

**HITACHI**

Reliable solutions

PART NO. ENMPTC-NA1-3

# Operator's Manual

# ZW

# 140-6

# 150-6

# 150PL-6

# Wheel Loader

ZW140-6 • 150-6 • 150PL-6 WHEEL LOADER OPERATOR'S MANUAL

ENMPTC-NA1-3

 **Hitachi Construction Machinery Co., Ltd.**

URL:<https://www.hitachicm.com>



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Serial No. 005201 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 45 °C (-4 °F to 113 °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 your 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. Your 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 your authorized dealer.

**Warranty** is provided as a part of Hitachi'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 your dealer.

This warranty provides you with the assurance that Hitachi will back its products where defects appear within the warranty period. In some circumstances, Hitachi 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).

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.

### 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.**

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## MEMO

A series of horizontal dotted lines for writing a memo.

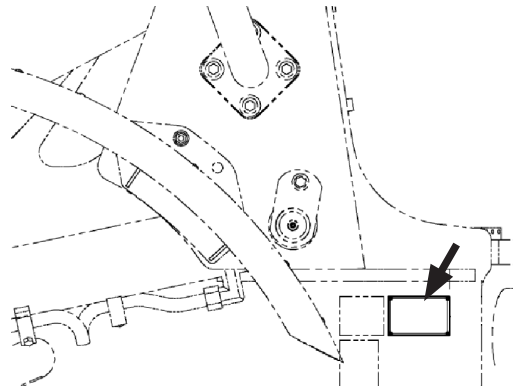
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# MACHINE NUMBERS

The manufacturing Nos. explained in this group is the individual number (serial No.) given to each machine and hydraulic 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

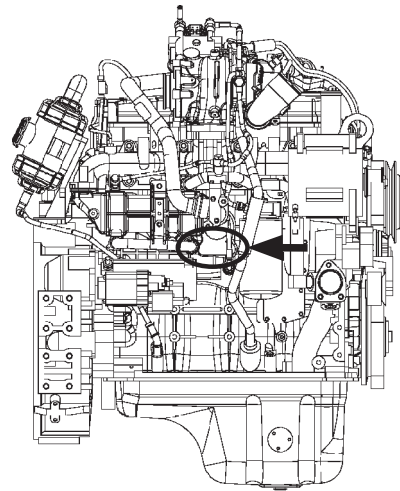
MODEL/TYPE : \_\_\_\_\_  
PRODUCT IDENTIFICATION NUMBER : \_\_\_\_\_



M4FC-00-05US

## Engine

TYPE : \_\_\_\_\_  
MFG. NO. : \_\_\_\_\_



MPTC-00-001

# MACHINE NUMBERS

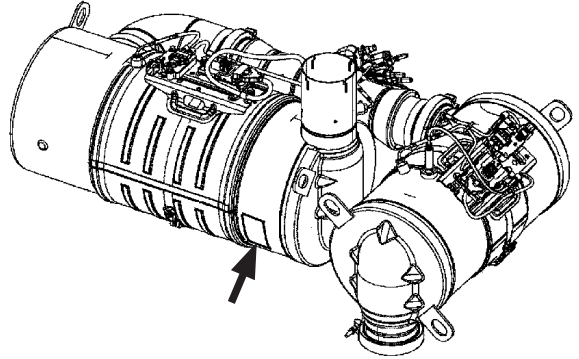
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## Aftertreatment Device

### 1. SCR

TYPE : \_\_\_\_\_

MFG. NO. : \_\_\_\_\_

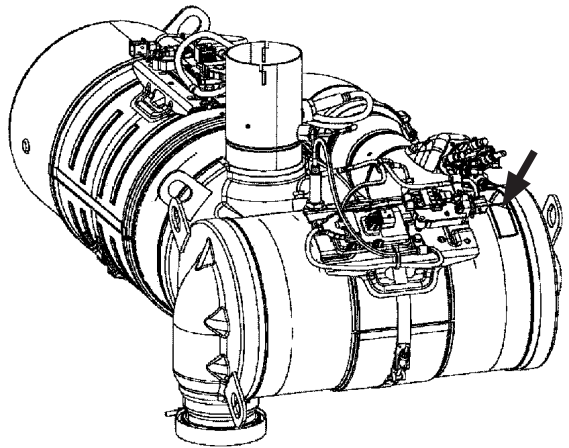


MPTC-00-002

### 2. DOC

TYPE : \_\_\_\_\_

MFG. NO. : \_\_\_\_\_

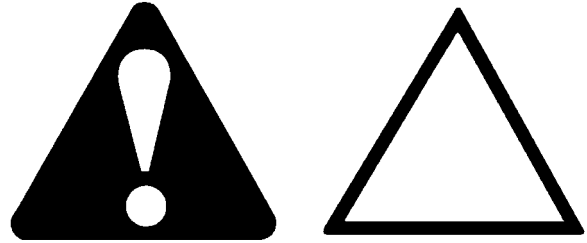


MPTC-00-003

## SAFETY


### 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 a piece of information.



**IMPORTANT**



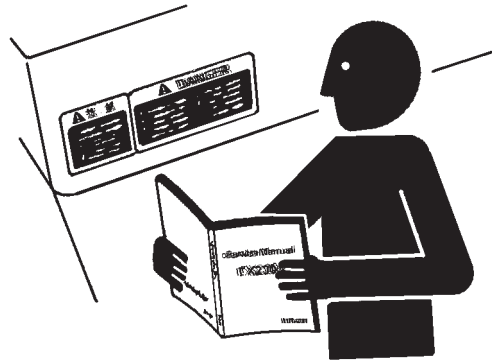
SA-1223

# SAFETY

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## 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 your 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 part. In addition, personal accident, machine trouble, and/or damage to material caused by unauthorized modifications will void Hitachi 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. 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 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 your authorized dealer before operating or performing maintenance work on the machine.



SA-003

# SAFETY

## 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.



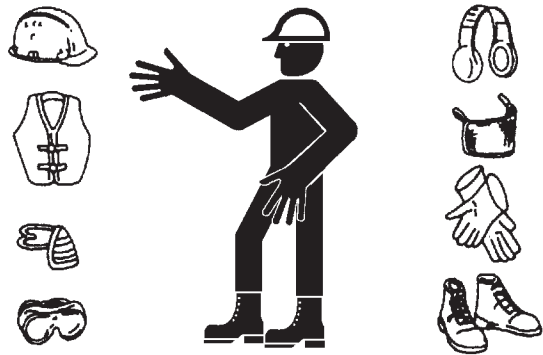
SA-437

## Wear Protective 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
- Heavy gloves
- Hearing protection
- Reflective clothing
- Wet weather gear
- Respirator or filter mask.



SA-438

Be sure to wear the correct equipment and clothing for the job. Do not take any chances.

- Avoid wearing loose clothing, jewelry, or other items that can catch on 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.



## SAFETY

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### Protect Against Noise

- Prolonged exposure to loud noise can cause impairment or loss of hearing.
- Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortably loud noises.



SA-434

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### 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

## SAFETY

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### 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.
- Correctly lay the floor mat specific to the machine. If another floor mat is used, it may be displaced and contact with the accelerator or brake pedals during operation, resulting in serious injury or death.

## SAFETY

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### 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

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### Never Ride Attachment

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

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### 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

## SAFETY

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### Ensure Safety Before Rising from or Leaving Operator's Seat

- Before rising from the operator's seat to open / close either side window or to adjust the seat position, be sure to first lower the front attachment to the ground and then move the control lever lock switch 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 control lever, possibly resulting in serious personal injury or death.
- Before leaving the machine, be sure to first lower the front attachment to the ground and then move the control lever lock switch to the lock (🔒) position. Turn the key switch OFF to stop the engine.
- Before leaving the machine, close all windows, doors, and access covers and lock them.

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### 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

## SAFETY

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### 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 mirror, camera and the monitor.  
Refer to Rear View Monitor section for information on cleaning the camera lens and the monitor display.



SA-398

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### 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

## SAFETY

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### 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

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### 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

## SAFETY

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### Investigate Job Site Beforehand

- When working at 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 falling and to prevent the ground, stockpiles, or banks from collapsing.
- Make a work plan. Use machines appropriate to the work and job site.
- Reinforce ground, edges, and road shoulders as necessary. Keep the machine well back from the edges of excavations and road shoulders.
- When working on an incline or on a road shoulder, employ a signal person as required.
- Confirm that your machine is equipped with a FOPS cab before working in areas where the possibility of falling stones or debris exist.
- When the ground footing is weak, reinforce the ground before starting work.
- When working on frozen ground, be extremely 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



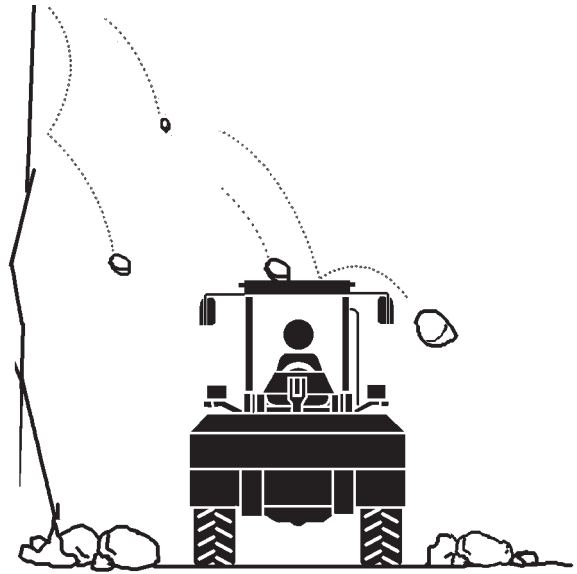
## SAFETY

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### Equipment of Head Guard, ROPS, FOPS

If the machine is operated in areas where the possibility of falling stones or debris, equip a head guard, ROPS, or FOPS according to the potential hazardous conditions. (The standard cab for this machine corresponds to ROPS and FOPS.) Any modification of the ROPS structure will modify its performance and its certification will be lost.

ROPS: Roll-Over Protective Structure  
FOPS: Falling Object Protective Structure



SA-521

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### 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

## SAFETY

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### 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

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### 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) 300 mm (12 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.

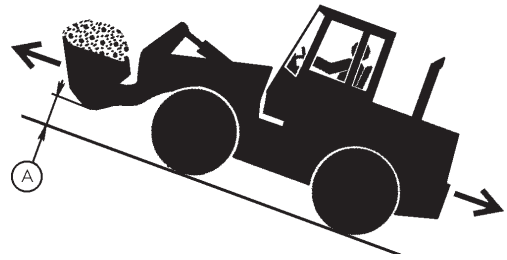


SA-448

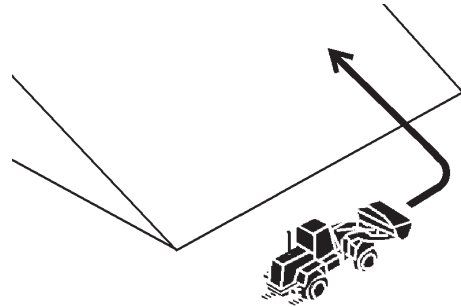
# SAFETY

## Drive Machine Safely (Work Site)

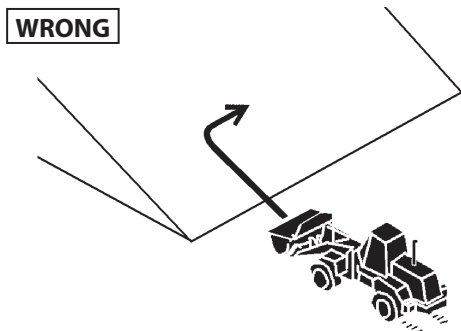
- Before driving the machine, always confirm that the steering wheel / and forward / reverse lever (switch) direction corresponds to the direction you wish to drive.
  - Be sure to detour around any obstructions.
- Driving on a slope may cause the machine to slip or overturn, possibly resulting in serious injury or death.
  - When driving up or down a slope, keep the bucket facing the direction of travel, approximately 200 to 300 mm (approximately 8 to 12 in) (A) 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

## SAFETY

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### 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.

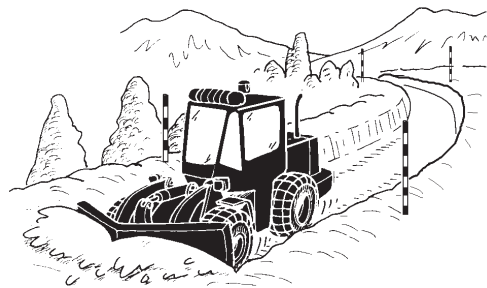


SA-400

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### 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

## SAFETY

### 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) above the road surface as illustrated.



Height A  
ZW140-6: 350~400 mm (13.8~15.7 in)  
ZW150-6, 150PL-6: 420~470 mm  
(16.5~18.5 in)

SA-453

### Avoid Injury from Rollaway Accidents

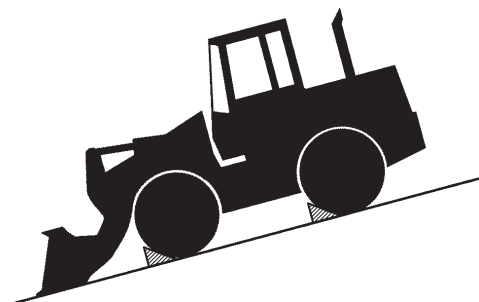
- Death or serious injury may result if you attempt to mount or stop a moving machine.

To avoid rollaways:

- 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 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



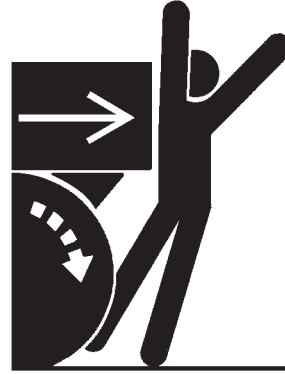
SA-458

## SAFETY

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### 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

## SAFETY

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### Avoid Positioning Bucket or Attachment Over Anyone

- 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.



SA-518

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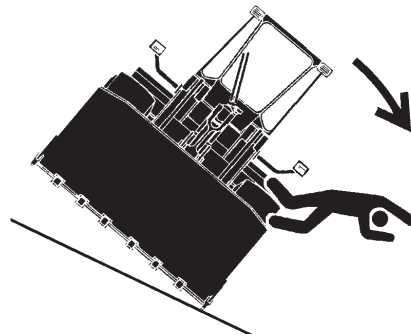
### Avoid Tipping

**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.



SA-463



## SAFETY

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### 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

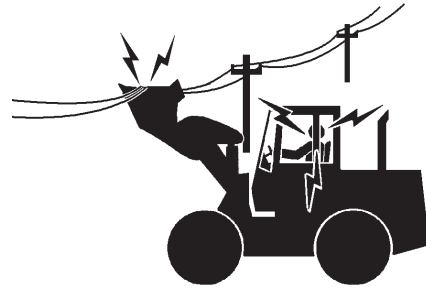
## SAFETY

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### 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

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### Precautions for Operation

- 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.

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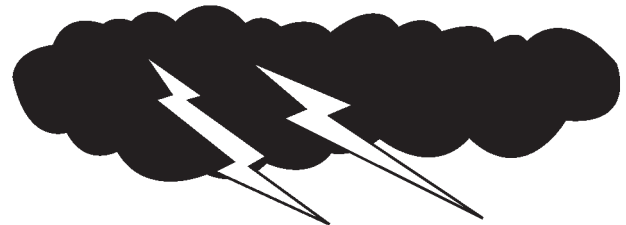
### Precautions for Lightning

- 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.



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## SAFETY

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### 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.



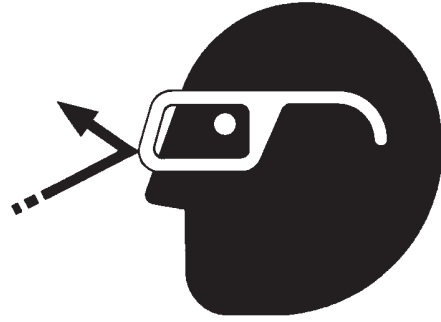
SA-132

## SAFETY

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### 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

## SAFETY

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### 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 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.

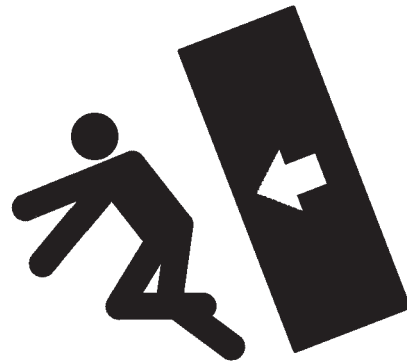


SA-456

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### Store Attachments Safely

- Stored attachments such as buckets, hydraulic hammers, and blades can fall and cause serious injury or death.
- Securely store attachments and implements to prevent falling. Keep children and bystanders away from storage areas.



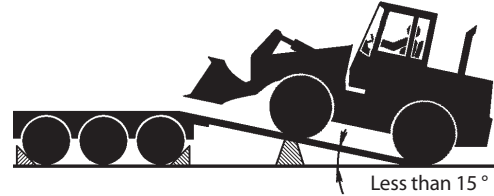
SA-034

## SAFETY

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### Transport Safely

- Be aware care that the machine may turn over when loading or unloading the machine onto or off of a truck or trailer.
  - Observe the related regulations and rules for safe transportation.
  - 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. Select solid and level ground.
    2. Always use a ramp or deck strong enough to support the machine weight.
    3. Use the low speed gear.
    4. 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.
    5. After loading, install the lock bar to securely hold the articulation mechanism.
    6. Wedge the front and rear of tires. Securely hold the machine to the truck or trailer deck with wire ropes.



SA-454

Be sure to further follow the details described in the TRANSPORTING chapter.

## SAFETY

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### 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.
- 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-018



SA-019

# SAFETY

## 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.

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.

- 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.
- Turn the battery disconnect switch to OFF before adjusting the electrical systems or performing welding on the machine.



SA-028



SA-312



SA-134



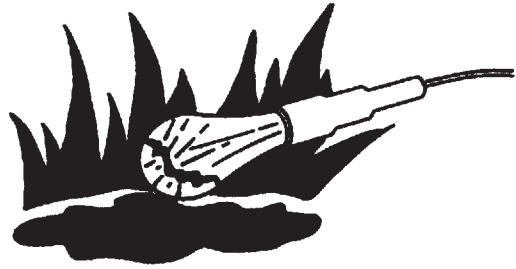
SA-527



## SAFETY

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- 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

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### 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 your 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.



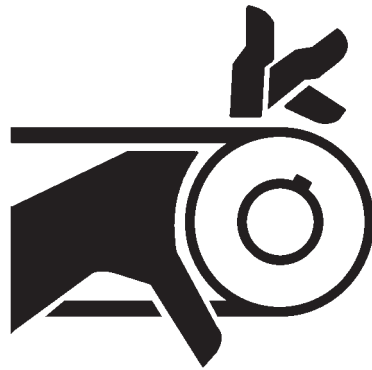
SA-527

## SAFETY

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### Stay Clear of Moving Parts

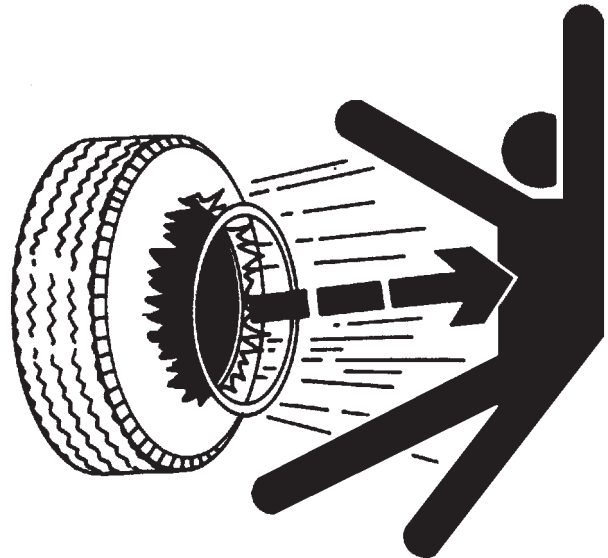
- Entanglement in moving parts can cause serious injury.
  - To prevent accidents, care should be taken to ensure that hands, feet, clothing, jewelry and hair do not become entangled when working around rotating parts.



SA-026

### 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 your 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

## SAFETY

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### 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

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### 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

## SAFETY

### 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

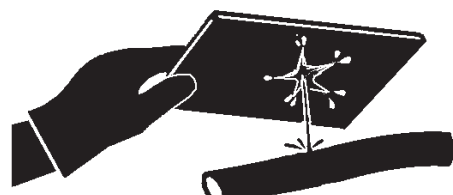
- Fluids such as diesel fuel or hydraulic oil under pressure can penetrate the skin or eyes causing serious injury, blindness or death.
  - Avoid this hazard by relieving pressure before disconnecting hydraulic or other lines.
  - Tighten all connections before applying pressure.
  - Search for leaks 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

## SAFETY

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### Prevent Fires

#### 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.



SA-019

#### 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.

## SAFETY

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### 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.

### 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.

## SAFETY

### 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.



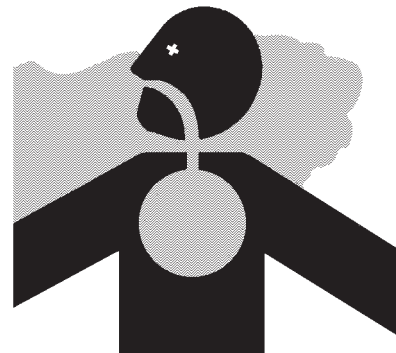
SA-393



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

## SAFETY

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### 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

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### 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.

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### 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 your authorized dealer.



## SAFETY

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### 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

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### 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 Parts.



SA-029

## SAFETY

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### 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

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### Service Air Conditioning System Safely

- If spilled onto skin, refrigerant may cause a cold contact burn.
  - 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

## SAFETY

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### 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 your authorized dealer for SDS's (available only in English) on chemical products used with your machine.

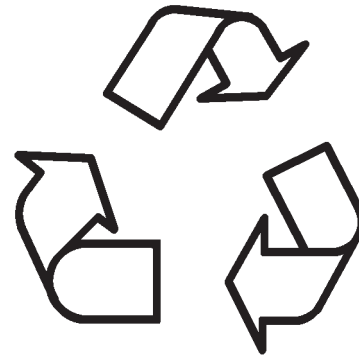


SA-2579

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### Dispose of Waste Properly

- Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with Hitachi equipment includes such items as oil, fuel, coolant, DEF/AdBlue®, 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 your authorized dealer.



SA-226

## SAFETY

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### 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.

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### 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.

## SAFETY

### Precautions for Communication Terminal Equipment

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 your 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.

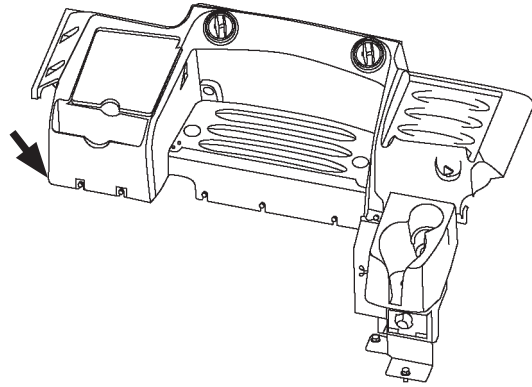
This machine is equipped with a communication terminal model HPRO-100, HPRO-4G, or QConnect. Consult your authorized dealer for the model of communication terminal.

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

	HPRO-100	HPRO-4G*	QConnect *
1.6 W/kg (1 g/unit)	0.51 W/kg	0.91 W/kg	-
2.0 W/kg (10 g/unit)	0.12 W/kg	0.50 W/kg (0.31 W/kg)	- (0.25 W/kg)

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.



MNEC-01-046

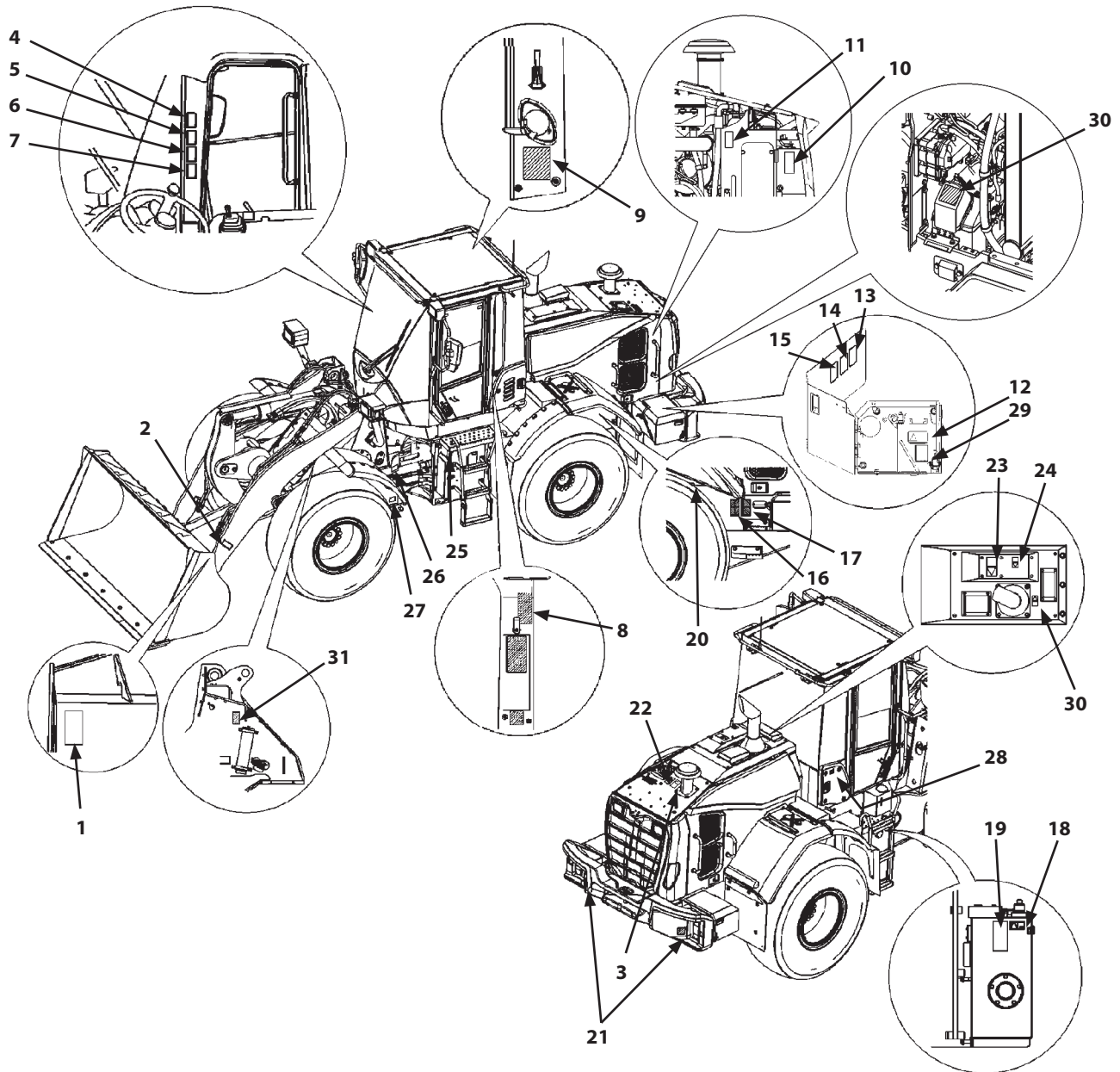
## SAFETY

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- Do not 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. (Before removing or installing the communication terminal, consult your authorized dealer.)
- Do not pinch or forcibly pull cables, cords or connectors. Failure to do so may cause damage or fire on the machine and the communication terminal due to short/broken circuit.

## SAFETY SIGNS

All safety signs and their locations affixed on the machine are illustrated in this group. Make sure of the contents described in the safety signs through reading actual ones affixed on the machine to ensure safe machine operation. Always keep the safety signs clean. In case a safety sign is broken or lost, immediately, obtain a new replacement and affix it again in position on the machine. Use the part No. indicated under the right corner of each safety sign illustration when placing an order of it to the authorized dealer.



SS-4059

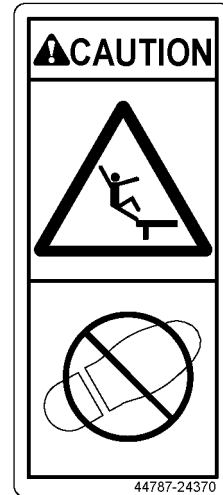
## SAFETY SIGNS

1. Bucket

23. Hood

**CAUTION:** Sign indicates a fall hazard.

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



4478724370

2. Both Sides of Lift Arm

**DANGER:** Crush Hazard

During operation, loads may spill from the bucket and/ or the bucket may suddenly fall.

Keep everyone far away from the machine during operation.



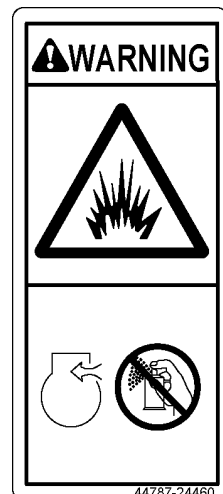
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3. Use no starting fluid

**WARNING:** 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.



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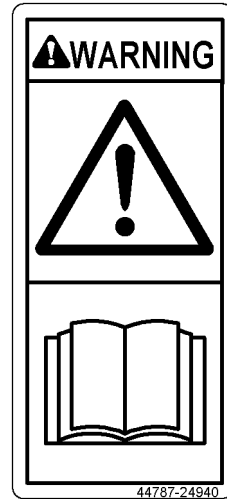


## SAFETY SIGNS

4. Cab Inside Right Front Column (First safety sign from the top)

**WARNING**

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

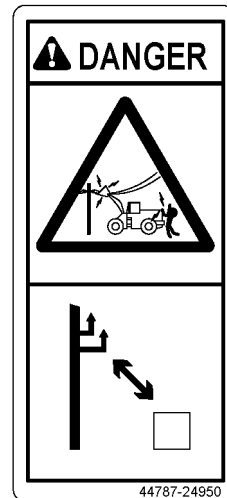


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5. Cab Inside Right Front Column (2nd safety sign from the top)

**DANGER: Electrocutation Hazard**

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

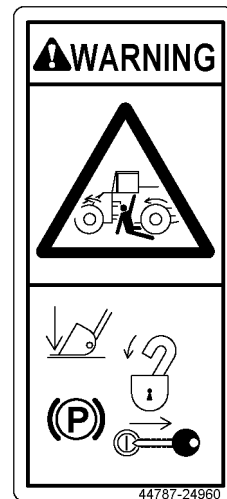


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6. Cab Inside Right Front Column (3rd safety sign from the top)

**WARNING: Runover or Entanglement Hazard**

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.



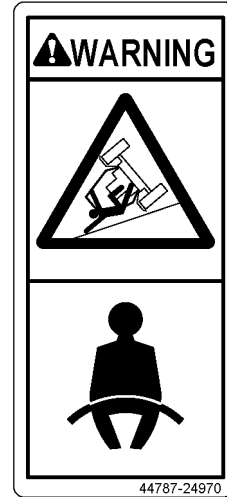
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## SAFETY SIGNS

7. Cab Inside Right Front Column (4th safety sign from the top)

**WARNING: Rollover Hazard**

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



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8. Cab Inside Left Front Column

**WARNING: Runover Hazard**

Be sure that the backup alarm is operable when the machine is put in reverse.

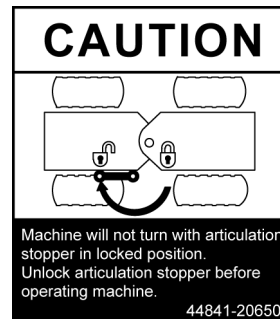


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9. Cab Inside Right Center Column

**CAUTION: Steering Hazard**

Unlock articulation stopper before operating machine.

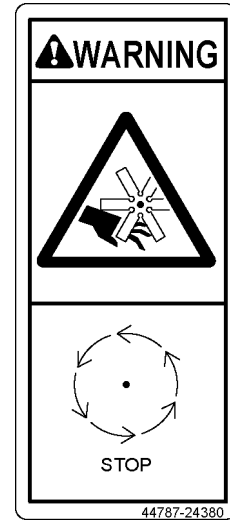


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## SAFETY SIGNS

### 10. Both Sides Top of Fan Guard

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



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### 11. Hood and Both Sides of Oil Cooler

#### 24. 30. Engine Housing

#### **WARNING: Burn Hazard**

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.

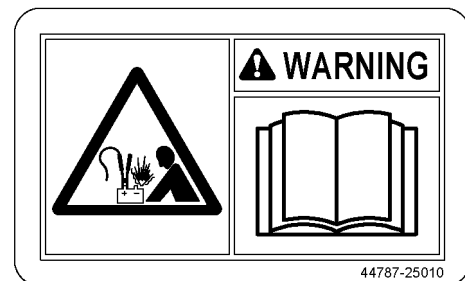


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### 12. Top of Battery

#### **DANGER: Explosion Hazard**

Do not cause electrical arcing from jumper cables or accidental placement of metal objects on the battery terminals. Read and understand the operator's manual.



4478725010

## SAFETY SIGNS

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### 13. Inside Battery Box

**⚠ CAUTION: Chemical Burn Hazard**

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



4478725000

### 14. Inside Battery Box

**⚠ WARNING: Explosion Hazard**

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



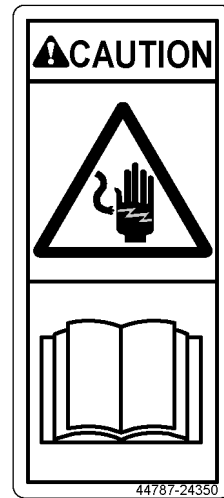
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## SAFETY SIGNS

### 15. Inside Battery Box

#### **CAUTION: Shock Hazard**

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

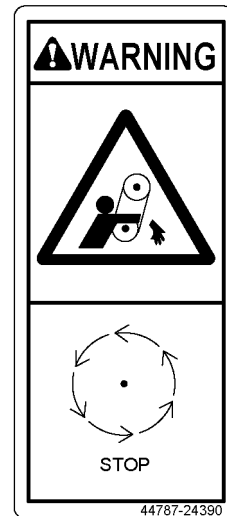


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### 16. Both Sides Bottom of Rear Frame Side Cover

#### **WARNING: Entanglement Hazard**

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



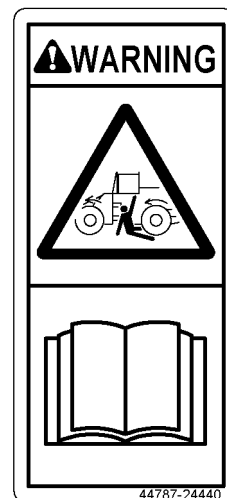
4478724390

### 17. Both Sides Bottom of Rear Frame Side Cover

#### **WARNING: Runover Hazard**

Unless the machine is correctly parked, the machine may run away, possibly creating a dangerous situation such as a person being run over.

Thoroughly read the operator's manual and park the machine in proper way to prevent run away accident.



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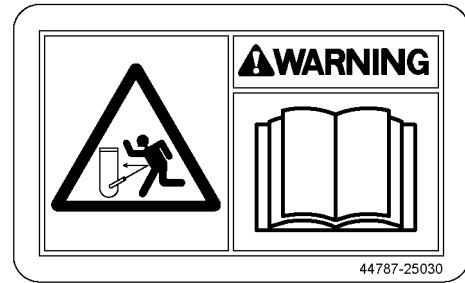
## SAFETY SIGNS

### 18. Hydraulic Oil Tank

**⚠ WARNING: Burn Hazard**

Sign indicates a burn hazard from compressed air and spurting hot oil if the oil inlet is uncapped during or right after operation.

Read the manual for safe and proper handling.



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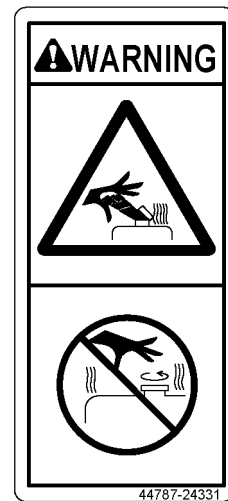
### 19. Hydraulic Oil Tank

### 22. Top of Coolant Reservoir Tank

**⚠ WARNING: Burn Hazard**

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.



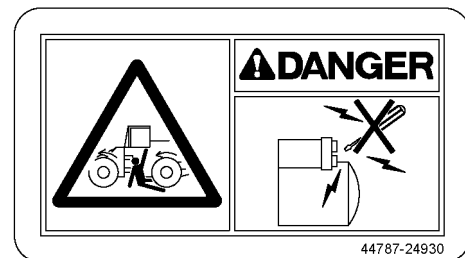
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### 20. Sides of Engine Starter

**⚠ DANGER: Runover Hazard**

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.



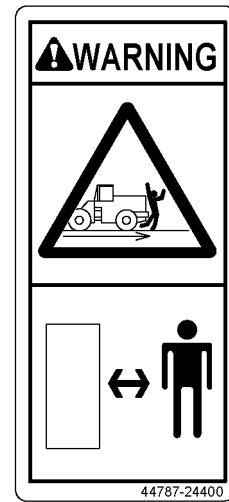
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## SAFETY SIGNS

### 21. Both Sides of Counterweight

#### **⚠ WARNING: Runover Hazard**

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



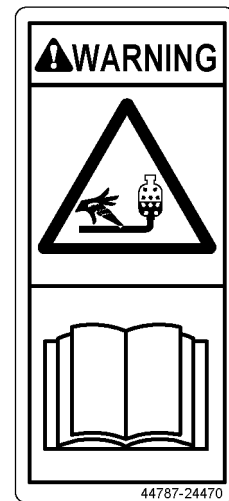
4478724400

### 25. Transmission Maintenance Cover

### 31. Inside of Left Front Frame

#### **⚠ WARNING: Oil injection hazard.**

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 handling.

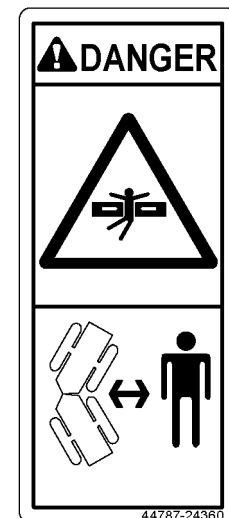


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### 26. Both Sides of Front Frame

#### **⚠ DANGER: Crush Hazard**

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



4478724360

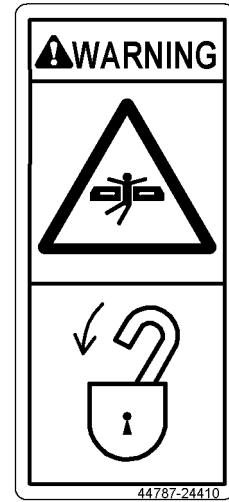
## SAFETY SIGNS

### 27. Articulate Lock Bar

#### **WARNING: Crush Hazard**

The articulation area becomes a pinch point when steering the machine.

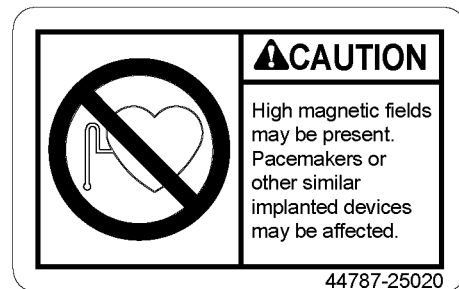
Keep all personnel away from the articulation area during operation of the machine.



4478724410

### 28. Cab Inside Right 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.

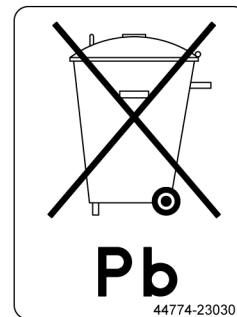


label 44787-25020

### 29. Top of Battery

#### **Recycle Batteries**

Batteries contain lead and acid. Obey all local and federal laws and regulation on disposal of batteries and electrolyte solution.



label 44774-23030



## SAFETY SIGNS

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30. Inside DEF/AdBlue® Tank Box

**IMPORTANT: Avoid Contamination**

- The DEF/AdBlue® tank should be filled with DEF/AdBlue® only. Do not mix any other liquid like water, oil, fuel.



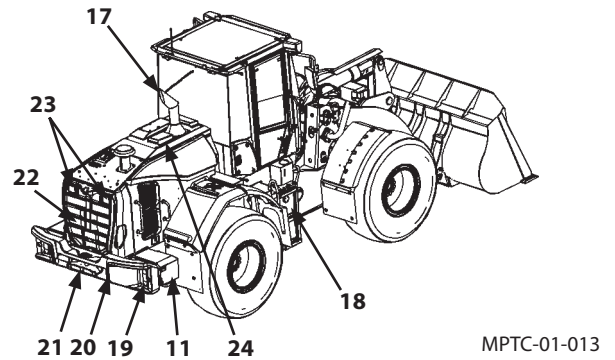
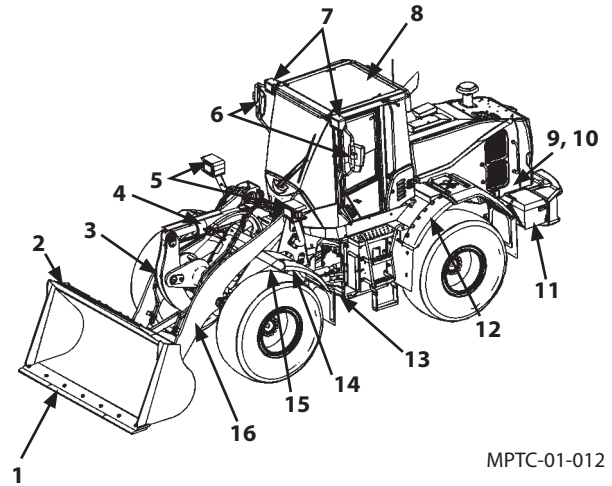
label 44774-27240

## COMPONENTS NAME

### Components Name

#### ZW140-6/ZW150-6

- 1- Cutting Edge (BOC)
- 2- Bucket
- 3- Lever
- 4- Bucket Cylinder
- 5- Front Combination Light  
(Headlight/Turn Signal/Clearance Light/Hazard Light)
- 6- Outside Rear View Mirror
- 7- Front Work Light
- 8- ROPS Cab
- 9- Fuel Filler Port
- 10- DEF/AdBlue® Tank
- 11- Battery (One each on both the right and left sides)
- 12- Rear Fender
- 13- Articulation Lock Bar
- 14- Front Fender
- 15- Lift Arm Cylinder
- 16- Lift Arm
- 17- Exhaust Pipe
- 18- Hydraulic Oil Tank
- 19- Rear Combination Light  
(Turn Signal/Hazard Light/Tail Light/Brake Light/Backup Light)
- 20- Counterweight
- 21- Towing Pin
- 22- Radiator/Oil Cooler
- 23- Rear Work Light
- 24- Aftertreatment Device

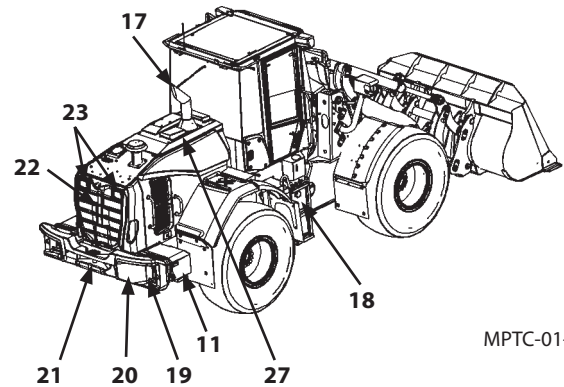
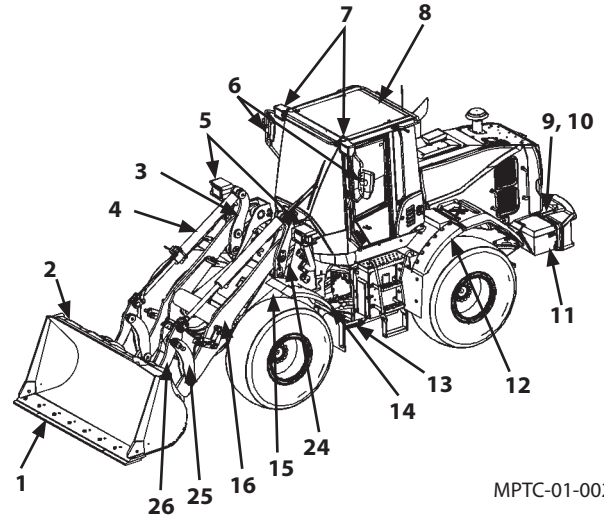


## COMPONENTS NAME

### Components Name

#### ZW150PL-6

- 1- Cutting Edge (BOC)
- 2- Bucket
- 3- Lever
- 4- Bucket Cylinder
- 5- Front Combination Light  
(Headlight/Turn Signal/Clearance Light/Hazard Light)
- 6- Outside Rear View Mirror
- 7- Front Work Light
- 8- ROPS Cab
- 9- Fuel Filler Port
- 10- DEF/AdBlue® Tank
- 11- Battery (One each on both the right and left sides)
- 12- Rear Fender
- 13- Articulation Lock Bar
- 14- Front Fender
- 15- Lift Arm Cylinder
- 16- Lift Arm
- 17- Exhaust Pipe
- 18- Hydraulic Oil Tank
- 19- Rear Combination Light  
(Turn Signal/Hazard Light/Tail Light/Brake Light/Backup Light)
- 20- Counterweight
- 21- Towing Pin
- 22- Radiator/Oil Cooler
- 23- Rear Work Light
- 24- Link
- 25- Guide
- 26- Bucket Link
- 27- Aftertreatment Device



## GETTING ON/OFF THE MACHINE

### Getting ON/OFF the Machine

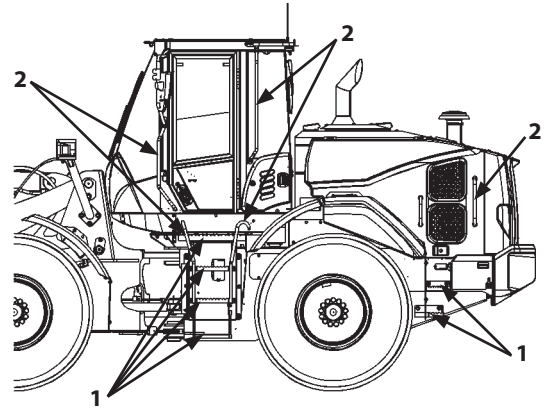
Footholds (1) and handrails (2) are provided in and around the machine.

These are used to get on and off the cab safely as well as to do inspection and maintenance of the machine safely.

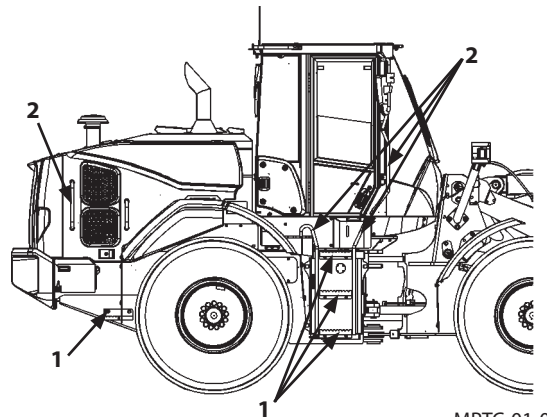
Never jump on or off the machine as it is very dangerous.

#### **⚠ WARNING:**

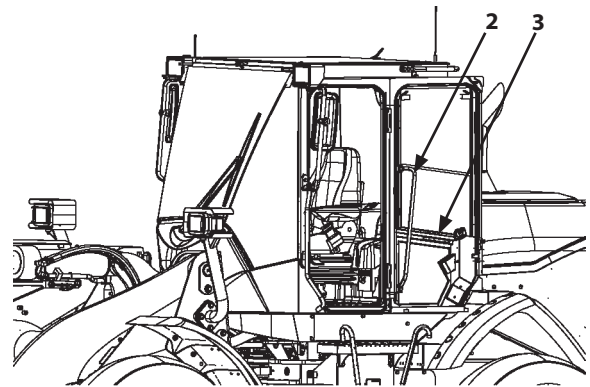
- **Never attach a wire on footholds (1) or handrails (2) to lift the cab or main body or while transporting the machine on a truck or trailer as it is dangerous.**
- **Door handle (3) is not a handrail. Do not hold door handle (3) as a handrail when getting on and off the machine.**
- **Do not hold the steering wheel, forward/reverse lever or control levers when getting on and off the machine.**



MPTC-01-004



MPTC-01-005



Inside of Left Door

MNDF-01-005

## OPERATOR'S STATION

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### About Aftertreatment Device

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

#### WARNING:

- **Exhaust gas from the aftertreatment device, muffler, exhaust piping and tail piping becomes hot during and just after engine running and regeneration of aftertreatment device. Pay attention 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.**
- **To avoid burns, stop the engine and make sure the engine has sufficiently cooled down before performing maintenance.**

#### IMPORTANT:

- **Be sure to use fuel that complies with JIS K-2204, EN-590 or ASTM D-975 that 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 occur.**
- **Refill DEF/AdBlue® which meets Japanese Industrial Standards (JIS) or International Organization for Standardization (ISO). If improper liquid (diesel oil, kerosene or gasoline) is refilled in the DEF/AdBlue® tank, fire or system failure may result.**
- **Use only genuine Hitachi engine oil. Using engine oil other than Hitachi genuine oil may result in malfunction of the aftertreatment device.**
- **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.**

## OPERATOR'S STATION

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- **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 piping. Also never attempt to disassemble the aftertreatment device. Avoid giving shocks on the aftertreatment device by striking elements with other objects or dropping the device. Failure to do so may affect the aftertreatment device, possibly damaging it or lowering its performance.**
- **White smoke may be generated during the aftertreatment device regeneration. Do not attempt to perform a manual regeneration in a poorly ventilated area.**
- **Consult your authorized dealer for checking or repairing the aftertreatment device.**

 NOTE:

- *White deposits may accumulate inside the aftertreatment device. The aftertreatment device is automatically regenerated to remove accumulated white deposits at regular intervals. It is called auto-regeneration. The auto-regeneration may start during operation of the machine; you can continue to operate the machine. (Refer to the page 1-73)*
- *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 60 hours after the previous regeneration (either auto or manual).*

## OPERATOR'S STATION

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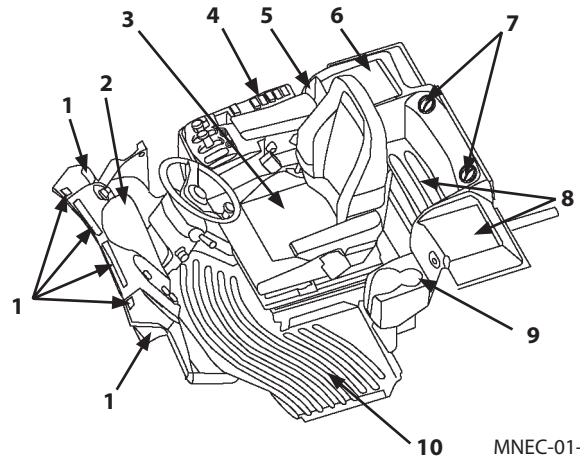
- *If auto regeneration did not complete, an aftertreatment device regeneration request will blink on the monitor. (Refer to the page 1-16) Perform manual regeneration following the specified procedure. (Refer to the page 1-74)*
- *When the machine is operated without performing manual regeneration, 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.*

# OPERATOR'S STATION

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## Cab Features

- 1- Front Defroster
- 2- Front Console
- 3- Operator's Seat
- 4- Right Console
- 5- Document Holder
- 6- Hot/Cool Box
- 7- Rear Defroster
- 8- Glove Compartment
- 9- Cup Holder
- 10- Floor Mat



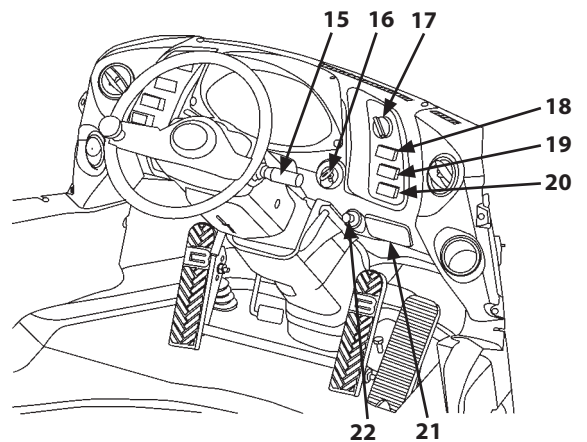
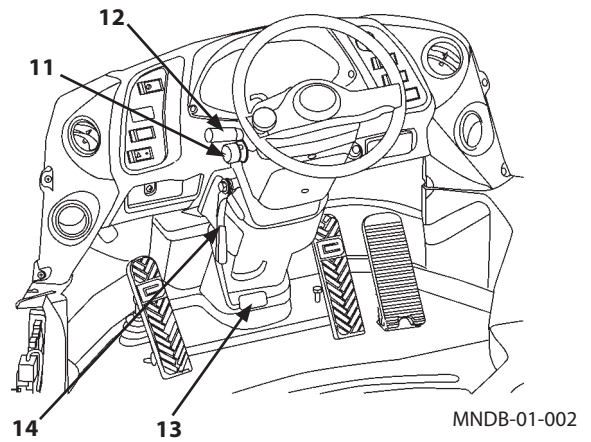
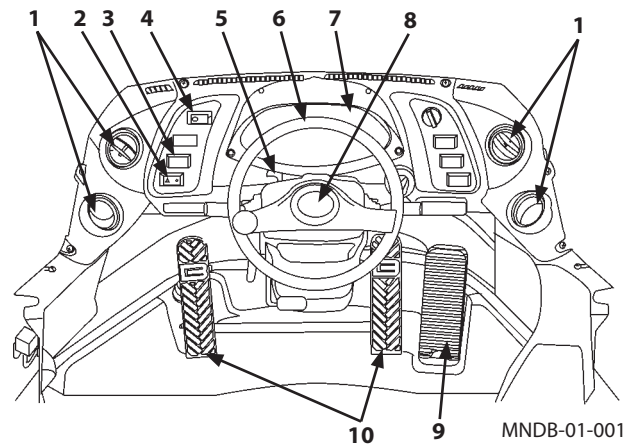
MNEC-01-035



# OPERATOR'S STATION

## Front Console

- 1- Air Conditioner Front Vent
- 2- Hazard Switch
- 3- Work Light Switch
- 4- Parking Brake Switch
- 5- Neutral Lever Lock (for the Forward/Reverse Lever)
- 6- Steering Wheel
- 7- Monitor Panel
- 8- Horn Switch
- 9- Accelerator Pedal
- 10- Brake/Inching Pedal (Both right and left sides are interlocked.)
- 11- Front/Rear Wiper Switch
- 12- Forward/Reverse Lever/Shift Switch
- 13- Steering Column Tilt Pedal
- 14- Tilt, Telescopic Lever
- 15- Turn Signal Lever/Light Switch/High-Low Beam Switch
- 16- Key Switch
- 17- 1st Speed Select Switch
- 18- Auto Shut-Down (Idling Stop) Switch
- 19- Auxiliary
- 20- Auxiliary
- 21- Ash Tray
- 22- Cigar Lighter

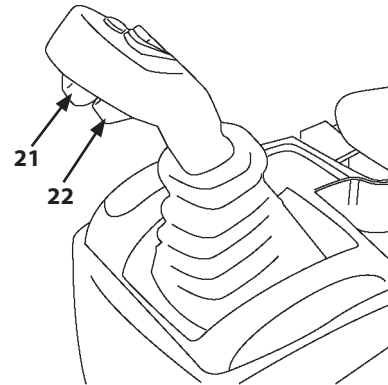
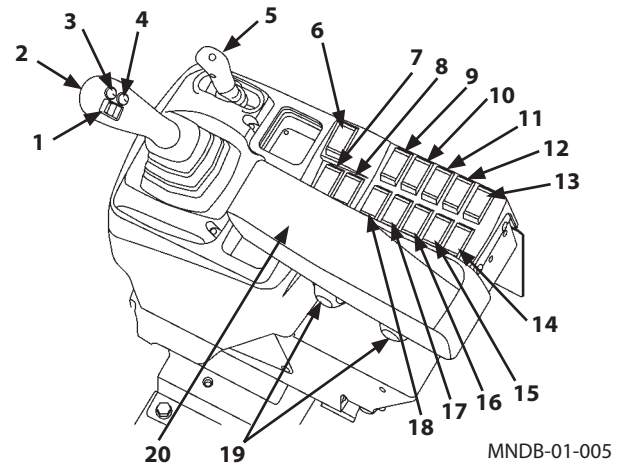


# OPERATOR'S STATION

## Right Console

### Multi-Function Joystick Type

- 1- Forward/Reverse Switch
- 2- Multi-Function Joystick Lever
- 3- Auxiliary
- 4- Auxiliary
- 5- Auxiliary Control Lever (Optional)
- 6- Control Lever Lock Switch
- 7- Creep Mode Switch
- 8- Traction Control Switch
- 9- Power Mode Switch
- 10- Forward/Reverse Selector Switch
- 11- Fan Reverse Rotation Switch
- 12- Auxiliary
- 13- Quick Cupler Switch (ZW140-6/150-6: Optional)
- 14- Secondary Steering Operation Check Switch (Optional)
- 15- Aftertreatment Device Regeneration Switch
- 16- Lift Arm Auto Leveler Switch (Upward Set)
- 17- Lift Arm Auto Leveler Switch (Downward Set)
- 18- Ride Control Switch
- 19- Armrest Adjust Handle
- 20- Armrest
- 21- Auxiliary
- 22- Horn Switch (Under the Lever)

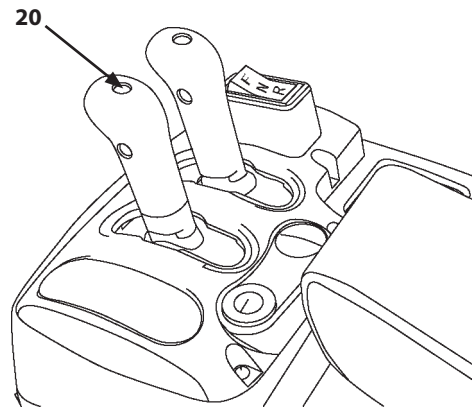
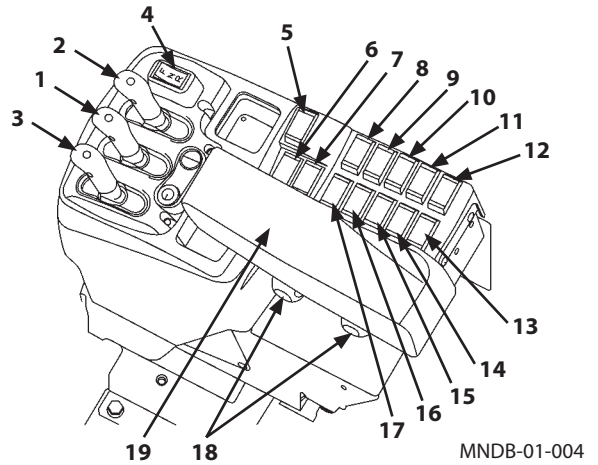


# OPERATOR'S STATION

## Right Console

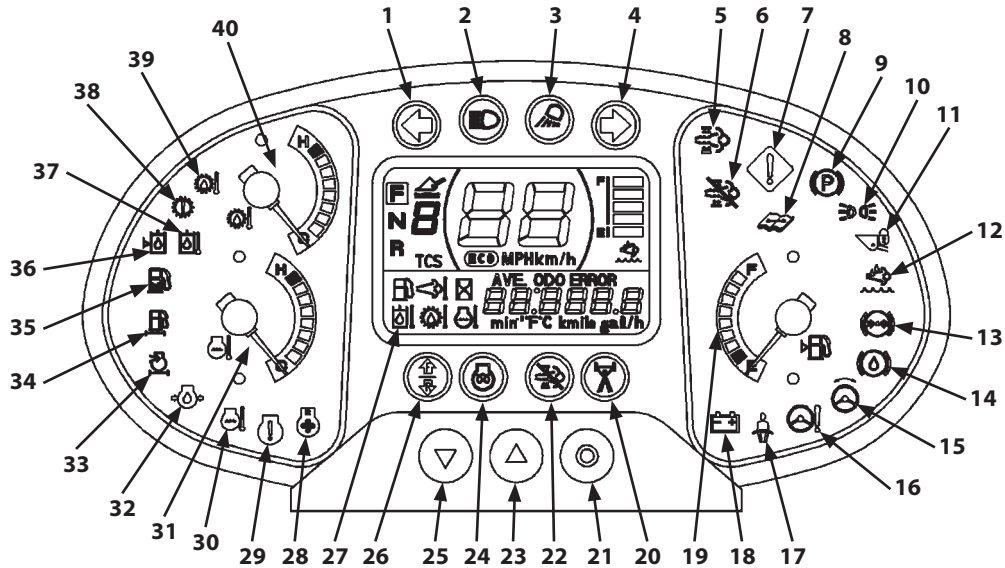
### Fingertip Control Type

- 1- Bucket Control Lever
- 2- Lift Arm Control Lever
- 3- Auxiliary Control Lever (Optional)
- 4- Forward/Reverse Switch
- 5- Control Lever Lock Switch
- 6- Creep Mode Switch
- 7- Traction Control Switch
- 8- Power Mode Switch
- 9- Forward/Reverse Selector Switch
- 10- Fan Reverse Rotation Switch
- 11- Auxiliary
- 12- Quick Cupler Switch (ZW140-6/150-6: Optional)
- 13- Secondary Steering Operation Check Switch (Optional)
- 14- Aftertreatment Device Regeneration
- 15- Lift Arm Auto Leveler Switch (Upward Set)
- 16- Lift Arm Auto Leveler Switch (Downward Set)
- 17- Ride Control Switch
- 18- Armrest Adjust Handle
- 19- Armrest Adjustment
- 20- Horn Switch



# OPERATOR'S STATION

## Monitor Panel



MPTC-01-019

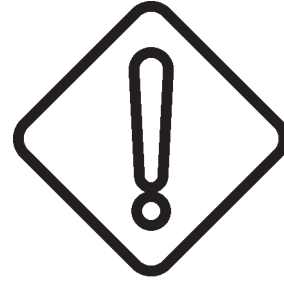
- |   |  |
|---|--|
| 1- Left Turn Signal Indicator                                     | 21- Monitor Display Mode Selector                          |
| 2- High Beam Indicator  | 22- Aftertreatment Device Regeneration inhibited Indicator |
| 3- Work Light Indicator   | 23- Monitor Display Selector (Up)                          |
| 4- Right Turn Signal Indicator                                    | 24- Preheat Indicator                                      |
| 5- Aftertreatment Device Warning Indicator                        | 25- Monitor Display Selector (Down)                        |
| 6- Aftertreatment Device Regeneration inhibited Warning Indicator | 26- Forward/Reverse Selector Switch Indicator              |
| 7- Service Indicator  | 27- Monitor Display  |
| 8- Maintenance Indicator  | 28- Fan Reverse Rotation Indicator                         |
| 9- Parking Brake Indicator  | 29- Engine Trouble Indicator                               |
| 10- Clearance Light Indicator                                     | 30- Overheat Indicator                                     |
| 11- Control Lever Lock Indicator                                  | 31- Coolant Temperature Gauge                              |
| 12- Urea Warning Indicator  | 32- Engine Oil Low Pressure Indicator                      |
| 13- Brake Oil Low Pressure Indicator                              | 33- Air Filter Restriction Indicator                       |
| 14- Not Used  | 34- Fuel Filter Restriction Indicator                      |
| 15- Secondary Steering Indicator (Optional)                       | 35- Water Separator Indicator                              |
| 16- Low Steering Oil Pressure Indicator (Optional)                | 36- Hydraulic Oil Level Indicator                          |
| 17- Seat Belt Indicator   | 37- Not Used   |
| 18- Discharge Warning Indicator                                   | 38- HST Warning Indicator                                  |
| 19- Fuel Gauge  | 39- HST Oil Temperature Indicator                          |
| 20- Power Mode Indicator  | 40- HST Oil Temperature Gauge                              |

## OPERATOR'S STATION

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### Service Indicator

**⚠ 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.**



MPTC-01-026

The service indicator comes ON and the alarm buzzer sounds if one of the following cases below occurs. Immediately, stop operating the machine. Move the machine to a safe area. Park the machine and stop the engine. Contact your authorized dealer for machine inspection:

- If the engine oil pressure decreases,
- If the engine coolant temperature abnormally increases,
- If the brake oil pressure decreases,
- If the steering oil pressure decreases,
- If the hydraulic oil level decreases,
- If the aftertreatment device is clogged excessively.

