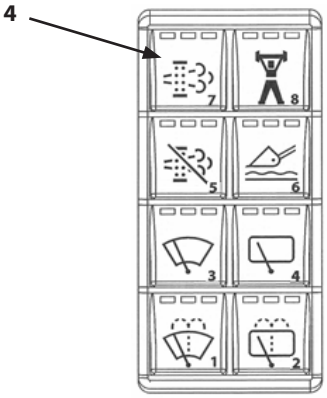
Manual Regeneration Request Screen

MNUD-01-033

3. Push the aftertreatment device regeneration switch (4) on panel switch (3).

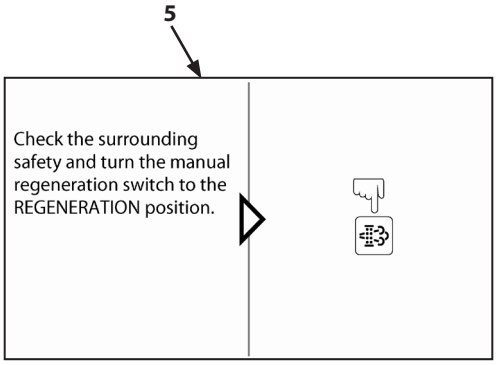


MNUD-01-200



MNUD-01-202

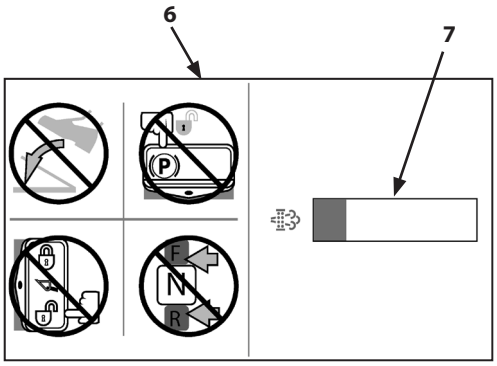
4. When pushing the aftertreatment device regeneration switch, screen (5) as shown in the right will be displayed. Pushing the aftertreatment device regeneration switch again displays screen (6) and the manual regeneration starts. Bar graph (7) on the screen indicates progress of the regeneration process.



MNUD-01-034EN

CAUTION: The manual regeneration does not start unless the accelerator pedal is OFF, forward/reverse lever is in Neutral, parking switch is ON, and the control lever lock switch is ON. When touching the accelerator pedal, forward/reverse lever, parking switch and the control lever lock switch, the regeneration process is aborted. When the process is aborted, start over again.

5. When the regeneration is finished, "Regeneration Has Completed." message will be displayed on the main monitor. If "Regeneration Has Failed." message is displayed, start over the regeneration process again. Failure of regeneration process may happen in the conditions other than above (such as malfunction of a sensor that affects regeneration at low ambient temperature).



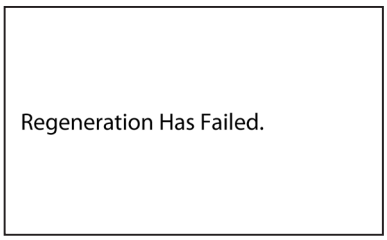
MNUD-01-032

NOTE:

- *Regeneration process may fail in conditions other than those mentioned above (such as sensor malfunction or low ambient temperature).*
- *The engine sound may change and the engine speed may increase when the manual regeneration starts, this is not a malfunction.*
- *Regeneration time varies depending on the ambient temperature.*
- *White smoke may temporarily be generated from the tail pipe during the regeneration process, this is not a malfunction.*
- *Manual regeneration time is shorter directly after machine operation, and longer when engine temperature is low.*
- *Coolant temperature may increase during the manual regeneration.*



MNUD-01-043EN



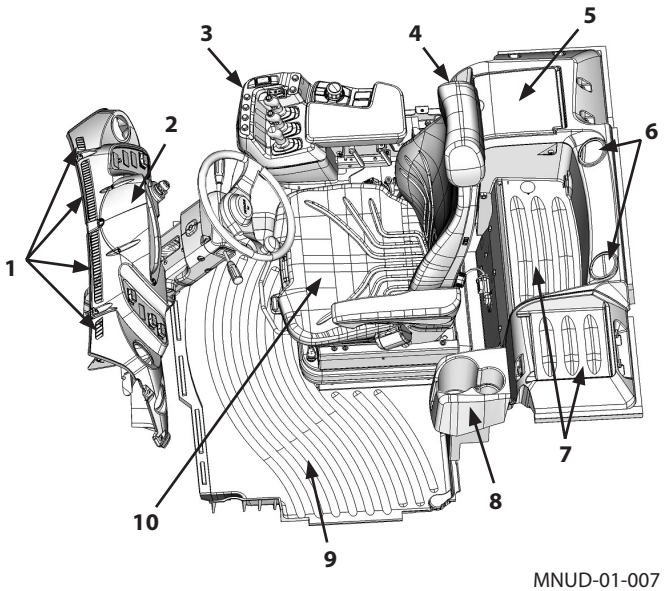
MNUD-01-044EN

IMPORTANT: If regeneration must be interrupted, push the manual regeneration switch again. The message "Regeneration Has Failed." will be displayed on the monitor, but the machine becomes operable. In this case, manual regeneration should be performed again. Restart manual regeneration as soon as possible.

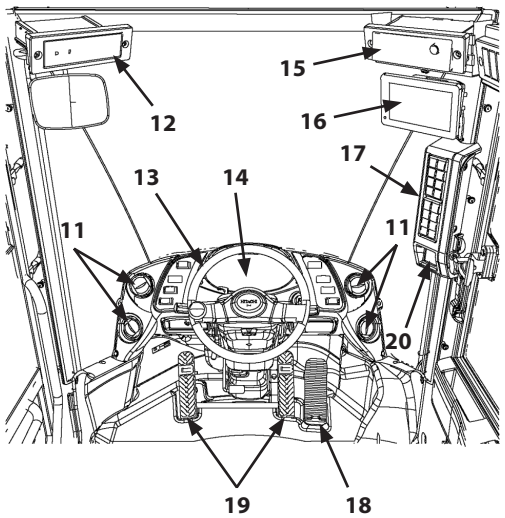
Layout of Equipment in Operator's Station (Illustration Contents)

The following shows the names and locations of the equipment in the operator's station. For detailed descriptions of each equipment, refer to the page indicated in ( ).

1- Front Defroster
2- Front Console (1-139)
3- Right Console (1-148)
4- Document Holder
5- Hot/Cool Box
6- Rear Defroster
7- Glove Compartment
8- Cup Holder
9- Floor Mat
10- Operator's Seat (1-169)
11- Air Conditioner Front Vent
12- Air Conditioner Control Panel (1-177)
13- Steering Wheel (4-4)
14- Main Monitor (1-13)
15- Radio (1-183)
16- Sub Monitor (1-60)
17- Panel Switch (1-122)
18- Accelerator Pedal (4-8)
19- Brake/Clutch Cut Pedal (Both right and left sides are interlocked.) (4-10)
20- Rear View Mirror Angle Adjust Switch (Optional) (1-249)



MNUD-01-007



MNUD-01-008

NOTE: Refer to page 1-139 for the front console switches.

20- Forward/Reverse Lever (4-2)

21- Smartphone Holder

22- USB Power Supply (1-168)

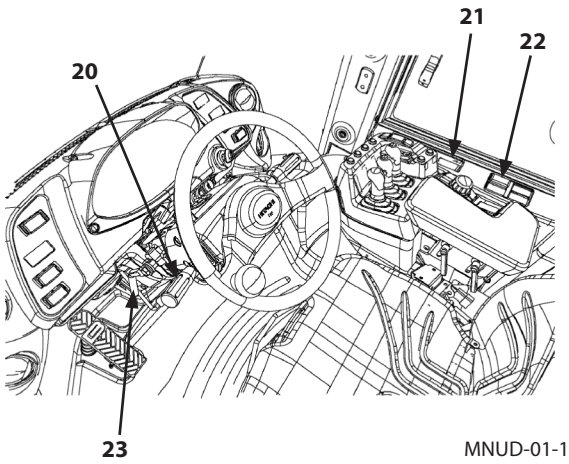
23- Tilt, Telescopic Lever (4-11)

24- Steering Column Pop-up Pedal (4-11)

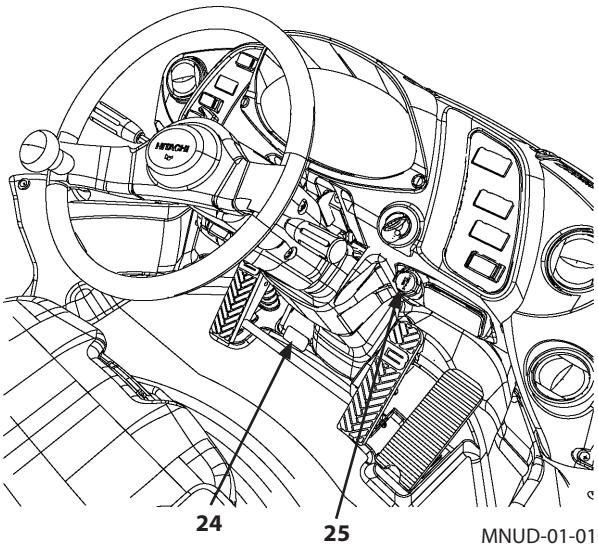
25- 24V Power Supply Socket (1-165)

26- Joystick Steering (1-156)

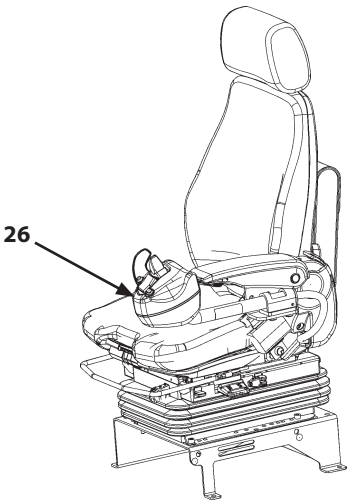
NOTE: Refer to page 1-139 for the front console switches.



MNUD-01-145



MNUD-01-010



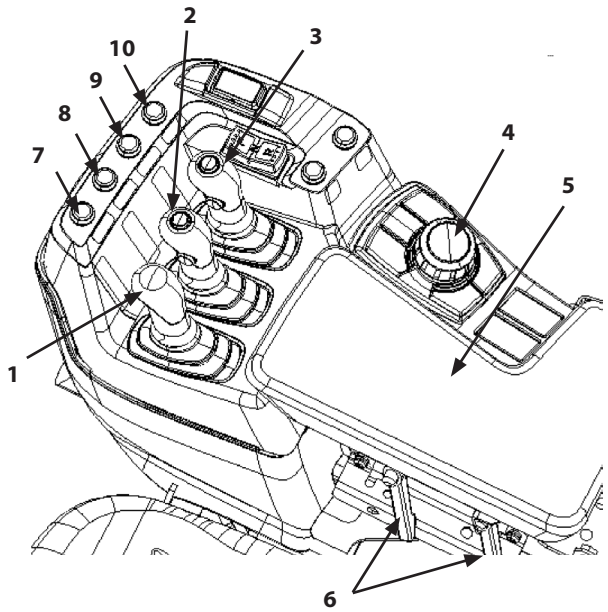
MNEK-13-001

Right Console Controls (Illustration Contents)

1- Auxiliary Control Lever (1-162)
2- Bucket Control Lever (1-161)
3- Lift Arm Control Lever (1-160)
4- Sub Monitor Controller (1-60)
5- Armrest
6- Armrest Adjustment Lever (1-155)
7- Cancel (for Payload Checker)
8- Tip Off (for Payload Checker)
9- Truck Clear (for Payload Checker)
10- Add Load (for Payload Checker)
11- Multi-Function Joystick Lever (1-164)

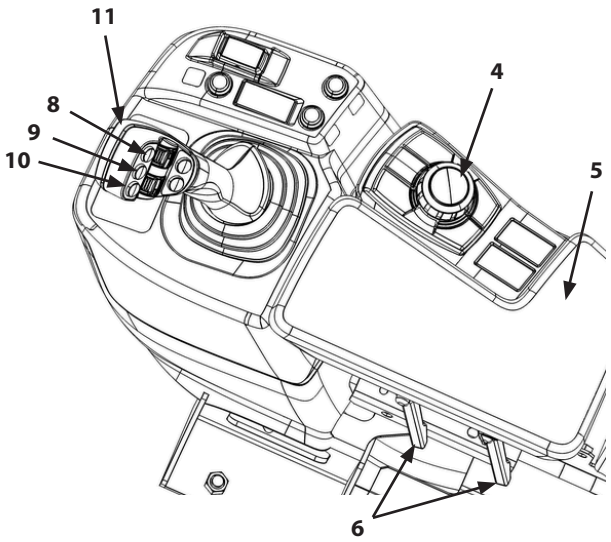
NOTE:

- *Refer to page 1-148 for the right console switches.*
- *Refer to page 5-26 for the payload checker function switches.*



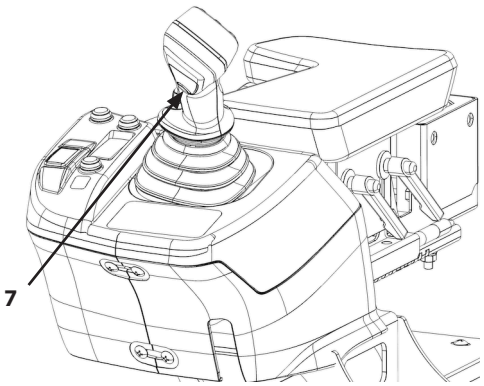
Fingertip Control Type

MNUD-01-027



Multi-Function Joystick Type

MNUD-01-028



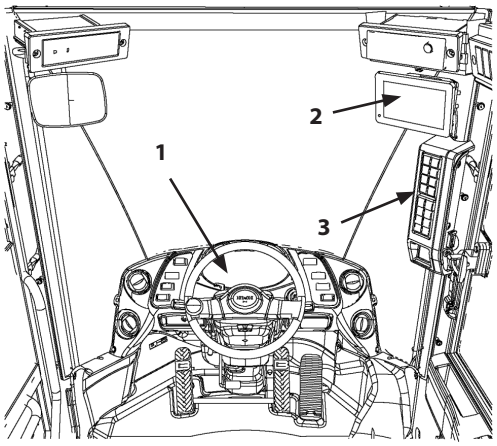
MNUD-01-029

Multi-Function Joystick Type

Multi-Function Monitors

Summary

Two multi-function monitors, main monitor (1) in the front console and sub monitor (2) on the front right pillar, are installed on this machine.
They are to provide information such as displays for the various meters, indicators, rear and aerial angle camera views, and necessary instruction messages.
The following screen menu are available on these monitors to operate, setup, and maintain the machine.



MNUD-01-008

Main Menu of Main Monitor (1)
- Sub Meter
- Display
- Aftertreatment Device Regeneration Inhibit Setting
- Troubleshooting
- Maintenance
- Monitoring

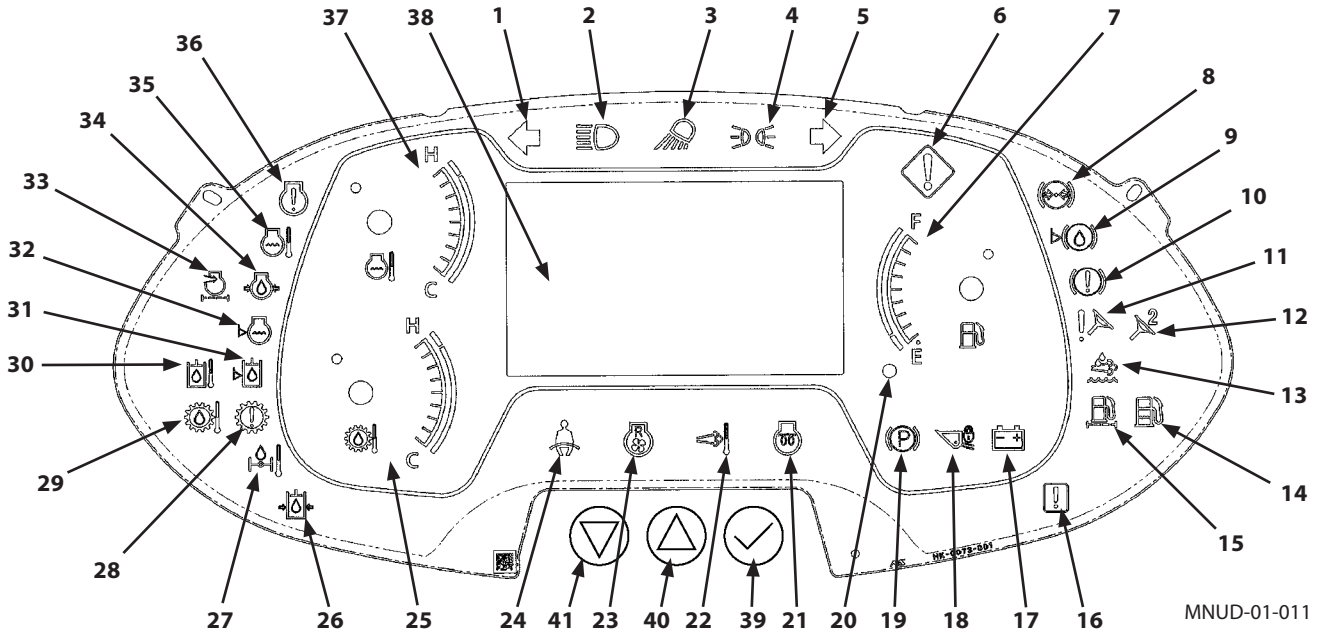
NOTE: Refer to page 1-39 for further information.

Main Menu of Sub Monitor (2)
- Alarm List
- Operator Setting
- Material Select
- Target Load Select
- Payload Checker
- Ride Control
- Auto Leveler
- Setting
- Display
- Information

NOTE:
- *Refer to page 1-73 for further information.*
- *The switches on panel switch (3) also provide various settings with LED indicators to show the current status. Refer to page 1-122 for further information.*

Multi-Function Main Monitor

Main Monitor Indicators (Illustration Contents)



1- Left Turn Signal Indicator (1-14)
2- High Beam Indicator (1-14)
3- Work Light Indicator (1-14)
4- Clearance Light Indicator (1-14)
5- Right Turn Signal Indicator (1-14)
6- Service Indicator (1-15)
7- Fuel Gauge (1-16)
8- Brake Oil Low Pressure Indicator (1-17)
9- Brake Oil Level Indicator (Not used)
10- Service Brake Warning Indicator (Not used)
11- Low Steering Oil Pressure Indicator (1-18)
12- Secondary Steering Indicator (1-23)
13- Urea Alarm (Not used)
14- Water Separator Indicator (Not used)
15- Fuel Filter Restriction Indicator (Not used)
16- Communication Error Indicator (1-19)
17- Discharge Warning Indicator (1-19)
18- Control Lever Lock Indicator (1-19)
19- Parking Brake Indicator (1-17)
20- Fuel Level Indicator (1-16)
21- Preheat Indicator (1-24)
22- Aftertreatment Device Indicator (1-24)
23- Fan Reverse Rotation Indicator (1-24)
24- Seat Belt Indicator (1-24)
25- Transmission Oil Temperature Gauge (1-16)
26- Main Pump Oil Pressure Indicator (1-19)
27- Axle Oil Temperature Indicator (1-20)
28- Transmission Warning Indicator (1-20)
29- Transmission Oil Temperature Indicator (1-20)
30- Hydraulic Oil Temperature Indicator (1-21)
31- Hydraulic Oil Level Indicator (1-21)
32- Coolant Level Indicator (Not used)
33- Air Filter Restriction Indicator (1-22)
34- Engine Oil Low Pressure Indicator (1-22)
35- Overheat Indicator (1-22)
36- Engine Trouble Indicator (1-23)
37- Coolant Temperature Gauge (1-16)
38- Multi Function Monitor (1-25)
39- Select Button
40- Monitor Display Selector (Up)
41- Monitor Display Selector (Down)

NOTE: Refer to page shown in ( ) for each item.

Turn Signal Indicator (Green)

When the turn signal lever is operated, the turn signal and the turn signal indicator start flashing.



M4GB-01-032

High Beam Indicator (Blue)

When the head lights are used at the high beam position, the indicator will light.



M4GB-01-033

Work Light Indicator (Yellow)

When the work lights are turned ON, this indicator will light.



M4GB-01-034

Clearance Light Indicator (Green)

When the clearance lights are turned ON, this indicator will light.



M4GB-01-035

Service Indicator (Yellow)

WARNING: Prevent possible casualty and/or machine damage. If the service indicator flashes and the alarm buzzer sounds, immediately stop machine operation. Then, check and service the section displaying the trouble.

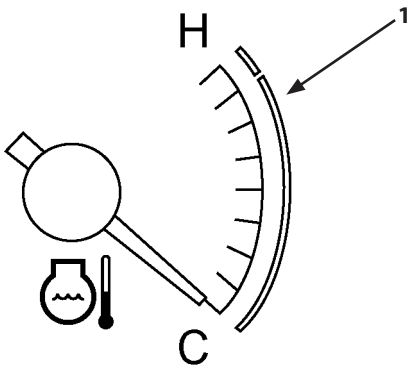
When any of the warning indicator is turned ON, this indicator will come ON and the alarm buzzer will sound. Immediately, stop operating the machine. Move the machine to a safe area. Park the machine and stop the engine. Contact Authorized Dealer for machine inspection.



MNUD-01-012

Coolant Temperature Gauge

The engine coolant temperature is indicated with a needle. When the needle stays in the range (1) during operation, the coolant temperature is normal.
If the engine coolant temperature becomes abnormally high, the service indicator will flash and the alarm buzzer will sound. Stop machine operation and run the engine at low idle to lower the coolant temperature. After the coolant temperature lowers, stop the engine for inspection. If the needle does not move at all, error in the electrical system is suspected. Contact Authorized Dealer for machine inspection.

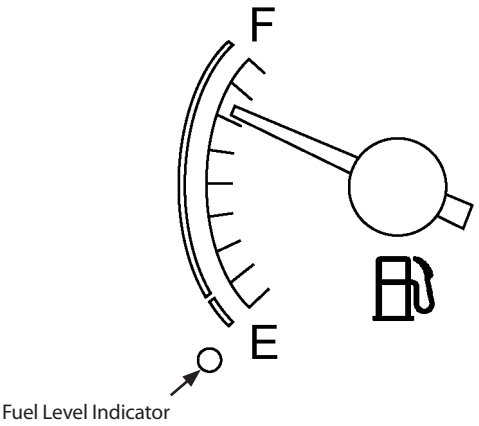


MNUD-01-014

Fuel Gauge

The remaining fuel amount is indicated by the needle. Refuel before the needle reaches in the red range "E".
When the needle reaches in the red range (E), the fuel level indicator lights.

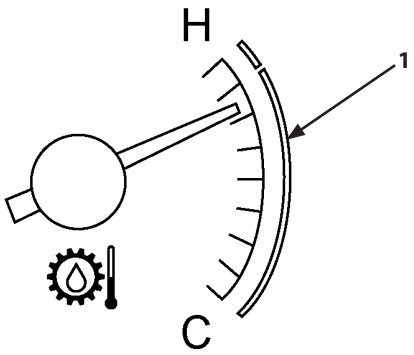
NOTE: The fuel level indicator may light even if the indicator needle does not reach the red range (E), depending on the tilt angle of machine.



MNUD-01-016

Transmission Oil Temperature Gauge

The transmission oil temperature in the torque converter is indicated with a needle.
When the needle stays in the range (1) during operation, the transmission oil temperature is normal.
If the transmission oil temperature becomes abnormally high, the service indicator will flash and the alarm buzzer will sound. Stop machine operation and run the engine at low idle to lower the transmission oil temperature. After the transmission oil temperature lowers, stop the engine for inspection. If the needle does not move at all, error in the electrical system is suspected. Contact Authorized Dealer for machine inspection.



MNUD-01-015

Parking Brake Indicator (Red)

The parking brake indicator will light when the parking brake is applied.
If the forward/reverse lever is moved to either the forward (F) or the reverse (R) position when the parking brake is applied, the alarm buzzer will sound. Return the forward/reverse lever to neutral (N) and release the parking brake.



M4GB-01-012

Brake Oil Low Pressure Indicator (Red)

WARNING: Stop machine operation if the brake oil pressure decreases. Failure to do so may result in personal injury or death. If the indicator comes ON, immediately stop machine operation.

If the brake oil pressure becomes low, the brake oil low pressure indicator and the service indicator will light, and the alarm buzzer will sound.
Immediately move the machine to a safe area, set the machine in the park position and stop the engine. Inspect the brake system for any abnormality.
When the brake oil pressure increases to specification, the buzzer stops and the indicator goes off.



M4GB-01-013

Low Steering Oil Pressure Indicator (Red)

IMPORTANT: The emergency steering system shall only be used provisionally when the steering oil pressure dropped. If continuously used, it may damage the system.



MNUD-01-012

If the steering oil pressure decreases, the low steering oil pressure indicator and the service indicator will light, and the alarm buzzer will sound. Immediately move the machine to a safe area, set the machine in the park position and stop the engine. Check the steering system.

Communication Error Indicator (Red)

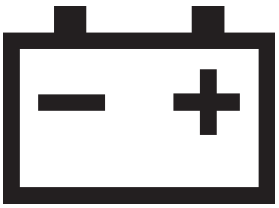
When communication system malfunction occurs, the communication error indicator lights. Contact Authorized Dealer for machine inspection.



MNUD-01-022

Discharge Warning Indicator (Red)

If the voltage from the alternator is low or is abnormally high, the discharge warning indicator and the service indicator come ON. Inspect the alternator and battery circuitry.



M4GB-01-018

Control Lever Lock Indicator (Red)

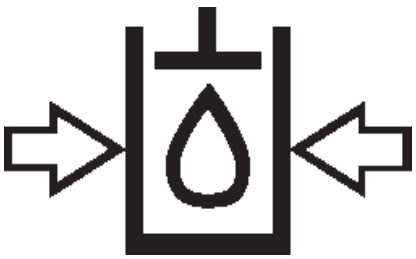
When the control lever lock switch is in ON position, the control lever lock indicator will light.



MNEC-01-004

Main Pump Oil Pressure Indicator (Red)

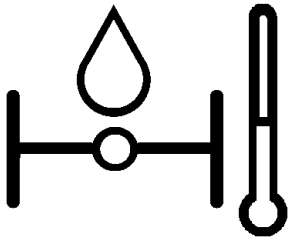
If the main pump oil pressure decreases, the main pump oil pressure indicator and the service indicator will light, and the alarm buzzer will sound. Immediately move the machine to a safe area, set the machine in the park position and stop the engine. Check the front attachment piping for leaks.



MNEC-01-009

Axle Oil Temperature Indicator (Red)

If the axle oil temperature becomes higher than the specification, both the axel oil temperature indicator and the service indicator comes ON, and the warning buzzer sounds.



MNUD-01-023

NOTE:

- *Stop driving and wait until the axle oil temperature is lowered to the normal range.*
- *If the brake pedal is continuously stepped on, an increase of the axle oil temperature may result. Carefully operate the brake pedal.*

Transmission Warning Indicator (Red)

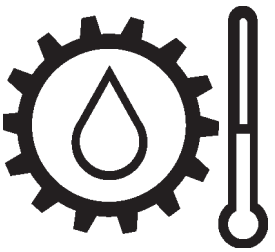
If any serious abnormality occurs in the transmission and/or transmission related parts, the red indicator will light. If the transmission warning indicator and the service indicator light, immediately move the machine to a safe area, set the machine in the park position and stop the engine. Contact Authorized Dealer for machine inspection.



M4GB-01-024

Transmission Oil Temperature Indicator (Red)

If the transmission oil temperature is kept higher than the specification for a short period of time, the transmission oil temperature indicator turns ON. If a higher than the specification transmission oil temperature is continued for a long period of time, the service indicator comes ON and the warning buzzer sounds. Immediately stop operation of the machine and run the engine at low idle speed to reduce the transmission oil temperature.



M4GB-01-027

Hydraulic Oil Temperature Indicator (Red)

If the hydraulic oil temperature becomes higher than the specification, both the hydraulic oil temperature indicator and the service indicator comes ON, and the warning buzzer sounds.

NOTE: Stop driving and wait until the hydraulic oil temperature is lowered to the normal range.

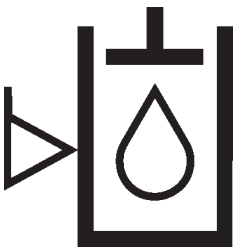


MDAA-01-068

Hydraulic Oil Level Indicator (Red)

WARNING: Stop machine operation if the hydraulic oil level decreases. Failure to do so may result in personal injury or death. If the red indicator comes ON, immediately stop machine operation.

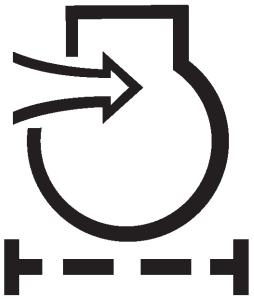
If the hydraulic oil level becomes low, the hydraulic oil level indicator and the service indicator will light, and the alarm buzzer will sound. Immediately move the machine to a safe area, set the machine in the park position and stop the engine. Check hydraulic oil level and any oil leaks from hydraulic circuit.



MNEC-01-057

Air Filter Restriction Indicator (Red)

If the air cleaner element becomes clogged, the air filter restriction indicator and the service indicator light. Immediately stop the engine and inspect the air cleaner element. Replace the element, if necessary.



M4GB-01-023

Engine Oil Low Pressure Indicator (Red)

WARNING: If the engine is kept running with the engine oil pressure low, damage to the engine may result. Immediately stop machine operation and stop the engine if the indicator lights.

If the engine oil pressure becomes low, the low engine oil pressure indicator will light, the service indicator will flash, and the alarm buzzer will sound.
Immediately move the machine to a safe area, set the machine in the park position and stop the engine. Inspect the engine oil pressure system and the oil level for any abnormality.



M4GB-01-021

NOTE: Cold oil temperature or operating on a steep slope may also cause the indicator to light.

Overheat Indicator (Red)

If the engine coolant temperature increases to the abnormally high range, the red indicator will light, the service indicator will flash, and the alarm buzzer will sound. Stop operation. Run the engine at low idle speed to lower the coolant temperature.



M4GB-01-020

Engine Trouble Indicator (Red)

If any serious abnormality occurs in the engine and/or engine related parts, the red indicator will light.
If the engine trouble indicator and the service indicator light, immediately move the machine to a safe area, set the machine in the park position and stop the engine. Contact Authorized Dealer for machine inspection.



M4GB-01-019

Secondary Steering Indicator (Red)

IMPORTANT: The secondary steering system shall be provisionally used. If continuously used, damage to the system may result.



If the secondary steering system operates, the secondary steering indicator will turn on and the buzzer sounds. Move the machine to a safe area and stop the machine.

NOTE: When pressing the emergency steering operation check switch on the front console, this indicator will turn on, but no buzzer sounds.

MNUD-01-025

IMPORTANT: If no operating sound can be heard or an indicator lights after starting the engine, immediately stop the engine and consult Authorized Dealer.

NOTE: The secondary steering auto-check is performed for one to two seconds after starting the engine. The pump's operating noise will be heard and the secondary steering indicator might come ON for a second according to the situation during the check but it's normal procedure. If any abnormality is found during the checking, the secondary steering indicator stays ON and transmission gear is kept in Neutral.

Preheat Indicator (Yellow)

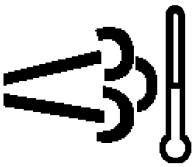
The engine is being preheated as long as the preheat indicator stays ON. When the preheat indicator goes OFF, engine preheating is completed.



M4GB-01-031

Aftertreatment Device Indicator (Yellow)

The indicator indicates that the exhaust temperature is higher than normal during the aftertreatment device regeneration. It lights while auto-regeneration or manual regeneration is in process.



MNUD-01-017

Fan Reverse Rotation Indicator (Green)

The indicator lights when the fan is rotating in reverse.



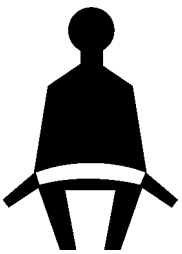
MNUD-01-026

Seat Belt Indicator (Red)

After the key switch is turned ON, the seat belt indicator turns ON if the seat belt is not fastened. No buzzer sounds.

After starting the engine, the seat belt indicator turns ON and a buzzer will sound three times when the parking brake is released. A guidance message to fasten the seat belt is also displayed on the sub monitor for assistance.

NOTE: If the parking brake is applied, the seat belt indicator turns ON but no buzzer will sound.



MNUD-01-036

Switches for Multi-Function Monitor Operation

Use the switches on the switch panel to perform operations and make settings on the multi-function main monitor.

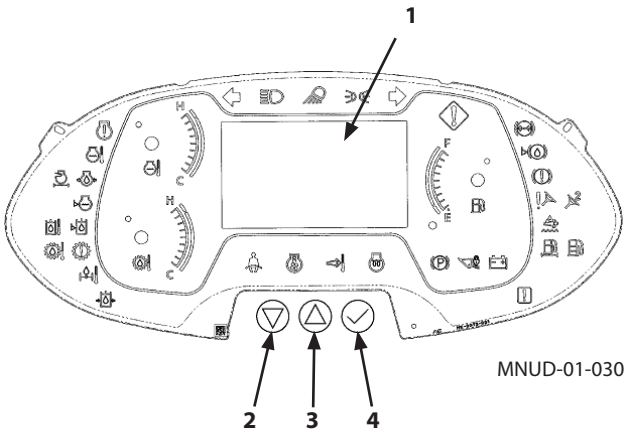
Press monitor display selector (down) (2) to select the lower next item by one, or monitor display selector (up) (3) to select the upper next item. Press monitor display mode selector (4) to fix the selection.

1- Monitor Display

2- Monitor Display Selector (Down)

3- Monitor Display Selector (Up)

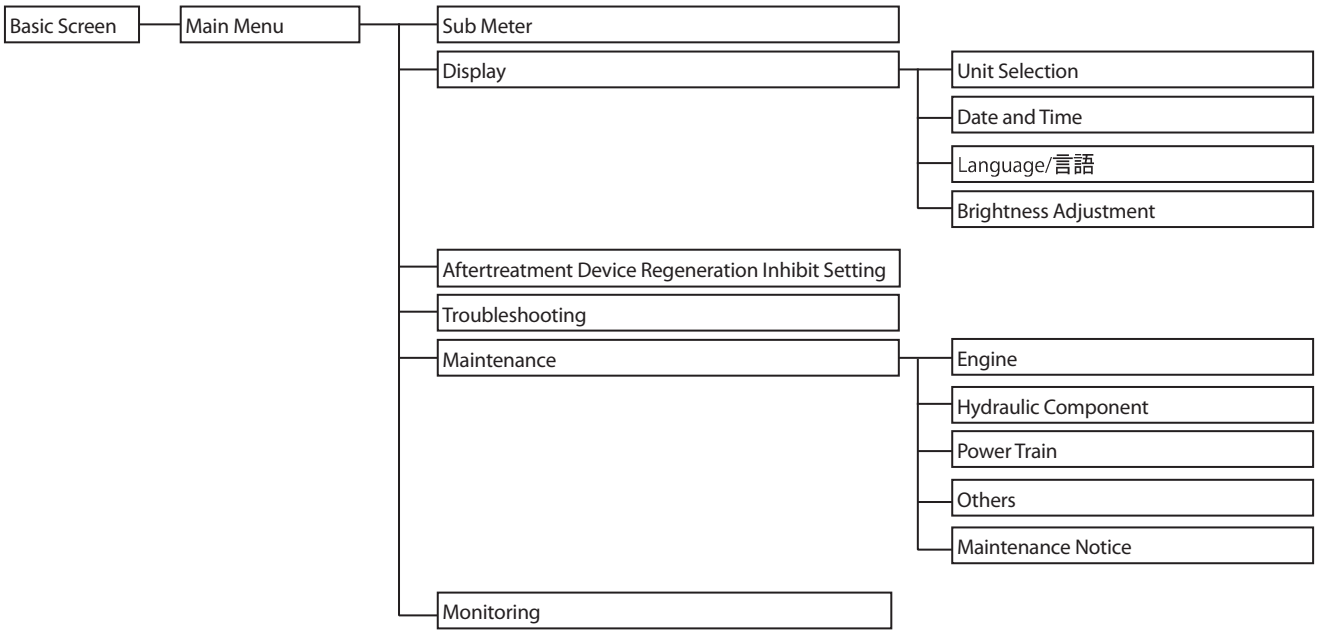
4- Monitor Display Mode Selector



MNUD-01-030

Main Monitor Menu Configuration

The main monitor menu consists of the following screens.
There are 6 main menus and 9 sub menus.



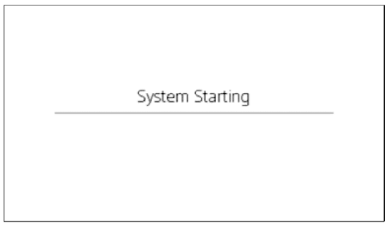
Displaying Main Monitor Basic Screen

IMPORTANT: Start the engine after the basic screen is displayed.

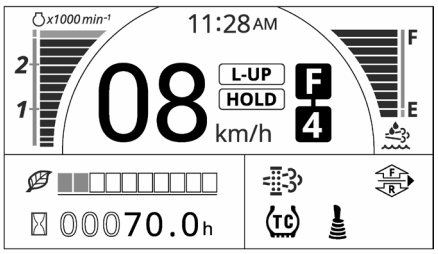
When the key switch is turned to the ON position, the starting screen displays for about two seconds.
Then, the basic screen displays various meters, gauges, machine conditions, or a request screen displays the aftertreatment regeneration process or periodical maintenance item if applicable.

The multi-function main monitor provides 6 menus and 9 sub menus. Refer to page 1-40 for further information.

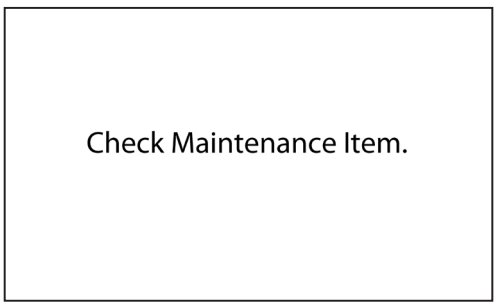
NOTE: "Maintenance Announce Screen" or "Aftertreatment Device Announce Screen" may be displayed before the basic screen appears. Refer to the following pages.



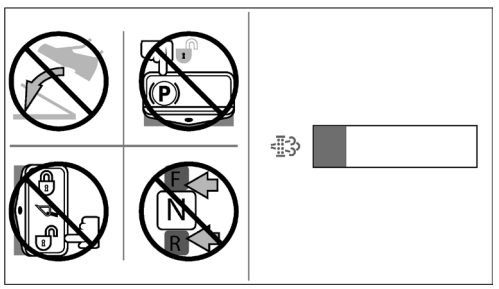
Starting Screen MNTL-MT-014



MNFQ-01-021



Maintenance Announce Screen
MNUD-01-035aEN

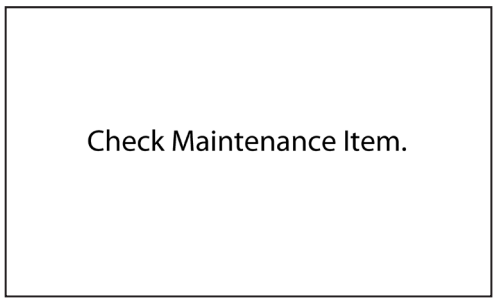


Aftertreatment Device Announce Screen
MNUD-01-032

Maintenance Announce Screen

If any of the periodical maintenance item is requested within 20 hours, the maintenance announce screen is displayed for about 5 seconds before displaying the basic screen.
Check and perform the requested maintenance by referring to the each item in the "MAINTENANCE" section.

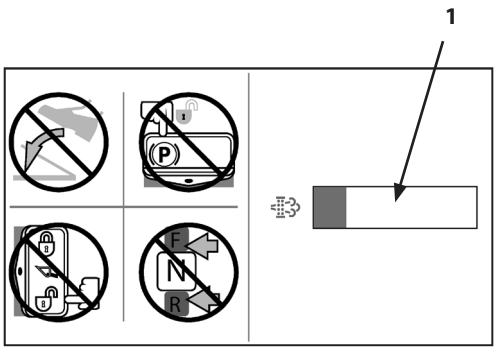
NOTE: This screen does not appear if the maintenance notice function is turned OFF. Refer to page 1-56 for the details.



MNUD-01-035aEN

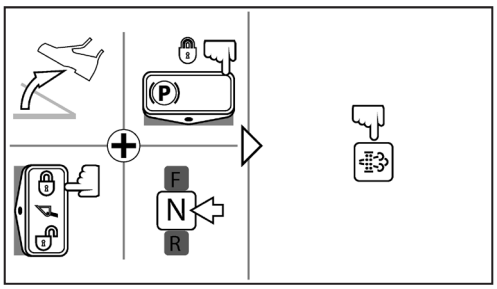
Aftertreatment Device Announce Screen

If the aftertreatment device auto regeneration is being started after displaying the starting screen, aftertreatment device regeneration screen with bar graph (1) is displayed instead of the basic screen.
You can continue to operate the machine. Do not stop the engine during regeneration unless absolutely necessary.
Refer to page 1-5 for the aftertreatment device regeneration.

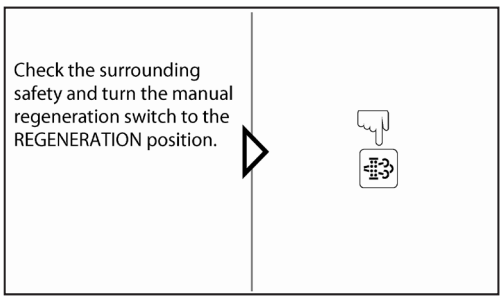


MNUD-01-032

If the aftertreatment device manual regeneration is required after displaying the starting screen, the aftertreatment regeneration request screen is displayed instead of the basic screen.
Park the machine in a safe place, and start the aftertreatment device manual regeneration by referring to page 5-11 for the necessary check and settings as well as the regeneration procedure.



MNUD-01-033



MNUD-01-034EN

Main Monitor Basic Screen Configuration

1- Engine Tachometer

2- DEF Level Gauge

3- ECO Indicator

4- Speedometer

5- Clock

6- Hour Meter/Odometer/Voltmeter/Average Fuel Consumption Rate

7- F-N-R Position Indicator

8- Shift Position Indicator

9- HOLD Display

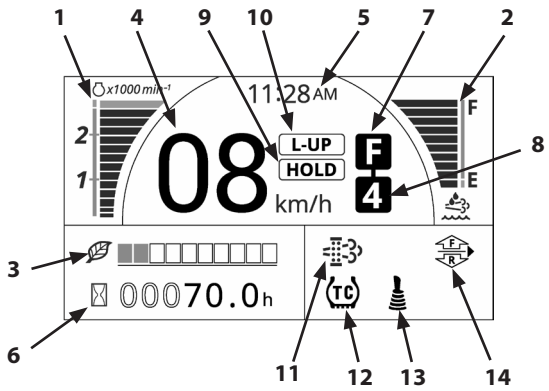
10- Lock-Up Indicator

11- Aftertreatment Device Indicator

12- Traction Control Indicator

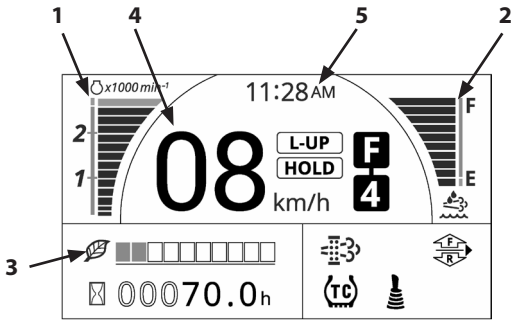
13- Joystick Steering Indicator

14- Forward/Reverse Selector Switch Indicator



MNFQ-01-021

Main Monitor Basic Screen Displayed Items



MNFQ-01-021

- Engine Tachometer (1)
  Engine tachometer (1) indicates the speed of currently running engine in a gauge form. (200 min^{-1} step)
  If the engine is overspeeding, the color of the gauge changes.

- DEF Level Gauge (2)
  DEF level gauge (2) displays the remaining DEF amount. When DEF level becomes low, the last segment and the right side bar turn yellow. When DEF level becomes further lower, the last segment turns red and engine operation is restricted. Refer to page 1-37 for details.

- ECO Indicator (3)
  ECO indicator (3) lights when the engine runs in energy efficient condition. The green block bar becomes longer with more efficient condition.

NOTE: ECO indicator (3) does not appear when any of the following alarm should be displayed in this area.

- *DEF Related Alarms:*
  Refer to page 1-36 for the DEF related alarm below.



- *System Restart Request:*
  When continuous operation exceeded 23 hours, it is necessary to restart the system. Stop the engine once, make sure that the monitor display has disappeared, then restart the engine. Refer to Section 3 for the engine start operation.



- Speedometer (4)
  Speedometer (4) indicates the present driving speed.

- Clock (5)
  Displays the current time. 24-h/12-h display can be selected. Refer to page 1-43 for details.

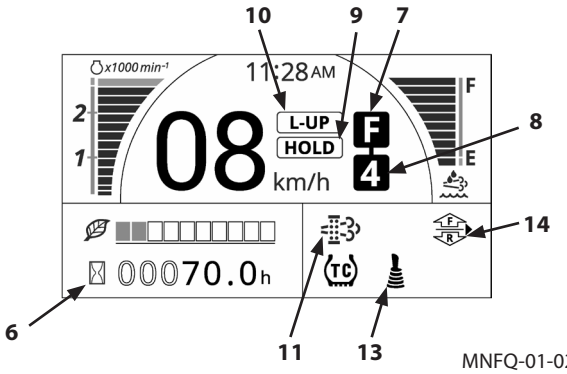
- Sub Meter (6)
  One display item can be selected among Hour Meter, Odometer, Voltmeter, and Average Fuel Consumption Rate by Sub Meter menu. Refer to page 1-40 "Sub Meter".

  Hour Meter:
  The total accumulated operating hours since the machine started working, are displayed in hours (h). One digit after the decimal point indicates tenths of an hour (6 minutes).

  Odometer:
  Total machine traveling distance is indicated by changing display mode.

  Voltmeter:
  Battery level is displayed in voltage (V).

  Average Fuel Consumption Rate :
  The fuel consumption, machine operation hours, and average fuel consumption rate can be checked and reset.



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- F-N-R/Shift Position Indicator (7)(8)
  F-N-R/Shift Position Indicator displays machine operating condition (status of the transmission).

  F-N-R Display (7):
  F-N-R indicator displays status of the transmission.

Forward	→	F
Neutral	→	N
Reverse	→	R

  Shift Position Indicator (8):
  It displays currently engaged gears. It is not displayed at neutral position.

Forward	:	1st - 4th
Reverse	:	1st - 4th

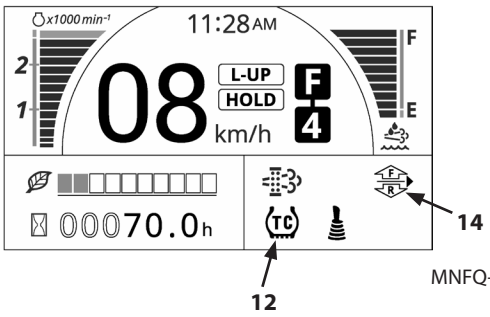
- HOLD Display (9)
  Hold display (9) is displayed when the hold switch on the side console is in ON position. Refer to page 1-150 for details.

- Lock-Up Indicator (10)
  Lock-up indicator (10) appears during the torque converter lock-up shifting. Refer to 1-123.

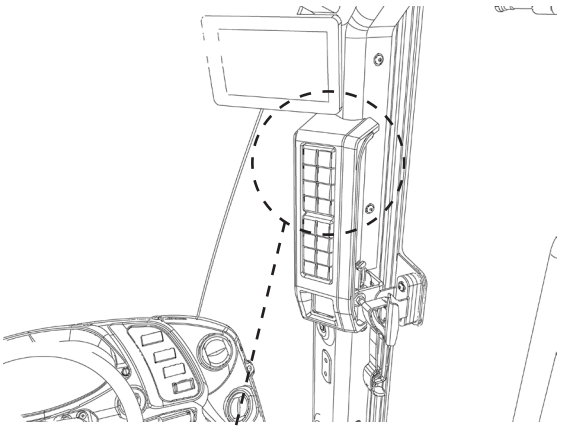
- Aftertreatment Device Indicator (11)
  Displays condition of the aftertreatment device. Refer to page 1-5 for further information.

- Traction Control Indicator (12)
  Traction control indicator (12) appears when the traction control is turned ON by the setting menu. Refer to page 1-96 for further information.

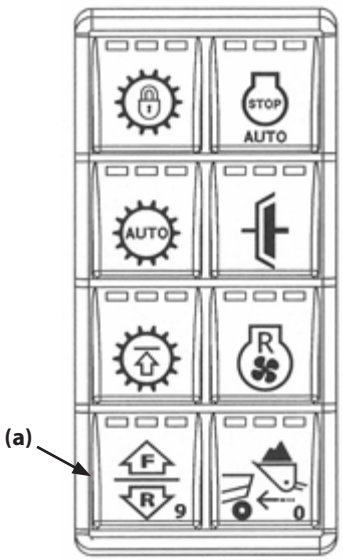
- Forward/Reverse Selector Switch Indicator (14)
  The forward/reverse indicator (14) is lit when the forward/reverse switch (a) on the right console, or on the multi-function lever is usable. Refer to page 1-131 "Forward/Reverse Selector Switch".
  If a problem occurs in the Forward/Reverse switch (right or left) system, a warning mark is displayed in the Forward/Reverse selector switch indicator (14) on the monitor.



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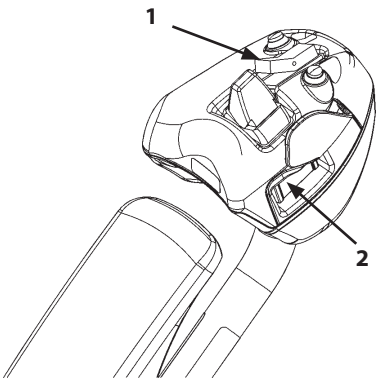


MNUD-01-200

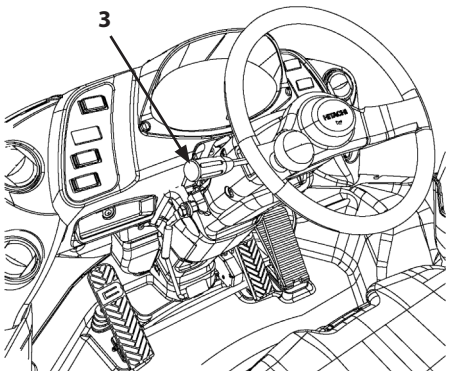


MNFQ-01-201

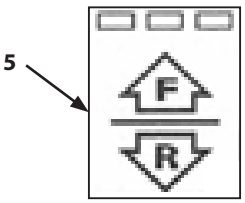
Display	Description
 Yellow	There is a problem in forward/reverse switch (left)(1) system. Turn off joystick steering selector switch (2) and operate the machine with forward/reverse lever (3). Check and/or repair the related parts.
 Yellow	There is a problem in forward/reverse switch (right)(4) system. Turn forward/reverse selector switch (5) OFF and operate the machine with forward/reverse lever (3). Check and/or repair the related parts.
 Yellow	There is a problem in the Forward/Reverse switch (right or left) system. Operate the machine with forward/reverse lever (3) and park the machine in a safe place. Contact Authorized Dealer.
 Red	There is a serious problem in the forward/ reverse switch (right or left) system. Operate the machine with forward/reverse lever (3) and park the machine in a safe place. Contact Authorized Dealer.



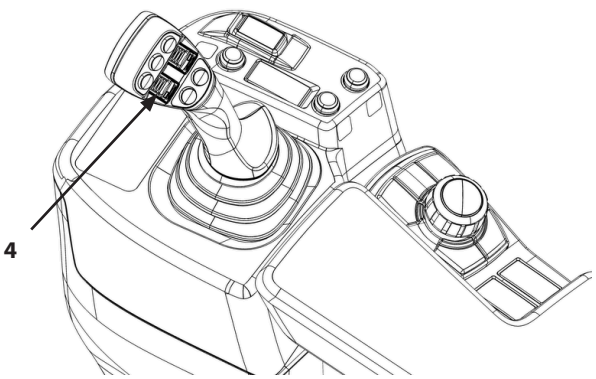
MNEK-13-002



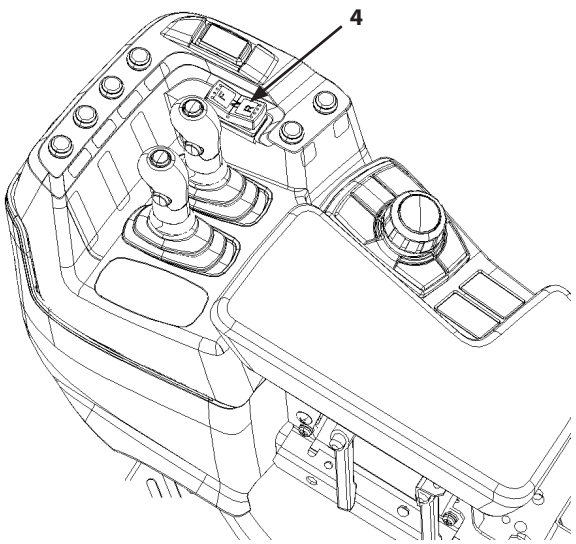
MNUD-01-009



MNUD-01-209



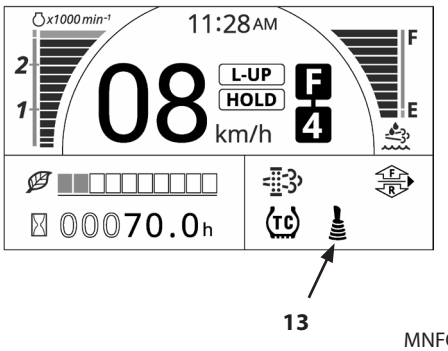
MNUD-01-099



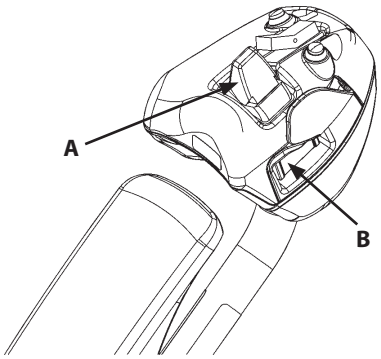
MNFQ-01-047

- Joystick Steering Indicator (13)
  Joystick steering indicator (13) is displayed when the joystick steering is available and made effective (turned ON). If a problem occurs in the joystick steering system, this indicator changes as follows.

Display	Description
 Yellow	There is a problem in the joystick steering system. Even if joystick steering lever (A) can be used, turn joystick steering selector switch (B) OFF and use the steering wheel for turning. Check and/or repair the related parts.
 Yellow	There is a problem in the joystick steering system. Joystick steering lever (A) does not operate. Use the steering wheel for turning and park the machine in a safe place. Contact Authorized Dealer.
 Red	There is a serious problem in the joystick steering system. Joystick steering lever (A) does not operate. Use the steering wheel for turning and park the machine in a safe place. Contact Authorized Dealer.



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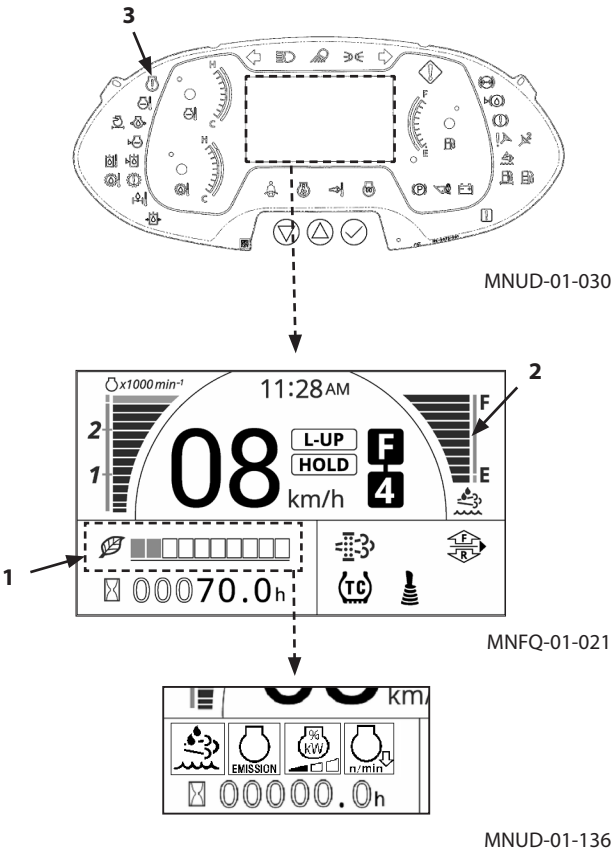


MNEK-13-002

DEF/SCR System Alarm

When the DEF level becomes low and/or the Urea SCR system malfunctions, the engine performance is controlled depending on the status.
The operator is alerted with alarm indicators, which appear on the main monitor instead of ECO indicator (1).
Move and park the machine in a safe place and follow the displayed message, or troubleshooting guide for the accompanied alarms.

NOTE: Set the forward/reverse lever to neutral or apply the parking brake to show the alarm message on the monitors.



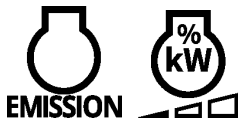
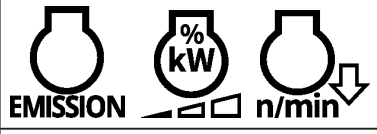
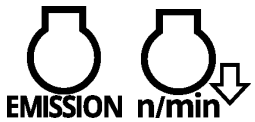
DEF Alarm Indicators

The following alarm indicator will appear in ECO indicator field (1) up to 4 in order of priority.

Priority	Display	Content of Alarm
1	EMISSION	Engine is in the Inducement mode and the engine output will gradually be restricted if continued operation.
2		Abnormal aftertreatment device
3	(Red)	Refer to the table on the next page.
4	(Yellow)	Refer to the table on the next page.
5	% kW	Engine output is restricted.
6	n/min	Engine speed is low.

DEF Level Alarm

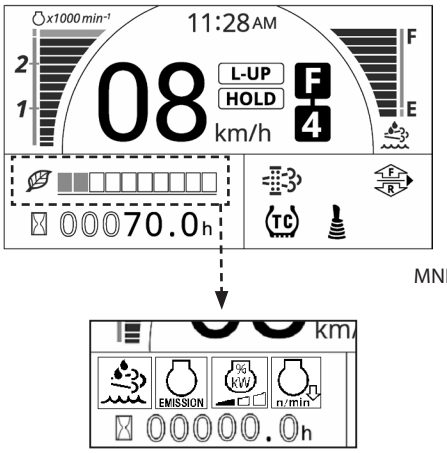
Display of the DEF gauge (2) changes depending on the DEF level.
The engine speed and output level control is as follows.

Level Gauge (2)	Alarm Indicator on Main Monitor (1)		Engine Trouble Indicator (3)	Status/Inducement
 (Yellow)	 (Yellow, light)		OFF	DEF level is low. Refill DEF.
 (Red)	 (Red, slow blink)		OFF	DEF is insufficient. Refill DEF. Engine output is restricted.
 (Red)	 (Red, fast blink)		 (Yellow)	DEF tank is empty. Refill DEF. Engine output and speed are restricted.
	 (Red, fast blink)		 (Yellow)	
	 (Red, fast blink)		 (Red)	

IMPORTANT: When DEF tank becomes empty, the engine runs but machine operation is disabled until DEF is supplied.

Urea SCR System Malfunction

The urea SCR system alarm indicator(s) appear instead of the ECO indicator depending on the engine condition as follows.



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Alarm Indicator	Engine Trouble Indicator	Status/Inducement
(Light) EMISSION	(Yellow)	Urea SCR system is broken.
(Light) EMISSION % kW	(Yellow)	Urea SCR system is broken. Engine output is restricted.
(Slow blink) EMISSION % kW	(Yellow)	Urea SCR system is broken. Engine output and speed are restricted. Contact Authorized Dealer for service.
(Slow blink) EMISSION % kW n/min	(Yellow → Red)	
(Fast blink) EMISSION n/min	(Red)	

Displaying Main Monitor Main Menu

IMPORTANT: If the forward/reverse lever is set to forward or reverse position while displaying the main menu screen, the screen changes back to the basic screen. (You can not change to the other screen.)

1. Press monitor display selector (down) (2) or monitor display mode selector (4) while displaying basic screen (1) to display the Main Menu screen.

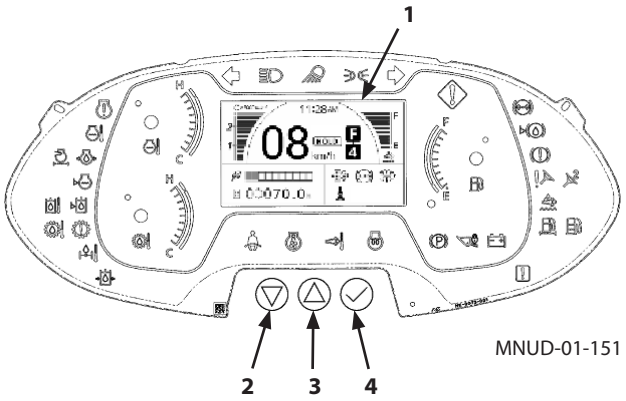
   The main menu screen shows the six item tags (5) on the left end as shown in the figure to the right.

2. Select the desired tag using monitor display selector (down) (2) or monitor display selector (up) (3), and press monitor display mode selector (4).

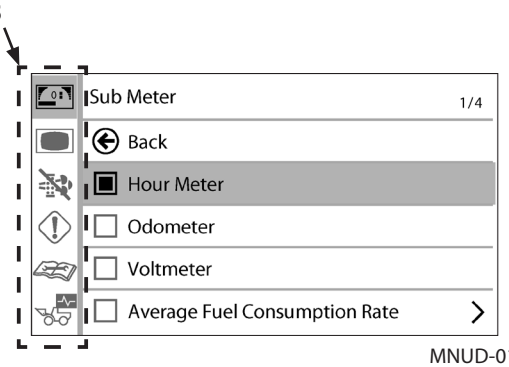
3. By pressing monitor display selector (down) (2) once from the main menu screen, the second tag from the top (6) for the Display setting is selected in blue.

4. Press monitor display mode selector (4) to show Display setting menu.
5. Select the desired menu using monitor display selector (down) (2) or monitor display selector (up) (3), and press monitor display mode selector (4).
6. Select "Back" at the top of menu list to the tag select mode.
7. Select "Exit" at the bottom of menu list to show the basic screen.

NOTE: By pressing monitor display selector (up) (3) once from the main menu screen, the monitor changes back to the basic screen (1).
By pressing monitor display selector (down) (3) once while selecting monitoring tag (7), the monitor changes back to the basic screen (1).

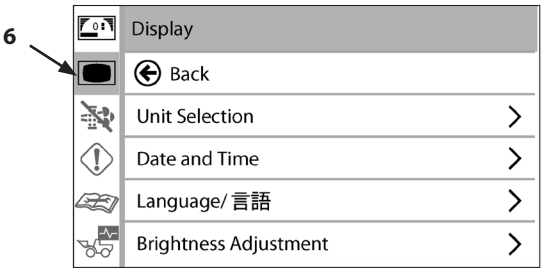


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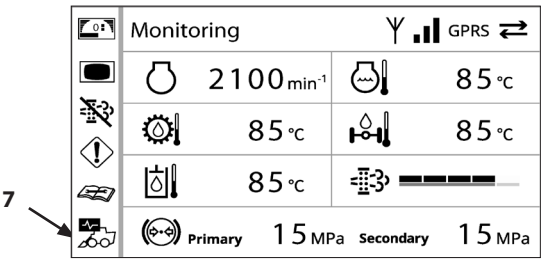


MNUD-01-100EN

Main Menu Screen



MNUD-01-101EN



MNFQ-01-025EN

Sub Meter

Item to be displayed on the main monitor can be selected in this screen. Either one of hour meter, odometer, voltmeter, or average fuel consumption rate can be displayed.

1. Select Sub Meter tag (1) on the main menu screen.

NOTE: For how to select the desired tag, refer to "Displaying Main Monitor Main Menu" (page 1-39).

2. Push monitor display mode selector (2) to display the Sub Meter screen (5).

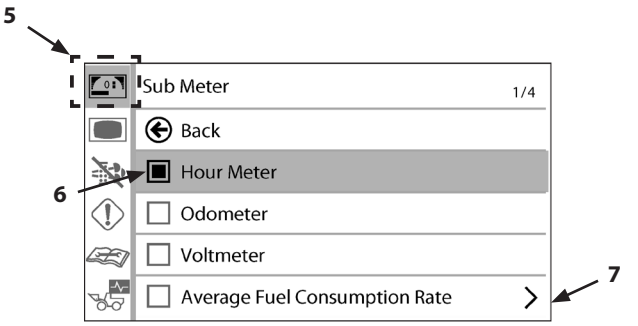
3. Push monitor display selector (down)(3) or monitor display selector (up)(4) to highlight an item to display on the basic screen. The box for the selected item lights in green (6).

4. Highlight Fuel Consumption (7), and push monitor display mode selector (2) to display Average Fuel Consumption Rate screen (8).
   The fuel consumption, machine operation hours, and average fuel consumption rate can be checked.

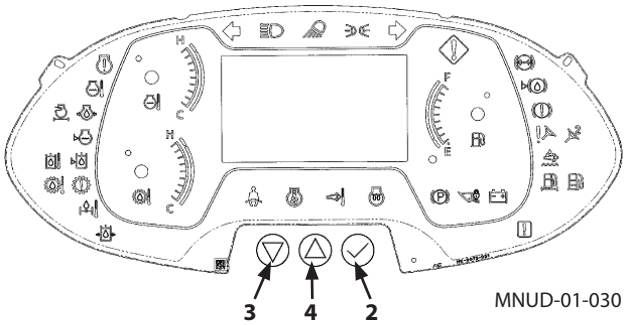
5. To clear the fuel consumption, machine operation hours, and average fuel consumption rate, use monitor display selector (down)(3) or monitor display selector (up)(4) to highlight RESET (9), and then push monitor display mode selector (2).

IMPORTANT: Total fuel consumption and fuel consumption rate depend on the operating environment and the operation method of the machine.
The values shown on the screen are just for reference. A difference could arise between actual fuel consumption and fuel consumption as displayed on the monitor unit.

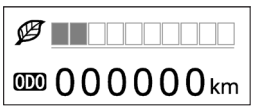
Refer to page 1-32 for further information.



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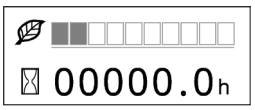


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Odometer Display

MNUD-01-038



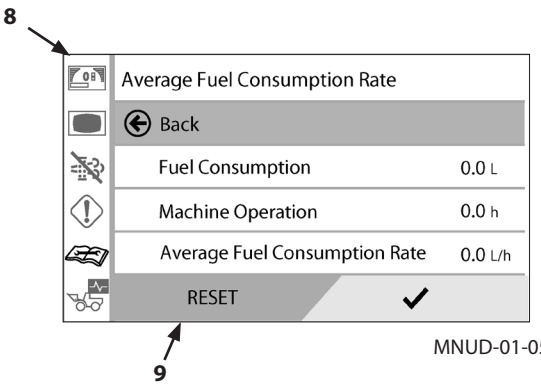
Hour Meter Display

MNUD-01-051a



Voltmeter Display

MNUD-01-052



MNUD-01-059EN

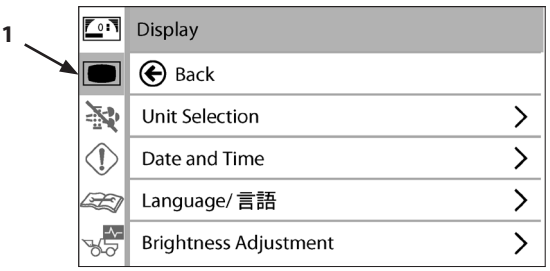
Display Setting

Display Setting menu consists of unit setting, date and time setting, language setting, and LCD brightness adjustment.

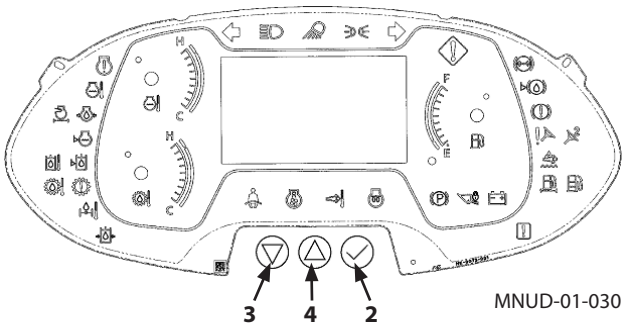
1. Select Display Setting tag (1) on the main menu screen.

NOTE: For how to select the desired tag, refer to "Displaying Main Monitor Main Menu" (page 1-39).

2. Push monitor display mode selector (2) to display the Display screen (5).

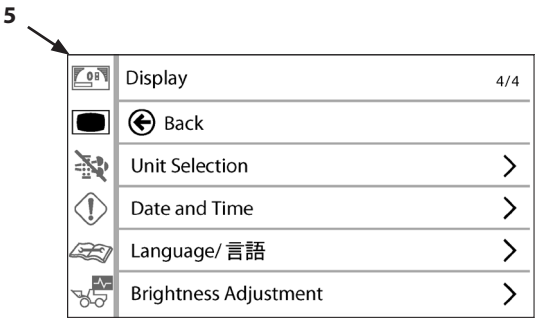


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3. Push monitor display selector (down)(3) or monitor display selector (up) (4) to highlight an item you want to set.
4. Push monitor display mode selector (2) to display the selected setting screen.



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Unit Selection

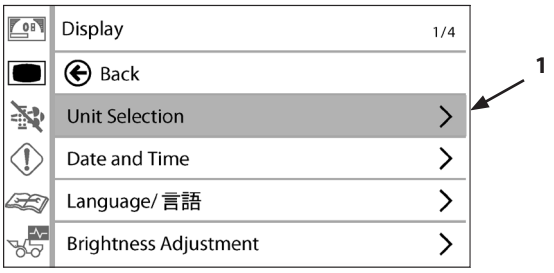
The "Metric" (SI Units) or "U.S." unit to be used for the main monitor displayed items can be selected.

1. From Display Setting screen, highlight Unit Selection (1) and push monitor display mode selector (2).

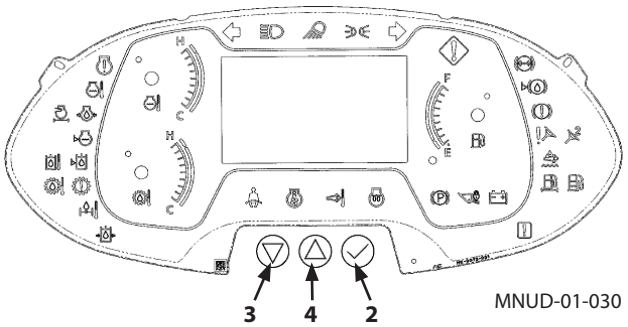
NOTE: For how to go to Display Setting screen, refer to "Display Setting" (page 1-41).

2. Select "Metric" or "U.S." unit using monitor display selector (down) (3) or monitor display selector (up) (4), and push monitor display mode selector (2) to fix the selection.

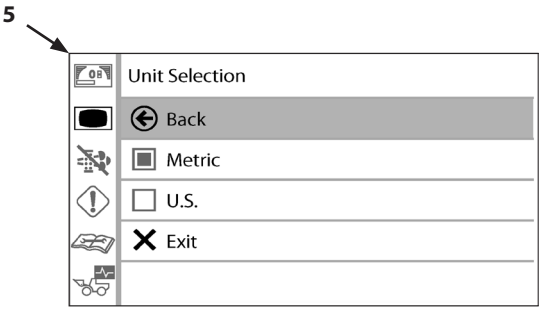
	Metric	U.S.
Driving Speed	km/h	miles/h
Odometer	km	miles
Ave. Fuel	L L/h	gal gal/h



MNUD-01-108EN



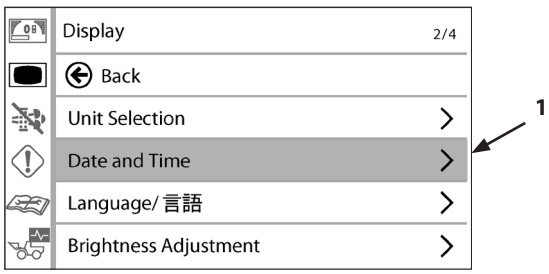
MNUD-01-030



MNUD-01-112EN

Date and Time

Date and time can be adjusted, and the display format for date and time can be selected on this screen.



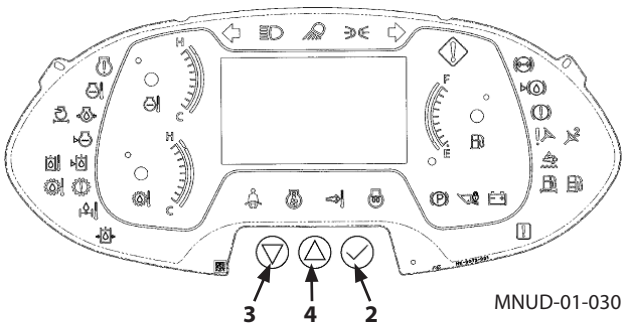
MNUD-01-109EN

Time Adjustment

1. From Display Setting screen, highlight Date and Time (1) and push monitor display mode selector (2).

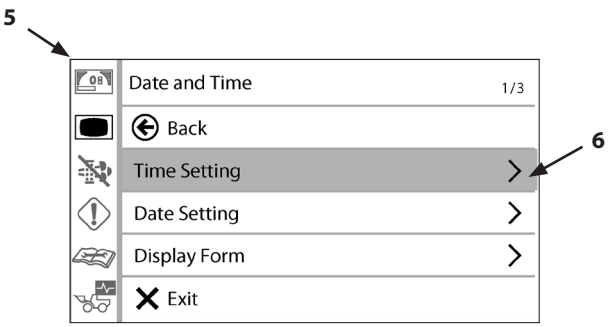
NOTE: For how to go to Display Setting screen, refer to "Display Setting" (page 1-41).

2. Date and Time setting screen (5) is displayed.



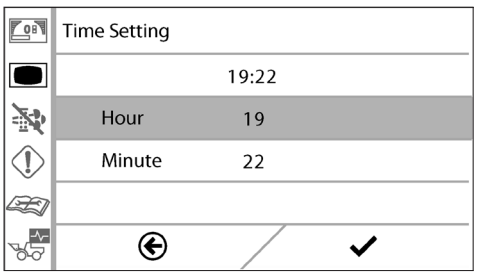
MNUD-01-030

3. Push monitor display selector (down)(3) to select Time Setting (6), and push monitor display mode selector (2).



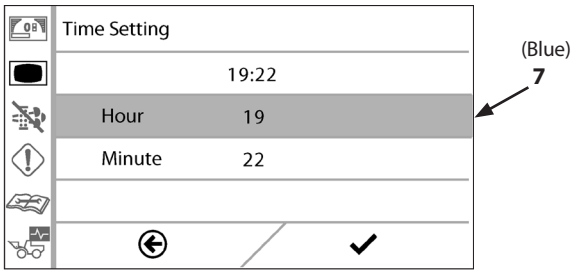
MNUD-01-113EN

4. The time setting screen is displayed showing the current time.
   For example of current time "19:22":
   When the time format is "24h", the time display is as shown in the screen to the right.
   When the time format is "12h", "PM 7:22" is displayed.



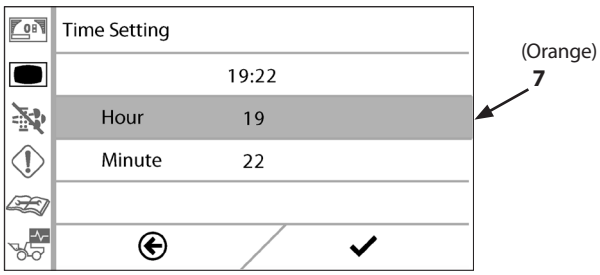
MNUD-01-114aEN

5. Push monitor display selector (down) (3) or monitor display selector (up) (4) to select "Hour" or "Minute" you want to adjust.



MNUD-01-114aEN

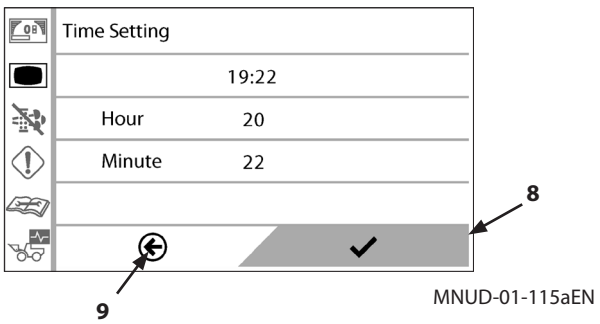
6. While highlighting an item in blue, push monitor display mode selector (2), then the background color changes to orange (7).
   Push monitor display selector (up) (4) to increase the number by one. Push monitor display selector (down) (3) to decrease it by one.



MNUD-01-114aEN

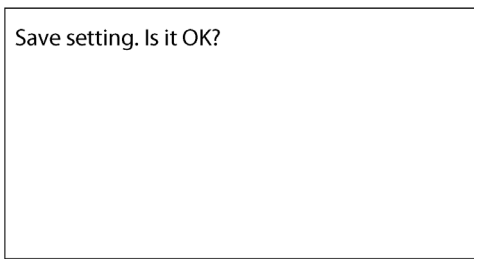
7. Push monitor display mode selector (2) after adjustment.
8. After adjusting both Hour and Minute, select "✔" (8) and push monitor display mode selector (2).

NOTE: Selecting "←" (9) here cancels the time setting changes.



MNUD-01-115aEN

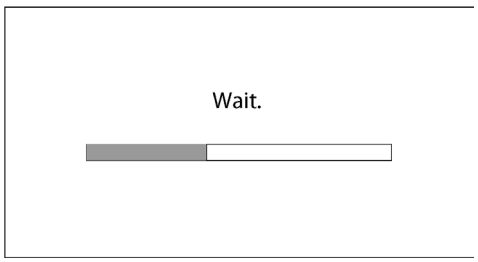
9. "Save Setting. Is it OK?" appears. Push monitor display mode selector (2) to make the change.



MNTK-01-100EN

10. Waiting message appears with progress bar while updating the clock display.

NOTE: This time setting is also applied to the other controllers. If any trouble such as communication error occurs, the message "Failed" is displayed. The date and time setting is canceled. Contact Authorized Dealer.

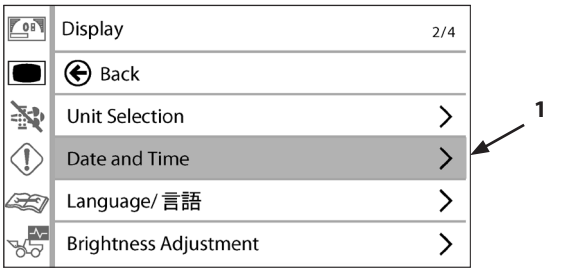


MNTK-01-101EN

Date Adjustment

1. From Display Setting screen, highlight Date and Time (1) and push monitor display mode selector (2).

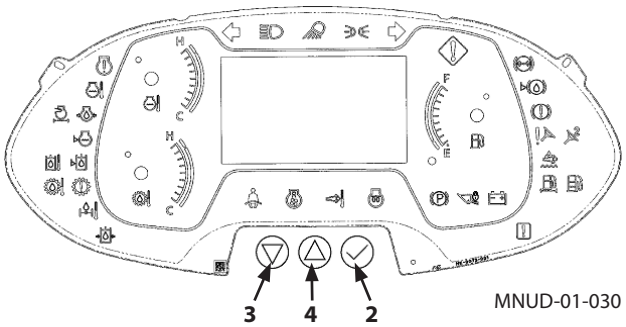
NOTE: For how to go to Display Setting screen, refer to "Display Setting" (page 1-41).



MNUD-01-109EN

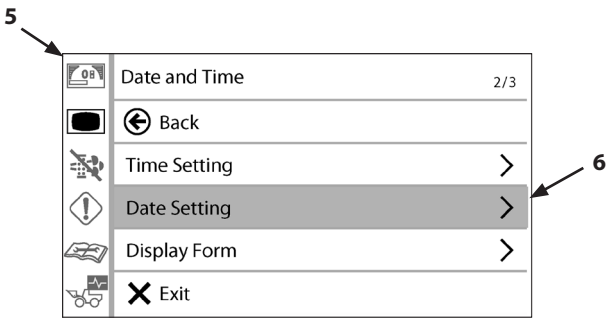
2. Date and Time setting screen (5) is displayed.

3. Push monitor display selector (down)(3) to select Date Setting (6), and push monitor display mode selector (2).

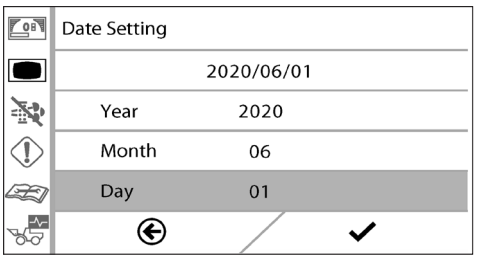


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4. The date setting screen is displayed showing the date in the currently selected date format.

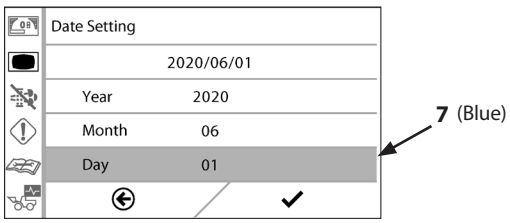


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MNUD-01-118EN

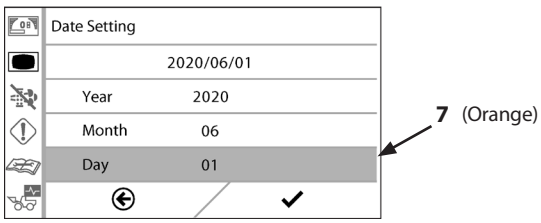
5. Push monitor display selector (down)(3) or monitor display selector (up) (4) to select "Year" "Month" or "Day" you want to adjust.



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6. While highlighting an item in blue, push monitor display mode selector (2), then the background color changes to orange (7).

   Push monitor display selector (up) (4) to increase the number by one. Push monitor display selector (down) (3) to decrease it by one.

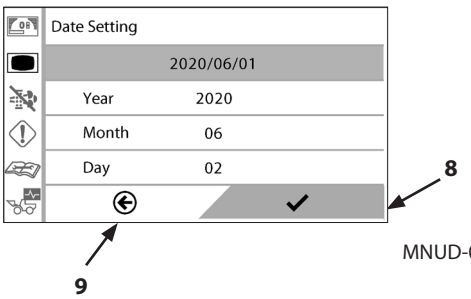


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7. Push monitor display mode selector (2) after adjustment.
8. After adjusting all items, select "✔" (8) and push monitor display mode selector (2).

NOTE: Selecting "←" (9) here cancels the date setting changes.

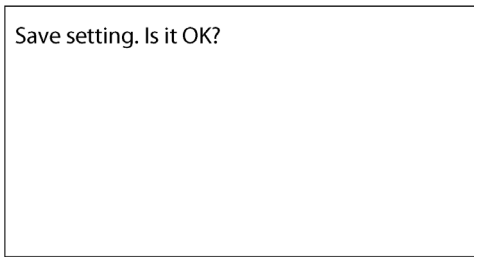
9. "Save Setting. Is it OK?" appears. Push monitor display mode selector (2) to make the change.



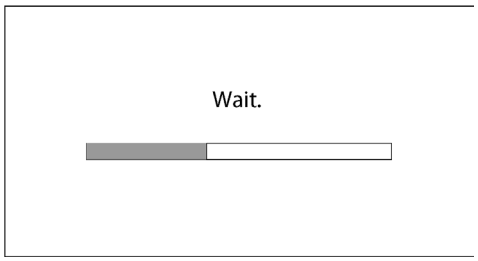
MNUD-01-138EN

10. Waiting message appears with progress bar while updating the date display.

NOTE: This date setting is also applied to the other controllers. If any trouble such as communication error occurs, the message "Failed" is displayed. Contact Authorized Dealer.



MNTK-01-100EN



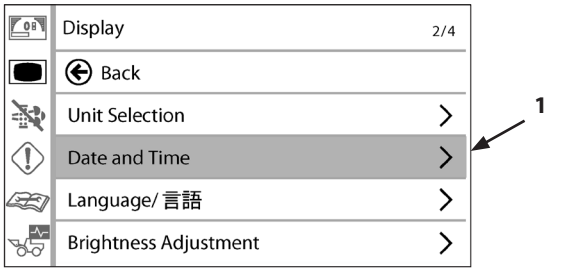
MNTK-01-101EN

Display Format Setting

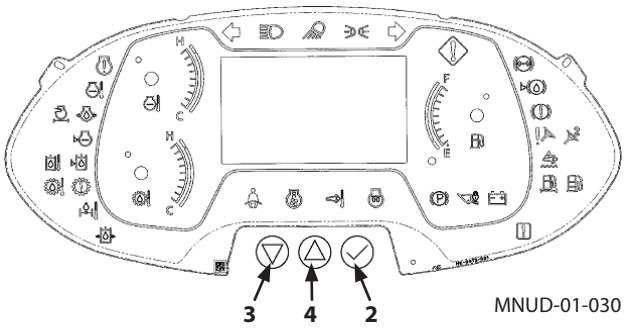
1. From Display Setting screen, highlight Date and Time (1) and push monitor display mode selector (2).

NOTE: For how to go to Display Setting screen, refer to "Display Setting" (page 1-41).

2. Date and Time setting screen (5) is displayed.

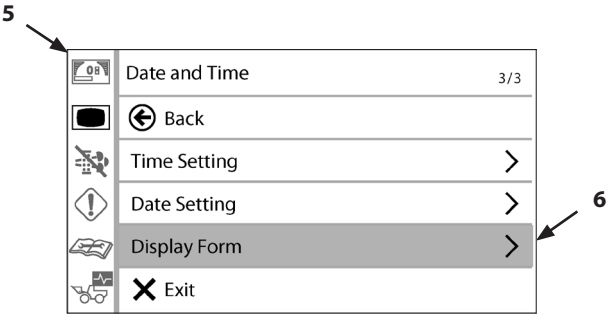


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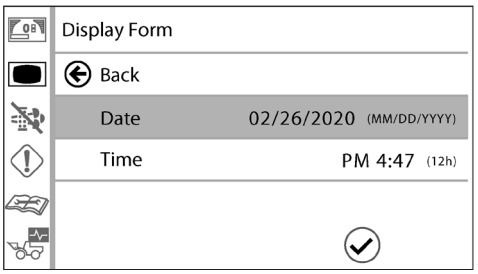
MNUD-01-030

3. Push monitor display selector (down)(3) to select Display Form (6), and push monitor display mode selector (2).



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4. The display format setting screen is displayed showing the current date and time in the currently selected format.



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5. Push monitor display selector (down)(3) or monitor display selector (up) (4) to select "Date" or "Time" you want to change the format.

6. While highlighting "Date" in blue, push monitor display mode selector (2).

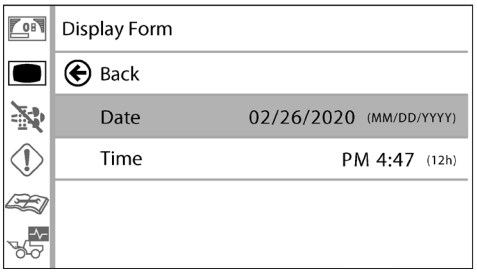
   Pushing monitor display mode selector (2) displays the date in different formats in order: (YYYY/MM/DD) → (DD/MM/YYYY) → (MM/DD/YYYY) → (YYYY/MM/DD).

7. Push monitor display mode selector (2) when a desired format is shown. The date format is applied.

8. While highlighting "Time" in blue, push monitor display mode selector (2).

   Pushing monitor display mode selector (2) displays the time in (12h) format and (24h) format alternately. When (12h) is selected, "AM" or "PM" is indicated before time.

9. Highlight "Back" and push monitor display mode selector (2) when a desired format is shown. The time format is applied.



MNUD-01-045EN

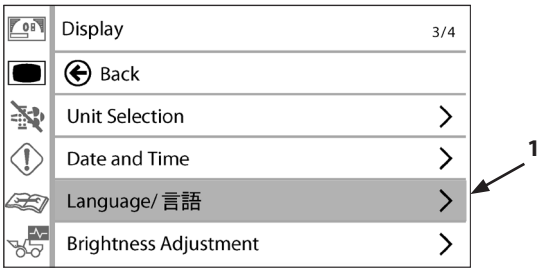
Language Selection

The language used in the main monitor display and sub monitor display can be selected.

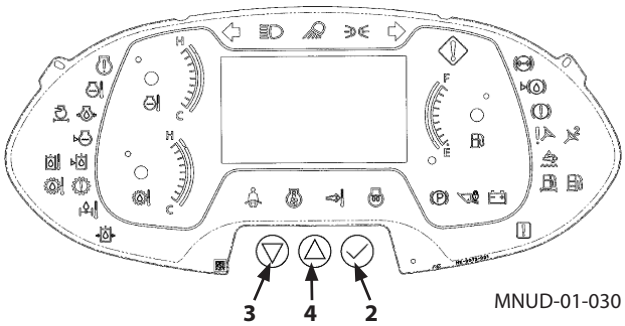
1. From Display Setting screen, highlight Language/言語 (1) and push monitor display mode selector (2).

NOTE: For how to go to Display Setting screen, refer to "Display Setting" (page 1-41).

2. Language/言語 screen (5) is displayed.



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3. Select a desired language using monitor display selector (down) (3) and monitor display selector (up) (4), and push monitor display mode selector (2).

4. The monitor language is immediately changed to the selected one when exit from the selection screen.

NOTE: The sub monitor language is also changed to the same language selected in this menu. However, a monitor system restart is required to update the sub monitor language. Turn the key switch to the OFF position and then turn it to the ON position again.



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Display Language List

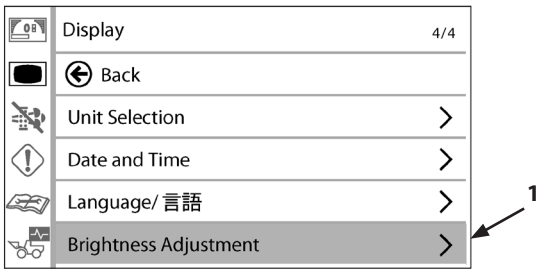
Language	Screen Display
English	English
Japanese	日本語
Traditional Chinese	繁體中文
Spanish	Español
Italian	Italiano
French	Français
German	Deutsch
Dutch	Nederlands
Russian	Русский
Portuguese	Português
Simplified Chinese	简体中文
Finnish	Suomi
Greek	Ελληνικά
Swedish	Svenska
Norwegian	Norsk
Slovak	Slovenčina
Serbian	Srpski
Hebrew	עברית
Vietnamese	Tiếng Việt
Myanmar	မြန်မာ
Arabic	اللغة العربية
Persian	زبان فارسی
Turkish	Türkçe
Danish	Dansk
Estonian	Eesti
Polish	Polski
Icelandic	Íslenska
Croatian	Hrvatski
Slovenian	Slovenščina
Romanian	limba română
Bulgarian	Български език
Lithuanian	Lietuvių kalba
Czech	Čeština
Latvian	Latviešu
Hungarian	Magyar

Brightness Adjustment Procedure

The brightness of LCD main monitor (1) can be adjusted.

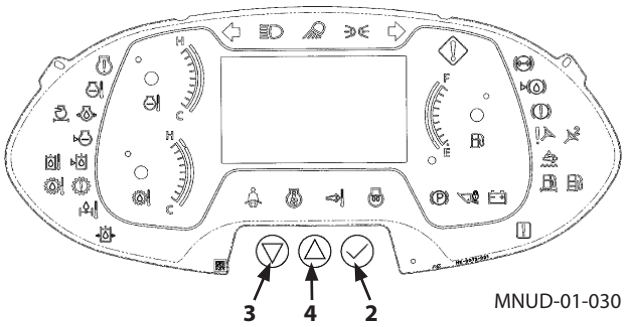
1. From Display Setting screen, highlight Brightness Adjustment (1) and push monitor display mode selector (2).

NOTE: For how to go to Display Setting screen, refer to "Display Setting" (page 1-41).



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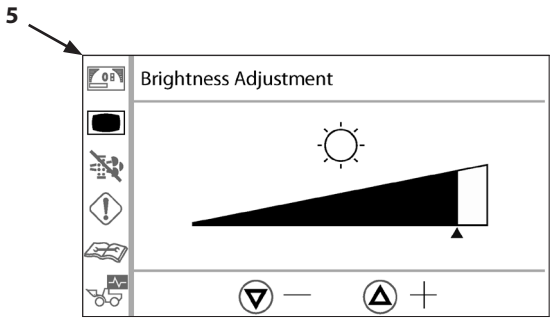
2. Brightness Adjustment screen (5) is displayed.



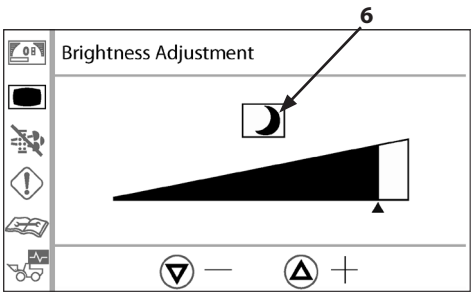
MNUD-01-030

3. Push monitor display selector (up) (4) to make the screen brighter, and push monitor display selector (down) (3) to make the screen darker. The adjustment can be done by 5% (20 steps) up to 100%, except the level "0%".
4. Push monitor display mode selector (2) when the desired brightness is achieved.

NOTE: When the clearance light is turned ON, the monitor screen changes to night mode and moon mark (6) is displayed. Brightness can be adjusted for day mode and night mode respectively.



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MNUD-01-123EN

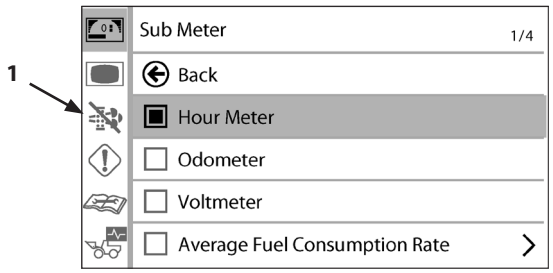
Aftertreatment Device Regeneration Inhibit

IMPORTANT: The aftertreatment device regeneration can be inhibited at this screen to prevent auto regeneration while operating the machine in a dusty area or indoors.

Inhibit Aftertreatment Device Regeneration

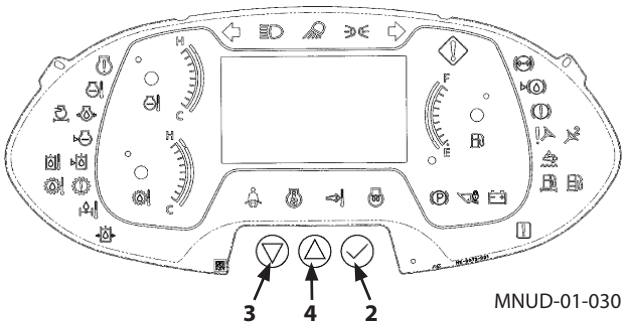
1. Select Aftertreatment Device Regeneration Inhibit Setting tag (1) on the main menu screen.

NOTE: For how to select the desired tag, refer to "Displaying Main Monitor Main Menu" (page 1-39).



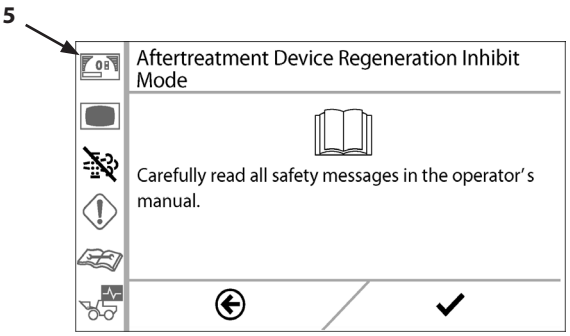
MNUD-01-100EN

2. Push monitor display mode selector (2) to display the Aftertreatment Device Regeneration Inhibit Mode screen (5).



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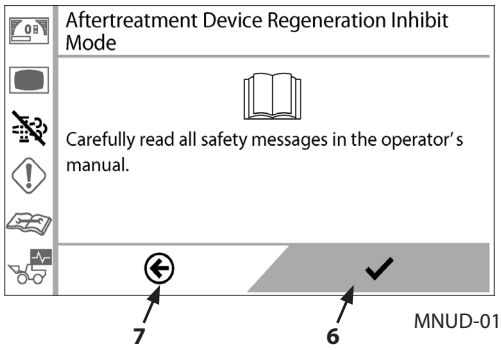
3. Check the message displayed on the monitor. After confirming, push monitor display mode selector (2).



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4. Highlight "✔" (6) by pushing monitor display selector (down) (3) and push monitor display mode selector (2).

NOTE: Selecting "←" (7) to cancel the setting.



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5. Aftertreatment Device Regeneration Inhibit screen (8) is displayed.

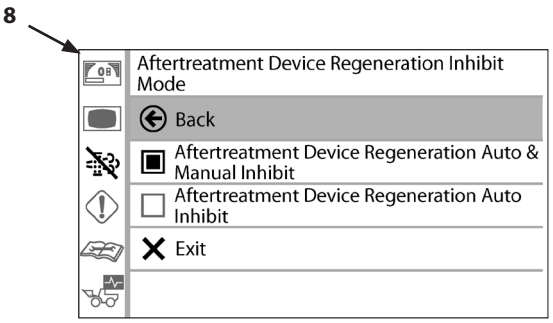
   Select either "Aftertreatment Device Regeneration Auto & Manual Inhibit" or "Aftertreatment Device Regeneration Auto Inhibit" can be specified to inhibit regeneration process to occur and push monitor display mode selector (2) to fix the selection.

   The check box for the selected item lights in green.

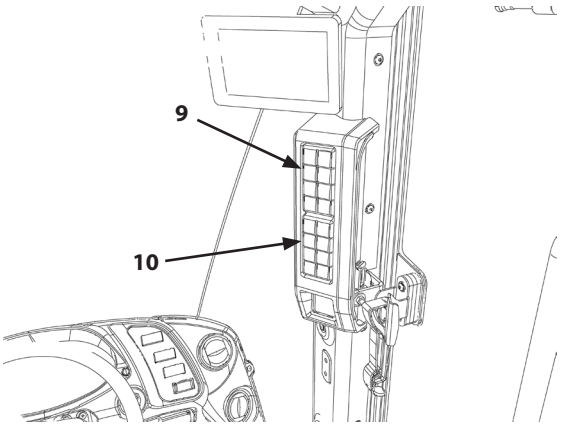
6. To activate the aftertreatment device regeneration inhibit function, press aftertreatment device regeneration inhibit switch (10) on panel switch (9). Refer to page 1-135.

IMPORTANT: When the machine is operated with the aftertreatment device regeneration inhibited, the aftertreatment device becomes clogged. When the aftertreatment device regeneration request is displayed, move the machine to a safe place. Perform the manual regeneration following the specified procedure. Failure to do so may damage the aftertreatment device. Refer to "Aftertreatment Device" for the manual regeneration (pages 1-7, 5-11).

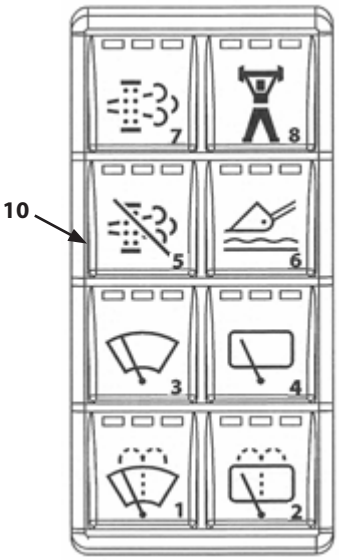
NOTE: When the manual regeneration switch is pushed when the manual regeneration is inhibited by this setting, the message is displayed to notify the switch operation is not effective, and instruct to release the regeneration inhibition. Follow the displayed instruction on the main monitor.



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MNUD-01-200



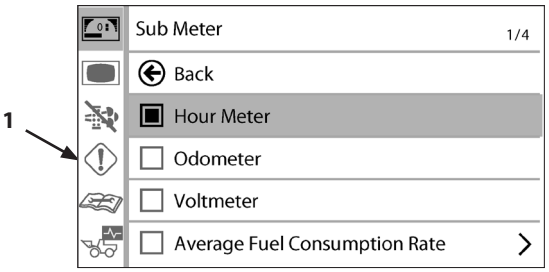
MNUD-01-202

Troubleshooting

An active fault code generated by the controller connected to the controller area network (CAN) is displayed on this screen.

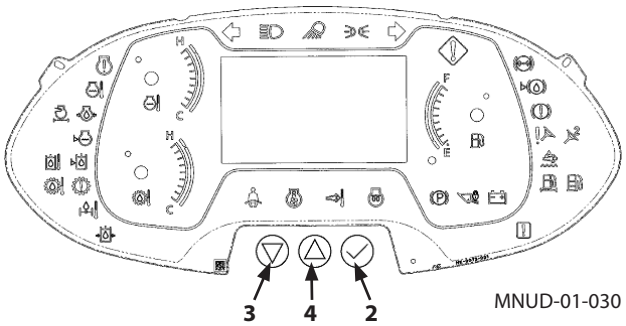
1. Select Troubleshooting tag (1) on the main menu screen.

NOTE: For how to select the desired tag, refer to "Displaying Main Monitor Main Menu" (page 1-39).



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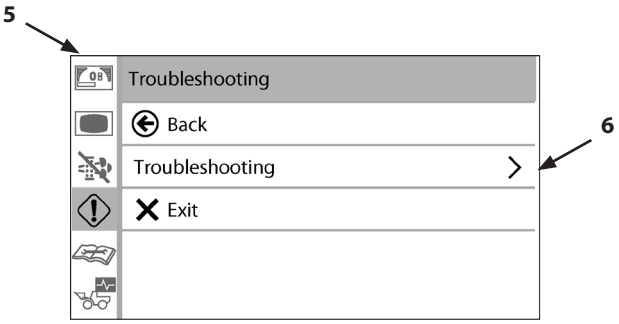
2. Push monitor display mode selector (2) to display the Troubleshooting screen (5).



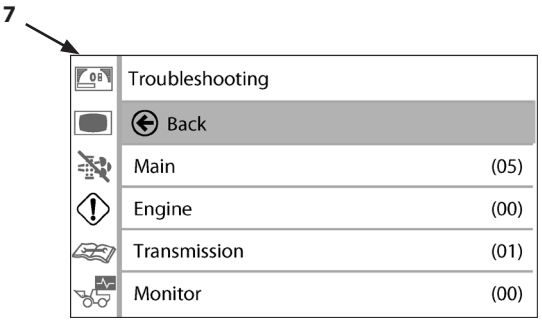
MNUD-01-030

3. Select Troubleshooting (6) and push monitor display mode selector (2).
   Troubleshooting screen (7) is displayed. The number of currently generated fault codes are displayed to the right of each controller.

NOTE: (00) indicates no fault code is reported.



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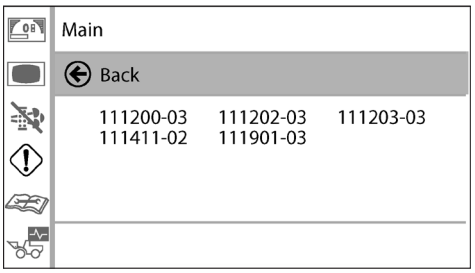


MNUD-01-126EN

4. Push monitor display selector (down)(3) or monitor display selector (up) (4) to highlight an item, and push monitor display mode selector (2) to display the fault code list.
   (In this example, Main Controller (6) is selected.)

NOTE:

- *The controller with no fault code cannot be selected.*
- *A maximum of 18 fault codes in order of occurrence can be displayed.*



MNUD-01-127EN

IMPORTANT: Send the troubleshooting result to Authorized Dealer as soon as possible.

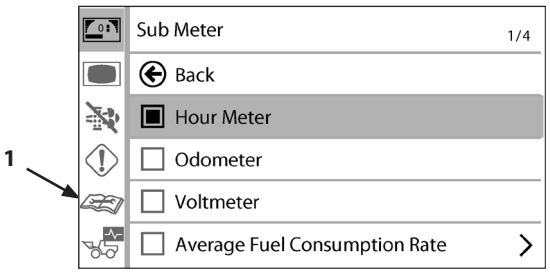
Maintenance

The maintenance screen includes maintenance notice, remaining hours until the next maintenance, and maintenance intervals.

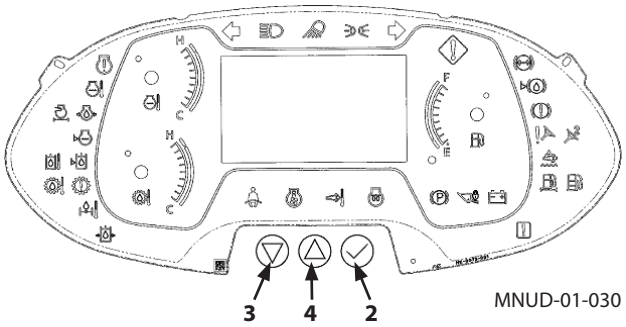
1. Select Maintenance tag (1) on the main menu screen.

NOTE: For how to select the desired tag, refer to "Displaying Main Monitor Main Menu" (page 1-39).

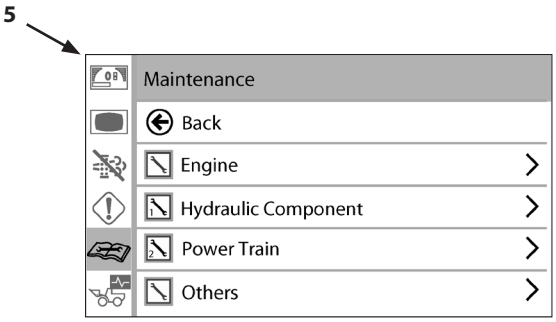
2. Push monitor display mode selector (2) to display the Maintenance screen (5).
3. Push monitor display selector (down)(3) or monitor display selector (up) (4) to highlight an item to be checked.



MNUD-01-100EN



MNUD-01-030



MNUD-01-104EN

Maintenance Items and the default interval:

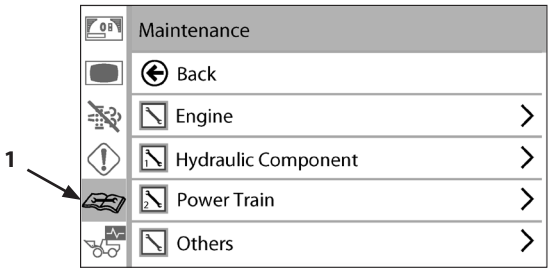
Category	Item	Default Interval
Engine	• Engine Oil	500
	• Engine Oil Filter	500
	• Muffler Filter	4500
	• DEF Supply Module Main Filter	4500
	• Fuel Solenoid Pump Filter	1000
	• Fuel Filter	1000
	• Air Cleaner Element	250
	• Coolant	3000
	• Coolant Filter	500
	• DEF Filler Port Filter	4500
Hydraulic Component	• Hydraulic Oil	4000
	• Pilot Hydraulic Oil Filter	2000
	• Hydraulic Oil Full-Flow Filter	2000
Power Train	• Transmission Oil	1000
	• Transmission Oil Filter	1000
	• Front Axle Oil	2000
	• Rear Axle Oil	2000
Others	• Air Conditioner Filter	1000
	• User Setting 1	0
	• User Setting 2	0

Maintenance Notice

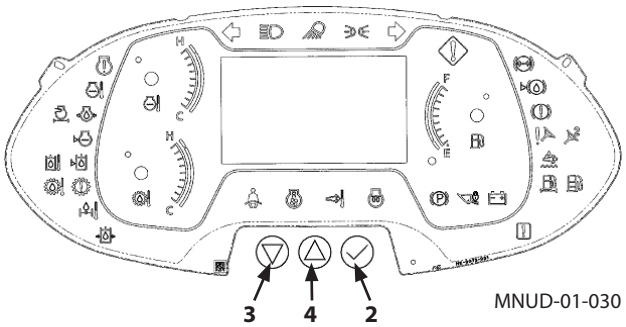
1. Select Maintenance tag (1) on the main menu screen.

NOTE: For how to select the desired tag, refer to "Displaying Main Monitor Main Menu" (page 1-39).

2. Push monitor display mode selector (2) to display the Maintenance screen.



MNUD-01-104EN



MNUD-01-030

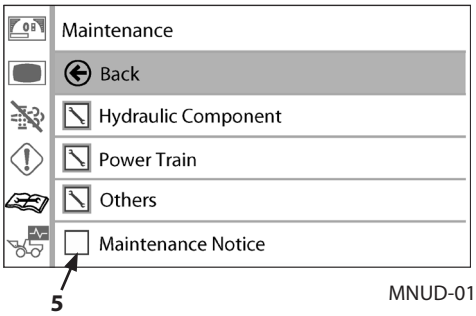
3. Push monitor display selector (down)(3) to highlight Maintenance Notice.

4. Push monitor display mode selector (2). The box (5) at Maintenance Notice lights on or off alternately by pushing monitor display mode selector (2).

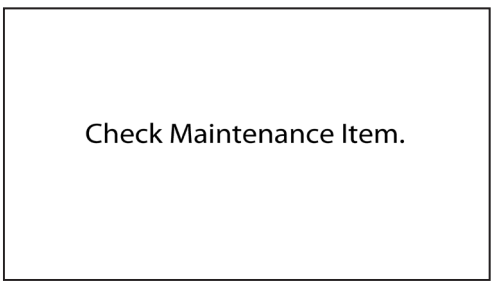
5. When the maintenance notice function is "ON", the box lights on in green.

   [ON]
   When the replacement interval reaches the set time within 20 hours, a maintenance announce screen is displayed for about 5 seconds after the key switch is turned on. (Refer to page 1-28.)

   [OFF]
   The maintenance announce screen is not displayed.



MNUD-01-128EN



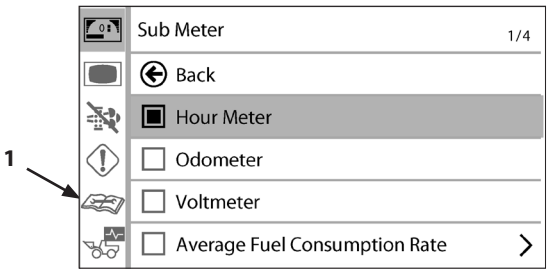
MNUD-01-035aEN

Remaining Time and Maintenance Interval

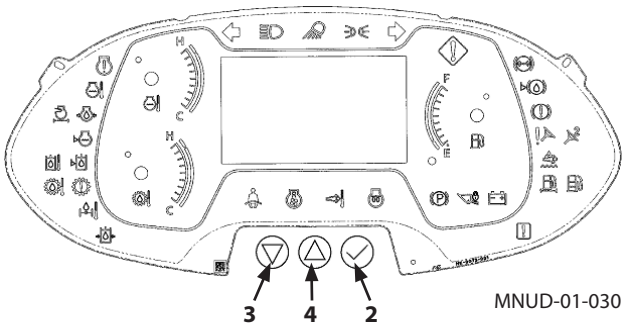
1. Select Maintenance tag (1) on the main menu screen.

NOTE: For how to select the desired tag, refer to "Displaying Main Monitor Main Menu" (page 1-39).

2. Push monitor display mode selector (2) to display the Maintenance screen.



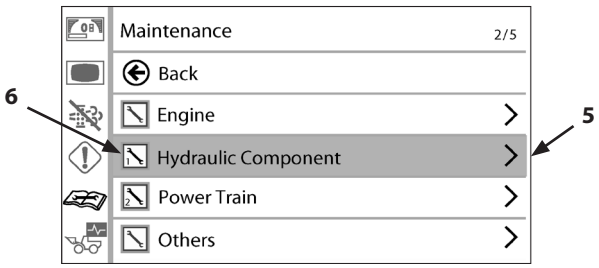
MNUD-01-100EN



MNUD-01-030

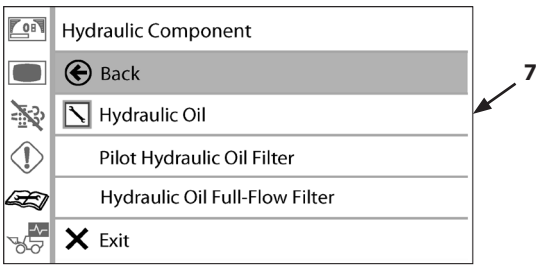
3. Push monitor display selector (down)(3) or monitor display selector (up) (4) to highlight an item to be checked.
(In this example, Hydraulic Component (5) is selected.)

NOTE: When checking the maintenance items from the menu, items where the set time has been reached are marked with a spanner (6). The accompanied number indicates the number of sub items reaching the set time.

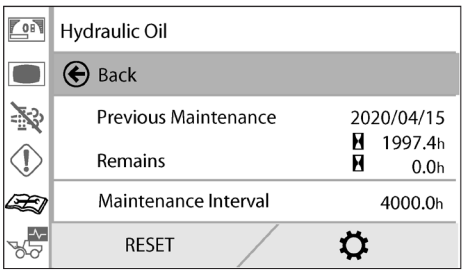


MNUD-01-129EN

4. Push monitor display selector (down)(3) or monitor display selector (up) (4) to highlight a desired item, and push monitor display mode selector (2) to display the time remaining for the desired item.
(In this example, Hydraulic Oil (7) is selected.)



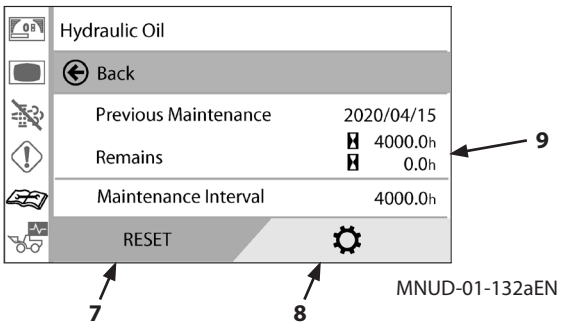
MNUD-01-130EN



MNUD-01-131aEN

5. Pressing monitor display selector (down) (3) moves to "RESET" (7) to reset the remaining time data.
   Pressing monitor display selector (down)(3) again moves to "gear" icon (8) to change the maintenance interval.

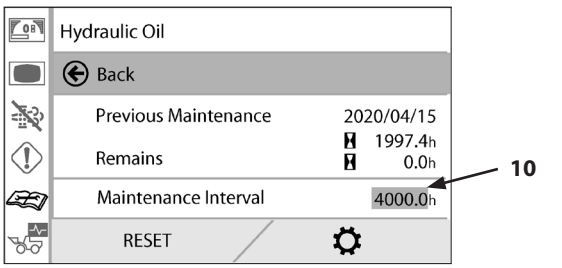
[Resetting Remaining Time]
When selected RESET (7), the value of the remaining time is reset to the maintenance interval (9), and the maintenance date is updated to the current date.



MNUD-01-132aEN

[Changing Maintenance Interval]
When selected "gear" icon (8), the background color of Maintenance Interval (10) changes.
Push monitor display selector (down)(3) or monitor display selector (up) (4) to adjust the time. Pressing these button once decreases or increases the interval time by 10 hours.

Push monitor display mode selector (2) to set the value.
Confirmation message "Save setting. Is it OK?" appears.
Select "✓" and push monitor display mode selector (2) to fix the change.
Select "←" and push monitor display mode selector (2) to cancel the change. The Maintenance Interval returns to the previous setting.



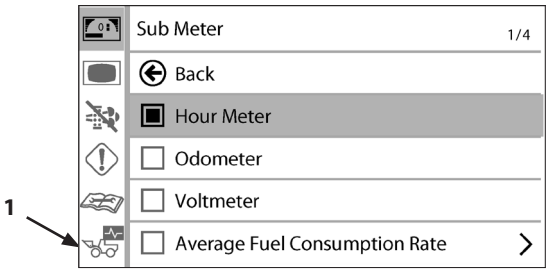
MNUD-01-133aEN

Monitoring

The current status or values of engine speed, oil temperatures, brake pressure, communication status, and PM level can be checked.

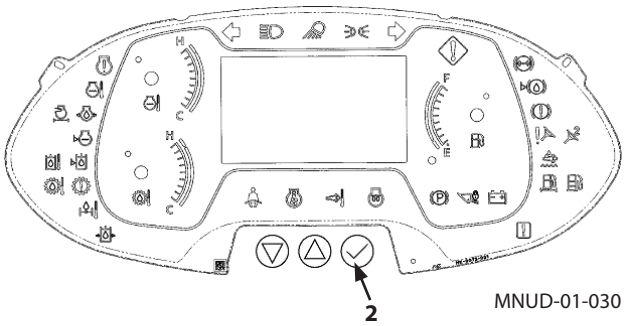
1. Select Monitoring tag (1) on the main menu screen.

NOTE: For how to select the desired tag, refer to "Displaying Main Monitor Main Menu" (page 1-39).



MNUD-01-100EN

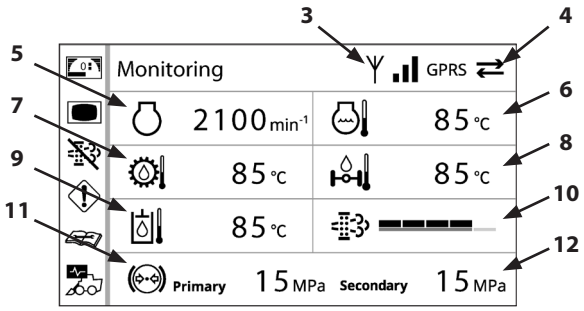
2. Push monitor display mode selector (2) to display the Monitoring screen.



MNUD-01-030

Monitoring Items:

- Antenna Reception Level (3)
- GPRS Communication Status (4)
- Engine Speed (5)
- Coolant Temperature (6)
- Transmission Oil Temperature (7)
- Axle Oil Temperature (8)
- Hydraulic Oil Temperature (9)
- PM Level (10)
  Accumulated particle materials in the aftertreatment device is indicated by 20% block bar. When reaching 100%, 5 blocks in red appear.
- Service Brake Primary Pressure (11)
- Service Brake Secondary Pressure (12)



MNFQ-01-025EN

Multi-Function Sub Monitor

Sub Monitor Controller

Use the sub monitor controller (1) with rotary device on the right console to perform operations and make settings on multi-function sub monitor (2).

The following describes the layout and function of the sub monitor controller switches.

- Selector Knob (4)
  Push : Push this switch while the basic screen is displayed, the Main Menu Screen opens. Push this switch after the menu screen, the action is confirmed.
  Rotate : Cursor moves.

NOTE: When selector knob operation is applicable, they are displayed on the left end of each menu screen.

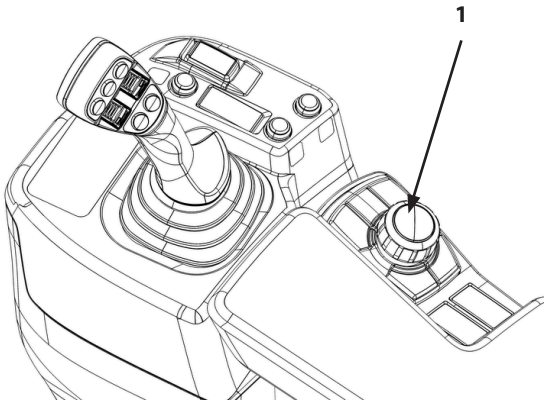
- Backward Switch (5)
  Push this switch to return to the previous screen.

- Home Switch (6)
  Allows any screen to return to the basic screen.
  When any alarm is reported, pressing home switch (6) displays the Alarm List screen. Refer to page 1-75 for the Alarm List screen.

- Screen Select (7)
  Push this switch to change the payload data display pattern.

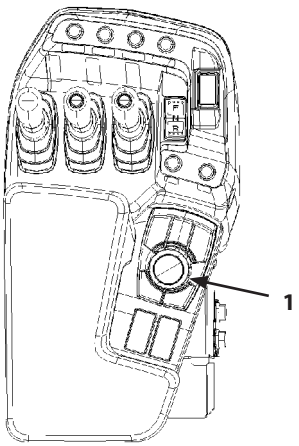
- Switch Panel Setting Confirmation Switch (8)
  Push this switch to check the current status of settings made by the panel switches (3).

- Rear View Camera Switch (9)
  Changes the size of rear view camera view displayed on sub monitor (2).



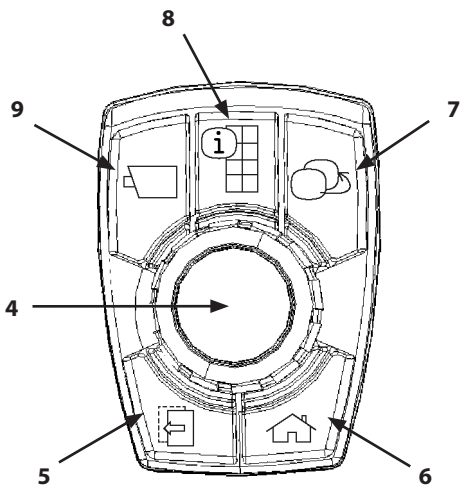
Multi-Function Joystick Type

MNUD-01-099

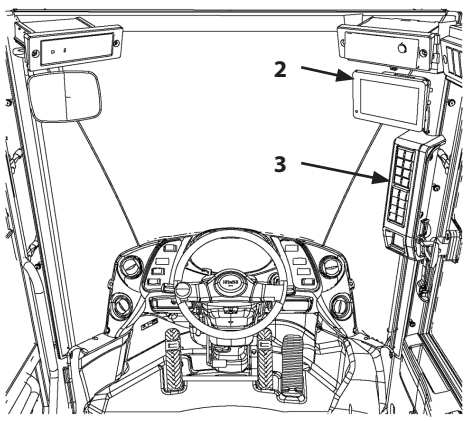


Fingertip Control Type

MNUD-01-251



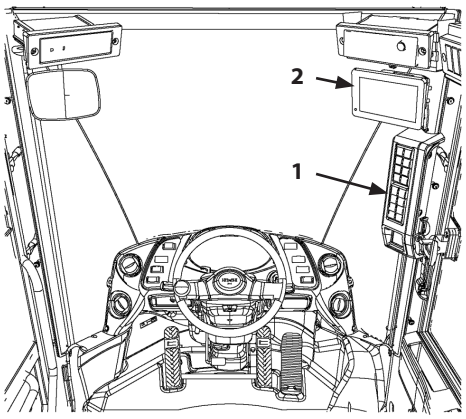
MNUD-01-252



MNUD-01-008

Panel Switch Setting Confirmation

The list of current status of switches on panel switch (1) can be shown on sub monitor (2).



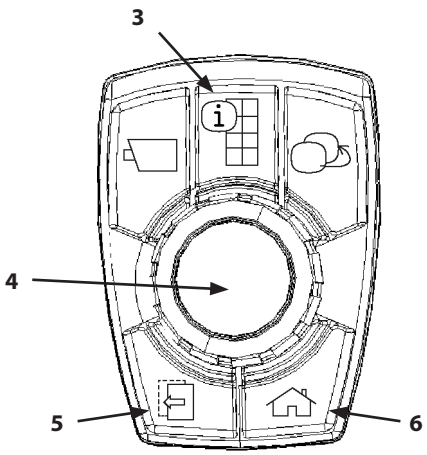
MNUD-01-008

IMPORTANT: This function is available only when the machine is stopped. If the machine starts to drive, the displayed screen immediately returns to the basic screen.

1. Stop the machine. When the basic screen is on sub monitor (2), press switch panel setting confirmation switch (3).

2. There are two screens for the upper and lower block of panel switch (1). Rotate selector knob (4) to switch the screens.
   The items are indicated by the icon on each switch as shown in the next page.

3. Pressing either switch panel setting confirmation switch (3), backward switch (5), or home switch (6) returns to the basic screen.



MNUD-01-252

Displayed Items

7- Lock-Up Mode Selector Switch

8- Auto Shut-Down Switch

9- Travel Mode Selector Switch

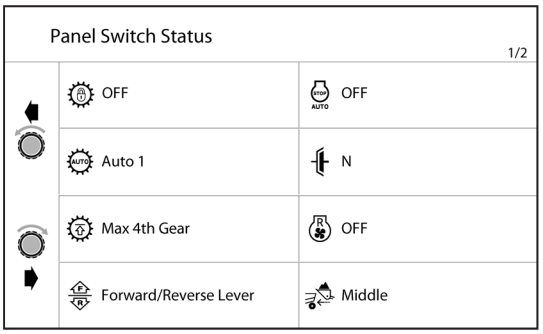
10- Clutch Cut Position Switch

11- Maximum Gear Limited Switch (Not used)

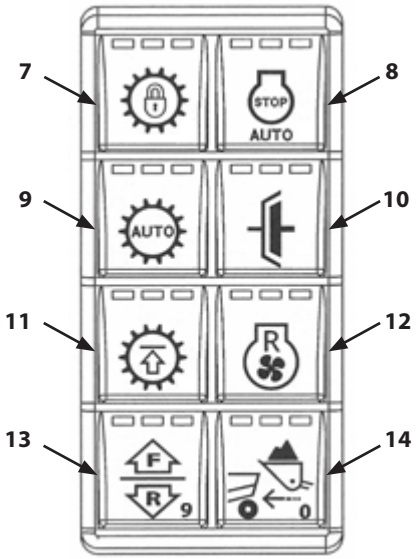
12- Fan Reverse Rotation Switch

13- Forward/Reverse Selector Switch

14- Dump Truck Approach Speed Control Switch



MNFQ-01-026EN



MNFQ-01-201

15- Aftertreatment Manual Regeneration Switch

16- Power Mode Switch

17- Aftertreatment Device Regeneration Inhibit Switch

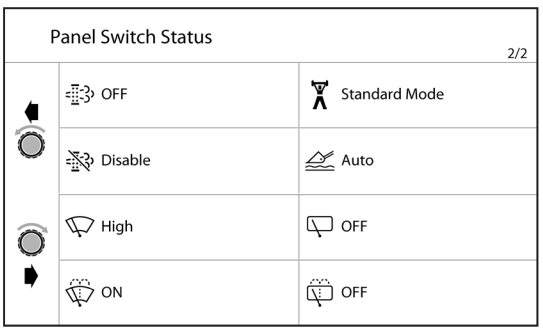
18- Ride Control Switch

19- Front Wiper Switch

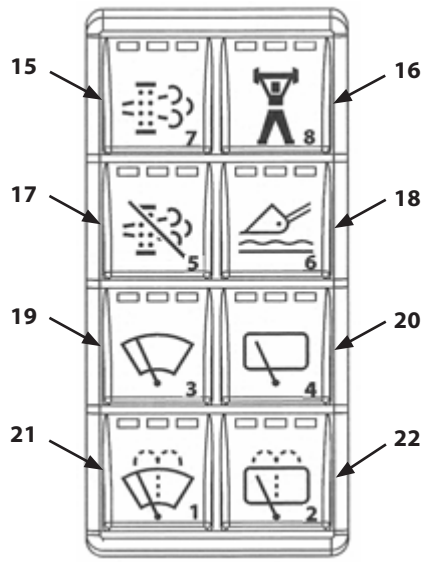
20- Rear Wiper Switch

21- Front Wiper Washer Switch

22- Rear Wiper Washer Switch



MNUD-01-261EN

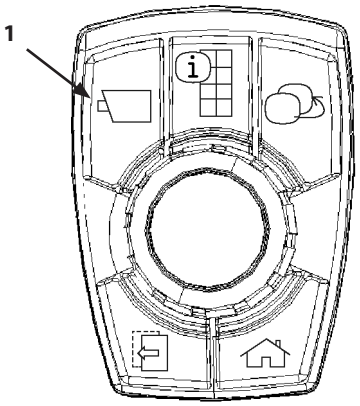


MNUD-01-202

NOTE: Refer to page 1-122 Panel Switch for each switch explanation.

Rear View Camera Display Mode

Rear view camera switch (1) changes the size of the rear camera view displayed on the sub monitor.



MNUD-01-252

IMPORTANT: The image displayed of the rear view camera is meant only as an aid. Actual position and distance of people and objects in the rear view camera image may be different. When operating the machine, pay thorough attention to the surrounding situation.

1. When the sub monitor basic screen shows the rear view camera image in standard size (2) with other information, press rear view camera switch (1).
2. The rear view camera image will be displayed on the sub monitor in full-screen size (3).
3. Pressing rear view camera switch (1) alternates the rear view camera image size on the sub monitor between standard size (2) and full-screen size (3).



MNVA-01-042

CAUTION: The image size update may cause a small time lag. Do not repeatedly alternate the rear view camera image on the monitor.

IMPORTANT: In order to obtain a clear image, clean the camera lens and the monitor display before operating the machine.

NOTE: The monitor and camera lens surface is a resin product. Lightly wipe the surface with a wet clean cloth. Never use an organic solvent.



MNUD-01-284

IMPORTANT:

- **Never attempt to change the mounting position of the rear view camera.**
- **Consult Authorized Dealer if any abnormality is found on the rear view image.**

Displaying Sub Monitor Basic Screen

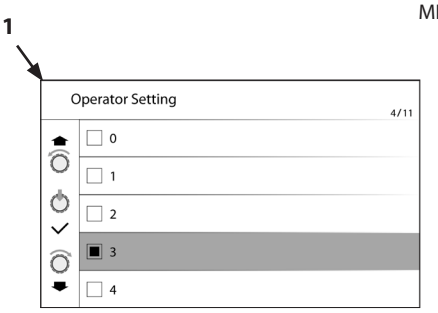
When the key switch is turned to the ON position, the starting screen displays for about two seconds.



Starting Screen

MNEC-01-102

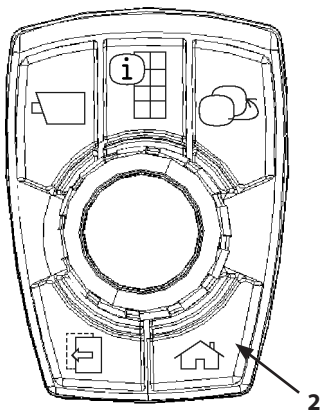
Then, Operator Setting screen (1) appears for about 7 seconds to select the operator ID who will start the operation. See the next page.



MNUD-01-254EN

After the Operator Setting screen display, or pressing home switch (2) while the Operator Setting screen is displayed, basic screen (3) displays the status of front attachment, payload checker items, rear view camera and aerial angle screens, and applicable guidance messages to help operation.

The multi-function sub monitor provides 10 main menus and 24 sub menus to be used in combination with the switches on the switch panel. Refer to page 1-74 for further information.



MNUD-01-252

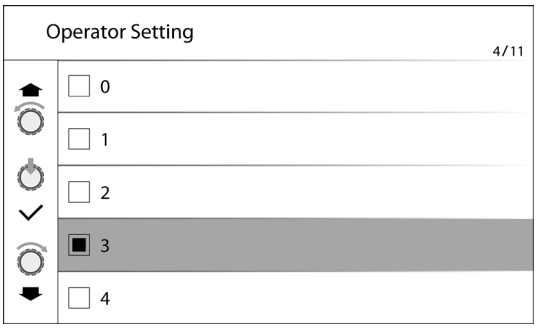


MNVA-01-042

Operator Setting Selection (At Start Up)

There are various operation conditions which can be made via sub monitor screen menu.
The different settings can be stored for 11 operators with a number 0 through 10. The specified operator settings are applied by selecting the desired operator No. when starting today's work.

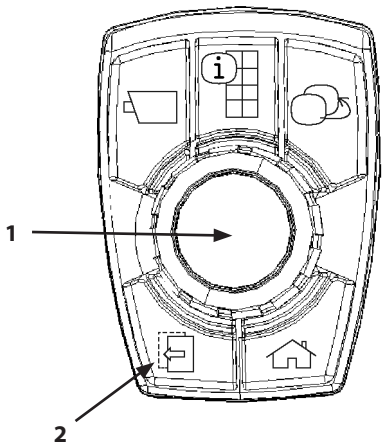
NOTE: The factory default setting is stored with Operator No. "0" at shipment.



MNUD-01-254EN

IMPORTANT: The selected operator No. settings are stored after the starter key is turned off. You don't have to select the same operator No.

1. Rotate selector knob (1) to highlight a desired operator No.
2. Press selector knob (1) and the check box for the selected item is turned on. The machine condition is updated with the stored settings for the selected operator No.



MNUD-01-252

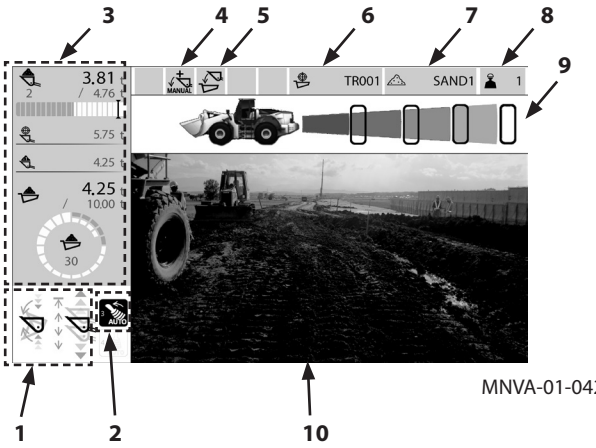
NOTE:

- *Pressing backward switch (2) while appearing the Operator Setting screen this timing will move to the main menu screen.*
- *Operator Setting screen is selected from the sub monitor main menu. Refer to page 1-79 for further information.*

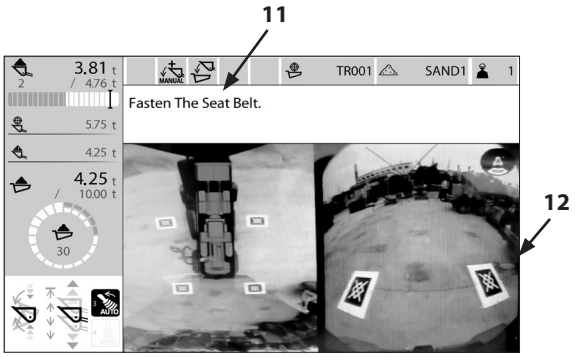
Sub Monitor Basic Screen Configuration

1- Lift Arm/Bucket Kick Out/Detent Status
2- 3rd Lever Detent Status
3- Current Payload Data (Payload Checker)
4- Add Auto/Manual Indicator (Payload Checker)
5- Tip Off Mode Indicator (Payload Checker)
6- Target Load (Payload Checker)
7- Target Material (Payload Checker)
8- Operator No.
9- Rear Obstacle Detection and Warning (Optional)
10- Rear View Camera Image
11- Advice Message Display
12- Aerial Angle Image (Optional)

NOTE: The layout of basic screen differs depending on the payload checker setting, machine status, or selected device.



MNVA-01-042



MNFQ-01-308EN

Sub Monitor Basic Screen Displayed Items

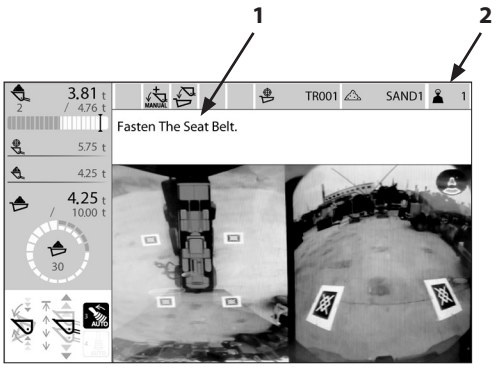
- Advice Message Display (1)
  Any applicable instruction, suggestion, warning message is displayed in this area to assist the operator's action to be made.

NOTE: When any alarm is detected, "An alarm is generated. Push the HOME switch." will appear in this area. Stop the machine and position the forward/reverse lever or switches at "N". Pushing home switch (3) displays Alarm List menu. Confirm the alarm and take appropriate action. (Refer to page 1-75 for Alarm List.)

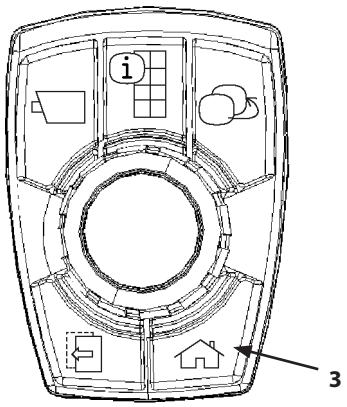
If the rear obstacle detection system detects an obstacle, the advice message disappears and the rear obstacle detection system display comes on.

NOTE: While driving reverse, the rear obstacle detection system display is always displayed. Advice message will not be displayed even when an alarm is detected.

- Operator No. (2)
  The currently selected operator No. is displayed. The stored settings for this number are applied. Refer to page 1-79.



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MNUD-01-252

- Lift Arm, Bucket Kick Out Status
  Its icon lights when the lift arm, bucket kick out setting is enabled.
  - Lift Arm Height Kick Out 1 Icon (1)
  - Lift Arm Height Kick Out 2 Icon (2)
  - Lift Arm Lower Kick Out 1 Icon (3)
  - Lift Arm Lower Kick Out 2 Icon (4)

NOTE: For how to set lift arm kick out, refer to "Lift Arm Height Kick Out ON/OFF, Stop Position Height Settings" on page (1-85) or "Lift Arm Lower Kick Out ON/OFF, Stop Position Height Settings" on page (1-87).

  - Bucket Kick Out 1 Icon (Tilt Back) (5)
  - Bucket Kick Out 2 Icon (Dump) (6)

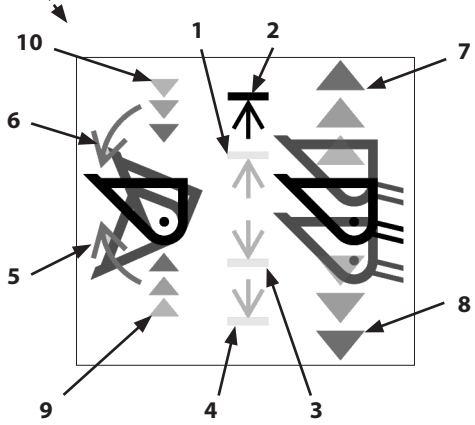
NOTE: For how to set bucket kick out, refer to "Bucket Kick Out ON/OFF, Stop Angle Settings" on page (1-89).

- Lift Arm, Bucket Detent Status
  Its icons light when the lift arm, bucket detent setting is enabled.
  - Lift Arm Detent (Raise Position) (7)
  - Lift Arm Detent (Lower Position) (8)
  - Bucket Detent (Tilt Back Position) (9)
  - Bucket Detent (Dump Position) (10)

NOTE: For details of lever operations, refer to "Multi-Function Joystick Lever" on page (1-163).



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MNUD-01-310

- 3rd Lever Detent Status (11) (Optional)
  Detent icon (11) lights when the 3rd lever detent is operated.



Detent Operation (Down)

MNUD-01-311



Detent Operation (Up)

MNUD-01-312



Detent OFF

MNUD-01-320

- Rear Obstacle Detection and Warning (Optional)

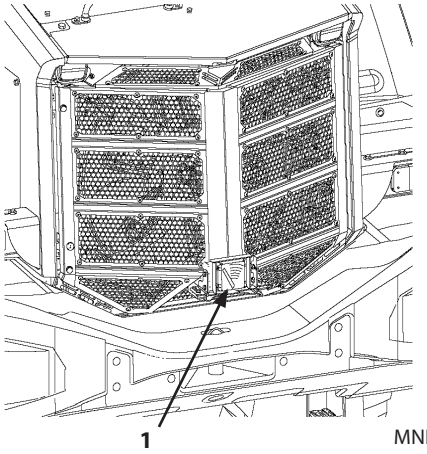
The obstacle detection sensor (1) is installed at the rear bottom of the machine.

When an obstacle is detected behind the machine, the graph(2) changes depending on the travel speed and the distance to the obstacle and mark (3) appears in green backlight.

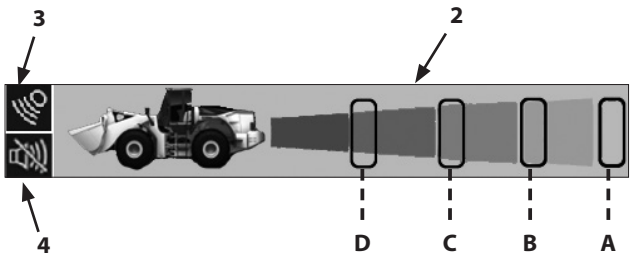
NOTE: When the obstacle detection system has a trouble, this mark appears in red backlight.

The buzzer setting is also possible from the sub monitor menu to alert the operator. Refer to page 1-111 for the settings. The buzzer will sound according to the setting, the travel speed, and the distance to the obstacle as follows. When the buzzer is turned off, buzzer off indicator (4) is displayed.

Alarm Level	Graph Bar level	Buzzer Setting	
		ON	OFF
1	A, Yellow	No sound	No sound
2	B, Yellow	Slow short beep	No sound
3	C, Red	Quick short beep	Quick short beep
4	D, Red	Long beep	Long beep



MNFQ-01-036

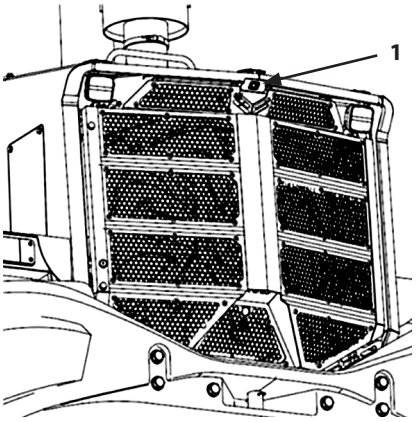


MNVA-01-043

- Rear View Camera Image

The rear view camera (1) is installed at the top of the rear grille, which provides the area view below the counterweight and at a specified distance behind the machine.

The rear view camera image is displayed on the sub monitor. The size of image, standard (2) or full-screen (3), can be selected using rear view camera switch (4) in the right console. Refer to page 1-63 for the switch operation.



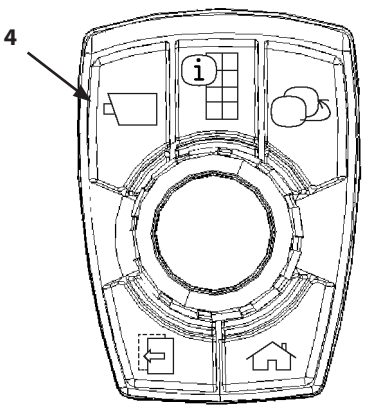
MNFQ-01-313



MNVA-01-042



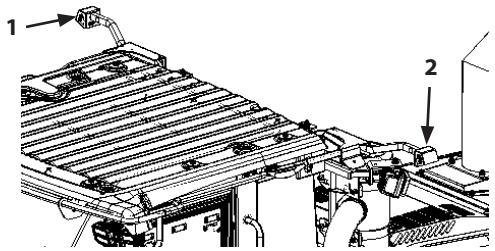
MNUD-01-284



MNUD-01-252

- Aerial Angle Image (Optional)

The right side camera (1) and left side camera (2) are optionally installed at the top of the cab, which provide a single image of the machine surroundings composed of images from these side cameras (1)(2).

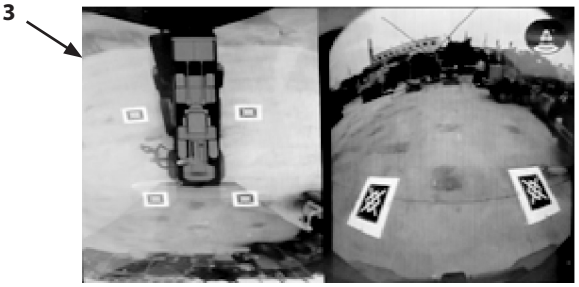


MNFQ-07-038

The aerial angle function displays surrounding image (3) from side cameras (1)(2) and rear view image (4) from the rear view camera on the sub monitor. This provides the operator with additional assistance when checking obstacles around the machine.

NOTE: Refer to the previous page for the rear view camera display.

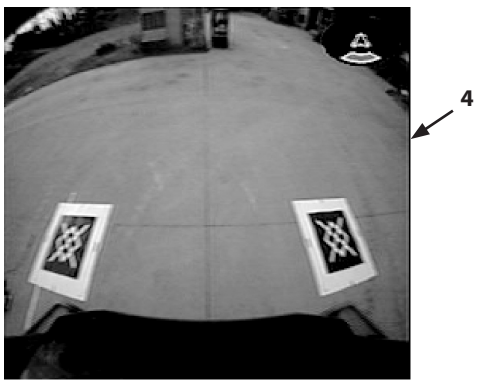
There are three patterns of display, combining side camera image (3) and rear camera image (4). The patterns can be changed by rotating selector knob (5) in the right console. Refer to page 1-234 for the aerial angle function and operation.



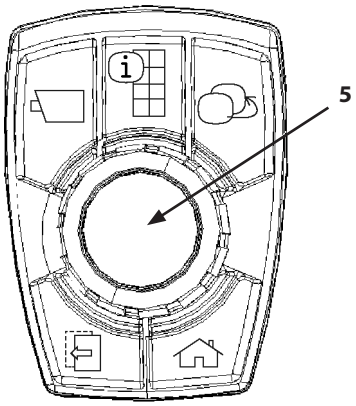
MNUD-01-319

WARNING:

- **The images are displayed for the purpose of helping the operator check the area around the machine.**
- **People and objects displayed on the monitor may appear differently from their actual positions or distances. Some areas, such as near and under the machine, cannot be depicted by the cameras. Before moving the machine, always check the area around the machine thoroughly before moving it.**



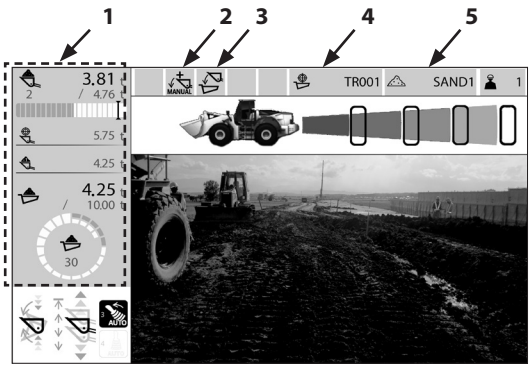
MNUD-01-317



MNUD-01-252

- Payload Checker

The payload data are displayed on the sub monitor in real time.



MNVA-01-042

1- Current Payload Data
The display can be selected from 4 patterns by operator's favorite.

2- Add Auto/Manual Indicator
The selected weight counting method, auto or manual, is displayed.

3- Tip-off Mode Indicator
The selected tip-off mode, tip-off to pile or tip-off to dump, is displayed.

4- Target Load
The target load to be measured is displayed.

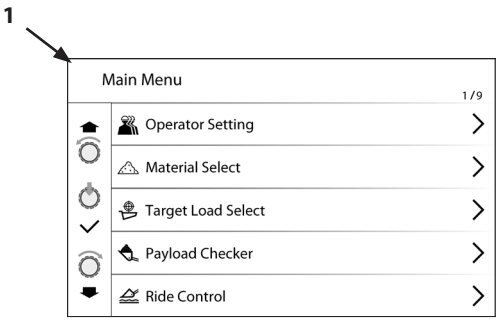
5- Target Material
The target material to be handled is displayed.

Refer to page 5-25 Payload Checker for the payload checker for details.

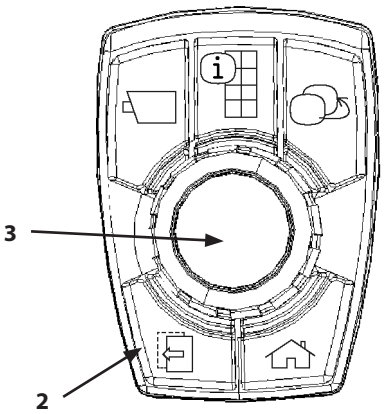
Displaying Sub Monitor Main Menu

IMPORTANT: If the forward/reverse lever is set to forward or reverse position while displaying the main menu screen, the screen changes back to the basic screen. (You can not change to the other screen.)

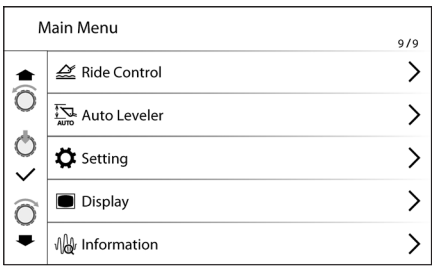
1. To display the sub monitor main menu screen (1), push backward switch (2) while the Operator Setting screen is displayed after the starting screen display.
   Or if the screen moves to the basic screen, push selector knob (3) displays sub monitor main menu screen (1).
2. Rotate selector knob (3) to highlight the desired menu and push selector knob (3). The selected menu screen appears.
3. Rotating selector knob (3) scrolls the screen to show the other menu.



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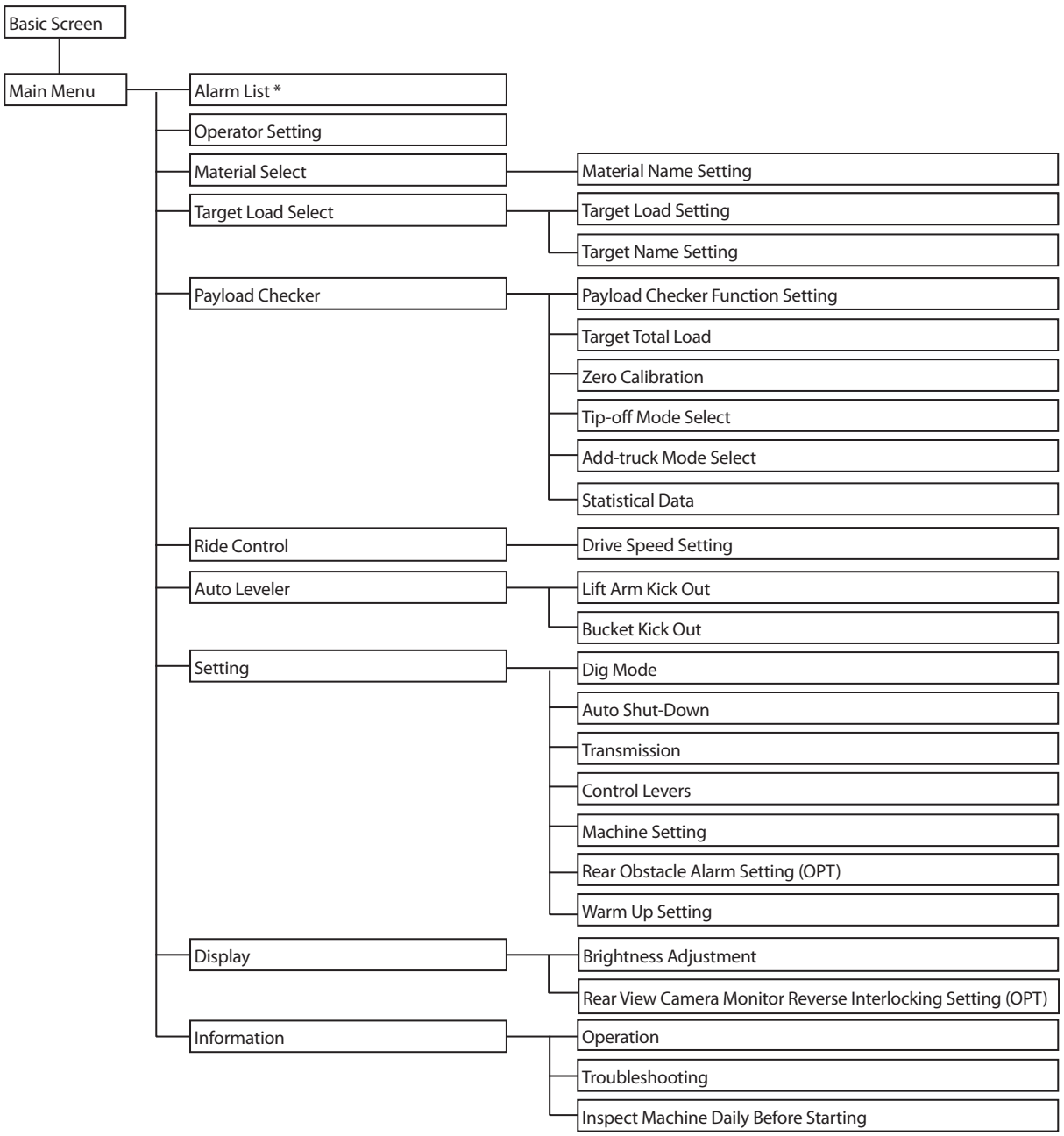


MNUD-01-264aEN

Sub Monitor Menu Configuration

The sub monitor menu consists of the following screens.
There are 10 main menus and 24 sub menus.

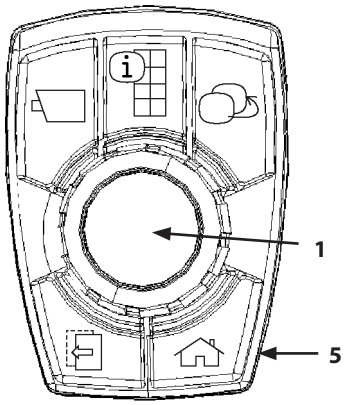
*NOTE: The menu with * mark appears only when any alarm is currently reported.*



Alarm List

The alarms are listed in order or occurrence. Follow the procedure below to display detailed information for an alarm.

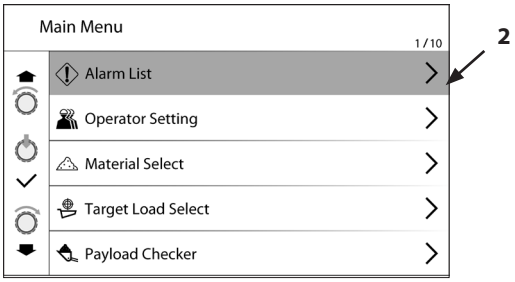
1. Push selector knob (1) when the basic screen appears on the sub monitor to display the main menu.



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2. Rotate selector knob (1) to highlight Alarm List (2), and push selector knob (1).

NOTE: The main menu includes "Alarm List" (2) only when an alarm occurs.

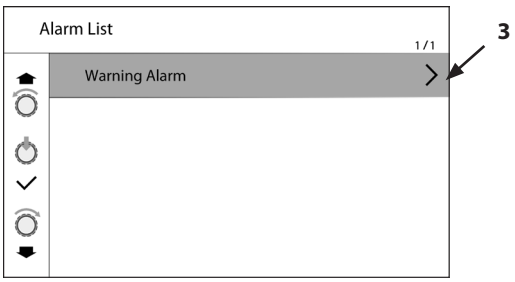


MNUD-01-262aEN

3. Highlight Warning Alarm (3) and push selector knob (1). The currently reported alarms (4) are displayed.

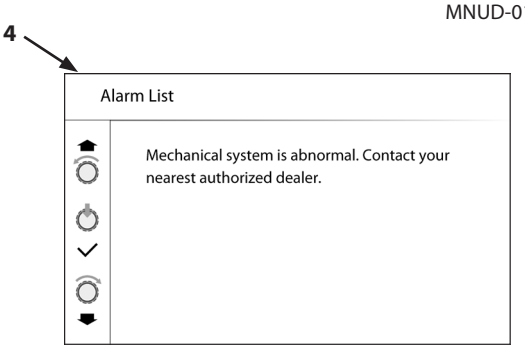
NOTE:

- *The alarm list contains only currently generated alarms.*
- *The corresponding alarm indicator on the main monitor panel, if provided, should light on.*



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4. Push home switch (5) to exit from the alarm list.



MNUD-01-266EN

Remedy

Alarm	Alarm Contents and Suggested Action
Warning Alarm	Mechanical system is abnormal. Contact Authorized Dealer.
Engine Trouble Alarm	Engine or engine related parts are abnormal. Immediately set the machine in a safe position, stop the engine and contact Authorized Dealer.
Engine Warning Alarm	Engine or engine related parts are abnormal. Contact Authorized Dealer.
Aftertreatment Device Abnormal Alarm	Aftertreatment device is abnormal. Immediately set the machine in a safe position, stop the engine and contact Authorized Dealer.
Aftertreatment Device Regeneration Request	Aftertreatment Device Regeneration Is Needed. Set The Machine In A Regeneration Condition, Turn The Regeneration Switch To The Manual Regeneration Position.
Aftertreatment Device Regeneration Inhibit Alarm	As regeneration is inhibited, can not execute regeneration. Move the machine to a safe place, release the regeneration inhibition. For more information, refer to the operation manual.
Hydraulic Oil Overheat Alarm	Hydraulic oil temperature is abnormally increasing. Stop operation. Run the engine at slow idle speed to lower the hydraulic oil temperature. Clean the oil cooler and front screen, and check the hydraulic oil level and piping oil leak by following the operation manual.
Alternator Alarm	The generated voltage of the alternator is decreasing. Check the belt driving the alternator and adjust it if necessary by following the operation manual. If the alarm does not disappear, contact Authorized Dealer.
Overheat Alarm	Coolant temperature is abnormally increasing. Stop operation. Run the engine at slow idle speed to lower the coolant temperature. Clean the radiator and front screen by following the operation manual.
Air Cleaner Restriction Alarm	Air cleaner is clogged. Clean or replace the air cleaner element by following the operation manual.
Camera System Abnormal Alarm	Camera system is abnormal. Contact Authorized Dealer.

Remedy (Continued)

Alarm	Alarm Contents and Suggested Action
Preheating Operation Status	The glow plug is in operation.
Seat Belt Unfasten Alarm	Be sure to fasten the seat belt when operating the machine.
DEF Low Level Alarm	DEF level is low. Refill DEF by following the operation manual.
Engine Output Restriction Alarm	Engine output is limited.
Engine Output Reduction Alarm	Engine Output And Speed Are Restricted.
Urea SCR System Abnormal Alarm	Aftertreatment device is broken. Contact Authorized Dealer.
Escape Mode Alarm	DEF level is low or engine output restriction is temporally suspended due to abnormality of the aftertreatment device. Immediately refill DEF or repair the aftertreatment device. If the system is abnormal, contact Authorized Dealer.
System Restart Request	Since continuous operation exceeded 23 hours, it is necessary to restart the system. Stop the engine once, make sure that the monitor display has disappeared, then restart the engine.
Steering Oil Pressure Alarm	Steering oil pressure is low. Immediately stop machine operation and check the steering system.
Axle Oil Temperature Alarm	Axle oil temperature is abnormally high. Check if the service brake is dragged. If the brake pedal is continuously stepped on, an increase of the axle oil temperature may result.
Brake Oil Pressure Alarm	Brake oil pressure is low. Immediately stop machine operation and check the brake system.
Transmission Oil Overheat Alarm	Transmission oil temperature is abnormally high. Stop machine operation. Run the engine at slow idle speed to lower the oil temperature.
Transmission Warning Alarm	Transmission or accessory is abnormal. Safely park the machine and stop the engine immediately. Contact Authorized Dealer.
Hydraulic Oil Level Alarm	Hydraulic oil level is low. Immediately stop machine operation and check hydraulic oil level and leaks of piping.
Main Pump Oil Pressure Alarm	Main pump oil pressure is low. Immediately stop machine operation and check front attachment piping for leaks.
Emergency Steering Alarm	Emergency steering oil pressure comes short of the specified pressure. Check emergency steering system.
System Failure Alarm	Machine network system is abnormal. Contact Authorized Dealer.

Remedy (Continued)

Alarm	Alarm Contents and Suggested Action
Engine Oil Pressure Alarm	"Engine oil pressure is decreased. Immediately set the machine in a safe position and stop the engine. Check the engine oil level by following the operation manual. If the alarm does not disappear even if engine oil is refilled, contact Authorized Dealer."
Coolant Level Check (Abnormal)	Check coolant level and add coolant if necessary by following the operation manual.
Object Detection System Abnormal Alarm	"Object detection system is abnormal. Contact Authorized Dealer."
Control Levers Lock System Alarm	"Control levers lock system is abnormal. Contact Authorized Dealer."
Lift Arm Lever System Alarm	"Lift arm lever system is abnormal. Contact Authorized Dealer."
Bucket Lever System Alarm	"Bucket lever system is abnormal. Contact Authorized Dealer."
3rd Lever System Alarm	"3rd lever system is abnormal. Contact Authorized Dealer."
Joystick Steering Function Disabled Alarm	Joystick Steering Or accessory Is Abnormal. Safely Park The Machine And Stop The Engine Immediately. Contact Authorized Dealer.
Forward/Reverse Operation Disabled Alarm	Forward/Reverse Operation Or accessory Is Abnormal. Safely Park The Machine And Stop The Engine Immediately. Contact Authorized Dealer.

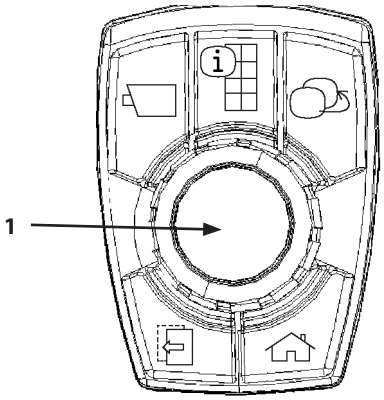
Operator Setting Screen

The different settings made via sub monitor screen menu and the switch panel can be stored for 11 operators with a number 0 through 10.
The stored operator settings are applied by selecting the desired operator No. when starting today's work.

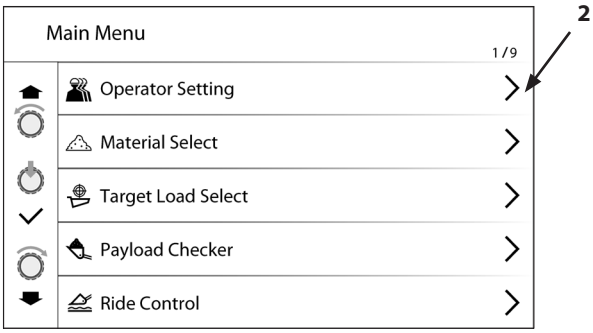
NOTE: This screen appears right after the starting screen at key on. Refer to page 1-65.

1. Push selector knob (1) when the basic screen appears on the sub monitor to display the main menu.
2. Rotate selector knob (1) to highlight Operator Setting (2), and push selector knob (2).
3. Rotate selector knob (1) to highlight a desired operator No.
4. Press selector knob (1) and the check box for the selected item is turned on.

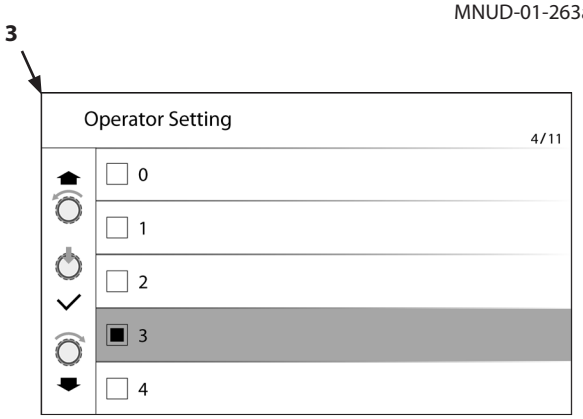
   The machine condition is updated with the currently stored settings for the selected operator No.



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MNUD-01-254EN

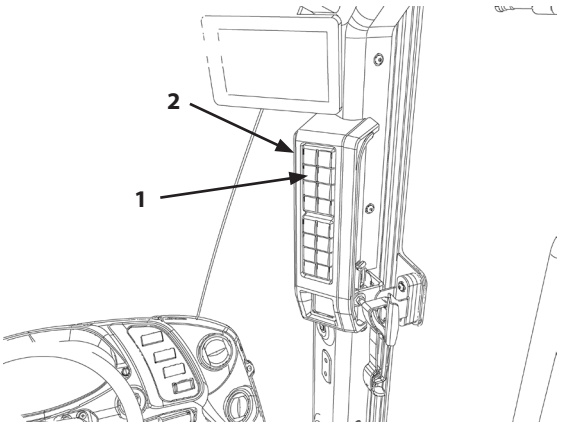
<Sub Monitor Setting>
- Ride control speed
- Lift arm height kick out 1&2
- Lift arm lower kick out 1&2
- Bucket kick out 1&2
- Dig mode setting
- Auto shut-down interval
- Rise run shift prohibit mode
- DSS operation
- Parallel/tandem switching height
- Lift arm lever characteristic mode
- Bucket lever characteristic mode
- 3rd lever characteristic mode
- Cylinder end soft stop mode
- 3rd lever detent
- Rear obstacle sensor buzzer operation
- Tip off mode (Payload checker)
- Auto add mode (Payload checker)
- Traction control setting

<Panel Switch Setting>
- Ride control ON/OFF
- Power mode ON/OFF
- Clutch cut position setting
- Travel mode selection
- Auto shut-down ON/OFF
- Maximum gear speed setting
- Fan reverse rotation ON/OFF
- Dump truck approach speed control mode
- Lock-up setting

Changing Operator Setting

IMPORTANT:

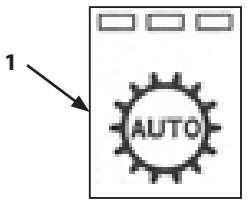
- **The selected operator No. settings are stored after the starter key is turned off. You don't have to select the same operator No.**
- **The settings before selecting the other operator No. or before the starter key is turned off are stored for each operator No.**



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Example of changing Travel Mode:

1. From Operator Setting menu, select Operator No. 1.
2. E.g.) The Travel Mode "AUTO1" is currently selected. Change the Travel Mode by travel mode selector switch (1) on switch panel (2) to "AUTO2". Refer to page 1-126 for the Travel Mode setting.
3. Once turn off the key switch, and switch on. The Operator No. 1 is automatically selected with "AUTO2" setting. The other settings except Travel Mode remain unchanged.
4. Then, change the Travel Mode from "AUTO2" to "Manual".
5. Select Operator Setting menu, and select Operator No. 2. The Travel Mode "AUTO1" is currently selected.
6. Change the Travel Mode to "AUTO2".
7. Select Operator Setting menu, and select Operator No. 1. The Travel Mode "Manual", which was set by step 4 is selected.



MNUD-01-205

	Pilot Lamp			
	■ ■ ■	□ □ □	■ □ □	
Function	Manual	AUTO1	AUTO2	

□: LED ON ■: LED OFF

Material Select

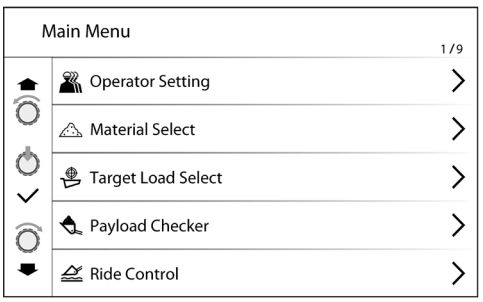
Select the material to handle.

Target Load Select

Set the target of payload work.

Payload Checker

There are various menu to handle the payload data and setup payload checker related functions.
Refer to page 5-25 "Payload Checker".

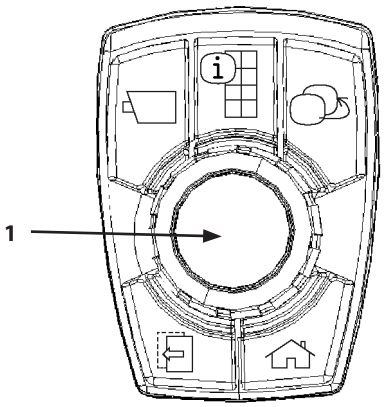


MNUD-01-263aEN

Ride Control Drive Speed Setting

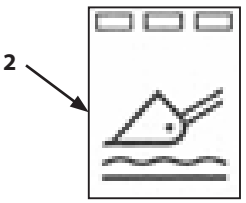
This is to set the driving speed at which the ride control function is activated.

IMPORTANT: To make this setting effective, set the ride control setting to "AUTO" using ride control switch (2) on the panel switch. The middle LED lamp turns on when "AUTO" is selected. Refer to page 1-136 for the ride control switch (2).



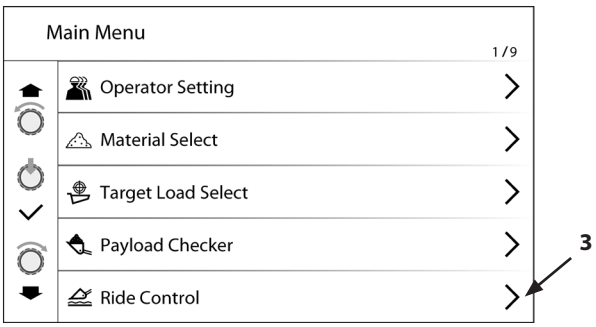
MNUD-01-252

1. Push selector knob (1) when the basic screen appears on the sub monitor to display the main menu.



MNUD-01-214

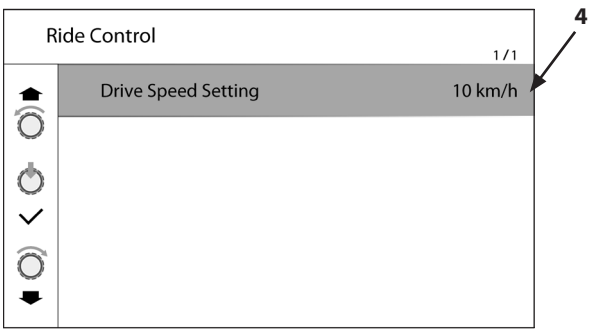
2. Rotate selector knob (1) to highlight Ride Control (3), and push selector knob (3).



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3. Ride Control screen with the current drive speed setting (1) is displayed. The background color is blue.
4. Push selector knob (2) once and the background color will change to orange.
5. Then rotate selector knob (2) clockwise to increase set speed at 1 km/h (0.6 mph) intervals. Rotate selector knob (2) counterclockwise to decrease set speed at 1 km/h (0.6 mph) intervals.

NOTE: The default set vehicle speed is 6 km/h (3.7 mph). It can be changed within the range between 3 km/h (1.9 mph) and 10 km/h (6.2 mph).



MNUD-01-268EN

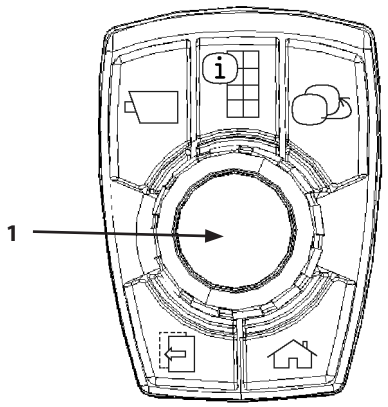
6. When the desired speed value is displayed, push selector knob (1) to complete the changes of setting. The background color returns to blue.

IMPORTANT: The ride control activation speed is automatically adjusted according to the machine conditions so that the ride control function may not be activated while driving forward in digging position.

Auto Leveler Setting

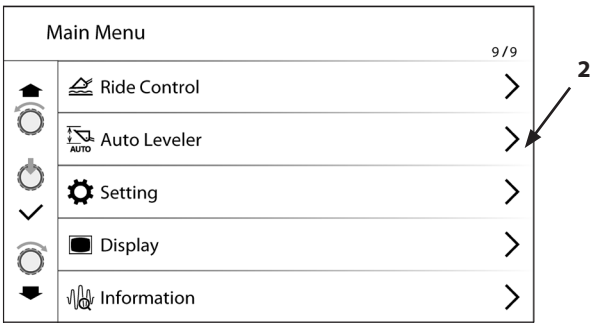
This is to set the height at which the movement automatically stops while lift arm up and down operation (lift arm kick out position).
This is also to set the angle at which the bucket automatically stops while tilt and dump operation (bucket kick out position).

1. Push selector knob (1) when the basic screen appears on the sub monitor to display the main menu.



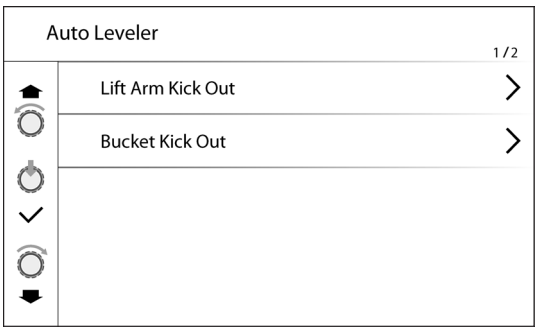
MNUD-01-252

2. Rotate selector knob (1) to highlight Auto Leveler (2), and push selector knob (1).



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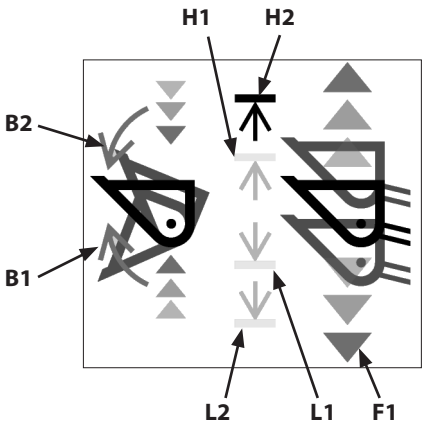
3. The kick out settings for the lift arm and bucket are provided. Rotate selector knob (1) to highlight the desired function to set, and push selector knob (1).



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NOTE: The effective kick out position is indicated by the corresponding icon on the sub monitor. They do not turn on when set to off. Refer to page 1-68.

- *Lift Arm Height Kick Out 1 indicator (H1)*
- *Lift Arm Height Kick Out 2 indicator (H2)*
- *Lift Arm Lower Out 1 indicator (L1)*
- *Lift Arm Lower Out 2 indicator (L2)*
- *Bucket Kick Out indicator (tilt back) (B1)*
- *Bucket Kick Out indicator (dump) (B2)*
- *Float indicator (F1)*

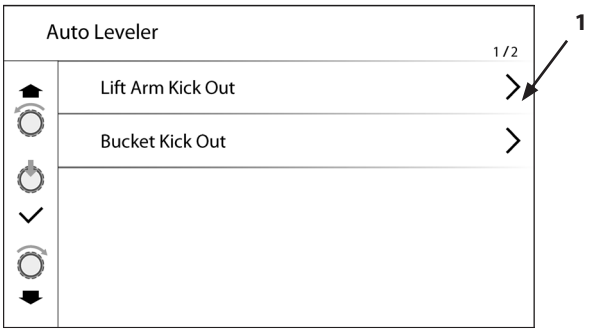


MNUD-01-310

Lift Arm Height Kickout ON/OFF, Stop Height Setting

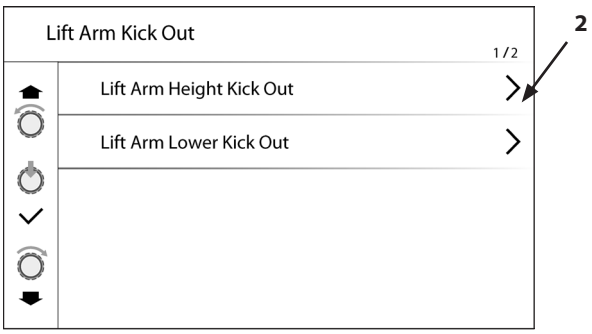
This is to set the height at which the lift arm automatically stops while raising operation. Two positions can be set.

1. Rotate the selector knob to highlight Lift Arm Kick Out (1), and push the selector knob.



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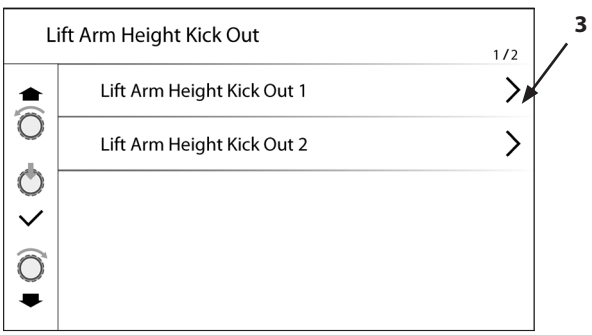
2. Rotate the selector knob to highlight Lift Arm Height Kick Out (2), and push the selector knob.



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3. Rotate the selector knob to highlight Lift Arm Height Kick Out 1 (3), and push the selector knob.
   Lift Arm Height Kick Out 1 setting screen (4) appears.

   When the height kickout is ON (enabled), the lift arm stop height can be set.



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<ON/OFF Setting>

4. Rotate the selector knob to highlight ON/OFF box (5). When the background color of switch bar is green with a round button to the right end, it is ON (enabled). This enables the setting of the lift arm height "1", and indicator (H1) will be displayed on the sub monitor.



ON Position

5. Press the selector knob again to turn OFF (disabled).

<Height Setting>

6. Segment (7) indicates current set value of the height kickout. (Position [1])
   Segment (8) indicates current height of the lift arm.

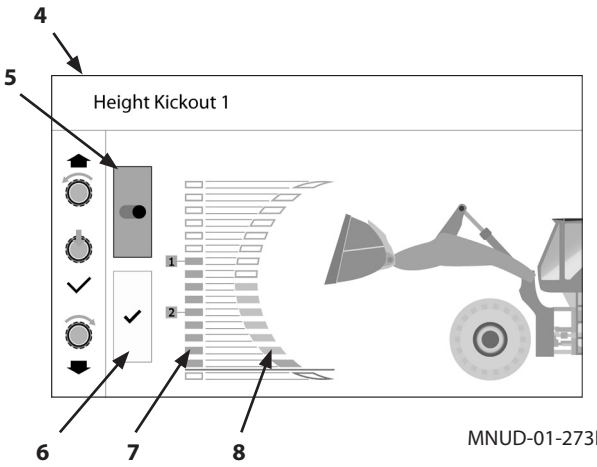
   Change the lift arm height by operating the lift arm control lever. The lift arm height can be adjusted within the orange segment range.

7. Rotate the selector knob to highlight height setting box with mark ✔ (6) and push the selector switch.

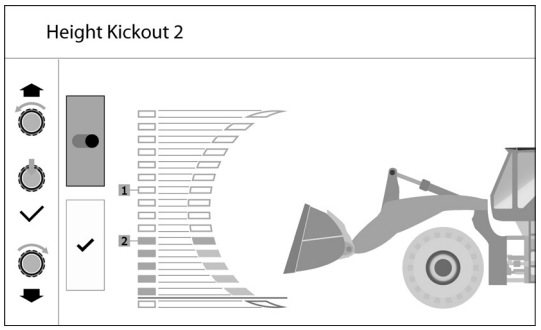
8. The height kick out 1 set value changes to the current arm position, and the value displayed on segment (7) will change accordingly.

9. The lift arm height kick out 2 setting to specify a different height can be done in the same manner.

   Select Lift Arm Height Kick Out 2 menu and follow the above steps 3 through 8.



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Lift Arm Lower Kickout ON/OFF, Stop Height Setting

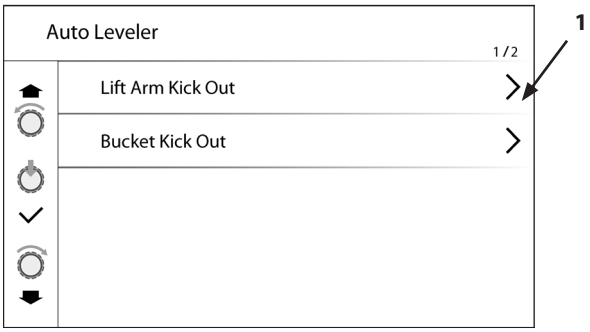
This is to set the height at which the lift arm automatically stops while lowering operation. Two positions can be set.

1. Rotate the selector knob to highlight Lift Arm Kick Out (1), and push the selector knob.

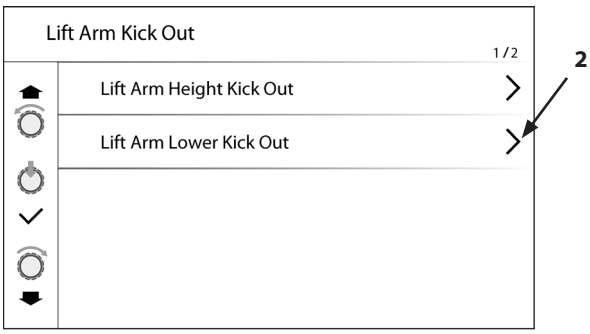
2. Rotate the selector knob to highlight Lift Arm Lower Kick Out (2), and push the selector knob.

3. Rotate the selector knob to highlight Lift Arm Lower Kick Out 1 (3), and push the selector knob.
   Lift Arm Lower Kick Out 1 setting screen (4) appears.

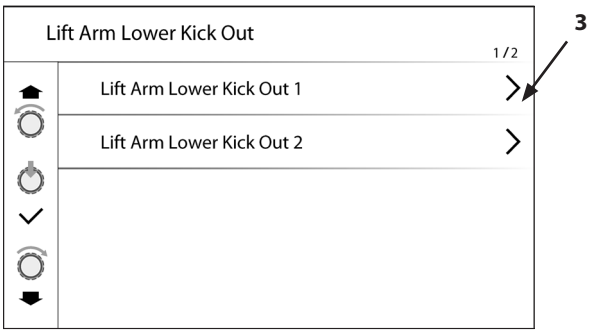
   When the height kickout is ON (enabled), the lift arm stop height can be set.



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MNUD-01-275EN

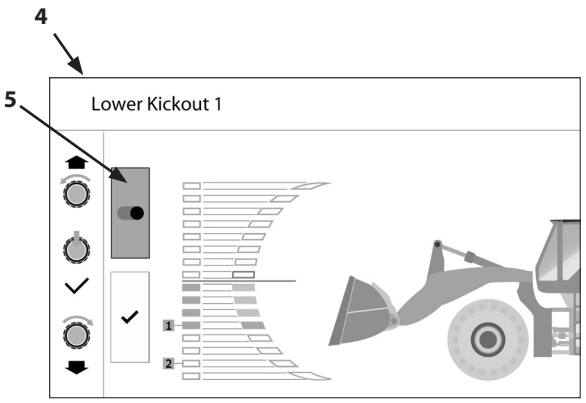
<ON/OFF Setting>

4. Rotate the selector knob to highlight ON/OFF box (5).
   When the background color of switch bar is green with a round button to the right end, it is ON (enabled).
   This enables the setting of the lift arm height "1", and indicator (L1) will be displayed on the sub monitor.



ON Position

5. Press the selector knob again to turn OFF (disabled).



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<Height Setting>

6. Segment (7) indicates current set value of the height kickout. (Position [1])
   Segment (8) indicates current height of the lift arm.

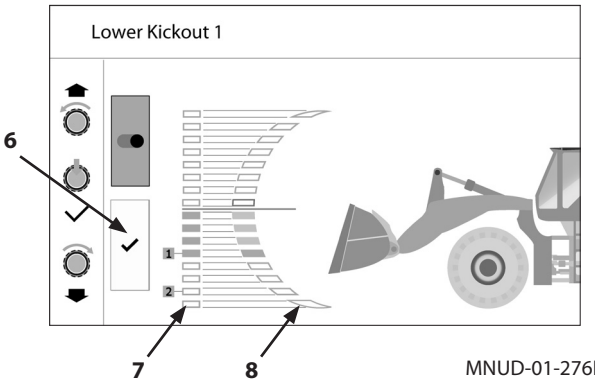
   Change the lift arm height by operating the lift arm control lever. The lift arm height can be adjusted within the orange segment range.

7. Rotate the selector knob to highlight height setting box with mark ✔ (6) and push the selector switch.

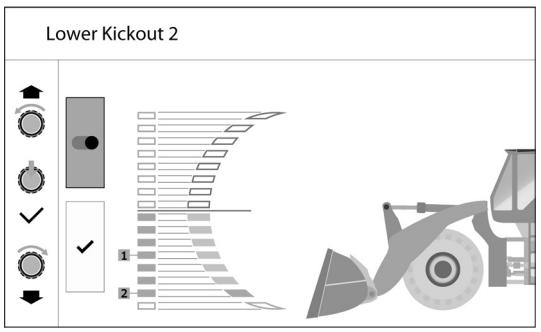
8. The lower kick out 1 set value changes to the current arm position, and the value displayed on segment (7) will change accordingly.

9. The lift arm lower kick out 2 setting to specify a different height can be done in the same manner.

   Select Lift Arm Lower Kick Out 2 menu and follow the above steps 3 through 8.



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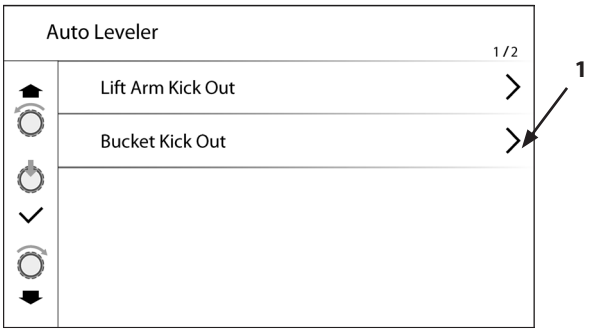


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Bucket Kickout ON/OFF, Stop Angle Setting

This is to set the angle at which the bucket automatically stops while tilting back or dumping.

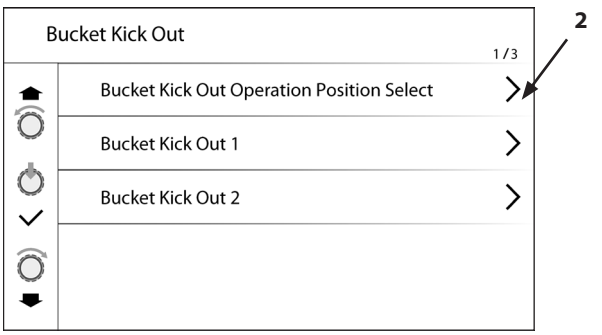
1. Rotate the selector knob to highlight Bucket Kick Out (1), and push the selector knob.



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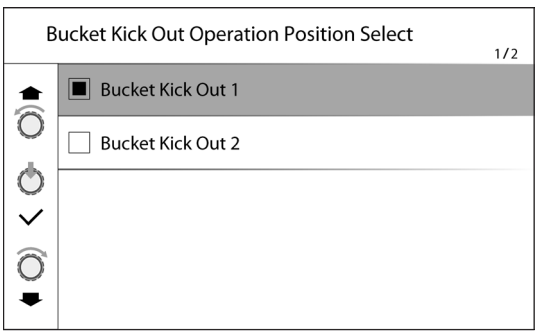
<ON/OFF Setting>

2. Rotate the selector knob to highlight Bucket Kick Out Operation Position Select (2), and push the selector knob.
   Bucket Kick Out Operation Position Select screen appears.



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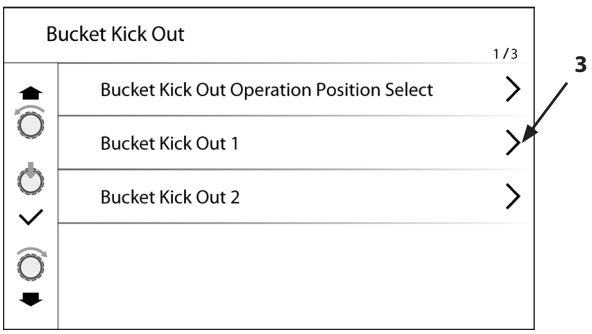
3. Rotate the selector knob to highlight the desired position, Bucket Kick Out 1 and/or Bucket Kick Out 2, and push the selector knob. The box for the selected position lights in green.



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<Angle Setting>

4. Rotate the selector knob to highlight Bucket Kick Out 1 (3), and push the selector knob.
   Bucket Kickout 1 setting screen (4) is displayed.



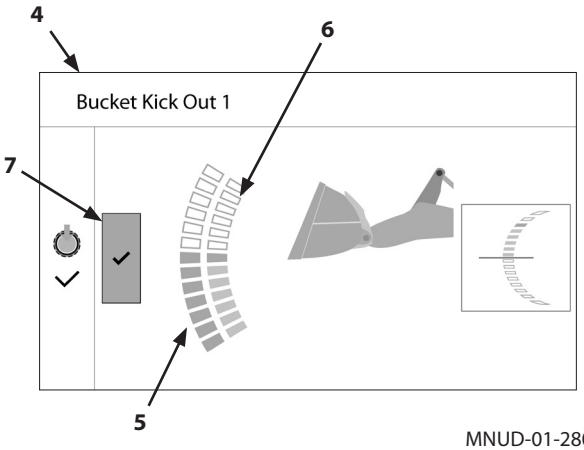
MNUD-01-250EN

5. Blue segment (5) indicates current set value.
   Orange segment (6) indicates current angle of the bucket.

   Change the bucket angle by operating the bucket control lever. The bucket angle can be adjusted within the orange segment range.

6. Rotate the selector knob to highlight "✔" (7) and push the selector switch.

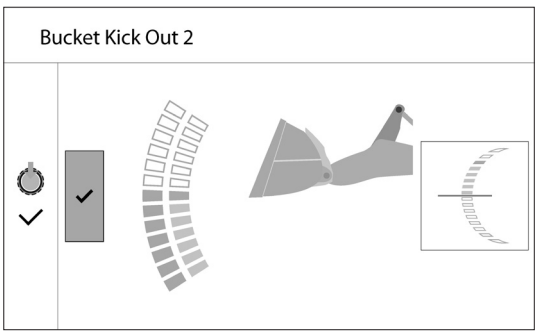
7. The bucket kick out 1 set value changes to the current bucket position, and the value displayed on segment (5) will change accordingly.



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8. The bucket kick out 2 setting for bucket dump kick out angle setting can be done in the same manner.

   Select Bucket Kick Out 2 menu and follow the above steps 5 through 7.



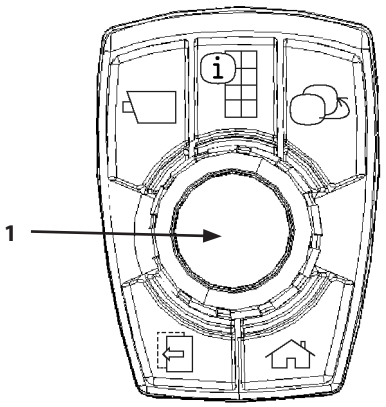
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Setting Menu

Dig Mode Setting

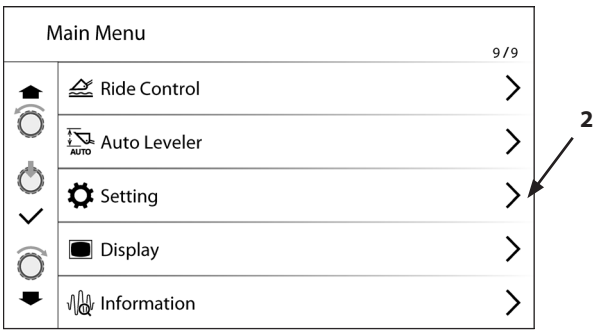
This is to select the power control type suitable for front attachment operation.

1. Push selector knob (1) when the basic screen appears on the sub monitor to display the main menu.



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2. Rotate selector knob (1) to highlight Setting (2), and push selector knob (1).



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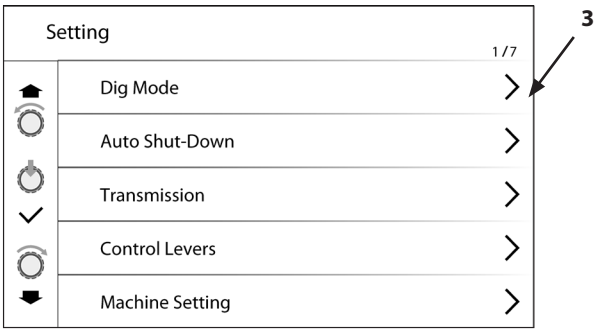
3. Rotate selector knob (1) to highlight Dig Mode (3), and push selector knob (1).

   The mode selection screen appears. Rotate selector knob (1) to highlight the desired mode, and push selector knob (1). The check box for the selected mode turns on.

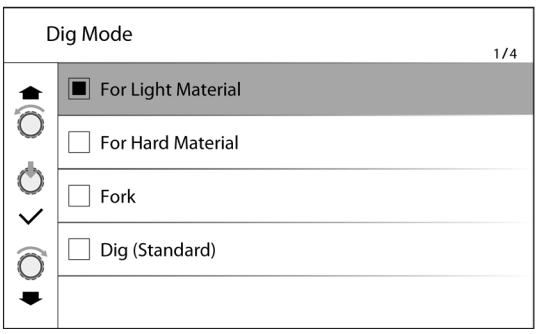
   The specified power is applied in regardless of Power Mode setting.

- For Light Material
  Equivalent to Power Mode OFF. Apply when handling light materials.
- For Hard Material
  Equivalent to Power Mode ON. Apply when handling hard materials.
- Fork
  Apply when fork is attached.

NOTE: When selecting "Dig (Standard)", the Power Mode setting is effective.



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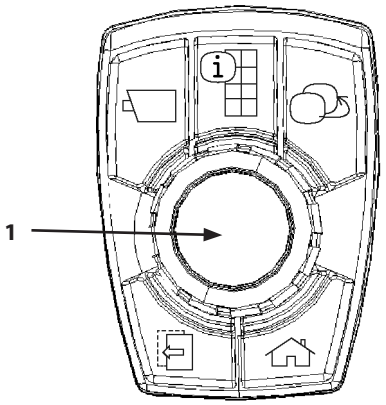


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Auto Shut-Down Time Setting

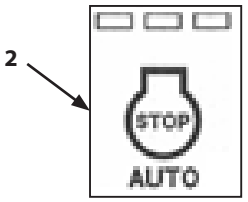
This is to set the auto shut-down acting time.

IMPORTANT: To make this setting effective, set the auto shut-down setting to "ON" using auto shut-down switch (2) on the panel switch. The middle LED lamp turns on when "ON" is selected. Refer to page 1-124 for auto shut-down switch (2).



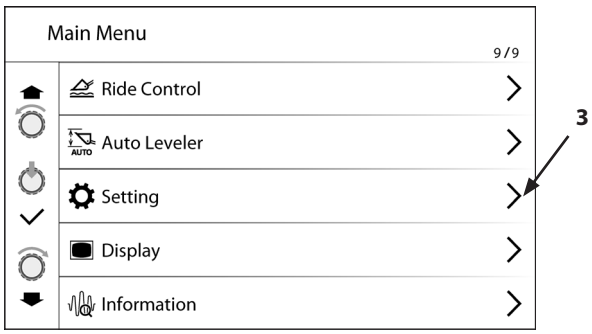
MNUD-01-252

1. Push selector knob (1) when the basic screen appears on the sub monitor to display the main menu.



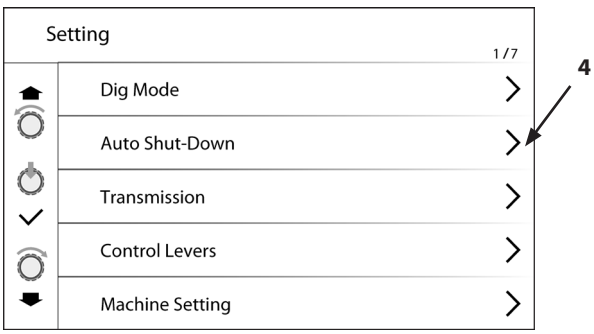
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2. Rotate selector knob (1) to highlight Setting (3), and push selector knob (1).



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3. Rotate selector knob (1) to highlight Auto Shut-Down (4), and push selector knob (1).



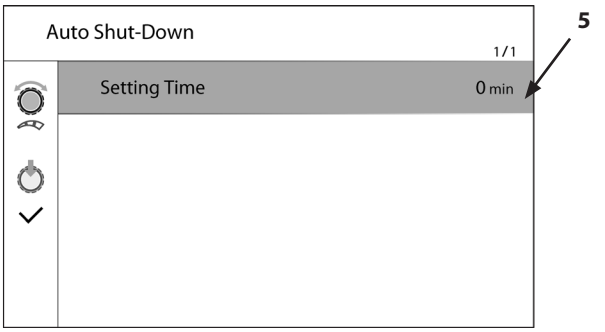
MNUD-01-300EN

4. On the Auto Shut-Down screen, push selector knob (1) while highlighting Setting Time (5). The background color will change to orange.

5. Select the desired acting time by rotating selector knob (1) clockwise or counterclockwise.
   The selectable idle time appears in the following order:

   1 → 2 → 3 → 4 → 5 → 7 → 10 → 15 → 20 → 25 → 30 → 1

6. Press selector knob (1) to make the change.



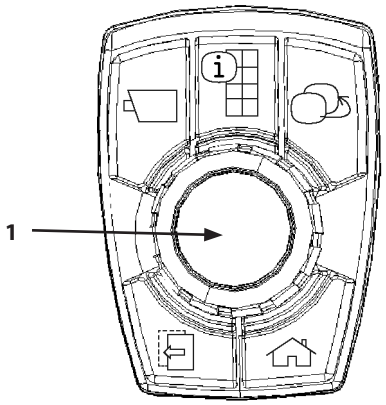
MNUD-01-282EN

NOTE:

- *30 seconds before the engine stop, the monitor displays a message to notify the engine will be stopped soon. The buzzer sounds. The buzzer also sounds once at 15 seconds before, and once at 5 seconds before, then stops after 5 seconds.*
  When the machine is in the operating state before stopping the engine, the auto shut-down is disabled and the engine will not stop.
- *If a different Operator No. is selected during this auto shut-down timer is running, the timer function is reset to the timer start.*

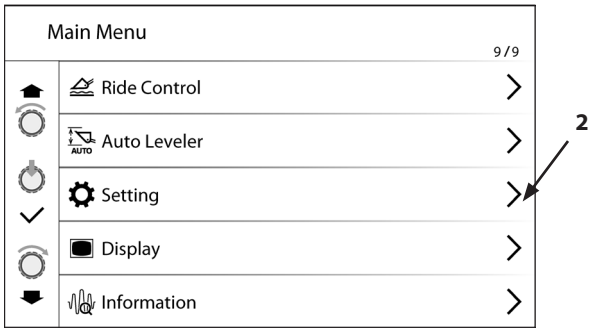
Displaying Transmission Setting Menu

1. Push selector knob (1) when the basic screen appears on the sub monitor to display the main menu.



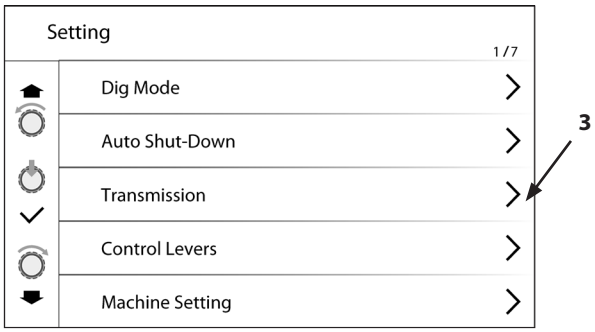
MNUD-01-252

2. Rotate selector knob (1) to highlight Setting (2), and push selector knob (1).



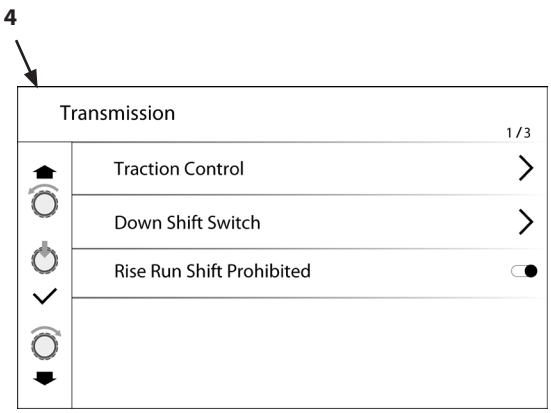
MNUD-01-264aEN

3. Rotate selector knob (1) to highlight Transmission (3), and push selector knob (1).



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4. Rotate selector knob (1) to highlight the desired menu, and push selector knob (1) to display each setting screen.



MNFQ-01-028EN

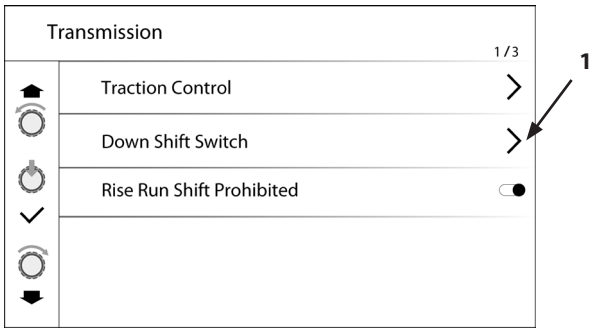
DSS Operation Setting

Downshift switch (DSS) is provided onto the control lever in the right console to lower the shift range without operating the shift lever during loading work.
This is to set the downshift operation when pressing the DSS switch.

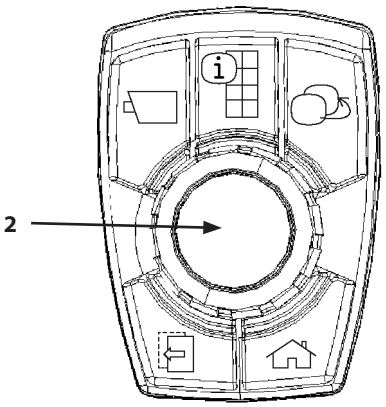
NOTE: Refer to page 1-152 for DSS operation.

1. From Transmission Setting screen, highlight Down Shift Switch (1) and push selector knob (2).

NOTE: For how to go to Transmission Setting screen, refer to "Displaying Transmission Setting Menu" (page 1-94).



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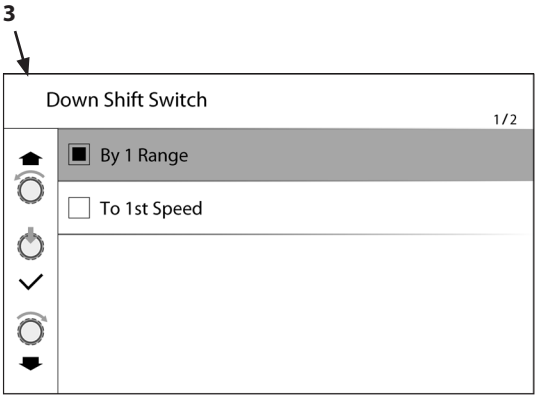
MNUD-01-252

2. Down Shift Switch screen (3) is displayed.

3. Rotate selector knob (2) to highlight the desired switch operation, and push selector knob (2).

   The check box for the selected mode turns on.

- By 1 Range
  Each time the DSS is pressed, the gear down shifts at 1-speed step.
- To 1st Speed
  Pressing the DSS down shifts to the 1st speed range.



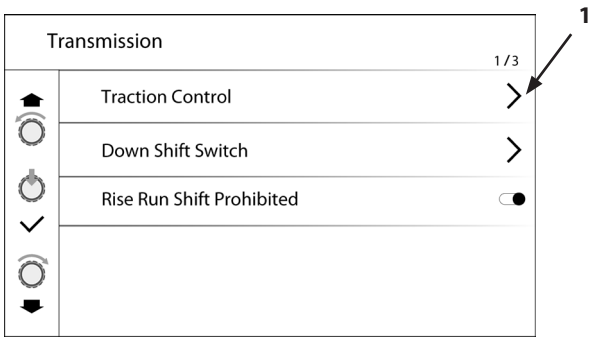
MNUD-01-285EN

Traction Control Setting

If the tire is ready to spin, by keeping the traction control function ON, the engine speed is temporarily slowed down and tire spin is reduced. This increases tire life.

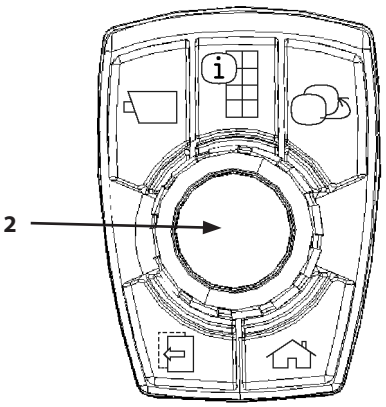
1. From Transmission Setting screen, highlight Traction Control (1) and push selector knob (2).

NOTE: For how to go to Transmission Setting screen, refer to "Displaying Transmission Setting Menu" (page 1-94).



MNFQ-01-028EN

2. Traction Control screen (3) is displayed.

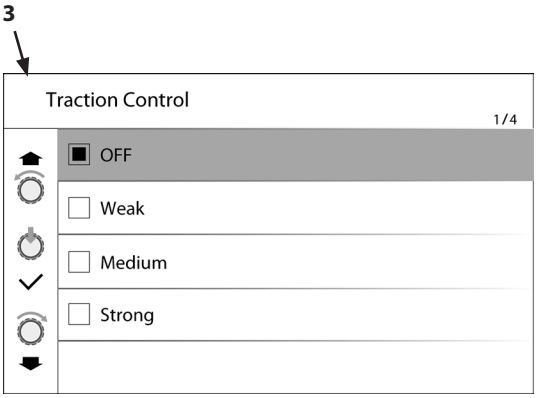


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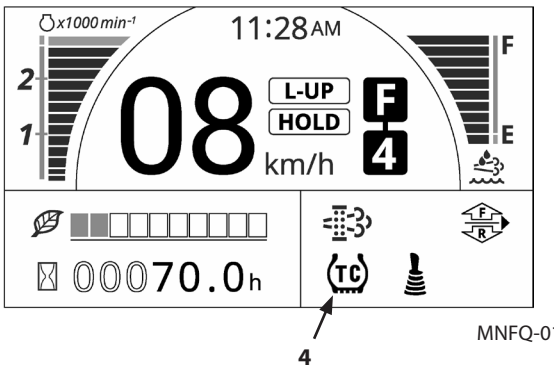
3. Rotate selector knob (2) to highlight the desired switch operation, and push selector knob (2).

   The check box for the selected mode turns on.

- OFF
  Traction control is turned OFF.
- Weak/Medium/Strong
  The engine speed is limited by weak, medium, or strong level. When any of these setting is selected, traction control indicator (4) on the main monitor is turned ON.



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MNFQ-01-021

Rise Run Shift Prohibit ON/OFF

This is to hold the 2nd speed range during loading work, when the shift position 3rd or Auto is selected.

NOTE: This functions only when "AUTO1" or "AUTO2" travel mode is selected. Travel mode is selected by the travel mode selector switch on the panel switch. Refer to page 1-126.

1. From Transmission Setting screen, highlight Rise Run Shift Prohibited (1).

NOTE: For how to go to Transmission Setting screen, refer to "Displaying Transmission Setting Menu" (page 1-94).

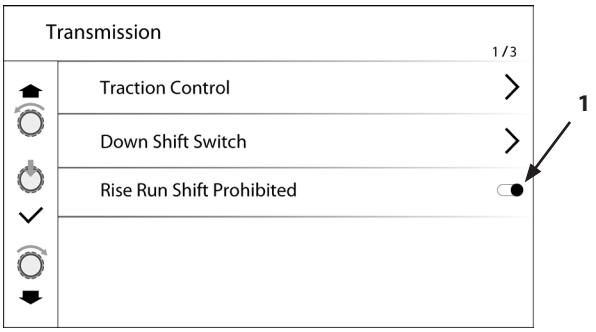
2. Rise Run Shift Prohibited (1) with ON/OFF switch indicator is shown.
   When the setting is ON, the background color is green with a round button to the right end.



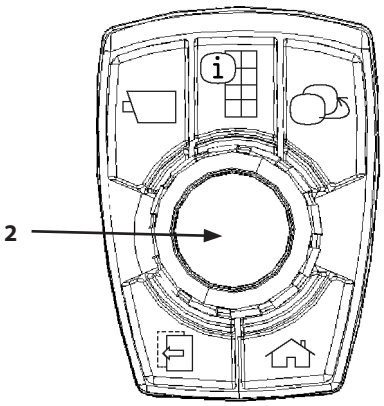
ON Position

3. Push selector knob (2) to alternate ON and OFF setting.

NOTE: When approaching to a dump truck, the engine speed may be limited due to the dump truck approach speed control setting. This rise run shift prohibited setting can prevent the dump truck approach speed control being disabled due to shift up during approaching to a dump truck while rising the lift arm. Refer to page 1-133 for the dump truck approach speed control.



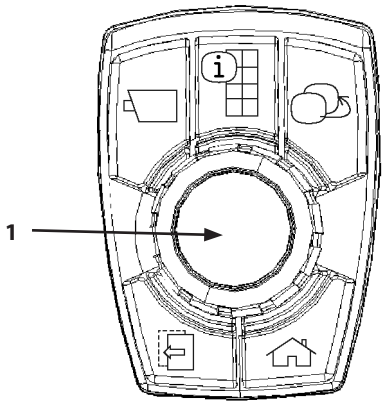
MNFQ-01-028EN



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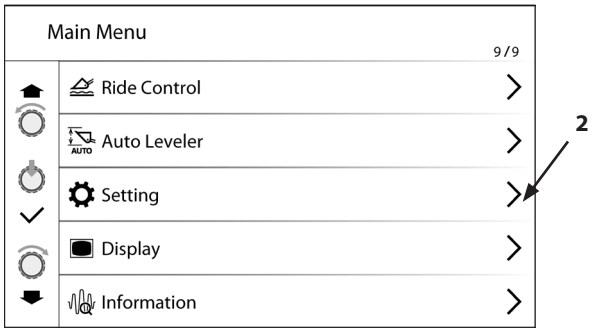
Displaying Control Levers Setting Menu

1. Push selector knob (1) when the basic screen appears on the sub monitor to display the main menu.



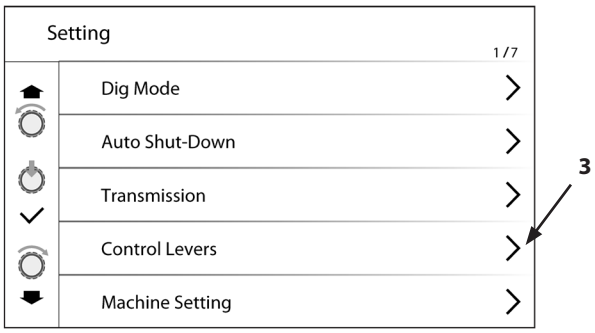
MNUD-01-252

2. Rotate selector knob (1) to highlight Setting (2), and push selector knob (1).



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3. Rotate selector knob (1) to highlight Control Levers (3), and push selector knob (1).



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4. Press selector knob (1) to display Control Levers Setting screen (4).

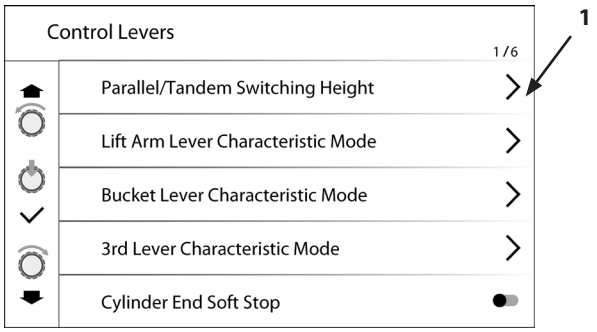
5. Rotate selector knob (1) to highlight the desired menu, and push selector knob (1) to display each setting screen.



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Parallel/Tandem Switching Setting

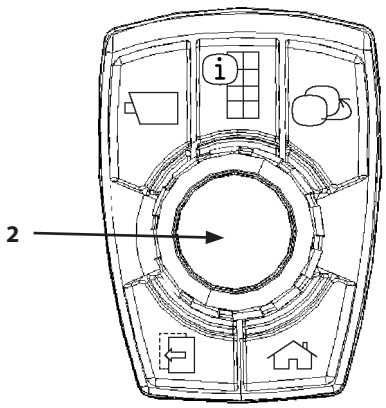
This is to set the lift arm height to switch the parallel circuit and tandem circuit for loading operation.



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1. From Control Levers screen, highlight Parallel/Tandem Switching Height (1) and push selector knob (2).

NOTE: For how to go to Control Levers screen, refer to "Displaying Control Levers Setting Menu" (page 1-98).



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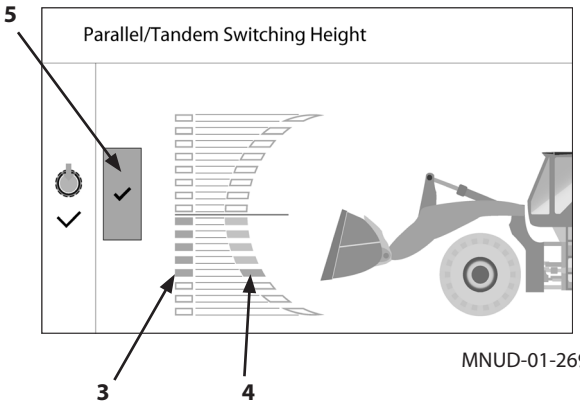
2. Parallel/Tandem Switching Height screen is displayed.

3. Blue segment (3) indicates current set value of the parallel/tandem switching height.
   Orange segment (4) indicates current height of the lift arm.

   Change the lift arm height by operating the lift arm control lever.

4. Rotate the selector knob to highlight height setting box with mark ✔ (5) and push the selector switch.

5. The parallel/tandem height setting value changes to the current arm position, and the value displayed on segment (3) will change accordingly.



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NOTE: When the lift arm height is below the set height, the operation mode is set to Parallel (Lift arm and bucket), when the lift arm height is above the set height, the mode is set to Tandem (Bucket priority).

Lift Arm Lever Characteristic Mode

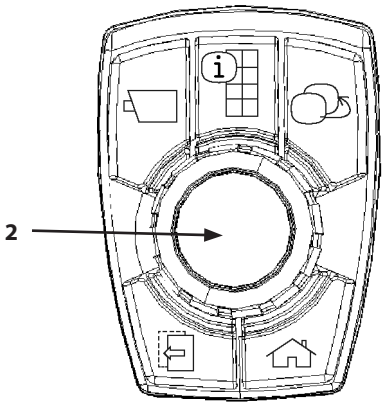
This is to set the slow operation mode for lift arm raise or lower operation.

1. From Control Levers screen, highlight Lift Arm Lever Characteristic Mode (1) and push selector knob (2).

NOTE: For how to go to Control Levers screen, refer to "Displaying Control Levers Setting Menu" (page 1-98).



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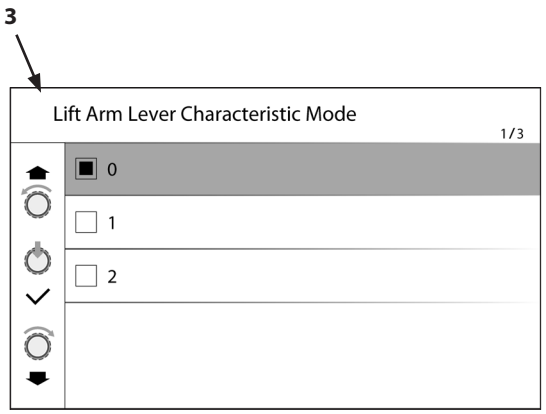


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2. Lift Arm Lever Characteristic Mode screen (3) is displayed.

3. Rotate selector knob (2) to highlight the desired operation mode number, and push selector knob (2).

Mode	Lift Arm Operation Speed	
	Raise	Lower
0	Standard	Standard
1	Standard	Slow
2	Lower half: Slow Upper half: Standard	Slow



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4. The check box for the selected mode turns on.

Bucket Lever Characteristic Mode

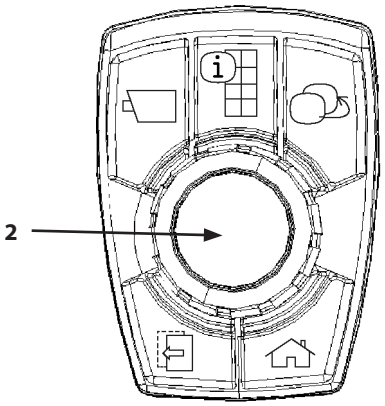
This is to set the slow operation mode for bucket tilt and dump operation.

1. From Control Levers screen, highlight Bucket Lever Characteristic Mode (1) and push selector knob (2).

NOTE: For how to go to Control Levers screen, refer to "Displaying Control Levers Setting Menu" (page 1-98).



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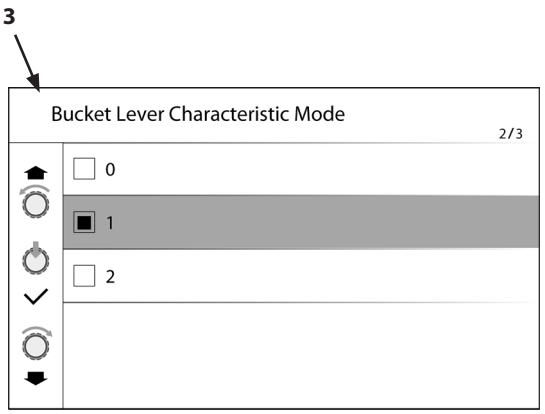
MNUD-01-252

2. Bucket Characteristic Mode screen (3) is displayed.

3. Rotate selector knob (2) to highlight the desired operation mode number, and push selector knob (2).

Mode	Bucket Operation Speed	
	Tilt	Dump
0	Standard	Standard
1	Standard	Slow
2	Lower half: Slow Upper half: Standard	Slow

4. The check box for the selected mode turns on.



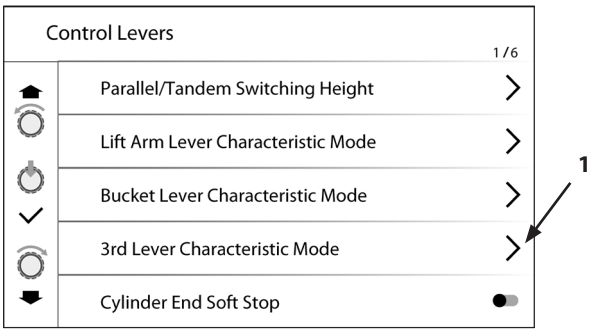
MNUD-01-290EN

3rd Lever Characteristic Mode (Optional)

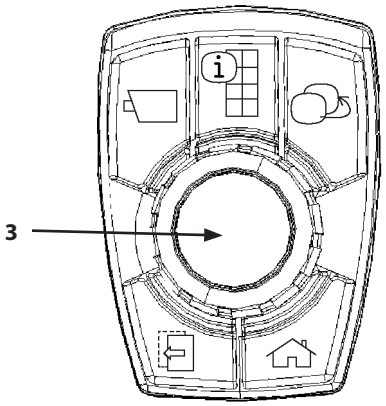
This is to set the slow operation mode for attachment operation using the 3rd control lever.

1. From Control Levers screen, highlight 3rd Lever Characteristic Mode (1) for the 3rd control lever and push selector knob (3).

NOTE: For how to go to Control Levers screen, refer to "Displaying Control Levers Setting Menu" (page 1-98).



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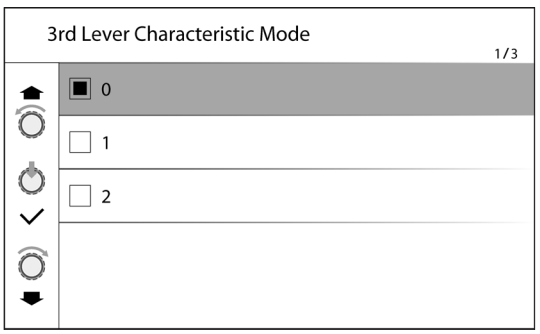
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2. The selected attachment characteristic mode setting screen is displayed.

3. Rotate selector knob (3) to highlight the desired operation mode number, and push selector knob (3).

Mode	Attachment Operation Speed	
	All Range	All Range
0	Standard	Standard
1	Slow	Slow
2	Slower than Mode 1	Slower than Mode 1

4. The check box for the selected mode turns on.



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Cylinder End Soft Stop

This function stops the lift arm cylinder and the bucket cylinder operations slowly at the cylinder full operation points in order to reduce the shock due to the lift arm and bucket operation.

1. From Control Levers screen, highlight Cylinder End Soft Stop (1).

NOTE: For how to go to Control Levers screen, refer to "Displaying Control Levers Setting Menu" (page 1-98).

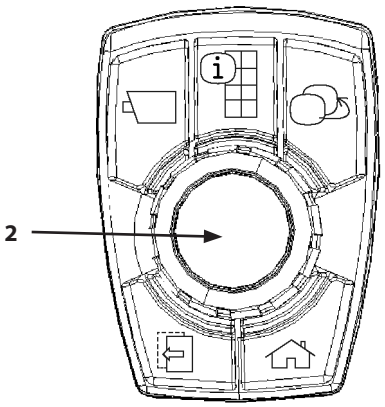


MNFQ-01-030EN

2. Cylinder End Soft Stop (1) with ON/OFF switch indicator is shown.
   When the setting is ON, the background color is green with a round button to the right end.



ON Position



MNUD-01-252

3. Push selector knob (2) to alternate ON and OFF setting.

   When this setting is turned on, the shock when lift arm is raised to the top, bucket is tilted back, or when bucket is dumped will be reduced even if the control lever is fully operated.

NOTE:

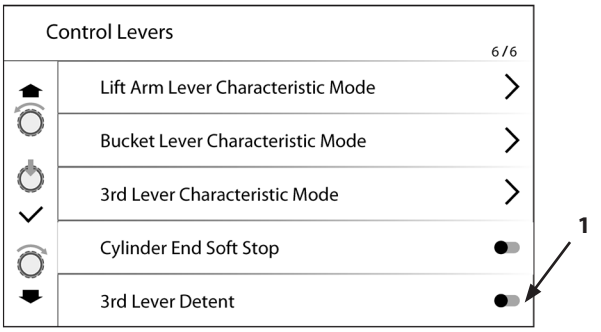
- *When tip-off truck or tip-off pile is selected, the cylinder end soft stop setting is forcibly set to ON.*
- *When the hydraulic oil temperature is low, the shock may not be reduced.*
  Warm up the machine sufficiently in advance.

3rd Lever Detent Setting (Optional)

This enables the detent function of the 3rd control lever during attachment operation.

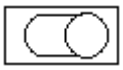
1. From Control Levers screen, highlight 3rd Lever Detent (1) for the 3rd control lever.

NOTE: For how to go to Control Levers screen, refer to "Displaying Control Levers Setting Menu" (page 1-98).

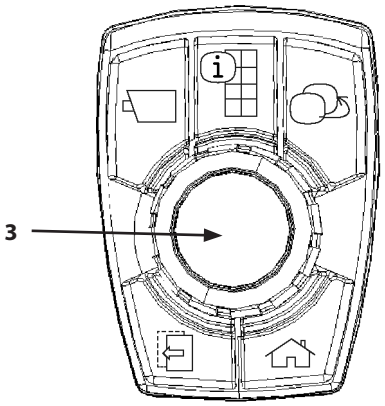


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2. The current detent setting is shown by ON/OFF switch indicator.
   When the setting is ON, the background color is green with a round button to the right end.



ON Position



MNUD-01-252

3. Push selector knob (3) to alternate ON and OFF setting.

   When the 3rd lever detent setting is turned on, the detent function is available for the 3rd control lever.

   By holding the lever at full operation position, the detent function is turned on. The attachment operation continues even if the lever returns to the neutral position. Operating the lever again can stop the detent mode. Refer to Section 5 for the lever operation.

NOTE: During the attachment lever detent operation, 3rd lever detent status indicator (4) on the sub monitor turns on.



MNVA-01-042



Detent Operation (Down)

MNUD-01-311



Detent Operation (Up)

MNUD-01-312

Bucket Dump Stopper Contact Cylinder Length Learning

IMPORTANT: After replacing the bucket, be sure to perform this program.

This is to learn the cylinder length when the bucket contacts to the bucket dump stopper.

NOTE: Before starting this menu, change some settings as follows:

- *Cylinder end soft stop: OFF (See page 1-103.)*
- *Tip-off mode: Disabled (See page 5-60.)*

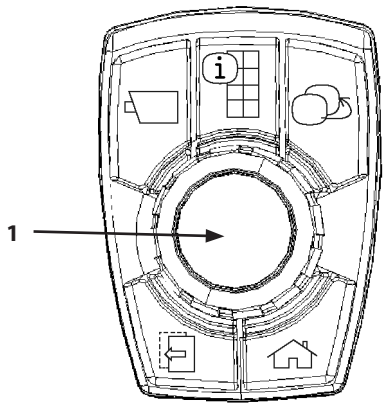
1. Start the engine and run at low idle. Do not depress the accelerator pedal.
2. Push selector knob (1) when the basic screen appears on the sub monitor to display the main menu.
3. Rotate selector knob (1) to highlight Setting, and push selector knob (1).
   Rotate selector knob (1) to highlight Machine Setting (2) from the Setting sub menu, and push selector knob (1).
4. Rotate selector knob (1) to highlight Bucket Dump Stopper Contact Cylinder Length Learning (3), and push selector knob (1) to display the learning screen.

IMPORTANT: The lift arm must be raised fully to the top, and the bucket must be fully dumped.

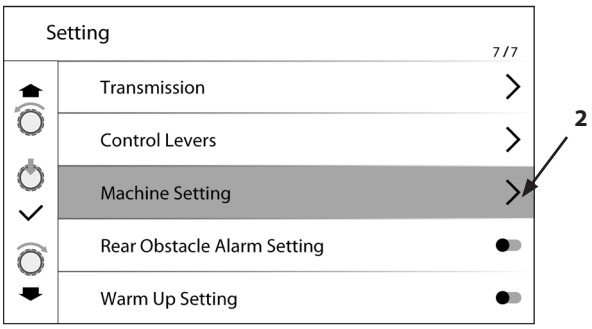
5. Raise the lift arm to the highest position, and fully dump the bucket. Verify that the bucket contacts to the dump stopper.
6. When the conditions are satisfied, start button (4) appears on the screen. Push selector knob (1) to start the learning process.

NOTE: The start button does not appear until the conditions are satisfied. Operate the control levers to position the lift arm and bucket to the specified position.

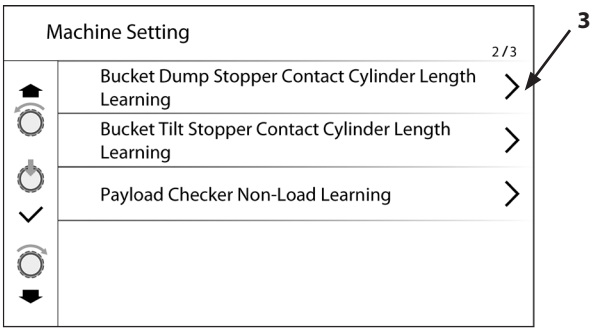
7. When "Completed" message appears, turn off the key.
8. Perform "Bucket Tilt Stopper Contact Cylinder Length Learning" menu by referring to the following page.



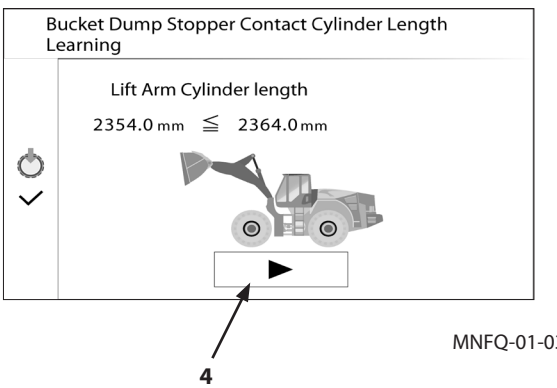
MNUD-01-252



MNUD-01-267EN



MNUD-01-279EN



MNFQ-01-032EN

Bucket Tilt Stopper Contact Cylinder Length Learning

IMPORTANT: After replacing the bucket, be sure to perform this program.

This is to learn the cylinder length when the bucket contacts to the bucket tilt stopper.

NOTE: Before starting this menu, change some settings as follows:

- *Cylinder end soft stop: OFF (See page 1-103.)*
- *Tip-off mode: Disabled (See page 5-60.)*

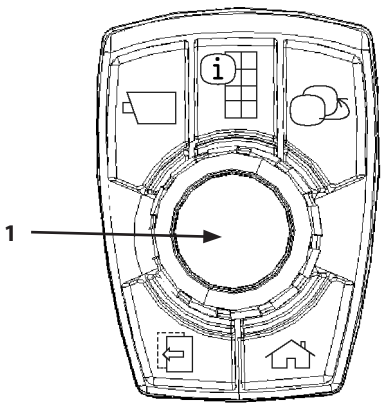
1. Start the engine and run at low idle. Do not depress the accelerator pedal.
2. Push selector knob (1) when the basic screen appears on the sub monitor to display the main menu.
3. Rotate selector knob (1) to highlight Setting, and push selector knob (1).
   Rotate selector knob (1) to highlight Machine Setting (2) from the Setting sub menu, and push selector knob (1).
4. Rotate selector knob (1) to highlight Bucket Tilt Stopper Contact Cylinder Length Learning (3), and push selector knob (1) to display the learning screen.

IMPORTANT: The lift arm must be positioned within the specified range, and the bucket must be fully tilted.

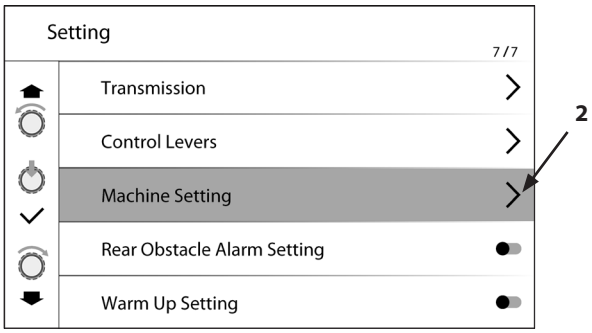
5. Move the lift arm so that it falls within the range displayed on the monitor.
   Fully tilt the bucket and verify that the bucket contacts to the tilt stopper.
6. When the conditions are satisfied, start button (4) appears on the screen. Push selector knob (1) to start the learning process.

NOTE: The start button does not appear until the conditions are satisfied. Operate the control levers to position the lift arm and bucket to the specified position.

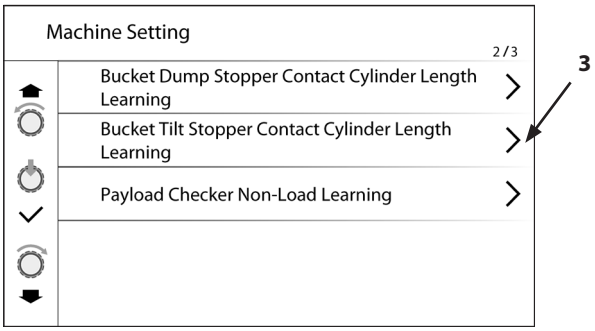
7. When "Complete" message appears, turn off the key.
8. Perform "Payload Checker Non-Load Learning" menu by referring to the following page.



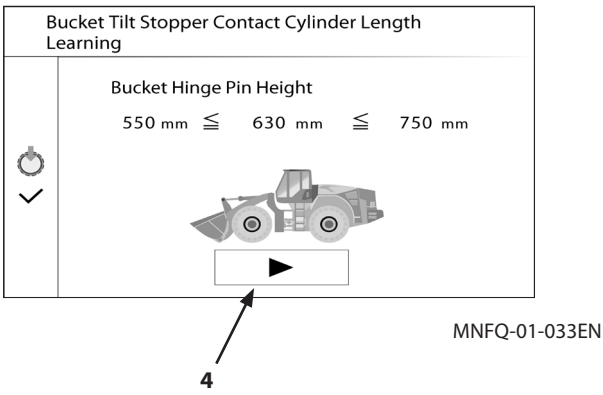
MNUD-01-252



MNUD-01-267EN



MNUD-01-279EN



MNFQ-01-033EN

Payload Checker Non-Load Learning

IMPORTANT: After replacing the bucket, be sure to perform this program.

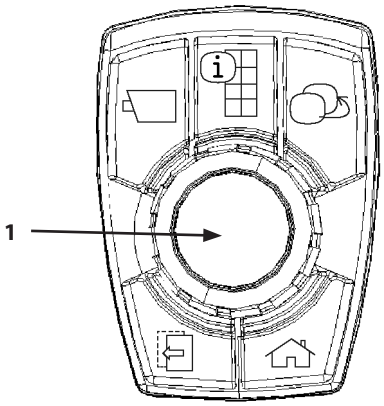
This is to learn the loader operation conditions when the bucket is empty.

Learning at Engine Low Idle

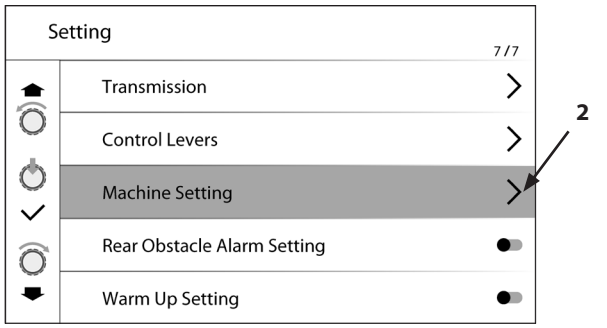
1. Start the engine.
2. Push selector knob (1) when the basic screen appears on the sub monitor to display the main menu.
3. Rotate selector knob (1) to highlight Setting, and push selector knob (1).
   Rotate selector knob (1) to highlight Machine Setting (2) from the Setting sub menu, and push selector knob (1).
4. Rotate selector knob (1) to highlight Payload Checker Non-Load Learning (3), and push selector knob (1).
   Rotate selector knob (1) to highlight Low Idle Learning (4), and push selector knob (1).
5. Perform warming up until the hydraulic oil temperature falls in the range between 40°C and 80°C (104 °F and 176 °F).

NOTE: *Refer to page 3-14 for the warming up operation.*

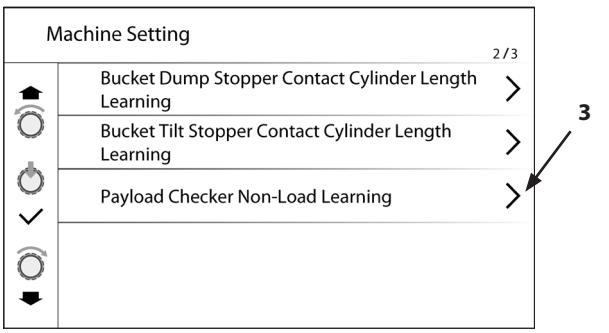
6. Lower the lift arm to the lowest position, and fully tilt the bucket.
   Verify that the parking brake is applied and the forward/reverse lever/switches are all at the neutral position.



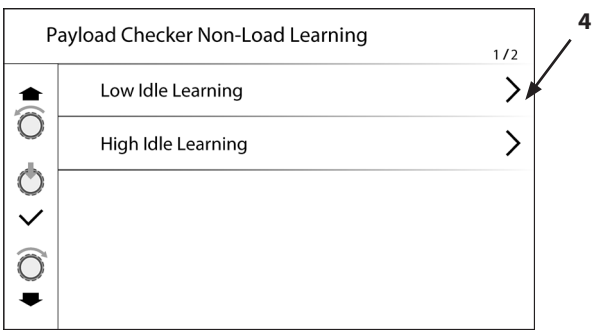
MNUD-01-252



MNUD-01-267EN



MNUD-01-279EN



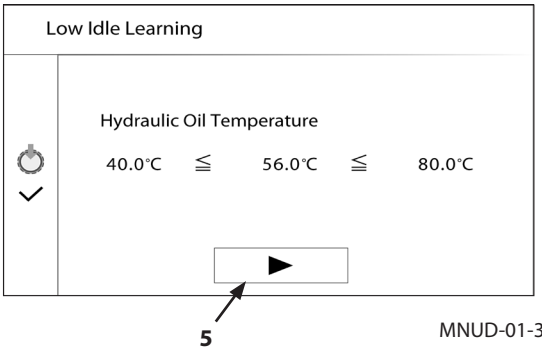
MNUD-01-347EN

7. When the conditions are satisfied, start button (5) appears on the screen.
   While running the engine at low idle, push selector knob (1) to start the learning process.

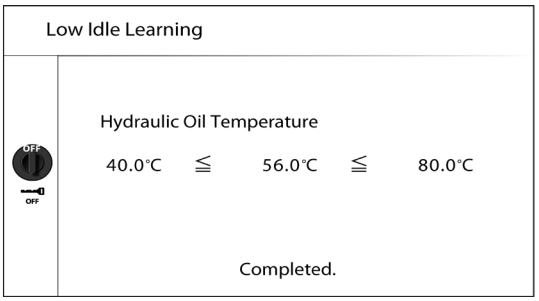
NOTE: The start button does not appear until the conditions are all satisfied.

IMPORTANT: Do not depress the accelerator pedal. Keep running the engine at low idle while learning.

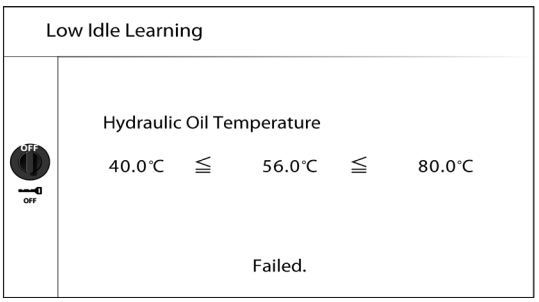
8. "Learning" message will appear. Raise the lift arm fully to the top.
9. When "Completed." message appears, turn off the key switch.
   If "Failed." is displayed, turn off the key switch and restart from step 1.



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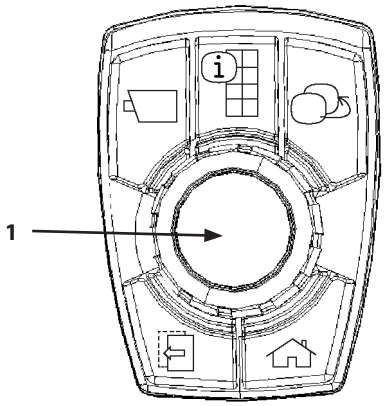
MNUD-01-350aEN



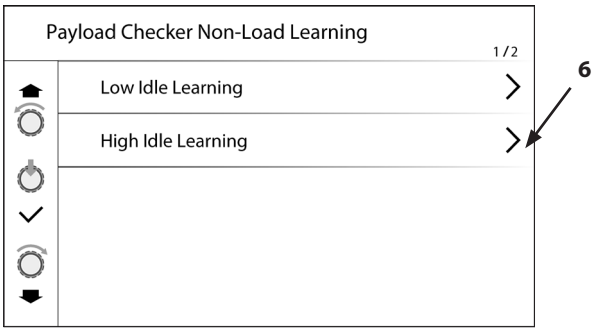
MNUD-01-351aEN

Learning at Engine High Idle

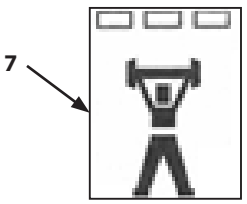
10. Start the engine.
11. Push selector knob (1) when the basic screen appears on the sub monitor to display the main menu.
12. Rotate selector knob (1) and select "Setting" - "Machine Setting" - "Payload Checker Non-Load Learning" menu, and push selector knob (1). (See the previous page for the detailed procedure to select this menu.)
13. Rotate selector knob (1) to highlight High Idle Learning (6), and push selector knob (1).
14. Verify that the hydraulic oil temperature falls in the range between 40 °C and 80 °C (104 °F and 176 °F). If not perform the warming up operation.
15. Lower the lift arm to the lowest position, and fully tilt the bucket.
    Verify that the parking brake is applied and the forward/reverse lever/switches are at the forward position.
16. Check that the left and middle LED for Power+ mode switch (7) is ON. If all LEDs are OFF or only the left LED is ON, press power mode switch (7).



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MNUD-01-212

	Pilot Lamp			
	■ ■ ■	□ ■ ■	□ □ ■	
Function	OFF	ON (Power)	ON (Power+)	

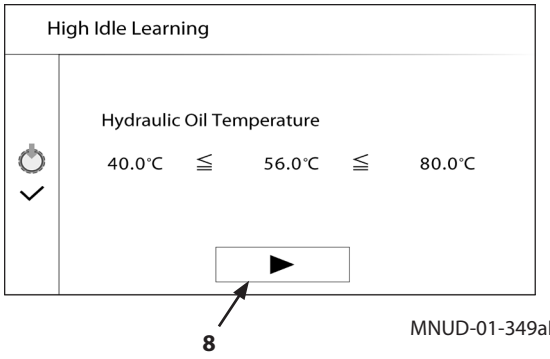
□: LED ON ■: LED OFF

17. When the conditions are satisfied, start button (8) appears on the screen.
18. Depress the accelerator pedal.
    While running the engine at high idle, push selector knob (1) to start the learning process.

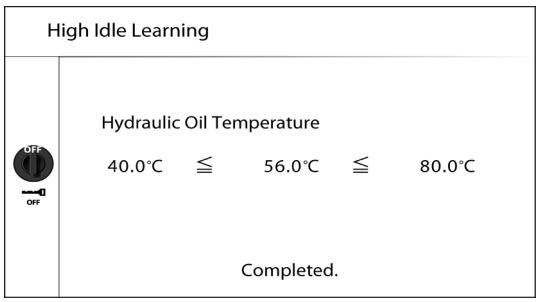
NOTE: The start button does not appear until the conditions are all satisfied.

IMPORTANT: Keep depressing the accelerator pedal to run the engine at high idle while learning.

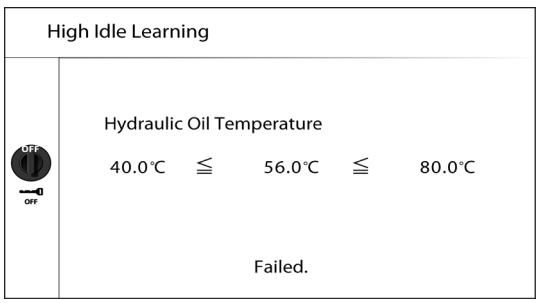
19. "Learning" message will appear. Raise the lift arm fully to the top.
20. When "Completed." message appears, lower the lift arm to the safe position and turn off the key switch.
    If "Failed." is displayed, turn off the key switch and restart from step 10.



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MNUD-01-352aEN

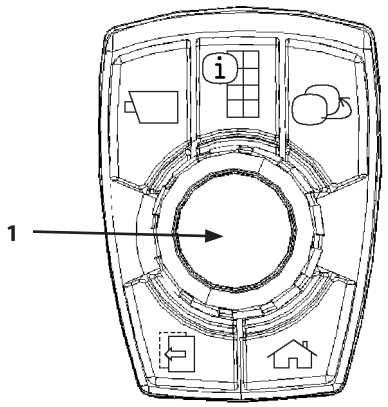


MNUD-01-353aEN

Rear Obstacle Detection Alarm ON/OFF (Optional)

This is to sound the buzzer when the rear obstacle detection level is low.

1. Push selector knob (1) when the basic screen appears on the sub monitor to display the main menu.



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2. Rotate selector knob (1) to highlight Setting (2), and push selector knob (1).

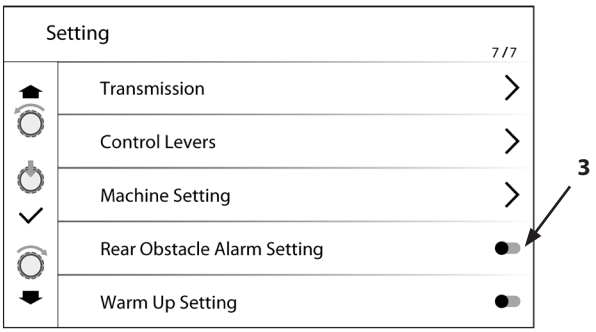


MNUD-01-264aEN

3. Rear Obstacle Alarm Setting (3) with ON/OFF switch indicator is shown.
   When the setting is ON, the background color is green with a round button to the right end.

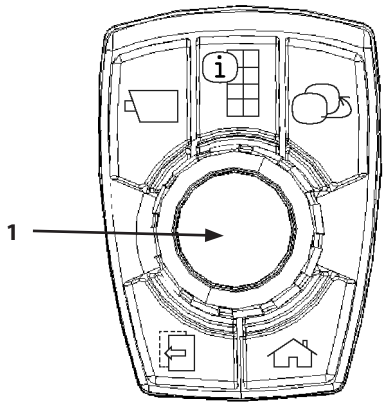


ON Position



MNUD-01-301EN

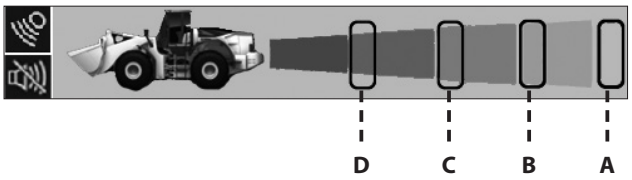
4. Push selector knob (1) to alternate ON and OFF setting.



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NOTE: The buzzer operation according to the distance to the obstacle and this alarm setting is as follows.

Alarm Level	Graph Bar level	Buzzer Setting	
		ON	OFF
1	A, Yellow	No sound	No sound
2	B, Yellow	Slow short beep	No sound
3	C, Red	Quick short beep	Quick short beep
4	D, Red	Long beep	Long beep

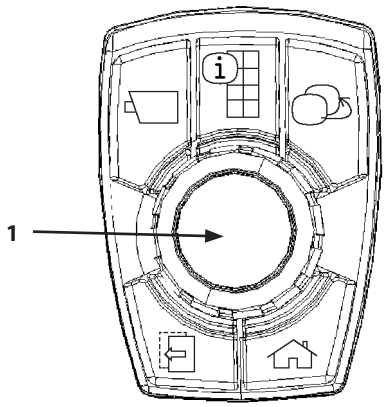


MNVA-01-043

Warm Up Operation ON/OFF

When warm up setting is turned on, the engine speed will be increased for warming up at engine start or when some conditions are satisfied.

NOTE: Refer to page 3-14 for operation under warming up setting.



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1. Push selector knob (1) when the basic screen appears on the sub monitor to display the main menu.

2. Rotate selector knob (1) to highlight Setting (2), and push selector knob (1).



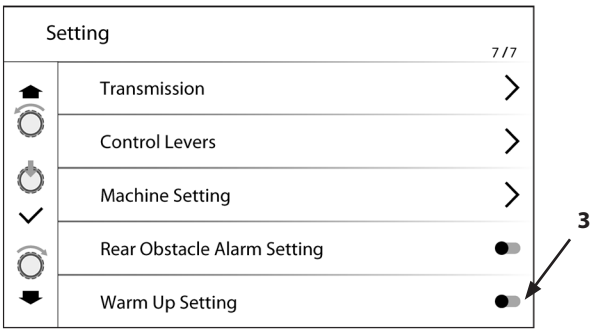
MNUD-01-264aEN

3. Rotate selector knob (1) and highlight Warm Up Setting (3). Warm Up Setting (3) with ON/OFF switch indicator is shown.
   When the setting is ON, the background color is green with a round button to the right end.



ON Position

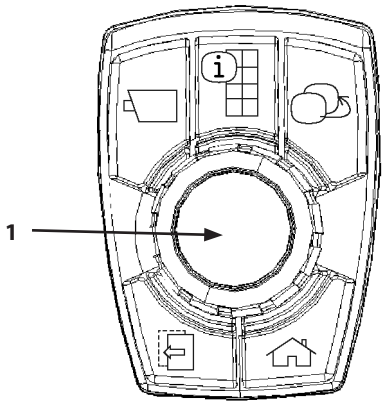
4. Push selector knob (1) to alternate ON and OFF setting.



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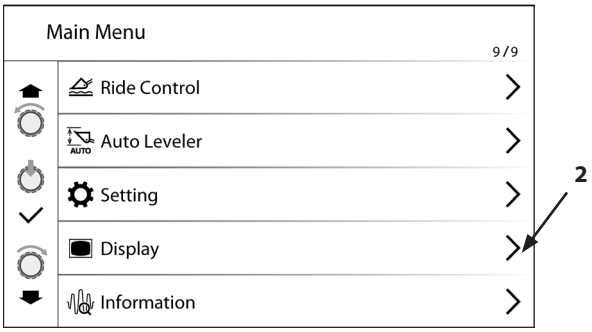
Displaying Display Menu

1. Push selector knob (1) when the basic screen appears on the sub monitor to display the main menu.



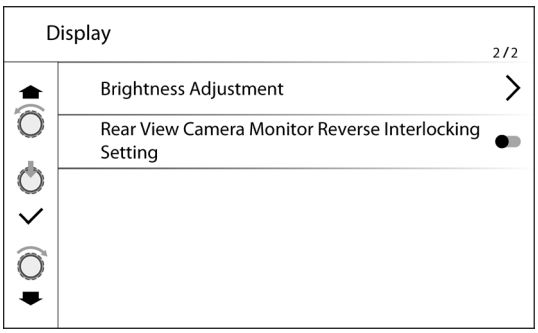
MNUD-01-252

2. Rotate selector knob (1) to highlight Display (2), and push selector knob (1).



MNUD-01-264aEN

3. Rotate selector knob (1) to highlight the desired item, and push selector knob (1) to display each screen.



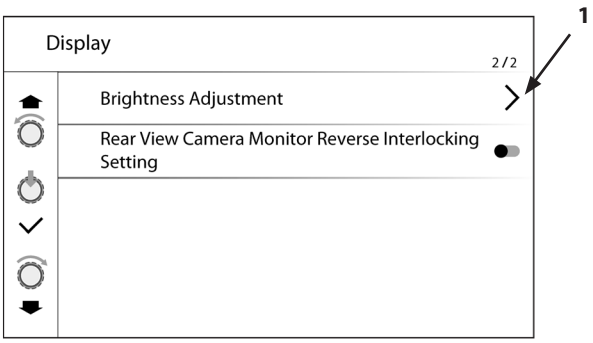
MNUD-01-298EN

Brightness Adjustment Procedure

The brightness of the sub monitor can be adjusted.

1. From Display screen, highlight Brightness Adjustment (1) and push selector knob (2).

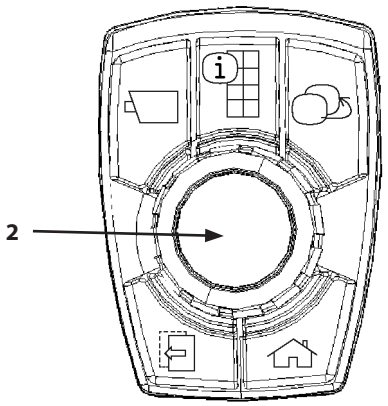
NOTE: For how to go to Display screen, refer to "Displaying Display Menu" (page 1-114).



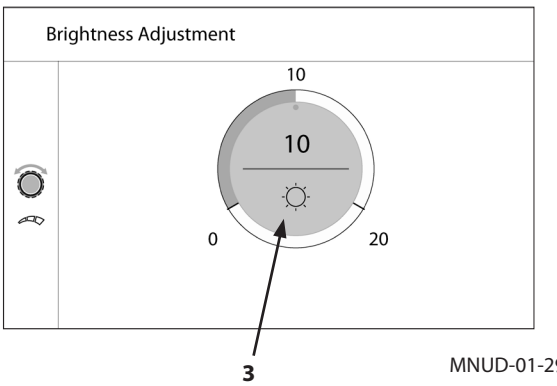
MNUD-01-298EN

2. Rotate selector knob (2) clockwise to make the screen brighter.
   Rotate selector knob (2) counterclockwise to make the screen darker.
   The adjustment can be done by 5% (20 steps) up to 100%, except the level "0%".

NOTE: When the clearance light is turned ON, the monitor screen changes to night mode and a moon mark is displayed instead of sun mark (3). Brightness can be adjusted for day mode and night mode respectively.



MNUD-01-252



MNUD-01-299EN

Rear View Camera Monitor Reverse Interlocking Setting (Optional)

NOTE: This menu is available only when the optional aerial angle is installed.

This is to select the camera image to be displayed during reverse driving.

1. From Display screen, highlight Rear View Camera Monitor Reverse Interlocking Setting (1) and push selector knob (2).

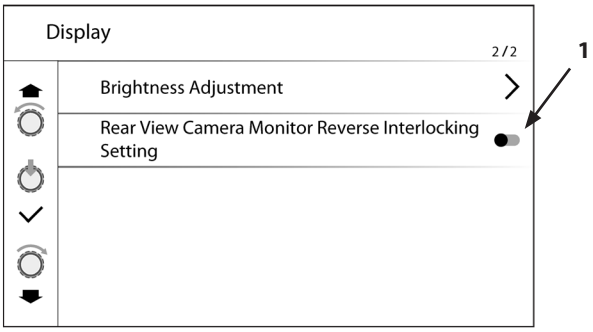
NOTE: For how to go to Display screen, refer to "Displaying Display Menu" (page 1-114).

2. Rear View Camera Monitor Reverse Interlocking Setting (1) with ON/OFF switch indicator is shown.
   When the setting is ON, the background color is green with a round button to the right end.

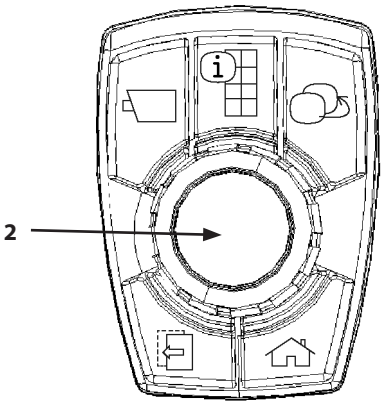


ON Position

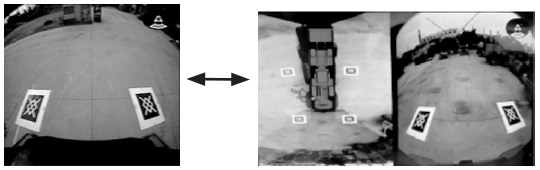
3. Push selector knob (2) to alternate ON and OFF setting.



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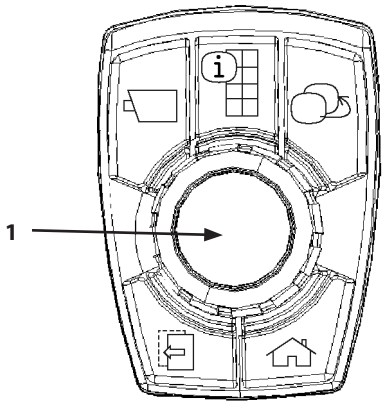


MNUD-01-252

Shift Lever/Switch Position	Rear View Camera Monitor Interlocking Setting	Sub Monitor Image
Reverse (R)	ON	Rear View Camera Image Only 
Forward (F) Neutral (N)	ON	Switching between 2 patterns by rotating selector knob (1) 
Forward (F) Neutral (N) Reverse (R)	OFF	*NOTE: Applicable only when the optional aerial angle is installed.*

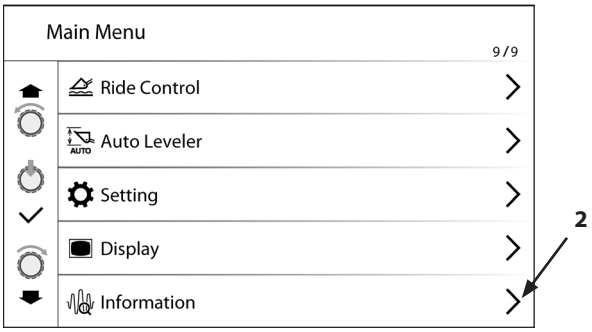
Displaying Information Menu

1. Push selector knob (1) when the basic screen appears on the sub monitor to display the main menu.



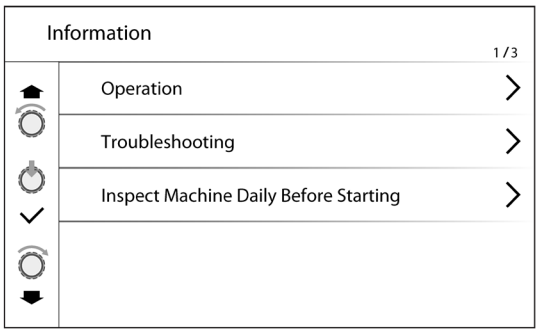
MNUD-01-252

2. Rotate selector knob (1) to highlight Information (2), and push selector knob (1).



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3. Rotate selector knob (1) to highlight the desired item, and push selector knob (1) to display each information screen.



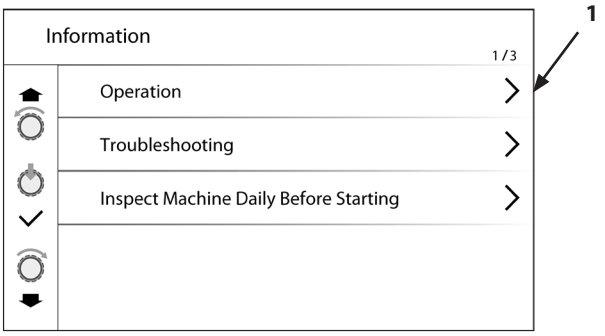
MNUD-01-293EN

Machine Operation Information

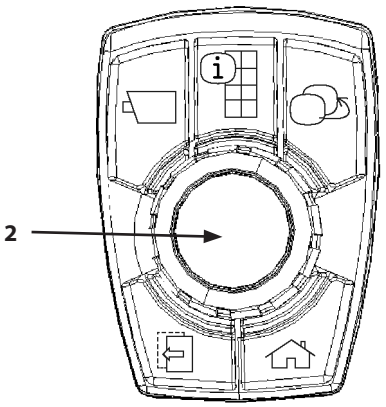
The Operation screen displays operating hours and travel distance.

1. From Information screen, highlight Operation (1) and push selector knob (2).

NOTE: For how to go to Information screen, refer to "Displaying Information Menu" (page 1-117).

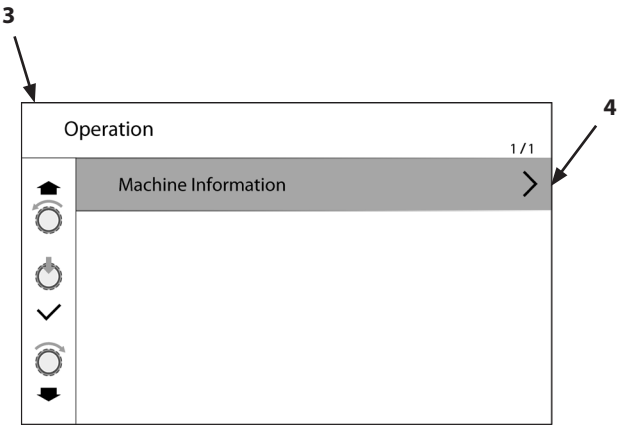


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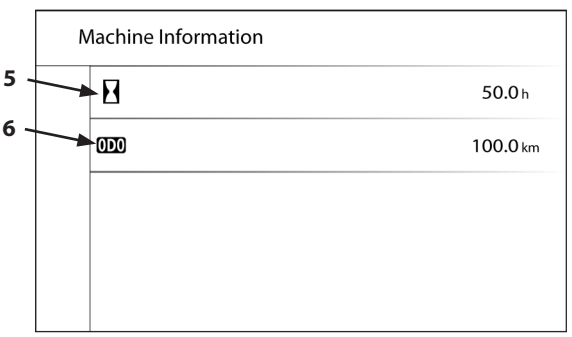
2. Operation screen (3) is displayed.



MNUD-01-303EN

3. Rotate selector knob (2) to highlight Machine Information (3), and push selector knob (2) to display machine information screen.

- Hour meter (5)
  The accumulated operation hour.
- Odometer (6)
  The accumulated drive distance.



MNUD-01-304EN

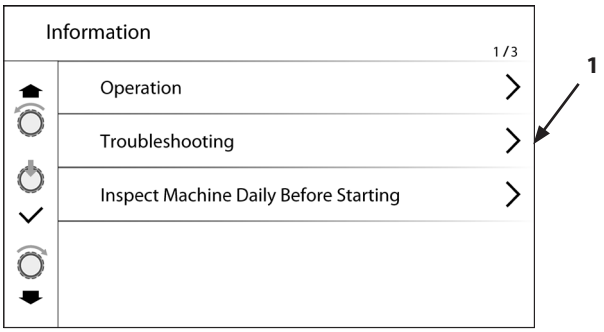
4. Push selector knob (2) to display Operation screen (3).

Troubleshooting

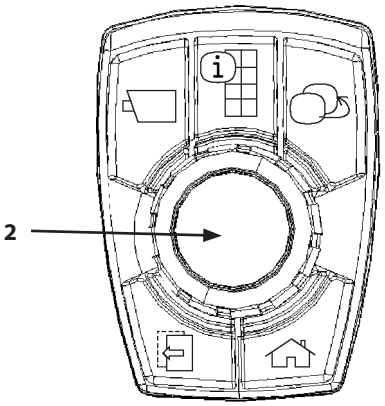
An active fault code generated by the controller connected to the controller area network (CAN) is displayed on this screen.

1. From Information screen, highlight Troubleshooting (1) and push selector knob (2).

NOTE: For how to go to Information screen, refer to "Displaying Information Menu" (page 1-117).



MNUD-01-293EN

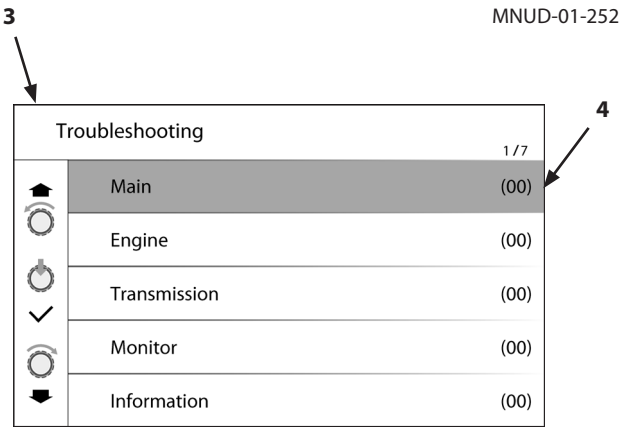


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2. Troubleshooting screen (3) is displayed.

3. The number of currently generated fault codes are displayed to the right of each controller.

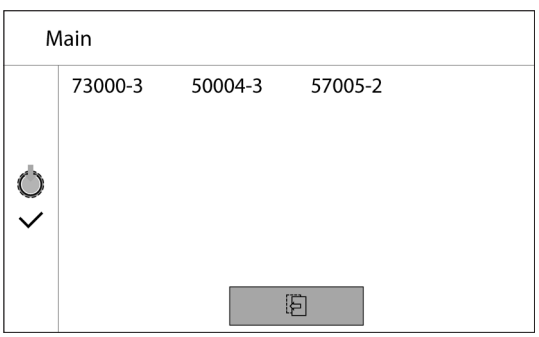
4. Rotate selector knob (3) to highlight an item, and push selector knob (3) to display the fault code list, which are currently reported from the controller.
(In this example, Main Controller (4) is selected.)



MNUD-01-306EN

NOTE:

- *This is not an error log including old errors to be resolved.*
- *The same fault code list is available on the main monitor, Troubleshooting. Refer to page 1-54.*



MNUD-01-307EN

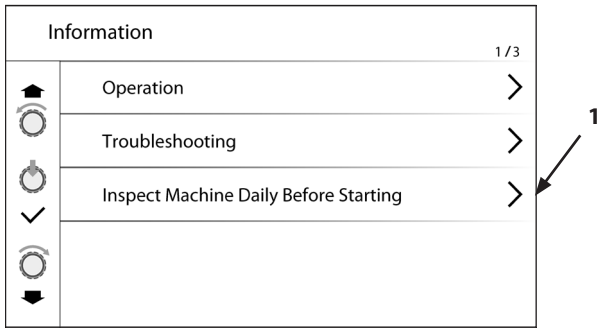
IMPORTANT: Send the troubleshooting result to Authorized Dealer as soon as possible.

Selecting Daily Inspection Before Starting

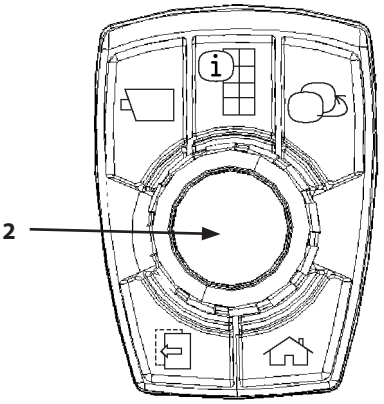
This selects the inspection items to be checked before starting today's work. An advice message will be reported for the selected items.

1. From Information screen, highlight Inspect Machine Daily Before Starting (1) and push selector knob (2).

NOTE: For how to go to Information screen, refer to "Displaying Information Menu" (page 1-117).



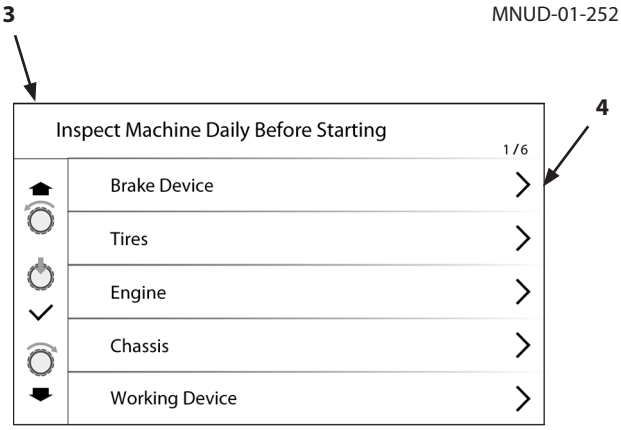
MNUD-01-293EN



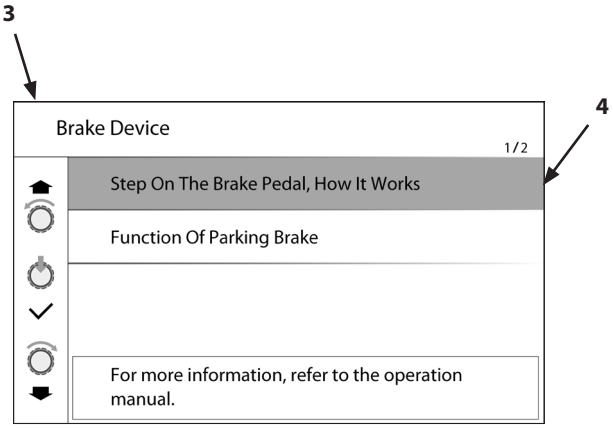
MNUD-01-252

2. Machine Daily Before Starting screen (3) is displayed.

3. Rotate selector knob (2) to highlight an item, and push selector knob (2) to display the inspection items. (In this example, Brake Device (4) is selected.)



MNUD-01-294EN



MNUD-01-295EN

Inspection Items

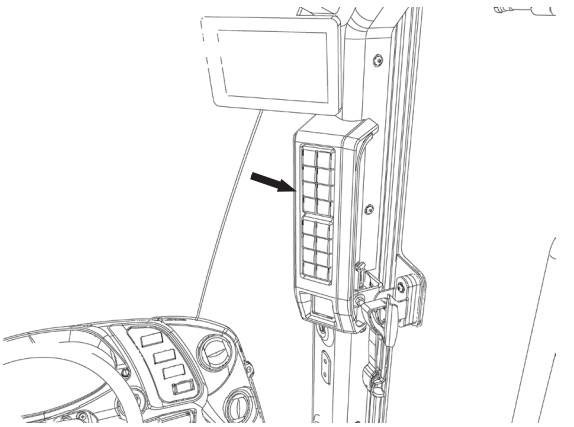
Brake Device	Step On The Brake Pedal, How It Works
	Function Of Parking Brake
Tires	Tire Pressure
	Tire Cracks, Damage, Abnormal Wear
	Installation Of Tire Discs And Wheels
Engine	Engine Oil And Cooling Water Volume And Dirt
	Loose Or Damaged Alternator Drive Belt
	Ease Of Starting, Exhaust Gas Color, And Noise
	Oil And Water Leaks, Damage To Hoses And Pipe Lines
	Clogging And Damage To Radiator, Oil Cooler And Intercooler
	Loose And/Or Missing Mounting Bolts And Nuts
	Low Speed And Acceleration Status
	Check Crankcase Breather Tube
	Fuel Moisture Separator Discharge
	Check The Air Cleaner Dust Discharge Valve
Chassis	Oil Leaks Of The Transmission And The Axle
	Level, Leaks And Contamination Of The Fuel Tank. Drain Water From Fuel Tank.
	Level And Leaks Of The Hydraulic Oil Tank
	Operation, Play And Operating Force Of Control Levers And Steering Wheel
	Operation Of All Hydraulic Components, Oil Leaks And Damage To Pipings And Hoses
	Deformity, Breakage, And Abnormal Noise At Each Part
	Window Washer Fluid
	Wiper Wiped Condition
	Level, Leaks And Contamination In DEF Tank
	Leaks From DEF Hoses
	Dirt Around The Aftertreatment Device
Working Device	Check Cylinders, Pipe Lines And Hoses For Oil Leaks And Damage
	Loose, Worn And Missing Cutting Edges
	Wear And Damage To The Bucket
	Grease Condition Around The Loader Front
	Damage To The Pin Lock Bolts, Stoppers And Links
	Loose And/Or Missing Mounting Bolts And Nuts
Others	Defective,Dirty,Damaged Lighting Device And Direction Indicator
	Defective Rear-View Mirror And Reflector
	Reflector And Car Registration Number Display Or Vehicle Number Mark Dirt Or Damage
	Operating Status Of Each Instrument, Switch, Alarm, Back Buzzer
	Damage And Deformation To The ROPS Cab
	Abnormal Outside Appearance Of Machine
	Looseness Of The Battery Terminals
	Wear And Damage Of The Seat Belt
	Damaged To The Steps

Panel Switch (Illustration Content)

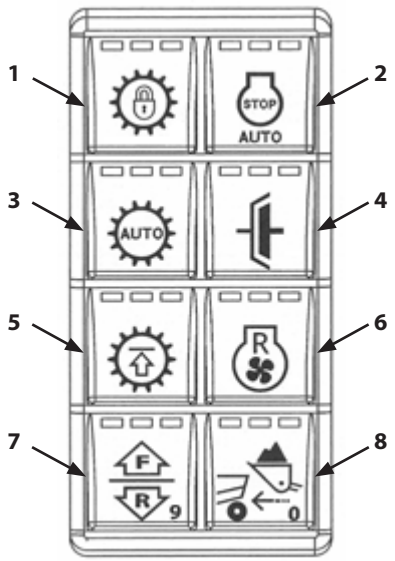
The following describes the names of the switches provided on the panel switch located on the right front pillar.
All switch is accompanied with three LED pilot lamps to indicate the current status of each switch function.
For the explanations of each switch, refer to page shown in ( ).

1- Lock-Up Mode Selector Switch (1-123)
2- Auto Shut-Down Switch (1-124)
3- Travel Mode Selector Switch (1-126)
4- Clutch Cut Position Switch (1-127)
5- Maximum Gear Limited Switch (Not used)(1-128)
6- Fan Reverse Rotation Switch (1-129)
7- Forward/Reverse Selector Switch (1-131)
8- Dump Truck Approach Speed Control Switch (1-133)
9- Aftertreatment Device Manual Regeneration Switch (1-135)
10- Power Mode Switch (1-134)
11- Aftertreatment Device Regeneration Inhibit Switch (1-135)
12- Ride Control Switch (1-136)
13- Front Wiper Switch (1-137)
14- Rear Wiper Switch (1-137)
15- Front Washer Switch (1-138)
16- Rear Washer Switch (1-138)

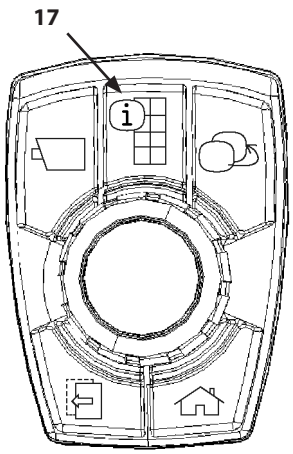
NOTE: The list of current status of these switches are shown on the sub monitor. Press switch panel setting confirmation switch (17) in the right console. Refer to page 1-61.



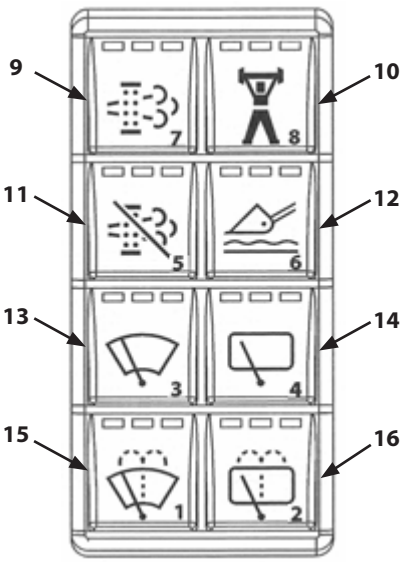
MNUD-01-200



MNFQ-01-201



MNUD-01-252

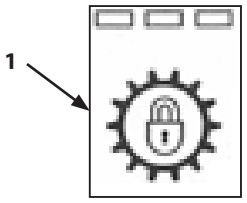


MNUD-01-202

Lock-Up Mode Selector Switch

Lock-up mode selector switch (1) selects the lock-up mode. Pressing lock-up mode selector switch (1) changes the selected mode "OFF" → "2-D" → "3-D"→ "OFF" in this order.

Lock-up clutch is provided for efficient power transmission from the engine, that helps to improve fuel efficiency and have higher ground speed.
Use this setting to activate the lockup shifting (refer to page 4-14).



MNUD-01-203

[OFF]
The lock-up shifting is not available.

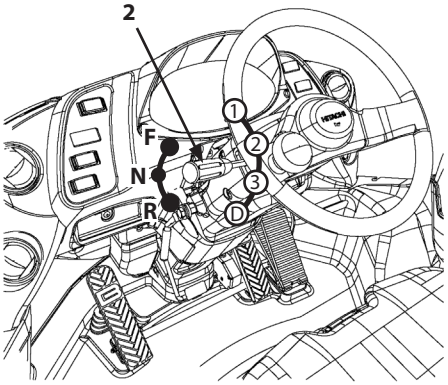
[2-D]
The lock-up clutch is used when traveling in the 2nd range speed or higher.

[3-D]
The lock-up clutch is used when traveling in the 3rd range speed or higher.

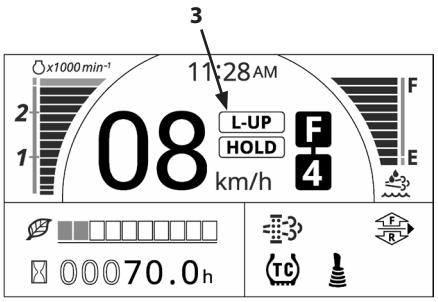
	Pilot Lamp			
	■ ■ ■	■ □ □	■ ■ □	
Function	OFF	2-D	3-D	

□: LED ON ■: LED OFF

NOTE: Lock-up indicator (3) turns ON while the lock-up clutch is being engaged.



MNUD-01-009



MNFQ-01-021

Auto Shut-Down ON/OFF

WARNING: This function automatically stops the engine. Pay extra attention to the work and work environment when using this function.

The auto shut-down function can be ON or OFF using auto shut-down switch (1).

NOTE: The auto shut-down time setting is done between 1 and 30 minutes using sub monitor menu. Refer to page 1-92 for the procedures.

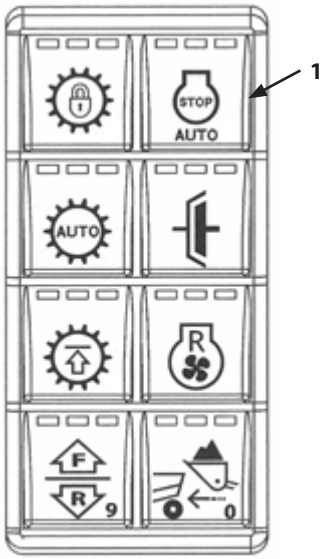
The engine automatically stops after the preset time when machine is parking under the following conditions:

- The auto shut-down switch (1) is ON position.
- The engine is running.
- The parking brake is applied.
- The forward/reverse lever (switch) is in neutral (N).
- The accelerator pedal is not depressed.
- The brake pedal is not depressed.
- The control lever is not operated.
- The steering wheel is not operated.
- Coolant, hydraulic oil and transmission temperature are not high.
- The aftertreatment device manual regeneration is not operating.

NOTE: 30 seconds before the engine stop, the monitor displays a message to notify the engine will be stopped soon. The buzzer also sounds. The buzzer also sounds once at 15 seconds before, and once at 5 seconds before, then stops after 5 seconds. When the machine is in the operating state before stopping the engine, the auto shut-down is disabled and the engine will not stop.

IMPORTANT:

- **When the engine stops because of the auto shut-down function, the ignition key is still switched to ON. To restart the engine, first switch the key to OFF, and then perform normal starting procedure.**
- **Do not leave the machine after auto shut-down. Failure to do so may discharge the batteries.**



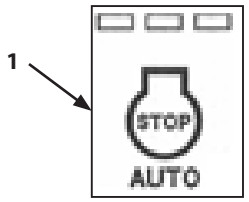
MNFQ-01-201

Auto Shut-Down Switch

Pressing auto shut-down switch (1) alternates "ON" and "OFF".

[OFF]
When all LEDs of auto shut-down switch (1) are turned off, the auto shut-down function is off (deactivated). Even if the auto shut-down timer is set, it does not work.

[ON]
When all LEDs of auto shut-down switch (1) are turned off, press auto shut-down switch (1). The middle LED turns ON and the auto shut-down function is turned on (activated).



MNUD-01-204

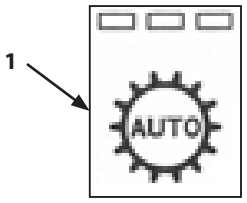
	Pilot Lamp			
	■ ■ ■	■ □ ■		
Function	OFF	ON		

□: LED ON ■: LED OFF

Travel Mode Selector Switch

Travel mode selector switch (1) selects the travel mode. Pressing travel mode selector switch (1) changes the selected mode "Manual" → "AUTO1" → "AUTO2"→ "Manual" in this order.

Selecting the manual mode sets the transmission to Manual mode, which allows manual shift change by using shift switch (2).
AUTO 1 and AUTO 2 are choices selectable at auto-shift mode. Select the most efficient mode for the travel and work condition.



MNUD-01-205

	Pilot Lamp			
	■ ■ ■	□ □ □	■ □ □	
Function	Manual	AUTO1	AUTO2	

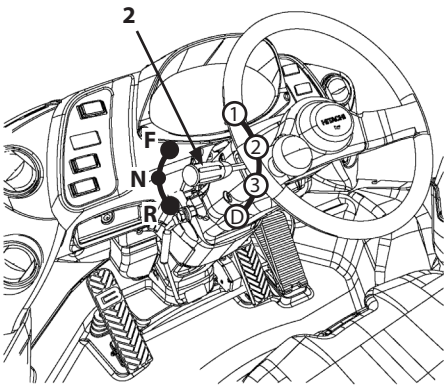
□: LED ON ■: LED OFF

IMPORTANT: Be sure to stop the machine and set forward/reverse lever (2) in the neutral (N) position before operating travel mode selector (1).

[Manual]
Manual gear shift. The gear shifts according to the shift switch.

[AUTO1]
Start traveling at 2nd speed. When traveling load increases, it automatically shifts from 2nd to 1st speed. (Auto downshift function)
This mode is suited for heavy digging work or ascending on a slope.

NOTE: The AUTO 1 mode shifts up to the set shift switch position. When the shift switch is set to 4th speed, auto-shift range is 1st to 4th speed. When the shift switch in set to 3rd speed, auto-shift range is 1st to 3rd speed.



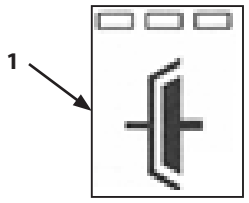
MNUD-01-009

[AUTO2]
Start traveling at 2nd speed. This mode uses 2nd or more gear shifts.
This mode is suited for removing snow.

NOTE: Refer to "DRIVING MACHINE" section.

Clutch Cut Position Switch

Clutch cut position switch (1) changes the function of left and right brake pedals.
Pressing clutch cut position switch (1) changes the selected mode "OFF" → "N Mode" → "D Mode" → "OFF" in this order. When keep depressing the switch while "N Mode" is selected, it skips "D Mode" and returns to "OFF".



MNUD-01-206

	Pilot Lamp			
	■ ■ ■	□ □ ■	□ □ □	
Function	OFF	N Mode	D Mode	

□: LED ON ■: LED OFF

- Clutch cut OFF
  Clutch gear is engaged. When depressing left or right brake pedal, brake is applied while driving power is transmitting to the tires.

- Clutch cut ON
  By depressing left or right brake pedal, the clutch is disengaged and brake is applied without transmitting the drive power to the tires.

[N Mode]



: Clutch cut ON while lightly depressing the brake pedal.
Suitable for loading work on a level surface, such as when approaching to a dump truck.

[D Mode]



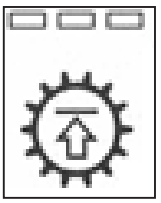
: Clutch cut ON while deeply depressing the brake pedal. The clutch can be disengaged at a slower timing.
Suitable for work on a slope.

NOTE:

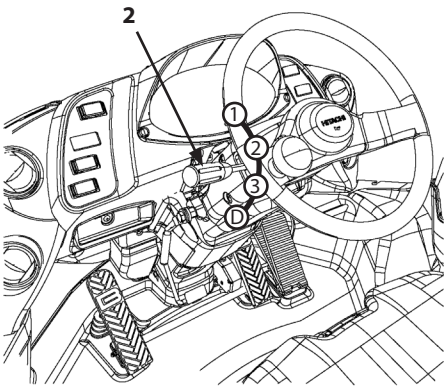
- *When starting to ascend a slope, turn clutch cut position switch (1) OFF (neutral), depress the left brake pedal. Gradually release the left brake pedal while depressing the accelerator pedal to easily start ascending the slope.*
- *Effective use of the clutch cut position switch leads to reduced fuel consumption and overheating of axle oil.*

Maximum Gear Limited Switch

The maximum gear limit switch has no function.
The shift lever (2) "D" position speed range is fixed to 4th speed.



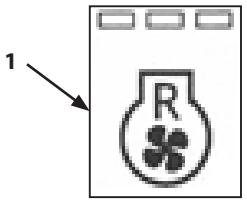
MNUD-01-207



MNUD-01-009

Fan Reverse Rotation Switch

Fan reverse rotation switch (1) reverses the hydraulic driven fan. If the radiator is clogged, rotate the hydraulic driven fan in reverse direction to blow out the clogged dust. Carry out the fan reverse rotation regularly to prevent the cooling system from clogging.
Pressing fan reverse rotation switch (1) alternates the fan reversing operation "ON" and "OFF".



MNUD-01-208

[OFF]
When all LEDs of fan reverse rotation switch (1) are turned off, the fan is rotating in normal direction only for cooling inside the engine room.

[ON]
When all LEDs of fan reverse rotation switch (1) are turned off, press fan reverse rotation switch (1). The middle LED turns ON and the following fan operation starts.

	Pilot Lamp			
	■ ■ ■	■ □ ■		
Function	OFF	ON		

□: LED ON ■: LED OFF

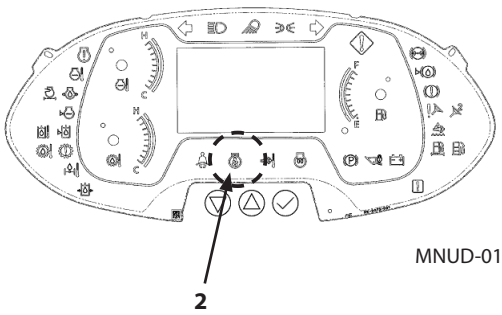
Fan Reverse Rotation Operation (Auto)

Press fan reverse rotation switch (1).
The fan rotates in the normal direction for 10 minutes for the first time; then starts reverse rotation for 60 seconds (1 minute).
After that, normal rotation for 30 minutes and reverse rotation for 1 minute alternates until fan reverse rotation switch (1) is pressed to turn it off.

IMPORTANT: If abnormal situation occurs such as engine coolant overheating, reverse rotation may forcibly be released, or fan reverse rotation switch (1) may be disabled.

NOTE:

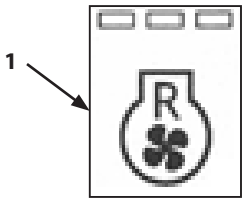
- *The normal rotation time is automatically shortened to 20 minutes and returned to 30 minutes depending on the coolant temperature and the outside air temperature.*
- *The reverse rotation time becomes 90 seconds (1.5 minutes) at low temperature.*
- *While switching the fan rotating direction, fan reverse rotation indicator (2) flashes. (When fan reverse rotation switch (1) is pressed while fan reverse rotation indicator (2) turns ON, indicator (2) starts flashing.) Do not press fan reverse rotation switch (1) during indicator (2) is flashing to avoid malfunction.*
- *When the fan rotates in reverse direction, indicator (2) stays ON. When the fan rotates in normal direction, fan reverse rotation indicator (2) goes OFF.*



MNUD-01-030

Fan Reverse Rotation Operation (Manual)

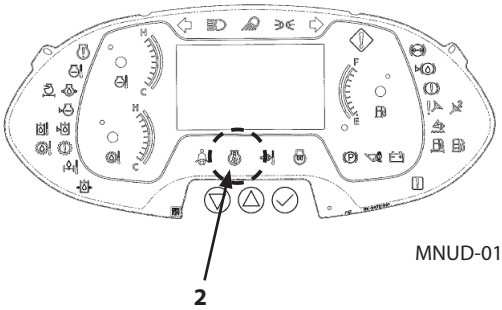
Keep depressing fan reverse rotation switch (1) starts the following fan reversing operation.



MNUD-01-208

IMPORTANT: Fan rotating direction can be changed during the engine is running. Always operate fan reverse rotation switch (1) while applying the parking brake. When the parking brake is released, the fan reverse condition is automatically canceled after 1 minute. If abnormal situation occurs such as engine coolant overheating, reverse rotation may forcibly be released, or fan reverse rotation switch (1) may be disabled.

1. Close the side cover and the rear grille. Start the engine. Be sure to confirm that the parking brake is applied.
2. Keep depressing fan reverse rotation switch (1). Fan reverse rotation indicator (2) starts flashing. Approximately 1 minute later, the fan rotates in reverse direction, and fan reverse rotation indicator (2) stays ON.
3. After operation, press fan reverse rotation switch (1) again to return the fan rotation to the normal direction. The fan reverse rotation indicator (2) turns OFF.



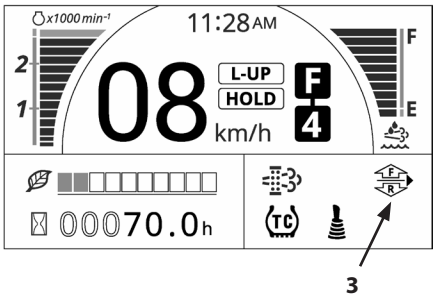
MNUD-01-030

Forward/Reverse Selector Switch

Forward/reverse selector switch (1) is a switch that activates forward/reverse switch (2) on the right console, or on the multi-function lever.

NOTE: This is not to activate the forward/reverse switch on the joystick steering. Refer to pages 1-33 and 1-157.

When forward/reverse selector switch (1) is in ON position, forward/reverse selector switch indicator (3) is lit on the main monitor.



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NOTE: The LED lamps for forward/reverse selector switch (1) do not light.

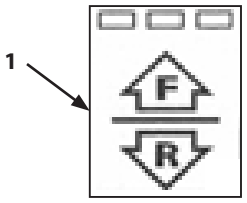
The machine travels in forward or reverse direction by pressing (F) or (R) button of forward/reverse switch (2).



Forward/Reverse Selector Switch Indicator (3)

MNEK-13-007

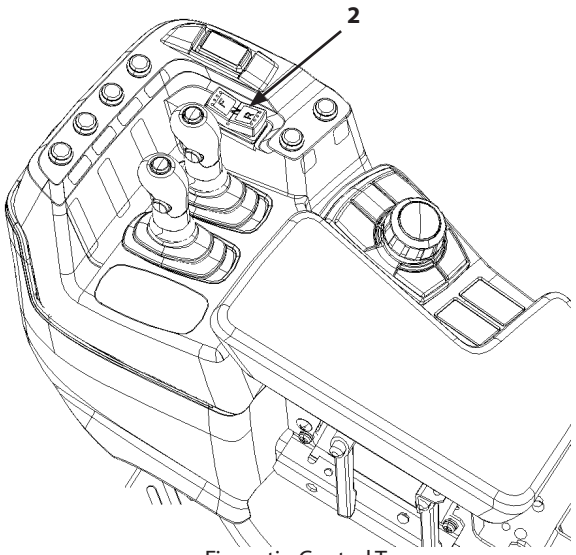
When forward/reverse switch (1) is ON, pressing either (F) or (R) on forward/reverse switch (right) (2) puts the machine in forward or reverse.



MNUD-01-209

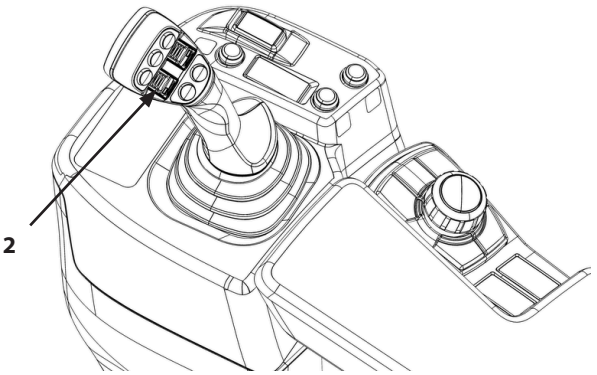
	Pilot Lamp			
	■ ■ ■			
Function	---			

□: LED ON ■: LED OFF



Fingertip Control Type

MNFQ-01-047



Multi-Function Joystick Type

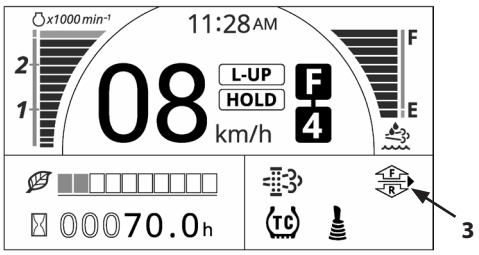
MNUD-01-099

Forward/Reverse Selector Switch Operation

1. Turn the parking brake switch ON to apply the parking brake.
   Verify that both forward/reverse lever (4) and forward/reverse switch (2) are in the neutral (N) position.

WARNING: At this time, be sure to depress the brake pedal to ensure safety.

2. Press forward/reverse selector switch (1) on the panel switch. When it turns ON, forward/reverse selector switch indicator (3) is lit.



MNFQ-01-021

NOTE: When forward/reverse switch (right) (2) is enabled, forward/reverse selector switch indicator (3) will appear as illustrated below.



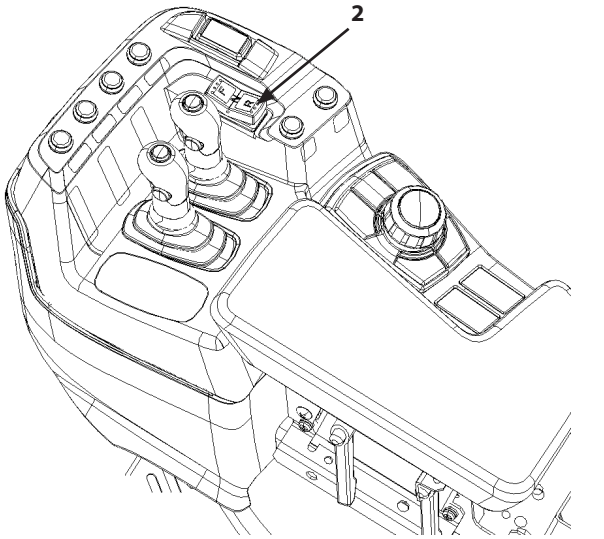
Forward/Reverse Selector Switch Indicator (3)

MNEK-13-007

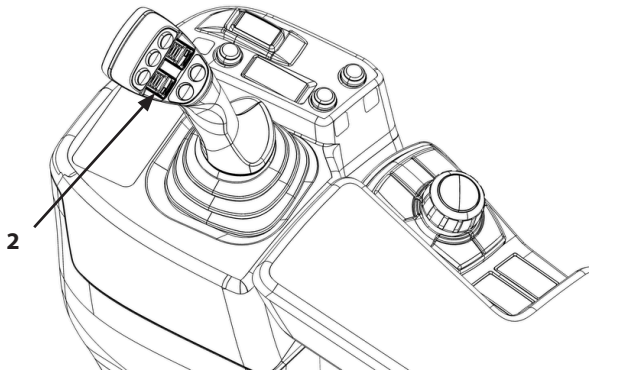
3. Turn the parking brake switch OFF.
   Set forward/reverse switch (2) to (F) or (R) to move the machine forward or reverse direction.

NOTE:

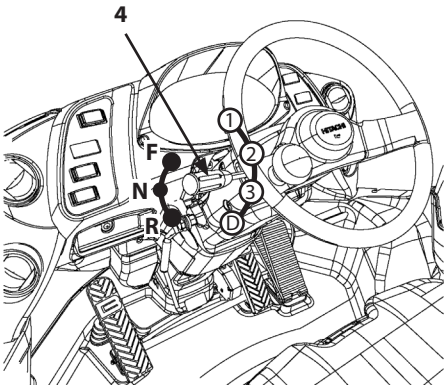
- *When forward/reverse lever (4) and forward/reverse switch (2) is set to other than the neutral (N) position, pressing forward/reverse selector switch (1) cannot be ON (forward/reverse switch (2) is disabled). The sub monitor shows an instruction message to confirm neutral positions.*
- *Refer to pages 4-6 and 4-19 for the use of forward/reverse switch (2).*



MNFQ-01-047



MNUD-01-099



MNUD-01-009

Dump Truck Approach Speed Control Switch

Dump truck approach speed control switch (1) controls the travel speed when approaching a truck for dumping bucket.

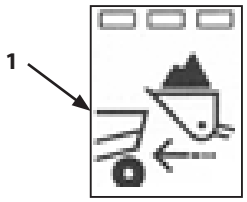
The function activates when the shift switch is set to 2nd speed and the lift arm is raised while moving forward.

Pressing dump truck approach speed control switch (1) changes the travel speed "OFF" → "Fast" → "Middle" → "Slow" → "OFF" in this order.

Loading to a dump truck is judged by the lift arm height when moving forward with the shift switch in 2nd speed and at a certain speed or more.
When the function activates, machine speed will slow.

The operator can select a favorite approaching speed depending on the driving distance and operation conditions for better fuel efficiency and operability.

NOTE: When the setting is "OFF", the machine may approach to a dump truck at a speed around 12 km/h (7.5 mph). When selecting "Slow", the speed will reduced to 8 or 9 km/h (5.0 or 5.6 mph) even if the accelerator pedal is fully depressed.



MNUD-01-210

	Pilot Lamp			
	■ ■ ■	□ ■ ■	□ □ ■	□ □ □
Function	OFF	Fast	Middle	Slow

□: LED ON ■: LED OFF

Power Mode ON/OFF

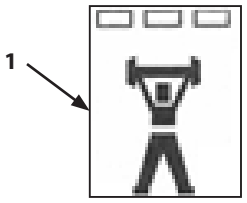
Pressing power mode switch (1) alternates "ON" and "OFF" the power mode.

[OFF (Standard Mode)]
When all power mode switch LEDs are off, power mode is off (Standard Mode).
Standard Mode is suitable for loading work when emphasizing fuel economy.
Auto shifting mode quickens the timing of the shift-up.

[ON (Power Mode)]
To switch to power mode, press power mode switch (1) when all its LEDs are off. The left LED will turn on, indicating that power mode is on.
Power Mode is suitable for heavy-duty work (e.g. digging) when emphasizing workload, balancing fuel economy and work effectiveness.
Auto shifting mode quickens the timing of the shift-up.

[ON (Power+ Mode)]
To switch to power+ mode, press power mode switch (1) when power mode is on (middle LED is on). The left and middle LED will turn on, indicating that power+ mode is on.
Power+ mode is suitable for heavy-duty work (e.g. digging in rock) when emphasizing workload more than in power mode.

NOTE: From sub monitor menu, "Dig Mode" is selectable for comfortable heavy-duty work in combination with power mode setting. Refer to page 1-91.



MNUD-01-212

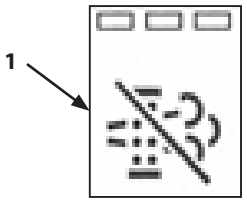
	Pilot Lamp			
	■ ■ ■	□ ■ ■	□ □ ■	
Function	OFF	ON (Power)	ON (Power+)	

□ : LED ON ■ : LED OFF

NOTE: When the quick P switch is pressed, the left and middle LED of this switch turns ON. Refer to page 1-153 for the quick P switch.

Aftertreatment Device Regeneration Inhibited

IMPORTANT: The aftertreatment device regeneration can be inhibited to prevent auto regeneration while operating the machine in a dusty area or indoors.



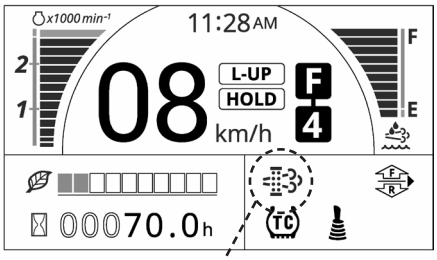
MNUD-01-213

Aftertreatment device regeneration inhibit switch (1) alternates "ON" and "OFF" the aftertreatment device regeneration inhibit function.
Aftertreatment device regeneration inhibit setting is done by the main menu mode; both auto and manual regeneration or only auto regeneration process can be inhibited. Refer to page 1-52 for the setting.

	Pilot Lamp			
	■ ■ ■	■ □ ■		
Function	OFF	ON		

□: LED ON ■: LED OFF

[OFF]
When all LEDs of aftertreatment device regeneration inhibit switch (1) are turned off, the aftertreatment device regeneration inhibit function is off.
The auto regeneration runs when required as specified, and manual regeneration can be done by pressing manual regeneration switch (3) on the panel switch. Refer to page 1-5.



MNFQ-01-021

[ON]
When all LEDs of aftertreatment device regeneration inhibit switch (1) are turned off, press aftertreatment device regeneration inhibit switch (1). The middle LED turns ON and the aftertreatment device regeneration inhibit function is on. Regeneration inhibited indicator (2) will be displayed on the main monitor.
The auto regeneration will not run. The manual regeneration is also disabled according to the setting.

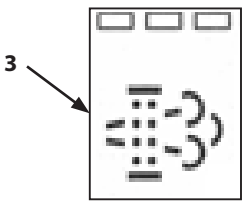


MDAA-01-282

IMPORTANT: When the machine is operated with the aftertreatment device regeneration inhibited, the aftertreatment device becomes clogged. When the aftertreatment device regeneration request is displayed, move the machine to a safe place. Perform the manual regeneration following the specified procedure. Failure to do so may damage the aftertreatment device. Refer to "Aftertreatment Device" section for the manual regeneration.

Aftertreatment Device Manual Regeneration Switch

Aftertreatment device regeneration switch (3) starts the aftertreatment device manual regeneration process. Refer to page 1-7 for the procedure.



MNUD-01-211

	Pilot Lamp			
	■ ■ ■	■ □ ■		
Function	OFF	ON		

□: LED ON ■: LED OFF

Ride Control Switch

WARNING:

- **To ensure safety, operate the ride control switch only after parking the machine with the bucket lowered to the ground.**
- **When operating the machine with the front attachment in the float position (scooping, grading, or snow removal), always turn the ride control switch OFF. Failure to do so may allow the front attachment to unexpectedly move up or down when the ride control system is activated.**
- **When operating the machine with the ride control ON, reduce the machine speed. Ride control accumulator will carry high pressure if sudden impact load is applied on the working equipment, causing gas leakage.**

The ride control switch damps the vertical vibration of the front attachment during drive operation so that comfortable machine ride quality is obtained. As stable drive operation is achieved, bucket load spill can be prevented.

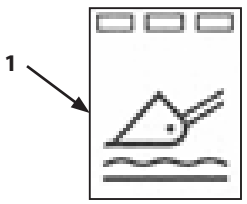
Ride Control Switch Operation

Pressing ride control switch (1) alternates "OFF" and "AUTO" mode.

[OFF]
When ride control switch (1) is turned off, the ride control system becomes inoperable.

[AUTO]
When ride control switch (1) is turned to AUTO, the drive speed sensor and the controller are activated.
When the drive speed becomes faster than the preset travel speed, the ride control system automatically operates.
When the drive speed becomes slower than the preset travel speed, the ride control system becomes inoperable.
When the key switch is in the OFF position, the ride control system does not operate even if ride control switch (1) is in AUTO position. When the engine is stopped while ride control switch (1) is in AUTO, the ride control is turned off.

NOTE: The ride control activation speed is automatically adjusted so that the ride control function may not be activated while driving forward in digging position.



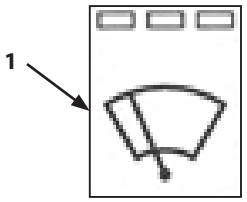
MNUD-01-214

	Pilot Lamp			
	■ ■ ■	■ □ ■		
Function	OFF	AUTO		

□: LED ON ■: LED OFF

Front/Rear Wiper Switch

Operate front wiper switch (1) to move the front windshield wiper.



MNUD-01-215

IMPORTANT:

- **The washer motor may become damaged if the wiper switch is operated with no fluid in the washer tank. Take care about the fluid level in the washer tank.**
- **The windshield surface, the wiper blade, the wiper motor and the relay may be damaged due to dry or frozen condition of the wiper and the windshield.**
- Before operating the windshield wiper, remove snow or dust from the windshield surface and defrost the frozen windshield.
- Use anti-freeze type washer fluid.
- Squirt windshield washer fluid on the dry windshield before operating the wiper. Continuous operation of the windshield wiper in semiarid (such as light rain or snow) conditions may cause failure of the wiper. Use wiper intermittently to protect it from damage.
- If the machine is equipped with a hot-wire heater (for windshield), continuous operation of the windshield wiper with the heater switch kept ON for a long time may cause the wiper blades to be burnt.

NOTE: When the key switch is turned off while a wiper is operating, it keeps operation and then returns to the original position.

	Pilot Lamp			
	■ ■ ■	□ ■ ■	□ □ ■	□ □ □
Function	OFF	INT	Low	High

□: LED ON ■: LED OFF

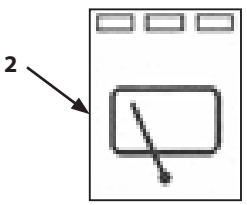
Front Wiper Operation

Pressing front wiper switch (1) changes the front wiper operation "OFF" → "INT" → "Low" → "High" → "OFF" in this order. When keep depressing the switch, it returns to "OFF".

[OFF]
The front windshield wiper stops moving and the wiper blade is returned to the pre-start position.
[INT]
The front windshield wiper intermittently operates.
[Low]
The front windshield wiper operates at slow speed.
[High]
The front windshield wiper operates at fast speed.

Rear Wiper Operation

Pressing rear wiper switch (2) alternates the rear wiper operation "OFF" and "ON".



MNUD-01-216

	Pilot Lamp			
	■ ■ ■	■ □ ■		
Function	OFF	ON		

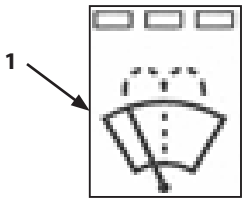
□: LED ON ■: LED OFF

Front/Rear Washer Switch

Operate washer switches (1)(2) to supply washer fluid before the front and rear windshield wipers operate.

IMPORTANT:

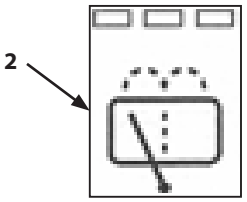
- **The washer motor may become damaged if washer fluid is continuously used for more than 20 seconds. Take care about the switch operation time.**
- **The windshield surface, the wiper blade, the wiper motor and the relay may be damaged due to dry or frozen condition of the wiper and the windshield.**
- Before operating the windshield wiper, remove snow or dust from the windshield surface and defrost the frozen windshield.
- Use anti-freeze type washer fluid.
- Squirt windshield washer fluid on the dry windshield before operating the wiper. Continuous operation of the windshield wiper in semiarid (such as light rain or snow) conditions may cause failure of the wiper. Use wiper intermittently to protect it from damage.



MNUD-01-217

	Pilot Lamp			
	■ ■ ■			
Function	---			

□: LED ON ■: LED OFF



MNUD-01-218

	Pilot Lamp			
	■ ■ ■			
Function	---			

□: LED ON ■: LED OFF

Washer Operation

While pressing front washer switch (1), washer fluid squirts from the front nozzle and the front windshield wiper operates.
While pressing rear washer switch (2), Washer fluid squirts from the rear nozzle and the rear windshield wiper operates.

NOTE: The LED lamps for front washer switch (1) and rear washer switch (2) do not light.

Front Console Switches (Illustration Contents)

The following shows the names and locations of the switches in the operator's station front console. For detailed descriptions of each equipment, refer to the page indicated in ( ).

1- Parking Brake Switch (1-140)

2- Work Light Switch (1-141)

3- Hazard Switch (1-142)

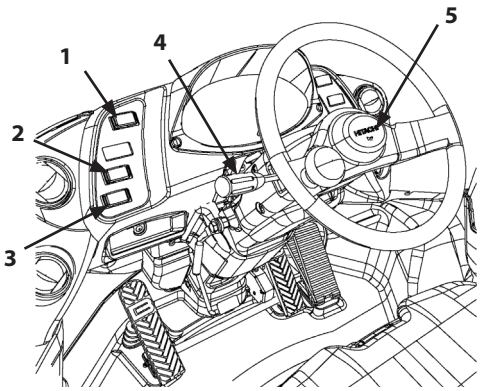
4- Shift Switch (1-143)

5- Horn Switch (1-143)

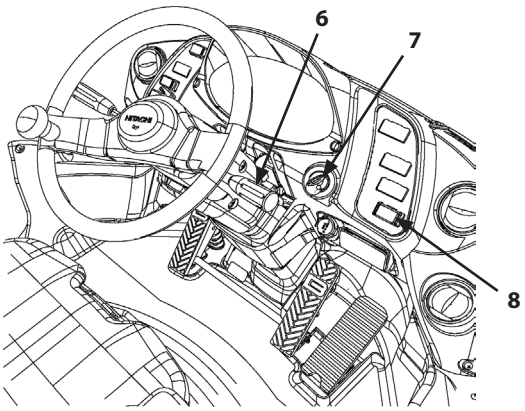
6- Turn Signal Lever (4-5)
Light Switch (1-144)
High-Low Beam Switch (1-145)

7- Key Switch (1-146)

8- Emergency Steering Operation Check Switch (1-147)



MNUD-01-009



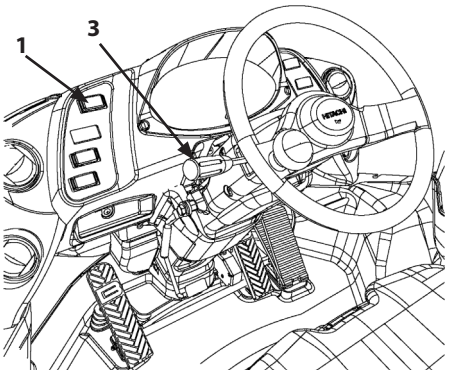
MNUD-01-010

Parking Brake Switch

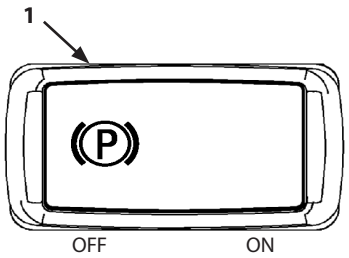
WARNING:

- **To prevent accidents due to running away of the machine, after parking the machine or before leaving the machine, be sure to apply the parking brake.**
- **Never apply the parking brake while traveling the machine.**
- **Apply the parking brake only after the machine has stopped.**
- **Failure to do so may cause sudden deceleration of the machine travel speed, possibly creating a dangerous situation. Also, premature wear and/or damage to the parking brake may result. After the parking brake has been applied in an emergency while traveling the machine, have the parking brake checked at Authorized Dealer.**
- **The parking brake could be released by residual hydraulic pressure in the accumulator even when the engine is stopped.**
- **On a slope, make sure to keep the engine running when releasing the parking brake. Failure to do so may allow the machine unexpectedly to move, possibly creating a dangerous situation.**

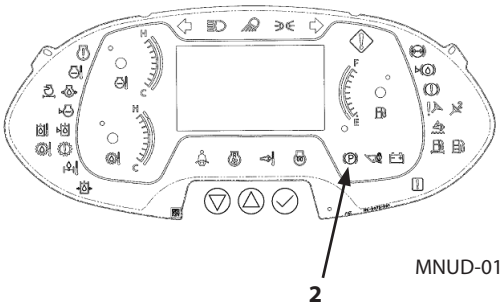
When parking brake switch (1) is turned ON, the parking brake is applied; parking brake indicator (2) will be lit. Press the OFF side of parking brake switch (1) to release the parking brake. Check that parking brake indicator (2) goes OFF by pressing the switch twice with clicks.



MNUD-01-009



MNUD-01-146

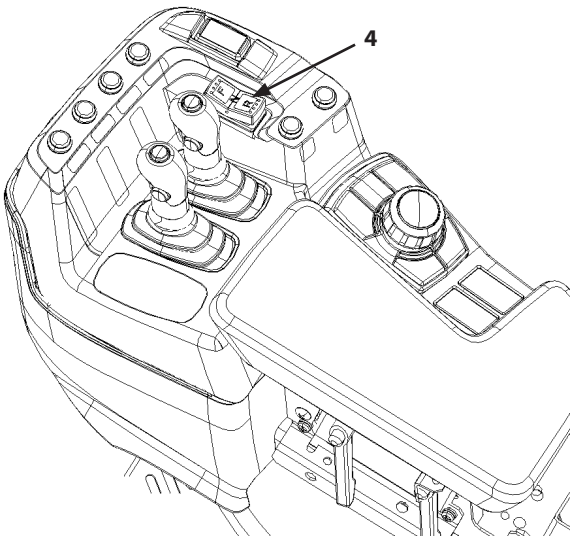


MNUD-01-030

NOTE:

- *To ensure safe operation, when the parking brake is applied, even though forward/reverse lever (3) is moved to forward (F) or reverse (R) position, the machine does not travel.*
- *To ensure safe operation, when the engine is stopped, the parking brake is applied even if parking brake switch (1) is in the OFF position.*

  Before restarting the engine, ensure forward/reverse lever (3) and forward/reverse switch are in "Neutral" position, and forward/reverse selector switch (4) is in OFF position for safety.
- *The parking brake will apply when the key is turned OFF.*

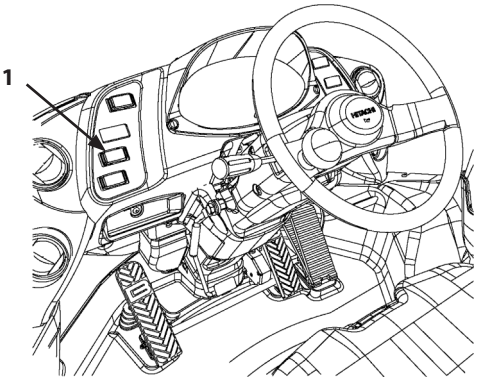


MNFQ-01-047

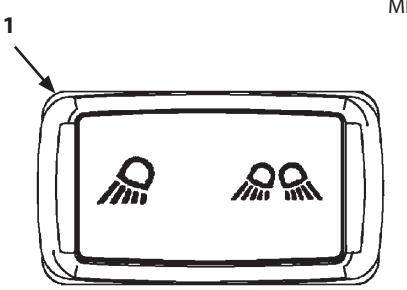
Work Light Switch

Press the mark on switch (1) while the light switch is in "" or "" position to turn front work lights (2) ON. Rear work lights (3) stay OFF. When the side with mark on switch (1) is pressed, both front work lights (2) and rear work lights (3) are turned ON.

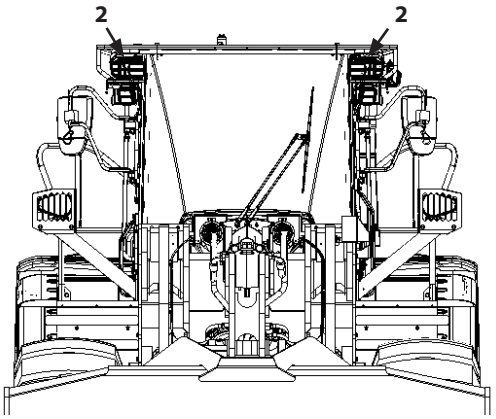
CAUTION: Do not turn the work lights ON while driving on a public road.



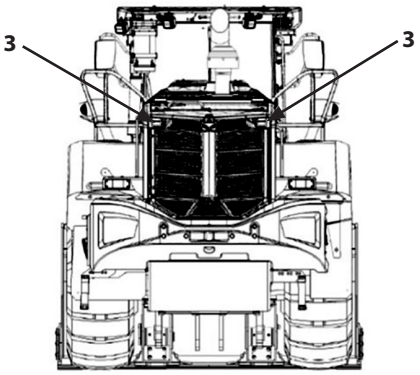
MNUD-01-009



MNVA-01-046



MNFQ-01-314

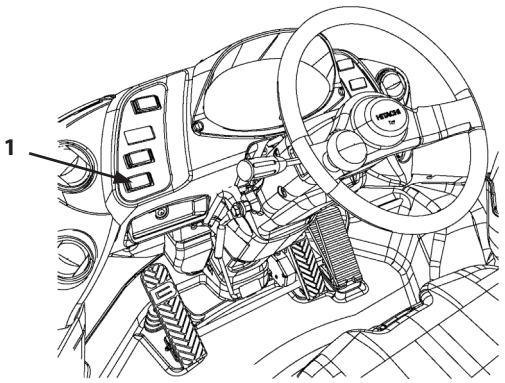


MNFQ-01-315

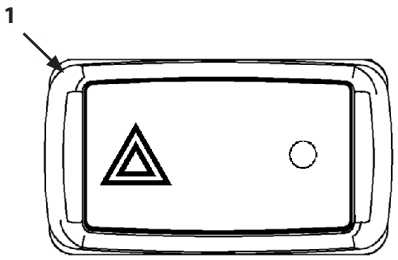
Hazard Switch

IMPORTANT: Do not hold hazard switch (1) in the "⚠" position for a long time with the engine stopped. The batteries will become discharged.

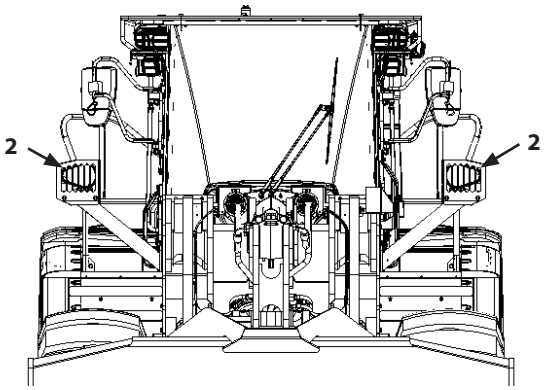
When a machine failure occurs, use this switch to inform other vehicles that the machine is in an emergency situation.
When the position marked with "⚠" on hazard switch (1) is pressed, front and rear turn signals (hazard light) (2) on both right and left sides start flashing.
Press the opposite side of hazard switch (1) to turn the hazard signals (2) OFF.



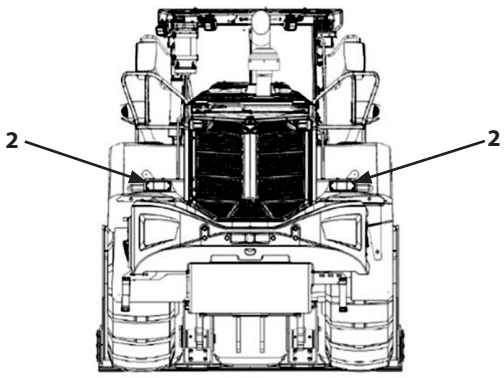
MNUD-01-009



MNUD-01-135



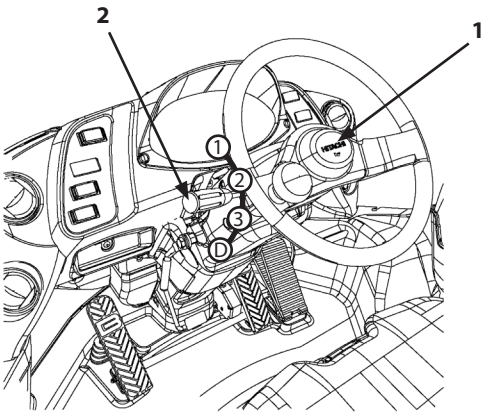
MNFQ-01-314



MNFQ-01-315

Horn Switch

Press horn switch (1) to sound the horn.
The horn switch is provided also on the control lever to improve operator comfort.



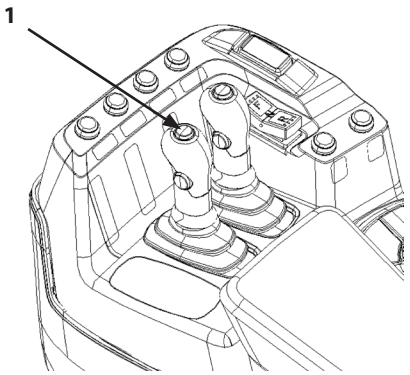
MNUD-01-009

Shift Switch

Rotate shift switch (2) to shift the gear.

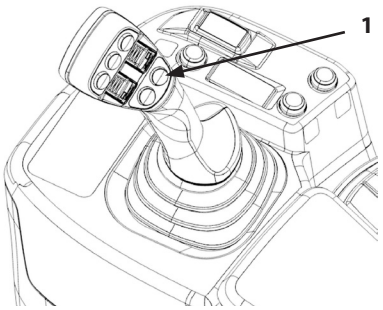
Forward	Reverse
1st - 4th	1st - 4th

Select a proper shift for the work. Refer to Section 4 for driving.



Fingertip Control Type

MNFQ-05-002



Multi-Function Joystick Type

MNUD-05-004

Light Switch

Light switch (1) has three positions, OFF, Small, and Main. As shown below, each light comes ON (☼) or OFF (✕) according to the selected position of the light switch.

2- Headlight

3- Turn Signal / Hazard Light / Clearance Light

4- Turn Signal/Hazard Light

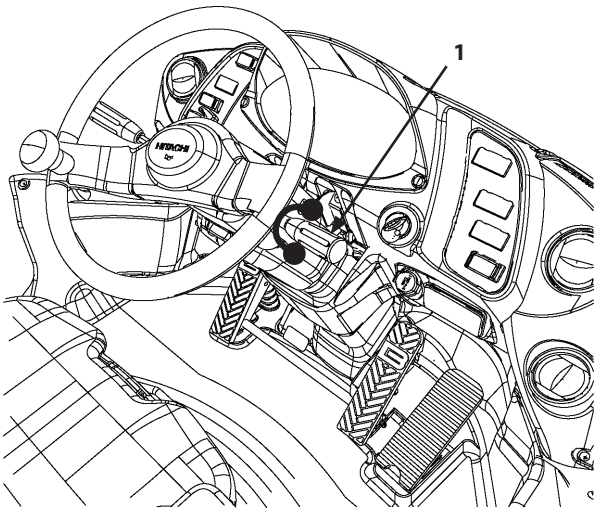
5- Brake Light/Tail Light

Light Switch Position	Headlight	Clearance Light	Tail Light	Number Plate Light	Monitor Panel Light
OFF	✕	✕	✕	✕	✕
	✕	☼	☼	☼	☼
	☼	☼	☼	☼	☼

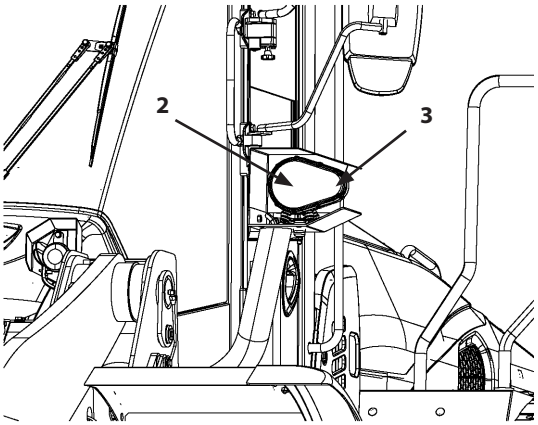
NOTE:

- *The light switch position remains lit even if the key switch is turned OFF. It is used as a parking light when parking the machine on a public road.*
- *If light switches are in any position other than OFF when the key switch is turned OFF, a buzzer will sound continuously for a maximum of 10 seconds to prevent forgetting to turn off the vehicle's clearance light. Stop the buzzer by either turning the light switch OFF or the key switch ON.*

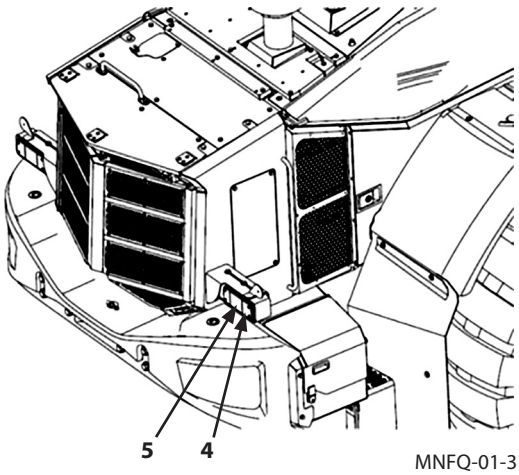
IMPORTANT: Do not hold the switch position for a long time with the engine stopped. The batteries will become discharged.



MNUD-01-010



MNUD-01-056



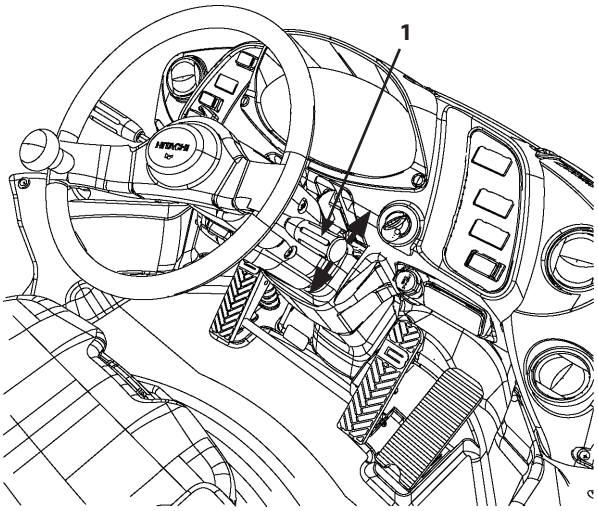
MNFQ-01-316

High-Low Beam Switch

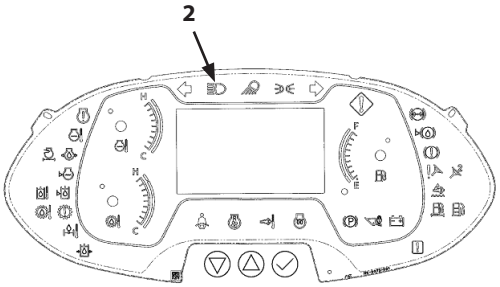
Shifts the direction of the headlight beam high and low.

CAUTION: Travel the machine with the headlight in the low beam position when other vehicles are present in the vicinity.

By bringing down the signal lever (1) with the headlight ON, the headlight beam turns upward, and the high beam indicator (2) comes ON.
By bringing up the signal lever (1), the headlight beam turns downward, and the high beam indicator (2) goes OFF.