The service indicator comes ON if one of the following cases as described below occurs. Immediately, stop the engine. Check the cause of the trouble.

- If the alternator voltage decreases or becomes excessively high,
- If the air cleaner is restricted,
- If any abnormality is found in engine operation,
- If any abnormality is found in HST operation,
- If the HST oil temperature is kept higher than the specification for a short period of time,
- If the fuel filter is clogged,
- If the water level of water separator is higher than the specification,
- If the secondary steering system operates,
- If the aftertreatment device is clogged.

**✎ NOTE:** *The monitor has a self-check function (indicator light check). Under normal conditions, when the key switch is turned ON, all indicators including the service indicator "!" come and stay ON for approximately 2 seconds, and the buzzer sounds. If any indicator does not come ON, the indicator light may have burned out. Replace the burned out indicator light. If the buzzer does not intermittently sound, contact your authorized dealer for machine inspection.*

## OPERATOR'S STATION

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### 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.

**📌 NOTE:** After starting the engine, the service indicator light may come on until the brake oil pressure, which decreased while being stopped, increases to specification. The alarm buzzer may also sound.

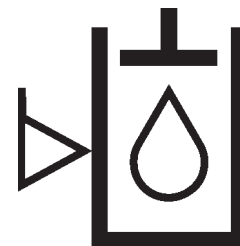


M4GB-01-013

### 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

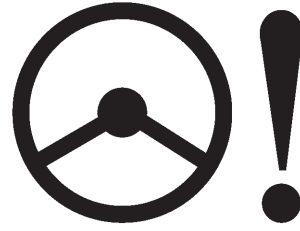
## OPERATOR'S STATION

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### Low Steering Oil Pressure Indicator (Red) (Optional)

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

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.



M4GB-01-016

### HST Warning Indicator (Red)

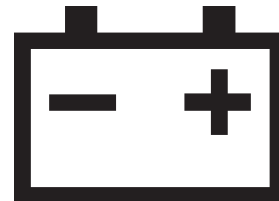
If any serious abnormality occurs in the HST and/or HST related parts, the red indicator will light. If the HST warning indicator and the service indicator light, immediately move the machine to a safe area, set the machine in the park position and stop the engine. Contact your authorized dealer for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



M4GB-01-024

### Discharge Warning Indicator (Red)

If the alternator voltage lowers, the discharge warning indicator will light. If the alternator voltage is abnormally high, the discharge warning indicator and the service indicator will light. Inspect the alternator and the battery system.



M4GB-01-018

### Urea Warning Indicator (Red)

DEF/AdBlue® level is low or Urea SCR system is abnormal. Refill DEF/AdBlue® if level is low. Contact your authorized dealer for system malfunction.



MPTC-01-001

## OPERATOR'S STATION

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### 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 your authorized dealer for machine inspection.



M4GB-01-019

### 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 slow idle speed to lower the coolant temperature.



M4GB-01-020

### 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.



M4GB-01-021

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.

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

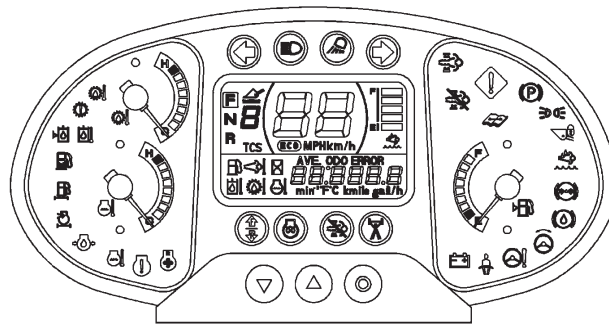


# OPERATOR'S STATION

## Aftertreatment Device Warning Indicator

### Aftertreatment Device Regeneration Request (Blinking Yellow)

Aftertreatment device regeneration is needed. Set the machine in a regeneration condition, turn the regeneration switch to the manual regeneration position.



MPTC-01-019

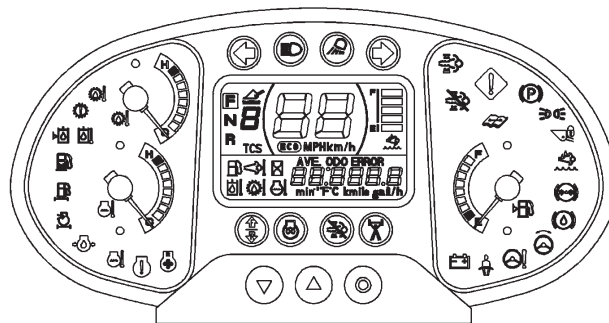


MNDF-01-036

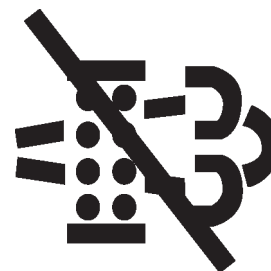
## Aftertreatment Device Regeneration Inhibited Warning Indicator

### Aftertreatment Device Regeneration Inhibited Warning (Yellow)

As the regeneration inhibition has been set, manual regeneration cannot be performed. Move the machine to a safe area, release the regeneration inhibition, and perform manual regeneration.



MPTC-01-019



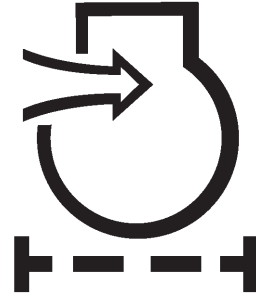
MNDF-01-037

## OPERATOR'S STATION

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### 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

### Preheat Indicator (Yellow)

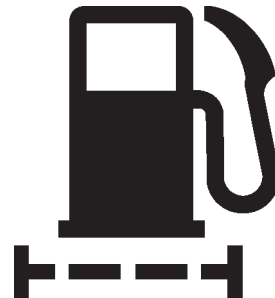
The engine is being preheated as long as the preheat indicator stays ON. When the preheat indicator goes OFF, engine preheating is completed.



M4GB-01-031

### Fuel Filter Restriction Indicator (Red)

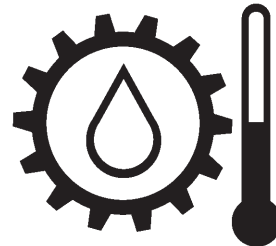
If the fuel filter element becomes clogged, the fuel filter restriction indicator and the service indicator light. Immediately stop the engine and inspect the fuel filter element. Replace the element, if necessary.



MNDF-01-038

### HST Oil Temperature Indicator (Red)

If the HST oil temperature is kept higher than the specification for a short period of time, both the HST oil temperature indicator and the service indicator come 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 HST oil temperature.



M4GB-01-027

## OPERATOR'S STATION


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### Secondary Steering Indicator (Yellow) (Optional)

**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 come ON. Move the machine to a safe area and stop the machine.

**IMPORTANT:** If no operating sound can be heard or an indicator lights after starting the engine, immediately stop the engine and consult your 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 during the check. If any abnormality is found during checking, the secondary steering indicator comes ON.



M4GB-01-015

### Seat Belt Indicator (Red)

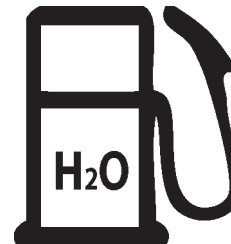
The indicator comes ON for 5 seconds after starting the engine, to inform the operator to fasten their seat belt.



M4GB-01-017

### Water Separator Indicator (Red)

If the water separator is full, the water separator indicator and the service indicator light. Immediately stop the engine and inspect the water separator. Drain the water, if necessary.



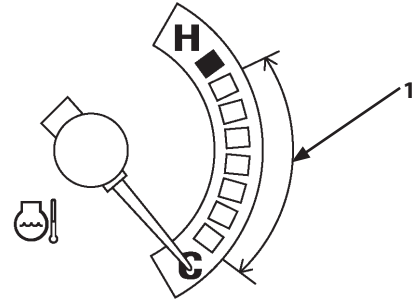
MNEC-01-010

# OPERATOR'S STATION

## Coolant Temperature Gauge

The engine coolant temperature is indicated with a needle. When the needle stays in 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. In case the needle does not move at all, error in the electrical system is suspected. Contact your authorized dealer for machine inspection.

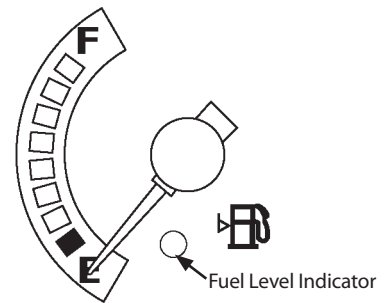


M4GB-01-028

## 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.

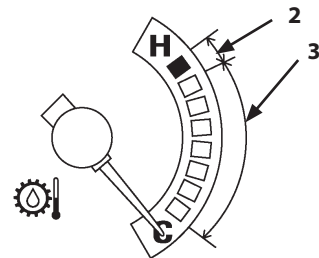
**NOTE:** The fuel level indicator may light even if the indicator needle does not reach the red range (E), depending on the tilt angle of machine.



MNEC-01-002

## HST Oil Temperature Gauge

The HST oil temperature is indicated with a needle. When the needle stays in range (3) during operation, the oil temperature is normal. If the HST oil temperature abnormally increases to range (2) and is kept higher than the specification for a short period of time, the service indicator comes ON. Stop machine operation and run the engine at low idle to lower the oil temperature. After the oil temperature lowers, stop the engine.



M4GB-01-029

## OPERATOR'S STATION

### 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)

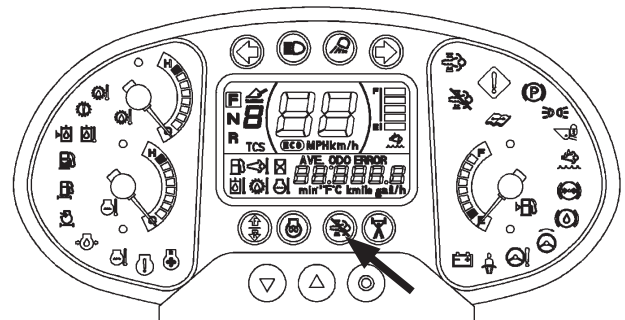
When the work lights are turned ON, this indicator will light.



M4GB-01-034

### Aftertreatment Device Regeneration Inhibited Indicator (Green)

If the aftertreatment device regeneration switch is in regeneration inhibited position, the aftertreatment device regeneration inhibited indicator will light. The aftertreatment device regeneration will not perform while this indicator light.



MPTC-01-019



MNDF-01-037

## OPERATOR'S STATION

---

### Clearance Light Indicator (Green)

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



M4GB-01-035

### Control Lever Lock Indicator (Red)

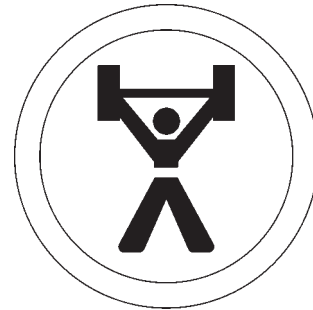
When the control lever lock switch is in ON position, the control lever lock indicator will light.



MNEC-01-004

### Power Mode Indicator (Green)

When the power mode switch is in ON position, the power mode indicator will light.



MNDB-01-036

## OPERATOR'S STATION

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### Maintenance Indicator (Yellow)

Indicates that the maintenance times for the following items are approaching. Each time the ignition key is turned ON, the indicator comes ON for 30 seconds. The indicator lights 20 hours before the specified maintenance time arrives.

Items to be indicated:

- Hydraulic oil change
- Hydraulic oil filter replacement 1, 2, 3
- Transmission oil change
- Transmission oil filter replacement
- Engine oil change
- Engine oil filter replacement
- Oil separator element replacement
- Fuel filter replacement
- DEF/AdBlue® supply module main filter replacement
- Axle oil change



M4GB-01-037

### Forward/Reverse Selector Switch Indicator (Green)

Comes ON when the forward/reverse selector switch is operable.



M4GB-01-038

### Fan Reverse Rotation Indicator (Green)

Lights when the fan is rotating in reverse.

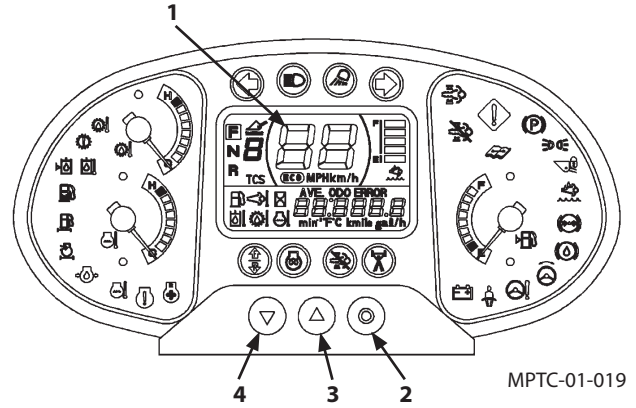


MNDB-01-067

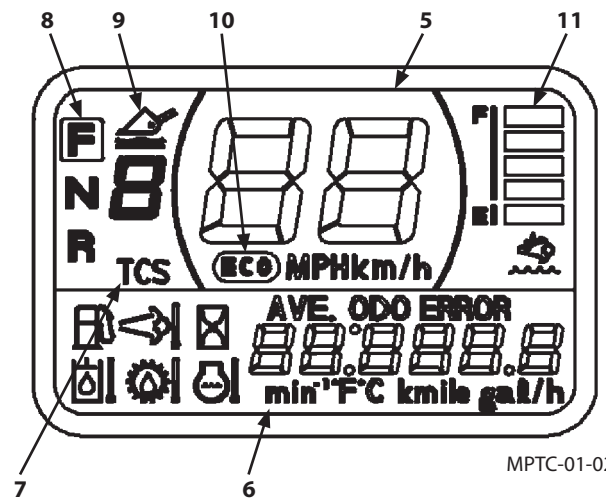
# OPERATOR'S STATION

## Monitor Display

- 1- Monitor Display
- 2- Monitor Display Mode Selector
- 3- Monitor Display Selector (Up)
- 4- Monitor Display Selector (Down)
- 5- Speedometer
- 6- Information Display
- 7- Traction Control Indicator
- 8- Forward/Reverse and Shift Position Indicator
- 9- Ride Control Indicator
- 10- ECO Indicator
- 11- DEF/AdBlue® Level Gauge



MPTC-01-019



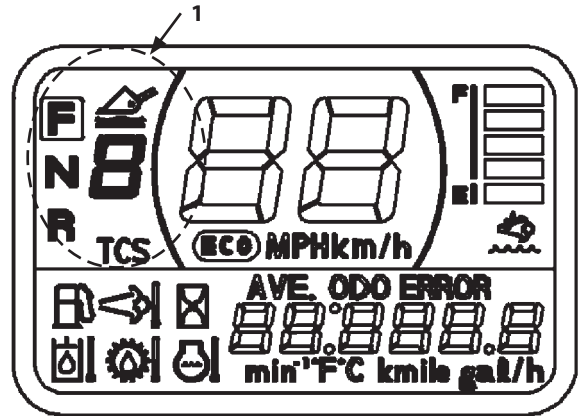
MPTC-01-020



# OPERATOR'S STATION

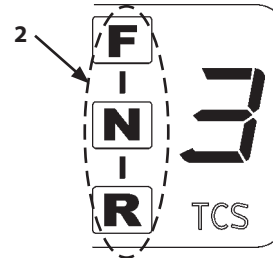
## Forward/Reverse and Shift Position Indicator

Forward/Reverse and Shift Position Indicator (1) displays the machine driving status (selected FNR lever and shift positions).

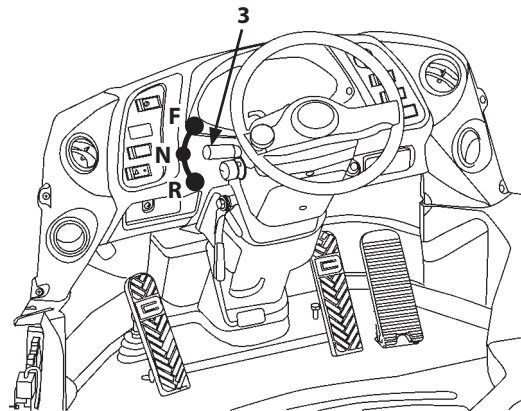


MPTC-01-020

- FNR (Forward/Reverse) Position Indicator  
FNR position indicator (2) displays the selected position of forward (F)/neutral (N)/reverse (R) lever (3). (Letters F-N-R are constantly displayed.)



MPTC-01-022

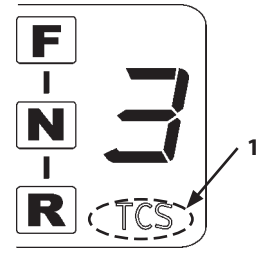


MNDB-01-002

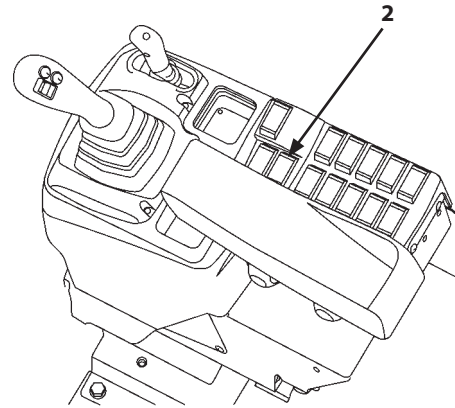
## OPERATOR'S STATION

- Traction Control Indicator

When traction control switch (2) is ON, traction control indicator (1) lights.



MPTC-01-022

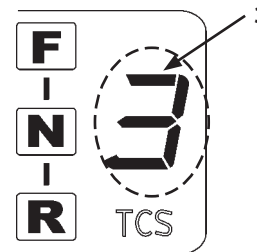


MNDB-01-005

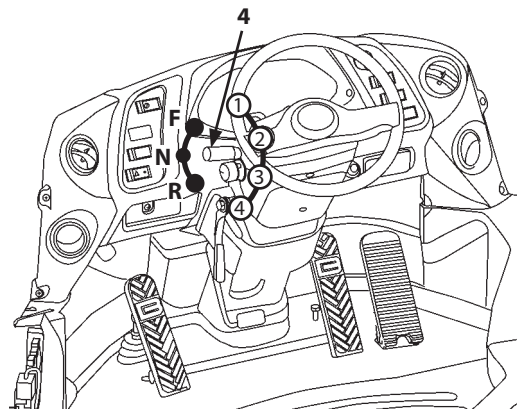
- Shift Position Indicator

When forward/reverse lever (4) is in either the forward or reverse position, shift position indicator (3) displays the actually selected shift stage.

- Forward: 4 stages
- Reverse: 4 stages



MPTC-01-022

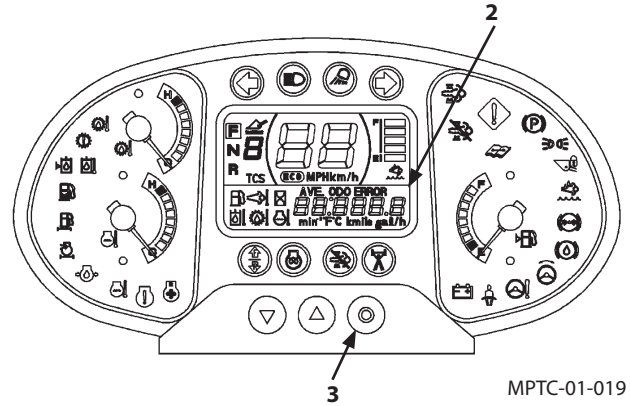


MNDB-01-002

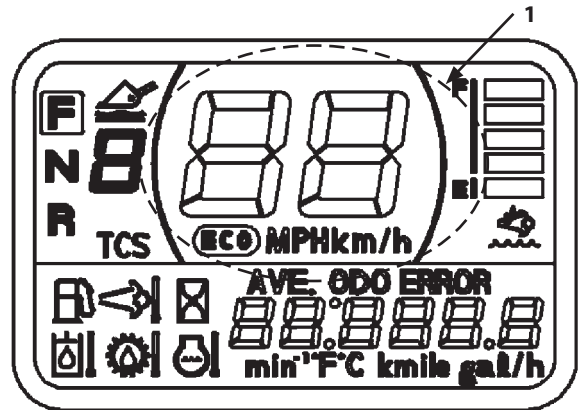
# OPERATOR'S STATION

## Speedometer

Speedometer (1) indicates the present machine driving speed. While information display (2) is indicating the drive distance, each time monitor display mode selector (3) is pressed, the indicated speed unit alternates between "km/h" and "MPH."



MPTC-01-019

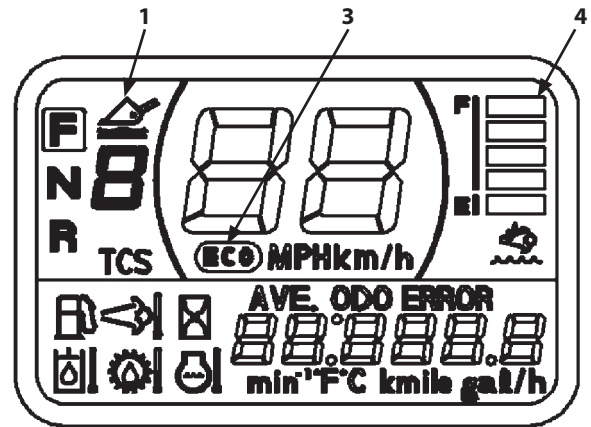


MPTC-01-020

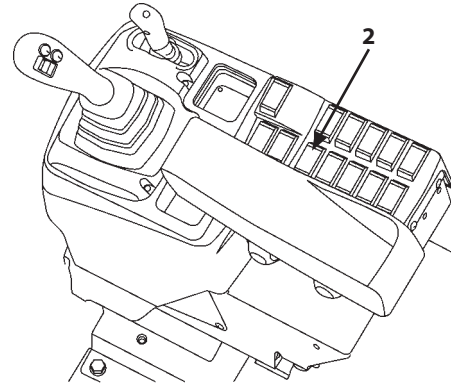
## OPERATOR'S STATION

### Ride Control Indicator

Ride control indicator (1) lights when ride control switch (2) is turned ON.



MPTC-01-020



MNDB-01-005

### ECO Indicator

ECO indicator (3) lights when the engine runs in energy efficient condition. It becomes OFF when the driving speed is 2 km/h or lower or under heavy driving load.

### DEF/AdBlue® Level Gauge

DEF/AdBlue® level gauge (4) displays the remaining DEF/AdBlue® amount.

## OPERATOR'S STATION

### DEF/SCR System Alarm

When the DEF/AdBlue® 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 and buzzer.

Move and park the machine in a safe place and follow troubleshooting guide for the accompanied alarms.

#### DEF/AdBlue® Level Alarm







Display of the DEF/AdBlue® gauge changes depending on the DEF/AdBlue® level.

The engine speed and output level control is as follows.

Level Gauge	Alarm Indicator		Buzzer	Status/Inducement
	 (Red, light)		Buzzer sounds once.	DEF/AdBlue® level is low. Refill DEF/AdBlue®.
	 (Red, slow blink)		Buzzer sounds every 3.8 seconds.	DEF/AdBlue® is insufficient. Refill DEF/AdBlue®. Engine output is restricted.
	 (Red, slow blink)	 (Yellow)	Buzzer sounds every 1.2 seconds.	DEF/AdBlue® tank is empty. Refill DEF/AdBlue®. Engine output and speed are restricted.
	 (Red, fast blink)	 (Yellow)	Buzzer sounds every 0.3 seconds.	
	 (Red, fast blink)	 (Red)		

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

## OPERATOR'S STATION

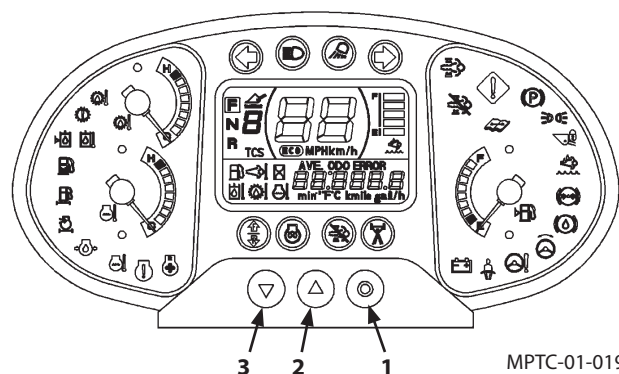
Urea SCR System Malfunction			
Alarm Indicator		Buzzer	Status/Inducement
 (Red, light)		Buzzer sounds once.	Urea SCR system is broken.
 (Red, slow blink)		Buzzer sounds every 3.8 seconds.	Urea SCR system is broken. Engine output is restricted.
 (Red, slow blink)		Buzzer sounds every 1.2 seconds.	Urea SCR system is broken. Engine output and speed are restricted. Contact your authorized dealer for service.
 (Red, fast blink)		Buzzer sounds every 0.3 seconds.	
 (Red, fast blink)	 (Red)		

## OPERATOR'S STATION

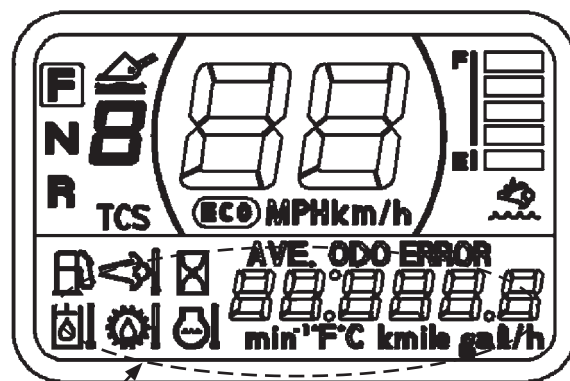
### Machine Information Display

When the key switch is turned ON, machine information area (4) displays the machine information.

When the key switch is turned ON, the machine information display indicates engine start-ready screen (5). Each 0.5 seconds, the most left side indication is counted down as shown in display illustration (6). Then, hour meter (7) is displayed for 5 seconds, and 24H clock screen (8) is displayed. Every time monitor display selector (2) is pressed, the display on the machine information screen is shifted from 24H clock screen (8) to return to engine start-ready screen (5). While displaying INFO screen, when monitor display selector (3) is pressed, each INFO screen is displayed.



MPTC-01-019

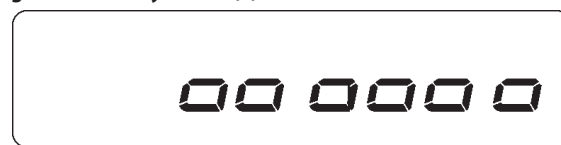


MPTC-01-020

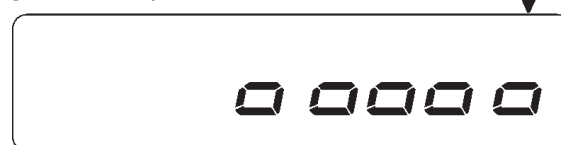
Display order of Items in the normal display mode

- Clock (24H)
- Hour Meter
- Odometer
- INFO (Press switch 3)
  - Hour Meter of Hydraulic Oil
  - Hour Meter 1 of Hydraulic Oil Filter
  - Hour Meter 2 of Hydraulic Oil Filter
  - Hour Meter 3 of Hydraulic Oil Filter
  - Hour Meter of Transmission Oil
  - Hour Meter of Transmission Oil Filter
  - Hour Meter of Engine Oil
  - Hour Meter of Engine Oil Filter
  - Hour Meter of Oil Separator Element
  - Hour Meter of Fuel Filter
  - Hour Meter of DEF/AdBlue® Supply Module Main Filter
  - Hour Meter of Axle Oil
- Fuel Consumption (Press switch 3)
  - Average Fuel Consumption Rate

Engine Start-ready Screen (5)



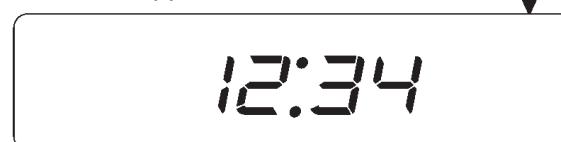
Engine Start-ready Screen (6)



Hour Meter (7)



24H Clock Screen (8)

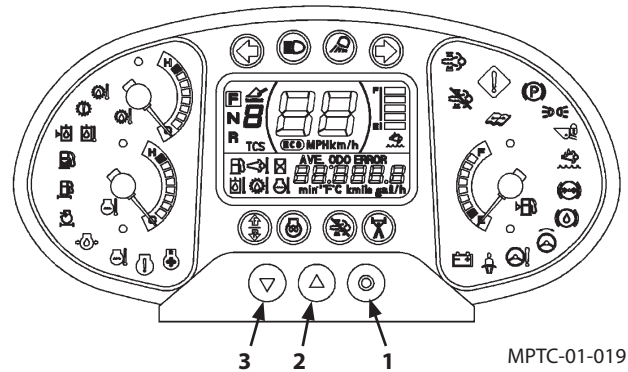


MNDB-01-038

# OPERATOR'S STATION

## Shifting Item to be Indicated on Machine Information Display

Press monitor display selector (2) to shift the display item one a time in order from the clock display on the machine information display.



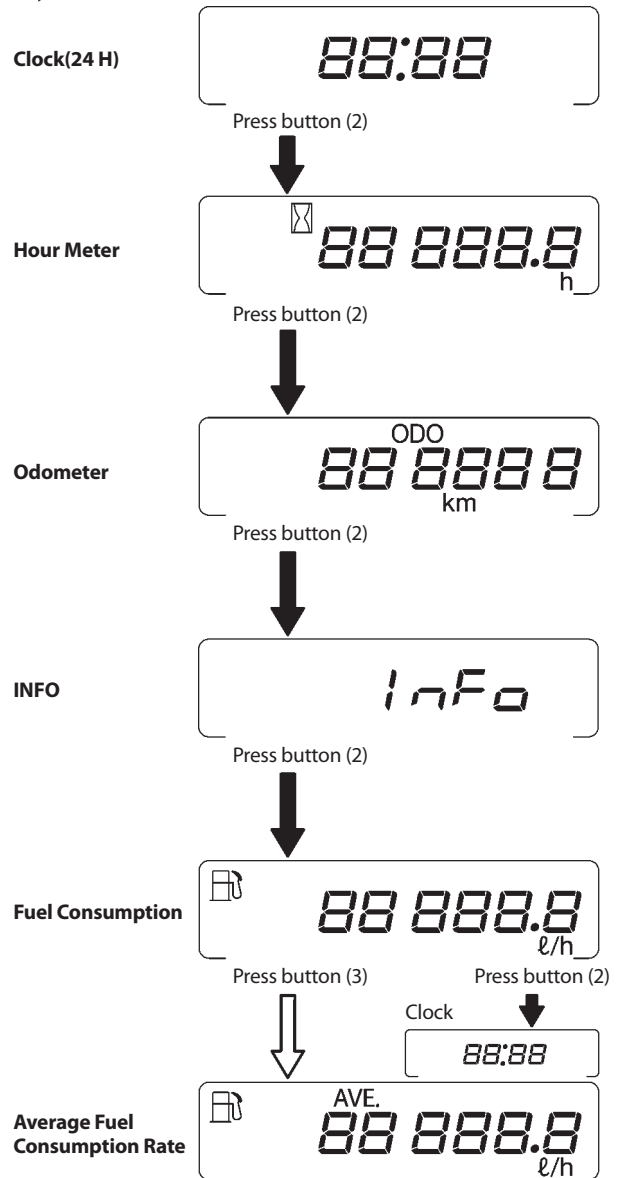
MPTC-01-019

- Clock (24H)**  
 Indicates the present time. When this display is indicated, press monitor display selector (2) one a time to display the Hour Meter.
- Hour Meter**  
 Indicates the total machine operating hours up to present. In case the operating hour exceeds 99999.9h, the meter restarts counting the hour from 0 hour. When this display is indicated, press monitor display selector (2) once at a time to display the odometer.
- Odometer**  
 Indicates the total machine traveling distance up to present. When this display is indicated, press monitor display selector (2) once at a time to display the INFO.
- Fuel Consumption**  
 Indicates the present fuel consumption. When this display is indicated, press monitor display selector (2) once at a time to return to the clock display. When monitor display selector (3) is pressed, this screen is shifted to the Average Fuel Consumption Rate.
- Average Fuel Consumption Rate**  
 Indicates the average fuel consumption rate up to present. To clear the average fuel consumption rate, press monitor display selector (1).

**IMPORTANT: Total fuel consumption and average 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.**

: When monitor display selector (△)(2) is pressed once:  
 : When monitor display selector (▽)(3) is pressed once:



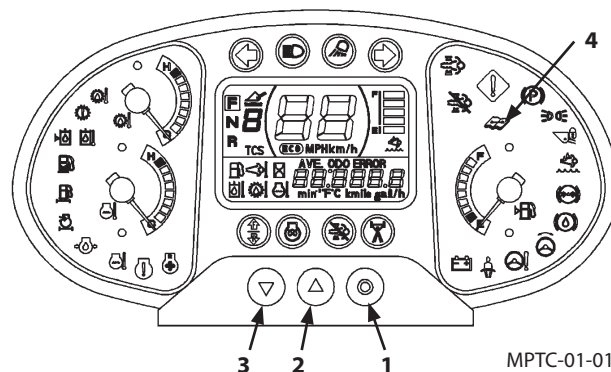
MPTC-01-028



## OPERATOR'S STATION

**IMPORTANT:** Each time the oil is changed and/or oil filter is replaced, reset the displayed monitor time by pressing monitor display mode selector (1) for more than 2 seconds.

Beware not to press monitor display mode selector (1) when the display is indicating the time to change or replace. The display will not be able to indicate the correct time.



- INFO

When screen A is indicated, press monitor display selector (3), the screen is shifted to the hydraulic hour meter display C.

- Hydraulic Oil Hour Meter

Screen C and time screen D indicating the remaining hours up to hydraulic oil change are alternately displayed.

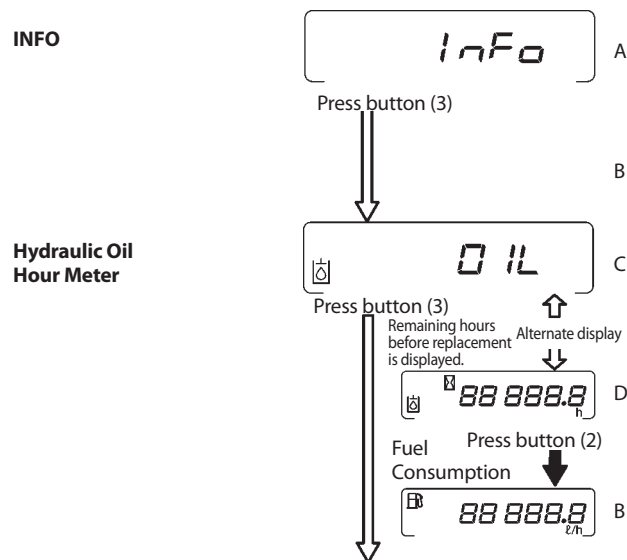
When the remaining hour reading becomes 0 hour, maintenance indicator (4) will light.

While displaying screen D, when monitor display selector (2) is pressed, the screen is returned to fuel consumption display B.

When monitor display selector (3) is pressed, screen E of "Hydraulic oil filter 1 hour meter" is displayed.

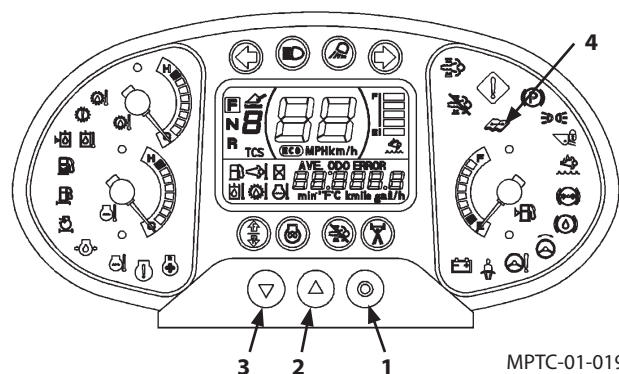
Refer to page 1-37 for the resetting of oil change and filter replacement intervals.

➡ : When monitor display selector (△)(2) is pressed once:  
 ⇨ : When monitor display selector (▽)(3) is pressed once:



MPTC-01-029

# OPERATOR'S STATION



MPTC-01-019

- **Hydraulic Oil Filter 1 Hour Meter**

Screen E and time screen F indicating the remaining hours up to hydraulic tank oil filter replacement are alternately displayed.

When the remaining hour reading becomes 0 hour, maintenance indicator (4) will light.

While displaying screen F, when monitor display selector (2) is pressed, the screen is returned to fuel consumption display B. When monitor display selector (3) is pressed, screen G of "Hydraulic oil filter 2 hour meter" is displayed.

Refer to page 1-38 for the resetting of oil change and filter replacement intervals.

- **Hydraulic Oil Filter 2 Hour Meter**

Screen G and time screen H indicating the remaining hours up to pilot oil filter replacement are alternately displayed.

When the remaining hour reading becomes 0 hour, maintenance indicator (4) will light.

While displaying screen H, when monitor display selector (2) is pressed, the screen is returned to fuel consumption display B. When monitor display selector (3) is pressed, screen I of "Transmission oil hour meter" is displayed.

Refer to page 1-39 for the resetting of oil change and filter replacement intervals.

- **Hydraulic Oil Filter 3 Hour Meter**

Screen I and time screen J indicating the remaining hours up to HST charge filter replacement are alternately displayed.

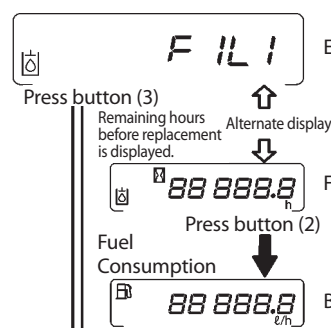
When the remaining hour reading becomes 0 hour, maintenance indicator (4) will light.

While displaying screen J, when monitor display selector (2) is pressed, the screen is returned to fuel consumption display B. When monitor display selector (3) is pressed, screen K of "Transmission oil hour meter" is displayed.

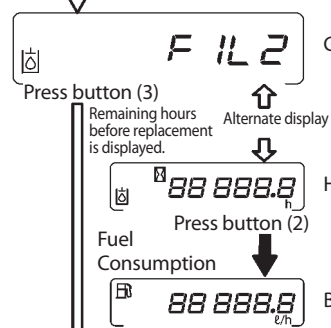
Refer to page 1-40 for the resetting of oil change and filter replacement intervals.

➡ : When monitor display selector (△)(2) is pressed once:  
 ⇨ : When monitor display selector (▽)(3) is pressed once:

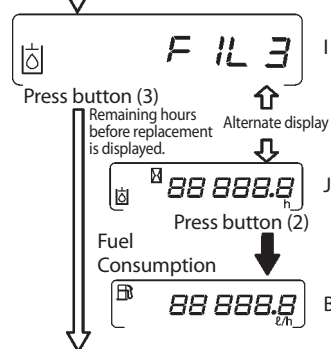
**Hydraulic Oil Filter 1 Hour Meter**



**Hydraulic Oil Filter 2 Hour Meter**

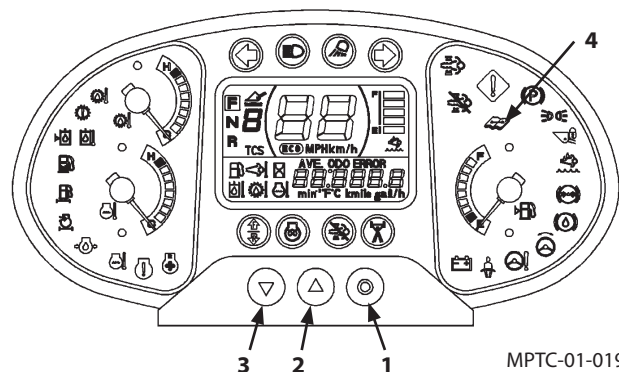


**Hydraulic Oil Filter 3 Hour Meter**



MPTC-01-030

# OPERATOR'S STATION



MPTC-01-019

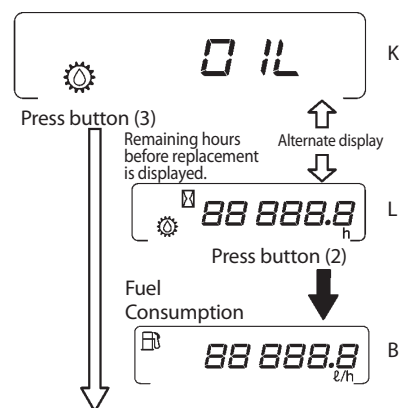
- **Transmission Oil Hour Meter**  
Screen K and time screen L indicating the remaining hours up to transmission oil change are alternately displayed. When the remaining hour reading becomes 0 hour, maintenance indicator (4) will light. While displaying screen L, when monitor display selector (2) is pressed, the screen is returned to fuel consumption display B. When monitor display selector (3) is pressed, screen M of "Transmission oil filter hour meter" is displayed. Refer to page 1-41 for the resetting of oil change and filter replacement intervals.

- **Transmission Oil Filter Hour Meter**  
Screen M and time screen N indicating the remaining hours up to transmission oil filter replacement are alternately displayed. When the remaining hour reading becomes 0 hour, maintenance indicator (4) will light. While displaying screen N, when monitor display selector (2) is pressed, the screen is returned to fuel consumption display B. When monitor display selector (3) is pressed, screen O of "Engine oil hour meter" is displayed. Refer to page 1-42 for the resetting of oil change and filter replacement intervals.

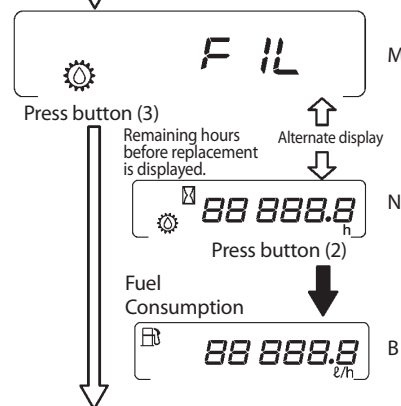
- **Engine Oil Hour Meter**  
Screen O and time screen P indicating the remaining hours up to engine oil change are alternately displayed. When the remaining hour reading becomes 0 hour, maintenance indicator (4) will light. While displaying screen P, when monitor display selector (2) is pressed, the screen is returned to fuel consumption display B. When monitor display selector (3) is pressed, screen Q of "Engine oil filter hour meter" is displayed. Refer to page 1-43 for the resetting of oil change and filter replacement intervals.

➡ : When monitor display selector (△)(2) is pressed once:  
 ⇩ : When monitor display selector (▽)(3) is pressed once:

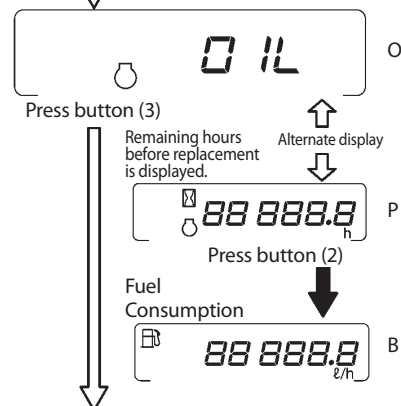
### Transmission Oil Hour Meter



### Transmission Oil Filter Hour Meter

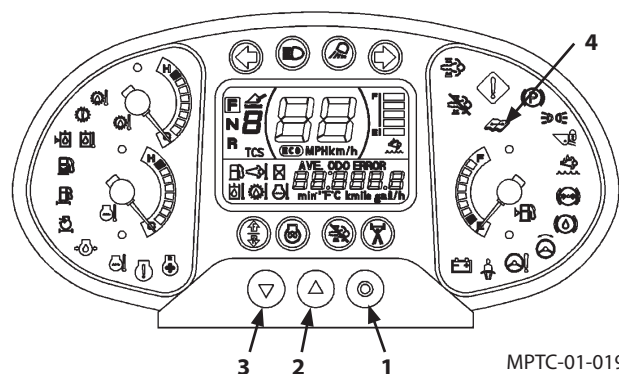


### Engine Oil Hour Meter



MPTC-01-031

# OPERATOR'S STATION



MPTC-01-019

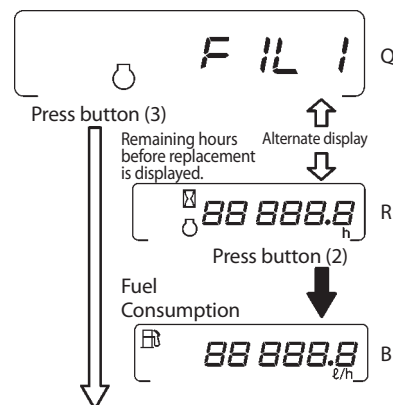
- Engine Oil Filter Hour Meter**  
 Screen Q and time screen R indicating the remaining hours up to engine oil filter replacement are alternately displayed. When the remaining hour reading becomes 0 hour, maintenance indicator (4) will light. While displaying screen R, when monitor display selector (2) is pressed, the screen is returned to fuel consumption display B. When monitor display selector (3) is pressed, screen S of "Oil Separator Element Hour Meter" is displayed. Refer to page 1-44 for the resetting of oil change and filter replacement intervals.

- Oil Separator Element Hour Meter**  
 Screen S and time screen T indicating the remaining hours up to oil separator replace are alternately displayed. When the remaining hour reading becomes 0 hour, maintenance indicator (4) will light. While displaying screen T, when monitor display selector (2) is pressed, the screen is returned to fuel consumption display B. When monitor display selector (3) is pressed, screen U of "Fuel filter hour meter" is displayed. Refer to page 1-45 for the resetting of oil change and filter replacement intervals.

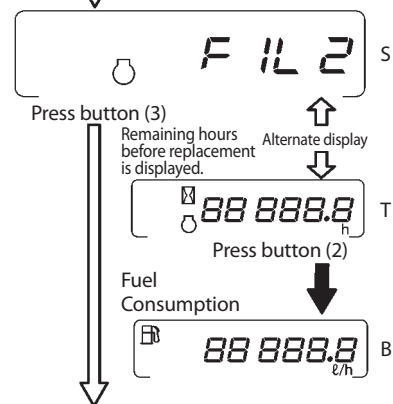
- Fuel Filter Hour Meter**  
 Screen U and time screen V indicating the remaining hours up to fuel filter replace are alternately displayed. When the remaining hour reading becomes 0 hour, maintenance indicator (4) will light. While displaying screen V, when monitor display selector (2) is pressed, the screen is returned to fuel consumption display B. When monitor display selector (3) is pressed, screen W of "DEF/ AdBlue® Supply Module Main Filter Hour Meter" is displayed. Refer to page 1-46 for the resetting of oil change and filter replacement intervals.

: When monitor display selector (△)(2) is pressed once:  
 : When monitor display selector (▽)(3) is pressed once:

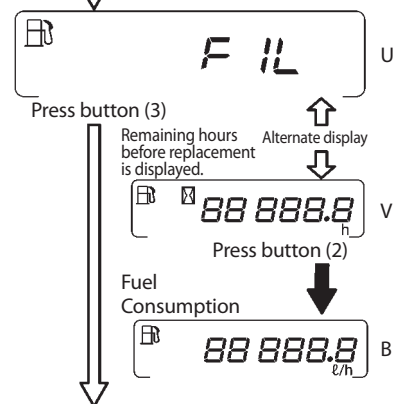
### Engine Oil Filter Hour Meter



### Oil Separator Element Hour Meter

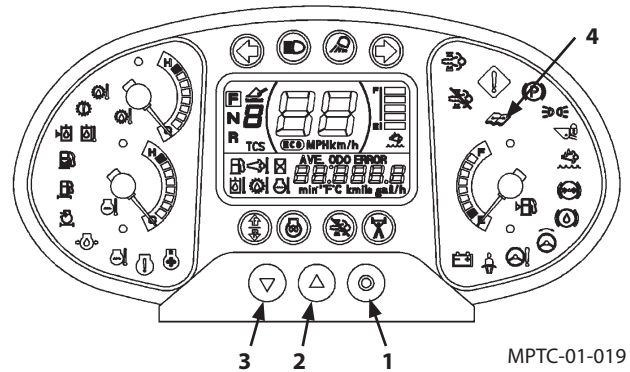


### Fuel Filter Hour Meter



MPTC-01-023

# OPERATOR'S STATION



MPTC-01-019

- DEF/AdBlue® Supply Module Main Filter Hour Meter  
Screen W and time screen X indicating the remaining hours up to DEF/AdBlue® supply module main filter replace are alternately displayed.

When the remaining hour reading becomes 0 hour, maintenance indicator (4) will light.

While displaying screen X, when monitor display selector (2) is pressed, the screen is returned to fuel consumption display B.

When monitor display selector (3) is pressed, screen Y of "Axle oil hour meter" is displayed.

Refer to page 1-47 for the resetting of oil change and filter replacement intervals.

- Axle Oil Hour Meter

Screen Y and time screen Z indicating the remaining hours up to axle oil change are alternately displayed.

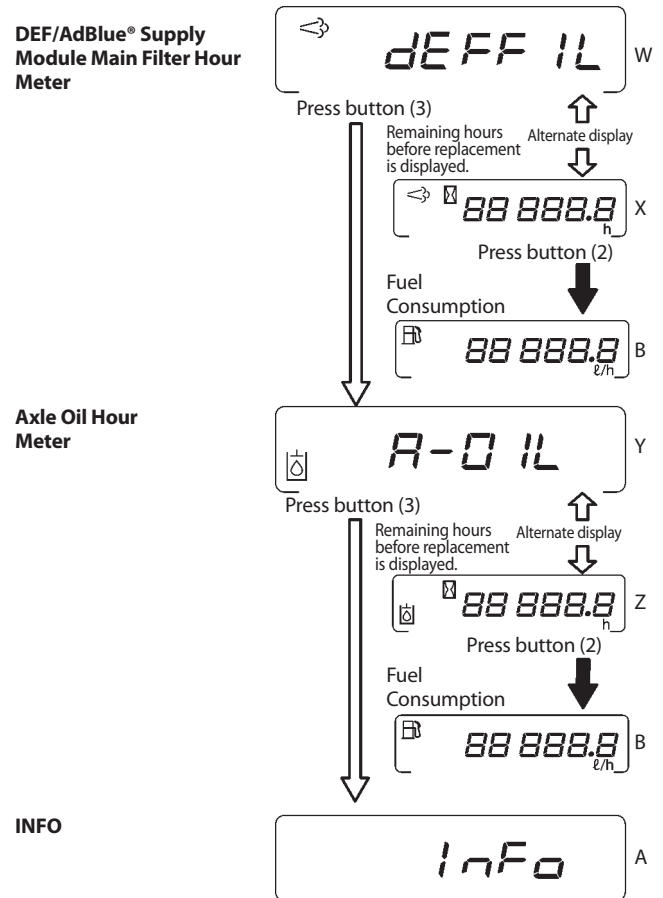
When the remaining hour reading becomes 0 hour, maintenance indicator (4) will light.

While displaying screen Z, when monitor display selector (2) is pressed, the screen is returned to fuel consumption display B.

When monitor display selector (3) is pressed, screen A of "INFO" is displayed.

Refer to page 1-48 for the resetting of oil change and filter replacement intervals.

➡ : When monitor display selector (△)(2) is pressed once:  
 ➡ : When monitor display selector (▽)(3) is pressed once:



MPTC-01-024

# OPERATOR'S STATION

## Resetting of Oil Change and Filter Replacement Intervals

Reset oil change and/or oil filter replacement intervals as needed:

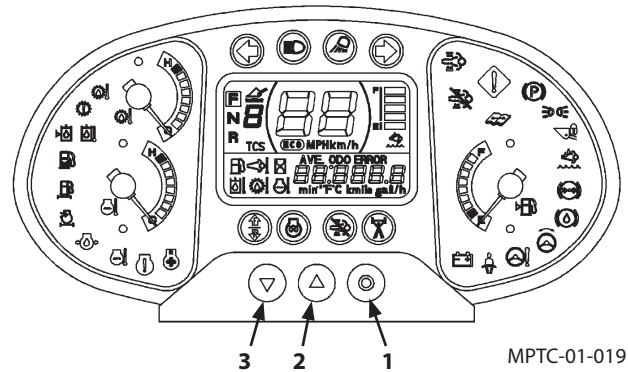
### Hydraulic Oil Change Interval Hour Meter

Oil change intervals can be reset to "2000.0", "1500.0", or "1000.0". The interval set when the machine was shipped from the factory is "2000.0".

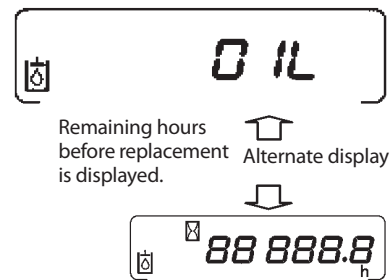
While displaying the change interval hours, keep pressing switch (1).

**NOTE:** When switch (1) is released, time resetting is completed. Keep pressing switch (1) until the desired resetting time is displayed.

Time display is changed four seconds after pressing switch (1). While keeping switch (1) pressed, press switch (3). Each time switch (3) is pressed, the displayed hours will change in the order of "2000.0 → 1500.0 → 1000.0". When the desired time is displayed, release switch (1) to complete resetting operation.

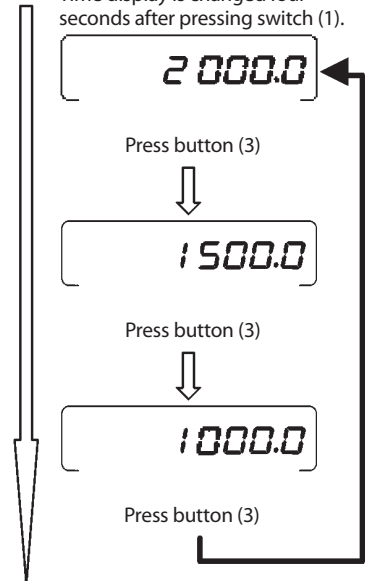


MPTC-01-019

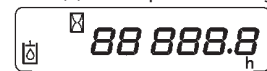


Keep pressing switch (1).

Time display is changed four seconds after pressing switch (1).



Release switch (1) to complete resetting operation.




MNDF-01-014

## OPERATOR'S STATION

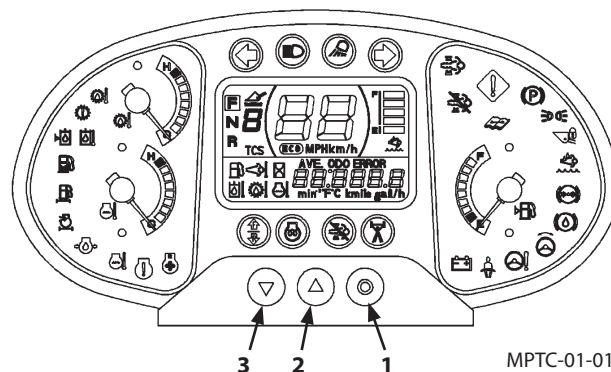
### Hydraulic Oil Filter 1 Replacement Interval Hour Meter

Hydraulic oil filter replacement intervals can be reset to "1000.0" or "500.0". The interval set when the machine was shipped from the factory is "1000.0".

While displaying the change interval hours, keep pressing switch (1).

 **NOTE:** When switch (1) is released, time resetting is completed. Keep pressing switch (1) until the desired resetting time is displayed.

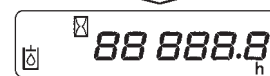
Time display is changed four seconds after pressing switch (1). While keeping switch (1) pressed, press switch (3). Each time switch (3) is pressed, the displayed hours will change in the order of "1000.0 → 500.0". When the desired time is displayed, release switch (1) to complete resetting operation.



MPTC-01-019



Remaining hours before replacement  
Alternate display is displayed.

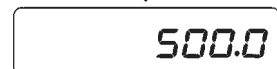


Keep pressing switch (1).

Time display is changed four seconds after pressing switch (1).

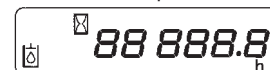


Press button (3)



Press button (3)

Release switch (1) to complete resetting operation.



MNDB-01-044

## OPERATOR'S STATION

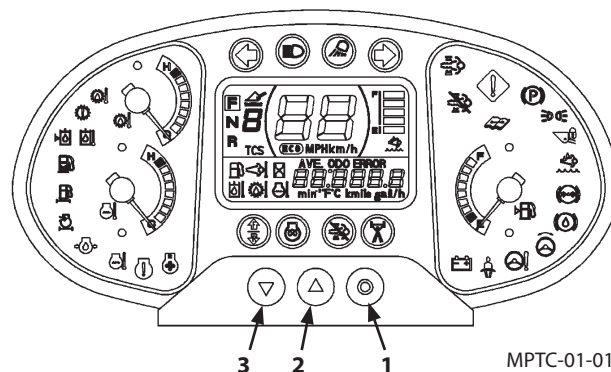
### Hydraulic Oil Filter 2 Replacement Interval Hour Meter

Hydraulic oil filter replacement intervals can be reset to "2000.0", "1500.0", or "1000.0". The interval set when the machine was shipped from the factory is "2000.0".

While displaying the change interval hours, keep pressing switch (1).

**NOTE:** When switch (1) is released, time resetting is completed. Keep pressing switch (1) until the desired resetting time is displayed.

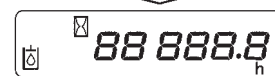
Time display is changed four seconds after pressing switch (1). While keeping switch (1) pressed, press switch (3). Each time switch (3) is pressed, the displayed hours will change in the order of "2000.0 → 1500.0 → 1000.0". When the desired time is displayed, release switch (1) to complete resetting operation.



MPTC-01-019



Remaining hours before replacement  
Alternate display is displayed.

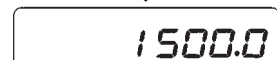


Keep pressing switch (1).

Time display is changed four seconds after pressing switch (1).



Press button (3)



Press button (3)



Press button (3)

Release switch (1) to complete resetting operation.



MNDB-01-045



# OPERATOR'S STATION

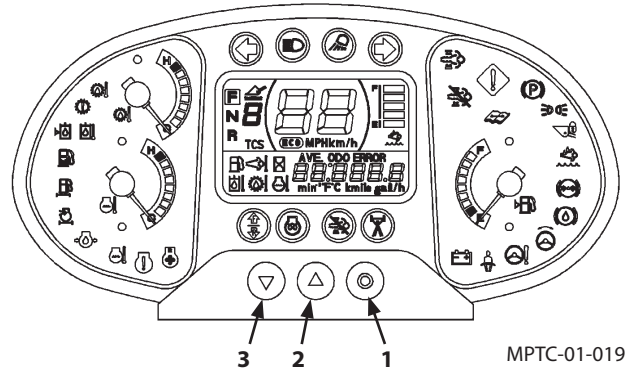
## Hydraulic Oil Filter 3 Replacement Interval Hour Meter

Hydraulic oil filter replacement intervals can be reset to "500.0", "250.0", or "100.0". The interval set when the machine was shipped from the factory is "500.0".

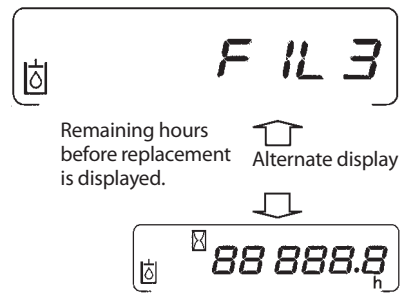
While displaying the change interval hours, keep pressing switch (1).

**NOTE:** When switch (1) is released, time resetting is completed. Keep pressing switch (1) until the desired resetting time is displayed.

Time display is changed four seconds after pressing switch (1). While keeping switch (1) pressed, press switch (3). Each time switch (3) is pressed, the displayed hours will change in the order of "500.0 → 250.0 → 100.0". When the desired time is displayed, release switch (1) to complete resetting operation.

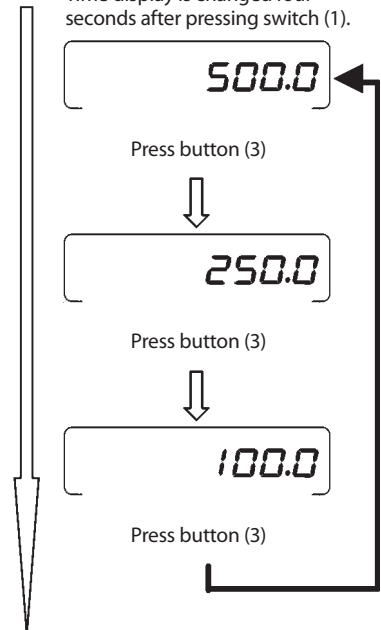


MPTC-01-019

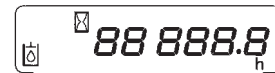


Keep pressing switch (1).

Time display is changed four seconds after pressing switch (1).



Release switch (1) to complete resetting operation.



MNDF-01-015

# OPERATOR'S STATION

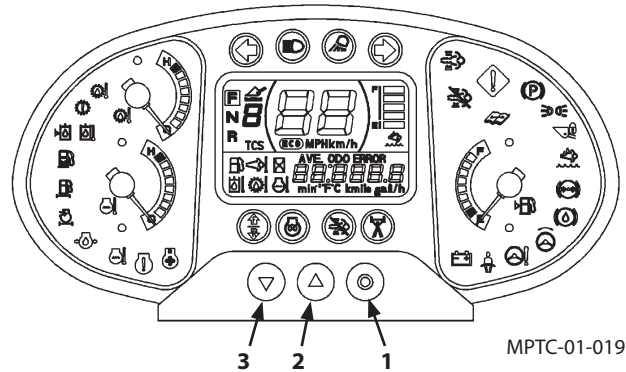
## Transmission Oil Change Interval Hour Meter

Oil change intervals can be reset to "1000.0", "500.0", or "250.0". The interval set when the machine was shipped from the factory is "1000.0".

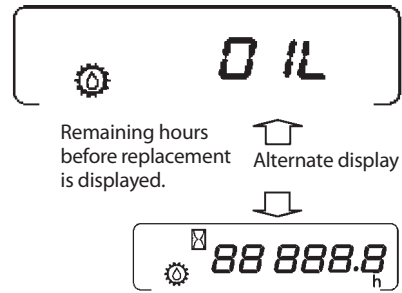
While displaying the change interval hours, keep pressing switch (1).

**NOTE:** When switch (1) is released, time resetting is completed. Keep pressing switch (1) until the desired resetting time is displayed.

Time display is changed four seconds after pressing switch (1). While keeping switch (1) pressed, press switch (3). Each time switch (3) is pressed, the displayed hours will change in the order of "1000.0 → 500.0 → 250.0". When the desired time is displayed, release switch (1) to complete resetting operation.



MPTC-01-019



Keep pressing switch (1).

Time display is changed four seconds after pressing switch (1).

1000.0

Press button (3)

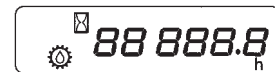
500.0

Press button (3)

250.0

Press button (3)

Release switch (1) to complete resetting operation.



MNDB-01-046

# OPERATOR'S STATION

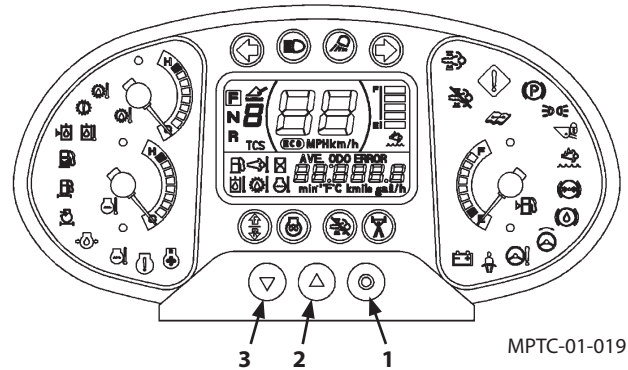
## Transmission Oil Filter Replacement Interval Hour Meter

Transmission oil filter replacement intervals can be reset to "500.0", "250.0", or "100.0". The interval set when the machine was shipped from the factory is "500.0".

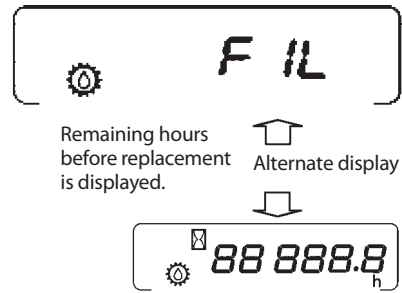
While displaying the replacement interval hours, keep pressing switch (1).

**NOTE:** When switch (1) is released, time resetting is completed. Keep pressing switch (1) until the desired resetting time is displayed.

Time display is changed four seconds after pressing switch (1). While keeping switch (1) pressed, press switch (3). Each time switch (3) is pressed, the displayed hours will change in the order of "500.0 → 250.0 → 100.0". When the desired time is displayed, release switch (1) to complete resetting operation.

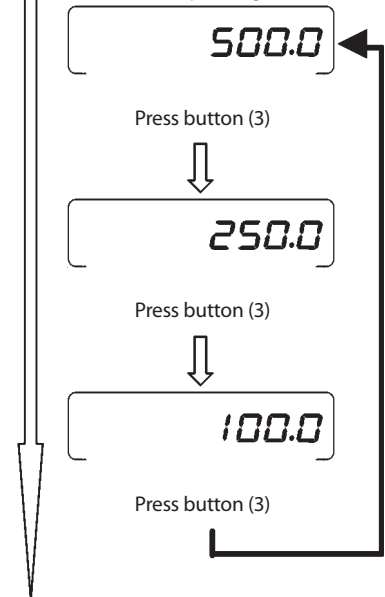


MPTC-01-019

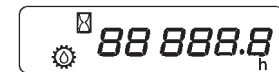


Keep pressing switch (1).

Time display is changed four seconds after pressing switch (1).



Release switch (1) to complete resetting operation.



MNDF-01-016

# OPERATOR'S STATION

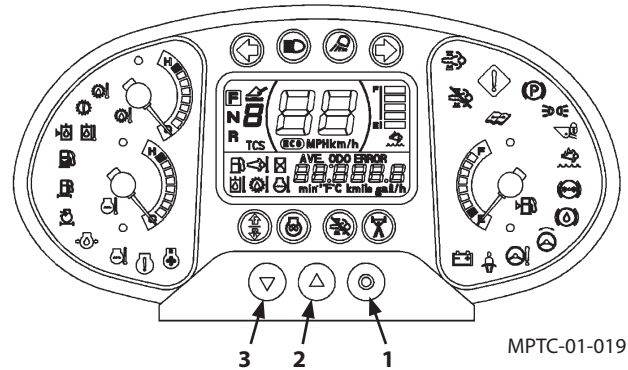
## Engine Oil Change Interval Hour Meter

Oil change intervals can be reset to "500.0", "250.0", or "200.0". The interval set when the machine was shipped from the factory is "500.0".

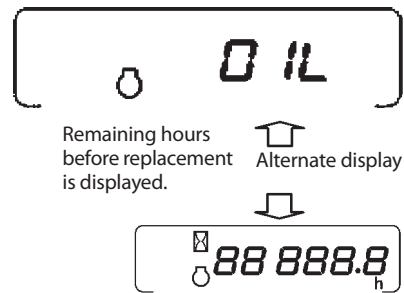
While displaying the change interval hours, keep pressing switch (1).

**NOTE:** When switch (1) is released, time resetting is completed. Keep pressing switch (1) until the desired resetting time is displayed.

Time display is changed four seconds after pressing switch (1). While keeping switch (1) pressed, press switch (3). Each time switch (3) is pressed, the displayed hours will change in the order of "500.0 → 250.0 → 200.0". When the desired time is displayed, release switch (1) to complete resetting operation.



MPTC-01-019



Keep pressing switch (1).

Time display is changed four seconds after pressing switch (1).

500.0

Press button (3)

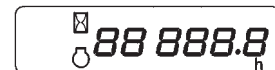
250.0

Press button (3)

200.0

Press button (3)

Release switch (1) to complete resetting operation.



MNDB-01-048

# OPERATOR'S STATION

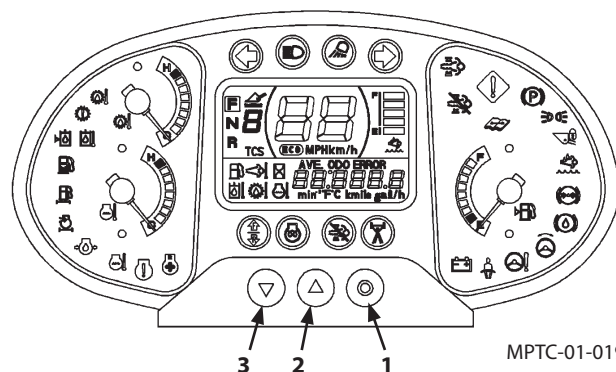
## Engine Oil Filter Replacement Interval Hour Meter

Filter replacement intervals can be reset to "500.0", "250.0", or "200.0". The interval set when the machine was shipped from the factory is "500.0".

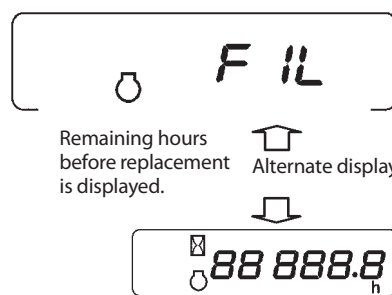
While displaying the replacement interval hours, keep pressing switch (1).

**NOTE:** When switch (1) is released, time resetting is completed. Keep pressing switch (1) until the desired resetting time is displayed.

Time display is changed four seconds after pressing switch (1). While keeping switch (1) pressed, press switch (3). Each time switch (3) is pressed, the displayed hours will change in the order of "500.0 → 250.0 → 200.0". When the desired time is displayed, release switch (1) to complete resetting operation.

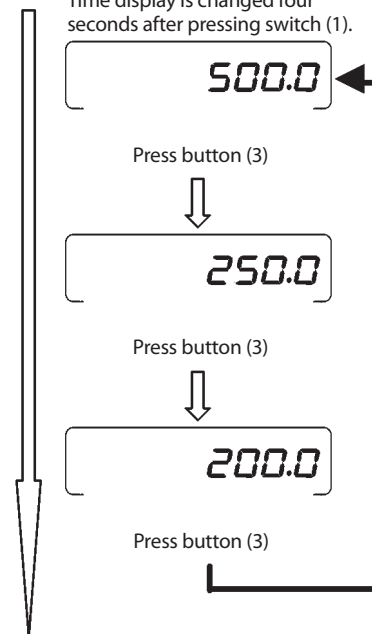


MPTC-01-019

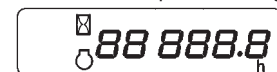


Keep pressing switch (1).

Time display is changed four seconds after pressing switch (1).



Release switch (1) to complete resetting operation.



MNDB-01-049

# OPERATOR'S STATION

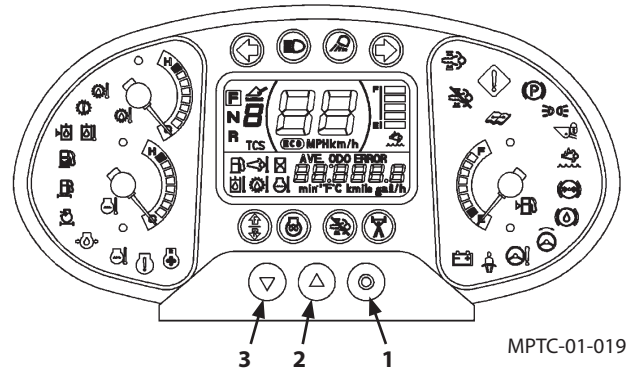
## Oil Separator Element Replacement Interval Hour Meter

Oil separator element replacement intervals can be reset to "2000.0", "1500.0", or "1000.0". The interval set when the machine was shipped from the factory is "2000.0".

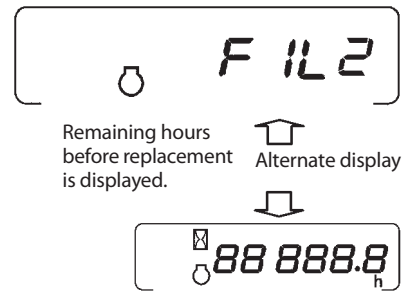
While displaying the replacement interval hours, keep pressing switch (1).

**NOTE:** When switch (1) is released, time resetting is completed. Keep pressing switch (1) until the desired resetting time is displayed.

Time display is changed four seconds after pressing switch (1). While keeping switch (1) pressed, press switch (3). Each time switch (3) is pressed, the displayed hours will change in the order of "2000.0 → 1500.0 → 1000.0". When the desired time is displayed, release switch (1) to complete resetting operation.

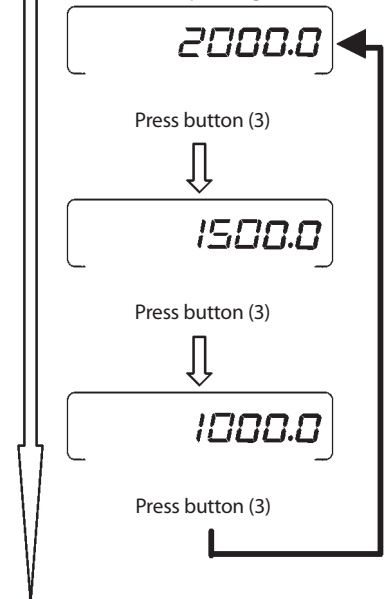


MPTC-01-019

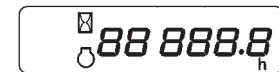


Keep pressing switch (1).

Time display is changed four seconds after pressing switch (1).



Release switch (1) to complete resetting operation.




MPTC-01-025

# OPERATOR'S STATION

## Fuel Filter Replacement Interval Hour Meter

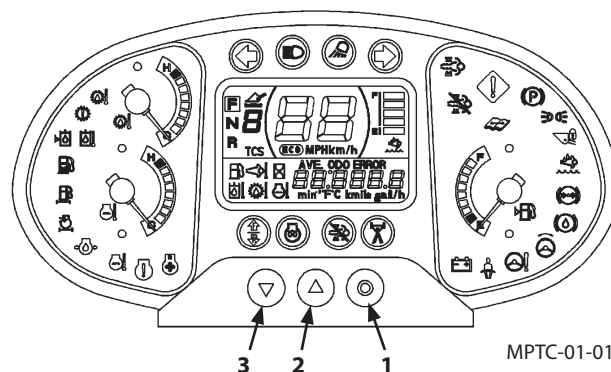
Filter replacement intervals can be reset to "500.0" or "250.0". The interval set when the machine was shipped from the factory is "500.0".

While displaying the replacement interval hours, keep pressing switch (1).

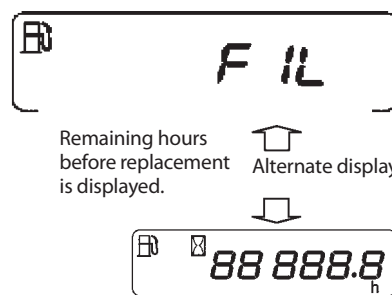
 **NOTE:** When switch (1) is released, time resetting is completed. Keep pressing switch (1) until the desired resetting time is displayed.

Time display is changed four seconds after pressing switch (1). While keeping switch (1) pressed, press switch (3). Each time switch (3) is pressed, the displayed hours will change in the order of "500.0 → 250.0".

When the desired time is displayed, release switch (1) to complete resetting operation.



MPTC-01-019



Keep pressing switch (1).

Time display is changed four seconds after pressing switch (1).

1000.0

Press button (3)

500.0

Press button (3)

Release switch (1) to complete resetting operation.

88 888.8 h


MNDF-01-017

## OPERATOR'S STATION

### DEF/AdBlue® Supply Module Main Filter Replacement Interval Hour Meter

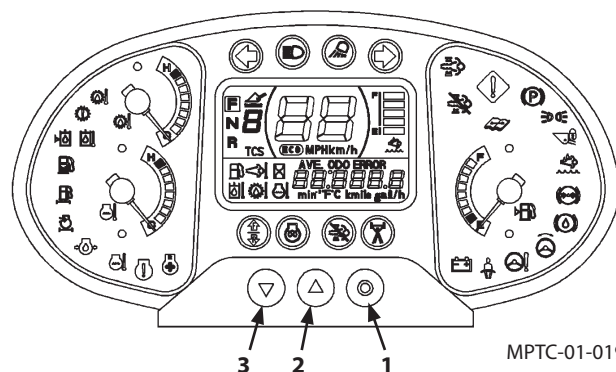
Filter replacement intervals can be reset to “4500.0” or “3000.0”. The interval set when the machine was shipped from the factory is “4500.0”.

While displaying the replacement interval hours, keep pressing switch (1).

 **NOTE:** When switch (1) is released, time resetting is completed. Keep pressing switch (1) until the desired resetting time is displayed.

Time display is changed four seconds after pressing switch (1). While keeping switch (1) pressed, press switch (3). Each time switch (3) is pressed, the displayed hours will change in the order of “4500.0 → 3000.0”.

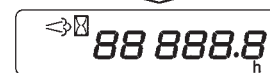
When the desired time is displayed, release switch (1) to complete resetting operation.



MPTC-01-019



Remaining hours before replacement is displayed.  Alternate display is displayed.

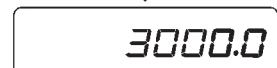


Keep pressing switch (1).

Time display is changed four seconds after pressing switch (1).

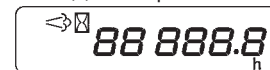


Press button (3)



Press button (3)

Release switch (1) to complete resetting operation.



MPTC-01-027



# OPERATOR'S STATION

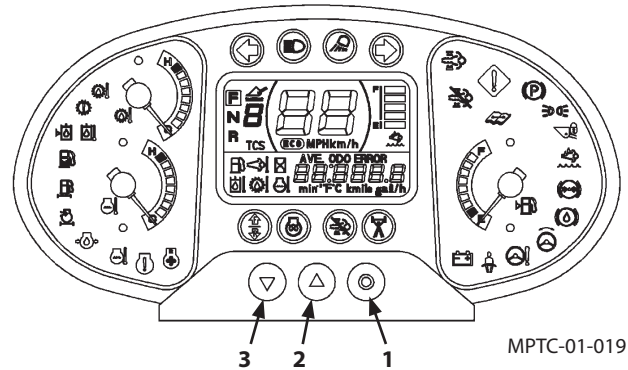
## Axle Oil Change Interval Hour Meter

Oil change intervals can be reset to "2000.0", "1500.0", or "1000.0". The interval set when the machine was shipped from the factory is "2000.0".

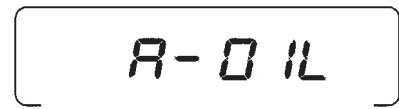
While displaying the change interval hours, keep pressing switch (1).

**NOTE:** When switch (1) is released, time resetting is completed. Keep pressing switch (1) until the desired resetting time is displayed.

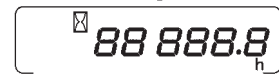
Time display is changed four seconds after pressing switch (1). While keeping switch (1) pressed, press switch (3). Each time switch (3) is pressed, the displayed hours will change in the order of "2000.0 → 1500.0 → 1000.0". When the desired time is displayed, release switch (1) to complete resetting operation.



MPTC-01-019



Remaining hours before replacement      Alternate display is displayed.



Keep pressing switch (1).

Time display is changed four seconds after pressing switch (1).



Press button (3)

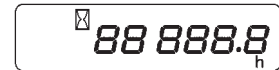


Press button (3)



Press button (3)

Release switch (1) to complete resetting operation.



MNDB-01-051

# OPERATOR'S STATION

## Clock Setting Mode

The clock display on the machine information display screen can be set in the clock setting mode.

**NOTE:** If battery power is interrupted for an extended period of time, the time display screen may indicate "Year of 2000, Month of 1, day of 1, and time of 00:00" when the engine is restarted.

### Clock (24H) Setting Procedures

After selecting the clock display on the information display screen, press and hold both selectors (1 and 3) at the same time for more than 1 second to shift the information display screen to the clock setting mode.

#### 1. Year Setting

Press monitor display selector (2 or 3) to increase or decrease the figure displayed on the screen respectively. After displaying the desired year, determine the displayed year by pressing monitor display mode selector (1). Then, move to the next setting screen.

#### 2. Month Setting

Press monitor display selector (2 or 3) to increase or decrease the figure displayed on the screen respectively. After displaying the desired month, determine the displayed month by pressing monitor display mode selector (1). Then, move to the next setting screen.

#### 3. Day Setting

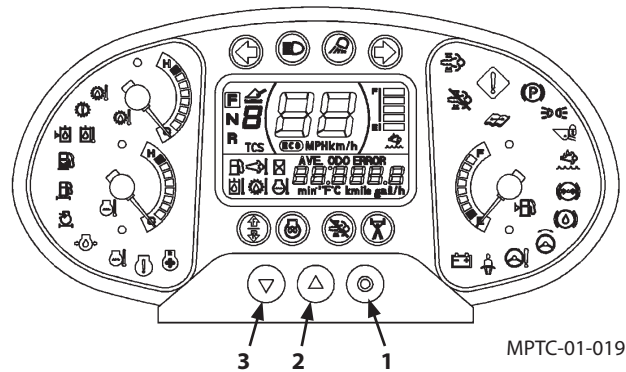
Press monitor display selector (2 or 3) to increase or decrease the figure displayed on the screen respectively. After displaying the desired day, determine the displayed day by pressing monitor display mode selector (1). Then, move to the next setting screen.

#### 4. Hour Setting

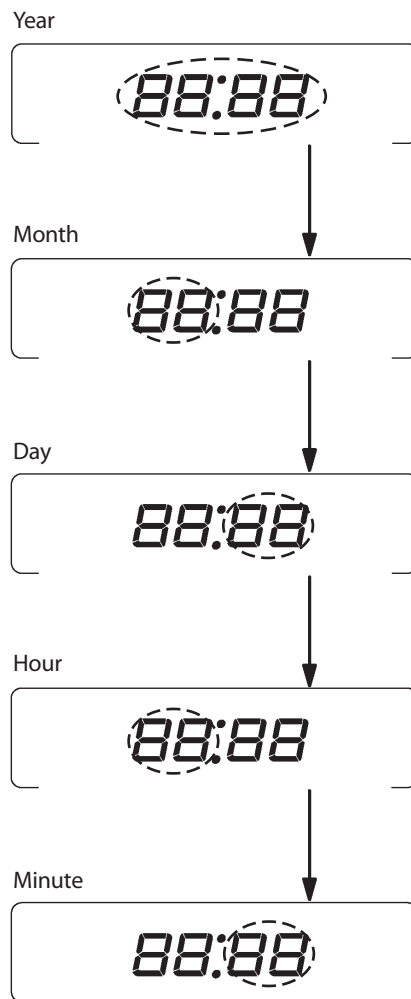
Press monitor display selector (2 or 3) to increase or decrease the figure displayed on the screen respectively. After displaying the desired hour, determine the displayed hour by pressing monitor display mode selector (1). Then, move to the next setting screen.

#### 5. Minute Setting

Press monitor display selector (2 or 3) to increase or decrease the figure displayed on the screen respectively. After displaying the desired minute, determine the displayed minute by pressing monitor display mode selector (1). Then, clock setting is complete.



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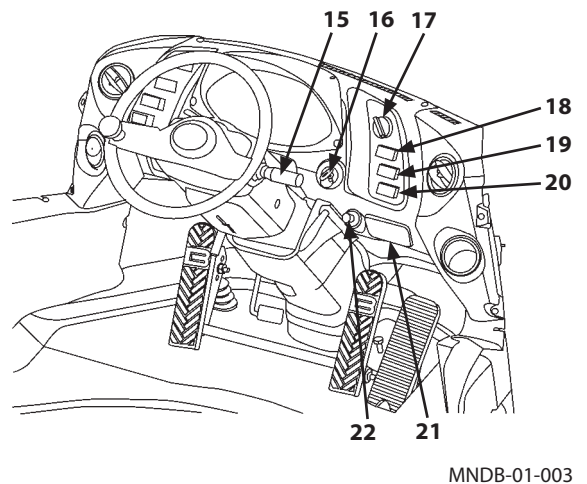
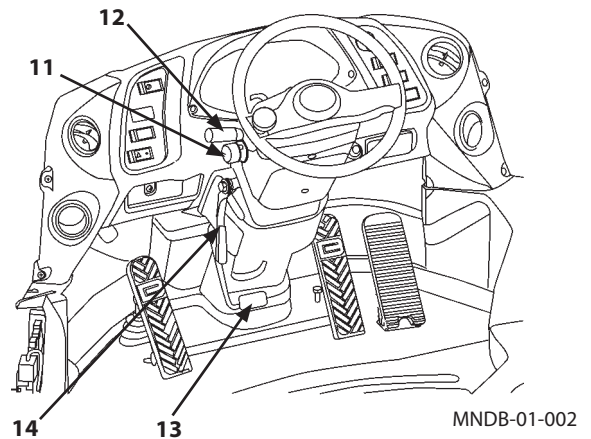
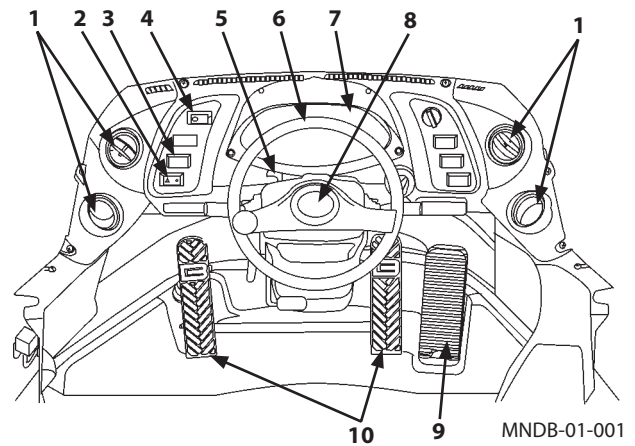


M4GB-01-057

# OPERATOR'S STATION

## Switches, Steering Wheel and Pedals

- 1- Air Conditioner Front Vent
- 2- Hazard Switch
- 3- Work Light Switch
- 4- Parking Brake Switch
- 5- Neutral Lever Lock (for the Forward/Reverse Lever)
- 6- Steering Wheel
- 7- Monitor Panel
- 8- Horn Switch
- 9- Accelerator Pedal
- 10- Brake/Inching Pedal (Both right and left sides are interlocked)
- 11- Front/Rear Wiper Switch
- 12- Forward/Reverse Lever/Shift Switch
- 13- Steering Column Tilt Pedal
- 14- Tilt, Telescopic Lever
- 15- Turn Signal Lever/Light Switch/High-Low Beam Switch
- 16- Key Switch
- 17- 1st Speed Select Mode Selector
- 18- Auto Shut-Down (Idling Stop) Switch
- 19- Auxiliary
- 20- Auxiliary
- 21- Ash Tray
- 22- Cigar Lighter



# OPERATOR'S STATION

## Forward/Reverse Lever/ Shift Switch

**IMPORTANT:** The forward/reverse lever and shift switch are designed to operate with low effort.

Do not press and twist the lever and switch firmly.

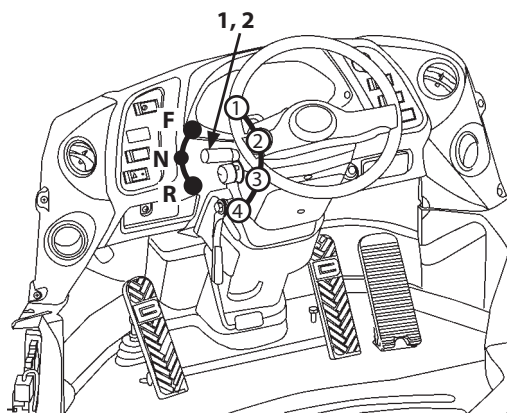
Damage to the lever and switch may result.

### 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.

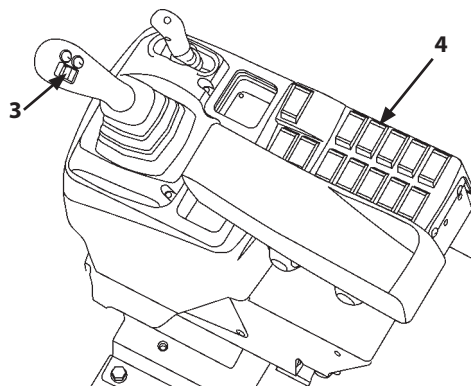
Move forward/reverse lever (1) to the R position to drive the machine in reverse.



MNDB-01-002

**IMPORTANT:** Never attempt to shift forward/reverse lever (1) while letting the machine travel at high speed (3rd or 4th speed). Failure to do so will cause engine to have excessively high RPM's, leading to hazardous situation. Also, it may cause damage to the transmission.

 **NOTE:** The engine will not be started unless forward/reverse switch (3) and forward/reverse lever (1) are in the neutral position. For safety, turn forward/reverse selector switch (4) in the OFF position. Refer to 1-79 for forward/reverse selector switch (4).



Multi-Function Joystick Type MNDB-01-005

### Shift Switch

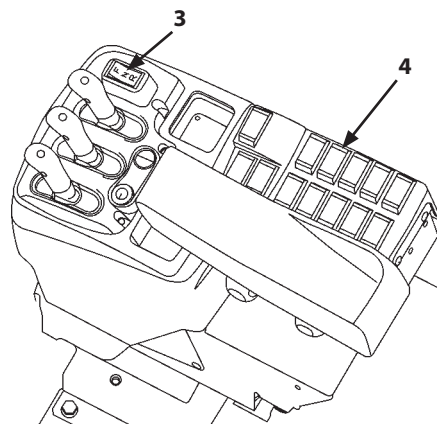
Rotate shift switch (2) to shift the gear.

Forward : 1st-4th

Reverse : 1st-4th

Select a proper shift for the work.

**IMPORTANT:** When shift switch (2) is shifted while traveling at high speed mode (3 or 4th gear stage), occasionally the abnormal HST light may flash and the buzzer may interruptedly sound (shift change alarm). In case the abnormal HST light flashes and the buzzer sounds, reduce the travel speed to the speed range matching the travel speed shift operation.



Fingertip Control Type MNDB-01-004

# OPERATOR'S STATION

## Neutral Lever Lock (for the Forward/Reverse Lever)

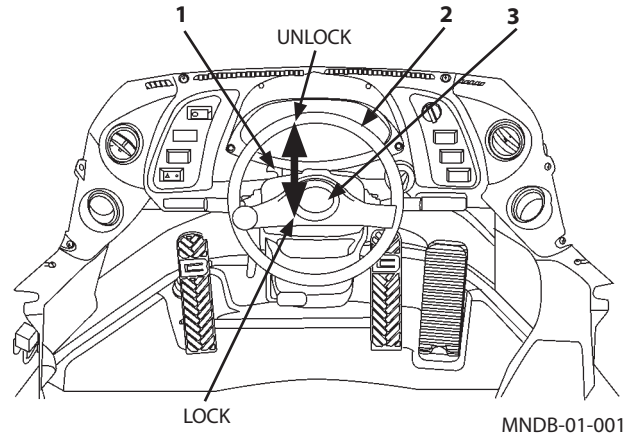
**WARNING:** When the machine is parked or serviced, be sure to place neutral lever lock (1) in the LOCK position.

The neutral lever lock makes the forward/reverse lever immovable so that the machine does not start moving even if a body part comes in contact with the forward/reverse lever by mistake.

Before starting the engine, set neutral lever lock (1) in the LOCK position.

Pull : UNLOCK

Push : LOCK

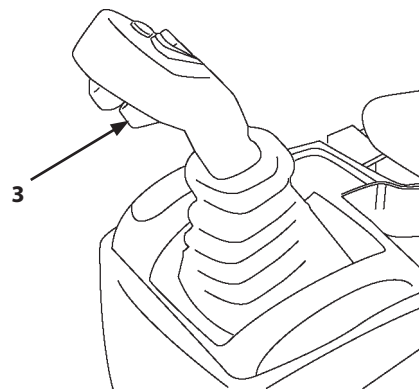


## Steering

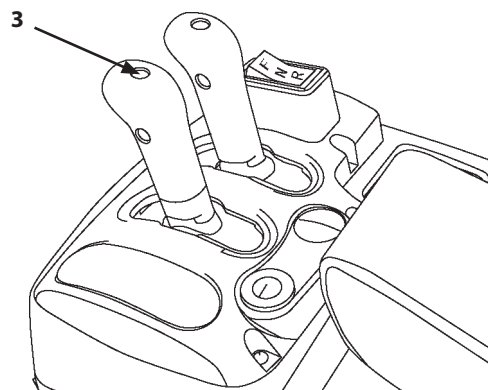
**IMPORTANT:** When steering wheel (2) is fully turned, the front and the rear frames come in contact with the stoppers so that the steering wheel does not rotate further. If the steering wheel is forcibly turned further, the engine may stall or malfunction of the steering system may result.

## Horn Switch

Press horn switch (3) to sound the horn. The horn switch is provided also on the control lever to improve operator comfort.



MNEC-01-044



MNEC-01-042

## OPERATOR'S STATION

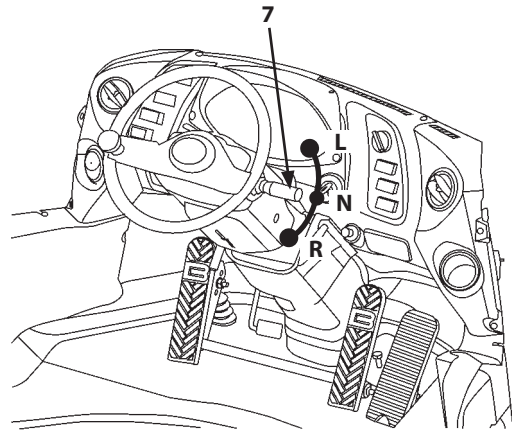
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### Turn Signal Lever

Indicates the drive change direction to persons and/or other vehicles by operating turn signal lever (7).  
Return turn signal lever (7) to neutral manually.

L- Left Turn

R- Right Turn



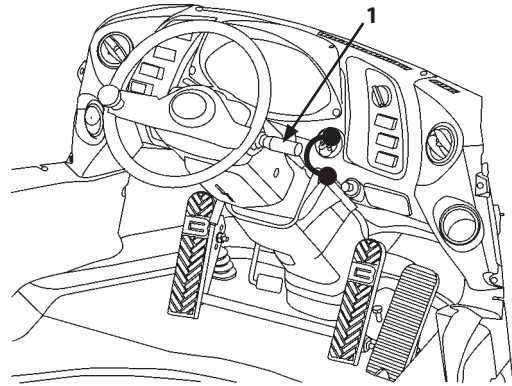
MNDB-01-003

# OPERATOR'S STATION

## Light Switch

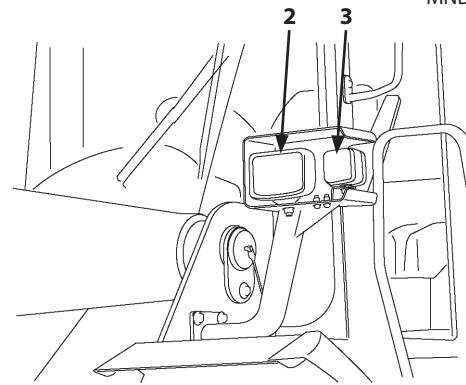
Light switch (1) has three positions, OFF, Small, and Main. As shown below, each light comes ON (☀) or OFF (X) according to the selected position of the light switch.

- 2- Headlight
- 3- Turn Signal / Hazard Light / Clearance Light
- 4- Turn Signal/Hazard Light
- 5- Brake Light/Tail Light



MNDB-01-003

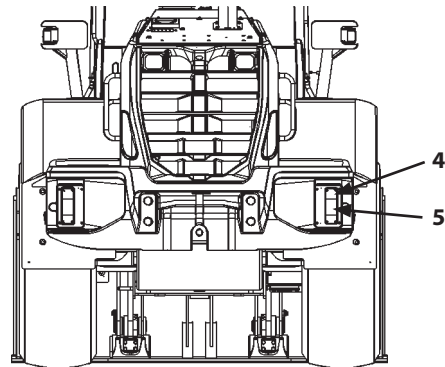
Light Switch Position	Headlight	Clearance Light	Tail Light	Monitor Panel Light
OFF	X	X	X	X
☀	X	☀	☀	☀
☀	☀	☀	☀	☀



M4GB-01-153

**NOTE:** The light switch position ☀ keeps lit even if the key switch is turned OFF. It is used as a parking light when parking the machine on a public road.

**IMPORTANT:** Do not hold the switch position for a long time with the engine stopped. The batteries will become discharged.



MPTC-01-006

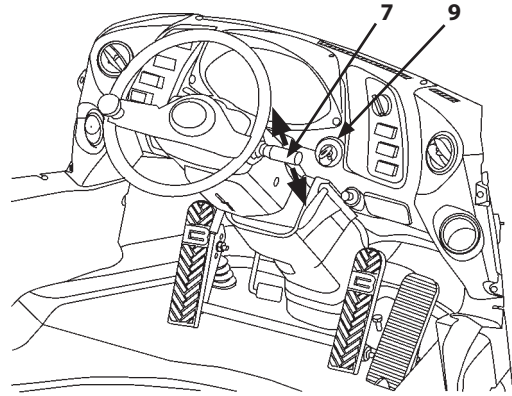
# OPERATOR'S STATION

## High-Low Beam Switch

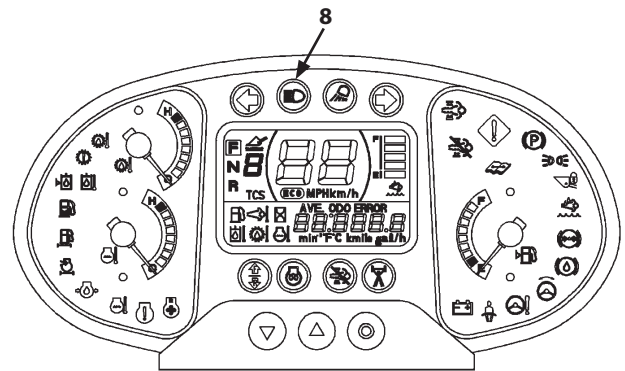
Shifts the direction of the headlight beam high and low.

**CAUTION:** Travel the machine with the headlight in the low beam position when other vehicles are present in the vicinity.

By bringing down signal lever (7) with the headlight ON, the headlight beam turns upward, and high beam indicator (8) comes ON. By bringing up signal lever (7), the headlight beam turns downward, and high beam indicator (8) goes OFF.



MNDB-01-003

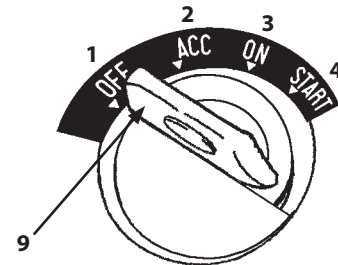


MPTC-01-019

## 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.

**WARNING:** Never turn key switch (9) OFF while traveling the machine. Failure to do so will result in steering wheel and brake pedal to be inoperable.



MNDB-01-053

- 1- OFF (Engine Off)
- 2- ACC (Radio)
- 3- ON (Power ON)
- 4- START (Engine Start)



## OPERATOR'S STATION

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### Wiper Switch

#### Wiper Operation

**IMPORTANT: 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.**

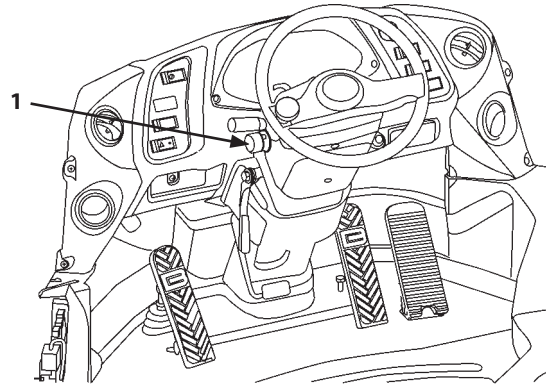
- Before operating the windshield wiper, remove snow or dust from the windshield surface and defrost the frozen windshield.
- Use anti-freeze type washer fluid.
- Squirt windshield washer fluid on the dry windshield before operating the wiper. Besides, continuous operation of the wiper with windshield at semiarid condition (sprinkling of snow or rain) may cause failure of the wiper. Use wiper intermittently to protect it from damage.
- In case of machine equipped with 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.

# OPERATOR'S STATION

## Front/Rear Wiper Switch

Operate wiper switch (1) to move the front and rear windshield wipers.

**IMPORTANT:** The washer motor may become damaged if washer fluid is continuously used for more than 20 seconds or the wiper switch is operated with no fluid in the washer tank. Take care about the switch operation time and the fluid level in the washer tank.



MNDB-01-002

: The front windshield wiper operates at fast speed.

: The front windshield wiper operates at slow speed.

INT : The front windshield wiper intermittently operates.

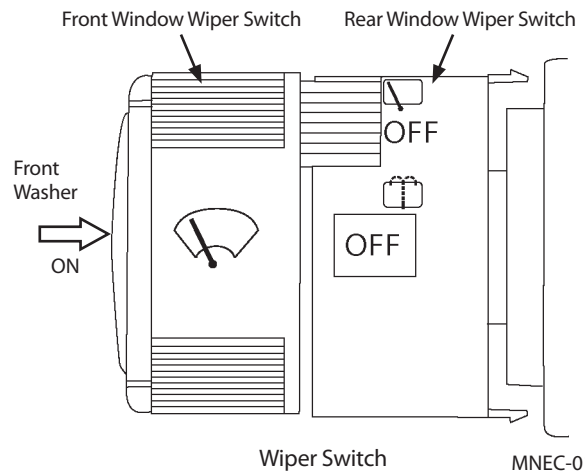
OFF : The front windshield wiper stops moving and the wiper blade is returned to the pre-start position.

: Washer fluid squirts from the front nozzle and the front windshield wiper operates.

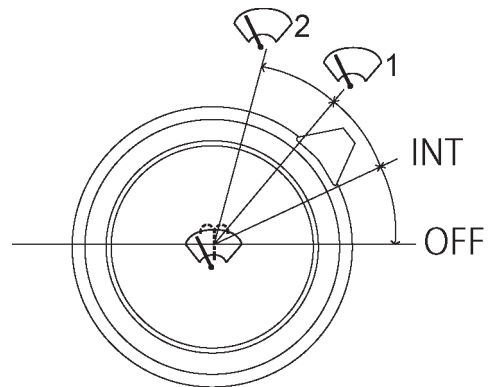
: Washer fluid squirts from the rear nozzle and the rear windshield wiper operates.

: Rear windshield wiper operates.

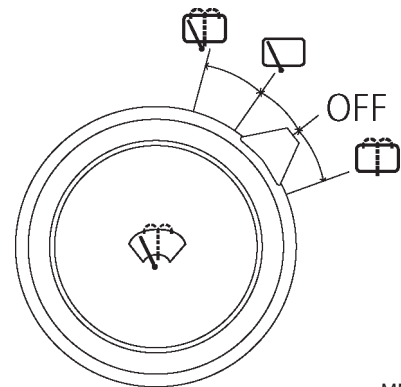
: Washer fluid squirts from the rear nozzle.



MNEC-01-075



Front Window Wiper Switch MNEC-01-076



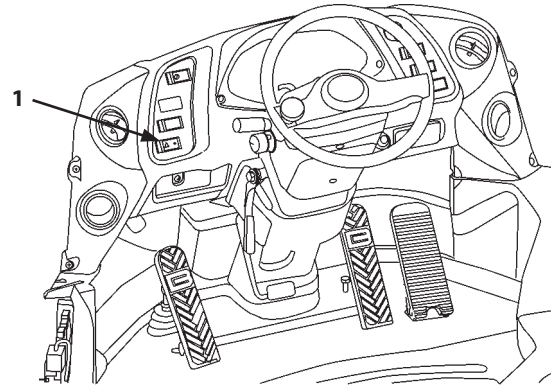
Rear Window Wiper Switch MNEC-01-077

# OPERATOR'S STATION

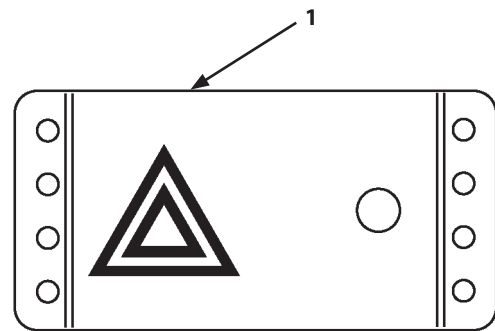
## Hazard Switch

**IMPORTANT:** Do not hold hazard switch (1) in the "▲" position for a long time with the engine stopped. The batteries will become discharged.

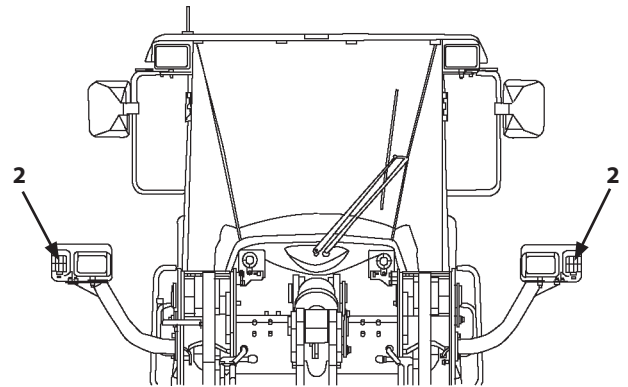
When a machine failure occurs, use this switch to inform other vehicles that the machine is in an emergency situation. When the position marked with "▲" on hazard switch (1) is pressed, front and rear turn signals (hazard light) (2) on both right and left sides start flashing. Press the opposite side of hazard switch (1) to turn hazard signals (2) OFF.



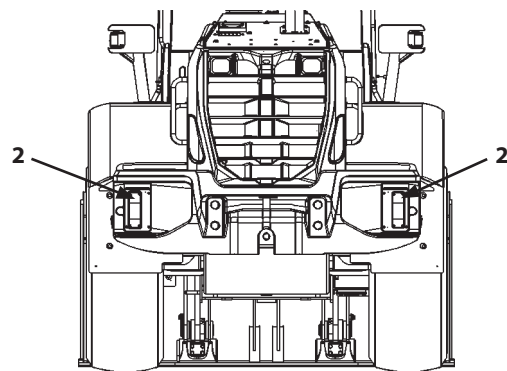
MNDB-01-002



M4GB-01-065







MNEC-07-039



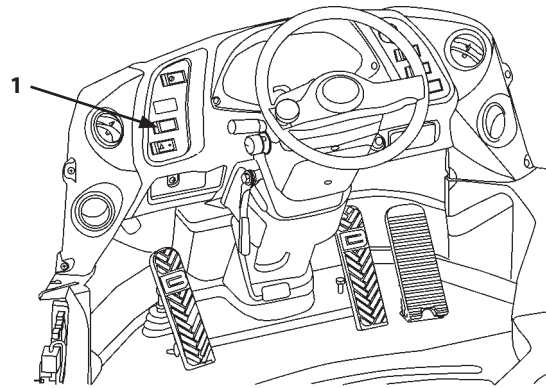
MPTC-01-006

# OPERATOR'S STATION

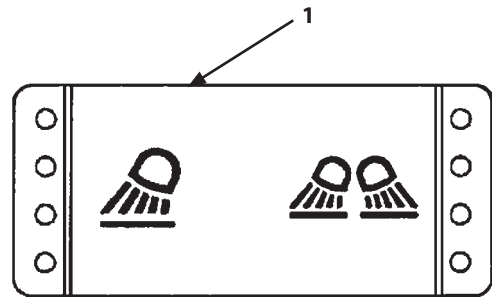
## Work Light Switch

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.

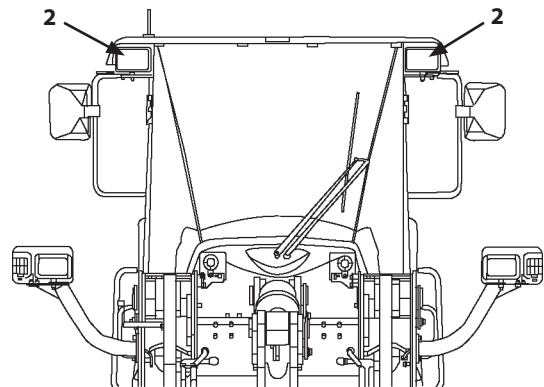
**CAUTION:** Do not turn the work lights ON while driving on a public road.



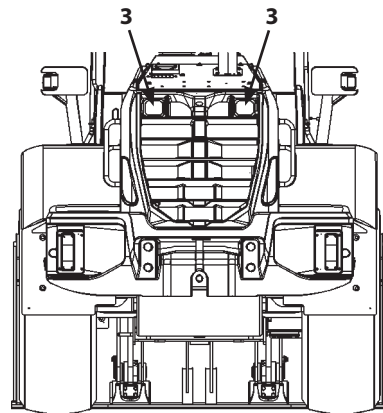
MNDB-01-002



MNFA-01-011



MNEC-07-039



MPTC-01-006

# OPERATOR'S STATION

## 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 your authorized dealer.

When parking brake switch (1) is turned ON, the parking brake is applied; parking brake indicator (2) will be lit.

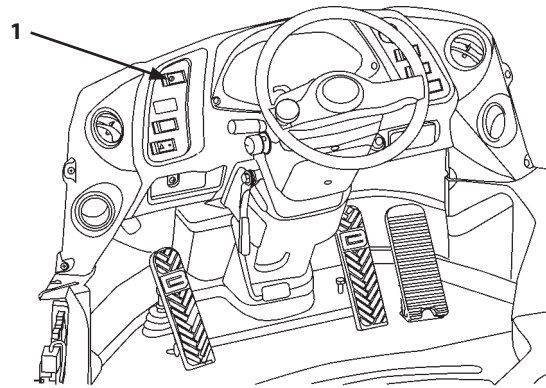
Press the OFF side of parking brake switch (1) to release the parking brake. Check that parking brake indicator (2) goes OFF by pressing the switch twice with clicks.

### ✎ NOTE:

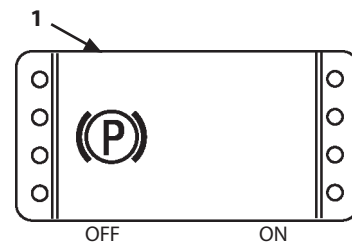
- The parking brake is released by hydraulic pressure only when the engine is running.
- To ensure safe operation, when the parking brake is applied, even though the forward/reverse lever is moved to forward (F) or reverse (R) position, the machine does not travel.
- To ensure safe operation, when the engine is stopped, the parking brake is applied even if parking brake switch (1) is in the OFF position.

Before restarting the engine, ensure the forward/reverse lever and forward/reverse switch (3) are in "Neutral" position, and forward/reverse selector switch (4) is in OFF position for safety, and parking brake switch (1) is turned ON.

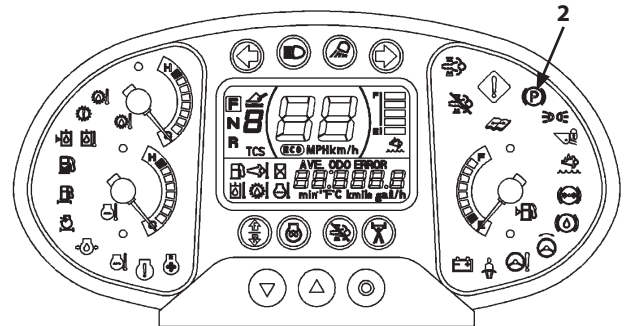
- The parking brake will apply when the key is turned OFF.



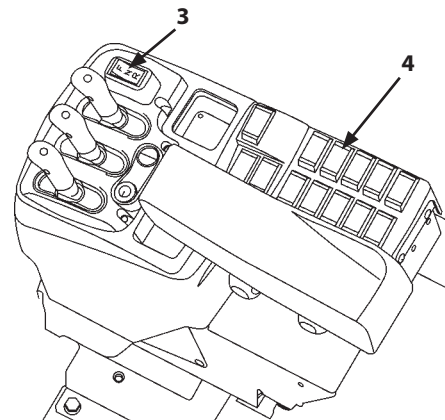
MNDB-01-002



MNEC-01-058



MPTC-01-019




Fingertip Control Type

MNDB-01-004

## OPERATOR'S STATION

### Accelerator Pedal

When accelerator pedal (3) 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.

### Brake/Inching Pedal

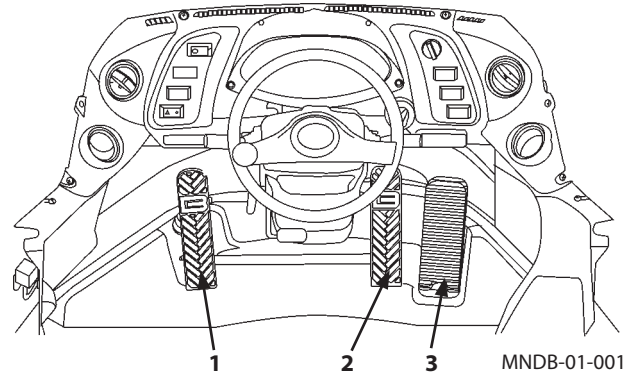
 **WARNING:**

- **Avoid sudden brake application during travel operation, possibly creating a hazardous situation. The machine may lose its balance.**
- **Unless necessary, do not place your foot on the brake pedal to prevent the brake pads, disks, and clutch from wearing out prematurely.**
- **Keep the installation areas around the brake pedals clean to prevent dust and/or grit from accumulating. The brake may become inoperable.**

 **WARNING:** Do not allow your foot to ride on the brake pedal unless necessary

The machine brake is applied by stepping on the brake pedal (1 or 2). When the brake pedal is stepped on, the HST pump becomes neutral, causing the travel speed to reduce. When the brake pedal is stepped on further, the service brake is activated, increasing braking force.

When the pedal is fully stroked, the machine is stopped regardless whether the F-N-R lever is placed in the forward or reverse position, the engine power is transmitted only to the working devices. Accordingly, when the brake pedal is stepped on, and the front attachment control lever is operated, the full engine power is used to operate the working devices.