MNUD-01-010



MNUD-01-030

Key Switch

WARNING:

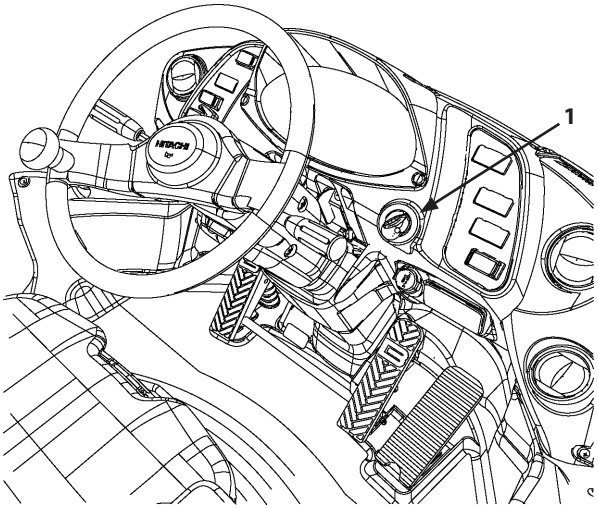
- **Before starting the engine, return the forward/ reverse lever and forward/reverse switch to neutral (N), apply the parking brake, lock the neutral lever lock, and lock the control lever. Refer to the descriptions in the OPERATING ENGINE section for the detail information.**
- **Never turn key switch (1) OFF while traveling the machine. Failure to do so will result in steering wheel and brake pedal to be inoperable.**

A- OFF (Engine Off)

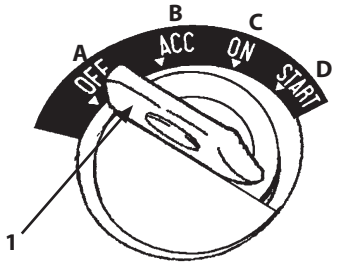
B- ACC (Radio)

C- ON (Power ON)

D- START (Engine Start)



MNUD-01-010



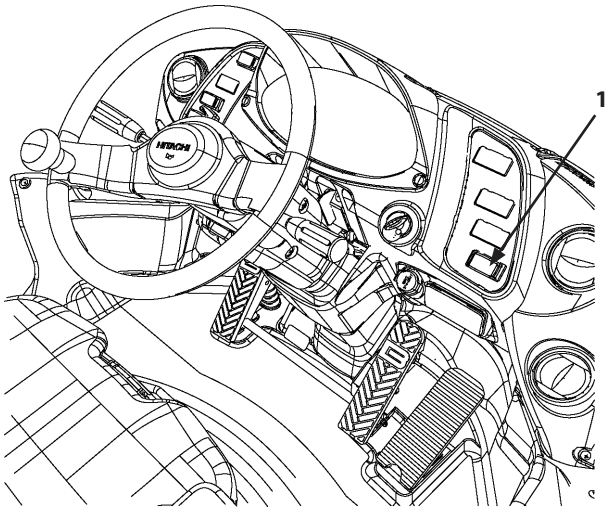
MPD8-01-307

Emergency Steering Operation Check Switch

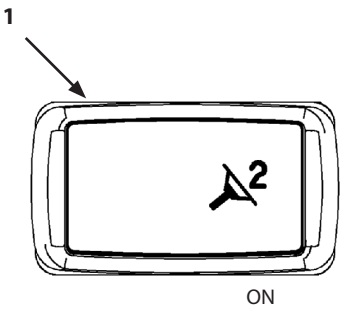
Push emergency steering operation check switch (1) to check whether the emergency steering pump operates. The emergency steering pump operates while pushing the ON side of the switch. In the meantime, emergency steering indicator (2) will turn on. Release the switch when the operation of the emergency steering pump is checked. The switch will return to OFF position.

IMPORTANT: As the pump requires a large amount of electric power for operation, check it within one or two seconds.

NOTE: The emergency steering auto-check is performed for one to two seconds after starting the engine. The pump's operating noise will be heard during the check.

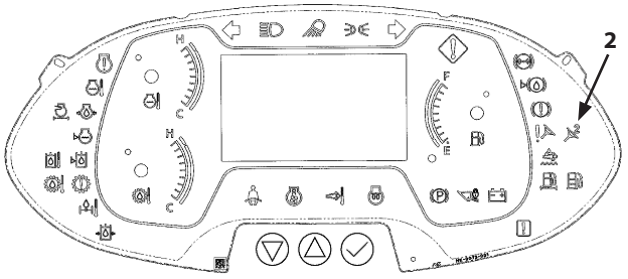


MNUD-01-010



ON

MNUD-01-058



MNUD-01-030

Right Console and Control Lever Switches (Illustration Contents)

The following shows the names and locations of the switches in the operator's station right console and control levers. For detailed descriptions of each equipment, refer to the page indicated in ( ).

1- Control Lever Lock Switch (1-149)

2- Forward/Reverse Switch (4-19)

3- Hold Switch (1-150)

4- Mist Switch (1-151)

5- Sub Monitor Controller (1-151)

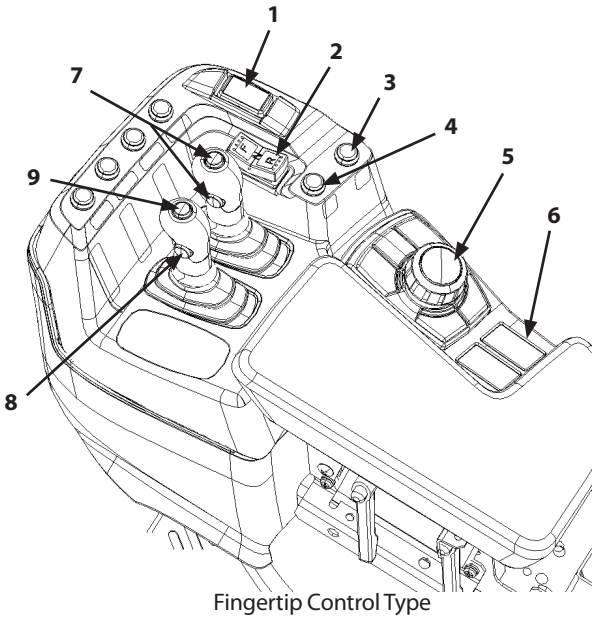
6- Auxiliary Control Switch (for 3rd Spool) (Optional) (1-154)

7- DSS (Down Shift Switch) (1-152)

8- Quick Power Switch (1-153)

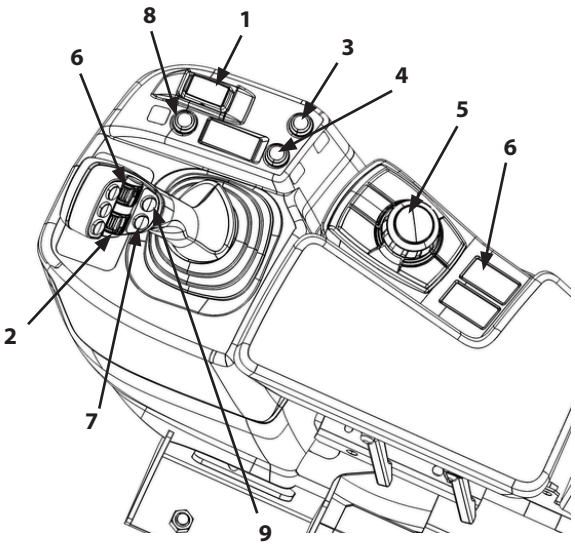
9- Horn Switch (1-143)

NOTE: Refer to page 5-25 for the payload checker function switches.



Fingertip Control Type

MNFQ-01-047



Multi-Function Joystick Type

MNUD-01-028

Control Lever Lock Switch

WARNING:

- **Before leaving the operator's seat, be sure to stop the engine. Set control lever lock switch (1) to the LOCK (🔒) position.**
- **Always check to be sure that the control lever lock switch is set in the LOCK position before transporting the machine or leaving the machine at the end of the shift.**

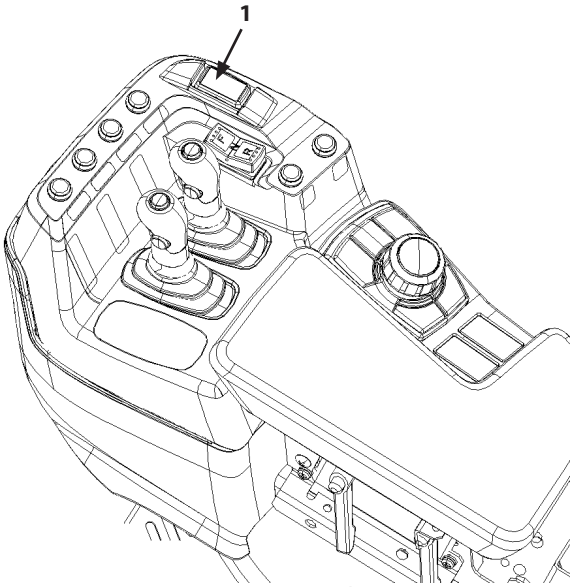
Refer to page 5-4 for details.

Control lever lock switch (1) is provided to prevent the machine from being mistakenly operated when the operator accidentally touches the bucket and/or lift arm control lever when getting on or off the machine. When control lever lock switch (1) is placed to the UNLOCK (🔓) position, the front control lever becomes operable.

NOTE: If control lever lock switch (1) is placed to the UNLOCK position with the control lever in operation position, the lever does not work. Once return the lever to the neutral position and operate the lever.

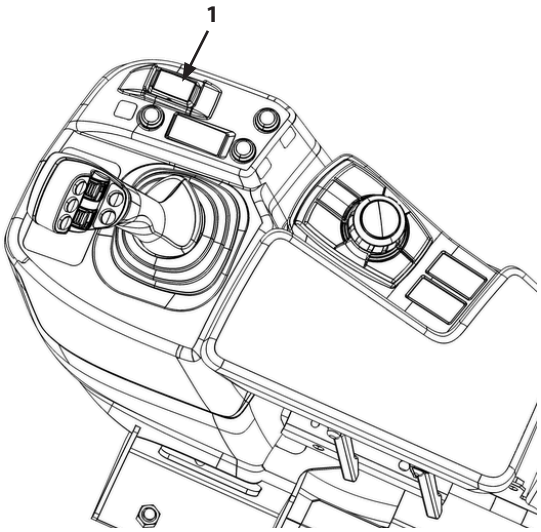
IMPORTANT: After starting the engine, the control lever lock function check is done by interrupting the pilot pressure regardless of the control lever lock switch status. If the engine is restarted while loading operation, the lever control is disabled due to the interrupted pilot pressure. Once return the lever to the neutral position to restart the loading operation.

NOTE: When control lever lock switch (1) is placed to the LOCK position, the ride control function is disabled.



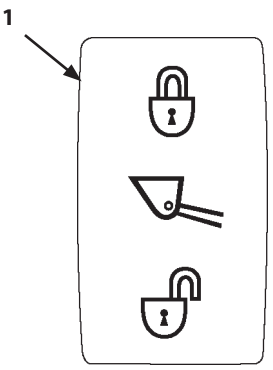
Fingertip Control Type

MNFQ-01-047



Multi-Function Joystick Type

MNUD-01-028



MNEC-01-015

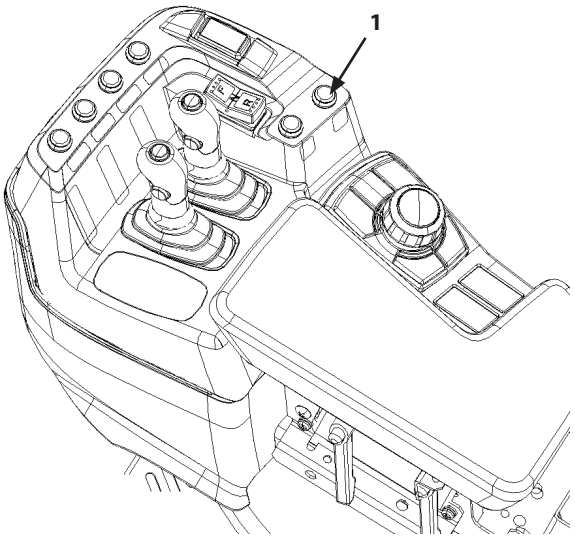
Hold Switch

Press hold switch (1) while letting the machine travel in the auto shift mode. The machine holds the speed gear stage that is currently displayed on the monitor.

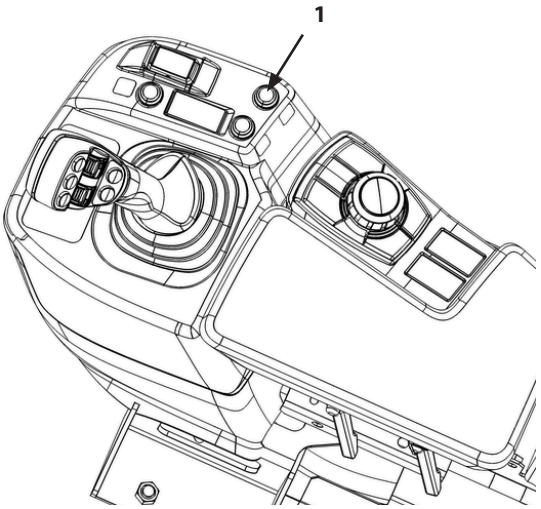
"HOLD" indicator (2) appears on the main monitor.

Operate one of the following methods to release the hold function:
- Press the hold switch again
- Change the shift
- Change the travel mode
- Press DSS (down shift switch)

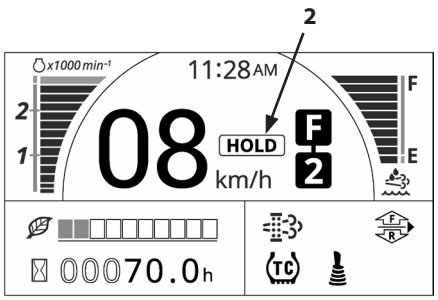
NOTE: The lock-up does not function while holding the speed range.



MNFQ-01-047



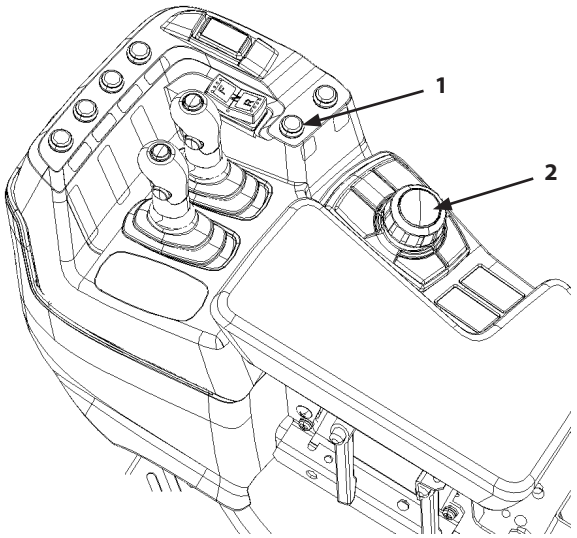
MNUD-01-028



MNFQ-01-035

Mist Switch

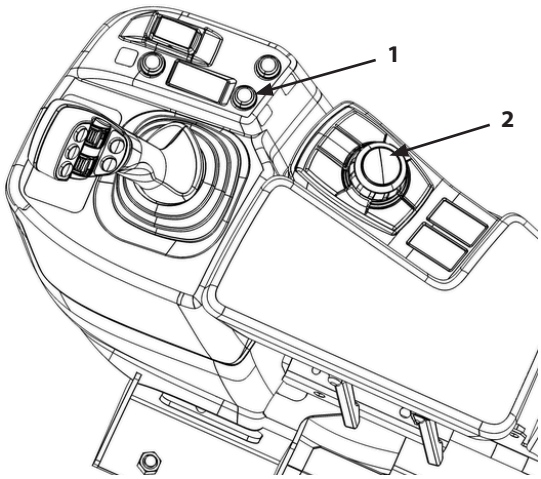
The front windshield wiper operates slowly while pressing mist switch (1).
Releasing this switch returns the wiper to the original position.



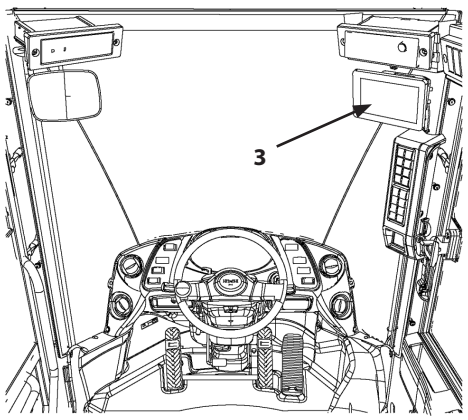
MNFQ-01-047

Sub Monitor Controller

This controller (2) is used to operate sub monitor (3).
Refer to page 1-60 for further information.



MNUD-01-028



MNUD-01-008

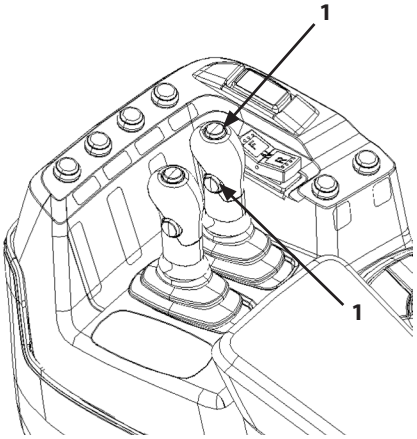
DSS (Down Shift Switch)

Press DSS (1) to down shift the gear.

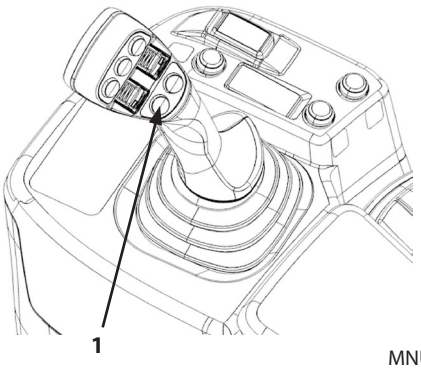
The shift gear is set to the 2nd speed for the normal operation.
By pressing DSS (1) while digging operation with the machine traveling forward, the gear automatically shifts to the 1st speed, which increases the traveling drive force and improves digging activity.
When the forward/reverse lever or the forward/reverse switch is set to reverse (R), the gear automatically returns to the 2nd speed.

NOTE:

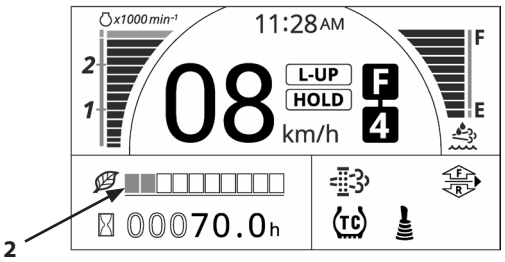
- *Under auto shift mode or manual shift mode, each time DSS (1) is pressed, the gear down shifts at 1-speed step. Under auto shift mode, keep depressing hold DSS (1) to down shift from the current speed to the 1st speed.*
- *From sub menu, down shift operation to the 1st speed by pressing DSS (1) once can be set. Refer to page 1-95 for the setting.*
- *When DSS (1) is pressed during lock-up shift range, the speed range is downshifted by one. (e.g. Pressing DSS during 4th L-UP moves down to 3rd shift range.)*



MNFQ-05-002



MNUD-05-004



MNFQ-01-021

Quick Power Switch

When quick power switch (1) is pressed while power mode switch (3) at panel switch (2) is OFF (Standard Mode) or ON (Power Mode), the work mode is temporarily switched to the Power+ Mode. The left LED and middle LED of power mode switch (3) turns ON.

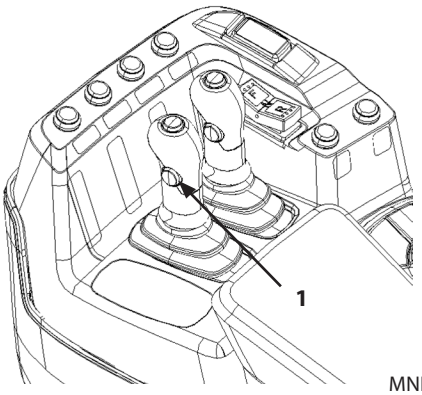
NOTE: The quick power switch is operable only in the following cases:

- *An added push to power mode power is needed during digging (tractive) operation.*
- *Need a little more acceleration or travel speed while ascending on a slope.*

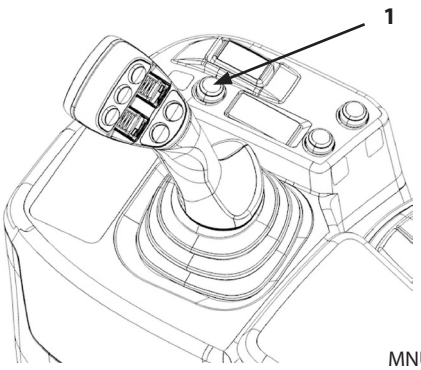
When driving under low load or the forward/reverse lever is in "Neutral" (N) position, the mode will not change to power mode even if quick power mode switch is pressed. The switch becomes invalid.

Also, even if the machine is in the power mode by pressing quick power switch (1), it is canceled when one of the following conditions is satisfied.

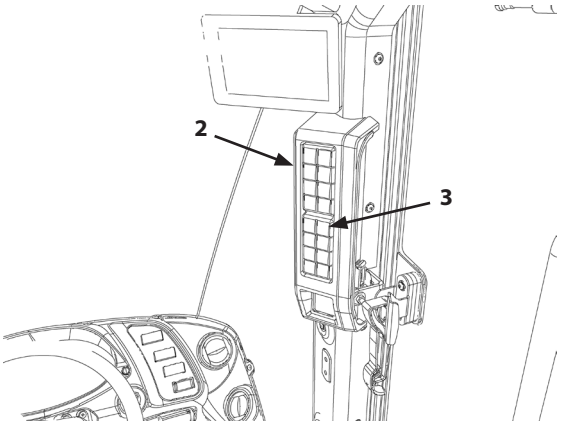
- When driving load is decreased while digging.
- When quick power switch (1) is pressed.
- The forward/reverse lever or forward/reverse switch is at the neutral (N) position.
- The forward/reverse lever or forward/reverse switch is shifted.
- When driving on a level surface.



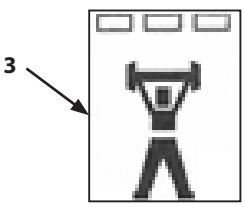
MNFQ-05-002



MNUD-05-004



MNUD-01-200



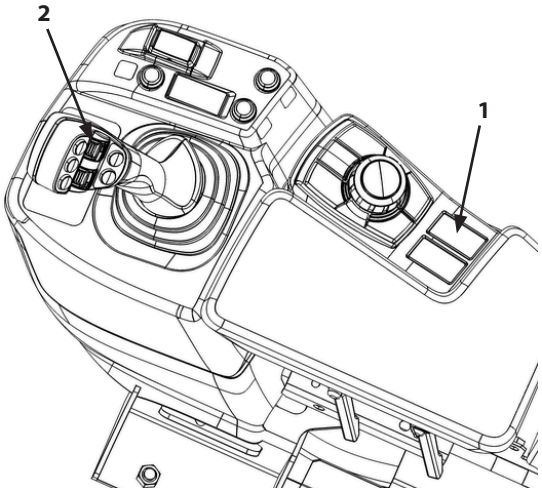
MNUD-01-212

	Pilot Lamp			
	■ ■ ■	□ ■ ■	□ □ ■	
Function	OFF	ON (Power)	ON (Power+)	

□: LED ON ■: LED OFF

Auxiliary Control Switch (Optional)

Auxiliary control switch (for 3rd Spool) (2) is available for the attachment control.

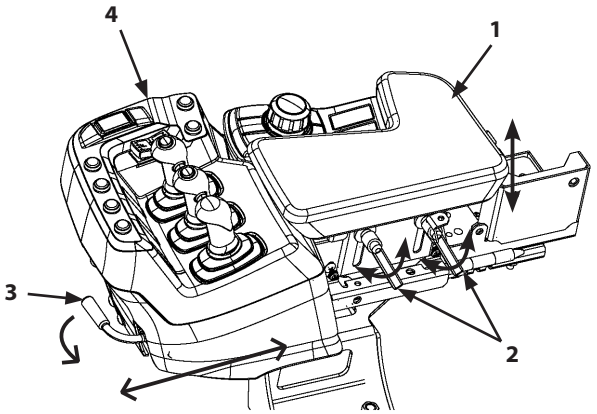


Multi-Function Joystick Type

MNUD-01-028

Armrest Position Adjustment

A wide armrest (1) is provided so that the operator can operate the lever with an arm on the armrest.
Move armrest (1) to the operator's arbitrary position, for comfort and ease.



MNUD-01-046

Height Adjustment

Turn and loosen handles (2) and adjust the armrest height to fit the operator's preference. After adjustment, turn handles (2) to tighten to fix the armrest height.

Height adjustment: 50 mm (2.0 in)

NOTE: Handles (2) are locked so that they do not turn freely. Pull handle (2) to release this handle lock, then the position (angle) of handle can be changed. Push handle (2) to lock its position.

Fore-aft Adjustment

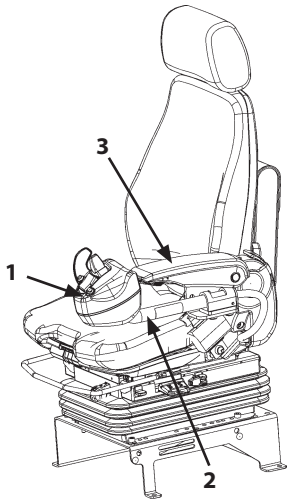
Move right console (4) forward or backward by holding the armrest with your right hand while rotating lever (3) clockwise by holding the lever with your left hand. Stop the console at a desired position, and return lever (3) to original position to secure the console.

Fore-aft position adjustment: 90 mm (3.5 in)

Joystick Steering (Illustration Contents)

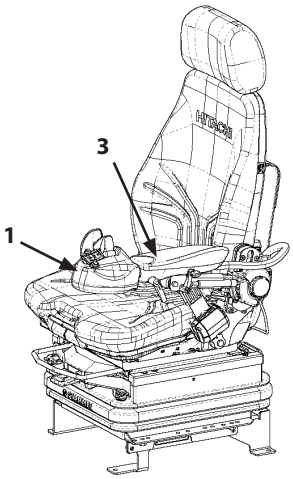
IMPORTANT: The joystick steering system has two types. The function and usage differ depending on the type. Make sure in advance the type of the joystick steering system that is equipped on the machine.

1- Switch Box (157, 4-8)
2- Left Console Pipe
3- Left Armrest
4- Left Console Lock Release Lever (1-153)
5- Switch Box Fore/Aft Adjustment Bolt (1-174)
6- Left Console Height Adjustment Bolt (1-174)
7- Left Armrest Angle Adjustment Dial (1-174)
8- Switch Box Angle Adjustment Bolt (1-174)
9- Joystick Steering Indicator (1-35)
10- Forward/Reverse Selector Switch Indicator (1-34)
11- Switch Box Fore/Aft Adjustment Knob (1-175)
12- Left Console Height Adjustment Dial (1-175)
13- Left Armrest Angle Adjustment Lever (1-175)
14- Switch Box Angle Adjustment Lever (1-175)



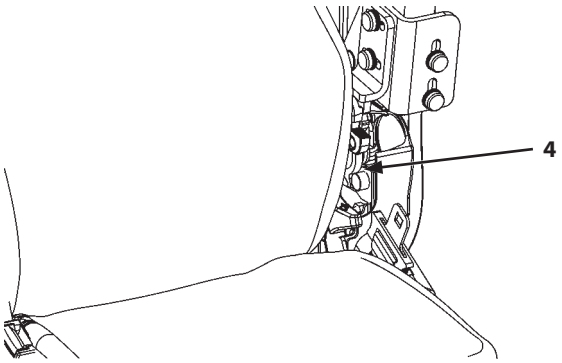
Type A

MNEK-13-001



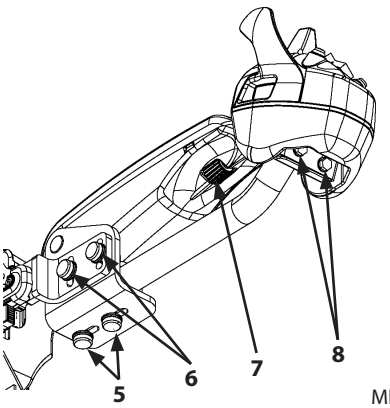
Type B

MNFQ-01-034



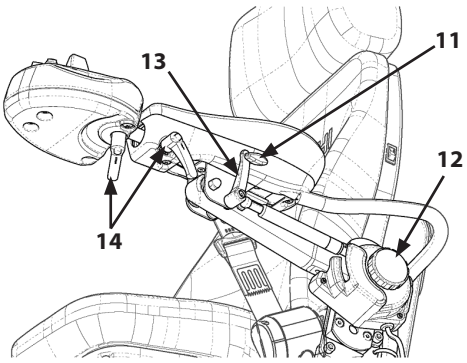
Type A

MNEK-13-003



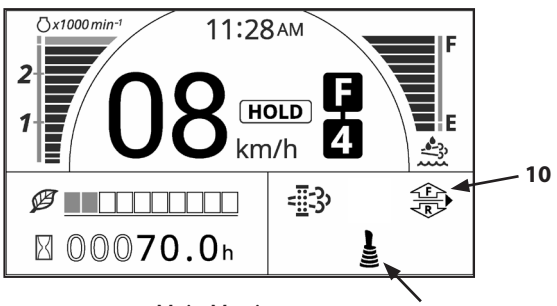
MNUD-01-139

Type A



MNFQ-01-038

Type B



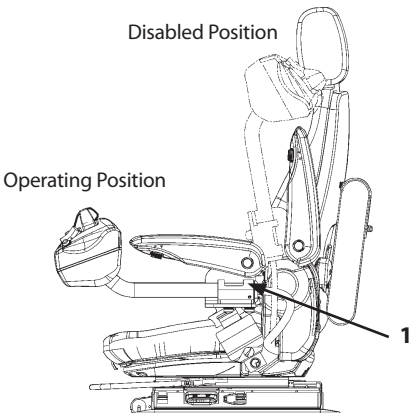
Main Monitor

MNUD-01-018

Joystick Steering Selector (Type A)

Joystick steering selector switch (2) is the switch that activates joystick steering lever (3) and forward/reverse switch (left) (4).

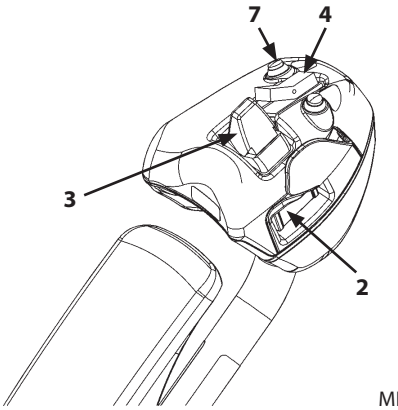
IMPORTANT: To use joystick steering selector switch (2), lower left console (1) to the operating position. If left console (1) is not in the operating position, both the joystick steering selector switch (2) and the Forward/ Reverse switch (left) (right) cannot be operated.



MNEK-13-005

1. Put the forward/reverse lever and the forward/reverse switches (right) and (left) are in the neutral (N) position.
2. Press joystick steering selector switch (2) in the ON position for one second. Joystick steering lever (3) and forward/reverse switch (left)(4) are enabled.
3. Check joystick steering indicator (5) and forward/reverse selector switch indicator (6) are displayed on the main monitor.

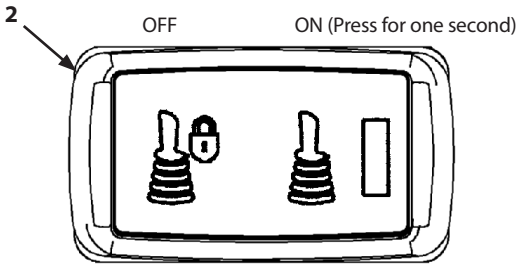
NOTE: DSS (7) operations are effective regardless of joystick steering status.



MNEK-13-002

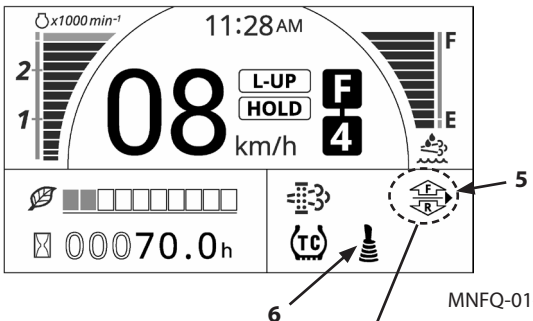
IMPORTANT: If the forward/reverse lever is put in any position other than neutral (N) position when joystick steering lever (8) is enabled, forward/reverse switch (left)(4) becomes disabled. (The forward/reverse lever operation has priority.)

To re-enable forward/reverse switch (left)(4), put the forward/reverse lever and forward/reverse switch (left) (4) in the neutral (N) position and turn joystick steering selector switch (2) OFF for a moment and then press it in the ON position for one second.



Joystick Steering Selector

MNUD-01-091



MNFQ-01-021

NOTE: The triangle mark appears to the left side.

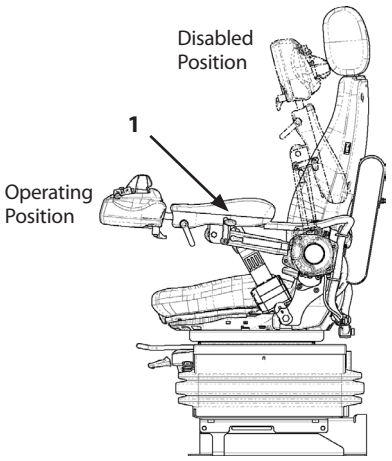


MNEK-13-012

Joystick Steering Selector (Type B)

Joystick steering selector switch (2) is the switch that activates joystick steering lever (3) and forward/reverse switch (left) (4).

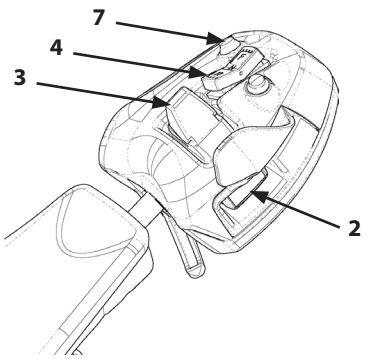
IMPORTANT: To use joystick steering selector switch (2), lower left console (1) to the operating position. If left console (1) is not in the operating position, both joystick steering selector switch (2) and forward/ reverse switch (left) (4) cannot be operated.



MNFQ-01-022

1. Put the forward/reverse lever and the forward/reverse switches (right) and (left) are in the neutral (N) position.
2. Press joystick steering selector switch (2) in the ON position for one second. Joystick steering lever (3) and forward/reverse switch (left)(4) are enabled.
3. Check joystick steering indicator (5) and forward/reverse selector switch indicator (6) are displayed on the main monitor.

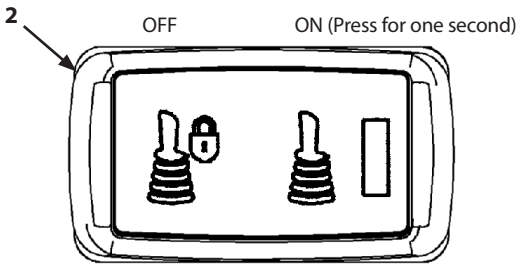
NOTE: DSS (7) operations are effective regardless of joystick steering status.



MNFQ-01-023

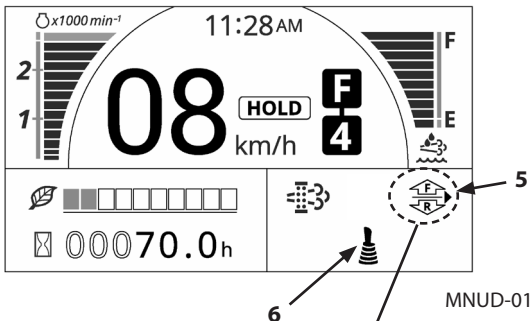
IMPORTANT: If the forward/reverse lever is put in any position other than neutral (N) position when joystick steering lever (3) is enabled, forward/reverse switch (left)(4) becomes disabled. (The forward/reverse lever operation has priority.)

To re-enable forward/reverse switch (left)(4), put the forward/reverse lever and forward/reverse switch (left) (4) in the neutral (N) position and turn joystick steering selector switch (2) OFF for a moment and then press it in the ON position for one second.



Joystick Steering Selector

MNUD-01-091



MNUD-01-018

NOTE: The triangle mark appears to the left side.



MNEK-13-012

Left Console Lock Release Lever

WARNING: When leaving the operator's station, lift up left console (1) to the disabled position. Once left console (1) is lifted up to the disabled position, it is locked.

IMPORTANT:

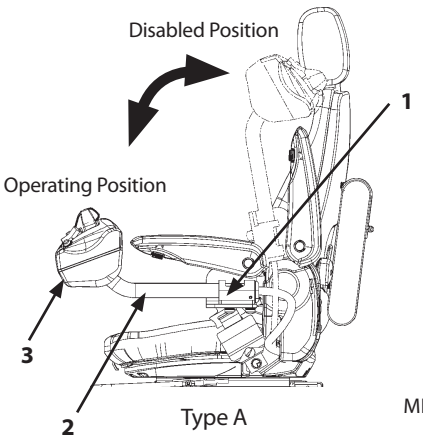
- **When raising or lowering left console (1), hold the armrest or left console pipe (2). If the console is moved by holding switch box (3) or any other part, it may damage the device.**
- **Left console (1) is not locked when in the operating position. When the console is lifted 30° (type A)/10° (type B) above the operating position, the joystick steering function is disabled. Do not lift up left console (1) while using the joystick steering function.**

If left console lock release lever (4) is lowered while left console (1) is in the disabled position, left console (1) is unlocked and can be lowered into the operating position. If left console (1) is put in the disabled position, the joystick steering lever cannot be operated.

NOTE: Left console lock release lever (4) is not used on the machine with JSS type B. The left console (1) is not locked and can be manually moved.

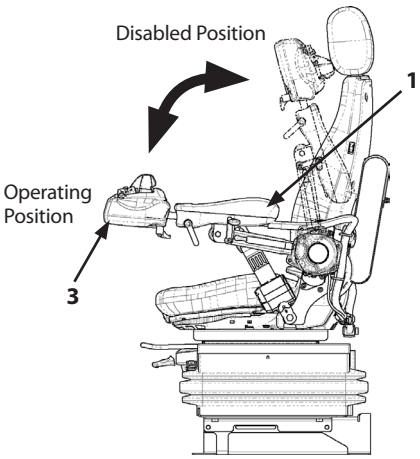
Some functions (switches) are disabled when the left console is put in the disabled position. The left console positions and their corresponding usable functions (switches) are shown in the table below.

Function or Switch	Left Console Position	
	Operating Position	Disabled Position
Joystick Steering Selector switch	Enabled	Disabled
Joystick Steering Lever	Enabled	Disabled
Forward/Reverse Switch (Left)	Enabled	Disabled
Forward/Reverse Switch (Right)	Enabled	Enabled
DSS (Down Shift Switch)	Enabled	Enabled
Forward/Reverse Lever	Enabled	Enabled
Engine Start	Enabled	Enabled



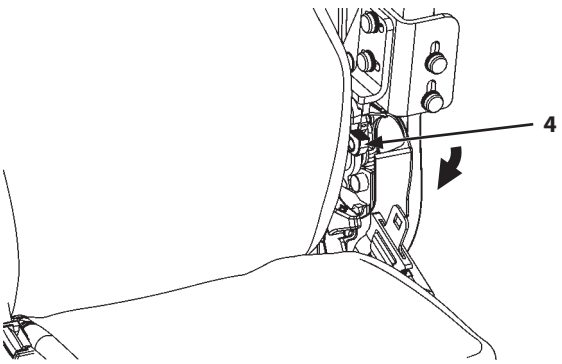
Type A

MNEK-13-005



Type B

MNFQ-01-022



Type A

MNEK-13-003

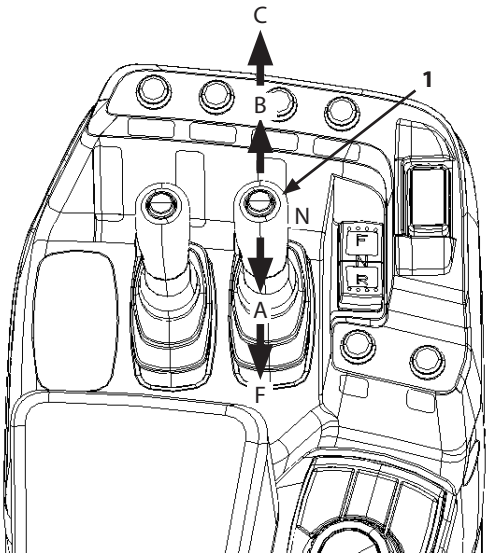
Control Lever

Fingertip Control Type Basic Operation

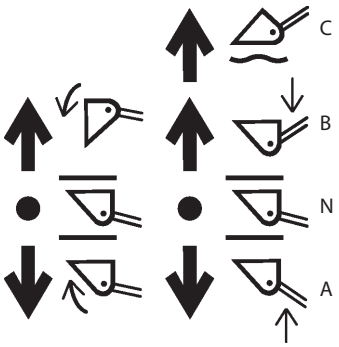
The lift arm control lever and the bucket control lever are used to operate the lift arm and/or bucket.

Lift Arm Control Lever (1)

Lever Position	Lift Arm Operation
C	Float: The lift arm free falls and can be moved as loads are applied.
B	Lift Arm Lower
N	Neutral: The lift arm is stopped and held in that position during the lower or raise movement.
A	Lift Arm Raise
F	Detent: Lift arm is held in the raise position.



MNFQ-05-001

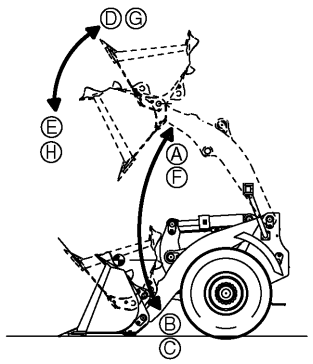


M4GB-01-072

IMPORTANT: Due to the control lever check function, which should shut off the pilot pressure, the control lever may not operate under some conditions. Once return the lever to the neutral position (N) and try operation again.

NOTE:

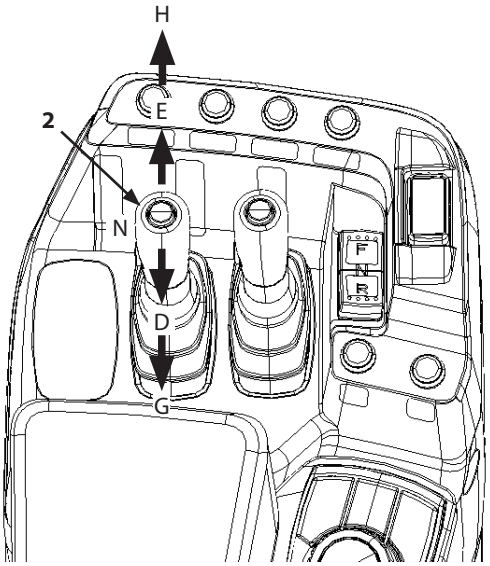
- *Further pulling lift arm control lever (1) to "Detent" position (F), the lever operation becomes slightly heavy. When releasing lift arm control lever (1) automatically moves to "Neutral" position (N), but the lift arm continues to move until it reaches the position set at the height kickout.*
- *Further pushing down the lift arm control lever to "Float" position (C), the lever operation becomes slightly heavy. When releasing lift arm control lever (1) automatically moves to "Neutral" position (N). The lift arm continues to move to the position preset at lower kickout and is held in the position.*
- *When operating the machine in the Float position (C), lower the bucket onto the ground by placing lift arm control lever (1) at Lower position (B), and then move the lever to Float position (C).*
- *The lift arm kick out can be set at two positions for both raise and lower operation by the sub monitor menu. Refer to page 1-83 "Auto Leveler Setting".*
- *The lift arm slow operation mode can be set for loading operation by the sub monitor menu. Also the function to stop the lift arm cylinder slowly at the full operation points in order to reduce the vibration shock. Using these functions, the lift arm lever operation mode can be customized for each operator. Refer to page 1-100 "Lift Arm Lever Characteristic Mode", and page 1-103 "Cylinder End Soft Stop" for the settings.*



MNUD-05-005

Bucket Control Lever (2)

Lever Position	Bucket Operation
H	Dump Detent: The bucket is held in the dump position.
E	Bucket Dump: The bucket is tilted forward to dump the bucket load.
N	Neutral: The bucket is stopped and held in that position during the dump or tilt movement.
D	Bucket Tilt: The bucket is tilted back, taking the transportation position.
G	Tilt Detent: The bucket is held in the raised back position.

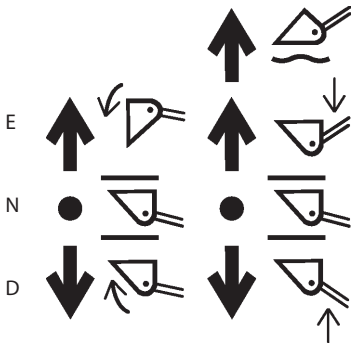


MNFQ-05-001

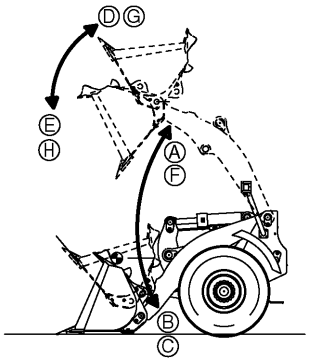
IMPORTANT: Due to the control lever check function, which should shut off the pilot pressure, the control lever may not operate under some conditions. Once return the lever to the neutral position (N) and try operation again.

NOTE:

- *Further pulling bucket control lever (2) to "Tilt Detent" position (G), the lever operation becomes slightly heavy. When releasing bucket control lever (2) automatically moves to "Neutral" position (N), but the bucket continues to move until it reaches the position set at the tilt kickout.*
- *Further pushing down bucket control lever (2) to "Dump Detent" position (H), the lever operation becomes slightly heavy. When releasing bucket control lever (2) automatically moves to "Neutral" position (N), but the bucket continues to move until it reaches the position set at the dump kickout.*
- *The bucket slow operation mode can be set for loading operation by the sub monitor menu. Also the function to stop the bucket cylinder slowly at the full operation points in order to reduce the vibration shock. Using these functions, the bucket lever operation mode can be customized for each operator. Refer to page 1-101 "Bucket L ever Characteristic Mode", and page 1-103 "Cylinder End Soft Stop" for the settings.*



M4GB-01-072



MNUD-05-005

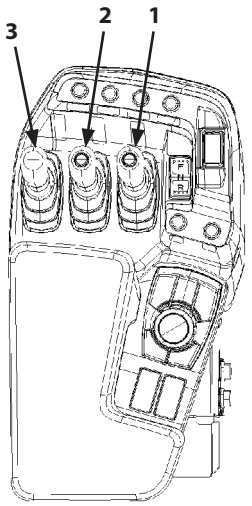
Fingertip Control Variation with 3rd Control

The 3rd control lever is installed for the attachment control.

1- Lift Arm Control Lever

2- Bucket Control Lever

3- Hydraulic Attachment Control Lever (3rd) Auxiliary lever.



MNUD-01-251

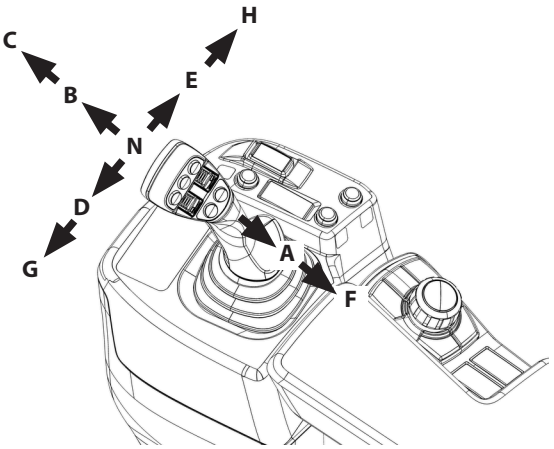
Multi-Function Joystick Lever

The multi-function joystick lever is used to operate the lift arm and/or bucket.

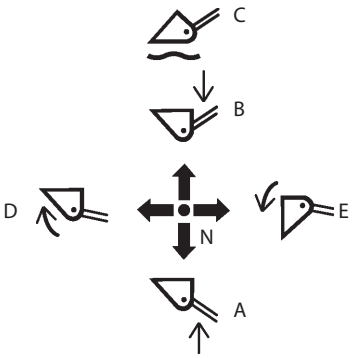
Lever Position	Lift Arm and Bucket Operation
C	Float: The lift arm free falls and can be moved as loads are applied.
B	Lift Arm Lower
N	Neutral: The lift arm or bucket is stopped and held in that position during the movement.
A	Lift Arm Raise
F	Detent: Lift arm is held in the raise position.
G	Tilt Detent: The bucket is held in the raised back position.
D	Bucket Tilt: The bucket is tilted back, taking the transportation position.
E	Bucket Dump: The bucket is tilted forward to dump the bucket load.
H	Dump Detent: The bucket is held in the dump position.

IMPORTANT: Due to the control lever check function, which should shut off the pilot pressure, the control lever may not operate under some conditions. Once return the lever to the neutral position (N) and try operation again.

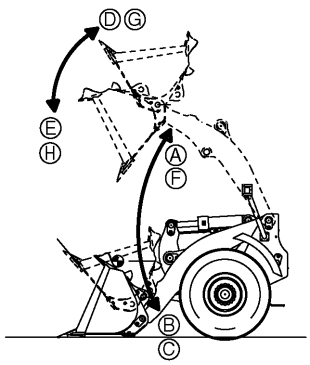
NOTE: When moving the MF control lever to "Float" (C) or "Detent" positions (F)(G)(H), the lever operation becomes slightly heavy. When releasing lever, it automatically returns to "Neutral" position (N), but the lift arm or bucket continues to move until it reaches the specified position.



MNUD-01-099



M4GB-01-074



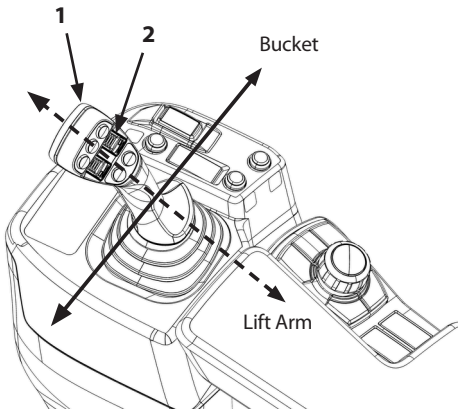
MNUD-05-005

Multi-Function Joystick Variation with 3rd Control

The 3rd control switch is installed for the attachment control.

1- Lift Arm/Bucket Control Lever

2- Hydraulic Attachment Control Switch (3rd) Auxiliary small switch lever.



MNUD-01-099

Facilities in Operator's Station

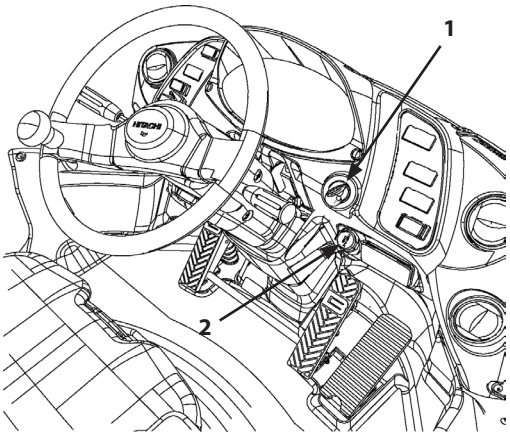
24V Power Supply Socket

WARNING: Do not power anything other than a genuine Hitachi Construction Machinery electrical device from the power socket.

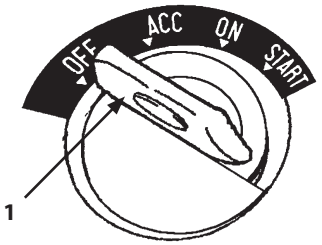
IMPORTANT:

- **Power socket (2) is for 24V DC only and can be used with accessories having a power rating up to 120W. Failing to observe these restrictions on voltage and power may damage the battery and accessory.**
- **Do not use power for long periods of time with the engine stopped. Doing so may discharge the batteries.**

1. Insert key (1) into the key switch and turn it to the ON position.
2. Open the socket cap and plug the accessory into socket (2).
3. After use, fit the cap securely to close the socket.



MNUD-01-010



MPD8-01-307

Rear Tray

1- Document Holder

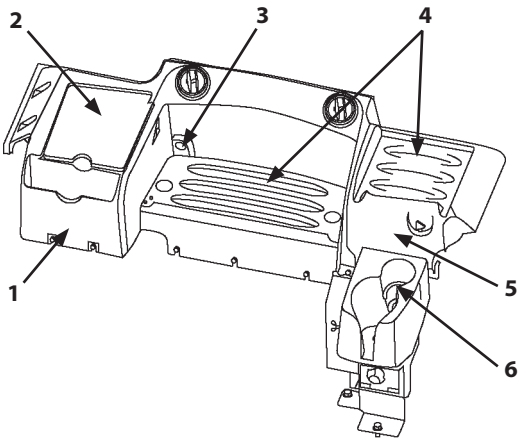
2- Hot/Cool Box

3- Electric Power Output

4- Tray

5- Fuse Box

6- Cup Holder



MNEC-01-046

Electric Power Output (12V)

WARNING: Do not power anything other than a genuine Hitachi Construction Machinery electrical device from the power socket.

12 V DC electric power is available from electric power output (3). The maximum current is 5A (60W). Use the electric power output to supply power to lighting equipment for servicing the machine.



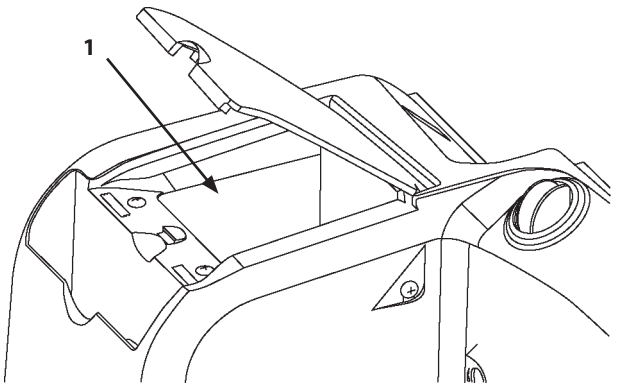
MPD8-01-307

IMPORTANT: Never connect accessories that use power other than 12 V. Damage to the batteries and accessories may result. Do not supply power to accessories for a long time without running the engine. The batteries may be discharged.

1. Remove covers.
2. Insert the socket of the accessory to be used into the electric power output port.
3. Turn the key switch (7) ON. Power is supplied to the connected accessory.
4. After completing operation of the accessory, disconnect the accessory. Reinstall the cover.

Hot/Cool Box

Cool or warm air from the air conditioner is routed to hot & cool box (1) so that food or a drink can be temporarily stored.
Use a container with a tight cap in the hot/cool box.

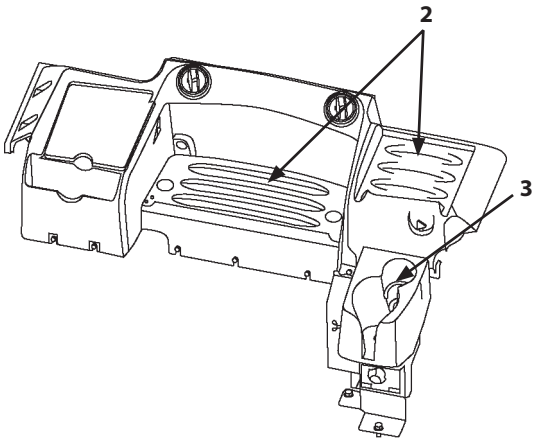


MNEC-01-048

Tray and Drink Holder

IMPORTANT: Tray (2) is not waterproof. Be careful not to spill liquid on the tray.

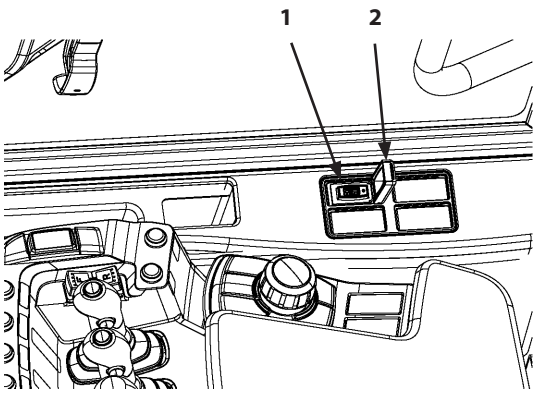
Place a bottle with a plug or cap on drink holder (3).



MNEC-01-046

USB Power Supply

Use USB power supply (1) for operating or charging compatible mobile or electronic devices.



MNUD-01-047

IMPORTANT:

- **The USB power supply of the machine can be used at up to DC 5V. Its maximum rated capacity is 5 V/2 A. Connecting a device that exceeds the rated capacity activates the protection function, so the device may fail to operate or charge.**
- **USB devices with A-type terminals may be used. A device with incompatible terminals will not operate or charge, and may cause damage.**
- **It works only as a power supply and cannot be used for data transfer or communications.**
- **A special cable may be required to connect to some devices. In such cases, use the required cable.**
- **Do not use for a long time with the engine off. Doing so may discharge the batteries. Remove the device promptly after recharging is complete.**
- **As it is not waterproof, do not get any liquids, such as water on it.**
- **Take all due care as warranty repairs do not cover damage to connected devices or corruption or loss of data.**
- **Do not connect a broken device. Smoke and/or fire may result.**
- **Never insert metal or any foreign object into the USB terminals. Electrical shock and/or damage will result.**
- **Be careful when a cable is connected. Tripping over it may result in injury and/or damage to the device.**

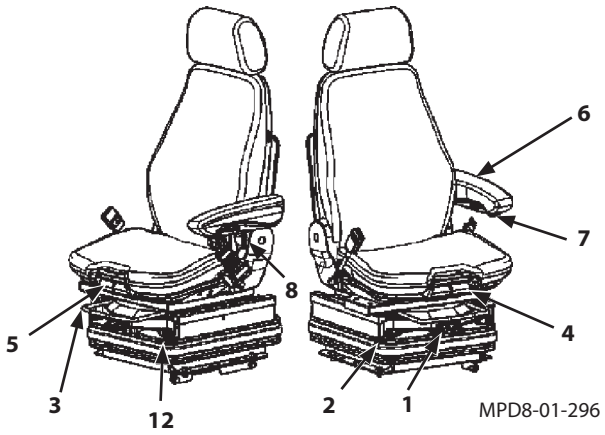
How to Use

1. Open cap (2) for USB power supply (1).
2. Plug in the USB connector of the device you wish to connect.
3. Turn the key switch to the ON position. Use the USB power supply in this state.
4. After use, remove the USB connector of the connecting device and cover the USB power supply (1) using cap (2).

NOTE: The radio also has a USB port. Refer to page 1-185.

Adjusting Operator's Seat

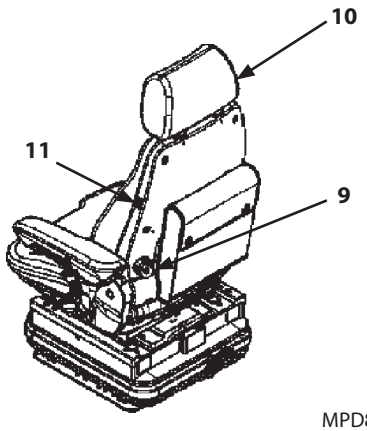
CAUTION: Adjust the seat position so that all the pedals, levers and switches can be easily and correctly operated. Adjust the seat position while the machine is parked.



MPD8-01-296

Components Name

1- Height/Weight Support Adjustment
2- Damper Adjustment
3- Fore-Aft Position Adjustment
4- Inclination Adjustment
5- Seat Depth Adjustment
6- Armrest
7- Armrest Angle Adjustment
8- Reclining Angle Adjustment
9- Lumbar Support Adjustment
10- Headrest
11- Seat Heater Switch
12- Fore-Aft Isolator (Heavy Duty Seat Only)



MPD8-01-295

1. Height/Weight Support Adjustment

IMPORTANT: Set damper adjustment lever (2) to the "soft" position before pulling up lever (1).

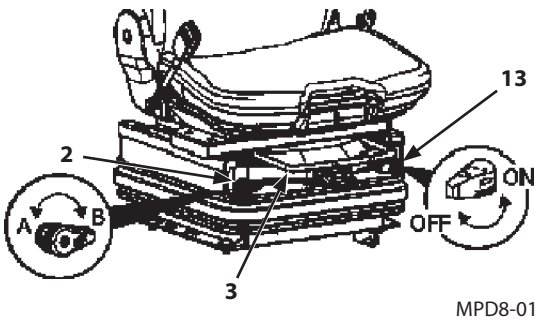
Slightly pull up lever (1) to automatically adjust the weight support strength.

IMPORTANT: Do not continuously operate the lever for more than 1 minute. Damage to the lever and switch may result.

2. Damper Adjustment

   The damper stiffness can be adjusted in accordance with the type of work engaged in or the conditions of the road surface.

   A : Hard
   B : Soft



MPD8-01-297

3. Fore-Aft Position Adjustment

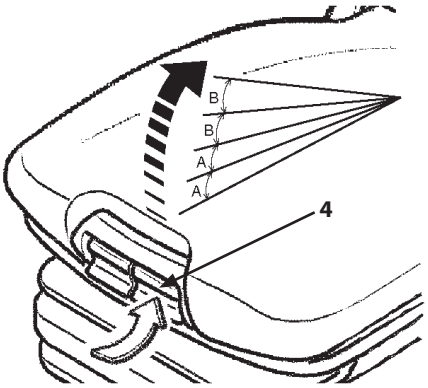
   Pull up slide lever (3) to adjust the fore/after position of the seat assembly. The adjustment range for seat fore-aft is 210 mm (8.3 in) with steps every 10 mm (0.4 in). Return the lever to the original position after the seat assembly is moved to the desired position. Check that the seat assembly is locked in the desired position.

NOTE: When fore-aft isolator (12) is set to ON side, the seat assembly may slightly moves fore and aft while driving the machine in order to cushion the shock.

4. Inclination Adjustment

   The inclination of the seat surface can be changed. While pulling up lever (4) provided in the front of the seat, press or release the seat surface to adjust the inclination of the seat surface from 3° to 11° in 4 steps.

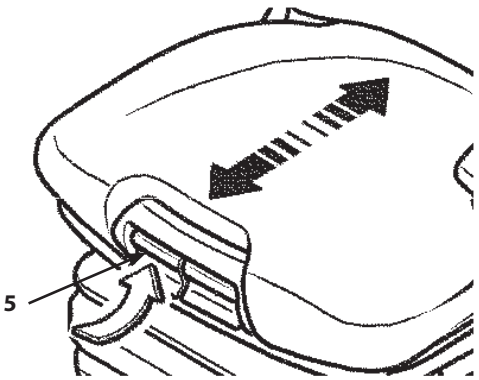
   A : 3 °
   B : 2.5 °



M4GB-01-093

5. Seat Depth Adjustment

   The fore/after position of only the seat surface can be changed. While pulling up lever (5) provided in the front the seat, slide the seat in the front or rear direction to adjust the seat depth up to 60 mm (2.4 in) by 15 mm (0.6 in) interval.



M4GB-01-094

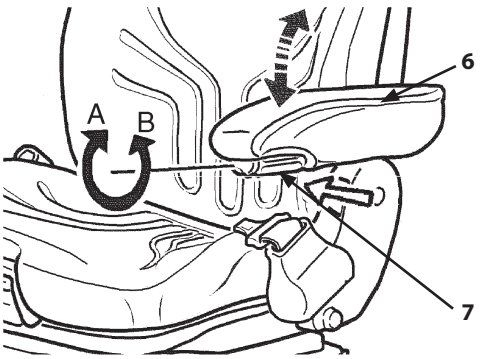
6. Armrest Adjustment

   The armrest is a movable type. Keep the armrest in the upright position unless required.

7. Armrest Angle Adjustment

   The angle of the armrest can be adjusted by turning knob (7) provided under the armrest.

   A : Raise
   B : Lower

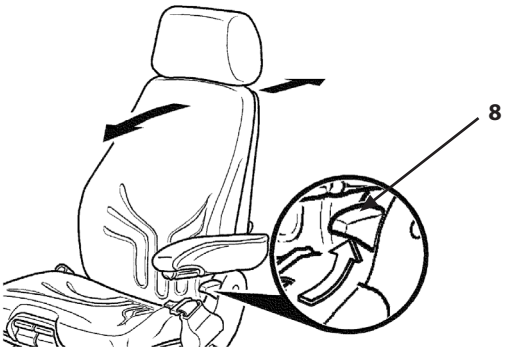


M4GB-01-095

8. Reclining Angle Adjustment

CAUTION: Reclining the seat too far may make it hit surrounding parts.
Recline the seat so that it does not hit parts.

The reclining angle can be adjusted up to 10° forward and 34° backward by 2° intervals respectively by pulling up reclining adjusting lever (8). After moving the seat to the desired position, return the reclining adjusting lever to the original position. Check that the reclining angle is locked in the desired position.



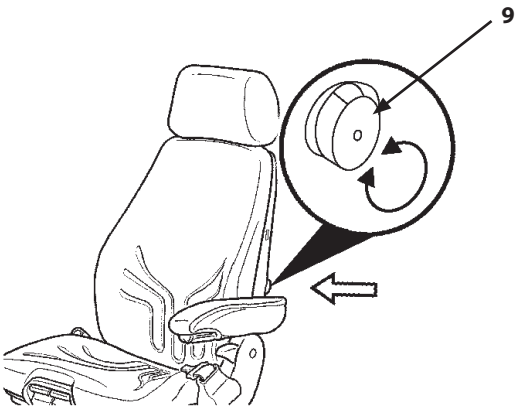
M4GB-01-096

9. Lumbar Support Adjustment

A swelling on the backrest surface can be adjusted. Turn knob (9) until the desired swelling is obtained.

NOTE:

- *Turn the knob to adjust the swelling on the lumbar support. The lumbar support adjusting knob works irrespective of the turning direction.*
- *When the knob is continuously rotated, swelling / shrinking of the backrest is repeated.*

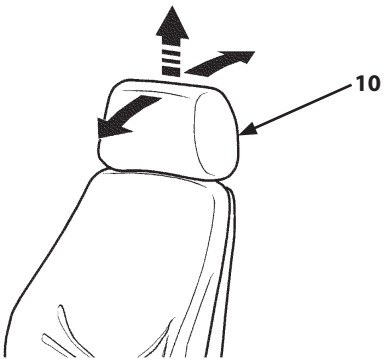


M4GB-01-097

10. Headrest

Adjust the headrest position by pulling up or pushing down the headrest. The headrest height adjusting stroke is 100 mm (3.9 in). In addition, the fore/after angle of the headrest can be adjusted in the range of 49° on both sides by pulling forward or pushing backward the headrest.

When required to remove the headrest, fully pull up the headrest.



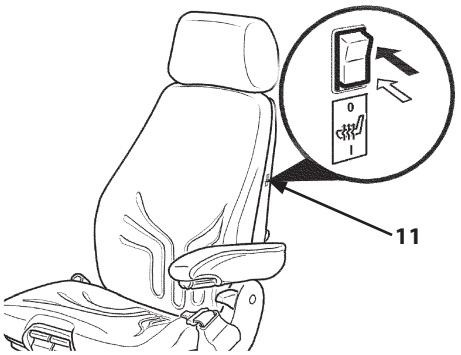
M4GB-01-099

11. Seat Heater Switch

Turn the heater ON or OFF by operating switch (11) provided on the side of the backrest.

○ : OFF
| : ON

When seat heater switch (11) is turned ON, the seat and/or backrest are heated to warm them up. When the temperature of the seat and/or backrest reaches its specified temperature, heating turns off automatically.



M4GB-01-098

WARNING:

- **Use with seat wet or something poking into seat could cause electrical shock.**
- **Be careful when handling water or drinking water.**
- **Do not use if clothes are extremely wet.**
- **Do not poke the seat with a sharp object or put anything heavy with protruding parts on the seat.**

CAUTION:

- **Certain person as noted below, could be at risk of a low temperature burn, so should be careful during use.**
- **Person with delicate skin**
- **Person suffering from fatigue**
- **Person under excessive drinking or medication that could cause sleepiness (sleeping pills, cold medicines, etc.)**
- **Continuous use could cause low temperature burn to person.**
- **Use with blanket or cushion which may retain heat could cause abnormal heating of the seat.**

IMPORTANT:

- **To prevent damage, do not poke the seat with sharp objects or put anything heavy with protruding parts on the seat.**
- **If a liquid like water or a drink is spilled on the seat, wipe off with a soft cloth and make sure the seat is dry before using again.**
- **If the seat is abnormally hot, stop use and contact Authorized Dealer.**

NOTE:

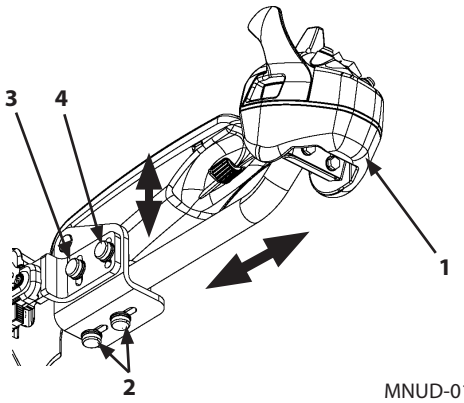
- *The point where heated varies with the type of seat.*
- *Even if switch (11) is turned OFF after using the seat heater, the seat temperature does not decrease immediately. Operate the machine after sufficiently checking the switch position.*

Joystick Steering Adjustment (Type A)

Adjusting the Switch Box Fore/Aft Position

If switch box fore/aft adjustment bolts (2) are loosened, the fore/aft position of switch box (1) can be adjusted through a range of 20 mm (0.8 in).
To loosen bolts (2), remove their caps. After adjusting the position, tighten bolts (2) again. After tightening them, put their caps back on.

Wrench Size: 17 mm
Tightening Torque: 50 N·m (5.0 kgf·m, 37 lbf·ft)

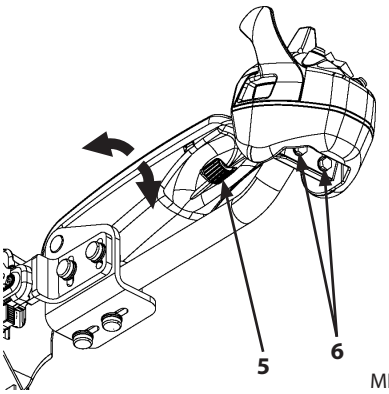


MNUD-01-139

Adjusting the Vertical Height of the Left Console

Remove bolt (4) and loosen bolt (3). The vertical height can be adjusted by selecting from 3 positions (15 mm (0.6 in) pitch, adjustment range of 30 mm (1.2 in)). When loosening bolts (3) and (4), remove their caps.
After adjusting the position, tighten bolts (3) and (4) again. After tightening them, put their caps back on.

Wrench Size: 17 mm
Tightening Torque: 50 N·m (5.0 kgf·m, 37 lbf·ft)



MNUD-01-139

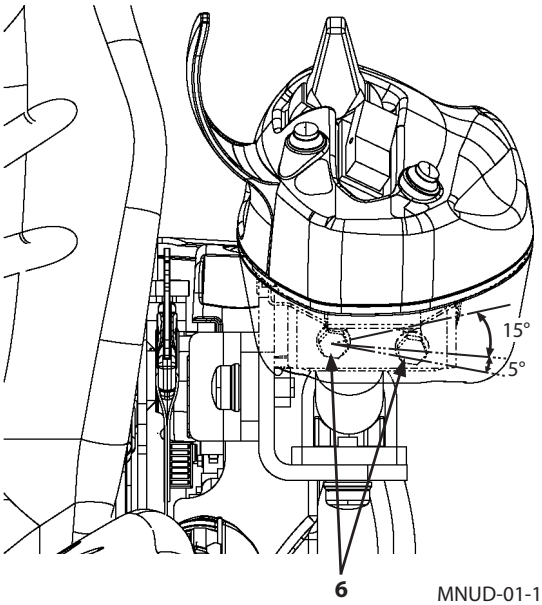
Left Armrest Angle Adjustment

The armrest can be adjusted in a range of 30° vertically by turning armrest angle adjustment dial (5).

Switch Box Angle Adjustment

If 2 bolts (6) are loosened, the switch box angle can be adjusted in a range of 15° upwards and 5° downwards, relative to one bolt.
After adjusting the position, tighten the bolts (6) again.

Wrench Size: 13 mm
Tightening Torque: 20 N·m (2.0 kgf·m, 15 lbf·ft)

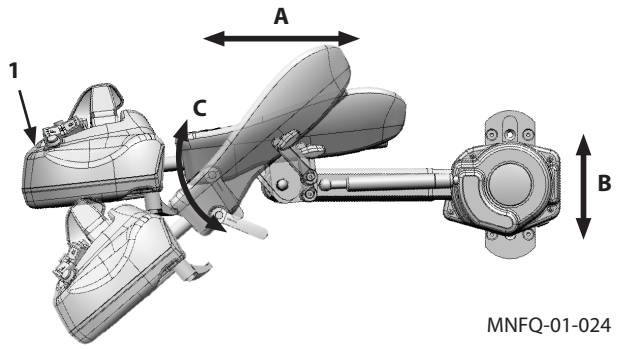


MNUD-01-140

Joystick Steering Adjustment (Type B)

Adjusting the Switch Box Fore/Aft Position (A)

Turn switch box fore/aft adjustment knob (2) counterclockwise to loosen. The fore/aft position of switch box (1) can be adjusted through a range of 80 mm (3.1 in). After adjusting the position, turn knob (2) clockwise to secure.



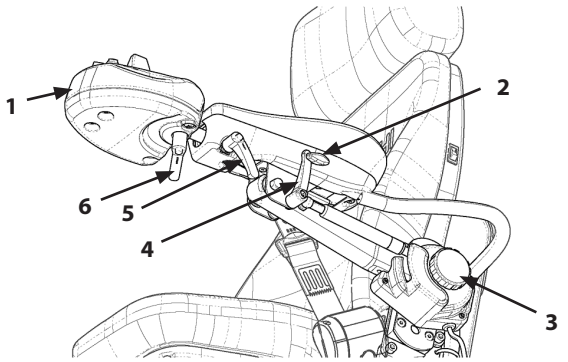
MNFQ-01-024

Adjusting the Vertical Height of the Left Console (B)

Turn left console height adjustment dial (3) counterclockwise to loosen. The vertical height can be adjusted through a range of 69 mm (2.7 in).
After adjusting the position, turn dial (3) clockwise to secure.

Left Armrest Angle Adjustment (C)

Turn left armrest angle adjustment lever (4) to loosen. The armrest can be adjusted in a range of 34° vertically.

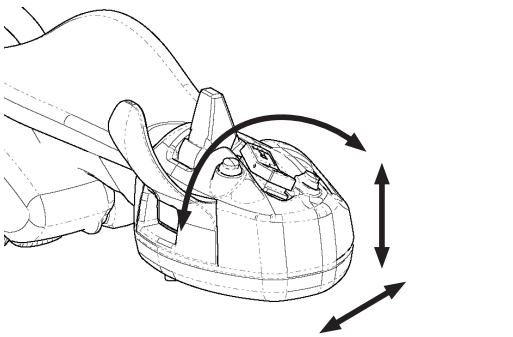


MNFQ-01-038

Switch Box Angle Adjustment

By loosening switch box angle adustment levers (5)(6), the switch box angle can be adjusted.
When lever (5) is loosened, the switch box shaft can rotate.
When lever (6) is loosened, the switch box can move right and left by 50°, up and down by 50°, and rotate by 180°.
After adjusting the position, tighten levers (5)(6) to secure.

NOTE: Levers(4)(5)(6) are locked so that they do not turn freely. Pull levers(4)(5)(6) to release this handle lock, then the position(angle) of handle can be changed. Push levers(4)(5)(6) to lock its position.



MNFQ-01-039

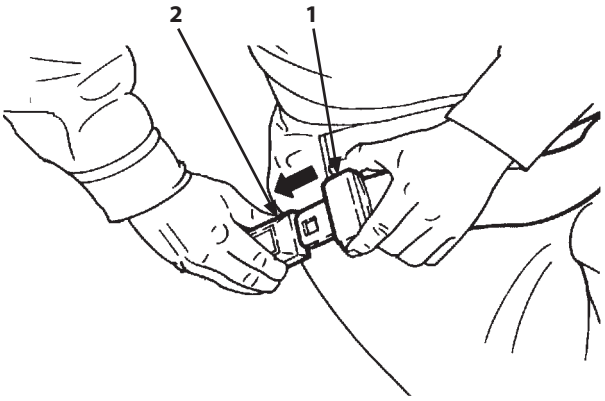
Seat Belt

WARNING:

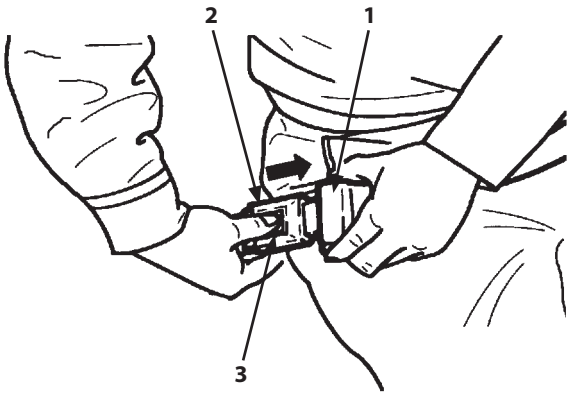
- **Be sure to use seat belt (1) when operating the machine.**
- **Before operating the machine, be sure to examine seat belt (1) and attaching hardware for any failure. If any damage and/or wear are found, replace the part concerned.**
- **Replace seat belt (1) every 3 years regardless of appearance.**

1. Confirm that seat belt (1) is not twisted. Securely insert the end of seat belt (1) into buckle (2). Lightly pull on the belt to confirm that the buckle latches securely.
2. Push button (3) on buckle (2) to unfasten seat belt (1).

Replace seat belt (1) if it is damaged or worn, or if the machine is involved in an accident which puts severe stress on the seatbelt.



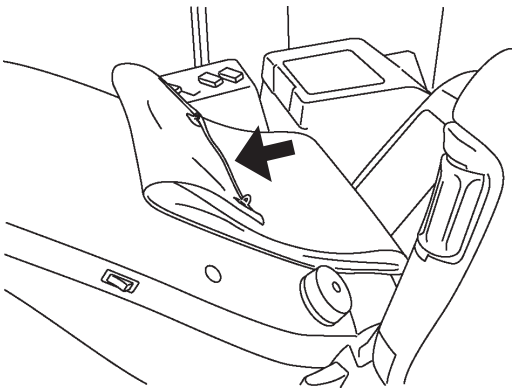
M1U1-01-031



M1U1-01-032

Seat Pocket

A pocket is provided on the back of the operator's seat. Store the Operator's Manual in this pocket.



M4GB-01-139

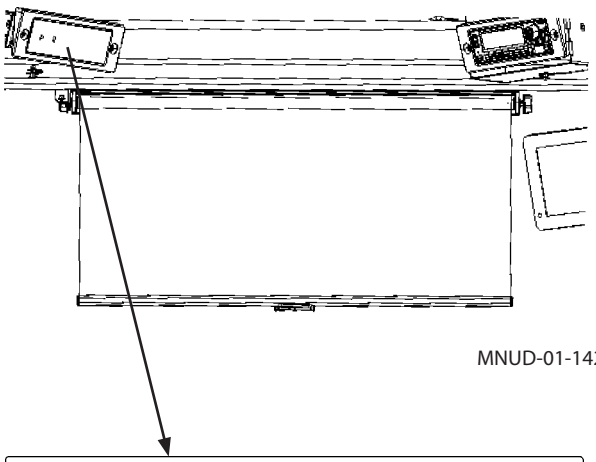
Auto Air Conditioner

Features

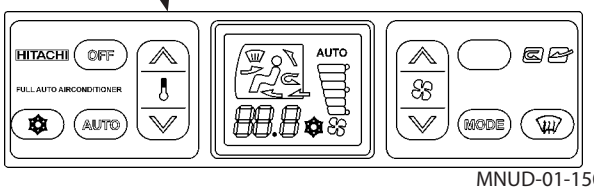
- Full Auto-Temperature Control:
  Automatically controls the cab temperature to maintain the temperature set by the temperature control switch regardless of outside air temperature and insolation.

- Max. Cooling and Heating:
  Maximum cooling or heating can be obtained by pressing the top side mark "/\" on temperature control switch (32 °C) (90°F) or the bottom side mark "\/" (18 °C)(64°F) respectively.

- Preheating:
  During preheating the cab in winter with the foot vent selected, the air volume is reduced to Low until the coolant temperature rises to prevent cool air from entering the cab. Cool head / warm feet operation fans cool air to the head and warm air to the feet.



MNUD-01-142



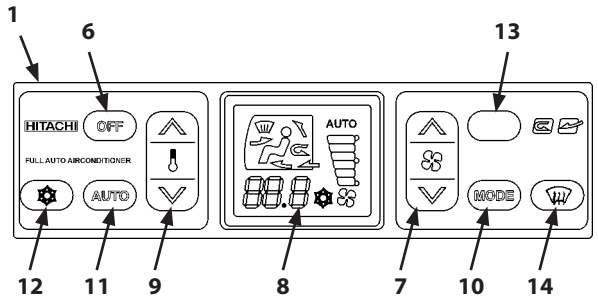
MNUD-01-150

Components Name

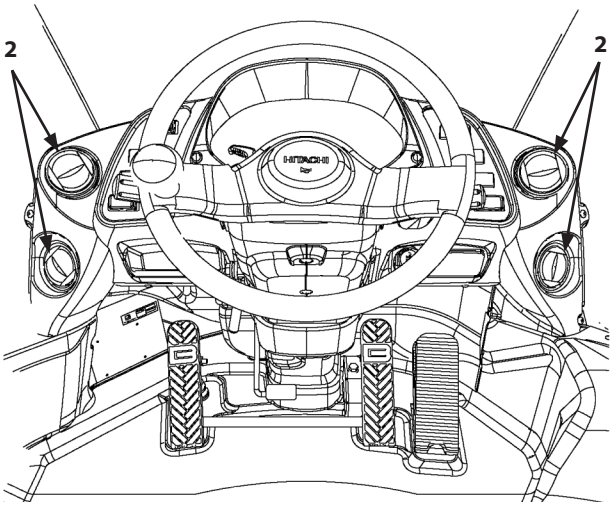
1- Control Panel
2- Front Vent
3- Rear Vent
4- Foot Vent
5- Defroster Vent
6- Power OFF Switch
7- Blower Switch
8- Liquid-Crystal Display (LCD)
9- Temperature Control Switch
10- Mode Switch
11- AUTO Switch
12- Air Conditioner Switch
13- Circulation/Fresh Air Switch
14- Defroster Switch

NOTE:

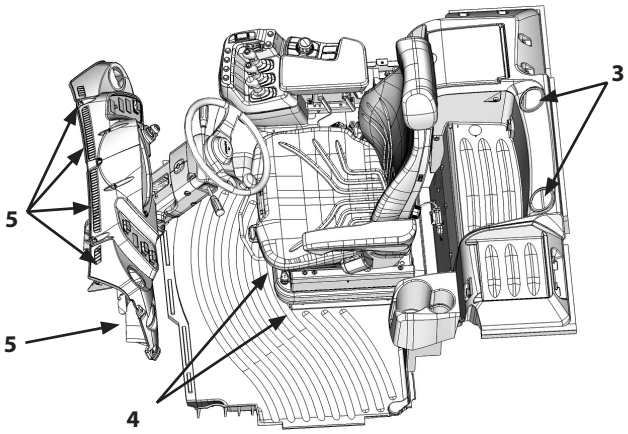
- *Apart from foot vents (4) and defroster vents (5), the direction air blows from the various vents can be changed with their louvers.*
- *Fogging of the windows can be reduced by adjusting the direction of vents to the sides and rear.*
- *Front and rear vents can be opened and closed manually.*



MNUD-01-150



MNUD-01-143



MNUD-01-007

Controller Part Name and Function

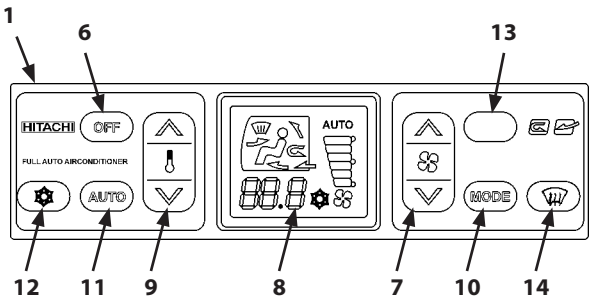
- Power OFF Switch (6)
  Stops the blower.
  When the switch is pressed, all displays (vent mode, set-temperature, and blower speed) on the LCD (8) panel will disappear and the blower stops in both the auto and manual modes.

- Blower Switch (7)
  Controls the blower speed from Low to High in 6 stages in the manual mode. The blower speed is displayed at the right side on the LCD (8).
  - Increasing Blower Speed
    Each time the top side mark "⋀" on blower switch (7) is pressed, the blower speed is increased by one increment.
  - Decreasing Blower Speed
    Each time the bottom side mark "⋁" on blower switch (7) is pressed, the blower speed is decreased by one increment.

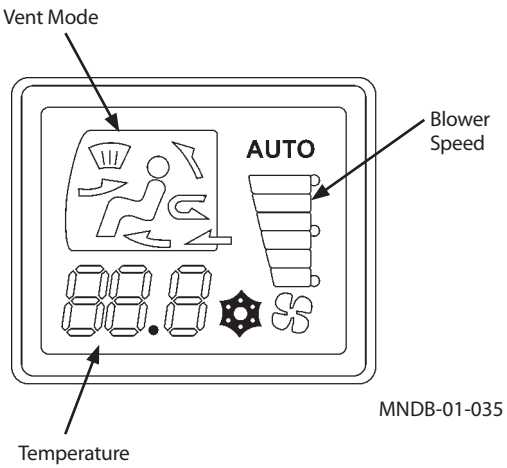
NOTE: In the AUTO mode operation, the fan speed will be automatically controlled with the fan speed indicator flashing.

- LCD (8)
  Displays the set-status of the air conditioner operating temperature, fan speed, and vent mode.
  - Temperature Display
    Indicates the set-temperature (18 to 32.0 °C, 65 to 90 °F) by 0.5 °C (0.9 °F) increments at the panel center.
  - Blower Speed Display
    Indicates the blower speed in 6 stages by lighting the segment at the right side of panel.
  - Vent Mode Display
    Indicates the selected vent mode at the panel top.
    The vent modes are as shown below:

: Front Vent Mode
: Front/Rear Vent Mode
: Front/Rear/Foot Vent Mode
: Foot Vent Mode
: Foot/ Defroster Vent Mode
: Defroster Vent Mode

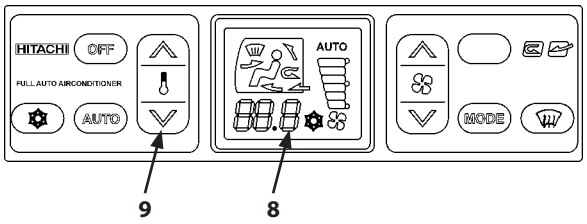


MNUD-01-150



MNDB-01-035

- Temperature Control Switch (9)
  Sets the air temperature in the range of 18 to 32.0 °C (64 to 90 °F) in the MANUAL and AUTO modes. Temperature can be set by 0.5 °C (0.9 °F) increments. The set-temperature is displayed on the LCD (8) center.
  - Increasing Temperature
    Each time the top side mark "∧" on temperature control switch (9) is pressed, the set-temperature is increased by 0.5 °C (0.9 °F) increments.
  - Decreasing Temperature
    Each time the bottom side mark "∨" on temperature control switch (9) is pressed, the set-temperature is decreased by 0.5 °C (0.9 °F) increments.



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Mode/Temperature Control Switch

- Mode Switch (10)
  Selects the air vent. The selected air vent is indicated on LCD (8).

 : Front Vent Mode

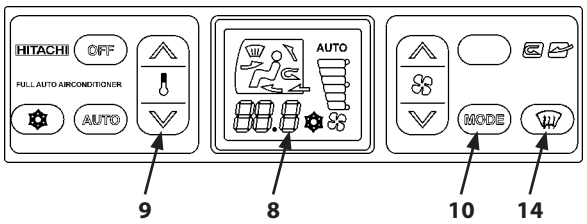
 : Front/Rear Vent Mode

 : Front/Rear/Foot Vent Mode

 : Foot Vent Mode

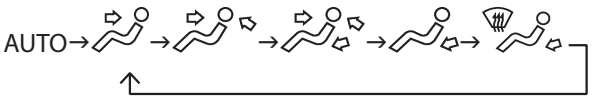
 : Foot/Defroster Vent Mode

 : Defroster Vent Mode



MNUD-01-150

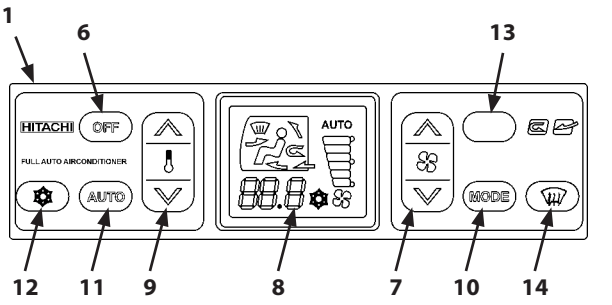
Each time mode switch (10) is pressed, the vent location can be changed in 6 stages as illustrated below.



Press defroster switch (14) to change defroster  vent mode.

- AUTO mode
  The air vent location is automatically selected.

- AUTO Switch (11)
  Selects the air conditioner operation mode in either AUTO or MANUAL.
  - AUTO Operation Mode
    Press AUTO switch (11). When the indicator comes ON, the AUTO operation mode is selected. In response to the set-temperature, the blower speed, vent mode, and ventilation mode are automatically controlled.
  - MANUAL Operation Mode
    Press AUTO switch (11). When the indicator goes OFF, the MANUAL operation mode is selected. Air temperature, blower speed, vent mode, and ventilation mode can be selected as desired.



MNUD-01-150

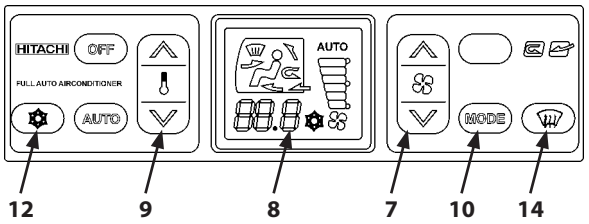
- Air Conditioner Switch (12)
  The air conditioner will turn on and the air conditioner indicator will be lit when air conditioner switch (12) is pressed.

- Circulation/Fresh Air Switch (13)
  It switches over the air intake port to circulation mode and fresh air mode.
  Icon of the selected mode will light.
  Circulation mode (15), Fresh air mode: (16).

- Defroster Switch (14)
  Press defroster switch (14) to select defroster vent mode.

Defroster Operation

1. Press defroster switch (14) to change defroster vent mode; the fresh air mode and air conditioner will turn ON.
2. Temperature in the cab can be adjusted by operating temperature control switch (9).
3. Operate blower switch (7) to adjust flow.
4. Operate mode switch (10) to change foot/defroster mode.



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Cool Head/Warm Feet Operation

Cool and warm air is simultaneously supplied to the head vents and feet vents respectively.

1. Rotate blower switch (7) to adjust the blower speed.
2. Press Mode switch (10) to display the front and rear vent mark on LCD (8).

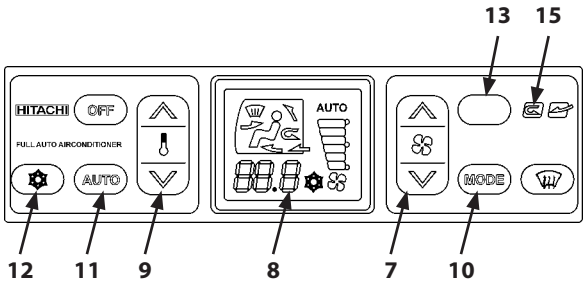
   Turn A/C ON by using air conditioner switch (12).

Control air temperature inside the cab by using temperature control switch (9).

Tips for Optimal Air Conditioner Usage

For Rapid Cooling

Temperature in the cab may rise over 80°C (176°F) when the machine is exposed to sun light in the summer. For rapid cooling, ventilate air in the cab first.
After starting the engine, set the temperature control to maximum cooling (18°C, 65°F) using temperature control switch (9). Then select the circulation mode (15) by operating circulation/fresh air switch (13).
Select the front/rear vent mode by operating mode switch (10). Set the blower speed to the maximum flow rate (6 segments lit) by operating blower switch (7). Then, turn air conditioner switch (12) ON (the indicator lights).
After running the engine at a little over 1000 min-1 for a few minutes, press AUTO switch (11) and close the windows.
When the temperature in the cab starts to lower, set the desired temperature with temperature control switch (9).



MNUD-01-150

When Windows Become Misty

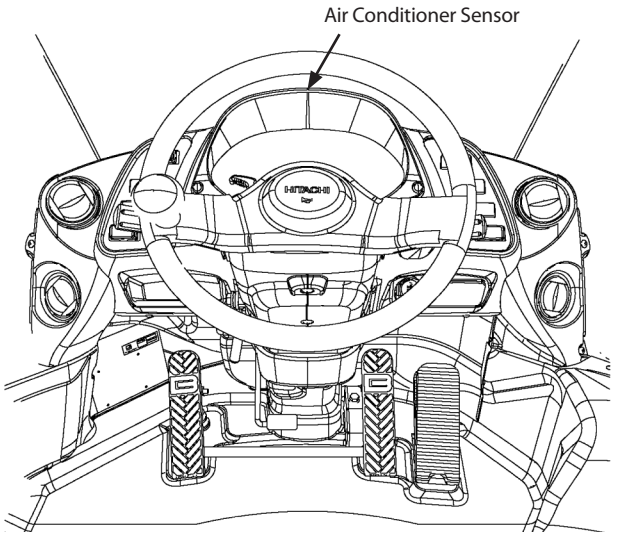
If the insides of the windows become clouded during rainy weather or on humid days, operate the air conditioner to aid in keeping the windows clear. When the atmosphere is very damp, and if the air conditioner has run excessively, the outside of the windows may become clouded. If this happens, turn off the air conditioner to adjust the temperature in the cab.

Off-Season Air Conditioner Maintenance

To protect each part of the compressor from a lack of lubricant, operate the air conditioner at least once a month for several minutes with the engine running at a slow speed during off-season. When the cab temperature is lower than 15°C (59°F), the air conditioner may not operate. If this happens, warm the cab using the heater first.

IMPORTANT:

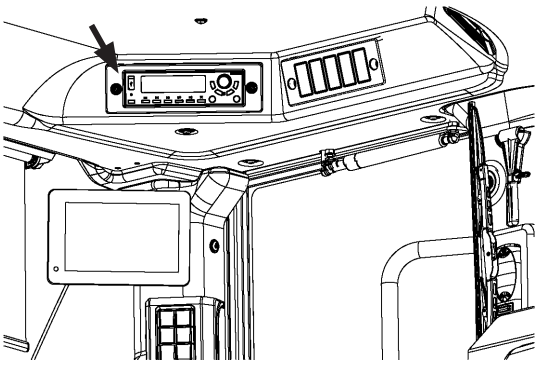
- **Do not suddenly increase the engine speed.**
- **Keep any flames away from the control panel.**
- **Refer to the item "Check Air Conditioner Filter" in the Maintenance Section for maintenance of the air conditioner filters.**
- **Always clean the auto air conditioner sensor for effective air conditioner performance. Avoid placing any obstructions around the sensor.**



MNUD-01-143

Digital Radio Unit (Built-in Microphone)

Control Panel



MNUD-01-401

1- POWER button

Turns the device ON/OFF.

2- SRC button

Switches the source (FM1→FM2→AM→Bluetooth®→USB).

3- Search button

Makes auto presets (FM/AM).

4- Return button

Returns to the previous screen while setting operation.

5- Hands-Free button

Receives mobile phone signal. Makes a redial call.

6- Rotary switch

Adjust the volume.

Switches between menu items and makes various settings.

7- SEEK BAND+/SEEK BAND- buttons

Adjusts radio frequency.

8- PRESET buttons ([1] to [6])

Calls up/registers preset frequencies.

Operates the connected Bluetooth®/USB device.

9- MIC

Microphone for hands-free operation.

10- USB port

Connect a USB device.

11- LCD

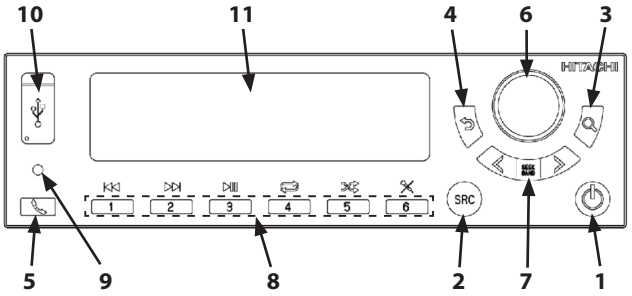
Refer to the following page.

12- Power Connector

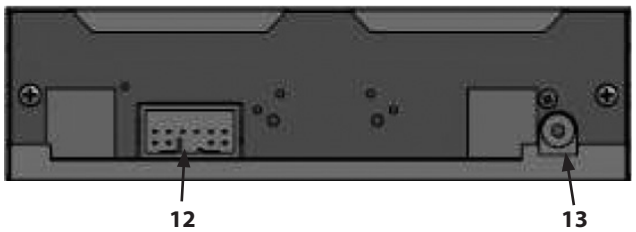
Power inlet and machine information input.

13- Antenna Port (for Analog Radio)

Connect the antenna to receive AM/FM radio.



MNUD-01-402



Rear View

MPTC-01-088

LCD Display

1- Information section

Indicates the source name, frequency, service name, etc. in characters and/or numbers.

2- Source label

Indicates the selected source name.

3- ST label

Lights to indicate stereo reception when FM are selected.

4- USB label

Lights when a USB device is connected.

5- Bluetooth® label

Lights when connected to a Bluetooth® compatible device.

6- Clock

Current time in 24 h format.

7- REPEAT label

Lights when Bluetooth®/USB device is playing in repeat mode.

8- RANDOM label

Lights when Bluetooth®/USB device is playing in random mode.

9- Folder No.

Indicates the USB memory folder No.

10- Track No.

Indicates the USB memory track No.

11- Menu/List title

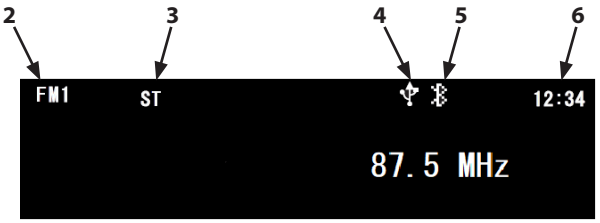
Indicates the title of the selected menu, source, program type.

12- List No.

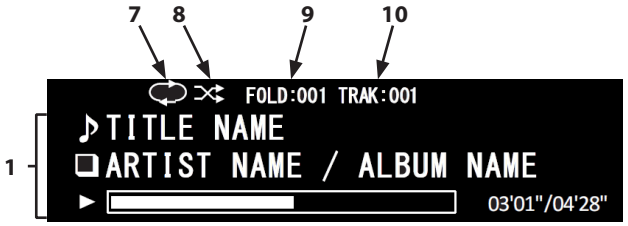
Indicates the selected list number among total selections.

13- Volume display

Indicates the volume of currently selected source.



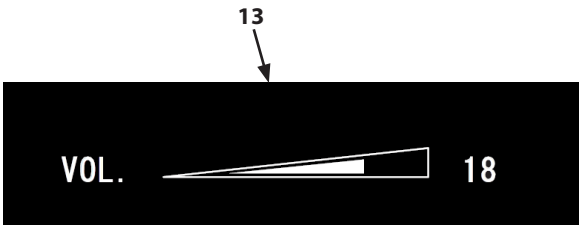
MNUD-01-448



MNUD-01-404



MNUD-01-406



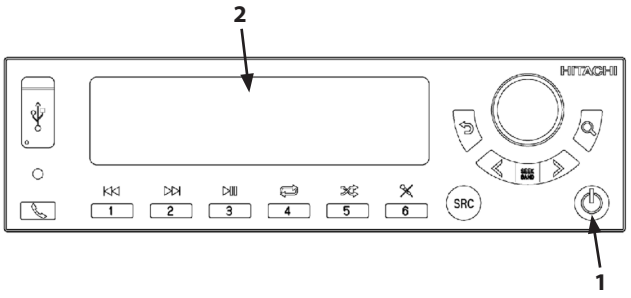
MNUD-01-405

Basic Operation

Turn ON the device

When the machine starter key is set to ON or ACC, the previously selected source is displayed on LCD (2).
If the LCD displays nothing, press power button (1). The previously selected source appears on the LCD.

NOTE: When the starter key is turned to OFF when the radio unit is in the standby mode, the radio unit starts up in the standby mode when the key is turned to ON or ACC. Refer to "Turn OFF the device" for the standby mode.



MNUD-01-402

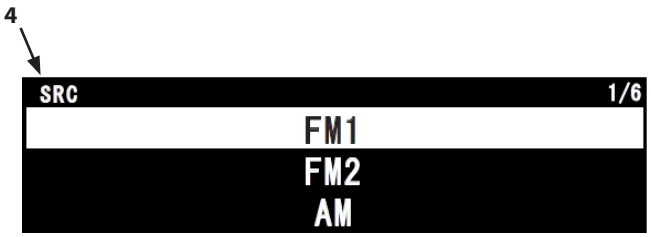
Turn OFF the device

When the machine starter key is set to ON or ACC, the pressing power button (1) turns off the LCD. The power button (1) remains lit on (standby mode).

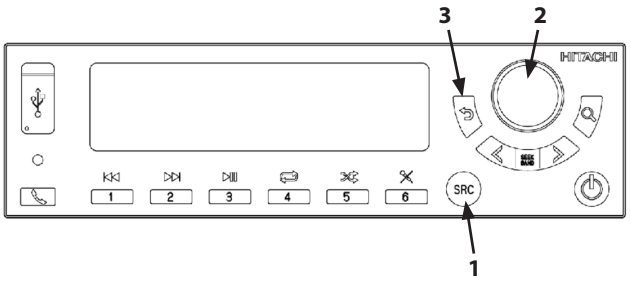
When the machine starter key is set to OFF with the radio unit is powered on, power button (1) and LCD (2) are both turned off.

Selecting Source

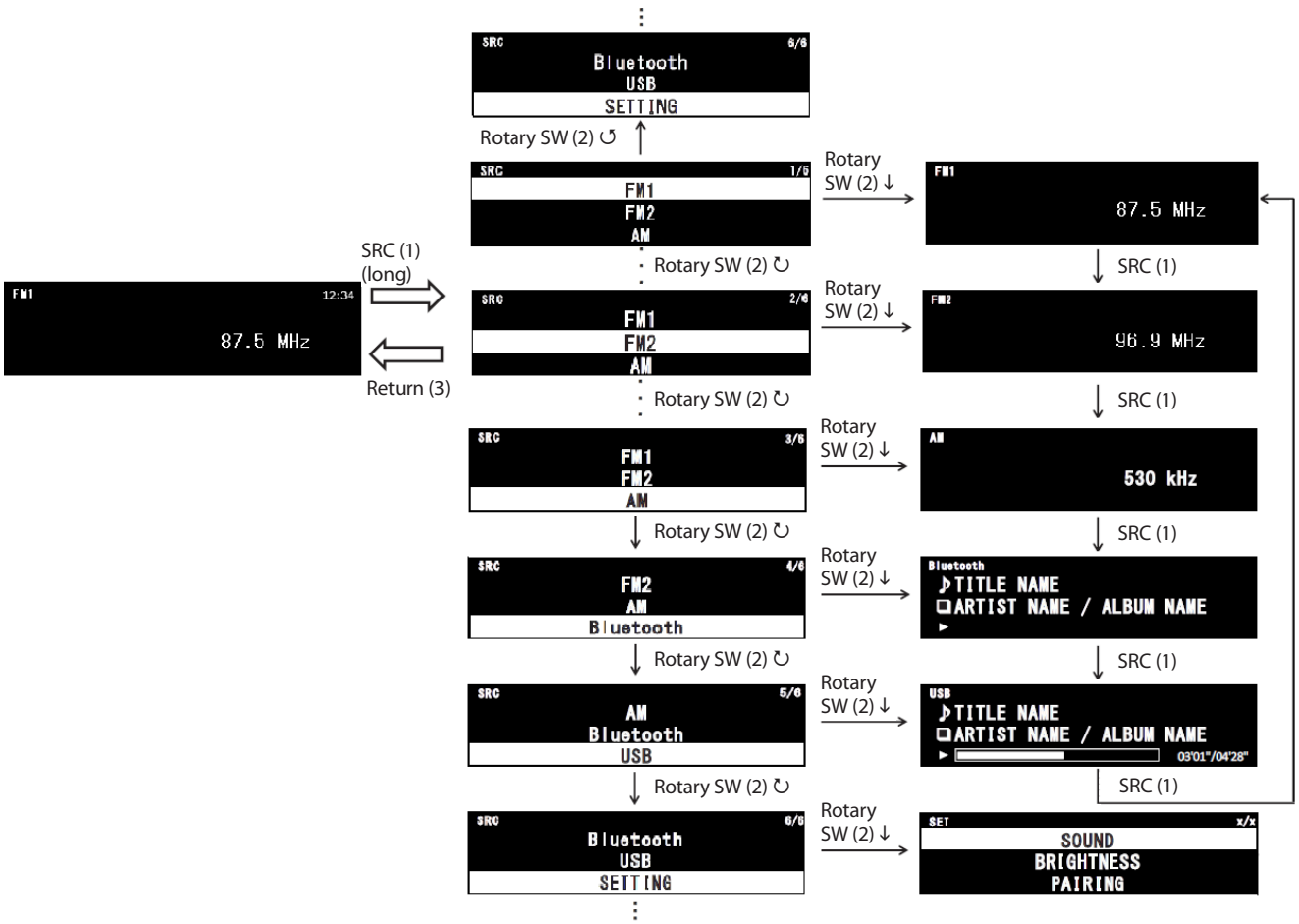
Long depressing SRC button (1) displays the source selection screen (4).



MNUD-01-450



- Rotate rotary switch (2) to highlight a desired source (FM1⇆FM2⇆AM⇆Bluetooth®⇆USB⇆SETTING⇆FM1).
- Press rotary switch (2) while selecting a source to display its sub-sources.
- Pressing SRC button (1) on each source screen moves to the screen to the next source screen (FM1→FM2→AM→Bluetooth®→USB→FM1).



MNUD-01-449US

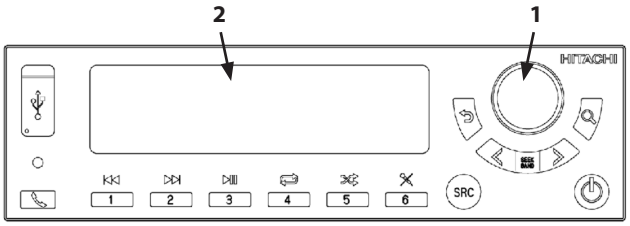
Volume Control

The volume control can be done individually for each source and for hands-free calling.

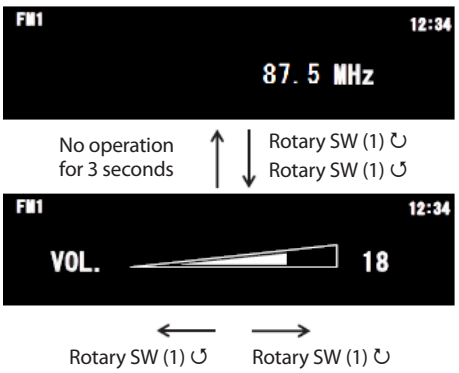
Rotating rotary switch (1) clockwise increases the volume. Rotating rotary switch (1) counterclockwise decreases the volume.

The volume level is selected between 0 (mute) and 32.

NOTE: The screen returns to the source screen when no operation is made for 3 seconds.



MNUD-01-402



MNUD-01-416

About Trademark

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Other trademarks and trade names belong to their respective owners.

CAUTION:

- **Do not operate the radio or other audio equipment while driving or working.**
- **The speaker volume may vary depending on the source, radio, USB audio input, Bluetooth® audio or handsfree phone. Adjust to an appropriate volume, such as by changing the volume of the Bluetooth® compatible device.**

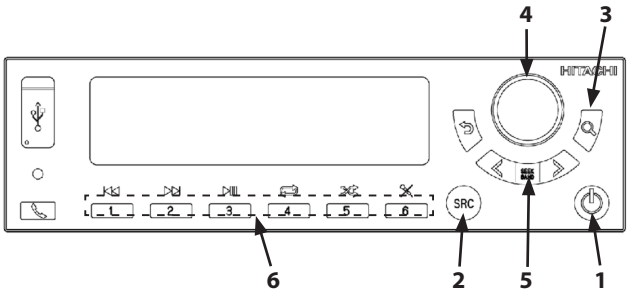
IMPORTANT: This device cannot connect to more than 1 Bluetooth® compatible device at a time.

FM/AM Radio Operation

CAUTION: Refrain from listening to the radio while operating the machine.

Receives both FM and AM radio.

NOTE: The only difference between FM1 and FM2 is the grouping of preset numbers; the function is the same.



MNUD-01-402

Control Panel

1- POWER button

Turns the radio ON/OFF.

2- SRC button

Switches the source (FM1→FM2→AM→Bluetooth®→USB).

3- Search button

FM/AM auto presets.

4- Rotary switch

Adjust the volume.

5- SEEK BAND+/SEEK BAND- buttons

Adjusts radio frequency.

6- PRESET buttons ([1] to [6])

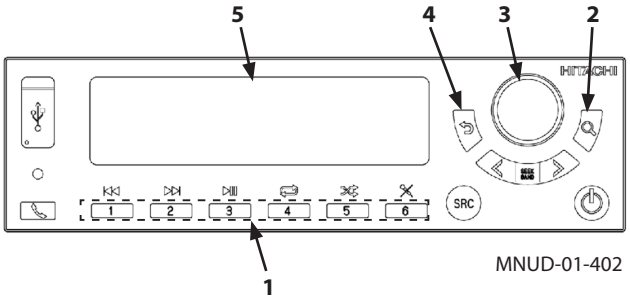
Calls up/registers preset frequencies.

Station Presetting Procedure

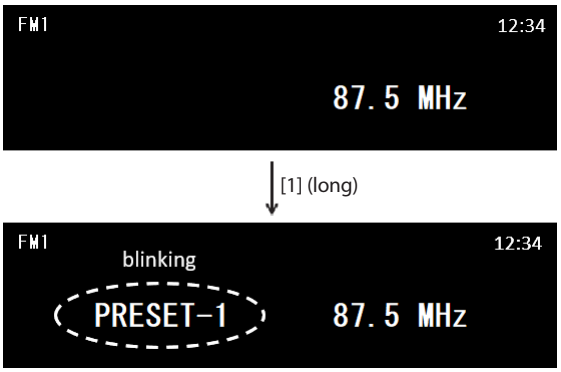
1. Select the desired station. Refer to the following page "Tuning Procedure".

2. Press and hold a desired PRESET button (1) for more than 1 second. The current station is preset to the selected number of button. When the station is preset, the "PRESET-x" blinks for 3 seconds on LCD (5).
   Once the presetting is complete for a PRESET button, the radio will be tuned to the preset station when the PRESET button is pressed.

3. To change the preset station, follow the same steps 1 and 2.



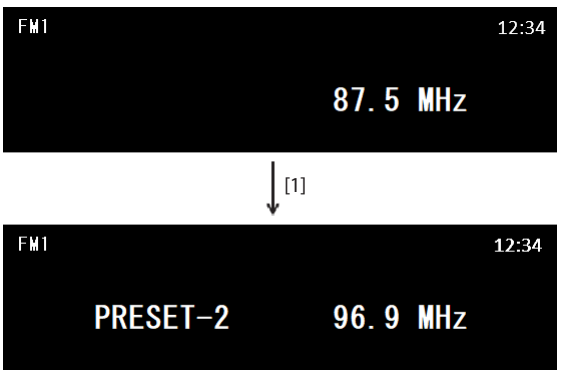
MNUD-01-402



MNUD-01-411US

Calling up Preset Stations

Press any of PRESET buttons (1) to tune and receive the registered station frequency. "PRESET-x" with the selected number is displayed on LCD (5).



MNUD-01-412US

Factory Default Setting

PRESET	AM (kHz)	FM (MHz)
1	530	87.5
2	910	96.9
3	1000	97.9
4	1100	98.9
5	1540	106.9
6	1710	107.9

IMPORTANT: The PRESET data will not be erased even disconnected from the battery. The changed PRESET data is stored in the internal memory at ACC OFF, however, if ACC and battery are both OFF at the same time, the changed data is not stored.

Auto-Preset Function

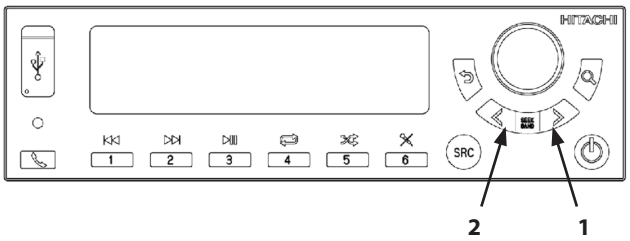
By keep depressing search button (2), up to 6 stations with best reception can be automatically registered to PRESET buttons (1) (auto-preset function).
"AUTO PRESET" blinks on LCD (5) while auto-preset is running.
The station frequency is registered from No. 1 through No. 6 in frequency order.



MNUD-01-413

Tuning Procedure

- Automatic Search Function (Auto Seek)



MNUD-01-402

Press and hold SEEK BAND+ button (1) and/or SEEK BAND- button (2) for more than half a second, then release. Automatic search for the station starts to run and stops when a station is received.

Press SEEK BAND+ button (1) to search a higher frequency.
Press SEEK BAND- button (2) to search a lower frequency.

If no stations with good reception can be found after searching the entire band, the radio continues searching. Press either SEEK BAND button (1)(2) to cancel the searching operation.

NOTE: If the receiving radio waves are weak, i. e. such as when the machine is located between high rising buildings, etc., use the manual tuning procedure to select the desired station.



MNUD-01-414US

- Manual Tuning Procedure (Manual Seek)

Press SEEK BAND+ button (1) and/or SEEK BAND- button (2) until the desired station is reached.
Each time SEEK BAND buttons (1)(2) is pressed, the frequency changes at an interval.

Press SEEK BAND+ button (1) to increase the frequency.
Press SEEK BAND- button (2) to decrease the frequency.

NOTE: AM frequency interval: 10 kHz
FM frequency interval: 0.2 MHz



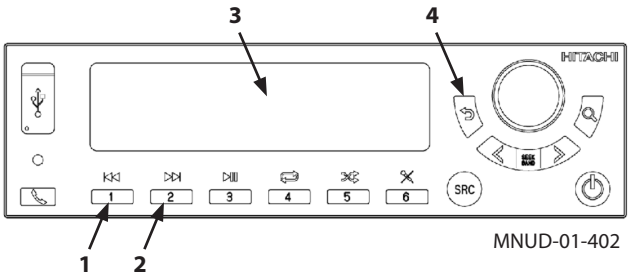
MNUD-01-415US

Bluetooth® Input

IMPORTANT: A special Bluetooth® unit is necessary to use this function.

Specified Characteristics

Frequency	2.4 GHz
Version	3.0
Class	2
Applicable profile	A2DP, AVRCP, HFP, HSP, SPP
Max. Number of Pairing Device	16



MNUD-01-402

The audio files can be played via Bluetooth® connection with a cell phone or Bluetooth® audio playback device.

NOTE: Refer to page 1-205 for pairing.
Refer to page 1-207 for device connection.

The track title, artist name, album name are displayed on LCD (3).
If they are too long to display in one line, separately displayed as shown to the right. Press return button (4) to change the screens.

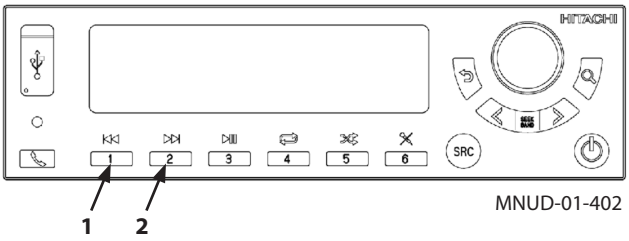


MNUD-01-418

Change Track

Press [2] button (2) to start playing the next track.

Press [1] button (1) to play the previous track.
According to the connected device setting, pressing [1] button (1) returns to the top of the currently playing track. Then press [1] again to play the previous track.

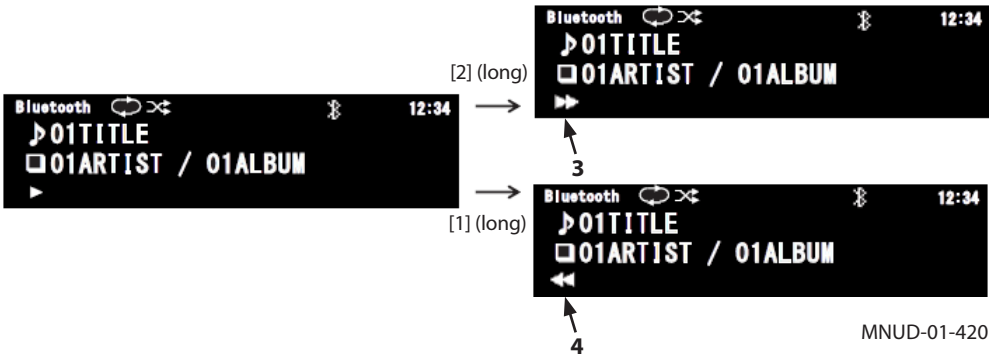


MNUD-01-402

Fast-forward/Fast-rewind

While playing a track, depressing [2] button (2) fast-forwards the track until releasing [2] button. Fast-forward label (3) is displayed while depressing [2] button.

While playing a track, depressing [1] button (1) fast-rewinds the track until releasing [1] button. Fast-rewind label (4) is displayed while depressing [1] button.

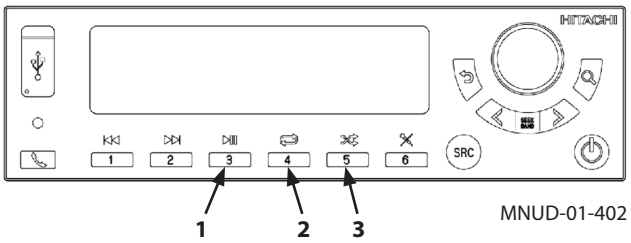


MNUD-01-420

Pause/Playback

Pressing [3] button (1) while playing a track pauses playback. PAUSE label (4) is displayed.

Pressing [3] button (1) again starts playing from where it was paused.



MNUD-01-402

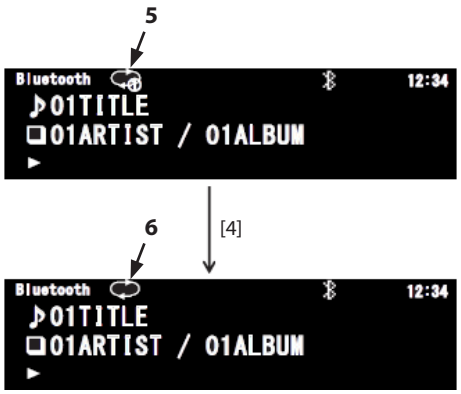


MNUD-01-419

Repeat

Pressing [4] button (2) plays the same track repeatedly. REPEAT label (5) is displayed.
Pressing [4] button (2) again plays the same album or folder repeatedly. REPEAT label (6) is displayed.

NOTE: This function is not applicable depending on the connected device.

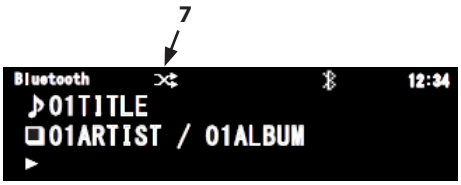


MNUD-01-421

Random

Pressing [5] button (3) plays the tracks in random order. RANDOM label (7) is displayed.

NOTE: This function is not applicable depending on the connected device.

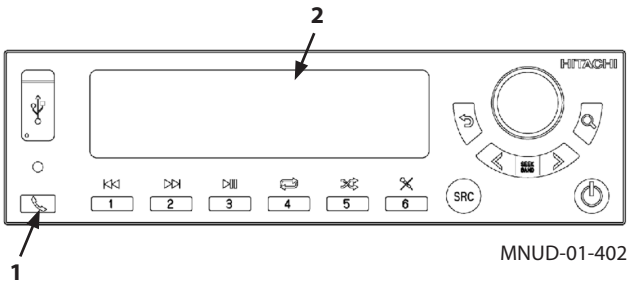


MNUD-01-422

Hands-free Call

IMPORTANT: A special Bluetooth® connected cellphone is necessary to use this function.

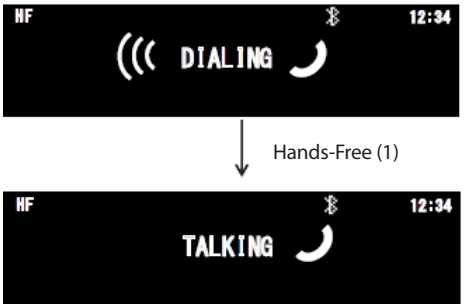
Allows handsfree conversations when using a Bluetooth® (HFP protocol) compatible cellphone.



MNUD-01-402

- Making a Call
  When calling from the cellphone, "DIALING" is displayed on LCD (2) and the sound from dialing is heard from the speakers. The voice of the other end party is heard from the speakers when connected.

- Redial
  Regardless of the band (or operation), long pressing Hands-Free button (1) dials to the last incoming dial number since the ACC was turned ON.
  "DIALING" is displayed on LCD (2) and the sound from dialing is heard from the speakers. The voice of the other end party is heard from the speakers when connected.
  Pressing Hands-Free button (1) during talk ends call.



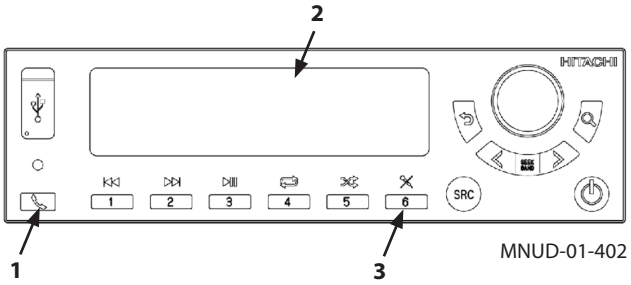
MNUD-01-423

NOTE: The redial function may not work if the length of the previous incoming call was short.

- Incoming Call
  When a call comes in, "CALLING" is displayed on LCD (2), regardless of the band (or operation), and the speaker rings with the call.
  Press Hands-Free button (1) to answer.

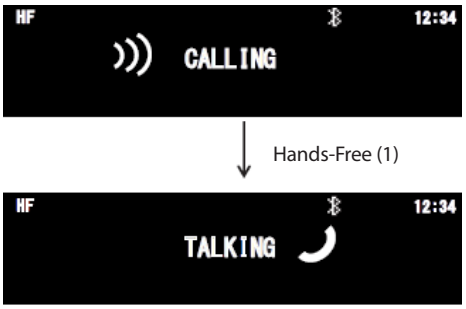
NOTE:

- *Even if the source of the radio unit is OFF when a call comes in, the source automatically turns ON, and "CALLING" is displayed and the speaker sounds ringing.*
- *According to the setting, auto-answer to the incoming call is possible. Refer to page 1-206 for the setting procedure.*



MNUD-01-402

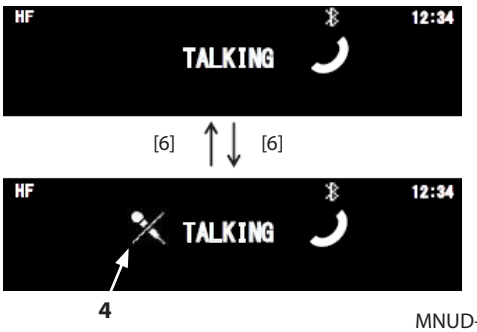
- Reject call
  When a call comes in, keep depressing Hands-Free button (1) rejects and ends the call. The radio returns to the band (or operation) before the call.



MNUD-01-424

- MIC Mute
  A microphone for hands-free talking is built-in the front panel of the radio unit.
  Pressing [6] button (3) turns ON/OFF this microphone.
  When the microphone is OFF, MUTE label (4) is displayed.

NOTE: MIC mute is canceled at each call.



MNUD-01-425

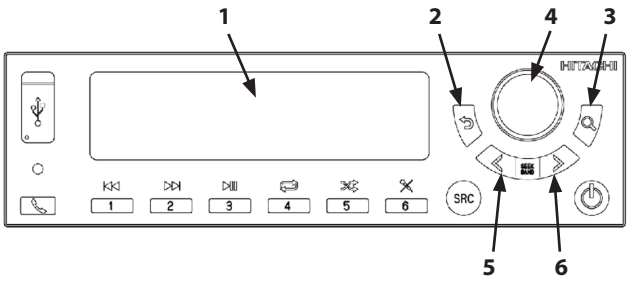
USB Device Input

Plays audio files via USB connection with a cell phone or audio playback device.

USB Specifications

Rated Current	Max. 2 A
Output Voltage	5.00 V when USB cable is not connected.
Applicable Data Format	MP3, WMA, AAC, WAV

NOTE: MP4 or other formatted files may not be played and skipped. If accepted, it may not be played in good enough quality.



MNUD-01-402

IMPORTANT: The basic functions provided with this radio unit are explained in this section. It may not be applicable to the USB device depending on its specifications and application. Refer to the instruction manual of the USB connected device.



MNUD-01-427

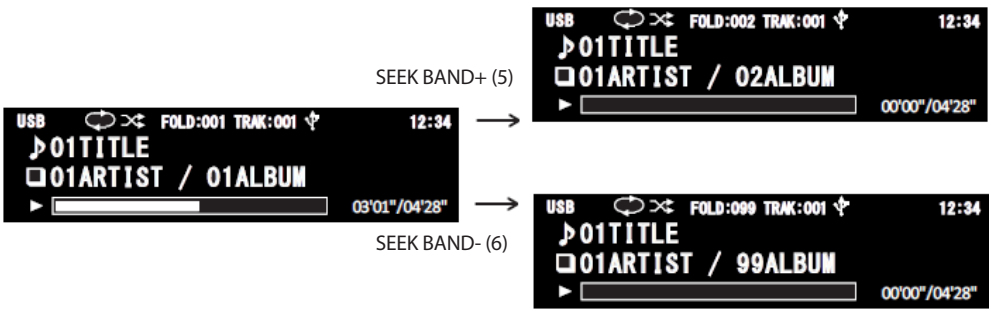
The track title, artist name, album name are displayed on LCD (1).
If they are too long to display in one line, they are separately displayed on different screens. Press return button (2) to change the screens.

Select Play List

Pressing search button (3) may import the playlist from the specified device.
Select a desired track and play, if available, using rotary switch (4).

Select Folder/Album

Press SEEK BAND+ button (5) moves to the next folder or album stored in the USB device.
Press SEEK BAND- button (6) moves to the previous folder or album stored in the USB device.

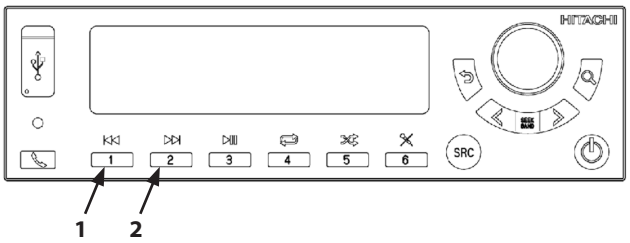


MNUD-01-426

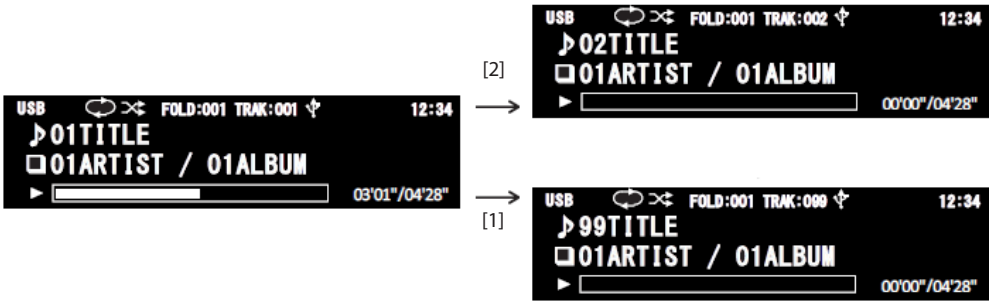
Change Track

Press [2] button (2) to start playing the next track.

Press [1] button (1) to play the previous track.
According to the connected device setting, pressing [1] button (1) returns to the top of the currently playing track. Then press [1] again to play the previous track.



MNUD-01-402

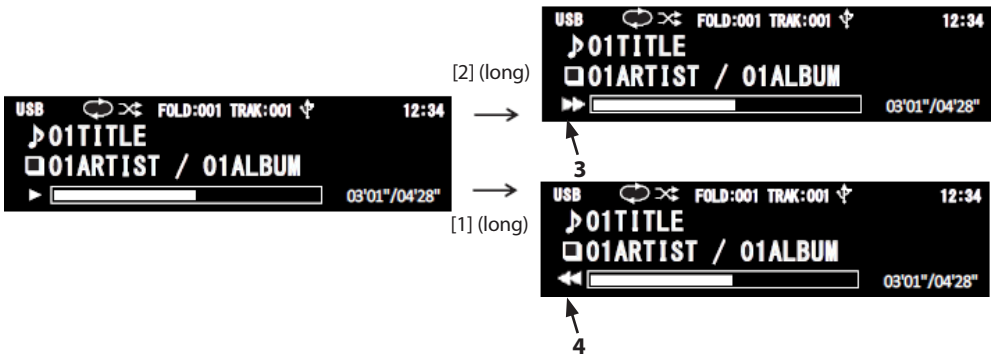


MNUD-01-428

Fast-forward/Fast-rewind

While playing a track, depressing [2] button (2) fast-forwards the track until releasing [2] button. Fast-forward label (3) is displayed while depressing [2] button.

While playing a track, depressing [1] button (1) fast-rewinds the track until releasing [1] button. Fast-rewind label (4) is displayed while depressing [1] button.

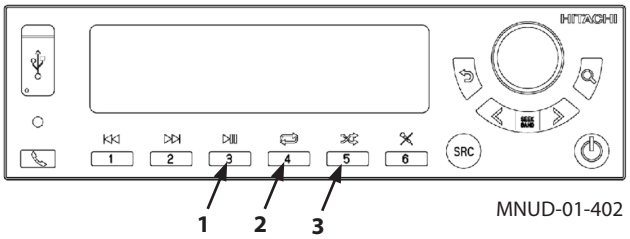


MNUD-01-429

Pause/Playback

Pressing [3] button (1) while playing a track pauses playback. PAUSE label (4) is displayed.

Pressing [3] button (1) again starts playing from where it was paused.



MNUD-01-402

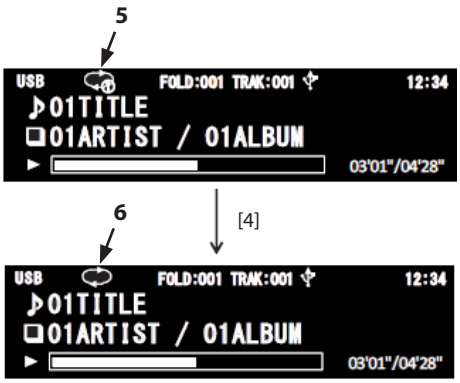


MNUD-01-430

Repeat

Pressing [4] button (2) plays the same track repeatedly. REPEAT label (5) is displayed.
Pressing [4] button (2) again plays the same album or folder repeatedly. REPEAT label (6) is displayed.

NOTE: This function is not applicable depending on the connected device.



MNUD-01-431

Random

Pressing [5] button (3) plays the tracks in random order. RANDOM label (7) is displayed.

NOTE: This function is not applicable depending on the connected device.

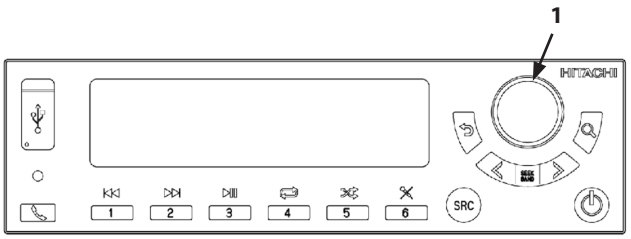


MNUD-01-432

Setting Screens

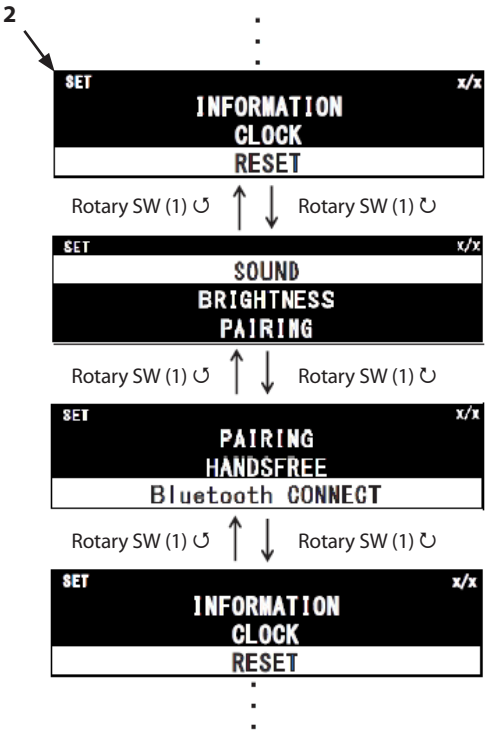
Allow changes to the various settings.

Press rotary switch (1) from any source screen to display setting screen (2).
Or select SETTING from the source selection operation.
Refer to page *1-188* "Selecting Source" for details.



MNUD-01-402

There are 7 setting menu and their submenu.
Rotate rotary switch (1) and highlight a desired menu to set, and push rotary switch (1) to display its submenu.



MNUD-01-451

			Default Setting
SOUND	*	BALANCE	0
	*	TREBLE	0
	*	BASS	0
	*	LOUDNESS	OFF
BRIGHTNESS	*	DISPLAY	0
	*	SWITCHES	0
PAIRING			
HANDSFREE	*	AUTO ANSWER	OFF
Bluetooth® CONNECT	*	AUTO CONNECT	ON
		SELECT	
		DELETE	
INFORMATION		SOUND	
		BRIGHTNESS	
		HANDSFREE	
		Bluetooth® CONNECT	
		REGION	
		VERSION	
CLOCK	*	DISP	OFF
		TIME	
RESET			

Reset Settings

To reset the setting values, select RESET and press rotary switch (1). "RESET ALL SETTINGS?" appears.



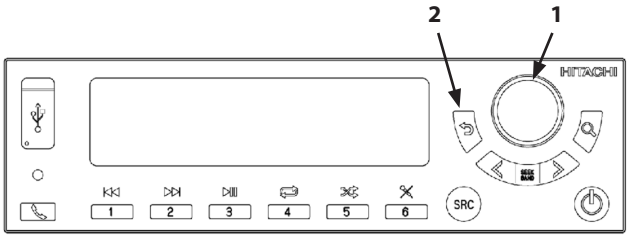
MNUD-01-434

Highlight "YES" by rotating rotary switch (1) and press rotary switch (1). The setting for all the items with an asterisk mark (*) in the above chart will be reset to the default setting.

Select "NO" to cancel the setting reset.

Sound Setting

1. From "SOUND" setting menu, highlight the desired item to adjust by rotating rotary switch (1) and push rotary switch (1).
2. The setting screen appears.
3. Make adjustment by rotating rotary switch (1).
4. Push rotary switch (1) to fix the adjustment.
5. Pressing return button (2) cancels the setting and it returns to the Menu screen.



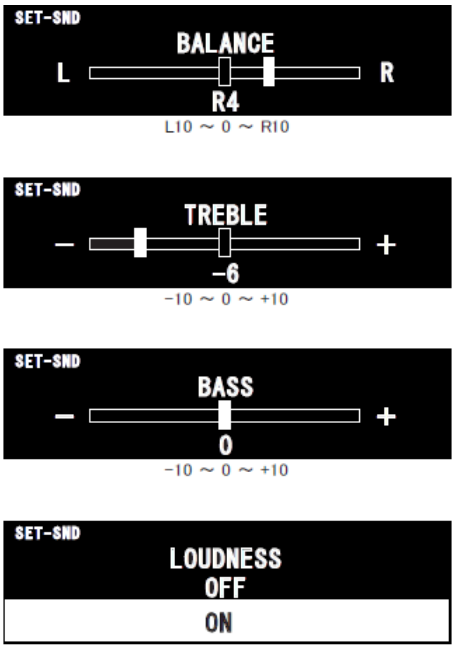
MNUD-01-402

- Left/Right Output Balance Adjustment
  Adjusts the output balance between the left and right speakers.
  There are 21 steps to this adjustment: L10 (left only) to L1, 0 (Center) and R1 to R10 (right only).

- Treble Output Adjustment
  Adjusts the high frequency part of the sound tone output to the speakers.
  There are 21 steps to this adjustment: +10 to 0 to -10.

- Bass Output Adjustment
  Adjusts the low frequency part of the sound tone output to the speakers.
  There are 21 steps to this adjustment: +10 to 0 to -10.

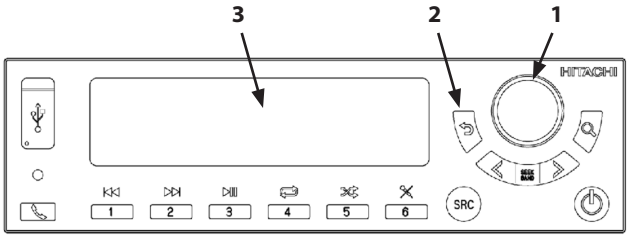
- Loudness Setting
  Adjusts the bass and treble ranges to be increased at low volumes to enhance hearing of those ranges.
  The setting is either ON or OFF.



MNUD-01-435

Brightness Adjustment

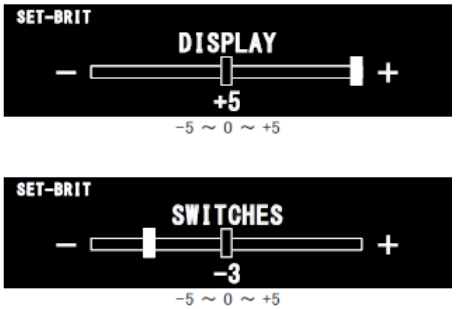
1. From "BRIGHTNESS" setting menu, highlight the desired item to adjust by rotating rotary switch (1) and push rotary switch (1).
2. The setting screen appears.
3. Make adjustment by rotating rotary switch (1).
4. Push rotary switch (1) to fix the adjustment.
5. Pressing return button (2) cancels the setting and it returns to the Menu screen.



MNUD-01-402

- LCD Brightness
  Adjusts the brightness of LCD (3).
  There are 11 steps to this adjustment: +5 to 0 to -5.

- Switch Brightness
  Adjusts the brightness of activated switches.
  There are 11 steps to this adjustment: +5 to 0 to -5.



MNUD-01-436

Pairing

The pairing authenticates up to 16 Bluetooth® devices for use with this radio unit.

NOTE: When the pairing is tried for the 17th device, it replaces any of the current 16 devices. To delete a Bluetooth® device, refer to the following page 1-208 for procedure.

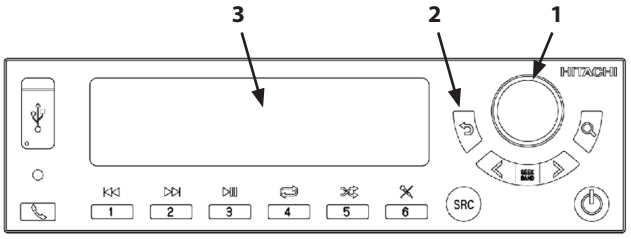
1. Highlight "PAIRING" menu by rotating rotary switch (1) and push rotary switch (1).
2. "PAIRING START?" message appears on LCD (3).
3. Push rotary switch (1) to start the pairing.
   Push Return button (2) to cancel the pairing.

IMPORTANT: The pairing should be completed within 180 seconds after pairing starts.

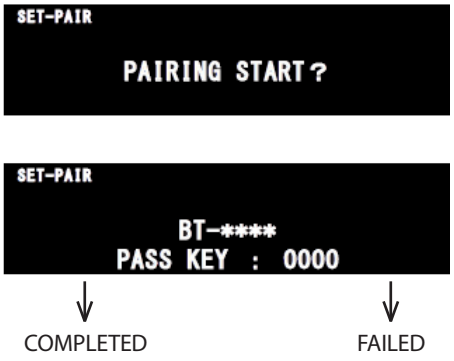
4. Once the Bluetooth® module of the radio unit completes preparations, "PASS KEY: 0000" and "BT-****" are displayed on the screen.

*NOTE: "****" is the smallest 4-digit of the Bluetooth® module address.*

5. If pairing is successful, "COMPLETED" is displayed. The Bluetooth® device operation is possible on this radio unit. Refer to page *1-195* for each operation.
6. If pairing fails due to timeout, etc., "FAILED" is displayed. Repeat the above steps again for pairing.



MNUD-01-402



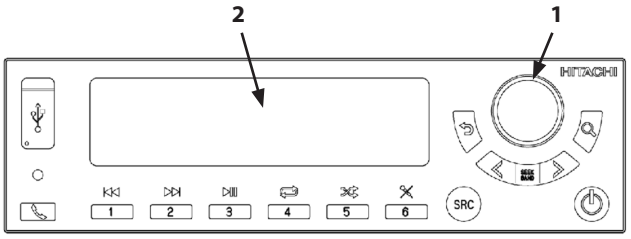
MNUD-01-438

Handfree Setting

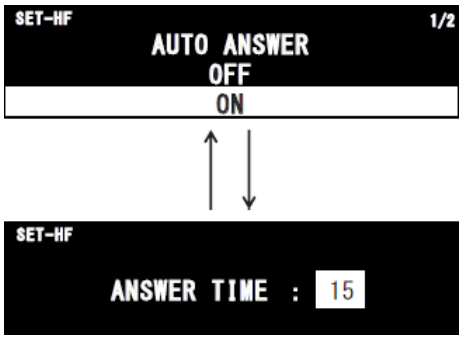
1. Highlight "HANDSFREE" menu by rotating rotary switch (1) and push rotary switch (1).
2. AUTO ANSWER setting appears on LCD (2).
3. Select "OFF" and push rotary switch (1) to disable the auto-answering to an incoming call.
4. Select "ON" and push rotary switch (1).
   The time period before answering can be set among 1 to 30 seconds. Rotating rotary switch (1) clockwise increases the time by one second. Rotating rotary switch (1) counterclockwise decreases the time by one second. Push rotary switch (1) to fix the time.

   This will automatically answer to an incoming call in the specified time period.

NOTE: The call quality may vary depending on the connected device.



MNUD-01-402

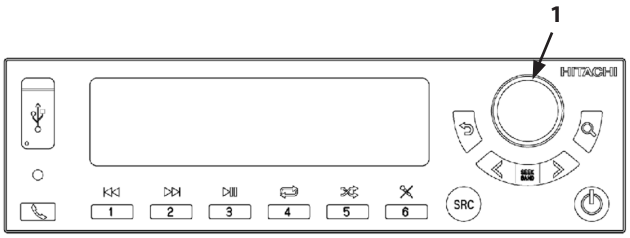


MNUD-01-439

Bluetooth® Connection

This specifies the connection method to the device after Bluetooth® pairing.

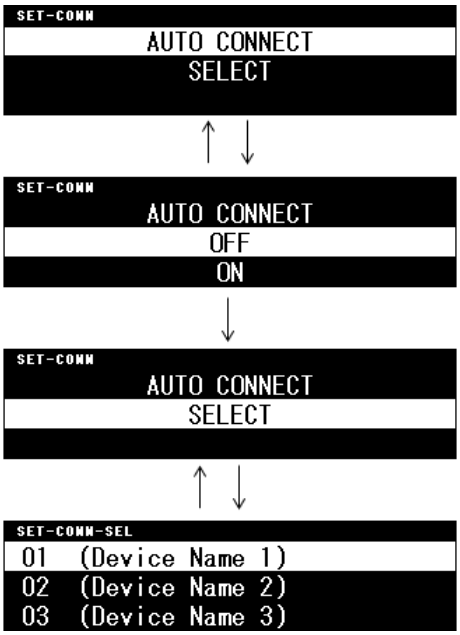
1. From "Bluetooth® CONNECT" menu, highlight "AUTO CONNECT" by rotating rotary switch (1) and push rotary switch (1).



MNUD-01-402

2. Select either OFF or ON and push rotary switch (1).

   OFF: Disable auto-connection to a Bluetooth® device.
   ON: Automatically connect to the available device for which pairing in Bluetooth® is completed.



MNUD-01-440

3. If "OFF" is selected in step 2, highlight "SELECT" from Bluetooth® CONNECT menu and push rotary switch (1).

NOTE: SELECT is effective only when AUTO CONNECT setting is OFF.

4. The available Bluetooth® device name or the device address are listed.
5. Select a device to connect by rotating rotary switch (1). Pressing rotary switch (1) starts connection to the selected device.

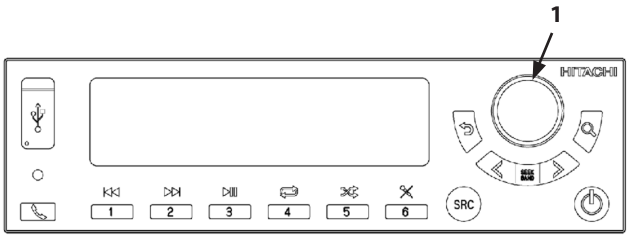
NOTE:

- *If there is no device to connect in Bluetooth®, "NO DEVICE" is displayed.*
- *The device name is obtained when connecting the first time to the device after ACC ON. If the device name is changed after connection, the listed device name will not be updated.*

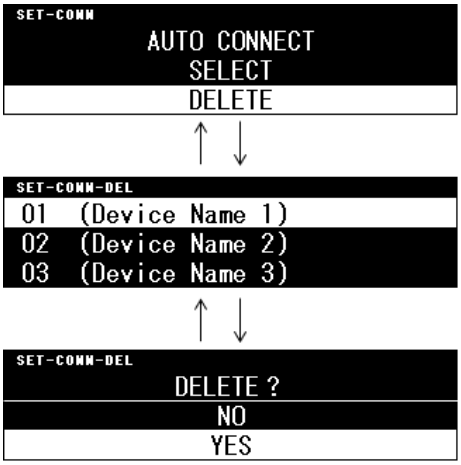
Deleting Bluetooth® Device

The selected device is deletec from the device list from Bluetooth® CONNECT - DELETE menu.

Highlight a desired device and push rotary switch (1). Select "YES" and push rotary switch (1) to delete the selected device.



MNUD-01-402



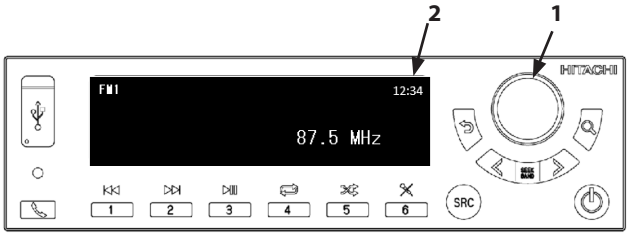
MNUD-01-441

Clock Display

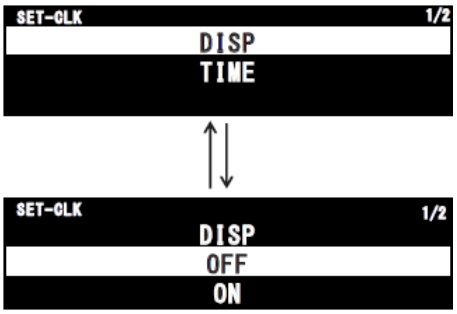
The current time is displayed on LCD (2).

1. From "CLOCK" menu, highlight "DISP" by rotating rotary switch (1) and push rotary switch (1).
2. Highlight a desired setting and push rotary switch (1).

   OFF: No time display
   ON: Time display in 24-hour format



MNUD-01-402



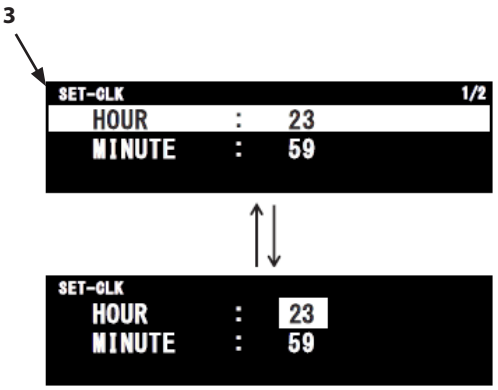
MNUD-01-442

Time Adjustment

NOTE: When the machine battery runs out, the clock becomes 00:00.

1. From "CLOCK" menu, highlight "TIME" by rotating rotary switch (1) and push rotary switch (1).
2. The time setting screen (3) appears.
3. Highlight "HOUR" and push rotary switch (1). The hour can be set between 0 and 23.

   Rotating rotary switch (1) clockwise increases number. Rotating rotary switch (1) counterclockwise decreases number.
4. Push rotary switch (1) to fix the hour and returns to the time setting screen (3).
5. Adjust "MINUTE" in the same manner. The minute can be set between 0 and 59.



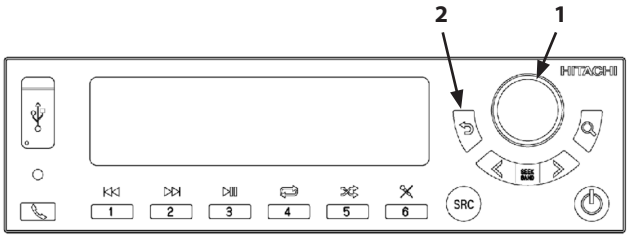
MNUD-01-444

Information

The current setting values are displayed.

1. From "INFORMATION" menu, highlight a desired setting by rotating rotary switch (1) and push rotary switch (1).
2. The current setting(s) are displayed. If there are 4 or more submenu, rotate rotary switch (1) to display them.

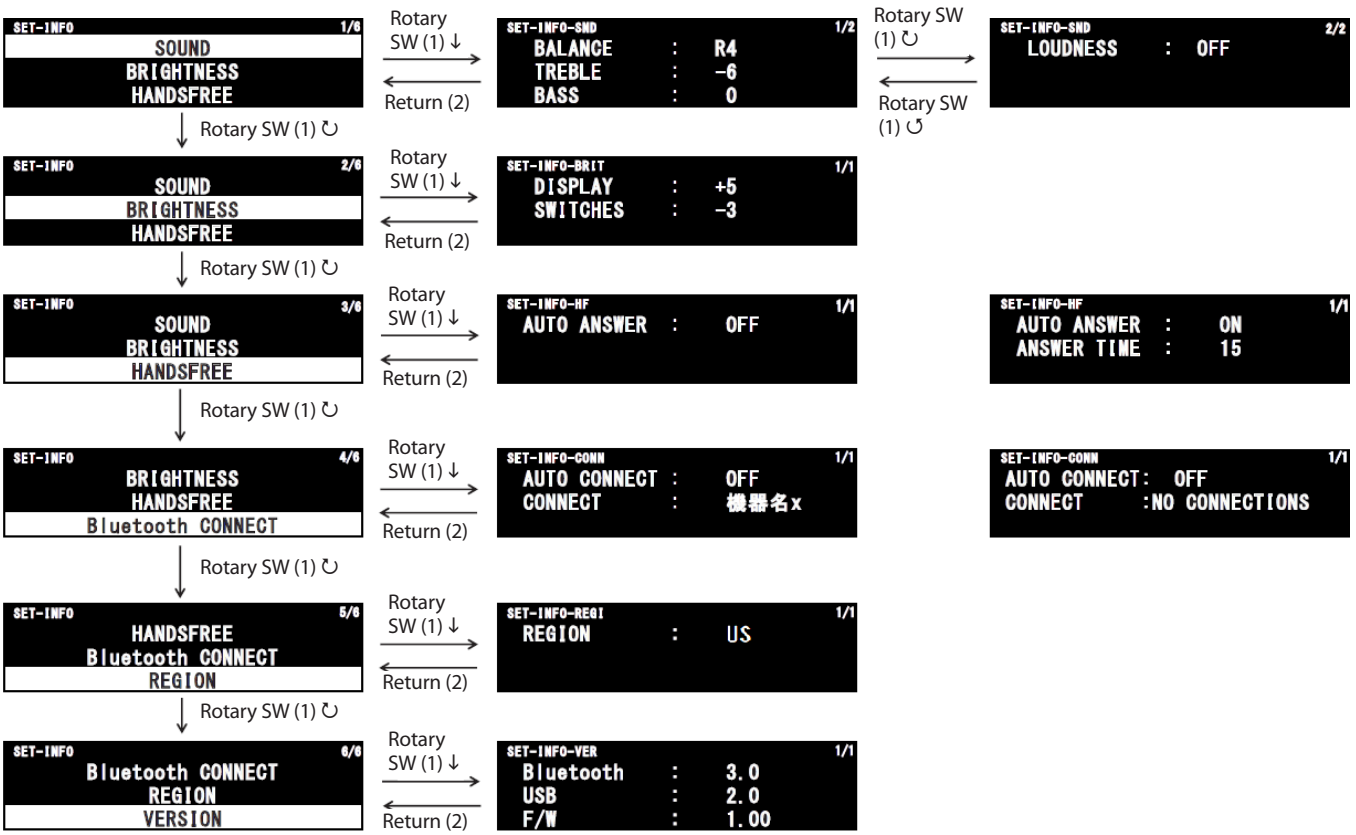
NOTE: The REGION setting and VERSION information are additionally displayed in this menu.



MNUD-01-402

- Region Display
  Make sure the region displayed is "US."
  AE: Europe, Asia, Australia
  JP: Japan
  US: USA, Canada
  SA: Latin America

- Version Display
  Displays the version of the radio unit's firmware, Bluetooth®, and USB protocol.



MNUD-01-445US

Digital Radio Unit (External Microphone)

Control Panel

1- POWER button

Turns the device ON/OFF.

2- SRC button

Switches the source
(FM1→FM2→AM→AUX→Bluetooth®).

3- Search button

Makes auto presets (FM/AM).

4- Return button

Returns to the previous screen while setting operation.

5- Hands-Free button

Receives mobile phone signal. Makes a redial call.

6- Rotary switch

Adjust the volume.

Switches between menu items and makes various settings.

7- SEEK BAND+/SEEK BAND- buttons

Adjusts radio frequency.

8- PRESET buttons ([1] to [6])

Calls up/registers preset frequencies.

Operates the connected Bluetooth®

9- MIC

Microphone for hands-free operation.

10- LCD

Refer to the following page.

11- Power Connector

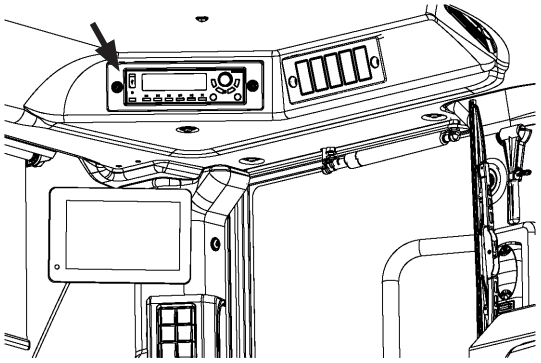
Power inlet and machine information input.

12- Antenna Port (for Analog Radio)

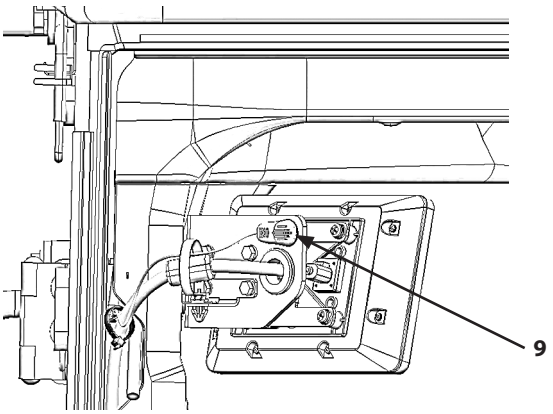
Connect the antenna to receive AM/FM radio.

13- Microphone Port (for Hands-free)
Connect the Microphone for Hands - free.

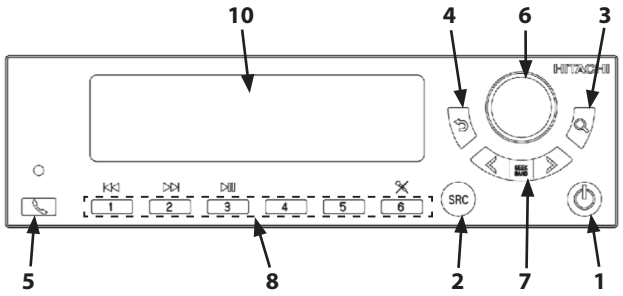
NOTE: There is an AUX indication, but it cannot be used.



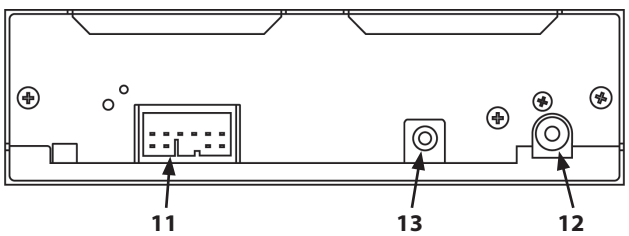
MNUD-01-401



MNTK-01-055



MPTC-01-068



MPTC-01-059

LCD Display

1- Information section

Indicates the source name, frequency, service name, etc. in characters and/or numbers.

2- Source label

Indicates the selected source name.

3- ST label

Lights to indicate stereo reception when FM are selected.

4- Bluetooth® label

Lights when connected to a Bluetooth® compatible device.

5- Clock

Current time in 24 h format.

6- Menu/List title

Indicates the title of the selected menu, source, program type.

7- List No.

Indicates the selected list number among total selections.

8- Volume display

Indicates the volume of currently selected source.



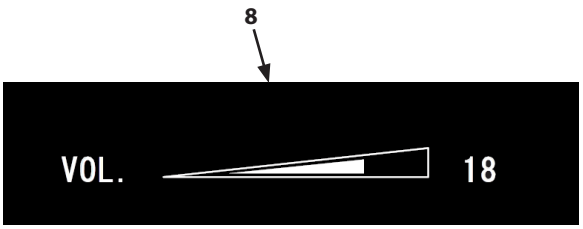
MPTC-01-060



MPTC-01-061



MNUD-01-406



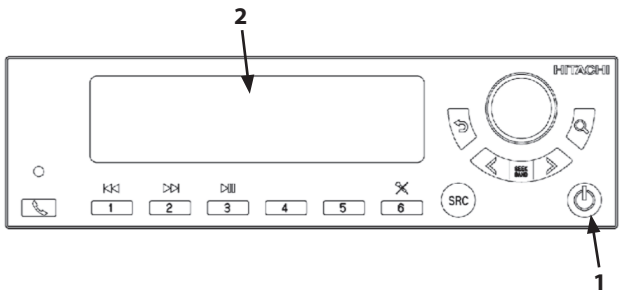
MNUD-01-405

Basic Operation

Turn ON the device

When the machine starter key is set to ON or ACC, the previously selected source is displayed on LCD (2).
If the LCD displays nothing, press power button (1). The previously selected source appears on the LCD.

NOTE: When the starter key is turned to OFF when the radio unit is in the standby mode, the radio unit starts up in the standby mode when the key is turned to ON or ACC. Refer to "Turn OFF the device" for the standby mode.



MPTC-01-068

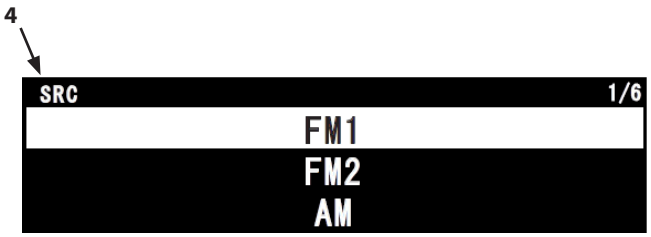
Turn OFF the device

When the machine starter key is set to ON or ACC, the pressing power button (1) turns off the LCD. The power button (1) remains lit on (standby mode).

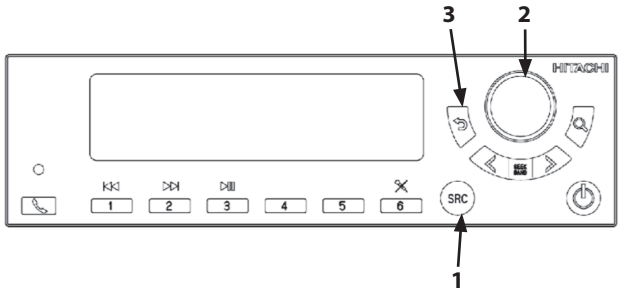
When the machine starter key is set to OFF with the radio unit is powered on, power button (1) and LCD (2) are both turned off.

Selecting Source

Long depressing SRC button (1) displays the source selection screen (4).