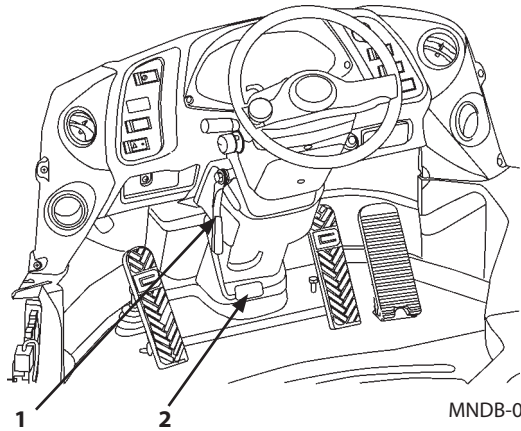
## OPERATOR'S STATION

### Tilt, Telescopic Lever/Steering Column Tilt Pedal

**WARNING:**

- Before operating the machine, be sure that the steering wheel is locked.
- Do not operate tilt, telescopic lever (1) and steering column tilt pedal (2) during operation.
- 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 tilt 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.




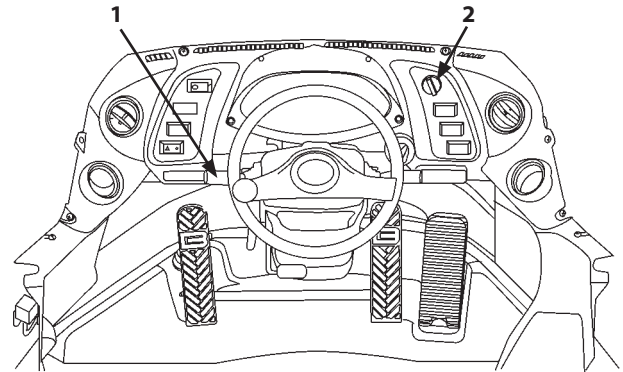
MNDB-01-002

# OPERATOR'S STATION

## 1st Speed Select Switch

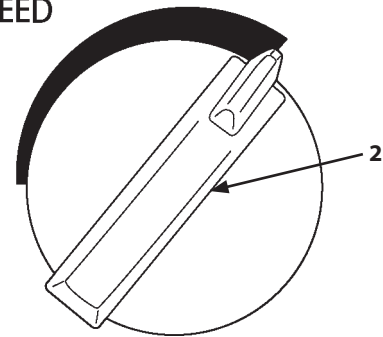
Maximum speed can be selected from 7 km/h to 13 km/h (4.3 to 8.1 mph) range by operating 1st speed select switch (2) while shift switch (1) is in the 1st speed position.

 **NOTE:** Maximum speed can be selected from 0 km/h to 7 km/h (0 to 4.3 mph) range when creep mode switch (3) is in the ON position.

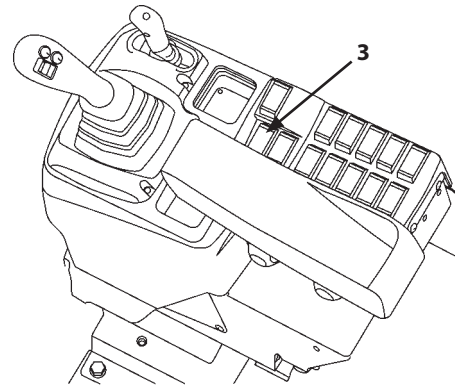


MNDB-01-001

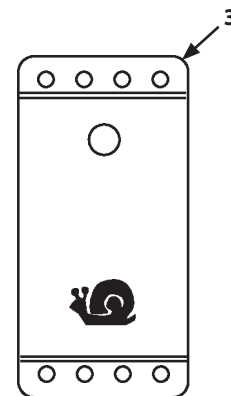
## 1L SPEED



MNDF-01-019



MNDB-01-005



MNDF-01-020



## OPERATOR'S STATION

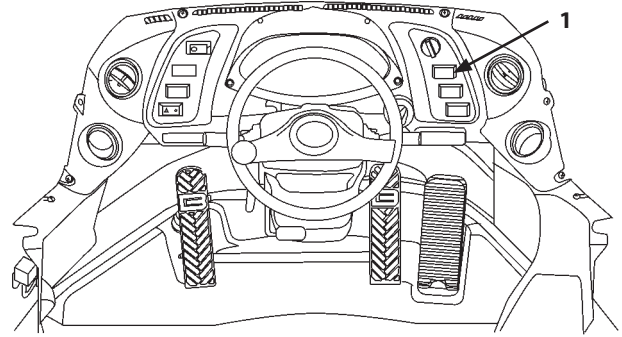
### Auto Shut-Down (Idling Stop) Switch

**⚠ WARNING:** This function automatically stops the engine. Take extra care on the work and work environment when using this function.

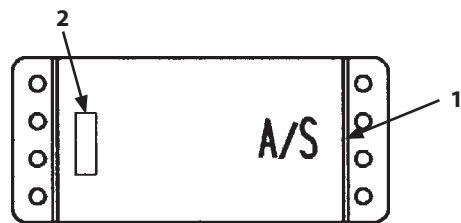
When auto shut-down (idling stop) switch (1) is set in ON, the engine automatically stops after the preset time at the state in which the machine is parking. 30 seconds before the engine stop, indicator (2) starts flashing. The buzzer also sounds. The buzzer sounds once at 30 seconds before, intermittently sounds from 15 seconds, and then stops after 15 seconds. When the machine is in the operating state before stopping the engine, the auto idling stop is disabled and the engine will not stop.

#### IMPORTANT:

- Do not leave the machine after auto idling stop. Failure to do so may discharge the batteries.
- To restart the engine, turn the key switch OFF, and then perform normal starting procedure.



MNDB-01-001



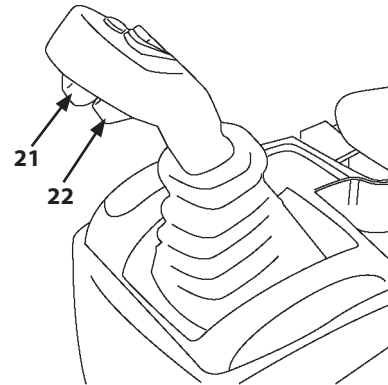
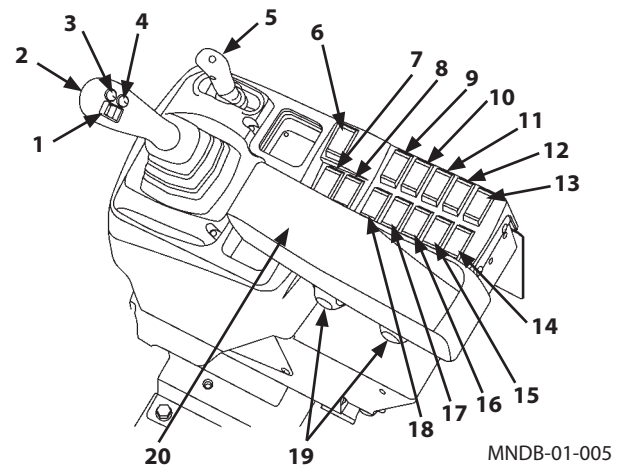
MNDB-01-018

# OPERATOR'S STATION

## Right Console / Switches

### Multi-Function Joystick Type

- 1- Forward/Reverse Switch
- 2- Multi-Function Joystick Lever
- 3- Auxiliary
- 4- Auxiliary
- 5- Auxiliary Control Lever (Optional)
- 6- Control Lever Lock Switch
- 7- Creep Mode Switch
- 8- Traction Control Switch
- 9- Power Mode Switch
- 10- Forward/Reverse Selector Switch
- 11- Fan Reverse Rotation Switch
- 12- Auxiliary
- 13- Quick Cupler Switch (ZW140-6/150-6: Optional)
- 14- Secondary Steering Operation Check Switch (Optional)
- 15- Aftertreatment Device Regeneration Switch
- 16- Lift Arm Auto Leveler Switch (Upward Set)
- 17- Lift Arm Auto Leveler Switch (Downward Set)
- 18- Ride Control Switch
- 19- Armrest Adjust Handle
- 20- Armrest Adjustment
- 21- Auxiliary
- 22- Horn Switch (Under the Lever)

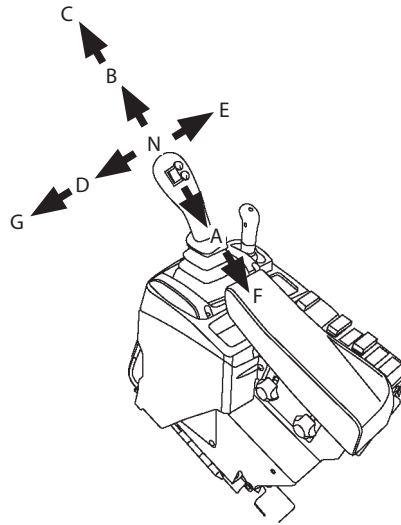


# OPERATOR'S STATION

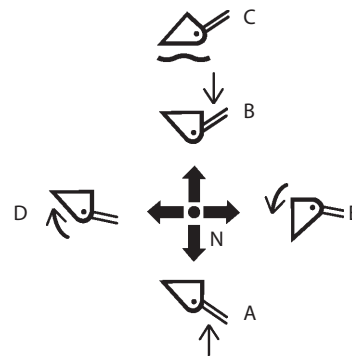
## Multi-Function Joystick Lever

The multi-function joystick lever is used to operate the lift arm and/or bucket.

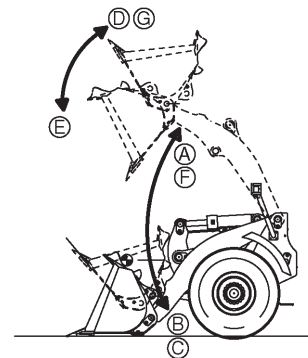
Lever Position	Bucket Operation
C	Float: The lift arm free falls and can be moved as loads are applied.
B	Lift Arm Lower
N	Hold: The lift arm is stopped and held in that position.
A	Lift Arm Raise
F	Detent: The lift arm is held in the raise position.
G	Detent: When the multi-function joystick lever is moved from the bucket dump position to the bucket tilt position, the multi-function joystick lever is maintained in this position.
D	Bucket Tilt: The bucket is tilted back, taking the transportation position.
N	Hold: The bucket is stopped and held in that position.
E	Bucket Dump: The bucket is tilted forward to dump the bucket load.



MNEC-01-059



M4GB-01-074



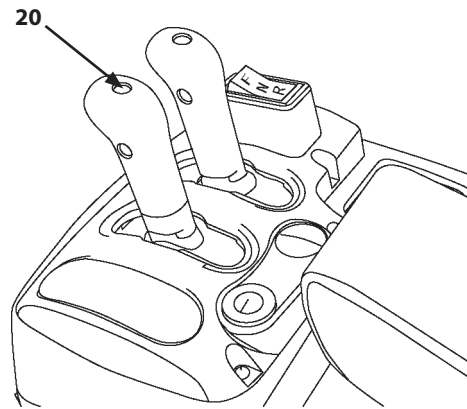
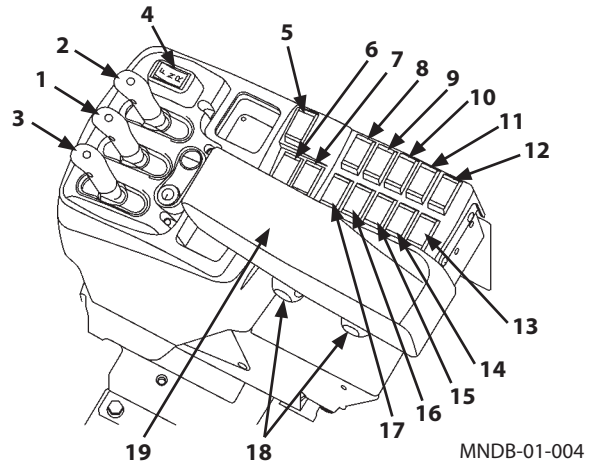
M4GB-01-073

# OPERATOR'S STATION

## Right Console / Switches

### Fingertip Control Type

- 1- Bucket Control Lever
- 2- Lift Arm Control Lever
- 3- Auxiliary Control Lever (Optional)
- 4- Forward/Reverse Switch
- 5- Control Lever Lock Switch
- 6- Creep Mode Switch
- 7- Traction Control Switch
- 8- Power Mode Switch
- 9- Forward/Reverse Selector Switch
- 10- Fan Reverse Rotation Switch
- 11- Auxiliary
- 12- Auxiliary
- 13- Secondary Steering Operation Check Switch (Optional)
- 14- Aftertreatment Device Regeneration Switch
- 15- Lift Arm Auto Leveler Switch (Upward Set)
- 16- Lift Arm Auto Leveler Switch (Downward Set)
- 17- Ride Control Switch
- 18- Armrest Adjust Handle
- 19- Armrest Adjustment
- 20- Horn Switch



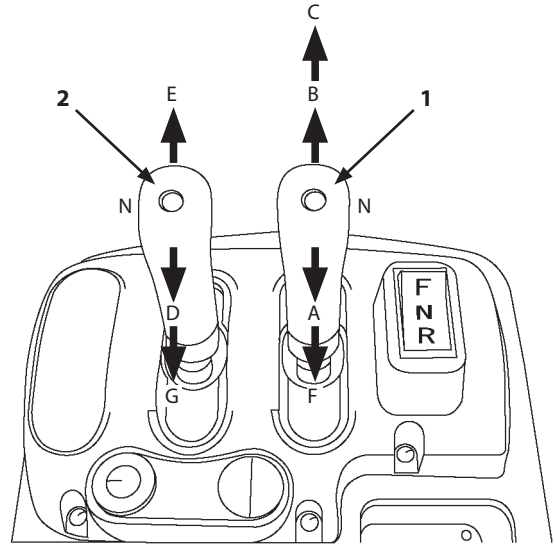
# OPERATOR'S STATION

## Control Lever

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)

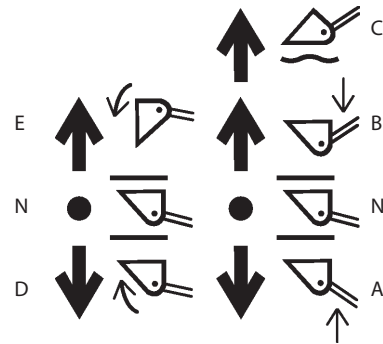
Lever Position	Lift Arm Operation
C	Float: The lift arm free falls and can be moved as loads are applied.
B	Lift Arm Lower
N	Hold: The lift arm is stopped and held in that position.
A	Lift Arm Raise
F	Detent: The lift arm is held in the raise position.



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### Bucket Control Lever (2)

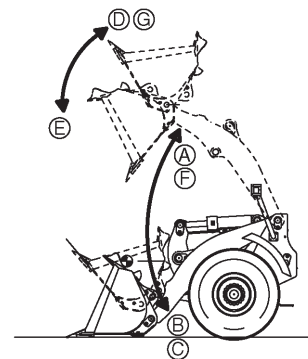
Lever Position	Bucket Operation
E	Bucket Dump: The bucket is tilted forward to dump the bucket load.
N	Hold: The bucket is stopped and held in that position.
D	Bucket Tilt: The bucket is tilted back, taking the transportation position.
G	Detent: When the bucket control lever is moved from the bucket dump position to the bucket tilt position, the bucket control lever is maintained in this position.



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### NOTE:


- Further pull lift arm control lever (1) from "Raise" position (A), the lever is held in position (F) until the lift arm moves to the position set at the height kickout. When the lift arm moves to the preset position, lift arm control lever (1) automatically moves to "Neutral" (N) position.
- Further turn bucket control lever (2) from "Tilt" position (D) after bucket dump operation; the lever is held in position (G) until the bucket moves to the position preset by the bucket auto leveler. When the bucket moves to the preset position, bucket control lever (2) automatically moves to "Neutral" (N) position.

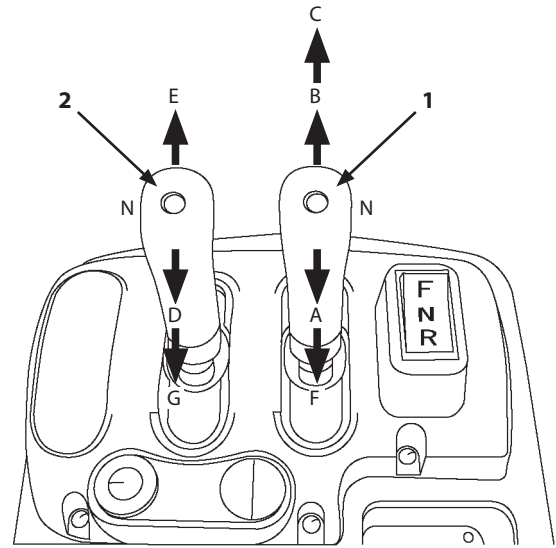


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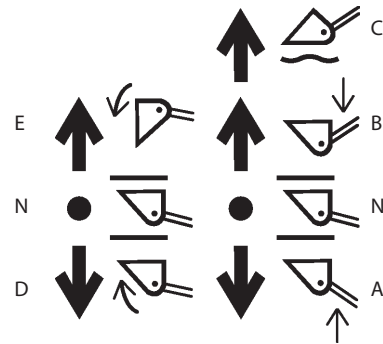
## OPERATOR'S STATION

- When pushing down the lift arm control lever to the "Float" position (C), the lift arm moves to the position preset at lower kickout and is held in the position. When the lift arm moves to the preset position, the lift arm control lever automatically moves to "Neutral" (N) position.

 **NOTE:** When operating the machine in the Float (C) position, lower the bucket on the ground by setting the lift arm lower position (B), and then tilt the lever to the Float position.



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# OPERATOR'S STATION

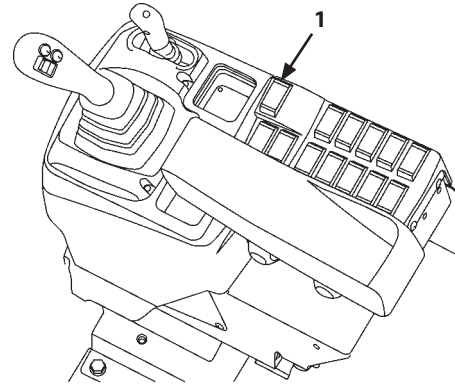
## Control Lever Lock Switch

**WARNING:**

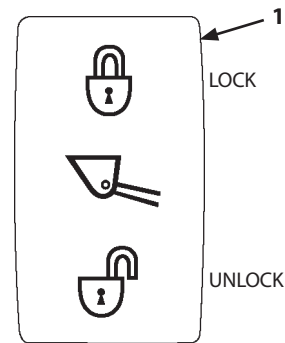
- Before leaving the operator's seat, be sure to stop the engine. Then, set control lever lock switch (1) to the LOCK (🔒) position.
- Always check to be sure that the control lever lock switch is set in the LOCK (🔒) position before transporting the machine or leaving the machine at the end of the shift.

Refer to page 5-4 for details.

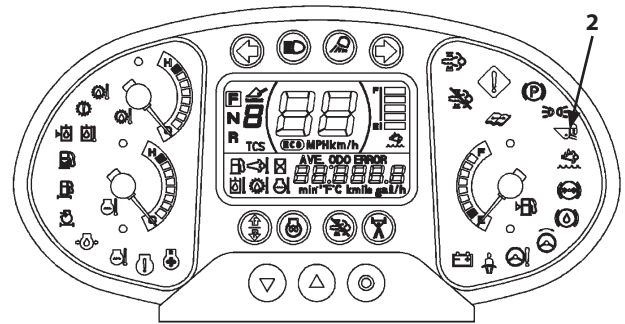
Control lever lock switch (1) is provided to prevent the machine being unexpectedly operated even if the operator mistakenly comes in contact with the bucket and/or lift arm control lever when getting on or off the machine. When control lever lock switch (1) is placed to UNLOCK (🔓) position, control lever lock indicator (2) goes OFF and the front control lever becomes operable.



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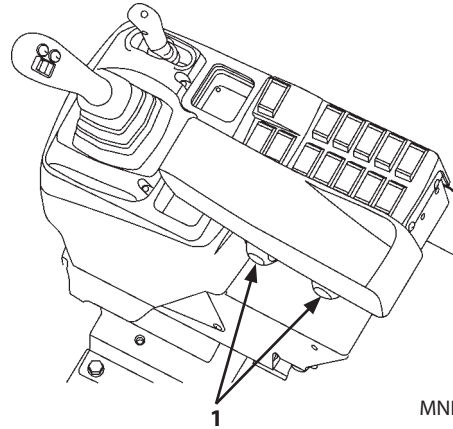
## OPERATOR'S STATION

### Armrest Adjust Handle

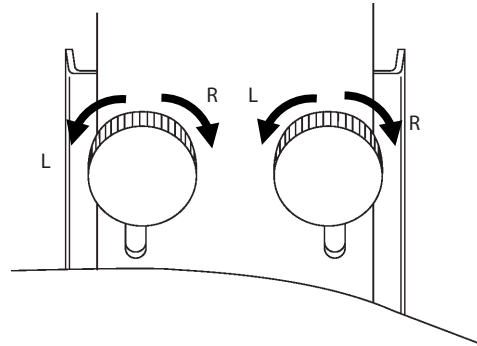
The armrest is provided so that the operator can operate the lever with an arm on the armrest, for comfort and ease.

Loosen handle (1) and position the armrest height to fit the operator's preference, tighten handle (1) to fix the armrest.

- L : Loosen
- R : Tighten



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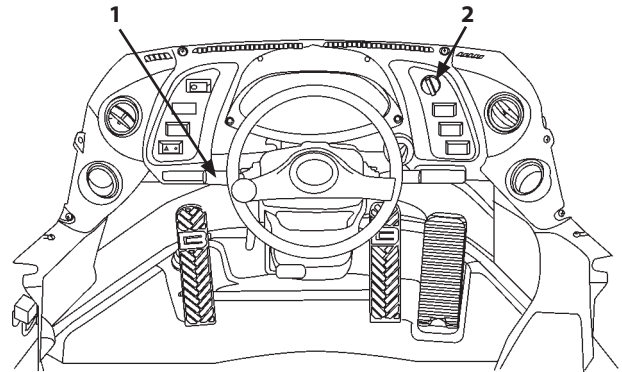
M4GB-01-077



# OPERATOR'S STATION

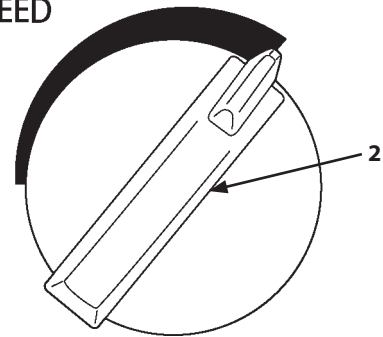
## Creep Mode Switch

Maximum speed can be selected from 0 km/h to 7 km/h (0 to 4.35 mph) range by turning ON creep mode switch (3) and then operating 1<sup>st</sup> speed select switch (2) while shift switch (1) is in the 1st speed position.

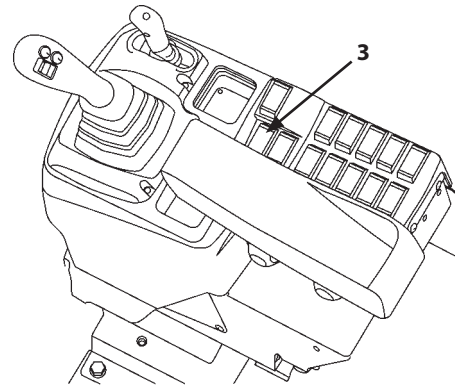


MNDB-01-001

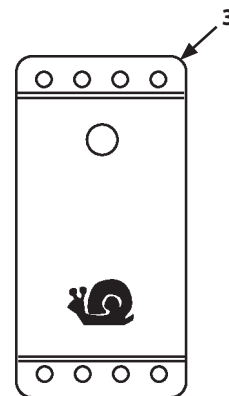
1L SPEED



MNDF-01-019



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MNDF-01-020

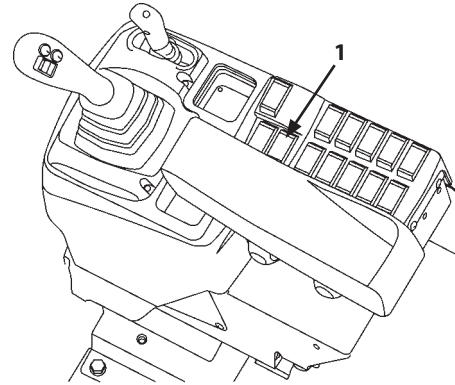
# OPERATOR'S STATION

## Traction Control Switch

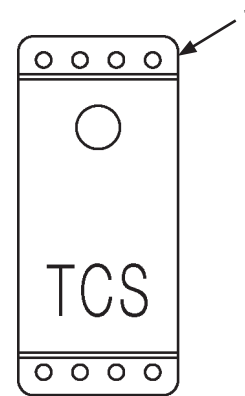
When traction control switch (1) is turned ON, indicator (2) is lit. This function prevents tire slip and improves working efficiency by controlling the maximum tractive force when digging load is high.

ON : This mode is suited for removing snow. Maximum tractive force is reduced.

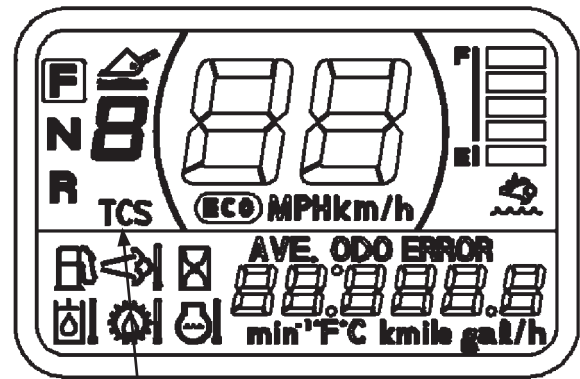
OFF : This mode is suited for normal operation.



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# OPERATOR'S STATION

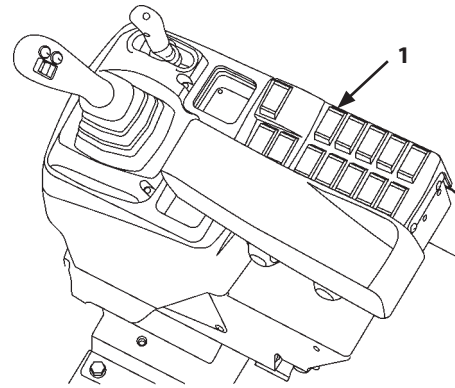
## Power Mode Switch

Operating power mode switch (1) turns the power mode function ON and OFF.

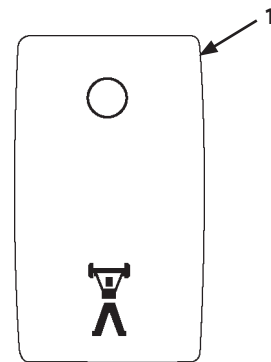
Power Mode	Material
OFF Mode (Loading work with more emphasis on fuel consumption)	<ul style="list-style-type: none"> <li>• Crushed Rocks in Smaller Diameter</li> <li>• Gravel</li> <li>• Stone</li> <li>• Sand</li> <li>• Waste Plastic</li> <li>• Chips</li> </ul>
ON Mode (Heavy digging work with more emphasis on work effectiveness)	<ul style="list-style-type: none"> <li>• Crushed Rocks in Larger Diameter</li> <li>• Crushed Concrete</li> <li>• Stone in higher specific gravity</li> <li>• Cohesive soil</li> </ul>

Each time the upper side of the switch (○ mark) is pressed, the power mode changes ON/OFF alternately. When the power mode is activated, power mode indicator (2) will light on the monitor panel.

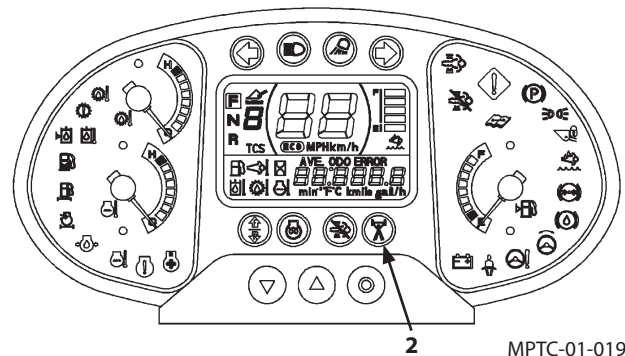
**NOTE:** When turning the key switch ON, the power mode always starts from OFF state. Before operating the machine at power mode, operate the power mode switch and ensure power mode indicator (2) is ON.



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## OPERATOR'S STATION

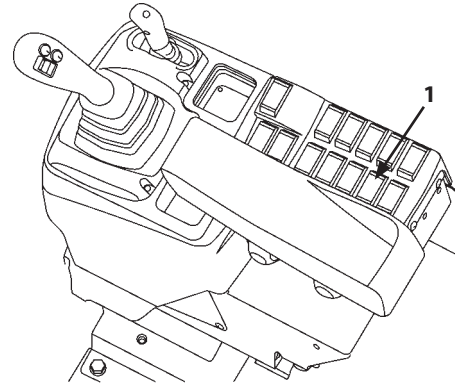
### Aftertreatment Device Regeneration Switch

Aftertreatment device regeneration switch (1) is a three-position switch. It selects auto-regeneration, manual regeneration and regeneration inhibited of the aftertreatment device.

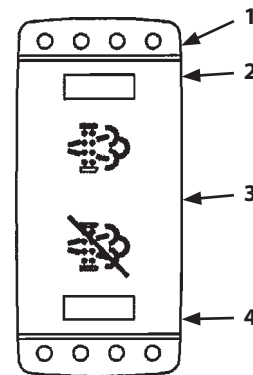
**Manual Regeneration (2)** : If the switch is in this position, the manual regeneration is performed when the aftertreatment device regeneration request is displayed.

**Auto Regeneration (3) (Neutral)** : If the switch is in this position, the aftertreatment device auto regeneration is performed at regular interval (60hrs).

**Regeneration Inhibited (4)** : Turn aftertreatment device regeneration switch (1) in the regeneration Inhibited position (4) to prevent auto regeneration while operating the machine in a dusty area or indoors.



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# OPERATOR'S STATION

## Manual Regeneration Procedure

### IMPORTANT:

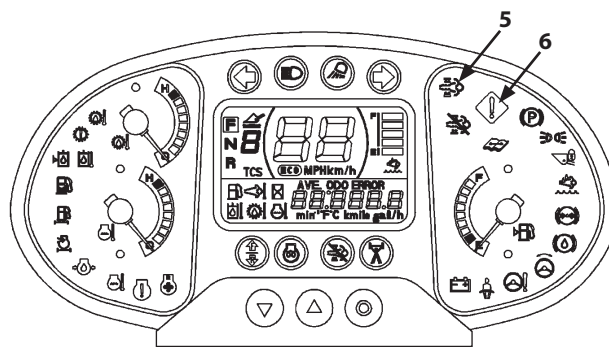
- Manual regeneration that is performed when the aftertreatment device regeneration request is displayed restores aftertreatment device function. This is not a malfunction.
- If the machine is continuously operated despite the aftertreatment device regeneration request is displayed, aftertreatment device alarm and engine trouble alarm will be displayed, and the buzzer sounds. Consult your authorized dealer for repairing the aftertreatment device.

When the manual regeneration is needed, aftertreatment device warning indicator (5) and service indicator (6) will light. The manual regeneration is needed. Before starting manual regeneration, be sure to check the following.

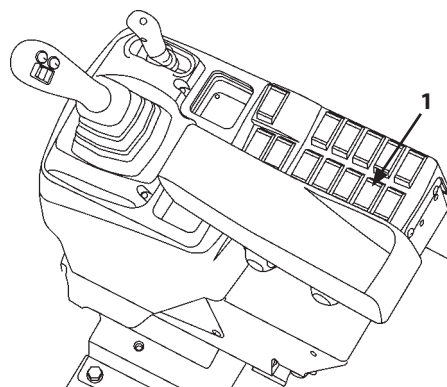
- No person is present around the machine.
  - Keep flammable objects away from the muffler.
  - Fuel level indicator is not lit.
  - Urea warning indicator is not lit.
1. Park the machine in a safe place. Lower the front attachment onto the ground.
  2. Set the accelerator pedal and switches to the following state.

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

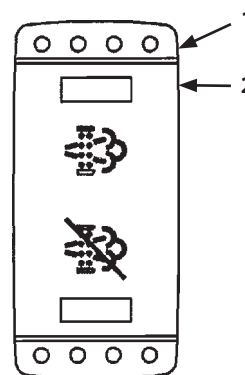
3. Push manual regeneration (2) side of aftertreatment device regeneration switch (1).



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## OPERATOR'S STATION

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 **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 front attachment lock switch is ON. When touching the accelerator pedal, forward/reverse lever, parking switch and the front attachment lock switch, the regeneration process is aborted. When the process is aborted, start over again.

4. When the regeneration is finished, aftertreatment device warning indicator (5) and service indicator (6) will be turned OFF. If indicators (5) and (6) do not turn OFF, 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).

## OPERATOR'S STATION

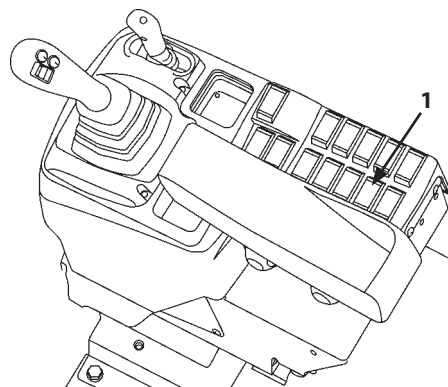
### Aftertreatment Device Regeneration Inhibited

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

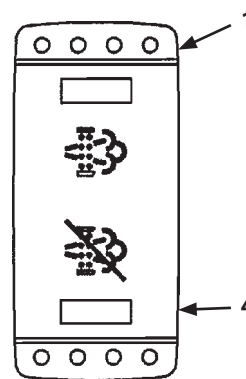
When aftertreatment device regeneration switch (1) is in regeneration inhibited (4) position, the auto regeneration will not be performed. At the same time, aftertreatment device regeneration inhibited indicator (8) on the monitor screen will be light.

**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 "Manual Regeneration Procedure" section for the manual regeneration.

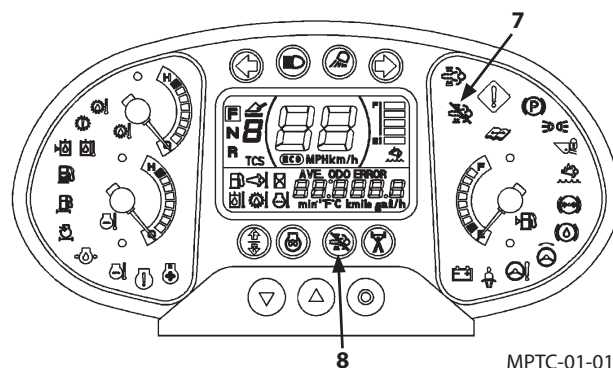
When aftertreatment device regeneration inhibited warning indicator (7) is lit while aftertreatment device regeneration switch (1) is in regeneration inhibited (4) position, the manual regeneration is needed. Perform manual regeneration following the specified procedure.



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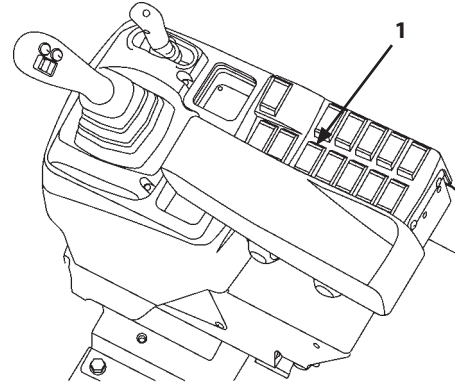
MPTC-01-019

# OPERATOR'S STATION

## 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.




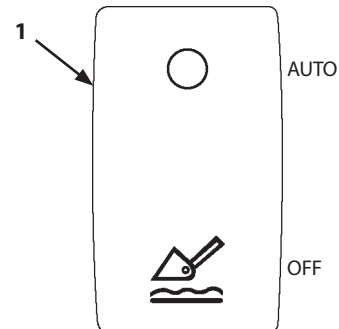
MNDB-01-005

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.

### AUTO

When ride control switch (1) is turned to AUTO, the drive speed sensor and the controller are activated. Then, when the drive speed becomes faster than the preset travel speed, the ride control system automatically operates.

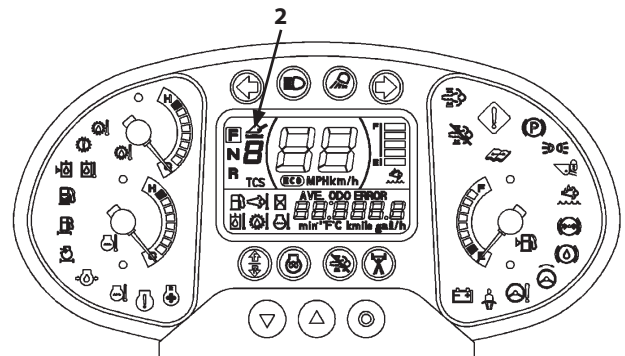
When ride control switch (1) is turned to AUTO mode, ride control indicator  (2) on the monitor display comes ON.



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### OFF

When ride control switch (1) is turned OFF, ride control indicator (2) on the monitor display goes OFF and the ride control system becomes inoperable.



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# OPERATOR'S STATION

## Fan Reverse Rotation Switch

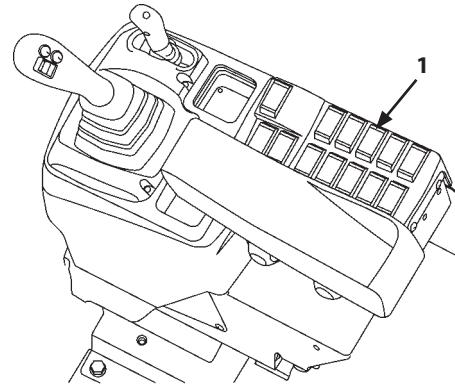
Fan reverse rotation switch (1) reverses the hydraulic driven fan. In case the radiator is clogged, rotate the hydraulic driven fan in reverse direction to blow out the clogged dust. Carry out the fan reverse rotation regularly to prevent the cooling system from clogging.

### Manual Operation

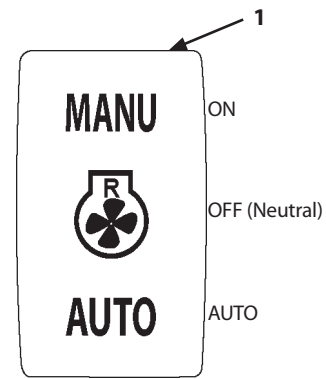
#### IMPORTANT:

- Fan rotating direction can be changed during the engine is running. Each time the ON side of fan reverse rotation switch (1) is pressed, the fan's rotating direction switches alternatively. While switching the fan rotating direction, fan reverse rotation indicator (2) flashes. When the fan rotates in reverse direction, indicator (2) stays ON. When fan reverse rotation switch (1) is pressed while fan reverse rotation indicator (2) turns ON, indicator (2) starts flashing. When the fan rotates in normal direction, fan reverse rotation indicator (2) goes OFF. Do not press fan reverse rotation switch (1) during indicator (2) is flashing.
- Always operate the switch while applying the parking brake. When the parking brake is released, the fan reverse condition is automatically canceled after 1 minute. In case abnormal situation occurs such as engine coolant overheating, reverse rotation may forcibly be released, or fan reverse rotation switch may be disabled.

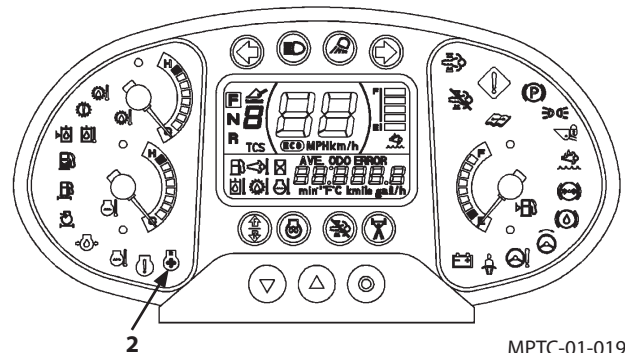
1. Close the side cover and the rear grille before operating the switch.
2. Start the engine. Be sure to confirm that the parking brake is applied. Press ON side of fan reverse rotation switch (1) once. Fan reverse rotation indicator (2) starts flashing. Approximately 1 minute later, the fan rotates 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.



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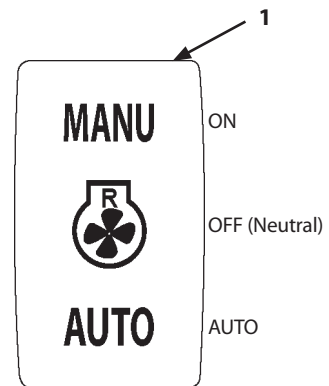
## OPERATOR'S STATION

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### AUTO

When fan reverse rotation switch (1) is set to AUTO position, the fan automatically reverses rotation and then returns to the normal direction. Normal rotation → Reverse rotation → Normal rotation →... The fan rotates in the normal direction for 10 minutes for the first time; after that it keeps normal rotation for 30 minutes. The reverse rotation time is 60 seconds (1 minute). (90 seconds (1.5 minutes) at low temperature).

In case an abnormal situation occurs such as engine coolant overheating or high refrigerant pressure of the air conditioner, duration time of reverse rotation may become shorter to protect devices from being damaged.



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# OPERATOR'S STATION

## Forward/Reverse Selector Switch

Forward/reverse selector switch (2) is a switch that activates forward/reverse switch (1) on the control lever. When forward/reverse selector switch (2) is in ON position, the machine travels in forward or reverse direction by pressing (F) or (R) button of forward/reverse switch (1).

### Operational Procedure

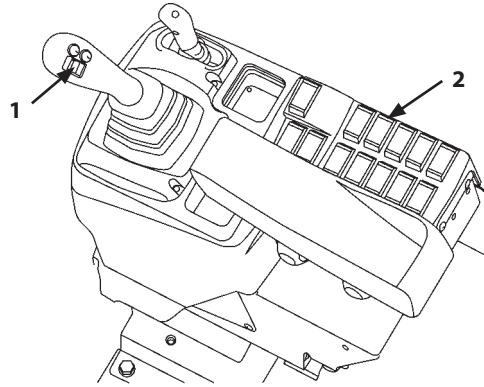
1. Turn the parking brake switch OFF.

**WARNING:** At this time, be sure to depress the brake pedal to ensure safety.

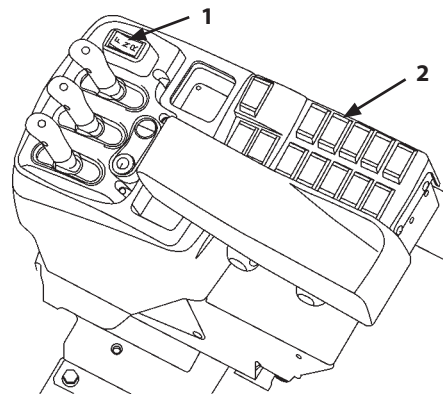
2. When forward/reverse selector switch (2) is turned ON while both forward/reverse lever (3) and forward/reverse switch (1) are in the neutral (N) position, forward/reverse indicator (4) is lit.
3. Set forward/reverse switch (1) to (F) or (R).

**NOTE:** When forward/reverse lever (3) is set to other than the neutral (N) position while forward/reverse switch (1) is operating, forward/reverse switch (1) becomes disabled. (Forward/reverse lever priority control)

If you use forward/reverse switch (1) again, perform step 2.



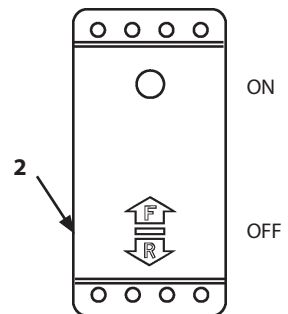
Multi-Function Joystick Type MND B-01-005



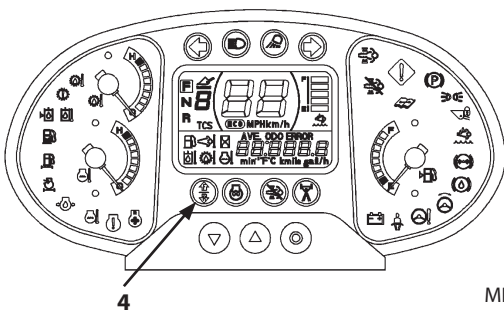
Fingertip Control Type MND B-01-004



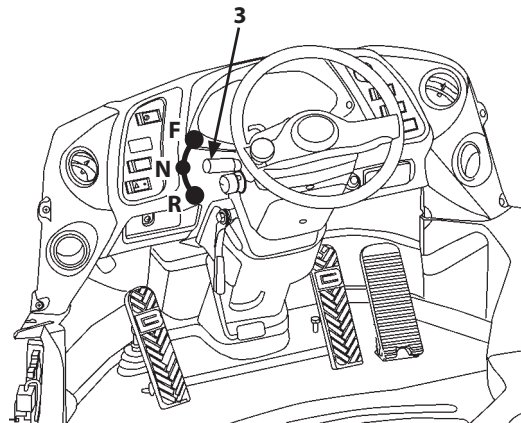
M4GB-01-084



M4GB-01-083



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MND B-01-002

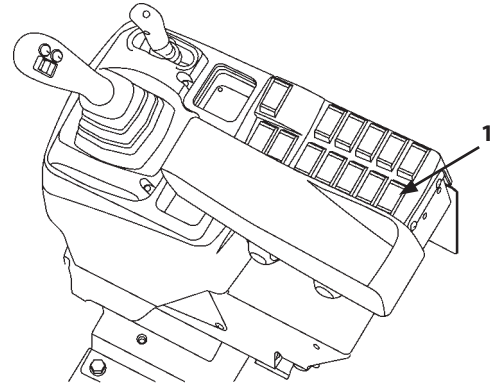
## OPERATOR'S STATION

### Secondary Steering Operation Check Switch (Optional)

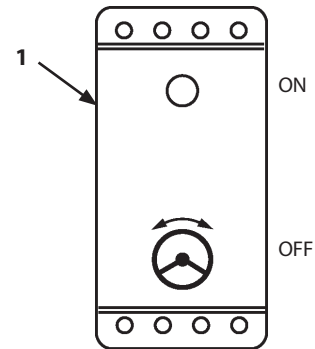
Push secondary steering operation check switch (1) to check whether the secondary steering pump operates. The secondary steering pump operates while pushing the ON side of the switch. In the meantime, secondary steering alarm (2) will be displayed on the monitor screen. Release the switch when the operation of the secondary 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.

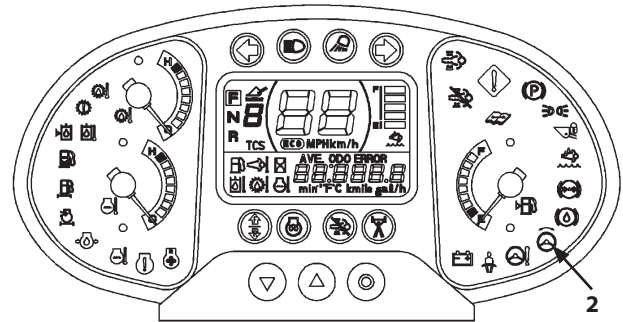
 **NOTE:** The secondary steering auto-check is performed for one to two seconds after starting the engine. The pump's operating noise will be heard during the check.



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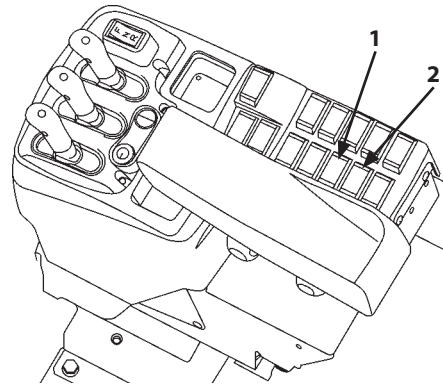
# OPERATOR'S STATION

## Dual Lift Arm Auto Leveler

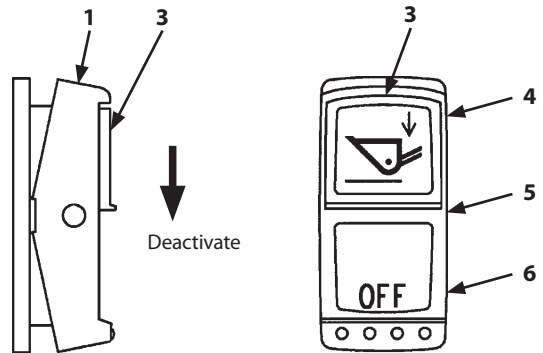
The lift arm auto leveler is a device that automatically stops the lift arm at the preset position while lowering or raising the lift arm. It is convenient to change the setting of stop position by using this function when the machine is constantly used in a specific way for cargo handling work.

- 1- Lift Arm Auto Leveler Switch (Down)
- 2- Lift Arm Auto Leveler Switch (Up)
- 3- Lock Switch (Down)
- 4- SET (Down)
- 5- ON (Down)
- 6- OFF (Down)
- 7- Lock Switch (Up)
- 8- SET (Up)
- 9- ON (Up)
- 10- OFF (Up)

Refer to the chapter of "OPERATING MACHINE" for the operation.



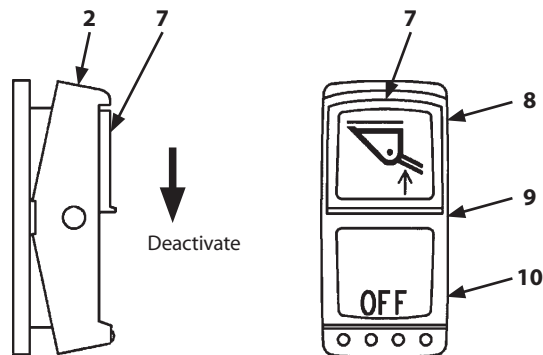
MNDB-01-004



MNDB-01-022

Downward

MNDB-01-021



MNDB-01-022

Upward

MNDB-01-023

## OPERATOR'S STATION

### Cigar Lighter (24 VDC Electrical Outlet)

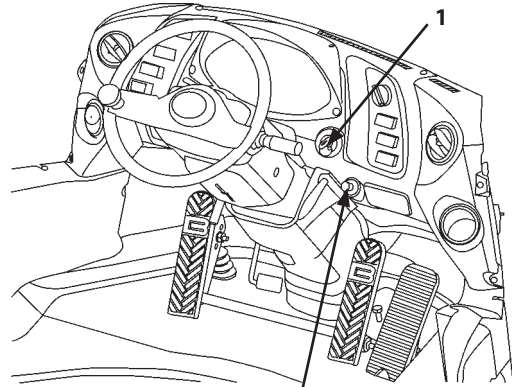
#### Using Cigar Lighter

**WARNING:** Never touch other than the knob part. Otherwise, it may result in severe burns.

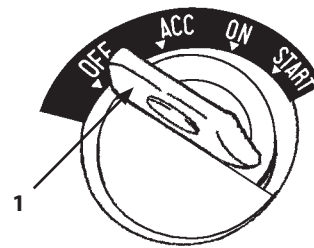
**CAUTION:** Do not power anything other than a genuine Hitachi Construction Machinery electrical device from the cigar lighter port.

**IMPORTANT:** In case the cigar lighter does not pop out automatically 30 seconds after pushing the cigar lighter in, pull out the cigar lighter manually. Then, consult your authorized dealer.

1. Turn key switch (1) ON.
2. Press and release lighter knob (2).
3. The cigar lighter knob will return to the original position when the lighter becomes usable. Pull the cigar lighter out to use.
4. After using the cigar lighter, insert the cigar lighter into the panel until the knob is seated in the original position.



MNDB-01-003



MNDB-01-053

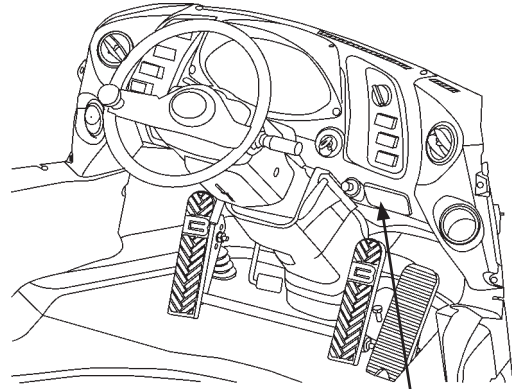
## OPERATOR'S STATION

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### Ash Tray

**⚠ WARNING: Take precautions against fires.**

Use ash tray (1) when smoking in the cab.



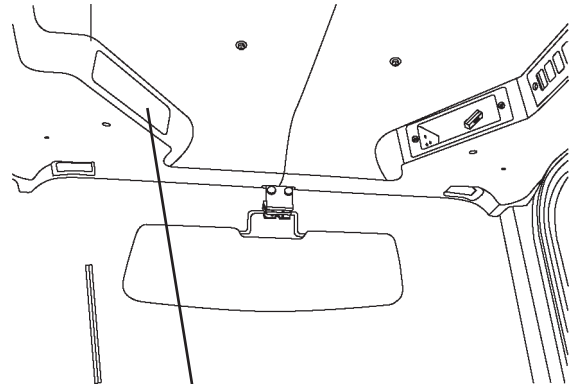
1 MNDB-01-003

# OPERATOR'S STATION

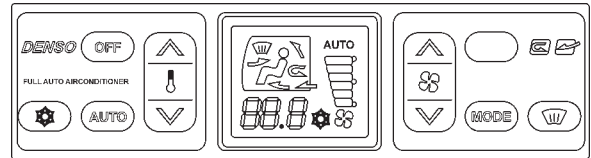
## Auto Air Conditioner

### Feature

- 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.



MNEC-01-052



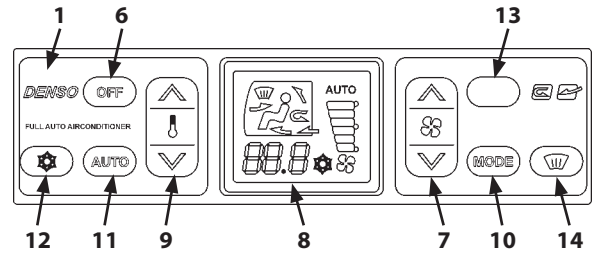
MNDB-01-011




# OPERATOR'S STATION

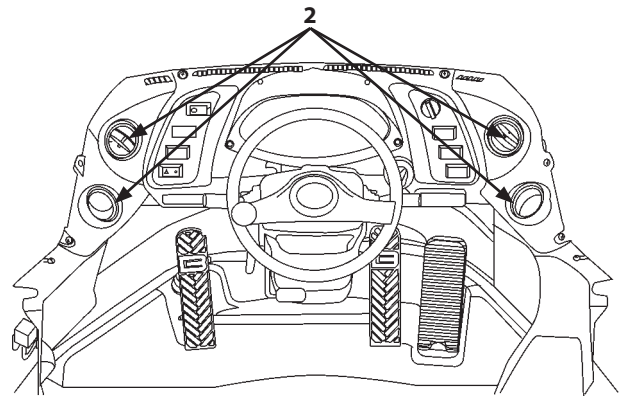
## Components Name

- 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

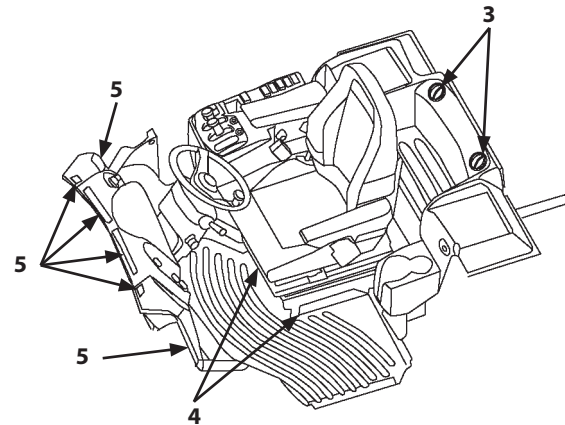


MNDB-01-011

 **NOTE:** Except for foot vent (4) and defroster vent (5), all vents are provided with louvers to adjust the air flow direction. In addition, the louvers on the front vent and rear vent can be completely opened and closed by hand.



MNDB-01-001




MNEC-01-035

# OPERATOR'S STATION







## Controller Part Name and Function

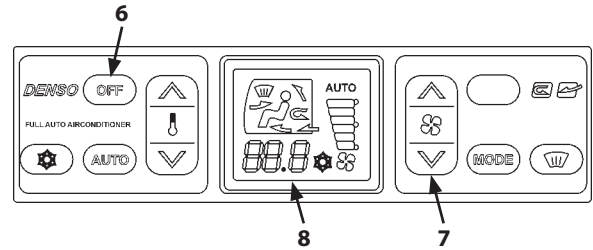
- Power OFF Switch (6)  
Stops the blower.  
When the switch is pressed, all displays (vent mode, set-temperature, and blower speed) on the LCD (8) panel will disappear and the blower stops in both the auto and manual modes.

- 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 “v” on blower switch (7) is pressed, the blower speed is decreased by one increment.

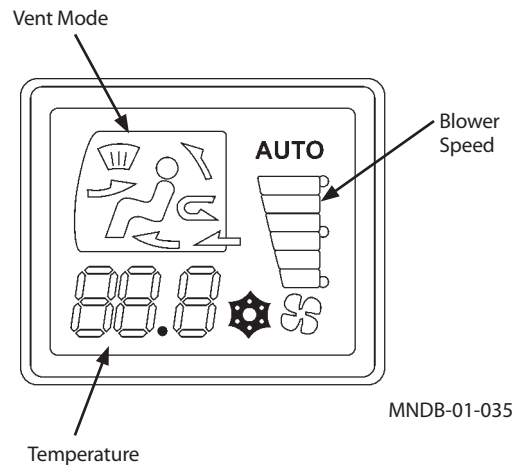
 **NOTE:** In the AUTO mode operation, the fan speed will be automatically controlled with the fan speed indicator flashing.

- 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



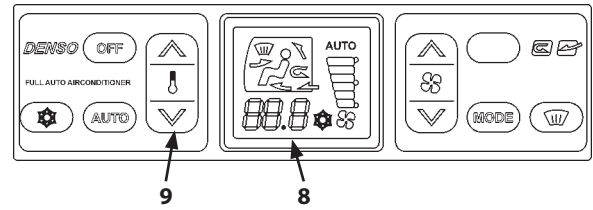
MNDB-01-011



MNDB-01-035

## OPERATOR'S STATION

- **Temperature Control Switch (9)**  
Sets the air temperature in the range of 18 to 32.0 °C (65 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 “v” on temperature control switch (9) is pressed, the set-temperature is decreased by 0.5 °C (0.9 °F) increments.
  - **Temperature Mode Change (Centigrade ↔ Fahrenheit)**  
Press both “^” and “v” marks on the temperature control switch for longer than 5 seconds at the same time to change the temperature mode (Centigrade ↔ Fahrenheit). (Unit in temperature mode is abbreviated.)



MNDB-01-011

Temperature Mode	Display on LCD
Centigrade	18.0 to 32.0
Fahrenheit	63 to 91

# OPERATOR'S STATION

## 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



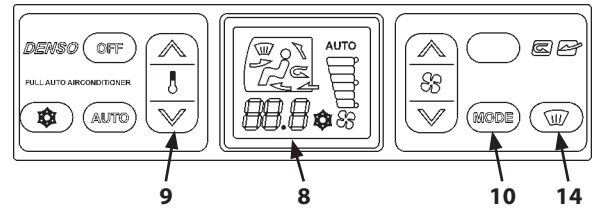
: Foot Vent Mode



: Foot/Defroster Vent Mode

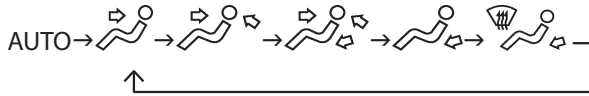



: Defroster Vent Mode



MNDB-01-011

Each time mode switch (10) is pressed, the vent location can be changed in 6 stages as illustrated below.

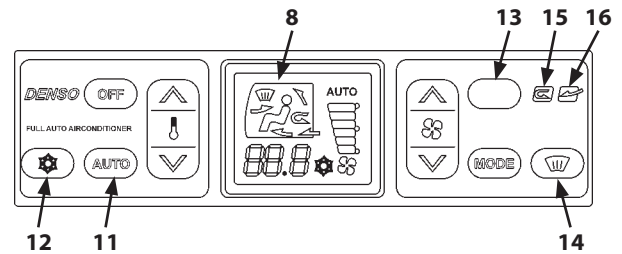


Press defroster switch (14) to change defroster  vent mode.

- AUTO mode  
The air vent location is automatically selected.
- Temperature Control Switch (9):  
Sets temperature in the cab.  
Temperature in the cab can be set from 18.0 to 32.0 °C by pressing temperature control switch (9). Temperature can be set by 0.5 °C increments.  
The set temperature is displayed on LCD (8).

## OPERATOR'S STATION

- 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.



MNDB-01-011



- 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).

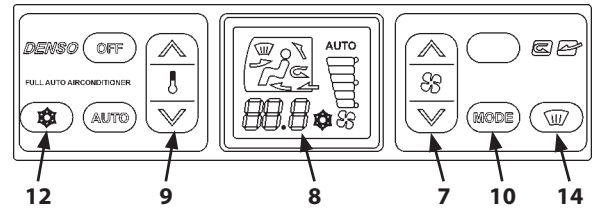
### IMPORTANT:

- **When running the air conditioner for a long time, turn the lever to Fresh position once an hour to perform ventilation and cooling.**
- **If you smoke when the air conditioner is on, the smoke may hurt your eyes. In such a case, open the window and turn the lever to Fresh for a while for ventilation and cooling to drive smoke out.**
- Defroster Switch (14)  
Press defroster switch (14) to select defroster vent mode.

## OPERATOR'S STATION

### 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. Press 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).


## OPERATOR'S STATION

### Tips for Optimal Air Conditioner Usage

#### For Rapid Cooling

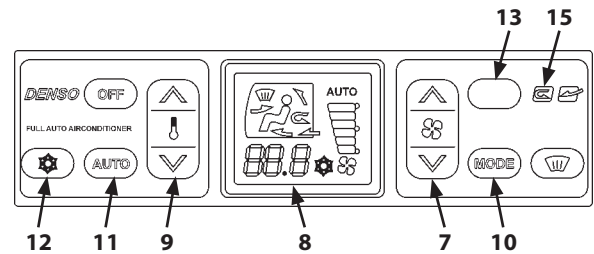
Temperature in the cab may rise over 80°C (176°F) when the machine is exposed to sun light in the summer. For rapid cooling, ventilate air in the cab first.

After starting the engine, set the temperature control to maximum cooling (18°C, 65°F) using temperature control switch (9). Then select 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<sup>-1</sup> 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).



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#### When Windows Become Clouded

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.

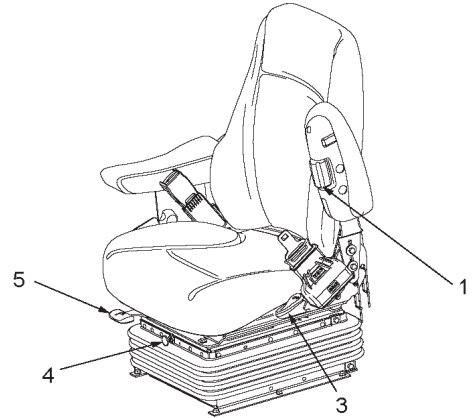
## OPERATOR'S STATION

### Adjusting Operator's Seat (Air Suspension Type Seat)

Adjust the seat for comfort and so that the pedals may be pushed fully down when the operator's back is fully against the seat back.

#### Components Name

- 1- Armrest Angle Adjustment
- 2- Lumbar Support Adjustment
- 3- Reclining Angle Adjustment
- 4- Damper Adjustment
- 5- Fore-Aft Position Adjustment



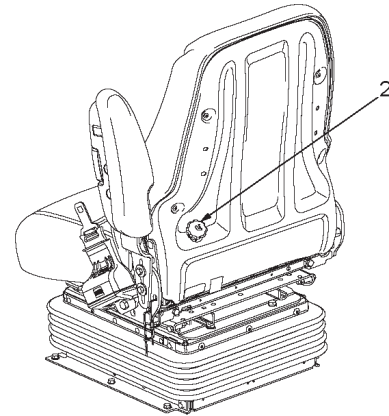
90Z7-1-117-1

1. Rotate control knob (1) to select desired angle. The armrests will pivot up and parallel with backrest when not in use.
2. Turn adjustment knob (2) for desired lumbar support.
3. Lift handle (3) and allow the back cushion to angle forward, or lean backward into the cushion. Release the handle at desired position.
4. With the key turned "ON" push the knob (4) to increase the air pressure. This will raise the seat and make a firmer ride. Pull the knob (4) to reduce the air pressure (air will be vented). This will lower the seat and make a softer ride.

When properly adjusted the seat will not "bottom out" over rough terrain.

5. Lift handle (5) and move the seat forward or backward.

Release handle (5) at one of the several positions.



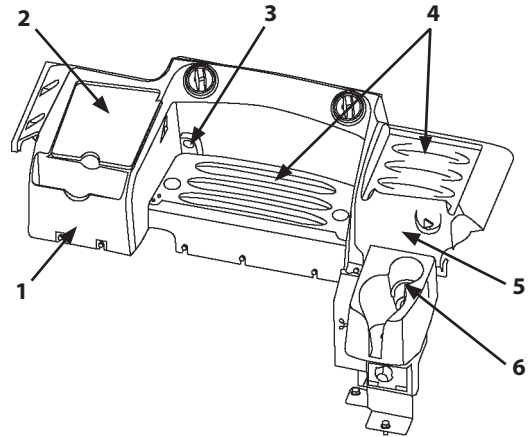
90Z7-1-117-2



## OPERATOR'S STATION

### Rear Tray

- 1- Document Holder
- 2- Hot/Cool Box
- 3- Electric Power Output
- 4- Tray
- 5- Fuse Box
- 6- Cup Holder

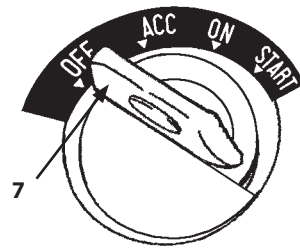


MNEC-01-046

### Electric Power Output (12 VDC Electrical Outlet)

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.

**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.**



MNDB-01-053

1. Remove the cover.
2. Insert the socket of the accessory to be used into the electric power output port.
3. Turn key switch (7) ON. Power is supplied to the connected accessory.
4. After completing operation of the accessory, disconnect the accessory. Reinstall the cover.

# OPERATOR'S STATION

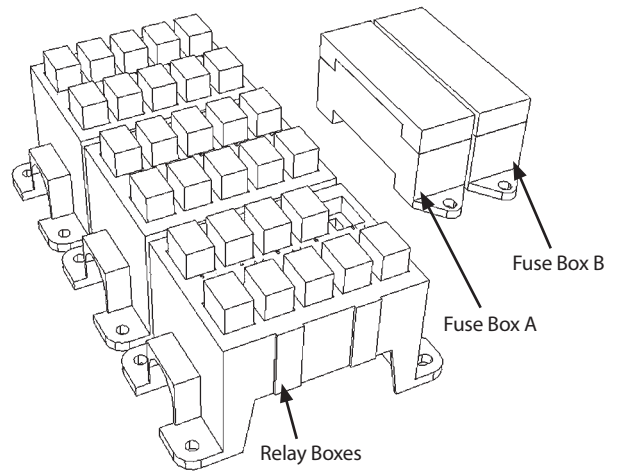
## Fuse Box

**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.**

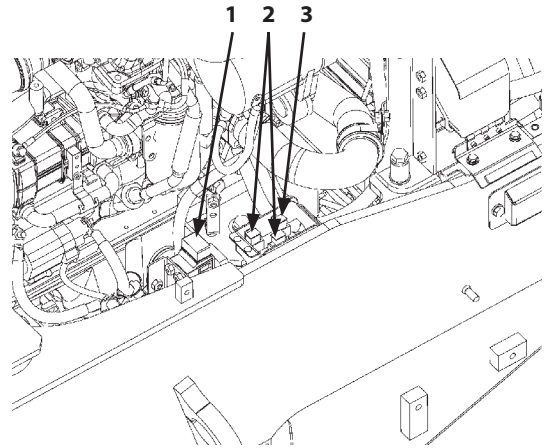
Slow blow fuses (1 and 2) function as a safety valve to prevent excess current from flowing in the electrical system. The fuse capacity varies depending on its corresponding circuit. Be sure to replace the blown fuses only with the specified ones. When checking fuses, check the fuse A, B and slow blow fuses (1 to 3) in this order.

Capacity of slow blow fuses

- 1- 100A×2
- 2- 65A×2
- 3- 45A×1



MNEK-07-017

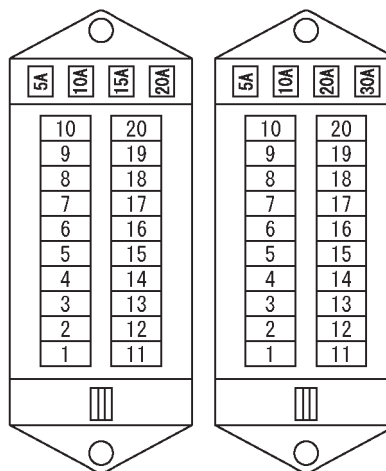


MPTC-01-021

## OPERATOR'S STATION

### Fuse Box A

10- PARKING 5 A	20- OPTION 4 (ACC3) (10 A)
9- AC1 10 A	19- OPTION 3 (ACC2) (15 A)
8- STOP LAMP 5 A	18- DEF HEATER 15 A
7- BACK ALARM 5 A	17- DEF SUPPLY 15 A
6- HST 2 5 A	16- DEF SENSOR 15 A
5- HEAD LAMP LH 5 A	15- AC2 20 A
4- WORKING LAMP FRONT 20 A	14- ROTARY BEACON 10 A
3- WIPER FRONT 15 A	13- SEAT HEATER 20 A
2- SOCKET 10 A	12- OPTION 2 (ACC1) (20 A)
1- HEAD LAMP RH 5 A	11- RADIO 10 A



Fuse Box A

Fuse Box B

MNDB-01-062

### Fuse Box B

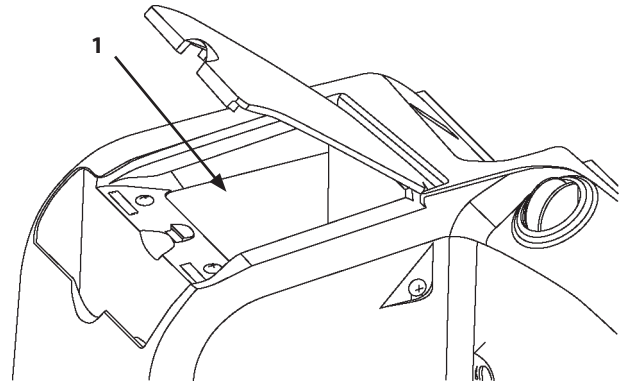
10- HST 1 15 A	20- SECONDARY STEERING 5 A
9- MC 10 A	19- HI BEAM 10 A
8- ECM 30 A	18- WIPER REAR 10 A
7- CONTROLLER 10 A	17- WORKING LAMP REAR 20 A
6- FLASHER 10 A	16- LOADER CONTROL 10 A
5- HORN 10 A	15- FUEL PUMP 5 A
4- OPTION 1 (BT) (15 A)	14- POWER ON 2 10 A
3- CAB DOME LAMP 5 A	13- POWER ON 1 10 A
2- LIGHTING 10 A	12- POSITION 2 5 A
1- DC-DC UNIT 20 A	11- POSITION 1 5 A

## OPERATOR'S STATION

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### 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.

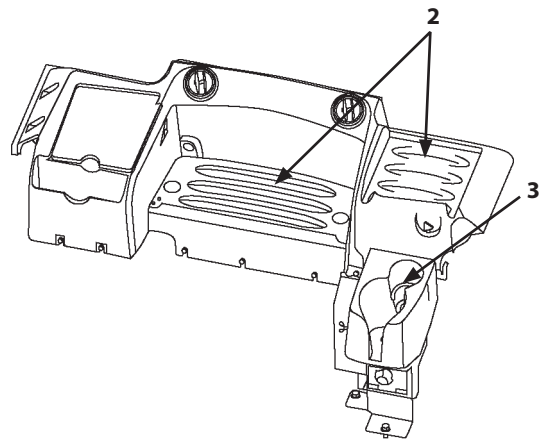


MNEC-01-048

### Tray and Drink Holder

**IMPORTANT:** Tray (2) is not a waterproof type. Be careful not to spill liquid on the tray.

Place a bottle with a plug or cap on drink holder (3).



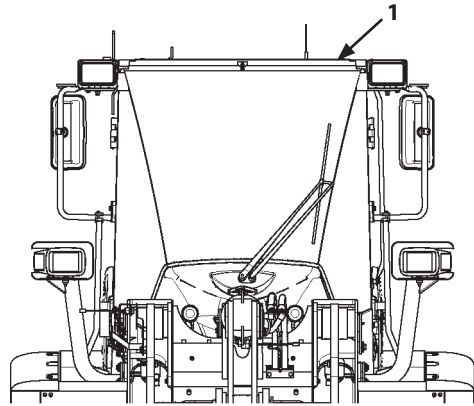
MNEC-01-046

# OPERATOR'S STATION

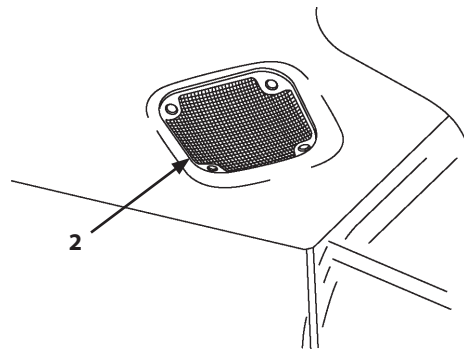
## ROPS Cab

ROPS cab (1) is standard equipment.

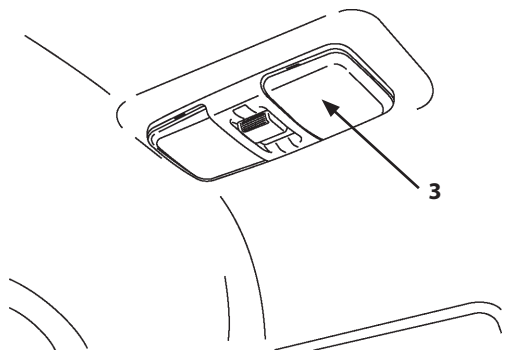
- 1- ROPS Cab
- 2- Speakers
- 3- Front Room Light
- 4- Sun Visor



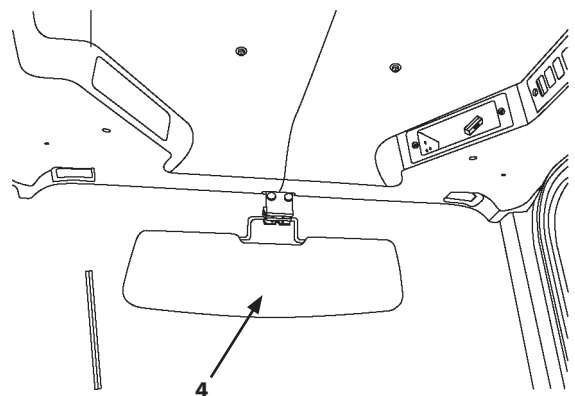
MNDF-07-029



M4GB-01-113



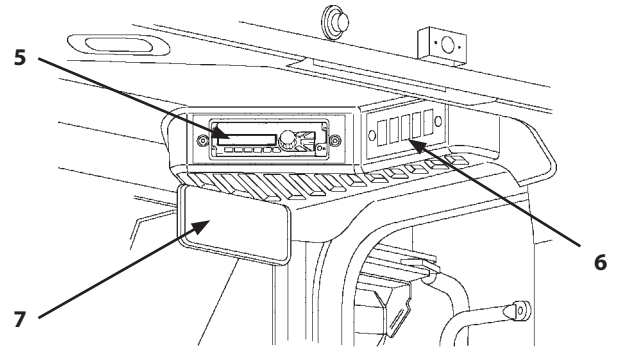
M4GB-01-114



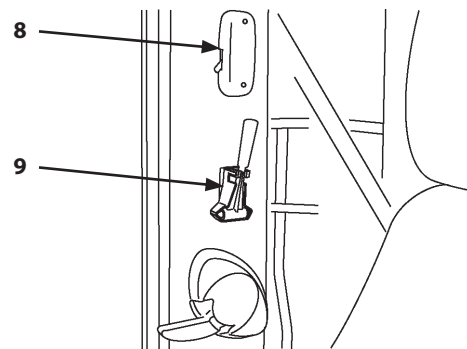
MNEC-01-052

## OPERATOR'S STATION

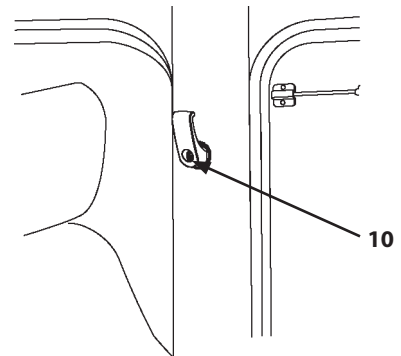
- 5- Radio
- 6- Cab Switch Panel (Optional)
- 7- Room Rear View Mirror
- 8- Rear Room Light
- 9- Emergency Evacuation Hammer
- 10- Coat Hook



MNDF-01-051



M4GB-01-117



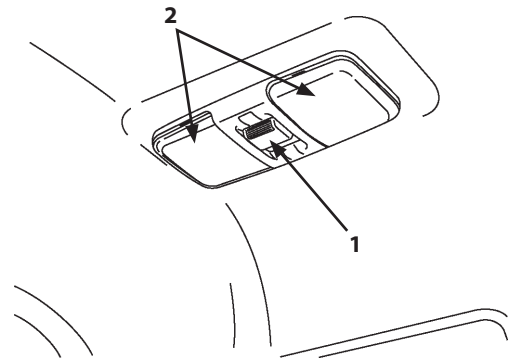
MNEC-01-536

# OPERATOR'S STATION

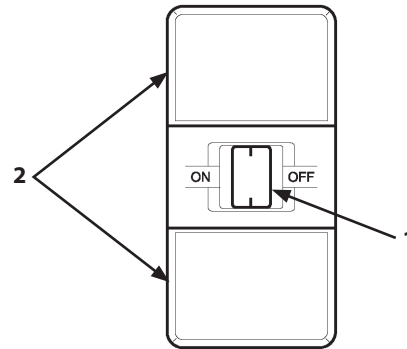
## Front Room Light

Press ON side of switch (1) to turn the room light ON. The room light switch has three operation positions.

- ON : Light (2) comes and stays ON.
- Neutral : When the cab door is opened, light (2) comes ON.  
When closed, light (2) goes OFF.
- OFF : Light (2) goes OFF.



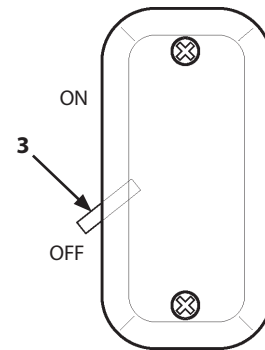
M4GB-01-114



M4GB-01-119

## Rear Room Light

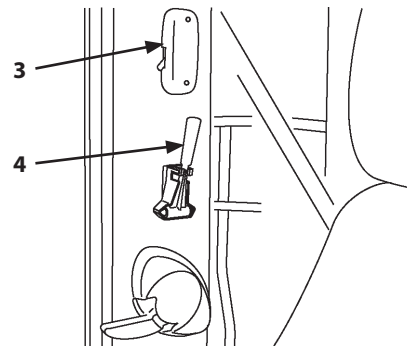
Switch (3) ON: Rear room light comes and stays ON.  
Switch (3) OFF: Rear room light goes OFF.



M4GB-01-120

## Emergency Evacuation Hammer

In case 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 (4).



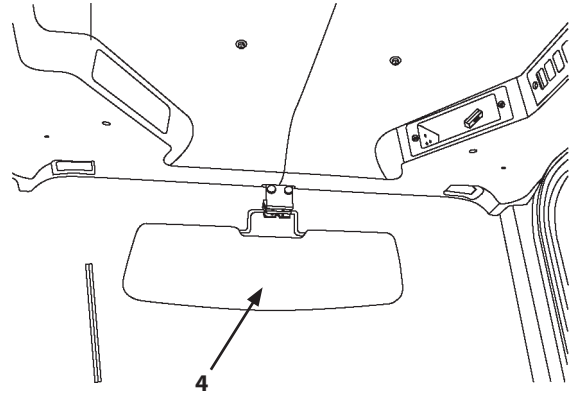
M4GB-01-117

## OPERATOR'S STATION

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### Sun Visor

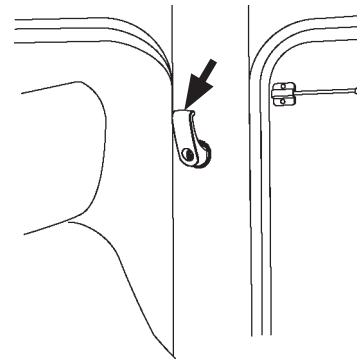
When sunlight is strong, use sun visor (4) by hanging its edge from the cab top down to a desired hook preset.



MNEC-01-052

### Coat Hook

Use to hang your coat, hat, etc.



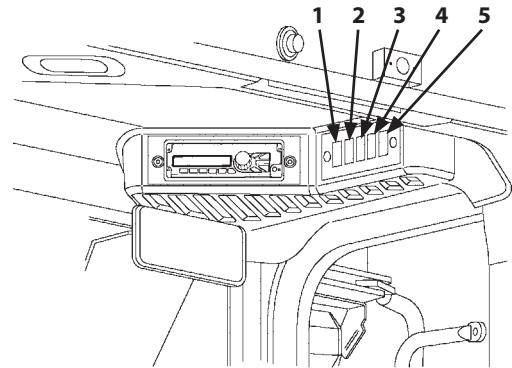
MNEC-01-536



# OPERATOR'S STATION

## Upper Switch Panel

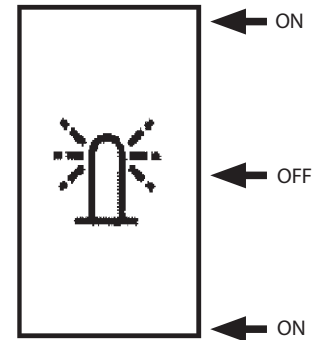
- 1- Rotary Light Switch (Optional)
- 2- Rear View Mirror Heater Switch
- 3- Auxiliary
- 4- Auxiliary
- 5- Auxiliary



MNDF-01-051

## Rotary Light Switch (Optional)

Press either upper part or lower part of the switch to turn the rotary light ON. Press middle part of the switch to turn OFF.



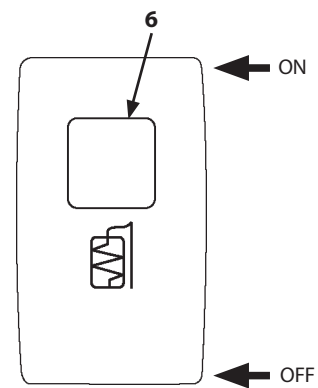
M4GB-01-125

## Rear View Mirror Heater Switch

**IMPORTANT: Do not use for a long time with the engine stopped. Doing so will drain the battery.**

**Once the mirror is defogged, turn OFF the switch.**

Press the upper part of the switch to turn ON the rear view mirror heater. While operating the heater, indicator (6) lights. Press the lower part of the switch to turn OFF the heater and indicator (2).



MNEC-01-539

## OPERATOR'S STATION

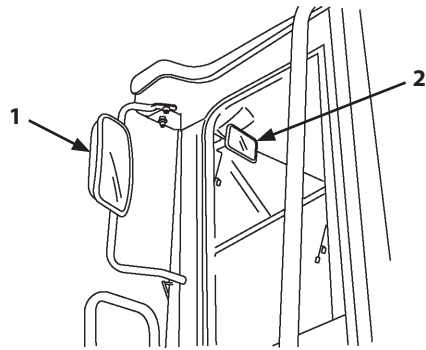
### Outside Rear View Mirror

**⚠ WARNING:** Do not travel the machine in reverse by relying on only the range of vision rear view mirror (1) 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 the rear view mirror so that 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.



M4GB-01-126

### Room Rear View Mirror

Always keep room rear view mirrors (2) clean.

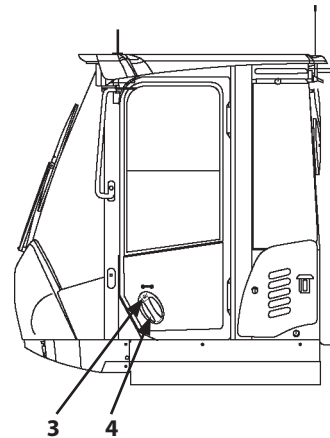
### Cab Door

**⚠ 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.

3- Door Lock Key

4- Door Open/Close Lever



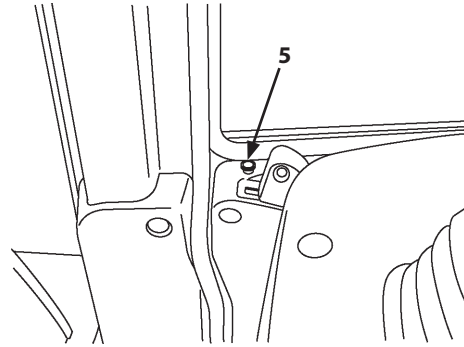
MNEC-01-505

## OPERATOR'S STATION

### Door Lock Knob

**CAUTION:** After closing the door, always check that the door lock is securely engaged.

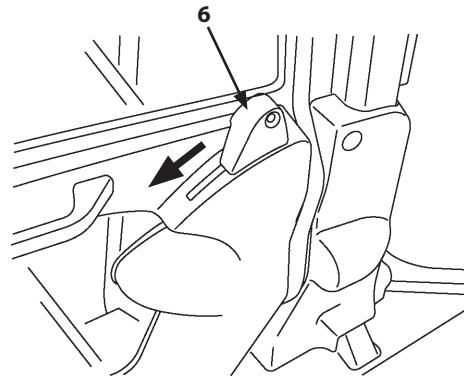
Depress door lock knob (5) to engage the door lock.



M4GB-01-128

### Door Open/Close Lever

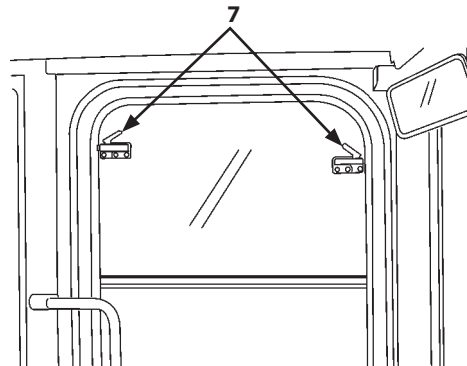
When opening the door, while lifting door lock knob (5), pull lever (6) to disengage the door lock.



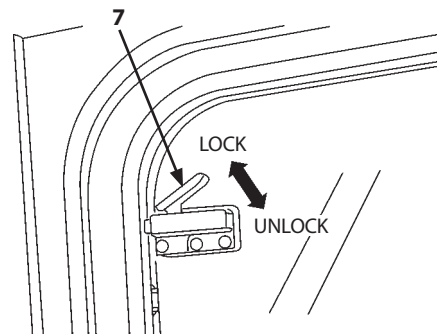
M4GB-01-129

### Window Open/Close Levers

When window open/close levers (7) on both sides are simultaneously pressed from left and right sides toward center, the window is unlocked, allowing the windowpanes to move. When window open/close levers (7) are released, stoppers are engaged in the nearest steps so that the window is locked in that position.



M4FJ-01-016



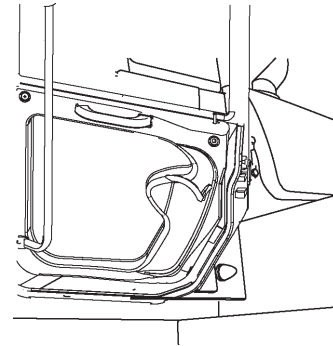
M4EK-01-048

## OPERATOR'S STATION

### When Fully Opening the 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.

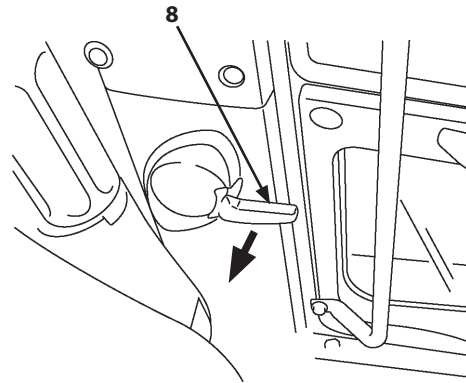
Push the door toward the outside of the cab to fully open the door (180°).



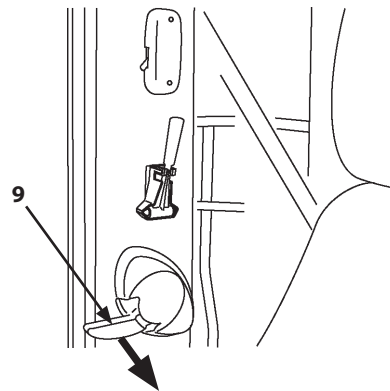
M4GB-01-132

### Cab Door Release Lever

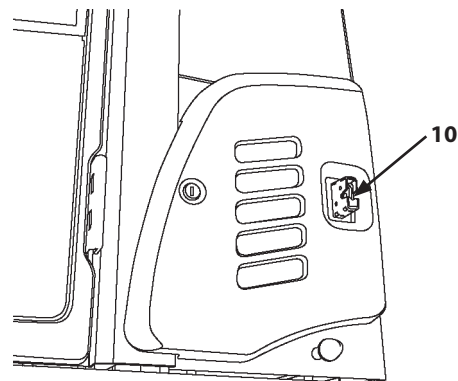
**⚠ CAUTION:** When keeping the door open, open the door until latch (10) on the cab securely locks the door. When disengaging the door lock, push door lock disengage levers (8) and (9) downward.



Left door lock disengage lever M4GB-01-133



Right door lock disengage lever M4GB-01-117



MNEC-01-055

## OPERATOR'S STATION

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### Battery Disconnect Switch

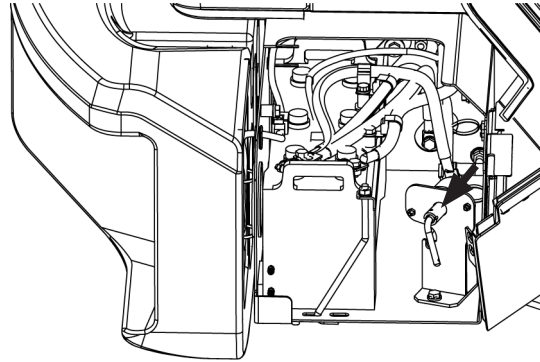
**IMPORTANT:** Never turn the disconnect switch OFF while the engine is running or the key switch is in the position other than OFF. Failure to do so may damage the electrical system.

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.

Before turning the battery disconnect switch OFF, be sure to turn key switch OFF and wait 5 minute or more after the engine stops. If the battery disconnect switch is turned OFF within 5 minute after the engine stops, it may result in malfunction of the electrical system. When turning the battery disconnect switch from OFF to ON, preset radio station and the clock may be reset. Set them again.

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 of time, reducing the battery discharge
- Before performing welding operation on the machine.
- Before replacing the batteries.



MPTC-01-014

## OPERATOR'S STATION

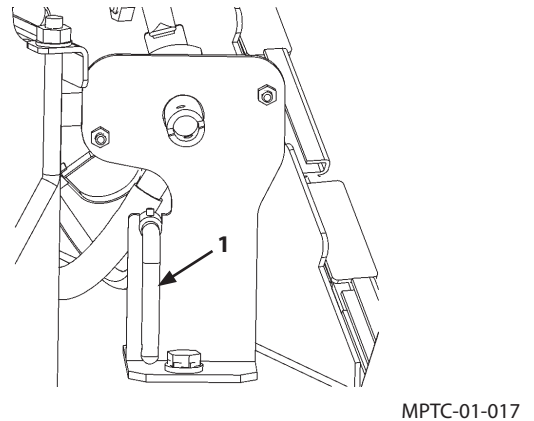
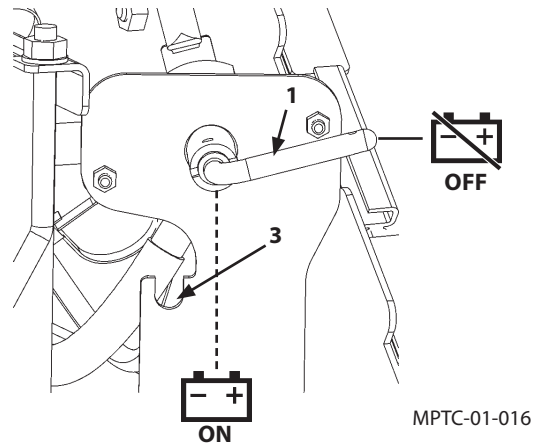
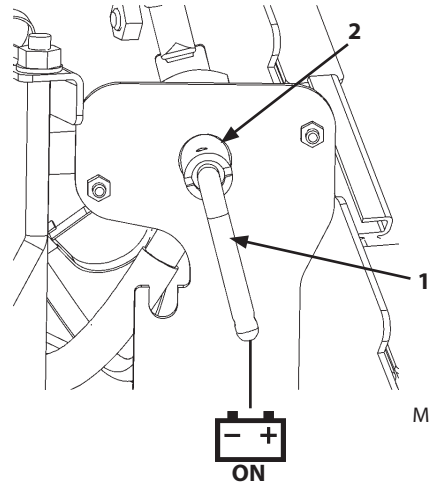
### Switch Operation

1. Open the cover of the battery box.

When lever (1) is vertical to the ground, battery disconnect switch (2) turns ON. The lever can not be removed when lever (1) points downward.

When operating the machine with battery disconnect switch (2) ON, close the cover.

2. When turning lever (1) 90° counterclockwise (the lever is lateral to the ground), battery disconnect switch (2) turns OFF. Lever (1) can be removed from battery disconnect switch (2) when it is in OFF position.
3. Store lever (1) removed from switch (2) on holder (3).
4. Close the cover. If lever (1) is in the OFF position, the cover of the battery box can not be closed.



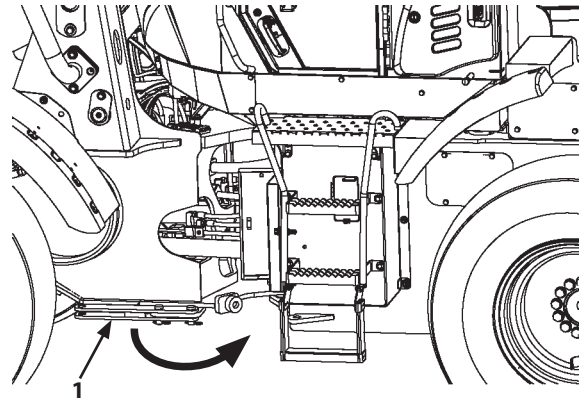
## OPERATOR'S STATION

### Articulation Lock Bar

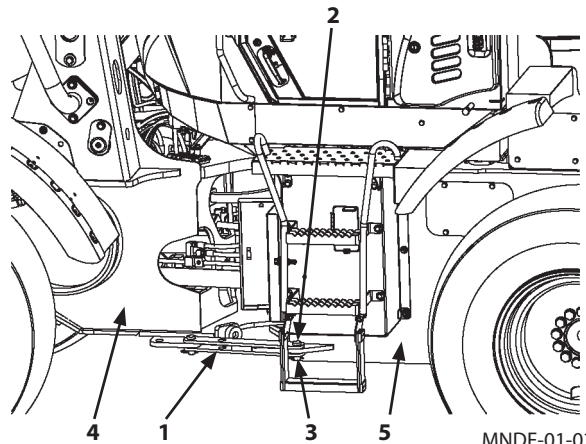
**⚠ WARNING:**

- Before servicing or transporting the machine, be sure to engage lock bar (1).
- Before driving the machine, be sure to disengage lock bar (1) from the rear frame and fasten lock bar (1) to the front frame with pin (2) and  $\beta$ -form lock pin (3).

Articulation lock bar (1) locks the front and rear frames to prevent articulation between front frame (4) and rear frame (5) when servicing or transporting the machine.



MND-01-025



MND-01-026

## OPERATOR'S STATION

### Towing Pin

**⚠ WARNING:** Since towing is a potentially dangerous operation, perform only when there is an emergency and crisis situation.

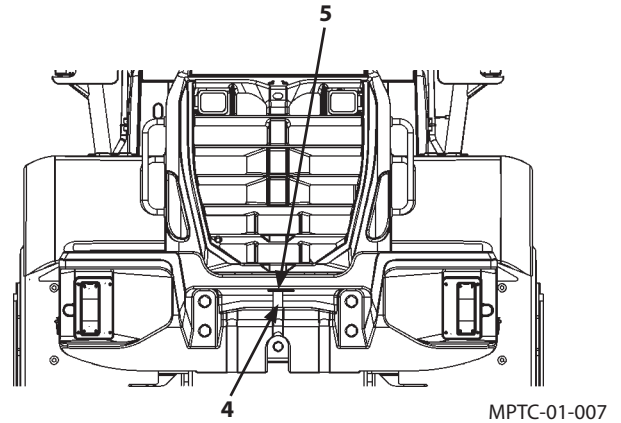
**IMPORTANT:** Available towing forces by machine model are as follows. To prevent excessive wear of tires, avoid towing operation requiring more than the available towing force.

**Available towing force**

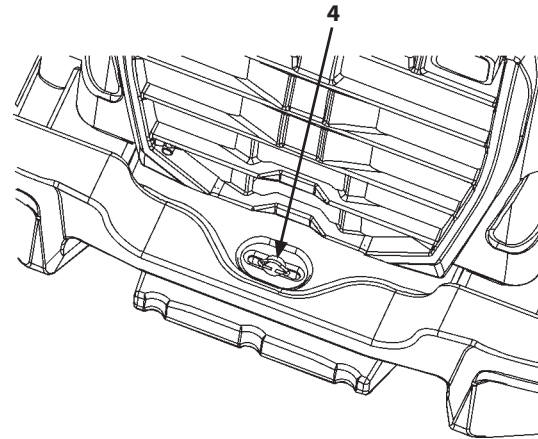
**ZW140-6: 94.5 kN (9640 kgf) (21245 lbf)**

**ZW150-6, 150PL-6: 104 kN (10600 kgf) (23380 lbf)**

Towing pin (4) is located on the rear end of the base machine. It is used for towing other 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).



MPTC-01-007



MPTC-01-008



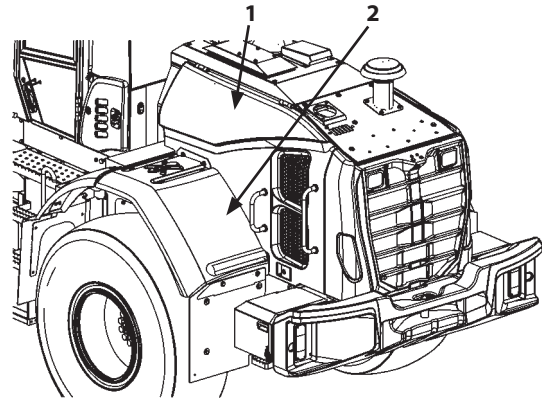
## OPERATOR'S STATION

### Inspection/Maintenance Side Access Cover

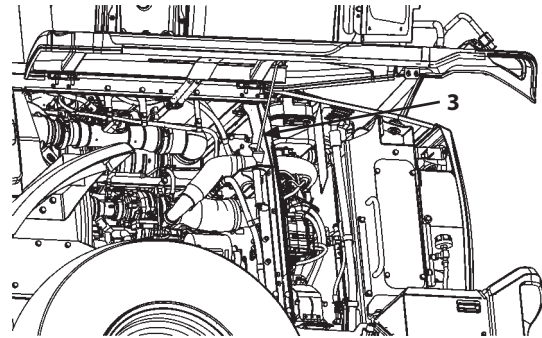
**CAUTION:**

- Always close side covers (1) during traveling and/or working operation.
- Do not keep the side cover open on a slope or when a strong wind is blowing. Failure to do so may be dangerous because the side cover may unexpectedly close.
- Take care not to pinch your fingers when opening/closing side covers (1).
- As the side cover flips up by itself, care should be taken not to contact with the cover when opening it.
- Before checking around the engine, be sure to lock the cover in position with locking rod (3) provided inside the side cover.
- Never attempt to stand on fenders (2) if side covers (1) are provided with fenders (2).

**NOTE:** Lock the side cover in position with locking rod (3).



MPTC-01-009



MPTC-01-018

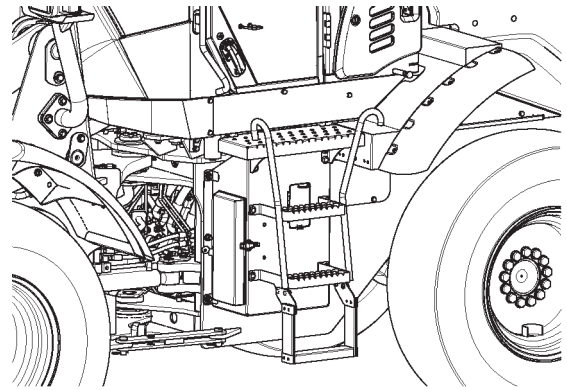
## OPERATOR'S STATION

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### Steps

**⚠ WARNING:** When getting on and off the machine, use steps and hand rails 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.

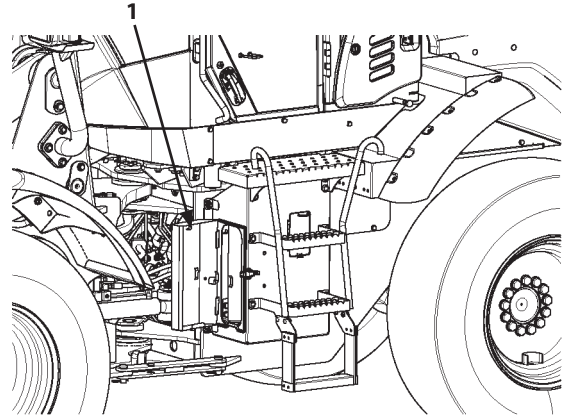
Although the steps are provided on both sides of the machine, mainly use the steps on the left side. The control levers are located on the right side, obstructing easy access.



MNDF-01-031

### Tool Box

Use tool box (1) to store tools.

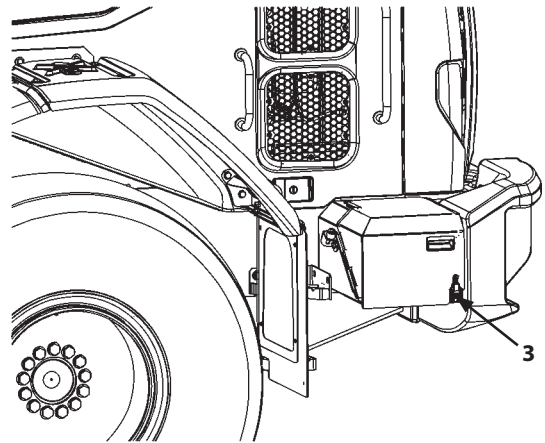
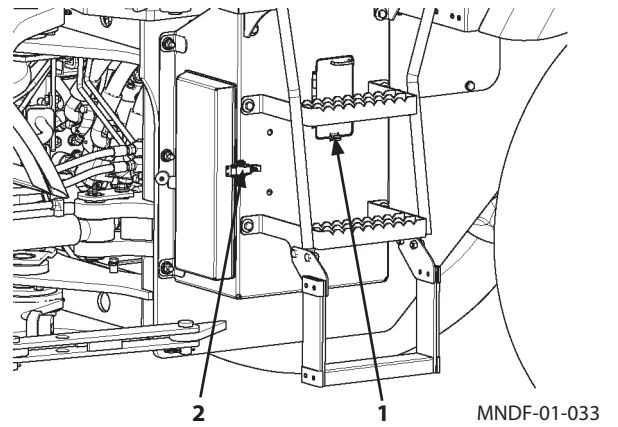


MNDF-01-032

## OPERATOR'S STATION

### Vandal-Proof Devices

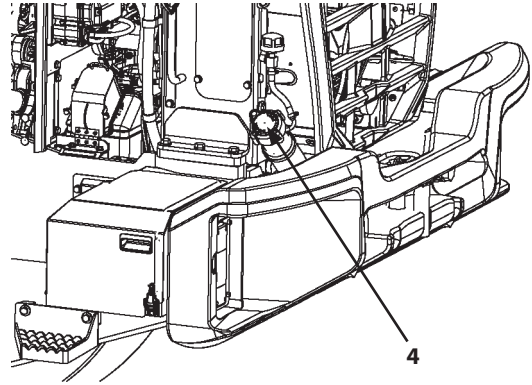
A lock key can be installed to transmission inlet cap (1), tool box (2), and battery cover (3).



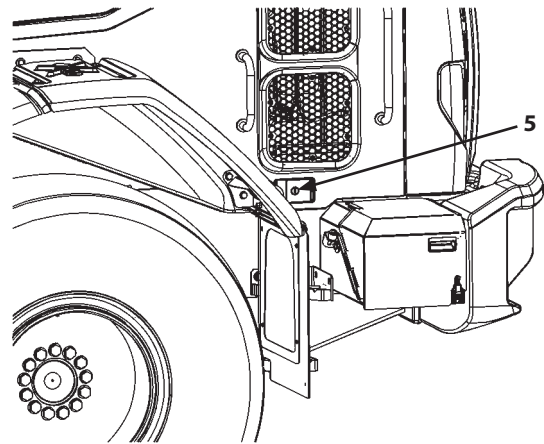
## OPERATOR'S STATION

### Vandal-Proof Devices (continue from previous page)

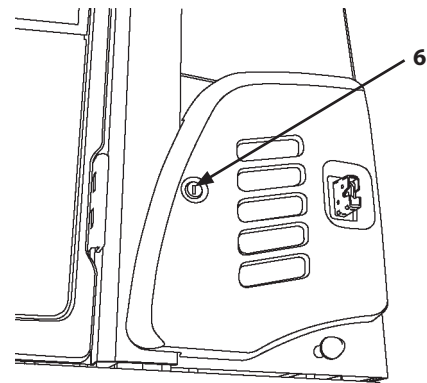
Fuel tank cap (4), side covers (5), and air conditioner fresh air filter (6) can be locked with the keys.



MPTC-01-011



MPTC-01-010



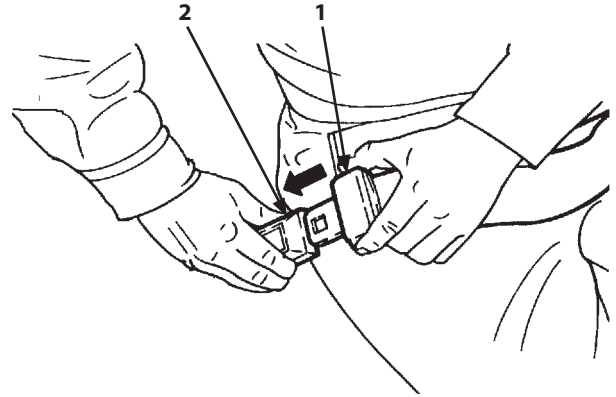
MNEC-01-055

## OPERATOR'S STATION

### 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.

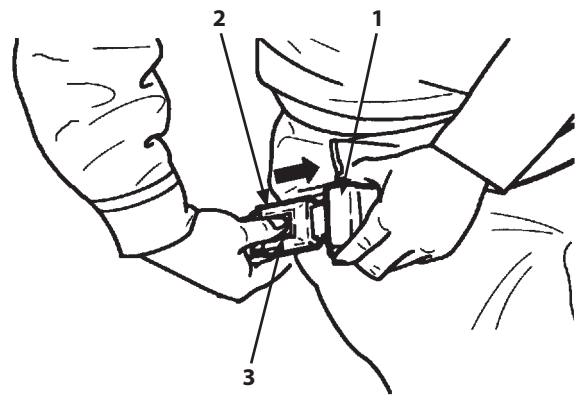


M1U1-01-031

### Seat Belt

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).

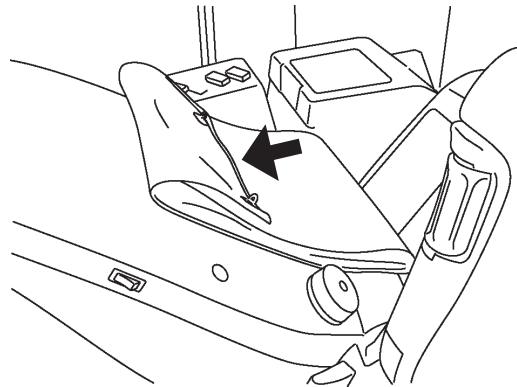
Replace seat belt (1) if it is damaged or worn, or if the machine is involved in an accident which puts severe stress on the seatbelt.



M1U1-01-032

### 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

# OPERATOR'S STATION

## Rear View Camera Monitor

### Components Name

- 1- Monitor
- 2- Setting and Adjustment Switches (① to ⑧)
- 3- Camera

### Starting and Stopping the Rear View Camera Monitor (Optional)

**⚠ WARNING:** The image displayed on the rear view monitor is meant only as an aid. Actual position and distance of people and objects in the rear view monitor will be different. When operating the machine, pay thorough attention to the surrounding situation.

#### IMPORTANT:

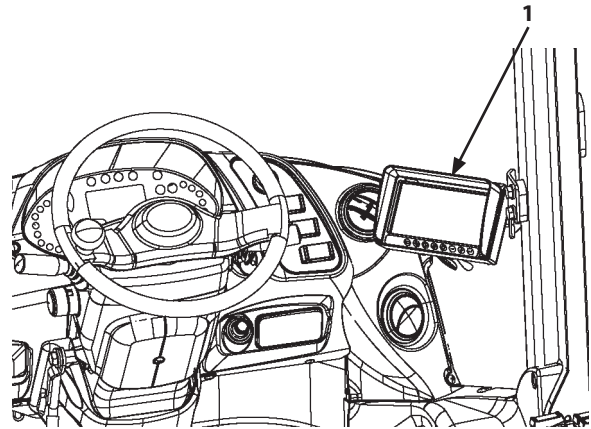
- In order to obtain a clear image, clean the camera lens and the monitor display before operating the machine.
- The monitor and camera lens surface is a resin product. Lightly wipe the surface with a wet clean cloth. Never use an organic solvent.
- Never attempt to change the mounting position of the rear view camera.
- Consult your authorized dealer if any abnormality is found on the rear view image.

#### Starting Procedure

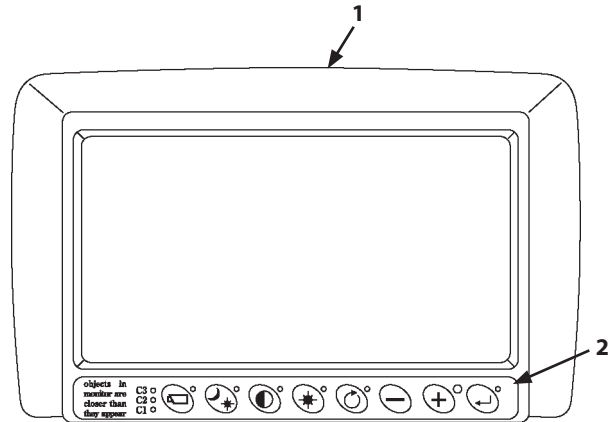
This system starts (start screen is displayed) when the vehicle key switch is turned ON.

#### Stopping Procedure

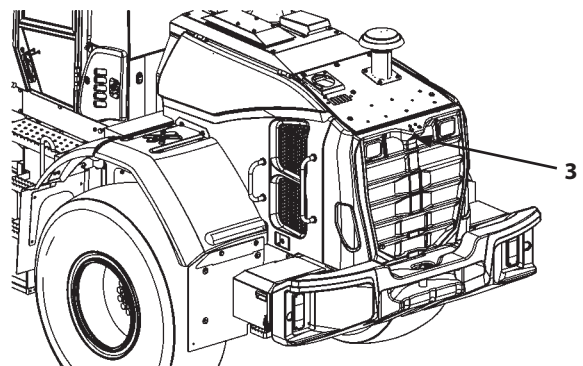
This system terminates 10 seconds after the key switch is turned OFF.



MNDB-13-001



MQHA-OP01-001



MPTC-01-009

# OPERATOR'S STATION

## Monitor Setting and Adjustment (Optional)

A switch panel is located on the underside of monitor (1), providing 8 switches (switch ① to ⑧).


- Switch ①: Do not use
- Switch ②: Auto Backlight Control, Day setting and Night setting  
 Push this switch to adjust the Auto Backlight Control (ABC) mode, the LCD backlight day and the LCD backlight night settings.  
 The ABC mode automatically adjusts the luminance of the monitor backlight by sensing the ambient light with a light sensor located on the surface of the monitor.  
 Under the Day and Night backlight setting, the backlight switches over to preset luminance.

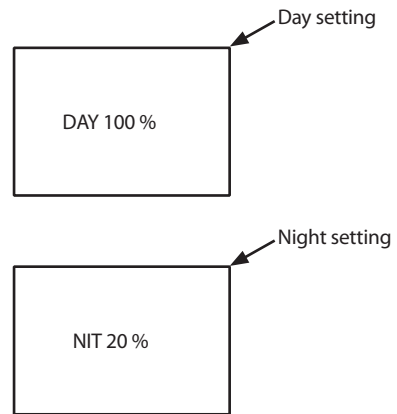
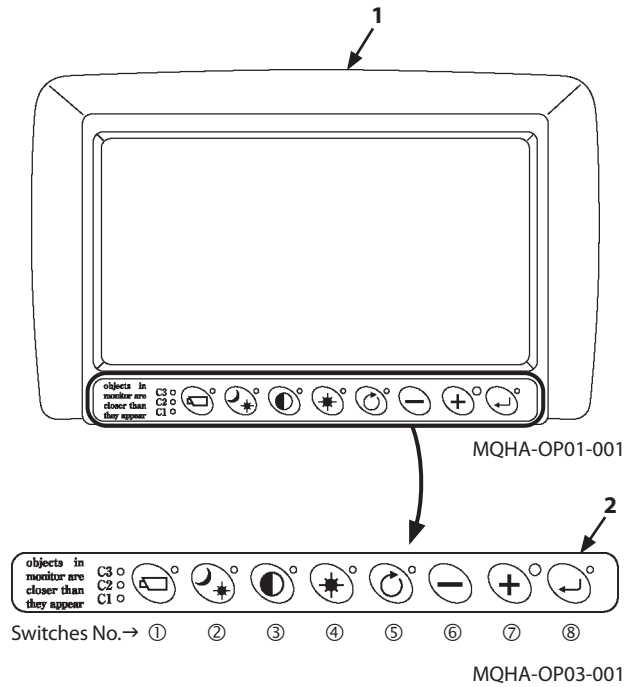
### How to set Day and Night backlight luminance

1. Select Day or Night setting mode by pushing the switch ②.
2. Push switch ⑥ (-) or ⑦ (+) to adjust luminance. Push switch ⑥ (-) to decrease and push switch ⑦ (+) to increases the backlight luminance.
3. The set value will be displayed in percent at upper left section of the screen.

### Factory Setting:

Backlight luminance: Day	100 %
Backlight luminance: Night	20 %

 **NOTE:** Changes in backlight luminance will be retained even when the mode is changed or the system is rebooted.

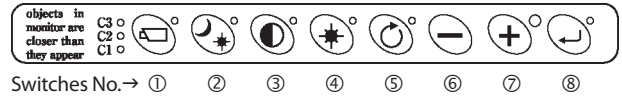


# OPERATOR'S STATION

- Switch ③: Contrast Adjustment

Contrast is the difference in brightness between brightest and darkest part of the image.

In high contrast, difference of highest and lowest brightness becomes significant, making the bright part and dark part clearer, but middle part becomes unclear. In low contrast, difference of highest and lowest brightness becomes smaller, making the bright part and dark part unclear.



MQHA-OP03-001

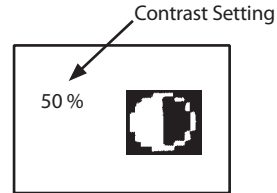
How to adjust contrast

1. Push contrast adjust switch ③ once to enter contrast adjustment mode.
2. Push switch ⑥ (-) to decrease the contrast, push switch ⑦ (+) to increase the contrast.

Factory Setting:

Contrast: 50 %

The set value will be displayed in percent at upper left section of the screen.



MQHA-OP03-012

- Switch ④: Brightness Adjustment

When the brightness is increased, luminance of monitor elements increases. And when the brightness is turned down, their luminance decreases.

This function is similar to the backlight effect of switch ②. Reduce the brightness if you feel the screen is too bright.

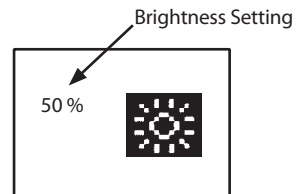
How to adjust brightness:

1. Push brightness adjust switch ④ once to enter brightness adjustment mode.
2. Push switch ⑥ (-) to decrease the brightness, push switch ⑦ (+) to increase the brightness.

Factory Setting:

Brightness: 50 %

The set value will be displayed in percent at upper left section of the screen.



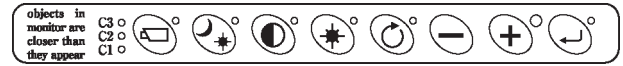
MQHA-OP03-013



## OPERATOR'S STATION

- Push switches ③ and ④ simultaneously: Saturation Adjustment

The saturation switch adjusts image colorfulness. When the saturation value is increased, image colorfulness increases, making the darker part of the image brighter. However, when the value is increased too much, the brighter part of the image saturates and it becomes white. When the saturation value is decreased, the image colorfulness decreases, making the brighter part unsaturated, but notice that the darker part becomes even darker.

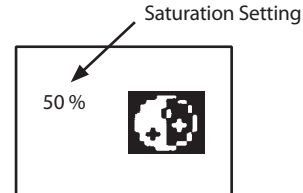


Switches No.→ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧

MQHA-OP03-001

How to adjust saturation:

1. Push switches ③ and ④ simultaneously to enter saturation adjustment mode.
2. Push switch ⑥ (-) to decrease the saturation, push switch ⑦ (+) to increase the saturation.



MQHA-OP03-014

Factory Setting:

Saturation: 50 %

The set value will be displayed in percent at upper left section of the screen.

- Switch ⑤: Do not use
- Switch ⑥: Minus (-) Switch
- Switch ⑦: Plus (+) Switch
- Switch ⑧: Standby mode switching switch  
Push switch ⑧ to enter the standby mode. In the standby mode, the monitor becomes blank. Push switch ⑧ again to exit the standby mode, and the image again is displayed on the monitor screen.