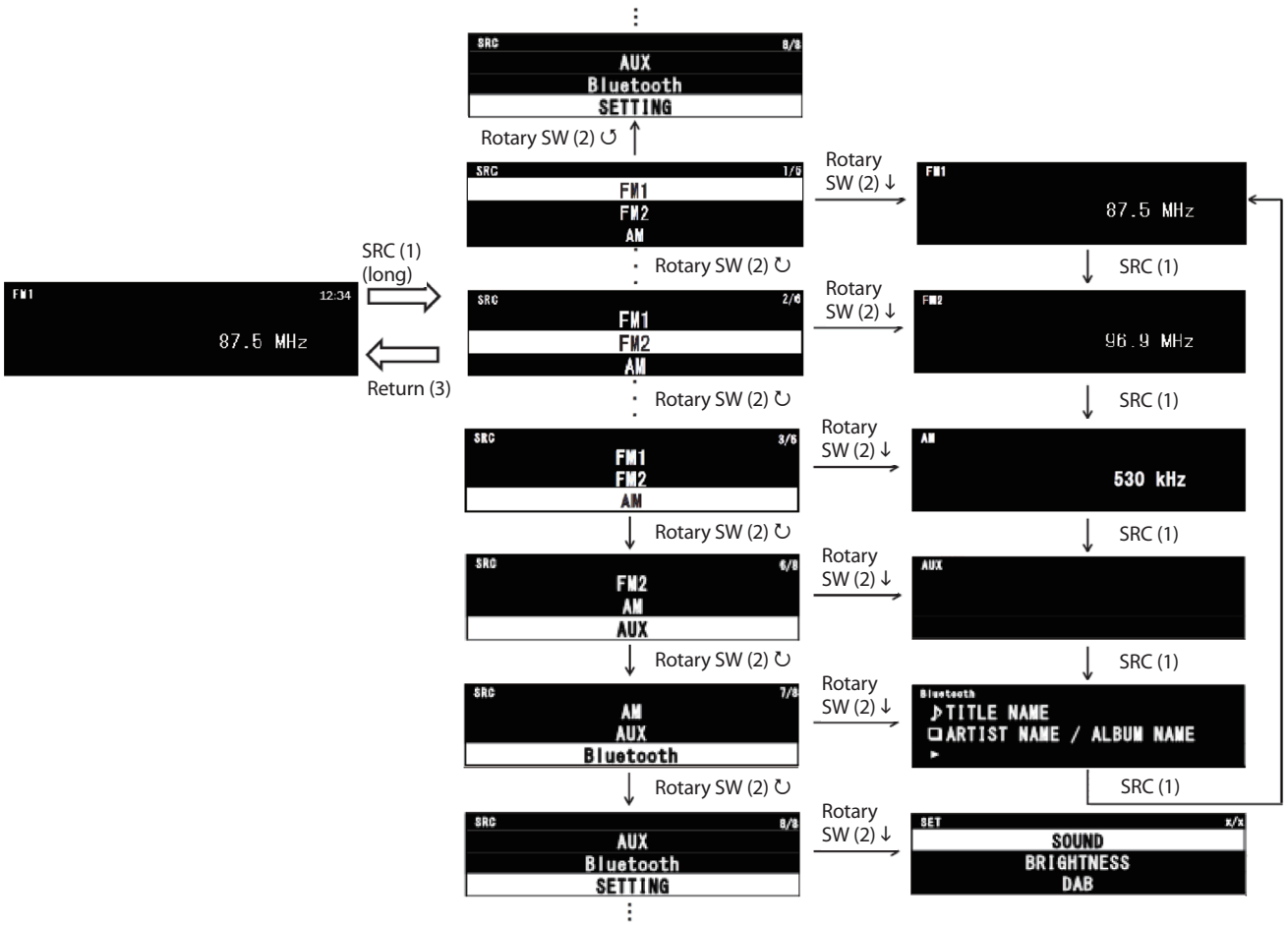


MNUD-01-450



MPTC-01-068

- Rotate rotary switch (2) to highlight a desired source (FM1⇆FM2⇆AM⇆AUX⇆Bluetooth®⇆←SETTING⇆FM1).
- Press rotary switch (2) while selecting a source to display its sub-sources.
- Pressing SRC button (1) on each source screen moves to the screen to the next source screen (FM1→FM2→AM→AUX→Bluetooth®→FM1).



NOTE: There is an AUX indication, but it cannot be used.

MPTC-01-062

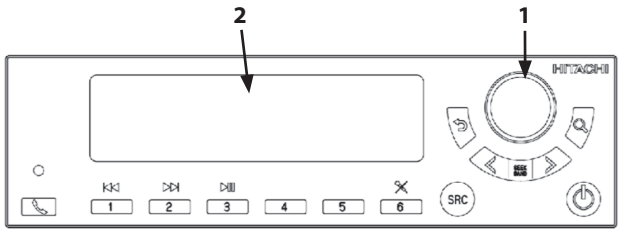
Volume Control

The volume control can be done individually for each source and for hands-free calling.

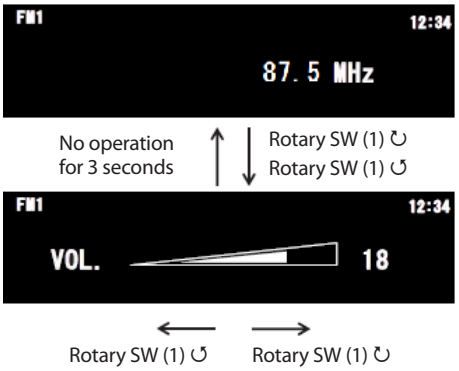
Rotating rotary switch (1) clockwise increases the volume. Rotating rotary switch (1) counterclockwise decreases the volume.

The volume level is selected between 0 (mute) and 32.

NOTE: The screen returns to the source screen when no operation is made for 3 seconds.



MPTC-01-068



MNUD-01-416

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CAUTION:

- **Do not operate the radio or other audio equipment while driving or working.**
- **The speaker volume may vary depending on the source, radio, Bluetooth® audio or handsfree phone. Adjust to an appropriate volume, such as by changing the volume of the Bluetooth® compatible device.**

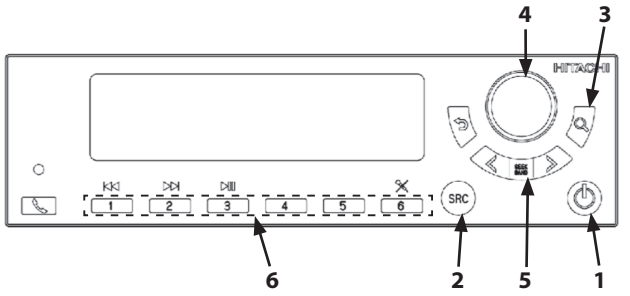
IMPORTANT: This device cannot connect to more than 1 Bluetooth® compatible device at a time.

FM/AM Radio Operation

CAUTION: Refrain from listening to the radio while operating the machine.

Receives both FM and AM radio.

NOTE: The only difference between FM1 and FM2 is the grouping of preset numbers; the function is the same.



MPTC-01-068

Control Panel

1- POWER button

Turns the radio ON/OFF.

2- SRC button

Switches the source (FM1→FM2→AM→AUX→Bluetooth®).

3- Search button

FM/AM auto presets.

4- Rotary switch

Adjust the volume.

5- SEEK BAND+/SEEK BAND- buttons

Adjusts radio frequency.

6- PRESET buttons ([1] to [6])

Calls up/registers preset frequencies.

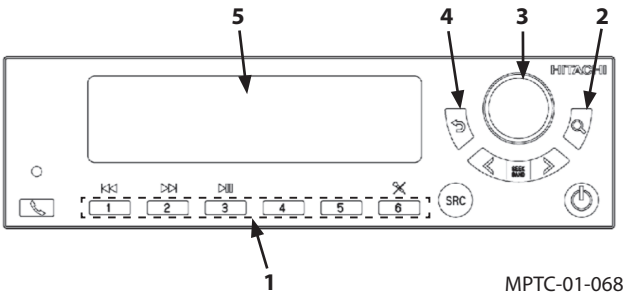
NOTE: There is an AUX indication, but it cannot be used.

Station Presetting Procedure

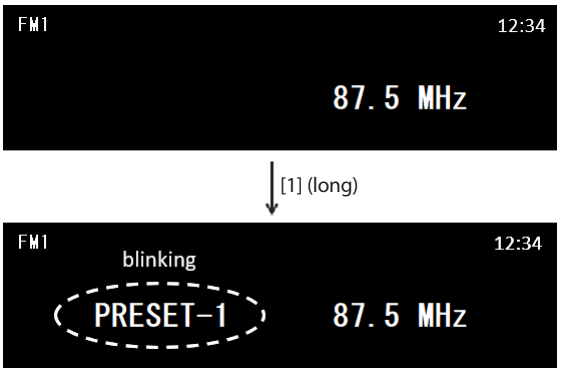
1. Select the desired station. Refer to the following page "Tuning Procedure".

2. Press and hold a desired PRESET button (1) for more than 1 second. The current station is preset to the selected number of button. When the station is preset, the "PRESET-x" blinks for 3 seconds on LCD (5).
   Once the presetting is complete for a PRESET button, the radio will be tuned to the preset station when the PRESET button is pressed.

3. To change the preset station, follow the same steps 1 and 2.



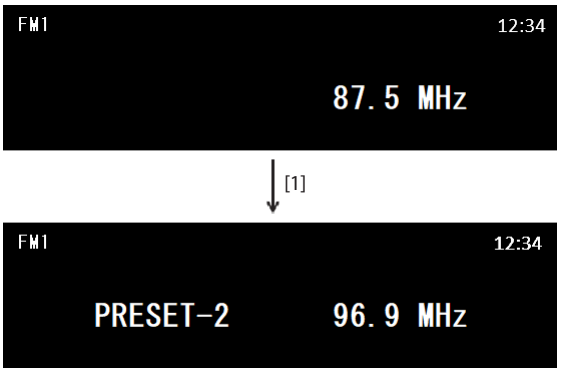
MPTC-01-068



MNUD-01-411US

Calling up Preset Stations

Press any of PRESET buttons (1) to tune and receive the registered station frequency. "PRESET-x" with the selected number is displayed on LCD (5).



MNUD-01-412US

Factory Default Setting

PRESET	AM (kHz)	FM (MHz)
1	530	87.5
2	910	96.9
3	1000	97.9
4	1100	98.9
5	1540	106.9
6	1710	107.9

IMPORTANT: The PRESET data will not be erased even disconnected from the battery. The changed PRESET data is stored in the internal memory at ACC OFF, however, if ACC and battery are both OFF at the same time, the changed data is not stored.

Auto-Preset Function

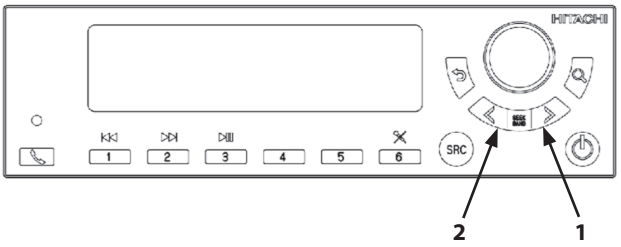
By keep depressing search button (2), up to 6 stations with best reception can be automatically registered to PRESET buttons (1) (auto-preset function).
"AUTO PRESET" blinks on LCD (5) while auto-preset is running.
The station frequency is registered from No. 1 through No. 6 in frequency order.



MNUD-01-413

Tuning Procedure

- Automatic Search Function (Auto Seek)



MPTC-01-068

Press and hold SEEK BAND+ button (1) and/or SEEK BAND- button (2) for more than half a second, then release. Automatic search for the station starts to run and stops when a station is received.

Press SEEK BAND+ button (1) to search a higher frequency.
Press SEEK BAND- button (2) to search a lower frequency.

If no stations with good reception can be found after searching the entire band, the radio continues searching. Press either SEEK BAND button (1)(2) to cancel the searching operation.

NOTE: If the receiving radio waves are weak, i. e. such as when the machine is located between high rising buildings, etc., use the manual tuning procedure to select the desired station.



MNUD-01-414US

- Manual Tuning Procedure (Manual Seek)

Press SEEK BAND+ button (1) and/or SEEK BAND- button (2) until the desired station is reached.
Each time SEEK BAND buttons (1)(2) is pressed, the frequency changes at an interval.

Press SEEK BAND+ button (1) to increase the frequency.
Press SEEK BAND- button (2) to decrease the frequency.

NOTE: AM frequency interval: 10 kHz
FM frequency interval: 0.2 MHz



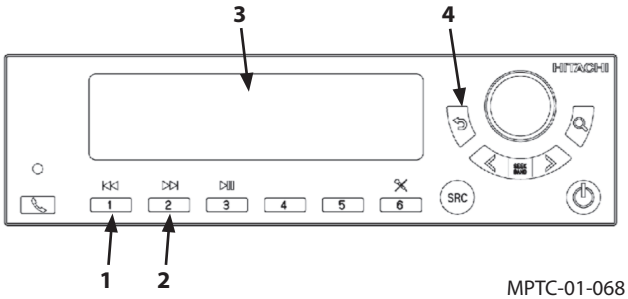
MNUD-01-415US

Bluetooth® Input

IMPORTANT: A special Bluetooth® unit is necessary to use this function.

Specified Characteristics

Frequency	2.4 GHz
Version	5.0
Class	1
Applicable profile	A2DP, AVRCP, HFP, SPP
Max. Number of Pairing Device	7



MPTC-01-068

The audio files can be played via Bluetooth® connection with a cell phone or Bluetooth® audio playback device.

NOTE: Refer to page 1-228 for pairing.
Refer to page 1-230 for device connection.

The track title, artist name, album name are displayed on LCD (3).
If they are too long to display in one line, separately displayed as shown to the right. Press return button (4) to change the screens.

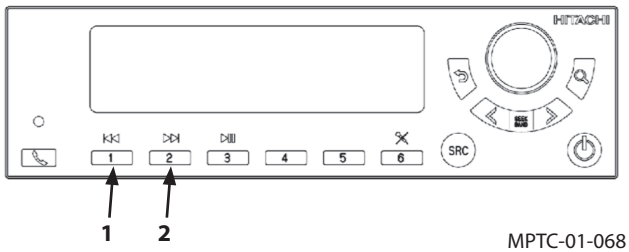


MPTC-01-063

Change Track

Press [2] button (2) to start playing the next track.

Press [1] button (1) to play the previous track.
According to the connected device setting, pressing [1] button (1) returns to the top of the currently playing track. Then press [1] again to play the previous track.

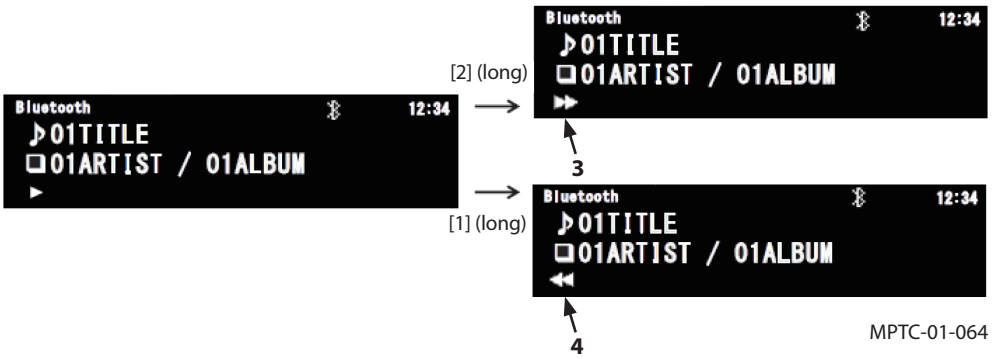


MPTC-01-068

Fast-forward/Fast-rewind

While playing a track, depressing [2] button (2) fast-forwards the track until releasing [2] button. Fast-forward label (3) is displayed while depressing [2] button.

While playing a track, depressing [1] button (1) fast-rewinds the track until releasing [1] button. Fast-rewind label (4) is displayed while depressing [1] button.

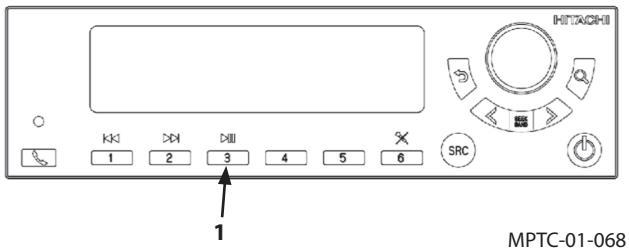


MPTC-01-064

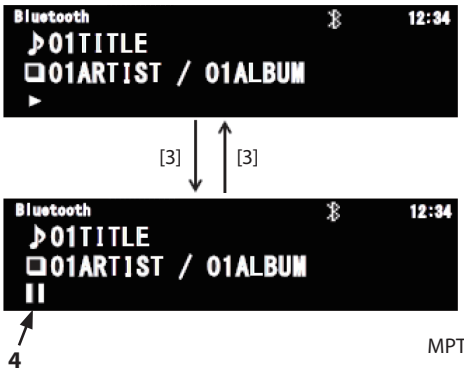
Pause/Playback

Pressing [3] button (1) while playing a track pauses playback. PAUSE label (4) is displayed.

Pressing [3] button (1) again starts playing from where it was paused.



MPTC-01-068

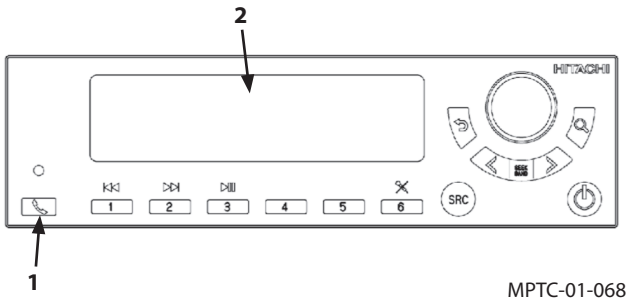


MPTC-01-065

Hands-free Call

IMPORTANT: A special Bluetooth® connected cellphone is necessary to use this function.

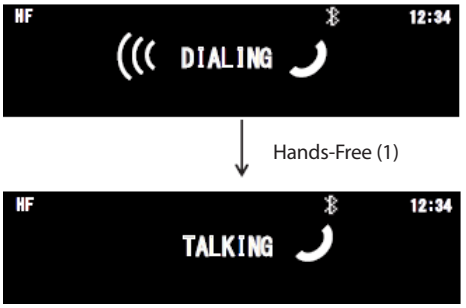
Allows handsfree conversations when using a Bluetooth® (HFP protocol) compatible cellphone.



MPTC-01-068

- Making a Call
  When calling from the cellphone, "DIALING" is displayed on LCD (2) and the sound from dialing is heard from the speakers. The voice of the other end party is heard from the speakers when connected.

- Redial
  Regardless of the band (or operation), long pressing Hands-Free button (1) dials to the last incoming dial number since the ACC was turned ON.
  "DIALING" is displayed on LCD (2) and the sound from dialing is heard from the speakers. The voice of the other end party is heard from the speakers when connected.
  Pressing Hands-Free button (1) during talk ends call.



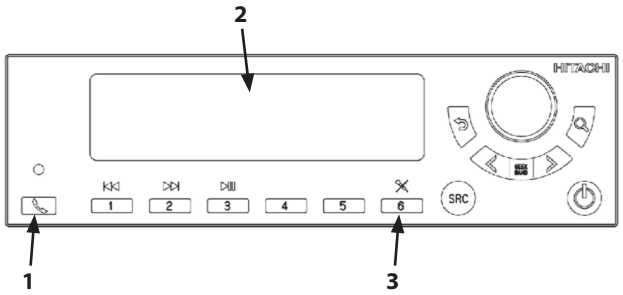
MNUD-01-423

NOTE: The redial function may not work if the length of the previous incoming call was short.

- Incoming Call
  When a call comes in, "CALLING" is displayed on LCD (2), regardless of the band (or operation), and the speaker rings with the call.
  Press Hands-Free button (1) to answer.

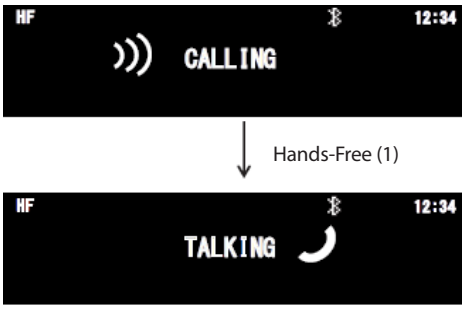
NOTE:

- *Even if the source of the radio unit is OFF when a call comes in, the source automatically turns ON, and "CALLING" is displayed and the speaker sounds ringing.*
- *According to the setting, auto-answer to the incoming call is possible. Refer to page 1-229 for the setting procedure.*



MPTC-01-068

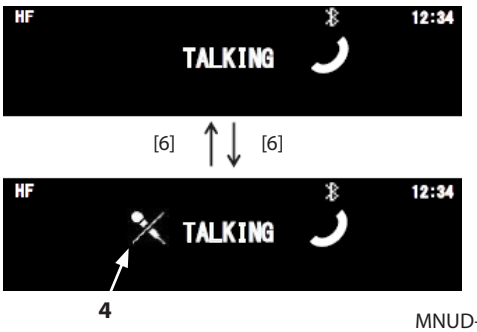
- Reject call
  When a call comes in, keep depressing Hands-Free button (1) rejects and ends the call. The radio returns to the band (or operation) before the call.



MNUD-01-424

- MIC Mute
  A microphone for hands-free talking is built-in the front panel of the radio unit.
  Pressing [6] button (3) turns ON/OFF this microphone.
  When the microphone is OFF, MUTE label (4) is displayed.

NOTE: MIC mute is canceled at each call.

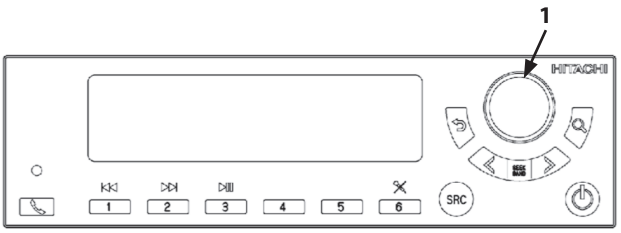


MNUD-01-425

Setting Screens

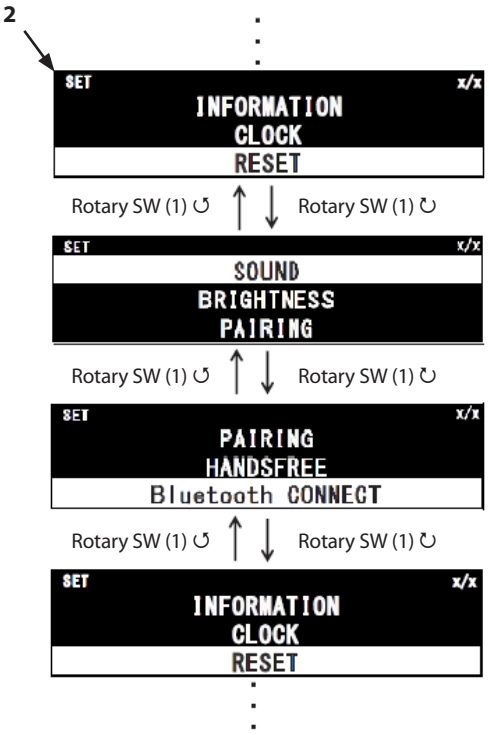
Allow changes to the various settings.

Press rotary switch (1) from any source screen to display setting screen (2).
Or select SETTING from the source selection operation.
Refer to page *1-214* "Selecting Source" for details.



MPTC-01-068

There are 7 setting menu and their submenu.
Rotate rotary switch (1) and highlight a desired menu to set, and push rotary switch (1) to display its submenu.



MNUD-01-451

			Default Setting
SOUND	*	BALANCE	0
	*	TREBLE	0
	*	BASS	0
	*	LOUDNESS	OFF
BRIGHTNESS	*	DISPLAY	0
	*	SWITCHES	0
PAIRING			
HANDSFREE	*	AUTO ANSWER	OFF
Bluetooth® CONNECT	*	AUTO CONNECT	ON
		SELECT	
		DELETE	
INFORMATION		SOUND	
		BRIGHTNESS	
		HANDSFREE	
		Bluetooth® CONNECT	
		REGION	
		VERSION	
CLOCK	*	DISP	OFF
		TIME	
RESET			

Reset Settings

To reset the setting values, select RESET and press rotary switch (1). "RESET ALL SETTINGS?" appears.



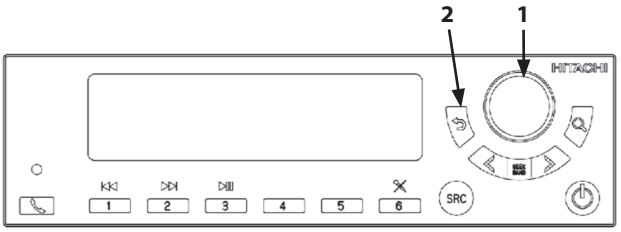
MNUD-01-434

Highlight "YES" by rotating rotary switch (1) and press rotary switch (1). The setting for all the items with an asterisk mark (*) in the above chart will be reset to the default setting.

Select "NO" to cancel the setting reset.

Sound Setting

1. From "SOUND" setting menu, highlight the desired item to adjust by rotating rotary switch (1) and push rotary switch (1).
2. The setting screen appears.
3. Make adjustment by rotating rotary switch (1).
4. Push rotary switch (1) to fix the adjustment.
5. Pressing return button (2) cancels the setting and it returns to the Menu screen.



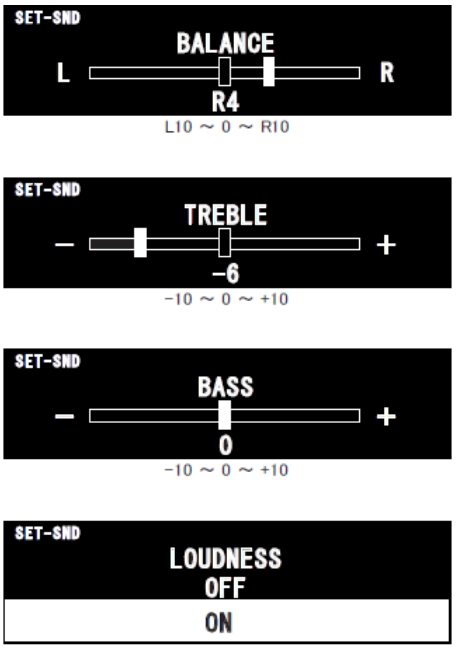
MPTC-01-068

- Left/Right Output Balance Adjustment
  Adjusts the output balance between the left and right speakers.
  There are 21 steps to this adjustment: L10 (left only) to L1, 0 (Center) and R1 to R10 (right only).

- Treble Output Adjustment
  Adjusts the high frequency part of the sound tone output to the speakers.
  There are 21 steps to this adjustment: +10 to 0 to -10.

- Bass Output Adjustment
  Adjusts the low frequency part of the sound tone output to the speakers.
  There are 21 steps to this adjustment: +10 to 0 to -10.

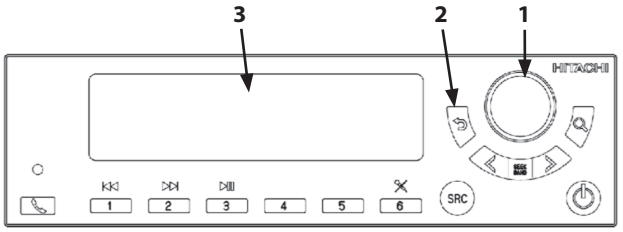
- Loudness Setting
  Adjusts the bass and treble ranges to be increased at low volumes to enhance hearing of those ranges.
  The setting is either ON or OFF.



MNUD-01-435

Brightness Adjustment

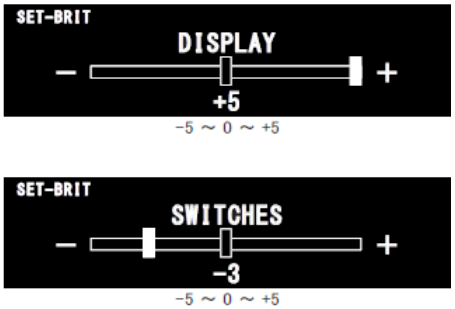
1. From "BRIGHTNESS" setting menu, highlight the desired item to adjust by rotating rotary switch (1) and push rotary switch (1).
2. The setting screen appears.
3. Make adjustment by rotating rotary switch (1).
4. Push rotary switch (1) to fix the adjustment.
5. Pressing return button (2) cancels the setting and it returns to the Menu screen.



MPTC-01-068

- LCD Brightness
  Adjusts the brightness of LCD (3).
  There are 11 steps to this adjustment: +5 to 0 to -5.

- Switch Brightness
  Adjusts the brightness of activated switches.
  There are 11 steps to this adjustment: +5 to 0 to -5.



MNUD-01-436

Pairing

The pairing authenticates up to 7 Bluetooth® devices for use with this radio unit.

NOTE: When the pairing is tried for the 8th device, it replaces any of the current 7 devices. To delete a Bluetooth® device, refer to the following page 1-231 for procedure.

1. Highlight "PAIRING" menu by rotating rotary switch (1) and push rotary switch (1).
2. "PAIRING START?" message appears on LCD (3).
3. Push rotary switch (1) to start the pairing.
   Push Return button (2) to cancel the pairing.

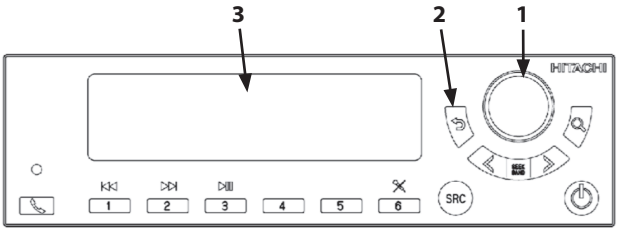
IMPORTANT:

- **The pairing should be completed within 180 seconds after pairing starts.**
- **Do not turn off the key switch during pairing settings.**

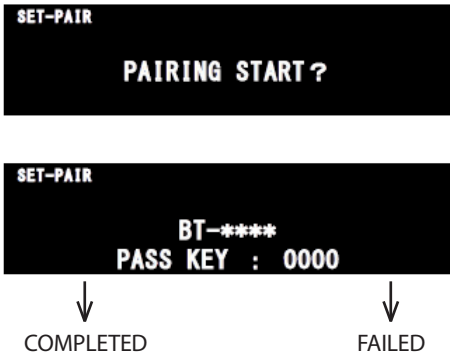
4. Once the Bluetooth® module of the radio unit completes preparations, "PASS KEY: 0000" and "BT-****" are displayed on the screen.

*NOTE: "****" is the smallest 4-digit of the Bluetooth® module address.*

5. If pairing is successful, "COMPLETED" is displayed. The Bluetooth® device operation is possible on this radio unit. Refer to page *1-221* for each operation.
6. If pairing fails due to timeout, etc., "FAILED" is displayed. Repeat the above steps again for pairing.



MPTC-01-068



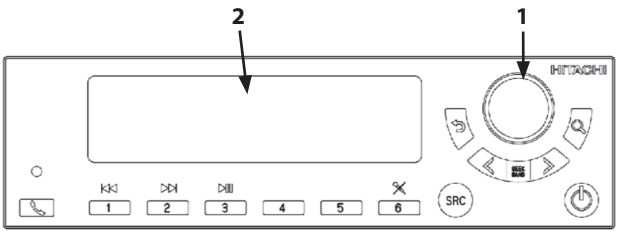
MNUD-01-438

Handfree Setting

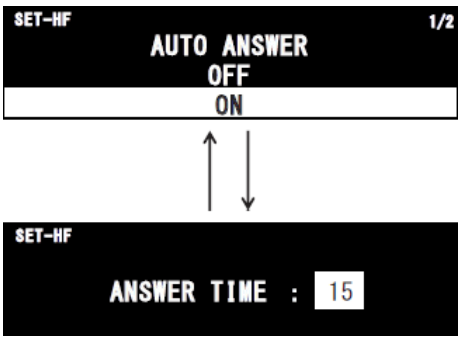
1. Highlight "HANDSFREE" menu by rotating rotary switch (1) and push rotary switch (1).
2. AUTO ANSWER setting appears on LCD (2).
3. Select "OFF" and push rotary switch (1) to disable the auto-answering to an incoming call.
4. Select "ON" and push rotary switch (1).
   The time period before answering can be set among 1 to 30 seconds. Rotating rotary switch (1) clockwise increases the time by one second. Rotating rotary switch (1) counterclockwise decreases the time by one second. Push rotary switch (1) to fix the time.

   This will automatically answer to an incoming call in the specified time period.

NOTE: The call quality may vary depending on the connected device.



MPTC-01-068

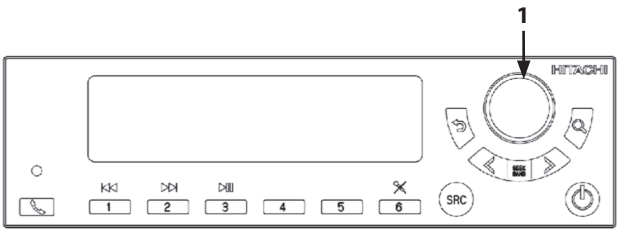


MNUD-01-439

Bluetooth® Connection

This specifies the connection method to the device after Bluetooth® pairing.

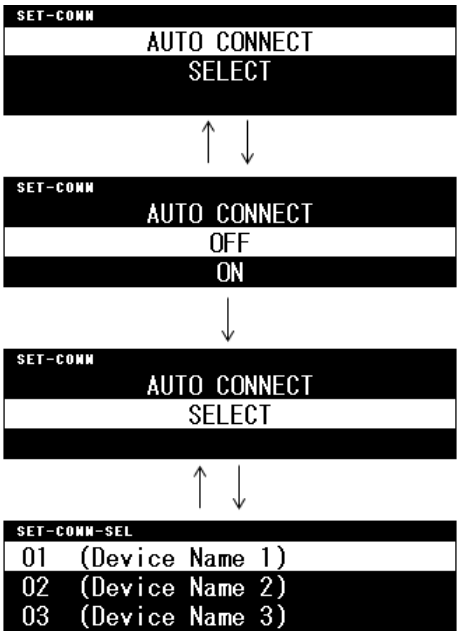
1. From "Bluetooth® CONNECT" menu, highlight "AUTO CONNECT" by rotating rotary switch (1) and push rotary switch (1).



MPTC-01-068

2. Select either OFF or ON and push rotary switch (1).

   OFF: Disable auto-connection to a Bluetooth® device.
   ON: Automatically connect to the available device for which pairing in Bluetooth® is completed.



MNUD-01-440

3. If "OFF" is selected in step 2, highlight "SELECT" from Bluetooth® CONNECT menu and push rotary switch (1).

NOTE: SELECT is effective only when AUTO CONNECT setting is OFF.

4. The available Bluetooth® device name or the device address are listed.
5. Select a device to connect by rotating rotary switch (1). Pressing rotary switch (1) starts connection to the selected device.

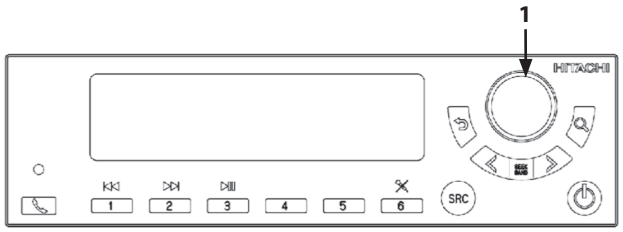
NOTE:

- *If there is no device to connect in Bluetooth®, "NO DEVICE" is displayed.*
- *The device name is obtained when connecting the first time to the device after ACC ON. If the device name is changed after connection, the listed device name will not be updated.*

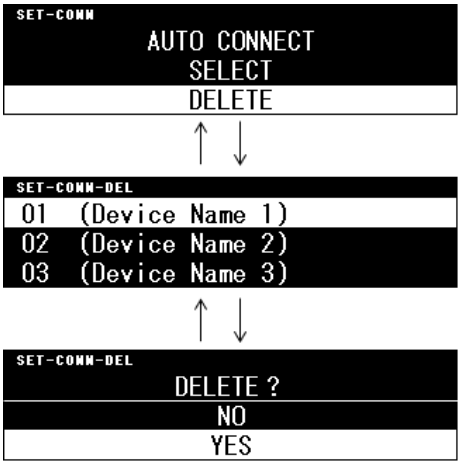
Deleting Bluetooth® Device

The selected device is deletec from the device list from Bluetooth® CONNECT - DELETE menu.

Highlight a desired device and push rotary switch (1). Select "YES" and push rotary switch (1) to delete the selected device.



MPTC-01-068



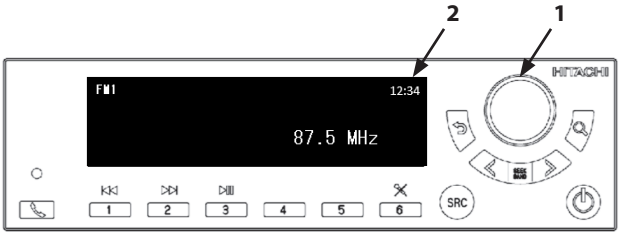
MNUD-01-441

Clock Display

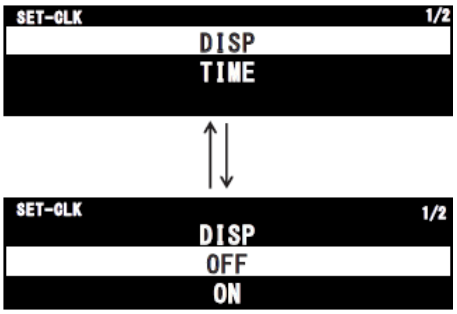
The current time is displayed on LCD (2).

1. From "CLOCK" menu, highlight "DISP" by rotating rotary switch (1) and push rotary switch (1).
2. Highlight a desired setting and push rotary switch (1).

   OFF: No time display
   ON: Time display in 24-hour format



MPTC-01-066



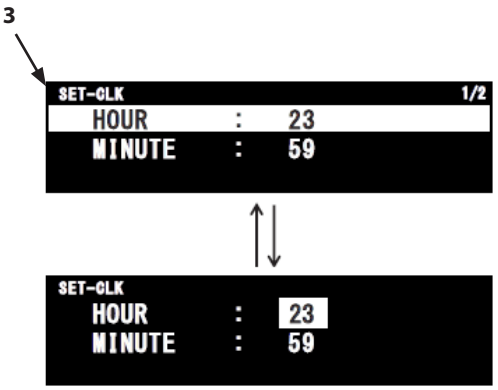
MNUD-01-442

Time Adjustment

NOTE: When the machine battery runs out, the clock becomes 00:00.

1. From "CLOCK" menu, highlight "TIME" by rotating rotary switch (1) and push rotary switch (1).
2. The time setting screen (3) appears.
3. Highlight "HOUR" and push rotary switch (1). The hour can be set between 0 and 23.

   Rotating rotary switch (1) clockwise increases number. Rotating rotary switch (1) counterclockwise decreases number.
4. Push rotary switch (1) to fix the hour and returns to the time setting screen (3).
5. Adjust "MINUTE" in the same manner. The minute can be set between 0 and 59.

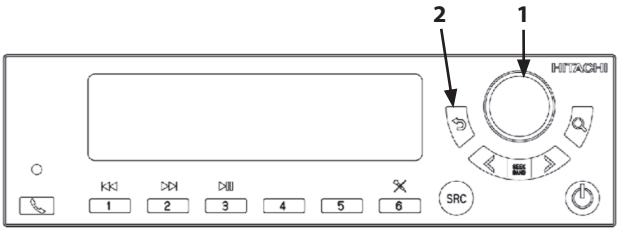


MNUD-01-444

Information

The current setting values are displayed.

1. From "INFORMATION" menu, highlight a desired setting by rotating rotary switch (1) and push rotary switch (1).
2. The current setting(s) are displayed. If there are 4 or more submenu, rotate rotary switch (1) to display them.

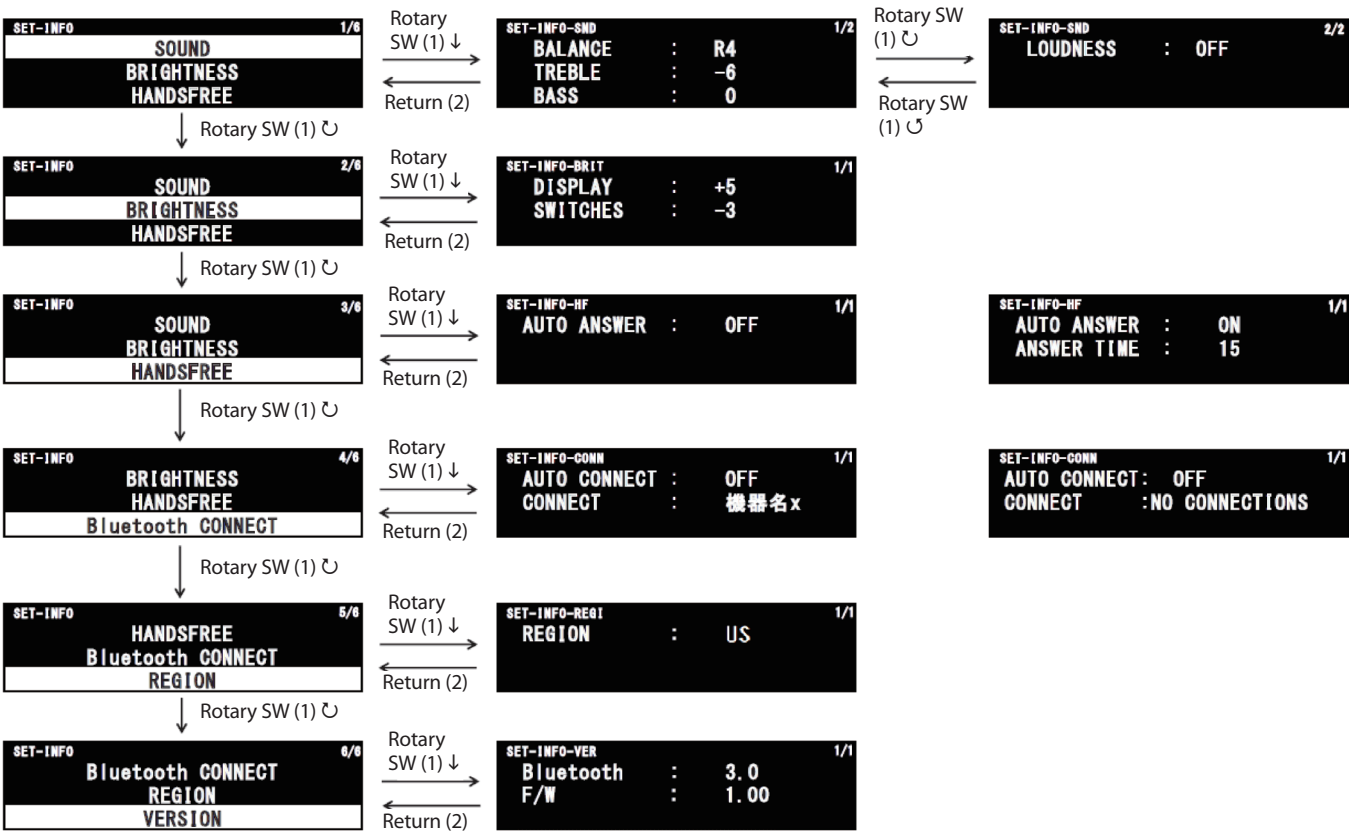


MPTC-01-068

NOTE: The REGION setting and VERSION information are additionally displayed in this menu.

- Region Display
  Make sure the region displayed is "US."
  AE: Europe, Asia, Australia
  JP: Japan
  US: USA, Canada
  SA: Latin America

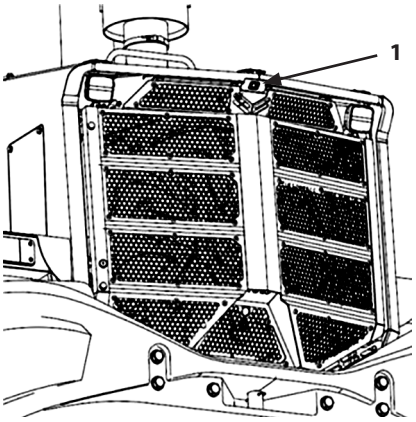
- Version Display
  Displays the version of the radio unit's firmware, Bluetooth®.



MPTC-01-067

Aerial Angle (Optional)

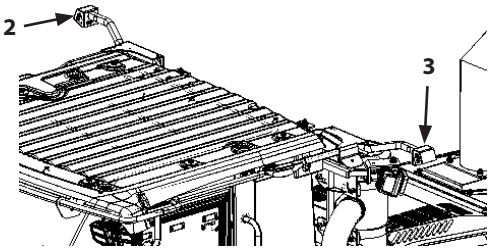
The rear view camera (1) is installed at the top of the rear grille, which provides the area view below the counterweight and to a specified distance behind the machine ("image to rear").
The right side camera (2) and left side camera (3) are installed at the top of the cab, which provides a single image of the machine surroundings composed of images from these side cameras (2)(3) ("Surrounding image").



MNFQ-01-313

"Aerial Angle" is a function for displaying the "image to rear" from rear view camera (1) and the "surrounding image" from machine right side camera (2) and machine left side camera (3) on the sub monitor (4).

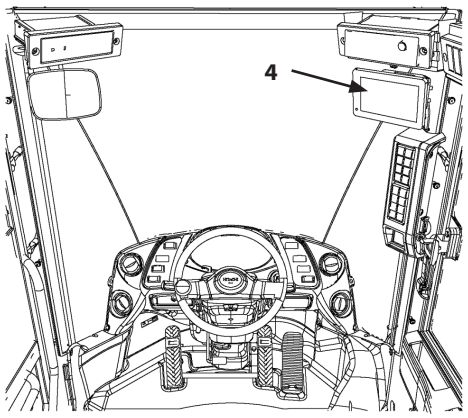
This provides the operator with additional assistance when checking obstacles around the machine.
The unaltered camera images can be displayed by pushing selector knob (5) on the right console.



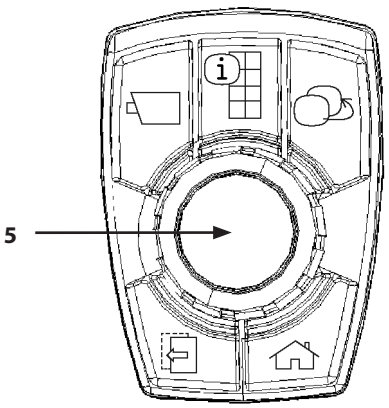
MNFQ-07-038

⚠ WARNING:

- **The images are displayed for the purpose of helping the operator check the area around the machine. People and objects displayed on the monitor may appear differently from their actual positions or distances. Some areas, such as near and under the machine, cannot be depicted by the cameras. Before moving the machine, always check the area around the machine thoroughly before moving it.**
- **Check visibility of the monitor image before operating the machine. If the visibility is poor, the field of vision cannot be ensured, which may result in serious personal injury or property damage.**
- **The installation position of cameras is adjusted to produce a good composite image. Do not make any alterations, such as changing the position of the machine rear camera (1), machine right side camera (2), and machine left side camera (3).**
- **If the image is difficult to see, clean the camera(s) and/or monitor to make the image clearer. Always ensure good footing when cleaning the cameras.**



MNUD-01-008



MNUD-01-252

NOTE: The surfaces of multi-function sub monitor (4) and the camera lenses are made of plastic. When cleaning, use a clean, water-dampened cloth and wipe lightly. Never use an organic solvent.

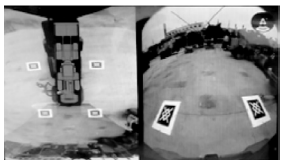
IMPORTANT:

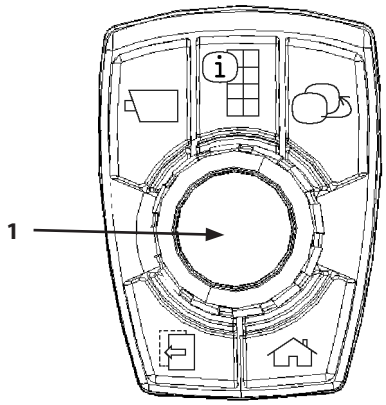
- **If there are any problems with the image on sub monitor (4), contact Authorized Dealer.**
- **After performing work that affects the installation position of the cameras (detachment of brackets or counterweight where cameras are mounted, camera replacement etc.), it may be necessary to redo the camera composition settings. Make sure camera images are displayed properly by using the inspection methods indicated in "Check Camera Images Used to Compose the Aerial Angle" in Chapter 7 "MAINTENANCE". If any camera images are not displayed properly, contact Authorized Dealer.**

Switching the Monitor Display

Turn selector knob (1) to switch between screens.

- Display Screen
  1- Image to Rear
  2- Surrounding Image + Image to Rear

Display Order	Image from	Sample Image
1	Rear Camera	Image to Rear 
2	Rear Camera Side Cameras	Surrounding Image + Image to Rear 

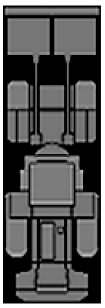


MNUD-01-252

NOTE: The image to be displayed during reverse driving can be fixed to the "Image to Rear" using the sub monitor menu. Refer to page 1-116 "Rear View Camera Monitor Reverse Interlocking Setting".

Machine Icon

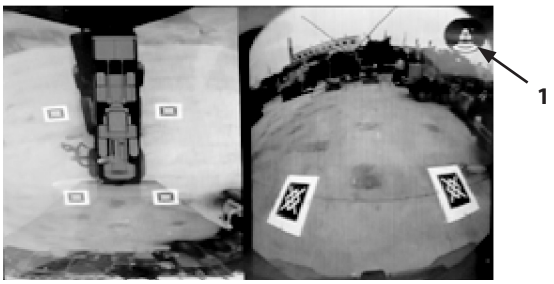
The machine icon is a bird's eye view of the machine from directly above it.
The machine icon on the monitor makes it possible to imagine the orientation of the machine and the position of the cab.



MNUD-01-048

Surrounding Image + Image to Rear

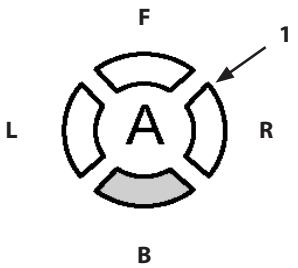
The surrounding image and image from the rear-facing camera are displayed.



MNUD-01-319

Camera Direction Guide Icons

Camera direction guide icon (1) indicate which camera the displayed image is from.
The arrow in the center of the icon indicates the front of the machine and which image(s) are displayed around the icon indicate which camera the image is from. As illustrated at right, the image from the rearview camera is displayed on the monitor.



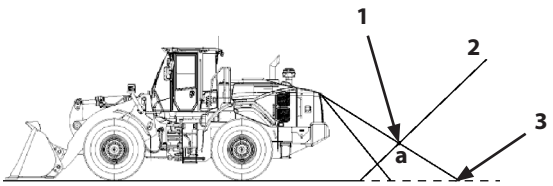
F: Front B: Rear
L: Left R: Right

AA-02-14

Discrepancies between Image and Actual Road Surface

1. Image of upslope or working face

   This indicates how the camera looks when shooting uphill. Because point (a) on the upslope is stretched on the monitor screen on an extended line of the plane, the distance from the machine icon is depicted as further than it actually is.

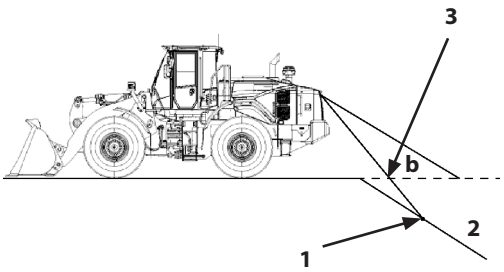


MNUD-01-154-1

1- Position of actual point (a)
2- Slope
3- Position of a point (a) on screen

2. Image of downslope or drop

   This indicates how the camera looks when shooting downhill. Because point (b) on the downslope is shortened on the monitor screen on an extended line of the plane, the distance from the machine icon is depicted as closer than it actually is.



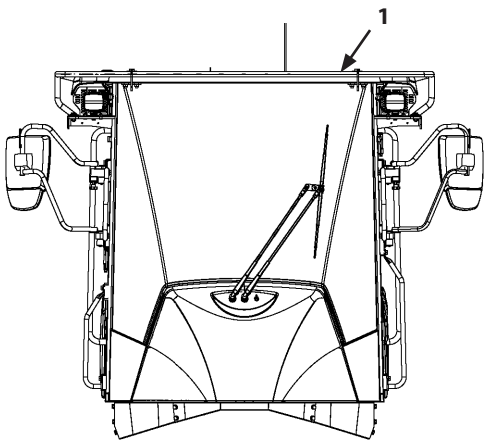
MNUD-01-154-2

1- Position of actual point (b)
2- Slope
3- Position of a point (b) on screen

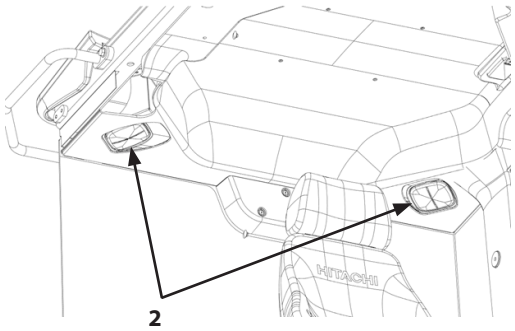
ROPS Cab

ROPS cab (1) is standard equipment.

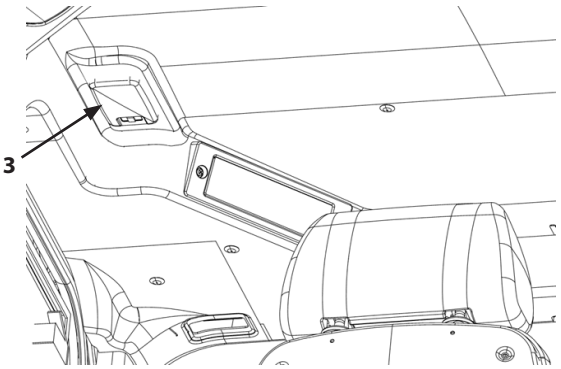
1- ROPS Cab
2- Speakers
3- Room Light (1-241)
4- Radio (1-185)
5- Cab Switch Panel (Optional) (1-244)



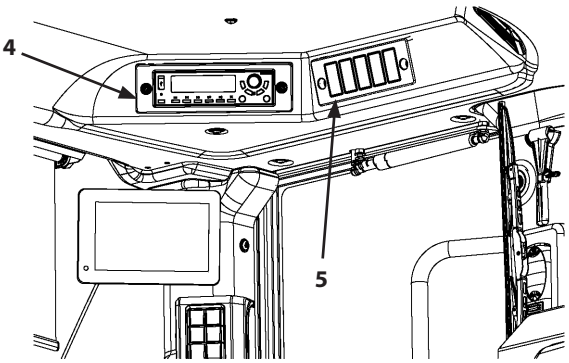
MNUD-01-060



MNTK-01-018



MNTK-01-019



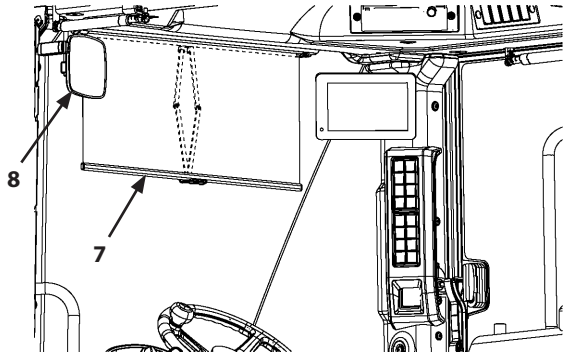
MNUD-01-401

7- Roll-Up Blind (1-243)

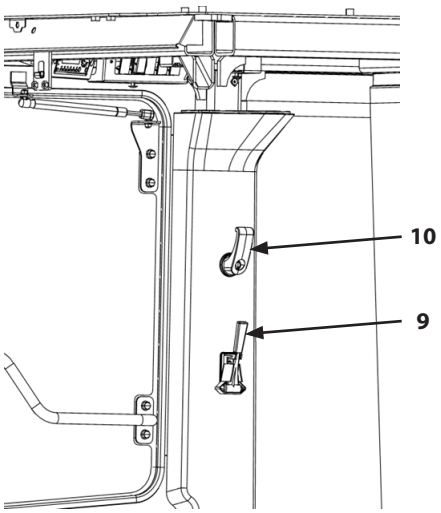
8- Room Rear View Mirror (1-248)

9- Emergency Evacuation Hammer (1-241)

10- Hook (1-242)



MNUD-01-064

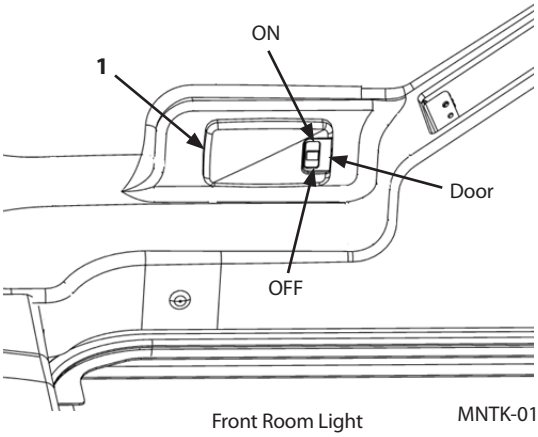


MNTK-01-022

Room Light

Press the desired side of light.

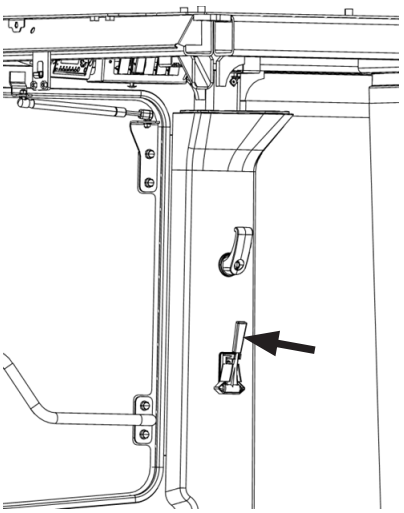
ON : The light (1) comes and stays ON.
Door : When the cab door is opened, the light (2) comes ON. When closed, the light (2) goes OFF.
OFF : The light (1) goes OFF.



Front Room Light MNTK-01-024

Emergency Evacuation Hammer

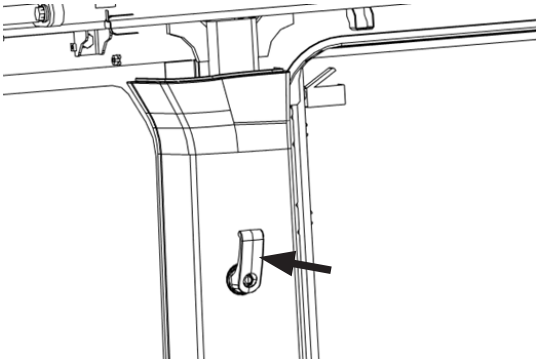
If the cab door becomes difficult or impossible to open if an emergency situation occurs, evacuate from the machine by breaking the windowpane using the provided hammer.



MNTK-01-022

Hook

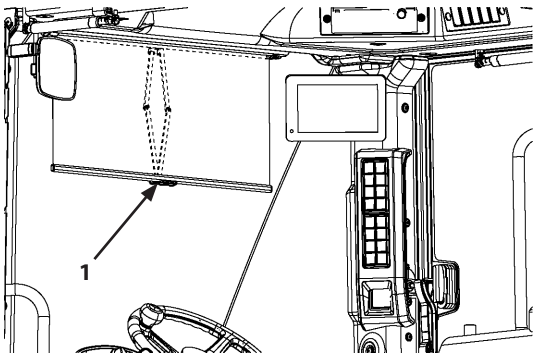
Use to hang your coat, hat, etc.



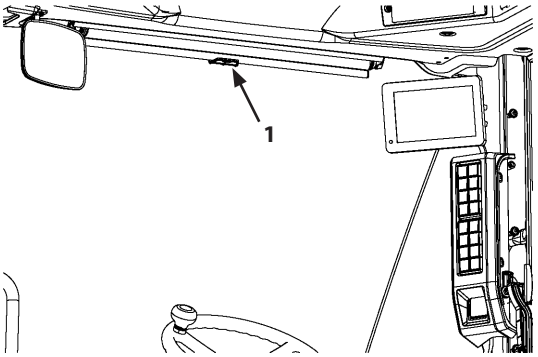
MNTK-01-023

Roll-Up Blind

The roll-up type see-through blind can be installed instead of sun visor.
When sunlight is strong, use the blind by holding pull tab (1) at bottom end, and slowly pull down from the cab top until it stops (single drop).
To roll up the blind, hold pull tab (1) and slowly push up to the cab top.



MNUD-01-064



MNUD-01-067

Upper Switch Panel (Optional)

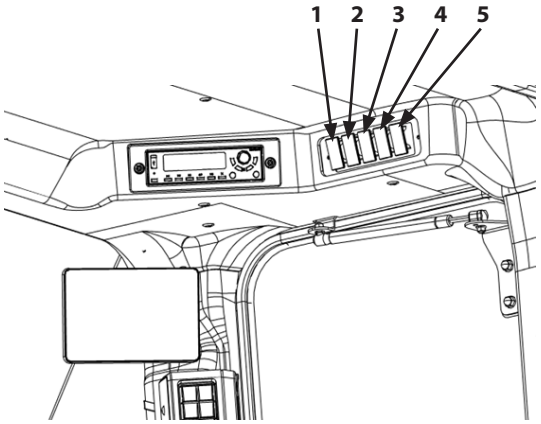
1- Rotary Light Switch (Optional)

2- Rear View Mirror Heater Switch (Optional)

3- Auxiliary

4- Auxiliary

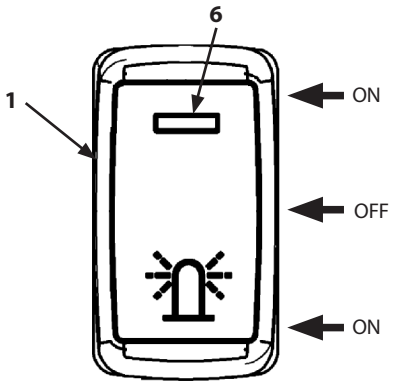
5- Auxiliary



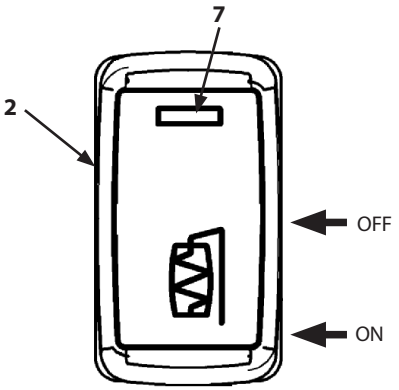
MNTK-01-020

Rotary Light Switch (Optional)

Press either upper or lower part of the switch turns ON the rotary light. While operating the rotary light, indicator (6) lights.
Position the switch flat to turn OFF the rotary light.



MNUD-01-092



MNUD-01-093

Rear View Mirror Heater Switch (Optional)

IMPORTANT: Do not use the rear view mirror heater for a long time with the engine stopped. Doing so will discharge the battery.
Once the mirror is defogged, turn OFF the switch.

Press the lower part of the switch to turn ON the rear view mirror heater. While operating the heater, indicator (7) lights.
Position the switch flat to turn OFF the rear view mirror heater.

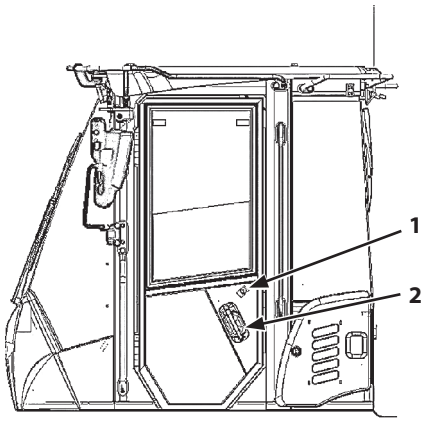
Cab Left Door

CAUTION: When closing the door, securely close the door. Before leaving the operator's seat, securely close the door.

NOTE: Unless the cab door is securely closed, the room light switch keeps the room light ON. Securely close the cab door.

1- Door Lock Key

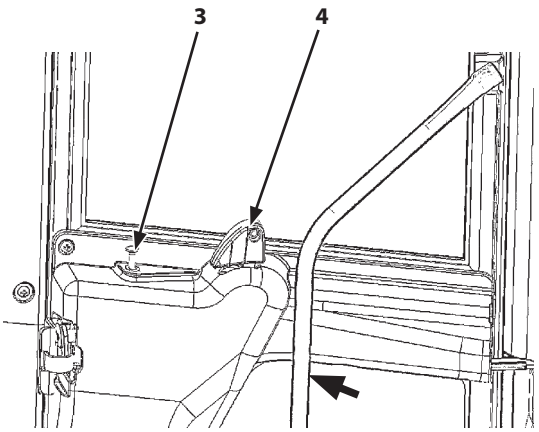
2- Door Open/Close Lever



MNTK-01-325

Left Door Open/Close Lever

When opening the left door, hold and push lever (2) to disengage the door lock.

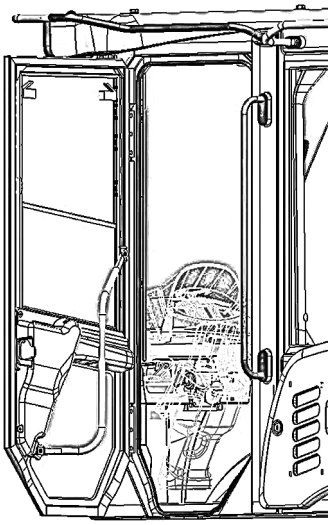


MNTK-01-326

When Fully Opening the Left Door

WARNING: Before getting on or off the cab using the hand rails, check that the cab door is securely locked. If the hand rails are used without locking the door securely, the door lock may come off, possibly causing falling accident.

Push the door toward the outside of the cab to fully open the door (85°).



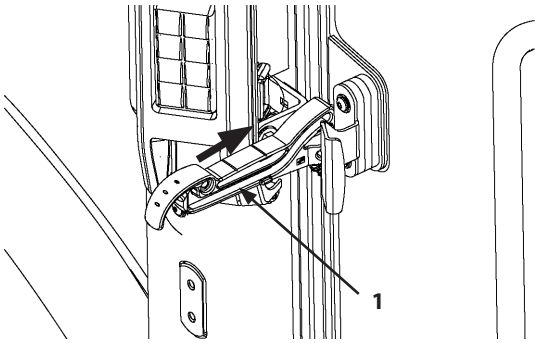
MNTK-01-327

Cab Right Door

Right Door Open/Close Lever

When opening the right door, move lever (1) to a horizontal position, and push it to the fixed position.

NOTE: The right door cannot be opened from the cab outside.

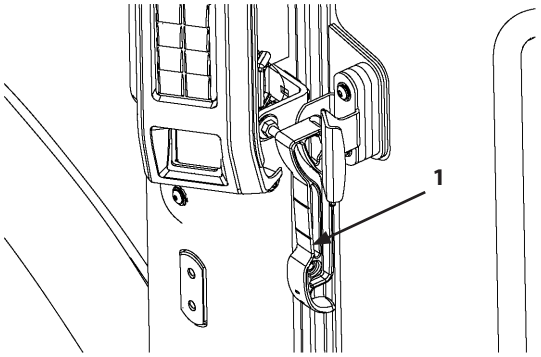


MNUD-01-071

Right Door Lock

CAUTION: After closing the door, always check that the door lock is securely engaged.

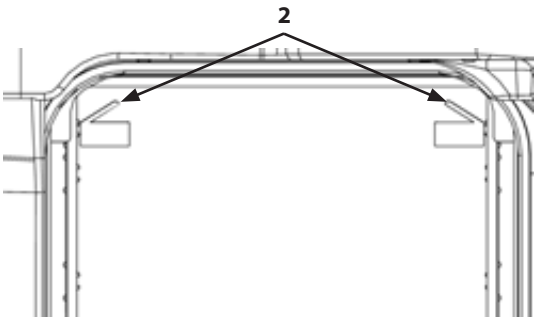
Depress lever (1) to engage the door lock.



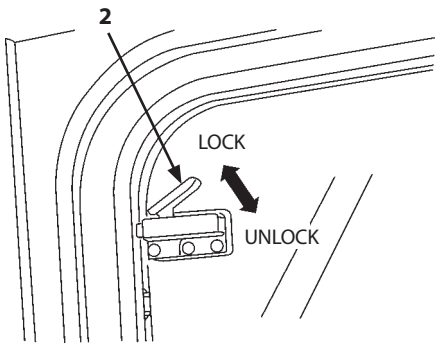
MNUD-01-072

Window Open/Close Levers

When window open/close levers (2) on both sides are simultaneously pressed, the window is unlocked, allowing the windowpanes to move. When window open/close levers (2) are released, stoppers are engaged in the nearest steps so that the window is locked in that position.



MNTK-01-030



M4EK-01-048

Rear View Mirror

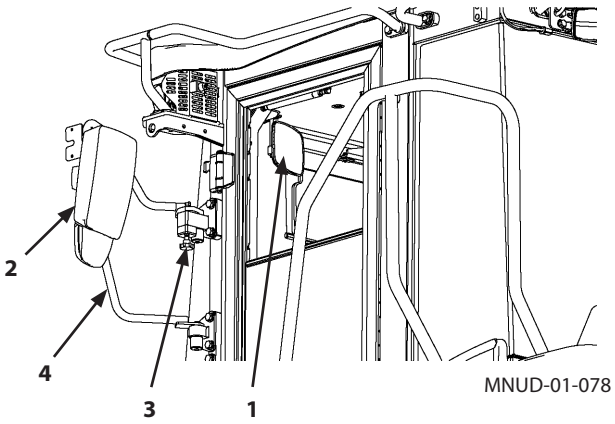
Room Rear View Mirror

Always keep room rear view mirrors (1) clean.

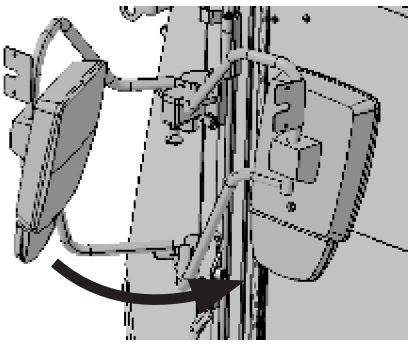
Outside Rear View Mirror

WARNING: Do not travel the machine in reverse by relying on only the range of vision the rear view mirror (2) provides. Use the rear view mirror only as an assistant during travel operation. Be sure to confirm the safety by using your own visibility when traveling the machine in reverse.

After taking the seat, adjust rear view mirror (2) so that the good rearward visibility can be obtained.
Adjust the mirrors so that persons standing on left and right back-end of the machine (or object with height of 1 m and 30 cm in diameter) can be recognized from the operator's seat.
Always keep the mirrors clean.



MNUD-01-078


MNUD-01-079

Rear View Mirror Closing Procedure

Outside rear view mirror (2) can be closed to make easier path to the cab front side for maintenance.

1. Pull down knob (3) and turn by 60° until it stops. The lock pin releases mirror stay (4).
2. Turn mirror stay (4) by 30° to the cab side.
3. Return knob (3) by 30°.
4. Turn mirror stay (4) fully to the cab side until it stops.
5. The lock pin fits in the hole in the mirror stay plate, then the lock pin secure mirror stay (4).
6. Rear view mirror (2) is opened following the same steps. Turn mirror stay (4) to the opposite side in steps 2 and 4.

NOTE: While moving the rear view mirror (2), make sure to maintain a three-point contact with the steps and handrails.

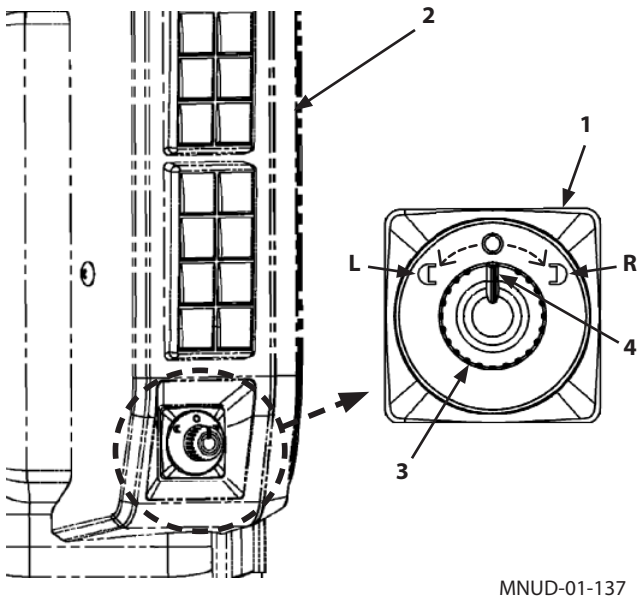
Rear View Mirror Angle Adjust Switch (Optional)

The angle of the outside rear view mirrors can be adjusted by the electric adjustment switch (1), if equipped.
The switch is located below the panel switch (2).

1. Turn knob (3) of adjustment switch (1) to select left or right mirror to adjust the angle. Position the bar (4) at either left mirror (L) or right mirror (R).

2. Hold knob (3) and incline upward or downward to change the mirror face angle in vertical direction.

   Hold knob (3) and incline right or left to change the mirror face angle in inside/outside direction.



MNUD-01-137

Installation and Adjustment of Mirrors

WARNING:

- **Adjust the mirrors, referring to the field of vision in the mirrors in the "VISIBILITY MAP" chapter.**

  Perform adjustment with the machine position as shown.
- **If the mirrors are adjusted improperly, the field of vision cannot be ensured and/or will be obstructed, which may result in serious personal injury.**
- **Check the field of vision in the mirrors every day before starting work.**
- **If any of the mirrors are dirty, clean them.**
- **Ensure appropriate footing when adjusting or cleaning mirrors.**



Machine Position Image MNEK-VM-001

IMPORTANT:

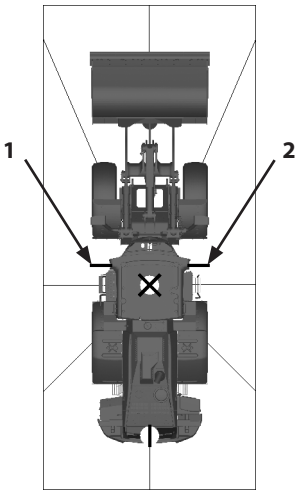
- **Mirrors and cameras only act as aids. Before operating the machine, always check the area around the machine thoroughly.**
- **If a modification is made that could restrict the field of vision, it may result in an obstruction to the field of vision, so check the field of vision again.**

Mirror Installation Diagram

The mirror installation locations (1, 2) on this machine are shown in the right.
Adjust the installation locations of each mirror by following the instructions below to ensure safety.
Installation angle and dimension varies depending on the model.

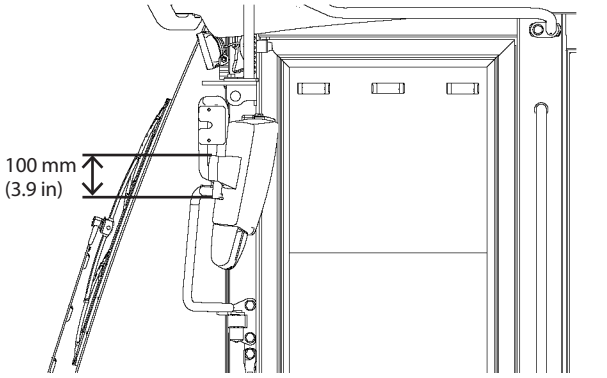
1- Outside Rear View Mirror (Left)
or Rear View Mirror with Close-Proximity Mirror (Left)

2- Outside Rear View Mirror (Right)
or Rear View Mirror with Close-Proximity Mirror (Right)



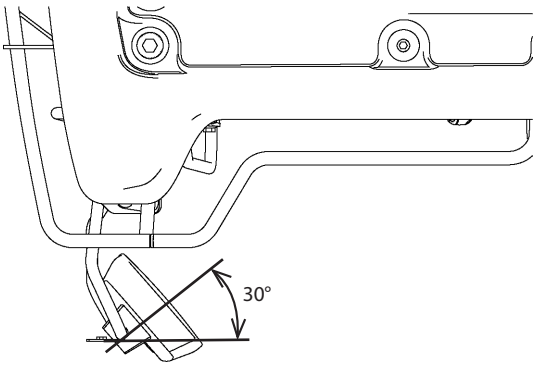
MPD8-01-009

- Rear View Mirror with Close-Proximity Mirror (Height)
  Adjust the mirror to the specified position.
  Ensure a wide view from the rear of the machine.



MNUD-01-082

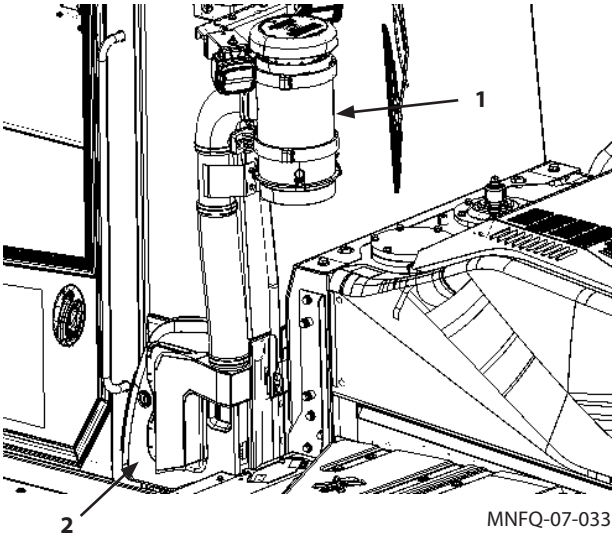
- Rear View Mirror with Close-Proximity Mirror (Angle)
  Adjust the mirror to the specified position.
  Changing the angle and positioning as shown on the right, so as to ensure a wide view from the rear of the machine.



MNUD-01-083

Cab Air Prefilter (Optional)

Outside air is pre cleaned by passing through a prefilter unit (1) before flowing into air conditioner filter, which is installed inside cover (2).

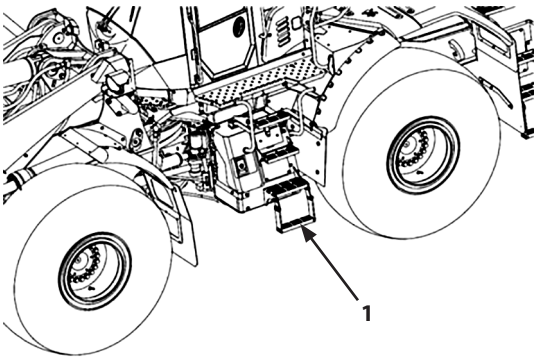


MNFQ-07-033

Steps

WARNING: When getting on and off the machine, use steps and handrails to support your body with at least three points. Getting on and off the machine with less than three support points may cause you to slip, possibly resulting in a falling accident.

Although there are steps on both sides of the machine (left and right), use step (1) on the left side to get in and out of the operator's station.
The cab right side door cannot be opened from outside. The step on the right is for escape from the operator's station in emergencies, or for the access to the right outside of cab, such as mirror or right side camera.

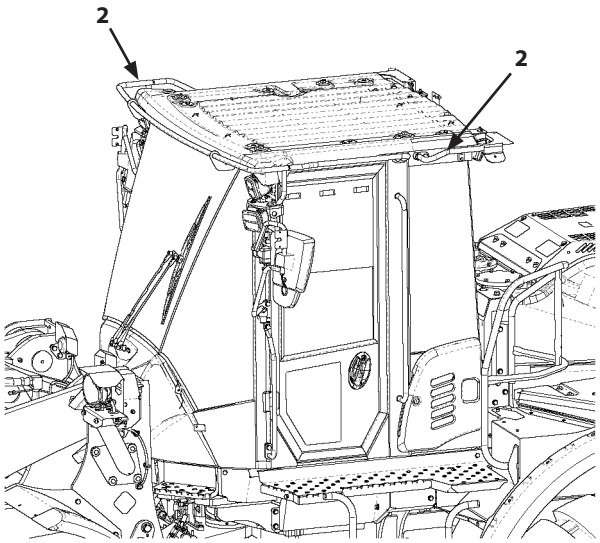


MNFQ-01-317

Cab Top Rails

WARNING: When walking outside around the cab, use steps and rails to support your body with at least three points. If failed to do so may cause you to slip, possibly resulting in a falling accident.

Cab top rails (2) are installed around the cab roof so that you can hold it when approaching items outside cab, such as glasses, wipers, side cameras, for servicing.



MNFQ-01-318

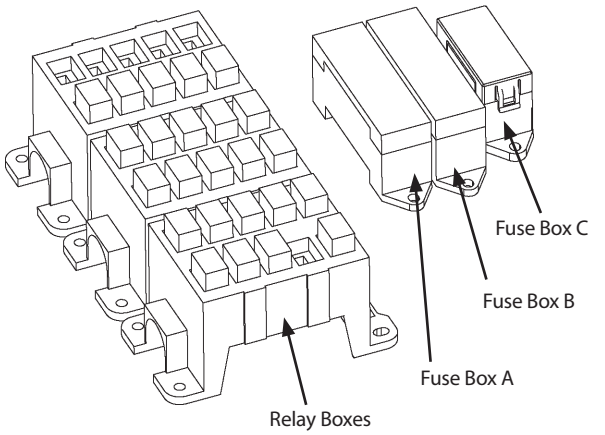
Fuse Box

IMPORTANT: If a fuse blows, turn the key switch OFF. After checking and correcting the cause of the trouble, replace the fuse with a new one.

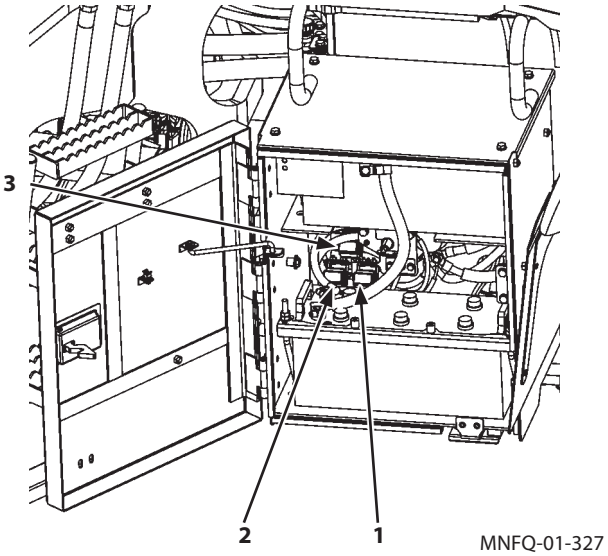
The slow blow fuses (1)(2)(3) function as a safety valve to prevent excess current from flowing in the electrical system. The fuse capacity varies depending on its corresponding circuit. Be sure to replace the blown fuses only with the specified ones.
When checking fuses, check the fuses in fuse boxes A, B, C and slow blow fuses (1)(2)(3) in this order.

Capacity of slow blow fuses:

1- 30A, 70A
2- 120A, 120A
3- 30A, 140A



MNUD-07-001



MNFQ-01-327

Fuse Box A

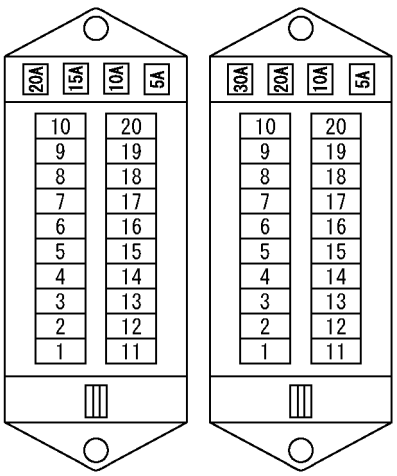
10- Parking Solenoid 5 A
9- Air Conditioner 1 10 A
8- Stop Lamp, Turn Signal 5 A
7- Back Buzzer 5 A
6- Head Lamp (Left) 5 A
5- Working Lamp Front 20 A
4- Wiper Front 15 A
3- Seat Heater 15 A
2- Head Lamp (Right) 5 A
1- Fuel Pump 5 A
20- Option 4 (JSS) (5 A)
19- Option 3 (ACC4) (10 A)
18- DEF Heater 10 A
17- DEF Supply Module 10 A
16- DEF Sensor 15 A
15- Air Conditioner 2 20 A
14- Rotary Beacon, Quick Coupler 10 A
13- Starter Switch 15 A
12- Option 2 (ACC1, ACC2, ACC3, ROD Sensor) (20 A)
11- GSM/GPS 5 A

Fuse Box B

10- ECU 30 A
9- TCU 10 A
8- Controller 10 A
7- Flasher 10 A
6- Horn 10 A
5- OPT C/U 5 A
4- Option 1 (Battery) (20 A)
3- Room Lamp, DC-DC Unit 20 A
2- Lighting Switch 10 A
1- Radio, USB Power 5 A
20- Switch Control 5 A
19- High Beam Lamp 10 A
18- Wiper Rear 10 A
17- Working Lamp Rear 20 A
16- PLCU 15 A
15- MC Solenoid 10 A
14- TCU POWER 10 A
13- Power ON 10 A
12- Position 2 5 A
11- Position 1 5 A

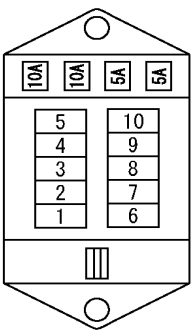
Fuse Box C

5- (Open)
4- (Open)
3- (Open)
2- Option 6 (ACC6) (10 A)
1- Option 5 (ACC5) (10 A)
10- (Open)
9- (Open)
8- Aerial Angle 5 A
7- 12V Socket 10 A
6- 24V Socket 5 A



Fuse Box A Fuse Box B

MNUD-07-003



Fuse Box C

MNUD-07-004

Battery Disconnect Switch

IMPORTANT:

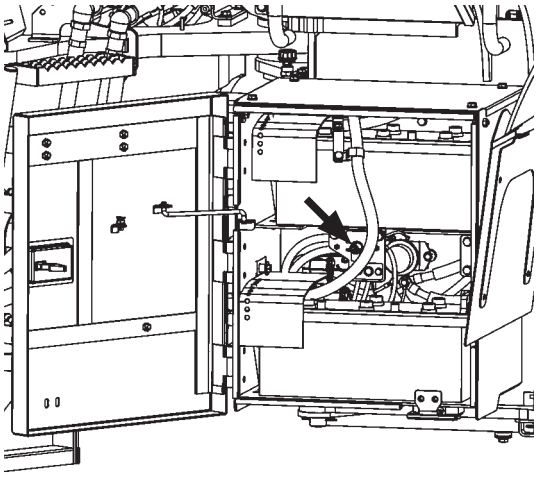
- **Never turn the battery disconnect switch OFF while the engine is running or the key switch is in the position other than OFF. Failure to do so may damage the electrical system.**
- **After stopping the engine, the DEF pump keeps operating to circulate the DEF in piping. Do not turn the battery disconnect switch OFF while pump is running. Failure to do so may damage the SCR system.**
- **Before turning the battery disconnect switch OFF, be sure to turn key switch OFF and wait about 10 minutes until LED indicator (1) turns off. Failure to do so may result in malfunction of the electrical system.**

NOTE: The LED indicator (1) turns on while the key switch is at ON position, at START position, and for 10 minutes after the key switch is turned to OFF or ACC position. Also the main monitor displays instruction message (2).

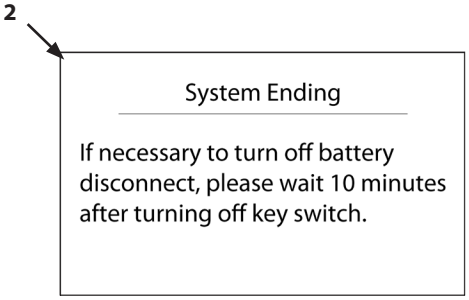
The battery disconnect switch is different from the engine start key switch. When the battery disconnect switch is turned OFF, the electrical system will completely be isolated from the battery. No current will flow through the whole electrical system.

Use the battery disconnect switch only for the following purposes; otherwise, turn it ON.

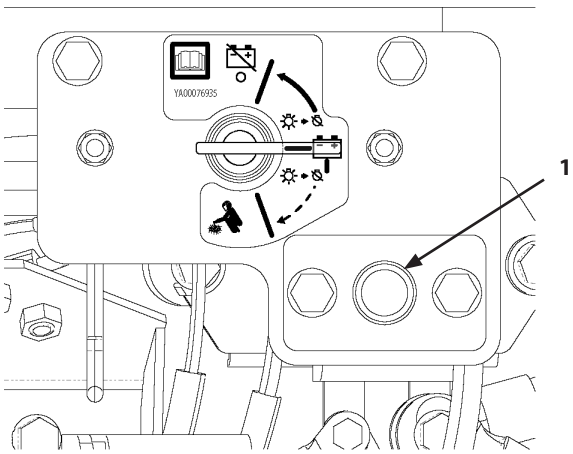
- Before maintaining and repairing the electrical system
- Before storing the machine for long period
- Before performing welding operation on the machine.
- Before replacing the batteries.



MNFQ-01-328



MNUD-03-001EN



MNFQ-01-048

When turning the battery disconnect switch from OFF to ON, preset radio station and the clock may be reset. Set them again. To avoid this situation, "partial" battery disconnection is possible to supply power to enable the radio, GSM, etc.

Switch Operation

1. Open the battery box cover.

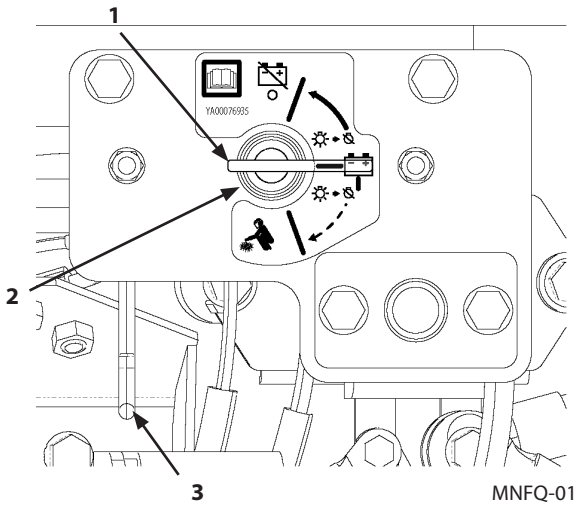
   When lever (1) is lateral to the ground, battery disconnect switch (2) turns ON.

2. When turning lever (1) 70° counterclockwise to ON-OFF position, battery disconnect switch (2) partially disconnects the power supply. This keeps supplying power to the GSM and some controllers, and you do not have to reset the monitor or communication data.

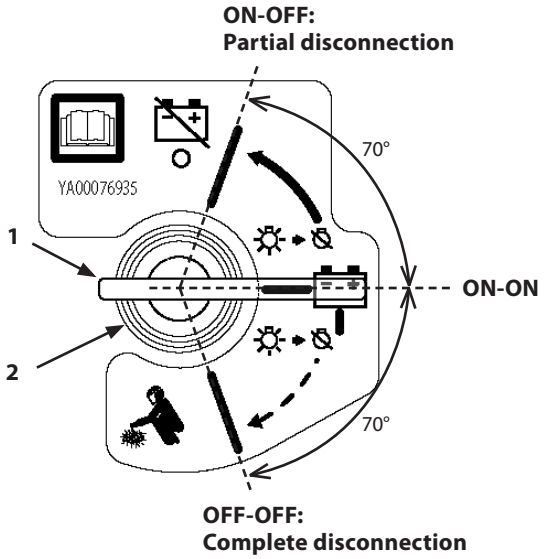
3. When turning lever (1) 70° clockwise to OFF-OFF position, battery disconnect switch (2) completely disconnects the power supply to the machine. Use this position when welding or during the long-term shut-down of the machine.

4. Lever (1) can be removed from battery disconnect switch (2) when it is in either OFF position. Insert lever (1) removed from switch (2) and hang on hook (3).

5. Close the battery box cover.



MNFQ-01-048



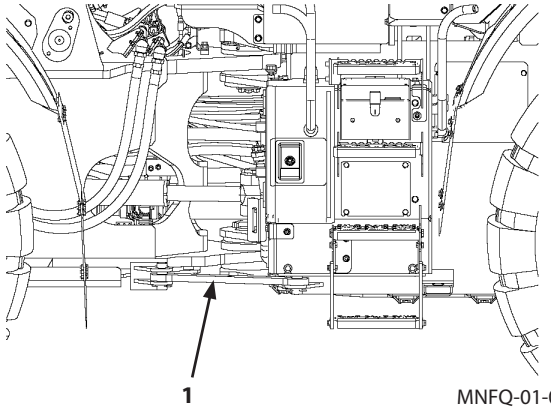
MNFQ-01-052

Articulation Lock Bar

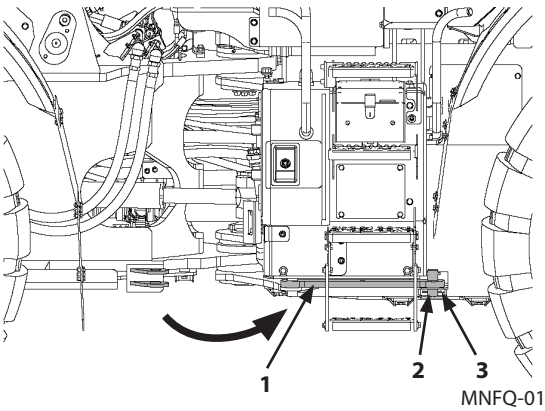
WARNING:

- **Before servicing or transporting the machine, be sure to engage lock bar (1).**
- **Before driving the machine, be sure to disengage the lock bar (1) from the front frame and fasten the lock bar to the rear frame with pin (2) and β-form lock pin (3).**

Articulation lock bar (1) locks the front and rear frames to prevent articulation between the front and rear frames when servicing or transporting the machine.



MNFQ-01-007



MNFQ-01-008

Inspection/Maintenance Access Side Cover

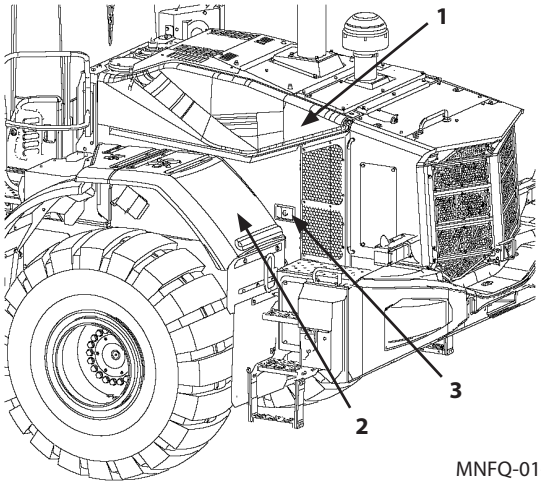
CAUTION:

- **Always close side covers (1) during driving and operation.**
- **Do not keep side covers (1) open on a slope or when a strong wind is blowing. Failure to do so may be dangerous because side cover (1) may unexpectedly close.**
- **Take care not to pinch your fingers when opening/ closing the side covers (1).**
- **When side cover (1) is opened, the cover may move suddenly. Be careful not to come in contact with the cover.**
- **Before inspecting around the engine, be sure to secure side cover (1) with holding rod (4).**
- **If the machine is equipped with the fenders (2) on side covers (1), never ride on the fenders (2).**

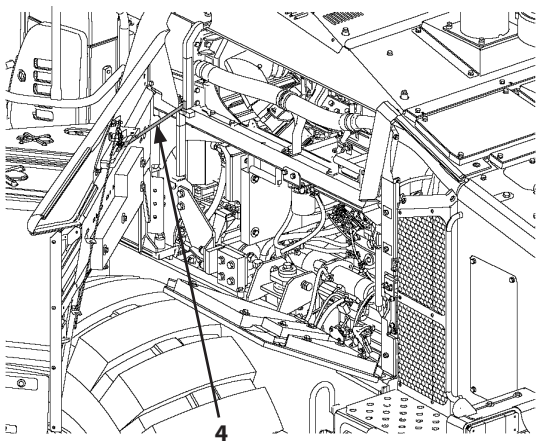
When opening side cover (1), pull latch (3).

NOTE: When required to inspect the machine for a long time with side cover (1) kept open, lock side cover (1) using the holding rod (4) provided inside the side cover.

Side cover (1) has a holding groove. Engage the holding rod (4) in the holding groove beforehand.



MNFQ-01-009



MNFQ-01-010

Rear Grille

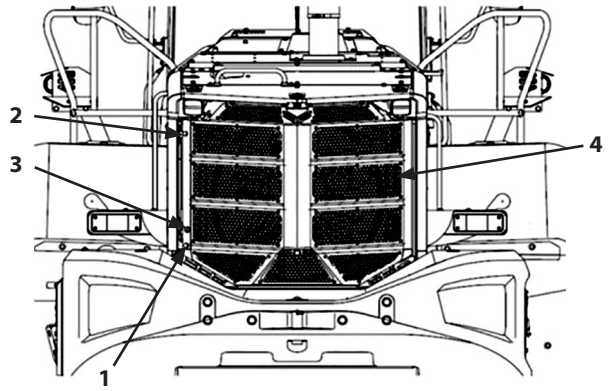
WARNING: Open or close rear grille (4) only after stopping the engine. It is very dangerous if you are entangled in the cooling fan. Before driving the machine, always check that the rear grille will not open.

1. Remove bolts (1)(2).
2. Insert the starter key, turn and push rear grille open/close button (3) to allow the rear grille (4) to open so that the cooling fan can be cleaned.

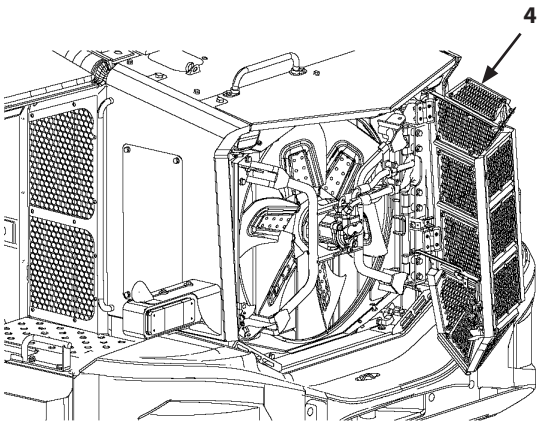
NOTE: Without removing bolt (1), rear grille open/close button (3) cannot be turned.

3. When closing rear grille (4), while supporting rear grille (4), push in rear grille (4) until a click sound is heard.
4. Tighten bolts (1)(2) and remove the starter key.

NOTE: Without tightening bolt (1), the starter key cannot be removed.



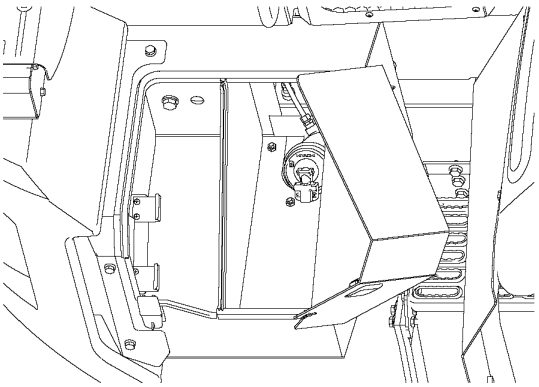
MNFQ-01-319



MNFQ-01-012

Tool Box

Use tool box to store tools.



MNFQ-01-013

Towing Pin

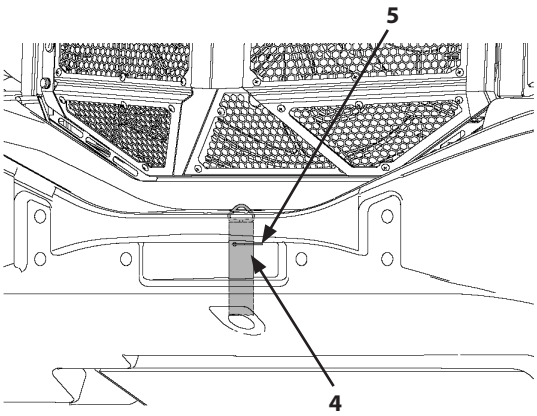
WARNING: Since towing is a potentially dangerous operation, perform only in an emergency situation.

IMPORTANT: Available towing forces by machine model are as follows. To prevent excessive wear of tires, avoid towing operation requiring more than the available towing force.

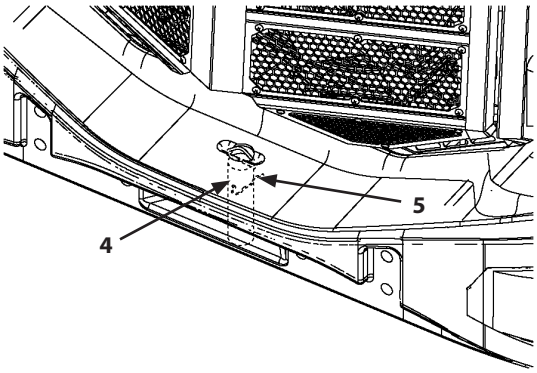
ZW310-7: 188.0 kN (19170 kgf, 42262 lbf)

- **To ensure safety, always tow the machine at the speed 5 km/h (3.1 mph) or less.**
- **Never tow the machine long distance more than 5 km.**
- **Do not tow other machine.**

Towing pin (4) is located on the rear end of the base machine. It is used for towing for recovery of machine or fastening the machine on a trailer deck for transportation. Tie or loop the towing rope and let it pass through the hole. Secure it with the β-shaped lock pin (5).



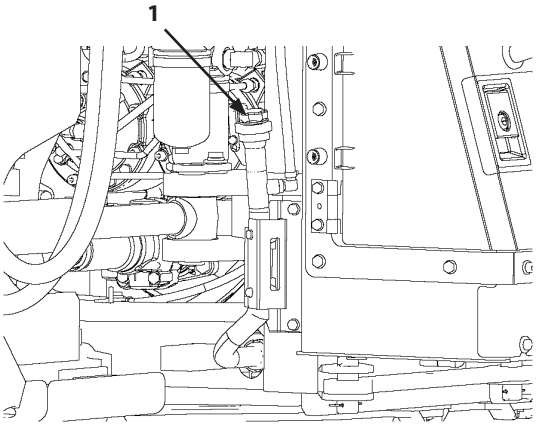
MNFQ-01-014



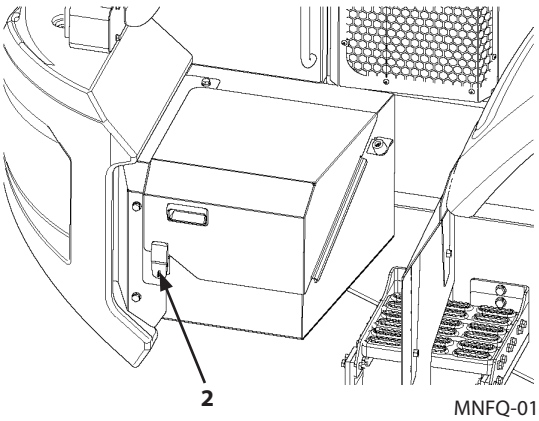
MNFQ-01-015

Vandal-Proof Devices

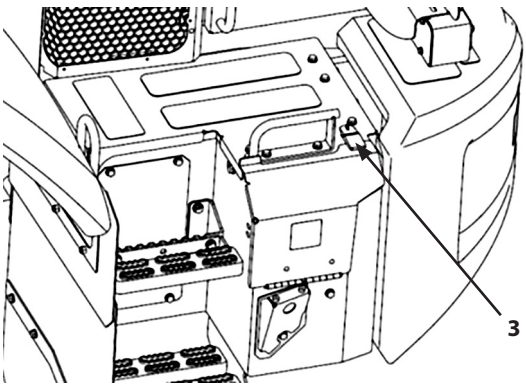
A lock key can be installed to transmission inlet cap (1), tool box (2), DEF tank cover (3), and expansion tank cap cover (4).



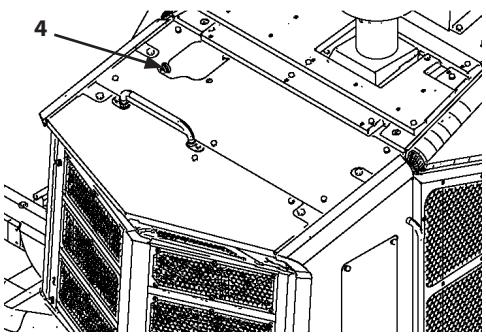
MNFQ-01-040



MNFQ-01-041



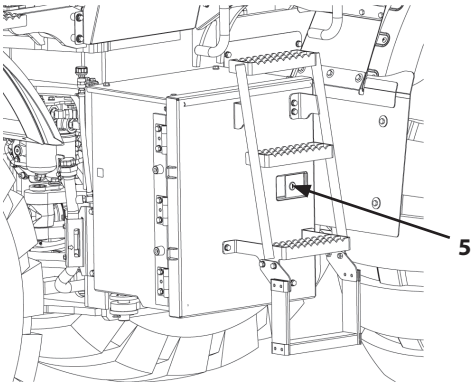
MNFQ-01-320



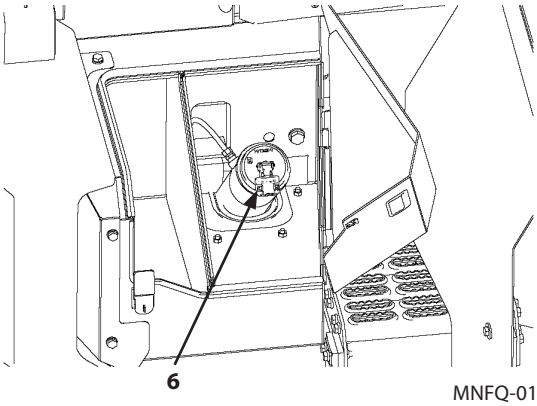
MNFQ-01-054

Vandal-Proof Devices (continue from previous page)

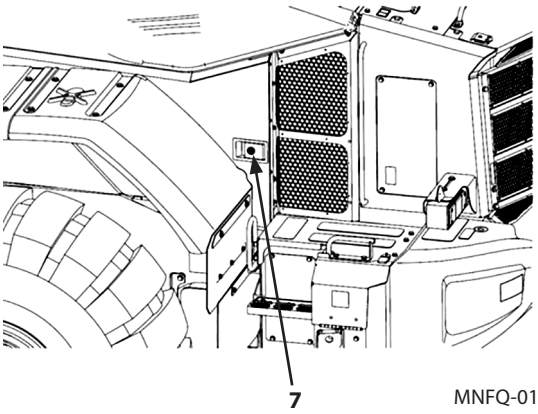
Battery cover (5), fuel tank cap (6), side covers (7), and air conditioner fresh air filter (8) can be locked with the keys.



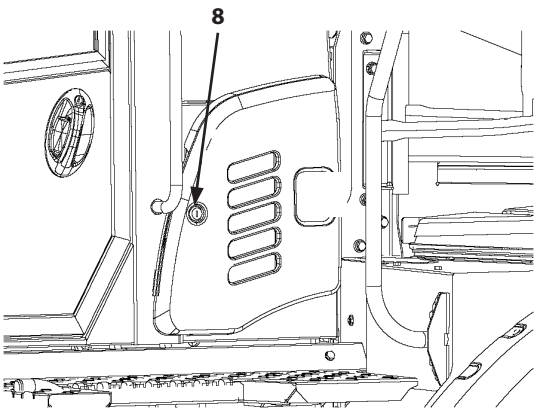
MNFQ-01-329



MNFQ-01-044



MNFQ-01-321



MNFQ-01-046

Break-in Operation for New Machine

IMPORTANT: If the machine is heavily loaded without performing the break-in operation, damage to the machine such as seizure and/or scoring may result and the machine life will be significantly shortened. Be sure to sufficiently perform break-in operation.

Machine life and performance will be greatly affected by the extent of operation and maintenance of the machine during the initial operation. Perform break-in operation for the first 100 hours.

- Check the machine before starting the engine.
- After starting the engine, sufficiently perform warm up operation.
- Avoid sudden starting, sudden acceleration and sudden braking while travelling the machine.
- Avoid heavy load for the front attachment.

Inspect Machine Daily Before Starting

Perform the required daily check before starting the engine.

- Refer to "Maintenance" section for detailed information.

Check Points	Check Contents
1. Brake System	1. The brake pedal stroke is appropriate, brake performance is sufficient, and the brakes apply evenly. 2. The parking brake performance is sufficient.
2. Tires	1. Tire pressure is appropriate. 2. No cracks and damage observed. 3. No excessive wear observed. 4. No metal pieces, stones or other foreign material found.
3. Wheel Disk	Mounting condition of the wheel disk is correct.
4. Lights and Turn Signals	They light up or flash normally without contamination and damage.
5. Outside Rear View Mirror and Inside Rear View Mirror	Appropriate visibility obtained.
6. Reflectors and Registration Plate	No contamination and damage found.
7. The portions where abnormality was found at previous operation.	No abnormality observed.
8. Engine	1. Level and contamination of engine oil and coolant. 2. Loose or damage of the alternator drive belt. 3. Ease of starting, exhaust gas color, and noise. 4. Oil and water leaks, damage to hoses and pipe lines. 5. Clogging and damage of radiator, oil cooler and inter cooler. 6. Looseness and/or missing mounting bolts and nuts. 7. Check crankcase breather tube. 8. Drain water and sediment from fuel filter. 9. Check accelerator pedal operation.

Check Points	Check Contents
9. Chassis	1. Oil level and leaks of the transmission and the axle. 2. Level, leaks and contamination of the fuel tank. Drain fuel tank sump. 3. Fuel leaks and damage of the fuel hoses and pipe lines. 4. Level and leaks of the hydraulic oil tank. 5. Operation, play and operating force of control levers and steering wheel. 6. Operation of hydraulic equipment. Oil leaks and damage to pipings and hoses. 7. Deformity, damage, and abnormal noise of each part. 8. Washer fluid. 9. Level, leaks and contamination of the DEF tank. 10. DEF leaks of pipe lines and hoses. 11. Damage to DEF supply pump. 12. Clean around the aftertreatment device.
10. Loader	1. Oil leaks and damage to cylinders, pipe lines and hoses. 2. Loose, wear and missing of the cutting edge. 3. Wear and damage to the bucket. 4. Condition of lubrication of the loader front. 5. Damage to the pin lock bolts, stoppers and links. 6. Loose and/or missing mounting bolts and nuts.
11. Others	1. Operation of instruments, switches, lights and buzzer/horn. 2. Damage and deformation to the ROPS cab. 3. Abnormal outside appearance of machine. 4. Looseness of the battery terminals. 5. Wear and damage to the seat belt. 6. Damage to the step.

Check Before Starting the Engine

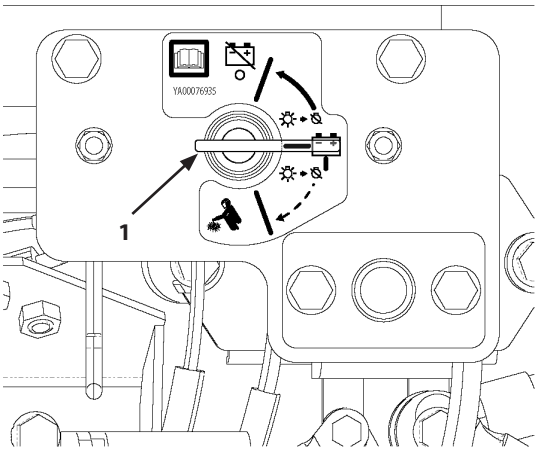
NOTE: When the joystick steering (Optional) is installed, refer to page 3-6 for additional information.

1. Check that the battery switch (1) in the battery box is in the ON-ON position shown in the image to the right. Refer to page 1-257 "Battery Disconnect Switch".
2. Check the forward/reverse selector switch indicator is not displayed on the main monitor. If it is displayed, turn it off by pressing forward/reverse selector switch (2) on the panel switch. Refer to page 1-131 "Forward/Reverse Selector Switch".
3. Check that both forward/reverse lever (3) and forward/reverse switch (4) are in the neutral (N) position and neutral lever lock (5) is in the LOCK position.

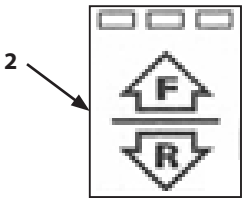
NOTE: Unless forward/reverse lever (3) and forward/reverse switch (4) are in neutral (N), the engine will not start. The buzzer sounds and the advice message displayed on the sub monitor to check the neutral positions will alert the operator.

4. Check that parking brake switch (6) is in the ON position.

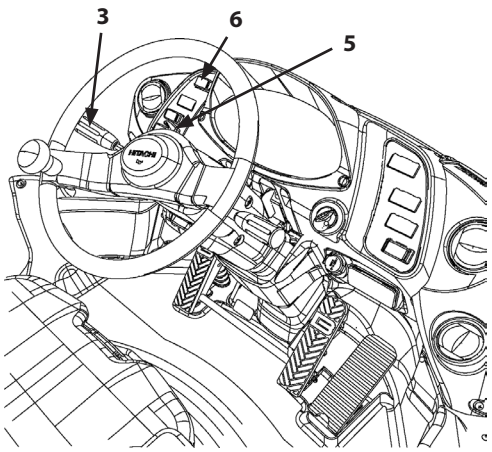
   After the engine starts and checking indicator bulbs, check that the parking brake indicator is ON.
5. Check that bucket control lever (7) and lift arm control lever (8) are in the neutral (N) position.



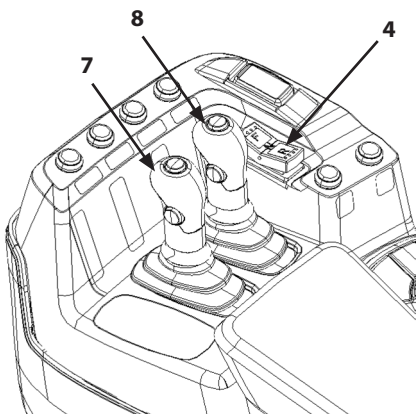
MNFQ-01-048



MNUD-01-209

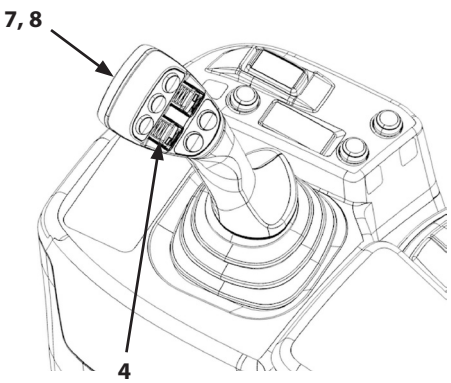


MNUD-01-010



Fingertip Control Type

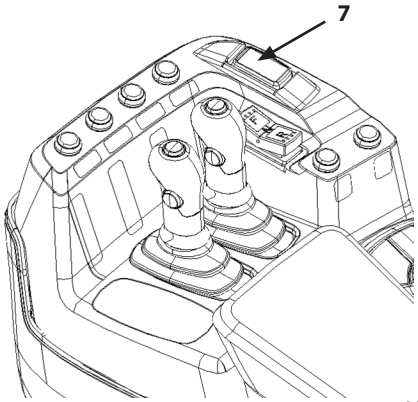
MNFQ-05-002



Multi-Function Joystick Type

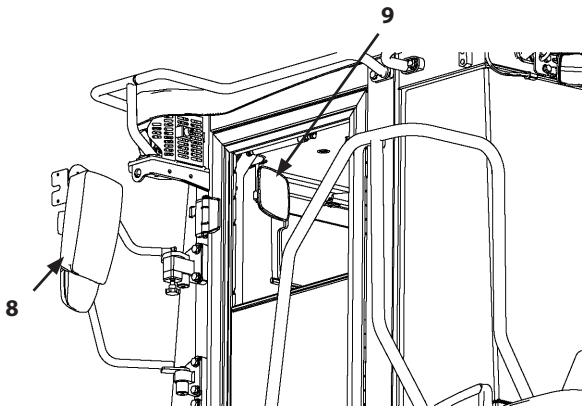
MNUD-05-004

6. Check that control lever lock switch (7) is in the LOCK ( ) position.



MNFQ-05-002

7. Adjust the position of outside rear view mirror (8) and room rear view mirror (9) so that the best rear visibility can be obtained. Refer to page 1-250 "Installation and Adjustment of Mirrors" for the mirror adjustment.



MNUD-01-078

8. While seated on the operator's seat with your back in contact with the backrest, adjust each function of the seat so that the brake pedal can be fully stepped on. Refer to page 1-169 "Adjusting Operator's Seat" for the seat adjustment.

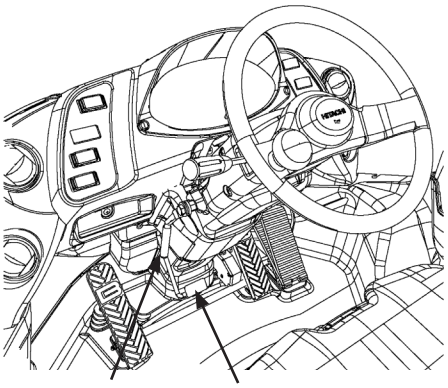
9. Adjust the steering column inclination so as to match the operator's physical constitution.

WARNING: Do not operate the tilt, telescopic lever (10) and steering column pop-up pedal (11) during operation.

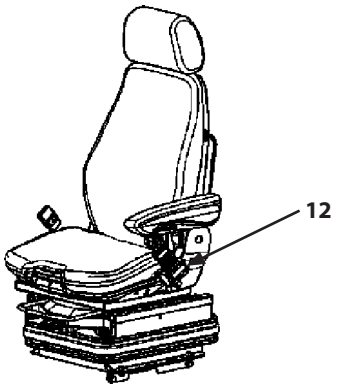
CAUTION: Never attempt to drive the machine while moving the steering column forward.

- Pull tilt, telescopic lever (10) to set the steering column inclination to the desired position. Push tilt, telescopic lever (10) until it contacts the stopper, ensuring the steering column is locked.
- By depressing steering column pop-up pedal (11), the steering column moves forward, and the distance between the operator's seat and the steering wheel increases, allowing operator to get on and off the machine easily.
- After moving the steering column forward, pull the steering wheel to the operator side. The steering column will be automatically locked in the regular position and the machine becomes operable.

10. Fasten seat belt (12).



MNUD-01-009



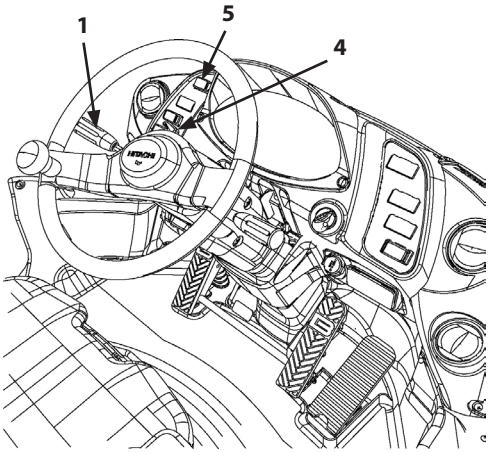
MNUD-01-049

Check Before Starting the Engine for JSS

WARNING:

- **When traveling on public roads, use steering wheel (1). The use of joystick steering (JSS) lever (2) is prohibited.**
- **When the emergency steering function is activated, use steering wheel (1) for turning.**
- **If the machine steering activates despite not being operated with the with joystick steering lever (2), immediately return the accelerator pedal to the idle position and correct the turning direction with steering wheel (1), then stop the machine with the service brake. Stop the engine and turn joystick steering selector switch (3) OFF. Contact Authorized Dealer for repairs as soon as possible.**
- **When operating steering wheel (1) and joystick steering lever (2) at the same time, priority is given to the operation that is displaced further from the neutral position.**

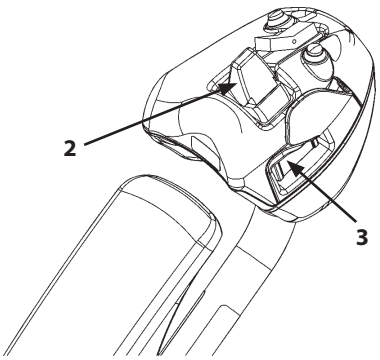
IMPORTANT: When joystick steering lever (2) is enabled, the maximum speed when traveling is limited to 25 km/h (15.5 mph). For inquiries about the maximum speed settings, contact Authorized Dealer.



MNUD-01-010

Preparations before Operation

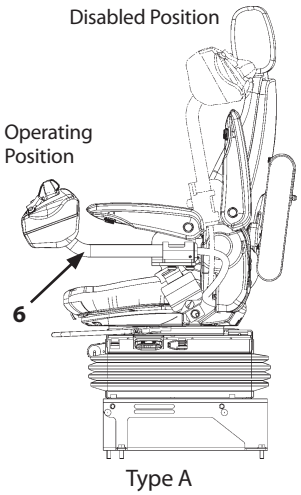
1. Check that both forward/reverse lever (1) and forward/reverse switch (2) are in the neutral (N) position and neutral lever lock (4) is in the LOCK position.



MNEK-13-002

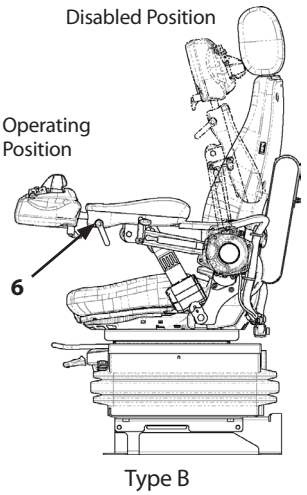
NOTE: Unless forward/reverse lever (1) and forward/reverse switch (2) are in neutral (N), the engine will not start. The buzzer sounds and the advice message displayed on the sub monitor to check the neutral positions will alert the operator.

3. Check that parking brake switch (5) is in the ON position.
4. Check that the bucket control lever and the lift arm control lever are in the neutral (N) position.
5. Put left console (6) in the operating position.
6. Adjust the position of switch box and armrest, if needed. Refer to page 1-174 "Joystick Steering Adjustment".



Type A

MNEK-13-005



Type B

MNFQ-01-022

Starting the Engine

Starting in Normal Temperatures

Follow the steps below to start the engine without depressing accelerator pedal (1).

1. Check that both forward/reverse lever (2) and forward/reverse switch (3) are in the neutral (N) position and neutral lever lock (4) is in the LOCK position.

   If the machine is equipped with joystick steering (optional), put the Forward/Reverse switch on the left console in the neutral (N) position.

2. Check that parking brake switch (5) is ON.
3. Turn the key switch (6) ON.
4. Check indicator bulbs

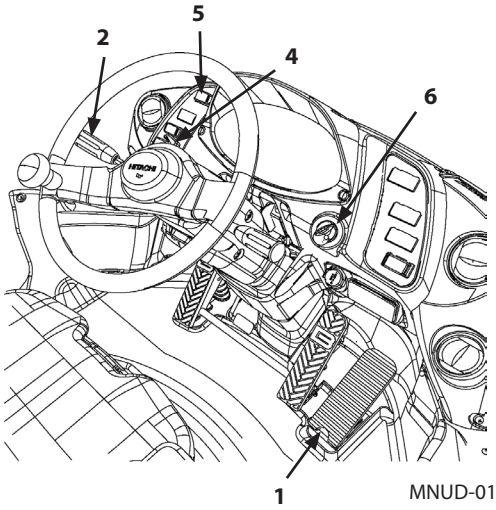
   When key switch (6) is turned ON, all indicators and the warning lights come and stay ON for 2 seconds. They go OFF afterward. Any indicator and/or warning light that fails to light at this time is a burned bulb.

   However, the indicators for brake oil pressure (7) (When the brake pressure is low) will continue to stay ON, and it will go OFF only after the engine is started.

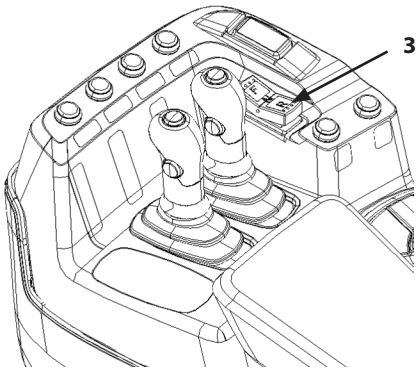
   Preheating will automatically start with the key switch ON. The preheat indicator (9) will automatically come ON.

NOTE: When the key switch is turned ON, the maintenance notification for the item whose maintenance interval has expired displays for 5 seconds. The display will change when the monitor display mode selector switch (11) is pressed, forward/reverse lever (2) or forward/reverse switch (3) is set in Forward (F) or Reverse (R) position.

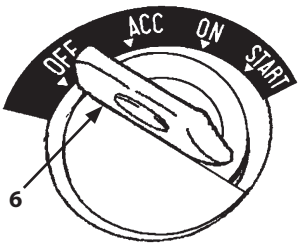
5. Check that parking brake indicator (10) is ON. When preheat indicator (9) goes OFF (the engine has preheated), sound the horn to clear any personnel away from the area surrounding the machine.



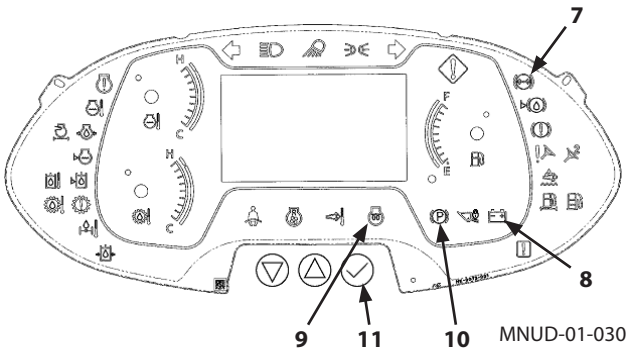
MNUD-01-010



MNFQ-05-002



MPD8-01-307



MNUD-01-030

IMPORTANT: Never operate the starter for more than 10 seconds at a time. If the engine fails to start, return the key switch to the OFF position. Wait for more than 2 minutes, then try again.

Failure to do so may cause damage to the starter and/ or discharge the batteries.

6. Turn key switch (6) to the START position to rotate the starter. The engine will start.

   Do not depress accelerator pedal (1) when starting the engine.

7. Release the key switch just after the engine has started.

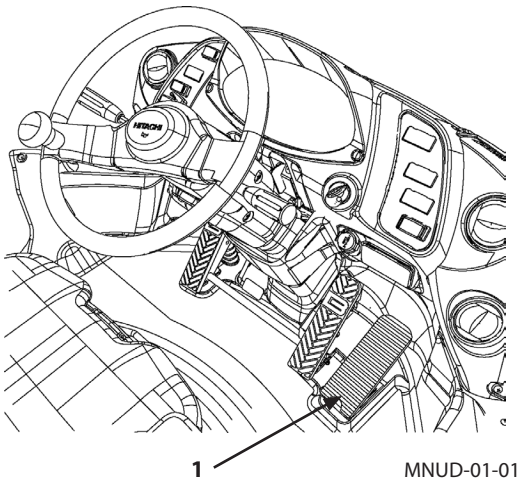
   The key switch will automatically return to the ON position.

   After the engine starts, perform idling operation without depressing accelerator pedal (1) to warm up the machine.



MPD8-01-307

IMPORTANT: Right after the engine starts, the engine speed will be kept to slow idle speed for maximum 30 seconds when the coolant, hydraulic oil or transmission oil temperature is low, or for 3 seconds at normal temperature even if accelerator pedal (1) is operated.



MNUD-01-010

WARNING: After starting the engine, start the machine operation only after confirming that the engine speed changes by operating accelerator pedal (1).

Otherwise, the machine or the front attachment may unexpectedly start moving, possibly causing accidents such as crash.

NOTE:

- *The emergency steering auto-check sound may be heard after starting the engine.*
- *White smoke may be emitted for several minutes after the engine starts, this is not a malfunction.*

Starting in Cold Weather

Preheating

1. Turn the key switch (1) ON. The ambient temperature sensor is activated so that the engine is automatically preheated.
2. Preheat indicator (2) comes ON. As long as the preheat indicator stays ON, the engine is being heated.



MPD8-01-307

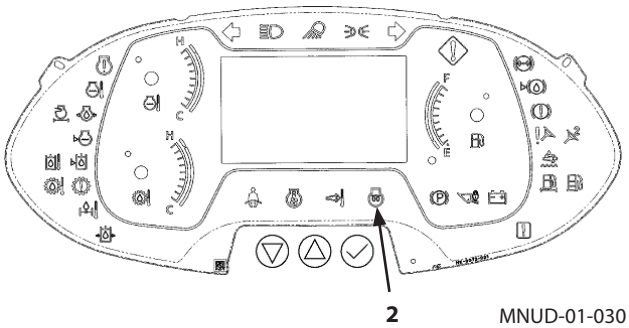
NOTE: Preheating time varies depending on the ambient temperature.

3. As soon as preheat indicator (2) goes OFF, turn key switch (1) to START position to rotate the starter. As soon as the engine starts, release the key switch. The key switch will automatically return to the ON position.

   Do not depress accelerator pedal (3) when starting the engine.

   After the engine starts, perform idling operation without depressing accelerator pedal (3) to warm up the machine.

   After starting the engine, perform warm-up operation as described on page 3-14.

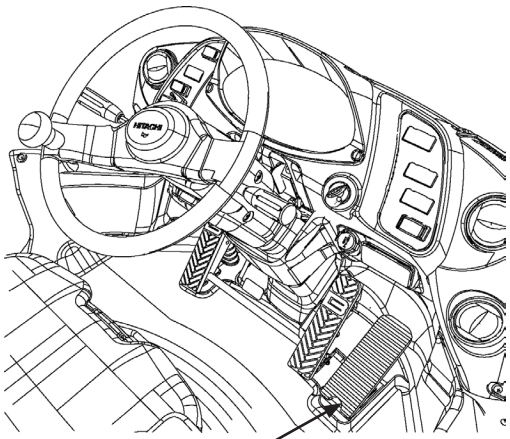


MNUD-01-030

IMPORTANT: Right after the engine starts, the engine speed will be kept to slow idle speed for maximum 30 seconds even if accelerator pedal (3) is operated.

WARNING: After starting the engine, start the machine operation only after confirming that the engine speed changes by operating accelerator pedal (3).

Otherwise, the machine or the front attachment may unexpectedly start moving, possibly causing accidents such as crash.

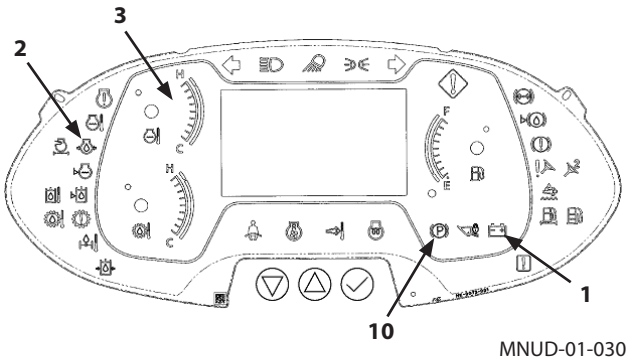


MNUD-01-010

NOTE: Illuminations such as headlight, work light or room light may become dim during the engine preheat operation at cold temperature.

Check After Starting

IMPORTANT: If any abnormality is found in the monitor functions, immediately stop the engine and investigate the cause of the trouble.



MNUD-01-030

Checking Instruments Through Monitor Functions

1. Check that discharge warning indicator (1) is OFF. If the discharge warning indicator stays ON, immediately stop the engine. Inspect the alternator and battery system for any abnormality.
2. Check that low engine oil pressure indicator (2) is OFF. If the low engine oil pressure indicator stays ON, immediately stop the engine. Inspect the engine oil pressure system and the oil level.
3. Check that engine coolant temperature gauge (3) is within the normal range (green).

NOTE: To check indicator bulbs and the buzzer function, when the key switch is turned ON, monitor indicators come ON and continue to stay ON for approx. 2 seconds.

Check Engine Noise and Exhaust Gas Color

Check that the engine noise and exhaust gas color is normal.

NOTE: Check the exhaust gas color as follows. (After warm-up operation, run the engine with no loads.)

Clear or light blue	:	Normal (Perfect combustion)
Black	:	Abnormal (Imperfect combustion, abnormal aftertreatment device, abnormal fuel system)
White	:	Abnormal (Oil is leaking into the combustion chamber, abnormal aftertreatment device, abnormal fuel system)

NOTE: White smoke may be emitted for several minutes after the engine starts, this is not a malfunction.

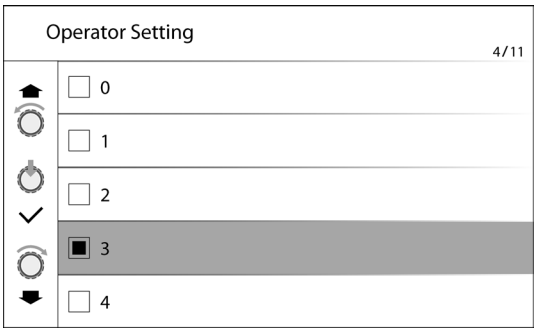
Selecting Operator's Setting

The Operator Setting screen appears on the sub monitor after the starting screen. The stored operator settings for each operator No. are applied to the machine by selecting the desired operator No.

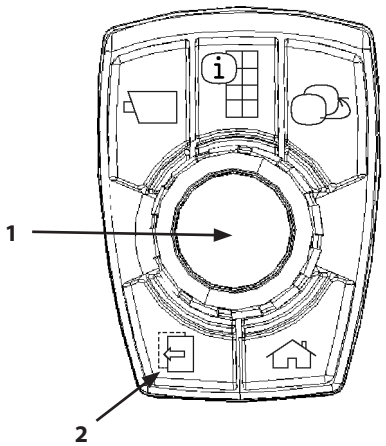
NOTE: Refer to page 1-79 "Operator Setting Screen" for details.

1. Rotate selector knob (1) to highlight a desired operator No.
2. Press selector knob (1) and the check box for the selected No. is turned on. The machine condition is updated with the stored settings for the selected operator No.

NOTE: Pressing backward switch (2) while appearing the Operator Setting screen this timing will move to the main menu screen.



MNUD-01-254EN



MNUD-01-252

Check Maintenance Item

If any of the periodical maintenance item is requested within 20 hours, the maintenance announce screen is displayed for about 5 seconds before displaying the basic screen.
Check and perform the requested maintenance. Refer to page 1-55 "Maintenance" for information.

NOTE: This screen does not appear if the maintenance notice function is turned off by the main monitor menu. Refer to page 1-56 "Maintenance Notice".



MNUD-01-035aEN

Using Booster Batteries

IMPORTANT: The machine electrical system is a 24 volt negative (-) ground. Use only 24 volt booster batteries with sufficient capacity.



SA-032

⚠ WARNING:

- **An explosive gas is produced while batteries are in use or being charged. Keep open flames and sparks away from the battery area. Do not continue to use or charge the battery when electrolyte level is lower than specified. Explosion of the battery may result.**
- **Park the machine and a machine with the booster batteries on a dry or concrete surface, not on steel plates. If the machine is parked on steel plates, the machine is equivalent to a continuously grounded machine so that dangerous unexpected current flow may result.**
- **Never connect a positive terminal to a negative terminal, as a dangerous short circuit will occur.**

If the machine batteries are completely discharged so that when starting the engine using booster batteries is necessary, follow the procedures described to the next page.

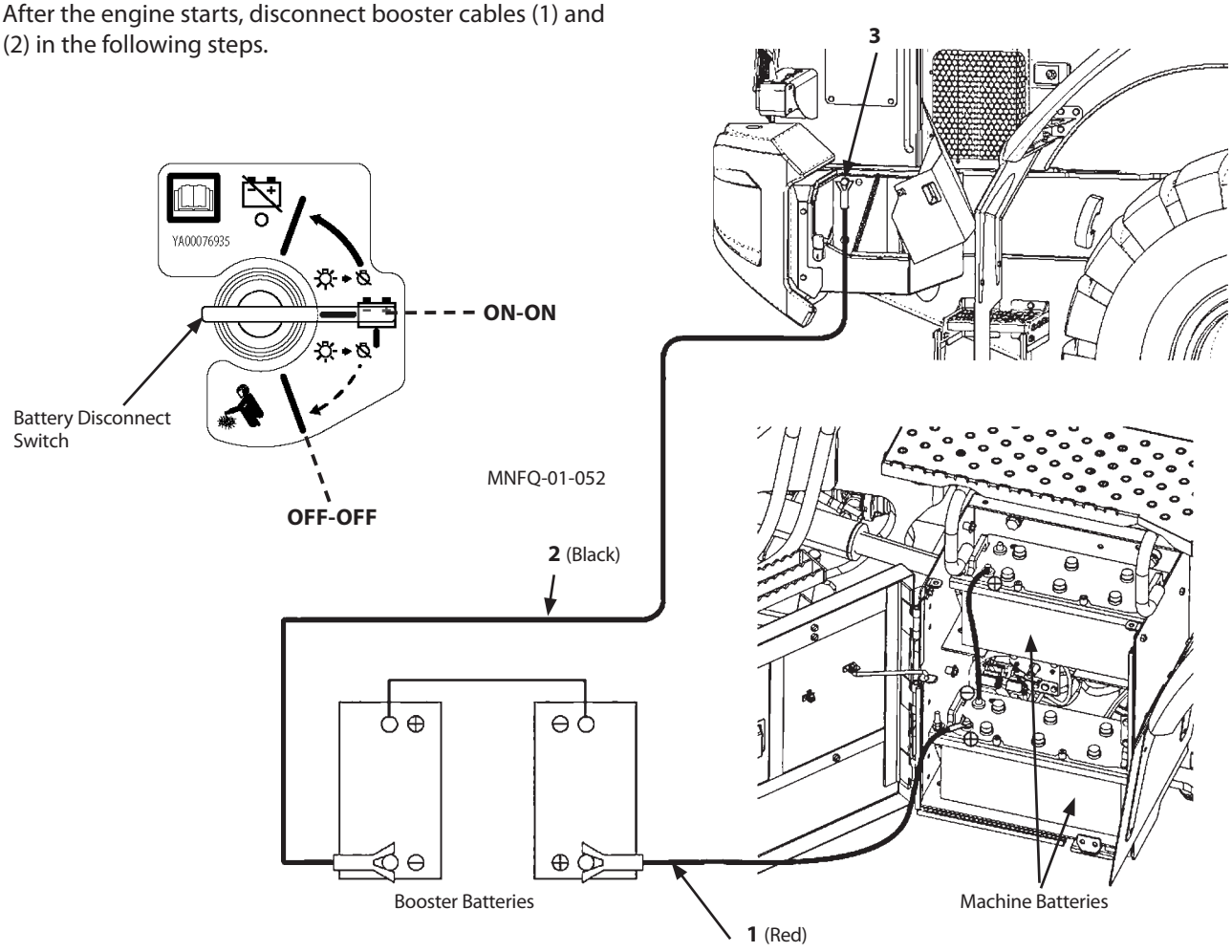
Connecting Booster Cables

1. Stop the engine on the booster battery mounted machine.
2. Put the battery disconnect switch in the "OFF-OFF" position.
3. Connect one end of red booster cable (1) to the positive (+) terminal of the machine battery, and the other end to the positive (+) terminal of the booster battery.
4. Put the battery disconnect switch in the "ON-ON" position.
5. Connect one end of black booster cable (2) to the negative (-) terminal of the booster batteries, and then connect the other end of the cable to an appropriate bolt on machine frame side that connects to the ground. In the last connection to the ground, sparks may fly so keep the machine batteries as far away as possible from the ground. (The bolt in tool box (3) is recommended.)
6. After securely connecting the booster cables, start the engine on the booster battery mounted machine.
7. Start the engine of the machine with a problem.
8. After the engine starts, disconnect booster cables (1) and (2) in the following steps.

Disconnecting the Booster Cables

1. Disconnect black negative (-) cable (2) from the machine frame grounding bolt first.
2. Disconnect the other end of black booster cable (2) from the negative terminal of the booster batteries.
3. Disconnect one end of red booster cable (1) from the positive terminal of the booster battery.
4. Disconnect the other end of red booster cable (1) from the positive terminal of the machine battery.

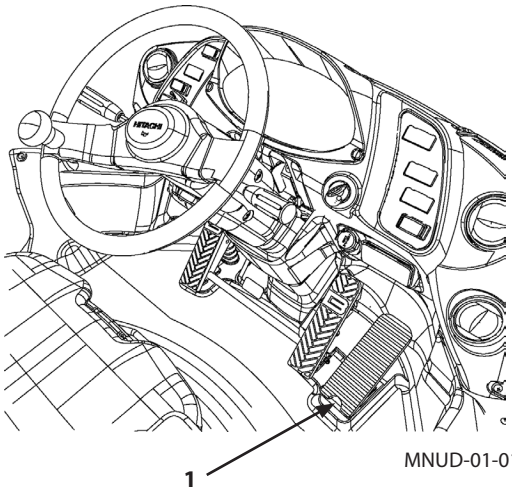
IMPORTANT: Make sure to connect/disconnect booster cables (1)(2) following the described steps. Connect booster cables one by one. Do not hold both cables at the same time to avoid short circuit.



MNFQ-03-002

Warming Up Operation

IMPORTANT: Right after the engine starts, the engine speed will be kept to slow idle speed for maximum 30 seconds when the coolant, hydraulic oil or transmission oil temperature is low, or for 3 seconds at normal temperature even if accelerator pedal (1) is operated.



MNUD-01-010

WARNING: After starting the engine, start the machine operation only after confirming that the engine speed changes by operating accelerator pedal (1).

Otherwise, the machine or the front attachment may unexpectedly start moving, possibly causing accidents such as crash.

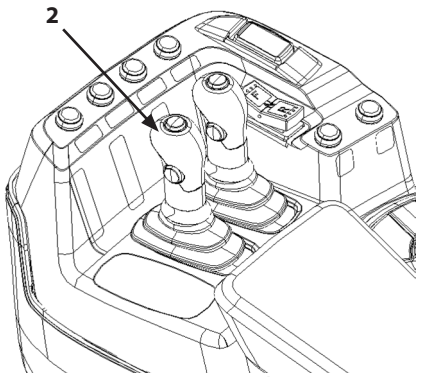
CAUTION:

- **Operating the machine without warming up operation causes damage to the engine and hydraulic components. Be sure to perform warm up operation not only to protect the hydraulic components from being damaged but also to ensure safe operation.**
- **Long periods of idling, more than 10 minutes, can cause poor engine performance.**
- **Do not idle for excessively long periods. Observe local and federal engine idling regulations.**

If the machine is operated excessively with the hydraulic oil temperature below 20 °C (68 °F), damage to the hydraulic components may result. To prevent this situation, after starting the engine, sufficiently perform warm up operation as described below before operating the machine until the hydraulic temperature increases to higher than 20 °C (68 °F).

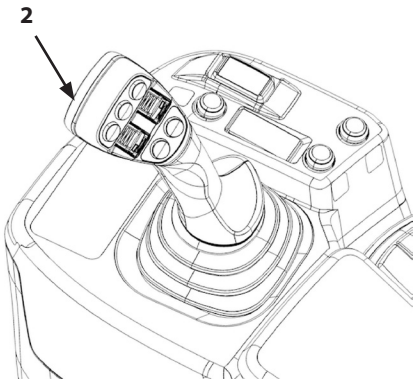
1. Run the engine at slow idle speed without operating the accelerator pedal (1) for about 3 to 5 minutes without load.
2. Increase the engine at medium speed. Raise the bucket above the ground and hold bucket control lever (2) in the tilt position for 10 seconds. (Do not operate control levers other than the bucket control lever at this time.)

IMPORTANT: Excessively repeated operation of bucket control lever (2) could generate abnormal surge pressure, resulting in damage to hydraulic parts.



Fingertip Control Type

MNFQ-05-002



Multi-Function Joystick Type

MNUD-05-004

Warming Up Operation in Cold Weather

IMPORTANT: Right after the engine starts, the engine speed will be kept to slow idle speed for maximum 30 seconds even if accelerator pedal (1) is operated.

WARNING: After starting the engine, start the machine operation only after confirming that the engine speed changes by operating accelerator pedal (1). Otherwise, the machine or the front attachment may unexpectedly start moving, possibly causing accidents such as crash.

CAUTION:

- **If the hydraulic oil temperature is low, perform cold weather warm up. Operate the machine only after the loader front operating speed becomes normal. Operating the machine without warming up operation causes damage to the engine and hydraulic components. Be sure to perform warm up, not only to protect the hydraulic components from being damaged, but also to ensure safe operation.**
- **Long periods of idling, more than 10 minutes, can cause poor engine performance.**
- **Do not idle for excessively long periods. Observe local and federal engine idling regulations.**

NOTE: Illuminations such as headlight, work light or room light may become dim during the engine preheat operation at cold temperature.

If the "Warm Up Operation" in the sub monitor setting menu is set to "ON" (enabled), the engine speed automatically increases from slow idle to 1000 min^{-1} (rpm) and enters warm-up mode when:

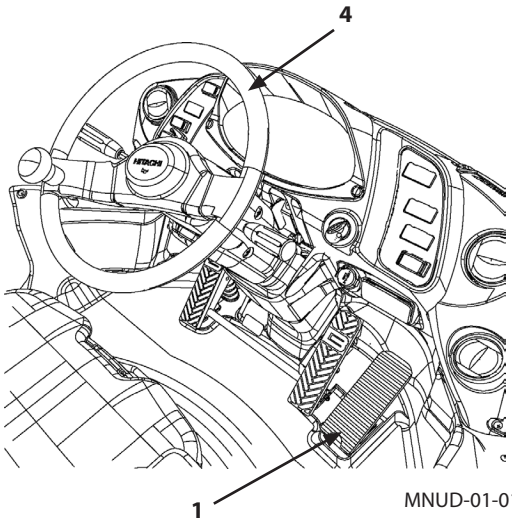
- Hydraulic oil temperature is below 0°C (32°F)
- Coolant temperature is below 30°C (86°F)
- Ambient temperature is below 0°C (32°F)
- Operator station temperature is below 5°C (41°F)

NOTE: The warm-up mode is activated anytime when the temperature conditions are satisfied, not only at start up. Refer to page 1-113 "Warm Up Operation ON/OFF".

The warm-up mode is automatically canceled, and the engine runs in slow idle mode when:

- Hydraulic oil temperature becomes 30°C (86°F) or higher
- Coolant temperature becomes 40°C (104°F) or higher

NOTE: According to the setting for extremely low temperature conditions, the engine speed will increase to 1100 min^{-1} (rpm), and the temperature setting to cancel the warm-up operation may differ. Contact your authorized representative for further information.



MNUD-01-010

IMPORTANT:

- **Do not subject the engine to sudden acceleration until the end of the warm-up period.**

1. Run the engine at slow idle speed for more than 5 minutes.

NOTE: At this time, do not operate the engine in slow or fast speed. Operate the machine after the needle of coolant temperature gauge (2) starts swinging.

2. Slowly extend the bucket cylinder to stroke end by operating bucket control lever (3).

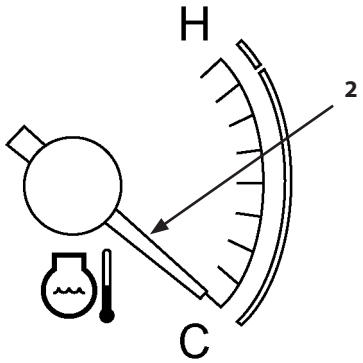
NOTE: Do not continuously operate bucket control lever (3) for more than 10 seconds at this time.

3. Slowly retract the bucket cylinder to stroke end.

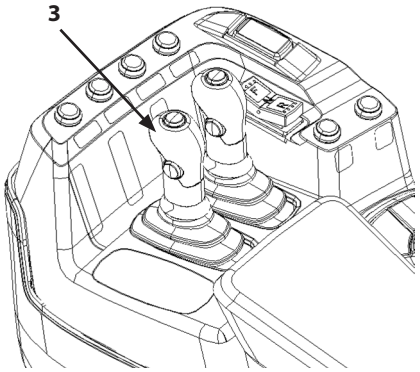
CAUTION: Do not continuously operate bucket control lever (3) after retracting the bucket cylinder to stroke end.

4. Repeat steps 2 and 3 until the loader front operating speed becomes normal.
   When the ambient temperature is lower than 0 °C (32 °F), extend the warming up operation time by running the engine at middle speed.
5. Run the engine at low idle speed.
6. Slowly turn steering wheel (4) until the steering cylinder is close to the end of stroke.
7. Slowly turn steering wheel (4) in the opposite direction, until close to the end of stroke.
8. Repeat steps 6 and 7 five times.
9. Press and release the brake pedal at least 5 times.

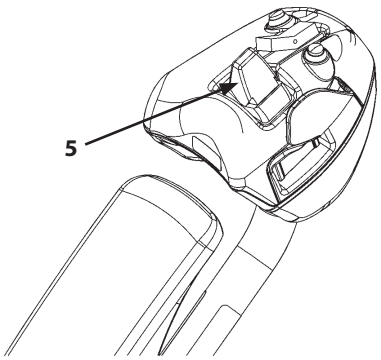
IMPORTANT: In cold weather, or if the hydraulic oil temperature is low, the turning speed may be slow when using the joystick steering. Perform a full warm-up by operating joystick steering lever (5) before operating the machine.



MNUD-01-014



MNFQ-05-002



MNEK-13-002

Stopping the Engine

Stop the engine in the following manner.

IMPORTANT: Never stop the engine while traveling the machine.

If the engine stops, the steering system may become inoperable, or it may cause other malfunctions or seizure of parking brake.

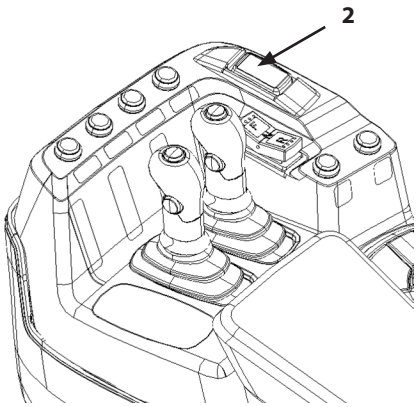
1. Lower the bucket before stopping the engine.



MPD8-01-307

IMPORTANT: If the engine equipped with a turbocharger is stopped without first performing the cool down operation, the lubricant on the turbocharger bearing surfaces may desiccate due to the intense heat present inside the turbocharger, possibly causing damage to the turbocharger.

2. Run the engine at slow idle speed for 5 minutes to cool the engine.
3. Turn key switch (1) to OFF position to stop the engine.
4. Press LOCK ( ) side of control lever lock switch (2).

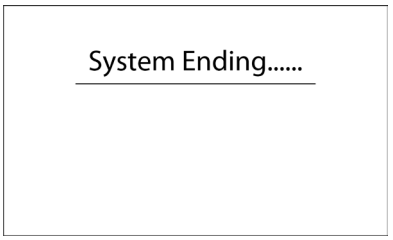


MNFQ-05-002

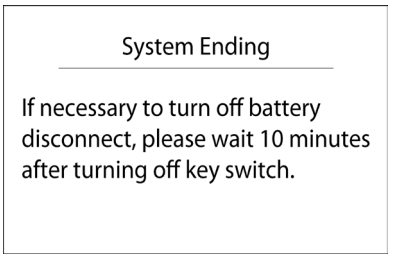
CAUTION: Do not idle for excessively long periods. Observe local and federal engine idling regulations.

IMPORTANT: After stopping the engine, the DEF pump keeps operating to circulate the DEF in piping. Do not turn the battery disconnect switch OFF while pump is running and wait 10 minutes or more after engine stops. Failure to do so may damage the SCR system.

NOTE: The LED indicator besides the battery disconnect switch turns on for about 10 minutes after the key switch is turned to OFF or ACC position. Wait until this LED indicator turns off and turn off the battery disconnect switch. Also the main monitor displays the system ending screens for assistance.



MNUD-01-144



MNUD-03-001EN

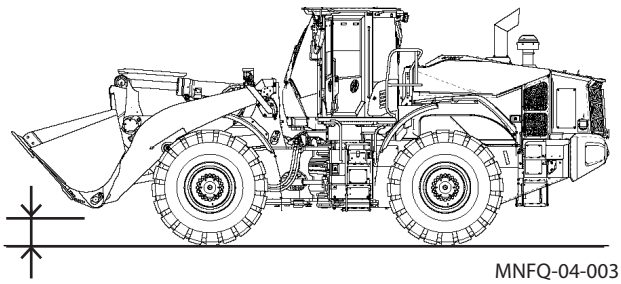
Precautions for Starting to Move

Correct operation will result in extending the service life of each part and component as well as saving fuel and oil. Always be sure to safely and efficiently operate the machine while paying attention to the following points.

1. While checking the tires for abnormal air pressure and any obvious damage, make sure that there is no hazardous and/or obstacles in and around the vicinity of the machine.
2. After raising the lift arm, set the machine to the driving position, fully tilt the bucket backward.
3. Before driving on public roads, set the machine to the driving position as illustrated to the right.
4. After starting the engine, be sure to run the engine at slow idle speed to warm up the machine before starting to move. Do not depress the accelerator pedal when starting the engine and idling operation.

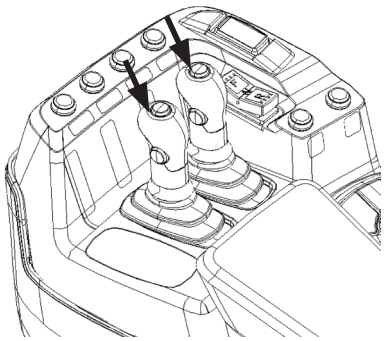
   Refer to page 3-14 for the warming up operation.

CAUTION: When driving on public road, never operate the control levers to move the front loaders, such as lift arm or bucket. Pay special attention not to touch the control levers while driving.



MNFQ-04-003

Driving Position
A: 500 mm (20 in)

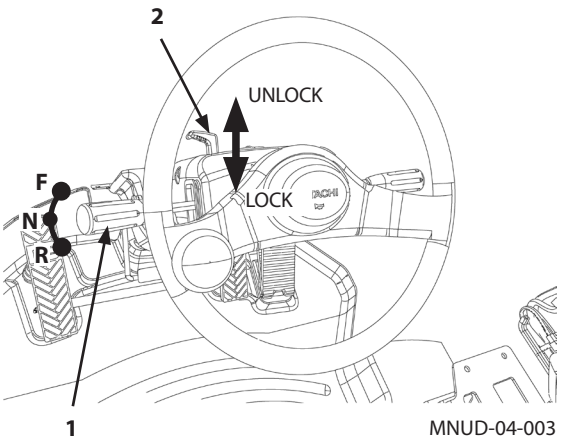


MNFQ-05-002

Travel Levers , Switches and Pedals

Forward/Reverse Lever

Changes the machine drive direction from forward to reverse and vice versa.
Move forward/reverse lever (1) to the F position to travel the machine forward.
Move forward/reverse lever (1) to the R position to drive the machine in reverse.



MNUD-04-003

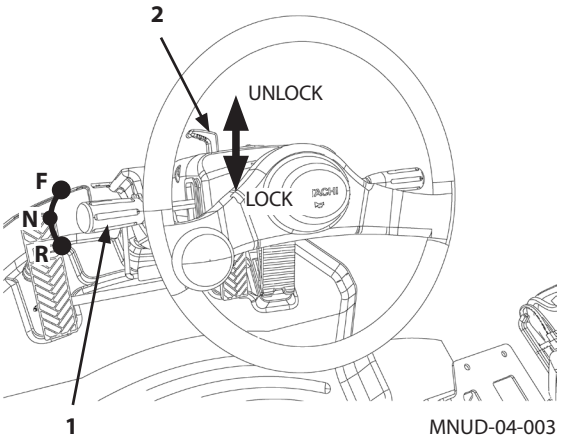
IMPORTANT: Never attempt to shift forward/reverse lever (1) while letting the machine travel at high speed (3rd, 4th or 5th speed). Failure to do so will cause engine brake to be suddenly applied, leading to hazardous situation. Also, it may cause damage to the transmission.

Neutral Lever Lock (for the Forward/Reverse Lever)

WARNING: When the machine is parked or serviced, be sure to place the neutral lever lock (2) in the LOCK position.

The neutral lever lock makes forward/reverse lever (1) immovable so that the machine does not start moving even if a body part comes in contact with forward/reverse lever (1) by mistake.
Before starting the engine, set neutral lever lock (2) in the LOCK position.

Pull : UNLOCK
Push : LOCK

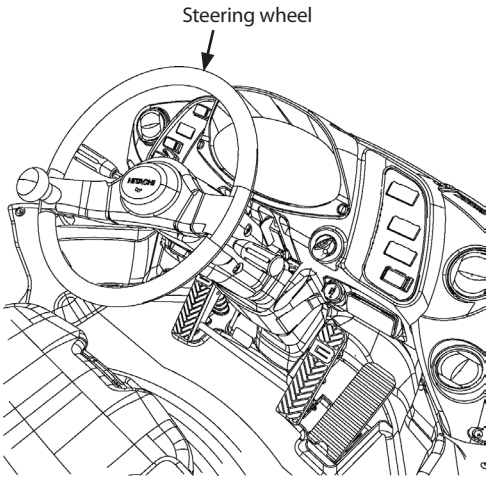


MNUD-04-003

Steering Wheel

WARNING:

- **Avoid quick steering while driving the machine at high speeds, while driving on a steep slope, or while raising the lift arms. Failure to do so may cause the machine to turn over.**
- **Never attempt to stop the engine while steering the machine. If the engine is stopped, the steering wheel will lock and the parking brake will be applied so that steering will be impossible. Never stop the engine while travelling with the machine.**
- **Never steer while raising the lift arm high as it is extremely dangerous and may cause the machine to turnover.**



MNUD-01-010

IMPORTANT: When the steering wheel is fully turned, the front and the rear frames come in contact with the stoppers so that the steering wheel does not rotate further. If the steering wheel is forcibly turned further, the engine may stall or malfunction of the steering system may result.

Turn the steering wheel toward the direction you intend to steer the machine during drive operation.

NOTE: This machine has an articulated frame. The front and rear frames are coupled by connection pins (center pins) so that the rear wheels follow the tracks of the front wheels.

Turn the steering wheel slowly so as to follow the motion of the machine.

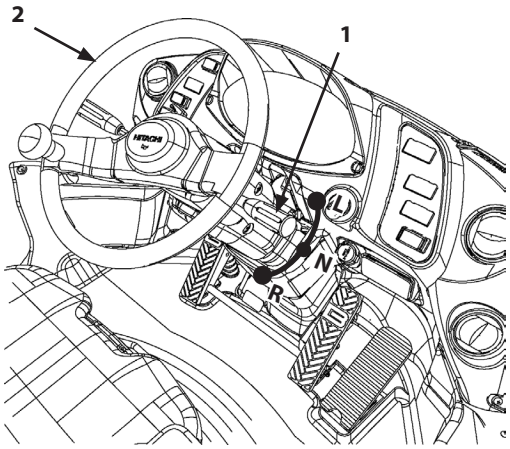
Turn Signal Lever

Indicates the drive change direction to persons and/or other vehicles by operating turn signal lever (1).

L- Left Turn

N- OFF

R- Right Turn



MNUD-01-010

Shift Switch

Rotate shift switch (3) to shift the gear.

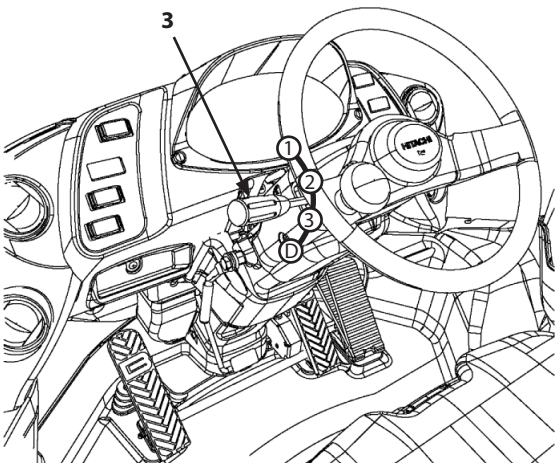
Forward	Reverse
1st - 4th	1st - 4th

Select a proper shift for the work.

IMPORTANT: The forward/reverse lever and shift switch are designed to operate lightly.

Do not press and twist the lever or switch firmly.

Damage to the lever and switch may result.

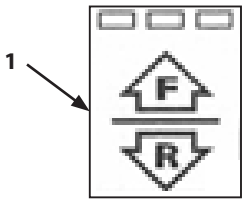


MNUD-01-009

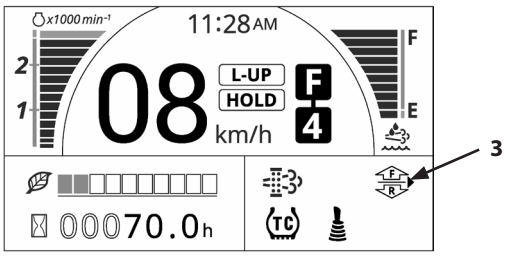
Forward/Reverse Selector Switch

Forward/reverse selector switch (1) is a switch that activates forward/reverse switch (2) on the right console, or on the multi-function lever.

When forward/reverse selector switch (1) is in ON position, forward/reverse selector switch indicator (3) is lit.
The machine travels in forward or reverse direction by pressing (F) or (R) button of forward/reverse switch (2).



MNUD-01-209



MNFQ-01-021

Switch Operation

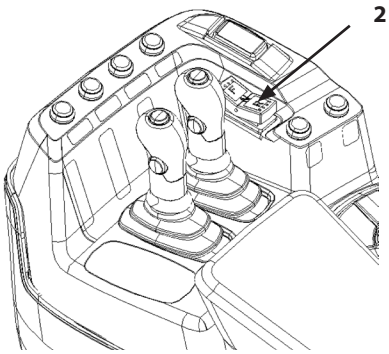
1. Turn off parking brake switch (4).

WARNING: At this time, be sure to depress the brake pedal to ensure safety.