# BREAK-IN

---

## Break-in Period for New Machine

Machine life and performance will be greatly affected by the treatment during operation and maintenance of the machine, but especially so during the initial operation.

**IMPORTANT: Always correctly warm the machine up to operating temperatures before running the machine ! This is always a requirement for good machine life.**

**IMPORTANT: The machine must be operated appropriately as the new parts start to wear during the “break-in” period.**

**If the new machine is abused, especially during the beginning break-in period, it will significantly reduce the operative life of the machine.**

**This abuse can be in many forms, including, but not limited to, the following.**

- Overloading in any from:
  - Bucket
  - Ballast
  - At drawbar
  - Others
- Hitting unmovable objects
- Using brakes during operation and burning friction material
- Running hydraulic system pressure over relief setting pressures too often and heating the oil excessively
- Tractively twisting the boom arms or chassis
- Running through impassible terrain
- Not decelerating while changing machine direction
- Scaling out heavy materials like heavy rock while in forward motion, causing the bucket to catch and break free, and catch materials again
- Other types of poor treatment

The machine must never be abused, and must be treated carefully while during the break-in period.

- Operate and maintain the machine well
- Generously lubricate it, especially during the first 100 hours

## Work Mode for Break-in

For the first 100 hours of operation, avoid using the power mode and perform the following:

- Thoroughly walk around and inspect the machine for damage
- Warm up the machine after engine start up
- Avoid sudden starts and stops
- Moderately load the machine and operate modestly at below 2/3 capacity

 **NOTE:** Refer to page 1-74 for the power mode.



## OPERATING ENGINE

### Inspect Machine Daily Before Starting

**IMPORTANT: Make sure there are no oil and water leaks on the ground under the machine. If there is oil and water leakage, it may cause damage. Please check the cause immediately, and perform the maintenance.**

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 exhaust gas color and noise. 10. Check accelerator pedal operation.

## OPERATING ENGINE

Check Points	Check Contents
9. Chassis	<ol style="list-style-type: none"> <li>1. Oil level and leaks of the transmission and the axle.</li> <li>2. Level, leaks and contamination of the fuel tank. Drain fuel tank sump.</li> <li>3. Fuel leaks and damage of the fuel hoses and pipe lines.</li> <li>4. Level and leaks of the hydraulic oil tank.</li> <li>5. Operation, play and operating force of control levers and steering wheel.</li> <li>6. Operation of hydraulic equipment. Oil leaks and damage to pipings and hoses.</li> <li>7. Deformity, damage, and abnormal noise of each part.</li> <li>8. Washer fluid.</li> <li>9. Level, leaks and contamination of the DEF/AdBlue® tank.</li> <li>10. DEF/AdBlue® leaks of pipe lines and hoses.</li> <li>11. Clean around the aftertreatment device.</li> </ol>
10. Loader	<ol style="list-style-type: none"> <li>1. Oil leaks and damage to cylinders, pipe lines and hoses.</li> <li>2. Loose, wear and missing of the cutting edge.</li> <li>3. Wear and damage to the bucket.</li> <li>4. Condition of lubrication of the loader front.</li> <li>5. Damage to the pin lock bolts, stoppers and links.</li> <li>6. Loose and/or missing mounting bolts and nuts.</li> </ol>
11. Others	<ol style="list-style-type: none"> <li>1. Operation of instruments, switches, lights and buzzer/horn.</li> <li>2. Damage and deformation to the ROPS cab.</li> <li>3. Abnormal outside appearance of machine.</li> <li>4. Looseness of the battery terminals.</li> <li>5. Wear and damage to the seat belt.</li> <li>6. Damage to the step.</li> </ol>

# OPERATING ENGINE

## Check Before Starting

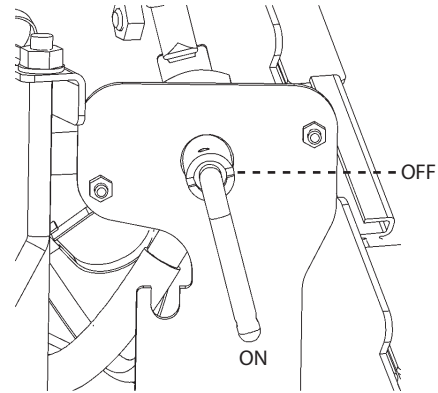
**CAUTION:** If your machine is equipped with forward/reverse selector switch (11), be sure to turn the switch in the OFF position before starting the engine to ensure safety.

1. If your machine is equipped with the battery disconnect switch, check that the switch is in the ON position.
2. Check that both forward/reverse lever (2) and forward/reverse switch (6) are in the neutral (N) position and neutral lever lock (3) is in the LOCK position.

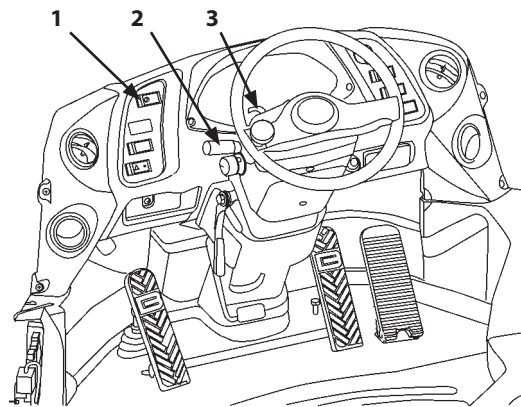
If your machine is not equipped with forward/reverse switch (6), set only forward/reverse lever (2) in the neutral (N) position.

**NOTE:** Unless forward/reverse lever (2) and forward/reverse switch (6) are in neutral (N), the engine will not start.

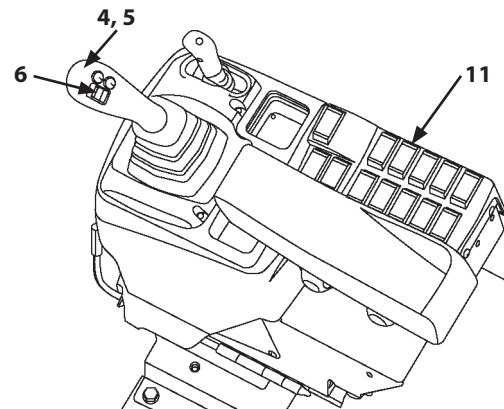
3. Check that parking brake switch (1) is in the ON position.  
After the engine starts and checking indicator bulbs (refer to page 3-5), check that the parking brake indicator is ON.
4. Check that control levers (4) and (5) are in the neutral (N) position.



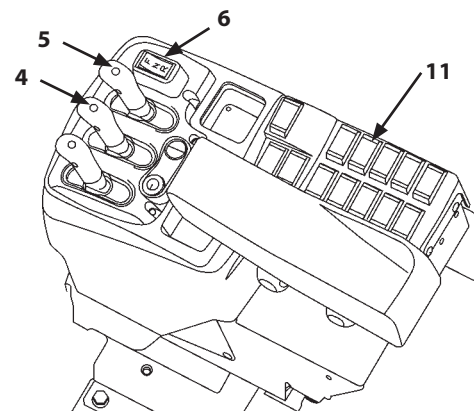
Battery Disconnect Switch MPTC-01-015



MNDB-01-002



Multi-Function Joystick Type MNEC-01-043

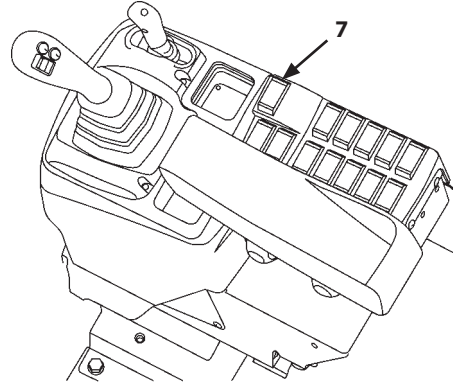


Fingertip Control Type MNDB-01-004

## OPERATING ENGINE

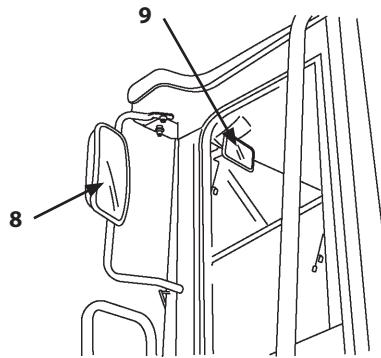
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5. Check that control lever lock switch (7) is in the LOCK (🔒) position.



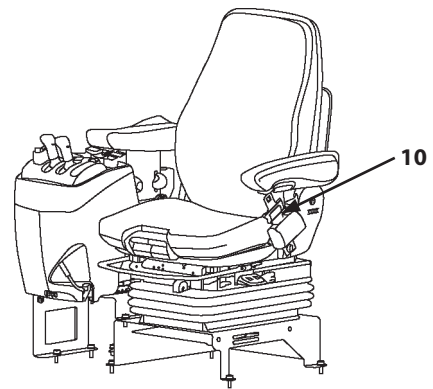
MNDB-01-005

6. Adjust the position of outside rear view mirror (8) and room rear view mirror (9) so that the best rear visibility can be obtained.



M4GB-01-126

7. 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.
8. Fasten seat belt (10).



MNEC-01-045

# OPERATING ENGINE

## Starting Engine

Follow the steps below to start the engine without depressing accelerator pedal (3).

1. Check that both forward/reverse lever (8) and forward/reverse switch (9) are in the neutral (N) position and neutral lever lock (10) is in the LOCK position.
2. Check that parking brake switch (1) is ON.
3. Turn key switch (2) ON.
4. Check indicator bulbs

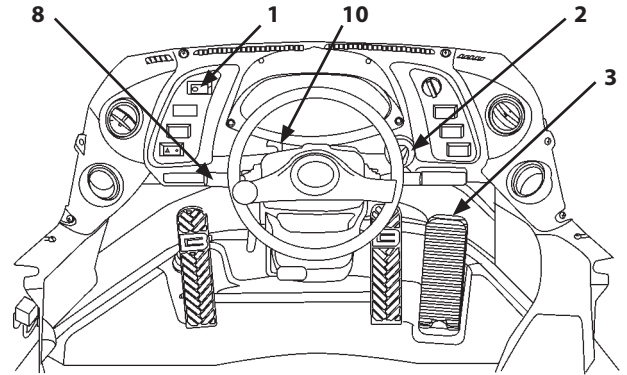
When key switch (2) is turned ON, all indicators and the warning lights come and stay ON for 2 seconds. Then, they go OFF afterward. Any indicator and/or warning light that fails to light at this time is a burned bulb.

However, the indicators for brake oil pressure (4) (when the brake pressure is low) and discharge warning indicator (5) will continue to stay ON, and it will go OFF only after the engine is started.

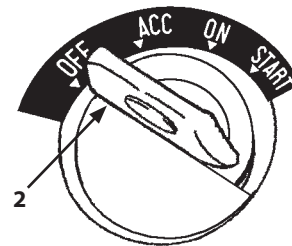
Preheating will automatically start with the key switch ON. Preheat indicator (6) will automatically come ON.

**IMPORTANT: When the machine is equipped with the secondary steering, ensure that low steering oil pressure indicator (11) is lit. If it is not lit, the secondary steering device has a malfunction. Contact your authorized Hitachi dealer for machine inspection. Low steering oil pressure indicator (11) goes off after the engine starts.**

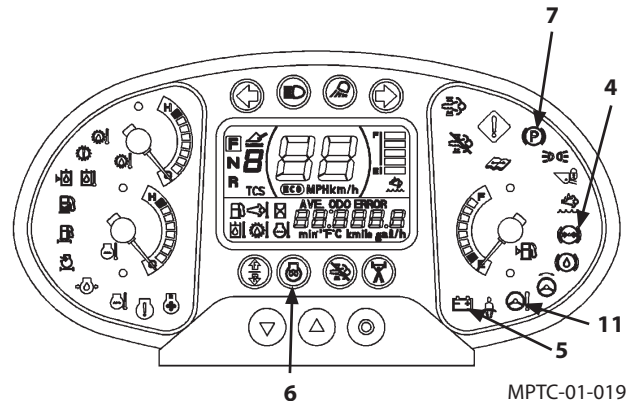
5. Check that parking brake indicator (7) and low steering oil pressure indicator (11) are ON. When the preheat lamp goes OFF (the engine has preheated), sound the horn to clear any personnel away from the area surrounding the machine.



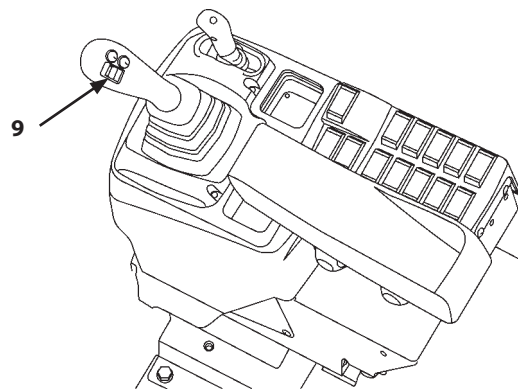
MNDB-01-001



MNDB-01-053



MPTC-01-019



MNDB-01-005



## OPERATING ENGINE

**IMPORTANT:** Never operate the starter for more than 10 seconds at a time. If the engine fails to start, return key switch to OFF. Wait for more than 30 seconds, then try again.

**Failure to do so may damage the starter or discharge the batteries.**

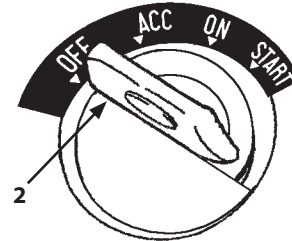
6. Turn key switch (2) to START position to rotate the starter. The engine will start.

Do not depress accelerator pedal (3) when starting the engine.

7. As soon as the engine starts, release the key switch.

The key switch will automatically return to the ON position.

After the engine starts, perform idling operation without depressing accelerator pedal (3) to warm up the machine.

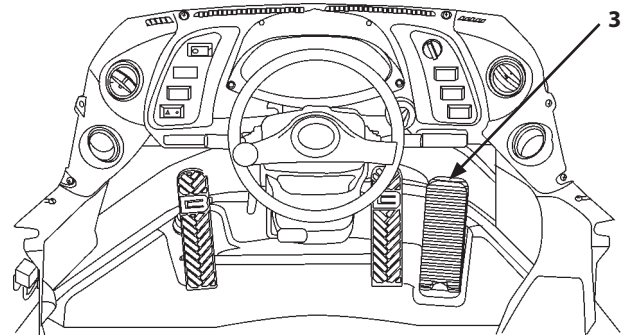


MNDB-01-053

**IMPORTANT:** Right after the engine starts, the engine speed will be kept to slow idle speed for maximum 35 seconds when the coolant, hydraulic oil or transmission oil temperature is low, or for 3 seconds at normal temperature 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 a crash.**



MNDB-01-001

**NOTE:**

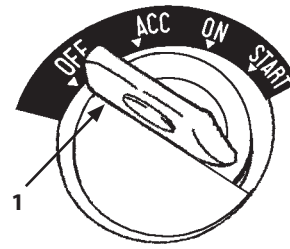
- If the machine is equipped with the secondary steering, the secondary steering auto-check sound may be heard after starting the engine.
- White smoke may occur for several minutes after the engine starts, this is not a malfunction.

# OPERATING ENGINE


## Starting in Cold Weather

### Preheating

1. Turn key switch (1) ON. The coolant 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.



MNDB-01-053

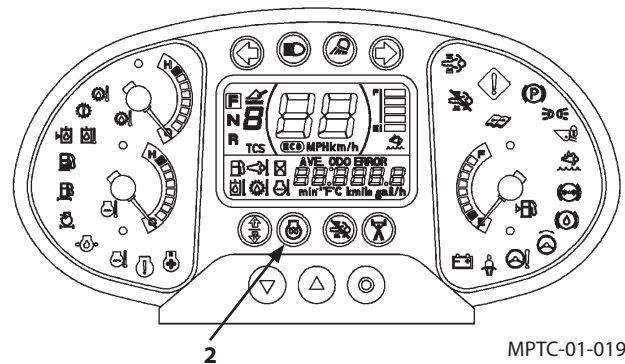
 **NOTE:** Preheating time varies depending on the coolant temperature.

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 3-11.

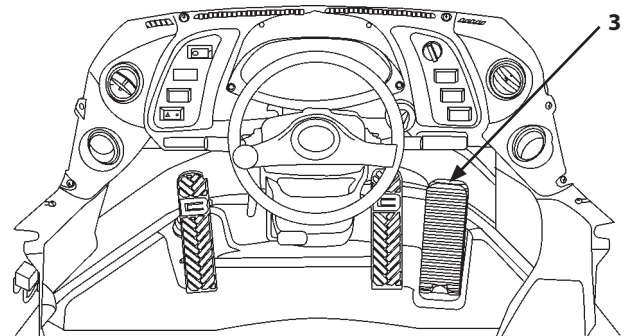


MPTC-01-019


**IMPORTANT:** Right after the engine starts, the engine speed will be kept to slow idle speed for maximum 35 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.



MNDB-01-001

 **NOTE:** Illumination such as headlight, work light or room light may become dim during the engine preheat operation at cold temperature.

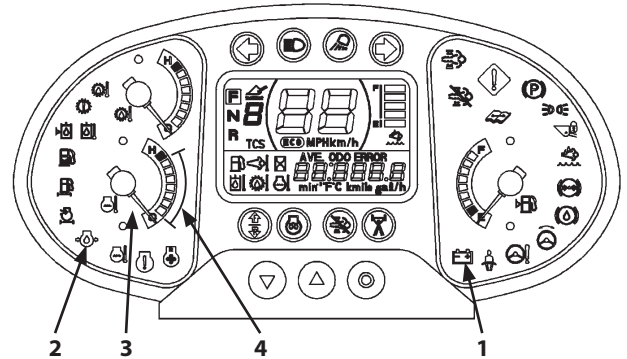
# OPERATING ENGINE

## Check After Starting

**IMPORTANT:** If any abnormality is found in the monitor functions, immediately stop the engine and investigate the cause of the trouble.

### Check the monitor operation:

1. Check that discharge warning indicator (1) is OFF.  
In case 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.  
In case 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 range (4).



MPTC-01-019

**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 occur for several minutes after the engine starts, this is not a malfunction.

## OPERATING ENGINE

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### Using Booster Batteries

**IMPORTANT:** The machine electrical system is a 24 volt negative (-) ground. Use only 24 volt booster batteries with sufficient capacity.

**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.



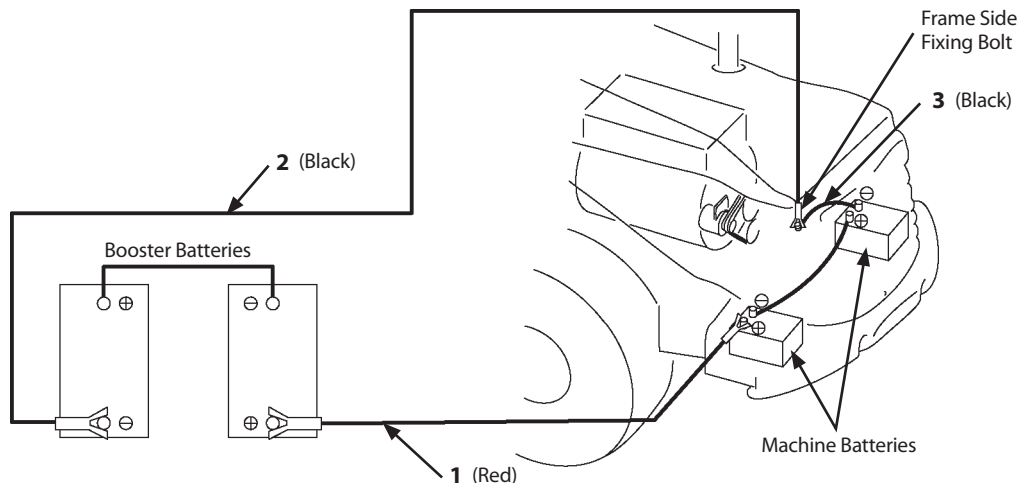
SA-032

## OPERATING ENGINE

1. Connecting the booster batteries
  - 1.1 Stop the engine on the booster battery mounted machine.
  - 1.2 Turn the battery disconnect switch to the OFF position.
  - 1.3 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.
  - 1.4 Turn the battery disconnect switch to the ON position.
  - 1.5 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 the bolt of black cable (3) on machine frame side that connects the negative (-) terminal of the machine battery and machine frame. In the last connection to the bracket, sparks may fly so keep the machine batteries as far away as possible from the bracket.
  - 1.6 After securely connecting the booster cables, start the engine on the booster battery mounted machine.
  - 1.7 Start the engine on the machine.
  - 1.8 After the engine starts, disconnect booster cables (1 and 2) in the following steps.

2. Disconnecting the booster cables

- 2.1 Disconnect black negative (-) cable (2) from the machine frame first.
- 2.2 Disconnect the other end of black booster cable (2) from the negative terminal of the booster batteries.
- 2.3 Disconnect one end of red booster cable (1) from the positive terminal of the booster battery.
- 2.4 Disconnect the other end of red booster cable (1) from the positive terminal of the machine battery.



## OPERATING ENGINE

### Warm Up

**IMPORTANT:** Right after the engine starts, the engine speed will be kept to slow idle speed for maximum 35 seconds when the coolant, hydraulic oil or transmission oil temperature is low, or for 3 seconds at normal temperature even if accelerator pedal (3) is operated.

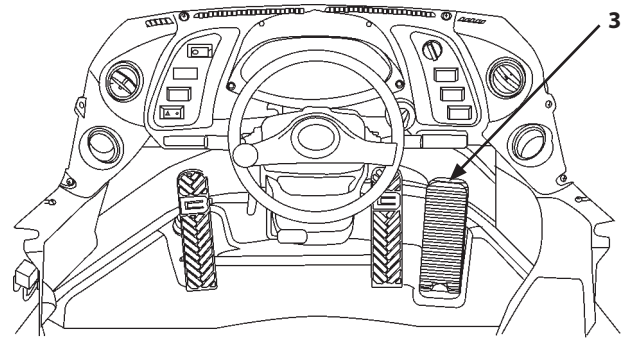
**WARNING:** After starting the engine, start the machine operation only after confirming that the engine speed changes by operating accelerator pedal (3).

Otherwise, the machine or the front attachment may unexpectedly start moving, possibly causing accidents such as a crash.

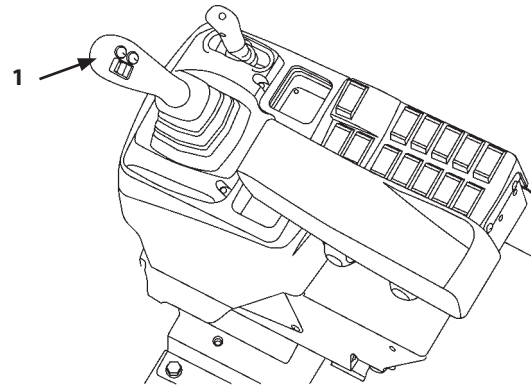
**CAUTION:** Operating the machine without warming up operation causes damage to the engine and hydraulic components. Be sure to perform warm up operation not only to protect the hydraulic components from being damaged but also to ensure safe operation.

If the machine is operated excessively with the hydraulic oil temperature below 20 °C (68 °F), damage to the hydraulic components may result. 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 accelerator pedal (3) for about 3 to 5 minutes without load.
2. Increase the engine at medium speed and raise the bucket above the ground. Alternately turn control lever (1) to the tilt position and the neutral position for 10 seconds. (Do not operate control levers other than the bucket control lever at this time.)



MNDB-01-001



MNDB-01-005

# OPERATING ENGINE

## Cold Weather Warm Up

**IMPORTANT:** At starting the engine, the engine RPM ( $\text{min}^{-1}$ ) is kept at low idle for maximum 35 seconds to warm up the coolant or hydraulic oil.

After this period, the engine RPM will increase by applying the accelerator pedal (3).

**WARNING:** Do not operate the machine while the engine RPM is being kept at low idle, otherwise, the machine or the front attachment could unexpectedly move that may result in serious injury.

**CAUTION:** In case the hydraulic oil temperature is low, perform cold weather warm up. Operate the machine only after loading linkage speed is normal. Operating the machine without warming up first 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.

1. Run the engine at slow idle speed for more than 5 minutes to warm up without stepping on accelerator pedal (3).

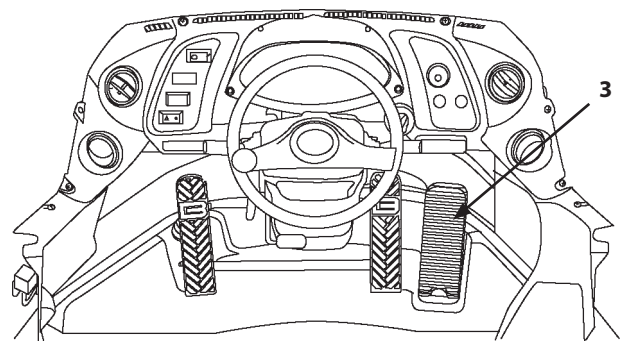
If the [Warm Up Operation] in the multi-monitor setting menu is set to "ON" (enabled), the engine speed automatically increases from slow idle to  $1000 \text{ min}^{-1}$  (rpm) and enters warm-up mode when hydraulic oil temperature is  $0 \text{ }^{\circ}\text{C}$  ( $32 \text{ }^{\circ}\text{F}$ ) or lower.

Further, when either hydraulic oil temperature reaches  $30 \text{ }^{\circ}\text{C}$  ( $86 \text{ }^{\circ}\text{F}$ ) or higher, or engine coolant temperature reaches  $40 \text{ }^{\circ}\text{C}$  ( $104 \text{ }^{\circ}\text{F}$ ) or higher, the warm-up mode is automatically canceled, and the engine runs in slow idle mode.

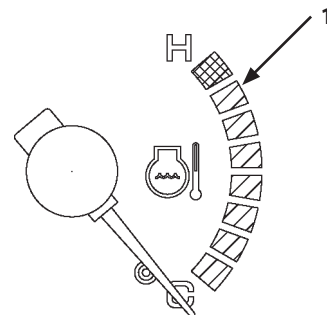
(Do not operate the machine until the needle of coolant temperature gauge (1) starts moving.)

### IMPORTANT:

- Do not subject the engine to sudden acceleration until the end of the warm-up period.
- Do not idle the engine for excessively long periods of time to prevent engine performance decrement.
- Long periods of idling (more than 10 minutes) can damage an engine because combustion chamber temperatures drop so low the fuel can not burn completely. This will cause carbon to form in the injector spray holes and on the piston rings and can result in stuck valves.



MNEC-01-036




MNEC-03-002


## OPERATING ENGINE

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2. Keep the engine running at low to medium speed for about 5 minutes more.

 *NOTE: At this time, do not operate the engine in slow or fast speed. Use medium engine speeds for safe and quick warm up.*


3. Fully extend the bucket cylinder.

 *NOTE: Do not continuously operate the bucket control lever for more than 10 seconds at a time. Do not bang linkage when cold.*

4. Slowly and fully retract the bucket cylinder.

 *NOTE: Do not continuously operate the bucket control lever for more than 10 seconds at a time. Do not bang linkage when cold.*

5. Repeat steps 2 to 4 above until the loading linkage speed is normal. When the air temperature is lower than 0 °C (32 °F), extend the warm up time by running the engine at about 1200~1500 min<sup>-1</sup> (RPM's).

 *NOTE: Headlights, working lights or room light may become dim during engine preheating in the cold environment.*



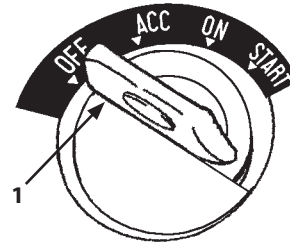
## OPERATING ENGINE

### Stopping 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.

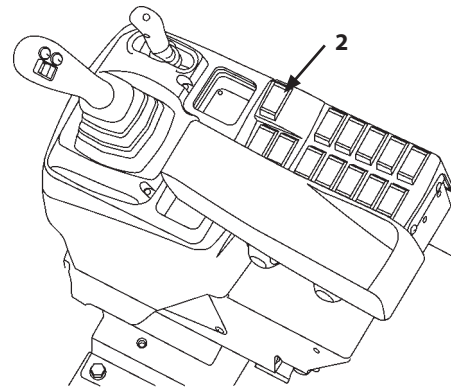


1. Lower the bucket before stopping the engine.

MNDB-01-053

**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. Press LOCK (Ⓛ) side of control lever lock switch (2).
4. Turn key switch (1) to OFF position to stop the engine.



MNDB-01-005

**IMPORTANT:** After stopping the engine, the DEF/AdBlue® pump keeps operating to return the DEF/AdBlue® in piping to the DEF/AdBlue® tank. Do not turn the battery disconnect switch OFF while pump running and wait 5 minutes or more after engine stops. Failure to do so may damage the SCR system.

# DRIVING MACHINE

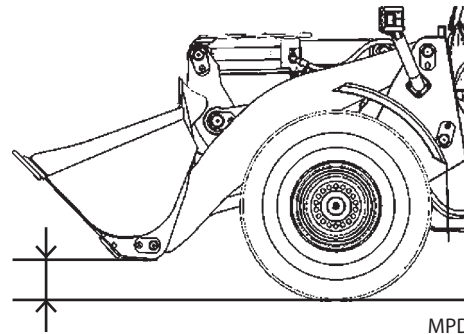
## Driving the Machine

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.

### Precautions for starting to move

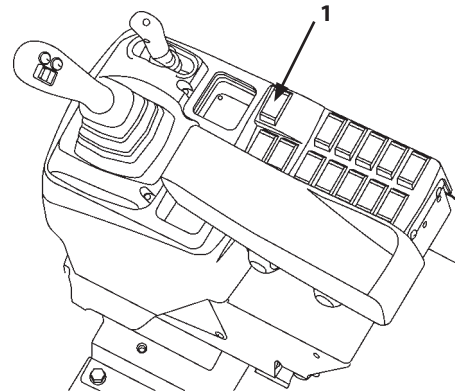
1. While checking the tires for abnormal air pressure and any obvious damage, make sure that there are no hazards and/or obstacles in and around the vicinity of the machine.
2. After raising the lift arm, set the machine to the driving position, fully tilt the bucket backward.
3. Before driving on public roads, set the machine to the driving position as illustrated to the right. Be sure to press LOCK (A) side of control lever lock switch (1) so that the linkage will not move even if the control levers are accidentally moved.
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 pages 3-11 and 3-12 for the warm-up operation.



MPD8-04-002

- A Driving Position (A)  
ZW140-6: 350~400 mm (13.8~15.7 in)  
ZW150-6/150PL-6: 420~470 mm (16.5~18.5 in)



MNDB-01-005

# DRIVING MACHINE

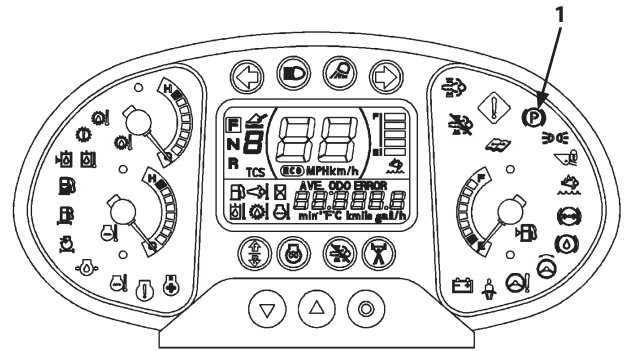
## Starting to Move

**WARNING:** Start to move the machine only after checking that no personnel and/or obstacles are present around the machine.

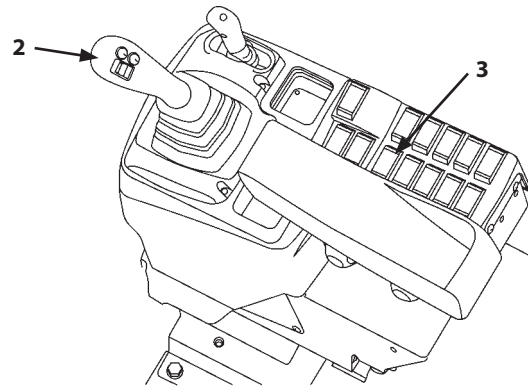
Never turn ride control switch (3) to ON position when traveling the machine or raising the bucket. Before turning the ride control switch (3) ON, stop the machine and confirm the safety around the bucket. Avoid turning ride control switch (3) to ON position while traveling the machine. Failure to do so may automatically move the lift arm up or down.

Refer to page 1-79 for detailed information of ride control switch (3).

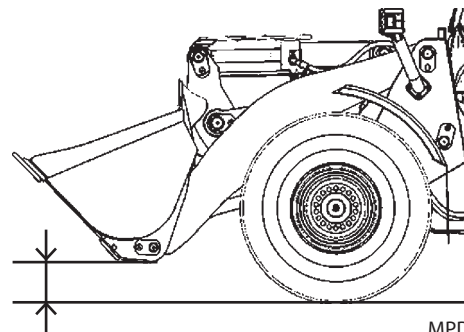
1. Check that none of the warning indicators except parking brake indicator (1) on the monitor panel is ON.
2. Set the front attachment in the driving position by operating control lever (2).
3. Turn neutral lever lock (4) to the UNLOCK (🔓) position.



MPPKCC-001-00199

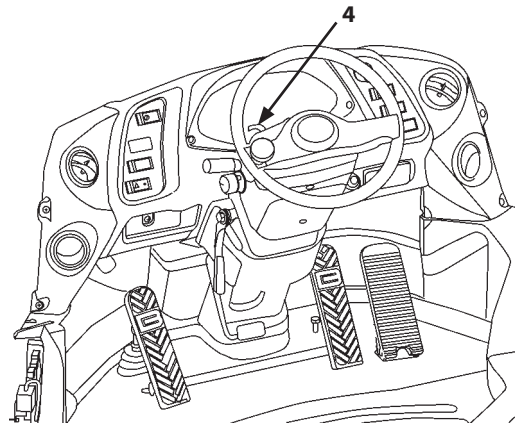


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MPD8-04-002

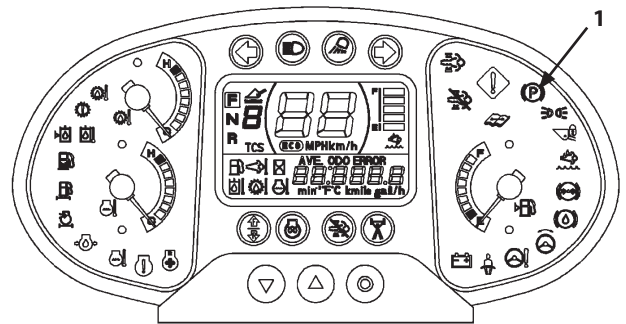
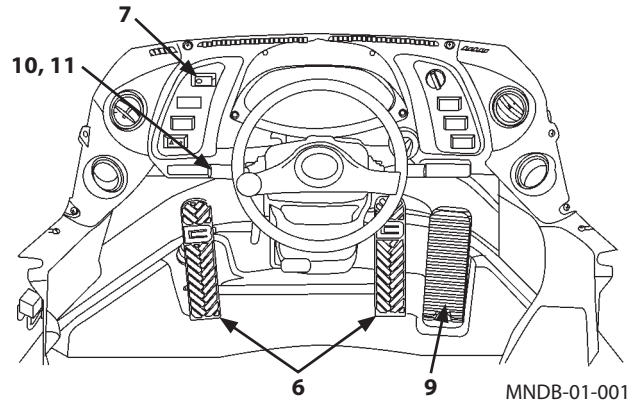
- A Driving Position (A)  
ZW140-6: 350~400 mm (13.8~15.7 in)  
ZW150-6/150PL-6: 420~470 mm (16.5~18.5 in)



MNDB-01-002

## DRIVING MACHINE

- Step on brake pedal (6) and press parking brake switch (7) to the OFF position to release the parking brake. Check that at this time parking brake indicator (1) goes OFF.
- After moving forward/reverse lever (10) to either forward (F) or reverse (R) position, move shift switch (11) 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.
- Release brake pedals (6) and step on accelerator pedal (9) to start traveling.

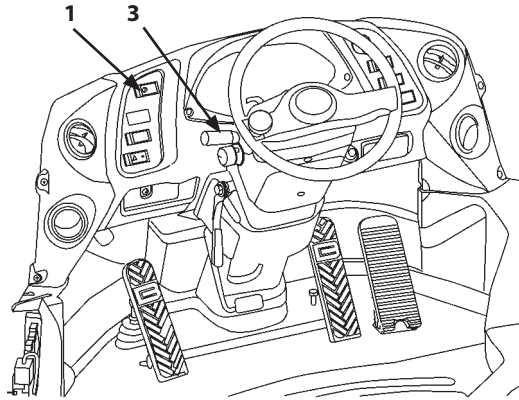


# DRIVING MACHINE

## 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 your authorized dealer.

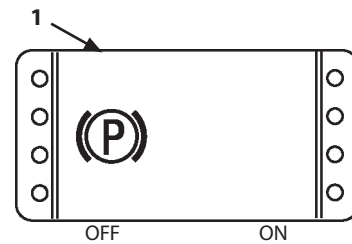


MNDB-01-002


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.

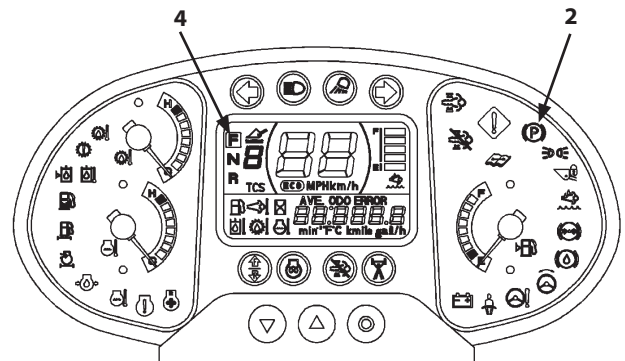
Operate the parking brake after parking the machine on level ground.



MNEC-01-058

 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". The display will not indicate "F" and "R" until the parking brake is released.
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.



MPTC-01-019


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. Then, push the OFF position parking brake switch (1) to release the parking brake.

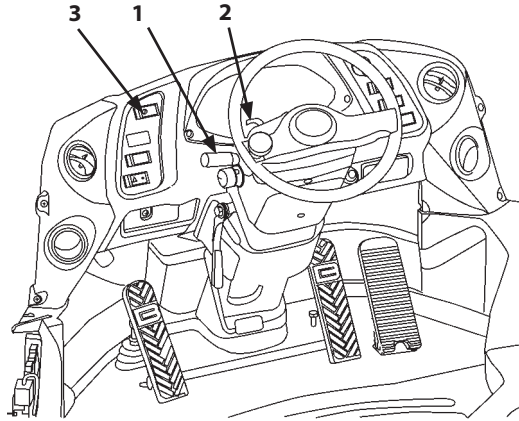
# DRIVING MACHINE

## Drive Speed Change

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.



MNDB-01-002

## 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 or slower if the gear is in 3rd or 4th speed position.

1. Pull neutral lever lock (2) to the UNLOCK position.
2. Press the OFF position of parking brake switch (3).
3. Move forward/reverse selector lever (1) to the desired position.

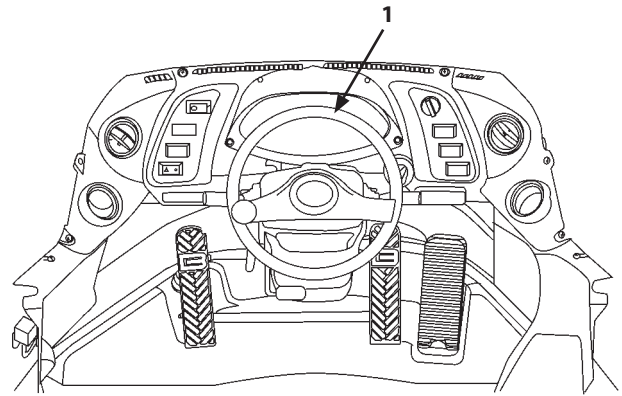
- F : Forward Driving
- N : Neutral
- R : Reverse Driving

# DRIVING MACHINE

## 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, steering wheel (1) will lock and the parking brake will be applied so that steering will be impossible. Never stop the engine while traveling the machine.
- Never steer while raising the lift arm high as it is extremely dangerous and may cause the machine to turnover.



MNDB-01-001

**IMPORTANT:** When steering wheel (1) is fully turned, the front and the rear frames come in contact with the stoppers so that steering wheel (1) does not rotate further. If steering wheel (1) is forcibly turned further, the engine may stall or malfunction of the steering system may result.

Turn steering wheel (1) 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 steering wheel (1) slowly so as to follow the motion of the machine.

# DRIVING MACHINE

## Secondary Steering (Optional)

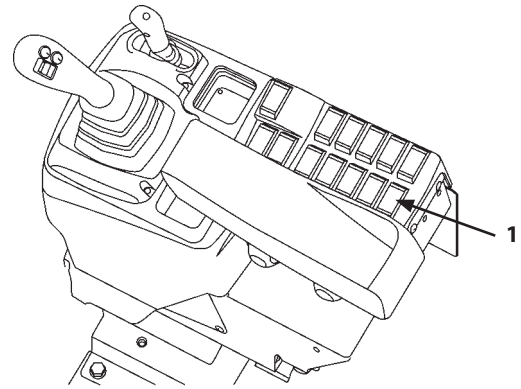
If the oil pressure in the steering system lowers, the secondary steering system is activated so that steering operation can be achieved.

If the secondary steering system is activated, secondary steering indicator (2) 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. Then, contact your authorized dealer.

The secondary steering can be used for 60 seconds.

**IMPORTANT: The secondary steering system is provided for a provisional use. If continuously used for more than 60 seconds, damage to the system may result.**



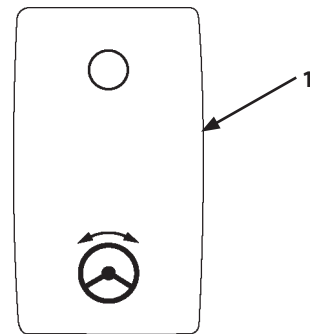
MNDB-01-005

Even though the machine is equipped with the secondary steering system, if the steering function becomes inoperable during drive operation, press secondary steering check switch (1) on the right console to activate the secondary steering system. Then, immediately park and stop the machine in a safe location.

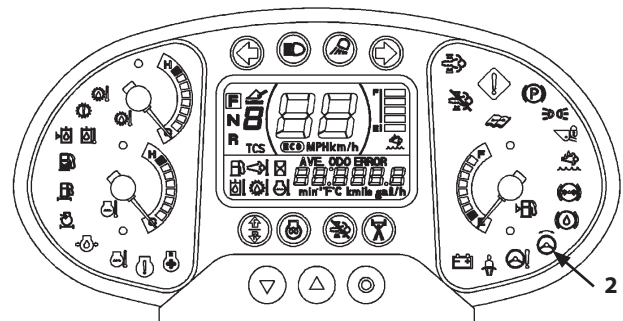
When the secondary steering system is activated by pushing secondary steering check switch (1), the secondary steering can be used for 30 seconds.

 **NOTE:**

- The secondary steering auto-check sound may be heard for two seconds after starting the engine.
- Before operating the machine, press secondary steering check switch (1) to confirm that the secondary steering pump operates normally.



MNEC-01-020



MPTC-01-019



# DRIVING MACHINE

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## 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. In case 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. Then, after rectifying the position of lift arm and bucket, begin driving the machine again. Always allow the machine to maintain correct drive position.

# DRIVING MACHINE

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## Precautions for driving

During drive operation, observe the general operating manners beside the precautions described below to ensure safe and correct operation.

### WARNING:

- **In case 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 notified while driving, immediately stop the engine and inspect the machine for any trouble.
- Avoid using sudden steering or braking as much as possible because not only own machine but also other machines may become involved in a hazardous condition.
- Driving speeds of this machine are lower than most normal automobiles. Always give the right of way to automobiles.
- 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 MACHINE

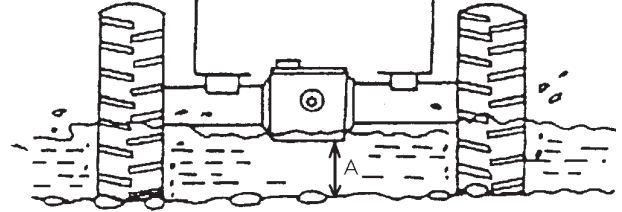
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### Driving in Water or on Soft Ground

**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 your 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 in case the river bed is feared to be 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.

In case 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 restart 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.
- In case the hydraulic oil and lubricant temperatures are low, the machine gradeability may decrease. Before climbing a steep slope, sufficiently perform the warm up operation of the machine.

# DRIVING MACHINE

## Precautions for Driving Speeds

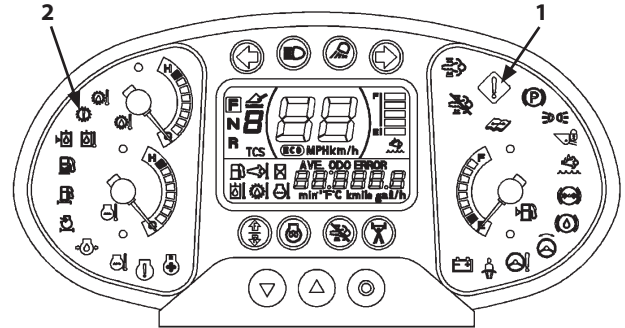
**CAUTION:** Descend the machine on a steep slope with the shift switch in the slow drive gear range while depressing the brake pedal (normal brake) if necessary as well as applying engine brake sufficiently. Traveling for a long time without reducing the speed will create the causes of various machine troubles.

When the machine travels faster than the speed set at each speed gear range, service indicator (1) and the HST warning indicator (2) flash, the buzzer sounds. When the indicator flashes and the buzzer sounds, release the accelerator pedal in order to reduce the speed.

### Speed Control Function

This controls the speed in order to prevent from overrunning (faster than the warning setting speed).

Travel Speed	Warning Setting Speed	HST Warning Indicator (2)	Service Indicator (1)	Buzzer
1-Speed	Approx. 14km/h	Flashing	Flashing	Intermittent
2-Speed		↑	↑	↑
3-Speed	Approx. 24km/h	↑	↑	↑
4-Speed	Approx. 42km/h	↑	↑	↑



MPTC-01-019

## DRIVING MACHINE

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### 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.

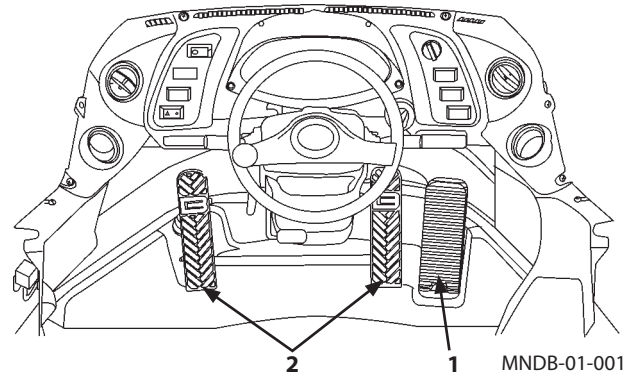
 **WARNING: Do not spill oil on the road surface. Failure to do so may cause the following vehicle to slide, possibly creating a serious accident.**

- In case of hydraulic oil leaks, immediately repair the machine. If the road surface is severely covered with oil, take the highest priority to notify the following vehicles of this danger. Then, remove the leaked oil as soon as possible.
- In case repairing the machine by yourself is impossible, contact your authorized dealer.
- Repair work in the tunnel is very dangerous. Avoid working outside the vehicle even simple tasks.

# DRIVING MACHINE

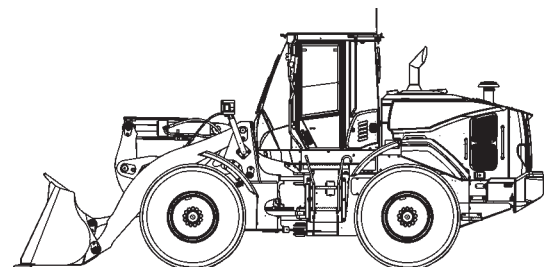
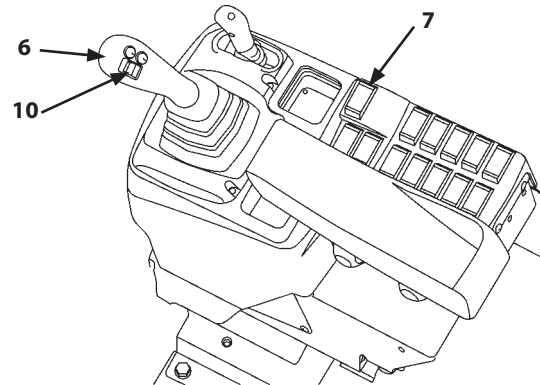
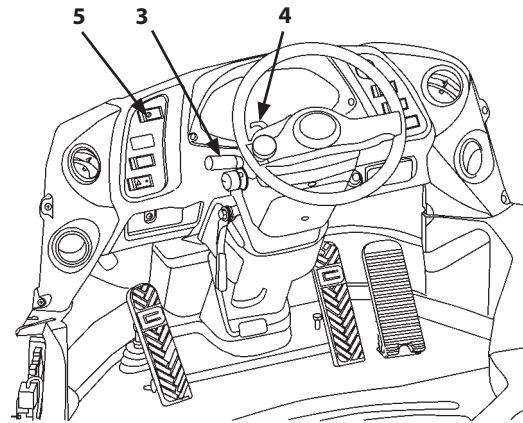
## Stop the Machine

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) and forward/reverse switch (10) 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 control lever (6).
5. Press LOCK (🔒) side of control lever lock switch (7).



**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.



Stop and Parking Position

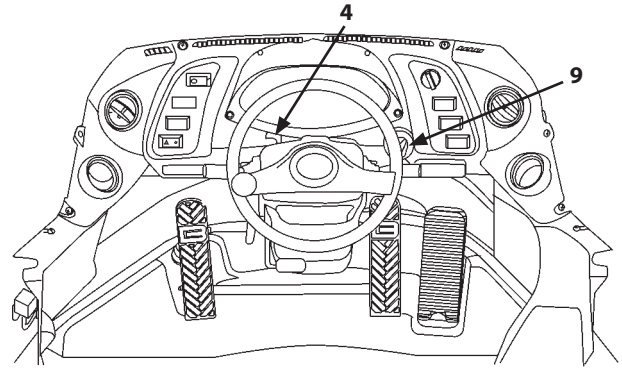
MPTC-04-001

## DRIVING MACHINE

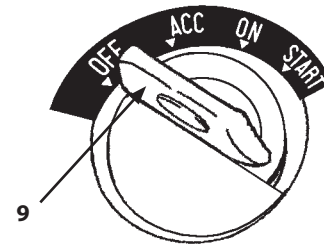
**IMPORTANT: Do not leave the machine by turning key switch (9) in ACC position. Failure to do so may discharge the batteries.**

**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.



MNDB-01-001



MNDB-01-053

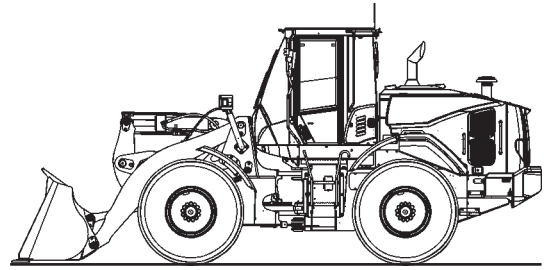


# DRIVING MACHINE

## 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.

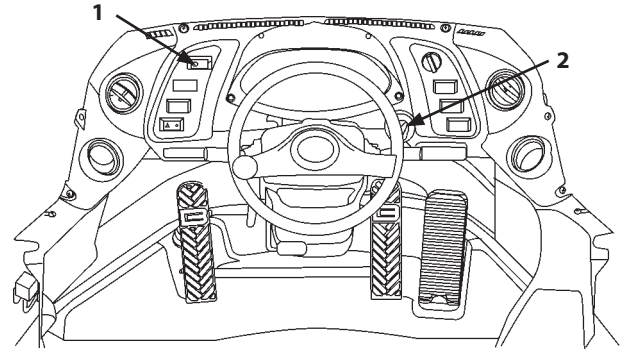


Stop and Parking Position

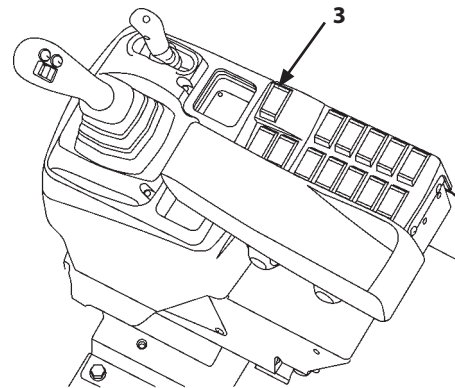
MPTC-04-001

**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.

3. Run the engine at low idle speed to cool the engine for 5 minutes.
4. Press LOCK (Ⓛ) side of control lever lock switch (3).
5. Turn key switch (2) to OFF position to stop the engine. Remove the key from the switch.
6. Before leaving the machine, close and lock all the windows, cab doors, and covers.



MNDB-01-001



MNDB-01-005

## DRIVING MACHINE

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### 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.  
In case a complicate failure has occurred, consult your authorized dealer.

# DRIVING MACHINE

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## MEMO

A series of horizontal dotted lines for writing a memo.

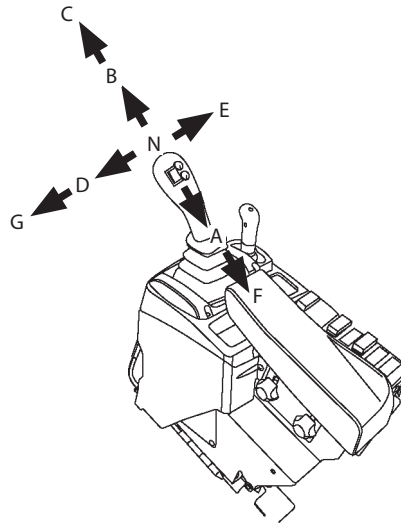
# OPERATING MACHINE

## Control Lever

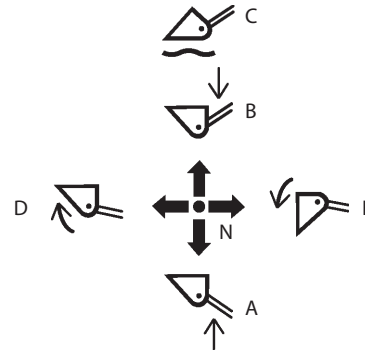
### Multi-Function Joystick Lever

The multi-function joystick lever is used to operate the lift arm and/or bucket.

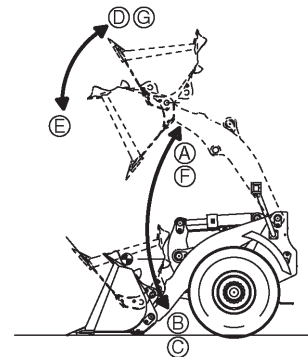
Lever Position	Lift Arm/Bucket Operation
C	Float: The lift arm free falls and can be moved as loads are applied.
B	Lift Arm Lower
N	Hold: The lift arm is stopped and held in that position.
A	Lift Arm Raise
F	Detent: The lift arm is held in the raise position.
G	Detent: When the multi-function joystick lever is moved from the bucket dump position to the bucket tilt position, the multi-function joystick lever is maintained in this position.
D	Bucket Tilt: The bucket is tilted back, taking the transportation position.
N	Hold: The bucket is stopped and held in that position.
E	Bucket Dump: The bucket is tilted forward to dump the bucket load.



MNEC-01-059



M4GB-01-074



M4GB-01-073

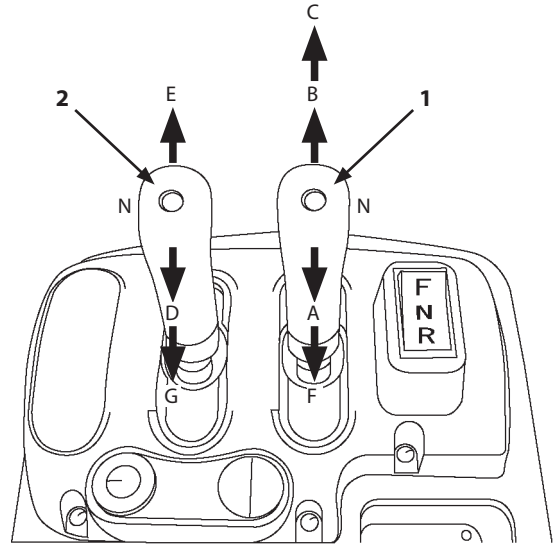
# OPERATING MACHINE

## Fingertip Control Type

The fingertip control lever is used to operate the lift arm and/or bucket.

### Lift Arm Control Lever (1)

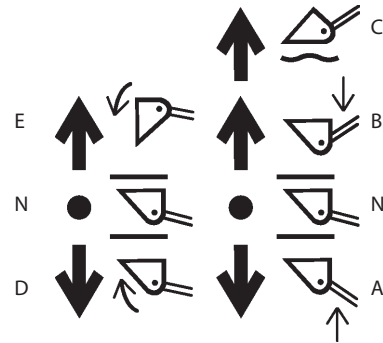
Lever Position	Lift Arm Operation
C	Float: The lift arm free falls and can be moved as loads are applied.
B	Lift Arm Lower
N	Hold: The lift arm is stopped and held in that position.
A	Lift Arm Raise
F	Detent: The lift arm is held in the raise position.



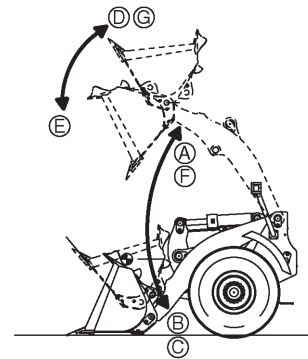
MNEC-03-003

### Bucket Control Lever (2)

Lever Position	Bucket Operation
E	Bucket Dump: The bucket is tilted forward to dump the bucket load.
N	Hold: The bucket is stopped and held in that position.
D	Bucket Tilt: The bucket is tilted back, taking the transportation position.
G	Detent: When the bucket control lever is moved from the bucket dump position to the bucket tilt position, the bucket control lever is maintained in this position.



M4GB-01-072




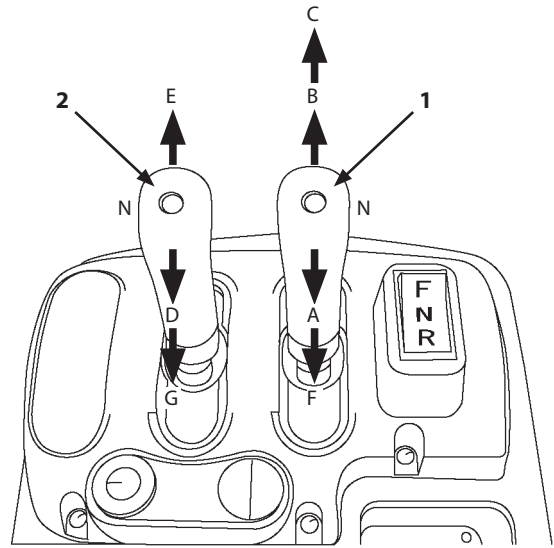
M4GB-01-073

## OPERATING MACHINE

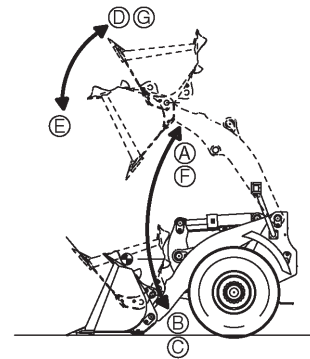
 NOTE:

1. Further pull lift arm control lever (1) from "Raise" position (A), the lever is held in the position (F) until the lift arm moves to the position preset by the lift arm kickout. When the lift arm moves the preset position, lift arm control lever (1) automatically moves to the Hold (N) position.
2. Further turn bucket control lever (2) from "Tilt" position (D) after bucket dump operation, the lever is held in the position (G) until the bucket moves to the position preset by the bucket auto leveler. When the bucket moves to the preset position, bucket control lever (2) automatically moves to the Hold (N) position.
3. When pushing down lift arm control lever (1) to the "Float" position (C), the lift arm moves to the position preset by lift arm auto-leveler system and is held in the position. When the lift arm moves to the preset position, lift arm control lever (1) automatically moves to the "Hold" (N) position. (Machine is equipped with the lift arm auto-leveler system)

 NOTE: When operating the machine in Float (C) position, first hold the lift arm at the float position; then further tilt the lever to the Float position, and lower the lift arm on the ground.