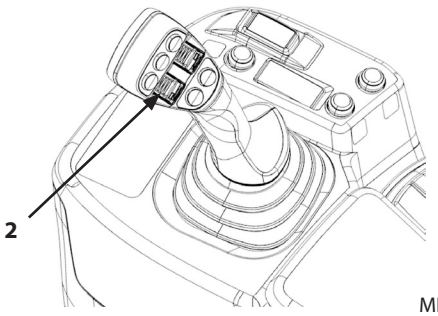
2. When forward/reverse selector switch (1) is turned ON while both forward/reverse lever (5) and forward/reverse switch (2) are in the neutral (N) position, forward/reverse selector switch indicator (3) is lit.
3. Set forward/reverse switch (2) to (F) or (R).

NOTE: When forward/reverse lever (5) is set to other than the neutral (N) position while forward/reverse switch (2) is operating, forward/reverse switch (2) becomes disabled. (Forward/reverse lever priority control)

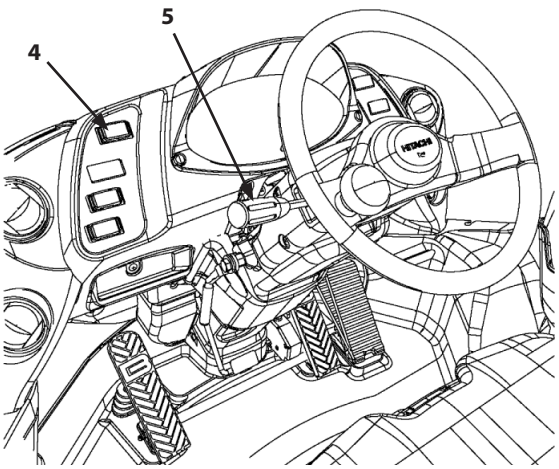
If you use the forward/reverse switch (2) again, perform step 2.



MNFQ-05-002



MNUD-05-004

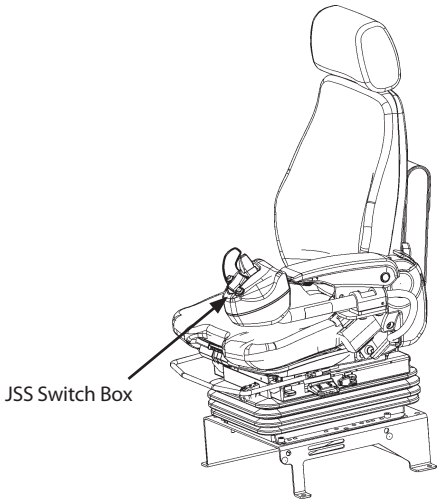


MNUD-01-009

Joystick Steering Controls (Type A)

Joystick Steering Lever (1)

This lever controls turning operations.
Pressing lever (1) down to the left turns the machine to the left.
Pressing lever (1) down to the right turns the machine to the right.
How far lever (1) is depressed, controls how fast the machine turns.
When operating the steering wheel at the same time, priority is given to the operation that is displaced further from the neutral position.
Under normal operating speeds, the steering wheel will be displaced further from the neutral position, so the steering wheel operation will have priority.



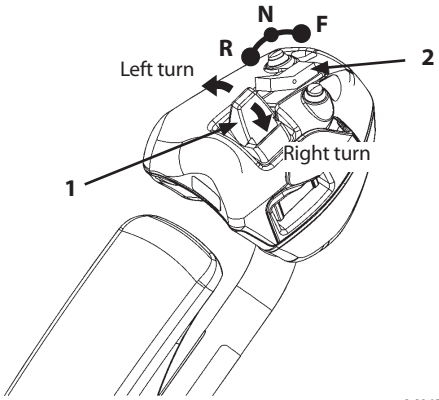
MNEK-13-001

Forward/Reverse Switch (Left) (2)

This switch (2) is for changing the direction of travel, between forward, neutral and reverse.

F position : Forward travel
N position : Neutral
R position : Reverse travel

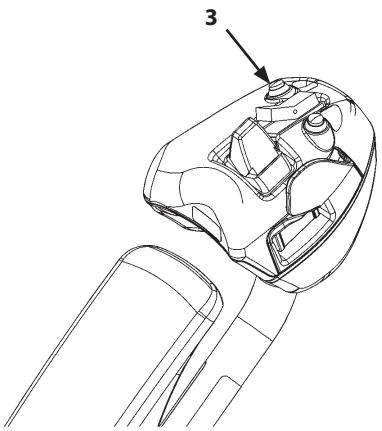
When the forward/reverse lever is operated, it is given priority.



MNEK-13-002

DSS (Down Shift Switch) (3)

When DSS (3) is pressed, it downshifts the transmission. During normal operations, the 2nd speed setting is used, but when traveling forward and digging, if DSS (3) is pressed, it shifts down to 1st, increasing the driving force and improving digging performance. If the position of forward/reverse switch (2) is switched to reverse (R), it shifts to 2nd, returning to the original speed range. For details, refer to page 4-20 "DSS (Down Shift Switch)".

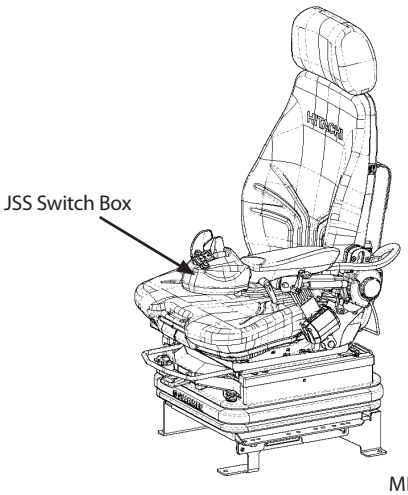


MNEK-13-002

Joystick Steering Controls (Type B)

Joystick Steering Lever (1)

This lever controls turning operations.
Pressing lever (1) down to the left turns the machine to the left.
Pressing lever (1) down to the right turns the machine to the right.
How far lever (1) is depressed, controls how fast the machine turns.
When operating the steering wheel at the same time, priority is given to the operation that is displaced further from the neutral position.
Under normal operating speeds, the steering wheel will be displaced further from the neutral position, so the steering wheel operation will have priority.



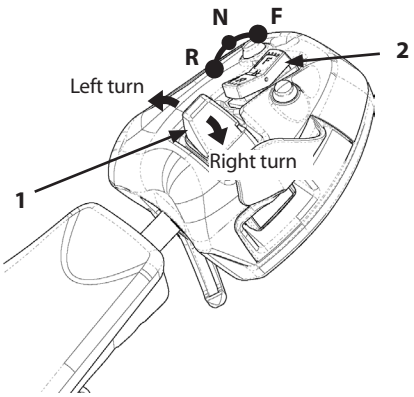
MNFQ-01-034

Forward/Reverse Switch (Left) (2)

This switch (2) is for changing the direction of travel, between forward, neutral and reverse.

F position : Forward travel
N position : Neutral
R position : Reverse travel

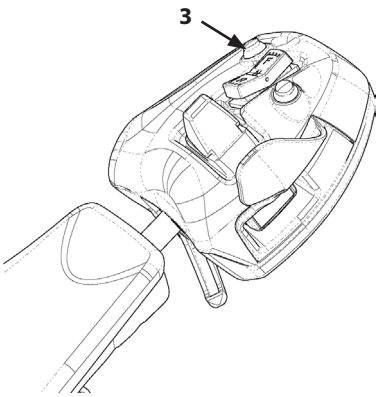
When the forward/reverse lever is operated, it is given priority.



MNFQ-01-023

DSS (Down Shift Switch) (3)

When DSS (3) is pressed, it downshifts the transmission. During normal operations, the 2nd speed setting is used, but when traveling forward and digging, if DSS (3) is pressed, it shifts down to 1st, increasing the driving force and improving digging performance. If the position of forward/reverse switch (2) is switched to reverse (R), it shifts to 2nd, returning to the original speed range. For details, refer to page 4-20 "DSS (Down Shift Switch)".

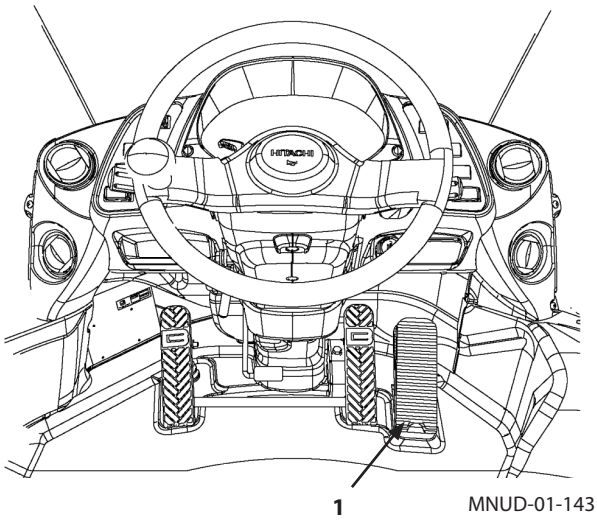


MNFQ-01-023

Accelerator Pedal

When accelerator pedal (1) is stepped on, the engine speed increases. When released, the engine speed decreases.

NOTE: The engine speed may change due to the machine control regardless of the operation of the accelerator pedal.

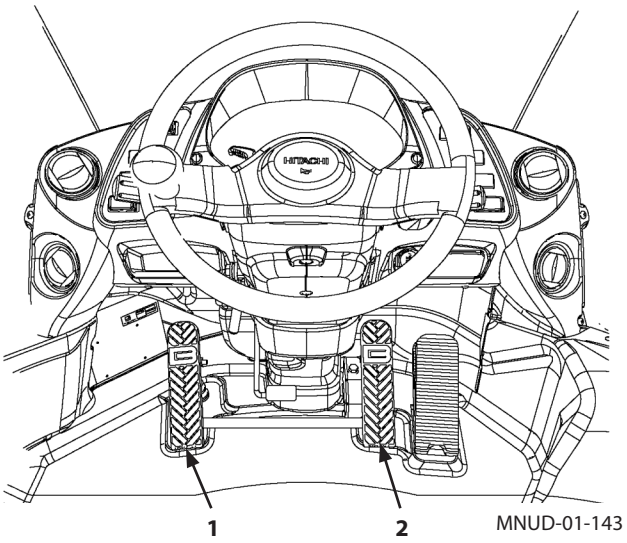


MNUD-01-143

Brake Pedal

WARNING:

- **Avoid sudden brake application during travel operation, possibly creating a hazardous situation. The machine may lose its balance.**
- **To prevent wear on the brake pads, brake discs and clutch, and to keep the axle oil from overheating, keep your feet off the brake pedal except when needed.**
- **Keep the installation areas around the brake pedals clean to prevent dust and/or grit from accumulating. The brake may become inoperable.**



MNUD-01-143

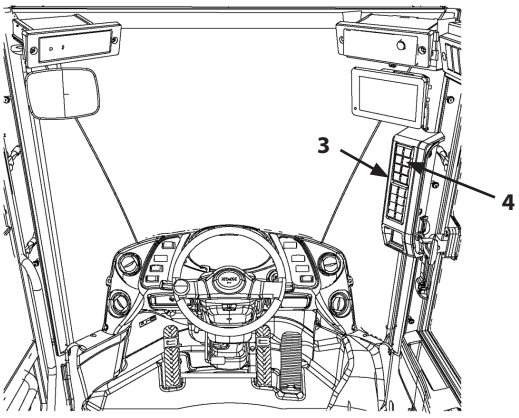
Left and right brake pedals (1), (2) can function as the service brake or the clutch cut brake by switching clutch cut position switch (4) on panel switch (3).

Service Brake

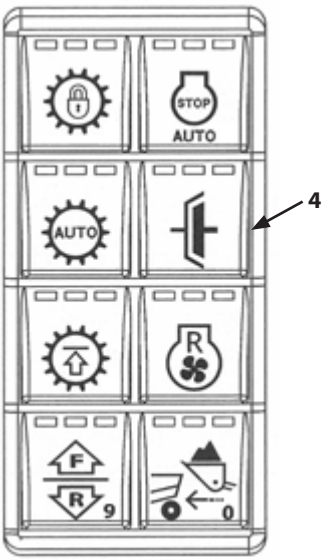
Brake pedals (1), (2) function as normal brake by setting clutch cut position switch (4) to OFF (Neutral) position. Be sure to turn clutch cut position switch (4) OFF (Neutral) before traveling a slope.

Clutch Cut Brake

Brake pedals (1), (2) function as clutch cut brake by setting clutch cut position switch to the ON ("N Mode" or "D Mode"). Use to stop the machine in the specified position to engage the machine in loading/unloading work.
Refer to page 1-127 for the position setting.



MNUD-01-008

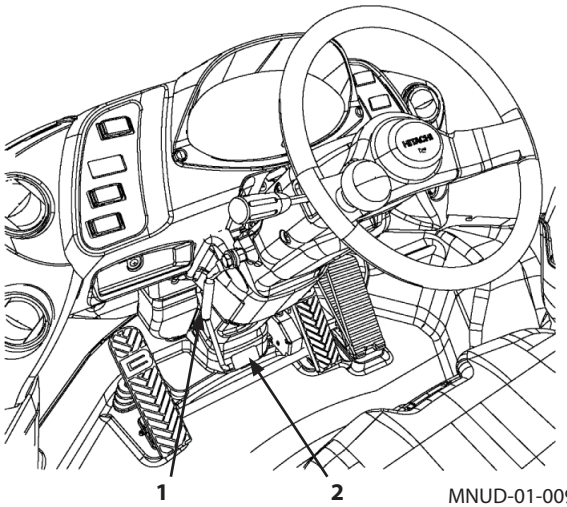


MNFQ-01-201

Tilt, Telescopic Lever/Steering Column Pop-up Pedal

WARNING:

- **Before operating the machine, be sure that the steering wheel is locked.**
- **Do not operate the tilt, telescopic lever (1) and steering column pop-up pedal (2) during operation.**



MNUD-01-009

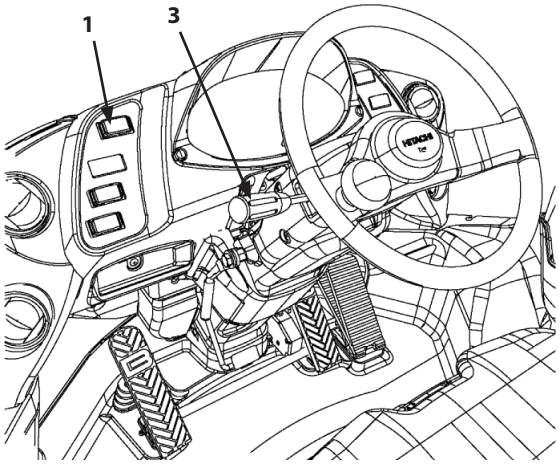
- Before operating the machine, adjust the steering column inclination so as to match the operator's physical constitution.
  Pull lever (1) to set the steering column inclination to the desired position. Push lever (1) until it contacts the stopper, ensuring the steering column is locked.
- By depressing steering column pop-up pedal (2), the steering column moves forward, and the distance between the operator's seat and the steering wheel increases, allowing operator to get on and off the machine easily.
- After moving the steering column forward, pull the steering wheel to the operator side. The steering column will be automatically locked in the regular position and the machine becomes operable.

CAUTION: Never attempt to drive the machine while moving the steering column forward.

Parking Brake Switch

WARNING:

- **To prevent accidents due to running away of the machine, after parking the machine or before leaving the machine, be sure to apply the parking brake.**
- **Never apply the parking brake by operating parking brake switch (1) while traveling the machine except in an emergency. Premature wear and/or damage to the parking brake may result. After the parking brake has been applied in an emergency while traveling the machine, have the parking brake checked at Authorized Dealer.**

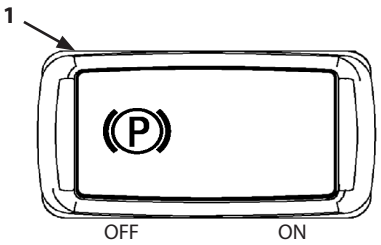


MNUD-01-009

1. Press the OFF side of parking brake switch (1) to release the parking brake. Check that parking brake indicator (2) goes OFF by pressing the switch twice with clicks.

   Press the ON side of parking brake switch (1) to apply the parking brake.

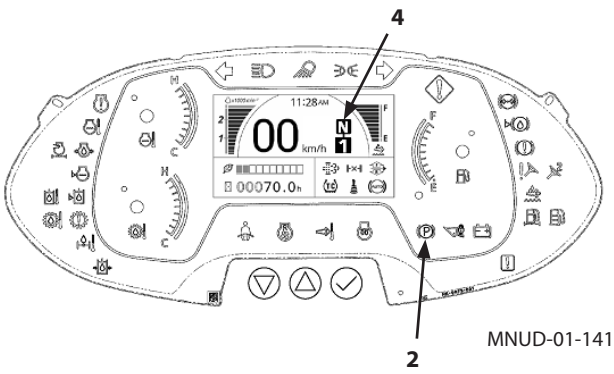
   Operate the parking brake after parking the machine on level ground.



MNUD-01-146

NOTE: While running the engine, when the parking brake is applied with forward/reverse lever (3) in neutral, parking brake indicator (2) comes ON.

2. While running the engine, when the parking brake is applied with forward/reverse lever (3) in either the forward (F) or reverse (R) position, parking brake indicator (2) comes ON, and the alarm buzzer sounds. F-N-R display (4) of the monitor display indicates "N", not "F" and "R".
   Release the parking brake and once returns the forward/reverse lever to the neutral position. Then, change to the forward or reverse position. ("F" or "R" is correctly indicated.)

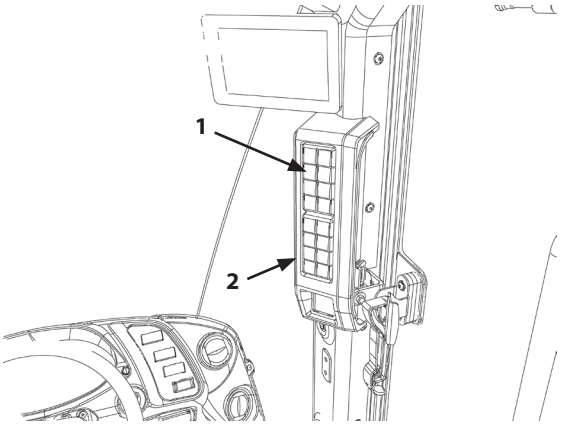


MNUD-01-141

3. To ensure safe operation, when the engine is stopped, the parking brake is applied even if parking brake switch (1) is in the OFF position.

   In this case even after the engine is restarted, the parking brake will not be released. After starting the engine, push the ON position of parking brake switch (1) once. Push the OFF position parking brake switch (1) to release the parking brake.

Travel Mode Setting

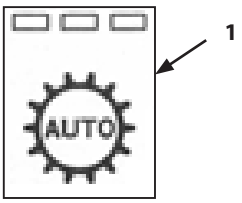


MNUD-01-200

Speed Gear Shift Change Mode

IMPORTANT: Be sure to stop the machine and set forward/reverse lever (3) in the neutral (N) position before operating travel mode selector switch (1).

Before starting to move, select the speed gear selection mode, manual or auto shift, by setting travel mode selector switch (1) on panel switch (2).
Pressing travel mode selector switch (1) changes the selected mode "Manual" → "AUTO1" → "AUTO2"→ "Manual" in this order.



MNUD-01-205

- Manual Shift Mode
  Selecting the manual mode sets the transmission to Manual mode, which allows manual shift change by using shift switch (4).
  After moving forward/reverse lever (3) to either forward (F) or reverse (R) position, move the shift switch (4) to the desired position. The transmission gear position can be shifted in 4 ranges in the forward and 4 ranges in the reverse mode. Select the most appropriate transmission gear position according to the type of the work engaged in or the driving road conditions.

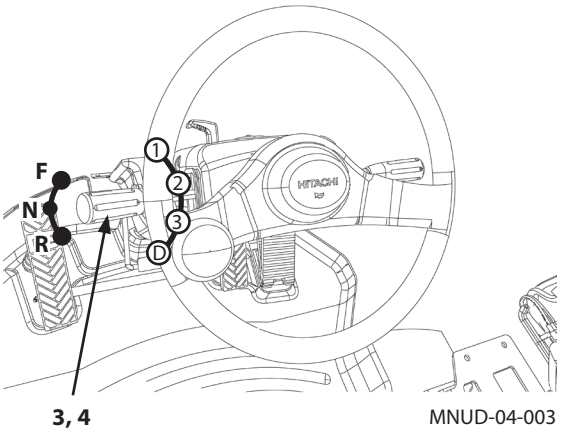
- Auto Shift Mode
  When the shift switch position is in other than the 1st speed position, selecting the auto mode starts traveling at 2nd speed, then shifts up to the set shift switch position automatically. When the shift switch is set to 4th speed, auto-shift range is 1st to 4th speed.
  Set forward/reverse lever (3) to (F) or (R). Select the most appropriate transmission gear position according to the type of the work engaged in or the driving road conditions.

  "AUTO1" or "AUTO2" is selectable. Select the most efficient mode for the travel and work condition.

AUTO1:	When traveling load increases, it automatically shifts from 2nd to 1st speed. (Auto downshift function) This mode is suited for heavy digging work or ascending on a slope.
AUTO2:	Start traveling at 2nd speed. This mode uses 2nd or more gear shifts. This mode is suited for removing snow.

	Pilot Lamp			
	■ ■ ■	□ □ □	■ □ □	
Function	Manual	AUTO1	AUTO2	

□: LED ON ■: LED OFF



MNUD-04-003

Shift Range of Auto Transmission

Mode	Shift Position	Shift Range
AUTO 1:	1st range	1st range only
	2nd range*	1st ↔ 2nd range ↔ 2nd L-UP
	3rd range*	1st range ↔ 2nd range → ← 2nd L-UP → ← 3rd range ↔ 3rd L-UP
	4th range*	1st range ↔ 2nd range → ← 2nd L-UP → ← 3rd range → ← 3rd L-UP → ← 4th range ↔ 4th L-UP
AUTO 2:	1st range	1st range only
	2nd range	2nd ↔ 2nd L-UP
	3rd range	2nd range → ← 2nd L-UP → ← 3rd range ↔ 3rd L-UP
	4th range	2nd range → ← 2nd L-UP → ← 3rd range → ← 3rd L-UP → ← 4th range ↔ 4th L-UP

NOTE:

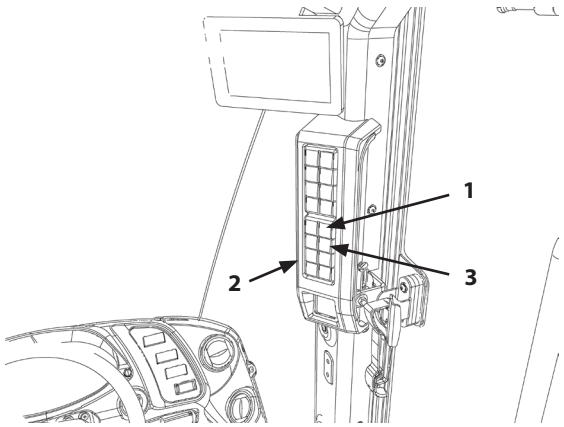
- ** Start traveling with 2nd range.*
- *"L-UP" stands for lock-up, and indicates lockup clutch is used.*
  When lockup setting is turned OFF, the L-UP shift ranges are skipped during shift change. Refer to page 1-123 for the lockup setting.
- *L-UP shift ranges are skipped during shift down.*
- *When AUTO 1 is selected, the gear automatically shifts in 1st range according to the load. However, the transmission will not shift in 1st range while depressing the brake pedal.*

Power Mode ON/OFF

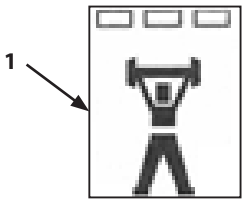
Power mode switch (1) setting may affect the gear shift timing in auto shift mode. Pressing power mode switch (1) alternates the Power mode ON and OFF.

OFF : Under auto shifting mode, the gear is shifted in early timing.
ON : Under auto shifting mode, the gear is shifted in regular timing.

NOTE: Refer to page 1-134 for the power mode switch operation.



MNUD-01-200



MNUD-01-212

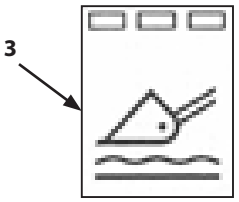
	Pilot Lamp			
	■ ■ ■	□ ■ ■	□ □ ■	
Function	OFF	ON (Power)	ON (Power+)	

□ : LED ON ■ : LED OFF

Ride Control ON/OFF

WARNING: Never turn ride control switch (3) to ON when traveling the machine or raising the bucket. Before turning the ride control switch (3) ON, stop the machine and confirm the safety around the bucket. Avoid turning ride control switch (3) to ON position while traveling the machine. Failure to do so may automatically move the lift arm up or down.

Before starting to move, turn off the ride control function by ride control switch (3) on panel switch (2). Pressing ride control switch (1) alternates the ride control ON and OFF.



MNUD-01-214

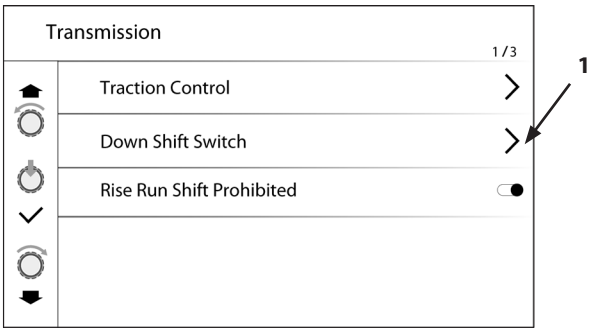
	Pilot Lamp			
	■ ■ ■	■ □ ■		
Function	OFF	AUTO		

□ : LED ON ■ : LED OFF

Rise Run Shift Prohibit ON/OFF

When the "rise run shift prohibited" setting is ON, the shift range is held at the 2nd speed range during loading work, even if the shift position 3rd, 4th or 5th is selected.

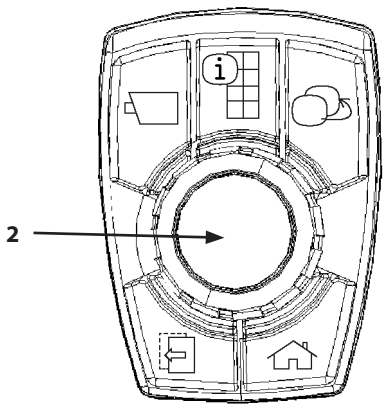
NOTE: This functions only when "AUTO1" or "AUTO2" travel mode is selected.



MNFQ-01-028EN

Forward traveling:
The gear will not shift while the lift arm is raising. When the bucket is at transportation or traveling height, the shift up timing delay operates once. When the bucket is at digging position (near the ground), the shift up timing delay always operates.

Reverse traveling:
The gear shifts up when traveling the machine at high speed in 2nd speed position for 5 seconds or longer. The shift up timing delay operates regardless of the bucket height.



MNUD-01-252

This setting can be changed from the sub monitor menu. From the sub monitor main menu, select [Setting] - [Transmission] - [Rise Run Shift Prohibited] (1). Push selector knob (2) to alternate ON and OFF setting.

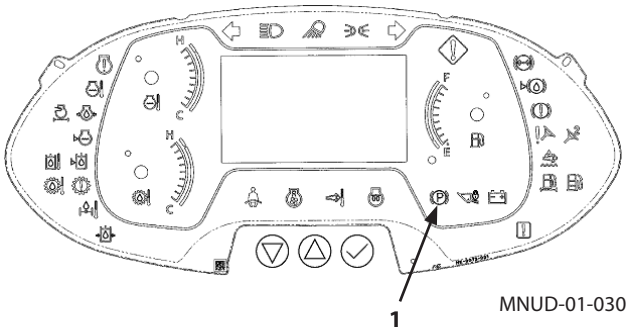
NOTE: Refer to page 1-97 "Rise Run Shift Prohibit ON/OFF" for the details.

Starting to Move

WARNING: Start to move the machine only after checking that no personnel and/or obstacles are present around the machine.

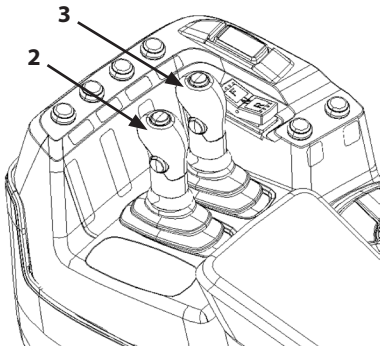
Never turn ride control switch (5) to ON position while traveling the machine. Failure to do so may automatically move the lift arm up or down. Before turning the ride control switch (5) ON, stop the machine and confirm the safety around the bucket.

NOTE: Refer to page 1-136 for detailed information of ride control switch (5).



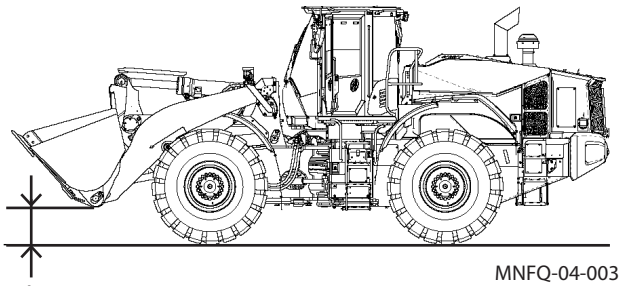
MNUD-01-030

1. Check that none of the warning indicators except parking brake indicator (1) on the monitor panel is ON.



MNFQ-05-002

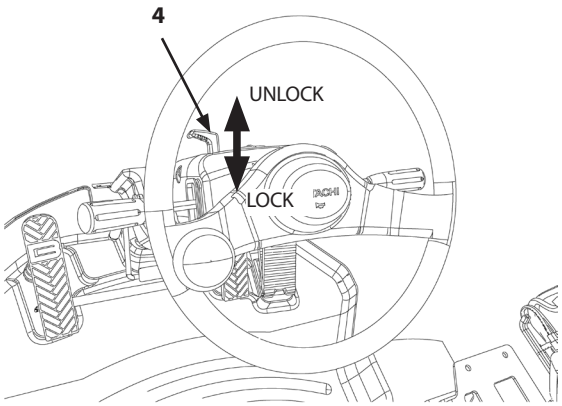
2. Set the front attachment in the driving position by operating control levers (2) (3).



MNFQ-04-003

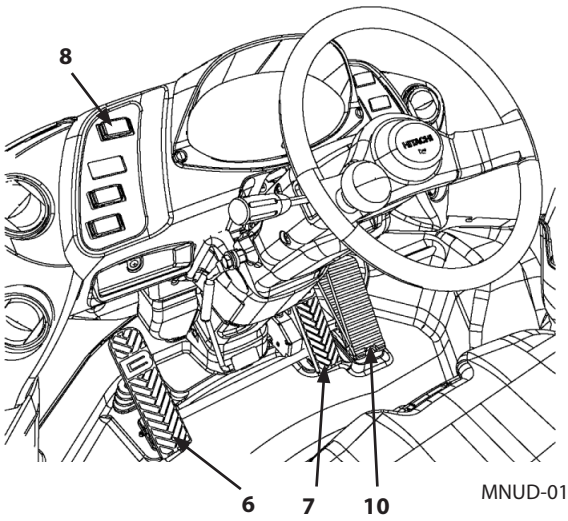
Driving Position
A: 500 mm (20 in)

3. Set neutral lever lock (4) to the UNLOCK ( ) position.



MNUD-04-003

4. Step on brake pedal (6) or (7) and press parking brake switch (8) to the OFF position to release the parking brake. Check that at this time parking brake indicator (1) goes OFF.

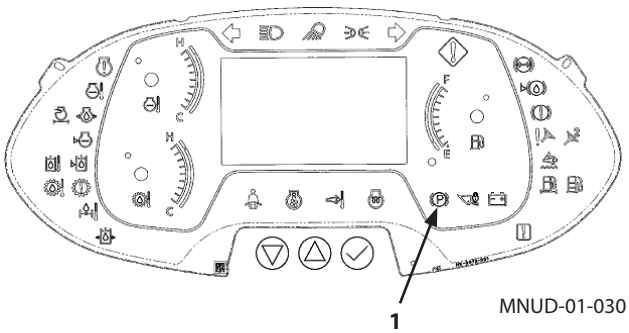


MNUD-01-009

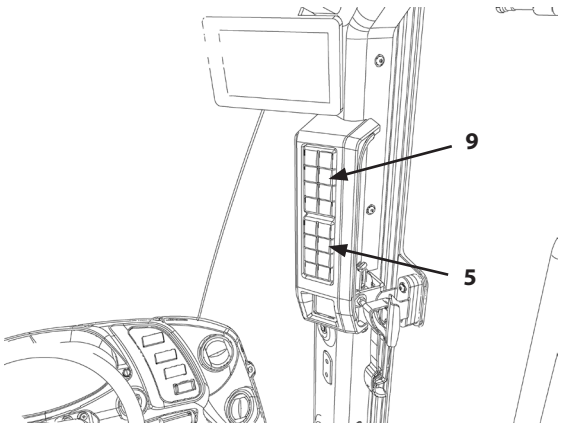
5. Release brake pedal (6) or (7) and step on accelerator pedal (10) to start traveling.

CAUTION: When driving on public road, never operate the control levers to move the front loaders, such as lift arm or bucket. Pay special attention not to touch the control levers while driving.

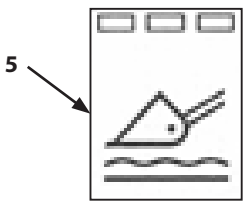
NOTE: When starting to ascend a slope, turn clutch cut position switch (9) OFF (clutch engaged), and depress brake pedal (6) or (7). Gradually release brake pedal (6) or (7) while depressing accelerator pedal (10) to easily start ascending a slope.



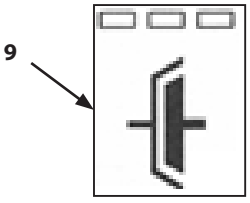
MNUD-01-030



MNUD-01-200



MNUD-01-214

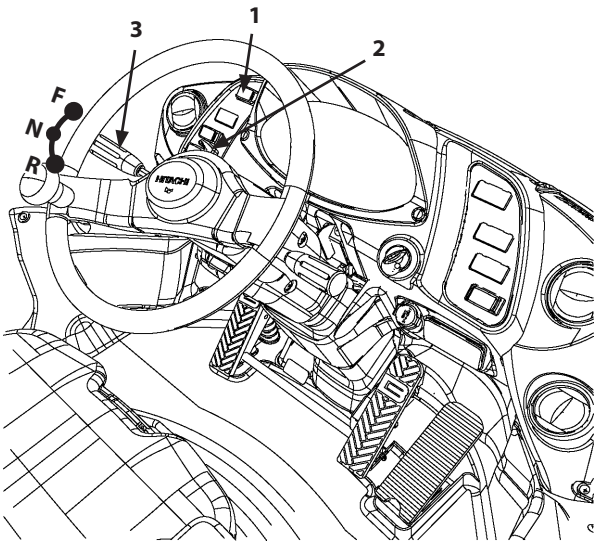


MNUD-01-206

Changing Forward/Reverse Drive Direction

WARNING:

- **Before changing the drive direction, confirm that the drive direction is clear.**
- **To ensure operator's safety and ensure the longevity of the power train system, change the machine drive direction only after sufficiently reducing the drive speed.**
- **Be sure to change the machine drive direction only when the machine travel speed is 13 km/h (8.1 mph) or slower if the gear is in 3rd, 4th or 5th speed position.**

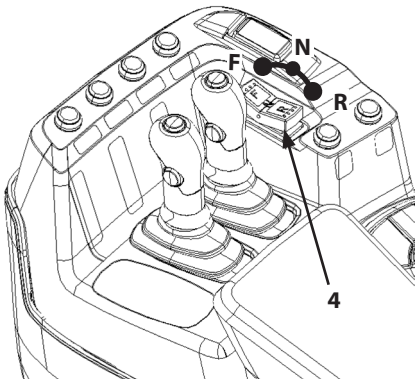


MNUD-01-010

1. Pull neutral lever lock (2) to the UNLOCK position.
2. Press the OFF position of parking brake switch (1).
3. Move forward/reverse lever (3) to the desired position.

   When forward/reverse switch (4) is effective, press to select the desired position.

F : Forward Driving
N : Neutral
R : Reverse Driving



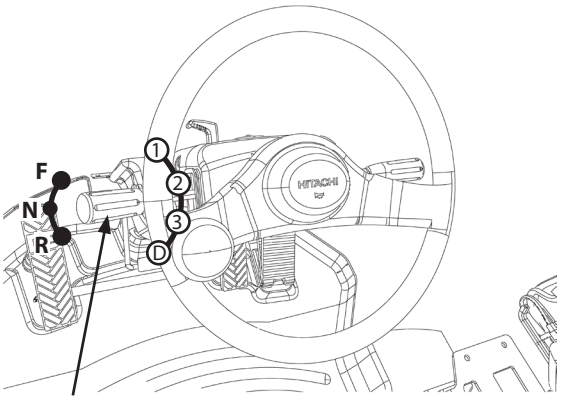
MNFQ-05-002

Changing Drive Speed

The transmission gear range can be selected by turning shift switch (1).

1st and 2nd speed	:	To be used for excavation and loading work
3rd and 4th speed	:	To be used for traveling operation.

NOTE: Avoid rapid gear changes using shift switch (1) while traveling at high speed. Shift the gear range only after reducing the travel speed by releasing the accelerator pedal.



MNUD-04-003

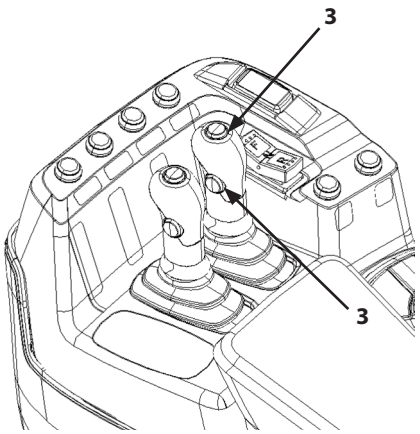
DSS (Downshift Switch)

Under auto shift mode or manual shift mode, each time DSS (3) is pressed, the gear down shifts at 1-speed step.

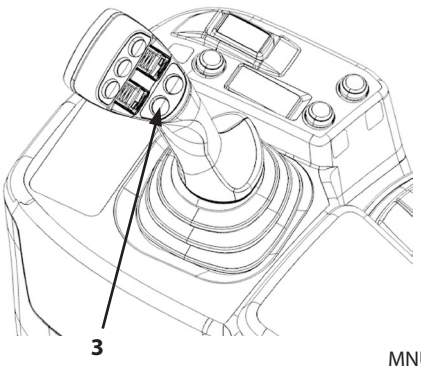
NOTE: The DSS operation to shift down to the 1st speed range by pressing DSS (3) once can be set from the sub monitor menu. Refer to page 1-95 "DSS Operation Setting".

Under auto shift mode, press and hold DSS (3) to down shift from 4th speed to 1st speed.

Set the shift gear to 2nd speed for the normal operation. By pressing DSS (3) while digging operation with the machine traveling forward, the gear automatically shifts to 1st speed, which increases the traveling drive force and improves digging activity. Once forward/reverse lever (2) or the forward/reverse switch is set to reverse (R), the gear returns to 2nd speed.



MNFQ-05-002



MNUD-05-004

Joystick Steering Operation (Type A)(Optional)

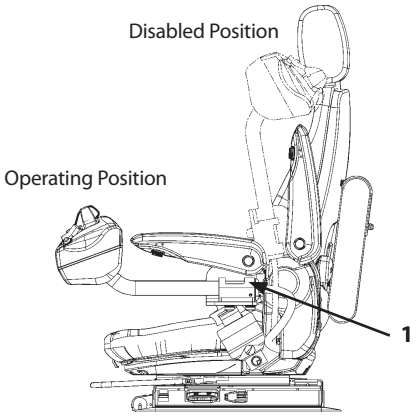
IMPORTANT: To use joystick steering selector switch (2), lower left console (1) to the operating position. If left console (1) is not in the operating position, both the joystick steering selector switch (2) and forward/ reverse switch (left) (4) cannot be operated.

WARNING:

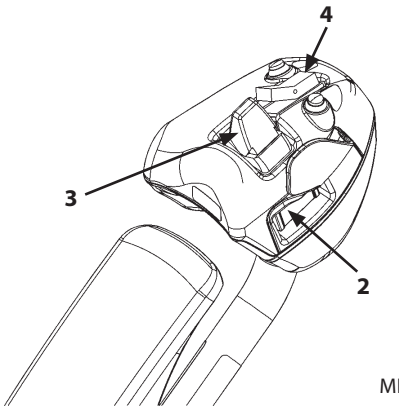
- **When traveling on public roads, use steering wheel (5). The use of joystick steering lever (3) is prohibited.**
- **When traveling at high speeds or driving in narrow areas, use steering wheel (5).**
- **When operating with steering wheel (5), turn joystick steering selector switch (2) OFF. If part of the driver's body should touch the joystick, it could result in the machine moving unexpectedly and result in a serious personal injury.**
- **When operating steering wheel (5) and joystick steering lever (3) at the same time, priority is given to the operation that is displaced further from the neutral position.**
- **When the emergency steering function is activated, use steering wheel (5) for turning.**
- **If the machine steering activates despite not being operated with the with joystick steering lever (3), immediately return accelerator pedal (6) to the idle position and correct the turning direction with steering wheel (5), then stop the machine with service brake (7). Stop the engine and turn joystick steering selector switch (2) OFF. Contact Authorized Dealer for repairs as soon as possible.**

IMPORTANT: In cold weather, or if the hydraulic oil temperature is low, the turning speed may be slow when using the joystick steering. Perform a full warm-up by operating joystick steering lever (3) before operating the machine.

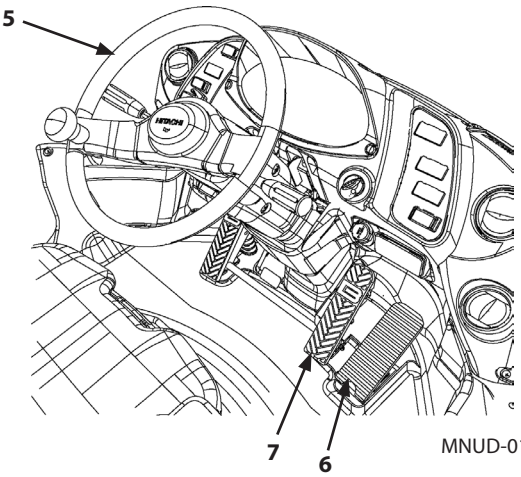
For information on the warm-up procedure, refer to page 3-14 "Warming Up Operation".



MNEK-13-005



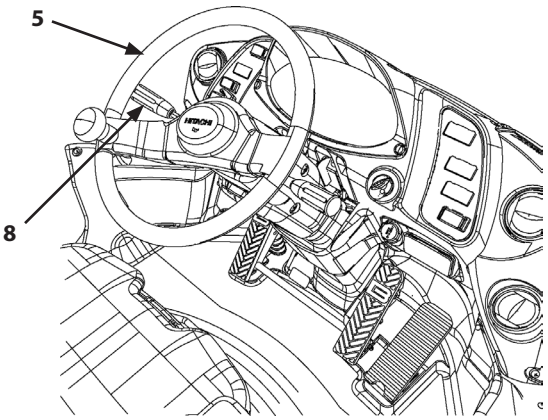
MNEK-13-002



MNUD-01-010

1. Put forward/reverse lever (8) and forward/reverse switch (left)(4) are in the neutral (N) position.
2. Press joystick steering selector switch (2) in the ON position for one second. Joystick steering lever (3) and forward/reverse switch (left)(4) are enabled.
3. Check joystick steering indicator (9) and forward/reverse selector switch indicator (10) are displayed on the main monitor.
4. Start the machine and operate joystick steering lever (3) to turn it.
   Pressing joystick steering lever (3) down to the left, the machine turns to the left. Pressing joystick steering lever (3) down to the right, the machine turns to the right.
   If joystick steering lever (3) is pressed further, the machine turning speed becomes faster.

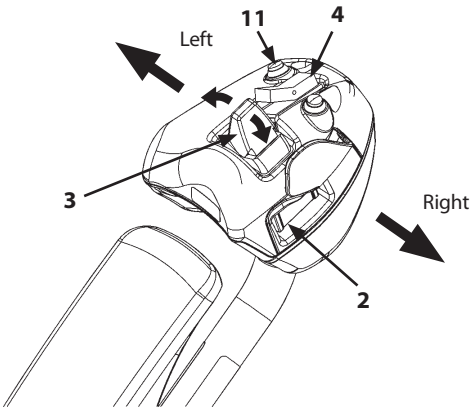
NOTE: Steering wheel (5) can also be operated instead of joystick steering lever (3) to turn the machine.



MNUD-01-010

5. Press DSS (11) to downshift the speed range.

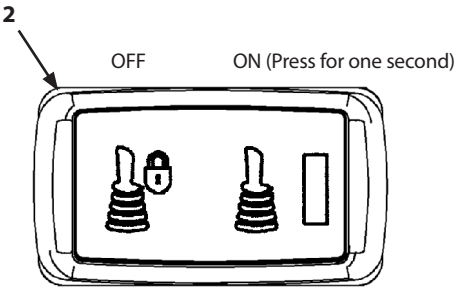
NOTE: DSS (11) operations are effective regardless of joystick steering status.



MNEK-13-002

IMPORTANT: If forward/reverse lever (8) is put in any position other than neutral (N) position when joystick steering lever (3) is enabled, forward/reverse switch (left)(4) becomes disabled. (The forward/reverse lever operation has priority.)

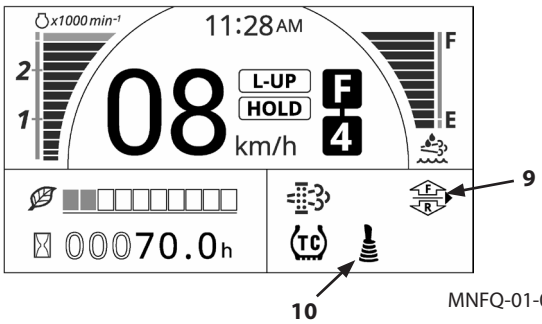
To enable forward/reverse switch (left)(3) again, put forward/reverse lever (8) and forward/reverse switch (left) (4) in the neutral (N) position and turn joystick steering selector switch (2) OFF for a moment and then press it in the ON position for one second.



Joystick Steering Selector MNUD-01-091

Canceling Operation

1. Stop the machine.
2. Put the Forward/Reverse switch (left) (4) in the neutral (N) position.
3. Turn joystick steering selector switch (2) OFF.
   Joystick steering indicator (9) and Forward/Reverse selector switch indicator (10) turn OFF on the monitor.
4. Follow the procedures for "Stop the Machine" and "Parking", and stop the engine.



MNFQ-01-021

Main Monitor

Joystick Steering Operation (Type B)(Optional)

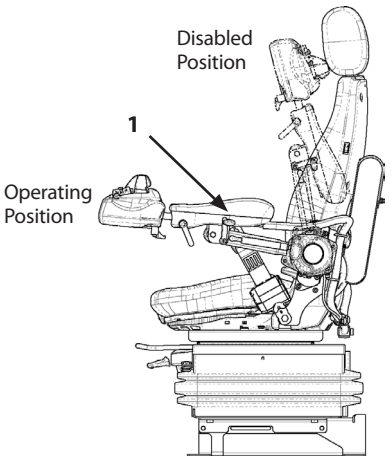
IMPORTANT: To use joystick steering selector switch (2), lower left console (1) to the operating position. If left console (1) is not in the operating position, both the joystick steering selector switch (2) and forward/ reverse switch (left) (4) cannot be operated.

WARNING:

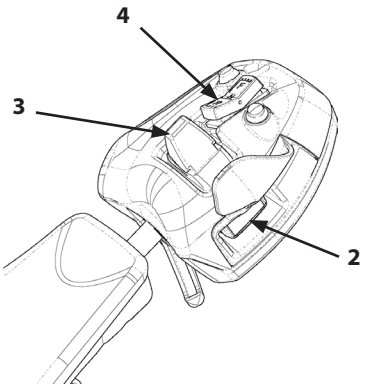
- **When traveling on public roads, use steering wheel (5). The use of joystick steering lever (3) is prohibited.**
- **When traveling at high speeds or driving in narrow areas, use steering wheel (5).**
- **When operating with steering wheel (5), turn joystick steering selector switch (2) OFF. If part of the driver's body should touch the joystick, it could result in the machine moving unexpectedly and result in a serious personal injury.**
- **When operating steering wheel (5) and joystick steering lever (3) at the same time, priority is given to the operation that is displaced further from the neutral position.**
- **When the emergency steering function is activated, use steering wheel (5) for turning.**
- **If the machine steering activates despite not being operated with the with joystick steering lever (3), immediately return accelerator pedal (6) to the idle position and correct the turning direction with steering wheel (5), then stop the machine with service brake (7). Stop the engine and turn joystick steering selector switch (2) OFF. Contact Authorized Dealer for repairs as soon as possible.**

IMPORTANT: In cold weather, or if the hydraulic oil temperature is low, the turning speed may be slow when using the joystick steering. Perform a full warm-up by operating joystick steering lever (3) before operating the machine.

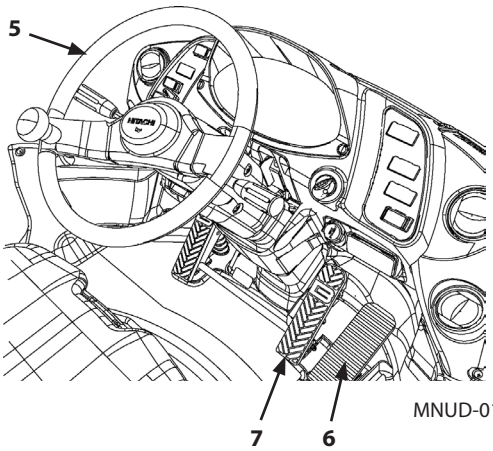
For information on the warm-up procedure, refer to page 3-14 "Warming Up Operation".



MNFQ-01-022



MNFQ-01-023



MNUD-01-010

1. Put forward/reverse lever (8) and forward/reverse switch (left)(4) are in the neutral (N) position.
2. Press joystick steering selector switch (2) in the ON position for one second. Joystick steering lever (3) and forward/reverse switch (left)(4) are enabled.
3. Check joystick steering indicator (9) and forward/reverse selector switch indicator (10) are displayed on the main monitor.
4. Start the machine and operate joystick steering lever (3) to turn it.
   Pressing joystick steering lever (3) down to the left, the machine turns to the left. Pressing joystick steering lever (3) down to the right, the machine turns to the right.
   If joystick steering lever (3) is pressed further, the machine turning speed becomes faster.

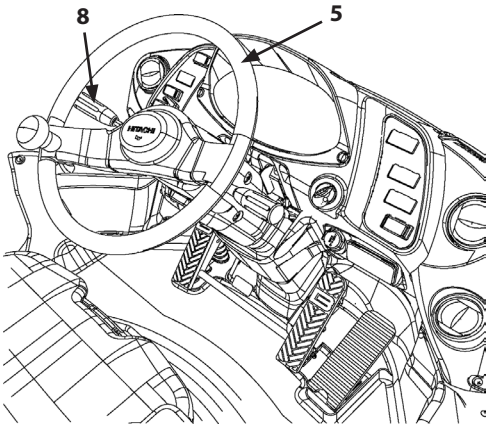
NOTE: Steering wheel (5) can also be operated instead of joystick steering lever (3) to turn the machine.

5. Press DSS (11) to downshift the speed range.

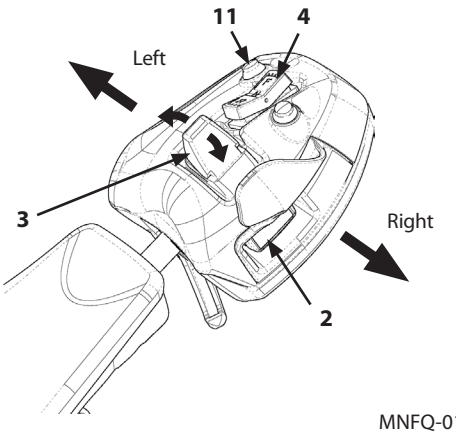
NOTE: DSS (11) operations are effective regardless of joystick steering status.

IMPORTANT: If forward/reverse lever (8) is put in any position other than neutral (N) position when joystick steering lever (3) is enabled, forward/reverse switch (left)(4) becomes disabled. (The forward/reverse lever operation has priority.)

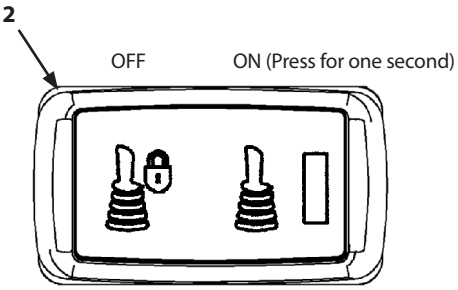
To enable forward/reverse switch (left)(4) again, put forward/reverse lever (8) and forward/reverse switch (left) (4) in the neutral (N) position and turn joystick steering selector switch (2) OFF for a moment and then press it in the ON position for one second.



MNUD-01-010



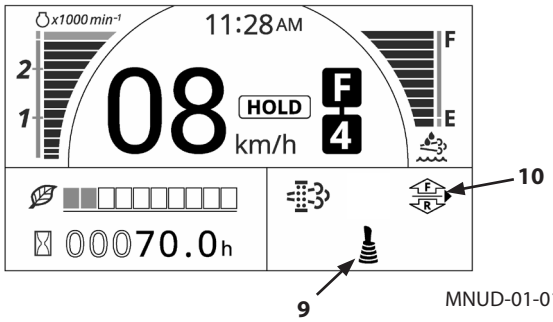
MNFQ-01-023



Joystick Steering Selector MNUD-01-091

Canceling Operation

1. Stop the machine.
2. Put the Forward/Reverse switch (left) (4) in the neutral (N) position.
3. Turn joystick steering selector switch (2) OFF.
   Joystick steering indicator (9) and Forward/Reverse selector switch indicator (10) turn OFF on the monitor.
4. Follow the procedures for "Stop the Machine" and "Parking", and stop the engine.



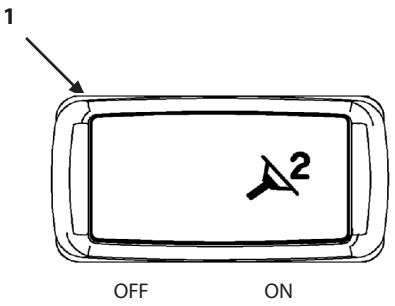
MNUD-01-018

Main Monitor

Emergency Steering

If the oil pressure in the steering system lowers, the emergency steering system is activated so that steering operation can be achieved.
If the emergency steering system is activated, the emergency steering indicator lights and the buzzer sounds.
The steering wheel will become hard to rotate but it is operable. Immediately park the machine in a safe location. Contact Authorized Dealer.
The emergency steering can be used for 60 seconds.

IMPORTANT: The emergency steering system is provided for provisional use. If continuously used for more than 60 seconds, damage to the system may result.



MNUD-01-058

Even though the machine is equipped with the emergency steering system, if the steering function becomes inoperable during drive operation, press emergency steering check switch (1) on the right console to activate the emergency steering system. Immediately park and stop the machine in a safe location.
When the emergency steering system is activated by pushing emergency steering check switch (1), the emergency steering can be used for 30 seconds.

NOTE:

- *The emergency steering auto-check sound may be heard for two seconds after starting the engine.*
- *Before operating the machine, press emergency steering check switch (1) to confirm that the emergency steering pump normally operates.*

Stop the Machine

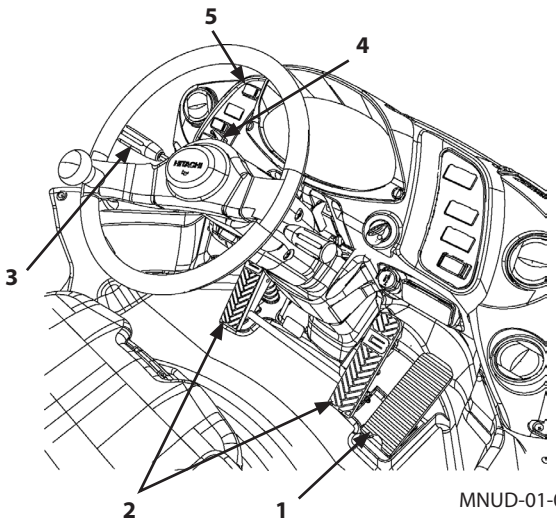
1. Avoid sudden deceleration. Smoothly reduce the drive speed.

   Release accelerator pedal (1) and step on brake pedal (2) to stop the machine on level surface.

2. Return forward/reverse lever (3) to neutral (N).

   Place neutral lever lock (4) to the LOCK position.

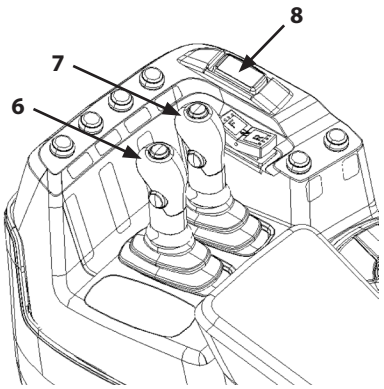
3. Press the ON side of parking brake switch (5).
4. Level the bucket with the surface of the ground and lower the bucket to the ground by operating bucket control lever (6) and lift arm control lever (7).
5. Press LOCK (🔒) side of control lever lock switch (8).



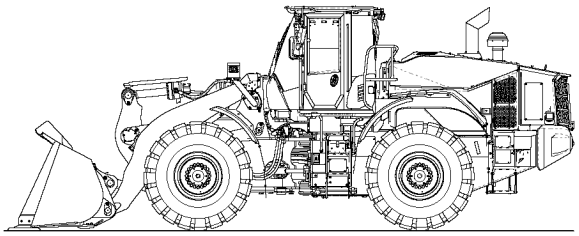
MNUD-01-010

IMPORTANT: This machine is equipped with a turbocharged engine. Therefore if the engine is stopped without performing cooling down operation, the lubricant on the turbocharger bearing surfaces may desiccate due to the intense heat present, possibly causing damage to the turbocharger.

6. Run the engine at slow idle speed for 5 minutes to cool the engine.



MNFQ-05-002

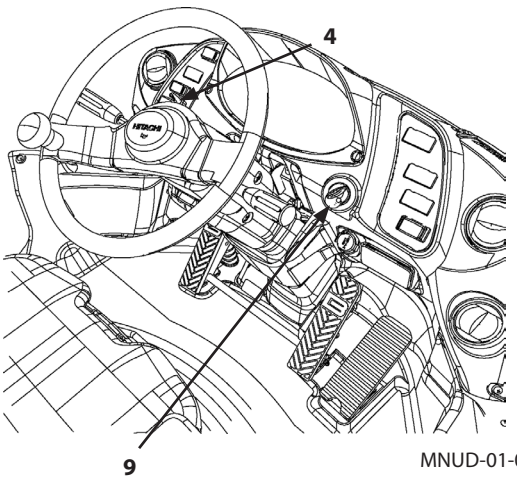

Stop and Parking Position

MNFQ-04-004

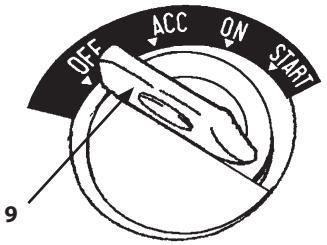
IMPORTANT: Do not leave the machine by turning key switch (9) in ACC position. Failure to do so may discharge the batteries.

Be sure to turn key switch to OFF position before leaving the machine.

7. Turn key switch (9) to OFF position to stop the engine. Remove the key from the switch. Place neutral lever lock (4) to the LOCK position.
8. Before leaving the machine, close and lock all the windows, cab doors, and covers.



MNUD-01-010



MPD8-01-307

Stop and Restart of Driving

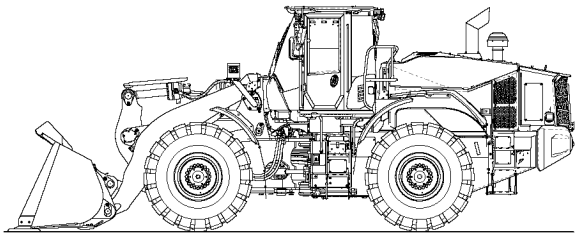
Follow the tips described below when required to stop or restart driving.

1. Slowly release the accelerator pedal. Depress the brake pedal to stop the machine.
2. Slowly depress the accelerator pedal to move the machine again.
3. If the machine is required to park for a long period of time, make it a rule to return the forward/reverse lever to neutral (N), turn the parking brake switch ON, and apply the parking brake to ensure safety operation.
4. During drive operation, the machine drive position may be changed due to inner hydraulic oil leaks. When required to rectify the drive position, stop driving, return the forward/reverse lever to neutral, apply the parking brake by turning the parking brake switch ON. After rectifying the position of lift arm and bucket, begin driving the machine again. Always allow the machine to maintain correct drive position.

Parking

IMPORTANT: When parking the machine with cab door and windows open, cab electrical components may be damaged by bad weather. Always close windows, roof vent and cab door when parking the machine.

1. Stop and park the machine on level surface. Lower the bucket to the ground.
2. Turn parking brake switch (1) ON.

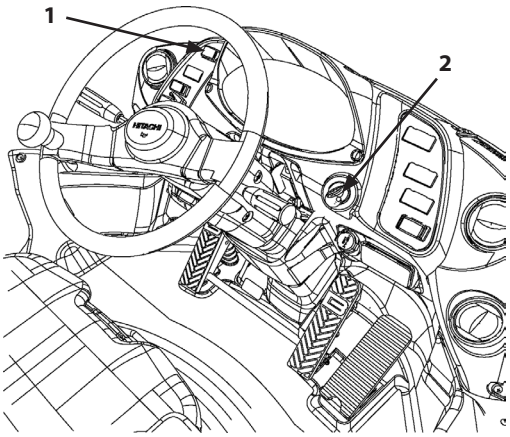


Stop and Parking Position

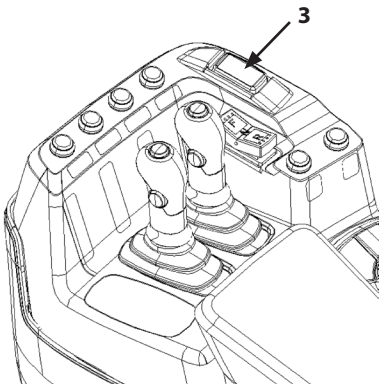
MNFQ-04-004

IMPORTANT: This machine is equipped with a turbocharged engine. If the engine is stopped without performing cooling down operation, the lubricant on the turbocharger bearing surfaces may desiccate due to the intense heat present, possibly causing damage to the turbocharger.

3. Run the engine at low idle speed to cool the engine for 5 minutes.
4. Turn key switch (2) to OFF position to stop the engine. Remove the key from the switch.
5. Press LOCK (🔒) side of control lever lock switch (3).
6. Before leaving the machine, close and lock all the windows, cab doors, and covers.



MNUD-01-010



MNFQ-05-002

Emergency Evacuation

When the engine has stalled during driving:

Pressurized oil in the accumulator acts on the brake when the brake pedal is depressed. Immediately park and stop the machine in a safe location. At this time, do not repeat to pat the brake pedal.
The brake oil pressure is quickly reduced so that the brake becomes inoperable.

If the machine does not stop even if the brake pedal is stepped on, press the parking brake switch ON side to stop the machine.

The steering wheel will become hard to rotate as the hydraulic system becomes inoperable.

In the event any symptom mentioned above occurs, immediately trace the cause of the problem.
If a complicate failure has occurred, consult Authorized Dealer.

Precautions for Driving

During drive operation, observe the general operating manners beside the precautions described below to ensure safe and correct operation.

⚠ WARNING:

- **If a tire is punctured while driving, securely hold the steering wheel and slowly reduce the drive speed.**

  If the brake is suddenly applied by strongly depressing the brake pedal, the steering may become out of control, possibly creating a serious accident. Never apply the brake quickly if a tire becomes punctured.

- **Never mount or dismount a moving machine. Never allow any personnel other than the operator to ride on the machine when driving.**

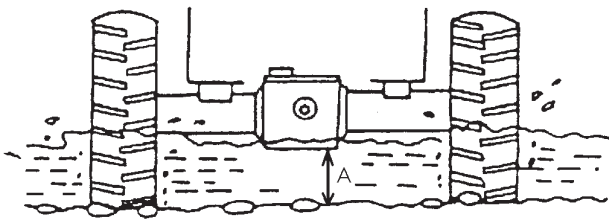
- Even after break-in operation is complete, avoid running the engine at fast speed under no load.
- If any abnormal condition such as an abnormal noise or smell is noticed while driving, immediately stop the engine and inspect the machine for any trouble.
- Avoid sudden braking and turning, as this is dangerous to other vehicles as well as your own.
- The driving speed of this machine is slower than most normal automobiles. Give way to normal automobiles that travel at faster speeds.
- Make it a habit to periodically scan the gauges and instruments. If any abnormality is recognized, immediately stop the machine and check the machine for the cause of the trouble.
- When required to drive on the road shoulder or in tight spaces, use a signal person.
- Slowly drive in or turn a crossing while paying attention to the visibility ahead and in the opposite driving lane.

Driving in Water or on Soft Ground

IMPORTANT: If the axles, transmission, etc. should become submerged, they must be reconditioned immediately, otherwise the inner gears may wear excessively, or the machine may become damaged. Contact Authorized Dealer for inspection and maintenance.

- Do not submerge the front and rear axles, transmission, or front and rear propeller shafts in water or mud. Avoid driving in water as much as possible.
- If driving in water or mud is unavoidable, do not allow the machine to be submerged deeper than allowable depth (A) (up to the bottom of the axle housing). Reduce the allowable depth if there is concern the river bed is rugged, or water is flowing fast.
- When driving/operating on muddy ground, mud can easily accumulate on the frame even if the frame is not heavily submerged in mud. Check regularly and clean as necessary.

NOTE: After operation is complete, be sure to wash and lubricate all areas which were submerged.



M4GB-04-003

Precautions for Driving on Slopes

WARNING:

- **Never allow the machine to descend a slope with the forward/reverse lever in neutral (N). Failure to do so will not only work the engine braking to malfunction but also create the causes of various machine troubles.**
- **When descending a slope, use engine braking. Apply the brakes only when absolutely required. If the brake is continuously used while descending a slope, the brake temperature will increase, possibly decreasing the braking performance.**

  If overheating of the brake system is recognized, immediately park the machine in a safe location. Restart and drive the machine only after the brake system is sufficiently cooled.
- **When descending a slope, do not drive the machine at a speed faster than the maximum travel speed. Failure to do so may damage the machine and/or a serious accident may result.**

When steering on a slope, lower the bucket to increase the machine stability. Do not steer on a steep slope. Failure to do so may possibly cause the machine to turn over.

When descending a slope, travel the machine in the slow drive gear range using sufficient engine braking.

Do not drive the machine at a speed faster than the maximum travel speed.

If the engine stalls on a slope, immediately step on the brake pedal as strongly as possible, lower the loader front to the ground and stop the machine. The parking brake is automatically applied when the engine is stopped regardless of the position of the parking brake switch. Before restarting the engine, return the Forward/Reverse lever to neutral (N) and turn the parking brake switch ON.

- Before descending a slope, confirm that the brake system works normally by operating the brake pedal.
- If the hydraulic oil and lubricant temperatures are low, the machine gradability may decrease. Before climbing a steep slope, sufficiently perform the warm up operation of the machine.

Precautions to be Taken if Machine Failure Occurs

- Keep alert. While paying attention to the vehicles following you, slowly reduce the travel speed and park the machine on the road shoulder as closely to the shoulder edge as possible. When any machine failure is recognized in a short tunnel, park the machine outside the tunnel as long as possible.
- Indicate using a sign that the machine is failure. Unless a sign is used, collision with a following vehicle from behind may result. Be sure to indicate the sign of the machine failure using one of the following methods.
  - Use a parking signboard.
  - Turn the hazard lights ON.
  - Use an emergency signal instrument (emergency signal light).
  - Use a red flag or light.
  - Tie a piece of cloth like a handkerchief to an easy-to-see place such as the door or the rear end of the machine.

- Check the failed part. If possible, repair the machine by yourself while ensuring safety and paying attention to the traffic conditions of other vehicles.

WARNING: Do not spill oil on the road surface. Failure to do so may cause the following vehicle to slide, possibly creating a serious accident.

- If hydraulic oil leaks, immediately repair the machine. If road is covered with oil, inform vehicles following behind of the hazard immediately. Remove the leaked oil as soon as possible.
- If repairing the machine by yourself is impossible, contact Authorized Dealer.
- Repair work in the tunnel is very dangerous. Avoid working outside the vehicle even simple tasks.

Control Lever

Fingertip Control Type

The fingertip control lever is used to operate the lift arm and/or bucket.

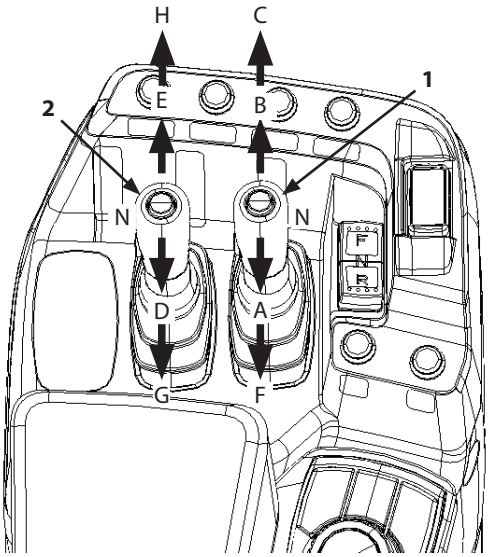
Lift Arm Control Lever (1)

Lever Position	Lift Arm Operation
C	Float: The lift arm free falls and can be moved as loads are applied.
B	Lift Arm Lower
N	Neutral: The lift arm is stopped and held in that position during the lower or raise movement.
A	Lift Arm Raise
F	Detent: Lift arm is held in the raise position.

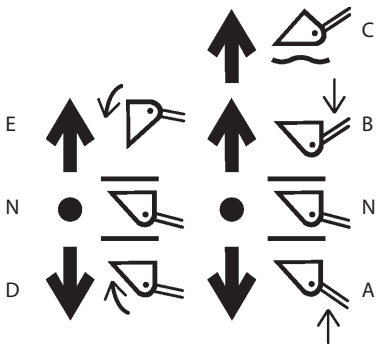
Bucket Control Lever (2)

Lever Position	Bucket Operation
H	Dump Detent: The bucket is held in the dump position.
E	Bucket Dump: The bucket is tilted forward to dump the bucket load.
N	Neutral: The bucket is stopped and held in that position during the dump or tilt movement.
D	Bucket Tilt: The bucket is tilted back, taking the transportation position.
G	Tilt Detent: The bucket is held in the raised back position.

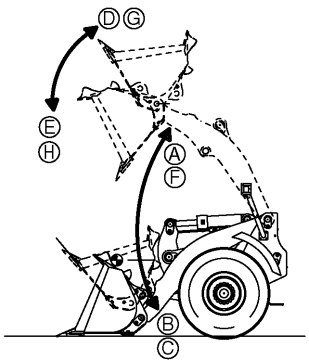
IMPORTANT: Due to the control lever check function, which should shut off the pilot pressure, the control levers may not operate under some conditions. Once return the lever to the neutral position (N) and try operation again.



MNFQ-05-001



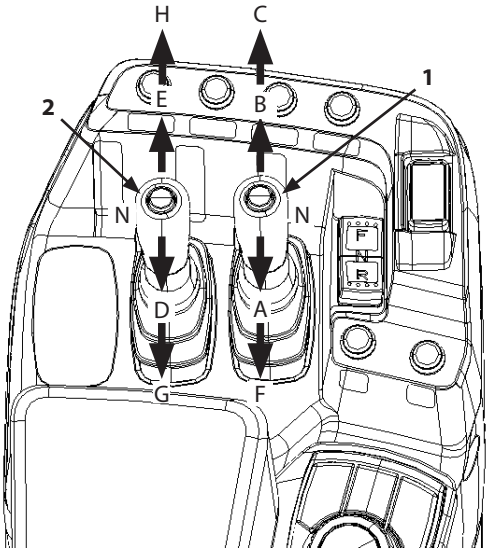
M4GB-01-072



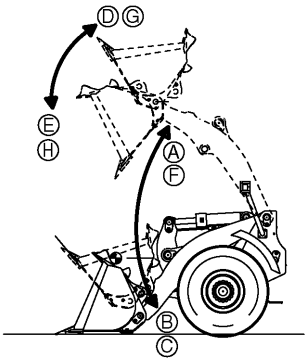
MNUD-05-005

NOTE:

- *Further pulling lift arm control lever (1) to "Detent" position (F), the lever operation becomes slightly heavy. When releasing lift arm control lever (1) automatically moves to "Neutral" position (N), but the lift arm continues to move until it reaches the position set at the height kickout.*
- *Further pushing down the lift arm control lever to "Float" position (C), the lever operation becomes slightly heavy. When releasing lift arm control lever (1) automatically moves to "Neutral" position (N). The lift arm continues to move to the position preset at lower kickout and is held in the position.*
- *When operating the machine in the Float position (C), lower the bucket onto the ground by placing lift arm control lever (1) at Lower position (B), and then move the lever to Float position (C).*
- *Further pulling bucket control lever (2) to "Tilt Detent" position (G), the lever operation becomes slightly heavy. When releasing bucket control lever (2) automatically moves to "Neutral" position (N), but the bucket continues to move until it reaches the position set at the tilt kickout.*
- *Further pushing down bucket control lever (2) to "Dump Detent" position (H), the lever operation becomes slightly heavy. When releasing bucket control lever (2) automatically moves to "Neutral" position (N), but the bucket continues to move until it reaches the position set at the dump kickout.*



MNFQ-05-001



MNUD-05-005

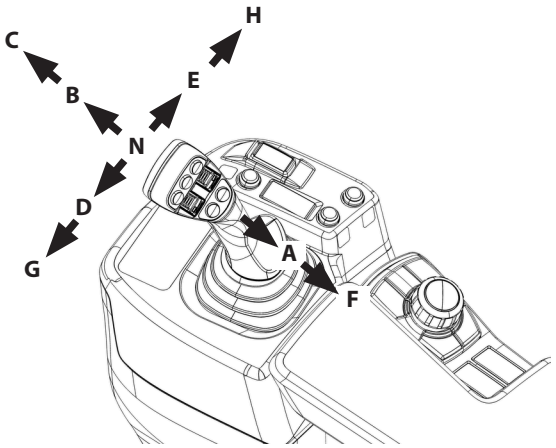
Multi-Function Joystick Lever

The multi-function joystick lever is used to operate the lift arm and/or bucket.

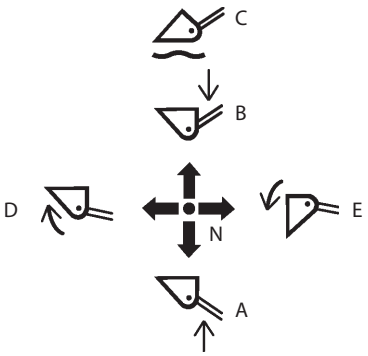
Lever Position	Lift Arm/Bucket Operation
C	Float: The lift arm free falls and can be moved as loads are applied.
B	Lift Arm Lower
N	Neutral: The lift arm or bucket is stopped and held in that position during the movement.
A	Lift Arm Raise
F	Detent: Lift arm is held in the raise position.
G	Tilt Detent: The bucket is held in the raised back position.
D	Bucket Tilt: The bucket is tilted back, taking the transportation position.
E	Bucket Dump: The bucket is tilted forward to dump the bucket load.
H	Dump Detent: The bucket is held in the dump position.

IMPORTANT: Due to the control lever check function, which should shut off the pilot pressure, the control lever may not operate under some conditions. Once return the lever to the neutral position (N) and try operation again.

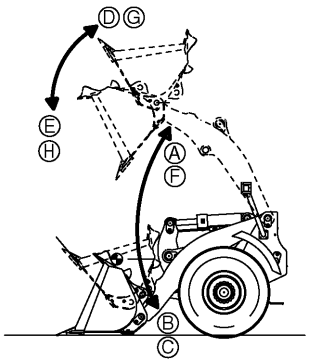
NOTE: When moving the MF control lever to "Float" (C) or "Detent" positions (F)(G)(H), the lever operation becomes slightly heavy. When releasing lever, it automatically returns to "Neutral" position (N), but the lift arm or bucket continues to move until it reaches the specified position.



MNUD-01-099



M4GB-01-074



MNUD-05-005

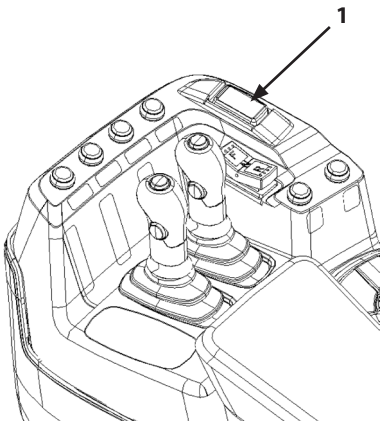
Control Lever Lock Switch

WARNING:

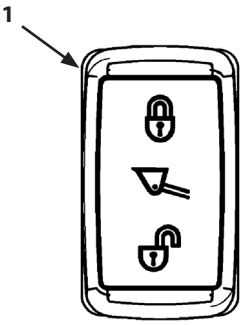
- **Be sure to press LOCK (🔒) side of control lever lock switch (1).**
- **Before leaving the operator's seat, be sure to stop the engine. Set control lever lock switch (1) to the LOCK (🔒) position.**
- **Always check to be sure that the control lever lock switch is set in the LOCK (🔒) position before transporting the machine or leaving the machine at the end of the shift.**

Control lever lock switch (1) is provided to prevent the machine unexpectedly being operated even if the operator mistakenly comes in contact with the bucket and/or lift arm control lever when getting on or off the machine. When control lever lock (1) is placed in the UNLOCK (🔓) position, the control lever becomes operable.

NOTE: When control lever lock switch (1) is placed to the LOCK position, the ride control function is disabled.



MNFQ-05-002



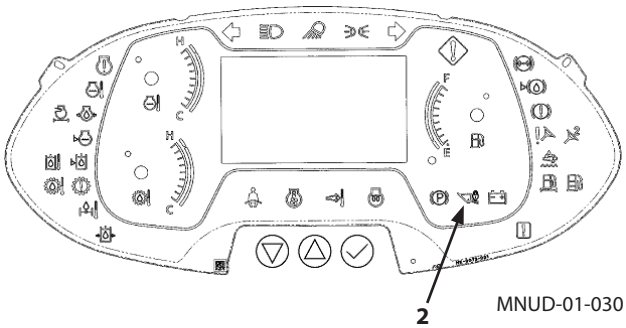
MNUD-01-019

Control Lever Lock Switch Operation

- When leaving the operator's seat:

1. Park the machine on solid level ground. Lower the bucket to the ground. Return all levers to hold. Stop the engine.
2. Press LOCK (🔒) side of control lever lock switch (1). Verify that control lever lock indicator (2) is turned on.

- Before starting operation:
  Before starting operation, check that control lever lock switch (1) is in the UNLOCK (🔓) position.

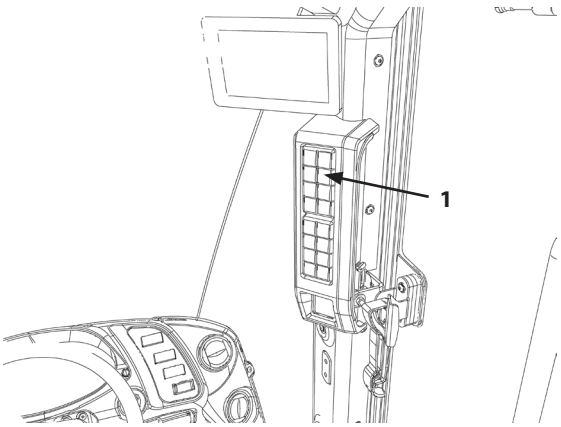


MNUD-01-030

Clutch Cut Position Switch

To perform digging (scooping) or loading operation, clutch cut position switch (1) can be set to any position.
Turn the clutch cut position switch ON to let the machine power concentrate on digging operation or to increase the lift arm raising speed.

Pressing clutch cut position switch (1) changes the selected mode "OFF" → "N Mode" → "D Mode" → "OFF" in this order.



MNUD-01-200

NOTE: Refer to page 1-127 "Clutch Cut Position Switch".

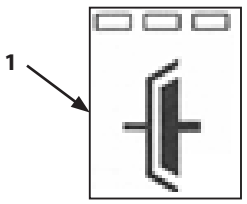
- Clutch Cut ON
  By depressing left or right brake pedal (2), the clutch is disengaged and brake is applied without transmitting the drive power to the tires.

  [N Mode]

  
  : Clutch cut ON while lightly depressing the brake pedal.
  Suitable for loading work on a level surface, such as when approaching to a dump truck, or on a gentle slope.

  [D Mode]

  
  : Clutch cut ON while deeply depressing the brake pedal. The clutch can be disengaged at a slower timing.
  Suitable for work on a steep slope.



MNUD-01-206

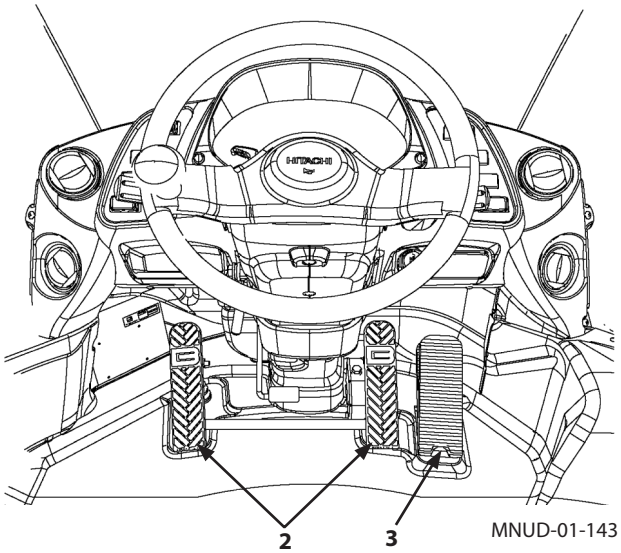
	Pilot Lamp			
	■ ■ ■	□ □ ■	□ □ □	
Function	OFF	N Mode	D Mode	

□: LED ON ■: LED OFF

- Clutch Cut OFF (Clutch Engaged)
  By depressing left or right brake pedal (2), brake is applied while driving power is transmitted to the tires.

NOTE:

- *When starting to ascend a slope, turn clutch cut position switch (1) OFF (clutch engaged), depress the left brake pedal (2). Gradually release the left brake pedal while depressing the accelerator pedal (3) to easily start ascending a slope.*
- *Effective use of the clutch cut position switch leads to reduced fuel consumption and overheating of axle oil.*



MNUD-01-143

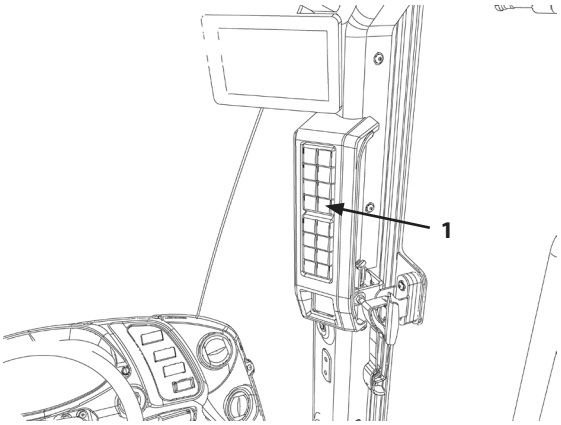
Dump Truck Approach Speed Control Switch

The loading operation to a dump truck is judged by detecting the lift arm position while traveling forward at a specified speed of faster. Then, the travel speed is reduced automatically by reducing the engine speed.

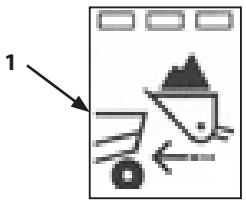
The operator can select a favorite approaching speed depending on the driving distance and operation conditions for better fuel efficiency and operability.

Pressing dump truck approach speed control switch (1) changes the travel speed "OFF" → "Fast" → "Middle" → "Slow" → "OFF" in this order.

NOTE: When the setting is "OFF", the machine may approach to a dump truck at a speed around 12 km/h (7.5 mph). When selecting "Slow", the speed will reduced to 8 or 9 km/h (5.0 or 6.6 mph) even if the accelerator pedal is fully depressed.



MNUD-01-200



MNUD-01-210

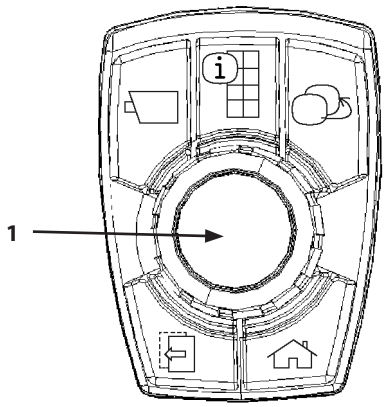
	Pilot Lamp			
	■ ■ ■	□ ■ ■	□ □ ■	□ □ □
Function	OFF	Fast	Middle	Slow

□: LED ON ■: LED OFF

Dig Mode Setting

The power control type suitable for front attachment operation can be selected from the sub monitor menu.

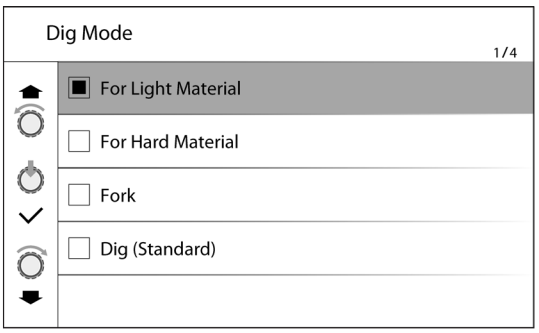
1. Using selector knob (1) select "Setting" - "Dig Mode".



MNUD-01-252

2. Select the desired mode. The specified power is applied in regardless of Power Mode setting.

- For Light Material
  Equivalent to Power Mode OFF. Apply when handling light materials.
- For Hard Material
  Equivalent to Power Mode ON. Apply when handling hard materials.
- Fork
  Apply when fork is attached.



MNUD-01-297EN

NOTE: When selecting "Dig (Standard)", the Power Mode setting is effective.
Refer to page 1-91 for the details of Dig Mode Setting.

Adjustment of Dual Lift Arm Auto Leveler

WARNING:

- **Take extra care to prevent personal injury and/or death when adjusting the lift arm auto leveler.**
- **Apply the parking brake to prevent the machine from moving unexpectedly. Wedge the wheels with blocks. Keep bystanders away from the vicinity of the machine.**

IMPORTANT:

- **When the lift arm auto leveler function is activated with the bucket loaded, the bucket may stop under the set position.**
- **Height setting of lowering direction can not be done when the lift arm is higher than horizontal position. Also, height setting of raising direction can not be done when the lift arm is lower than horizontal position.**

The lift arm auto leveler is a device that automatically stops the lift arm at the preset position while lowering or raising the lift arm. It is convenient to change the setting of stop position by using this function when the machine is constantly used in a specific way for cargo handling work.
Refer to page 1-85 "Lift Arm Kick Out" to adjust the stop position.

Auto Shut-Down

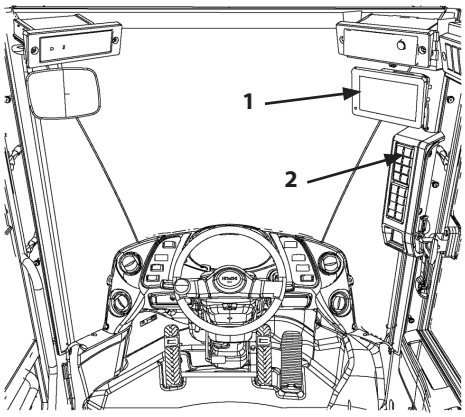
WARNING: This function automatically stops the engine. Pay extra attention to the work and work environment when using this function.

When the auto shut-down function is ON (enabled), the engine automatically stops after the preset time from the state in which the auto shut-down operation conditions are met, such as the parking brake switch is ON, the forward/reverse lever or switches are all in neutral position. Refer to the descriptions in the next page for the detail operating condition.

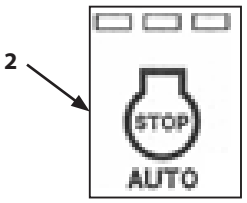
30 seconds before the engine stop, sub monitor (1) displays a message "Engine Shut-Down Soon." and a buzzer sounds. The buzzer sounds once at 30 seconds before, sounds once at 15 seconds before, and sounds at 5 seconds before, then stops after 15 seconds.

The auto shut-down is disabled and the engine will not stop if any of the following conditions are met:
- The parking brake switch is set in OFF position.
- The forward/reverse lever (switch) is set in (F) or (R) position.
- The brake pedal is depressed.
- The accelerator pedal is depressed.

IMPORTANT: Ensure the ON or OFF status of auto shut-down. If the middle LED of auto shut-down switch (2) is ON, the auto shut-down function will be activated.



MNUD-01-008



MNUD-01-204

	Pilot Lamp			
	■ ■ ■	■ □ ■		
Function	OFF	ON		

□: LED ON ■: LED OFF

Auto Shut-Down Operating condition

- The engine is running.
- The parking brake is applied.
- The forward/reverse lever (switch) is in neutral (N).
- The accelerator pedal is not depressed.
- The brake pedal is not depressed.
- The control lever is not operated.
- The steering wheel is not operated.
- Coolant, hydraulic oil and transmission temperature are not high.
- The aftertreatment device manual regeneration is not operating.

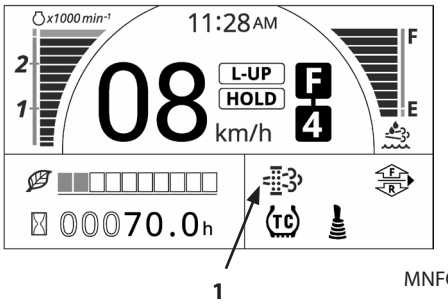
IMPORTANT:

- **When the engine stops by the auto shut-down function, turn the key switch to ACC or OFF once and then turn it to START to restart the engine. Do not leave the machine after auto shut-down. Failure to do so may discharge the batteries.**
- **When the key switch is turned to OFF position while the auto shut-down function is ON, the setting will be reset. When it is required to keep the setting, consult Authorized Dealer.**

Refer to page 1-92 for setting the auto shut-down function.

Aftertreatment Device Manual Regeneration Procedure

When the manual regeneration is needed, indicator (1) as shown in the right will appear in yellow, and the service indicator will turn on. When indicator (1) is displayed, you need to perform manual regeneration.



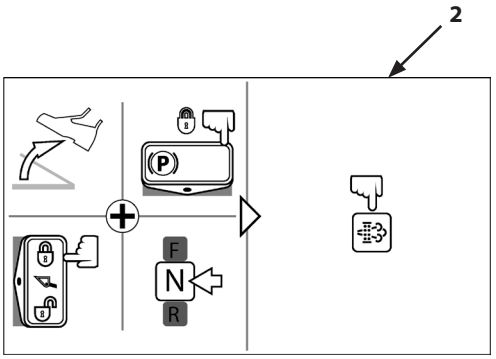
MNFQ-01-021

Before starting manual regeneration, be sure to check the following.

- No person is present around the machine.
- Keep flammable objects away from the muffler.
- Remaining fuel alarm is not lit.
- DEF alarm is not lit.

1. Park the machine in a safe place. Lower the front attachment onto the ground.

2. Set the following state. Aftertreatment device manual regeneration request screen (2) will be displayed on the main monitor.

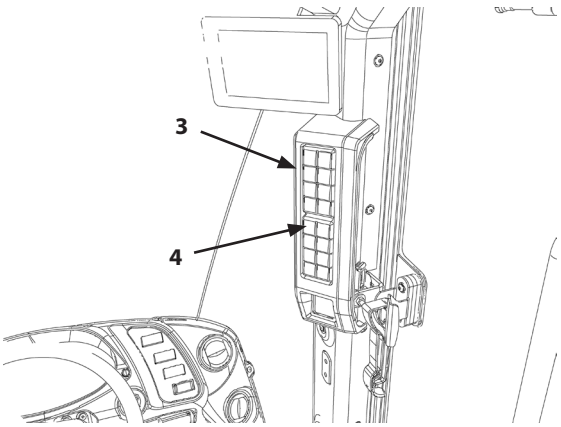


Manual Regeneration Request Screen

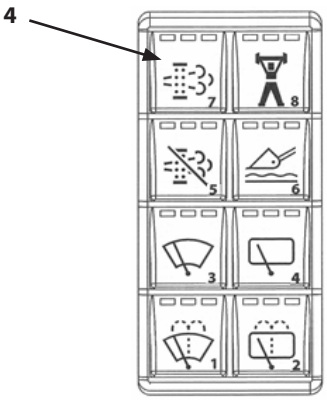
MNUD-01-033

Accelerator Pedal	:	OFF
Forward/Reverse Lever	:	N (Neutral)
Parking Brake Switch	:	ON
Control Lever Lock Switch	:	Lock (🔒)
Aftertreatment Device Regeneration inhibited Setting	:	OFF

3. Push the aftertreatment device regeneration switch (4) on panel switch (3).

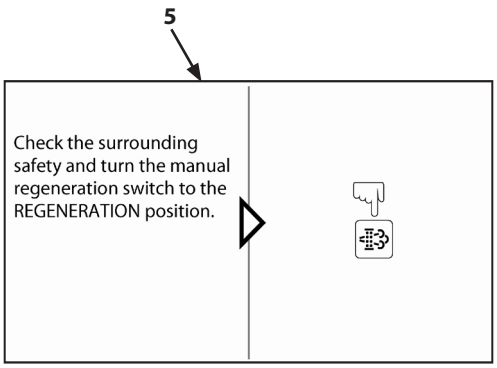


MNUD-01-200



MNUD-01-202

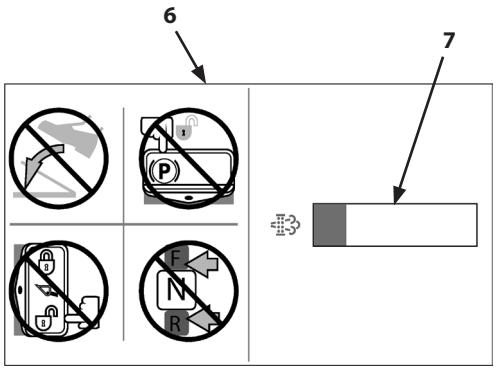
4. When pushing the aftertreatment device regeneration switch, screen (5) as shown in the right will be displayed. Pushing the aftertreatment device regeneration switch again displays screen (6) and the manual regeneration starts. Bar graph (7) on the screen indicates progress of the regeneration process.



MNUD-01-034EN

5. When the regeneration is finished, "Regeneration Has Completed." message will be displayed on the main monitor.
   If "Regeneration Has Failed." message is displayed, start over the regeneration process again. Failure of regeneration process may happen in the conditions other than above (such as malfunction of a sensor that affects regeneration at low ambient temperature).

NOTE: Refer to page 1-7 for further information of aftertreatment device manual regeneration procedure.



MNUD-01-032

Precautions Before Operating Machine

Before Operation

WARNING:

- **Be sure to install only authorized buckets and other work tools on the front attachment.**
- **Never modify or increase the capacity of the bucket or other work tools without first receiving authorization. Do not overload the machine by installing additional counterweights. Failure to do so may result in personal injury and/or machine trouble.**

Ensure Safety When Operating on Road Shoulders

CAUTION: Reinforce the ground before operating the machine on soft road shoulders.

Avoid Reckless Digging Practices

WARNING:

- **To prevent accidents, do not dig the bucket into (piles of soil and/or gravel) at high speed.**
- **Avoid digging or scooping loads when the machine is articulated as it may cause the machine to turn over.**

IMPORTANT: Do not load on only one side of the bucket or attachment. Failure to do so may damage the machine or cause other kinds of trouble.

Avoid Sudden Steering Changes and/or Sudden Braking

WARNING: Always keep the worksite grounds level. Avoid abrupt steering changes and sudden braking while the lift arm is raised with a full bucket to prevent the machine from turning over.

Avoid Operating with Unbalanced Loads

WARNING: Do not operate the machine in a reckless manner by loading material on only one side of the bucket. It could cause the machine to turn over or deform the lift arm and other working devices.

Avoid Frequent Bucket Shaking

IMPORTANT: Do not dump and tilt the bucket repeatedly with high speed and high frequent. It may damage the front linkage and hydraulic components.

Intended Machine Operation

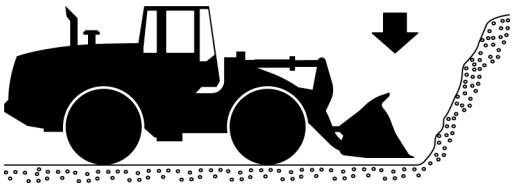
Excavation

Loading Accumulated Soil

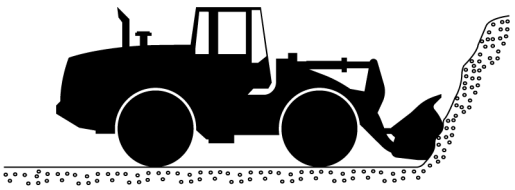
IMPORTANT: Avoid operating the machine with the front wheels raised off the ground. Machine traction force is reduced and excessive loads are applied to the undercarriage.

Scoop load while driving the machine forward as described below. As load increases the wheels begin to slip, slightly raise the bucket to reduce the load.

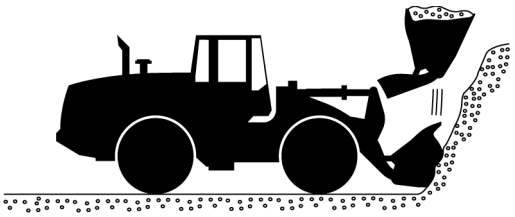
1. Level the bucket with the surface of the ground. Penetrate the bucket into the accumulated soil while driving the machine forward.
2. After the bucket has sufficiently penetrated the soil, raise the lift arm while driving the machine forward further and occasionally tilt the bucket back to fill the bucket. Sometimes set the bucket in the tilt position to fill up material in the bucket.
3. If it is difficult to penetrate the soil with the bucket, move the bucket back and forth and the bucket teeth up and down.
4. Drive the machine with the bucket tilted backward fully and held at the lowest possible position.



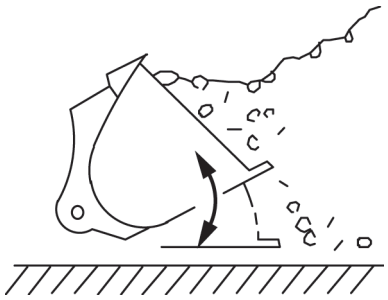
M4GB-05-003



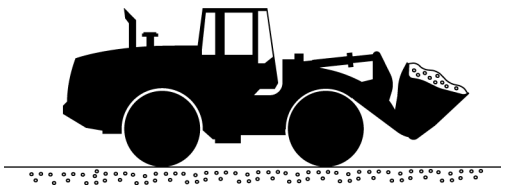
M4GB-05-004



M4GB-05-005



OM0115-Z7



M4GB-05-006

Digging and Loading Level Ground

IMPORTANT: While excavating with the bucket or fork, never apply excessive traction force to the tooth tips with the bucket or fork tilted more than 10°. Failure to do so may result in cracks or damage to the front attachment.

Slightly position the bucket teeth downward (0 to 10 degrees) and dig the ground while driving the machine forward as described below. Always take care not to apply loads to only to one side of the bucket.

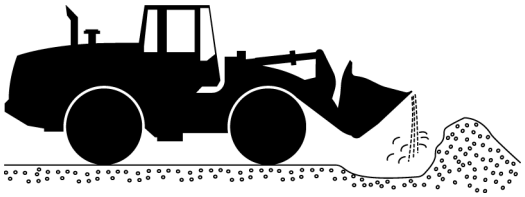
1. Position the bucket teeth slightly downward.
2. While driving the machine forward, tilt the bucket so that the ground surface is gradually separated.
3. Adjust the digging depth by operating the lift arm.
4. Drive the machine with the bucket tilted backward fully and held at the lowest possible position.



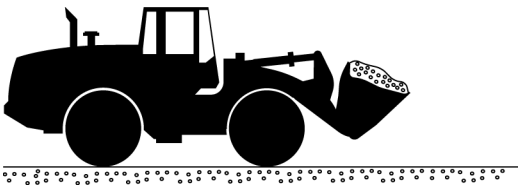
M4GB-05-007



M4GB-05-008



M4GB-05-009

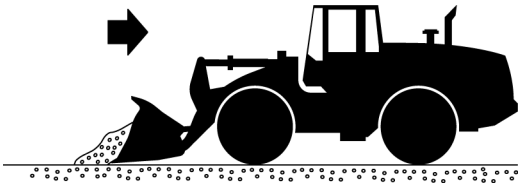


M4GB-05-010

Grading

CAUTION: Turn the Ride Control Switch OFF when performing work with the front attachment in the float position.

Performing work with the Ride Control Switch ON and the front attachment lever in the float position, ride control is active and may allow the attachment to drop while the machine is driving.

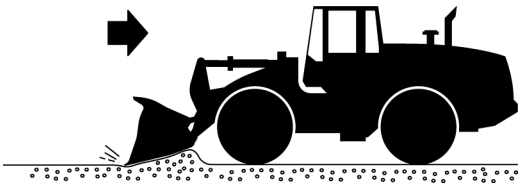


M4GB-05-011

IMPORTANT: Be sure to perform grading work while driving the machine in reverse. If grading work is performed by driving the machine forward, severe loads are applied to the front attachment, possibly creating cracks or damage to the front attachment.

1. After filling soil into the bucket, dump the bucket gradually to disperse soil while driving the machine in reverse.
2. Lower the bucket teeth tips onto the ground. Grade and level the ground surface while driving the machine in reverse with the bucket teeth tips dragging.
3. After filling the bucket with a load such as soil, position the bucket level with the ground surface. Finish the ground surface utilizing the bucket weight.

   At this time, drive the machine in reverse with the lift arm held in the FLOAT position.



M4GB-05-012



M4GB-05-013

Loading

IMPORTANT:

- **Always maintain a clean surface for machine operation.**

  Cleaning of materials such as soil spilled on the driving surface will reduce wear and/or damage on tires.

- **When carrying loads in the bucket, pay attention to the travel road surface conditions. Drive the machine at such speed so that the load will not spill out of the bucket, while positioning the bucket at the lowest possible height.**
- **Refrain from allowing the bucket to come in contact with the bucket stopper as much as possible when removing adhered material, like clay, from the bucket. Failure to do so may result in damage to the front attachment.**

  Remove material stuck to the bucket by washing with water.

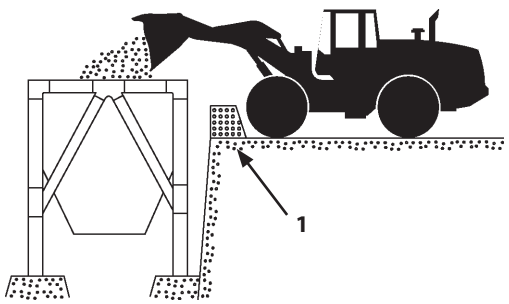
Loading is dumping the handling material onto a truck or into a hopper.
Loading work is performed in either the load and carrying method or loader and dump truck method. Select either method depending on the work site conditions while taking the merits in cost and safety into account.

Load and Carrying Method

WARNING:

- **Be sure to provide tire stopper (1) in front of the dumping port.**
- **Before raising the lift arm, slightly tilt the bucket back and forth to stabilize the load in the bucket to avoid personal injury or damage to the machine due to falling of the load.**

  Avoid raising the lift arm on a slope.
- **When approaching the machine to the dumping port with the lift arm raised to a high enough position, never operate steering wheel. Slowly drive the machine. Never rapidly operate the machine to prevent turning over accident.**



M4GB-05-014

A wheel loader performs work process of loading, carrying, and dumping in sequence. Generally, when the carrying distance is 30 to 100 m, this method is employed.
Make an upgrade slope of approx. 3° around a hopper when dumping into the hopper. Be sure to provide a level area 10 m apart from the dumping port and tire stopper (1) at the dumping port edge. Automatic reduction in travel speed will assist operator's braking operation effort.

Loader and Dump Truck Combination Method

WARNING:

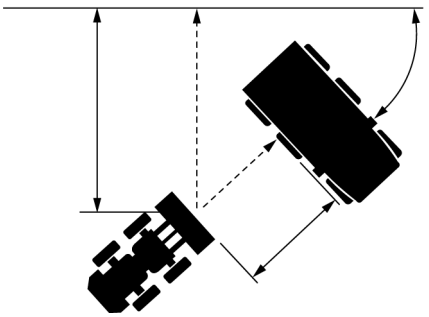
- **Always maintain a flat work site surface. Avoid rapid turns and/or sudden braking while raising the lift arm with the bucket loaded to prevent the machine from tipping over.**
- **Do not penetrate the bucket into a loading face at fast travel speeds to avoid personal accidents.**

A loader carries out loading, and carrying and dumping is carried out by a dump truck. Either V- or I-shape loading method is employed in this method. Depending on the work site conditions encountered and matching with available trucks, select the most efficient method.

V-Shape Loading

1. Park a dump truck in a spot located at approx. 60° angle toward the face of loading by the wheel loader. After loading material, travel the wheel loader in reverse and turn its direction so that the wheel loader faces the parked dump truck at a right angle. Travel forward to carry material onto the dump truck.
2. Position the wheel loader so that the material can be loaded around the center of the dump truck body. If the dump truck body is longer than twice the bucket width, load from the front to rear position of the dump truck body in order.
3. When dumping sticky material such as clay, move the bucket lever back and forth to lightly hit the bucket to the stoppers.

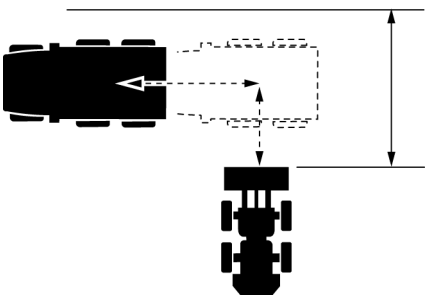
   Take a steering angle as small as possible to operate the machine efficiently.
4. Before raising the lift arm to the maximum height with the bucket full, lightly tap the bucket on the ground to stabilize the material in the bucket to prevent the material from spilling off the backside of the bucket.



M4GB-05-015

I-Shape Loading

Park a dump truck in a direction parallel to the loading face. After loading material into the bucket, travel the wheel loader straight in reverse. Move a dump truck to a spot between the loading face and the wheel loader. Travel the wheel loader forward to load material onto the dump truck body.
Loading times become shorter using this loading method, reducing the total working cycle time and increasing work efficiency. Position the machine down the wind as much as possible. The engine will not only inhale as little dust as possible but also operator's eyes will be protected from being contaminated.

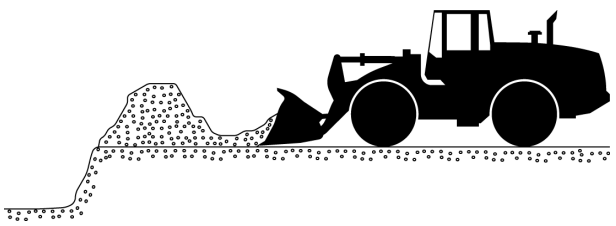


M4GB-05-016

Dozing

IMPORTANT:

- **Never attempt to forcibly push piled material higher than the bucket capacity. Premature wear of the tires due to slipping and/or waste of fuel may result.**
- **Do not perform dozing with the bucket dumped. Abnormal excessive stress will be applied on the front attachment.**
- **Never apply great traction force to the cutting edge with the cutting edge tilted forward more than 10°. Failure to obey so may result in damage such as cracks to the working tools and front attachment.**



M4GB-05-017

Dozing stands for a working method performed by a wheel loader using the wheel loader bucket in place of a bulldozer blade. This operation method is employed when reclaiming land or dumping material into a hopper.
Set the bucket bottom parallel with the ground surface and drive the wheel loader forward.

Scooping

WARNING: Do not allow the machine to engage in piling up material on a soft ground. It is import to be aware that steering operation on soft ground may easily cause tipping over of the machine.



M4GB-05-018

Take care not to touch the ground with the counterweight while engaging in scooping work.
The machine may become unstable, possibly causing the machine to turnover.

Removing Snow

CAUTION:

- **Remove snow in the same method as employed in general loading work. However, pay attention to slippage of tires and obstacles covered with snow.**
- **Turn the Ride Control Switch OFF when performing work with the front attachment in the float position.**

  Performing work with the Ride Control Switch ON and the front attachment lever in the float position, ride control is active and may allow the attachment to drop while the machine is driving.



M4GB-05-019

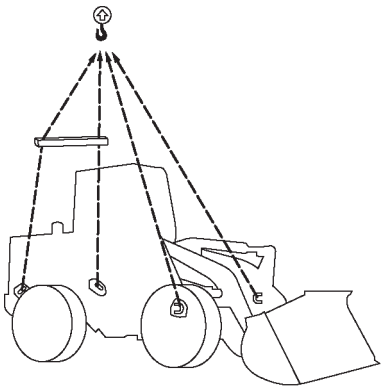
Precautions for removing snow

- Avoid sudden starting and stopping as well as rapid steering of the machine.
- Use tire chains on all four wheels.
- Pay attention to the presence of the utility facilities such fire hydrants, manholes, curbs, roadside drains, etc. The facilities or the machine may be damaged.

Lifting Wheel Loader

WARNING:

- **Be sure to use lifting tools and set the articulation lock bar in the LOCK position.**
- **Never allow any person to ride on the machine to be lifted.**
- **Never allow any person to enter below the lifted machine. Before fully lifting the machine above the ground, check that the hooks are securely attached to the machine and the machine is well balanced while lifting the machine slightly above the ground.**



MNEC-05-001

Lifting work of the machine will become necessary when loading the machine onto a ship or truck for repairing and/or transporting.

NOTE: Refer to page 6-11 "Lifting Machine"

Precautions for After Operations

1. After finishing the day's operation, drive the machine to a firm, level ground where no possibility of falling stones, ground collapse, or floods are present.

   (Park the machine referring to the "Parking" in the "DRIVING THE MACHINE" chapter.)

2. Refill the fuel tank.

CAUTION: Wash the machine immediately after operation and then coat rust-preventive oil to protect the machine from rusting. If the machine continues to be used with rust developing, oil leaks may occur.

IMPORTANT: If heavy rain is expected or the machine is to be stored, wrap the muffler with a tarpaulin to prevent water from entering the muffler.

3. Clean the machine.

4. If anti-freeze or long life coolant is not used in cold weather, be sure to drain coolant from the radiator and the engine jacket.

   Also, be sure to put a "No Water in Radiator" tag in a visible place after the coolant has been drained.

5. Maintenance for long term machine storage after engaging in snow removal. (Refer to STORAGE section.)

   Anti-freeze agents such as salt (sodium chloride or calcium chloride) are scattered on snow roads. When the machine is stored for a long time after engaging in snow removal work, perform the following maintenance to protect the machine from being corroded and/or damaged by salt.

IMPORTANT: Take care not to spray water directly to electrical parts, harnesses and connectors.

Kinds of lights such as the headlights, work lights, and turn signal lights are waterproof.

5.1 Clean the machine thoroughly.

Clean each cylinder rod (plated areas) and the radiator with extra care.

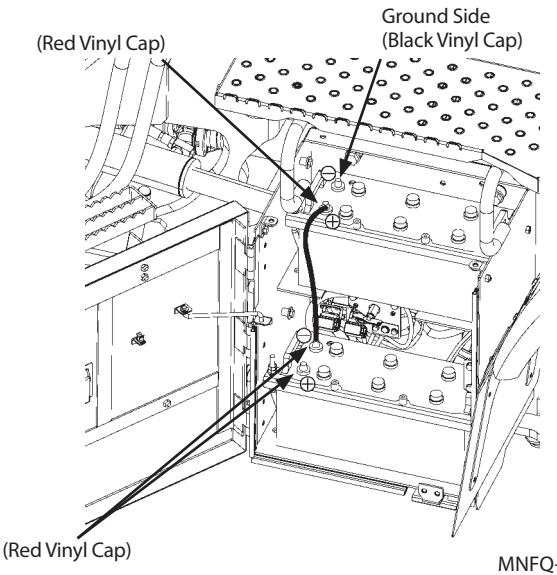
5.2 After positioning the machine for storage, carefully coat each cylinder rod (plated areas) and the control valve spools with rust-preventive oil.

5.3 Lubricate all pins while referring to A Greasing Section in the Maintenance Guide List.

CAUTION: When removing the batteries, disconnect the ground cable from the battery terminal first (covered with a black vinyl cap).

5.4 Remove the batteries and store them in a dry cool place.

When the batteries are not removed, disconnect the ground terminal cable.



MNFQ-05-006

Payload Checker

Introduction

This device shows the weight of loads, such as earth or sand and the load that is loaded on a dump truck. The displayed load may vary due to machine specifications, such as a special lift arm, special attachment, etc., so use it as a guide.

This device is not a scale.
Use the displayed number as a guide and not for commercial transactions.

Do not attempt to modify the device. Doing so will make weighing inaccurate.

If changes, such as the bucket or lift arm, is made, it must be reconfigured.
Consult Authorized Dealer or sales office.

Avoid strong shocks to the device. They may damage or make it malfunction.

The device is only effective on machines that come equipped with a bucket and not on machines equipped with anything other than a bucket.

Consult Authorized Dealer or sales office to enable the device if a bucket is installed after delivery.

Function Button

The control levers are equipped with the following function buttons for the payload checker quick operation.

1- Add Load

Push when the bucket becomes full of material. Added to the short total.

2- Truck Clear

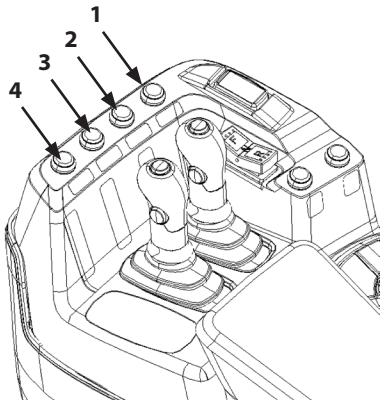
Push when the truck becomes full of material. The short total is stored, and the memory is cleared for the next operation.

3- Tip-off

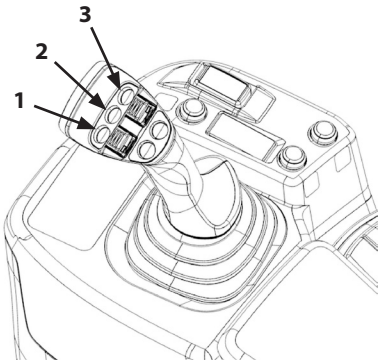
Used for the tip-off mode operation. Refer to page 5-69 "Tip-off Mode".

4- Cancel

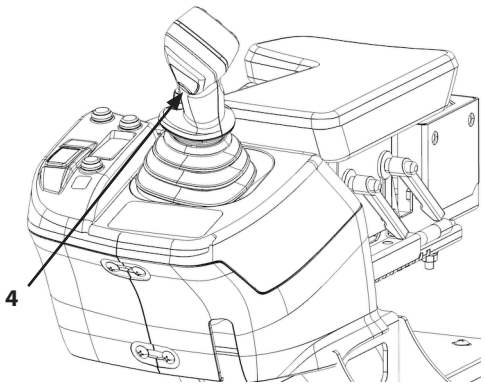
Cancels the current load in the bucket.



MNFQ-05-002

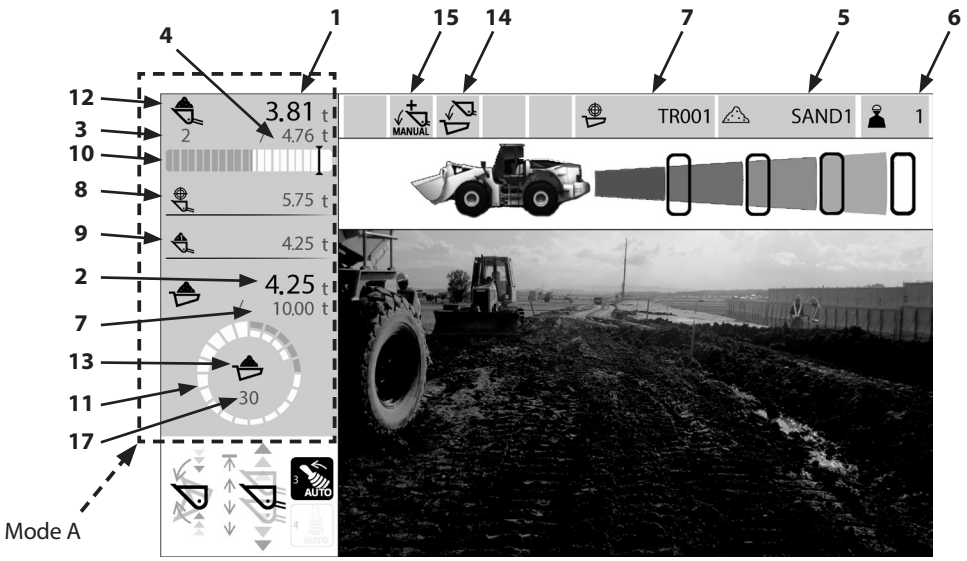


MNUD-05-004

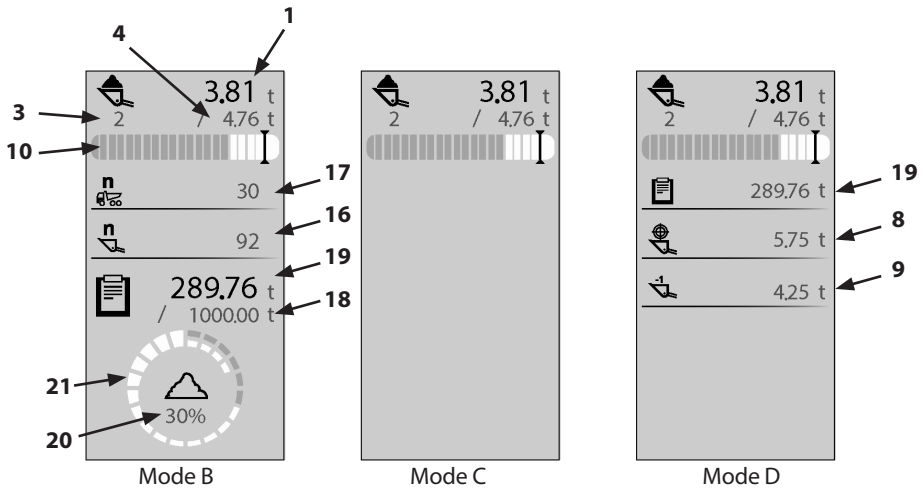


MNUD-01-029

Payload Checker Monitor Display



MNVA-01-042



MNUD-05-021a

1- Bucket Payload
2- Cumulative Dump Truck Load
3- Buckets Loaded Count
4- Rated Payload
5- Target Material
6- Operator No.
7- Target Load/Target Load Name
8- Amount To Go/Overload
9- Weight of Last Bucket Loaded
10- Bucket Level Gauge
11- Truck Level Gauge
12- Bucket Icon
13- Truck Icon
14- Tip-Off Mode Icon
15- Add Mode Icons
16- Total Loads Count
17- Trucks Count
18- Target Total Load
19- Total Load
20- Progress
21- Progress Level Gauge

Bucket Payload (1)

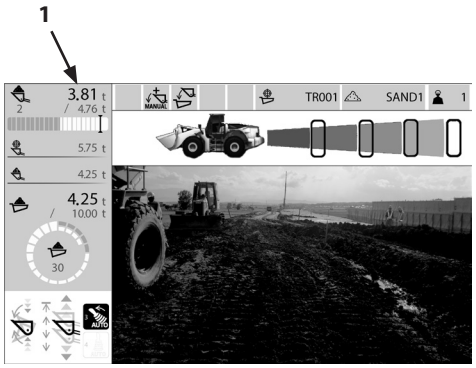
Displays the weight of the load currently in the bucket (payload).

Pressing Cancel switch (2) on the control lever after the payload is displayed makes the load display go to (--.-- t).

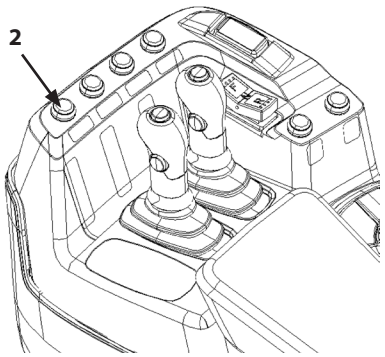
The display items and text color vary with the results of weighing the payload.

List of Display Changes

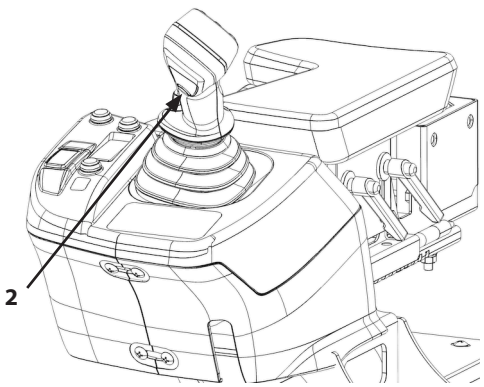
State	Display (unit: t)	Text Color
Not ready to weigh payload	--.--	Gray
Ready to weigh payload	0.00	Gray
Weighing payload	Calculated load value	Gray
Weighing payload complete	Calculated load value	White
If value from weighing payload is undetermined	(not displayed)	
Communication disrupted	(not displayed)	



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Cumulative Dump Truck Load (2)

Displays the current weight loaded on the dump truck (cumulative loaded weight).

After a load is added, pressing the Cancel switch decreases the bucket load count by 1 and subtracts the just added load.

Clearing the cumulative dump truck load:
Pressing Truck Clear switch (3) resets the cumulative dump truck load to 0.00 t.

Display at machine restart:
Even when the machine is restarted (key ON→OFF→ON), the cumulative dump truck load is displayed prior to restarting.
If the date changes while the key is OFF, load data is deleted automatically, so the cumulative dump truck load returns to 0.00 t.

NOTE:

- *Pressing Cancel switch (1) twice does not subtract 2 loads prior from the cumulative load.*
- *The cancel function described above is available until weighing of the next load starts.*

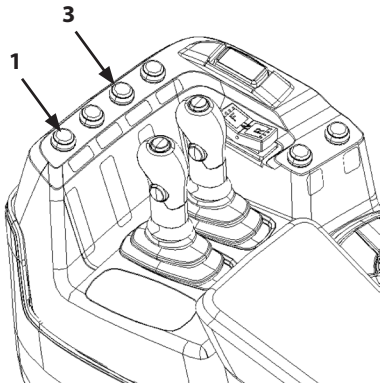
The display items and text color vary with the results of weighing the payload.

List of Display Changes

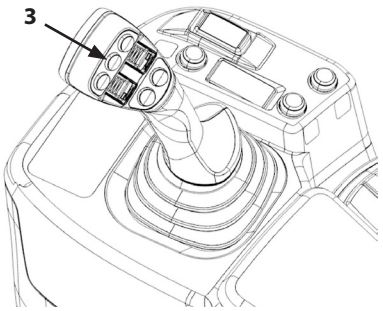
State	Display (unit: t)	Text Color
Default state (truck empty)	0.00	White
Estimated load (tip-off mode ON)	Calculated load value	Gray
Confirm load	Calculated load value	White
Weighing payload complete	Calculated load value	White
If value from weighing payload is undetermined	(not displayed)	
Communication disrupted	(not displayed)	



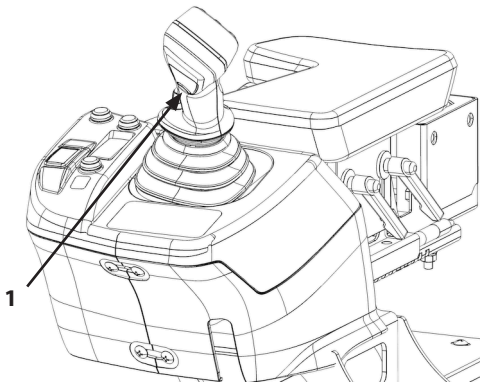
MNVA-01-042



MNFQ-05-002



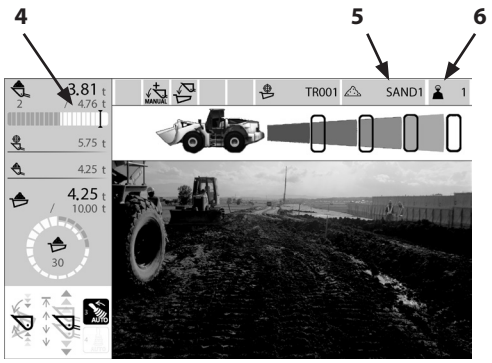
MNUD-05-004



MNUD-01-029

Rated Payload (4)

The rated payload of the bucket is displayed.



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IMPORTANT: The rated payload varies with the type of attachment and lift arm.
The default value is input according to the specifications (attachment and lift arm) when shipped from the factory. Consequently, the rated payload must be input again for any changes to the specifications made after shipment. Your local service representative must do this, so consult Authorized Dealer or sales office to re-input the rated payload.

Target Material (5)

The selected load material is displayed.

The name of load materials can be set and saved as desired using alphanumeric and symbols, up to a total of 20 names.

Materials can be changed on the Material Select screen in the Main menu.

NOTE: For more information, see page 5-44 "Material Name Setting".

Operator No. (6)

The selected operator number is displayed.

Operator numbers can be changed with Operator Setting on the Start screen and in the Main menu.

NOTE: For more information, see page 1-79 "Operator Setting".

Target Load/Target Load Name (7)

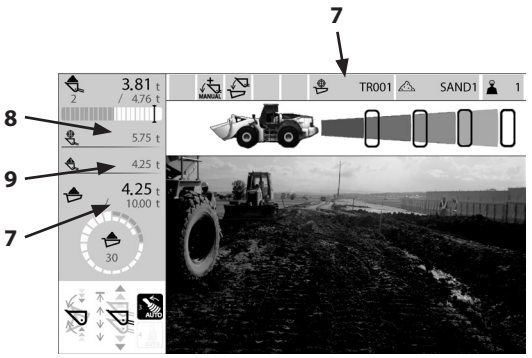
The operator is free to change the target load to any value possible as the target of the cumulative dump truck load (2).

Up to 10 types of target loads can be saved and the operator can configure them with any target load name and load value.

NOTE: For more information, see page 5-48 "Target Load Setting".

Target loads can be changed on the Target Load Select screen in the Main menu.

NOTE: For more information, see page 5-47 "Target Load Select".



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Amount To Go/Overload (8)

Displays the value obtained by subtracting the cumulative dump truck load from the target load.

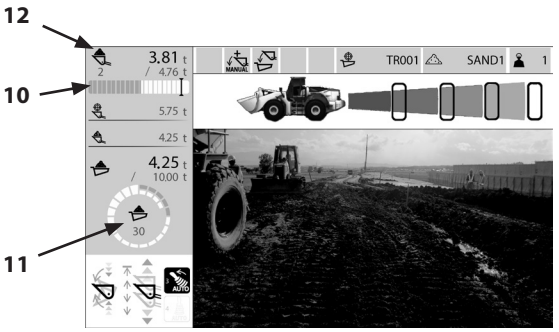
Weight of Last Bucket Loaded (9)

Displays the load just added to the cumulative dump truck load.
This is used as a guide when canceling the load after loading a truck.

Bucket Level Gauge (10)

The level gauge displays the ratio of the bucket payload to 100% (% of full) of the bucket's rated payload.

The scale of the level gauge has 20 segments, so the load gauge increases in 5% increments (lights green).
When the load gauges goes over the 20 segments (100% full), the bucket is overloaded and the gauge turns red.



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Truck Level Gauge (11)

The scale of the level gauge has 20 segments, so the load gauge increases in 5% increments (lights green).
When the load gauges goes over the 20 segments (100% full), the truck is overloaded and the gauge turns red.

NOTE: The maximum scale on the level gauge is 24 (120%). If the full ratio is 120% or higher, the maximum scale is displayed.

Bucket Icon (12)

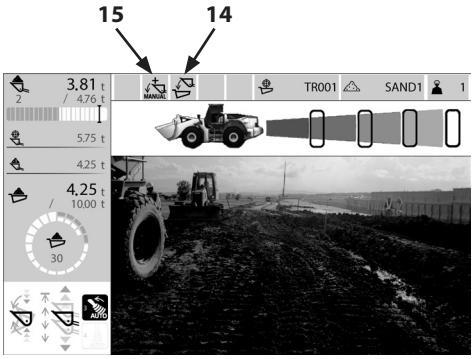
The bucket icon changes according to the weighing status.

Icon	Color	Status
	White	Ready to Weigh
	Gray	Weighing Function OFF
	Red	System Error

Tip-Off Mode Icon (14)

The icon of the tip-off function changes according to the setting mode and ON/OFF status.

NOTE: The tip-off function is for adjusting the load for final loading. For more information, see page 5-69 "Tip-off Mode."



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Icon	Status
	Tip-off To Truck
	Tip-off To Pile
	Tip-off disabled

Add Mode Icon (15)

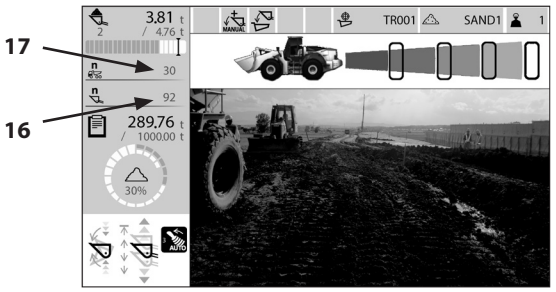
This icon changes according to the add truck selection mode.

Icon	Status
	Auto-Add Mode ON
	Manual-Add Mode ON

Total Loads Count (16)

Displays the number of buckets loaded during the day (total loads count).
The total loads count is only displayed in mode B.

Difference in buckets loaded count:
The bucket loaded count is reset when the Confirm Truck switch is pressed, but the total loads count is not reset.



Mode B

MNVA-01-044

Trucks Count (17)

Displays the number of confirmed trucks (trucks count).

NOTE: The location the trucks count is displayed depends on the screen mode.



Mode A

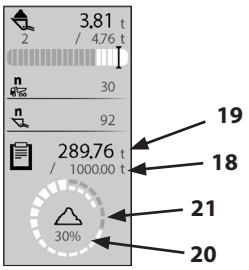
MNVA-01-042

Target Total Load (18)

Displays the target total load for the day.
The total loads count is only displayed in mode B.

The operator is free to change the total target load to any value possible as the target of the total load.

NOTE: For more information on changes, see page 5-47 "Target Load Select".



Mode B

MNUD-05-022a

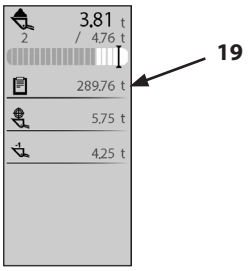
Total Load (19)

Displays the total weight of (total loaded weight) buckets loaded for the day.
The total loads count is displayed only in mode B and mode D.

After adding a load, press the Cancel switch to subtract the previous bucket load value from the total payload.

Difference with the cumulative dump truck load:
The cumulative dump truck load is reset when the Confirm Truck switch is pressed, but the total payload is not reset.

Display at machine restart:
Even when the machine is restarted (key ON→OFF→ON), the total payload is displayed prior to restarting.
If the date changes while the key is OFF, load data is deleted automatically, so the total payload returns to 0.00 ton.



Mode D

MNUD-05-044a

Progress (20)/Progress Level Gauge (21)

Displays the current ratio of total load to the target total load (18) (=100%) of the day.
The progress and progress level gauge are displayed only in mode B.

Display Ranges and Default Values

Numeric Values and Text Strings (Home Screen)

Item	Display Ranges	Unit	Resolution	Factory Default
Bucket Payload	-9.99 to 99.99	t	0.01	- -.- -
Cumulative Dump Truck Load	0.00 to 9999.99	t	0.01	0.00
Buckets Loaded Count	0 to 999	times	1	0
Rated Payload	0.00 to 99.99	t	0.01	Set according to machine specifications
Load Material	5-digit Alphanumeric			M1
Operator No.	0~9	-	1	0
Target Load	0.00 to 9999.99	t	0.01	10.00 (T1)
Target load name	5-digit Alphanumeric			T1
Amount To Go/Overload	0.00 to 9999.99	t		10.00
Weight of Last Bucket Loaded	0.00 to 99.99	t		10.00
Total Loads Count	0 to 9999	-		0
Trucks Count	0 to 999	-		1
Target Total Load	0.00 to 99999.99	t	0.01	1000.00
Total Payload	0.00 to 99999.99	t	0.01	0.00
Progress	0 to 120	%	5	0

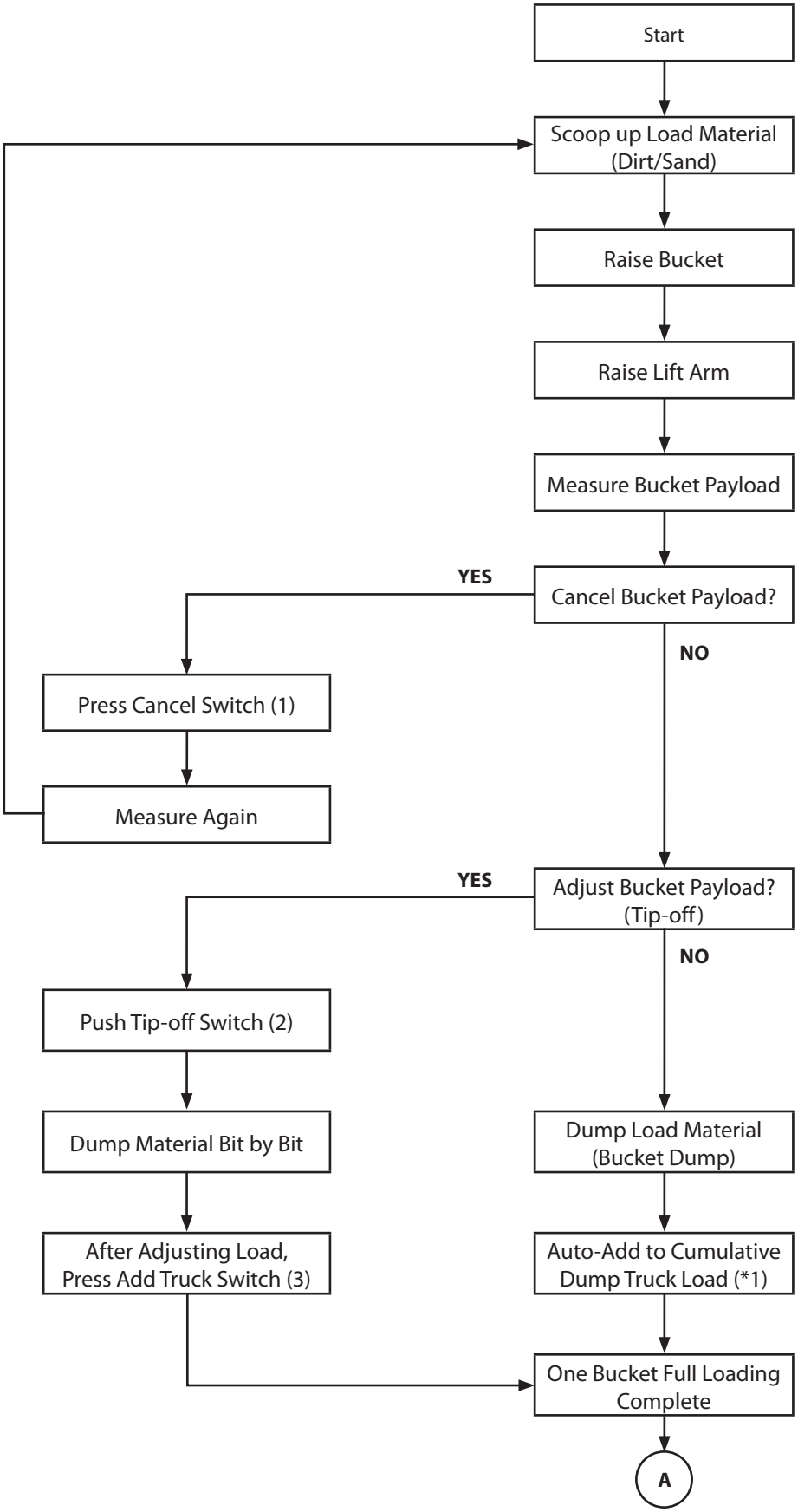
Setting Mode

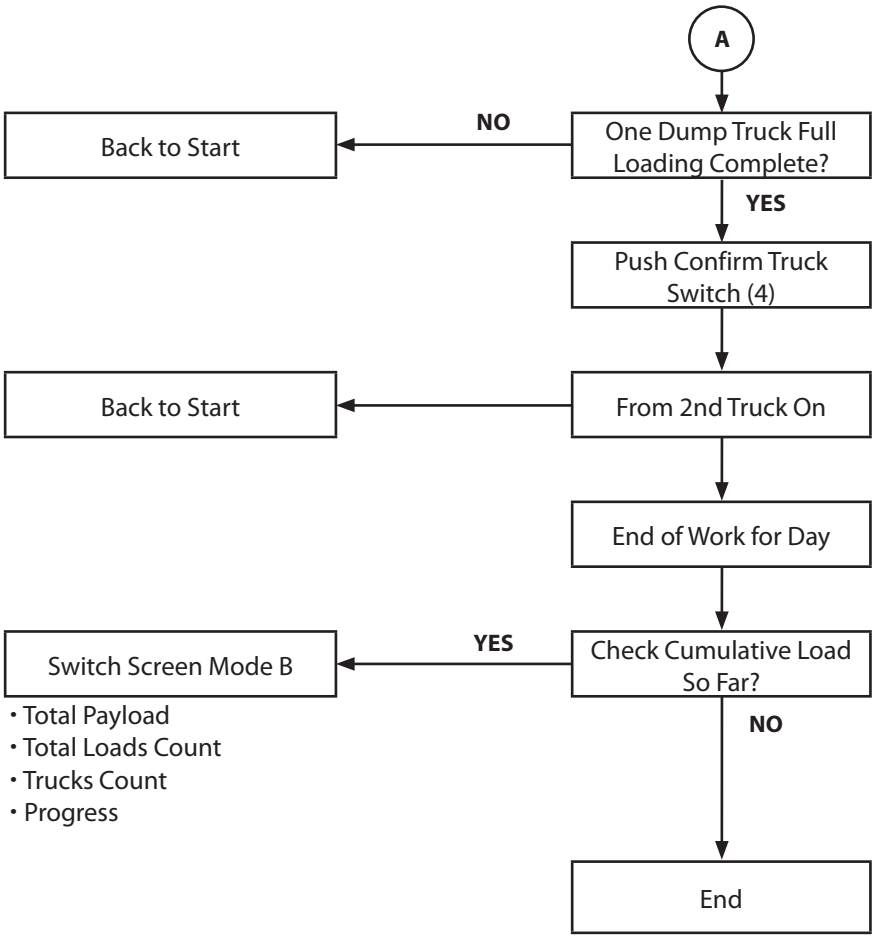
Item	Display Ranges	Factory Default
Tip-Off Mode	Tip-off To Pile, Tip-off To Truck	Tip-off To Truck
Add Mode	Auto-Add, Manual-Add	Auto-Add
Bucket Overload Warning	ON, OFF	ON
Dump Truck Overload Warning	ON, OFF	ON

Numeric Values and Text Strings (Default Settings)

Item	Display Ranges	Unit	Resolution	Factory Default
Zero Calibration	-9.99 to 99.99	t	0.01	Factory Set Value
Target Load T1	0.00 to 9999.99	t	0.01	10.00
				20.00
				30.00
				40.00
				50.00
				60.00
				70.00
				80.00
				90.00
				100.00
Target Load T1 Name	5-digit Alphanumeric			T1
				T2
				T3
				T4
				T5
				T6
				T7
				T8
				T9
				T10
Material M1 Name	5-digit Alphanumeric			M1
				M2
				M3
				M4
				M5
				M6
				M7
				M8
				M9
				M10
				M11
				M12
				M13
				M14
				M15
				M16
				M17
				M18
				M19
				M20

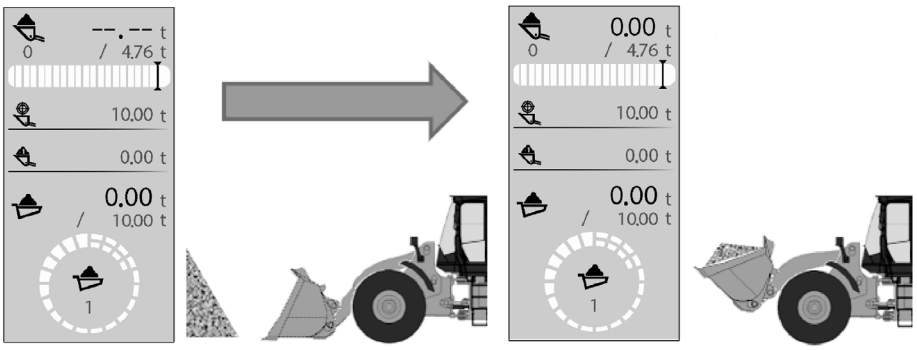
Weighing Flowchart




A
One Dump Truck Full Loading Complete?
NO
Back to Start
YES
Push Confirm Truck Switch (4)
From 2nd Truck On
Back to Start
End of Work for Day
Check Cumulative Load So Far?
YES
Switch Screen Mode B
• Total Payload
• Total Loads Count
• Trucks Count
• Progress
NO
End

Load Measurement Procedure

1. Turn the key switch ON. The Home screen is displayed on the sub monitor.
2. Tilt the bucket with the loaded material all the way up.



Before Loading — After Loading (Bucket Full Tilt)

MNUD-05-045a

3. Raise the lift arm holding the bucket fully tilted.

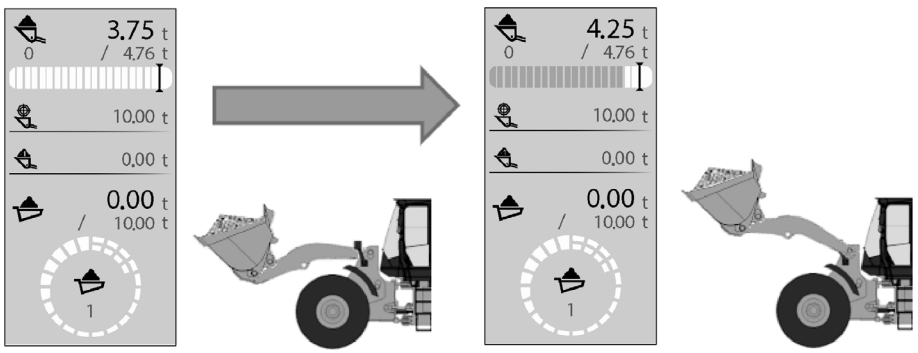
NOTE: When weighing a load, stop the machine and keep the engine speed stable, then raise the lift arm slowly to display an accurate value.

4. When the lift arm reaches the preset angle, the weight of the load material in the bucket is displayed in the bucket payload field.

IMPORTANT: Display of Unconfirmed Loads

The provisional results (unconfirmed load) of the calculated bucket load are displayed in the bucket payload field until the lift arm reaches the preset angle. This unconfirmed load cannot guarantee its accuracy as the data needed for weighing is insufficient. Check the load value that is displayed after reaching the preset angle (confirmed load) for the correct bucket payload.

NOTE: Unconfirmed loads are displayed in gray, while confirmed loads are in white. For more information, see page 5-28 of "Bucket Payloads."



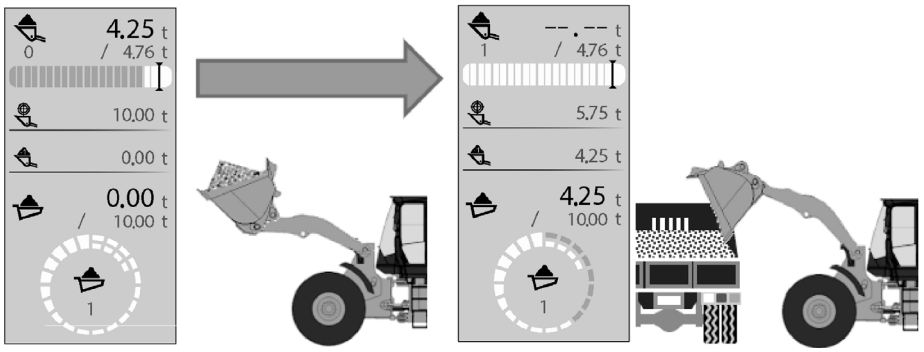
Weighting (Lift Arm Raising) — Load Confirmed (Lift Arm Stopped)

MNUD-05-046a

5. Choose an action below depending on the value of the bucket payload.
   - To make fine adjustments, go to tip-off function
   - To cancel load or reweigh, go to cancel payload function
   - To load onto dump truck, go to step 6

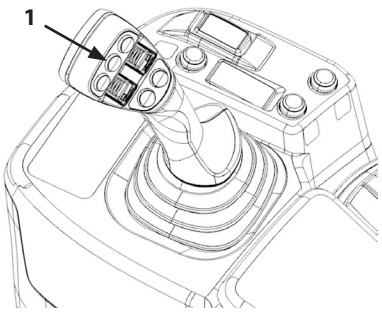
6. Dumping the bucket adds the bucket payload to the cumulative dump truck load.

IMPORTANT: There are 2 ways to add to the cumulative dump truck load, either via manual-add or auto-add. The procedure above shows operations when the auto-add mode is selected. See the explanation in "Add Mode Function" for details on when the manual-add mode is selected.

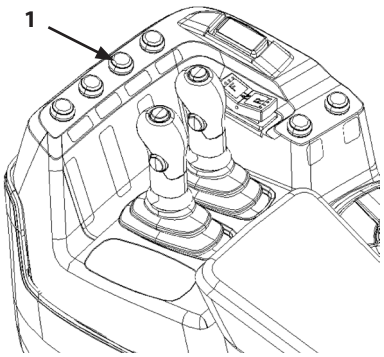


Dumping to Truck

MNUD-05-047a



MNUD-05-004



MNFQ-05-002

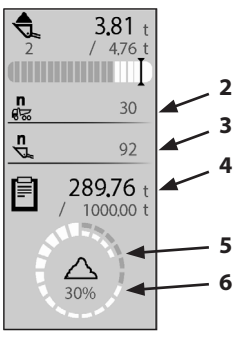
7. Repeat steps 2 through 6.

8. Once a truck is loaded, press Truck Clear switch (1) on the control lever.
   Pressing the Confirm Truck switch increases (+1) the trucks count display. The display of the bucket payload is also indicated by a bar and the cumulative dump truck load goes to 0.00 t.

NOTE: The memory is retained if the key is turned OFF during the day. The memory is automatically deleted when the date changes.

NOTE: The cumulative data can be confimed on the mode B screen.

- *Total Loads Count (3)*
- *Trucks Count (2)*
- *Total Load (4)*
- *Progress (5)*
- *Progress Level Gauge (6)*

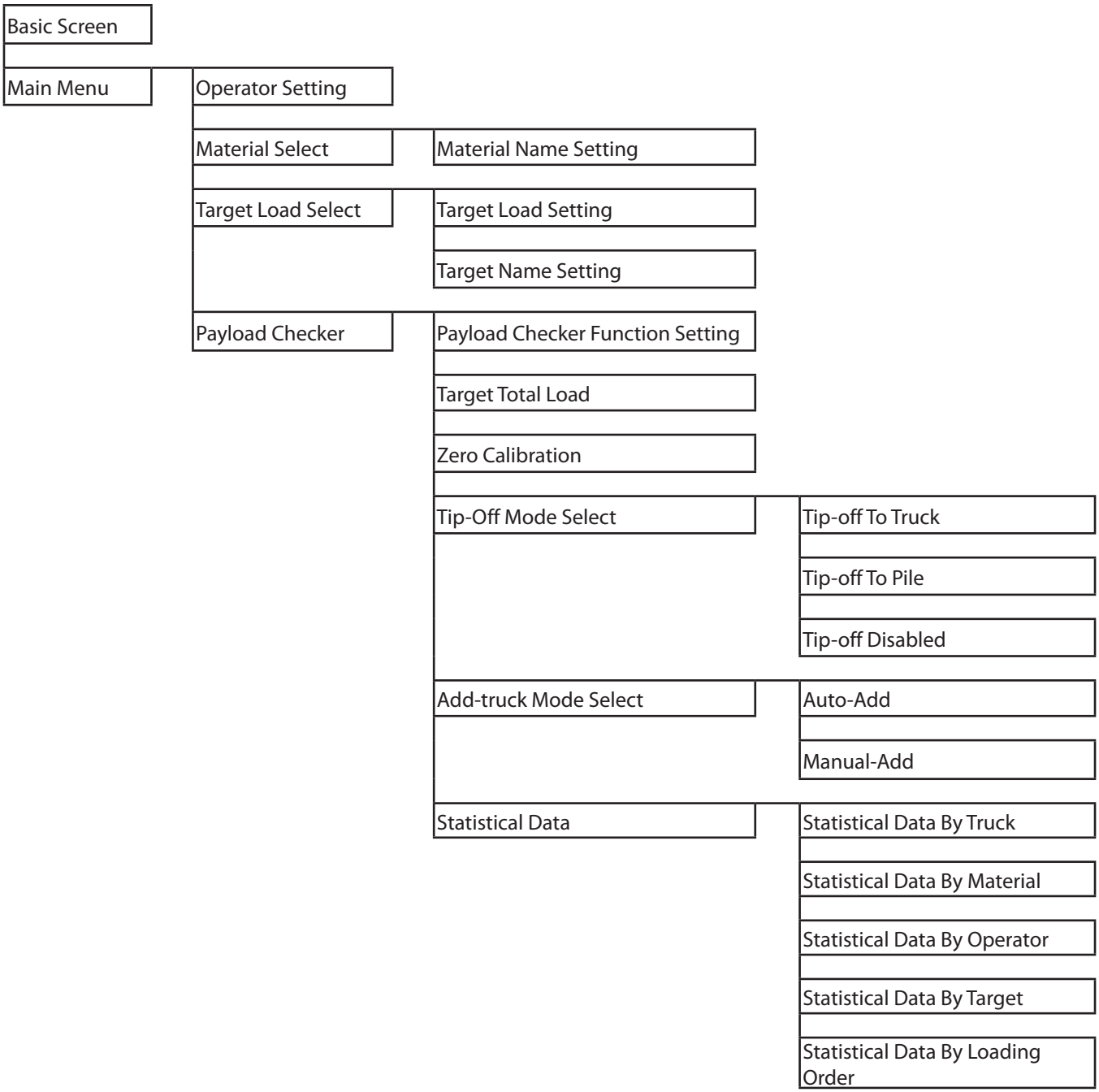


Mode B

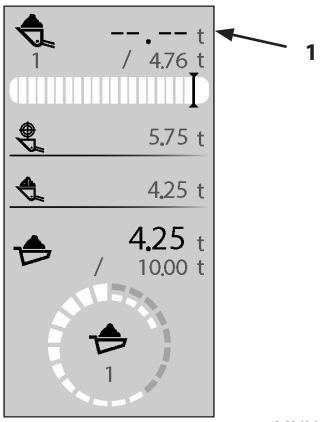
MNUD-05-022a

Payload Checker Related Menu Screen Structure

The sub monitor function menus for payload checker are structured as shown below.



Payload Checker Menu Operations

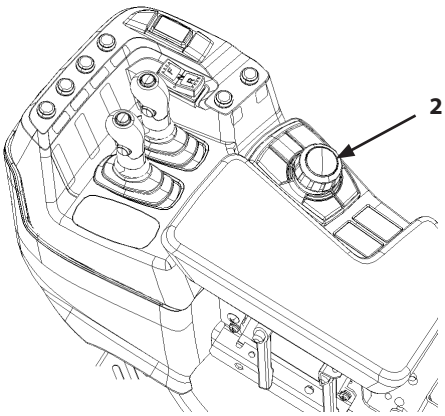


MNUD-01-321a

Material Select

Select the material to load.

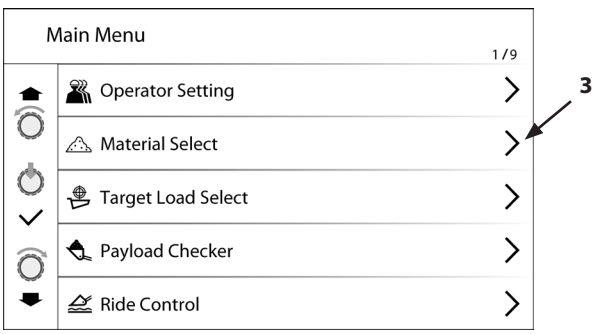
1. Check that the bucket payload value (1) is displayed as a bar (--.--t).
2. Press selector knob (2) to open the Main menu.
3. Rotate selector knob (2) to highlight Material Select (3), and push selector knob (2).
4. Rotate selector knob (2) to select the material to be loaded.
5. Push selector knob (2). The display returns to the Home screen and the selected material is displayed at the top of the screen.



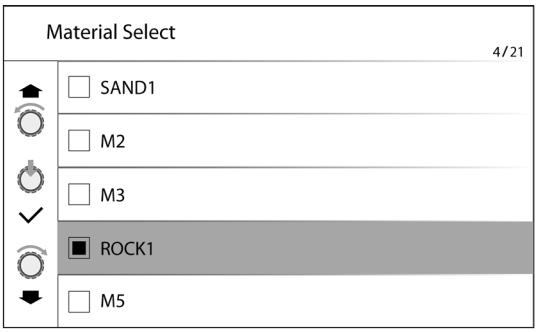
MNFQ-01-047

NOTE:

- *Select "Material Name Setting" in step 4 to go to the Material Name Setting screen. In such case, it reverts to the material before the change.*
  For information on changing the names of materials, see the next page.
- *The state selected on this screen is saved when the key is turned OFF. When the key is turned ON again, the state when the key was OFF is maintained.*



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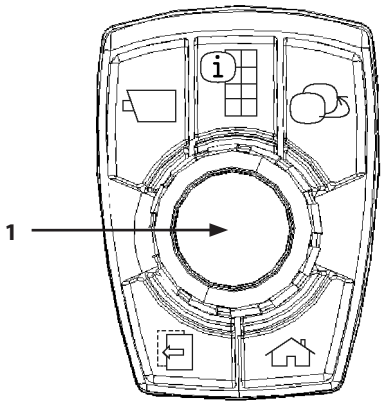


MNTK-01-322EN

Material Name Setting

The 5-digit names of materials, consists of alphanumeric and symbols, can be changed on this screen.

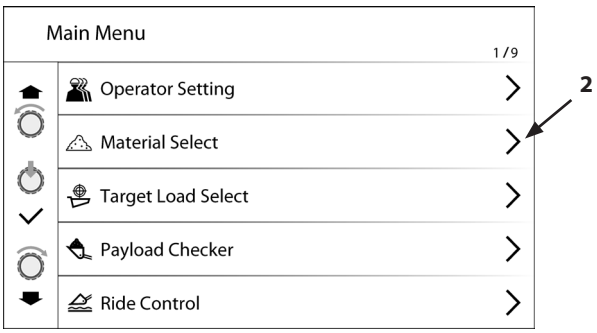
1. Press selector knob (1) to open the Main menu.



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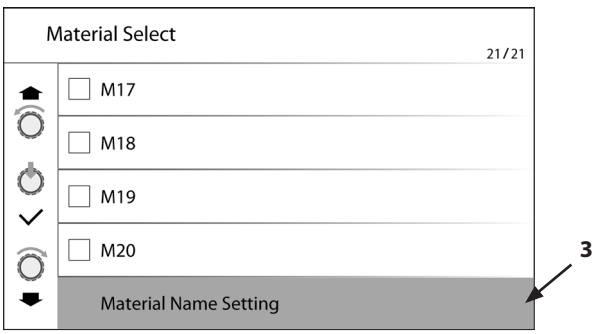
2. Rotate selector knob (1) to highlight Material Select (2), and push selector knob (1).

3. Rotate selector knob (1) to select Material Name Setting (3) and push selector knob (1).

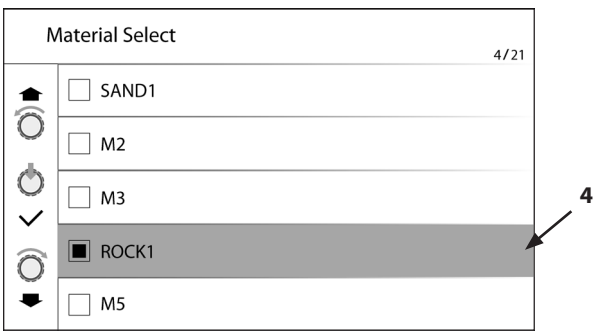


MNUD-01-263aEN

4. Select the desired material and push selector knob (1). ("ROCK1" (4) is selected as an example.)

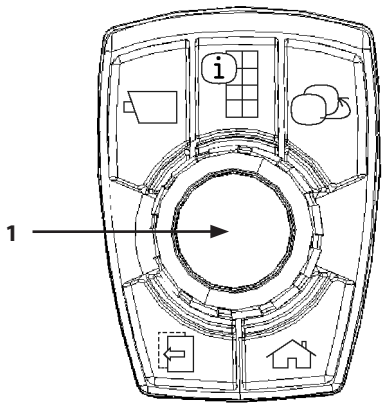


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MNTK-01-322EN

5. The Material Name Setting screen is displayed.



MNUD-01-252

6. Rotating selector knob (1) counterclockwise moves the highlighted item from the 1st digit (5) of the name through to the 5th digit (6), Clear All button (7), and Set button (8), then returns to the 1st digit (5).

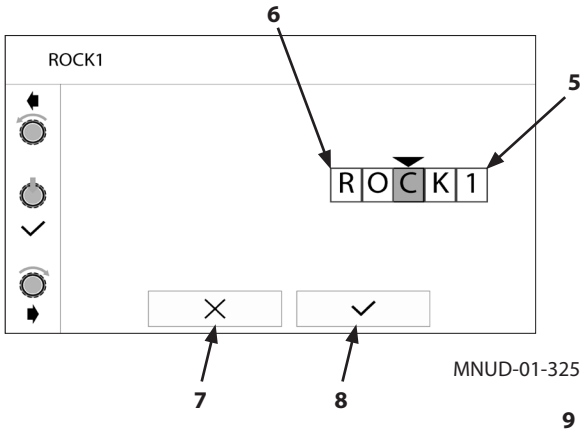
   Rotating selector knob (1) clockwise moves the highlighted item in reverse order; from the 1st digit (5) of the name, Set button (8), Clear All button (7), the 5th digit (6) through to the 1st digit (5).

7. Highlight a desired digit and push selector knob (1). ("C" is selected as an example.)

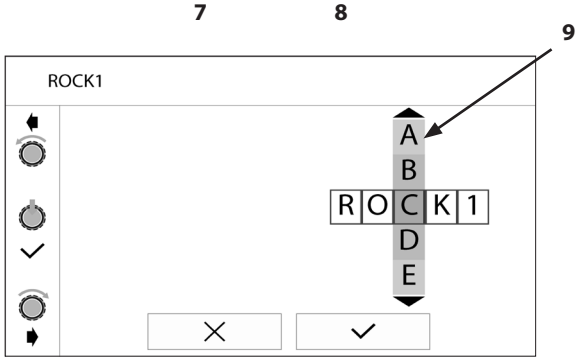
8. The 5-digit vertical character bar (9) appears as shown. Rotating selector knob (1) scrolls the character.

   Clockwise (bar (9) scrolls up):
   A → B ... Y → Z → 0 → 1 ... 8 → 9 → - → . → / → t → _(space) → A → B ...

   Counterclockwise (bar (9) scrolls down):
   A ← B ... Y ← Z ← 0 ← 1 ... 8 ← 9 ← - ← . ← / ← t ← _(space) ← A ← B ...

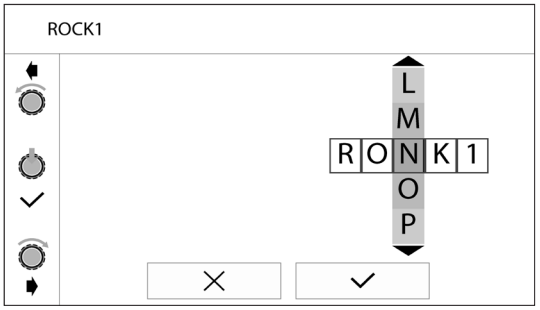


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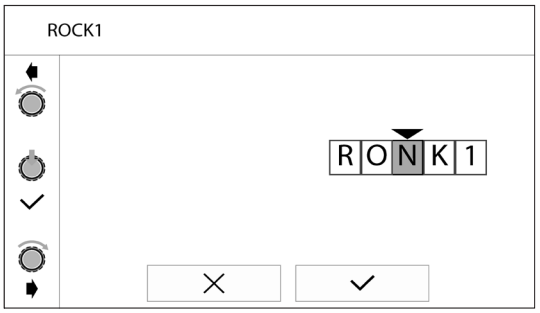
9. Stop rotating with a desired character in the middle crossing with the name line.
("N" is selected as an example.)



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10. Push selector knob (1) to fix the selection.
In this example, "ROCK1" is changed to "RONK1".

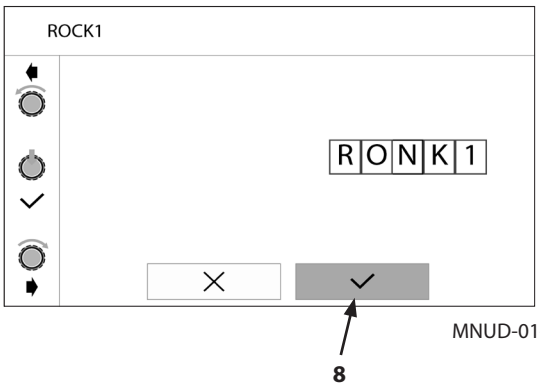
11. Rotate selector knob (1) to select Set button (8).