MNEC-03-003



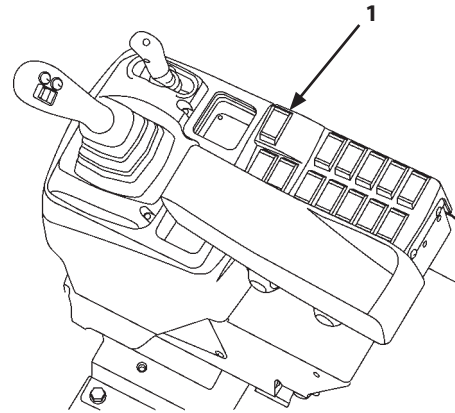
M4GB-01-073

# OPERATING MACHINE

## Control Lever Lock Switch

### WARNING:

- Ensure that control lever lock indicator (2) on the monitor panel is ON when control lever lock switch (1) is in LOCK (🔒) position, and indicator (2) is OFF when control lever lock switch (1) is in UNLOCK (🔓) position. In the case where indicator (2) does not go ON or OFF, the control lever lock system may be damaged. When the machine is operated with the damaged control lever lock system, serious injury or death may result. Consult your authorized dealer.
- Be sure to press LOCK (🔒) side of control lever lock switch (1).
- Before leaving the operator's seat, be sure to stop the engine. Then, set control lever lock switch (1) to the LOCK (🔒) position.
- Always check to be sure that control lever lock switch (1) is set in the LOCK (🔒) position before transporting the machine or leaving the machine at the end of the shift.



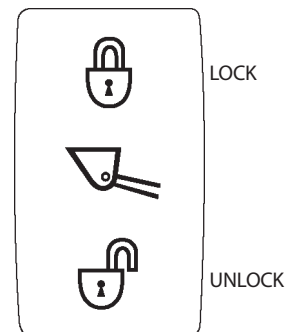
MNDB-01-005

Control lever lock switch (1) is provided to prevent the machine unexpectedly 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 UNLOCK (🔓) position, the control lever becomes operable.

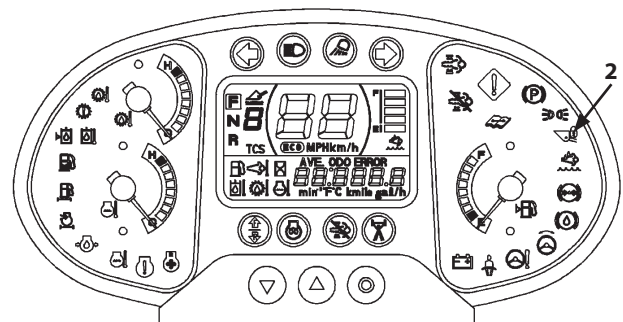
### Control Lever Lock Switch Operation

- 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). Ensure that control lever lock indicator (2) on the monitor panel is ON.
- Before starting operation:

Before starting operation, check that control lever lock switch (1) is in the UNLOCK (🔓) position.



MNEC-01-015



MPTC-01-019

## OPERATING MACHINE

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### 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 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.




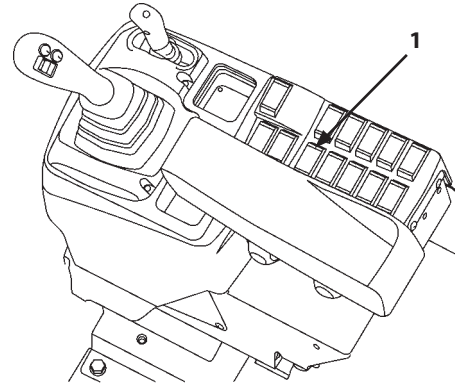
# OPERATING MACHINE

## AUTO

When ride control switch (1) is turned to AUTO, the drive speed sensor and the controller is activated. Then, 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 ride control switch (1) is turned to AUTO mode, ride control indicator  (2) on the monitor display comes ON.

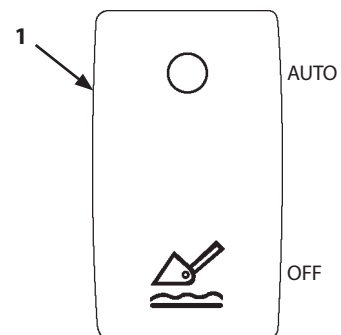


MNDB-01-005

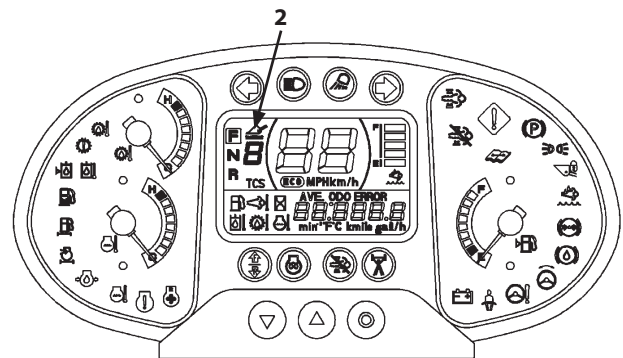
## OFF

When ride control switch (1) is turned OFF, ride control indicator (2) on the monitor display goes OFF and 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.



MNEC-01-022



MPTC-01-019

## OPERATING MACHINE

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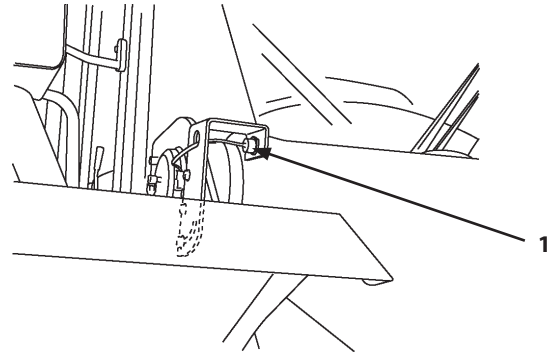
### Lift Arm Kick Out

**⚠ WARNING:**

- Take extra care to prevent personal injury and/or death when adjusting the lift arm kick out system.
- 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.

The lift arm kick out system automatically stops the lift arm at the preset height when raising the lift arm. (When shipping the machine from the factory, the kick out system is adjusted so that the lift arm is stopped at a slightly lower position than the maximum height.)

Adjust the lift arm stop position by moving the position of proximity switch (1), When adjustment is required, consult your authorized dealer.



M4GB-05-002

# OPERATING MACHINE

## 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.

### Lift Arm Auto Leveler Function

#### Switch

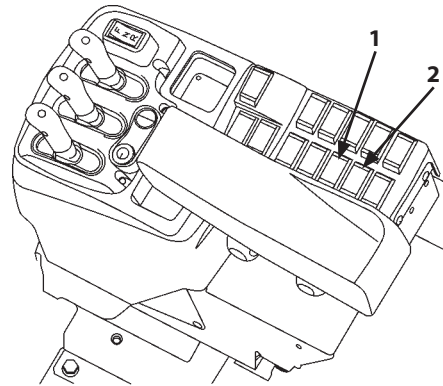
- SET (4 and 8): Presets the lift arm stop position.
- ON (5 and 9): Stops the lowering lift arm at the specified height.
- OFF (6 and 10): Deactivate the lift arm auto leveler function.

#### Presetting of lowering lift arm stop position

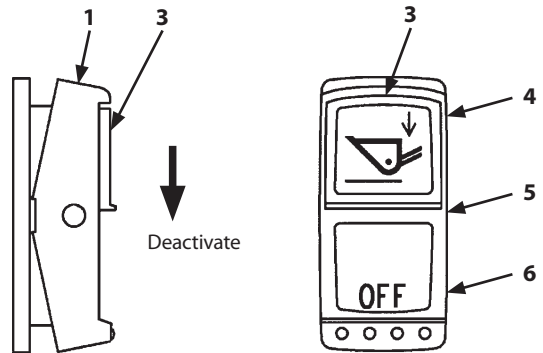
1. Hold the lift arm in the position at which the lowering lift arm is desired to stop.
2. While deactivating lock switch (3) on lift arm auto leveler switch (lowering) (1), press SET side (4).

#### Presetting of raising lift arm stop position

1. Hold the lift arm in the position at which the raising lift arm is desired to stop.
2. While deactivating lock switch (7) on lift arm auto leveler switch (raising) (2), press SET side (8).



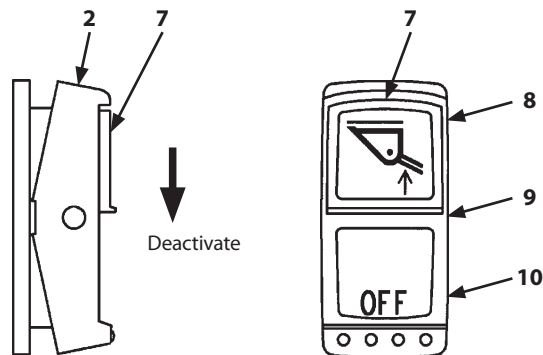
MNDB-01-004



MNDB-01-022

Downward

MNDB-01-021



MNDB-01-022

Upward

MNDB-01-023

# OPERATING MACHINE

## Bucket Auto Leveler

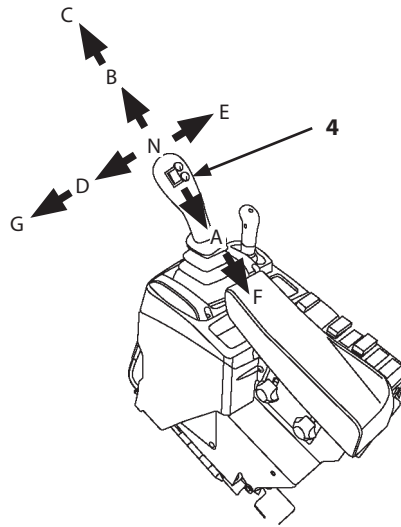
### WARNING:

- Pay attention to safety to avoid personal injury and/or death when adjusting the bucket auto leveler.
- Stop the engine. Lower the loader front on the ground to release oil pressure.
- 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.

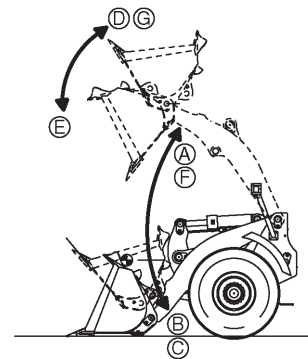
The bucket auto leveler automatically stops the bucket movement at the preset digging angle. (When the machine is shipped from the factory, the bucket positioner is preset so that the bucket is stopped with the bucket bottom parallel with the road surface.)

For example, after discharging material into a truck or a hopper, when control lever (4) is placed to detent position (G), the lever is held in that position. Then, when the bucket is returned to the preset angle position, the bucket is automatically stopped and the lever is returned to hold (N).

The bucket auto leveler is preset so that when the bucket bottom becomes parallel with the road surface, the bucket is stopped. Nevertheless, when required to tilt the bucket forward or backward more than level position, adjust the bucket auto leveler by moving the mounting position of the proximity switch.



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M4GB-01-073

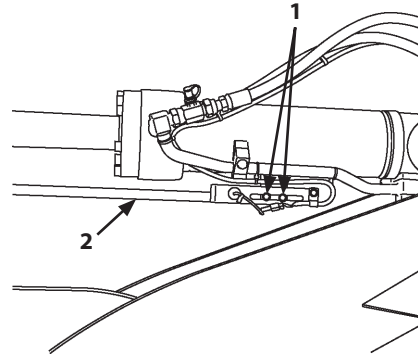
## OPERATING MACHINE

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### Adjustment Procedures

**IMPORTANT:** Do not operate the machine with the bucket dumped more than 10°. Avoid applying great towing force to the bucket cutting edge.

1. After moving the bucket to the desired digging angle, stop the engine.
2. Loosen bolts (1) of the proximity switch mounting bracket. Slide the end edge of leveler bar (2) up to the center of the sensitive area (orange color). Then, tighten bolts (1).
3. After adjustment start the engine. Check that the bucket can be stopped at the preset angle position.



M4FC-05-001

## OPERATING MACHINE

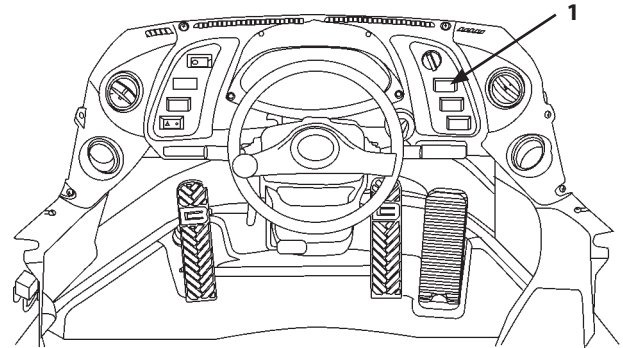
### Auto Shut-Down (Idling Stop)

**⚠ WARNING:** This function automatically stops the engine. Take extra care on the work and work environment when using this function.

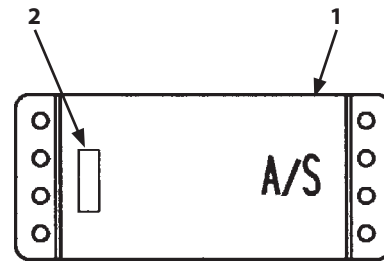
When pressing auto shut-down (idling stop) switch (1), the auto idling stop function is ON and auto shut-down (idling stop) indicator (2) lights.

When the auto idling stop function is ON (enabled), the engine automatically stops after the preset time from the state in which the following conditions are met: The parking brake switch is turned ON, the forward/reverse lever (switch) is set in neutral (N) position, and the brake pedal or accelerator pedal is not depressed. (Refer to the descriptions in the next page for the detail operating condition.) 30 seconds before the engine stop, the buzzer sounds. The buzzer sounds once at 30 seconds before, intermittently sounds from 15 seconds, and then stops after 15 seconds. The auto idling stop 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, or the brake pedal or the accelerator pedal is depressed to release it.

**IMPORTANT:** Ensure the ON or OFF status of auto shut-down (idling stop) indicator (2). If the indicator is ON, the auto idling stop function will be activated.



MNDB-01-001



MNDB-01-018

## OPERATING MACHINE

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### Auto Idling Stop 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 idling stop 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 idling stop. Failure to do so may discharge the batteries.**
- **When the key switch is turned to OFF position while the auto idling stop function is ON, the setting will be reset. When it is required to keep the setting, consult your authorized dealer.**

# OPERATING MACHINE

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## 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.

## Precautions for Operation

### WARNING:

- Confirm work site safety before starting any operations.
- Use the machine equipped with FOPS and ROPS if the machine is to be operated in the areas where the possibility of falling stones exists.
- If operation on soft ground is required, operate the machine only after reinforcing the ground.
- Be sure to wear close fitting clothing and safety equipment appropriate for the job, such as a hard hat, etc. when operating the machine.
- Clear all persons and obstacles away from the area of operation and machine movement. Always be aware of the area around the machine while operating.

## Ensure Safety When Operating on Road Shoulders

- ### CAUTION: Reinforce the ground before operating the machine on soft road shoulders.



## OPERATING MACHINE

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### Avoid Overloading

 **WARNING:**


- Do not penetrate the bucket into piles of soil and/or gravel at fast travel speed to avoid personal accidents.
- Avoid excavating or scooping loads when the machine is articulated, which could possibly cause the machine to turn over.

**IMPORTANT:** Avoid abusive machine operation by allowing the bucket or attachment to receive biased loads at only one side. Damage to the machine may result.

### Avoid Rapid Steering Changes and/or Sudden Braking

 **WARNING:** Always maintain a flat work site surface. Avoid rapid steering changes and sudden braking while raising the lift arm with the bucket loaded to prevent the machine from turning over.

### Avoid Operation with Biased Loads

 **WARNING:** Avoid abusive machine operation by allowing the bucket to receive biased loads at only one side, dozing or steering the machine with the front tires raised off the ground. Turning over of the machine or deformation of the working devices such as the lift arm may result.

## OPERATING MACHINE

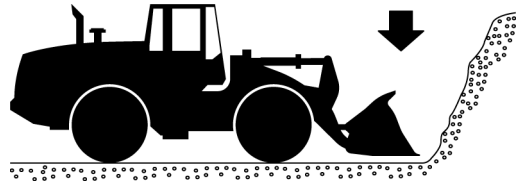
### Excavation

#### Loading Accumulated Soil

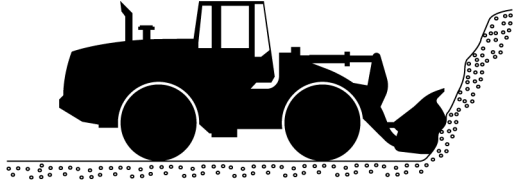
**IMPORTANT:** Avoid operating the machine with the front wheels raised off the ground. Machine traction force is reduced and excessive loads are applied to the undercarriage.

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.

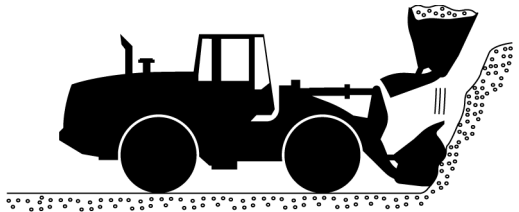
1. Level the bucket with the surface of the ground. Penetrate the bucket into the accumulated soil while driving the machine forward.
2. After the bucket has sufficiently penetrated the soil, raise the lift arm while driving the machine forward further and occasionally tilt the bucket back to fill the 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.



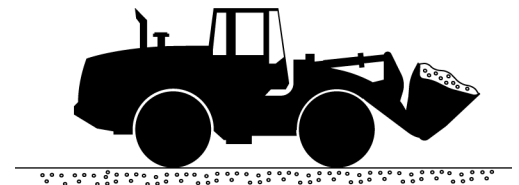
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M4GB-05-004



M4GB-05-005



M4GB-05-006

## OPERATING MACHINE

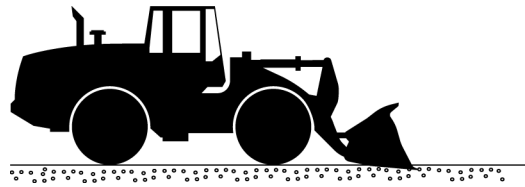
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### Digging and Loading Level Ground

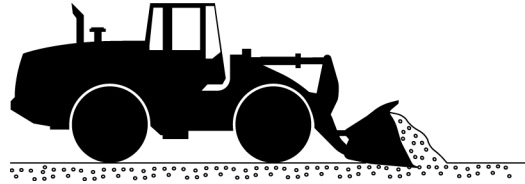
**IMPORTANT:** While excavating with the bucket or fork, never apply excessive traction force to the tooth tips with the bucket or fork tilted more than 10°. Failure to do so may result in cracks or damage to the front attachment.

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 one side of the bucket.

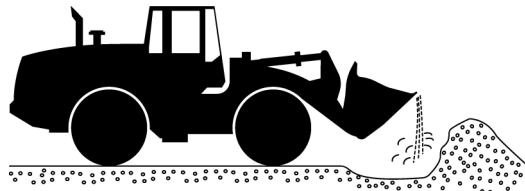
1. Position the bucket teeth slightly downward.
2. While driving the machine forward, tilt the bucket so that the ground surface is gradually separated.
3. Adjust the digging depth by operating the lift arm.
4. Drive the machine with the bucket tilted backward fully and held at the lowest possible position.



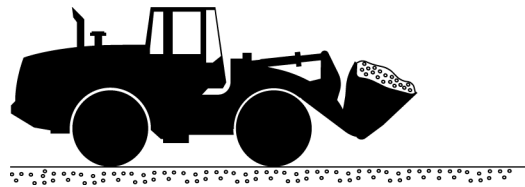
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M4GB-05-008



M4GB-05-009

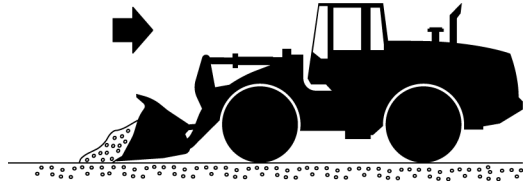


M4GB-05-010

## OPERATING MACHINE

### Grading

**⚠ WARNING:** When operating the ride control system equipped machine with the front attachment control lever in the float position when performing such works as soil scooping, land grading, or snow removal, be sure to turn the ride control switch OFF. Failure to do so may allow the ride control system to operate so that the front attachment may automatically move up and down.

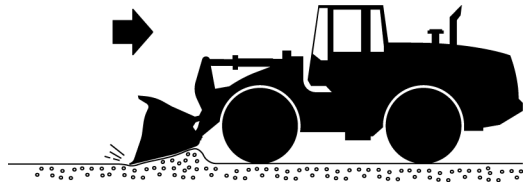


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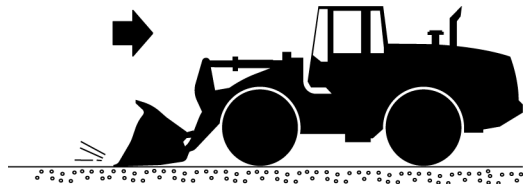
**IMPORTANT:** Be sure to perform grading work while driving the machine in reverse. If grading work is performed by driving the machine forward, severe loads are applied to the front attachment, possibly causing cracks or damage to the front attachment.

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

## OPERATING MACHINE

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### 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.

## OPERATING MACHINE

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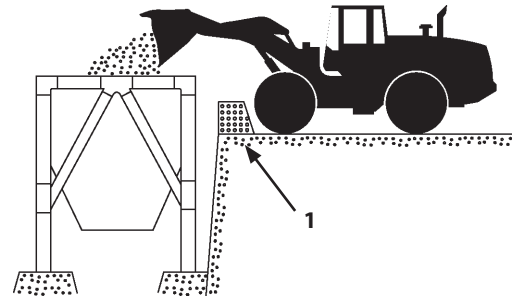
### Load and Carrying Method

**⚠ 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.

# OPERATING MACHINE

## Loader and Dump Truck Combination Method

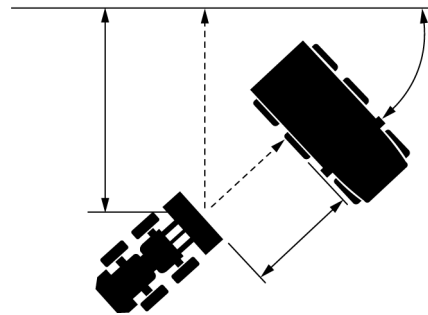
### WARNING:

- **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, possibly resulting in personal accident.**

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. Then, 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 body. In case the dump body is longer than twice the bucket width, load from the front to rear position of the dump 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.

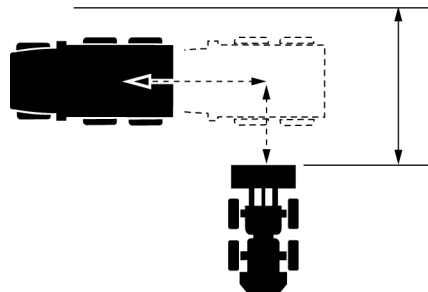


M4GB-05-015

### 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. Then, 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.



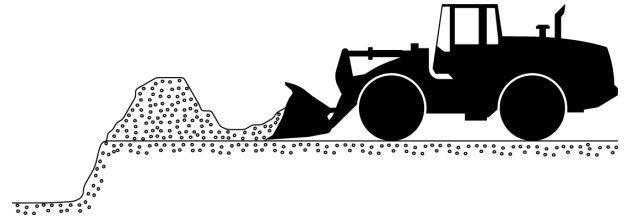
M4GB-05-016

## OPERATING MACHINE

### 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.**

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.



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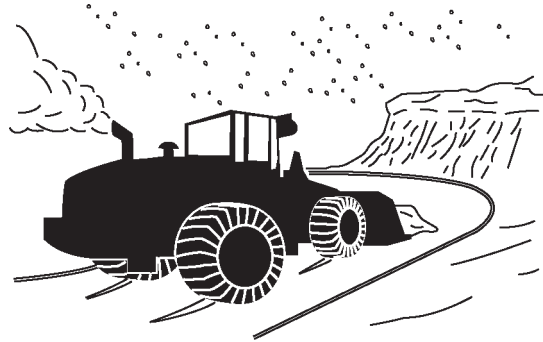


# OPERATING MACHINE

## Removing Snow

**⚠ WARNING:** When operating the ride control system equipped machine with the front attachment control lever in the float position when performing such works as soil scooping, land grading, or snow removal, be sure to turn the ride control switch OFF. Failure to do so may allow the ride control system to operate so that the front attachment may automatically move up and down.

**⚠ 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.



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 as fire hydrants, manholes, curbs, roadside drains, etc. The facilities or the machine may be damaged.

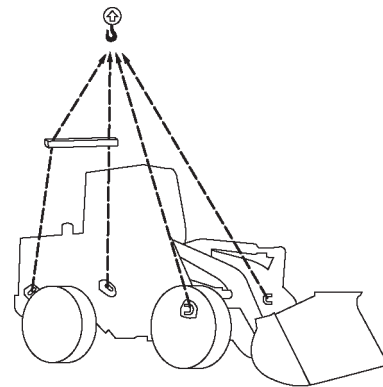
## Lifting Wheel Loader

**⚠ 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.

Refer to the "Lifting Machine" in the TRANSPORTING section.

Lifting work of the machine will become necessary when loading the machine onto a ship or truck for repairing and/or transporting.



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## OPERATING MACHINE


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### 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 hard 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.

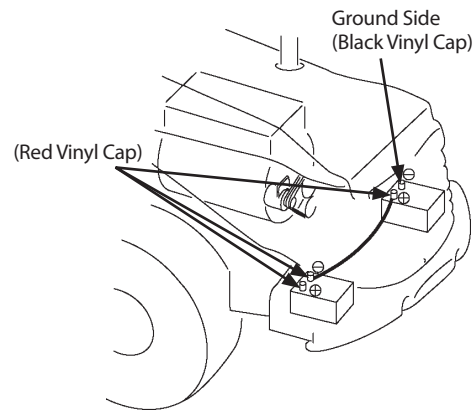
## OPERATING MACHINE

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 and dry 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.

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**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.

# TRANSPORTING

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## 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 beforehand the conditions of the route to be traveled, such as dimensional limits, weight limits, and traffic regulations.

In some cases, getting approval from the authority concerned, disassembling the machine to bring it within dimensional limits or weight limits of local regulations may become necessary.

## 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.

## TRANSPORTING

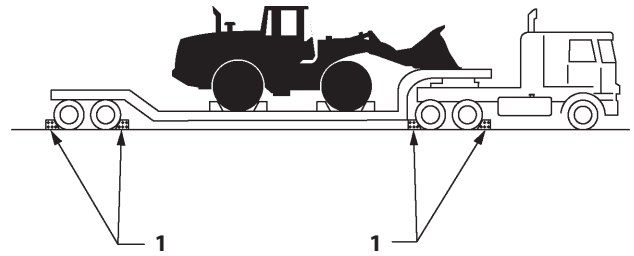
### Loading / Unloading on Trailer

**⚠ WARNING:** Be sure to use a loading dock or a ramp for loading/unloading.

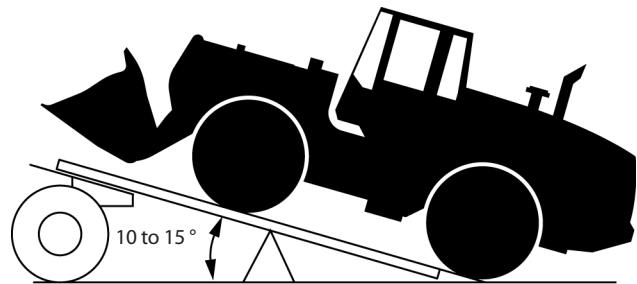
Always load and unload the machine on a firm, level surface.

#### 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

# TRANSPORTING

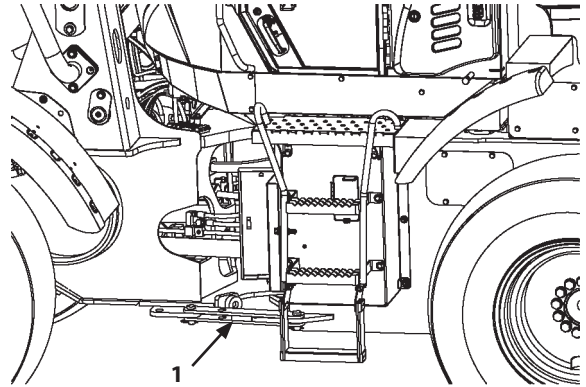
## Loading / Unloading on Trailer

### 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. Then, after changing the travel direction, begin to drive again.**

### 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.
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. Remove the key from the key switch.
8. Securely close the windows and cab door to protect the cab from rain. Place a cover over the exhaust outlet.
9. Install articulation lock bar (1) to prevent the machine from articulating.



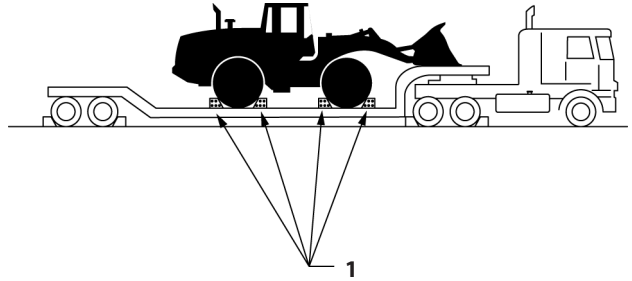
MNDF-01-026

# TRANSPORTING

## Fastening Machine for Transporting

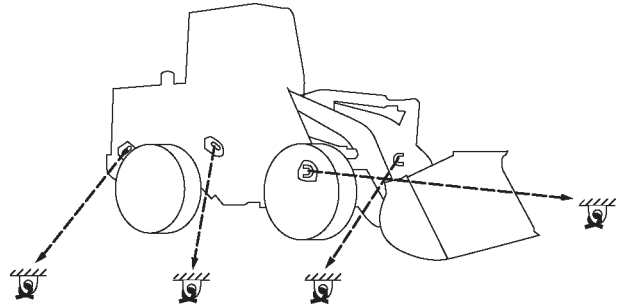
**⚠ WARNING:** Fasten the machine frame to the deck securely with chains and cables. While traveling, loads may shake around, move forward or backward or to the sides.

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.



M4GB-06-003

The machines for export are provided with lifting holes. (Optional) Use these holes for securing the machine.



MNEC-06-002

## TRANSPORTING

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### 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 your 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.



## TRANSPORTING

### Precautions for Towing

**⚠ WARNING:** Never attempt to tow the machine if the brake system is in need of repair. Ask your authorized dealer to repair the machine. Operate the machine only after repair is completed.

Avoid towing the machine as much as possible. If the machine is to be unavoidably towed, beware of the following points.

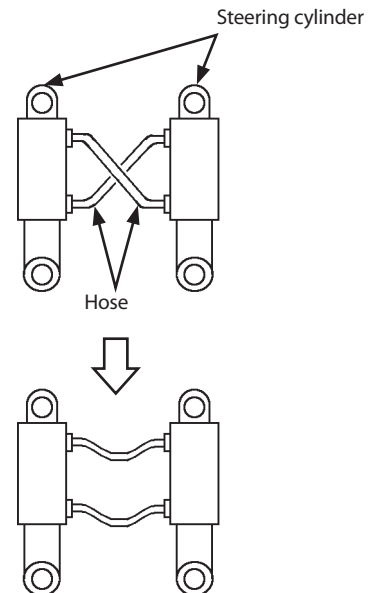
**IMPORTANT:** Do not tow the machine with the parking brake applied. Damage to the parking brake may result.

- 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.) Then, disconnect the front and rear propeller shafts. At this time, wedge wheel stoppers to all tires to prevent the machine from moving.
  - The steering system is inoperable when the engine is stopped. Changing the hydraulic hose connections between the rod end side and the head end side only of one steering cylinder enables the steering wheel operation.

#### Hydraulic Circuit Bypass

The machine can be towed by bypassing the hydraulic circuit without removing the propeller shaft when towing for short distance at vehicle speed less than 3 km/h (1.86 mph).

**🔧 NOTE:** Take care not to spill oil when disconnecting the hoses.



M4GB-06-007

# TRANSPORTING

## Hydraulic Circuit Bypass

The machine can be towed by loosening shuttle valve (1) in an emergency.

**CAUTION:** When towing the machine at high speed, components may be damaged by insufficient lubrication due to heat generated from the components. Use this towing method only in an emergency when towing for short distance at vehicle speed less than 3 km/h (1.86 mph).

**NOTE:** Before towing the machine in an emergency, be sure to forcibly release the parking brake. Refer to the page 6-8.

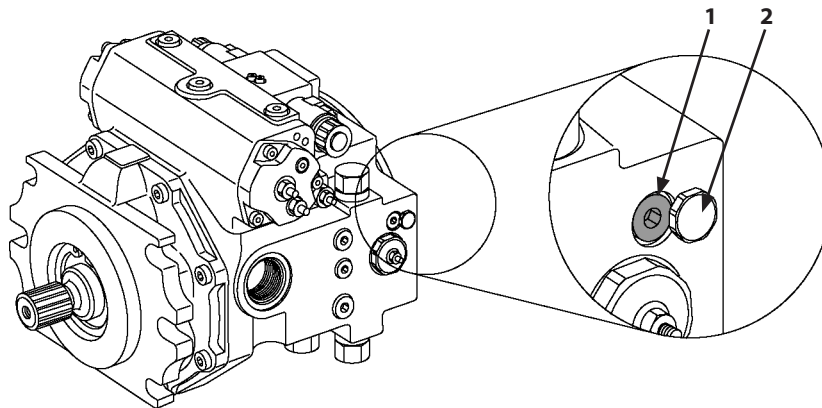
### Procedure

**IMPORTANT:** Set the machine in position for inspection and maintenance before starting work. Refer to the page 7-7.

1. Turn the key OFF to stop the engine.
2. Loosen shuttle valve (1) until it contacts to stopper (2).
3. The bypass function will be enabled.
4. After finishing the machine towing, tighten shuttle valve (1) to the original position.

Wrench size : 8 mm

Tightening torque : 50 N·m (5.0 kgf·m) (37 lbf·ft)



TNDF-03-01-013

## TRANSPORTING

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### Releasing Parking Brake

 **WARNING:**

- **Once the parking brake is released, the machine becomes impossible to stop with the brake system, possibly resulting in personal injury or death.**
- **Before releasing the parking brake or connecting the brake system, be sure to lock tires with wheel stoppers.**

 **CAUTION:**

- **As soon as towing operation is complete, connect the parking brake.**
- **Use 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.**

Releasing the parking brake is made manually only when the parking brake switch becomes inoperable due to any abnormality or failure in the brake system such as a pump.

# TRANSPORTING

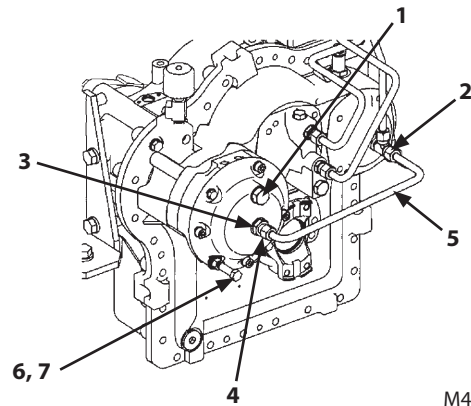
## Procedures

### WARNING:

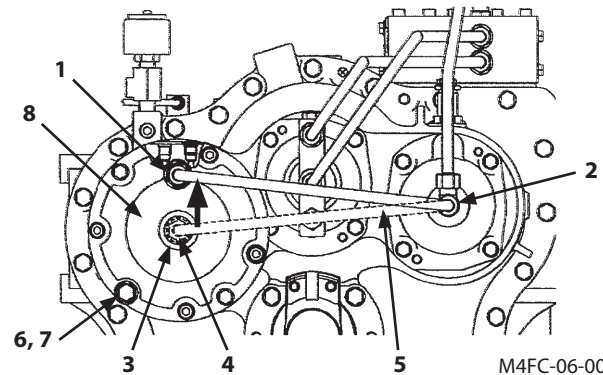
- Once the parking brake is released, the machine becomes impossible to stop with the brake system.
- Wedge wheel stoppers to all tires to prevent the machine from moving.
- Before restarting to operate the machine, consult your authorized dealer to have the parking brake adjusted.

1. Remove plug (1) from brake cap (8).
2. Remove nut (3) while preventing oil from spilling out by using waste cloth.
3. Loosen nut (2).
4. Remove connector (4). Install connector (4) to the hole of plug (1). Install tube (5) to connector (4) and secure them with nuts (2) and (3).
5. Remove orifice (9) from brake cap (8).
6. Remove release bolt (6) and flat washer (7).
7. Insert release bolt (6) and flat washer (7) into the hole of orifice (9). Tighten release bolt (6).
8. When release bolt (6) touches brake cap (8), further tighten release bolt (6) for 2 turns (approx. 2 to 3 mm (0.08 to 0.12 in)). The parking brake will be released.

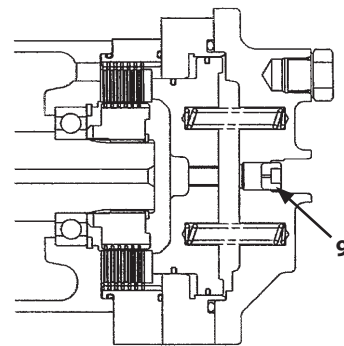
Wrench size: 17 mm, 22 mm, 27 mm  
8 mm (Hexagonal wrench)



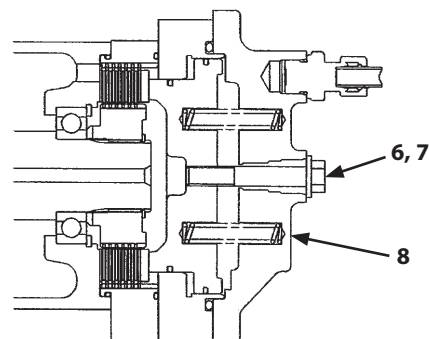
M4FC-06-001



M4FC-06-002



M4FC-06-003



M4FC-06-004

# TRANSPORTING

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## 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

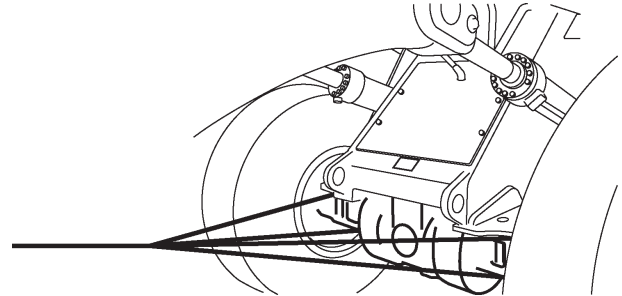
When using wire ropes, be sure to attach wire ropes to the front axle.

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 the drawbar pin.

Always use the lock pin after completely inserting the drawbar pin to prevent the wire rope from coming off.



M4GB-06-008

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.

## TRANSPORTING

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### Lifting Machine

 **WARNING:**

- The lifting tools are optional. Install specified lifting tools at your authorized dealer.
- Use lifting wire ropes and other lifting tools being free from any damage and/or aging, and having sufficient strength.
- Consult your authorized dealer for correct lifting procedures, and size and types of lifting wire ropes 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 ropes 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.

## TRANSPORTING

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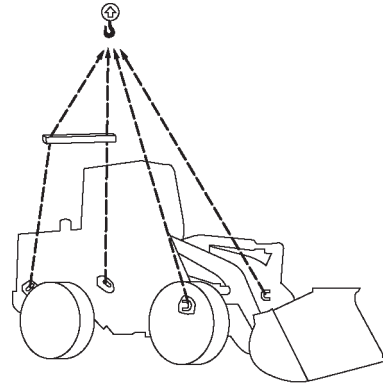
### Lifting

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. Please close all the doors and covers, and lock them.
6. Please use wire rope and a support bar that is long enough so they do not come in contact with the machine body when the machine is lifted.

(Refer to the section "Length and Load of Wire Rope/ Support bar" for more detailed information.)

Wrap a protective cover around the wire ropes as required to prevent the machine from being damaged. Be sure to use the specified lifting tools.

7. Set the crane in the appropriate position.
8. Attach the wire ropes to the lifting tool at the front and rear frame.



MNEC-05-001

# MAINTENANCE

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## Correct Maintenance and Inspection Procedures

Learn how to service your machine correctly. Follow the correct maintenance and inspection procedures shown in this manual.

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.



SA-005

If there is any problem with your machine, repair it before operating or contact your authorized dealer.

### IMPORTANT:

- **Use only recommended fuel and lubricants.**
- **Be sure to use only genuine Hitachi parts. Failure to do so may result in serious injury or death and/or machine breakdown.**
- **Failure to use recommended fuel, lubricants, and genuine Hitachi parts will result in loss of Hitachi product warranty.**
- **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.**
- **Use Hitachi genuine high performance filter.**



## MAINTENANCE

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- **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 download the stored information.  
Consult with your 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 your authorized dealer.  
Before installing any covering attachment such as a head guard, consult your authorized dealer.  
Never spray water on the communication terminal and the wirings.
- **Inquire on the proper way to recycle or dispose of oil, fuel, coolant, filters, batteries and other waste from your local environmental or recycling center, or from your authorized dealer.**

### **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:

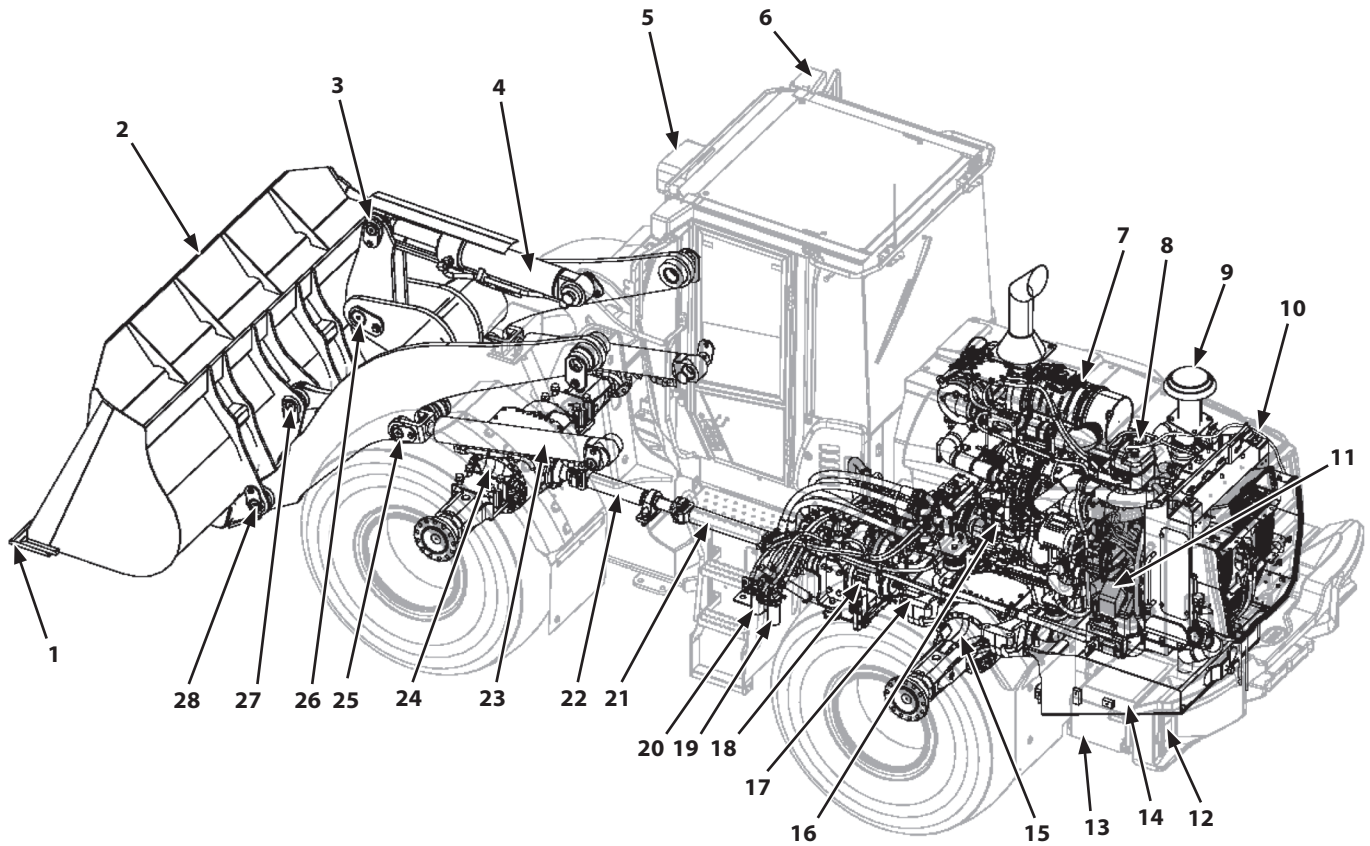
- Daily Check : To be conducted daily before operation
- Monthly Check: To be regularly conducted once per month
- Annual Check : To be regularly conducted once per year

Check and maintenance intervals shown in this manual are those for the machines to be operated under normal conditions. In case the machine is operated under more severe conditions, shorten the intervals.

# MAINTENANCE

## Layout

ZW140-6/ZW150-6



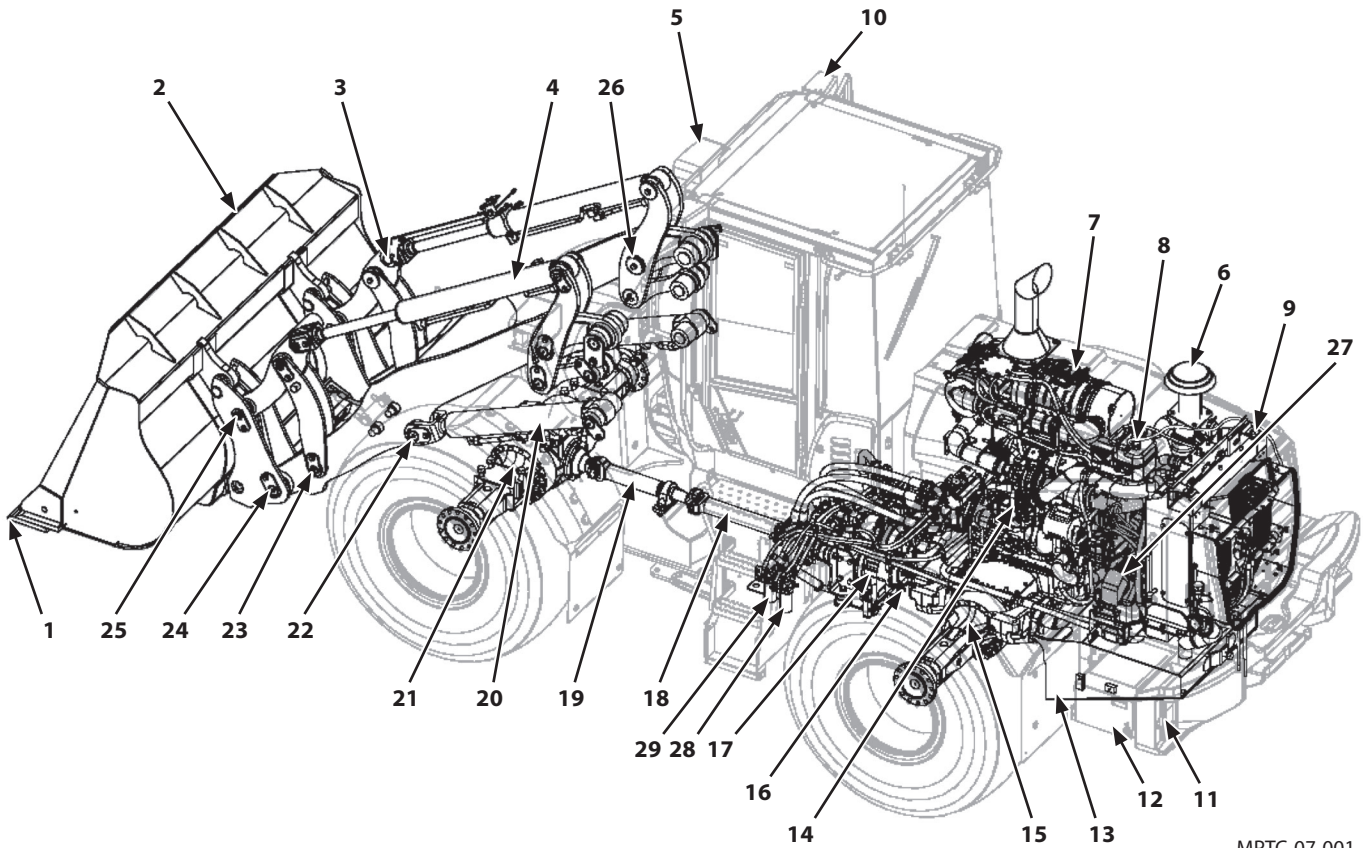
MPTC-07-002

- |  |                             |
|--|-----------------------------|
| 1. Bolt on Cutting Edge                            | 15. Rear Axle               |
| 2. Bucket  | 16. Engine                  |
| 3. Bucket Cylinder Pin                             | 17. Rear Propeller Shaft    |
| 4. Bucket Cylinder                                 | 18. Transmission            |
| 5. Front Combination Lamp                          | 19. Transmission Oil Filter |
| 6. Work Light                                      | 20. HST Charge Filter       |
| 7. Aftertreatment Device                           | 21. Center Propeller Shaft  |
| 8. Expansion Tank                                  | 22. Front Propeller Shaft   |
| 9. Air Cleaner                                     | 23. Lift Arm Cylinder       |
| 10. Radiator, Oil Cooler, and Other Cooling System | 24. Front Axle              |
| 11. DEF/AdBlue® Tank                               | 25. Lift Arm Cylinder Pin   |
| 12. Rear Combination Lamp                          | 26. Bell Crank Pin          |
| 13. Batteries                                      | 27. Bucket Link Pin         |
| 14. Fuel Tank                                      | 28. Bucket Pin              |

# MAINTENANCE

## Layout

ZW150PL-6



MPTC-07-001

- |   |                             |
|---|-----------------------------|
| 1. Bolt on Cutting Edge                           | 16. Rear Propeller Shaft    |
| 2. Bucket   | 17. Transmission            |
| 3. Bucket Cylinder Pin                            | 18. Center Propeller Shaft  |
| 4. Bucket Cylinder                                | 19. Front Propeller Shaft   |
| 5. Front Combination Lamp                         | 20. Lift Arm Cylinder       |
| 6. Air Cleaner                                    | 21. Front Axle              |
| 7. Aftertreatment Device                          | 22. Lift Arm Cylinder Pin   |
| 8. Expansion Tank                                 | 23. Guide Pin               |
| 9. Radiator, Oil Cooler, and Other Cooling System | 24. Bucket Pin              |
| 10. Work Light                                    | 25. Bucket Link Pin         |
| 11. Rear Combination Lamp                         | 26. Bell Crank Pin          |
| 12. Batteries                                     | 27. DEF/AdBlue® Tank        |
| 13. Fuel Tank                                     | 28. Transmission Oil Filter |
| 14. Engine  | 29. HST Charge Filter       |
| 15. Rear Axle                                     |                             |













## MAINTENANCE

### 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.

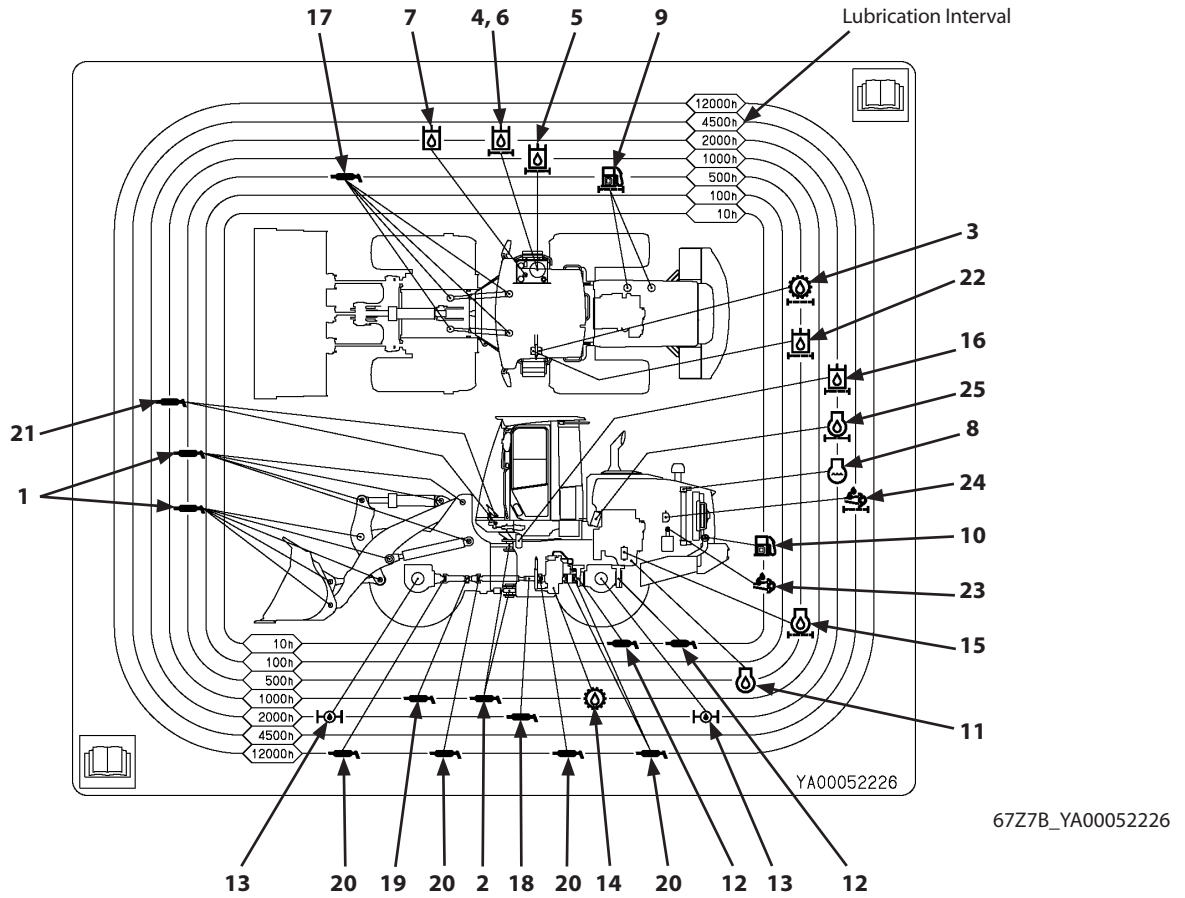
- Symbol Marks

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, HST Charge Filter, Hydraulic Oil Tank Filter, Suction Filter, Air Breather Element)
	Engine Oil Filter		Axle Gear Oil (Final Drive, Differential Gear)
	Coolant		Fuel
	Transmission Oil (Transmission)		Fuel Filter (Fuel Main Filter, Pre-Filter)
	Transmission Oil Filter		DEF/AdBlue® Supply Module Main Filter

# MAINTENANCE

- Maintenance Guide Table



	Item	Page		Item	Page
1	Grease (Front Joint Pins)	7-24, 25	14	Transmission Oil	7-38
2	Grease (Center Hinge Pins)	7-26	15	Engine Oil Filter	7-33
3	Transmission Oil Filter	7-40	16	Hydraulic Oil Filter (Pilot)	7-50
4	Hydraulic Oil Filter (Suction)	7-49	17	Grease (Steering Cylinder Pin)	7-26
5	Hydraulic Oil Filter (Hydraulic Tank)	7-52	18	Grease (Propeller Shaft Spline)	7-28
6	Air Breather Element	7-55	19	Grease (Propeller Shaft Center Support)	7-28
7	Hydraulic Oil	7-47	20	Grease (Propeller Shaft Universal)	7-28
8	Coolant (Long-Life Coolant)	7-76	21	Grease (Brake Pedal)	7-29
9	Fuel Main Filter, Fuel Pre-Filter	7-67, 68	22	HST Charge Filter	7-54
10	Fuel Oil (Diesel Fuel)	7-63	23	DEF/AdBlue®	7-124
11	Engine Oil	7-31	24	DEF/AdBlue® Supply Module Main Filter	7-127
12	Grease (Axle Support Pin)	7-27	25	Crankcase Breather Element	7-35
13	Axle Gear Oil (Final drive, Differential gear)	7-41			

# MAINTENANCE

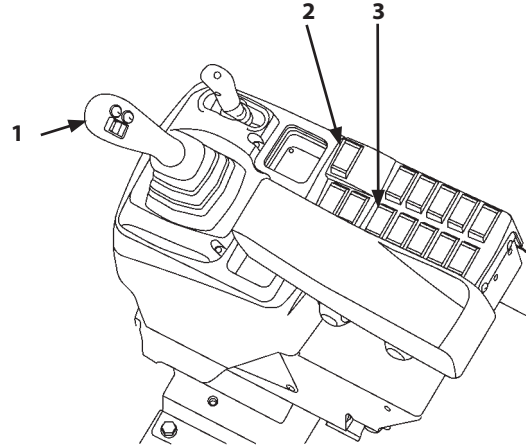
## Preparations for Inspection and Maintenance

**⚠ WARNING:** If ride control switch (3) 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 (3) OFF before beginning the inspection and/or maintenance of the machine.

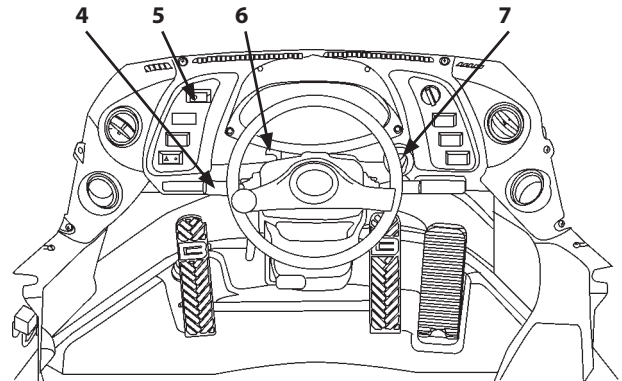
**⚠ CAUTION:** If the machine is unexpectedly moved, a serious accident may result. Be sure to apply the parking brake when parking the machine.

Unless specified otherwise, park the machine by following the procedures below before beginning the inspection and/or maintenance work.