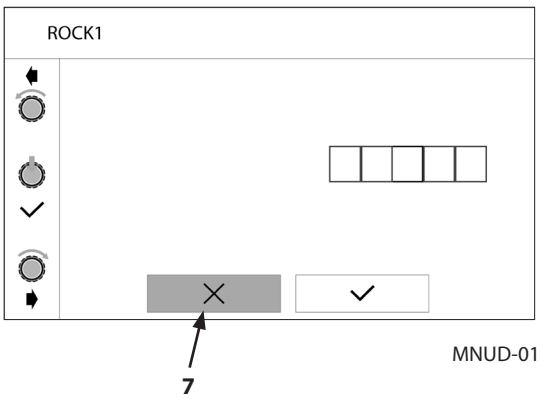
MNUD-01-328

12. Push selector knob (1) to fix the changed name.

NOTE: Selecting Clear All button (7) makes all digits blank at once.



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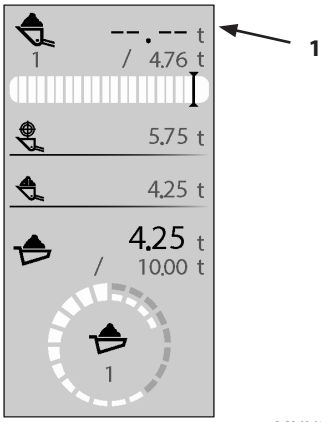


MNUD-01-330

Target Load Select

Up to 10 types of target loads can be saved. Select the target load to change.

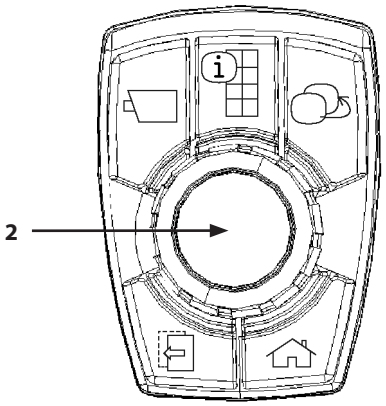
1. Check that the bucket payload value (1) is displayed as a bar (--.--t).



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2. Press selector knob (2) to open the Main menu.

3. Rotate selector knob (2) to highlight Target Load Select (3), and push selector knob (2).

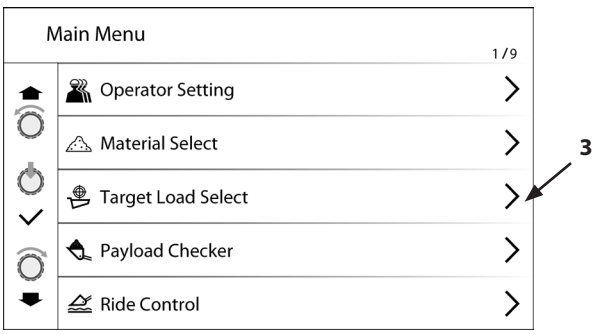


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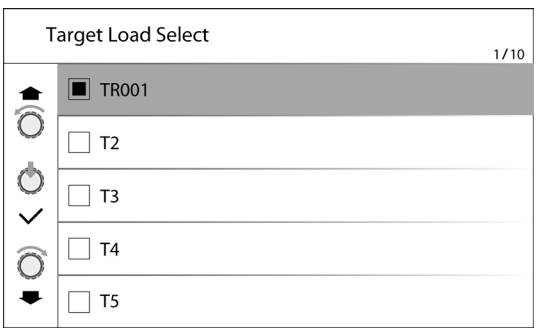
4. Rotate selector knob (2) to select the desired target load.

5. Push selector knob (2). The display goes back to the basic screen and the name of the selected target load is displayed at the top of the screen.

NOTE: Selecting either "Target Load Setting" or "Target Name Setting" in step 3 changes the display to the corresponding change screen. In such case, the target load prior to the change is selected. Refer to the following sections.



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MNUD-01-331aEN

Target Load Setting

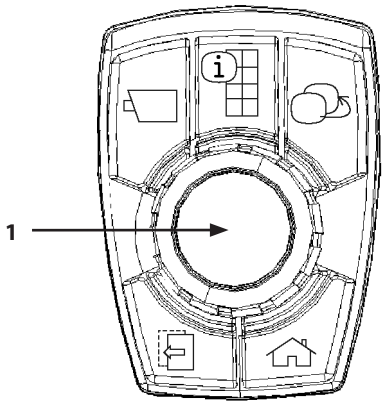
The operator can change the target load value within the range from 0.01 to 9999.99 t by 0.01 t.

1. Press selector knob (1) to open the Main menu.

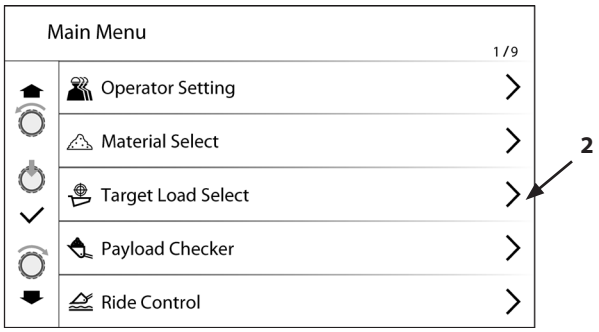
2. Rotate selector knob (1) to highlight Target Load Select (2), and push selector knob (1).

3. Rotate selector knob (2) to select Target Load Setting (3) and push selector knob (2).

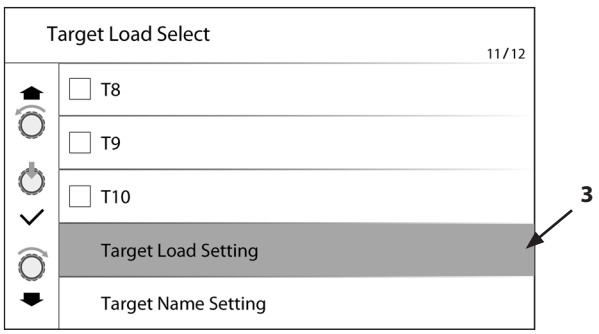
4. Select the desired target load and push selector knob (2). ("TR001" (4) is selected as an example.)



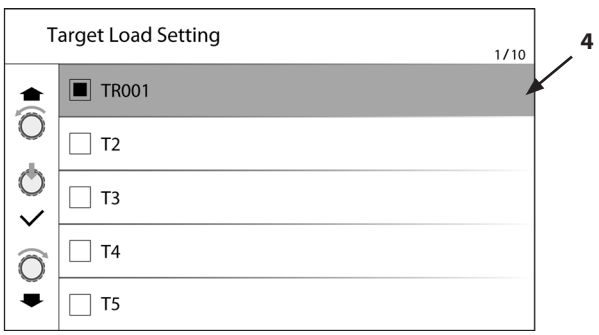
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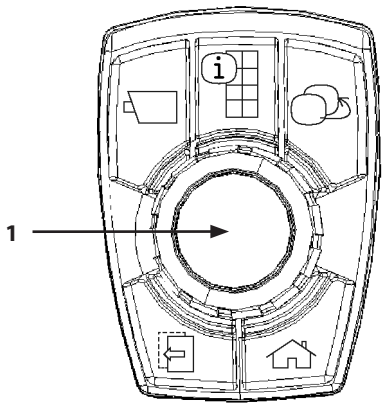


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5. The Target Load Setting screen is displayed.



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6. Rotating selector knob (1) counterclockwise moves the highlighted item from the 2nd decimal point digit (5) of the value through to the 4th digit (6), Clear All button (7), and Set button (8), then returns to the 2nd decimal point digit (5).

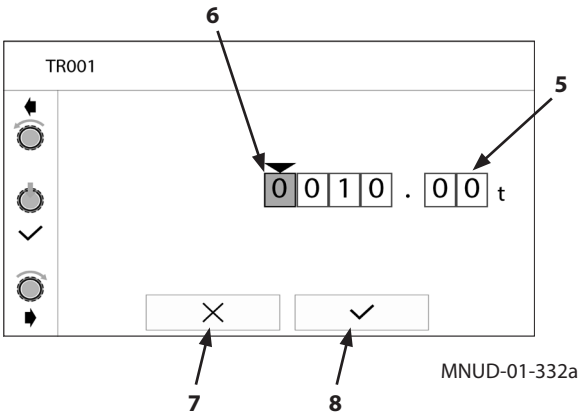
   Rotating selector knob (1) clockwise moves the highlighted item in reverse order; from the 2nd decimal point digit (5) of the value, Set button (8), Clear All button (7), the 4th digit (6) through to the 2nd decimal point digit (5).

7. Highlight a desired digit and push selector knob (1). (The 3rd digit is selected as an example.)

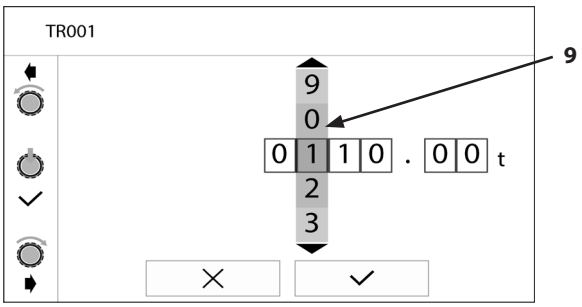
8. The 5-digit vertical character bar (9) appears as shown. Rotating selector knob (1) scrolls the character.

   Clockwise (bar (9) scrolls up):
   0 → 1 → 2 ... 8 → 9 → 0 ...

   Counterclockwise (bar (9) scrolls down):
   0 ← 1 ← 2 ... 8 ← 9 ← 0 ...



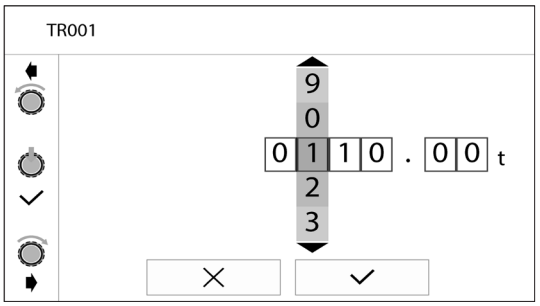
MNUD-01-332a



MNUD-01-333a

9. Stop rotating with a desired number in the middle crossing with the name line.
("1" is selected as an example.)

10. Push selector knob (1) to fix the selection.
In this example, "10.00" is changed to "110.00".

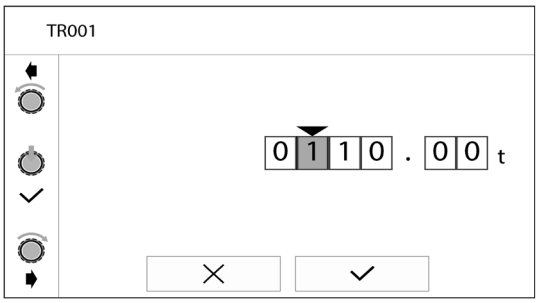


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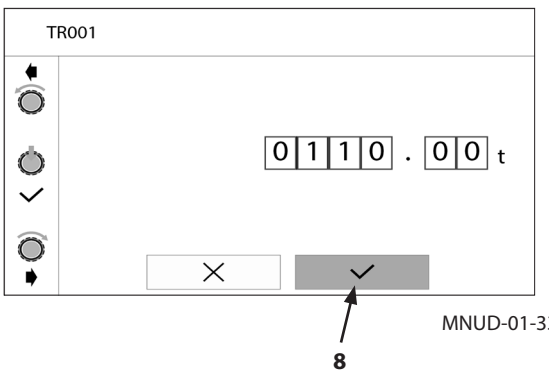
11. Rotate selector knob (1) to select Set button (8).

12. Push selector knob (1) to fix the changed load value.

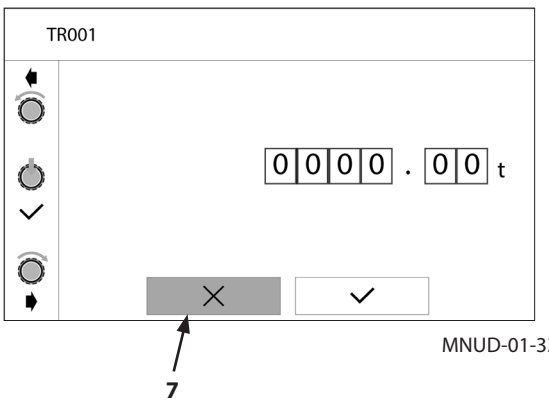
NOTE: Selecting Clear All button (7) makes all digits "0 (zero)" at once.



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Target Name Setting

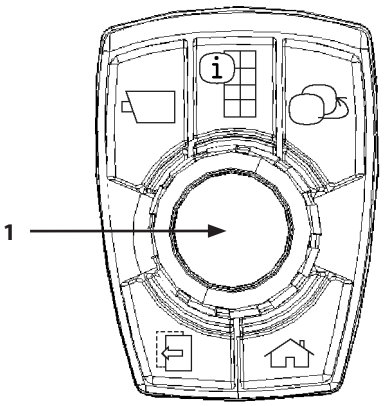
The operator can change the target load name.

1. Press selector knob (1) to open the Main menu.

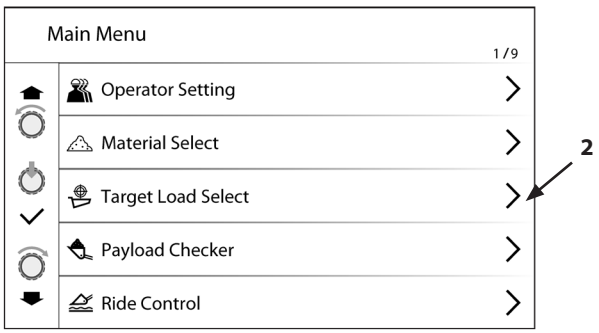
2. Rotate selector knob (1) to highlight Target Load (2), and push selector knob (1).

3. Rotate selector knob (2) to select Target Name Setting (3) and push selector knob (2).

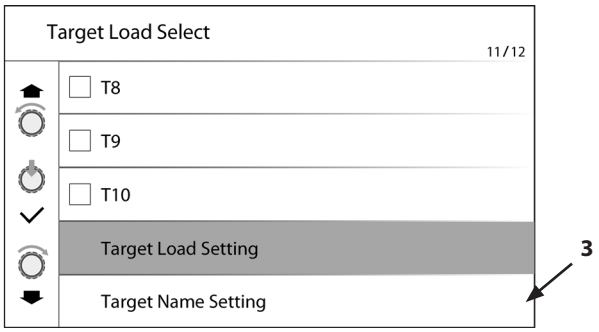
4. Select the desired target load and push selector knob (2). ("TR001" (4) is selected as an example.)



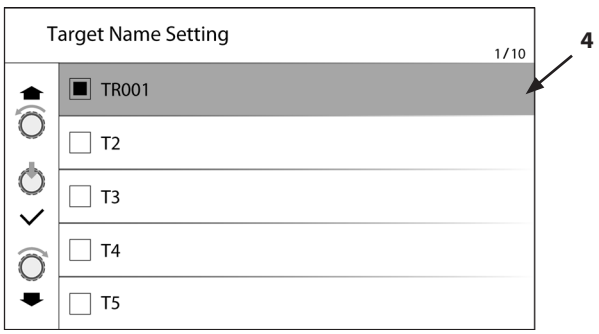
MNUD-01-252



MNUD-01-263aEN

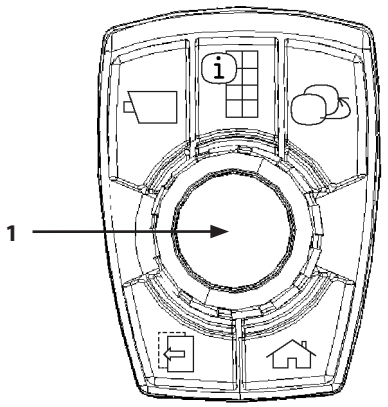


MNUD-01-323aEN



MNUD-01-255EN

5. The Target Name Setting screen is displayed.



MNUD-01-252

6. Rotating selector knob (1) counterclockwise moves the highlighted item from the 1st digit (5) of the name through to the 5th digit (6), Clear All button (7), and Set button (8), then returns to the 1st digit (5).

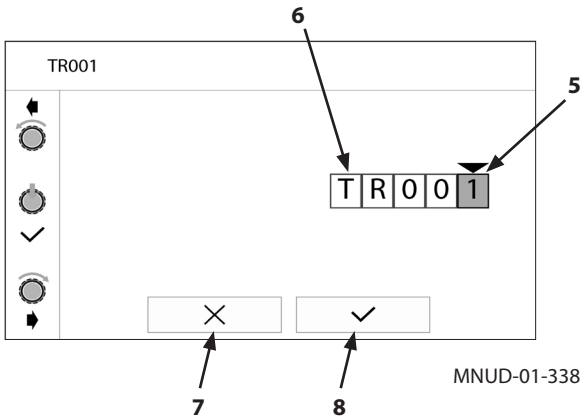
   Rotating selector knob (1) clockwise moves the highlighted item in reverse order; from the 1st digit (5) of the name, Set button (8), Clear All button (7), the 5th digit (6) through to the 1st digit (5).

7. Highlight a desired digit and push selector knob (1). ("1" is selected as an example.)

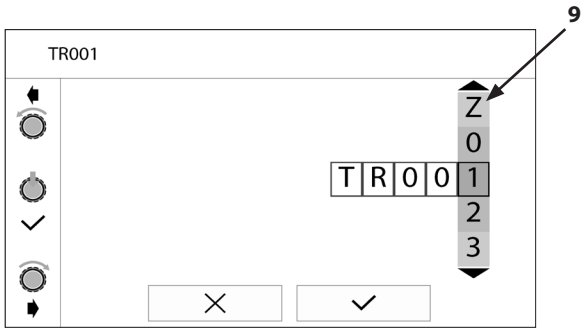
8. The 5-digit vertical character bar (9) appears as shown. Rotating selector knob (1) scrolls the characters.

   Clockwise (bar (9) scrolls up):
   A → B ... Y → Z → 0 → 1 ... 8 → 9 → - → . → / → t → _(space) → A → B ...

   Counterclockwise (bar (9) scrolls down):
   A ← B ... Y ← Z ← 0 ← 1 ... 8 ← 9 ← - ← . ← / ← t ← _(space) ← A ← B ...



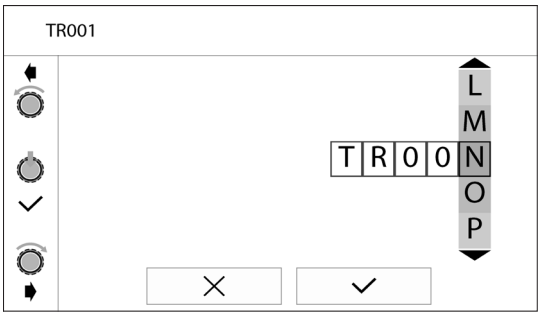
MNUD-01-338



MNUD-01-334

9. Stop rotating with a desired character in the middle crossing with the name line.
("N" is selected as an example.)

10. Push selector knob (1) to fix the selection.
In this example, "TR001" is changed to "TR00N".

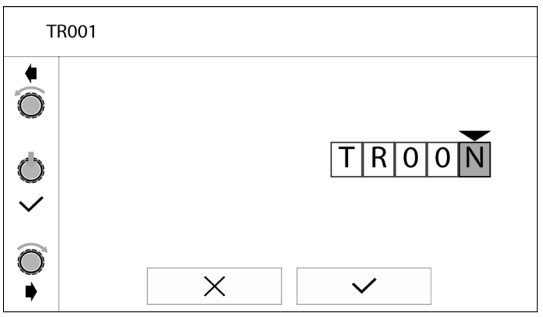


MNUD-01-339

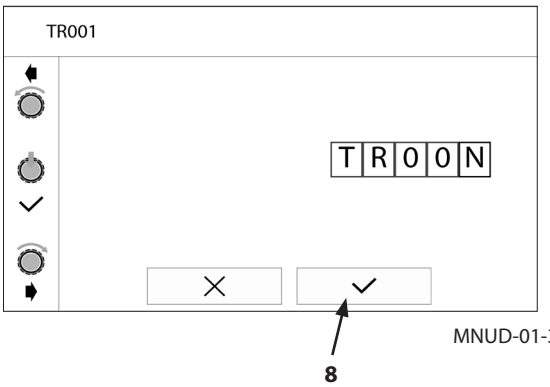
11. Rotate selector knob (1) to select Set button (8).

12. Push selector knob (1) to fix the changed name.

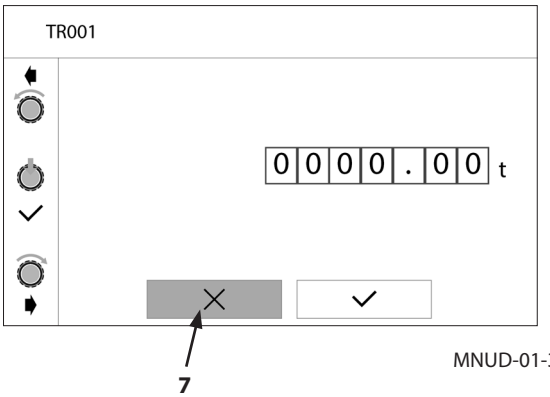
NOTE: Selecting Clear All button (7) makes all digits blank at once.



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MNUD-01-341



MNUD-01-337

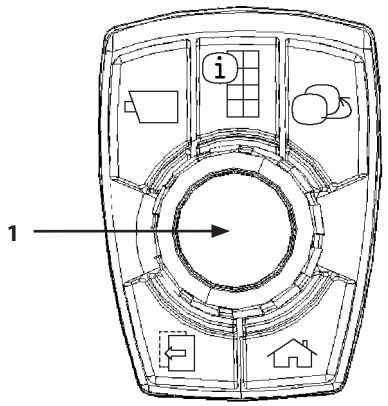
Payload Checker

This allows management of settings and load data for the payload checker.

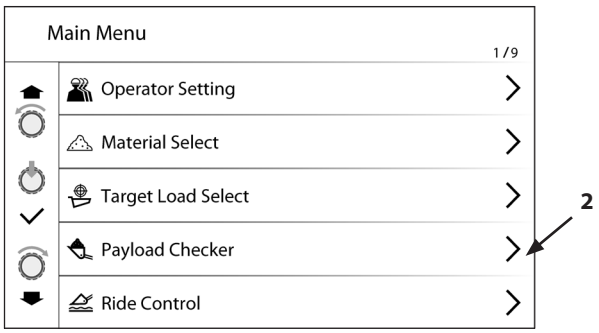
1. Press selector knob (1) to open the Main menu.

2. Rotate selector knob (1) to highlight Payload Checker (2), and push selector knob (1).

3. Rotate selector knob (1) to select the item to check and push selector knob (1).



MNUD-01-252

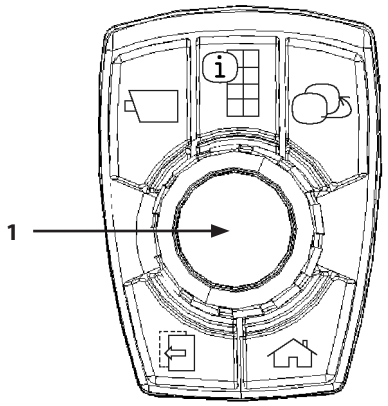


MNUD-01-263aEN

Payload Checker Function Setting

Switches the payload checker function ON/OFF.

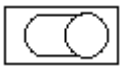
1. Press selector knob (1) to open the Main menu.



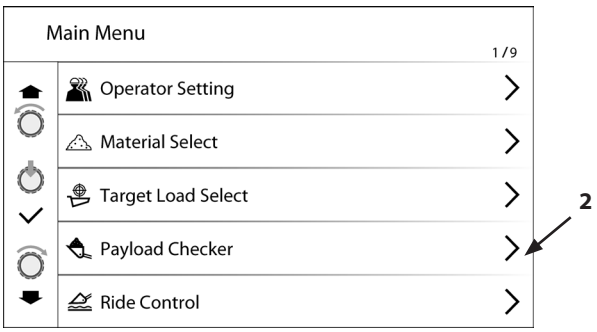
MNUD-01-252

2. Rotate selector knob (1) to highlight Payload Checker (2), and push selector knob (1).

3. Payload Checker Function Setting (3) with ON/OFF switch indicator is shown.
   When the setting is ON, the background color is green with a round button to the right end.



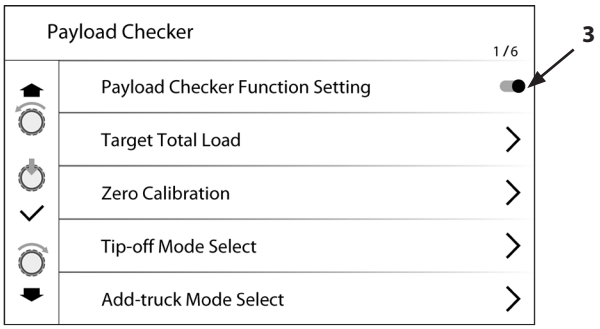
ON Position



MNUD-01-263aEN

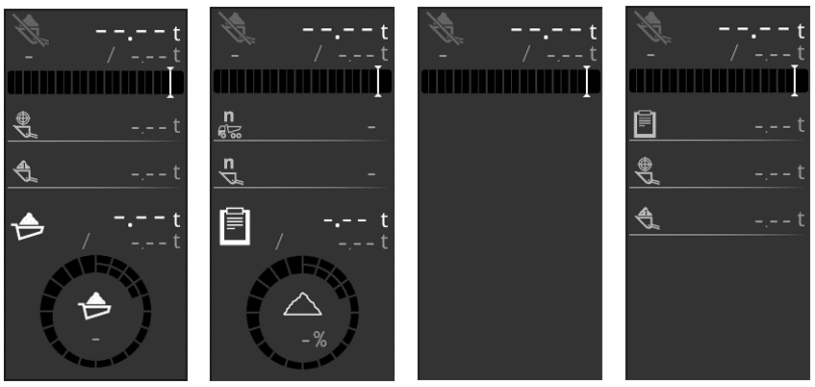
4. Push selector knob (1) to alternate ON and OFF setting.

   When this setting is turned on, the payload checker functions are available.



MNUD-01-342aEN

NOTE: When this setting is turned off, the sub monitor display will be as shown below.



Mode A Mode B Mode C Mode D

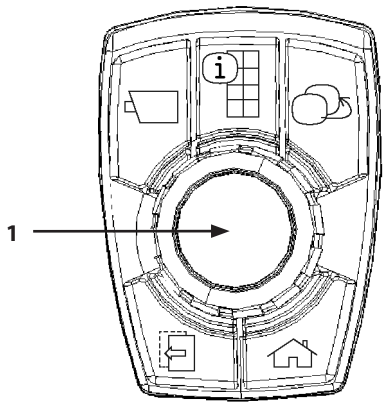
MNUD-05-024

Target Total Load

Sets the total payload to be measured for today.

NOTE: The payload data are automatically cleared when the date is changed.

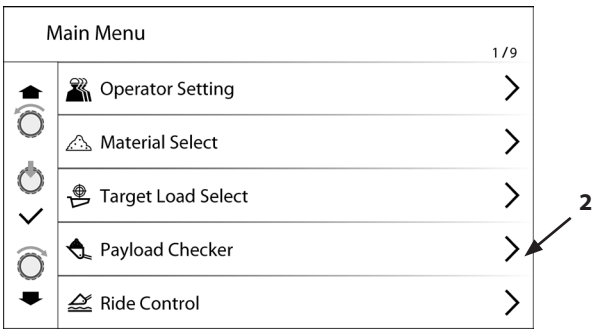
1. Press selector knob (1) to open the Main menu.



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2. Rotate selector knob (1) to highlight Payload Checker (2), and push selector knob (1).

3. Rotate selector knob (1) to select Target Total Load (3) and push selector knob (1).

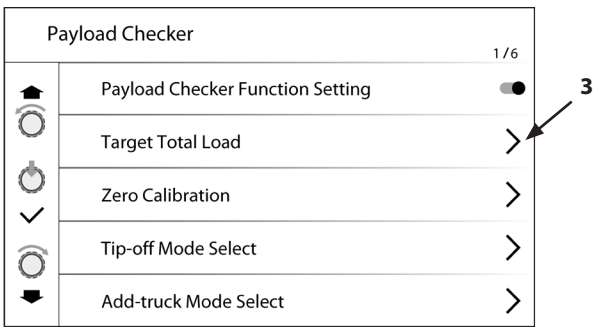


MNUD-01-263aEN

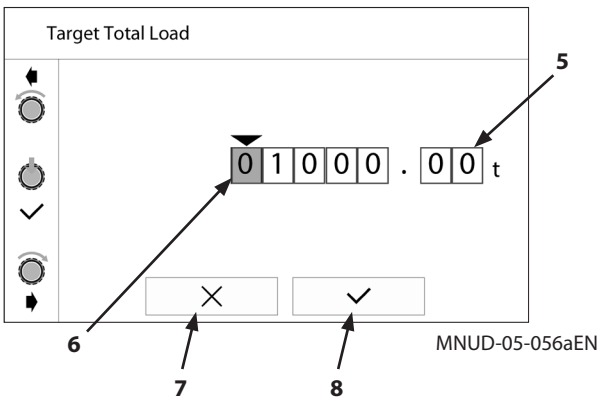
4. The Target Total Load setting screen is displayed.

5. Rotating selector knob (1) counterclockwise moves the highlighted item from the 2nd decimal point digit (5) of the value through to the 5th digit (6), Clear All button (7), and Set button (8), then returns to the 2nd decimal point digit (5).

   Rotating selector knob (1) clockwise moves the highlighted item in reverse order; from the 2nd decimal point digit (5) of the value, Set button (8), Clear All button (7), the 5th digit (6) through to the 2nd decimal point digit (5).



MNUD-01-342aEN



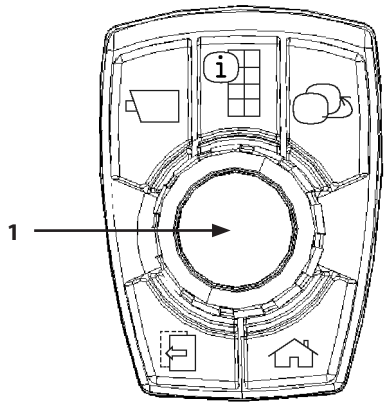
MNUD-05-056aEN

6. Highlight a desired digit and push selector knob (1). (The blank 5th digit is selected as an example.)

7. The 5-digit vertical character bar (9) appears as shown. Rotating selector knob (1) scrolls the character.

   Clockwise (bar (9) scrolls up):
   0 → 1 → 2 ... 8 → 9 → 0 ...

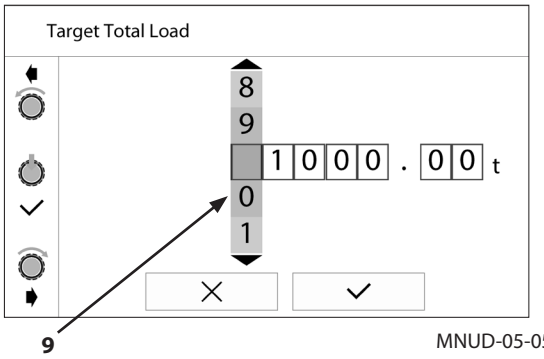
   Counterclockwise (bar (9) scrolls down):
   0 ← 1 ← 2 ... 8 ← 9 ← 0 ...



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8. Stop rotating with a desired number in the middle crossing with the name line. ("2" is selected as an example.)

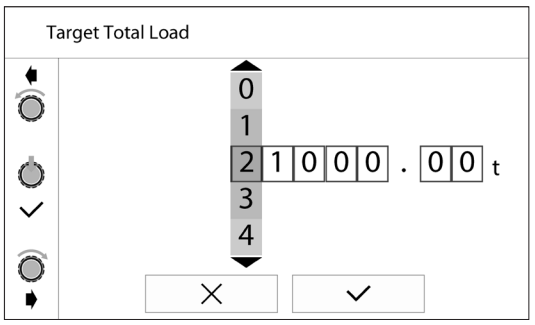
9. Push selector knob (1) to fix the selection. In this example, "1000.00" is changed to "21000.00".



MNUD-05-057aEN

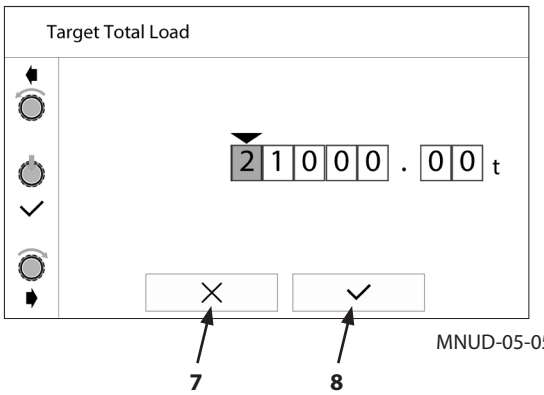
10. Rotate selector knob (1) to select Set button (8).

11. Push selector knob (1) to fix the changed value.



MNUD-05-058aEN

NOTE: Selecting Clear All button (7) makes all digits "0 (zero)" at once.

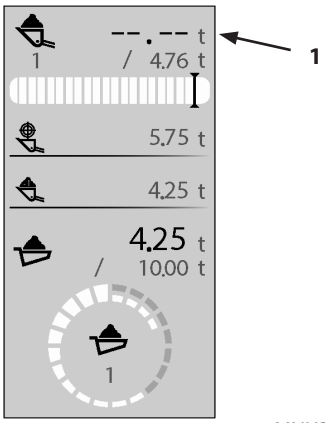


MNUD-05-059aEN

Zero Calibration

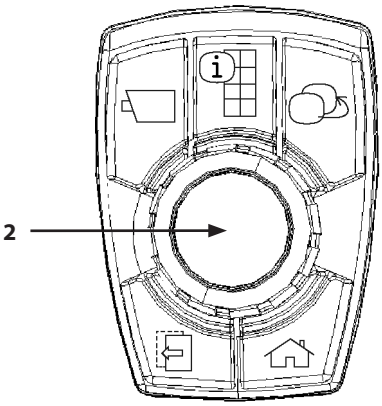
The zero calibration function is for saving the weighed load with the bucket empty (load of 0.00 t).

IMPORTANT: When using this device, the accuracy of the weighed load may drop if the weight of the bucket changes. For that reason, perform zero calibration periodically to keep the weighed load with the bucket empty at zero (0.00).



MNUD-01-321a

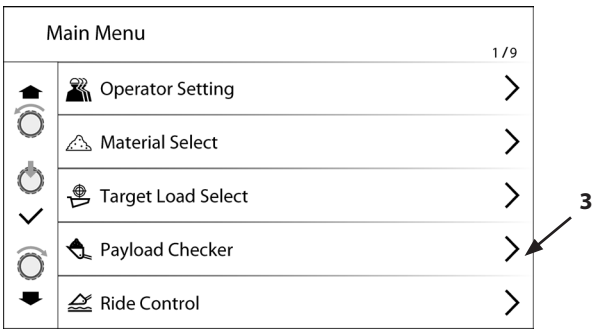
1. Check that the bucket payload value (1) is displayed as a bar (- -.- -t).



MNUD-01-252

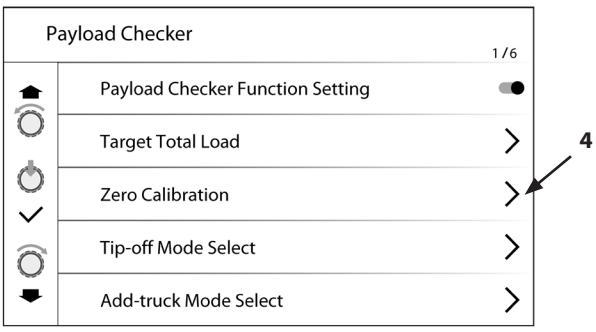
2. Press selector knob (2) to open the Main menu.

3. Rotate selector knob (2) to highlight Payload Checker (3), and push selector knob (2).



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4. Rotate selector knob (2) to highlight Zero Calibration (4), and push selector knob (2).
   Zero Calibration screen is displayed.



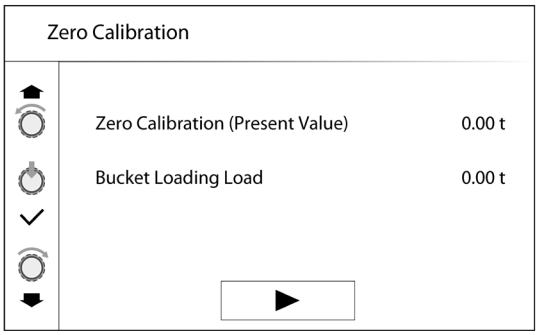
MNUD-01-342aEN

5. Stop the machine on hard level ground. Make sure the hydraulic oil temperature is 30 °C (86 °F) or higher. With the bucket empty, lower the lift arm to the lowest position, and fully tilt the bucket.

6. Raise the lift arm at slow, steady speed, and make sure the engine RPM is stable.

7. The weighed zero calibration is displayed on the monitor.

- If the calibrated load does not exceed the allowed amount:
  Start button (5) appears on the screen.
  Push selector knob (2) to save zero calibration. When "Completed" flashes on the monitor, turn off the key.
- If the calibrated load exceeds the allowed amount:
  The Error button on the monitor flashes, so press the Set button to terminate the calibrated load. The displayed calibrated load is not saved to the machine's controller.

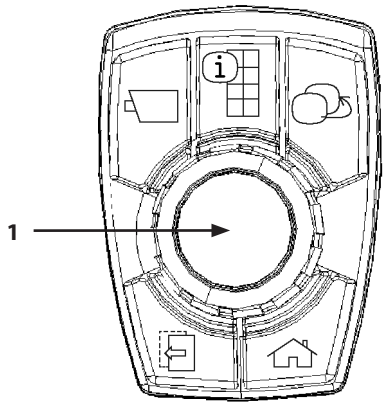


MNUD-01-343EN

Tip-off Mode Select

Selects the mode of the tip-off function.

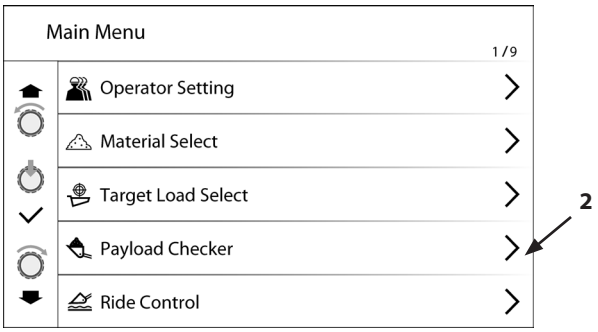
1. Press selector knob (1) to open the Main menu.



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2. Rotate selector knob (1) to highlight Payload Checker (2), and push selector knob (1).

3. Rotate selector knob (1) to highlight Tip-off Mode Select (3), and push selector knob (1).



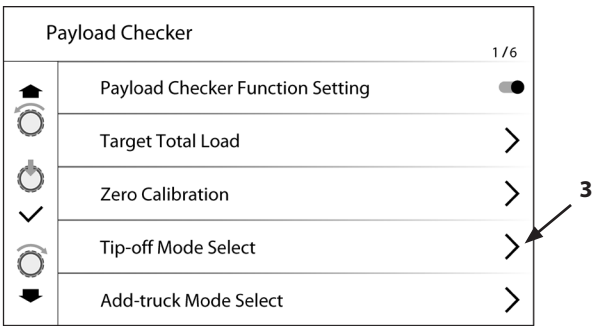
MNUD-01-263aEN

4. Tip-off Mode Select screen is displayed with the following mode selections.

   • Tip-off To Truck
   • Tip-off To Pile
   • Tip-off Disabled

   Refer to page 5-69 "Tip-off Mode" for each mode.

5. Rotate selector knob (1) to highlight a desired mode, and push selector knob (1).

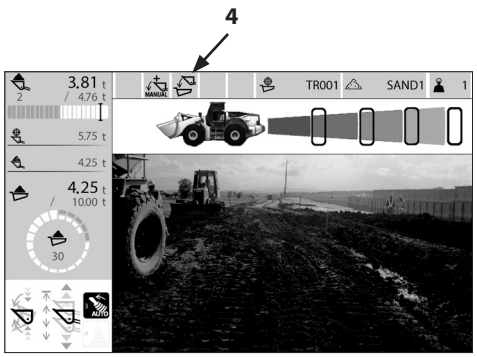


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6. Returns to the basic screen. Make sure tip-off mode icon (4) at the top of the screen corresponds to the selected mode.

IMPORTANT:

- **When tip-off truck or tip-off pile is selected, the lift arm and bucket operation is partially limited.**
- **Tip-off function is effective until the remaining load becomes low to about 1 ton. If the remaining load becomes below 1 ton, the accuracy of the calculated load might be decreased.**



MNVA-01-042

Add-truck Mode Select

Selects the mode of the add-truck function.

1. Press selector knob (1) to open the Main menu.

2. Rotate selector knob (1) to highlight Payload Checker (2), and push selector knob (1).

3. Rotate selector knob (1) to highlight Add-truck Mode Select (3), and push selector knob (1).

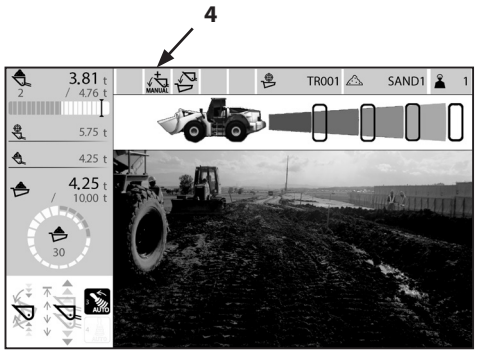
4. Add-truck Mode Select screen is displayed with the following mode selections.

   • Auto-Add
   • Manual-Add

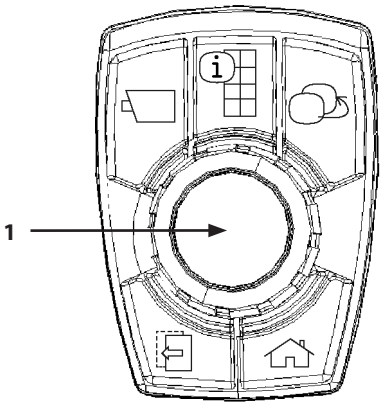
   Refer to page 5-74 "Add Mode" for each mode.

5. Rotate selector knob (1) to highlight a desired mode, and push selector knob (1).

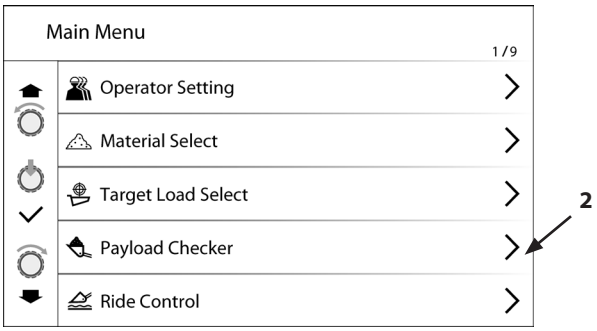
6. Returns to the basic screen. Make sure the add mode icon (4) at the top of the screen corresponds to the selected mode.



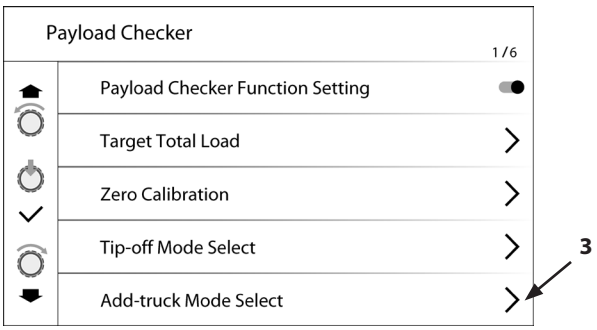
MNVA-01-042



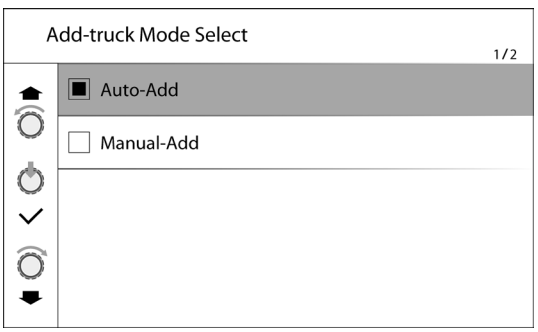
MNUD-01-252



MNUD-01-263aEN



MNUD-01-342aEN



MNUD-01-345EN

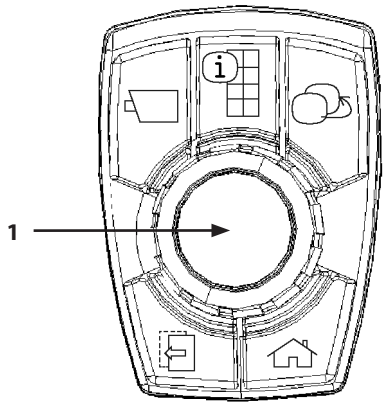
Statistical Data

The daily measurement load data can be displayed by different 5 categories.

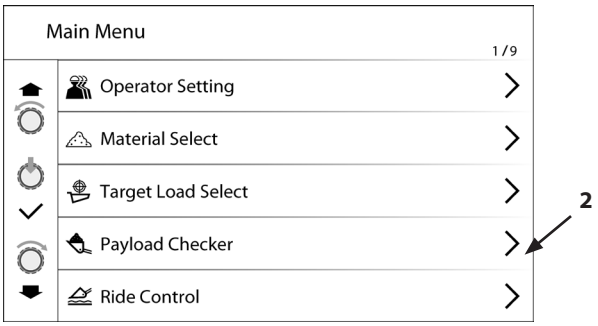
1. Press selector knob (1) to open the Main menu.
2. Rotate selector knob (1) to highlight Payload Checker (2), and push selector knob (1).
3. Rotate selector knob (1) to highlight Statistical Data (3), and push selector knob (1).
4. Statistical Data screen is displayed with the following selections.

   • Statistical Data By Truck
   • Statistical Data By Material
   • Statistical Data By Operator
   • Statistical Data By Target
   • Statistical Data By Loading Order

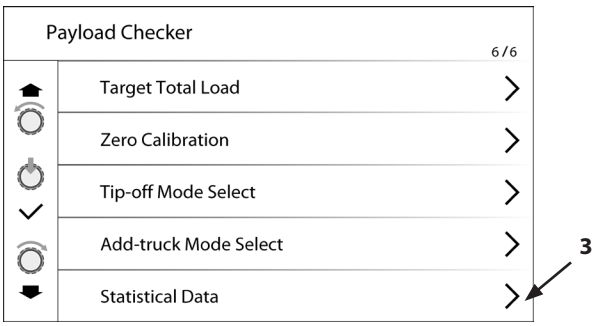
   Refer to the following sections for each data display.



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MNUD-01-346EN

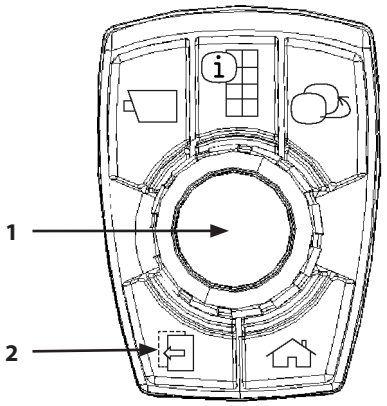
Statistical Data By Truck

The statistical data on loads by truck are listed.

NOTE: Truck number is the number of truck that is counted up in order of confirmation, with the 1st truck as No. 1.

1. From the Statistical Data Select screen, select Statistical Data by Truck and push selector knob (1).
2. A list of payloads by a truck (3) is displayed. Load data for 999 trucks can be saved per day.

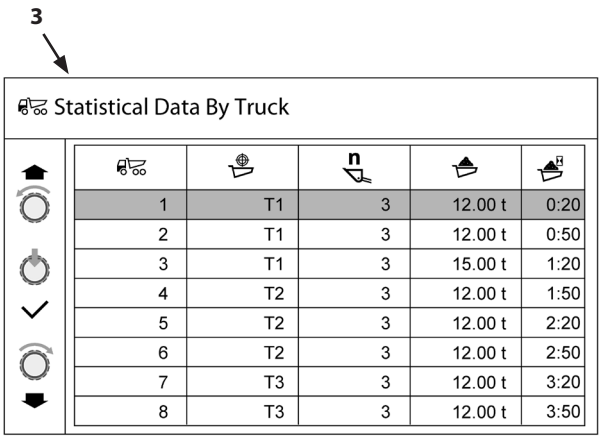
NOTE: When there is no available data due to a communication error, "No Data" is displayed.



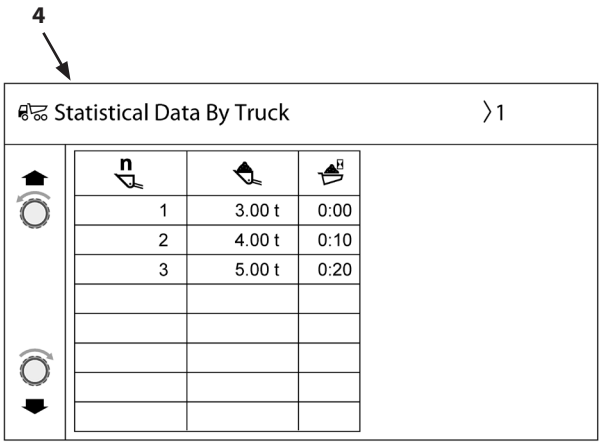
MNUD-01-252

Icon	Item	Description	Range
	Truck No.	Sequential No. of truck	1 - 999
	Target Load Name	Target load name when finished loading	
	Cycle time	Cycle time of truck dumping	1 - 9999
	Payload	Accumulated truck payload when finished loading	0.00 - 99999.99 (t)
	Load Time	Time when finished loading	00:00 - 23:59, - - : - -

3. Rotate selector knob (1) to highlight a desired truck No., and push selector knob (1).
4. The statistical data by loading order screen for the selected truck number (4) is displayed.



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MNUD-05-102EN

Icon	Item	Description	Range
	Cycle time	Cycle time of truck dumping	1 - 9999
	Payload	Accumulated bucket payload when finished loading	0.00 - 99999.99 (t)
	Load Time	Time when finished loading	00:00 - 23:59, - - : - -

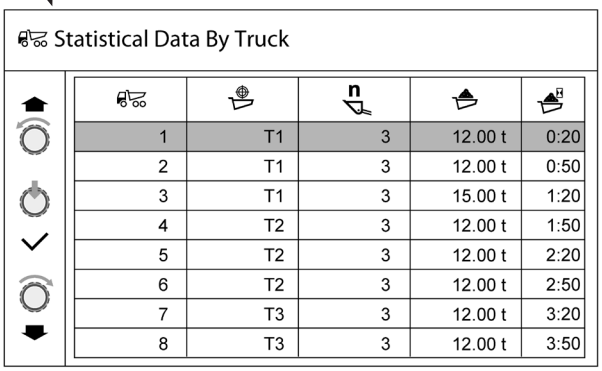
5. Push backward switch (2) to return to the Statistical Data By Truck screen.

Select Function (Jump)

When there are hundreds of data, jump and search list by 100 data is possible.

1. When the truck No. 1 is highlighted on Statistical Data By Truck screen (3), rotate selector knob (1) counterclockwise by one click. Statistical Data By Truck <Select> (5) is displayed.

3



		n		
1	T1	3	12.00 t	0:20
2	T1	3	12.00 t	0:50
3	T1	3	15.00 t	1:20
4	T2	3	12.00 t	1:50
5	T2	3	12.00 t	2:20
6	T2	3	12.00 t	2:50
7	T3	3	12.00 t	3:20
8	T3	3	12.00 t	3:50

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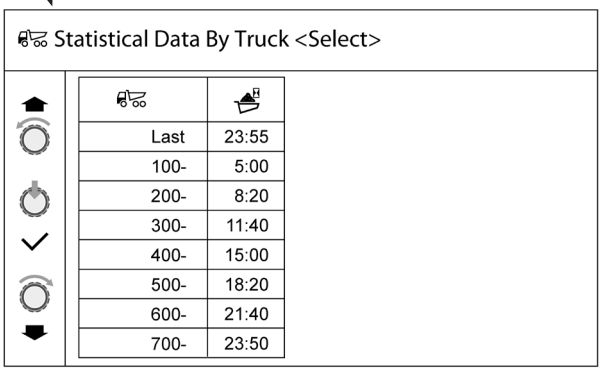
2. Select a desired number and push selector knob (1) to jump to the selected number.

   For example, select "200-" to move the cursor directly to truck No. 200 as shown screen (6).

NOTE:

- *Selecting "Last" will jump to the screen where the latest truck number is shown.*
- *When the truck No. 193 on screen (6) is highlighted, rotating selector knob (1) counterclockwise by one click scrolls the screen by one line and No.192 will appear. This jumping function is not available (screen (5) does not appear).*

5

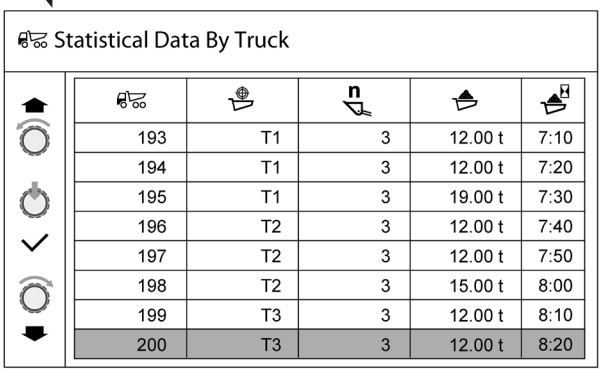


Last	23:55
100-	5:00
200-	8:20
300-	11:40
400-	15:00
500-	18:20
600-	21:40
700-	23:50

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3. Push backward switch (2) to return to the Statistical Data By Truck list screen.

6



		n		
193	T1	3	12.00 t	7:10
194	T1	3	12.00 t	7:20
195	T1	3	19.00 t	7:30
196	T2	3	12.00 t	7:40
197	T2	3	12.00 t	7:50
198	T2	3	15.00 t	8:00
199	T3	3	12.00 t	8:10
200	T3	3	12.00 t	8:20

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Statistical Data By Material

The statistical data on loads by material are listed.

1. From the Statistical Data Select screen, select Statistical Data by Material and push selector knob (1).
2. A list of payloads by material (3) is displayed.

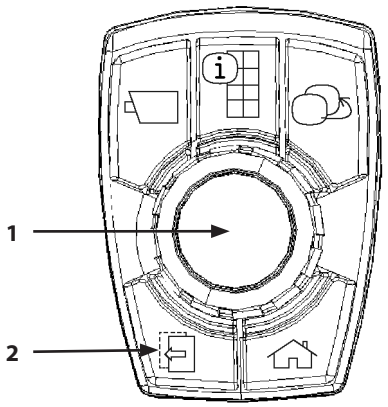
NOTE: When there is no available data due to a communication error, "No Data" is displayed.

Icon	Item	Description	Range
	Material ID	Registered target material name	
n	Number of Truck	Total number of dump truck fixed payload for the target material	1 - 999
n	Cycle time	Total cycle time of truck dumping added for the target material	1 - 9999
	Payload	Accumulated bucket payload added for the target material	0.00 - 99999.99 (t)

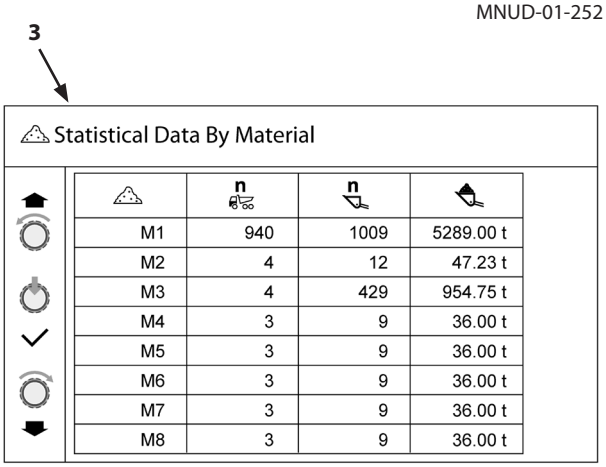
3. Rotate selector knob (1) to highlight a desired material, and push selector knob (1).
4. The statistical data by truck screen for the selected material (4) is displayed.

Icon	Item	Description	Range
	Truck No.	Sequential No. of finished truck	1 - 999
	Target Load Name	Target load name when finished loading	
	Payload	Accumulated bucket payload when finished loading	0.00 - 99999.99 (t)
	Load Time	Time when finished loading	00:00 - 23:59, - - : - -

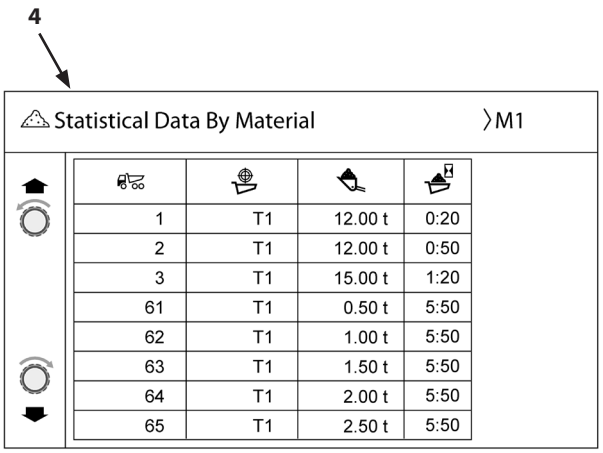
5. Push backward switch (2) to return to the Statistical Data By Material screen.



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MNUD-05-106EN

Statistical Data By Operator

The statistical data on loads by operator are listed.

1. From the Statistical Data Select screen, select Statistical Data by Operator and push selector knob (1).
2. A list of payloads by operator (3) is displayed.

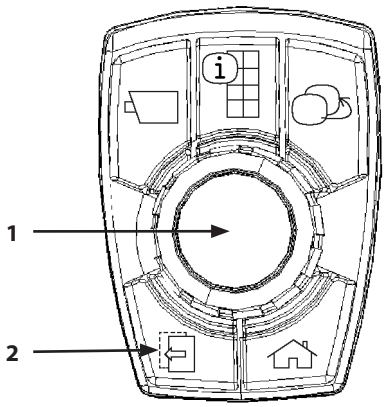
NOTE: When there is no available data due to a communication error, "No Data" is displayed.

Icon	Item	Description	Range
	Operator No.	Selected Operator No.	0 - 10
n	Number of Truck	Total number of dump truck fixed payload for the target operator	1 - 999
n	Cycle time	Total cycle time of truck dumping added for the target operator	1 - 9999
	Payload	Accumulated bucket payload added for the target operator	0.00 - 99999.99 (t)

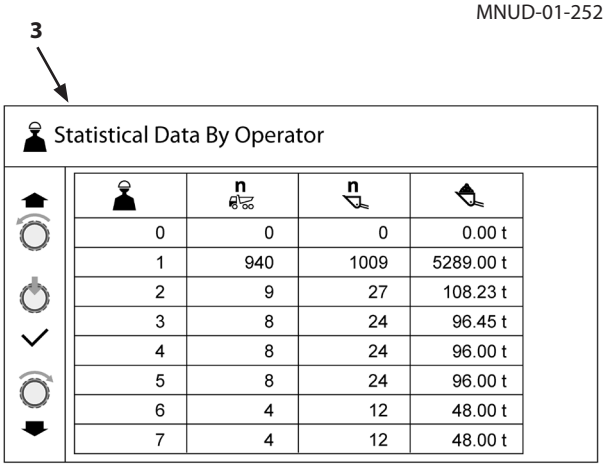
3. Rotate selector knob (1) to highlight a desired operator, and push selector knob (1).
4. The statistical data by truck screen for the selected operator (4) is displayed.

Icon	Item	Description	Range
	Truck No.	Sequential No. of finished truck	1 - 999
	Target Load Name	Target load name when finished loading	
	Payload	Accumulated bucket payload when finished loading	0.00 - 99999.99 (t)
	Load Time	Time when finished loading	00:00 - 23:59, - - : - -

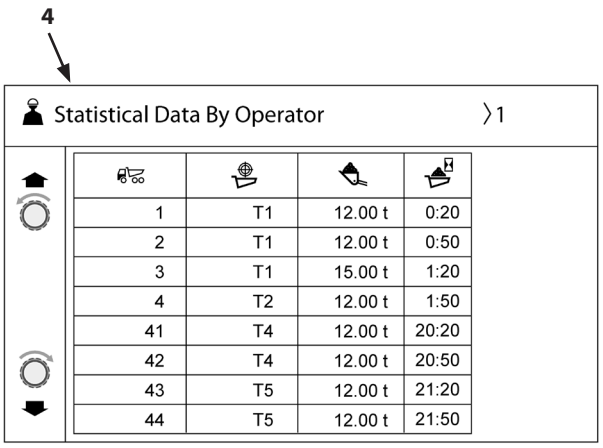
5. Push backward switch (2) to return to the Statistical Data By Operator screen.



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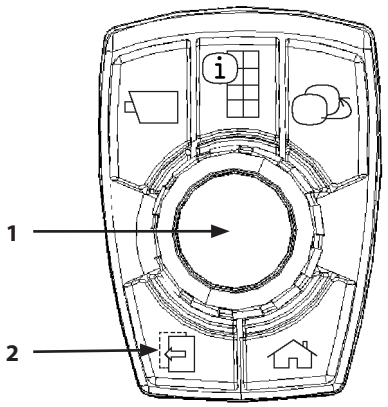
Statistical Data By Target

The statistical data on loads by target load are listed.

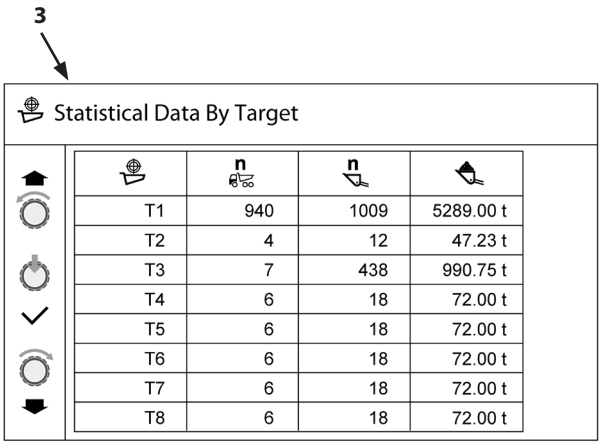
1. From the Statistical Data Select screen, select Statistical Data by Target and push selector knob (1).
2. A list of payloads by target (3) is displayed.

NOTE: When there is no available data due to a communication error, "No Data" is displayed.

Icon	Item	Description	Range
	Target Load Name	Registered target load name	
n	Number of Truck	Total number of dump truck fixed payload for the target load	1 - 999
n	Cycle time	Total cycle time of truck dumping added for the target load	1 - 9999
	Payload	Accumulated bucket payload added for the target load	0.00 - 99999.99 (t)



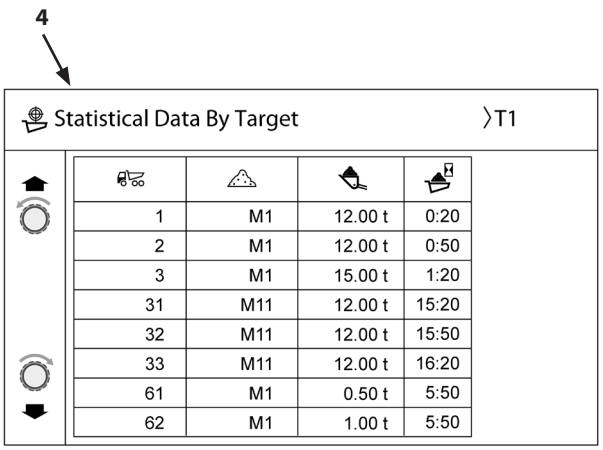
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3. Rotate selector knob (1) to highlight a desired target load, and push selector knob (1).
4. The statistical data by truck screen for the selected target load (4) is displayed.

Icon	Item	Description	Range
	Truck No.	Sequential No. of finished truck	1 - 999
	Material ID	Material name handled when finished loading	
	Payload	Accumulated bucket payload when finished loading	0.00 - 99999.99 (t)
	Load Time	Time when finished loading	00:00 - 23:59, - - : - -



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5. Push backward switch (2) to return to the Statistical Data By Target screen.

Statistical Data By Loading Order

The statistical data on loads by the loading order are listed.

1. From the Statistical Data Select screen, select Statistical Data by Loading Order and push selector knob (1).
2. A list of payloads by loading order (3) is displayed.

NOTE: When there is no available data due to a communication error, "No Data" is displayed.

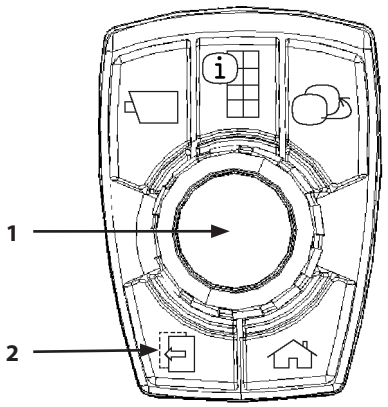
Icon	Item	Description	Range
	Loading No.	Sequential No. of loading in order of stored date	1 - 2600
	Truck No.	Sequential No. of truck	1 - 999
	Material ID	Material name handled when finished loading	
	Payload	Accumulated bucket payload added for the target load	0.00 - 99999.99 (t)
	Load Time	Time when added to truck	00:00 - 23:59, - - : - -

3. Push backward switch (2) to return to the Statistical Data By Loading Order screen.

Select Function (Jump)

When there are hundreds of data, jump and search list by 100 data is possible.

1. When the loading No. 1 is highlighted on Statistical Data By Loading Order screen (3), rotate selector knob (1) counterclockwise by one click. Statistical Data By Loading Order <Select> (4) is displayed.
2. Refer to page 5-64 "Select Function (Jump)" for the function and procedures.



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3

Statistical Data By Loading Order

n				
1	1	M1	3.00 t	0:00
2	1	M1	4.00 t	0:10
3	1	M1	5.00 t	0:20
4	2	M1	3.00 t	0:30
5	2	M1	4.00 t	0:40
6	2	M1	5.00 t	0:50
7	3	M1	5.00 t	1:00
8	3	M1	5.00 t	1:10

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4

Statistical Data By Loading Order <Select>

n	
Last	23:55
100-	3:20
200-	5:00
300-	6:40
400-	8:20
500-	10:00
600-	11:40
700-	13:20

MNUD-05-112EN

Payload Checker Function Mode

Tip-Off Mode

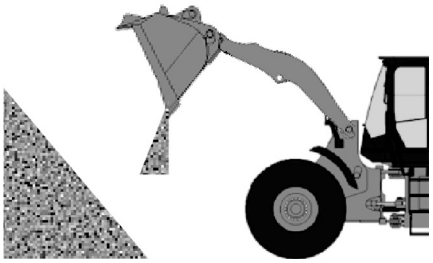
The tip-off mode is a function for adjusting the displayed bucket payload. It is mainly used during final loading of a dump truck to help achieve the target load.

IMPORTANT: There are 2 tip-off mode types, to be selected depending on the intended use. The behavior of the cumulative dump truck load during tip-off changes according to the mode.

"Tip-off To Pile" mode:
Use to gradually return the bucket load to the pile.

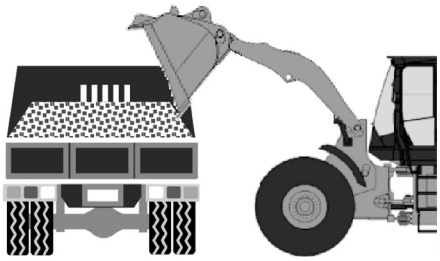
"Tip-off To Truck" mode:
Use to gradually load the bucket load on the truck.

NOTE: The currently selected mode can be checked via the tip-off mode icon at the top of the basic screen. The mode can be switched on the Tip-off Mode Select screen in the sub monitor main menu.



"Tip-off To Pile" Mode

MNUD-05-032



"Tip-off To Truck" Mode

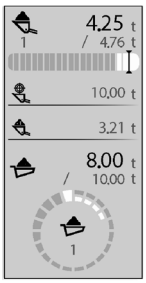
MNUD-05-033

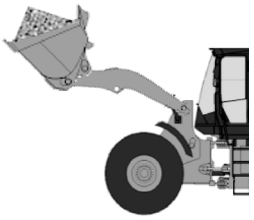
IMPORTANT:

- **The add-truck mode switches to manual mode during the tip-off mode. If the tip-off mode switch is pressed during the auto-add mode, it switches to manual-add mode for that loading operation only.**
- **The bucket payload measured under the tip-off mode is less accurate than the value obtained under normal weighing. As such, use the tip-off mode for loading trucks to adjust the final load. The accuracy under tip-off is relatively accurate if measured with the bucket fully raised (fully tilted).**
- **When tip-off truck or tip-off pile is selected, the stroke end of the lift arm raising and the bucket tilt operation forcibly becomes soft end stop.**

Tip-off To Pile Operation

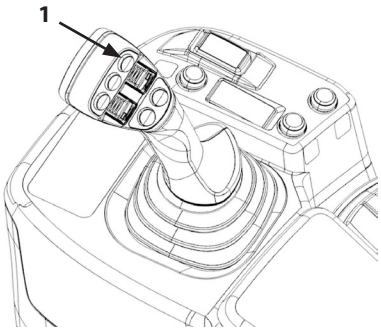
1. Confirm the bucket payload using normal digging operations.



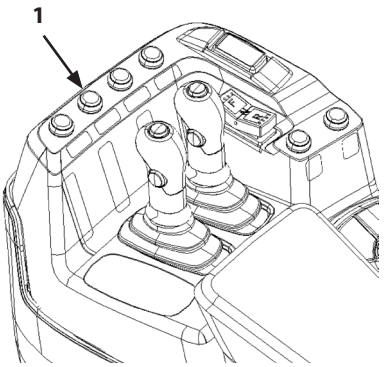


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2. Press the tip-off mode switch (1).



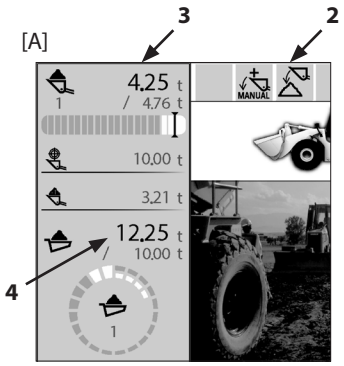
MNUD-05-004



MNFQ-05-002

3. The tip-off mode icon (2) flashes at the top of the basic screen.
   The bucket payload value (3) becomes undetermined (indicated in gray).
   The cumulative dump truck load (4) becomes undetermined (indicated in gray) and the load value with the bucket payload added is displayed.

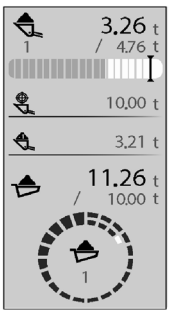
IMPORTANT: The cumulative dump truck load added here is a reference value for adjusting the bucket payload. It is not actually added to truck. To add to a truck, it is necessary to press the Add Load switch (5) in the following step 6.

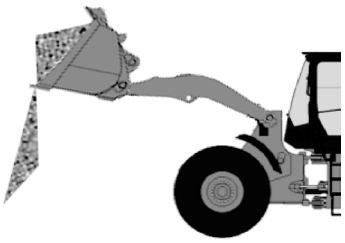


MNUD-05-048a

4. Dump the load in the bucket little by little.
   The values of the bucket payload and cumulative dump truck load change with the amount of the load dumped.

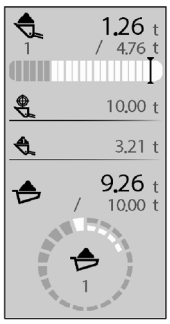
[A]

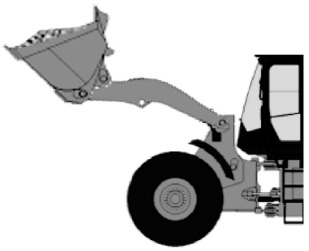




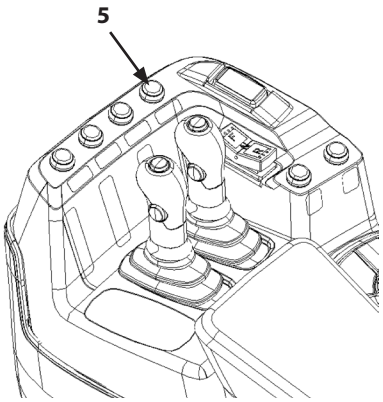
MNUD-05-049a

5. When the target load is reached, fully tilt the bucket up and move the machine to the truck.
6. Raise the lift arm to the height of the truck bed and press the Add Load switch (5).
7. The display of the bucket payload is indicated by a bar (--.--) and the cumulative dump truck load is displayed in white. The tip-off mode icon goes out.
8. Dump the bucket and load the material onto the truck.

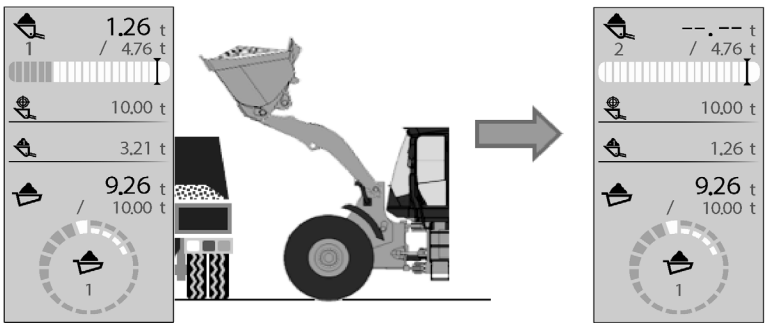




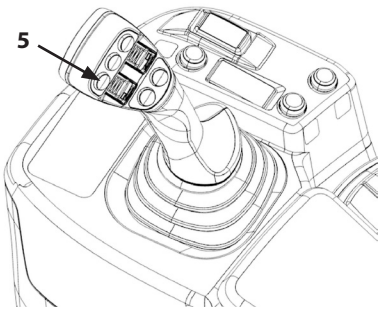
MNUD-05-050a



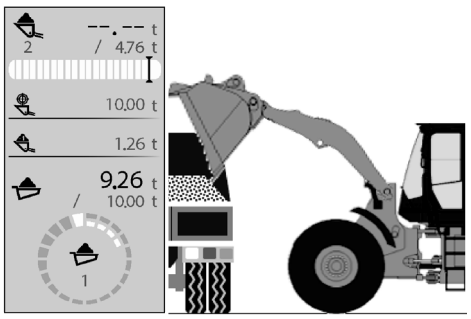
MNFQ-05-002



MNUD-05-036a



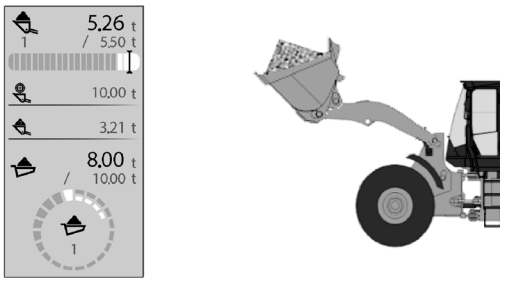
MNUD-05-004



MNUD-05-051a

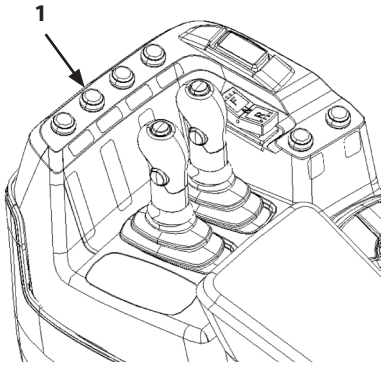
Tip-off To Truck Operation

1. Dig the material and move the machine to the truck.
2. Raise the lift arm to the height of the truck bed and confirm the bucket payload.

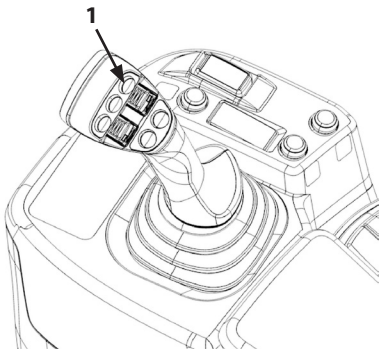


MNUD-05-034a

3. Press the tip-off mode switch (1).

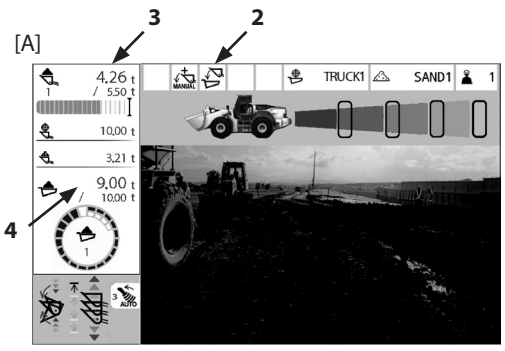


MNFQ-05-002



MNUD-05-004

4. The gauge of the tip-off mode icon (2) lights at the top of the Home screen.
   The bucket payload value (3) and the cumulative dump truck load (4) are not determined (indicated in gray).

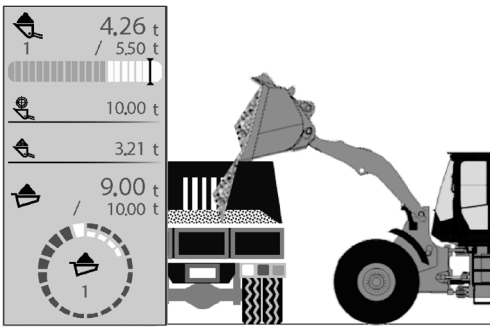


MNVA-01-045

5. Dump the load in the bucket little by little.
   The values of the bucket payload and cumulative dump truck load change with the amount of the load dumped.
6. The cumulative dump truck load is calculated by adding the amount reduced from the bucket payload (difference between when tip-off mode is ON and when dumping) ([A]→[B]).

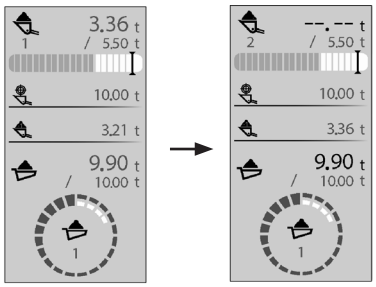
IMPORTANT: The cumulative dump truck load added here is a reference value for adjusting the bucket payload. It is not actually added to truck. To add to a truck, it is necessary to press the Add Load (5) switch in the following step 7.

7. When the target load is reached, fully tilt the bucket and press the Add Load switch (5). The bucket payload value is displayed as a bar (- -.- -) (As shown in image [C]).
8. The cumulative dump truck load becomes a confirmed load (indicated in white). The tip-off mode icon goes out.
9. Move the machine to the pile and dump out material still in the bucket.

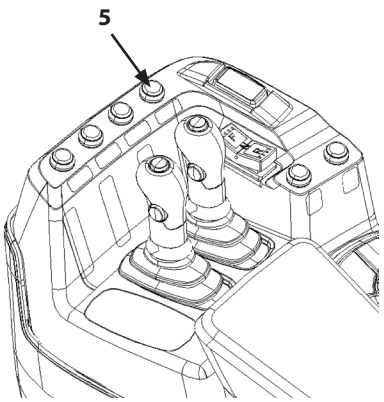


MNUD-05-052a

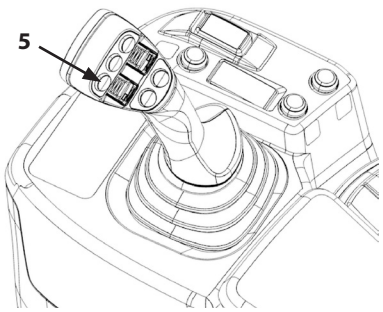
[B] [C]



MNUD-05-038a



MNFQ-05-002



MNUD-05-004

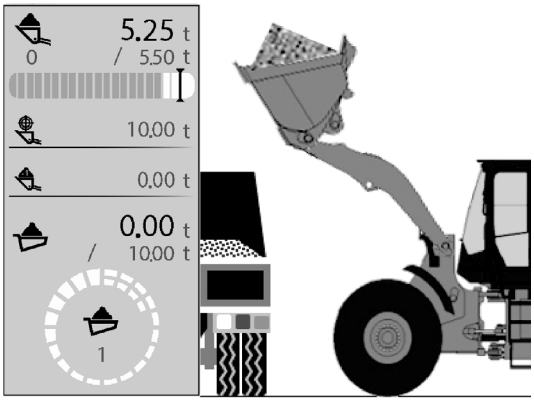
Add Mode

The add mode is a function for adding the measured bucket payload to the cumulative dump truck load.
Either Auto-Add or Manual-Add modes can be selected, depending on the use.

NOTE: The currently selected mode can be checked via the add mode icon at the top of the basic screen. The mode can be switched on the Add-truck Mode Select screen in the sub monitor main menu.

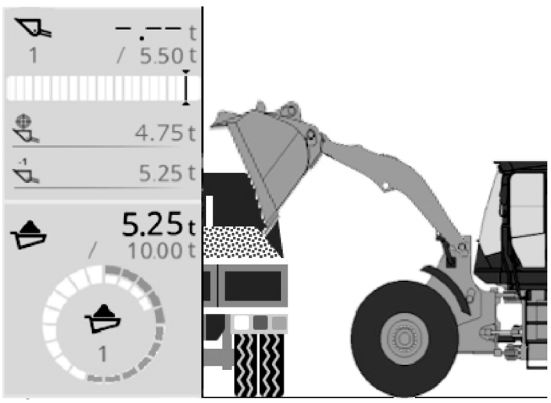
Auto-Add Mode

After measuring the bucket payload, full dumping the bucket automatically adds the measured load to the cumulative total load by detecting the bucket dump status. If used continuously when loading trucks, it eliminates pressing the Add switch, which makes work more efficient.



MNUD-05-039a

Bucket dumping automatically adds the measured load.

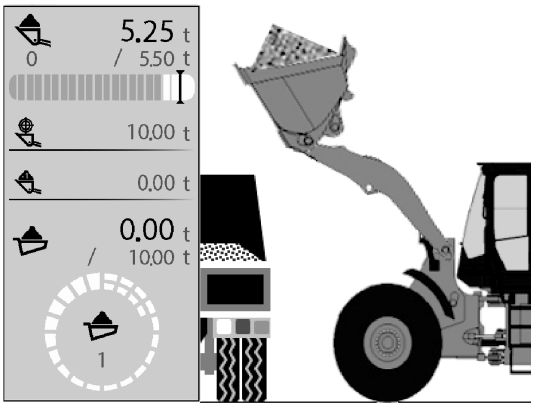


MNUD-05-040

Manual-Add Mode

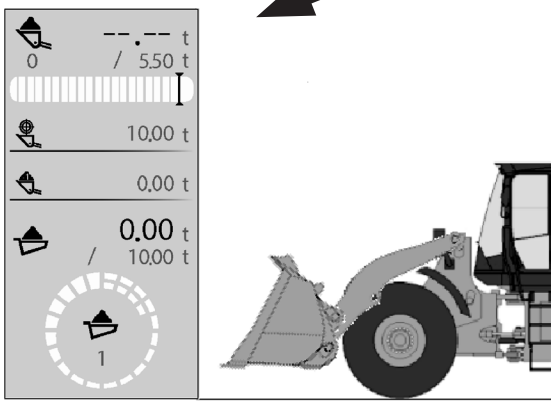
After measuring the bucket payload, it is added to the cumulative total load by pressing the Add switch.
When used for truck loading and leveling performed in parallel, it allows cumulative adding under some conditions, which enables more accurate load management.

NOTE: By lowering the lift arm without pressing the Add switch cancels the measured load.

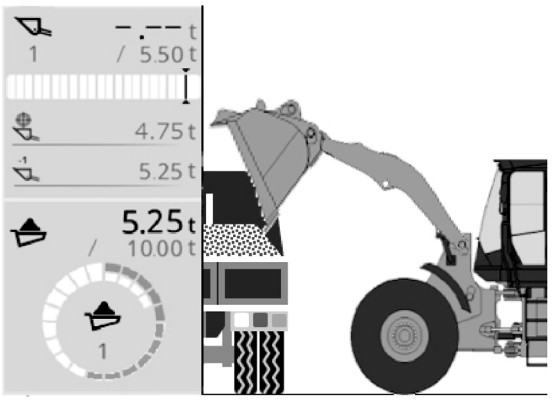


MNUD-05-039a

Pressing Add switch adds the measured load.



MNUD-05-041a

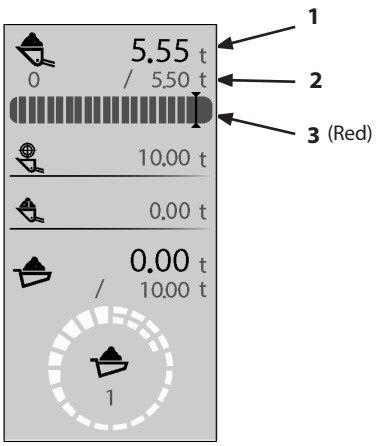


MNUD-05-040

Bucket Overload Warning

CAUTION: Bucket overloads increase the risk of turning over and affects the product life. Avoid the situation using this function.

If the bucket payload (1) exceeds the rated payload (2) the bucket level gauge (3) turns red.
If the load is significantly over the rated capacity, the warning buzzer sounds.



MNUD-05-042a

Dump Truck Overload Warning

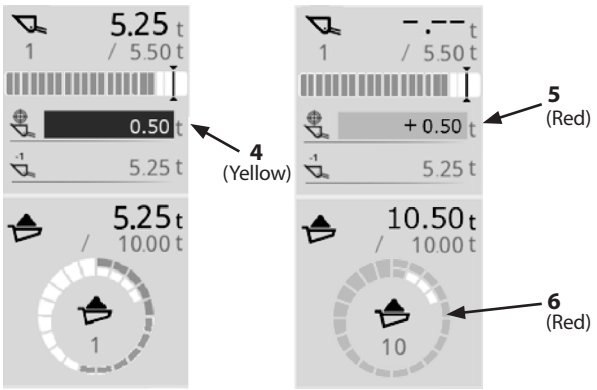
IMPORTANT: Overloaded trucks may be against the regulation. Check your local regulation.

The dump truck overload warning function warns the operator that the cumulative truck load is over the target load.
The operator can set the target load at will and can prevent overloading by setting the truck's maximum load.

The warning notifies the operator of overload before and after loading the truck:

Before loading truck:
The amount to reach overload (e.g. 0.50 t) is displayed with a yellow background (4). Adjust to reduce the load.

After loading truck:
The amount overloaded (e.g. 0.50 t) is displayed with a red background (5). The dump truck level gauge (6) also turns red. Adjust to reduce the load.



MNUD-05-043

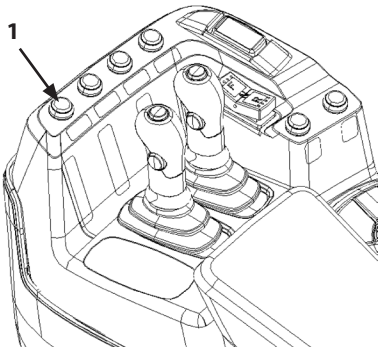
Canceling Payloads

Canceling Bucket Payloads

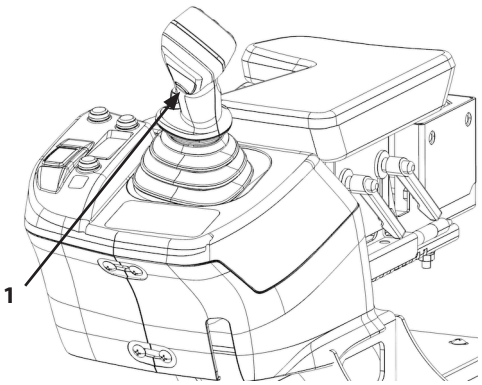
The bucket payload can be reset by pressing Cancel button (1) on the right console.

NOTE: Only the last cumulative dump truck load can be canceled. Use it to cancel trucks that are added accidentally.

Pressing Cancel button (1) while the value of the bucket payload is displayed resets the bucket payload. Use this to reweigh when there is a problem with weighing a load.



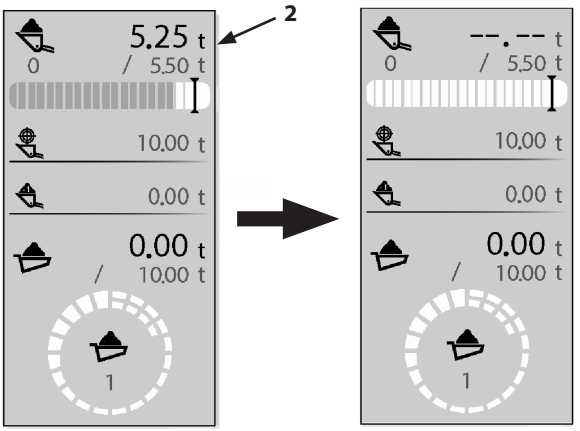
MNFQ-05-002



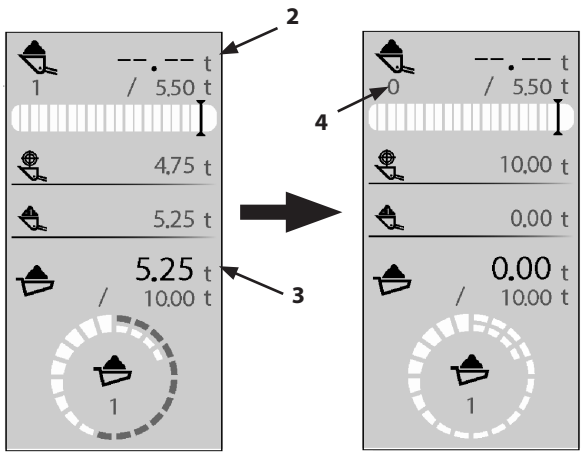
MNUD-01-029

Canceling before Truck Clear

Pressing Cancel button (1) while the values of the bucket payload (2) and the cumulative dump truck load (3) are displayed in white subtracts the last load from the cumulative dump truck load.
In addition, 1 is subtracted from the number of loads (4) when the cumulative dump truck load decreases.



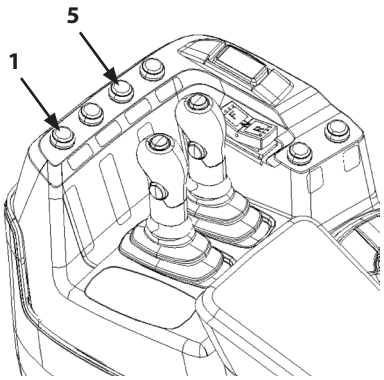
MNUD-05-053a



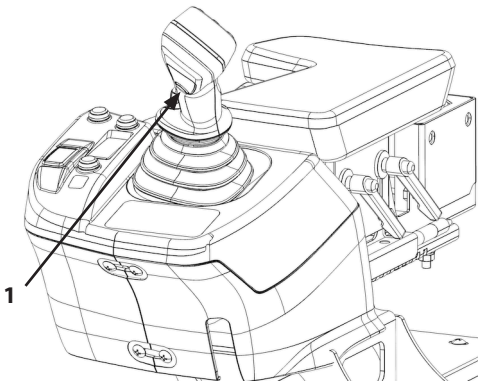
MNUD-05-054a

Canceling after Truck Clear

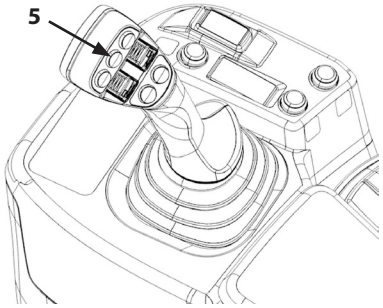
Pressing Cancel button (1) after pressing Truck Clear switch (5) delete the last dump truck load, and returns to the status before starting the last dump truck loading.
In addition, 1 is subtracted from the number of dump truck (6).



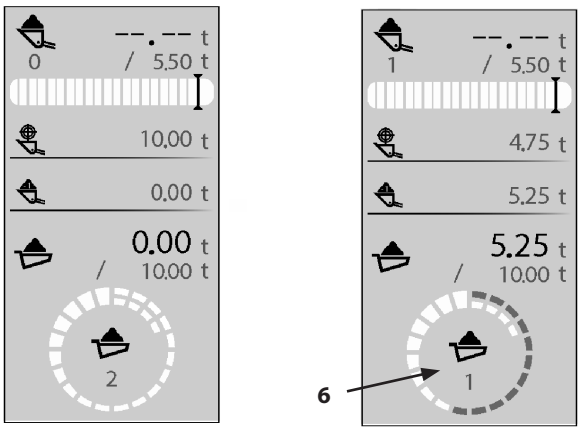
MNFQ-05-002



MNUD-01-029



MNUD-05-004



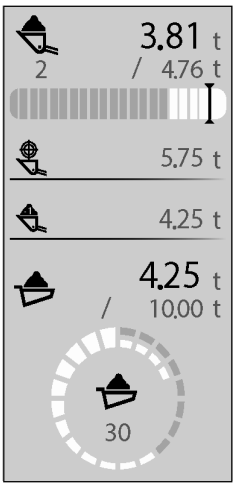
MNUD-05-055a

Progress

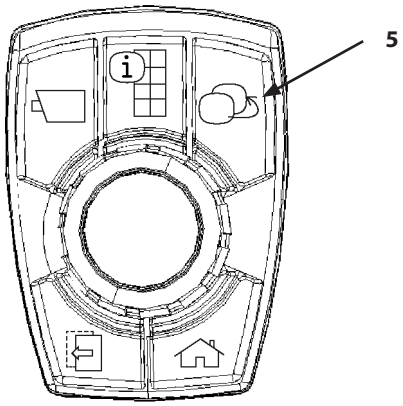
The progress display allows the operator to check the current ratio of total load to the target total load of the day and is used to understand the work progress.

Pressing the Screen Select switch (5) allows progress to be checked by selecting the B mode display.

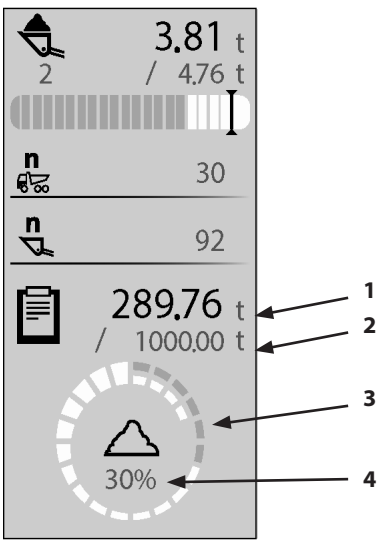
1. Total Load
2. Target Total Load
3. Progress Level Gauge
4. Progress (%)



MNUD-05-061a



MNUD-01-252



MNUD-05-060a

Transporting by Road

When transporting the machine on public roads, be sure to first understand and follow all local regulations.

1. For transporting using a trailer, check the width, height, length and weight of the trailer when the machine is loaded.
2. Investigate conditions on the route to be traveled in advance, such as dimensional limits, weight limits, and traffic regulations.

   In some cases it may be necessary to obtain permission from the local authority concerned, or to disassemble the machine to bring it within local regulation for dimensional or weight limits.

Transporting by Trailer

Provide an appropriate trailer while referring to the weight and dimensions shown in the specifications. When transporting the machine within the weight and dimensions shown in the specifications by a trailer, it is possible to transport the machine without disassembling.

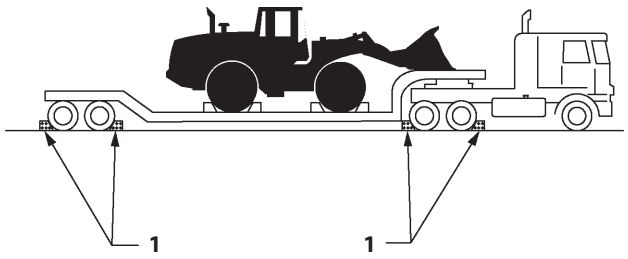
Loading / Unloading on Trailer

WARNING: Be sure to use a loading dock or a ramp for loading/unloading.

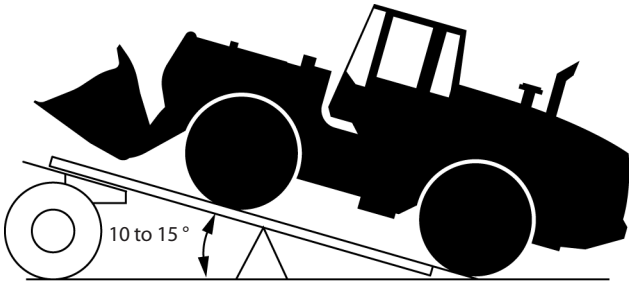
Always load and unload the machine on a firm, level surface.

Ramp/Loading Dock:

1. Before loading, thoroughly clean the ramps, loading dock and flatbed. Dirty ramps, loading docks, and flatbeds with oil, mud, or ice on them are slippery and dangerous.
2. Place blocks (1) against the truck and trailer wheels while using a ramp or loading dock.
3. Ramps must be sufficient in width, length, and strength. Be sure that the incline of the ramp is less than 15°.
4. Loading docks must be sufficient in width and strength to support the machine and have an incline of less than 15 °.



M4GB-06-001



M4GB-06-002

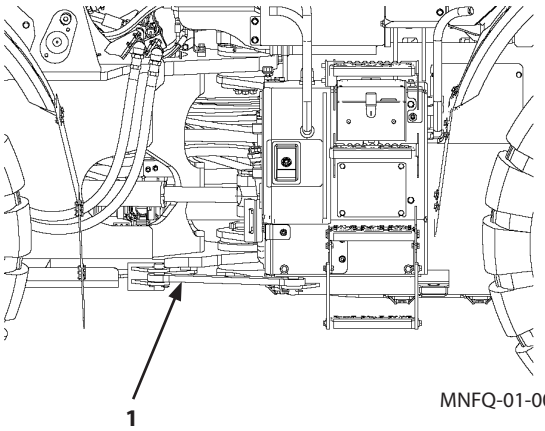
Loading / Unloading on Trailer

WARNING:

- **Never steer while driving up or down a ramp as it is extremely dangerous and may cause the machine to turnover. Never attempt to steer the machine on a ramp. If the travel direction must be changed on a slope, move back the machine to the flat ground. After changing the travel direction, begin to drive again.**
- **Select AUTO 2 for auto-shifting, or select 2nd speed for manual shifting.**

Loading

1. Load the machine so that the centerline of the machine aligns with the centerline of the trailer flatbed.
2. Slowly drive the machine on the ramp.
3. Lower the bucket onto the trailer deck.
4. Stop the engine. Remove the key from the key switch.
5. Operate the control lever several strokes to relieve pressure in the cylinders.
6. Move the control lever lock switch in the LOCK position.
7. Securely close the windows and cab door to protect the cab from rain. Place a cover over the exhaust outlet.
8. Install the articulation lock bar (1) to prevent the machine from articulating.

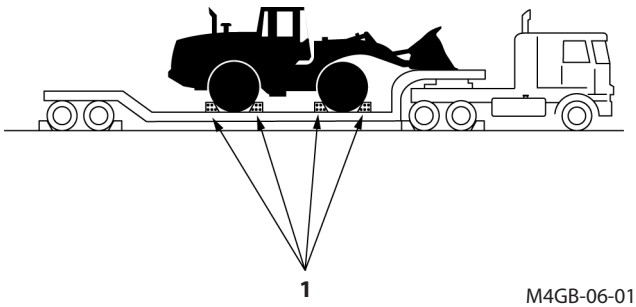


MNFQ-01-007

Fastening Machine for Transporting

WARNING:

- **Fasten the machine frame to the deck securely with chains and cables. While traveling, loads may shake around, move forward or backward or to the sides.**
- **Before tying down the vehicle, inspect the metal tie-down fixtures welded to the vehicle for any problems.**
- **If there is a problem with any metal tie-down fixture, contact Authorized Dealer to have it inspected and/or replaced.**



M4GB-06-012

1. Apply the parking brake. Slowly rest the bucket on the trailer deck or load-carrying platform.
2. Wedge wooden blocks (1) front and rear each tire to fasten the machine in position.
3. Securely fasten the base machine and the front attachment to the load-carrying platform with sufficient wire ropes.

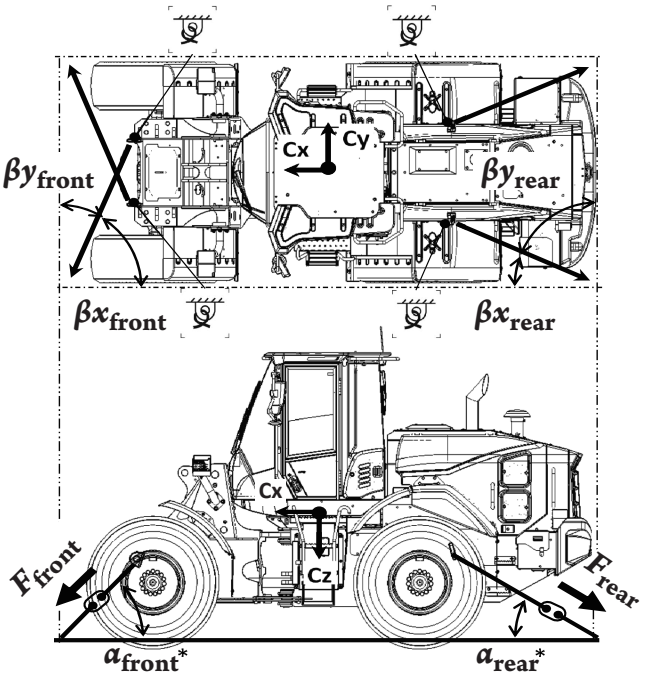
The machines for export are provided with lifting holes. Use these holes for securing the machine.

Tie-down Wire Angle

Model	Tying-down Attachment Point	Angle of Wire rope For tying-down			Distributed Tying-down Force Restraining Force	Lashing Capacity	Machine Mass For Calculation
		α	*βx*	*βy*	*Ffront / Frear*	*LC = 2 × F*	*W*
ZW310-7 (NA)	Front	55°	63°	27°	169 kN (17233 kgf, 37991 lbf)	338 kN (34466 kgf, 75982 lbf)	24.3 t (53582 lb)
	Rear	79°	55°	35°	234 kN (23861 kgf, 52603 lbf)	468 kN (47722 kgf, 105206 lbf)	

NOTE: The restraining force of the tie-down wire complies with (ISO15818:2017).

F_{front} / F_{rear}: Maximum restraining force applied to each tie-down point
α_{front} / α_{rear}: Angle between the tie-down wire and the bed on which the vehicle sits
*This variable is not the projected angle relative to the side view.
βx_{front} / βx_{rear}: Angle between the tie-down wire and the front/rear axes of the vehicle
βy_{front} / βy_{rear}: Angle between the tie-down wire and the left and right axes of the vehicle
Cx: Acceleration coefficient applied forward and toward rear (road transport Cx=0.8)
Cy: Acceleration coefficient applied sideways (road transport Cy=0.5)
Cz: Vertical acceleration coefficient (road transport Cz=1.0)



MNFQ-06-002

Transporting Wheel Loader (Urgent Situation)

The following procedures shall only be applied to cases when urgently moving the wheel loader a short distance is required. When required to transport the wheel loader long distance, use a trailer.

Precautions for Self-Traveling

Avoid driving the wheel loader long distances at high-speed as much as possible as it may overheat the tires, possibly resulting in premature tire damage and/or wear. Keep the following points in mind when transporting the wheel loader by self-traveling.

- Observe the rules and regulations associated to this wheel loader, and travel carefully.
- Recommended tire pressures and traveling speeds may vary depending on the type of tires used and the road conditions. Consult Authorized Dealer.
- Check the tire pressure before self-traveling when the tires are cool.
- After driving the wheel loader for one hour, allow the wheel loader to park for 30 minutes and meanwhile, check the tires and every part of the machine for any abnormality, and also check the oil and coolant levels.
- Keep the bucket empty when traveling.
- Do not drive the machine with the tires containing calcium chloride or dry ballast, which accelerate heating.

Precautions for Towing

WARNING: Never attempt to tow the machine if the brake system is in need of repair. Ask Authorized Dealer to repair the machine. Operate the machine only after repair is completed.

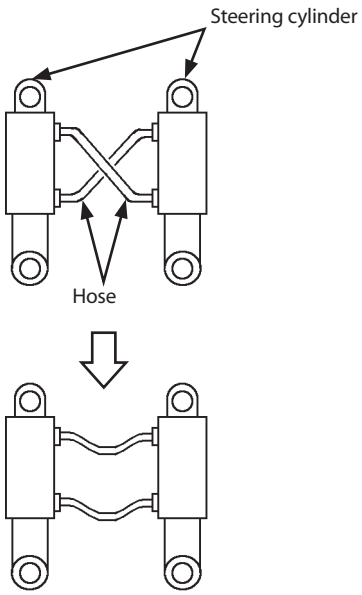
Avoid towing the machine except for recovery for machine. If the machine is to be unavoidably towed, beware of the following points.

IMPORTANT: Do not tow the machine with the parking brake applied. Damage to the parking brake may result.

- If the engine is operable:
  Keep the engine running so that the steering and brake system are operable. Release the parking brake.

- If the engine is inoperable:
  Removing the propeller shaft
  - When the parking brake cannot be released, manually release the parking brake. (Refer to the "Releasing Parking Brake" on page 6-8.) Disconnect the front and rear propeller shafts. At this time, wedge wheel stoppers to all tires to prevent the machine from moving.
  - When the engine is stopped, the machine cannot turn as the steering cylinders become inoperable. Changing the hydraulic hose connections as shown will enable the steering cylinders operation to turn by following the towing machine.

NOTE: Be careful not to spill oil when disconnecting the hoses.



M4GB-06-007

Releasing Parking Brake

WARNING:

- **Once the parking brake is released, the machine becomes impossible to stop with the parking brake system, possibly resulting in personal injury or death.**
- **Before releasing the parking brake be sure to chock tires with wheel stoppers.**

CAUTION:

- **As soon as towing is completed, connect the parking brake.**
- **Towing only when moving the machine to a place where the machine is inspected and/or serviced. Avoid towing to move the machine over a long distance.**

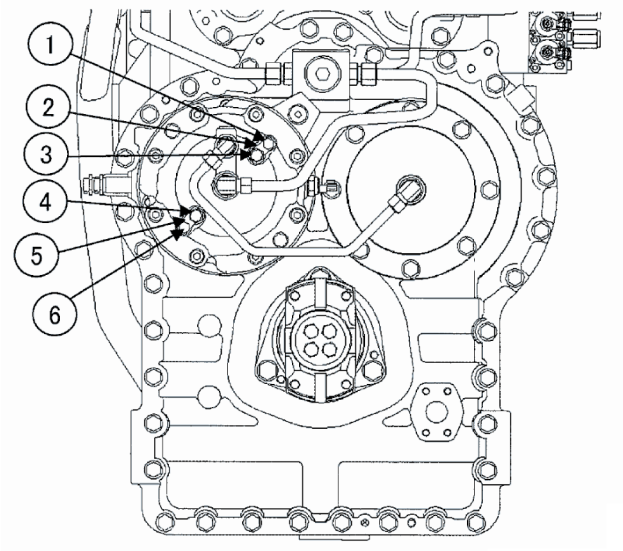
Release the parking brake manually only when the parking brake switch becomes inoperable due to any abnormality or failure in the brake system such as a pump.

Procedures

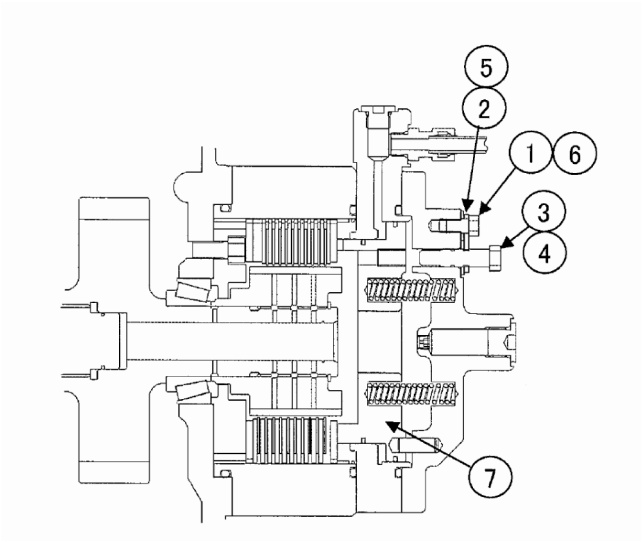
WARNING:

- **Once the parking brake is released, the machine becomes impossible to stop with the parking brake system.**
- **Chock all tires to prevent the machine from moving.**
- **Before restarting to operate the machine, consult Authorized Dealer to have the parking brake adjusted.**

1. Rotate bolts (1, 6) counterclockwise and remove the parking brake cap.
2. Remove lock plates (2, 5) from set bolts (3, 4).
3. Press in bolts (3, 4) until they reach the screwed part of piston (7).
4. Tighten bolts (3)(4) alternatively and evenly until the brake discs become free by removing piston (7) apart from the brake discs.



90Z7-6-8-1JPUS



90Z7-6-8-2JPUS

Towing Method

CAUTION:

- **Use wire rope with a towing strength of at least 150 % of the machine weight.**
- **Towing from the front side of the machine**

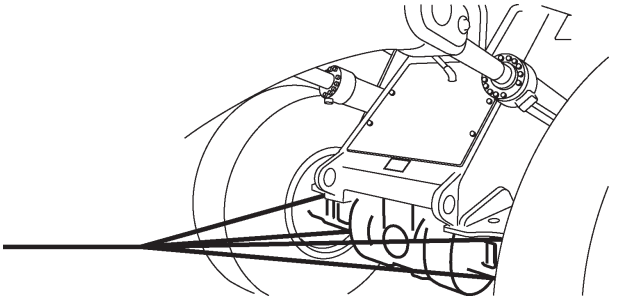
  When using wire ropes, be sure to attach wire ropes to the front axle.

  Always use soft material at the corners between the front axle and wire ropes to prevent damage to wire ropes.
- **Towing from the rear side of the machine**

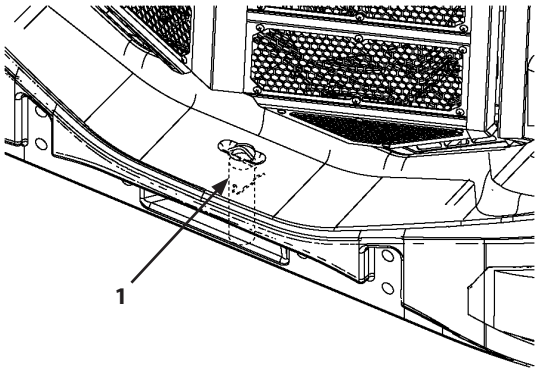
  When using wire ropes, be sure to attach wire ropes to towing pin (1).

  Always use the lock pin after completely inserting towing pin (1) to prevent the wire rope from coming off.

Attach wire ropes to the machine as illustrated when the machine must be unavoidably towed, such cases when the machine can not be evacuated from soft ground by its own driving power.



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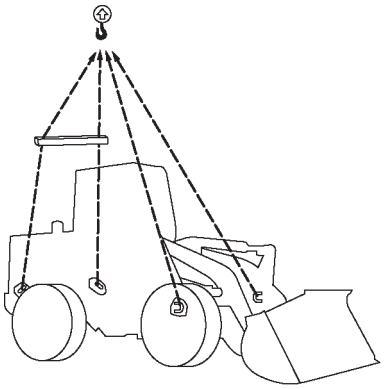


MNFQ-01-015

Lifting Machine

WARNING:

- **Before lifting the vehicle, inspect the metal lifting lugs welded to the vehicle for any problems.**
- **If there is a problem with any metal lifting lug, contact Authorized Dealer to have it inspected and/or replaced.**
- **Use lifting cables and other lifting tools being free from any damage and/or aging, and having sufficient strength.**
- **Consult Authorized Dealer for correct lifting procedures, and size and types of lifting cable and tools.**
- **Before lifting the machine, move the control lever lock switch to the LOCK ( ) position to prevent the machine from moving unexpectedly.**
- **Rigidly secure the front and rear frames using the articulation lock bar so that the machine front and rear frames are not articulated.**
- **Incorrect lifting procedure and/or incorrect wire rope attachment will cause the machine to move (shift) while being lifted, resulting in machine damage and/or personal injury.**
- **Do not lift the machine quickly. Excessive load will be applied to the lifting wire ropes and/or lifting tools, possibly causing them to break.**
- **Do not allow anyone to come close to or under the lifted machine.**
- **If full covered rear fenders is installed, remove the full covered rear fenders before lifting the vehicle.**



MNEC-05-001

Lifting

1. Straighten the machine and position the front attachment horizontally as illustrated to the right.
2. Move the control lever lock switch in the LOCK position.
3. Rigidly secure the front and rear frames using the articulation lock bar.
4. Stop the engine. Remove the key from the key switch.
5. Close all the doors and covers, and lock them.
6. Use wire ropes and a support bar that is long enough so that they do not come in contact with the machine body when the machine is lifted.

   Wrap some protectors around wire ropes and/or support bar as required to prevent the machine from being damaged. Be sure to use the specified lifting tools.

   Refer to the next page for further information.
7. Set a crane in an appropriate position.
8. Attach the wire ropes to the lifting tools at the front and rear frames.

Length and Load of Wire Rope/Support bar

This chart is not a guarantee of safety when lifting the machine.
Please use as a reference material when lifting the machine.

The angle between the vertical line and the wire rope

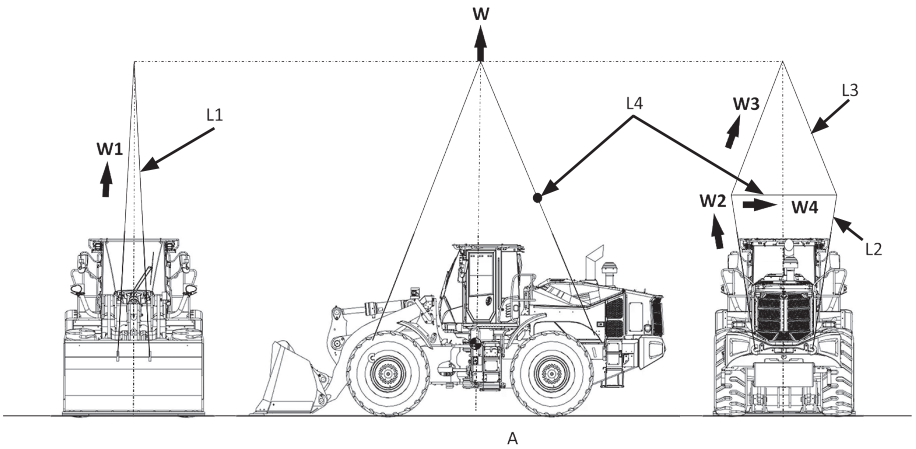
Machine Mass For Calculation W=24.3 t (53582 lb)

	The Angle Between The Vertical Line And The Wire Rope		Length Of The Attachment Point Of The Lifting Accessory		Distributed Lifting Force		Working Load Limit Safety factor: S=6	
Wire Rope 1	θ1	20.0°	L1	6530 mm (21.4 ft)	W1	6.5 t (14333 lb)	WLL1	39 t (85995 lb)
Wire Rope 2	θ2	28.5°	L2	2620 mm (8.6 ft)	W2	6.9 t (15215 lb)	WLL2	41 t (90405 lb)
Wire Rope 3	θ3	29.4°	L3	4260 mm (14.0 ft)	W3	7.0 t (15435 lb)	WLL3	42 t (92610 lb)
Lifting Beam	-	-	L4	2700 mm (8.9 ft)	W4	8.4 t (18522 lb)	WLL4	51 t (112455 lb)

NOTE: The above values are calculated based on the mass of the machine during operation.

For inquiries regarding non-above specification machines, contact Authorized Dealer.

Please use a wire rope and a support bar strong enough for the above load when lifting the machine.



A: Center of Gravity
L1: Wire Rope 1
L2: Wire Rope 2
L3: Wire Rope 3
L4: Lifting Beam

MNFQ-07-079

NOTE: The center of gravity position varies, depending on the specification.

Correct Maintenance and Inspection Procedures

Learn how to service your machine correctly. Follow the correct maintenance and inspection procedures shown in this manual.



SA-005

Inspect machine daily before starting.

- Check controls and instruments.
- Check coolant, fuel and oil levels.
- Check for leaks, kinked, frayed or damaged hoses and lines.
- Walk around machine checking general appearance, noise, heat, etc.
- Check for loose or missing parts.

If there is any problem with your machine, repair it before operating or contact Authorized Dealer.

IMPORTANT:

- **Use only recommended coolant, DEF, fuel and lubricants.**
- **Be sure to use fuel, lubricants, filter and parts, suitable to the machine with adequate quality. Failure to do so may result in serious injury or death, machine breakdown or failure and/or loss of Hitachi Construction Machinery Warranty Policy. Hitachi Construction Machinery genuine parts are specially designed and tested to provide adequate performance for the machine, hence we highly recommend to use the genuine parts.**
- **Never adjust engine governor or hydraulic system relief valve.**
- **Protect electrical parts from water and steam.**
- **Never spray high pressure water or steam to the transmission oil filler port and vicinity of the axle air breather.**
- **Never disassemble electrical components such as main controller, sensors, etc.**
- **Never adjust parts of engine fuel system or hydraulic equipment.**
- **Using bad quality fuel, drainage agent, fuel additives, gasoline, kerosene or alcohol refueled or mixed with specified fuel may deteriorate performance of fuel filters and cause sliding problem at lubricated contacts in the injector. It also affects the engine and aftertreatment device parts, leading to malfunction.**

- Body Information Controller
  This machine provides a body information controller that stores machine operation information for preventive maintenance.
  When maintaining the machine, our authorized service man may down load the stored information.
  Consult with Authorized Dealer for detailed function of this device.
- Communication Terminal Operation
  It is not necessary to check or operate the communication terminal however if any abnormality is found, consult Authorized Dealer.
  Before installing any covering attachment such as a head guard, consult Authorized Dealer.
  Never spray water on the communication terminal and the wirings.
- Inquire to your local environmental or recycling center or Authorized Dealer, for the proper way to recycle or dispose of oil, fuel, coolant, filters, batteries, DEF and other waste.

Check the Hour Meter Regularly

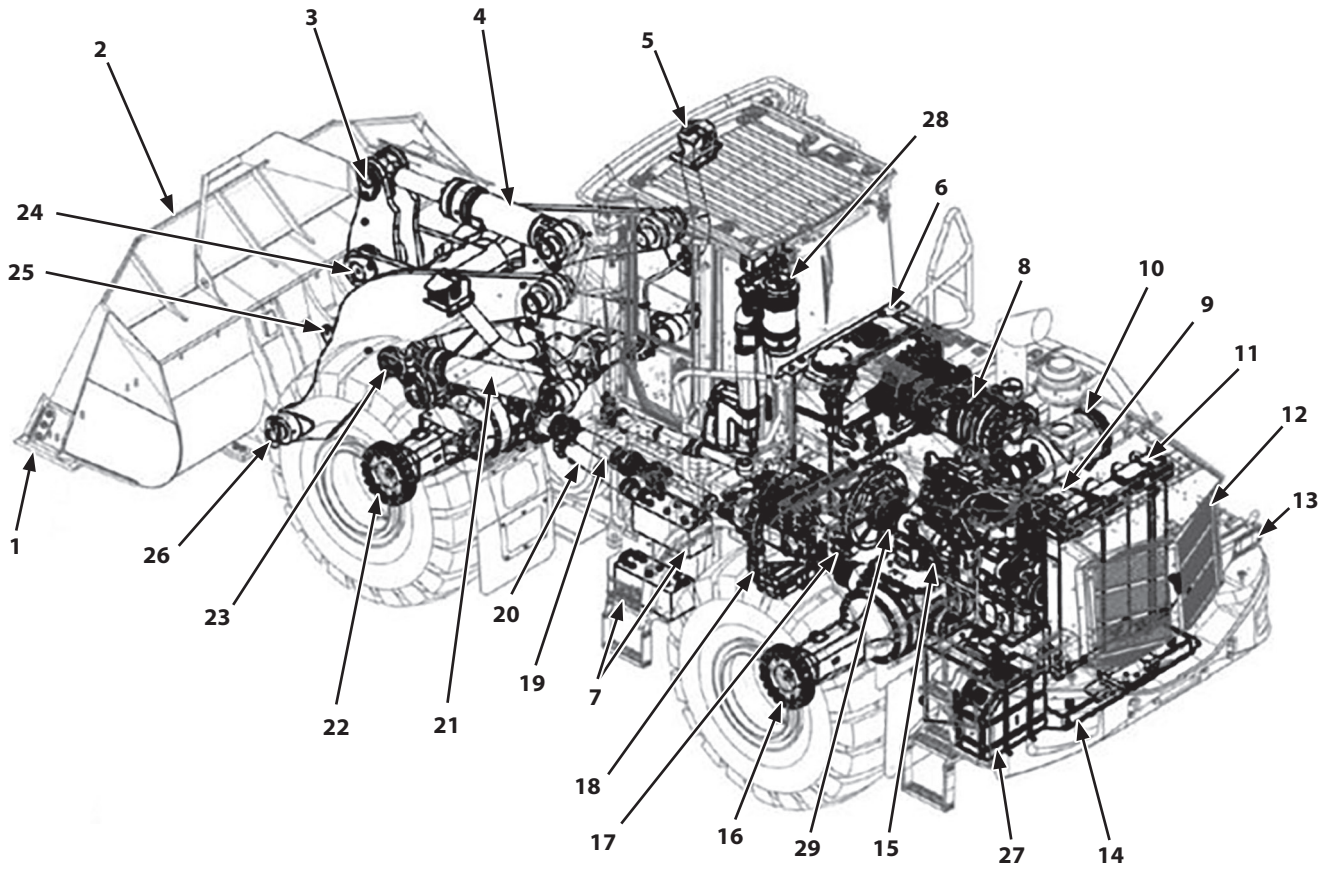
Refer to the List of Check and Maintenance for information about lubricants, check and adjustment intervals. The maintenance guide table is affixed in the back of the tool box cover. Refer to page 7-6.

This manual recommends grouping the intervals into three categories as follows:

Daily Check : To be conducted daily before operation
Monthly Check : To be regularly conducted once per month
Annual Check : To be regularly conducted once per year

Check and maintenance intervals shown in this manual are those for the machines to be operated under normal conditions. If the machine is operated under more severe conditions, shorten the intervals.

Layout



MNFQ-07-072

1. Bolt on Cutting Edge
2. Bucket
3. Bucket Cylinder Pin
4. Bucket Cylinder
5. Front Combination Lamp
6. Hydraulic Oil Tank
7. Batteries
8. Aftertreatment Device
9. Expansion Tank
10. Air Cleaner
11. Radiator, Oil Cooler, and Other Cooling System
12. Work Light
13. Rear Combination Lamp
14. Fuel Tank
15. Engine
16. Rear Axle
17. Rear Propeller Shaft
18. Transmission
19. Center Propeller Shaft
20. Steering Cylinder
21. Lift Arm Cylinder
22. Front Axle
23. Lift Arm Cylinder Pin
24. Bell Crank Pin
25. Bucket Link Pin
26. Bucket Pin
27. DEF Tank
28. Cab Precleaner (Optional)
29. Main Propeller Shaft

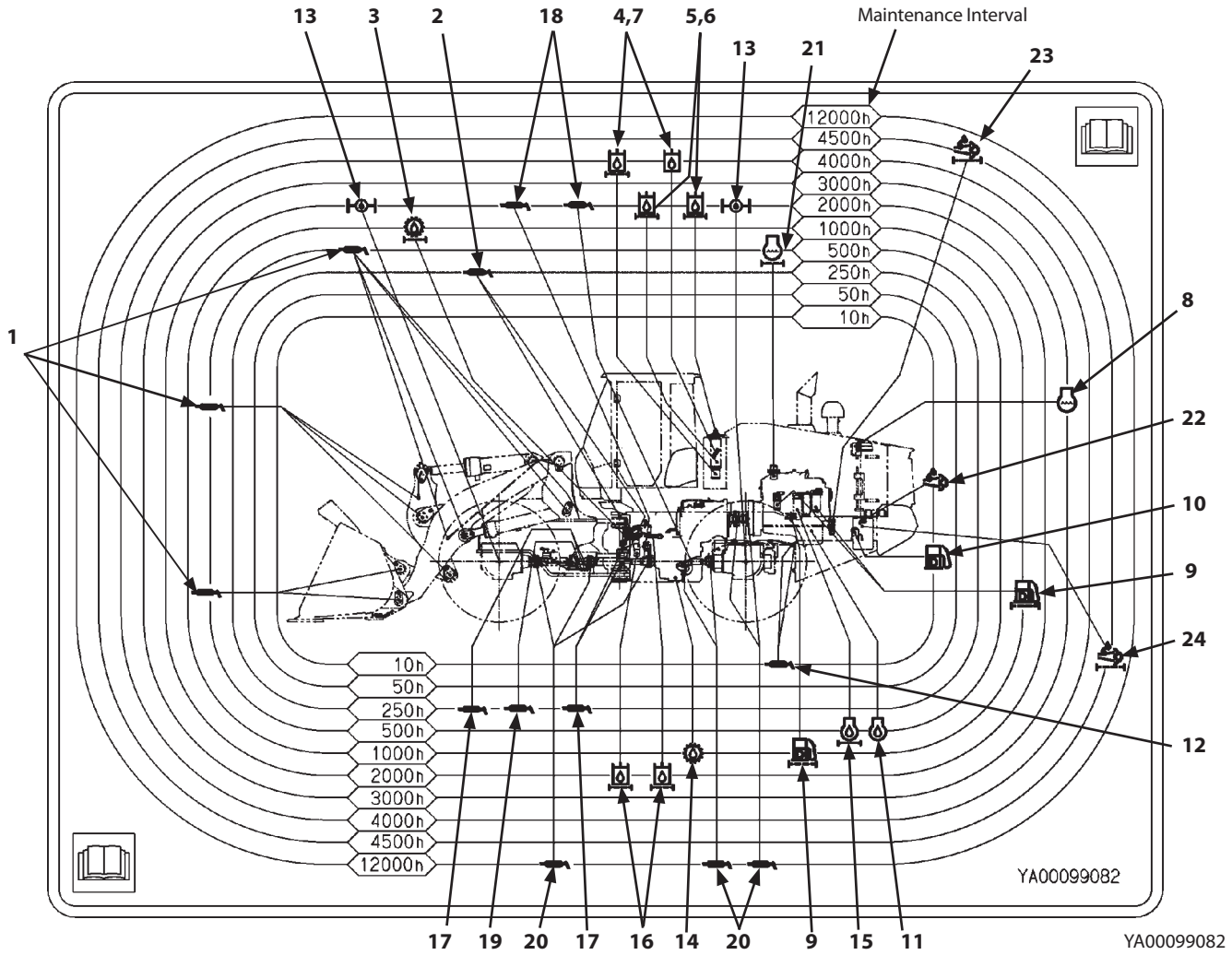
Maintenance Guide Table

The maintenance guide table is affixed to the reverse side of the tool box cover. Lubricate and/or service the parts at the intervals as instructed in the table so that all necessary maintenance can be performed regularly.

- Symbol Marks
  The following marks are used in the maintenance guide table.

	Grease (Front Joint Pin, Cylinder Pin, Propeller Shaft)		Hydraulic Oil
	Engine Oil		Hydraulic Oil Filters (Pilot Filter, Hydraulic Oil Tank Filter, Suction Filter, Air Breather Element)
	Engine Oil Filter		Gear Oil (Final Drive, Differential Gear)
	Coolant (Long-Life Coolant)		Fuel
	Transmission Oil (Transmission, Torque Converter)		Fuel Filter (Fuel Main Filter, Pre-Filter)
	Transmission Oil Filter		DEF Supply Module Filter Kit DEF Tank Water Supply Inlet Filter

- Maintenance Guide Table



	Item	Page		Item	Page
1	Grease (Front Joint Pin)	7-26	13	Axle Gear Oil (Final drive, Differential gear)	7-41
2	Grease (Frame Hinge Pin)	7-28	14	Transmission Oil	7-38
3	Transmission Oil Filter	7-38	15	Engine Oil Filter	7-34
4	Hydraulic Oil Filter (Suction)	7-50	16	Hydraulic Oil Filter (Pilot)	7-51
5	Hydraulic Oil Full-Flow Filter (Main)	7-55	17	Grease (Steering Cylinder Pin)	7-27
6	Hydraulic Tank Air Breather Element	7-56	18	Grease (Propeller Shaft Spline)	7-29, 30
7	Hydraulic Oil	7-48	19	Grease (Propeller Shaft Center Support)	7-29
8	Coolant (Long-Life Coolant)	7-79	20	Grease (Propeller Shaft Universal)	7-28, 29, 30
9	Fuel Main Filter	7-68	21	Coolant Filter (WF2072)	7-80
	Fuel Pre-Filter	7-69	22	DEF	7-114
10	Fuel (Diesel Fuel)	7-64	23	DEF Supply Module Filter Kit	7-116
11	Engine Oil	7-32			
12	Grease (Axle Support pin)	7-28	24	DEF Tank Inlet Filter	7-118

Preparations for Inspection and Maintenance

WARNING: If ride control switch (4) on the panel switch is in the AUTO position, the lift arm may unexpectedly rise. To avoid an accident due to unexpected movement of the lift arm, always turn ride control switch (4) OFF before beginning the inspection and/or maintenance of the machine.

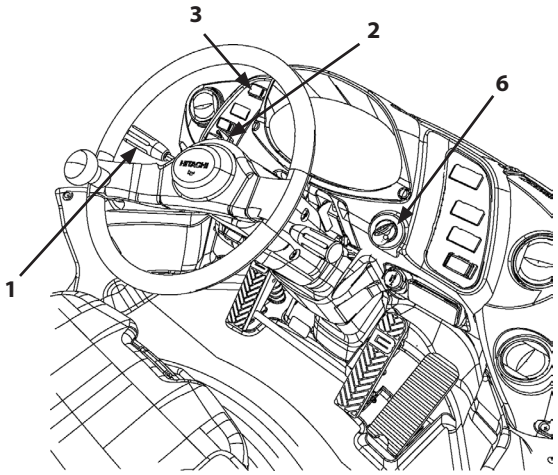
CAUTION: If the machine moves unexpectedly, a serious accident may result. Be sure to apply the parking brake when parking the machine.



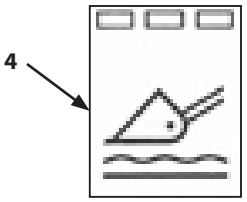
SA-456

Unless specified otherwise, park the machine by following the procedures below before beginning the inspection and/or maintenance work.

1. Park the machine on a solid level surface.
2. Lower the working tools such as the bucket to the ground.
3. Check ride control switch (4) on the panel switch is "OFF". The LEDs of the switch are all turned off when the switch setting is "OFF". If not, press ride control switch (4).
4. Place forward/reverse lever (1) to neutral and place neutral lever lock (2) to the lock (🔒) position.
5. Apply the parking brake (Turn parking brake switch (3) ON.)
6. Wedge the tires.

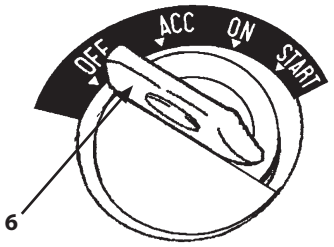


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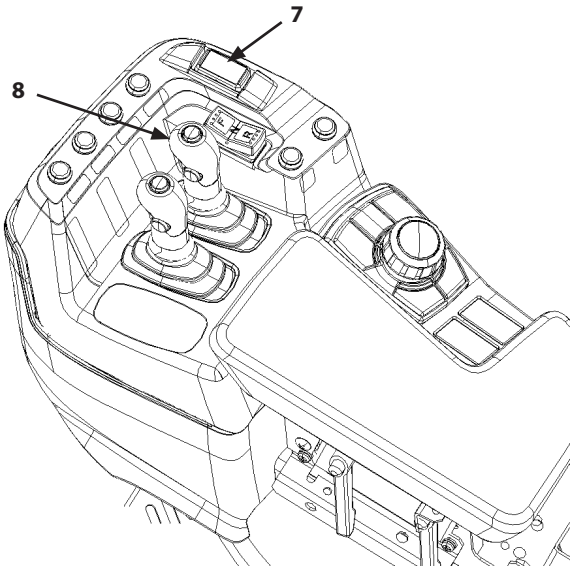


MNUD-01-214

7. Run the engine at low idle speed for 5 minutes to cool the engine. Turn key switch (6) OFF to stop the engine. Again, turn key switch (6) ON and place control lever lock switch (7) to the unlock (🔓) position.
   Fully operate the lift arm control lever (8) 3 to 4 strokes to release residual pressure in the hydraulic system. If inspection and/or maintenance must be performed with the engine kept running, use a signal person.
8. Be sure to place control lever lock switch (7) to the lock (🔒) position.
9. Turn key switch (6) OFF and remove the key.
10. Start working only after putting an "UNDER INSPECTION/ MAINTENANCE" tag in a highly visible place such as on the cab door or the control lever.



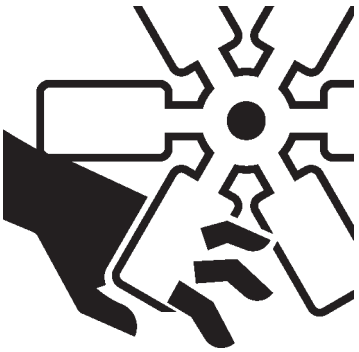
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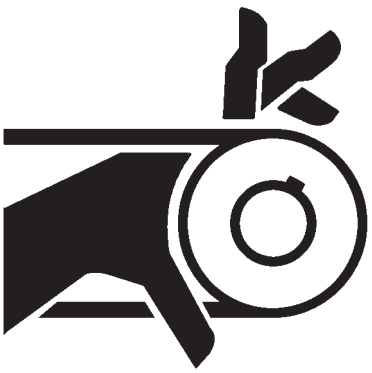
MNFQ-01-047

⚠ WARNING: Never attempt to maintain the machine when the engine is running in order to prevent an accident. If the engine must be run while working, do the following.

- **One person should take the operator's seat to be ready to stop the engine any time while communicating with other workers.**
- **When working around moving parts is unavoidable, pay special attention to ensure that hands, feet, and clothing do not become entangled.**
- **If parts or tools are dropped or inserted into the fan or the belt, they may fly off or be cut off. Do not drop or insert parts and tools into the moving parts.**
- **Move control lever lock switch (7) to the lock (🔒) position so that the front attachment will not move.**
- **Never touch the control levers and pedals. If operating the control levers or pedals is unavoidable, signal co-workers to move to a safe place.**



SA-2294

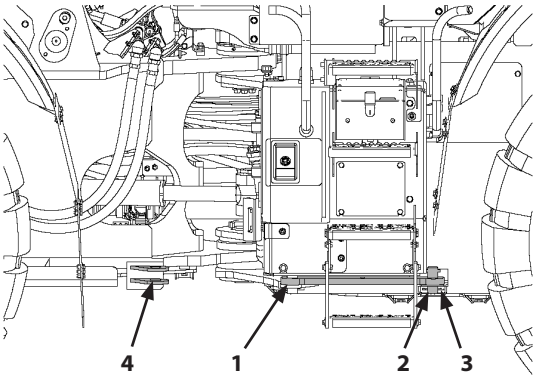


SA-026

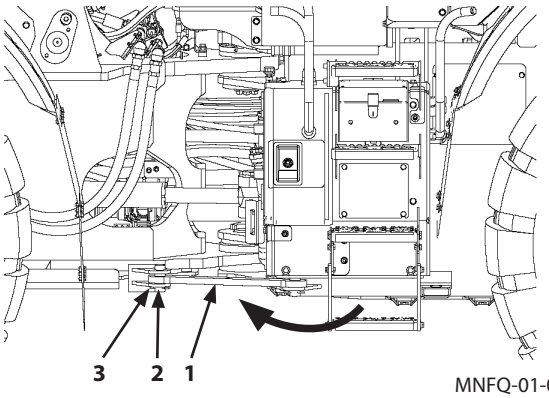
Lock Frames

WARNING: Before beginning to work near the frame center hinge, install articulation lock bar (1) to securely lock and prohibit movement between the front and rear frames. Avoid accidents due to unexpected movement of the machine.

1. Align the front and rear frame centers with each other.
2. Remove β-form pin (3) to remove set pin (2) from the rear frame hole.
3. Pull out and rotate articulation lock bar (1) to align it with the front frame hole (4).
4. Install set pin (2) into the front frame hole (4) and the articulation lock bar tip end hole. Install β-form pin (3) to lock the articulation lock bar (1) in position.



MNFQ-01-008



MNFQ-01-007

Inspection/Maintenance Access Side Cover

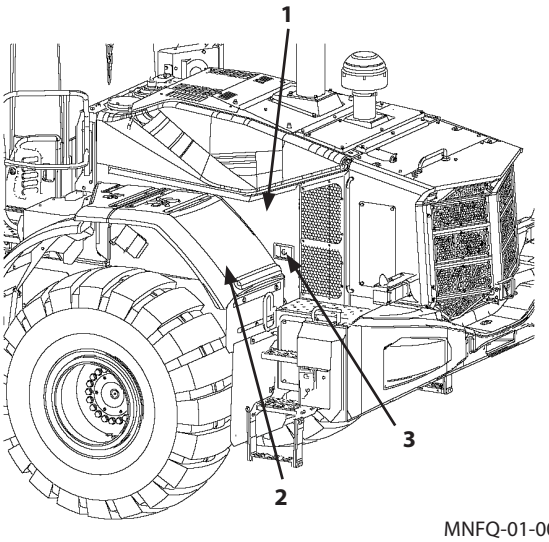
CAUTION:

- **Always close side covers (1) during driving and operation.**
- **Do not keep side covers (1) open on a slope or when a strong wind is blowing. Failure to do so may be dangerous because side cover (1) may unexpectedly close.**
- **Take care not to pinch your fingers when opening/ closing the side covers (1).**
- **When side cover (1) is opened, the cover may move suddenly. Be careful not to come in contact with the cover.**
- **Before inspecting around the engine, be sure to secure side cover (1) with holding rod (4).**
- **If the machine is equipped with the fenders (2) on side covers (1), never ride on the fenders (2).**

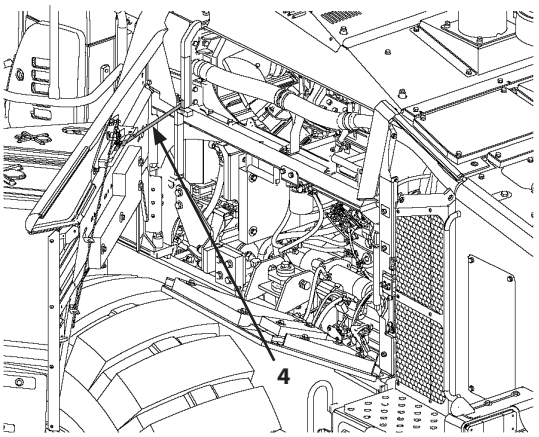
When opening side cover (1), pull latch (3).

NOTE: When required to inspect the machine for a long time with side cover (1) kept open, lock side cover (1) using the holding rod (4) provided inside the side cover.

Side cover (1) has a holding groove. Engage the holding rod (4) in the holding groove beforehand.



MNFQ-01-009

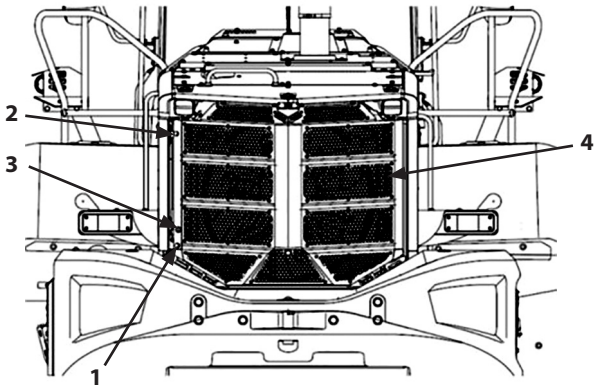


MNFQ-01-010

Rear Grille

WARNING:

- **Open or close rear grille (4) only after stopping the engine. Failure to do so may create a very dangerous situation as entanglement with the cooling fan may result.**
- **Before driving the machine, always check that rear grille (4) is not open.**



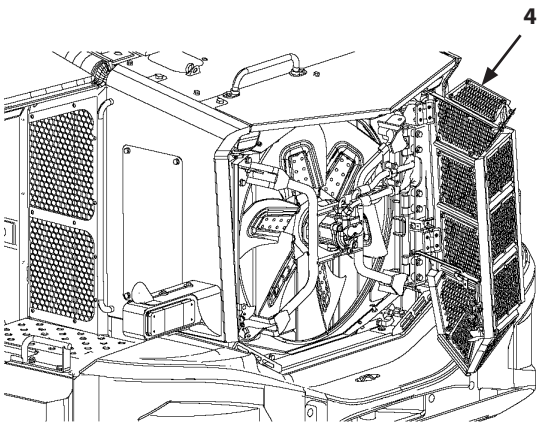
MNFQ-01-319

1. Remove bolts (1)(2).
2. Insert the starter key, turn and push rear grille open/close button (3) to allow the rear grille (4) to open so that the cooling fan can be cleaned.

NOTE: Without removing bolt (1), rear grille open/close button (3) cannot be turned.

3. When closing rear grille (4), while supporting rear grille (4), push in rear grille (4) until a click sound is heard.
4. Tighten bolts (1)(2) and remove the starter key.

NOTE: Without tightening bolt (1), the starter key cannot be removed.



MNFQ-01-012

Periodic Replacement of Parts

To ensure safe operation and long life, be sure to conduct periodic inspection and maintenance of the machine.
The parts listed below may pose serious safety/fire hazards due to deterioration, wear and fatigue due to aging of the materials or repeated operation.
It is very difficult to gauge the extent of deterioration, fatigue, or weakening of the parts listed below by visual inspection alone, therefore, replace these parts at the intervals shown in the table below.
Contact your authorized dealer for replacing the parts.
It is highly recommended to use Hitachi Construction Machinery geniune parts as these are specially designed and tested to provide adequate performance for the machine.

Periodic Replacement Parts			Replacement Intervals
Engine		Fuel hose (Fuel tank to filter)	Every 2 years or 4000 hours whichever comes first
		Fuel hose (Fuel tank to injection pump)	
		Fuel hose (Filter to engine)	
		Oil filter hose (Engine to oil filter)	
		Heater hose (Heater to engine)	
		Fuel hose (Engine to fuel tank)	
		Heater hose (Engine to dosing module)	
		DEF hose (Aftertreatment device)	
Brakes		Brake valve seals (Rubber parts)	Every 1 year
		Wet type brake (D-ring for piston)	Every 4 years
		Accumulator	Every 2 years
		Stop light switch	Every 2 years
		Brake hose	Every 2 years or 4000 hours whichever comes first
Steering Mechanism		Steering hose	Every 2 years or 4000 hours whichever comes first
		Steering cylinder seals (Rubber parts)	Every 4 years
		Steering valve seals (Rubber parts)	Every 2 years
Hydraulic System	Base Machine	Pump suction hose	Every 2 years or 4000 hours whichever comes first
		Hydraulic hose (Main pump to main valve)	
		Hydraulic hose (Fan pump to fan motor and fan valve)	
		Hydraulic hose (Pilot pump to charging valve)	
		Hydraulic hose (Transmission high pressure circuit hose)	
		Hydraulic hose (Transmission cooler line hose)	
		Hydraulic oil tank return hose	
		Hydraulic oil cooler line hose	
		Hydraulic hose (Valve to hydraulic oil tank return hose)	
	Front Attachment	Lift arm cylinder line hose	
		Bucket cylinder line hose	
		Pilot hose	
Cab		Seat belt	Every 3 years

NOTE: Be sure to replace seals, such as O-rings and gaskets, when replacing hoses.

Maintenance Guide

Shaded columns in the table indicate maintenance interval.

A. Greasing

	Parts	Quantity	Interval (hours)							Page
			10	50	250	500	1000	2000	4000	
1.	Bucket Pin	2	★		★★					7-26
2.	Bucket Link Pin	2	★		★★					7-26
3.	Bucket Cylinder Pin	1	★		★★					7-26
4.	Bucket Cylinder Rod Pin	1	★		★★					7-26
5.	Bell Crank Pin	1	★		★★					7-26
6.	Lift Arm Cylinder Rod Pin	2	★		★★					7-26
7.	Lift Arm Pivot Pin	2	★		★★					7-27
8	Lift Arm Cylinder Pin	2	★		★★					7-27
9.	Left Steering Cylinder Pin	1	★							7-27
10.	Right and Left Steering Cylinder Pin	3	★							7-27
11.	Upper and Lower Center Hinge Pin	2								7-28
12.	Front and Rear Axle Support Pin	2								7-28
13.	Front (2nd) Propeller Shaft Universal	1							★★★	7-28
14.	Propeller Shaft Center Support	1								7-29
15.	Center (2nd) Propeller Shaft Universal	2							★★★	7-29
16.	Center (2nd) Propeller Shaft Spline	1						★★★		7-29
17.	Rear (3rd) Propeller Shaft Universal	2							★★★	7-30
18.	Rear (3rd) Propeller Shaft Spline	1								7-30
19.	Main (1st) Propeller Shaft Universal	2							★★★	7-30

★ : Add grease daily during first 50 hours of operation.
If the machine is engaged in excavation in mud, water or snow, add grease after each work shift.

★★ : After 50 hours of operation, carry out next greasing at the first 250 hours of operation.
Carry out greasing every 500 hours of operation afterwards. Shorten greasing intervals when the machine is operated under severe conditions or when the machine is continuously operated for a long period of time.

★★★ : Shorten greasing intervals when the machine is operated under severe conditions or when the machine is continuously operated for a long period of time.

IMPORTANT: Grease bucket and link pivots every day until break-in period (50 hours) is complete.

B. Engine

IMPORTANT: Be sure to use the specified oil. Change oil at the exactly specified intervals. If unspecified oil is used, or the oil change intervals are arbitrarily extended, serious engine failure or damage may result.

	Parts		Quantity	Interval (hours)							Page
				10	50	100	250	500	1000	2000	
1.	Engine Oil	Check Oil Level	-	■							7-31
2.	Engine Oil	Change	30 L (7.9 gal)					■			7-32
3.	Engine Oil Filter	Replace	1					★			7-34
4.	Check Crankcase Breather Tube		-	■							7-35
5.	Check Vibration Damper		1							■	7-36

★ : Replace the engine oil filter every time the engine oil is changed.

C. Power Train

	Parts		Quantity	Interval (hours)							Page
				10	50	100	250	500	1000	2000	
1.	Transmission Oil	Check Oil Level	-	■	(When leaking oil)						7-37
2.	Transmission Oil	Change *Oil capacity (Amount of oil change)	51 L (40 L) [13.5 gal (10.6 gal)]			★			■		7-38
3.	Transmission Oil Filter	Replace	1			★			■		7-38
4.	Axle Oil	Change (Front)	48 L (12.7 gal)							■	7-41
		Change (Rear)	48 L (12.7 gal)							■	7-41
5.	Check Surroundings Around Axle and Covers for Oil Leaks		-						■		7-43
6.	Axle Housing Air Breather	Clean	Each 1 (F/R)					■			7-43
7.	Transmission Air Breather	Clean	1					■			7-44

★ : 100 hours at only first time

* : Transmission oil capacity indicates the entire amount of oil, including oil in the transmission oil sump, devices and lines. Amount at oil change means the amount of oil that is changed during inspection and maintenance.

D. Hydraulic System

	Parts	Quantity	Interval (hours)								Page
			10	50	100	250	500	1000	2000	4000	
1.	Check Hydraulic Oil Level	-	■								7-47
2.	Change Hydraulic Oil *Oil capacity (Amount of oil change) / Clean Hydraulic Oil Tank	205 L (139 L) [54.2 gal (36.7 gal)]								★	7-48
3.	Clean Suction Filter	1	(When changing hydraulic oil)								7-50
4.	Clean and Replace Pilot Oil Filter	1							■		7-51
5.	Replace Hydraulic Tank Oil Full-Flow Filter	1							■		7-55
6.	Replace Air Breather Element	1							■		7-56
7.	Check Ride Control Accumulator Function, Gas Leakage, Looseness, and Damage	1					■				7-57
8.	Check Gas Pressure in Ride Control Accumulator	1							■		7-57
9.	Check Gas Pressure in Steering Accumulator	1							■		7-58
10.	Check Hoses and Lines for Leaks	-	■								7-59
	Check Hoses and Lines for Cracks, Bend, etc.	-				■					7-59

★ : Hydraulic oil changing interval differs according to the kind of hydraulic oil used.

* : Hydraulic oil capacity indicates the entire amount of oil, including oil in the hydraulic oil tank, devices and lines. Amount at oil change means the amount of oil that is changed during inspection and maintenance.

E. Fuel System

IMPORTANT: Be sure to use the specified fuel. Failure to do so may result in malfunction or damage on the engine.

	Parts	Quantity	Interval (hours)							Page
			10	50	100	250	500	1000	2000	
1.	Check Fuel Level	-	■							7-64
2.	Drain Water and Sediment from Fuel Tank	1						■		7-66
3.	Drain Fuel Filter	1	■							7-67
4.	Replace Fuel Main Filter Element	1						■		7-68
5.	Replace Fuel Pre-Filter Element	1						■		7-69
6.	Clean Fuel Solenoid Pump Strainer	1						■		7-70
7.	Check Fuel Hoses for Leak, Cracks, etc.	-	■							7-72
	Check Fuel Hoses for Cracks, Bent, etc.	-				■				7-72

F. Air Cleaner

	Parts		Quantity	Interval (hours)							Page
				10	50	100	250	500	1000	2000	
1.	Air Cleaner Element	Clean	1	Every 250 hours or when the monitor indicator lights							7-73
		Replace	1	After Cleaning 6 times or every once a year whichever comes first							7-73
2.	Check Air Inlet System		-	■							7-74

G. Cooling System

IMPORTANT:

- **Use the Hitachi Construction Machinery genuine Long-Life Coolant or organic Coolant for the coolant used in the machine.**
- **It is highly recommended to use Hitachi Construction Machinery genuine Long-Life Coolant as it is specially designed and tested to provide adequate performance for the machine.**

	Parts	Quantity	Interval (hours)							Page
			10	50	100	250	500	1000	4000	
1.	Check Coolant Level	-	■							7-76
2.	Check Drive Belt	-	■							7-77
3.	Check Drive Belt Tensioner	1	Every 1000 hours or once a year whichever comes first							7-78
4.	Change Coolant	36 L (9.5 gal)	Every 3000 hours or two years whichever comes first							7-79
5.	Clean Radiator/Oil Cooler and Other Cooling System	-					★			7-80

★: Shorten the maintenance interval when the machine is operated in extremely dusty areas.

H. Electrical System

	Parts		Quantity	Interval (hours)							Page
				10	50	100	250	500	1000	2000	
1.	Batteries	Check Electrolyte Level	2			■					7-87
		Check Electrolyte Specific Gravity	2				■				7-89
2.	Check Monitor Functions and All Other Instrument Operation		-	■							7-90
3.	Check Work Lights		-	■							7-91
4.	Check Horn and Reverse Buzzer		-	■							7-92
5.	Check Electrical Harnesses and Fuses		-		■						7-92

I. Brake System

	Parts	Quantity	Interval (hours)							Page
			10	50	100	500	1000	2000	4000	
1.	Check Right and Left Brake Interlocking Performance	-	■							7-93
2.	Check Parking Brake Force	-	■							7-94
3.	Check Service Brake Accumulator Function, Gas Leakage, Looseness, and Damage	2				■				7-95
4.	Check Gas Pressure in Service Brake Accumulator	2						★		7-95
5.	Replace Parking Brake Accumulator	1							■	7-96
6.	Check Brake Disks (Service and Parking)	-						■		7-96

★ : If the ride control function is equipped, check the ride control accumulator at the same time.

J. Tire

	Parts		Quantity	Interval (hours)							Page
				10	50	100	250	500	2000	4000	
1.	Check Air Pressure	Check	4	■							7-97
		Adjustment	4	As required							7-97
2.	Check Tire for Damage		4	■							7-97
3.	Check Wheel Bolt Torque		4		★			■			7-98

★ : 50 hours at only first time

K. Air Conditioner

Parts				Quantity	Interval (hours)							Page
					10	50	100	250	500	1000	2000	
1.	Check Air Conditioner Filter	Fresh Air Filter	Clean	1			★					7-102
			Replace	1	After Cleaning 10 times							7-103
		Circulating Air Filter	Clean	1			★					7-104
			Replace	1	After Cleaning 10 times							7-104
2.	Check Air Conditioner			-	Every 250 hours or every 3 months							7-105
3.	Check Air Conditioner Piping			-	Every 250 hours or every 3 months							7-105
4.	Check Air Conditioner Condenser			1	Every 250 hours or every 3 months							7-106
5.	Check Air Conditioner Drive Belt			1	Every 250 hours or every 3 months							7-106
6.	Check Refrigerant			1	Every 250 hours or every 3 months							7-107
7.	Replace Air Conditioner Receiver Dryer			1	Every 16000 hours or 8 years whichever comes first.							7-107
8.	Check Compressor and Pulley			1	Every 250 hours or every 3 months							7-108
9.	Replace Cab Air Prefilter (Optional)			1								7-109

★ : Clean every 100 hours or every week whichever comes first.
If the machine is operated at a dusty job site, clean or replace the filter element earlier than the normal interval.

L. Aftertreatment Device

Parts		Quantity	Interval (hours)								Page
			10	50	100	250	500	1000	2000	4500	
1.	Check and Clean Filter Element of Muffler Filter	1								★	7-110
2.	Check and Clean Aftertreatment Device	1	As required								7-110

★ : Contact Authorized Dealer for maintenance.

M. Urea SCR System

Parts			Quantity	Interval (hours)								Page
				10	50	100	250	500	1000	2000	4500	
1.	Check DEF		1									7-113
2.	Change DEF		51.5 L (13.6 gal)	As needed								7-115
3.	Replace DEF Supply Module Filter	Main Filter	1									7-116
		Frostproof Filter	1									7-116
4.	Replace DEF Tank Inlet Filter		1									7-118

N. Miscellaneous

	Parts		Quantity	Interval (hours)								Page
				10	50	100	250	500	1000	2000	5000	
1.	Check Bucket Teeth and Cutting Edge		-									7-119
2.	Check and Replace Seat and Seat Belt	Check	1									7-120
		Replace	1	Every 3 years								
3.	Check ROPS cab, Resin Cab Roof, and Roof Mounting Bolts		-									7-120
4.	Check Windshield Washer Fluid Level		-									7-120
5.	Check Play Amount in Steering Wheel Stroke		-									7-121
6.	Check Accelerator Pedal Operation, and Exhaust Gas Color and Noise		-									7-122
7.	Check Rearview Mirror and Inside Rearview Mirror		-									7-123
8.	Clean Cab Window Glass											7-124
9.	Check Steps and Handrails for Damage and Looseness		-									7-125
10.	Clean Engine Compartment and Hood		-									7-125
11.	Check Sound Absorbing Mat Around Engine		-									7-126
12.	Cleaning of Camera Lens	Rear View	1									7-126
		Side View (Optional)	2									7-126
13.	* Check and Adjust Valve Clearance		-									7-127
14.	* Retighten Front Axle and Rear Axle Support Mounting Bolts		-		★							7-127
15.	Tightening and Retightening Torque of Nuts and Bolts		-		★							7-128
16.	Daily Check Camera Images Used to Compose the Aerial Angle (Optional)		-									7-142
17.	Check Camera Images Used to Compose Aerial Angle (Optional)		-	When performing a task affected by the installation position of the cameras.								7-143
18.	Check and Clean Rear Obstacle Detection Sensor Face (Optional)		-									7-143
19.	Check Rear Obstacle Detection Sensor System Operation (Optional)		-	When work is done that changes the sensor mounting position.								7-144

*NOTE: * Contact Authorized Dealer for maintenance.*

★ : 50 hours at only first time

Kind of Oils

Recommended Grease

Kind of Grease		Lithium Grease
Application		Front Joint Pins, etc.
Air Temp.		-20 to 40 °C (-4 to 104 °F)
Recommended Products		Hitachi Construction Machinery Genuine Grease NLGI EP-2
Alternative Products	Specification	NLGI 2 EP

IMPORTANT:

- **Hitachi Construction Machinery Genuine Greases are specially designed and tested to provide adequate performance for the machine, hence we highly recommend to use the greases.**
- **If you do not use Hitachi Construction Machinery Genuine Greases, use grease conforming to EP-2. Otherwise, the machine may suffer damage.**
- **Do not use greases which do not meet the above specification or requirements. Use of unsuitable grease may lead to failure which is not covered by Hitachi Construction Machinery Warranty Policy.**

Recommended Engine Oil

Kind of Oil		Engine Oil
Application		Engine Crank Case
Air Temp.		-20 to 40 ˚C (-4 to 104 ˚F)
Recommended Products		Hitachi Construction Machinery Genuine Engine Oil 10W-40 DH-2
Alternative Products	Viscosity	10W-40
	Specification	JASO DH-2

IMPORTANT:

- **Hitachi Construction Machinery Genuine Engine Oils are specially designed and tested to provide optimum performance for Hitachi construction machinery, hence we highly recommend to use the Engine Oils.**
- **If you do not use Hitachi Construction Machinery Genuine Engine Oil, use engine oil conforming to JASO DH-2. Otherwise, engine and aftertreatment device may suffer damage or performance of engine and aftertreatment device may deteriorate.**
- **Do not use oils which do not meet the above specification or requirements. Use of unsuitable oil may lead to engine damage or failure which is not covered by Hitachi Construction Machinery Warranty Policy.**

Recommended Transmission Oil

Kind of Oil	Engine Oil (API 10W, CD Class)
Application	Transmission
Air Temp. / Manufacturer	-25 °C (-13 °F) or higher
Hitachi Construction Machinery	* Hitachi Construction Machinery Genuine Transmission Fluid 10W

IMPORTANT:

- **Hitachi Construction Machinery Genuine Gear Oil and Hitachi Construction Machinery Genuine Engine Oil are specially designed and tested to provide optimum performance for the machine, hence we highly recommend to use the genuine Gear Oil and Engine Oil.**
- **If you do not use genuine Gear Oil or genuine Engine Oil, use gear oil or engine oil conforming to specifications described above. Use of unsuitable oil may lead to transimission damage or failure which is not covered by Hitachi Construction Machinery Warranty Policy.**
- **When the atmospheric temperature is below -25 °C (-13 °F), consult Authorized Dealer.**

*NOTE: The machine shipped from factory is filled with transmission oil marked with * .*

Recommended Axle Oil

Kind of Oil	Axle Oil	
Application / Manufacturer	Axle	
Hitachi Construction Machinery	High Gear Oil	
	Hitachi Construction Machinery Genuine AXLE GEAR OIL	TKTT 15150-4th

IMPORTANT:

- **Hitachi Construction Machinery Genuine Axle Oils are specially designed and tested to provide optimum performance for Hitachi Construction Machinery, hence we recommend to use Hitachi Construction Machinery Genuine Axle Oils. If other oil is used, which may lead to damage on the machine.**
- **Do not use oils which do not meet the above specification or requirements. Use of unsuitable oil may lead to damage which is excluded from Hitachi Construction Machinery Warranty Policy.**

Recommended Hydraulic Oil

Kind of Lubricant	Hydraulic Oil	
Where to be applied	Hydraulic System	
Change Interval	4000 hours	1500 hours
Environmental Temp.	–20 to 40 °C (–4 to 104 °F)	
Recommended Products	Hitachi Construction Machinery Genuine Hydraulic Oil 5000	Hitachi Construction Machinery Genuine Hydraulic Oil Multi
Alternative Product		Hydraulic Oil meeting JCMAS HK VG46W

IMPORTANT:

- **Hitachi Construction Machinery Genuine Hydraulic Oils are specially designed and tested to provide optimum performance for the machine, hence we highly recommend to use the genuine Hydraulic Oils.**
- **If you do not use genuine Hydraulic Oil, use Hydraulic oil confirming to JCMAS HK VG46W.**
- **Use of unsuitable oil may lead to machine damage or failure which is not covered by Hitachi Construction Machinery Warranty Policy.**

  For the information of JCMAS HK VG46W, refer to JALOS website.

Recommended Coolant

Kind of Coolant	Long-Life Coolant
Application	Radiator
Coolant Capacity	36 L (9.5 gal)
Manufacturer/ Recommended Products	Hitachi Construction Machinery Genuine Long Life Coolant

List of Consumable Parts

1. Filter Elements

	Part No.
Engine Oil Filter	YA00083032
Fuel Main Filter	YA00083039
Fuel Pre-Filter Element	YA00083036
Air Cleaner Element (outer)	YA00014855
Air Cleaner Element (inner)	YA00014856
Air Conditioner Circulating Air Filter	YA00001490
Air Conditioner Fresh Air Filter (Single)	4251527
Air Conditioner Fresh Air Filter (Double)	YA00005725
Air Conditioner Receiver Dryer Kit	YA00080993
Cab Air Cleaner Filter	YA00077800
Hydraulic Tank Full-Flow Filter	YA00072026 (Element with O-ring)
Hydraulic Tank Suction Filter	4631063
Hydraulic Tank Suction Filter Cover O-ring	A810160
Pilot Oil Filter	YA00061798
Pilot Oil Filter Element (Brake Circuit)	4033060610
Pilot Oil Filter Element (Steering Circuit)	3098170720
Transmission Oil Filter	3111570040
DCA4 Coolant Filter	YA00083041
DEF Tank Inlet Filter	YA00075016
DEF Supply Module Filter Kit	YA00080670
Hydraulic Tank Air Breather Element	4437838
Axle Oil Cooler Line Filter Element (Optional)	4252563

2. Drive Belts

	Part No.
Air Conditioner Drive Belt	YA00104835

3. Bucket Parts

		Part No.	Quantity
Cutting Edge	Center	3093524320	2
	Right and Left side	3093524330	2
	Bolt	4392720310	14
	Nut	3761260030	14
	Washer	4601120010	14
Bucket Teeth	Tooth	3680020340	6
	Bolt	4392720300	16
	Nut	3761260030	16
	Washer	4601120010	16
	Bolt	4392720310	6
	Nut	3761260030	6
	Washer	4601120010	6
	Tooth	3681520190	1
	Tooth	3681520200	1
	Shim	3420020950	4
O-Ring	Bucket Pin	263G872351	4
	Bucket Link Pin	263G872351	2
Wear Plate	Wear Plate	4165620470	2
	Bolt	4392720250	8
	Nut	3761260020	8
	Wsher	6271018221	8

4. Combination Light and Other Light

			Part No.
Front Combination Light (LED)	Front Combination Light Assembly (Right)		YA00074320
	Front Combination Light Assembly (Left)		YA00074319
Rear Combination Light (LED)	Rear Combination Light Assembly (Right)		YA00045092
	Rear Combination Light Assembly (Left)		YA00045092
Number Plate Light	Number Plate Light Assembly		3231505R91
	Bulb		4610062 (24V 10W)
Work Light (LED)	Front (Cab)	Work Light Assembly	YA00049494
	Front (Add On Cab)	Work Light Assembly	YA00049494
	Rear (Cab)	Work Light Assembly	YA00049494
	Rear	Work Light Assembly	YA00060221
Work Light (LED, High Brightness)	Front (Cab)	Work Light Assembly	YA00015760
	Front (Add On Cab)	Work Light Assembly	YA00031518
	Rear (Cab)	Work Light Assembly	YA00031518
	Rear	Work Light Assembly	YA00063511

5. Slow Blow Fuses

	Part No.
30A	3988070250
70A	4315073
120A	3988070240
140A	YA00021809

6. Seatbelt

		Part No.
Seatbelt	Belt	YA00091450
	Buckle	YA00091450

A. Greasing

CAUTION: Apply the parking brake and the articulation lock bar (Refer to page 7-9).

NOTE:

- *Until break-in is performed for more than 50 hours, lubricate the machine every day to get initial lubrication.*
- *In case excavation is made in mud, water or snow, lubricate the machine after operation is complete.*
- *Add high quality grease through the grease fittings. After removing contamination around the grease fitting, add grease. After greasing, thoroughly remove the old grease that was pushed-out from the seals and grease at the grease zerk nipple.*

1. One point each to right and left bucket pins (1).

   --- every 500 hours (250 hours at first time only)

2. One point each to bucket link pins (2 and 3).

   --- every 500 hours (250 hours at first time only)

3. One point to bucket cylinder pin (4).

   --- every 500 hours (250 hours at first time only)

4. One point to bucket cylinder rod pin (5).

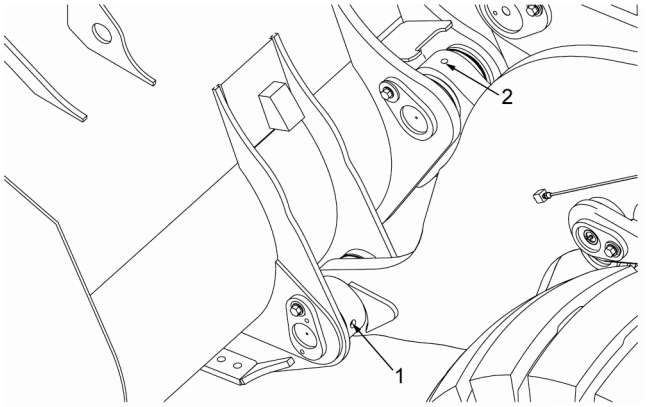
   --- every 500 hours (250 hours at first time only)

5. One point to bell crank pin (6).

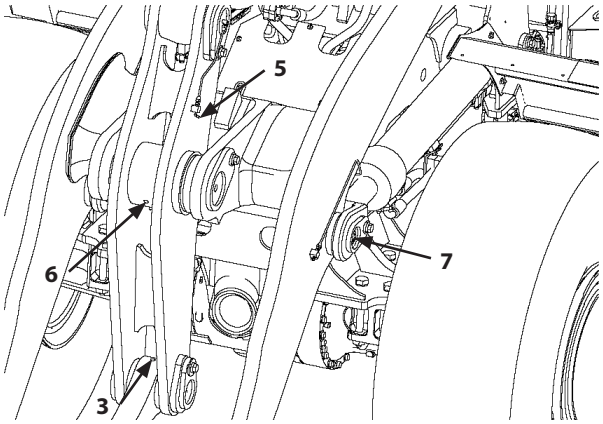
   --- every 500 hours (250 hours at first time only)

6. One point each to right and left lift arm cylinder rod pins (7).

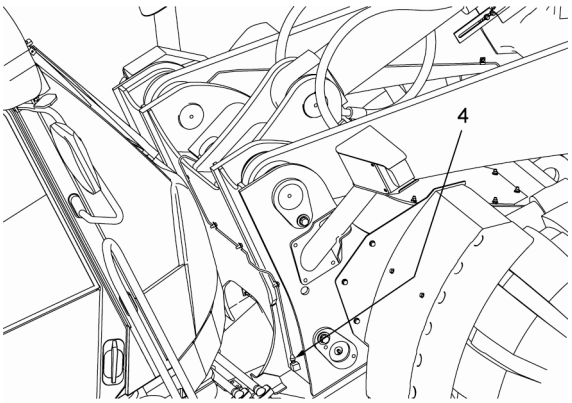
   --- every 500 hours (250 hours at first time only)



90Z7-7-20-1



90Z7B-7-20-2



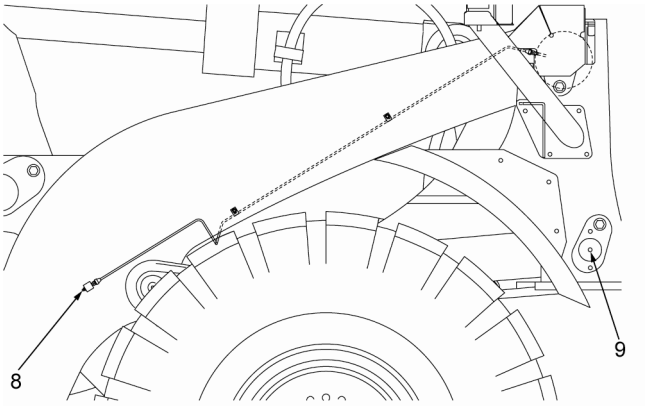
90Z7-7-20-3

7. One point each to right and left lift arm pivot pins (8).

   --- every 500 hours (250 hours at first time only)

8. One point each to right and left lift arm cylinder pins (9).

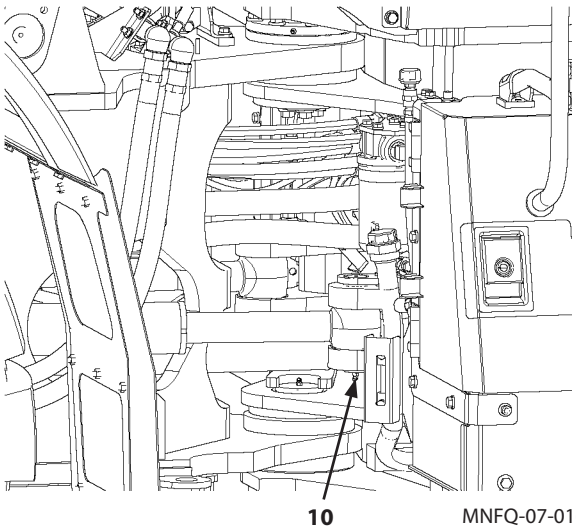
   --- every 500 hours (250 hours at first time only)



90Z7-7-21-1

9. One point to left steering cylinder pin (10).

   --- every 250 hours



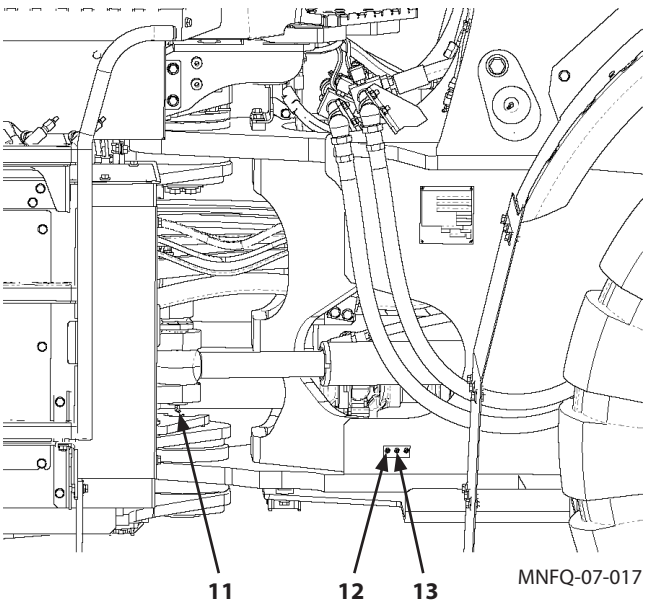
MNFQ-07-016

10. Three points to right and left steering cylinder pins (11, 12, 13).

    --- every 250 hours

    Steering cylinder (right) (11, 12)

    Steering cylinder (left) (13)



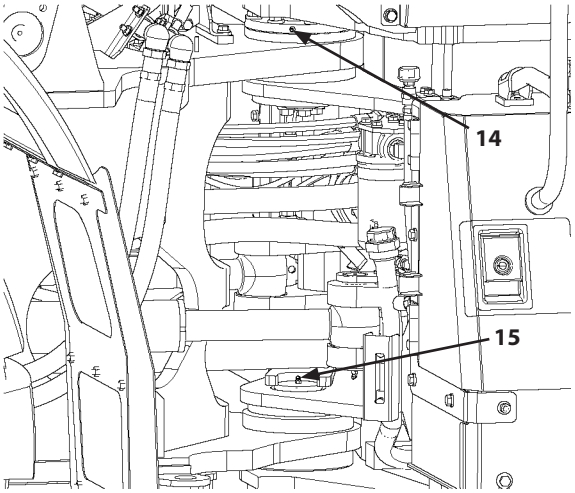
MNFQ-07-017

11. One point each to upper and lower center hinge pins (14 and 15).

    --- every 250 hours

    Upper (14)

    Lower (15)



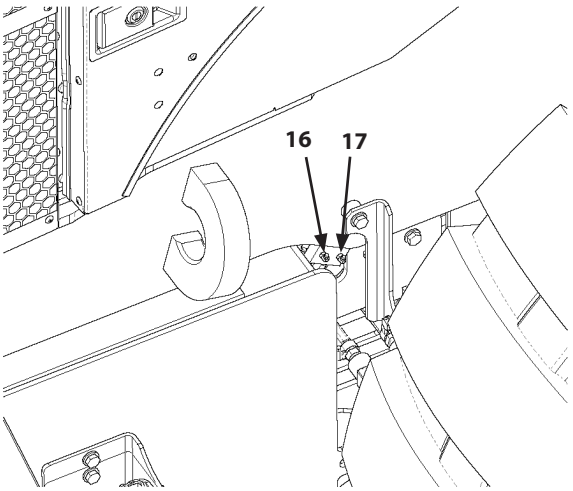
MNFQ-07-016

12. One point each to front and rear axle support pins (16 and 17).

    --- every 10 hours

    Front (17)

    Rear (16)

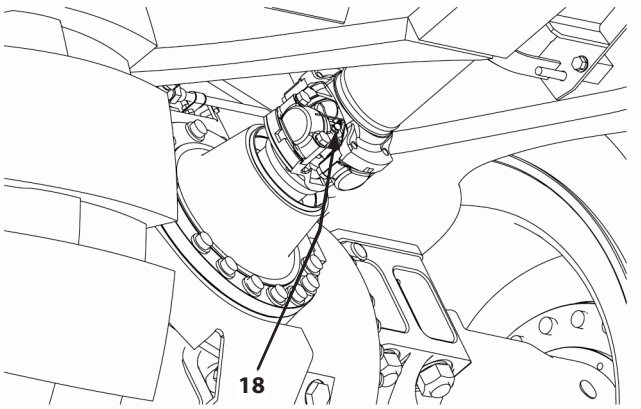


MNFQ-07-018

13. One point to second (front) propeller shaft universal (18).

    --- every 12000 hours

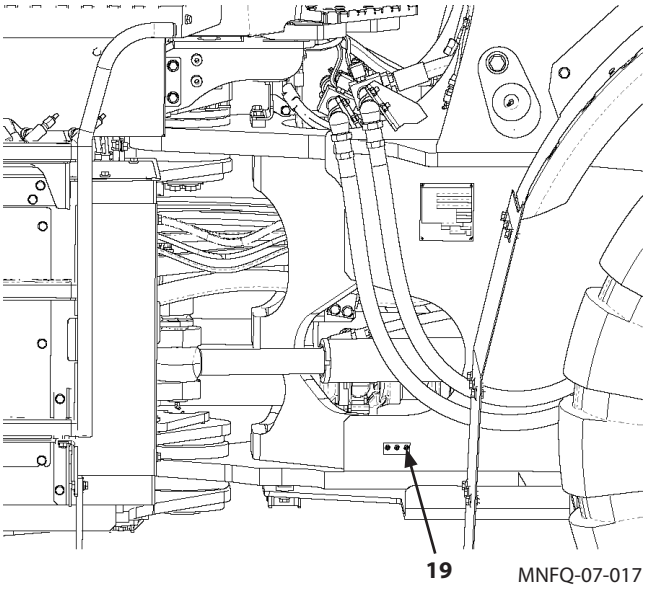
NOTE: When the machine is continuously operated under severe conditions for a long time, shorten the greasing intervals.



90Z7-7-23-2

14. One point to propeller shaft center support (19).

    --- every 250 hours



MNFQ-07-017

15. One point to second (center) propeller shaft universal.

    --- every 12000 hours

    Front (20)

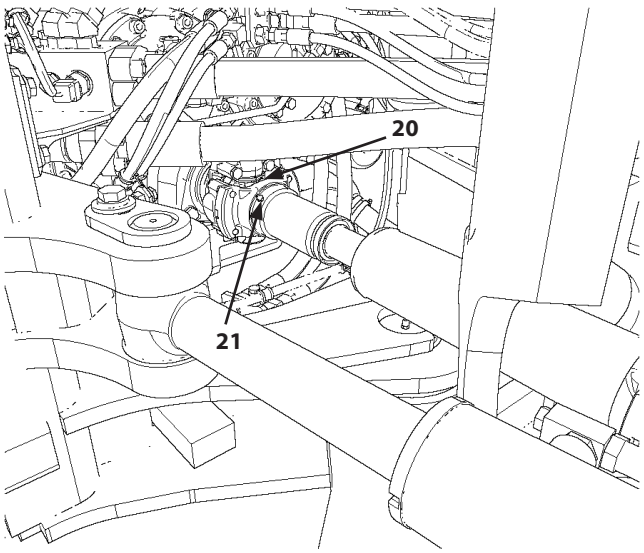
    Rear (22)

16. One point to second (center) propeller shaft splines (21).

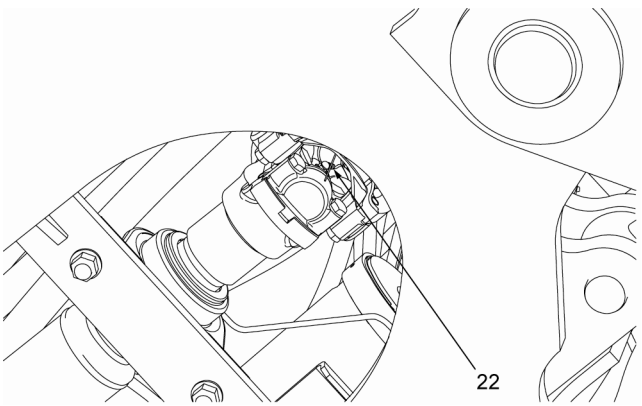
    --- every 2000 hours

NOTE: When greasing spline (21), steer the machine fully to the right or left, and stop the engine. Lubricate the fitting, start the engine and slowly turn the machine from side to side 2 or 3 times after greasing to lubricate the spline enough.

IMPORTANT: When greased with the machine positioned in straight, remove the fitting on the sleeve yoke before starting the engine.



MNFQ-07-020



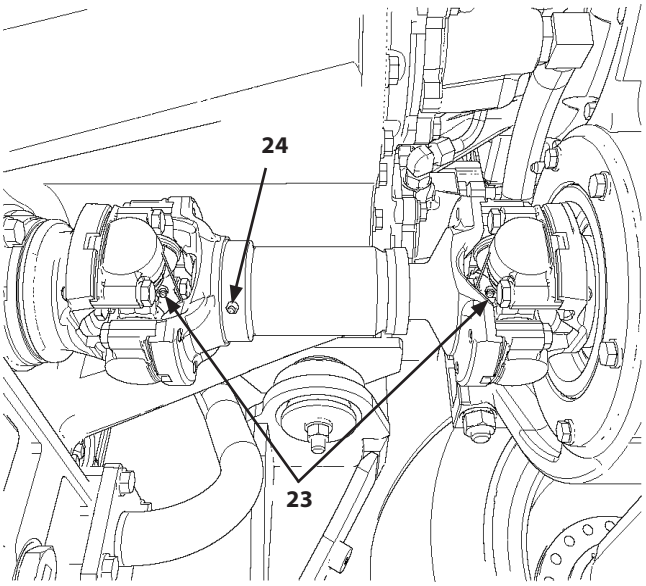
90Z7-7-24-3

17. Two points to third (rear) propeller shaft universal (23).

    --- every 12000 hours

18. One point to third (rear) propeller shaft splines (24).

    --- every 2000 hours

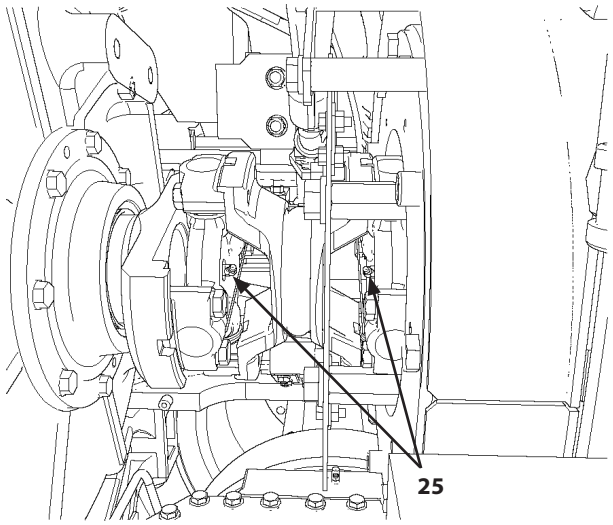


MNFQ-07-021

19. Two points to first (main) propeller shaft universal (25).

    --- every 12000 hours

NOTE: When the machine is continuously operated under severe conditions for a long time, shorten the greasing intervals.



MNFQ-07-022

B. Engine

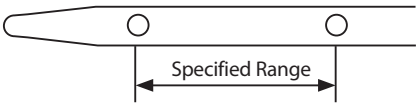
1 **Check Engine Oil Level**

--- every 10 hours (before starting the engine)

IMPORTANT: Incorrect engine oil level may cause engine problems (The oil level should be between the upper and lower marks on oil level gauge (1)).

If engine oil level is too high, control the oil level to the proper quantity before starting the engine.

Check oil level before starting the engine. Pull out oil level gauge (1). Check for mixing of foreign matter or contamination in the oil. Wipe oil level gauge (1) with cloth, re-insert it into the pipe to the end, and then pull it out again. The oil level should be between the upper and lower marks on oil level gauge (1).
If oil level is below the lower limit mark, add the recommended engine oil via oil filler (2).
If oil level exceeds the upper limit mark, remove drain plug (3), and then drain oil. Recheck oil level.



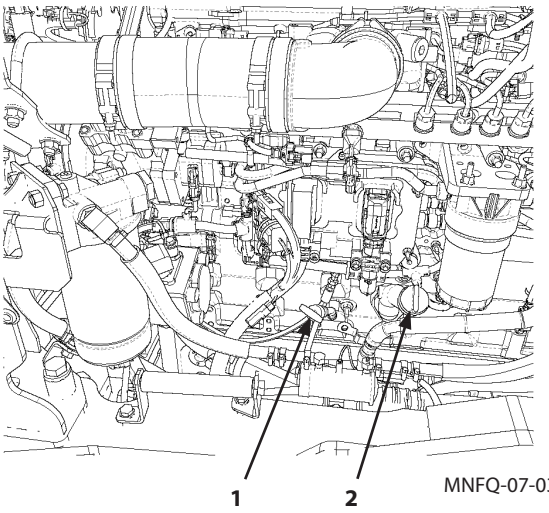
NOTE: Level the engine when adding oil or inspecting oil level.

When required to check oil level after operating the machine, first stop the engine. Wait for more than 15 minutes. Then check oil level.

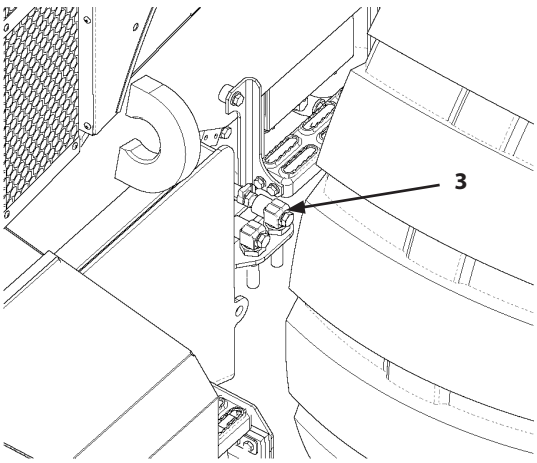
(This means that the oil level will become stabilized after all oil delivered to respective lubrication area returns to the oil pan.)

If the oil color changes, severe contamination and/or mixing of foreign matter may be seen, change the oil.

WARNING: Do not spill oil while changing oil. Spilled fuel and oil, and trash, grease, debris, accumulated coal dust, and other flammable materials may cause fires.



MNFQ-07-037



MNFQ-07-030

2 Change Engine Oil
--- every 500 hours

WARNING: Immediately after the machine has been operated, all engine parts are hot. Wait for the engine to cool before starting any maintenance work. Failure to do so may cause severe burns.

NOTE: Improper disposal of waste oil can threaten the earth's environment and ecology.

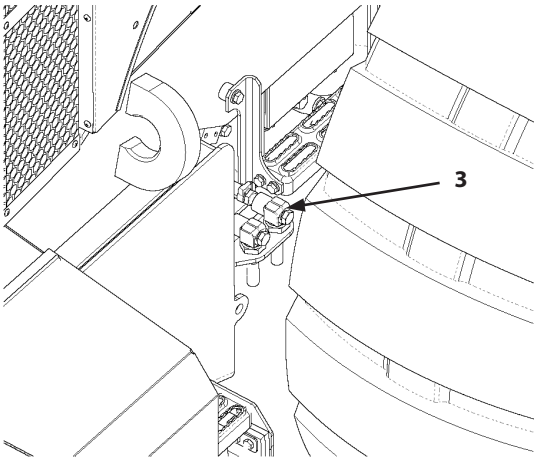
Consult professional collection trader or Authorized Dealer for disposing used oil and filters.

Be sure to replace the engine oil filter when changing the engine oil at the same time.

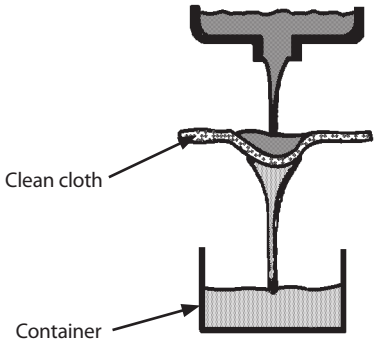
1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.
2. Clean the areas around the drain plug and the oil filter.
3. Arrange a 40 liter (10.6 gallon)- capacity container to receive the drain oil.
4. Remove drain plug (3) provided on the fuel tank side to allow oil to drain.
5. Drain oil from the oil filter cartridge.
6. Allow oil to drain through a clean cloth to check that no foreign matters such as metal pieces are included in the oil.
7. Install a new oil filter.

   (Refer to the descriptions for 3 Replace Engine Oil Filter.)
8. Securely tighten drain plug (3).

   : 78.4 N·m (7.8 kgf·m)(58 lbf·ft)



MNFQ-07-030

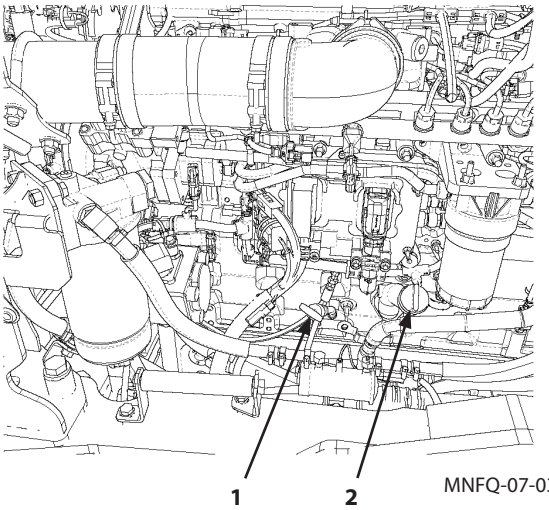


M4GB-07-020

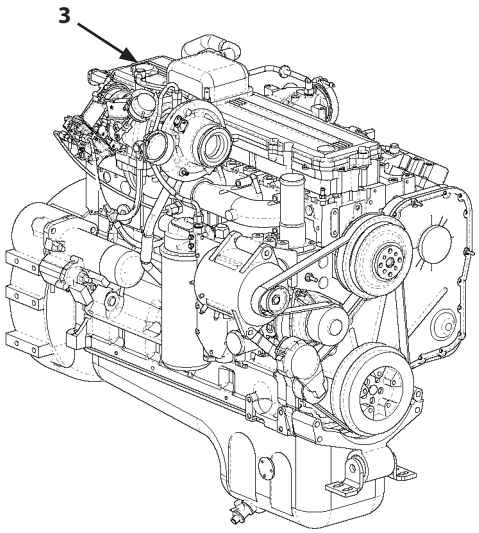
9. Remove oil filler cap (2). Supply the specified amount of engine oil.

   Engine Oil amount : 30 L (7.9 gal)

10. Securely tighten oil filler cap (2).
11. Check for looseness of other oil filler cap (3).
12. Check that the oil level is between the maximum and minimum level scales on oil level gauge (1). Then, start the engine.
13. After starting the engine, check the sealing surfaces for any oil leakage.
14. Keep the engine running at low idle speed for 5 minutes and stop the engine. About 15 minutes later, recheck the oil level. If necessary, add oil.



MNFQ-07-037



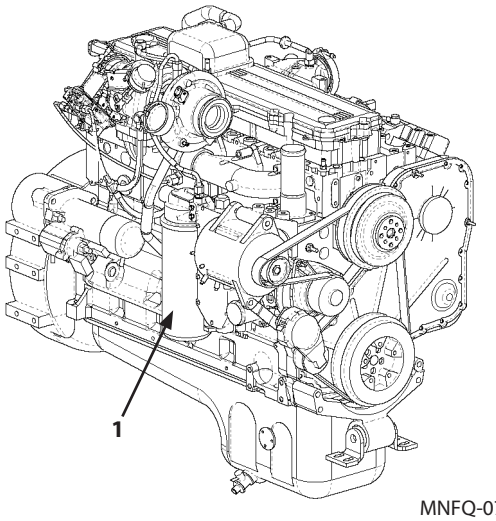
MNFQ-07-029

3 **Replace Engine Oil Filter**

--- every 500 hours (each time when engine oil is changed)

WARNING: Immediately after the machine has been operated, all engine parts are hot. Wait for the engine to cool before starting any maintenance work. Failure to do so may cause severe burns.

1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.
2. Clean the areas around the oil filter.
3. Before removing cartridge type element (1), loosen drain plug (2) to drain oil from the cartridge. The oil is drained through the drain hose. After draining the oil, tighten the drain plug.

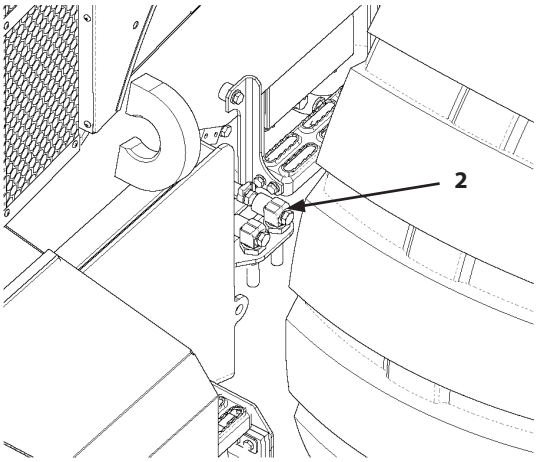


MNFQ-07-029

IMPORTANT:

- **Take care not to allow foreign matter such as dirt to enter the oil filter.**
- **Be careful not to damage the filter body when removing or installing the filter.**
- **Never reuse a cartridge type element.**

4. Remove cartridge type element (1) by turning it counterclockwise with a filter wrench.
5. Pour new oil into new element (1), being careful not to let it overflow.
6. After coating a new cartridge gasket with engine oil, turn the cartridge clockwise until the gasket comes in contact with the sealing surface.
7. Using the filter wrench, tighten the cartridge 3/4 to 1 turn more. Take care that if the cartridge is excessively tightened, the cartridge may be deformed.



MNFQ-07-030

NOTE: Install the cartridge with care so that the gasket is not damaged due to twisting.

Check for any oil leakage at the filter mounting area.

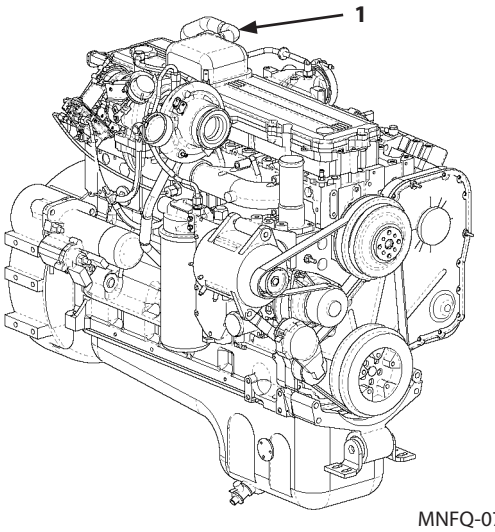
8. Supply the specified amount of engine oil.

   (Refer to the descriptions for **2** Change Engine Oil.)

4 **Check Crankcase Breather Tube**
--- every 10 hours (daily)

WARNING: Immediately after the machine has been operated, all engine parts are hot. Wait for the engine to cool down before starting any maintenance work. Failure to do so may cause severe burns.

1. Park the machine following the same procedure as described on page 7-7 for preparation of inspection/ maintenance work.
2. Check tube (1) for sludge, debris, or ice in the tube.
3. If sludge, debris, or ice is found clean the tube with detergent and warm water or a solvent. Dry the tube with compressed air.
4. Visually check the tube for cracks or damage. If damage is found, replace the crankcase breather tube.
5. Check for any oil leakage or loose clamps at the connection with the crankcase breather tube (1).
6. Check for loose clamp securing tube (1) to the engine.



MNFQ-07-029

5 **Check Vibration Damper**
--- every 2000 hours

1. Park the machine following the same procedure as described on page 7-7 for preparation of inspection/ maintenance work.

CAUTION: The silicone fluid in the vibration damper will become solid after extended service and will make the damper inoperative. An inoperative vibration damper can cause major engine or drivetrain failures.

2. Check vibration damper (1) on the fan end of the engine crankshaft for evidence of fluid loss, dents, and wobble. Inspect the vibration damper thickness for any deformation or raising of the damper cover plate.

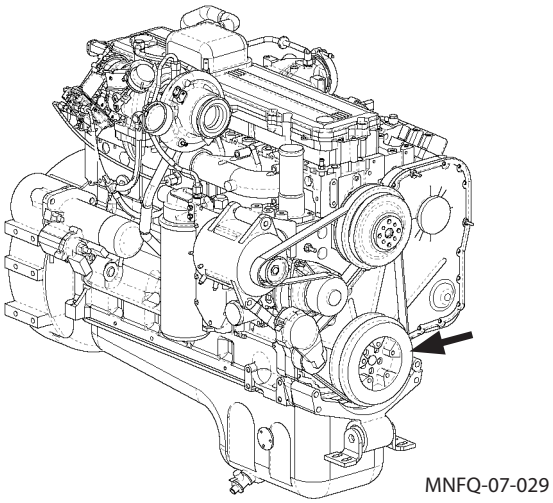
3. If any of these conditions are identified, consult Authorized Dealer for check and repair.

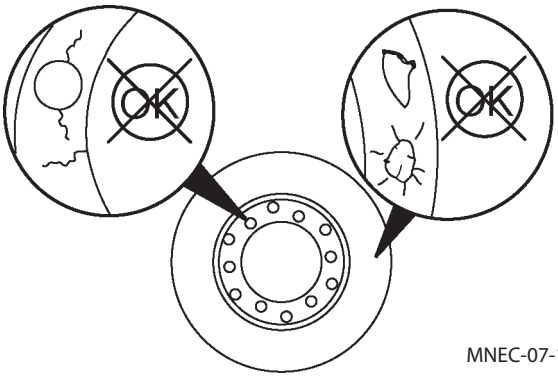
4. Check the index lines (A) on the damper hub (B) and the inertia member (C).
If the lines are more than 1.59 mm (1/16 in) out of alignment, replace the damper.

5. Inspect the vibration damper hub (B) for cracks. Replace the damper if the hub is cracked.

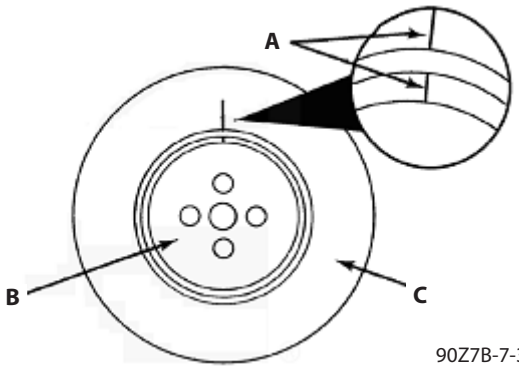
6. Inspect the rubber member for deterioration.
If pieces of rubber are missing or if the elastic member is more than 3.18 mm (1/8 in) below the metal surface, replace the damper.

NOTE: Also look for forward movement of the damper ring on the hub. Replace the damper if any movement is detected.

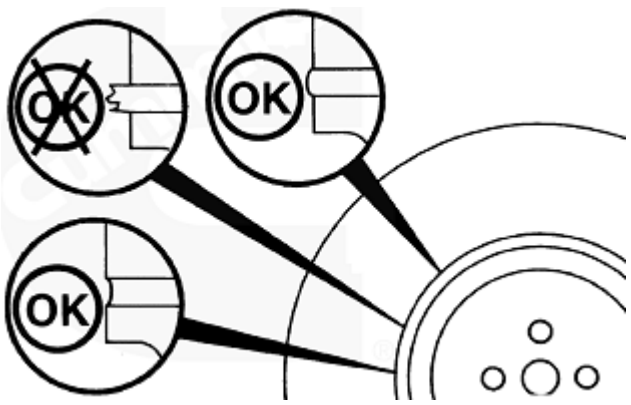

MNFQ-07-029



MNEC-07-117



90Z7B-7-32-2



90Z7B-7-32-3

C. Power Train

1 **Check Transmission Oil Level**
--- every 10 hours (daily)

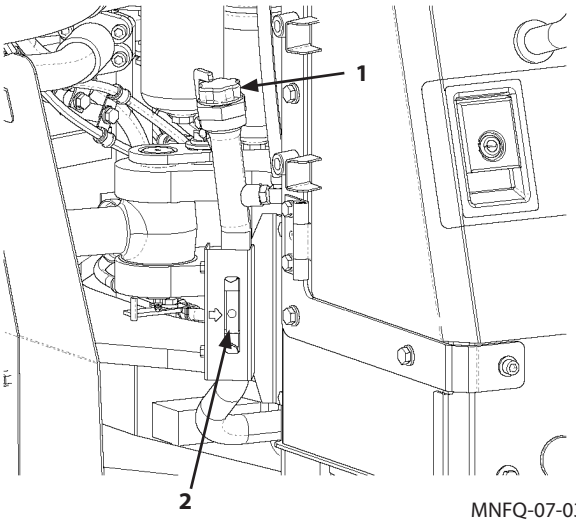
WARNING:

- **Move forward/reverse lever to neutral and turn parking brake switch ON.**
- **After leveling the bucket on the ground, move the control lever lock switch to the lock (🔒) position.**
- **Set the articulation lock bar (Refer to page 7-9).**

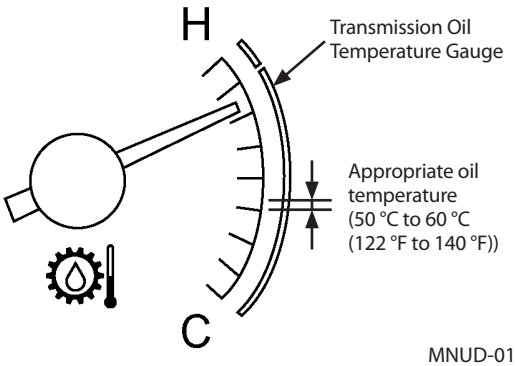
IMPORTANT:

- **Do not start the engine when the transmission oil level is low. Damage to the transmission may result. Do not use transmission oils other than those listed in the "Transmission Oil".**
- **Never spray high pressure water to the cap and vicinity of the cap. Water may enter into the transmission, damage to the transmission may result.**

Check the oil level when the transmission oil temperature is low.
Normal oil level is at the center of oil level sight gauge (2).
If the oil level is lower than the specified, add recommended oil from filler port (1) while the engine is at idle.
Do not overfill.



MNFQ-07-036

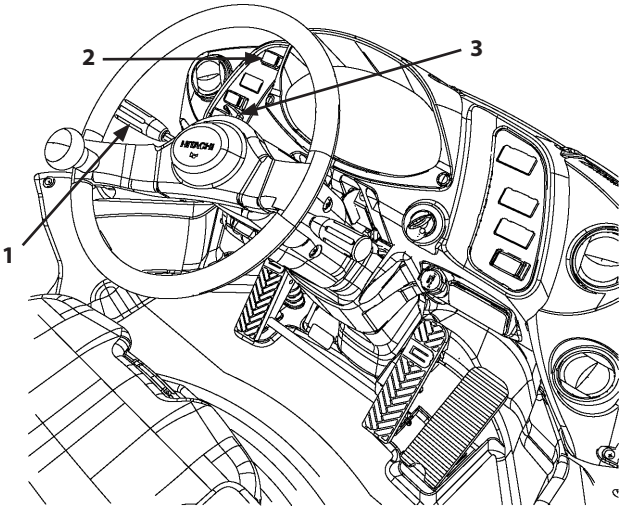


MNUD-01-015

2
3 **Change Transmission Oil and Transmission Oil Filter --- every 1000 hours (100 hours at first change only)**

WARNING:

- **Unexpected movement of the machine may cause a serious accident. When parking the machine, place F-N-R lever (1) in neutral and neutral lever lock (3) in the lock (🔒) position. Then, apply parking brake (2) and stop the engine.**
- **Before changing oil, install articulation lock bar (4) to securely hold the front and rear frames to avoid an accident due to unexpected machine movement. Avoid accidents due to unexpected movement of the machine.**

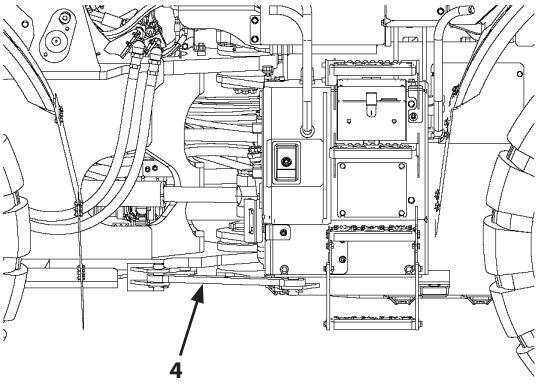


MNUD-01-010

IMPORTANT: Do not use transmission oils other than those listed in the "Recommended Transmission Oil".

NOTE: Be sure to replace the transmission oil filter when changing the transmission oil at the same time.

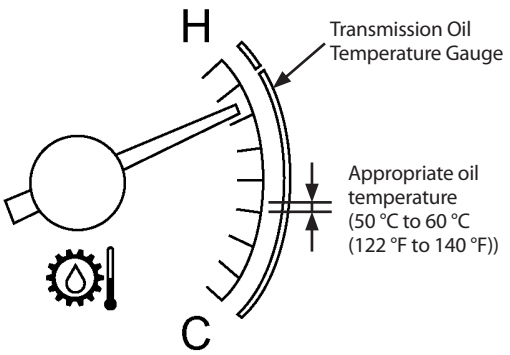
1. Operate the machine until the transmission oil is heated to the appropriate temperature (50 °C to 60 °C (122 °F to 140 °F)).
2. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.
3. Install articulation lock bar (4) to the front and rear of the frame by following the procedures described on page 7-9.



MNFQ-01-007

IMPORTANT: The machine is equipped with a turbocharged engine. Perform cool down operation before stopping the engine. Failure to do so may cause the lubricant on the turbocharger bearing surfaces to desiccate due to the intense heat present inside the turbocharger, possibly causing damage to the turbocharger.

4. Turn the key switch OFF to stop the engine. Leave the machine untouched for 10 minutes.
5. Prepare a container of more than 50 L (13.2 gal) capacity to receive the drain oil.



MNUD-01-015

IMPORTANT: The machine is equipped with a turbocharged engine. Cool down before stopping the engine. Failure to do so may cause the lubricant on the turbocharger bearing and seal surfaces to be dissipated due to the intense heat present inside the turbocharger, possibly damaging the turbocharger.

6. Turn the key switch OFF to stop the engine. Leave the machine untouched for 10 minutes.
7. Prepare a container of more than 60 L (16 gal) capacity to receive the oil.
8. Remove drain plug (12) from the transmission bottom to drain the oil.
   Dispose of the oil in accordance with local regulations.

NOTE: Drain plug (12) is magnetized. If excessive amount of metal pieces are found on drain plug (12), contact Authorized Dealer.

9. Securely tighten drain plug (12).

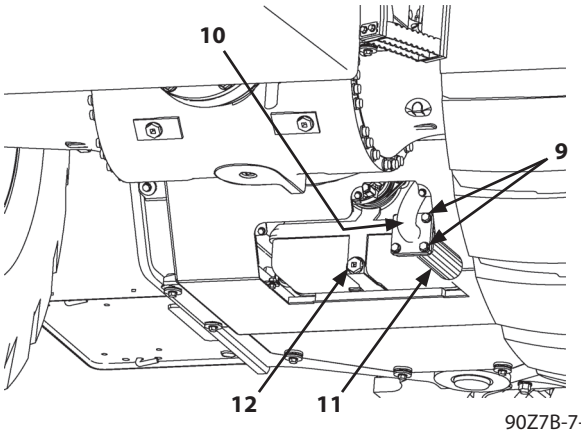
   (12) : 36 mm

   : 140 N·m (14.0 kgf·m, 103 lbf·ft)

NOTE: Do not apply sealant to drain plug (12).

10. Remove bolts (9) (4 used) and disconnect suction tube (10).
11. Take out and clean strainer (11) in clean oil.
    Replace strainer (11) if any abnormality is observed.
12. Install strainer (11) with a new gasket correctly.
    Install suction tube (10) with bolts (9) (4 used).

    (9) : 90 N·m (9.0 kgf·m, 66 lbf·ft)



90Z7B-7-35-1

13. Using a filter wrench, turn cartridge filter (6) counterclockwise to remove it. Properly dispose of the oil and filter.
14. Clean the filter-seating surface. After coating the new cartridge filter gasket surface with new oil, lightly turn the cartridge filter clockwise by hand until the cartridge filter sealing surface comes in contact with the filter-seating surface.
15. At this time, tighten the cartridge filter an additional 3/4 turn with a filter wrench. Take care not to tighten the filter cartridge excessively. Be careful not to damage filter cartridge by overtightening.

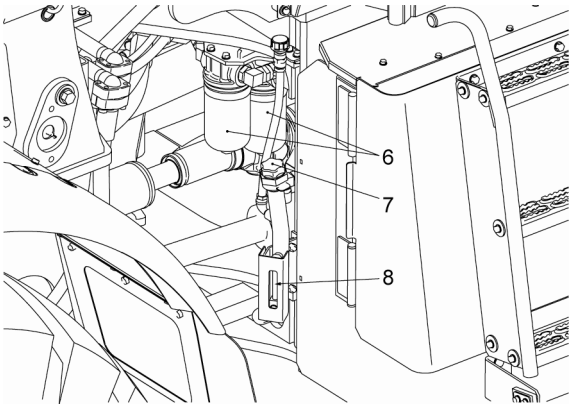
    : 25±5 N·m (2.5±0.5 kgf·m, 18±3.7 lbf·ft)

16. Refill the specified amount of oil through transmission oil filler port (7).

    Transmission oil capacity : 51 L (13.5 gal)
    Amount at change : 40 L (10.6 gal)

17. Start the engine and keep it running for two minutes.
18. Check that the oil level is within the specified range in oil level gauge (8). Refill as necessary.

NOTE: Replace both two filters (6). Never reuse cartridge type element.
Install the cartridge with care so that the O-ring is not damaged due to twisting.
Check for any oil leakage at the drain plug and the filter mounting area.



90Z7-7-32

4 **Change Axle Oil**
--- every 2000 hours

WARNING: Take care about the following points.

- **Starting repair work immediately after operation may cause burns. Wait for the oil to cool before starting any maintenance work.**
- **Lock the front and rear frames with the articulation lock bar.**

IMPORTANT: Do not use axle oils other than those listed in the "Recommended Axle Oil".

Change Axle Oil

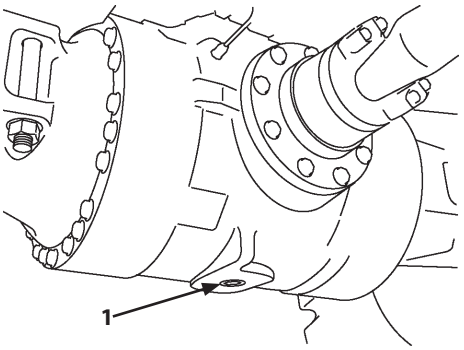
1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.
2. Install articulation lock bar to the front and rear of the frame by following the procedures described on page 7-9.
3. Clean the areas around the drain plug and the oil level plug (2).
4. Arrange a container of 50 liters (13.2 gallons) capacity to receive the drain oil.
5. Remove drain plug (1) to drain the oil.
6. Securely tighten drain plug (1).
7. Refill the specified amount of oil through oil level plug (2) hole.

Oil amount

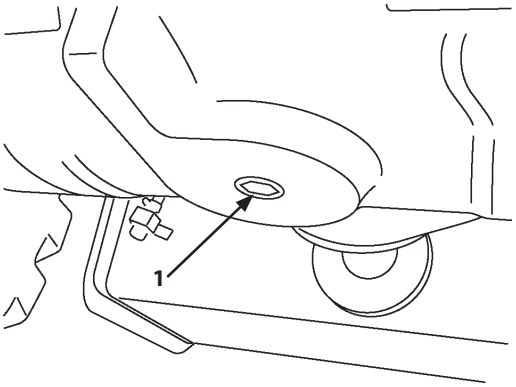
Front Axle	Rear Axle
48 L (12.7 gal)	48 L (12.7 gal)

IMPORTANT: It takes time for oil to fully lubricate the overall front axle.

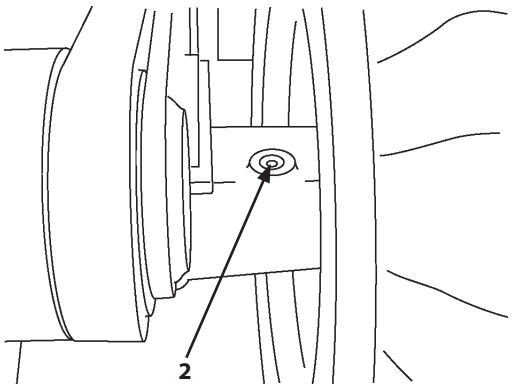
After installing the plug, allow the machine to drive for several minutes. Then, stop the engine and check the axle for any oil leaks.



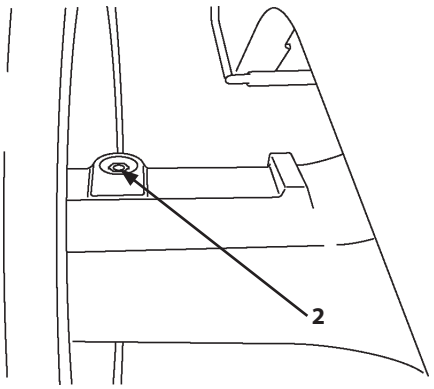
Front Axle M4GB-07-035



Rear Axle M4GB-07-036



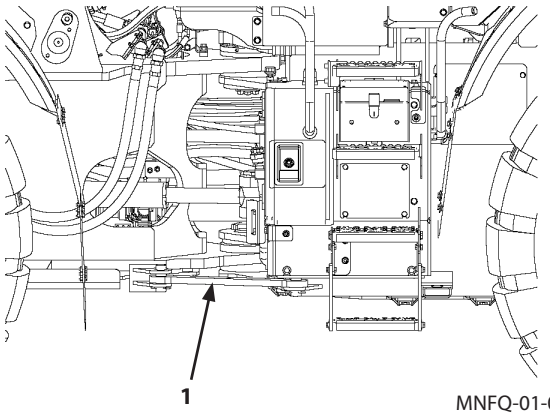
Front Axle M4GB-07-037



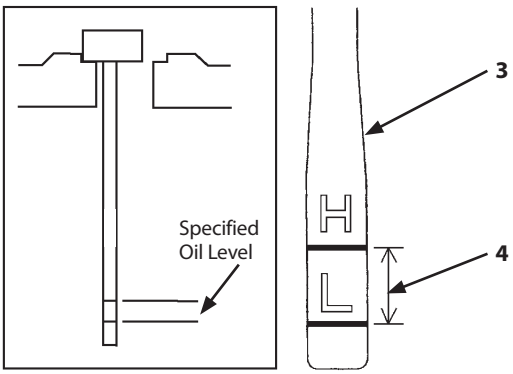
Rear Axle M4GB-07-038

Check Oil Level

1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.
2. Install articulation lock bar (1) to the front and rear of the frame by following the procedures described on page 7-9.
3. Clean the vicinity of oil level plug (2).
4. Remove oil level plug (2). Clean the tip of dipstick (3) connected to oil level plug (2) with a clean cloth.



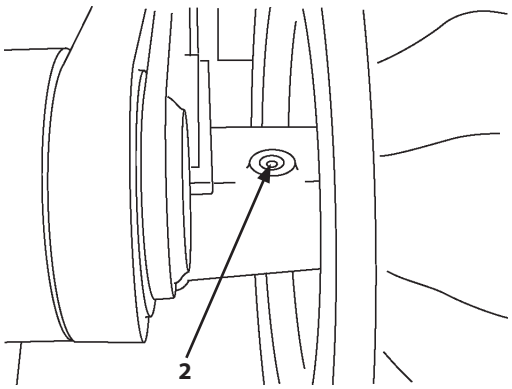
MNFQ-01-007



M4GB-07-039

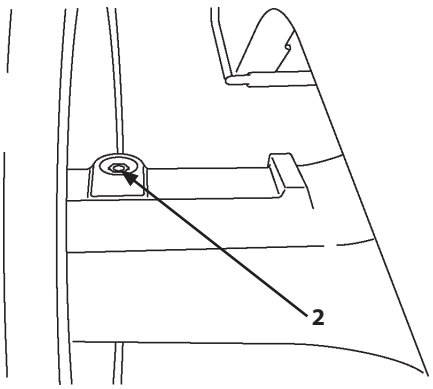
5. Make the plug lower surface contact to the axle seat face. Oil level must be between marks H and L (4) on the dipstick (3).

   If necessary, add oil.



Front Axle

M4GB-07-037



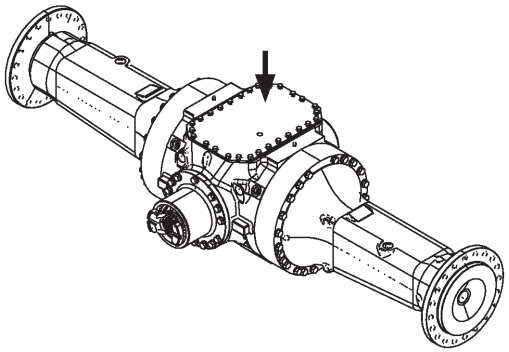
Rear Axle

M4GB-07-038

5 **Check Surroundings Around Axle and Covers for Oil Leaks**

--- every 1000 hours

Check the surroundings around the axle and covers for oil leaks. If any oil leaks are found, check the bolts in the oil leaking area for looseness. Retighten as needed.



M4GB-07-159

6 **Clean Axle Housing Air Breather**

--- every 500 hours

Front Axle Breather (1)
Rear Axle Breather (2)

1. Clean the vicinity around the air breather before removing the air breather.

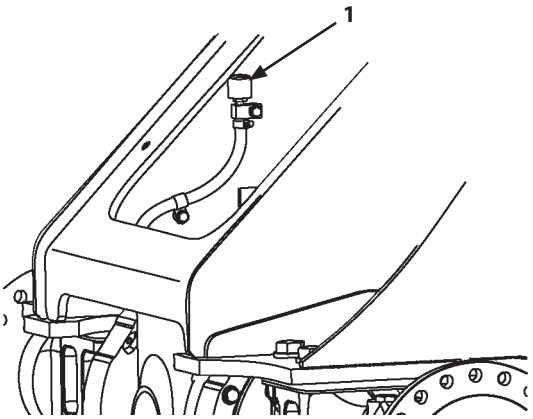
   Open the machine front cover. Front axle air breather (1) is located at the right side.

   Open the machine side cover. Rear axle air breather (2) is located at the left side.

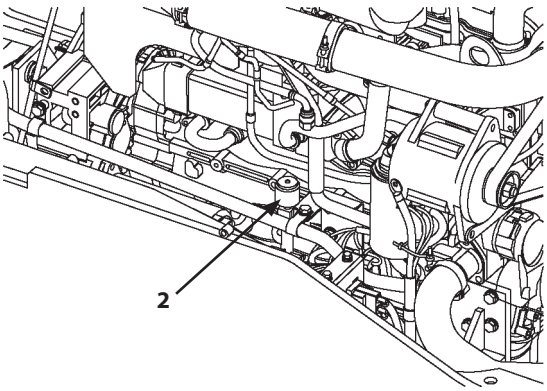
2. Put a cover on the air breather port to prevent foreign matter from entering.

CAUTION: Be sure to wear safety glasses when cleaning the air breather with compressed air.

3. Clean the air breather using compressed air. If completely contaminated, wash the air breather with a cleaning solvent and reinstall it.
4. Take care not to allow foreign matter to enter into the axle housing when reinstalling the air breather.



MNEC-07-071



MNEC-07-076

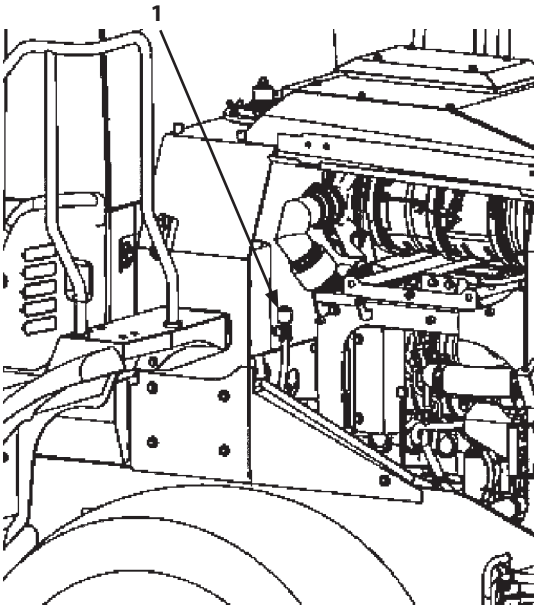
7 Clean the Transmission Air Breather --- every 500 hours

CAUTION: When cleaning with compressed air, wear safety glasses or goggles.

1. Wipe clean the area around where air breather (1) is mounted and then remove it.

   Transmission air breather (1) is located behind the engine compartment side panel, at the rear left of the hydraulic oil tank.

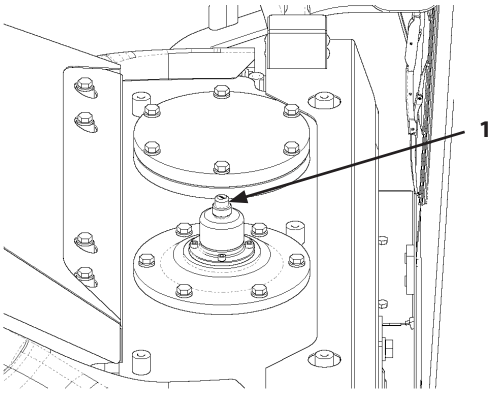
2. Put a cover over where it mounts so no debris gets inside.
3. Clean air breather (1) with compressed air and if it is very dirty, wash it clean with detergent.
4. During installation, take care that no foreign matter gets inside.



MNFQ-07-084

D. Hydraulic System

Inspection and Maintenance of Hydraulic Equipment



MNFQ-07-001

CAUTION: When checking and/or servicing the hydraulic components, pay special attention to the following points.

During operation, the parts of the hydraulic system become very hot. Allow the machine to cool down before beginning inspection or maintenance.

1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.
2. Begin servicing hydraulic components only after components, hydraulic oil and lubricants are completely cooled, and after releasing residual pressure.

2.1 Release internal pressure.

2.2 Be sure to relieve the air pressure from the hydraulic oil tank by pressing air bleed valve (1).

2.3 Allow the machine to cool down. Note that servicing heated and pressurized hydraulic components may cause hot parts and/or oil to fly off or escape suddenly, possibly resulting in personal injury.

Keep body parts and face away from plugs or screws when removing them. Hydraulic components may be pressurized even when cooled.

Never attempt to service or inspect the hydraulic circuits on slopes. They are highly pressurized due to self-weight.

IMPORTANT:

- **When connecting hydraulic hoses and pipes, take special care to keep seal surfaces free from dirt and to avoid damaging them. Keep these precautions in mind.**
- **Wash hoses, pipes, and the tank interior with a washing liquid and thoroughly wipe off before reconnecting them.**
- **Only use O-rings that are free of damage or defects. Be careful not to damage them during reassembly.**
- **Do not allow high pressure hoses to twist when connecting them. The life of twisted hoses will be shortened considerably.**
- **Carefully tighten low pressure hose clamps. Do not overtighten them.**
- **Always refill with the same hydraulic oil; do not mix brands/types of oil. When switching the brands/ types of oil, be sure to change the full amuount to avoid oil mixture.**
- **The machine is filled with Hitachi Construction Machinery Genuine Hydraulic Oil 5000 (change every 4000 hours) at delivery. Continuous use of the genuine hydraulic oil 5000 is highly recommended.**
- **Never run the engine without oil in the hydraulic oil tank.**

1 Check Hydraulic Oil Level --- every 10 hours (daily)

IMPORTANT: If the oil level is not viewed in the level gauge, immediately refill hydraulic oil up to the appropriate level. Failure to do so may result in a serious failure in the hydraulic system.

If the oil level is higher than the level gauge, drain oil down to the appropriate level using a pump.

1. Park the machine on solid, level surface, lower the front attachment (bucket, and so on) so it sits level on the ground as illustrated on the right, then stop the engine.

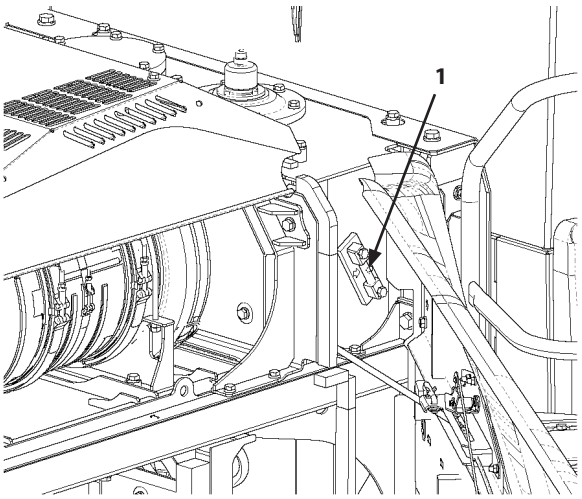
   Follow the instructions in "Preparations for Inspections and Maintenance" (page 7-7).

2. Check oil level with level gauge (1) on hydraulic oil tank. Oil must be between marks on the gauge. If necessary, add oil.

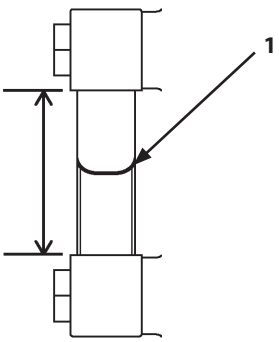
NOTE: During cold weather season, check the oil level after warming up the hydraulic oil by referring to the instructions described in the "Warm up operation" group.



SA-456



MNFQ-07-004



M4GB-07-160

2 Change Hydraulic Oil/Clean Hydraulic Oil Tank --- every 4000 hours

Changing and cleaning procedure

WARNING: Hydraulic oil becomes hot and pressurized during operation. Severe burns may result if skin comes in contact with escaping hydraulic oil immediately after operation. Wait for the oil to cool before starting any maintenance work.

IMPORTANT: Do not use hydraulic oils other than listed in the "Recommended Hydraulic Oil".

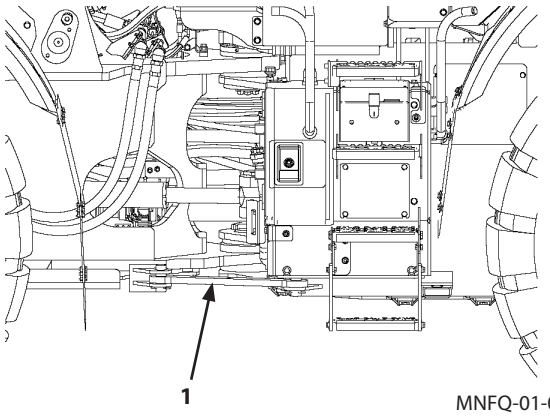
1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.
2. Install articulation lock bar (1) to the front and rear of the frame by following the procedures described on page 7-9.
3. Before changing the hydraulic oil, be sure to relieve the air pressure from the hydraulic oil tank (3) by pressing air bleed valve (2).

IMPORTANT: When changing hydraulic oil, take care not to permit foreign matter such as dirt, water, and /or sand to enter into the hydraulic oil tank.

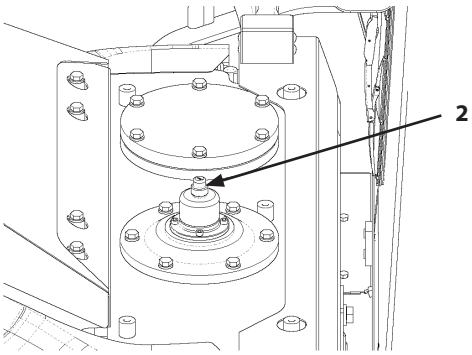
4. Arrange a container of approx. 150 liters (39.6 gallons).

IMPORTANT: Install drainer (7) to the drain valve slowly. Hydraulic oil may exhaust in large amounts when suddenly tightened.

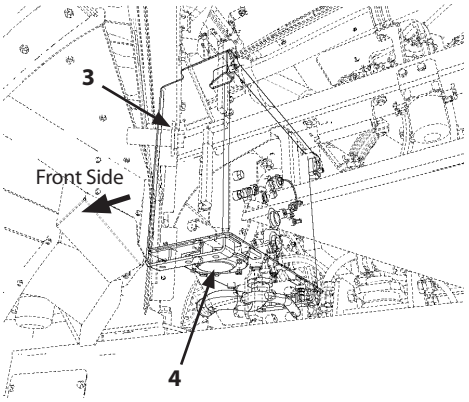
5. Remove cap (6) from drain valve (5). Install and screw drainer (7) located in the tool box into drain valve (5), then, drain valve (5) will be opened to drain oil.
6. Remove cleaning cover (4) on the bottom of hydraulic oil tank (3). Clean the tank bottom with cleaning oil. Install the cover to the original position after cleaning.



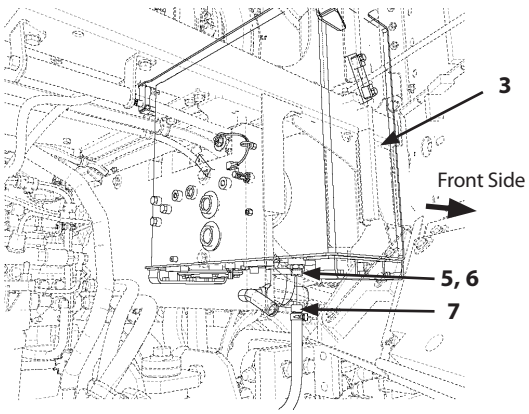
MNFQ-01-007



MNFQ-07-001



MNFQ-07-002



MNFQ-07-003

6. Supply hydraulic oil through cover (8) hole on the top of the hydraulic oil tank while checking the oil level at level gauge (9).

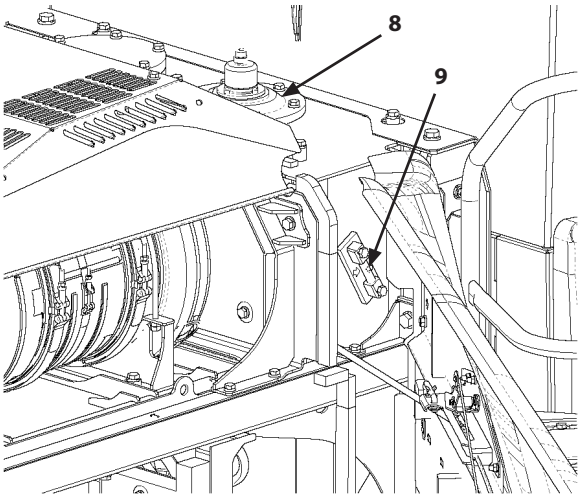
Oil capacity	205 L (54.2 gal)
Amount of oil change	139 L (36.7 gal)

7. Install cover (8) with bolts (6 used).

   Tightening torque: 50 N·m (5.1 kgf·m, 36.9 lbf·ft)

IMPORTANT: When changing hydraulic oil, take care not to permit foreign matter such as dirt, water, and/or sand to enter into the hydraulic oil tank.

8. Start the engine. Slowly raise or lower the arm and tilt the bucket forward and backward. Stop the engine. Check for any oil leakage. Check the oil level using level gauge (9).



MNFQ-07-004

Bleed Air from the Hydraulic System

After changing hydraulic oil or replacing the return filter, pilot filter and/or suction filter, bleed air from the hydraulic system following the procedures below.

Bleed Air from the Hydraulic Circuit

1. After supplying oil, start the engine. Move the bucket and lift arm cylinders several times to bleed air mixed in the hydraulic circuit. Do not operate the cylinders to stroke end.
2. Rest the bucket on the ground to resume the hydraulic oil level check position.
3. Stop the engine. Check the oil level. Add oil as needed.

3 Clean Suction Filter

--- each time the hydraulic oil is changed.

A suction filter is located on the bottom of the hydraulic oil tank.
Clean the suction filter when changing hydraulic oil.

1. After draining hydraulic oil, remove cover (1). Lift to take out rod (2). Put a cover over the oil supply port to prevent foreign matter from entering.

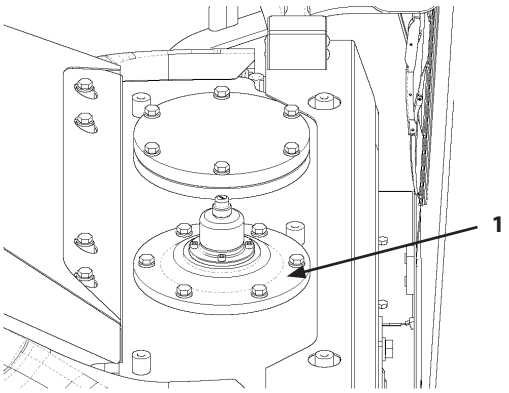
   When removing the suction filter upward, slowly lift it out. Failure to do so will allow trapped dust to fall into the tank.

2. Clean the suction filter and the hydraulic oil tank inside with cleaning oil.
3. Supply the specified volume of oil through the oil supply port while checking the oil level with the oil gauge.
4. Securely insert the suction filter into pipe (3) when installing the suction filter.
5. Before installing cover (1), check that the rod top is correctly inserted into support hole (4) on cover (1). Then, install cover (1) with bolts.

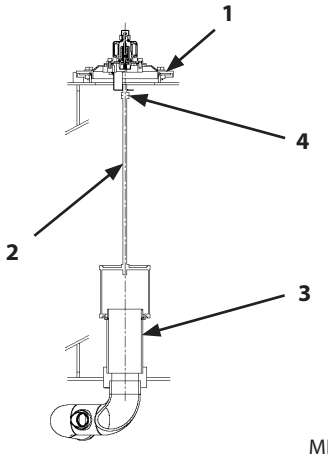
   Tightening torque: 50 N·m (5.1 kgf·m, 36.9 lbf·ft)

NOTE: Replace the O-ring under cover (1) to new one.

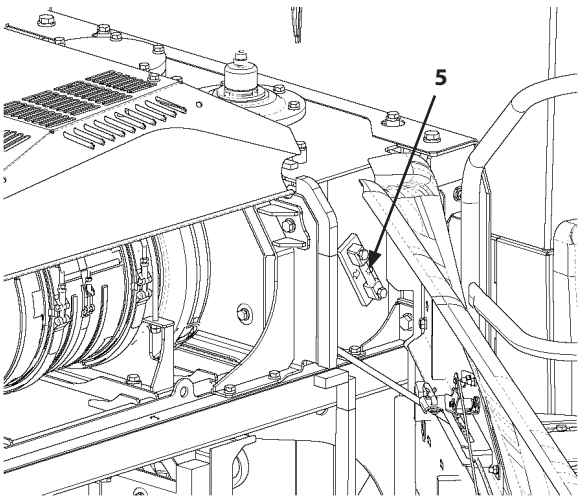
6. Start the engine. While slowly raising or lowering the arm and tilting the bucket forward and backward, check for any abnormality. Stop the engine. Check the oil level using level gauge (5).



MNFQ-07-001



MNFQ-07-005



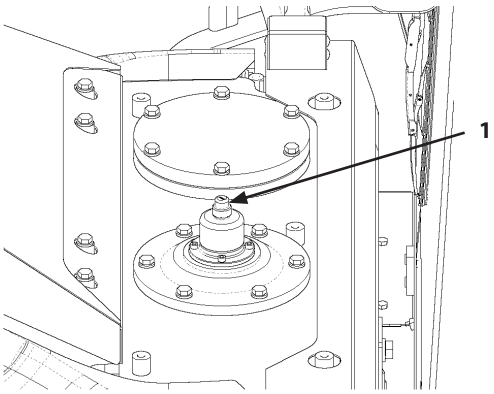
MNFQ-07-004

4 Clean and Replace Pilot Oil Filter --- every 2000 hours

Preparation

WARNING: Hydraulic oil becomes hot and pressurized during operation. Severe burns may result if skin comes in contact with escaping hydraulic oil immediately after operation. Wait for the oil to cool before starting any maintenance work.

1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.
2. Install articulation lock bar to the front and rear of the frame by following the procedures described on page 7-9.
3. Before replacing the filter element, be sure to relieve the air pressure from the hydraulic oil tank by pressing air bleed valve (1).



MNFQ-07-001

NOTE: Go to step 4 on page 7-52 for "Line Filter in Pilot Circuit", or page 7-53 for "Line Filter in Brake Circuit" and "Line Filter in Steering Circuit (Reducing Valve Unit)".

[Line Filter in Pilot Circuit]

4. Locate pilot oil filter (2) under the right side ladder.
5. Rotate the bottom of filter case (2) counterclockwise using a spanner to remove case (2) from head cover (3).
6. While turning element (4), remove the element downward.
7. Check any sediments or foreign material added to case (2) or head cover (3), especially in the threaded parts.
8. Check O-ring (5) and backup ring (6) for any damage. Replace them with new ones if any abnormality is observed.
9. Apply clean hydraulic oil to the threads of case (2) or head cover (3), O-ring (5) and backup ring (6). Sufficiently seat O-ring (4) and backup ring (6) in O-ring groove (7) on case (2).
10. Apply clean hydraulic oil to O-ring (8) of new element (4). While turning element (4), completely install element (4) into head cover (3) using care not to damage the element.
11. Take care never to allow water and/or dust to enter the filter case.
12. Install case (2) into head cover (3) while rotating case (2) clockwise, and tighten to the specified torque.

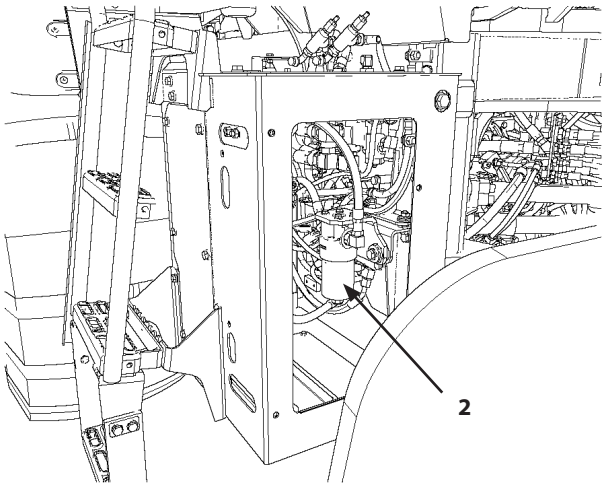
    : 24 mm

    : 25 to 30 N·m (2.5 to 3.1 kgf·m, 18 to 22 lbf·ft)
13. After replacing the filter, bleed air from the hydraulic pump and check the oil level in the hydraulic oil tank.

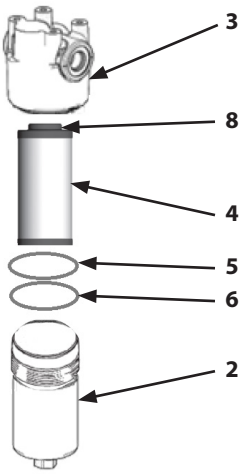
    (Refer to the descriptions for "Bleed air from the hydraulic system" in item 2.)

    If the machine is operated without bleeding the air mixed in the hydraulic circuit, damage to the hydraulic pump may result.

NOTE: Replace the element at the regular intervals to maintain clean hydraulic oil and extend the service life of the hydraulic components.



MNFQ-07-012



MNFQ-07-013

[Line Filter in Brake Circuit]

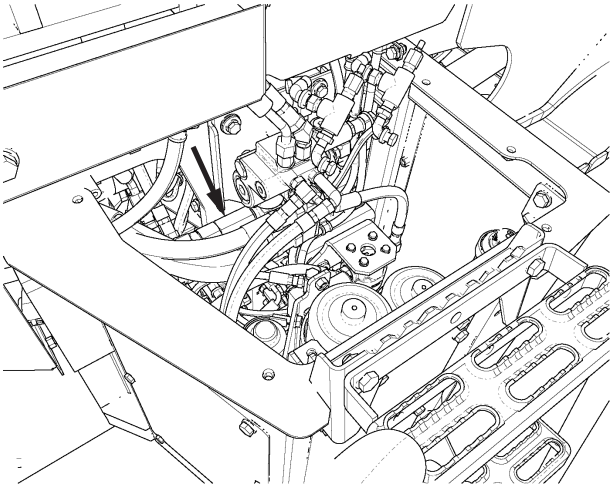
4. Disconnect hoses and remove adapter (7). Remove adapters (8, 9) including washer (10) and filter (11) inside.

5. Place a suitable container under the filter.

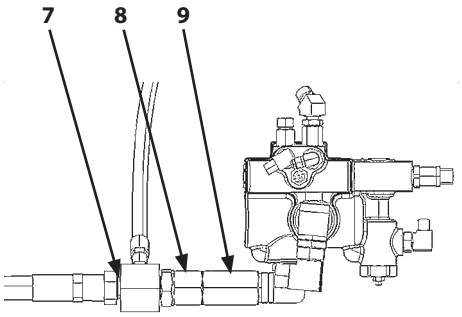
6. Remove adapter (8) and clean filter (11) by applying air or cleaning solution from the oil flow outlet side.

7. Install the cleaned filter with washer (10) and adapters (7, 8, 9).

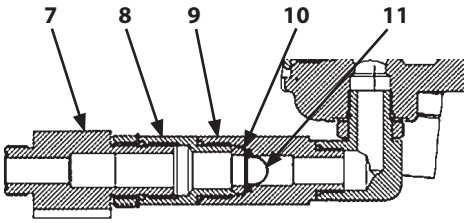
NOTE: If washer (10) and filter (11) are removed, carefully install the washer evenly in adapter (9), otherwise, adapter (8) cannot be fully tightened, causing leakage.



MNFQ-07-064



MNFQ-07-068



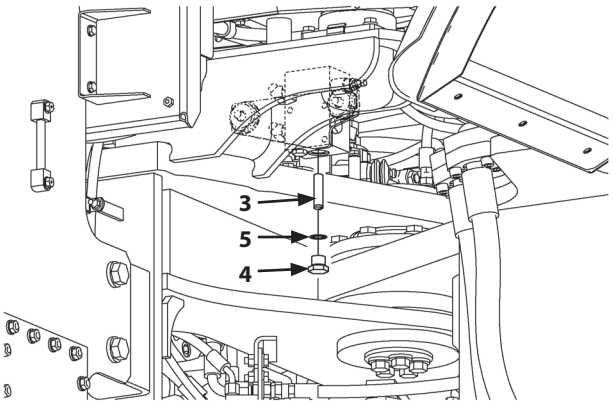
MNFQ-07-069

[Line Filter in Steering Circuit (Reducing Valve Unit)]

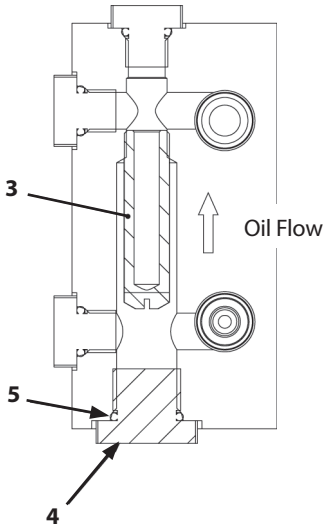
8. Remove plug (4) with O-ring (5).

9. Take out filter element (3) inside, and clean it by applying air or cleaning solution from the oil flow outlet side.

10. Install the cleaned filter, O-ring and tighten plug (4).



90Z7B-7-51-2



90Z7-38511-31770

5 **Replace Hydraulic Tank Full-Flow Filter**
--- every 2000 hours

Replace

WARNING: Hydraulic oil becomes hot and pressurized during operation.

Severe burns may result if skin comes in contact with escaping hydraulic oil immediately after operation. Wait for the oil to cool before starting any maintenance work.

Especially when removing the filter, be aware that the remaining oil in the filter may spill. Use extra care.

1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.
2. Install articulation lock bar to the front and rear of the frame by following the procedures described on page 7-9.
3. Clean the vicinity around cover plate (1).
4. Arrange a container and workshop towels to receive the spilled oil and the element. Relieve the air pressure from the hydraulic oil tank by pressing air bleed valve (8).
5. Loosen bolts (2) (6 used) to remove cover (1) and O-ring (3).

   When removing cover (1), slowly remove the cover while pressing the cover downward so that spring (4) does not fly off.
6. Remove spring (4) and element (5).
7. Replace element (5) and O-ring (3) with new ones. Install new element and O-ring in the hydraulic oil tank.

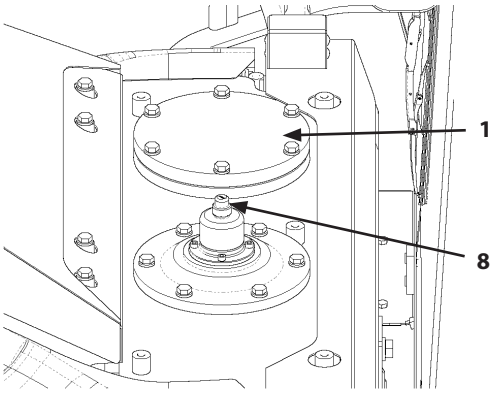
   Before installing element (5), make sure that rubber (6) is present.
8. Install cover (1) with bolts (2) (6 used).

   Tightening torque: 50 N·m (5.0 kgf·m)
9. After replacing the filter, bleed air from the hydraulic pump and check the oil level in the hydraulic oil tank.

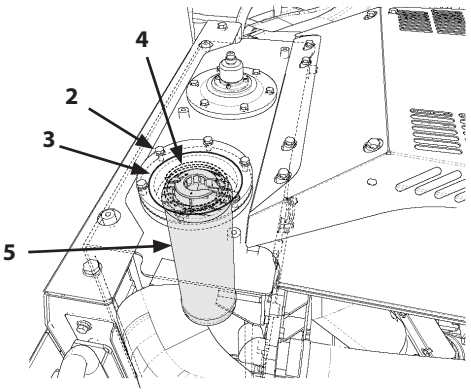
   (Refer to the descriptions for "Bleed air from the hydraulic system" in item **2**.)

   If the machine is operated without bleeding the air mixed in the hydraulic circuit, damage to the hydraulic pump may result.

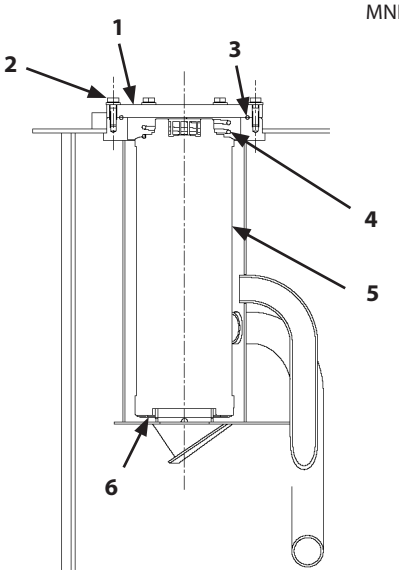
NOTE: Replace the element at the regular intervals to maintain clean hydraulic oil and extend the service life of the hydraulic components.



MNFQ-07-001



MNFQ-07-006

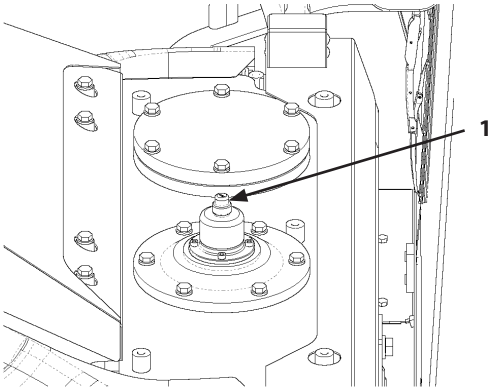


MNFQ-07-007

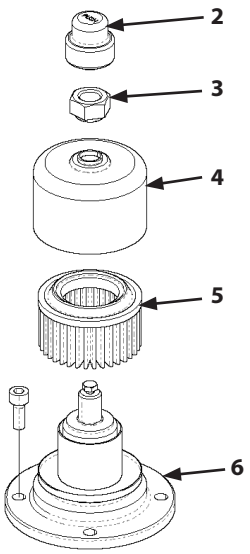
6 Replace Air Breather Element --- every 2000 hours

WARNING: Hydraulic oil becomes hot and pressurized during operation.

Severe burns may result if skin comes in contact with escaping hydraulic oil immediately after operation. Wait for the oil to cool before starting any maintenance work.



MNFQ-07-001



MNFQ-07-015

Replace

1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.
2. Before replacing the filter element, be sure to relieve the air pressure from the hydraulic oil tank by pressing air bleed valve (1).
3. Remove cap (2) and remove nut (3) by rotating it counterclockwise.
4. Rotate cover (4) counterclockwise and remove it. Remove element (5).
5. Install new element (5). Tighten cover (4) clockwise. After cover (4) comes in contact with the inside element, tighten the cover 1/4 turn further.
6. Install and tighten nut (3). Install cap (2).

   Nut (3) tightening torque:

   8 to 10 N·m (0.8 to 1.0 kgf·m, 6 to 7.4 lbf·ft)
7. Take care not to allow water or dust to enter the clearance (air discharge port) between cover (4) and body (6).

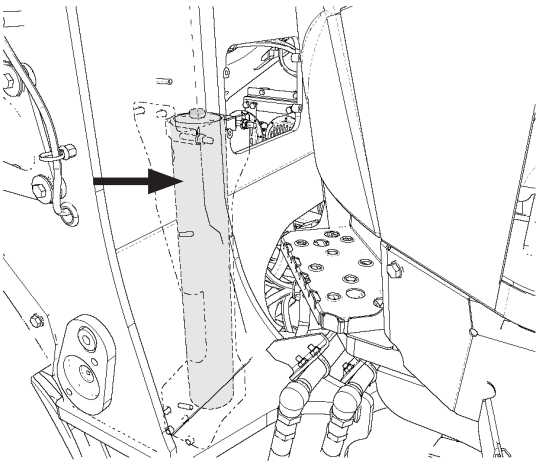
NOTE: Replace the element at the recommended regular intervals to keep the hydraulic oil clean and to extend the service life of the hydraulic equipment.

7 **Check Ride Control Accumulator Function, Gas Leakage, Looseness, and Damage**

--- every 500 hours

WARNING:

- **Allow only qualified personnel to handle the accumulator.**
- **High-pressure nitrogen gas is enclosed in the accumulator. Caution is required to prevent fires from occurring.**
- **Never strike the accumulator. Keep the accumulator away from sparks and/or flames.**
- **Do not directly heat the accumulator. Do not weld the accumulator housing.**
- **Be sure to release pressure before starting to work on the pipe lines.**



MNFQ-07-008

Let the machine travel with the ride control switch turned AUTO and OFF to compare the machine's vertical vibration during travel. Travel the machine at a speed faster than "Ride Control Drive Speed Setting" displayed on the multi-monitor. If the machine's vertical vibration is not dampened when letting the machine travel with the ride control function activated, the accumulator may be faulty. Consult Authorized Dealer for check and repair.

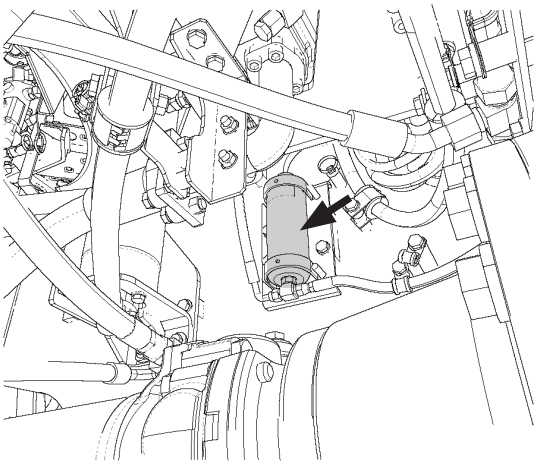
8 **Check Gas Pressure in Ride Control Accumulator**

--- every 2000 hours

Check the gas pressure at a regular interval. Ask Authorized Dealer for checking.

9 **Check Gas Pressure in Steering Accumulator --- every 2000 hours**

Check the gas pressure at a regular interval.
Check the gas pressure if the machine vibrates and the turning is not smooth when the steering wheel is operated. Consult Authorized Dealer for checking the gas pressure.



MNFQ-07-009

10 **Check Hoses and Lines**

--- every 10 hours (daily) / every 250 hours

WARNING: Escaping fluid under pressure can penetrate the skin causing serious injury. To avoid this hazard, search for leaks with a piece of cardboard. Take care to protect hands and body from high-pressure fluids. If an accident occurs, see a doctor familiar with this type of injury immediately.

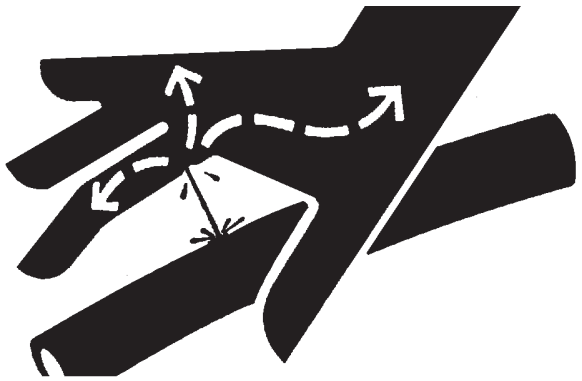
Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.

WARNING: Hydraulic oil and lubricant leaks can lead to fire that may result in serious injury.

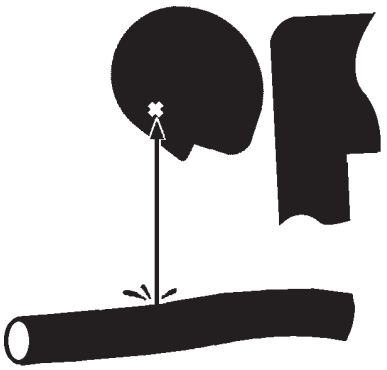
To avoid this hazard :

- **Park the machine on a firm, level surface. Lower the bucket to the ground. Stop the engine. Remove key from the key switch. Push the control lever lock switch to the lock (🔒) position.**
- **Check for missing or loose clamps, kinked hoses, lines or hoses that rub against each other, damaged oil cooler, and loose oil cooler flange bolts, and for leaks.**

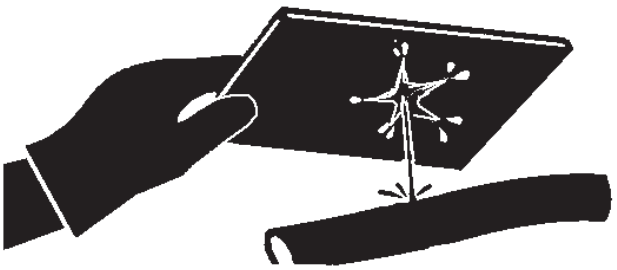
  Check hoses, lines and oil cooler at the check points indicated below for leaks and other damage that may result in future leaks. If any abnormalities are found, replace or retighten them, as shown in Tables below.
- **Tighten, repair or replace any missing, loose or damaged clamps, hoses, lines, oil cooler, and loose oil cooler flange bolts. Do not bend or strike high-pressure lines.**



SA-031



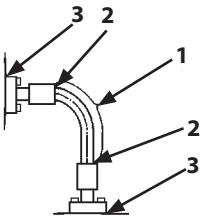
SA-292



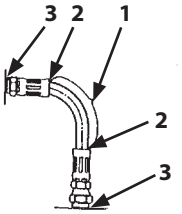
SA-044

Hose

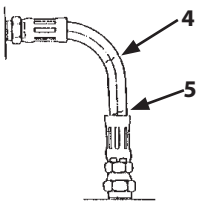
Interval (hours)	Check Points	Abnormalities	Remedies
Every 10 hours (daily)	Hose covers	Leak (1)	Replace
	Hose ends	Leak (2)	Replace
	Fittings	Leak (3)	Retighten or replace hose or O-ring
Every 250 hours	Hose covers	Leak (4)	Replace
	Hose ends	Leak (5)	Replace
	Hose covers	Exposed reinforcement (6)	Replace
	Hose covers	Blister (7)	Replace
	Hose	Bend (8), Collapse (9)	Replace
	Hose ends and Fittings	Deformation or Corrosion (10)	Replace



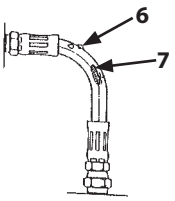
M137-07-008



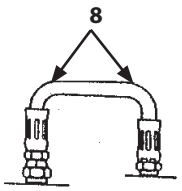
M115-07-145



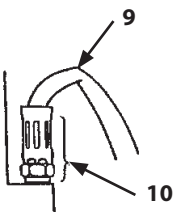
M115-07-146



M115-07-147



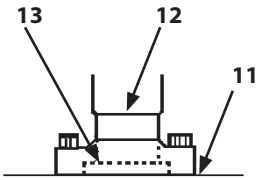
M115-07-148



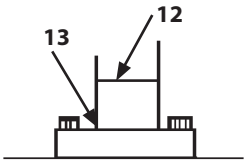
M115-07-149

Fig.1

Interval (hours)	Check Points	Abnormalities	Remedies
Daily Check	Contact surfaces of flange joints	Leak (11)	Replace
	Bolts	Loose or leak (11)	Retighten or replace O-ring
	Welded surfaces on flange joints	Leak (12)	Replace
Every 250 hours	Flange joint neck	Crack (13)	Replace
	Welded surfaces on flange joints	Crack (12)	Replace
	Clamps	Missing or deformation Loose bolts	Replace or retighten



M4GB-07-059



M4GB-07-060

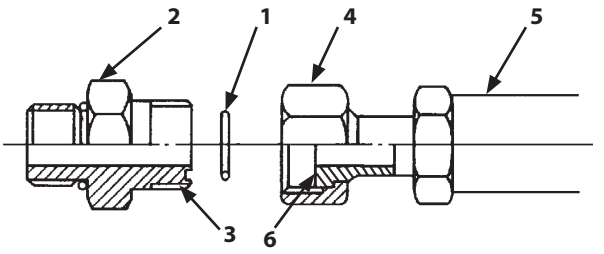
Fig.2

Service Recommendations for Hydraulic Fittings

Two hydraulic fitting designs are used on this machine.

Flat Face O-ring Seal Fitting (ORS Fitting)

An O-ring is used on the sealing surfaces to prevent oil leakage.



M104-07-033

1. Inspect fitting sealing surfaces (6). They must be free of dirt or defects.
2. Replace O-ring (1) with a new one when assembling fittings.
3. Lubricate O-ring (1) and install it into groove (3) using petroleum jelly to hold it in place.
4. Tighten fitting (2) by hand, pressing the fitting joint together to ensure O-ring (1) remains in place and is not damaged.
5. Tighten fitting (2) or nut (4) to the torque values shown. Do not allow hose (5) to twist when tightening fittings.
6. Check for leaks. If oil leaks from a loose connection, do not tighten fitting (2). Open the connection, replace O-ring (1) and check for correct O-ring position before tightening the connection.

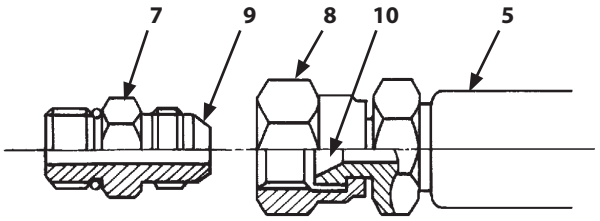
Tightening torque:
Tighten fittings to the torque values shown below.

Width across flats (mm)		27	36	41	50
Tightening torque:	N·m (kgf·m) (lbf·ft)	95 (9.5) (70)	180 (18) (132)	210 (21) (155)	350 (35) (258)

Metal Face Seal Fittings

Fittings are used on smaller hoses and consist of metal flare (9) and metal flare seat (10).

1. Tighten fitting (7) by hand.
2. Tighten fitting (7) or nut (8) to the torque values shown. Do not allow hose (5) to twist when tightening fittings.



M202-07-051

Tightening torque:
Tighten fittings to the torque values shown below.

Width across flats (mm)		17	19	22	27	36
Tightening torque:	N·m (kgf·m) (lbf·ft)	25 (2.5) (18)	30 (3.0) (22)	40 (4.0) (30)	80 (8.0) (59)	180 (18) (133)

E. Fuel System

1 **Check Fuel Level**
--- every 10 hours (daily)

DANGER: Beware of fire

Fuel is flammable. Keep fuel away from fire hazards.

IMPORTANT: Always fill the fuel tank with the specified diesel fuel. Failure to do so may cause engine trouble and also making it difficult for the engine to start.

Required fuel specification

Use only super high quality or high quality DIESEL FUEL (JIS K-2204) (ASTM D-975) (EN-590). Kerosene must NOT be used.
Using bad quality fuel, drainage agent, fuel additives, gasoline, kerosene or alcohol refueled or mixed with specified fuel may deteriorate performance of fuel filters and cause sliding problem at lubricated contacts in the injector.
Using fuel other than ultra low-sulfur or low-sulfur diesel fuel has adverse effects on the engine and the aftertreatment device, which may result in malfunction.

Refueling

1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.

IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.

DANGER: Handle fuel carefully. Shut the engine off before fueling. Do not smoke while you fill the fuel tank or work on fuel system.

2. Check fuel gauge (1) of the monitor panel. If the fuel level is low, stop the engine. Refuel by removing cap (2) on the fuel tank.
3. Remove cap (2) of filler port.
   [Cap unlock procedures]
   - Release the key lock.
   - Pull up handle (3) and turn it counterclockwise to release cap lock.
   - Remove cap (2).

IMPORTANT: When refueling, ensure that dirt, water and other impurities are not introduced into the fuel line.

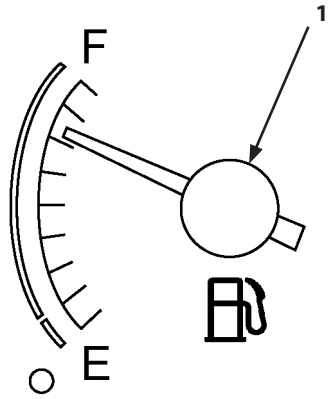
NOTE: Locate the fuel filler port inside the tool box on the right rear of the machine.

4. To avoid condensation, fill the tank at the end of each day's operation. Tank capacity is as follows.
   Do not fill the tank more than needed. Use the float on level gauge (4) to check the level.
   Stop filling when red mark (5) on the float becomes visible.
   Position the oil filler gun so that the gun will not obstruct the floating movement of level gauge (4).

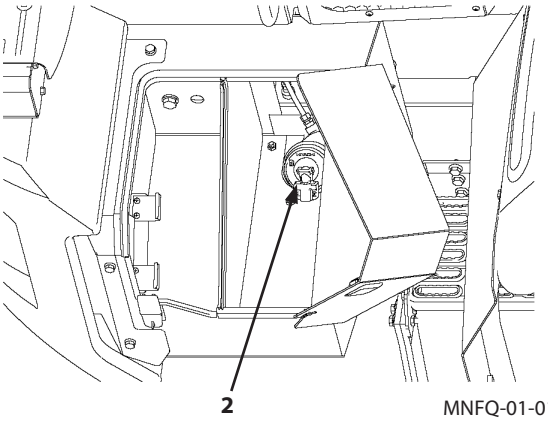
   Fuel tank capacity: 380 L (100 gal)

5. Just after fueling, install and lock fill cap (2) immediately.
6. Install cap (2) of filler port.
   [Cap lock procedures]
   - Install cap (2).
   - Turn handle (3) clockwise until cap is locked, and push down handle.
   - Lock the key.

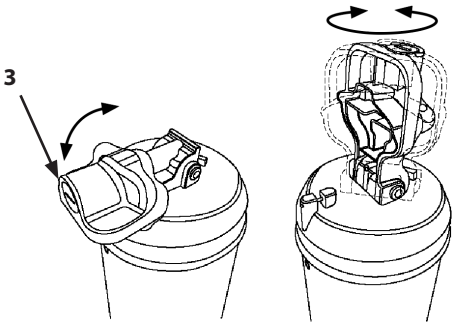
IMPORTANT: Wipe up any spilled fuel.



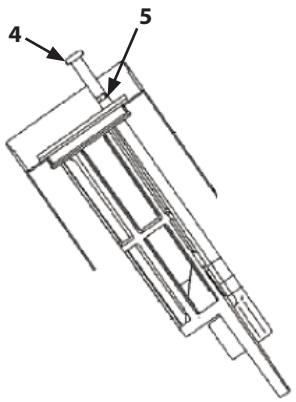
MNUD-01-016



MNFQ-01-013



MNTK-07-037

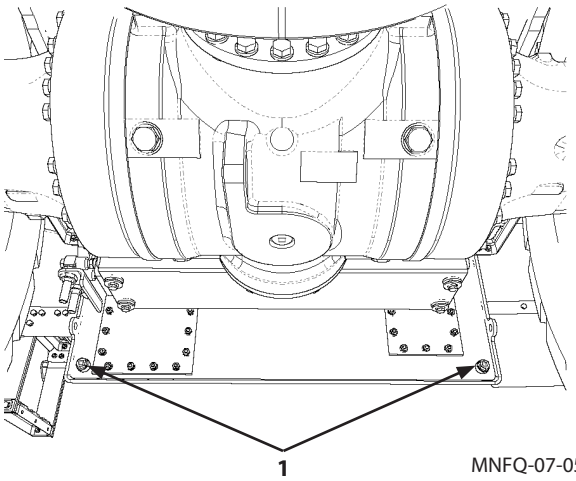


MNUD-07-065

2 **Drain Water and Sediment from Fuel Tank --- every 1000 hours**

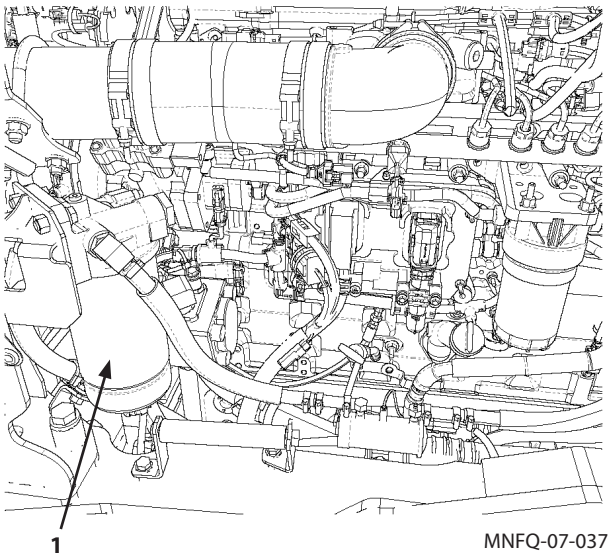
Before starting to operate the machine, loosen drain plug (1) on the fuel tank bottom and drain water and/or sediment from the fuel tank. Tighten plug when no more water is draining, and only fuel drainage is seen.

Drain plug (hex) width across flat: 24 mm (0.94 in), or
Hex socket width across flat: 12 mm (0.47 in)



MNFQ-07-051

3 Drain Fuel Filter
--- every 10 hours (daily)



MNFQ-07-037

IMPORTANT: Drain fuel filter daily before starting operation. The engine may be damaged if you do not drain fuel filter daily.

Fuel pre-filter (1) has water separator function, which drains water. Drain water when the engine trouble indicator flashes.

Draining Procedures

1. Connect transparent drain hose (5) located in the tool box to drain plug (3) under fuel pre-filter (1) and the case.
2. Loosen drain plug (3) to drain water.

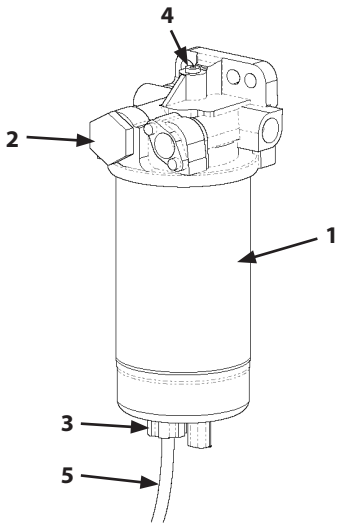
   Place a container to receive water for safety.
3. After draining water, securely tighten drain plug (3).

Bleed Air from the Fuel System

IMPORTANT: Air in the fuel system may make the engine hard to start or make it run rough or not run at all.

After running the fuel tank dry, draining water from fuel filter or fuel pre-filter (1) or replacing the fuel filter, be sure to bleed the air from the fuel system.

If fuel contains high water content, check the fuel filter earlier than the normal interval and drain water if necessary.



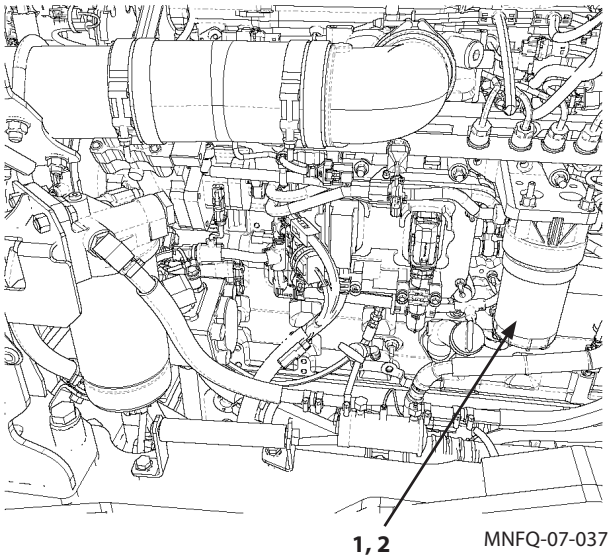
MNFQ-07-063

1. Loosen air bleed plug (4), operate feed pump (2) until no air bubble is observed in the fuel from the air bleed plug.
2. After no air bubble is spouted from air bleed plug (4), tighten air bleed plug (4) and operate the feed pump until it becomes difficult to move.
3. Once the feed pump becomes difficult to move, push the disk part of feed pump (2) back to the original position.
4. Start the engine. Check the fuel supply system for fuel leaks.

4 Replace Fuel Main Filter Element ---every 1000 hours

IMPORTANT:

- **Be sure to use only genuine Hitachi Construction Machinery elements for the fuel main filter element and the pre-filter element. Using a different element may adversely affect engine performance and/or shorten the engine service life. Note: any engine failure caused by using other manufacturers' elements, is not covered by Hitachi Construction Machinery Warranty Policy.**
- **Take care not to allow dirt and/or water to enter the fuel system.**



MNFQ-07-037

Procedures

1. Remove cartridge filter (2) from fuel filter (1) by using a filter wrench.

   Arrange a container to receive fuel for safety and to prevent ground from contamination.

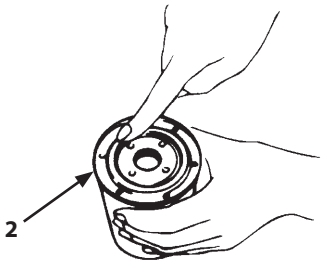
2. Apply a thin film of clean fuel to the gasket of new cartridge filter (2).
3. Turn cartridge filter (2) clockwise by hand until the gasket touches the contact area.
4. Using the filter wrench, tighten the cartridge 1/4 to 1/2 turn more.

   Be careful not to overly tighten cartridge filter (2). Deformation of the cartridge may result.

5. Bleed Air from the Fuel System

   After replacing the fuel filter, bleed air from the fuel system.

   (Refer to "Bleed Air from the Fuel System" in item 3.)



M4GB-07-066

5 Replace Fuel Pre-Filter Element ---every 1000 hours

IMPORTANT:

- **Be sure to use only genuine Hitachi Construction Machinery elements. Using a different element may adversely affect engine performance and/or shorten the engine service life. Note: any engine failure caused by using other manufacturers' elements, is not covered by Hitachi Construction Machinery Warranty Policy.**
- **Take care not to allow dirt and/or water to enter the fuel system.**

Procedures

1. Remove cartridge filter (1) by using a filter wrench.

   Arrange a container to receive fuel for safety and to prevent ground from contamination.

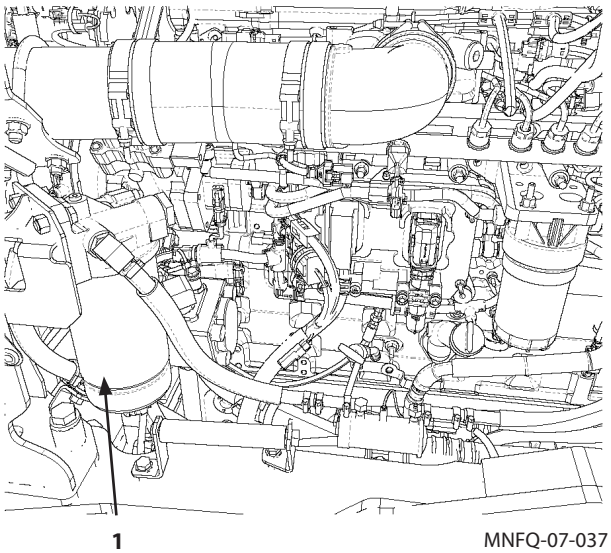
2. Apply a thin film of clean fuel to the gasket of new cartridge filter element (2).
3. Turn cartridge filter element (2) clockwise by hand until the gasket touches the contact area.
4. Using the filter wrench, tighten the cartridge 1/4 to 1/2 turn more.

   Be careful not to overly tighten cartridge filter (1). Deformation of the cartridge may result.

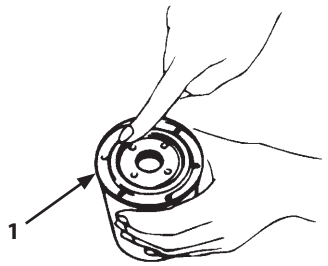
5. Bleed Air from the Fuel System

   After replacing the fuel pre-filter, bleed air from the fuel system.

   (Refer to "Bleed Air from the Fuel System" in item 3.)



MNFQ-07-037

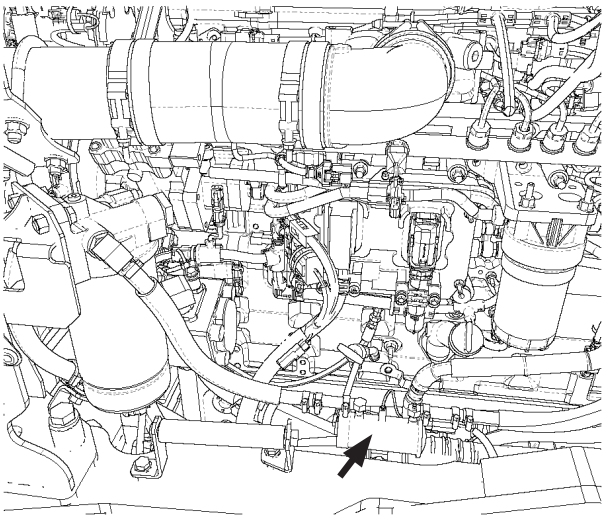


M4GB-07-066

6 Clean Fuel Solenoid Pump Strainer --- every 1000 hours

Cleaning

When the strainer is disassembled, be sure to replace the gasket. Install the cover and the magnet only after sufficiently cleaning them. After being assembled, closely check the air-tightness of the strainer.



MNFQ-07-037

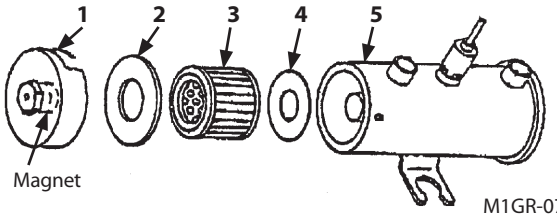
Disassembling/ Assembling

To remove cover (1), loosen with a spanner. After cover (1) is removed, gasket (2), strainer (3), and gasket (4) are easily removed in order. Wash removed strainer (3) with light oil. Install the strainer in the reverse order of disassembling. At that time, install gasket (2) into cover (1) first. Securely tighten cover (1) to pump (5) using a spanner.

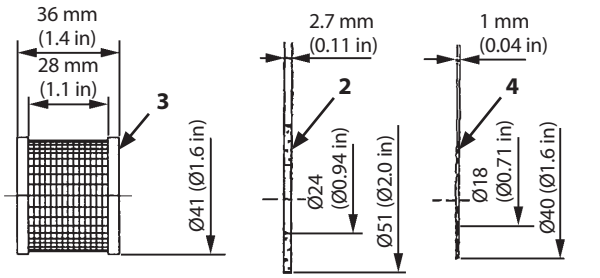
NOTE: Wrench size: 17 mm

IMPORTANT:

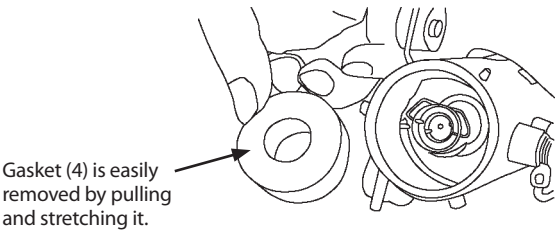
- **Only carry out cleaning and replacement of the strainer as well as the replacement of gaskets (2) and (4) while servicing the machine. Never attempt to disassemble other parts.**
- **Gasket (4) can get caught with the shaft of pump (5), making it difficult to remove the gasket, but do not disassemble the shaft of pump (5). If the gasket is difficult to remove, do not disassemble other parts but extend gasket (4) to remove it. Use new gasket (4) for assembling.**



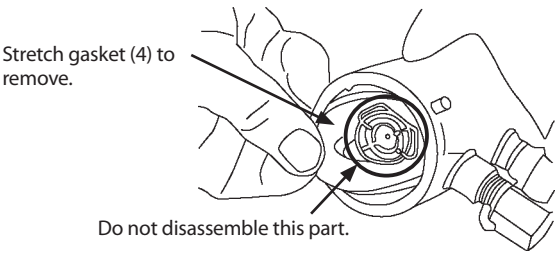
M1GR-07-004



M1U1-07-006



MDAA-07-054



MDAA-07-053

7 **Check Fuel Hoses**

--- every 10 hours (daily) / every 250 hours

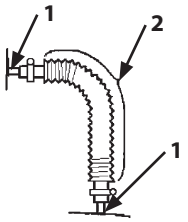
WARNING: Fuel leaks can lead to fires that may result in serious injury.

Check for kinked hoses, hoses that rub against each other, and any fuel leaks.

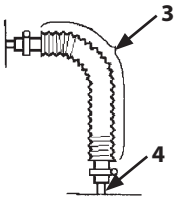
Repair or replace any loose or damaged hoses.

Never reinstall bent or damaged hoses.

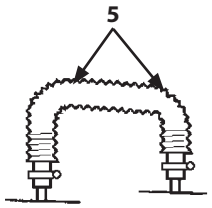
According to the check points shown below, check hoses for oil leaks and damage.
If any abnormality is found, replace or retighten as instructed in the table.



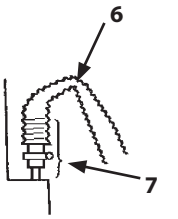
M4GB-07-071



M4GB-07-072



M4GB-07-073



M4GB-07-074

Hose

Interval (hours)	Check Points	Abnormalities	Remedies
Every 10 hours (daily)	Hose ends Hose covers	Leak (1) Wear, crack (2)	Retighten or replace
Every 250 hours	Hose covers Hose ends Hose Hose fittings	Crack (3) Crack (4) Bend (5), Collapse (6) Corrosion (7)	Replace Replace Replace Replace

F. Air Cleaner

1 **Clean and Replace Air Cleaner Element**

Cleaning --- every 250 hours or when the monitor indicator lights

Replacement --- after cleaning 6 times (or every 1 year)

Air cleaner (1) is comprised of double elements, the outer element and inner element. Normally, clean the outer element. In case severely contaminated, remove the inner element and clean it in the same cleaning method as the outer element is cleaned.

1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.

IMPORTANT: Take care not to allow foreign matter such as dirt to enter the engine when cleaning or replacing elements.

2. Loosen clip band (3) and remove dust cap (2). Clean off dust inside the cap.

CAUTION: Wear goggles or safety glasses when using compressed air [less than 0.2 MPa (2 kgf/cm², 29 psi)].

IMPORTANT: To clean elements (4) (5), avoid giving shocks or striking element with other objects.

3. Clean outer element (5) by blowing compressed air [less than 0.2 MPa (2 kgf/cm², 29 psi)] outward from the inside of the filter element. After cleaning, be sure to check element (5) for any damage. If any damage is found, replace the element with a new one.

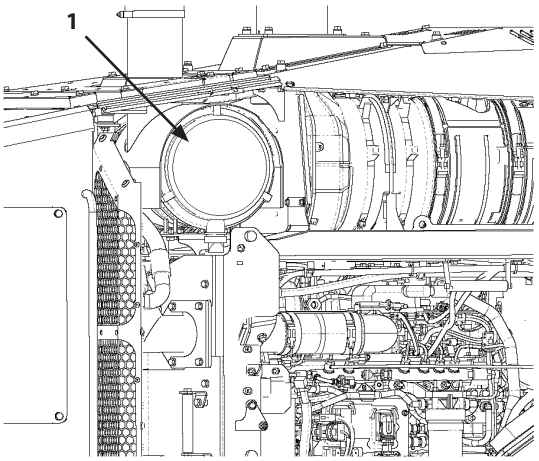
IMPORTANT: Do not reuse inner element (4).

4. In case the air filter restriction indicator lights soon after cleaning outer element (5) even if the cleaning times are less than 6 times, replace both outer and inner elements with new ones.

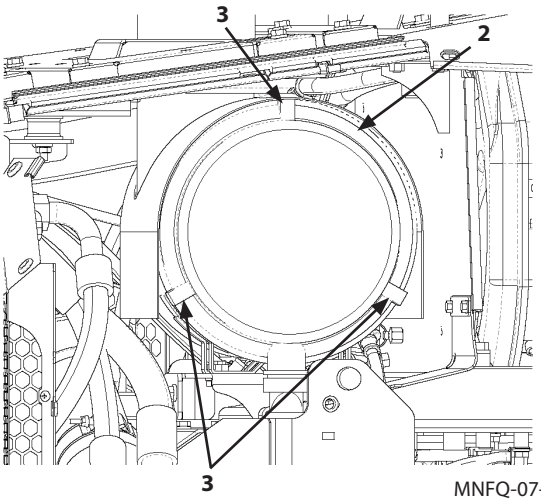
5. Install dust cap (2) in the original position.

NOTE: Check that O-ring (6) is installed to cap properly. Replace it if damaged or deteriorated.

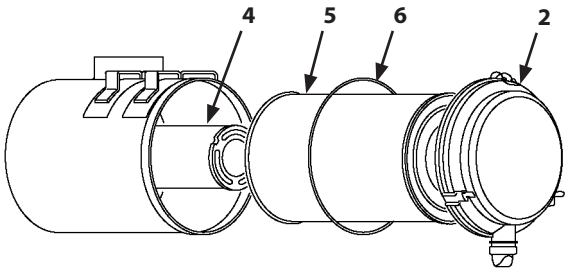
6. After cleaning is complete, run the engine at slow speed. Then, check that the air filter restriction indicator is not ON.



MNFQ-07-023



MNFQ-07-024

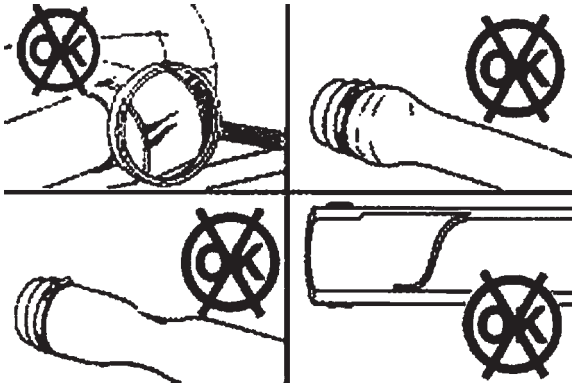


MNUD-07-018

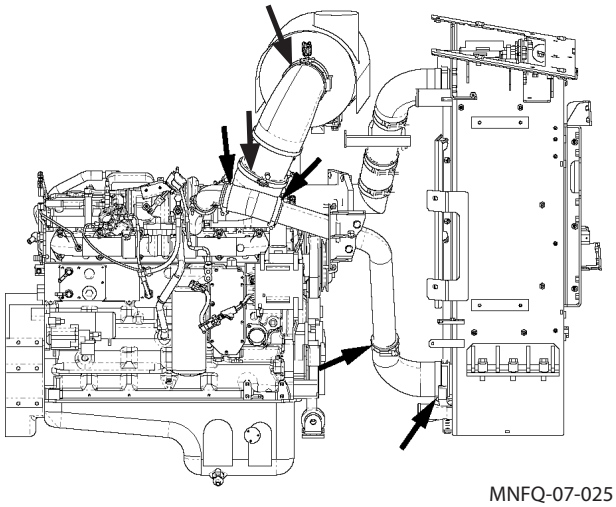
2 **Check Air Inlet System**
--- every 10 hours (daily)

Check pipes and hoses of the air inlet system for wear, damage or loose connections and clamps. Replace damaged pipes and hoses. Retighten loose clamps.

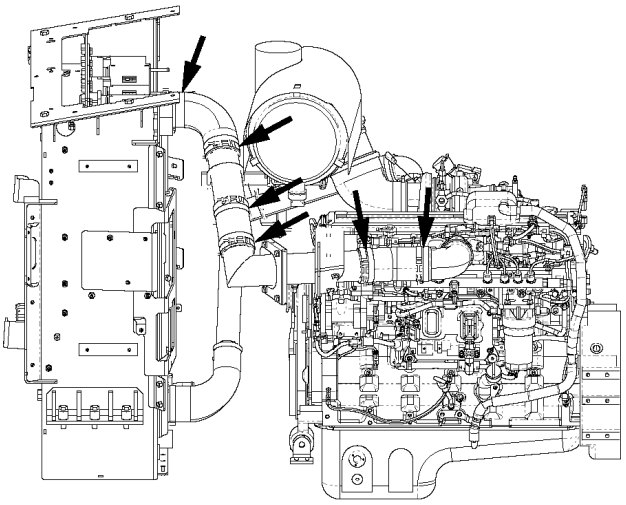
Tightening torque: 8 N·m (0.8 kgf·m, 5.9 lbf·ft)



MNEC-07-121



MNFQ-07-025



MNFQ-07-026

G. Cooling System

Coolant

Adjust the coolant used in the machine to the appropriate concentration of soft water and coolant according to the operating environment temperature. For the concentration for each operating temperature, refer to the table below. Do not use strong acid or alkaline water.
If the concentration is inappropriate, service life of the cooling parts and engine may be shortened due to damage by freezing or corrosion of coolant system parts, or machine over heat.
Use the Hitachi Construction Machinery genuine Long-Life Coolant or organic Coolant.
It is highly recommended to use Hitachi Construction Machinery genuine Long-Life Coolant as it is specially designed and tested to provide adequate performance for the machine.

Precautions for handling coolant

WARNING: Coolant is poisonous.

- **Coolant is poisonous; if ingested, it can cause serious injury or death. Induce vomiting and get emergency medical attention immediately.**
- **If coolant is accidentally splashed into eyes, flush with water for 10 to 15 minutes and get emergency medical attention.**
- **When storing coolant, be sure to keep it in a clearly marked container with a tight lid. Always keep coolant out of the reach of children.**
- **Pay attention to fire hazards. LLC is specified as a dangerous substance in the fire protection law.**

IMPORTANT: When storing or disposing of coolant, be sure to comply with all local regulations.

Mixing ratio [%]	Coolant Capacity: 36 L (9.5 gal)	
	LLC [L (gal)] *	Soft Water [L (gal)]
50	18 (4.8)	18 (4.8)

*NOTE: * Use concentrate type coolant.*

If the premix 50/50 type is used, do not mix with water.

Supplement Coolant Additive DCA4

The coolant contains the supplement coolant additive (SCA) DCA4 chemistry. The DCA4 concentration level must be maintained through routine maintenance.
To maintain the proper DCA4 level, change the coolant filter using the specified filter WF2072 every 500 hours. Refer to the following table for the filters and coolant additive to be used.

	Filter Type	SCA	
		Type	Quantity
Every 500 hours	WF2072	Not needed	-
When replacing coolant	WF2072	DCA65L	1
		DCA60L	1

When adding coolant or the coolant concentration is adjusted, the DCA4 level maybe lowered.
Contact Authorized Dealer for the DCA4 level check and adjustment.

Precautions for Using DCA4

WARNING: DCA4 includes alkali. Avoid splashing DCA4 in your eyes or swallowing it. If DCA4 is splashed into your eyes or swallowed, follow the instructions shown below. Keep out of reach of children.

- Exposure tolerances
  Slight skin exposure to DCA4 will cause no serious problems. However, longer or repeated exposure times, inhaling, swallowing or splashing DCA4 in your eyes will cause serious problems. Take the emergency measures shown below.

Cause	Symptoms	Emergency Measure
Inhaling	The nose smarts.	Breathe fresh air.
Long or repeated exposure	The skin smarts.	Wash with fresh water. Take off clothes contaminated with DCA4 and clean them thoroughly.
Splashing in eyes	The eyes smart.	Wash immediately with fresh water for 15 minutes and see a physician.
Swallowing		Drink a lot of carbonated beverages and see a physician.

- Disposal
  Be careful not to spill DCA4 on machine or ground. If DCA4 is spilt, wipe it up and clean contaminated surface thoroughly.
  Use a container to collect spilt DCA4 and consign it to professional disposers. Disposal of surplus DCA4 when changing coolant should also be assigned to professional disposers.

1 **Check Coolant Level**
--- every 10 hours (daily)

CAUTION: If the engine is kept running with insufficient coolant, the EGR cooler maybe damaged due to overheat.

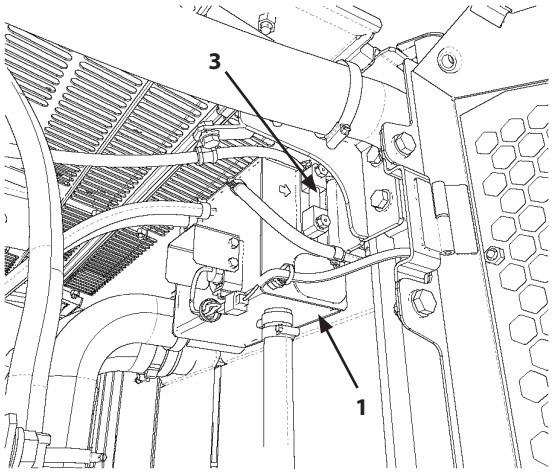
IMPORTANT:

- **When refilling a long life coolant (LLC), use the same brand product and the same mixture ratio as already used in the machine.**
- **If only water is refilled, the mixture ratio in the long life coolant (LLC) is diluted so that anti-rust and antifreeze effect in the coolant will become diluted and less affective.**
- **Refer to page 7-75 for the coolant specifications.**

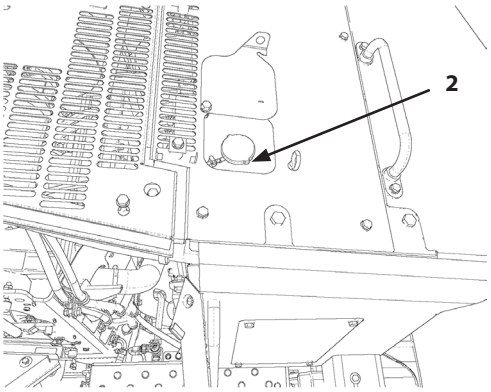
Check the coolant level at reservoir tank (1).
Sight gauge (3) of expansion tank (1) should be filled with coolant at normal level.
If not, add the coolant mixture via cap hole (2) on the expansion tank (1).

NOTE: Do not fill up expansion tank (1).

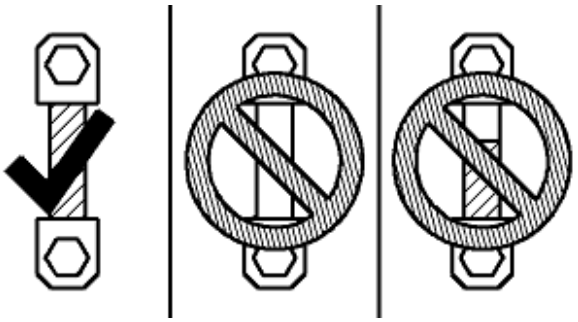
- When refilling a long life coolant (LLC), use the same brand product and the same mixture ratio as already used in the machine.
- If only water is refilled, the mixture ratio in the long life coolant (LLC) is diluted so that anti-rust and antifreeze effect in the coolant will become deteriorated.



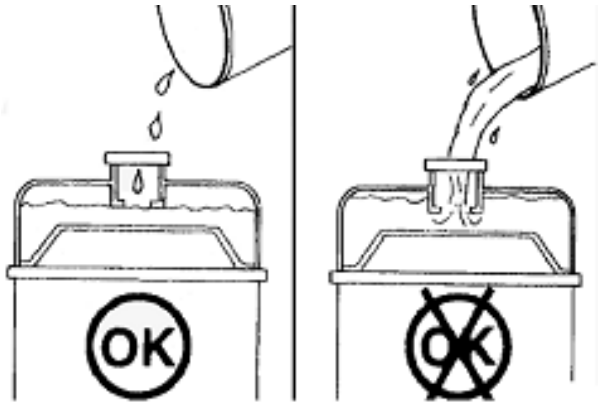
MNFQ-07-027



MNFQ-07-028



90Z7B-7-76-3

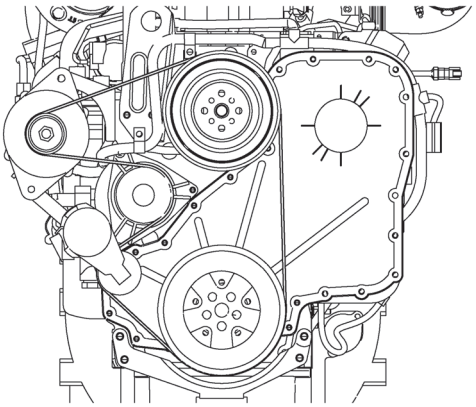


90Z7B-7-76-4

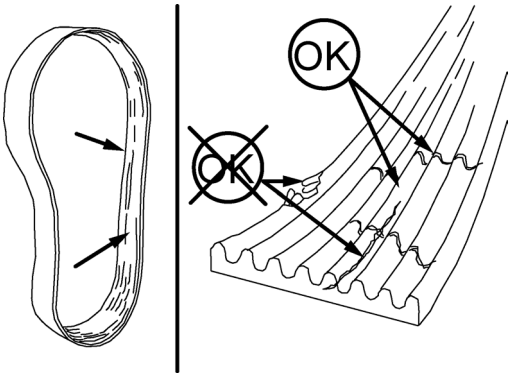
2 **Check Drive Belt**

--- every 10 hours (daily)

Check the drive belt for any abnormality. If any cracks are found, replace the belt with a new one.



90Z7B-7-77-1



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3 **Check Drive Belt Tensioner**

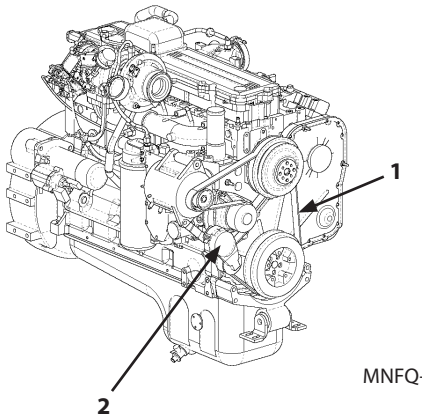
--- every 1000 hours or once a year which ever comes first.

1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.
2. Install articulation lock bar to the front and rear of the frame by following the procedures described on page 7-9.
3. Open the side cover to access the engine.
4. With the belt installed, verify that neither tensioner arm stop is in contact with the spring casing stop. If either stop is touching, drive belt (1) must be replaced.

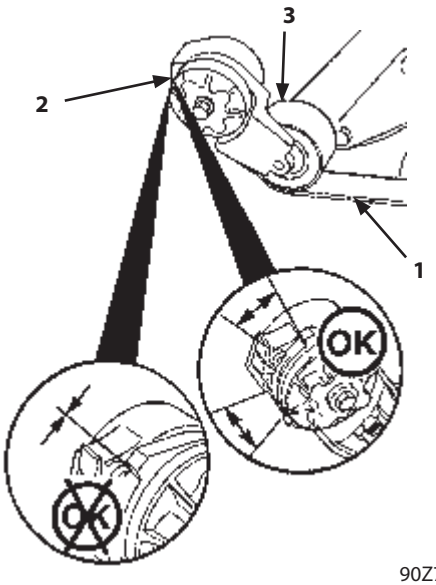
   After replacing the belt, if the tensioner arm stops are still in contact with the spring case stop, the belt tensioner must be replaced.
5. Check tensioner (2) for cracks on arm, pulley, and stops. If any cracks are observed, the drive belt tensioner must be replaced.

NOTE: Consult Authorized Dealer for the drive belt tensioner replacement.

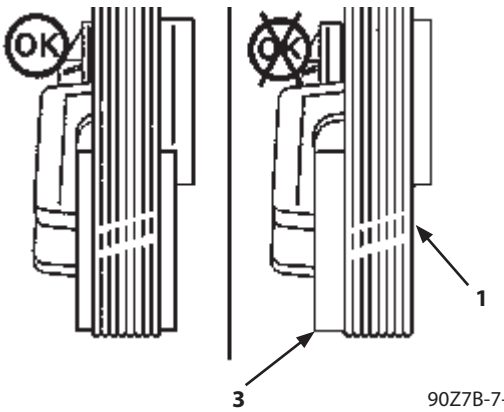
6. Check belt tensioner pulley (3) for any dirt or damage. If it is dirty or damaged, contact Authorized Dealer for cleaning or replacement.
7. Check the location of drive belt on belt tensioner pulley (3).
   The belt must be centered on, or close to the middle of, the pulley.
   Misaligned belts, either too far forward or backward, can cause belt wear, belt roll-off failures, or increase uneven tensioner bushing wear.



MNFQ-07-029



90Z7B-7-77-2



90Z7B-7-77-3

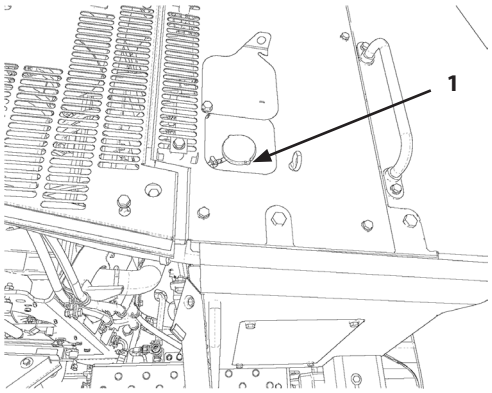
4 **Change Coolant**

--- every two years or 3000 hours whichever comes first.

NOTE: When Hitachi Construction Machinery Genuine Long-Life Coolant is used, change interval is once every two years (For example in autumn every other year) or every 3000 hours whichever comes first.

CAUTION: Do not remove the expansion tank cap (1) until the coolant temperature in the radiator is cool. Hot steam may spout out, possibly causing severe burns. After the coolant temperature cools, slowly loosen cap (1) to release the inside air pressure before removing cap (1).

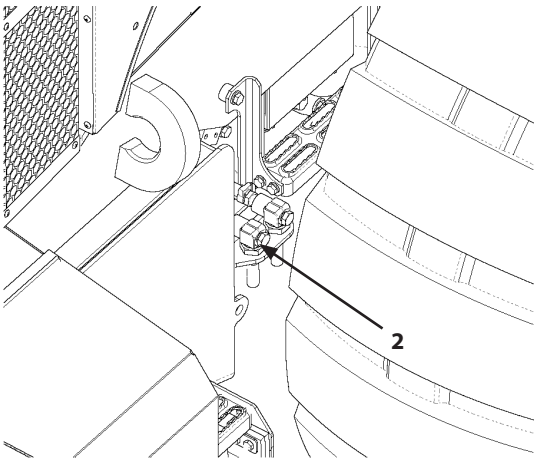
IMPORTANT: Use Hitachi Construction Machinery genuine coolant.



MNFQ-07-028

1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.
2. Install articulation lock bar to the front and rear of the frame by following the procedures described on page 7-9.
3. Remove expansion tank cap (1). Open radiator drain cock (2) and drain the coolant.

NOTE: The right side one is the engine oil drain cock. Do not erroneously open it.



MNFQ-07-030

4. Close radiator drain cock (2). Supply the specified coolant to the appropriate level by referring to **1** Check Coolant Level. When adding coolant, do so slowly to avoid mixing in the system.

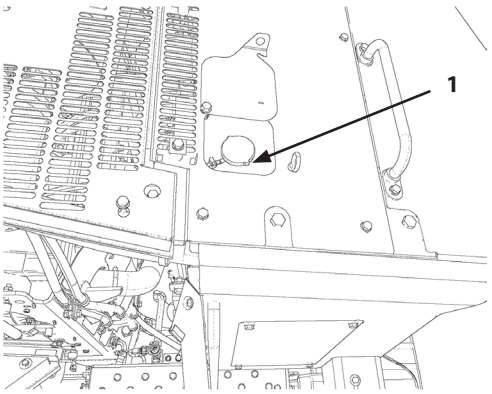
   Start the engine and sufficiently bleed air from the cooling system.

NOTE: When refilling a long-life coolant, pour it at flow rate 11 L/min or below. If flow rate is larger than the above, air does not bleed, being unable to fill the specified amount.

5. After adding coolant, operate the engine for several minutes. Check the coolant level again and add coolant if necessary.

5 Replace DCA4 Coolant Filter Cartridge --- every 500 hours

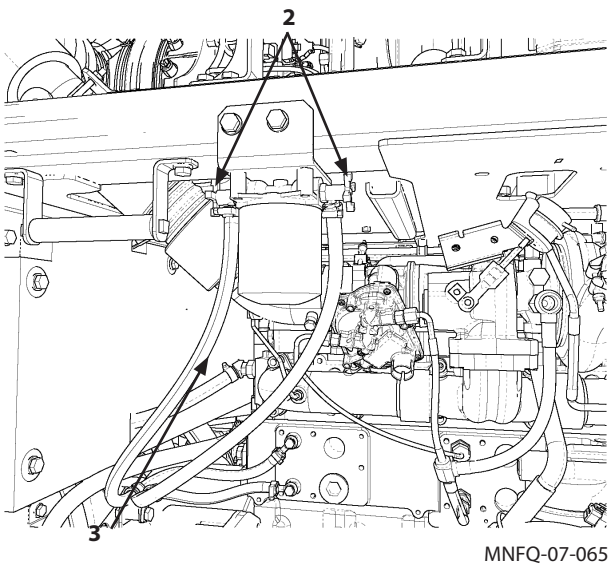
WARNING: Do not remove expansion tank cap (1) until the coolant temperature in the radiator is cool. Hot steam may spout out, possibly causing severe burns. After the coolant temperature cools, slowly loosen expansion tank cap (1) to release the inside air pressure before removing expansion tank cap (1).



MNFQ-07-028

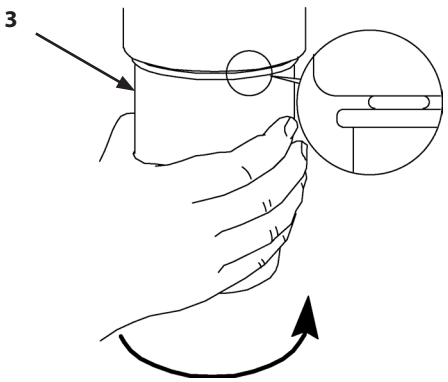
1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.
2. Turn to remove cap (1) slowly.
3. Turn to close coolant shut-off valves (2).
4. Remove and properly dispose of coolant filter (3).
5. Clean the filter head gasket surface.
6. Apply a light film of clean engine oil to the gasket surface of a new DCA4 coolant filter cartridge (WF2072).

NOTE: The filter WF2071 is initially installed when the machine is shipped from the factory. Refer to page 7-75 for the filter to be used.



MNFQ-07-065

7. Install filter (3) firmly by hand.
   Follow the instructions supplied with the filter.



OM0200

8. Open coolant shut-off valves (2) and install radiator cap (1).

9. Run the engine and check for coolant leaks.

10. Idle the engine for about five minutes to purge all the air from the coolant.

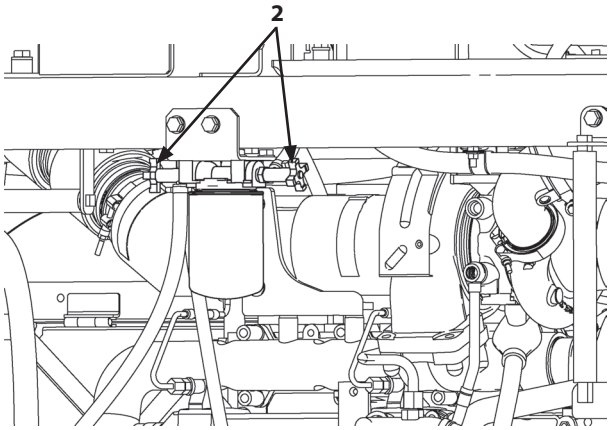
11. After air has been purged from the system, stop the engine and check the coolant level again.

12. If needed, add required amount of the coolant.

NOTE: Refer to page 7-75 for the correct mixture.

13. Check the DCA4 concentration in coolant as follows.

NOTE: The coolant concentration may be outside the specification according to operation conditions or due to an unexpected failure. Then, it is recommendable to check the concentration.

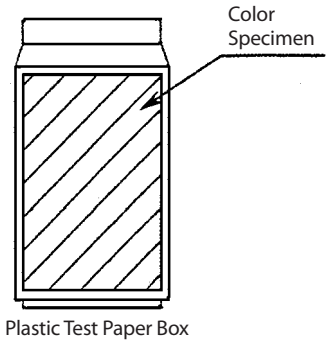


90Z7B-7-80-1

Inspection Procedures of Coolant Concentration

Check the concentration of DCA4 in coolant using the inspection kit shown below.

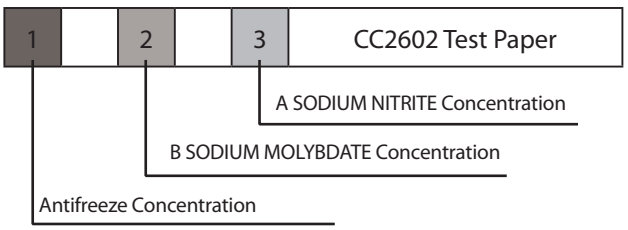
Name of Kit		Cummins Part No.	Hitachi Construction Machinery Part No.
Inspection Kit	CC2602	-	4404083



M162-07-077-1

- **Outline**

1. Both A and B reagents are coated on CC2602 test paper, allowing to measure the color changes on both A and B reagents.
2. At the same time, one more reagent is coated to easily determine the antifreeze concentration through color change.
   (The antifreeze concentration checked by this method should be just a guide line. When the exact antifreeze concentration is required, measure it using a specified equipment.)
3. Do not use diluted coolant for measurement. Collect coolant into a sample container. Directly dip the test paper into the collected coolant. Compare the reagent color change on the test paper with the color specimen coated on the test paper box 45 seconds after desiccating.



- **Precautions for Using CC2602 Test Kit**

Maintain coolant temperature to 10 to 54 °C (50 to 129.2 °F) while checking. Otherwise, incorrect color change may result.

Compare the reagent color with the color specimen to measure the concentration in daylight. In case it is difficult to specify the color concentration through the comparison of the reagent color with the color specimen, adopt the lighter side concentration as a safer value.

The reagents provided in the test kit are sensitive to light, heat, and excessive moisture so that they should be stored in a plastic container. Unless the test papers are used, be sure to close the container cover correctly.

Avoid to expose the test kit to the direct ray of the sun while storing and maintain the ambient temperature of the storing place to 32 °C (89.6 °F) or lower.

The effective life time of the reagent is printed on the upper section of the CC2602 container.
Do not use any reagents after the effective life time expires.

If the reagent color has changed to light brown or pink, avoid using such reagent.

If the color specimen was spoiled, wipe stain with a cloth. Do not use any soap or solvent.

The reagent color continues to change from soon after being dipped into coolant and stops after it is dried up. Therefore, measure the coolant concentration within the specified time range.

Concentration Check Table
% GLYCOL/FREEZEPOINT (°F)

25%		33%		40%		50%		60%
+10	+5	0	-5	-10	-20	-30	-45	-60

DCA Unit/3.78L (1 US gal)
(DCA UNITS PER GALLON)

(SODIUM MOLYBDATE LEVEL)	A	B	C	D	E	F	G	H
ROW 6	0.0	1.7	2.8	3.1	3.7	4.1	4.9	5.7
ROW 5	0.0	1.7	2.3	2.7	3.1	3.5	4.3	5.1
ROW 4	0.0	1.4	1.8	2.0	2.4	2.8	3.6	4.4
ROW 3	0.0	1.2	1.5	1.7	2.1	2.5	3.3	4.1
ROW 2	0.0	1.0	1.2	1.4	1.8	2.2	3.0	3.8
ROW 1	0.0	0.6	0.9	1.1	1.5	1.9	2.7	3.5
ROW 0	0.0	0.3	0.6	0.8	1.2	1.6	2.4	3.2

(SODIUM NITRITE LEVEL)

- **How to Use Test Kit**

IMPORTANT: Measure time precisely to obtain the correct test results. Use a stop watch or watch with a second hand. If the reagent color change is checked too early or too late, correct measurement results will not be obtained. If coolant is maintained based on incorrect check data, damage to the engine may result.

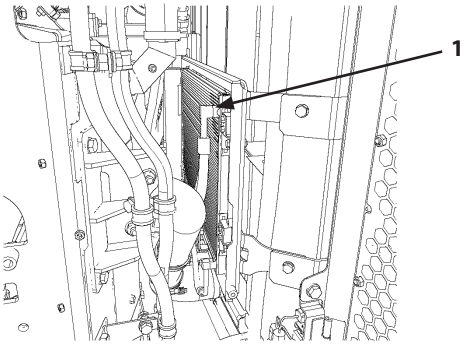
1. Use coolant collected from the radiator or the engine drain cock for checking. Wait to cool the collected coolant temperature to 10 to 54 °C (50 to 129.2 °F) before checking.
2. As soon as one test paper is taken out of the plastic container, close the cover correctly. Do not touch the area coated with the reagent. If the area has already changed to light brown use another test paper.
3. Dip the test paper into the collected coolant for one second. After taking up the test paper, desiccate the extra coolant.
4. Wait 45 seconds. Then, compare the changed reagent color on the test paper with the color specimen and determine the coolant concentration by following procedures.
   1) Take a record of the anti freeze concentration by comparing the color on reagent section (1) with the anti freeze color specimen printed on the test paper plastic box.
   2) Take a record of concentration by comparing the color on reagent section (2) with the SODIUM MOLYBDATE color specimen printed on the test paper plastic box.
   3) Take a record of concentration by comparing the color on reagent section (3) with the SODIUM NITRITE color specimen printed on the test paper plastic box.
5. Complete all color comparison check within 75 seconds after dipping the test paper into the coolant.
6. In case the reagent color corresponds to that between the color specimens, take the intermediate value. If it is difficult to determine which value should be taken, adopt the lighter color side concentration as a safer value.
7. Using the concentration check table, find the intersection between the recorded SODIUM MOLYBDATE concentration and the SODIUM NITRITE concentration.
   This intersection shows the coolant additive agent concentration per 3.78 L (1 US gal) of the coolant.
8. The colored concentration values in the concentration check table printed on the test paper box represents the values to be applied when the LLC concentration is 50%. When the LLC concentration is 40% or less, do not determine by color. Determine by figure values.
9. Record the measured coolant additive agent concentration value on the maintenance record sheet as reference data when performing next maintenance services.

6 **Clean Radiator/Oil Cooler and Other Cooling System --- every 500 hours or when the core is clogged.**

CAUTION: Wear goggles or safety glasses when using compressed air [less than 0.2 MPa (2 kgf/cm², 29 psi)].

IMPORTANT: If compressed air with the pressure of more than 0.2 MPa (2 kgf/cm², 29 psi) or tap water with high delivery pressure is used for cleaning, damage to the radiator/oil cooler fins may result.

Keep the nozzle away from the core surface more than 500 mm (20 in).



MNFQ-07-031

Over the Side Cover

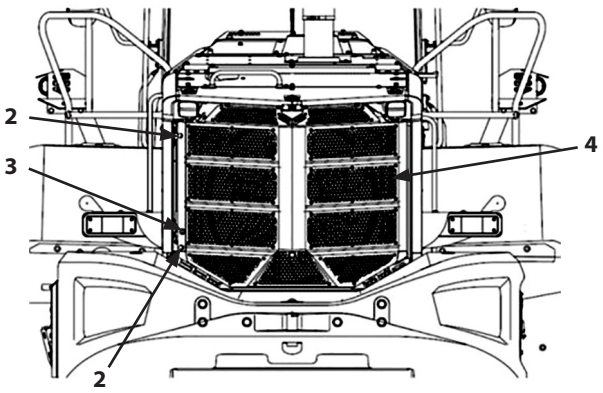
Check and clean air conditioner condenser (1).

Over the Rear Grille

Remove bolts (2) and release lock (3) and open rear grille (4). Removing bolts (5) opens the fan bracket. Check and clean torque converter oil cooler (6), hydraulic oil cooler (7), intercooler (8), radiator (9), and hydraulic driven fan (10).

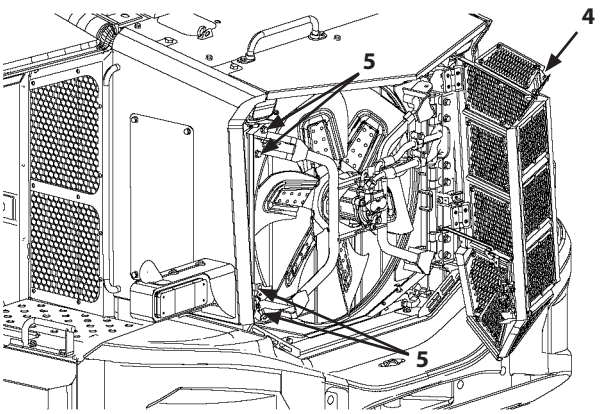
If dirt or dust is accumulated on them, cooling system performance decreases. Clean the radiator/oil cooler cores with compressed air pressure (lower than 0.2 MPa (2 kgf/cm², 29 psi)) or tap water. It will prevent a reduction in cooling system performance.

Close the fan bracket and rear grille (4). Be sure to tighten bolts (2).

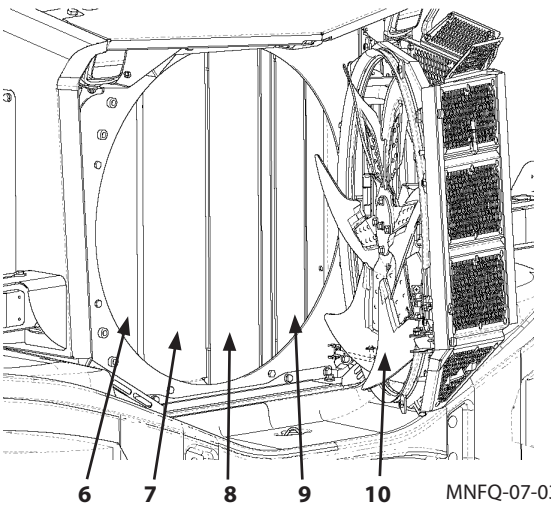


MNFQ-01-319

NOTE: Refer to page 1-261 for the rear grille.



MNFQ-01-012



MNFQ-07-032

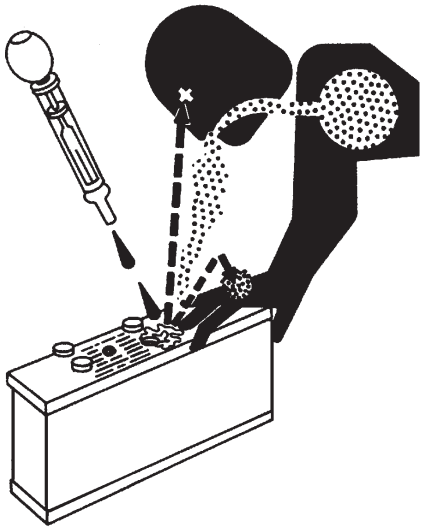
H. Electrical System

IMPORTANT:

- **Improper radio communication equipment and associated parts, and/or improper installation of radio communication equipment affects the machine's electronic parts, causing involuntary movement of the machine.**

  Improper installation of electrical equipment may cause machine failure and/or a fire on the machine.

  Be sure to consult Authorized Dealer when installing radio communication equipment or additional electrical parts, or when replacing electrical parts.
- **Never attempt to disassemble or modify the electrical/electronic components. If replacement or modification of such components is required, contact Authorized Dealer.**

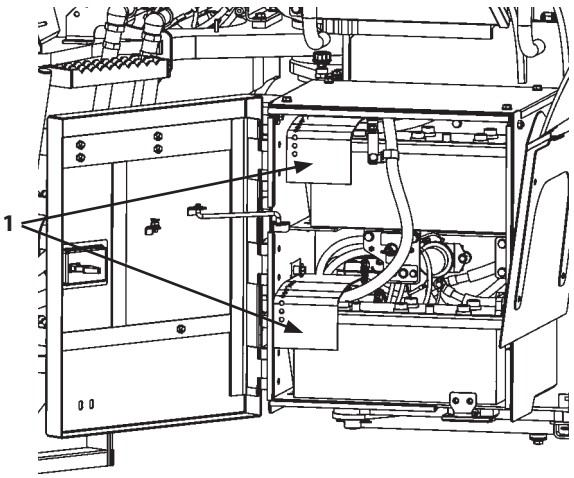


SA-036

1 Batteries

WARNING:

- **Battery gas can explode. Keep sparks and flames away from batteries.**
- **Do not leave cover (1) removed. Do not keep tools, metals or flammable materials around the battery or inside the battery room. If a metal tool is placed across the battery terminal and a vehicle component such as the engine block, sparks may be created, possibly resulting in fire and/or explosion.**
- **Use a flashlight to check the battery electrolyte level.**
- **Do not continue to use or charge the battery when electrolyte level is lower than specified. Explosion of the battery may result.**
- **Charge the batteries in a well ventilated location.**
- **Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into the eyes.**



MNFQ-01-328

Avoid hazard by:

1. **Filling batteries in a well-ventilated area.**
2. **Wearing eye protection and rubber gloves.**
3. **Avoiding breathing fumes when electrolyte is added.**
4. **Avoiding spilling or dripping electrolyte.**
5. **Using proper booster battery starting procedures.**

If you spill acid on yourself:

1. **Flush your skin with water.**
2. **Apply baking soda or lime to help neutralize the acid.**
3. **If splashed in eyes, flush with water for 10 to 15 minutes. Get medical attention immediately.**

If acid is swallowed:

1. **Do not induce vomiting.**
2. **Drink large amounts of water or milk.**
3. **Get medical attention immediately.**

IMPORTANT:

- **Add water to batteries in freezing weather before you begin operating your machine for the day, or else charge the batteries.**
- **If the battery is used with the electrolyte level lower than the specified lower level, the battery may deteriorate quickly.**
- **Do not refill electrolyte more than the specified upper level. Electrolyte may spill, damaging the painted surfaces and/or corroding other machine parts.**

NOTE: If electrolyte is refilled more than the specified upper level line or beyond the bottom end of the sleeve, remove the excess electrolyte until the electrolyte level is down to the bottom end of the sleeve using a pipette. After neutralizing the removed electrolyte with sodium bicarbonate, flush it with plenty of water, otherwise, consult the battery manufacturer.

Electrolyte Level Check --- every 100 hours (monthly)

1. Check the electrolyte level at least once a month.
2. Park the machine on level ground and stop the engine.
3. Check the electrolyte level.

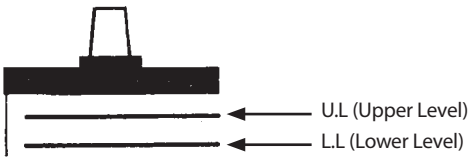
3.1 When checking the level from the battery side:

Clean around the level check lines with a wet towel. Do not use a dry towel. Static electricity may be developed, causing the battery gas to explode. Check if the electrolyte level is between U.L (Upper Level) and L.L (Lower Level).

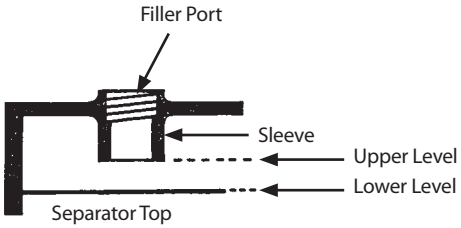
If the electrolyte level is lower than the middle level between the U.L and L.L, immediately refill with distilled water or commercial battery fluid.

Be sure to refill with distilled water before recharging (operating the machine).

After refilling, securely tighten the filler caps.



M146-07-109



M146-07-110

Specified Electrolyte Level



Since the electrolyte surface touches the bottom end of the sleeve, the electrolyte surface is raised due to surface tension so that the electrode ends are seen curved.

M146-07-111

Lower



When the electrolyte surface is lower than the bottom end of the sleeve, the electrode ends are seen straight.

M146-07-112

3.2 When impossible to check the level from the battery side or no level check mark is indicated on the side:

After removing the filler plug from the top of the battery. Check the electrolyte level by viewing through the filler port. It is difficult to judge the accurate electrolyte level in this case. When the electrolyte level is at the U.L, the level is judged to be proper. Referring to the illustrations at the right side, check the level. When the electrolyte level is lower than the bottom end of the sleeve, refill with distilled water or commercial battery fluid up to the bottom end of the sleeve.

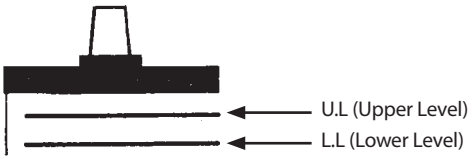
After refilling, securely tighten the filler caps.

Be sure to refill with distilled water before recharging (operating the machine).

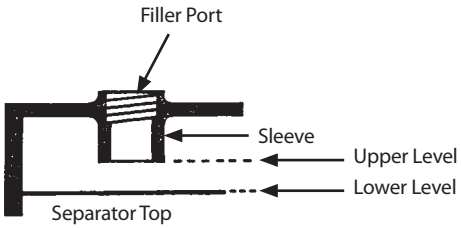
3.3 When an indicator is available to check the level, follow its check result.

4. Always keep the area around the battery terminals clean to prevent battery discharge.

Check terminals for loose and/or rust. Coat terminals with grease or petroleum jelly to prevent corrosion build up.



M146-07-109



M146-07-110

Specified Electrolyte Level



Since the electrolyte surface touches the bottom end of the sleeve, the electrolyte surface is raised due to surface tension so that the electrode ends are seen curved.

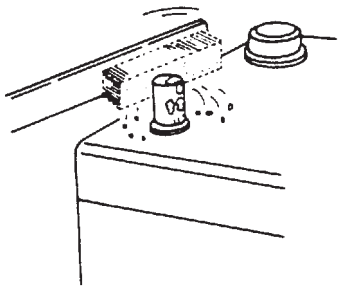
M146-07-111

Lower



When the electrolyte surface is lower than the bottom end of the sleeve, the electrode ends are seen straight.

M146-07-112



M409-07-072

Check Electrolyte Specific Gravity --- every 250 hours

WARNING:

- **Battery gas can explode. Keep sparks and flames away from batteries.**

  Use a flashlight to check the battery electrolyte level.
- **Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into the eyes.**
- **Never check the battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.**

Avoid hazard by:

1. **Filling batteries in a well-ventilated area.**
2. **Wearing eye protection and rubber gloves.**
3. **Avoiding breathing fumes when electrolyte is added.**
4. **Avoiding spilling or dripping electrolyte.**
5. **Using proper booster battery starting procedures.**

If you spill acid on yourself:

1. **Flush your skin with water.**
2. **Apply baking soda or lime to help neutralize the acid.**
3. **If splashed in eyes, flush with water for 10 to 15 minutes. Get medical attention immediately.**

If acid is swallowed:

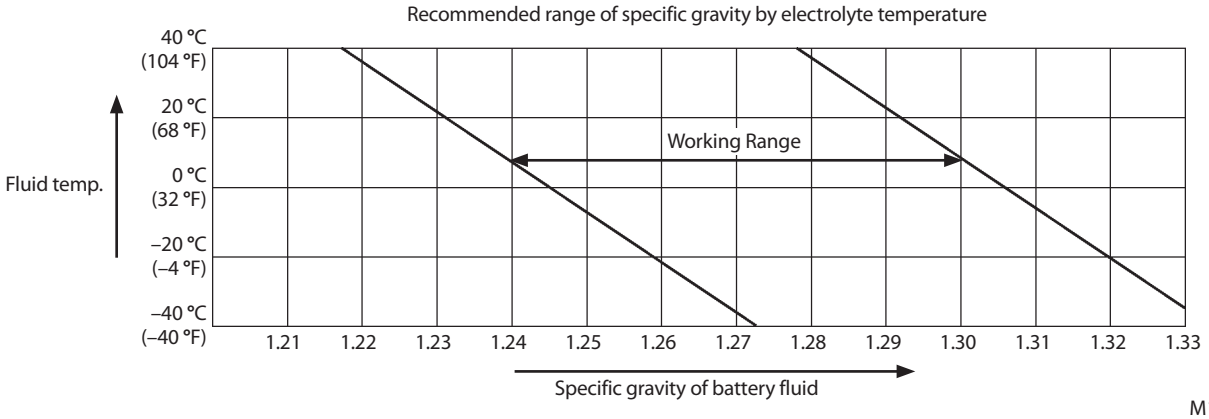
1. **Do not induce vomiting.**
2. **Drink large amounts of water or milk.**
3. **Get medical attention immediately.**

IMPORTANT: Check the electrolyte specific gravity in each battery cell.

The lowest limit of the specific gravity for the electrolyte varies depending on electrolyte temperature.

Check the electrolyte specific gravity in each battery cell.

The lowest limit of the specific gravity for the electrolyte varies depending on electrolyte temperature. The specific gravity should be kept within the range shown below. Charge the battery if the specific gravity is below the limit.



M104-07-054

Replace Batteries

IMPORTANT: Before replacing the battery, turn battery disconnect switch to OFF position.

When storing or disposing of battery, be sure to comply with all local regulations.

Your machine has two 12-volt batteries with negative (-) ground.
If one battery in a 24-volt system has failed but the other is still good, replace the failed battery with one of the same type. For example, replace a failed maintenance-free battery with a new maintenance-free battery. Different types of batteries may have different rates of charge. This difference could overload one of the batteries and cause it to fail.

2 Check Monitor Functions and All Other Instrument Operation

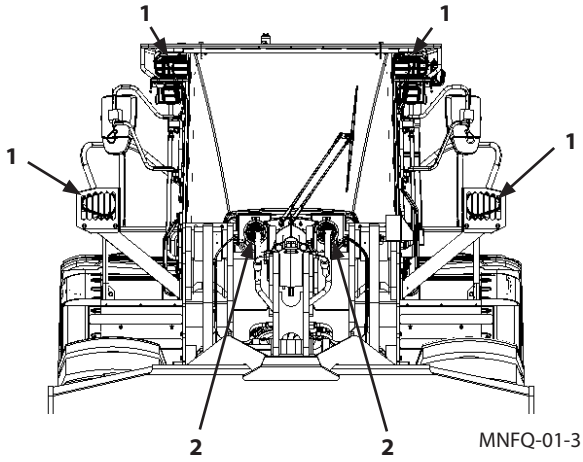
--- every 10 hours (daily)

Run the engine at low idle speed when checking the instruments.
The monitor indicates alarm, caution and confirmation status in red, orange, and normal operative condition in blue or green respectively.
Check each gauge or meter if its needle is moved with the key switch ON. The needle shall be moved to the blue range when normal and to the red range when abnormal.
Refer to the Group of Operator's Station in Section 1 for more information.

3 **Check Work Lights**
--- every 10 hours (daily)

CAUTION: If any burned-out light is found, immediately replace it with a new one.

Visually check all work lights (1), indicated by bold arrows, that they normally light and/or flash from the front and rear sides of the machine.
Verify that they are not loose or rattling. If any abnormality is found, consult Authorized Dealer.

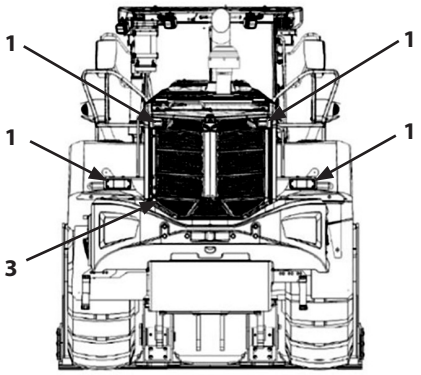


MNFQ-01-314

4 **Check Horn and Reverse Buzzer**
--- every 10 hours (daily)

WARNING: Before checking the horn and/or the reverse buzzer, always apply the parking brake and clear the machine's vicinity of other personnel.

The horn switch button is located at the steering wheel center and on the right console. If the machine is equipped with a multi-function joystick lever, the horn switch is located on the multi-function joystick lever.
Horn (2) is located on the front frame. Reverse buzzer (3) is located at the left side of the rear grille.
Check that reverse buzzer (3) correctly sounds by operating either the forward/reverse lever or the forward/reverse switch to the reverse drive side.



MNFQ-01-315

5 **Check Electrical Harnesses and Fuses**
--- every 50 hours

CAUTION: If dirt or dust is adhered on the wirings or relays, it may cause fire on the machine.

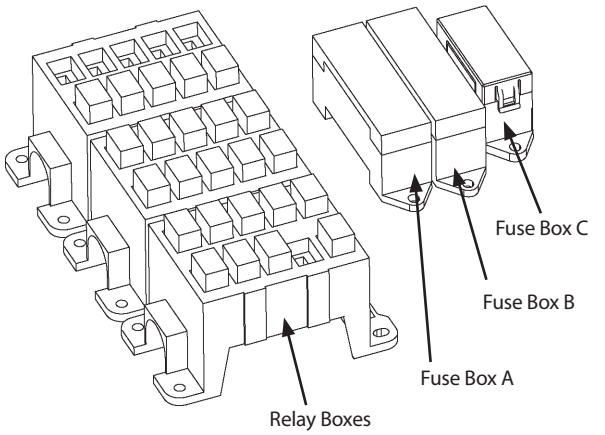
Check the electrical harness and terminals of the batteries, starter motor, and alternator for loose connection and/or short circuit (broken shield). Remove dirt or dust if necessary.
If any burned mark or an abnormal smell is noticed on a harness, consult Authorized Dealer.

Replace Fuse:

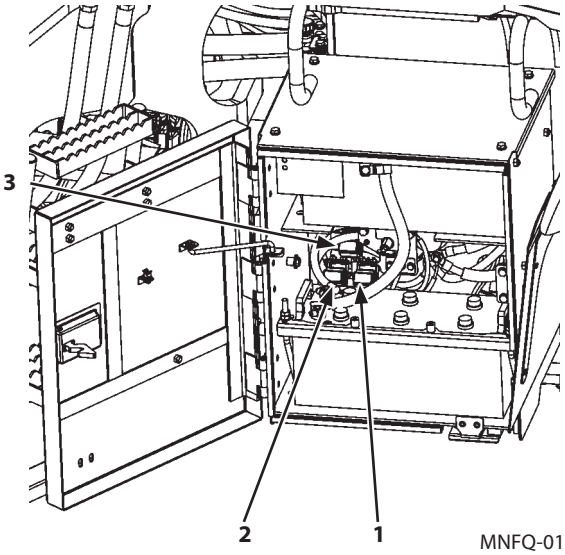
1. If any electrical equipment becomes inoperable, first check the fuses in the fuse boxes (A, B, C) located in the rear left console in the operator's station.
2. One spare fuse for each respective fuse capacity is provided in the fuse boxes (A, B).
3. Finally, check slow blow fuses (1)(2)(3) located on the inside of the battery box.

Capacity of slow blow fuses:
1- 30A, 70A
2- 120A, 120A
3- 30A, 140A

NOTE: Refer to page 1-255 for the fuses installed in each fuse box.



MNUD-07-001



MNFQ-01-327

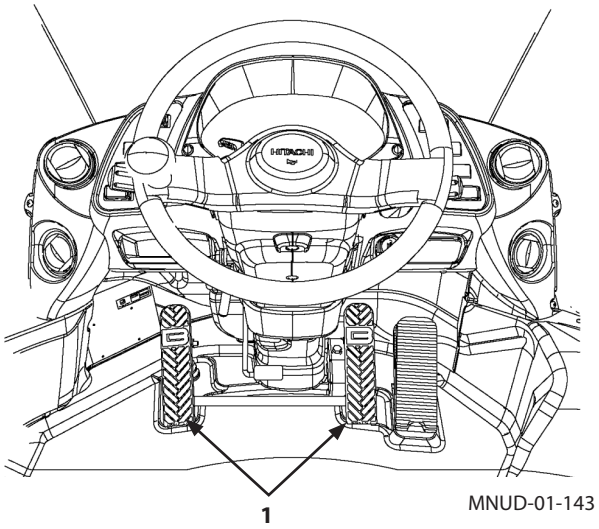
I. Brake System

1 **Check Right and Left Brake Interlocking Performance**

--- every 10 hours (daily)

WARNING:

- **Put up a no admission notice for the range of 100 m (328 ft) ahead in the forward machine travel direction. Arrange a safety monitor person.**
- **Do not allow dust and/or soil to accumulate in vicinity (3) of the brake pedal. The brake may become inoperable.**



MNUD-01-143

While stepping on brake pedal (1), check the pedal movement, the brake performance, and the play in the pedal stroke for any abnormality.
If dust and/or soil accumulates in vicinity of the brake pedal, remove the accumulated dust and/or soil.

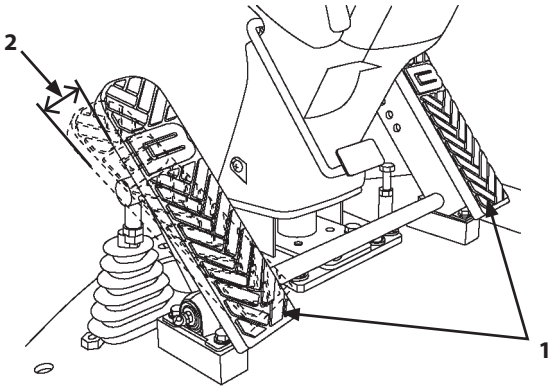
Check Brake Performance

The machine must be stopped within 5 m (16.4 ft) range after the brake is applied while driving at the speed of 20 km/h (12.4 mph) on a flat dry paved surface road.

Check Play in Brake Pedal Stroke

Measure the pedal stroke at pedal tip (2) by pressing the pedal with your hand until you feel an intermittent feed back from the pedal.

Correct Play (2) : 4 to 13 mm (0.2 to 0.5 in)



MNEC-07-042

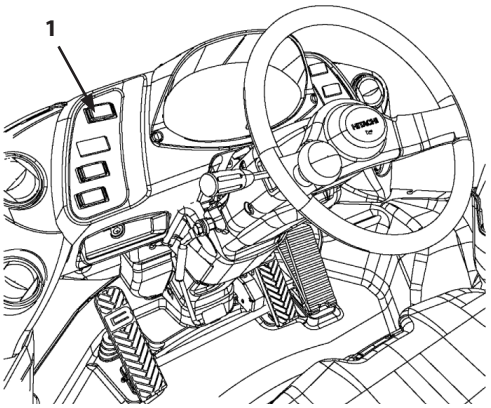
If the play is outside the specified range, consult Authorized Dealer.
If abnormal pedal operation and/or performance is noticed, consult Authorized Dealer. Get the machine checked and repaired.

2 **Check Parking Brake Force**
--- every 10 hours (daily)

WARNING: Check the machine in a place where no one is present or ahead in the traveling direction.

Keep bystanders away from the machine.

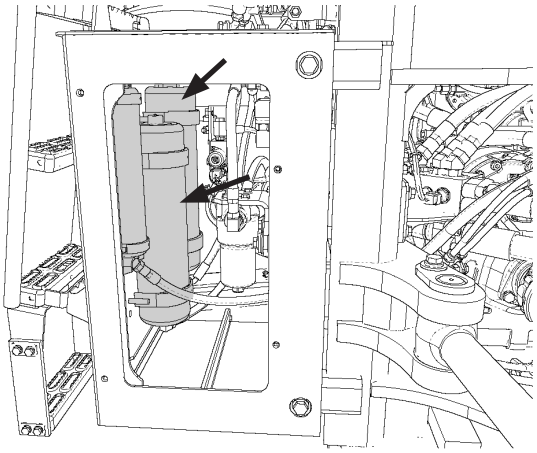
Park the machine with no load applied on a 20 % (11.3°) inclining dry surface slope. The machine must not move with the parking brake switch (1) ON.
Should the machine move during inspection, consult Authorized Dealer. Get the brake system checked and repaired.



MNUD-01-009

3 **Check Service Brake Accumulator Function, Gas Leakage, Looseness, and Damage**

--- every 500 hours



MNFQ-07-011

WARNING:

- **Allow only qualified personnel to handle the accumulator.**
- **High-pressure nitrogen gas is enclosed in the accumulator. Caution is required to prevent fires from occurring.**
- **Never strike the accumulator. Keep the accumulator away from sparks and/or flames.**
- **Do not directly heat the accumulator. Do not weld the accumulator housing.**
- **Be sure to release pressure before starting to work on the pipe lines.**

1. Precheck that alarm function is activated:

   Precheck that when the brake pedal is strongly stepped more than 5 strokes with the key switch ON and the engine stopping, the brake oil low pressure indicator comes ON.

2. Precheck that alarm function is deactivated:

   Start the engine. Run the engine at middle speed to pressurize the accumulator. When the pressure builds in the accumulated in the accumulator, the alarm buzzer stops sounding and the brake oil pressure indicator goes OFF.

3. Note how many times the brake pedal is stepped:

   Check that the brake pedal can be stepped more than 5 strokes before the brake oil low pressure indicator comes ON with the key switch ON and the engine stopping.

   Three points described above must be confirmed as normal. Besides the above points, check the accumulator for gas leakage, looseness, and damage. If any abnormality is found, immediately consult Authorized Dealer.

4 **Check Gas Pressure in Service Brake Accumulator**

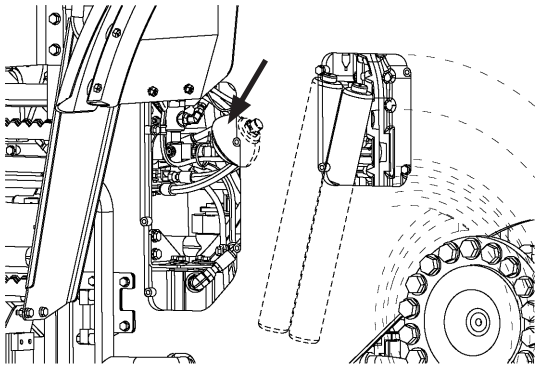
--- every 2000 hours

Check the gas pressure at a regular interval. If the machine is operated with the gas pressure lower than specified value, normal brake operation and/or loading operation may not be achieved, possibly creating very hazardous situations. Ask Authorized Dealer for checking.

5 **Replace Parking Brake Accumulator**

--- every 4000 hours or once every two years whichever comes first.

Consult Authorized Dealer for replace.

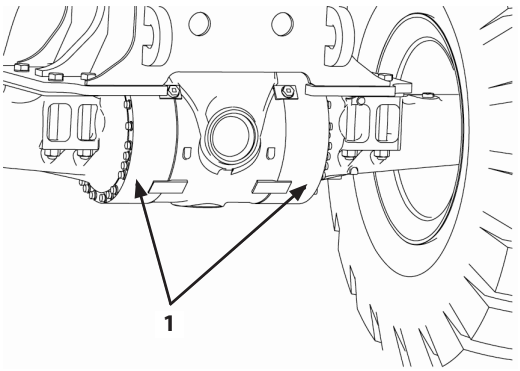


MNUD-07-022

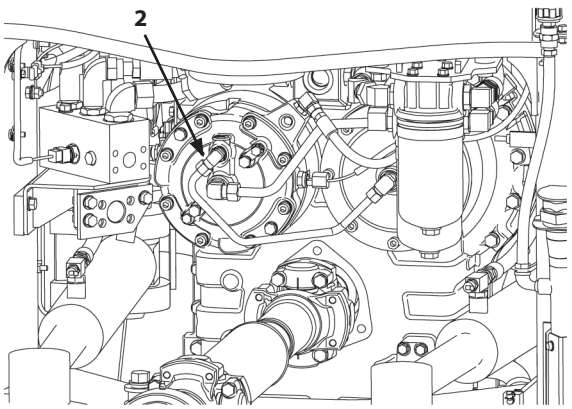
6 **Check Brake Disks (Service and Parking)**

--- every 2000 hours

Service brake (1) is a closed wet type brake.
Parking brake (2) is a dry type disk brake. Parking brake (2) is mounted on the transmission side.
Consult Authorized Dealer for checking.



90Z7-7-82-1



90Z7-7-82-2

J. Tire

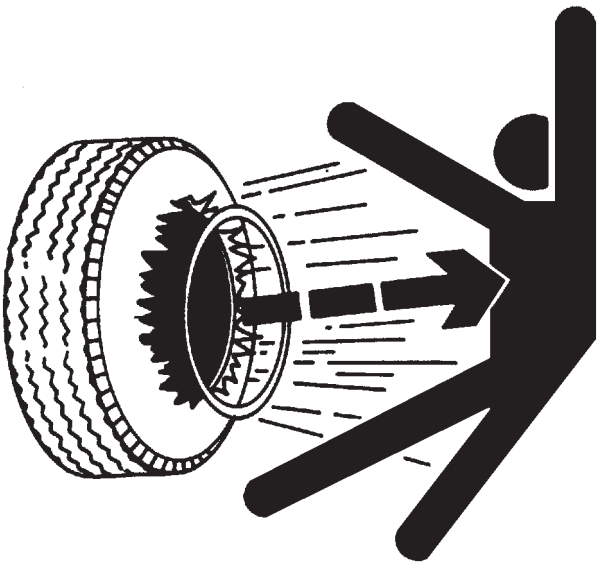
1 **Check Air Pressure**
--- every 10 hours (daily)
Adjustment
--- as necessary

⚠ WARNING:

- **Secure the front and rear frames with the articulation lock bar and pins.**
- **When inflating tires, stand behind the tread and use the self-attaching chuck.**
- **Avoid welding near tires, which could potentially cause the tires to explode.**
- **Tires may explode if a tire is smoking such as if the machine catches fire, the tires become abnormally hot, or the air smells of rubber or tire bead burning.**

IMPORTANT:

- **Always maintain the correct tire pressure.**
- **Even if only one tread pattern has worn out, replace the tire with a new one. Before operating the machine, check the tires for any breaks, damage or foreign matter.**
- **When replacing one tire, use a new tire having the same tread pattern and specification as the other tires.**



SA-249

Check Air Pressure

1. Measure air pressure when the tires are cool before operating the machine.

Radial Tire	Standard Air Pressure	
	Front	Rear
26.5R25	471~490 kPa (4.8~5.0 kgf/cm^2) (68.3~71.1 psi)	373~392 kPa (3.8~4.0 kgf/cm^2) (54.1~56.8 psi)

2. Check tires for any damage and/or excessive wear.

2 **Check Tire for Damage**
--- every 10 hours (daily)

⚠ WARNING: If tire has external damage such as scoring, an accident due to puncture or bursting of the tire may occur, possibly resulting in personal injury or death.

Check the external appearance of tires for any damage, metal piece and extraneous material.

3 **Check Wheel Bolt Torque**
--- every 500 hours (50 hours at first time only)

Be sure to check the wheel bolt torque by turning the bolt clockwise.

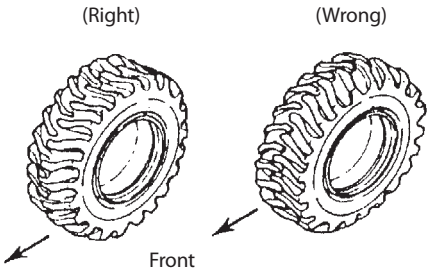
Tightening torque: 890 N·m (89 kgf·m, 656 lbf·ft)

Replace Tire

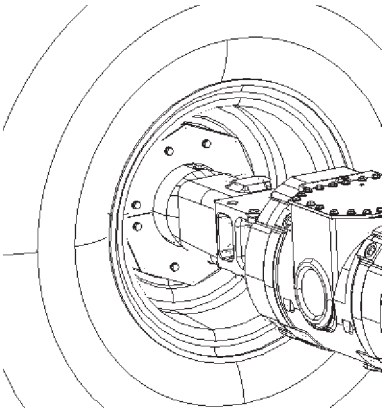
WARNING: Secure the front and rear frames with the articulation lock bar and pins.

IMPORTANT: Height of the machine may change according to the types of tires to be installed.
Do not change the specifications of the registered machine by using unauthorized tire sizes.
On the optional Axle Seal Guard equipped machines, remove the guard before tightening wheel bolts.

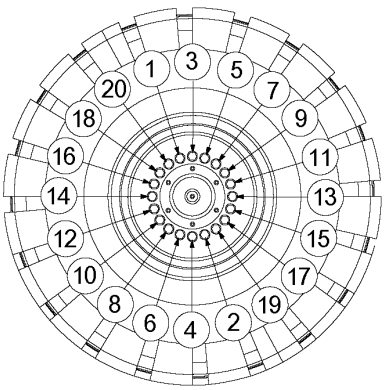
1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.
2. Install articulation lock bar to the front and rear of the frame by following the procedures described on page 7-9.
3. Loosen all wheel bolts one turn.
   Note which way the tread pattern is facing.
4. After jacking up the machine, securely support the machine with blocks.
5. Remove the wheel bolts. Replace the tire.
6. With the tire raised off the ground, lightly tighten the wheel bolts in order as illustrated to the right.
7. Lower the machine. Retighten the wheel bolts to the above torque specification in the order as illustrated to the right.



M4GB-07-104



MPD8-07-006



90Z6 07-88-01

NOTE: The number of tightening bolts may differ.

Applicable Tire Size

NOTE: Consult Authorized Dealer for tread pattern of optional tires.

The machine may vibrate while driving depending on the tread pattern of tires. This is a sympathetic vibration due to tread pattern, not a malfunction.

Radial Tires

Size	Standard Air Pressure	
	Front	Rear
26.5R25	471~490 kPa (4.8~5.0 kgf/cm^2) (68.3~71.1 psi)	373~392 kPa (3.8~4.0 kgf/cm^2) (54.1~56.8 psi)

NOTE: Adjust air pressure according to the size and type of tires provided in the table above regardless of the tread pattern.

Adjust tire pressure in conformity with the work mode the machine is engaged in.
Consult Authorized Dealer for more detailed information.

- Driving on Public Roads: ... Standard Pressure
- Loading/excavation on normal ground surface: ... Standard or slightly higher than standard pressure
- Heavy-duty excavation: ... Higher pressure in the standard pressure range
- Operation on soft terrain or sandy territory: ... Slightly lower than standard pressure

Tire Rotation

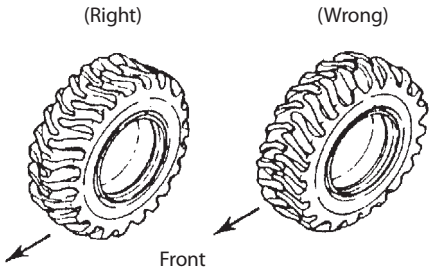
Rotate tires when uneven or abnormal wear is recognized on either front or rear, or right and left tire. Tire rotation is recommended to achieve uniformity of wear on tires or equalization of tire service life.

Rotation Procedure

WARNING: Install tire with no external damage such as score and abnormal wear.

Failure to do so may cause the puncture or the tire to blowout, possibly resulting in personal injury or death since tire load is increased when the machine is loaded or braked during operation.

- Switch tires only between the front and rear positions. Do not switch the tires between diagonal positions.
- Align the tire rotation direction with the tire tread design pattern. Especially traction tread design pattern (optional) will affect not only economy of tire but also safety of operation.

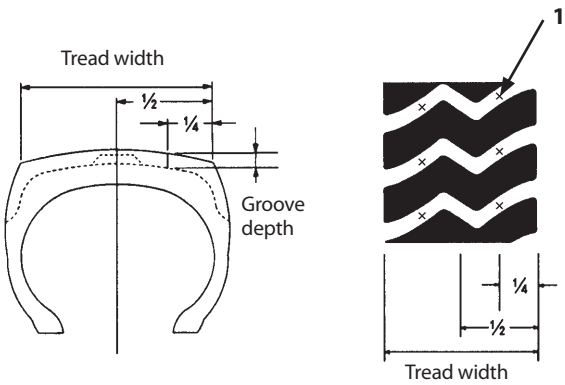


M4GB-07-104

How to Check Wear Amount (Tread Design Groove Depth):

Measure the groove depth at 1/4 tread width position [shown with × mark (1) in the figure].

Use limit of the groove depth shall be approx. 85 % of the new tire groove depth. If extreme uneven wear or exposed rubbing strips are found, replace the tire even before reaching 85 %.



MNEC-07-122

IMPORTANT: If the machine is operated with such tires at either rear or front being extremely worn or different in type, construction, or size, the travel driving system such as axles or transmission will be adversely affected in their performance and/or endurance.

When replacing tires, be sure to use the same tires in type, construction and size to the four wheels. It is recommended to replace tires of the four wheels at the same time.

Removal and Installation of Tire

WARNING: Wheel with tire is very heavy, making removal and installation of a tire is hazardous and difficult work. In addition, a crane to lift a tire is required when removing or installing the tire to the wheel. Consult Authorized Dealer or a professional tire sales shop for tire removal and installation work.

If jacking up the machine is required, be sure to observe the following points.

- **Select dry, solid and flat ground for a work site.**
- **Work in a group of more than two personnel. One person shall mainly engage in practicing the work and others shall work as assistants and/or ensure safety.**
- **Do not use the bucket to raise the front wheels.**
- **Do not raise the machine off the ground higher than necessary.**
- **When the front (rear) wheels are raised off the ground, wedge wheel stoppers under the rear (front) wheels.**
- **After the machine is raised off ground, be sure to block the machine using rigid supports. Never leave the machine to be supported only by jacks.**
- **The rear wheels oscillate. Insert wooden blocks between the axle and the frame to stop oscillation.**
- **When removing the wheel bolts, lift the wheel with a crane so that the wheel bolt remaining at the top position is finally removed.**
- **Wheel bolt tightening torque: 890 N·m (89 kgf·m, 656 lbf·ft)**

Tire Wheel

WARNING: When a tire wheel must be removed, ask a professional person to do so.

Allow only an authorized person to inflate a tire after the tire was installed onto the wheel.

Sufficiently remove rust from the wheel. Severe rust may cause the wheel to crack, possibly causing the machine trouble and/or personal accidents.

IMPORTANT: On the optional axle seal guard equipped machines, before removing wheel bolts, remove axle seal guard on backside.

K. Air Conditioner

1 **Clean/Replace Air Conditioner Circulation/Fresh Air Filters**

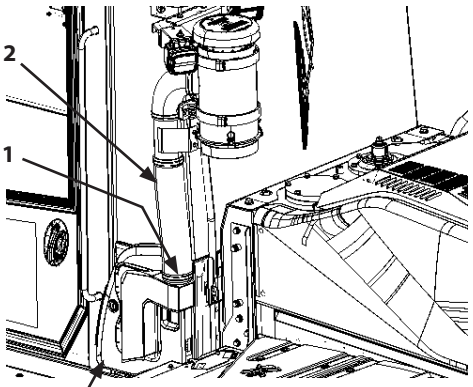
Clean filters

--- every 100 hours (or once a week whichever comes first)

Replace filter

--- after cleaning filters 10 times (or when the filters are severely clogged)

NOTE: If the machine is operated at a dusty job site, clean or replace the filter element earlier than the normal interval.

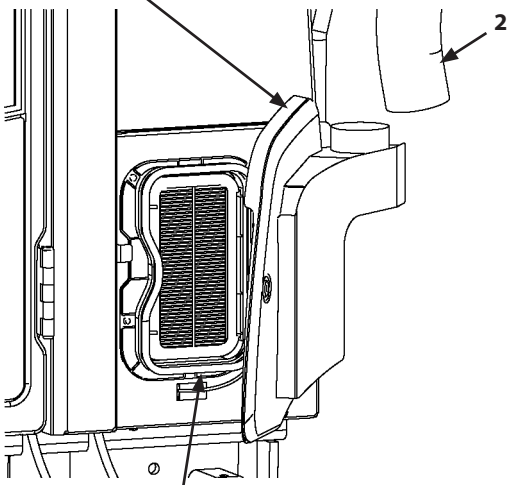


MNFQ-07-033

Clean Fresh Air Filter

1. Remove hose band (1) and disconnect prefilter hose (2), if installed.
2. Remove the filter:

   The fresh air filter is installed behind cover (3) on the left rear side of the cab exterior. Open cover (3) with the starter key.
3. Loosen wing nuts (4) and remove plate (6). Remove fresh air filter (5).



90Z7-7-92-3

CAUTION: When using compressed air pressure, wear safety glasses or goggles.

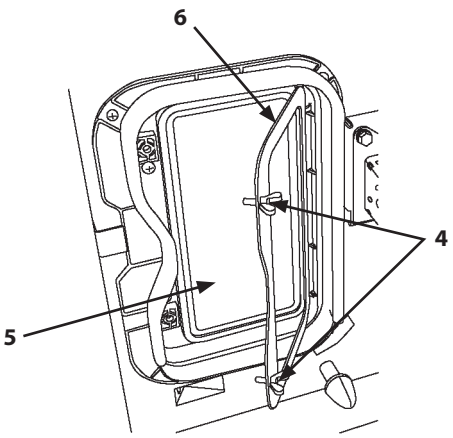
IMPORTANT: If compressed air delivery pressure is high, damage to the filter fins may result. Always use compressed air at the lower pressure than 0.2 MPa (2 kgf/cm², 29 psi). Keep the nozzle more than 500 mm (20 in) away from the core surface.

4. Clean fresh air filter (5) using compressed air.

IMPORTANT: Inappropriate installation of the filter may cause dust to enter into the air conditioner, causing malfunction or breakdown of the air conditioner.

Before installing the filter element, clean off dust around the mounting area; install the filter element with extra care.

Keep cab doors closed when operating machine.



MNEC-07-043

5. Install cleaned fresh air filter (5) or a new filter.
6. Install plate (6) and tighten wing nuts (4), and close cover (3).
7. Connect prefilter hose (2), and secure with hose band (1).

Clean and Replace Double Filter (Optional)

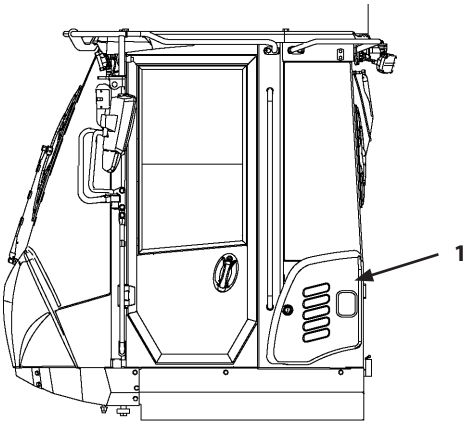
--- When cleaning fresh air filter

1. Remove the double filter:

   The double filter is installed behind cover (1) on the left rear side of the cab exterior. Open cover (1) with the starter key.

   Loosen wing nuts (3) and remove plate (2) with double filter (7).

   Remove bolts (5) (4 used), plate (6), and double filter (7) from plate (2).

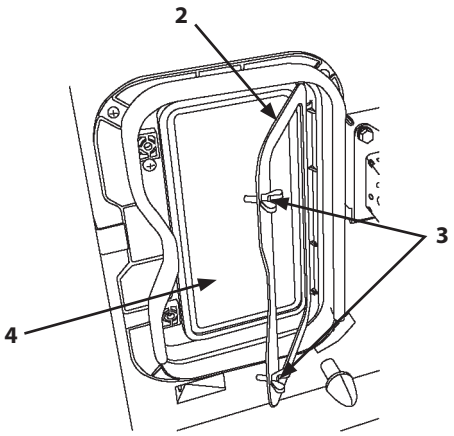


MNUD-01-070

CAUTION: When using compressed air pressure, wear safety glasses or goggles.

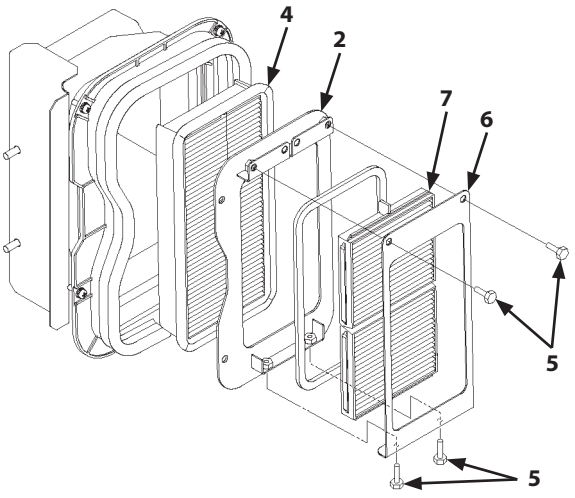
IMPORTANT: If compressed air delivery pressure is high, damage to the filter fins may result. Always use compressed air at the lower pressure than 0.2 MPa (2 kgf/cm², 29 psi). Keep the nozzle more than 500 mm (20 in) away from the core surface.

2. Clean double filter (7) using compressed air.



MNEC-07-043

NOTE: When the optional cab precleaner is installed, this double filter cannot be used.

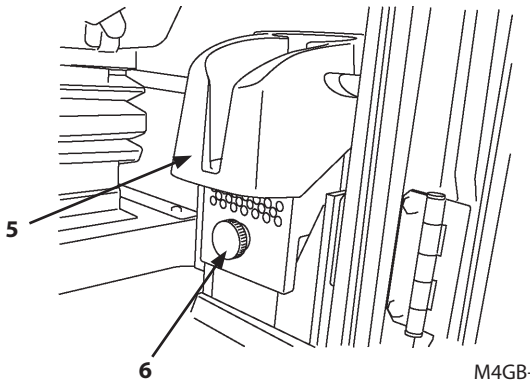


MNHE-07-048

Clean Circulation Air Filter

1. Remove the filter:

   Remove screw (6) under cup holder (5) and tilt the cup holder forward. Hold handle (7) and pull handle (7) toward you to remove circulation air filter (8).



M4GB-07-108

CAUTION: When using compressed air pressure, wear safety glasses or goggles.

IMPORTANT: If compressed air delivery pressure is high, damage to the filter fins may result. Always use compressed air at the lower pressure than 0.2 MPa (2 kgf/cm², 29 psi). Keep the nozzle away from the core surface more than 500 mm (20 in).

2. Clean circulation air filter (8).

   Clean circulation air filter (8) using compressed air or by washing with water.

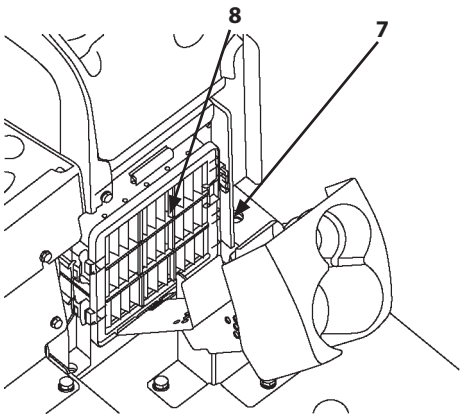
   Washing procedure with water is as follows:

2.1 Use tap water.

2.2 Submerge the filter in water containing a neutral detergent for about 5 minutes

2.3 Clean the filter with water again.

2.4 Sufficiently dry the filter.



MNEC-07-044

IMPORTANT: Inappropriate installation of the filter may cause dust to enter into the air conditioner, causing malfunction or breakdown of the air conditioner.

Before installing the filter element, clean off dust around the mounting area; install the filter element with extra care.

3. Install the cleaned circulation air filter or a new filter by following the filter removal procedure described in step 1 in the reverse order.

2 **Check Air Conditioner**

--- every 250 hours or every 3 months

Check the air conditioner switch panel, air conditioner unit, and condenser mounting areas for any abnormality, and check hoses for any damage.

NOTE: When the season to use the air conditioner comes close, check the air conditioner to get it ready to use at all times.

When not required to use the air conditioner for a long period of time, operate the air conditioner in the cooling mode once a week to prevent lack of lubrication.

WARNING: Do not clean the compressor and receiver tank with steam.

The refrigerant gas pressure will increase, possibly causing the hoses to break.

3 **Check Air Conditioner Piping**

--- every 250 hours or every 3 months

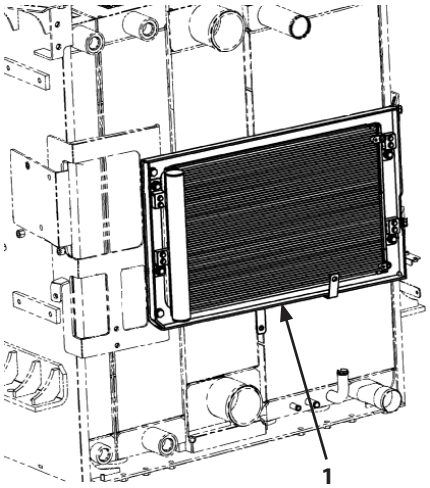
CAUTION: If any leakage is found, repair or replace the corresponding pipes. Tighten the joint bolts to specification.

Do not overly tighten piping.

Check the piping for abnormal deformation and/or damage. If a pipe joint is contaminated with oil, refrigerant leakage may be suspected. Check for leakage using a gas leak detector.

4 **Check Air Conditioner Condenser**
--- every 250 hours or every 3 months

If condenser (1) is covered with dirt and/or insects, air conditioner cooling performance will be reduced.
Remove dirt or stain from fins of condenser (1) using tap water. If the condenser has been severely contaminated, use a soft brush. Do not use a hard brush, which may damage the fins.



MNFQ-07-040

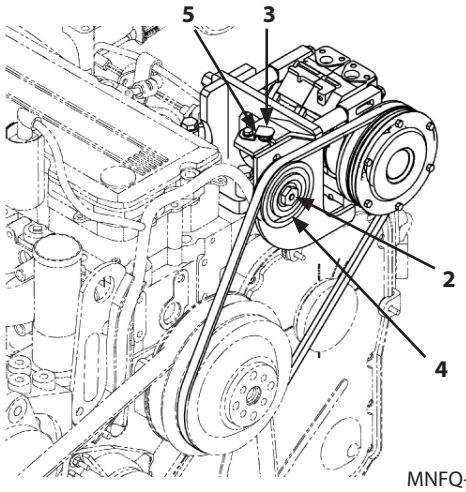
5 **Check Air Conditioner Drive Belt**
--- every 250 hours or every 3 months

The tension in the belt decreases as it rotates.
Improperly adjusted belt tension may lead to cracks, damage, or other malfunctions.Inspect it regularly.

Use a tension gauge to check that the belt tension is 220±10 N (22±1 kgf, 50±2.2 lbf).

If the tension is lower than 220±10 N (22±1 kgf, 50±2.2 lbf), adjust the tension to 343±49 N (35±5 kgf, 77±11 lbf).

Replace the belt if it is stretched and cannot be adjusted, or if it is cracked or has cuts.



MNFQ-07-041

NOTE: The belt tension should be 490±98 N (50±10 kgf, 110±22 lbf) when the belt is replaced with new one.

Compressor Belt Tension Adjustment Procedure

1. Loosen lock nut (2) of tension pulley (4).
2. Remove plate (5) and tension pulley (4) to adjust belt tension by turning belt tension adjustment bolt (3).
3. After adjustment, securely tighten lock nut (2) and mount plate (5).

   Lock nut (2) Tightening torque:
   30.4 to 31.4 N·m (3.0 to 3.1 kgf·m, 22.4 to 23.1 lbf·ft)

IMPORTANT: The initial tension of a new belt is 490±98 N (50±10 kgf, 110±22 lbf).

When a new belt is replaced, run the engine at slow idle for 3 to 5 minutes to break-in the belt, and then readjust the belt tension.

6 Check Refrigerant

--- every 250 hours or every 3 months

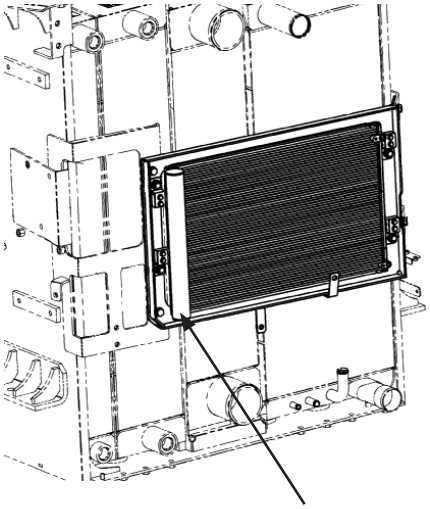
IMPORTANT: Do not release refrigerant into the atmosphere as this is illegal. Comply with refrigerant regulations.

1. Start the engine and run at approximately 1500 min^{-1} (rpm).
2. Turn the air conditioner switch to ON. Set the blower switch to HI and set the temperature control switch to the coolest position (18 °C (64 °F) on the monitor screen).
3. Operate the air conditioner 2 to 3 minutes.

   Check if cool air comes out from the vent in the cab.
4. In case any abnormality is found in the air conditioner, consult Authorized Dealer to check receiver dryer (1).

NOTE: This machine uses refrigerant R134a.

Type	Refrigerant No.	Quantity kg (lb)
HFC	R134a	0.75±0.05 (1.65±0.11)

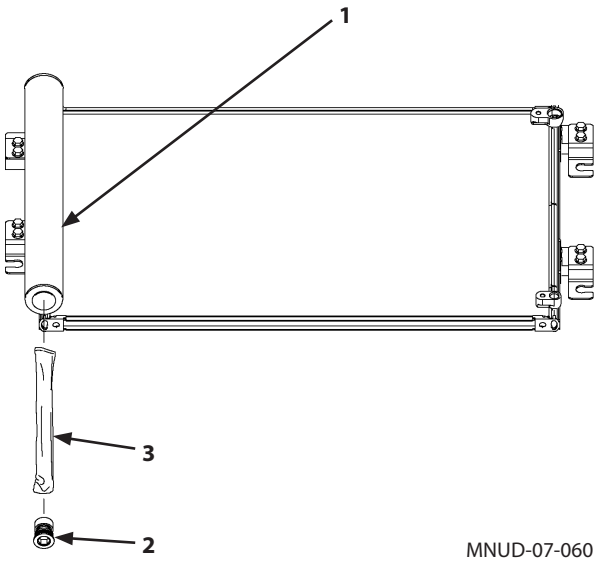


MNFQ-07-040

7 Replace Air Conditioner Receiver Dryer

--- every 16000 hours or 8 years whichever comes first

NOTE: The dryer is built-in type in the condenser unit, which applies desiccating agents requiring replacement every 16000 hours or 8 years whichever comes first.



MNUD-07-060

1. Remove bottom cap (2) using a 14-mm hex key wrench.
2. Pull out all dryer bags (3) containing desiccating agent.

CAUTION:

- **If tweezers maybe used, be careful not to damage the desiccating agents.**
- **Do not damage the bags while inserting. Secure the bags in position to prevent filter stuck.**

3. Insert 3 each of new dryer bag (3).

CAUTION: Do not apply oil to the cap threads.

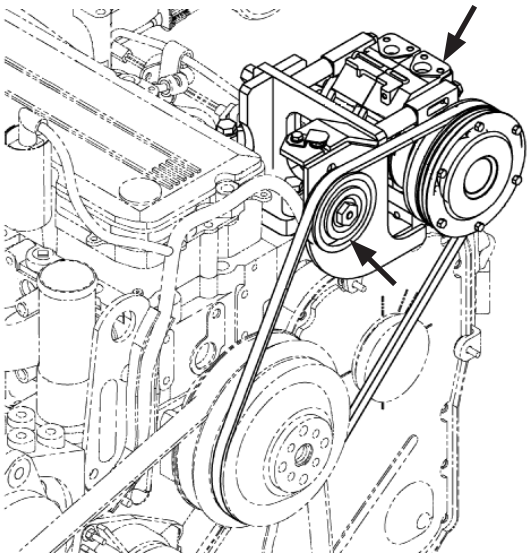
4. Apply clean oil ND-8 or equivalent on the cap O-ring (sealing area).
5. Close with a new cap (2) while securing there is no scratch, foreign materials on the mating surface. Tighten cap (2) to 4.0±1.0 N·m (0.4 to 0.1 kgf·m, 3.0 to 0.7 lbf).

8 **Check Compressor and Pulley**
--- every 250 hours or every 3 months

Check the compressor and its vicinity for abnormality in operation, oil stain, or refrigerant leakage. Check the pulley for abnormal noise.
Check the belt for abnormal deflection and damage.

Check Compressor:

After operating the air conditioner for 5 to 10 minutes, check temperature at both the high pressure pipe and the low pressure pipe.
Normally, the high pressure pipe must be hot and the low pressure pipe must be cool.



MNFQ-07-041

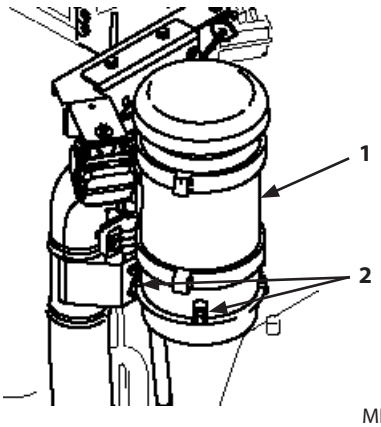
9 **Replace Cab Air Prefilter (Optional)**
--- every 1000 hours

IMPORTANT: More frequently replacement may be required in severe dust conditions.

IMPORTANT: Replace filter only. Do not clean or re-use filter. Re-using filter can create health hazards.

CAUTION: Wear gloves, safety glasses or goggles, and a dust mask to avoid breathing the dust.

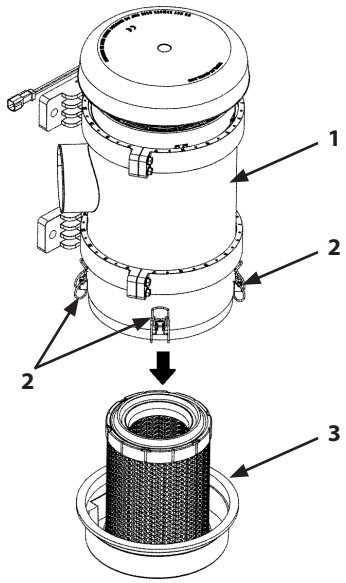
1. Locate air prefilter unit (1) installed onto the rear left top of the cab (outside). Visually check the system for any damage.
2. Release filter latches (2) (4 used) that retain filter element (3).
3. Once filter latches (2) are released, filter element (3) will come off. Prepare for the dropping filter element (3) out of the bottom of the unit.



MNUD-07-024

CAUTION: When the key switch is turned ON to test the fan motor, a cloud of dust will be ejected. Avoid the dust.

4. Turn the starter key to "ON" position without installing filter element (3). Ensure that air is blowing out of the empty filter housing cavity. Turn the starter key to "OFF" position.
5. Inspect and remove any loose debris found on a new filter element (3) using a clean rag. Never use compressed air.
6. Install the new filter element (3). Ensure that the filter element end cap seats properly on the filter housing.
7. Restrain filter element (3) by reattaching 4 each of filter latches (2).



MNUD-07-048

L. Aftertreatment Device

1 **Check and Clean Filter Element of Muffler Filter**
--- every 4500 hours

Contact Authorized Dealer.

2 **Check and Clean Aftertreatment Device**
--- as required

IMPORTANT:

- **Check and clean flammable materials on the area around the Aftertreatment device.**
- **Condensation for dew may blow out from the exhaust outlet of the afterfreatment device and black deposition may be observed; it is not a malfunction.**

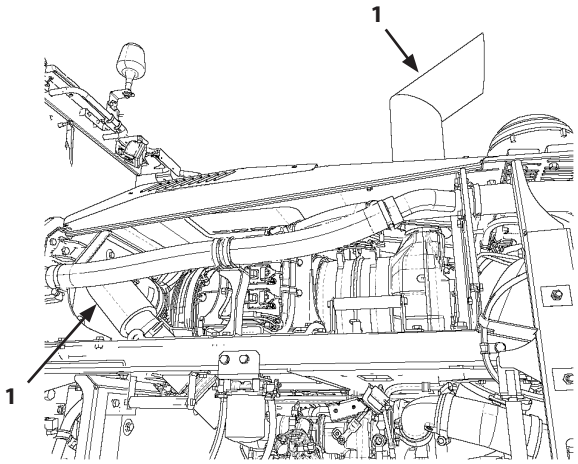
Do not disassemble the base machine support parts and sensors.
When the machine is operated in dusty areas, refer to page 9-1 "Maintenance Under Special Environmental Conditions".

1. Open the right and left side covers.

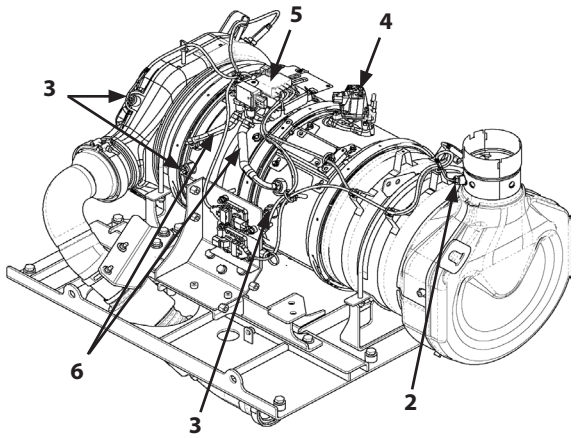
2. Check exhaust pipes (1) for cracks.
   Check the aftertreatment device units for loose or disconnection.

3. Check the connectors and harnesses of NOx sensor (2), temperature sensors (3) and dosing module (4) for abnormality.

4. Close the side cover.



MNFQ-07-042



MNFQ-07-066

M. Urea SCR System

WARNING: Fill specified DEF into the DEF tank.

If improper DEF is refilled, fire or system failure may result. If improper liquid is refilled in the DEF tank, consult Authorized Dealer for check or repair.

Specified DEF
Refill DEF which meets Japanese Industrial Standards (JIS K2247), International Organization for Standardization (ISO 22241) or Deutsche Industrie Normen (DIN 70070). If improper liquid (diesel oil, kerosene or gasoline) is refilled in the DEF tank, fire or system failure may result. The specified DEF is colorless and odorless solution (urea 32.5%, water 67.5%) which begins to freeze at -11 °C (12 °F). Store the DEF in -10 to 40 °C (14 to 104 °F)environment.

In some cases, specified urea solution is referred to by one or more of these names:

- Aqueous Urea Solution 32
- AUS 32
- NOx Reduction Agent
- Catalyst Solution

NOTE: DEF is produced from suppliers which are licensed by the VDA (Verband der Automobilindustrie e.V).

Diesel Exhaust Fluid (DEF) is certified by the API (American Petroleum Institute) Diesel Exhaust Fluid Certification Program.

CAUTION:

- **DEF is colorless and harmless solution. It is harmless when contacting with the body, however, it may cause skin to become inflamed depending on the constitution of the individual. Flush DEF with clean water when it contacts on the skin.**
- **If you swallow DEF by mistake, drink 1 or 2 cups of water or milk and seek immediate medical attention.**
- **If DEF is accidentally splashed into eyes, flush with water for 15 minutes or longer and get emergency medical attention.**

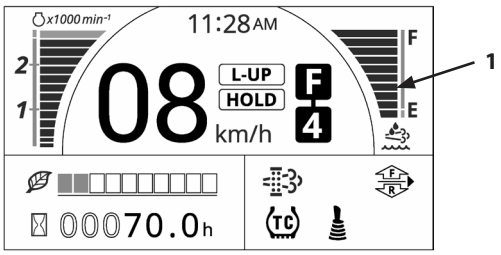
IMPORTANT:

- **Use dedicated container recommended by the business entity who is handling DEF to store DEF. Do not use general container, a container used for other purpose and contaminated container because the quality of DEF deteriorates.**
- **The DEF is non-combustible, however, move DEF to a safe place when fire occurs.**
- **Wash out spilled DEF with clean water.**
- **Seal the container and store it in a well ventilated place. If DEF freezes, the quality does not change just after freezing.**
- **As long as sealed by an airtight stopper, unless water evaporates DEF will not deteriorate within the guarantee period.**
- **Do not pour waste DEF and its containers onto the ground, and do not allow waste to flow into rivers and/or lakes. When disposing DEF, make sure to let authorized industrial waste disposal contractor dispose of it appropriately.**

1 **Check DEF**

--- every 10 hours (daily)

Park the machine on a level surface. Lower the bucket to the ground. Check the DEF level with DEF gauge (1).
If necessary, stop the engine and add DEF.



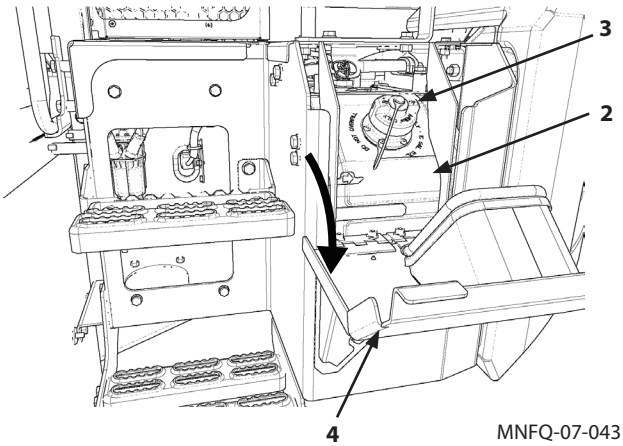
MNFQ-01-021

Refill DEF

CAUTION:

- **Refill DEF which meets Japanese Industrial Standards (JIS K2247), International Organization for Standardization (ISO 22241) or Deutsche Industrie Normen (DIN 70070) in DEF tank (2). If low density DEF is refilled, alarm will be generated, restricting machine operation. Do not dilute DEF with water.**
- **Wear safety equipment such as safety glasses or goggles, rubber gloves appropriate to the job. Wash DEF with clean water when it contacts on the skin. If DEF is accidentally splashed into eyes, flush with water for 15 minutes or longer and get emergency medical attention.**

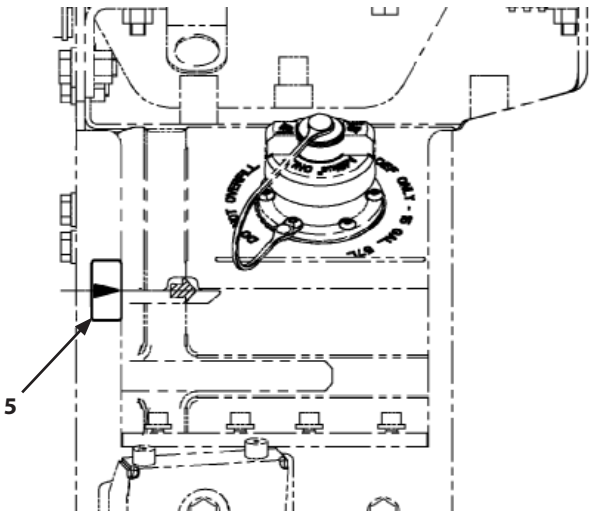
1. Park the machine according to the instruction on "Preparations for Inspection and Maintenance" (page 7-7).
2. DEF tank (2) is located at left rear of the machine. Open DEF tank cover (4).
3. Clean dust and mud around the filler port of DEF tank with clean cloth.
4. Remove cap (3) from DEF tank (2) and refill DEF. Be sure to stop refilling before the "FULL" line (5) indicated by the adhered label as shown.



MNFQ-07-043

IMPORTANT:

- **Take care not to allow dust and/or water to enter the DEF tank when refilling.**
- **If DEF is filled above the "FULL" line, the system may be damaged during operation or tank (2) may be broken when frozen.**

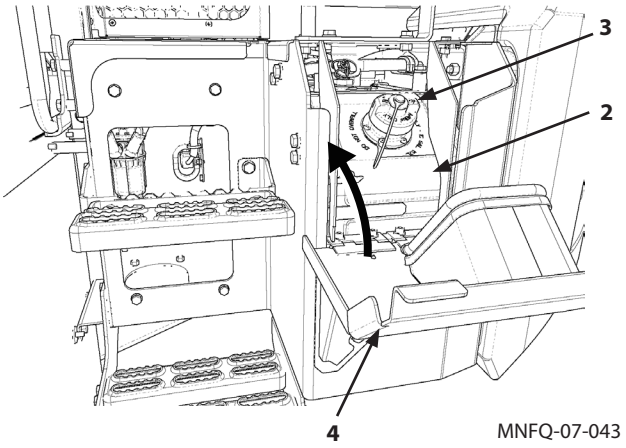


MNFQ-07-044

5. Install cap (3) after refilling DEF. Close DEF tank cover (4).

IMPORTANT:

- **Do not get on top of DEF tank (2) or sensors and piping on the tank. Failure to do so may damage the machine.**
- **White deposits may be observed when DEF is dried naturally; it is normal. Wash out DEF deposits with soft water. Never use a high pressure washer.**



MNFQ-07-043

NOTE:

- *Wipe spilled DEF and wash spilled area with plenty of water.*
- *The sound of flowing water may be heard from the tank after the engine stops. It is the sound of returning DEF from piping to the tank, not a malfunction.*
- *DEF will freeze at low temperature, and deteriorate (ammonification) at high temperature. Store DEF at temperature between -10 to 40 °C (14 to 104 °F).*
- *Use dedicated container (purchased container) to store or carry DEF. Alternatively use a polyethylene resin tank, or stainless steel tank.*

2 **Change DEF**

---As required

CAUTION: Wear safety equipment such as safety glasses or goggles, rubber gloves appropriate to the job. Wash DEF with clean water when it contacts with the skin. If DEF is accidentally splashed into eyes, flush with water for 15 minutes or longer and get emergency medical attention.

IMPORTANT: When contaminated or deteriorated DEF is used, malfunction may result. Change DEF periodically to keep cleanliness in the tank.

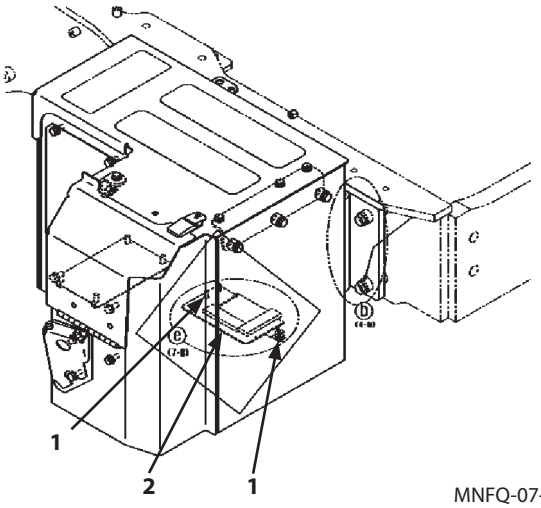
1. Remove bolts (1) and washers and remove cover (2).
2. Place a 50 liter (13 gallon) or larger capacity container under drain plug (3).
3. Slowly loosen drain plug (3) to drain DEF.
4. Tighten drain plug (3) after draining DEF.

   Wrench size: 6 mm

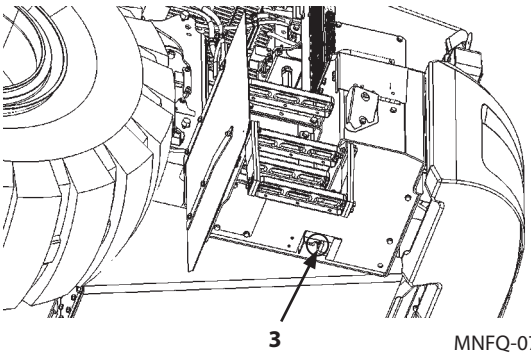
   Tightening torque: 5.0 to 7.0 N·m (0.5 to 0.7 kgf·m, 3.7 to 5.2 lbf·ft)
5. Fix cover (2) with bolts (1) and washers.
6. Remove the cap from the DEF tank and refill DEF.

   (Refer to "Check DEF" in item **1**.)

   DEF amount: 51.5 liter (13.6 gallon)



MNFQ-07-070



MNFQ-07-071

3 Replace DEF Supply Module Filter Kit --- every 4500 hours

Periodically replace main filter (4) and frostproof filter (3) mounted in DEF supply module (1).

CAUTION: Use rubber glove for protection during operation. Wash DEF with clean water when it contacts on the skin.

IMPORTANT:

- **Take care not to allow dirt and/or water to enter the DEF tank while replacing filter (4).**
- **Check for leaks around the mounting position after replacement.**
- **White deposition may be observed when DEF is dried naturally; it is normal. Wash out DEF deposition with clean water. Never use a high pressure washer.**

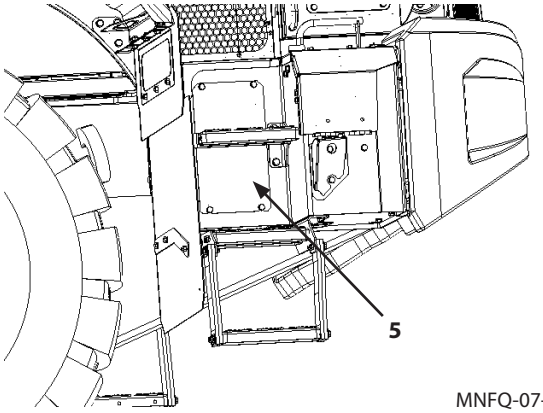
1. Park the machine according to the instruction on "Preparations for Inspection and Maintenance" (page 7-7).

2. Open cover (5). Remove the cover beneath DEF filter housing (2).

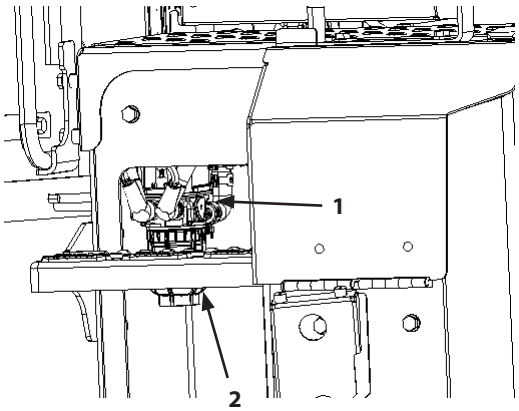
3. Remove DEF filter housing (2) from DEF supply module (1) by using a 46 mm socket wrench.

4. Check frostproof filter (3).

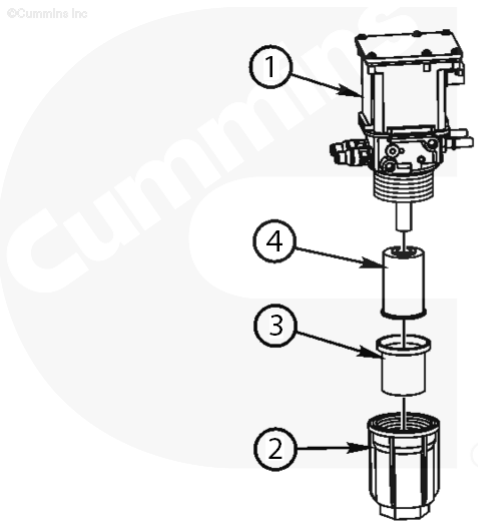
5. Pull out filter element (4) inside supply module (1) while turning it by hands. Wipe the spilled DEF from filter element (4) with a clean cloth. Dry supply module (1).



MNFQ-07-047

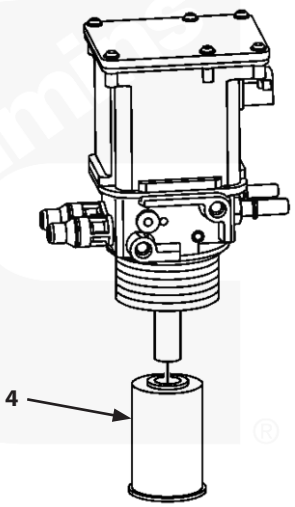


MNFQ-07-019



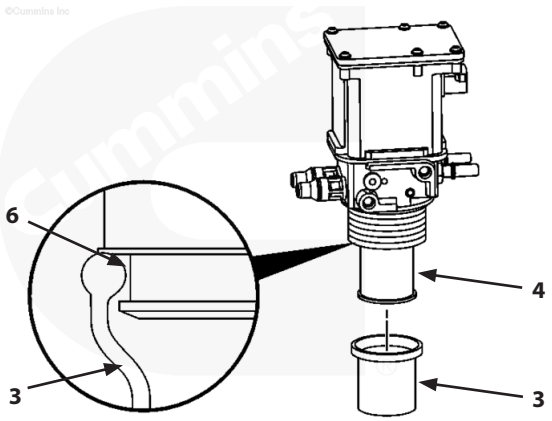
MNUD-07-035

6. Install a new filter element (4) by sliding it into supply module (1). Verify that filter element (4) is fully inserted.



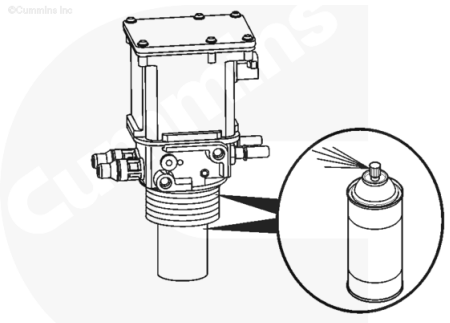
MNUD-07-049

7. Install a new frostproof filter (3) over filter element (4). The seal bead of frostproof filter (3) should fit to the groove (6) of supply module housing (1).



MNUD-07-050

NOTE: Spray the specified lubricant to the seal bead of frostproof filter and the thread of supply module housing.



8. Tighten filter housing (2) using a 46 mm socket wrench to 80 N·m (8.2 kgf·m, 59 lbf·ft) torque.

MNUD-07-051

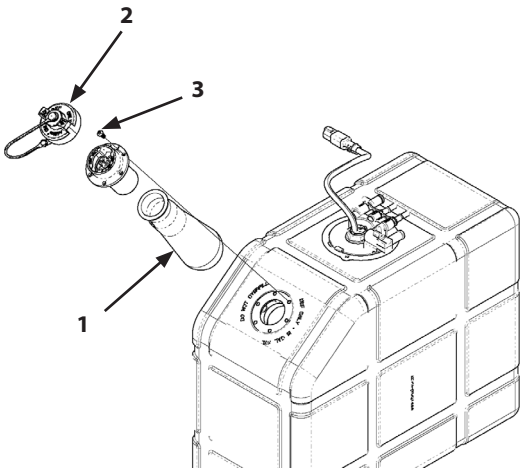
4 **Replace DEF Tank Inlet Filter**

--- every 4500 hours, or when DEF spills out while filling

IMPORTANT: Do not clean or reuse DEF tank inlet filter (1). Clean around DEF tank inlet cap (2) to avoid DEF contamination when opening the cap.

Locate filter (1) inside the DEF tank covering DEF tank inlet cap (2).
Replacement of filter (1) is required regularly or if DEF spills out while pouring it from the tank inlet port. Contact Authorized Dealer for assistance.

NOTE: Tightening torque of the screw (3) is 3.4 to 4.5 N·m (0.34 to 0.45 kgf·m, 2.5 to 3.3 lbf·ft).



MNFQ-07-067

N. Miscellaneous

1 **Check Bucket Teeth and Cutting Edge**
--- every 10 hours (daily)

Check bucket teeth for wear and looseness.

Replace

WARNING: Guard against injury from flying pieces of metal.

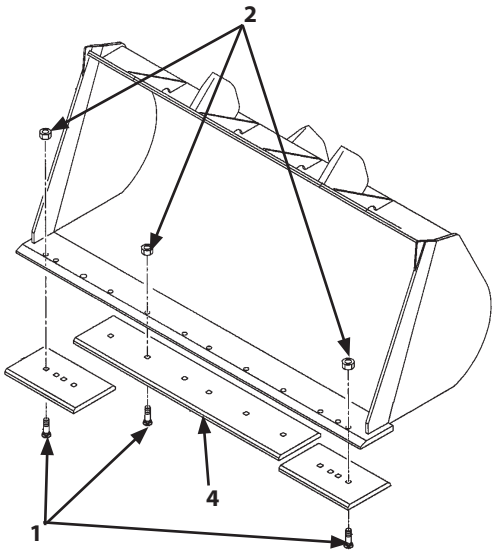
Wear goggles or safety glasses, hard hat and face shield.

Cutting Edge

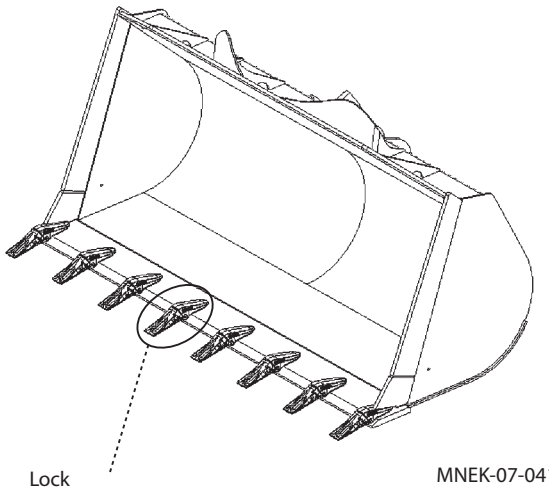
1. Lift the bucket so its bottom is level. Lift the bucket to an appropriate height and wedge a block under it so the bucket will not come down. Stop the engine.
2. Loosen bolts (1) and nuts (2). Remove cutting edge (4).
3. Install new cutting edge (4). If the reverse side of a cutting edge is not worn much, use it again with the face reversed. If both sides are worn out, replace it with a new one.
4. Tighten nuts (2).

   Tightening torque
   Cutting edge : 1068 N·m (109 kgf·m, 788 lbf·ft)

5. Retighten mounting nuts (2) after a few hours of operation.



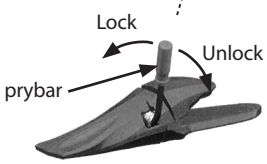
M4GB-07-116



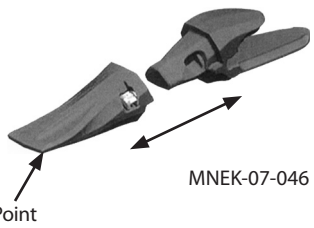
MNEK-07-041

Bucket Teeth

1. Lift the bucket so its bottom is level. Lift the bucket to an appropriate height and wedge a block under it so the bucket will not come down. Stop the engine.
2. Insert a pry bar into the locking part of the tooth, unlock it and remove the point.
3. Remove the point of the tooth.
4. Mount a new point and lock it with the pry bar.
5. After operating the machine for several hours, check and make sure there are no problems with the mounting of the point.



MNEK-07-045



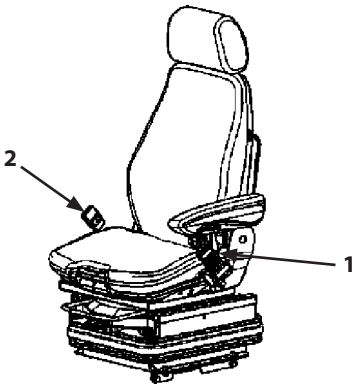
MNEK-07-046

2 **Check and Replace Seat and Seat Belt**

Check appearance --- every 10 hours (daily)

Replace --- every 3 years

Examine buckle (1), attaching hardware (2) and seat belt web. Replace the seat belt web, buckle, or attaching hardware if they are damaged, or worn. Also check the wind-up condition of the seat belt.
Replace seat belt every 3 years, regardless of appearance. Inspect the seat for large play or damage. Replace it if necessary.

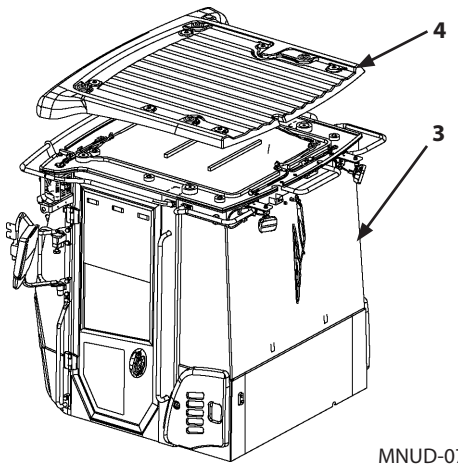


MNUD-01-049

3 **Check ROPS Cab, Resin Cab Roof, and Roof Mounting Bolts**

--- every 10 hours (daily)

Check the appearance of ROPS cab (3) and resin cab roof (4) for any abnormal damage or deformation.



MNUD-07-063

4 **Check Windshield Washer Fluid Level**

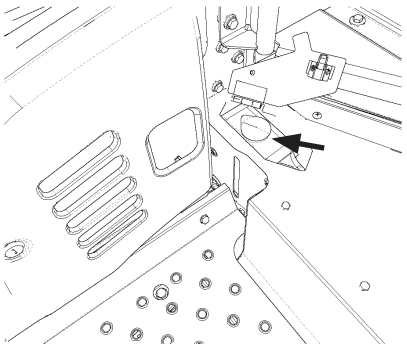
--- every 10 hours (daily)

IMPORTANT: Keep all dirt, dust and other foreign materials out of the tank.

Use anti-freeze type washer fluid in cold weather.

Check the fluid level. If necessary, add the fluid.

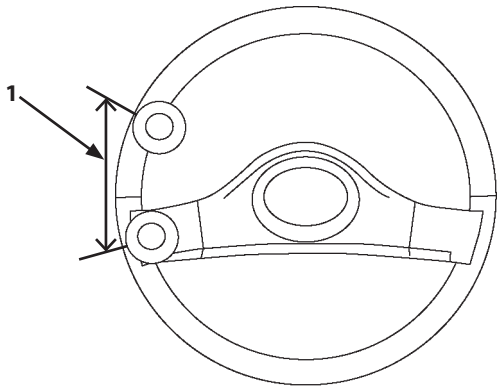
NOTE: The location of the windshield washer fluid tank is under the floorboard.



MNFQ-07-048

5 **Check Play Amount in Steering Wheel Stroke**
--- every 10 hours (daily)

WARNING: When the steering wheel is turned, the clearance between the front and rear frames becomes narrower, possibly creating a hazardous situation such as entanglement of limbs. Keep any personnel away from the frame articulation point during inspection.



MNEC-07-050

Check that play (1) in steering wheel stroke is correct and that steering column tilt telescopic lever (2) and pedal (3) are securely held.
In addition, check that the steering wheel column normally comes in contact with the stopper when the steering wheel is fully turned and that the steering cylinder operates normally.

1. Start the engine.

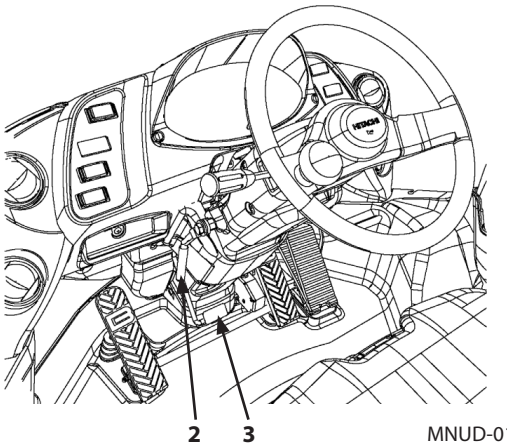
   Turn the parking brake switch ON.

2. Slightly lift the bucket above the ground.

   Place the control lever lock in the lock position.

3. While running the engine at slow speed, slightly rotate the steering wheel knob in both clockwise and counterclockwise direction. Measure the moving distance along the steering wheel circumference until both right and left steering cylinders start moving (check the movement of the bucket and/or tires).

   Play amount (1) : 5 to 15 mm (0.2 to 0.6 in)



MNUD-01-009

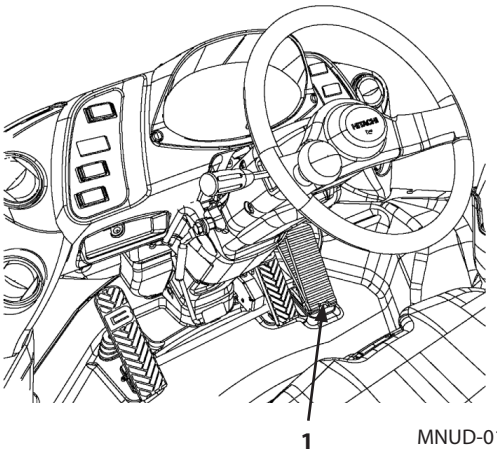
NOTE: If too much play amount of the steering wheel is found or if the steering wheel does not move smoothly, consult Authorized Dealer for checking.

6 **Check Accelerator Pedal Operation, and Exhaust Gas Color and Noise**

--- every 10 hours (daily)

WARNING: Move the forward/reverse lever to neutral. Apply the parking brake. After horizontally resting the bucket on the ground, set the wheel stoppers.

While slowly stepping on accelerator pedal (1), check that the engine speed smoothly increases. While slowly returning accelerator pedal (1), check that the engine speed smoothly decreases.
If dust and/or soil accumulate in vicinity of accelerator pedal (1), remove them.



MNUD-01-009

Exhaust Gas Color and Noise:

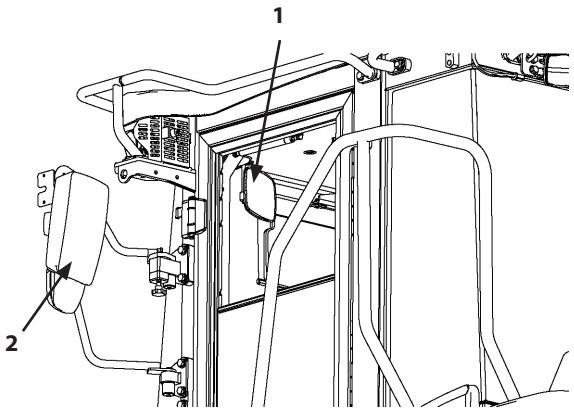
DANGER: Ventilate the shop with fresh air when carrying out warm-up operation indoors. Failure to do so may cause intoxication by exhaust gas, possibly resulting in personal death accident.

IMPORTANT: This machine is equipped with an engine that meets Stage V emission requirements. Never attempt to modify the inlet and exhaust system.

Exhaust gas color is normally transparent or light blue. Although exhaust gas color slightly becomes white immediately after the engine is started or quickly accelerated, this symptom is not abnormal.
If the exhaust gas color turns black, white, brown, or gray, check the engine oil level and the fuel supply system for any abnormality. In addition, check that no abnormal noise is heard coming from the engine or the muffler.

7 Check Rearview Mirror and Inside Rearview Mirror --- every 10 hours (daily)

Check that the inside of rearview mirror (1) and rearview mirror (2) are facing a correct direction.
Check inside rearview mirror (1) and rearview mirror (2) for contamination or damage.



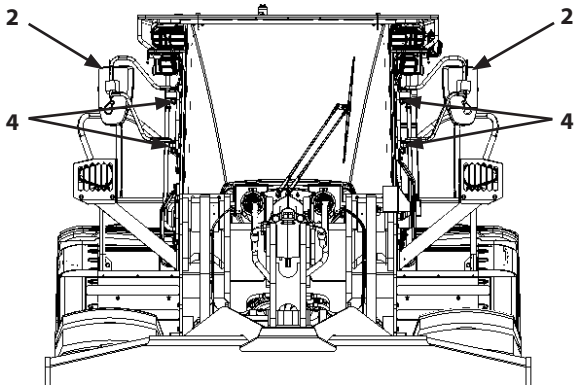
MNUD-01-078

Check Mirror Stay for Looseness

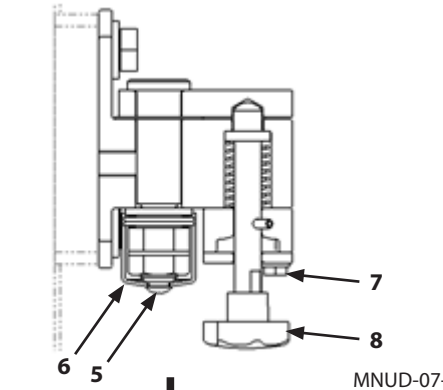
Check that the mirror stay (3) is not loosened.
Tighten the nuts of rotating shaft at mirror stay bearings (4), if needed, as follows.

1. Remove screw (5) and cap (6).
   As for the upper side bearings, remove bolt (7) and remove lock assembly (8).
2. Tighten convex nut (9) with a torque of 16 N·m (1.6 kgf·m, 11.8 lbf·ft).
3. While holding convex nut (9), tighten concave nut (10) with a torque of 80 N·m (8.0 kgf·m, 59 lbf·ft).

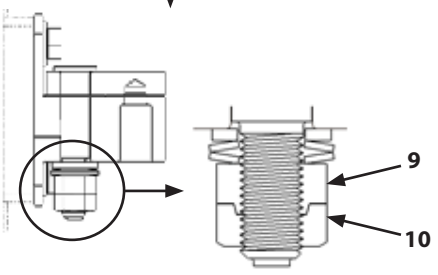
NOTE: The optimal operating force for opening and closing the mirror stay is 90 to 130 N (9.0 to 13 kgf, 20 to 29 lbf).



MNFQ-01-314



MNUD-07-066



MNUD-07-067

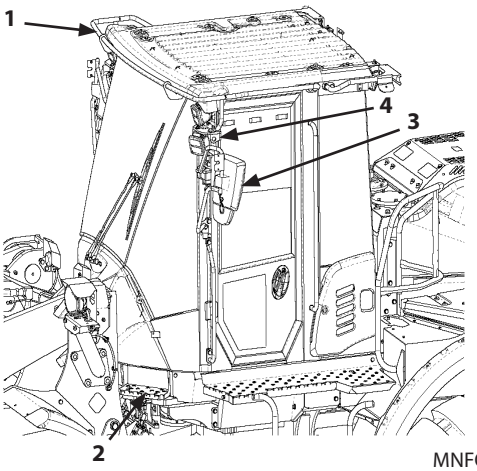
Enlarged View (4)

8 **Clean Cab Window Glass**
--- every 10 hours (daily)

WARNING: Securely hold your body with a safety belt and provided rails (1) and foot plates (2) while cleaning the windows around the cab. Failure to do so may result in personal injury or death due to dropping off the machine.

Keep clean the window glass to obtain clear views.
When cleaning, close the cab doors and close outside rear view mirrors (3) too for better accessibility to the glasses. Use a safety belt securing to anchor point (4) to hold your body to prevent dropping off the machine.

NOTE: To close rear view mirror (3), refer to page 1-248 for "Outside Rear View Mirror".

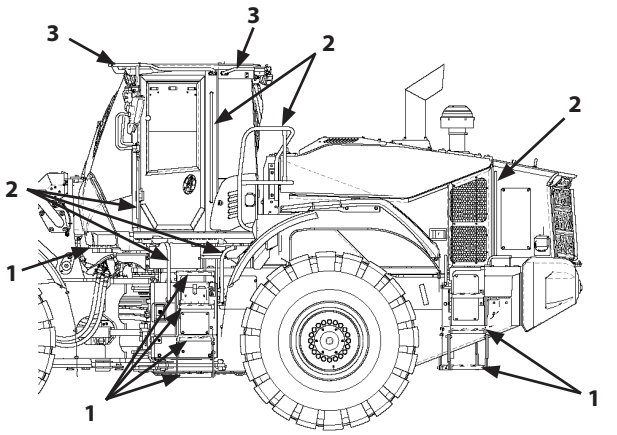


MNFQ-01-073

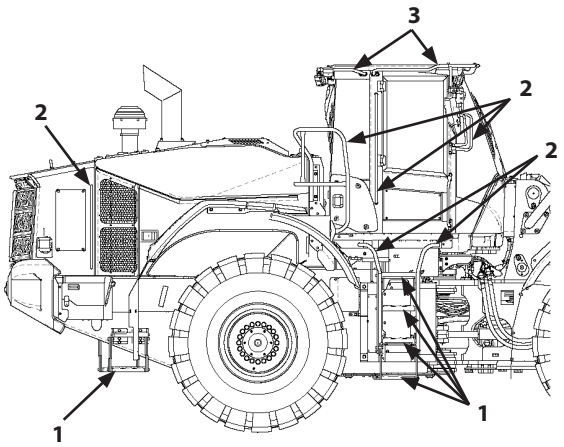
9 **Check Steps, Handrails and Cab Top Rails for Damage and Looseness**

--- every 10 hours (daily)

Check steps (1), handrails (2) and cab top rails (3) for any damage, looseness and contamination.
If any slippery matter such as machine lubricants or mud becomes adhered to steps (1), handrails (2) and/or cab top rails (3), remove such contaminant.
If steps (1) and/or handrails (2) become damaged or loosened so that getting on and off the machine is difficult, immediately repair or replace. If cab top rails (3) become damaged or loosened so that operator's security while servicing cannot be assured, immediately repair or replace.



MNFQ-01-074



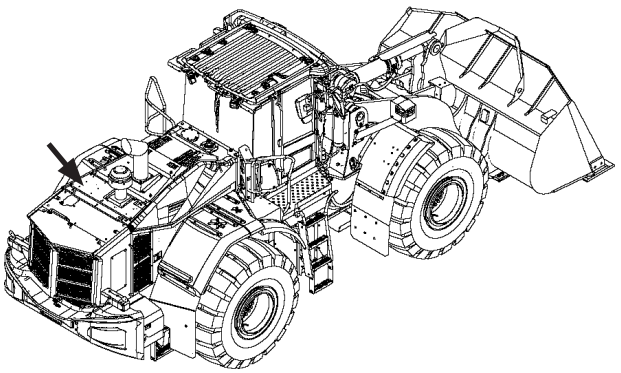
MNFQ-01-075

10 **Clean Engine Compartment and Hood**

--- every 10 hours (daily)

CAUTION: Dust or chips accumulated in the engine compartment or around the hood may come in contact with high temperature sections near the engine or hood, possibly causing fires.

Remove the accumulated dust and chips from the hood.
Open the side access cover and check if dust and/or chips are accumulated in the engine compartment and/or the areas above the engine. Remove the accumulated chips and/or dust if any.

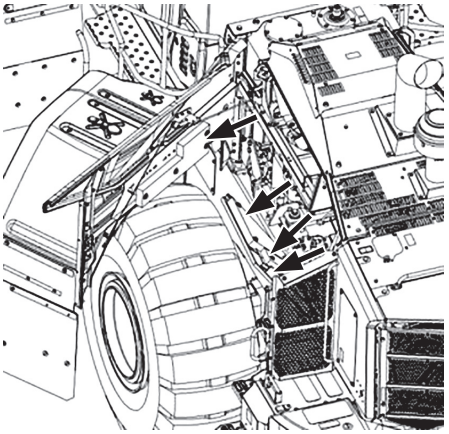


MNFQ-01-076

11 **Check Sound Absorbing Mat Around Engine**
--- every 10 hours (daily)

CAUTION: If the sound absorbing mat in the engine compartment becomes unglued, the mat may come in contact with high temperature sections of the engine, possibly resulting in fires.

Check if the sound absorbing mat around the engine is unglued. If any part of the mat is found unglued, immediately contact Authorized Dealer for repair.



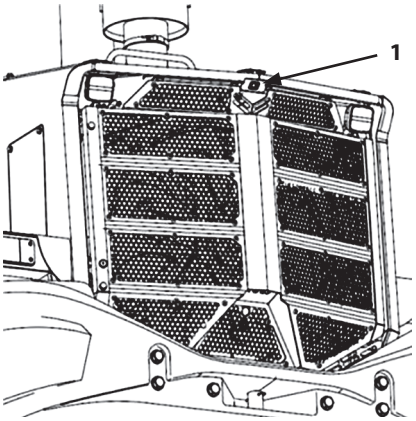
MNFQ-07-081

12 **Cleaning of Rear View Camera Lens and Side Camera Lens (Optional)**
--- every 10 hours

Oil, dust, moisture band, or others may obscure the image from the camera lens.
If image is not clear, clean the lens by following below procedure.

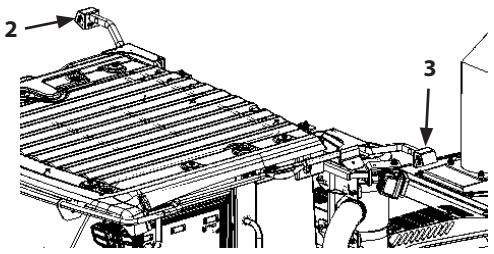
Gently wipe surface of rear view camera lens (1) with a damp cloth.

NOTE: Clean side cameras (2)(3), if installed.



MNFQ-01-313

IMPORTANT: Never use organic solvent.
Do not apply excessive force as it may damage the camera.



MNFQ-07-038

13 Check and Adjust Valve Clearance

--- every 5000 hours

Consult Authorized Dealer for check and repair.

14 Retighten Front Axle and Rear Axle Support Mounting Bolts

--- every 2000 hours (50 hours at first time only)

Check front and rear axle support mounting bolts for looseness.

Tightening torques of the front axle and rear axle support mounting bolts

Front Axle Mounting Bolt	Rear Axle Support Mounting Bolt
1420 N·m (142 kgf·m, 1047 lbf·ft)	1420 N·m (142 kgf·m, 1047 lbf·ft)

15 Tightening and Retightening Torque of Nuts and Bolts --- every 250 hours (50 hours at first time only)

Tighten or retighten nuts and bolts used on this machine in accordance with the torque values shown in the following table. Check nuts and bolts for looseness and missing daily before and after operation. If any loose or missing nuts and/or bolts are found , retighten or supply replacement parts. Check tightness after the first 50 hours then every 250 hours. The nuts and bolts other than those shown in the table below shall be tightened in accordance with the torque values shown in the table on page 7-129.
※ LOCTITE #262 is used.
Figures with * mark are shown in inch.

	Locations		Bolt Diameter mm (in)	Quantity	Wrench Size mm	Torque N·m	(kgf·m)	(lbf·ft)
1	Front axle mounting bolt		30 (1.18)	8	46	1420	(142)	(1047)
2	Rear axle support mounting bolt		30 (1.18)	10	46	1420	(142)	(1047)
3	Wheel rim mounting bolt		24 (0.94)	80	36	890	(89)	(656)
4	Propeller shaft mounting bolt		12 (0.47)	24	19	※ 142	※ (14)	※ (105)
	Propeller shaft support bearing mounting bolt		20 (0.79)	2	30	※ 400	※ (40)	※ (295)
6	Transmission mounting bolt : Bracket		16 (0.63)	12	24	※ 210	※ (21)	※ (155)
7	Transmission mounting bolt : Cushion rubber		20 (0.79)	4	30	※ 400	※ (40)	※ (295)
8	Engine mounting bolt	A	12 (0.47)	12	19	※ 90	※ (9.0)	※ (66.4)
		B	20 (0.79)	2	30	※ 400	※ (40)	※ (295)
		C	12 (0.47)	4	19	※ 90	※ (9.0)	※ (66.4)
		D	24 (0.94)	2	36	※ 700	※ (70)	※ (516)
		E	12 (0.47)	4	15	※ 115	※ (12)	※ (84.8)
		F	3.4 UNC	1	26 (1-1/8 UNC in)	※ 325	※ (33)	※ (240)
9	Aftertreatment device mounting bolt	A	12 (0.47)	6	19	90	(9.0)	(66.4)
	Aftertreatment device mounting nut	B	10 (0.39)	8	17	90	(9.0)	(66.4)
10	Counterweight mounting bolt		24 (0.94)	6	36	700	(70)	(516)
11	Top center pin upper flange lock		16 (0.63)	8	24	210	(21)	(155)
12	Top center pin lower flange lock		18 (0.71)	5	24	※ 422	※ (42)	※ (311)
13	Bottom center pin lock		20 (0.79)	1	30	400	(40)	(295)
14	Loader front pin lock		20 (0.79)	13	30	400	(40)	(295)
15	Steering cylinder pin lock		16 (0.63)	4	24	210	(21)	(155)
16	Radiator frame mounting bolt		16 (0.63)	6	24	210	(21)	(155)
17	Cooling device mounting bolt		12 (0.47)	9	19	90	(9.0)	(66.4)
18	Air conditioner condenser mounting bolt		8 (0.31)	4	13	10.2~15.2	(1.0~1.5)	(7.4~11.1)
19	Air conditioner compressor mounting bolt	A	8 (0.31)	4	13	20	(2.0)	(14.8)
		B	10 (0.39)	4	17	50	(5.0)	(36.9)
20	Cab cushion rubber mounting nut		16 (0.63)	4	24	210	(21)	(155)
21	Bucket tooth mounting bolt (Optional)		* 1-8 UNC	22	41	1313	(131)	(968)
22	Cutting edge mounting bolt		* 1-8 UNC	14	41	1310	(131)	(966)
23	Wear plate mounting bolt		* 7/8-9 UNC	8	36	834	(83)	(615)
24	Battery mounting nut : Upper	A	12 (0.47)	4	19	50	(5.0)	(36.9)
	Battery mounting nut : Lower	B	12 (0.47)	4	19	10	(1.0)	(7.4)
25	Rear under guard mounting bolt (Optional)	A	12 (0.47)	8	19	※ 90	※ (9.0)	※ (66.4)
		B	12 (0.47)	4	19	※ 50	※ (5.0)	※ (36.9)
		C	12 (0.47)	8	19	※ 90	※ (9.0)	※ (66.4)
26	Front under guard mounting bolt (Optional)		12 (0.47)	12	19	※ 90	※ (9.0)	※ (66.4)

Tightening Torque Chart

Bolt Dia. mm (in)	Hexagon Wrench									Wrench Size mm	Socket Bolt			
	10.9 Ⓣ T			8.8 Ⓗ H			7 M				Socket Bolt			Wrench Size mm
	N·m	(kgf·m)	(lbf·ft)	N·m	(kgf·m)	(lbf·ft)	N·m	(kgf·m)	(lbf·ft)		N·m	(kgf·m)	(lbf·ft)	
6 (0.24)							3~4	(0.3~0.4)	(2.2~3)	10				5
8 (0.31)	30	(3.0)	(22)	20	(2.0)	(14.8)	10	(1)	(7.4)	13	20	(2.0)	(14.8)	6
10 (0.39)	65	(6.5)	(48)	50	(5.0)	(36.9)	20	(2)	(14.8)	17	50	(5.0)	(36.9)	8
12 (0.47)	110	(11)	(81)	90	(9.0)	(66.4)	35	(3.5)	(25.8)	19	90	(9.0)	(66.4)	10
14 (0.55)	180	(18)	(133)	140	(14)	(104)	55	(5.5)	(40.6)	22	140	(14)	(104)	12
16 (0.63)	270	(27)	(199)	210	(21)	(155)	80	(8)	(59)	24	210	(21)	(155)	14
18 (0.71)	400	(40)	(295)	300	(30)	(221)	120	(12)	(88.5)	27	300	(30)	(221)	14
20 (0.79)	550	(55)	(406)	400	(40)	(295)	170	(17)	(125)	30	400	(40)	(295)	17
22 (0.87)	750	(75)	(553)	550	(55)	(406)	220	(22)	(162)	32				
24 (0.94)	950	(95)	(700)	700	(70)	(516)	280	(28)	(207)	36				19
27 (1.06)	1400	(140)	(1033)	1050	(105)	(774)	400	(40)	(295)	41				
30 (1.18)	1950	(195)	(1438)	1450	(145)	(1069)	550	(55)	(406)	46				
33 (1.30)	2600	(260)	(1918)	1950	(195)	(1438)	750	(75)	(553)	50				
36 (1.42)	3200	(320)	(2360)	2450	(245)	(1807)	950	(95)	(700)	55				

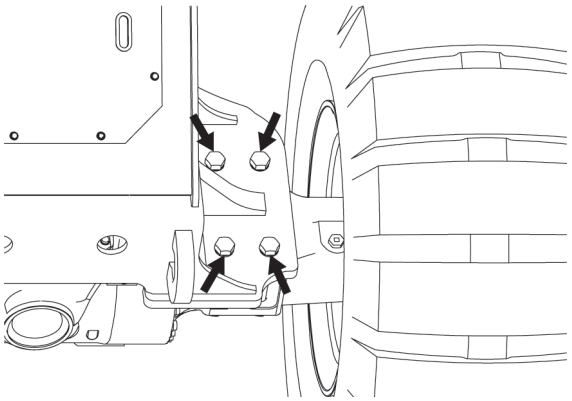
CAUTION: If fixing bolts for counterweight are loosened, consult Authorized Dealer.

IMPORTANT:

- **Apply lubricant (e.g. white zinc B dissolved into spindle oil) to new bolts and nuts before tightening them.**
- **Remove soil, dust, and/or dirt from the nut and bolt thread surfaces before tightening.**
- **Tighten nuts and bolts to specifications. If tightened with excessively low or high torque, missing or breakage of nuts and/or bolts may result.**

1. Front axle mounting bolt

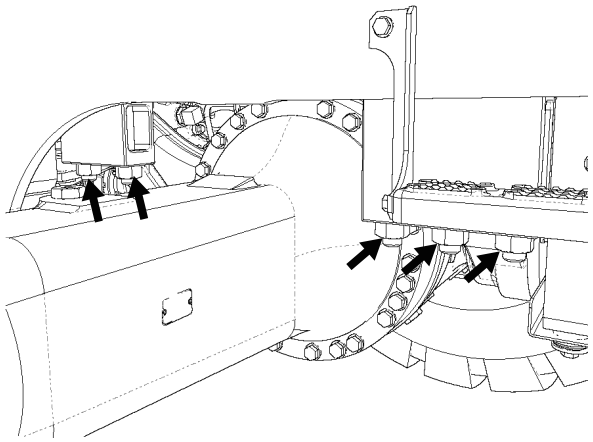
Bolt diameter	30 mm (1.2 in)
Quantity	8



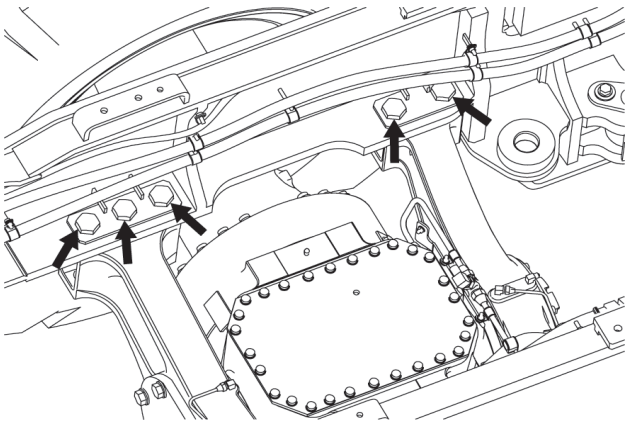
90Z7-7-105-1

2. Rear axle support mounting bolt

Bolt diameter	24 mm (0.9 in)
Quantity	8



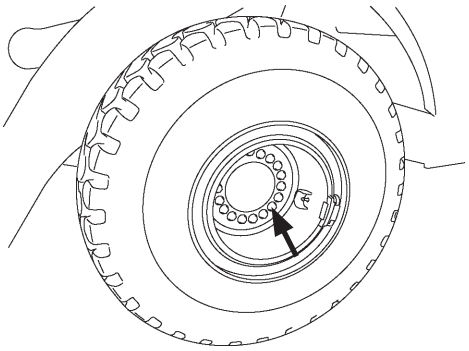
MNFQ-07-052



90Z7-7-105-3

3. Wheel rim mounting bolt

Bolt diameter	24 mm (0.9 in)
Quantity	72



M4GB-07-127

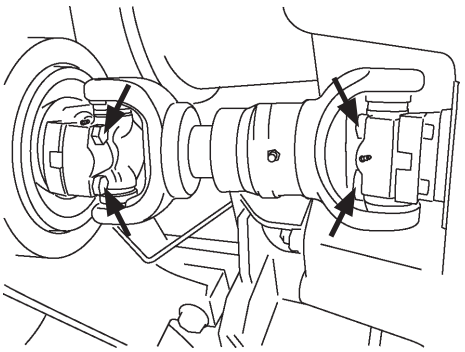
4. Propeller shaft mounting bolt

   Axle side

Bolt diameter	12 mm (0.5 in)
Quantity	12

   Transmission side

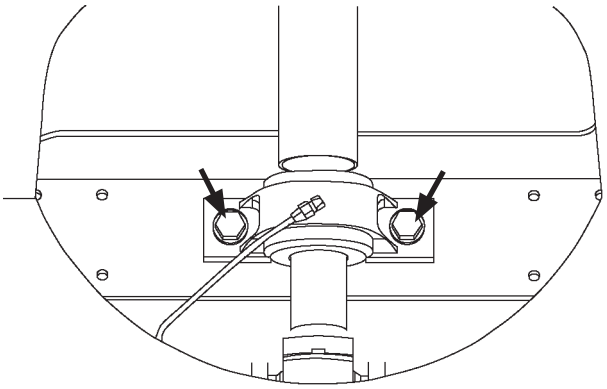
Bolt dia. inch	1/2-20 UNF-2A
Quantity	8



M4GB-07-017

5. Propeller shaft support bearing mounting bolt

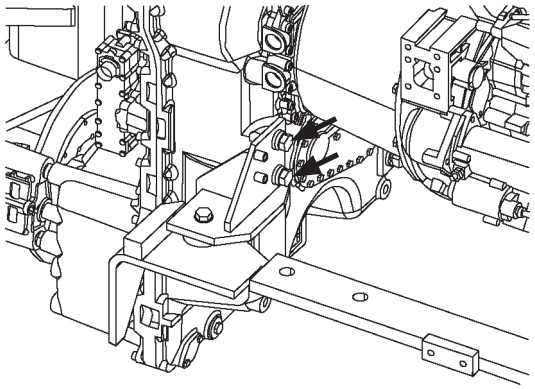
Bolt diameter	20 mm (0.8 in)
Quantity	2



MNEC-07-053

6. Transmission mounting bolt: Bracket

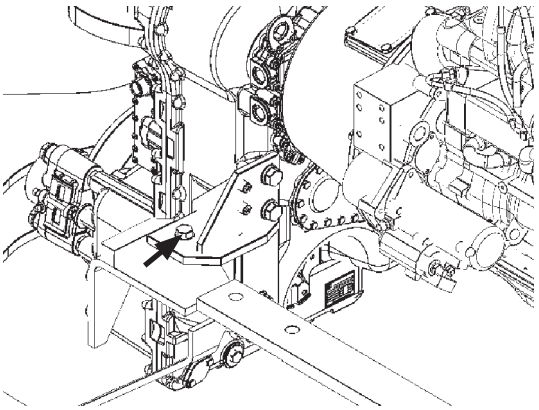
Bolt diameter	20 mm (0.8 in)
Quantity	6



MNEC-07-092

7. Transmission mounting bolt: Cushion rubber

Bolt diameter	20 mm (0.8 in)
Quantity	2



MNEK-07-042

8. Engine mounting bolt

Bolt A

Bolt diameter	12 mm (0.5 in)
Quantity	12

Bolt B

Bolt diameter	20 mm (0.8 in)
Quantity	2

Bolt C

Bolt diameter	12 mm (0.5 in)
Quantity	4

Bolt D

Bolt diameter	24 mm (0.9 in)
Quantity	2

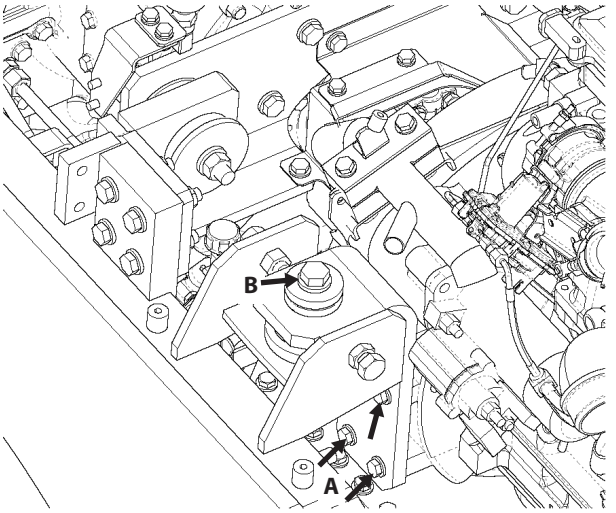
Bolt E

Bolt diameter	12 mm (0.5 in)
Quantity	4

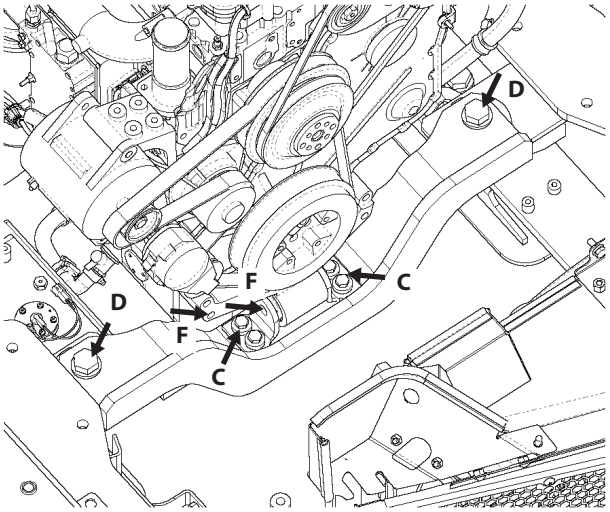
Bolt F

Bolt diameter	3.4 UNC
Quantity	1

NOTE: Apply LOCTITE#262 or equivalent to all engine mounting bolts A~F above.



MNFQ-07-053



MNFQ-07-054

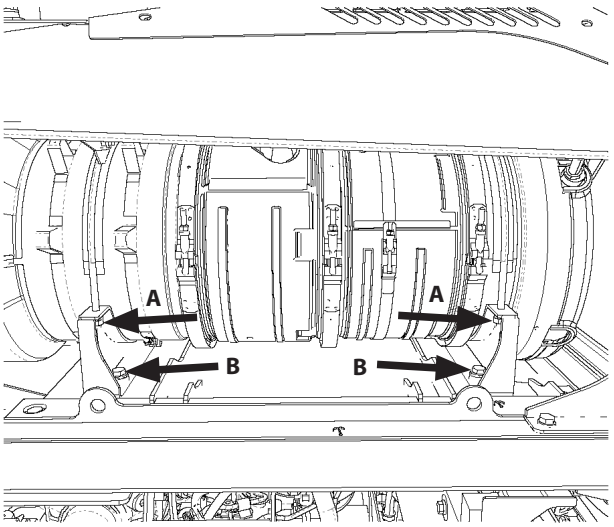
9. Aftertreatment device mounting bolt/nut

Bolt A

Bolt diameter	12 mm (0.5 in)
Quantity	4

Nut B

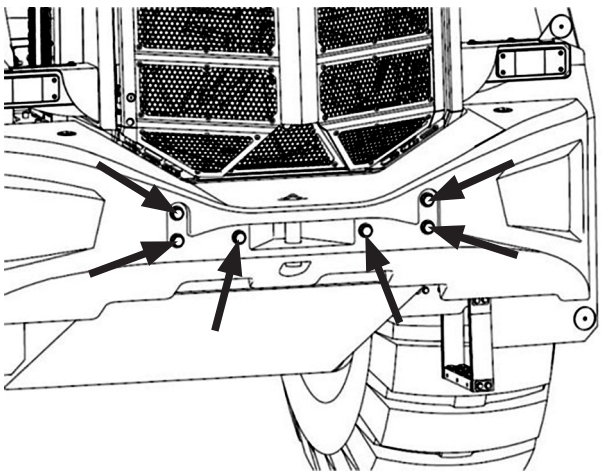
Bolt diameter	10 mm (0.4 in)
Quantity	8



MNFQ-07-055

10. Counterweight mounting bolt

Bolt diameter	24 mm (0.9 in)
Quantity	6



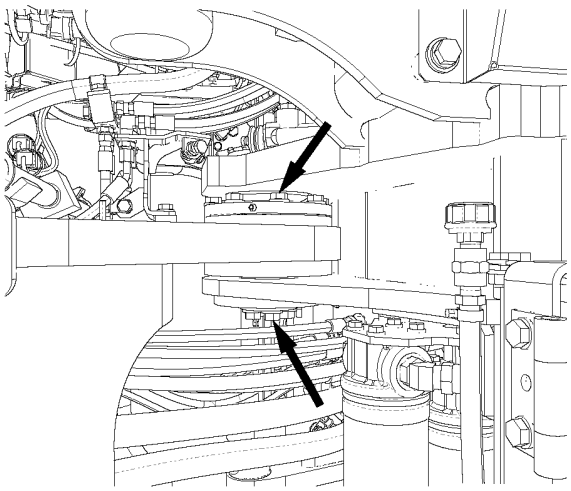
MNFQ-01-078

11. Top center pin upper flange lock

Bolt diameter	16 mm (0.6 in)
Quantity	8

12. Top center pin lower bushing lock

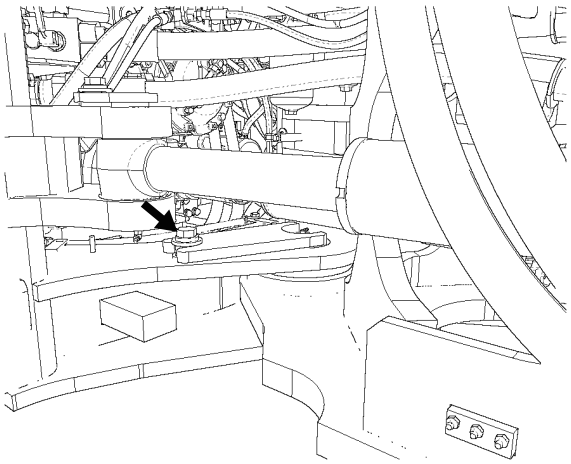
Bolt diameter	18 mm (0.7 in)
Quantity	5



MNFQ-07-057

13. Bottom center pin lock

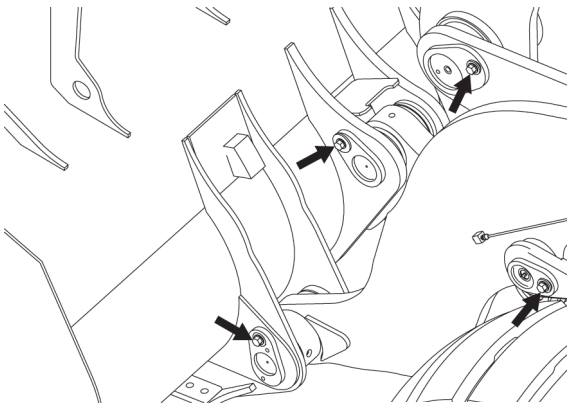
Bolt diameter	20 mm (0.8 in)
Quantity	1



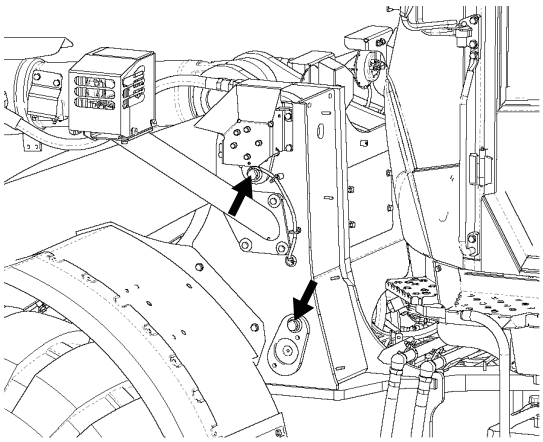
MNFQ-07-058

14. Loader front pin lock

Bolt diameter	20 mm (0.8 in)
Quantity	13



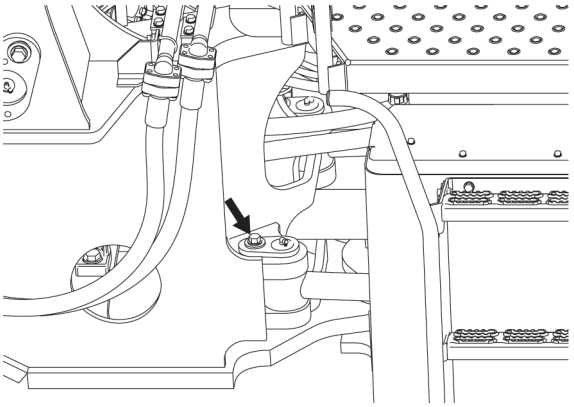
90Z7-7-109-2



MNFQ-07-059

15. Steering cylinder pin lock

Bolt diameter	16 mm (0.6 in)
Quantity	4



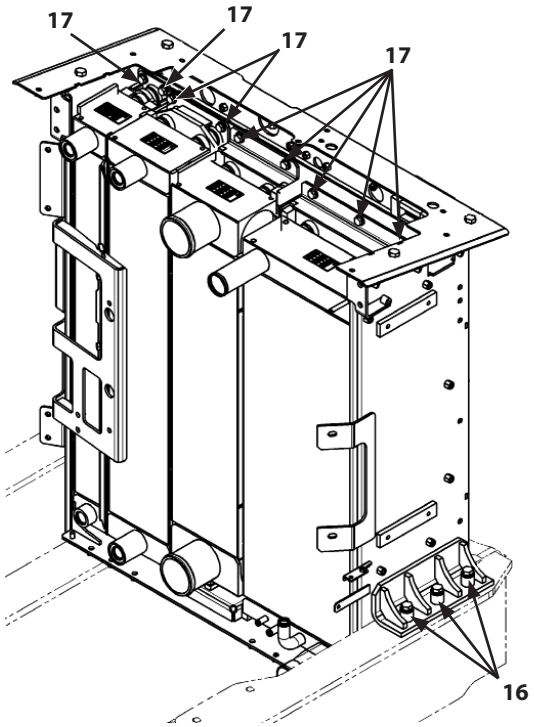
90Z7-7-109-4

16. Radiator mounting bolt

Bolt diameter	16 mm (0.6 in)
Quantity	6

17. Cooling device mounting bolt

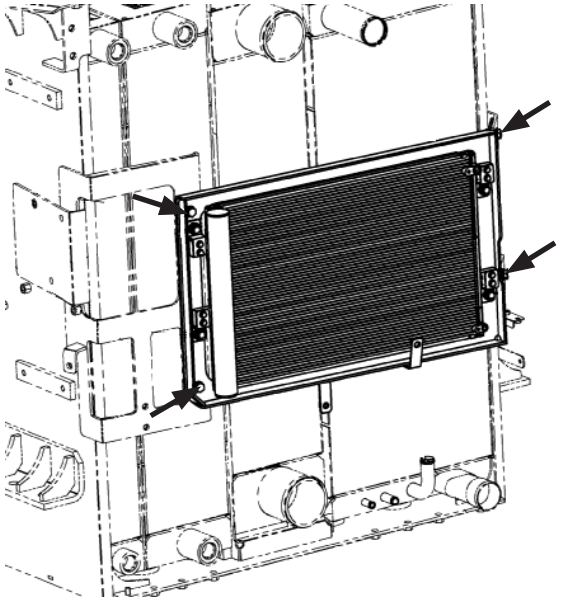
Bolt diameter	12 mm (0.5 in)
Quantity	9



MNFQ-07-060

18. Air conditioner condenser mounting bolt

Bolt diameter	8 mm (0.3 in)
Quantity	4



MNFQ-07-040

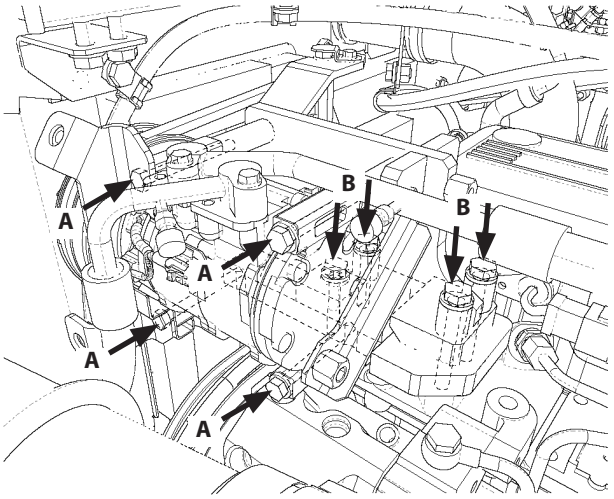
19. Air conditioner compressor mounting bolt

Bolt A

Bolt diameter	8 mm (0.3 in)
Quantity	4

Bolt B

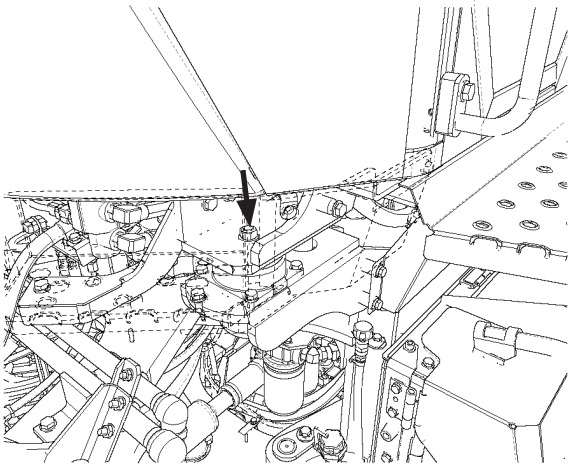
Bolt diameter	10 mm (0.4 in)
Quantity	4



MNFQ-07-061

20. Cab cushion rubber mounting bolt

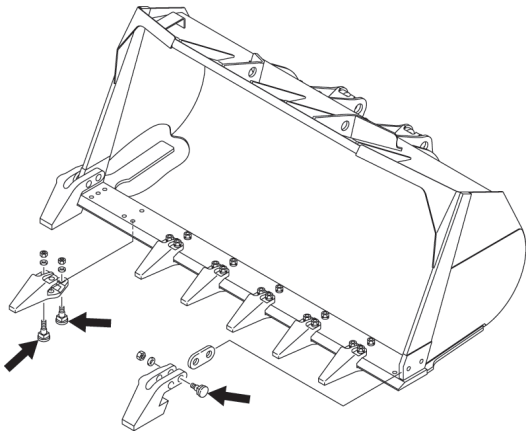
Bolt diameter	16 mm (0.6 in)
Quantity	4



MNFQ-07-062

21. Bucket tooth mounting bolt (Optional)

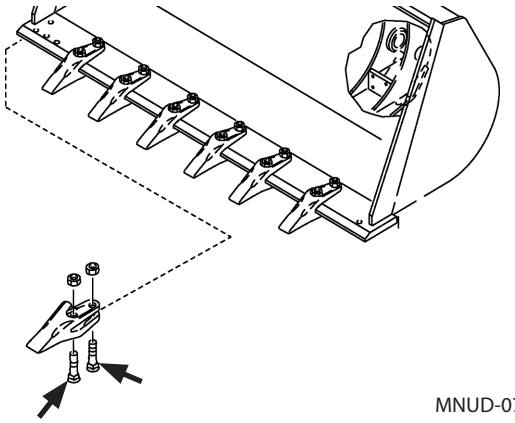
Bolt dia. inch	1-8UNC in
Quantity	22



90Z7-7-112-3

22. Cutting edge mounting bolt

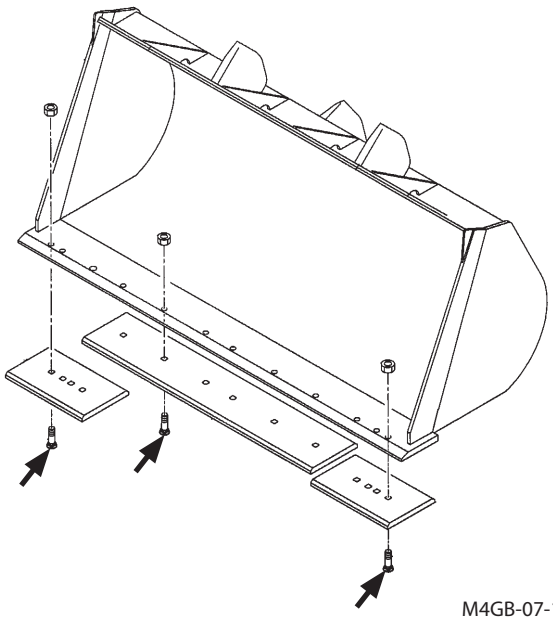
Bolt dia. inch	1"
Quantity	12



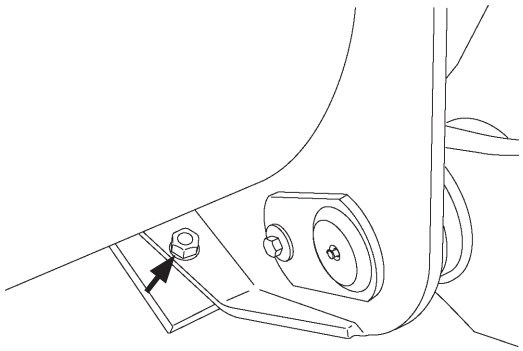
MNUD-07-057

23. Wear plate mounting bolt

Bolt dia. inch	1"
Quantity	4



M4GB-07-116



M4GB-07-150

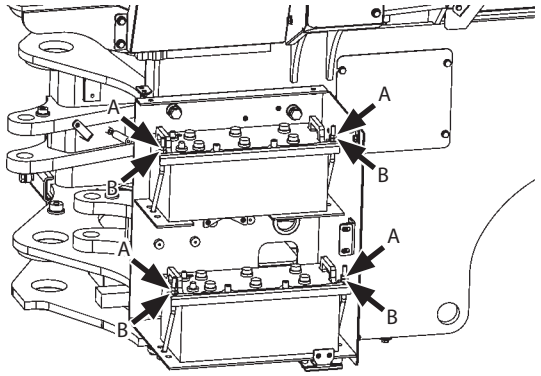
24. Battery mounting nut

Nut A (Upper)

Nut diameter	12 mm (0.5 in)
Quantity	4

Nut B (Lower)

Nut diameter	12 mm (0.5 in)
Quantity	4



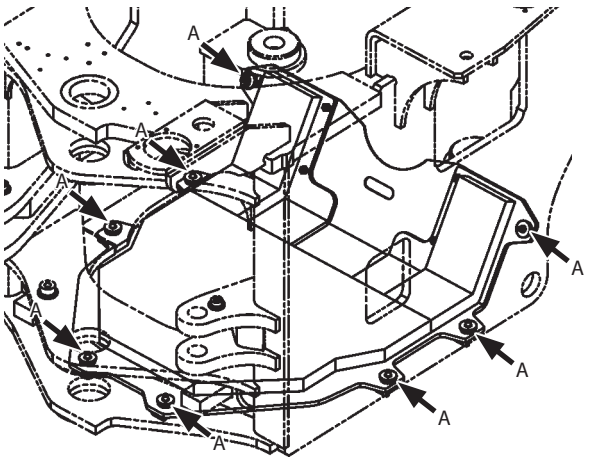
MNFQ-07-083

25. Rear under guard mounting bolt (Optional)

Bolt A

Bolt diameter	12 mm (0.5 in)
Quantity	8

NOTE: Apply LOCTITE#262 or equivalent.



MNFQ-07-085

Bolt B

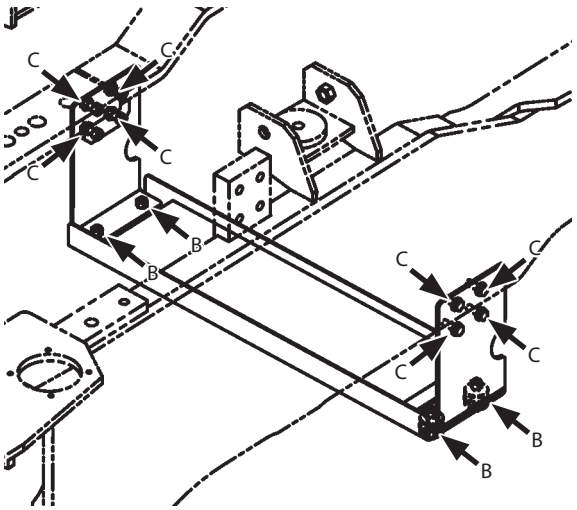
Bolt diameter	12 mm (0.5 in)
Quantity	4

NOTE: Apply LOCTITE#262 or equivalent.

Bolt C

Bolt diameter	12 mm (0.5 in)
Quantity	8

NOTE: Apply LOCTITE#262 or equivalent.

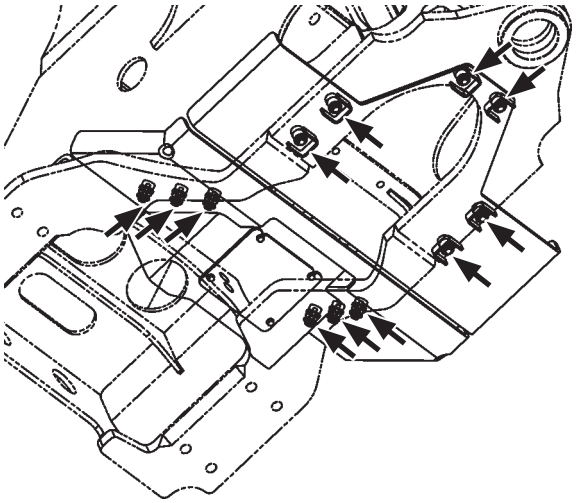


MNFQ-07-086

26. Front under guard mounting bolt (Optional)

Bolt diameter	12 mm (0.5 in)
Quantity	12

NOTE: Apply LOCTITE#262 or equivalent.



MNFQ-07-087

16 Daily Check of Camera Images Used to Compose the Aerial Angle (Optional)

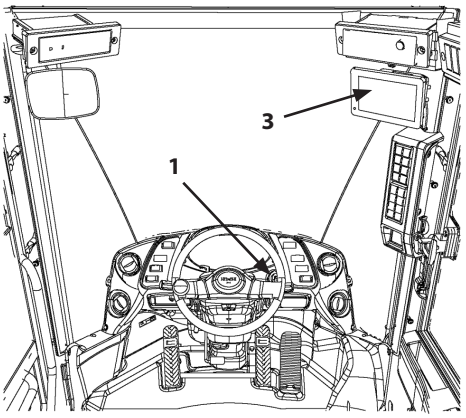
--- daily (before starting the engine)

1. Turn key switch (1) to the ON position.
2. Push selector knob (2) and check that the image changes on sub monitor (3).
3. Set sub monitor (3) to display the surrounding image and check that all the camera images are being output, and that there is no problem with visibility in the image.

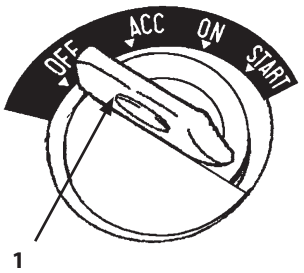
IMPORTANT:

- **If the image is not clear, clean the lenses of the offending cameras or monitor to make the image clear. Always ensure good footing when cleaning the cameras.**
- **If cleaning the camera lenses and monitor does not improve visibility, or if part of the image is missing, contact Authorized Dealer.**

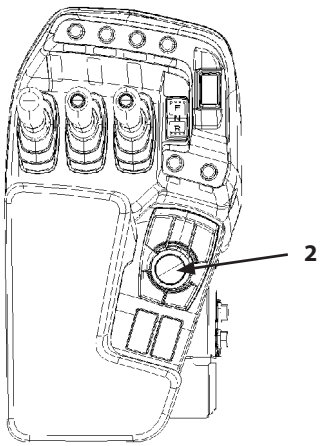
NOTE: The surfaces of sub monitor (3) and the camera lenses are made of plastic. When cleaning them, use a clean water-dampened cloth and wipe lightly. Never use an organic solvent.



MNUD-01-008



MPD8-01-307



MNUD-01-251

17 **Check Camera Images Used to Compose Aerial Angle (Optional)**

--- after performing work that affects the installation position of the cameras

IMPORTANT: After performing work that affects the installation position of the cameras (detachment of brackets or counterweight where cameras are mounted, camera replacement etc.), it may be necessary to redo the camera composition settings. Follow the check procedure below to check whether the camera images are being displayed normally.



MPD8-01-307

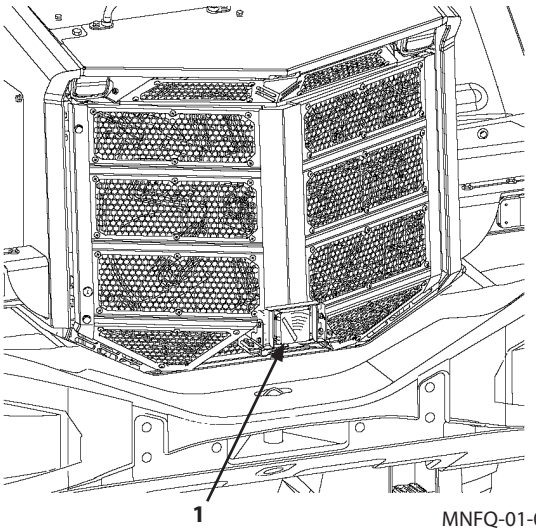
Turn key switch (1) ON and check that there are no problems with the surrounding image using the following procedure.

18 **Check and Clean Rear Obstacle Detection Sensor Face (Optional)**

--- daily (before starting the engine)

IMPORTANT: The obstacle detection system is designed to enhance the operator's awareness of the machine surroundings. Use of this system does not replace basic safety precautions and procedures for operating the machine.

Inspect radar object detection (ROD) system sensor face (1) for any accumulation of dirt, mud, snow, ice, or debris.
Clean sensor face as necessary.



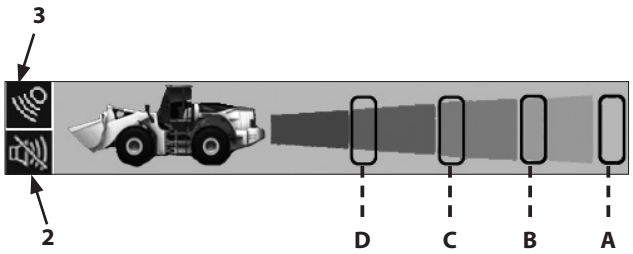
MNFQ-01-036

19 Check Rear Obstacle Detection Sensor System Operation (Optional)

IMPORTANT: Perform operational check of radar object detection (ROD) system properly.

1. Select "Setting" - "Rear Obstacle Alarm Setting" from the sub monitor main menu.
2. Set the rear obstacle alarm setting to OFF, and check the ROD buzzer off icon (2) is displayed on the sub monitor.
3. Set the rear obstacle alarm setting to ON, and check the ROD buzzer off icon (2) is not displayed.
   See page 1-111 for the setting.
4. Prepare an enough large obstacle behind the machine at about 4 m (13.1 ft).
5. With the rear obstacle alarm setting ON, place the shift lever in the 1st gear reverse (R1).
6. Verify that alarm sounds and display indicates that object is detected with icon (3).
7. Move machine closer to object. Verify that alarm sounds louder and longer to indicate that object detection is in closer detection zone.

Alarm Level	Graph Bar level	Buzzer Setting	
		ON	OFF
1	A, Yellow	No sound	No sound
2	B, Yellow	Slow short beep	No sound
3	C, Red	Quick short beep	Quick short beep
4	D, Red	Long beep	Long beep



MNVA-01-043

Maintenance Under Special Environmental Conditions

WARNING:

- **Before operating the machine in a river, check the riverbed conditions in advance.**
- **Avoid driving the machine into a river where the riverbed is steep and deep or the current is strong.**

Operating Conditions	Precautions for Maintenance		
Muddy Soil, Rainy or Snowy Weather	Before Operation	:	Check tightness of plugs and all drain cocks.
	After Operation	:	Clean the machine and check for cracks and damage. Check for loose or missing bolts and nuts. Lubricate all necessary parts without delay. If the machine should be submerged in water deeper than approximately 450 mm (17.7 in), water may get into the brake device (such as the parking brake), resulting in poor braking performance. Watch out when starting/stopping the machine.
Near the Ocean (or near chemical treatment place)	Before Operation	:	Check tightness of plug and all drain cocks.
	After Operation	:	Thoroughly clean the machine with fresh water to wash off salt. Service electrical equipment often to prevent corrosion.
Dusty Atmosphere	Air Cleaner	:	Replace the element at shorter service intervals.
	Radiator	:	Clean the radiator core and every coolers core.
	Fuel System, Urea SCR System	:	Clean the filter element and strainer regularly at shorter service intervals.
	Electrical Equipment	:	Clean them regularly, in particular, the commutator surface of the alternator and starter.
	Engine, Aftertreatment Device	:	Clean earlier than the normal interval to prevent dust from sticking and accumulating. Inhibit regeneration according to the machine operating condition.
Rocky Ground	Chassis	:	Check for damage on tires, for loose, cracked, worn, and damaged bolts and nuts.
	Front Attachment	:	Standard attachment may be damaged when digging rocky ground. Reinforce the bucket before using it, or use a heavy duty bucket. Consult Authorized Dealer.
Freezing Weather	Fuel	:	Use high quality fuel suitable for low temperature. Check the fuel tank breather pipe freezing.
	Lubricant	:	Use high quality low viscosity hydraulic oil and engine oil.
	Engine Coolant	:	Be sure to use antifreeze.
	Battery	:	Fully charge the batteries regularly at shorter service intervals. If not charged fully, electrolyte may freeze.
	Tires and Frames	:	Keep tires and frames clean. Park the machine on a hard surface to prevent the tires from freezing to the ground.
	DEF	:	May become frozen but the machine can be operated normally.
When handling old paper and/or industrial waste	Engine compartment	:	Remove old paper and/or waste accumulated around the radiator and in the engine compartment, possibly causing overheating or fires of the machine if not removed.
	Air cleaner	:	Clean the element at shorter intervals.
	Fuel system	:	Clean and replace the elements and the filters at shorter intervals.
	Loader frame	:	Remove the accumulated paper and/or waste from the surroundings around the loader frame and the attachment. Failure to do so may cause damage of the machine.
	Radiator	:	Wash as frequently as possible to prevent corrosion due to chemical materials.

IMPORTANT: If material to be handled is a substance that causes corrosion such as salt or chemical, consult Authorized Dealer. Special modification or treatment may be needed for the machine. If the machine continues to be used, malfunction may occur due to corrosion.

Consult Authorized Dealer when the machine is operated under special condition(s).

Precautions for Maintenance During Cold Weather Season

Before the atmospheric temperature becomes down below -0 °C (32 °F), practice the following points.

- Water and oil in the machine will freeze.
- Road surfaces will freeze so that tires may slip.

Keeping the above points in mind, follow the advices below:

1. Refill fluids such as water and lubricants prior to operation (except fuel).
2. Mix LLC in the radiator (coolant). When this machine is shipped from the factory, LLC (long life coolant) is supplied. Therefore, this machine can operate normally without any problem.
3. Change the engine oil to cold weather type oil.
4. Use fuel (diesel fuel) of an antifreeze type. To prevent condensation of air into dew on the wall in the fuel tank, fully refill the fuel tank with an antifreeze type diesel fuel.
5. If the electrolyte in the battery case freezes, damage to the battery case may result. Maintain the batteries at fully charged condition. After completing work, turn all lights OFF. Perform cooling operation for five minutes.

   Or by other way, dismount the batteries and store them in a warm indoor place. When it is possible to measure and adjust the specific gravity of the electrolyte, increase the specific gravity of the electrolyte up to 1.280. Do not increase more than 1.280.
6. Use anti-freeze type washer fluid.

After taking the measures as recommended above, start operation of the machine.

DANGER: Sufficiently ventilate when carrying out warming up operation indoors. Failure to do so may cause intoxication by exhaust gas, possibly resulting in personal death accident.

7. After preheating the engine, start the engine. Sufficiently perform warm-up operation.
8. After warming up the engine, warm up the front attachment system. Slowly operate the control levers to move the cylinders full stroke several times.
9. Road surfaces covered with snow, especially when snow has been compacted, will become frozen. Use tire chains on four wheels.
10. Take anti-freeze measures after completing operation.

- Cover the keyhole by sticking a tape on.
- Rubber parts such as wiper may freeze. Keep other parts away from the rubber parts.
- Remove packed snow from around the undercarriage and inside the machine with a bar or brush.
- In case it is impossible to store the machine indoors, park the machine on a level dry surface and cover overall the machine with a large machine cover.

NOTE: DEF starts freezing at -10°C (12°F). Freezing does not affect its performance once thawed.

STORAGE

Storing the Machine

WARNING: If it is unavoidable to perform the lubrication operation indoors, open windows and doors to maintain good air ventilation to prevent asphyxiation. Lubricant property will deteriorate even if the machine is kept stored. Check all lubricants before operating the machine after being stored.

Apply the parking brake while storing.

If the machine is to be stored for more than one month, observe the following precautions so that its function will not be impaired during storage.

PRECAUTION ITEMS FOR LONG TERM STORAGE

Item	Contents of Work
Wash Machine	Sufficiently wash the machine to remove stuck mud and/or dust.
Supply Oil and Grease	Check for low level/contamination of lubricating oil. Refill or change as necessary. Supply grease to greased parts. Apply a thin coat of oil to parts susceptible to rust. (i.e. cylinder rods etc.) Fill up fuel to prevent rust in the fuel tank.
Battery	Remove and fully recharge the battery, then store it. Turn the disconnect switch to OFF-OFF position. Refer to page 1-257 “Battery Disconnect Switch”.
Coolant	Supply a rust preventive agent without fail. If there is a possibility of freezing, also supply an antifreeze solution or fully drain the coolant. In this case, be sure to attach a "No Water in Radiator" sign in the operator's cab. If long-life coolant is used, the above measures are not necessary. Thoroughly wash the radiator by water and then dry it.
Tire	Inflate to recommended air pressure.
Prevention of Dust and Moisture	Store the machine in a relatively dry garage and cover it.
Tools	Inspect and repair, then store.
Lubrication Operation No-load Operation at a Slow Speed for Several Minutes	If the oil films of the parts are broken and parts are rusted, they will be worn abnormally when operated the next time. To prevent this, operate the machine, including the air conditioner, at least once a month to lubricate the parts. At this time, check the coolant and lubrication oil levels. Charge the batteries.
DEF	DEF may become ammonia when storing it under 40°C for one month or longer. Change DEF if ammonia odor is observed when opening the tank cap.

IMPORTANT: If the machine is operated without performing lubrication operation, damage to hydraulic equipment may result due to insufficient lubrication.

NOTE: Lubrication operation means that a series of operations such as drive, and loader front operation are repeated a few times after performing warm-up.

Before operating the loader front attachment and steering wheel, remove rust-prevention oil coated on the hydraulic cylinder rods.

Precautions for Simple Inspection of Air Conditioner

If a simple inspection comes due during long-term storage, contact Authorized Dealer.

Taking the Machine Out of Storage

WARNING: If it is unavoidable to perform the lubrication operation indoors, open windows and doors to maintain good air ventilation to prevent asphyxiation. Lubricant property will deteriorate even if the machine is kept stored. Check all lubricants before operating the machine after being stored.

Apply the parking brake while storing.

IMPORTANT:

- **Lubricants will deteriorate during storage of the machine.**
- **Thoroughly check lubricants and adequately perform lubrication operation before resuming operation of the machine. Avoid quick operation. Failure to do so may cause damage to the engine, hydraulic equipment, transmission, axle, etc. due to insufficient lubrication.**
- **If the lubrication operation is not performed for more than three months, start the engine and run the engine at slow idle speed for three minutes. Then carry out lubrication operation for cylinders.**

  If you suddenly started the engine or operated the cylinders without following the procedure above, it may cause damage to the machine such as engine seizure.
- **When turning the battery disconnect switch from OFF to ON, preset radio station and the clock may be reset. Set them again.**

1. Remove covers.
2. Remove grease from the cylinder rods if coated.
3. Fill the fuel tank. Bleed air from the fuel system. Check all fluid levels.
4. Adjust alternator and fan belt tension.
5. Check the oil level. Add oil as needed.
6. Install the battery.

   If the machine is equipped with the battery disconnect switch, turn the disconnect switch ON.
7. Start the engine. Run the engine at half speed for several minutes before full load operation.
8. Repeat the process several times.
9. Stop the engine. Check each device for oil leaks.
10. Replace the fuel filter and engine oil filter with a new one as needed. Change engine oil.
11. Check clamps of the suction hoses, air cleaner hoses and radiator hoses. Retighten them as needed.

Before operating the machine, thoroughly perform "Daily Check before Starting the Engine" on page 3-1. Sufficiently perform the warm up operation.

Troubleshooting

If any abnormality is found on the machine, immediately take action to solve it. Find out the cause of the abnormality to prevent the recurrence of malfunction.
If the cause of malfunction is unknown or for inquiry on solution item with mark "*" on the list below, consult Authorized Dealer.
Do NOT attempt to adjust or disassemble hydraulics, electrical and electronic parts.

Engine

Consult Authorized Dealer for the engine troubleshooting.

Engine Auxiliaries

Symptom	Cause	Solution
Batteries will not charge.	Broken battery separator	Replace
	Faulty regulator	* Adjust, Replace
	Faulty ground line	* Repair
	Faulty alternator	* Repair, Replace
Batteries discharge quickly after being charged.	Shorted cable	* Repair, Replace
	Shorted battery separator	* Repair, Replace
	Increased sediment in battery	* Replace
Coolant temperature is too high.	Low coolant level	Refill
	Abnormal fan rotation	* Repair, Adjust
	Damaged rubber hose	* Replace
	Faulty thermostat	* Replace
	Faulty coolant temperature gauge	* Replace
	Faulty radiator cap seal	Replace
	Radiator fin plugged	Clean

* Consult Authorized Dealer.

Engine does not Start.

Symptom	Cause	Solution
The starter does not turn.	Reduced battery voltage	Charge the batteries. Replace.
	High resistance in the starter circuit	* Clean and/or retighten the battery terminals and starter terminals
	Faulty key switch	* Replace
	Damaged wire harness	* Repair, Replace
	Faulty battery relay	* Replace
	Blown slow blow fuse link	* Replace
	The forward/reverse lever is in either the forward or reverse position.	Return to neutral.
	Faulty starter	* Repair, Replace
	Battery disconnect switch is turned OFF.	Turn the switch ON.
Although the starter turns, the engine does not start.	Use of poor quality fuel, insufficient fuel, lack of fuel	Change fuel. Refill tank with good quality fuel.
	Faulty glow plug	* Replace glow plug
	Air mixed in the fuel supply line	Bleed air
	Faulty injection pump or nozzle	* Repair, Replace
	Reduced compression pressure	* Adjust
Engine speed does not increase.	The accelerator pedal function is abnormal.	Replace the accelerator pedal or parts.
Although the engine cranks, running speed is low and easy to stall.	Deteriorated engine oil	Change engine oil
	Contaminated injection nozzle	* Replace
	Clogged fuel filter	Replace
	Clogged feed pump strainer	Clean
	Air mixed in the fuel supply line	Bleed air

* Consult Authorized Dealer.

Control Lever

Symptom	Cause	Solution
Hard to move.	Faulty electrical loading control lever	* The electrical loading control lever cannot be repaired by replacing each part. Replace the entire lever assembly.
Does not move smoothly.		
Does not return to neutral.		
The lever is tilted in the neutral position due to increase in play.		

* Consult Authorized Dealer.

Hydraulic System

After the machine has been kept stored for a long time, air in the oil may be separated and accumulate in the upper section in the cylinder, causing slow response time in operation or reducing cylinder power.
In case these symptoms appear, repeatedly operate all actuators several times.

Symptom	Cause	Solution
Loader front function is inoperable. (Hydraulic pump noise level increases.)	Faulty hydraulic pump	* Repair, Replace
	Lack of hydraulic oil	Refill
	Broken suction pipe and/or hose	* Repair, Replace
All actuators have no power.	Malfunction due to worn hydraulic pump	* Replace
	Decrease in set pressure of main relief valve in control valve	* Adjust
	Lack of hydraulic oil	Refill
	Trapped foreign matter in hydraulic oil tank suction filter	Clean
	Aeration in suction side	Retighten
Only one actuator is inoperable.	Broken control valve spool	* Replace
	Trapped foreign matter in valve spool	* Repair, Replace
	Broken pipe and/or hose	* Repair, Replace
	Loose pipe line joint	Retighten
	Broken O-ring at pipe line joint	* Replace
	Broken actuator	* Repair, Replace
Only one cylinder is inoperable or has no power.	Broken oil seal in cylinder	* Repair, Replace
	Oil leak due to damage to cylinder rod	* Repair, Replace
Oil overheats.	Contaminated oil cooler	Clean
	Faulty fan motor and pump	* Repair, Replace
	Abnormal fan rotation	* Repair, Adjust
Oil leak from low pressure hose	Loose clamp	Retighten
	Faulty suction pipe	* Repair, Replace

* Consult Authorized Dealer.

Drive Function

Steering System

Symptom	Cause	Solution
Steering wheel is heavy to operate.	Faulty hydraulic pump	* Repair, Replace
	Faulty steering device	* Repair, Replace
	Relief valve set pressure reduction	*Adjust
	Faulty steering column	* Repair, Replace
Steering wheel turns in unexpected direction.	Faulty steering device	* Repair, Replace

* Consult Authorized Dealer.

Accelerator Pedal

Symptom	Cause	Solution
Heavy to operate.	Rusted joint	* Lubricate, Repair
Accelerator pedal play is excessive.	Worn joint	* Repair, replace

* Consult Authorized Dealer.

Parking Brake

Symptom	Cause	Solution
Parking brake is dragging.	Oil leak due to worn parking brake piston sealing	* Repair, Replace
	Faulty disk brake	* Repair, Replace
	Malfunction of parking brake solenoid valve	* Repair, Replace
Parking brake does not work properly.	Worn or damaged brake spring in brake piston	* Replace
	Faulty disk brake	* Replace
	Seized piston, worn disk	* Repair, Replace
	Malfunction of parking brake solenoid valve	* Repair, Replace

* Consult Authorized Dealer.

Service Brake

Symptom	Cause	Solution
Service brake does not work properly.	Malfunction of brake valve	* Repair, Replace
	Oil leak from brake line, Air mixing	* Repair, Bleed air
Brake is dragged.	Malfunction of brake valve	* Repair, Replace
	Faulty brake pedal	* Repair, Replace
Lack of brake fluid (hydraulic oil)	Oil leak from brake line and/or hose connector	* Retighten or repair
	Oil leak due to brake piston seal (inside axle)	*Repair, Replace

* Consult Authorized Dealer.

Transmission

Symptom	Cause	Solution
Transmission is noisy.	Lack or deterioration of gear oil	Refill, change
	Worn inner parts in transmission	* Repair, Replace
	Broken gear or bearing	* Repair, Replace
Oil overheats.	Abnormal fan rotation	* Repair, Adjust

* Consult Authorized Dealer.

Propeller Shaft

Symptom	Cause	Solution
Propeller shaft vibrates.	Bent propeller shaft	* Repair, Replace
	Loosened parts, Loss of balance	* Retighten, Adjust
Propeller shaft is noisy.	Excessively worn spline	* Replace
	Worn or seized spider bearing	* Replace
	Loosened parts	Retighten
	Insufficient greasing	Grease

* Consult Authorized Dealer.

Front Axle, Rear Axle

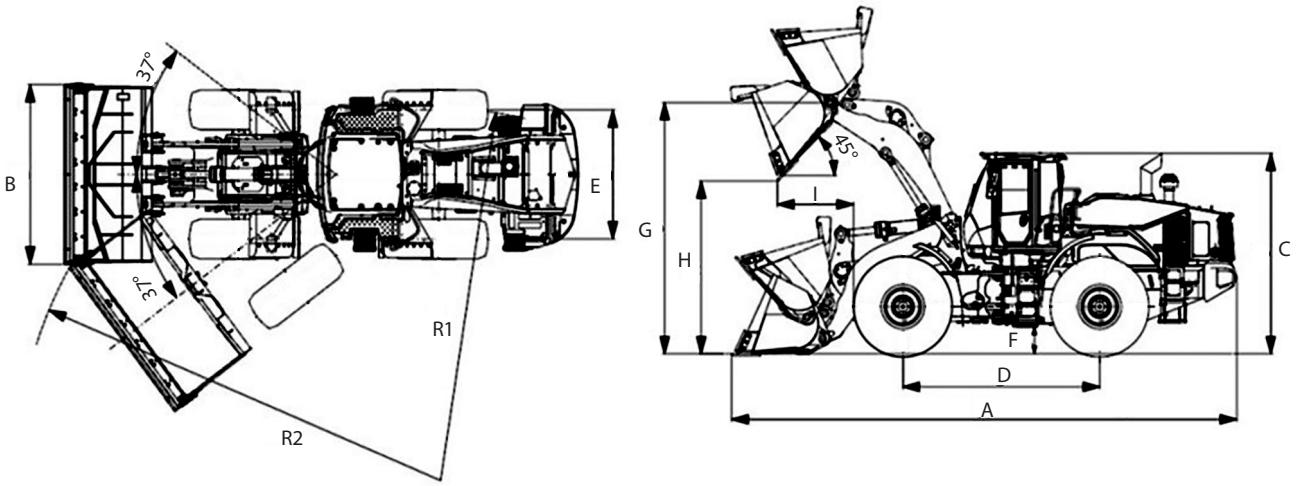
Symptom	Cause	Solution
Front and/or rear axle is noisy.	Worn or broken gears	* Replace
	Lack or deterioration of gear oil	Refill, Replace
	Worn bearings, Excess play	* Replace
	Excess play on shaft spline	* Repair, Replace
Front and/or rear axle does not transmit power.	Broken axle	* Replace
	Broken gears	* Replace

* Consult Authorized Dealer.

Others

If there is a problem with the machine, a noise, excessive vibration, and abnormal smells may occurs.
Always be aware of the machine conditions during operation.

Specifications



MNFQ-12-004

Model	-	ZW310-7
Bucket Capacity: heaped	m^3 (yd^3)	4.2 (5.5)
Operating Weight	kg (lb)	24580 (54190)
Tipping Load (Full turn)	kg (lb)	16050 (35384)
Engine	-	Cummins L9
A: Overall Length	mm (ft-in)	9020 (29' 7")
B: Overall Width (Bucket)	mm (ft-in)	3100 (10' 2")
C: Overall Height	mm (ft-in)	3530 (11' 6")
D: Wheel Base	mm (ft-in)	3540 (11' 7")
E: Tread (front and rear tires)	mm (ft-in)	2230 (7' 3")
F: Ground Clearance	mm (ft-in)	500 (1' 7")
G: Bucket Hinge Height	mm (ft-in)	4425 (14' 6")
H: Dumping Clearance (45 °)	mm (ft-in)	3100 (10' 2")
I: Dumping Reach (45 °)	mm (ft-in)	1320 (4' 3")
R1: Minimum Rotation Radius	mm (ft-in)	6420 (21' 0")
R2: Minimum Rotation Radius	mm (ft-in)	7485 (24' 6")
Travel Speed Forward/Reverse	km/h (mph)	36/36 (22.3/22.3)
Transmission Speeds (F/R)	-	4/4
Articulation Angle (Left/Right) deg	(°)	37
Tire Size	-	26.5R25

NOTE: These specifications are subject to change without notice.

Noise Level Inside of Cab

LpA: Measure of Noise Level Inside of Cab (ISO6396: 2008)

Unit: dB(A)

	LpA
ZW310-7	69

Axle Oil Cooler (Optional)

Maintenance Guide of the Axle Oil Cooler

Shaded columns in the table indicate maintenance interval.

Parts			Quantity	Interval (hours)					
				10	100	250	500	1000	2000
1.	Check Axle Oil Level		-						
2.	Change Axle Oil	Front	52 L (13.7 gal)						
		Rear	52 L (13.7 gal)						
3.	Replace Axle Oil Cooler Line Filter		2				★		
4.	Clean Axle Oil Cooler Fins		2	As required					

★ : Replace the filter every 500 hours or every 3 months whichever comes first.

Axle Oil

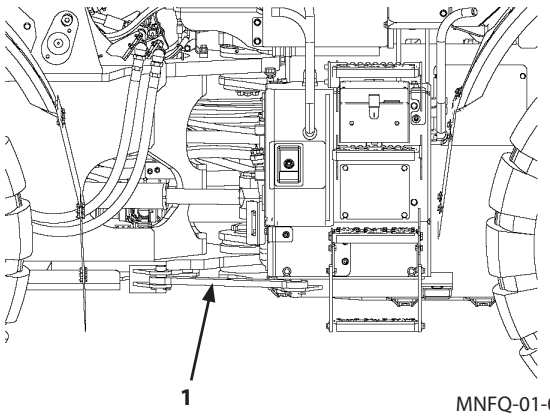
Kind of Oil / Application / Manufacturer	Axle Oil
Hitachi Construction Machinery	Axle, Parking Brake: High Gear Oil
	Axle, Parking Brake: TKTT 15150-4th

NOTE:

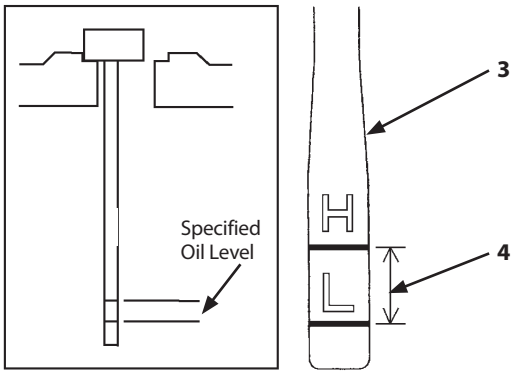
- *When using TO-4 SAE50 or TM-4M Fluid other than the listed recommended products, add 6% additive to prevent or eliminate service brake application noise. Recommended additive package: HCM 9990A or equivalent.*
- *The acceptable ambient temperature when using TO-4 SAE50 Fluid should fall within the range -15 to 45°C (5 to 113°F). The acceptable ambient temperature when using TO-4M Fluid should fall within the range -30 to 45°C (-22 to 113°F).*

1 Check Axle Oil Level --- every 250 hours

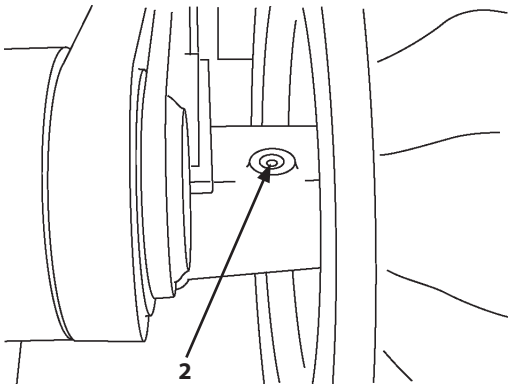
1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.
2. Install articulation lock bar (1) to the front and rear of the frame by following the procedures described on page 7-9.
3. Clean the vicinity of oil level plug (2).
4. Remove oil level plug (2). Clean the tip of dipstick (3) connected to oil level plug (2) with a clean cloth.



MNFQ-01-007



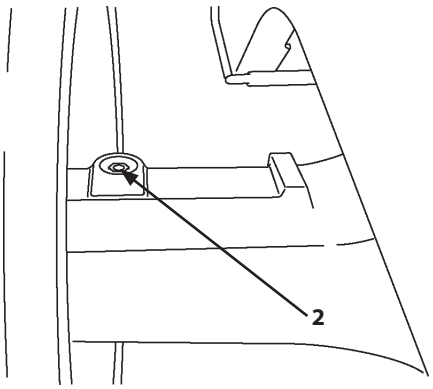
M4GB-07-039



Front Axle
M4GB-07-037

5. Make the plug lower surface contact to the axle seat face. Oil level must be between marks H and L (4) on the dipstick (3).

   If necessary, add oil.



Rear Axle
M4GB-07-038

2 **Change Axle Oil**
--- every 2000 hours

WARNING: Be cautious about the following items.

- **Starting repair work immediately after operation may cause burns. Wait for oil temperature to lower.**
- **Lock the front and rear chassis with the articulation stopper (lock bar).**
- **When working under the raised lift arm, be sure to avoid accidental injury or death by placing a safety column or stand under the lift arm to support it.**

IMPORTANT: Do not use axle oils other than those listed in the "Axle Oil".

1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work.
2. Install articulation stopper to the front and rear of the chassis by following the procedures described on page 7-9.
3. Clean the vicinity around drain plug (1) and the oil drain plug hole.
4. Arrange a container of 50 liters (13.2 gal) capacity to receive the drain oil.
5. Remove drain plug (1) to drain the oil.
6. Securely tighten drain plug (1).
7. Refill the specified amount of oil through oil level plug (2) hole.

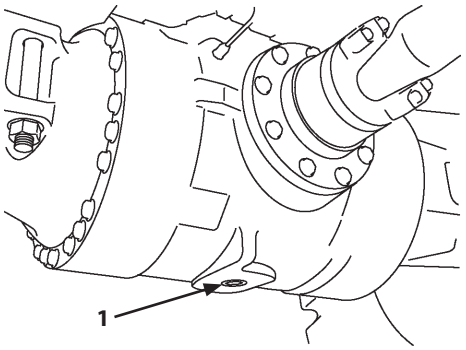
Front	Rear
48 L (12.7 gal)	48 L (12.7 gal)

8. Securely tighten the oil level plug.
9. Run the engine at slow idle speed for several minutes.
10. Refill the specified amount of axle oil through the oil level plug hole.

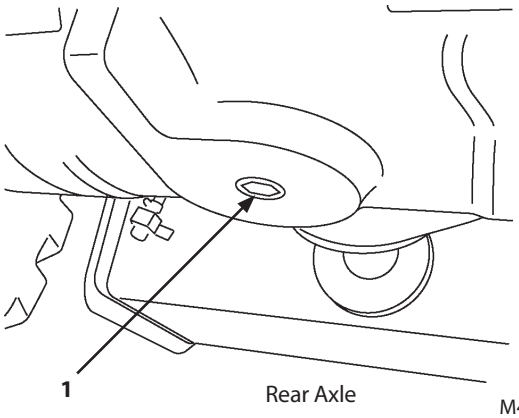
    Specified Oil Amount: 4 liters (1.1 gal)

IMPORTANT: It takes time for oil to fully lubricate the overall front axle. After installing the plug, operate the machine slowly for several minutes. Then, stop the engine and check the axle for any oil leaks.

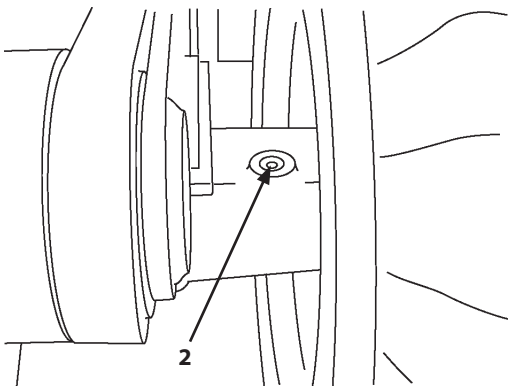
11. Securely tighten the oil level plug.
12. Run the engine at slow idle speed for several minutes.
13. Check the oil level. (Refer to the previous section.)



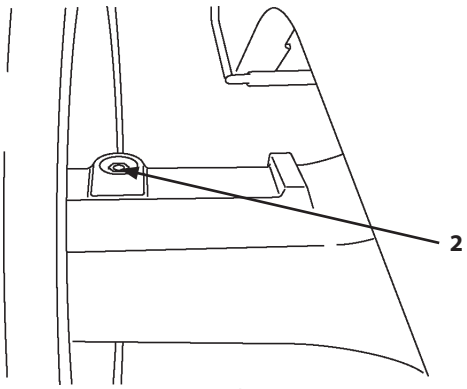
Front Axle
M4GB-07-035



Rear Axle
M4GB-07-036



Front Axle
M4GB-07-037



Rear Axle
M4GB-07-038

3 **Replace Axle Oil Cooler Line Filter (Optional)**
--- every 500 hours or every 3 months whichever comes first

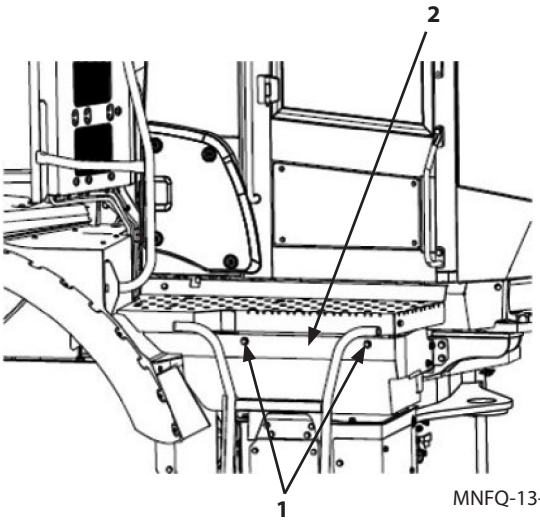
WARNING: Be cautious about the following items.

- **Starting repair work immediately after operation may cause burns. Wait for oil temperature to lower.**
- **Lower the attachment to the ground.**
- **Put the transmission shift lever in neutral. Apply parking brake. Place "DO NOT OPERATE" tag on steering wheel or steering lever (Optional).**

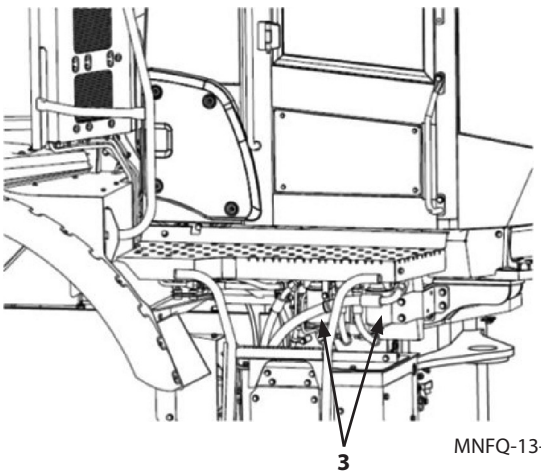
1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work. Stop the engine.
2. Install articulation lock bar to the front and rear of the frame by following the procedures described on page 7-9.
3. Remove bolts (1) (4 used) and cover (2).

IMPORTANT: Be sure to replace two oil filters (3) at the same time.

4. Using a filter wrench, turn the oil filter cartridge counterclockwise to remove it.
5. Clean the filter gasket seating surface.
6. Fill new axle oil in the new cartridge carefully without spilling it. Apply thin film of clean oil on the gasket of cartridge.
7. Turn filter cartridge (3) clockwise by hand until it makes in contact with the gasket. Do not damage the gasket when installing the filter cartridge.
8. Carefully tighten oil filter (3) for 3/4 turn by using a filter wrench. Do not overtighten it.
9. Run the engine at slow idle speed for 5 minutes. Check no oil is leaking from the filter.
10. Install cover (2) with bolts (1) (4 used).
11. Check the oil level. (Refer to the descriptions for "Check Axle Oil Level" on page 13-2)



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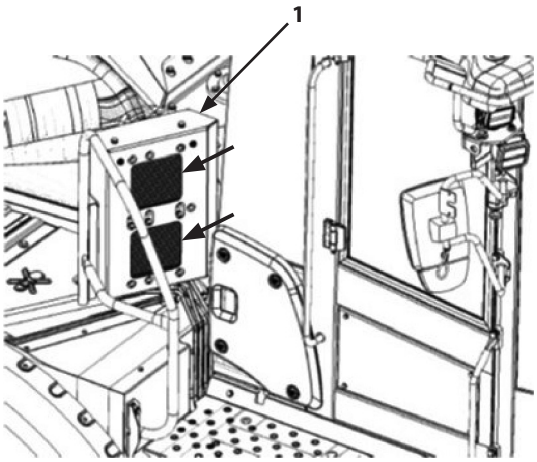
MNFQ-13-002

4 **Clean Axle Oil Cooler Fins (Optional)**
--- as required

1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/ maintenance work. Stop the engine.

IMPORTANT: High pressure air or water may damage oil cooler fins.
When used for cleaning purposes, the pressure of compressed air should be at 196 kPa or less.
When using high-pressure water, keep the nozzle a distance of at least 500 mm (20 in) away from the core surface, applying the water jet perpendicular to the core.
Move nozzle from side to side; not up and down.

2. Blow off mud, dirt, or clogging debris from the axle oil cooler (1) fins with compressed air. Use a pressure washer to remove harder debris.
3. Reverse the direction to flush all debris from the oil cooler fins.



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