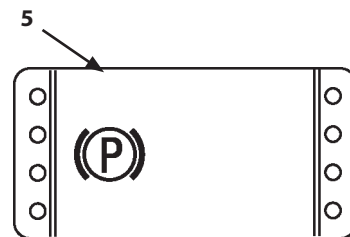
1. Park the machine on a solid level surface.
2. Lower the working tools such as the bucket to the ground.
3. Turn ride control switch (3) OFF.
4. Place forward / reverse lever (4) to neutral and place neutral lever lock (6) to lock (🔒) position.
5. Apply the parking brake (Turn parking brake (5) ON.)
6. Wedge the tires.
7. Run the engine at low idle speed for 5 minutes to cool the engine. Turn key switch (7) OFF to stop the engine. Again, turn key switch (7) ON and place control lever lock switch (2) to the unlock (🔓) position. Fully operate control lever (1) 3 to 4 strokes to release residual pressure in the hydraulic system. In case 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 (2) to the lock (🔒) position.
9. Turn key switch (7) 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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MNDB-01-001



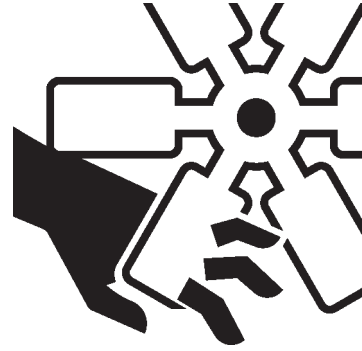
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## MAINTENANCE

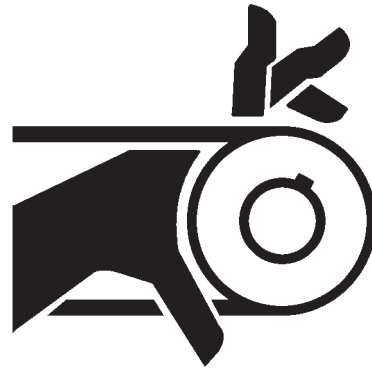
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**⚠ WARNING:** Never attempt to maintain the machine when the engine is running in order to prevent the accident. If the engine must be run while working, do the following.

- 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 (2) to 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

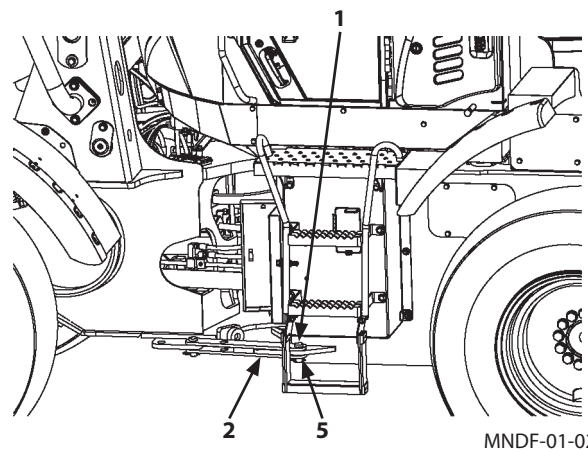
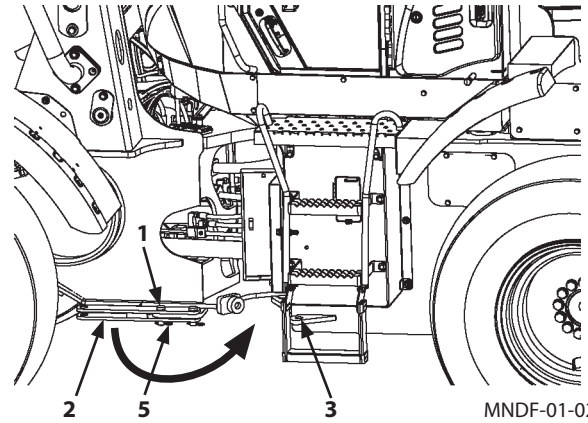


## MAINTENANCE

### Lock Frames

**⚠ WARNING:** Before beginning to work near the frame center hinge, install articulation lock bar (2) 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  $\beta$ -form pin (5) to remove set pin (1) from the front frame hole.
3. Pull out and rotate articulation lock bar (2) to align it with rear frame hole (3).
4. Install set pin (1) into the rear frame hole (3) and the articulation lock bar tip end hole. Install  $\beta$ -form pin (5) to lock articulation lock bar (2) in position.






## MAINTENANCE

### Inspection/Maintenance Access Side Cover

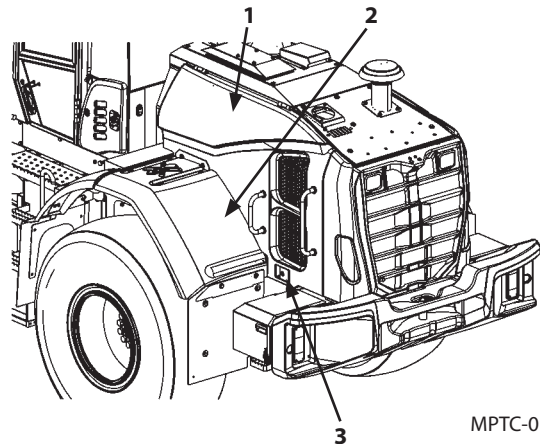
#### CAUTION:

- 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 covers (1) may unexpectedly close.
- Take care not to pinch your fingers when opening/closing side covers (1).
- When side covers (1) are opened, side covers (1) may move suddenly. Be careful not to come in contact with side covers (1).
- Before inspecting around the engine, be sure to secure side covers (1) with holding rod (4).
- In case the machine is equipped with fenders (2) on side covers (1), never ride on fenders (2).

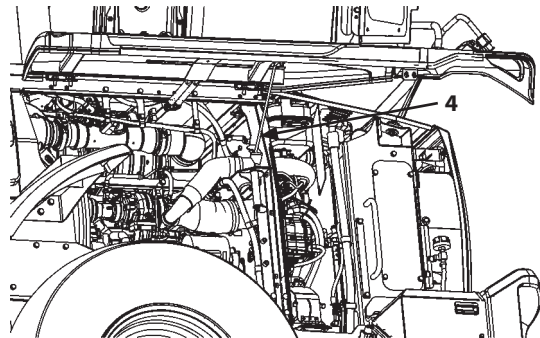
When opening side covers (1), pull latch (3).

 NOTE: When required to inspect the machine for a long time with side cover (1) kept open, lock side cover (1) using holding rod (4) provided inside side cover (1).

Side cover (1) has a holding groove. Engage holding rod (4) in the holding groove beforehand.



MPTC-01-009



MPTC-01-018

# MAINTENANCE

## Inspection and Maintenance Table

Check and/or carry out the maintenance at intervals of the specified operating hours below or the calendar date, whichever comes first.

<b>IMPORTANT</b>
Severe applications require more frequent maintenance. Severe conditions include heavy dust, extremely abrasive material, caustic chemicals, extremely wet conditions or abnormally hot or cold ambient temperatures.

△: First time replacement or cleaning only

Section	Item for check	Operating hours									Page	
		10	50	100	250	500	1000	2000	4000	4500		
Engine	Check Engine Oil Level	○									7-30	
	Check Coolant Level	○									7-73	
	Check DEF Level	○									7-124	
	Check Accelerator Pedal Operation, and Exhaust Gas Color and Noise	○									7-105	
	Drain Fuel Filter	○									7-66	
	Check Fuel Level	○									7-63	
	Check Drive Belt	○									7-74	
	Check Fuel Hoses	○									7-70	
	Check Sound Absorbing Mat Around Engine	○									7-107	
	Check Crankcase Breather Tube	○									7-34	
	Replace Engine Oil and Oil Filter Cartridge					○					7-31 7-33	
	Clean Radiator/Oil cooler Cores and Other Cooling System					*3 ○					7-77	
	Replace Fuel Main Filter Element					○					7-67	
	Replace Fuel Pre-Filter Element					○					7-68	
	Drain Water and Sediment from Fuel Tank						○				7-65	
	Clean Fuel Solenoid Pump Strainer						○				7-69	
	Check Drive Belt Tensioner		Every 1000 hours or once a year									7-75
	Replace Crankcase Breather Filter Element							○			7-35	
	Check Oil Drain Tube							○			7-36	
	Replace DEF Supply Module Main Filter Element									○	7-127	
	Check and Adjust Valve Clearance		Every 5000 hours									7-108
	Clean Air Cleaner Element		Indicator comes ON									7-71
	Replace Air Cleaner Element		After cleaning 6 times or 1 year									7-71
	Replace Coolant		Every 2000 hours or 2 years									7-75
	Check and Clean Aftertreatment Device		As required, when regeneration indicator comes ON									7-121

**NOTE:**

\*3: Shorten maintenance intervals when the machine is operated under severe conditions or when the machine is continuously operated for a long period of time.

## MAINTENANCE

△: First time replacement or cleaning only

Section	Item for check	Operating hours									Page
		10	50	100	250	500	1000	2000	4000	4500	
Transmission	Check Transmission Oil Level	○									7-37
	Replace Transmission Oil Filter Element					○					7-40
	Clean Transmission Air Breather						○				7-43
	Replace Transmission Oil					△	○				7-38
	Clean Transmission Strainer						○				7-38
Axle system	Greasing (Axle support)	○									7-27
	Check Tire for Damage	○									7-90
	Check Tire (Tire Pressure)	○									7-90
	Check Wheel Bolt Torque		△			○					7-91
	Greasing (Propeller Shaft Pillow Block Bearing)						○				7-28
	Check Surroundings around Axles and Axle Covers for Oil Leaks						○				7-43
	Greasing (Second Propeller Shaft Spline)							*3 ○			7-28
	Replace Axle Oil							○			7-41
	Retighten Front Axle and Rear Axle Support Mounting Bolts		△					○			7-108
	Greasing (Second (Front) Propeller Shaft)	Every 12000 hours *3 ○									7-27
	Greasing (Second (Center) Propeller Shaft)	Every 12000 hours *3 ○									7-28
	Greasing (Third (Rear) Propeller Shaft)	Every 12000 hours *3 ○									7-28

 NOTE:

\*3: Shorten maintenance intervals when the machine is operated under severe conditions or when the machine is continuously operated for a long period of time.

## MAINTENANCE

△: First time replacement or cleaning only

Section	Item for check	Operating hours									Page
		10	50	100	250	500	1000	2000	4000	4500	
Steering system	Check Steering Wheel Play	○									7-104
	Greasing (Steering Cylinder)	*1 △			*2 △	○					7-26
	Check Gas Pressure in Steering Accumulator							○			7-57
Brake system	Check Right and Left Brake Interlocking Performance	○									7-86
	Check Parking Brake Force	○									7-87
	Check Accumulator Function, Gas Leakage, Looseness, and Damage					○					7-88
	Greasing (Brake Pedal)						○				7-29
	Greasing (Brake Pedal Linkage)						○				7-29
	Check Brake Disks (Service and Parking)							○			7-89
	Check Gas Pressure in Accumulator							○			7-89

 NOTE:

\*1: Add grease daily during first 50 hours of operation. In case the machine is engaged in excavation in mud, water or snow, add grease after each work shift.

\*2: After 50 hours of operation, carry out next greasing at the first 250 hours of operation. Then, 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.

# MAINTENANCE

△: First time replacement or cleaning only

Section	Item for check	Operating hours									Page
		10	50	100	250	500	1000	2000	4000	4500	
Loading system	Check Hydraulic Oil Level	○									7-46
	Check Bucket Teeth and Cutting Edge	○									7-102
	Check Hoses and Lines for Leaks	○									7-58
	Check Hoses and Lines for Cracks, Bends, Etc.				○						7-58
	Greasing	*1 △			*2 △	○					7-24
	Replace HST Charge Filter					○					7-54
	Check Ride Control Accumulator Function, Gas Leakage, Looseness, and Damage (Option)					○					7-57
	Replace Hydraulic Tank Oil Return Filter						○				7-52
	Replace Pilot Oil Filter							○			7-50
	Replace Air Breather Element							○			7-55
	Check Pilot Circuit Accumulator Function, Gas Leakage, Looseness, and Damage							○			7-56
	Check Gas pressure in Ride Control Accumulator (Option)							○			7-57
	Replace Hydraulic Oil and Clean Suction Filter							*4 ○			7-47 7-49
	Replace Pilot Circuit Accumulator	Every 4000 hours or 2 years									7-57
Check Windshield Washer Fluid Level	○									7-103	
Check ROPS Cab Mounts, Resin Cab Roof, and Roof Mounting Bolts	○									7-103	
Check and Replace Seat Belt and Lower Tether	○	Replace every 3 years									7-103
Check Steps, Grab Handles and Handrails	○									7-106	
Check Outer and Inner Rear View Mirrors	○									7-106	
Clean Engine Room and Hood	○									7-107	
Greasing (Center Pin)							○			7-27	

 NOTE:

\*1: Add grease daily during first 50 hours of operation. In case the machine is engaged in excavation in mud, water or snow, add grease after each work shift.

\*2: After 50 hours of operation, carry out next greasing at the first 250 hours of operation. Then, 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.

\*4: Hydraulic oil changing interval differs according to the kind of hydraulic oil used.

## MAINTENANCE

△: First time replacement or cleaning only

Section	Item for check	Operating hours									Page
		10	50	100	250	500	1000	2000	4000	4500	
Electrical system	Check Monitor Functions and Instrument Operation	○									7-82
	Check Horn and Back Up Alarm	○									7-83
	Check Lights	○									7-83
	Check Electrical Harnesses and Fuses		○								7-84
	Check Battery Electrolyte Level			○							7-80
	Check Electrolyte Specific Gravity				○						7-81
Air Conditioner	Clean/Replace Air Conditioner Circulation/Fresh Air Filters			*3○			○				7-95
	Check Air Conditioner	Every 6 months or 1000 hours									7-99
	Check Air Conditioner Piping	Every 6 months or 1000 hours									7-99
	Check Air Conditioner Condenser	Every 6 months or 1000 hours									7-100
	Check Air Conditioner Fan Belt	Every 6 months or 1000 hours									7-100
	Check Refrigerant Level	Every 6 months or 1000 hours									7-101
	Check Compressor and Pulley	Once a year or 2000 hours									7-101
Others	Check Tightening Torque of Bolts and Nuts		△					○			7-109

 NOTE:

\*3: Shorten maintenance intervals when the machine is operated under severe conditions or when the machine is continuously operated for a long period of time.

## MAINTENANCE

### Periodic Replacement of Parts


To ensure safe operation, be sure to conduct periodic inspection of the machine. In addition, the parts listed below, if defective, may pose serious safety/fire hazards. It is very difficult to gauge the extent of deterioration, fatigue, or weakening of the parts listed below simply by visual inspection alone. For this reason, replace these parts at the intervals shown in the table below. However, if any of these parts are found to be defective, replace before starting operation, regardless of the interval.

Also, when replacing hoses, check the clamps for deformation, cracks, or other deterioration, and replace as necessary.

Be sure to perform periodic inspection of all hoses, as shown below, and replace or retighten any defective parts found, as necessary.


Consult your authorized dealer for correct replacement.

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)	
	Oil filter hose (Engine to oil filter)	
	Heater hose (Heater to engine)	
	Fuel hose (Engine to fuel tank)	
	Coolant filter hose (Engine to DCA coolant filter)	
	Heater hose (Engine to dosing module)	
	DEF/AdBlue® 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

 **NOTE:** Be sure to replace seals, such as O-rings and gaskets, when replacing hoses.

## MAINTENANCE

		Periodic Replacement Parts	Replacement Intervals
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 (HST high pressure circuit hose)	
		Hydraulic hose (HST cooler line hose)	
		Hydraulic oil tank return hose	
		Hydraulic oil cooler line hose	
	Front Attachment	Hydraulic hose (Valve to hydraulic oil tank return hose)	
		Lift arm cylinder line hose	
		Bucket cylinder line hose	
Cab	Pilot hose		
	Seat belt	Every 3 years	

 **NOTE:** Be sure to replace seals, such as O-rings and gaskets, when replacing hoses.



## MAINTENANCE

### Kind of Oils

#### Grease

Kind of Grease	Multipurpose-type Lithium Grease
Application	Chassis Lubrication, Front Attachment Joint Pins
Air Temperature	-20 to 45 °C (-4 to 113 °F)
Oil Specification	NLGI 2 EP

 **NOTE:**

- Be sure to use a lithium-based grease for universal joints and a propeller shaft spline. If other types of chassis grease are used, premature wear and/or a noise emission may result.
- NLGI No. 2 grease is suitable for most temperatures and some auto-lube systems. Use NLGI No. 1 or No. 0 grease for extremely low temperature.

#### Engine Oil


**IMPORTANT: Use engine oil equivalent to DH-2 specified in JASO or CJ-4, API. Failure to do so may reduce the engine performance and/or shorten the engine service life. Please be noted that all engine failures caused by using engine oil other than specified are excluded from Hitachi Warranty Policy. Consult your nearest authorized dealer for the unclear points.**

Kind of Oil	Engine Oil	
Application	Engine Crank Case	
Air Temperature	-20 to 20 °C (-4 to 68 °F)	-15 to 45 °C (5 to 113 °F)
Oil Specification	API CJ-4, JASO DH-2	
	SAE10W-30	SAE15W-40
	SAE10W-40	

## MAINTENANCE


### Transmission Oil

Kind of Oil	Engine Oil
Application	Transmission and Torque Converter
Air Temperature	-20 to 45 °C (-4 to 113 °F)
Oil Specification	API CF 10W Class

 **NOTE:** When the atmospheric temperature is below -20 °C: Contact your authorized dealer.

### Axle Oil

Kind of Oil	Gear Oil	
Application	Axle & Wet Disc Brake	
Air Temperature	-20 to 45 °C (-4 to 113 °F)	
Recommended Product	Hitachi	High Gear Oil TKTT15150-4th
Alternative Product	TO-4 SAE50 Fluid, with 6% friction modifier	

-  **NOTE:**
- When using TO-4 SAE50 Fluid other than the listed recommended products, add 6% friction modifier or "anti-chatter" additive to prevent or eliminate service brake application noise. Recommended additive package for universal tractor fluid: HCM 9990A or Afton Hitec8703 or equivalent.
  - The acceptable ambient temperature when using TO-4 SAE50 Fluid should fall within the range -15 to 40 °C (5 to 104 °F).
  - For extremely low ambient temperatures, lower viscosity or synthetic oils may be required.

## MAINTENANCE

### Hydraulic Oil

Kind of Oil	Hydraulic Oil		
Application	Hydraulic System (Hydraulic Oil Tank)		
Air Temperature	-20 to 45 °C (-4 to 113 °F)		
Change Interval	2000 hours		
Recommended Product	Hitachi	Super EX 46HN	-
Alternative Product	-		JCMAS HK VG46W

 NOTE:

- *Never mix hydraulic oils containing zinc with zinc-free hydraulic oils as hydraulic system component damage could result.*
- *Use appropriate oil of viscosity depending on the temperature. Low temperature viscosity will differ depending on each product. Contact each hydraulic oil manufacture directly.*


### Recommended Coolant

Refer to page 7-72 for information.

## MAINTENANCE

### Service Refill Capacity

Location	Liters	Gallons
Fuel Tank (Diesel Fuel)	205	54
Engine Lubricant (Engine Oil)	16	4.2
Engine Coolant	20	5.3
Transmission	10	2.6
Axle (Front/Rear)	25/25	6.6/6.6
Hydraulic Oil	150	40
DEF Tank	12*	3.2*

 **NOTE:** \*: Refill quantity when the level gauge indicates "empty". The other shows the maximum refill quantity to be required during level check, and may differ from the whole system quantity.

## MAINTENANCE

### List of Consumable Parts

#### 1. Filter Elements

	Part No.
Engine Oil Filter	YA00019107
Fuel Main Filter	YL00008001
Fuel Pre-Filter Element	YL00008002
Air Cleaner Element (outer)	263E237011
Air Cleaner Element (inner)	263E237001
Suction Filter	263E752001
Hydraulic Tank Oil Filter	263E752011
Pilot Oil Filter	2655742471
Transmission Oil Filter	4370435
Crankcase Air Breather Element	YA00054635
DEF/AdBlue® Supply Module Main Filter	YA00058284
Hydraulic Tank Air Breather Element	4437838
HST Charge Filter	4370435

#### 2. Drive Belts

	Part No.
Air Conditioner Drive Belt	291F947002


## MAINTENANCE

### 3. Combination Light and Other Light

		Part No.	
Head Light	Head Light Assembly	4436232 (44890-60350)	
	Bulb (24 V, 70/75 W)	4434679	
	Unit	4434678	
Turn Signal Light	Turn Signal Light Assembly	2640242432	
	Bulb	Clearance Light (24V 5W)	2640247301
		Turn Signal Light (24V 25W)	2640247291
Rear Combination Light	Rear Combination Light Assembly	44881-60490	
Work Light	Work Light Assembly	4336570	
	Bulb (24V 70W)	4285648	

### 4. Slow Blow Fuses

	Part No.
45A	4315323
65A	263G244421
100A	2681242871

 **NOTE:** The part numbers are subject to change without notice. Refer to the parts catalog.



# MAINTENANCE

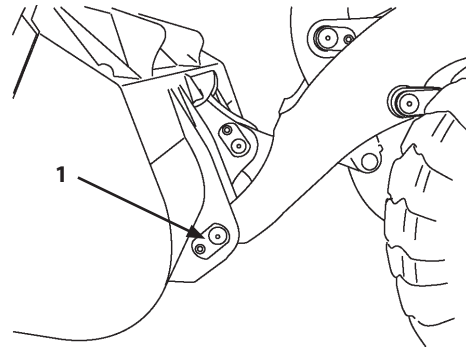
## A. Greasing

**WARNING:** Apply the parking brake and the articulation lock bar.

**NOTE:**

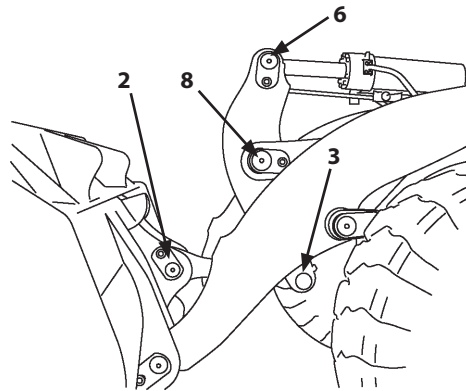
- Until break-in operation is performed for more than 50 hours, lubricate the machine every day to get initial operational concordance.
- In case excavation is made in mud, water or snow, lubricate the machine after operation is complete.
- Sufficiently add high quality grease through the grease fittings. After removing contamination around the grease fitting, add grease. After greasing, thoroughly remove the old grease that was pushed-out from the seals.

1. Bucket pins (1) (One point each to right and left).  
--- every 500 hours (250 hours at first time only)
2. Bucket link pin  
--- every 500 hours (250 hours at first time only)  
ZW140/150-6  
One point each to bucket link pins (2 and 3).  
ZW150PL-6  
Bucket link pins (2) (One point each to right and left).
3. One point each to guide link pins (4 and 5). (ZW150PL-6)  
--- every 500 hours (250 hours at first time only)
4. Bucket cylinder pin  
--- every 500 hours (250 hours at first time only)  
ZW140/150-6  
Bucket cylinder pin (7) One point.  
Bucket cylinder rod pin (6) One point.  
ZW140/150PL-6  
Bucket cylinder pins (7) (One point each to right and left).  
Bucket cylinder rod pins (6) (One point each to right and left).
5. Bell crank pin  
--- every 500 hours (250 hours at first time only)  
ZW140/150-6  
Bell crank pin (8) One point.  
ZW150PL-6  
Bell crank pins (8) (One point each to right and left).



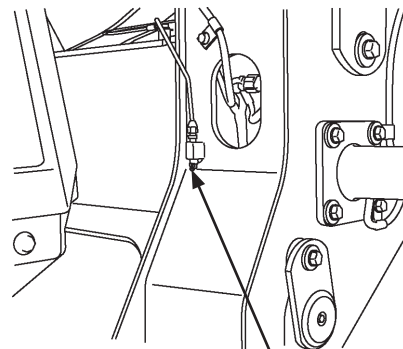
ZW140/150-6

M4GB-07-004



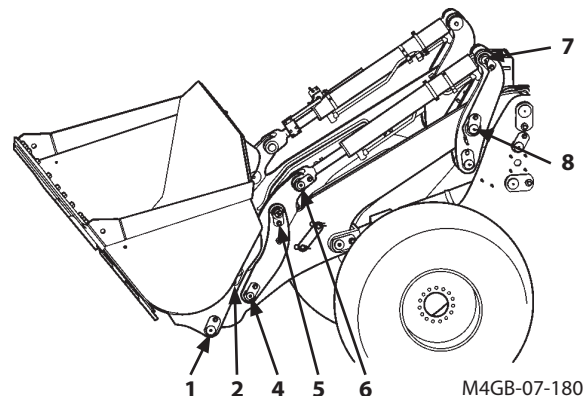
ZW150-6

M4GB-07-005



ZW140/150-6

M4FC-07-003



ZW150PL-6

M4GB-07-180

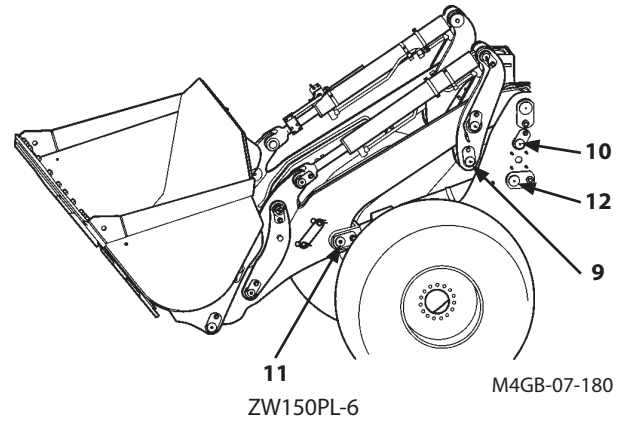


## MAINTENANCE

6. One point each to right and left link pins (9 and 10)

ZW150PL-6

--- every 500 hours (250 hours at first time only)

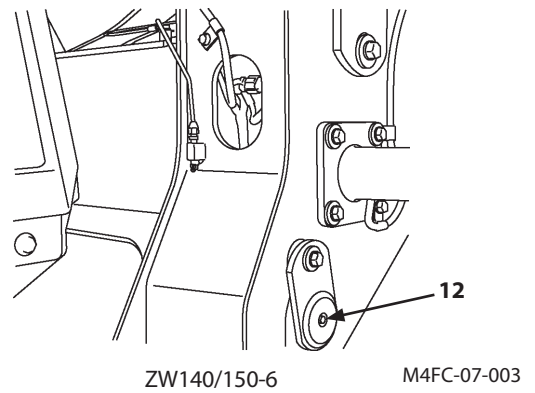
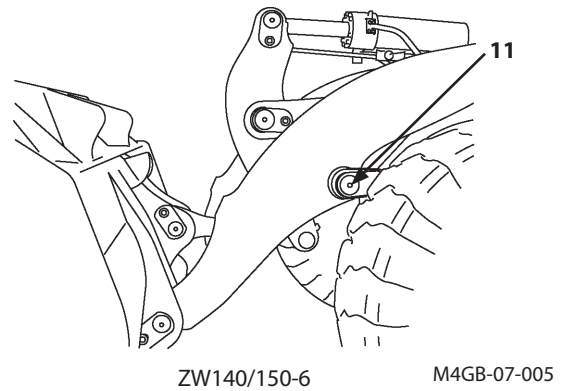


7. One point each to right and left lift arm cylinder rod pins (11).

--- every 500 hours (250 hours at first time only)

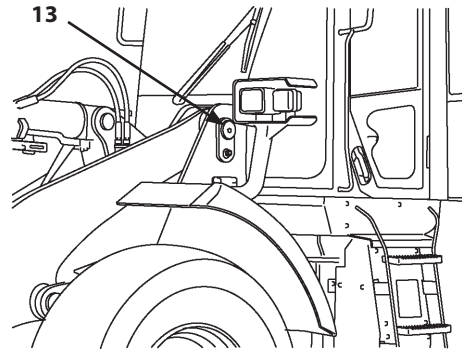
One point each to right and left lift cylinder pins (12).

--- every 500 hours (250 hours at first time only)



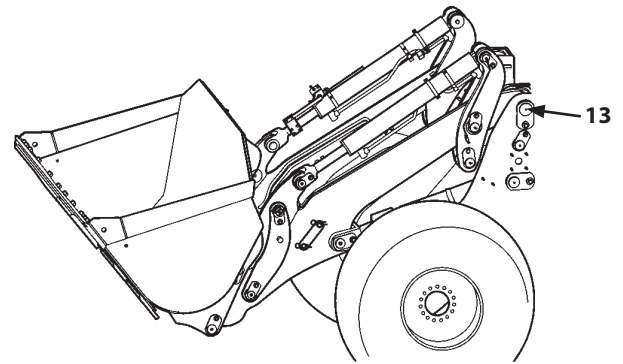
## MAINTENANCE

8. One point each to right and left lift arm pivot pins (13).  
--- every 500 hours (250 hours at first time only)



ZW140/150-6

M4FC-07-004

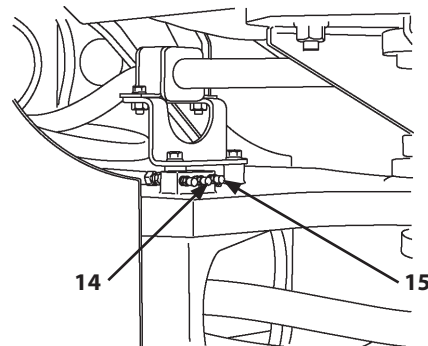


ZW150PL-6

M4GB-07-180

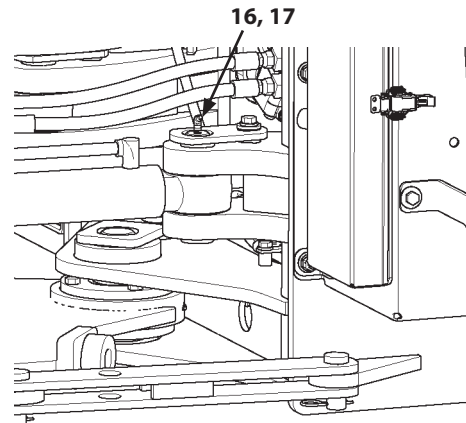
9. One point each to front right and left steering cylinder pins (14 and 15).  
--- every 500 hours (250 hours at first time only)

Cylinder left front (14)  
Cylinder right front (15)



M4FC-07-005

10. One point each to right and left steering cylinder rod pins (16 and 17).  
--- every 500 hours (250 hours at first time only)



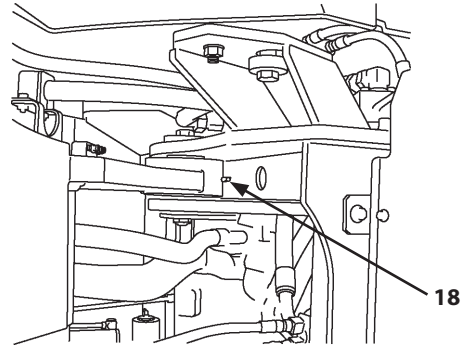
MNDF-07-056

## MAINTENANCE

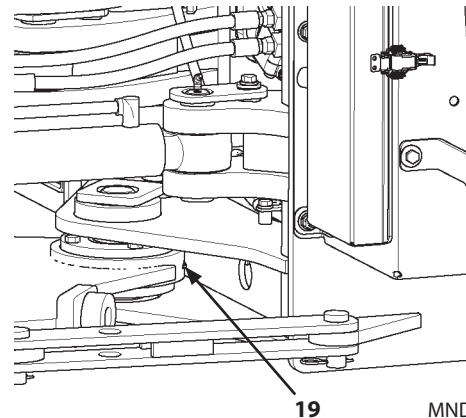
11. One point each to upper and lower frame center hinge pins (18 and 19).

--- every 1000 hours

Upper (18)  
Lower (19)



M4FC-07-007

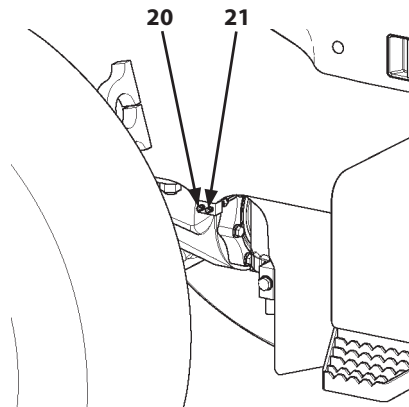


MNDF-07-056

12. One point each to front and rear axle support pins (20 and 21).

--- every 10 hours


Front (20)  
Rear (21)

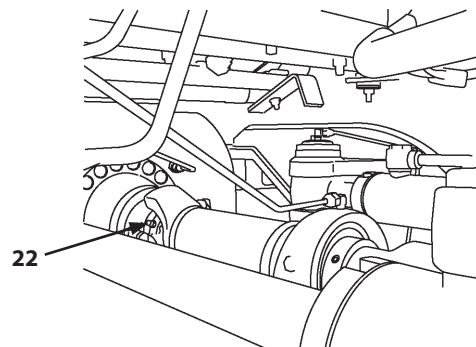


MNDF-07-003

13. One point to front propeller shaft universal (22).

--- every 12000 hours

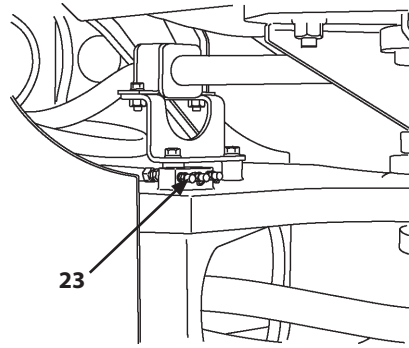
 **NOTE:** When the machine is continuously operated under severe conditions for a long time, shorten the greasing intervals.



M4FC-07-010

## MAINTENANCE

14. One point to propeller shaft center support (23).  
--- every 1000 hours

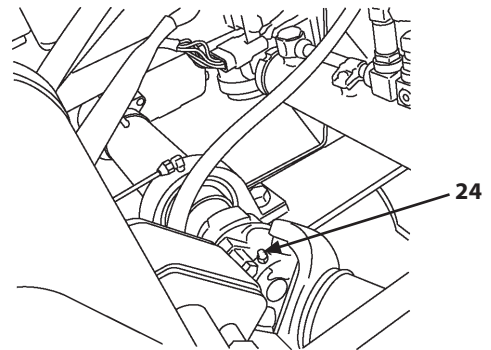


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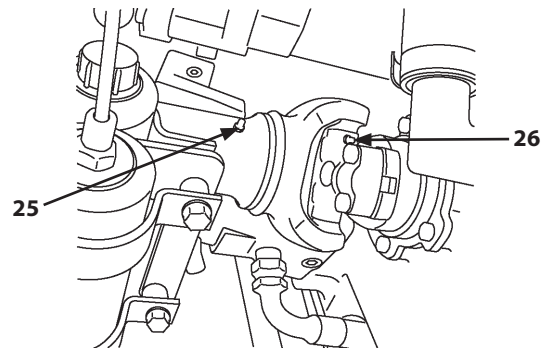
15. One point to center propeller shaft universal front (24).  
--- every 12000 hours

One point to center propeller shaft universal rear (26).  
--- every 12000 hours

16. One point to center propeller shaft splines (25).  
--- every 2000 hours

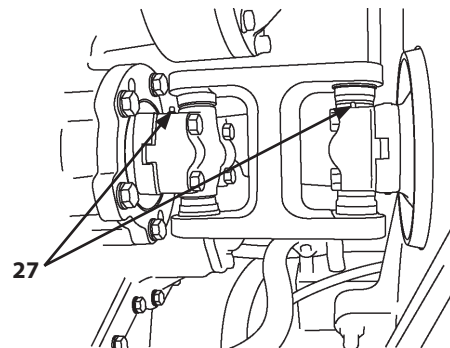


M4FC-07-011



M4FC-07-012

17. Two points to rear propeller shaft universal (27).  
--- every 12000 hours

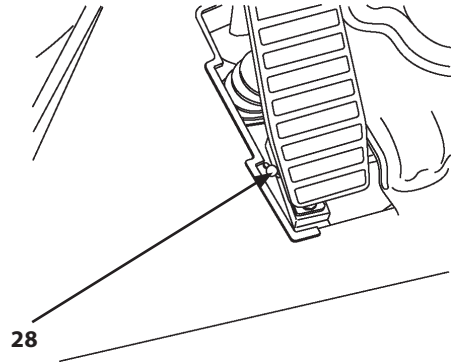


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## MAINTENANCE

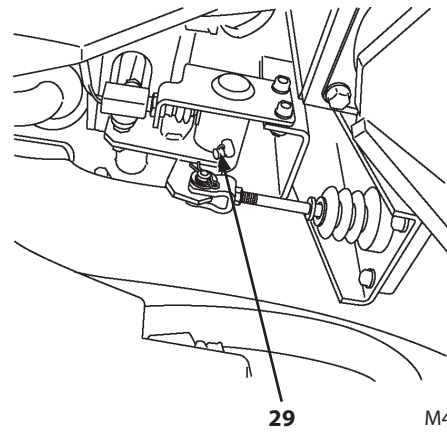
---

18. Two points to brake pedal (28)  
--- every 1000 hours



M4FC-07-014

19. One point to brake pedal linkage (29)  
--- every 1000 hours



M4FC-07-015

# MAINTENANCE

## B. Engine

1

### Check Engine Oil Level

--- every 10 hours (before starting the engine)

**IMPORTANT:** Incorrect engine oil level may cause engine trouble (The oil level should be between the upper and lower marks on oil level gauge (1)).

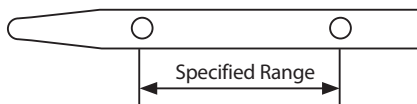
**If the engine oil level is too high, control the oil level to the proper quantity before starting the engine.**

Check the 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 the oil level is below the lower limit mark, add the recommended engine oil via oil filler (2).

If the oil level exceeds the upper limit mark, remove drain plug (3), and then drain oil.

Recheck the oil level.



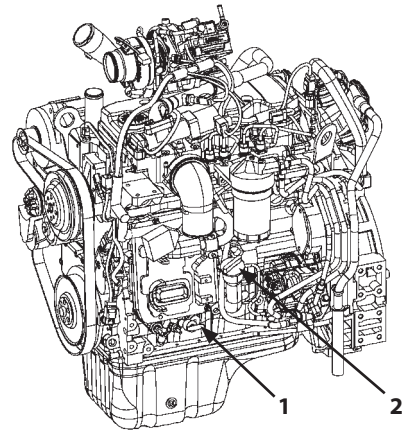
**NOTE:** Level the engine when adding oil or inspecting oil level.

When required to check the oil level after operating the machine, first stop the engine. Wait for more than 15 minutes. Then check oil level.

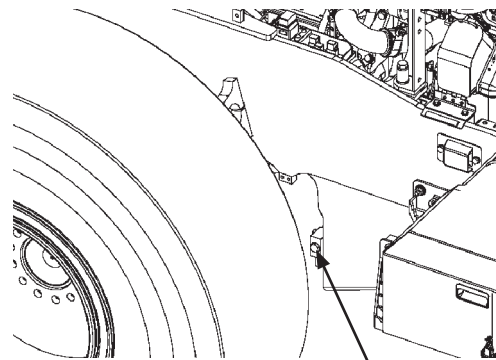
(This means that the oil level will become stabilized after all oil delivered to respective lubrication area returns to the oil pan.)

In case 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.



MPTC-07-022



MPTC-07-023

## MAINTENANCE

### 2 Change Engine Oil --- every 500 hours

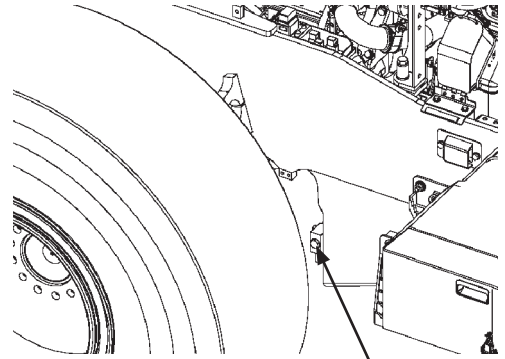
**WARNING:** Immediately after the machine has been operated, all engine parts are hot. Wait for the engine to cool before starting any maintenance work. Failure to do so may cause severe burns.

**NOTE:** Improper disposal of waste oil can threaten the earth's environment and ecology.

Consult professional collection trader or your authorized dealer for disposing used oil and filters.

Be sure to replace 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 20 liter (5.3 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 oil filter cartridge.



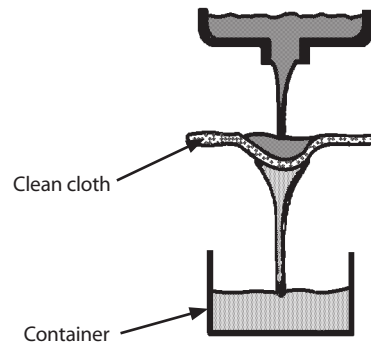
3 MPTC-07-023

## MAINTENANCE

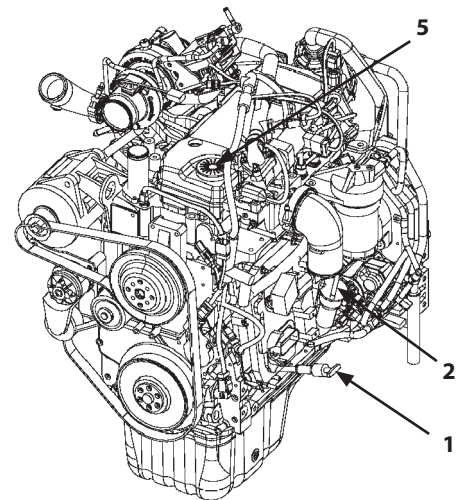
6. Allow oil to drain through a clean cloth to check if any foreign matters such as metal pieces are not included in the oil.
7. Install a new oil filter.  
(Refer to the descriptions for **3** Replace Engine Oil Filter.)
8. Securely tighten drain plug (3).
9. Remove oil filler cap (2). Supply the specified amount of engine oil.

Engine Oil amount: 18 liters (4.76 gallons)

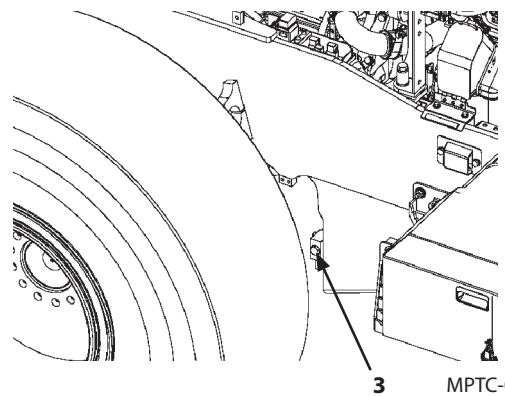
10. Securely tighten oil filler cap (2).
11. Check for looseness of other oil filler cap (5).
12. Check that the oil level is between the maximum and minimum level scales on oil level gauge (1). Then, start the engine.
13. After starting the engine, check the sealing surfaces for any oil leakage.
14. 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.



M4GB-07-020



MPTC-07-026



MPTC-07-023



## MAINTENANCE

### 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. After draining the oil, tighten the drain plug.

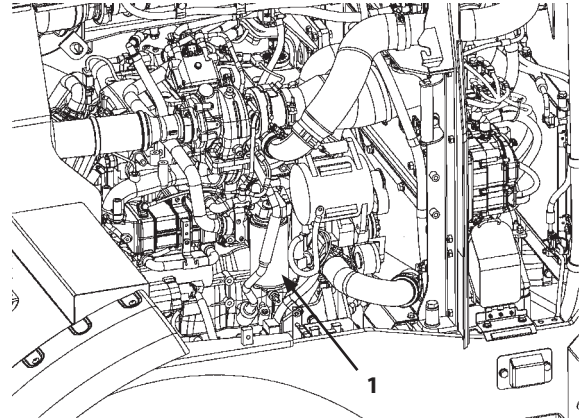
#### IMPORTANT:

- 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. After coating a new cartridge gasket with engine oil, turn the cartridge clockwise until the gasket comes in contact with the sealing surface.
  6. 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.

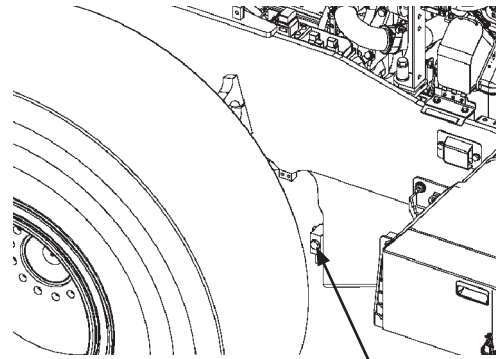
**NOTE:** Install the cartridge with care so that the gasket is not damaged due to twisting.

Check for any oil leakage at the filter mounting area.

7. Supply the specified amount of engine oil.  
(Refer to the descriptions for **2** Change Engine Oil.)



MPTC-07-027



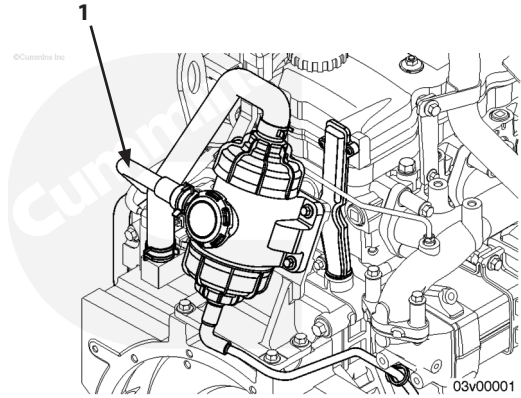
MPTC-07-023

## MAINTENANCE

### 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 crankcase breather tube (1).
6. Check for loose clamp securing tube (1) to the engine.

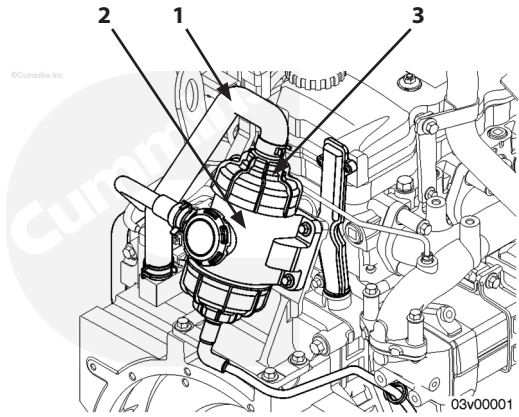


MPTC-07-038

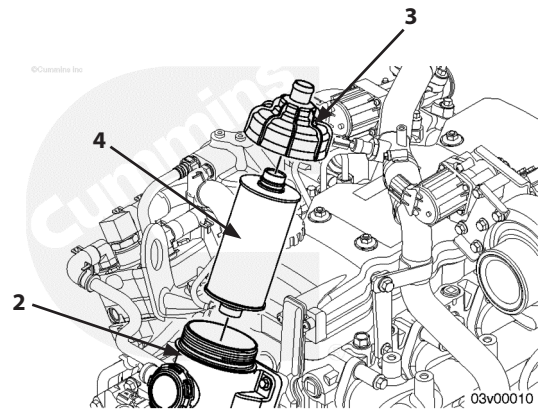
## MAINTENANCE

### 5 Replace Crankcase Breather Filter Element --- Every 2000 hours

1. Park the machine following the same procedure as described on page 7-7 for preparation of inspection/maintenance work.
2. Disconnect open crankcase ventilation hose (1) from crankcase ventilation filter housing (2).
3. Rotate top inlet cover (3) counterclockwise and remove filter element (4).
4. Install the new filter element. Tighten top inlet cover (3) clockwise.
5. Connect open crankcase ventilation hose (1) to crankcase ventilation filter housing (2).



MPTC-07-038



MPTC-07-040

## MAINTENANCE

### 6 Check Oil Drain Tube

--- Every 2000 hours

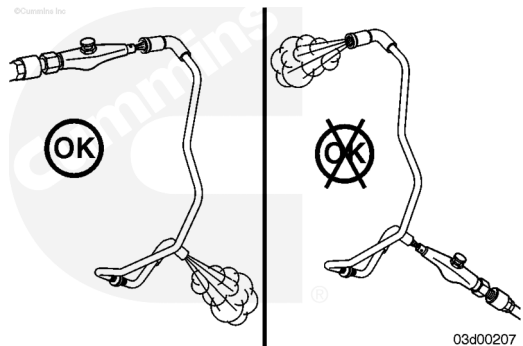
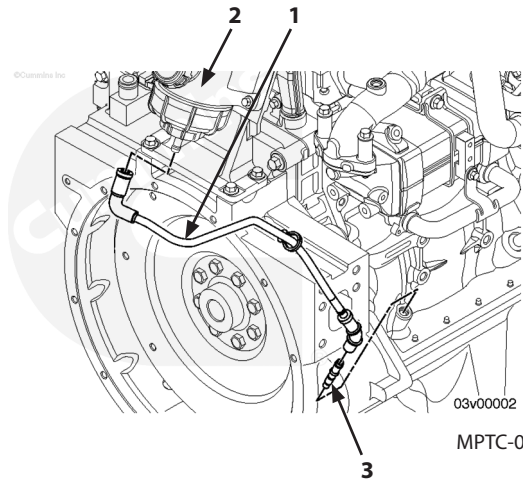
**WARNING:** Be sure to wear safety glasses when using compressed air.

1. Remove oil drain tube (1) from crankcase ventilation filter housing (2) and cylinder block.

**NOTE:** When oil drain tube (1) is removed, insert (3) may be left in the cylinder block. Insert (3) can be removed easily by hand.

2. Confirm that the check valve works normally by sending a small amount of air (less than 34 kPa (4.9 PSI)) through oil drain tube (1). (Refer to the right illustration.)
3. After coating the new O-ring surface with clean engine oil, install it on insert (3).
4. Install insert (3) to oil drain tube (1).
5. Connect oil drain tube (1) to crankcase ventilation filter housing (2) and cylinder block.

**IMPORTANT:** At this time, be careful not to point oil drain tube (1) in the incorrect direction.



# MAINTENANCE

## C. Power Train

### 1 Check Transmission Oil Level --- every 10 hours (daily)

**WARNING:** Check the oil level while running the engine with care about the following points.

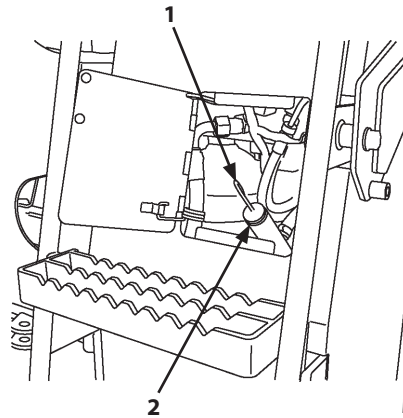
- Move forward/reverse lever to neutral and turn parking brake switch ON.
- After leveling the bucket on the ground, move the control lever lock switch to the lock (🔒) position.
- Set the articulation lock bar.

#### IMPORTANT:

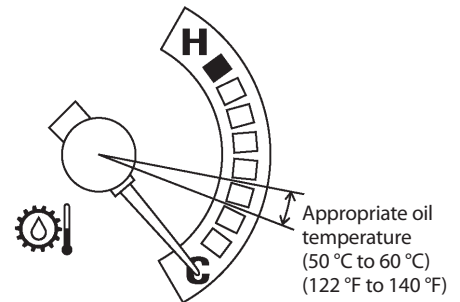
**Do not start the engine when the transmission oil level is low. Damage to the transmission may result. Do not use transmission oils other than those listed in the "Kind of Oils" - "Transmission Oil".**

Check the 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).

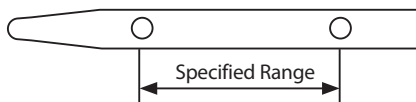
If the oil level is below the lower limit mark, add the recommended transmission oil via oil filler (2). Recheck the oil level.



M4FC-07-019



M4GB-07-158



**NOTE:** Level the machine when adding oil or inspecting oil level.

*In case the oil color changes, severe contamination and/or mixing of foreign matter may be seen, change the oil.*

## MAINTENANCE

**2** Change Transmission Oil  
--- every 1000 hours (500 hours at first change only)

**3** Clean Transmission Strainer  
---every 1000 hours

**WARNING:**

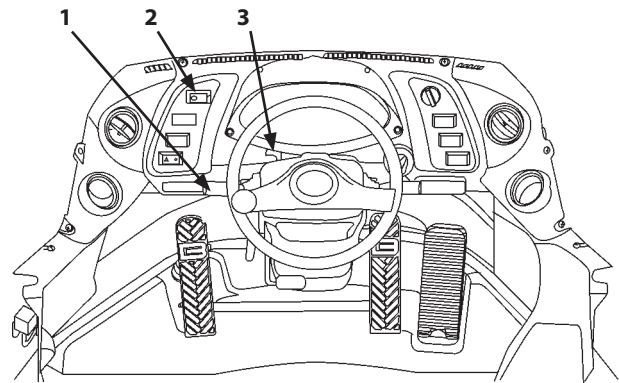
- Unexpected movement of the machine may cause a serious accident. When parking the machine, place F-N-R lever (1) in neutral and neutral lever lock (3) in the lock (🔒) position. Then, apply parking brake (2) and stop the engine.
- Before changing oil, install articulation lock bar (4) to securely hold the front and rear frames. Avoid accidents due to unexpected movement of the machine.

**IMPORTANT:** Do not use transmission oils other than those listed in the "Kind of Oils" - "Transmission Oil".

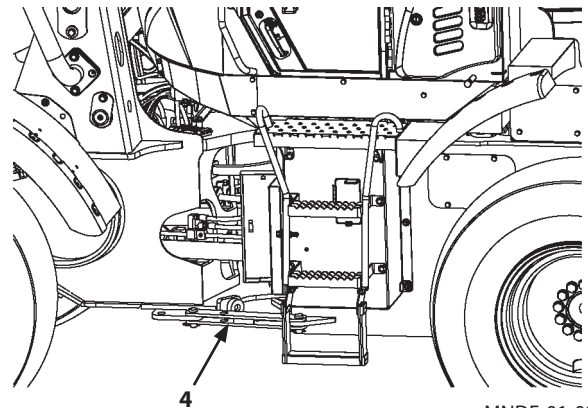
1. Operate the machine until the transmission oil is heated to the appropriate temperature.
2. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/maintenance work.
3. Install articulation lock bar (4) to the front and rear of the frame by following the procedures described on page 7-9.

**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.




MNDB-01-001




MNDF-01-026

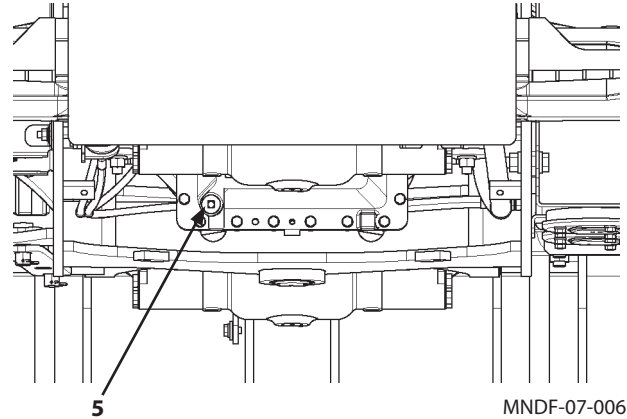
## MAINTENANCE

5. Prepare a container of more than 50 L capacity to receive the drain oil.

 **NOTE:** Drain plug (5) is magnetized. If excessive amount of metal pieces are found adhered to drain plug (5), contact your authorized dealer.

6. Remove drain plug (5) from the transmission bottom to drain the oil. Dispose of the drain oil in the proper way.
7. Securely tighten drain plug (5).


 **NOTE:** Do NOT apply sealant to drain plug (5).

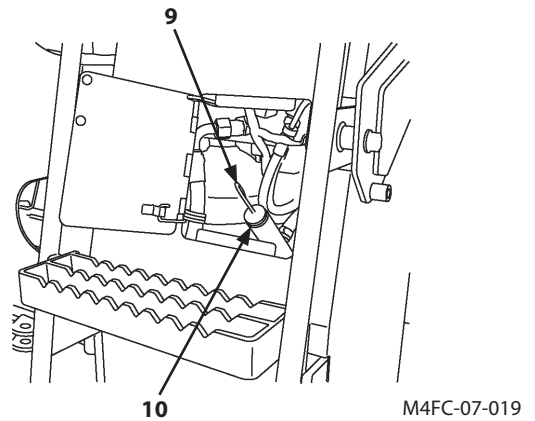
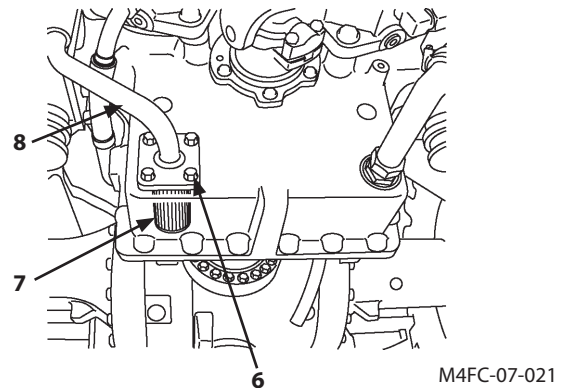


8. Remove bolts (6) (4 used) from suction tube (8).
9. Remove strainer (7) and clean it. If strainer (7) is damaged, replace with a new one. Replace the gasket and the O-ring with new ones.
10. Install strainer (7), O-ring and gasket. Tighten bolts (6) (4 used).
11. Refill the specified amount of oil through transmission oil filler port (10).

Transmission oil: 10 liters (2.6 gallons)

12. Start the engine and keep it running for two minutes.
13. Check that the oil level is within the specified range in oil level gauge (9). If necessary, add oil.

 **NOTE:** Check for any oil leakage at the drain plug and the strainer mounting area.





# MAINTENANCE

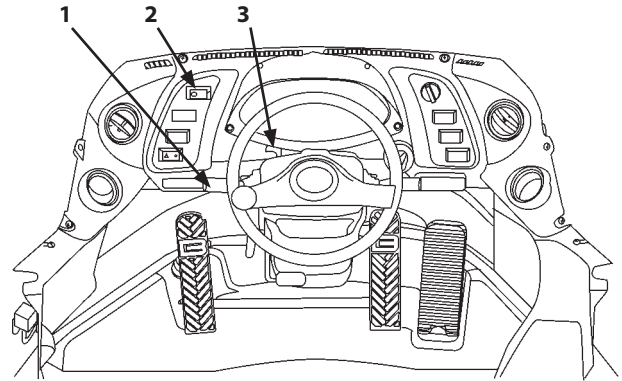
## 4 Replace Transmission Oil Filter --- every 500 hours

**WARNING:** Take care about the following points.

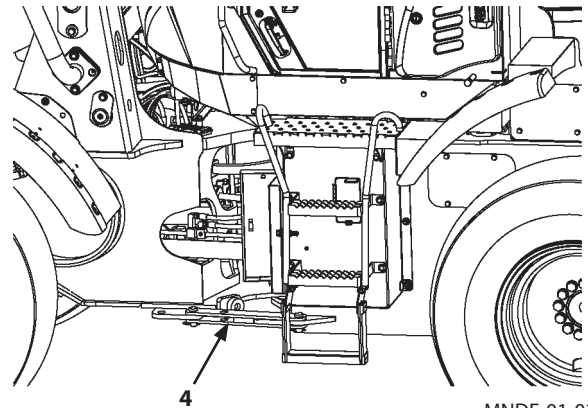
- Starting repair work immediately after operation may cause burns. Wait for the oil to cool before starting any maintenance work.
- Lock the front and rear frames with the articulation lock bar (4).

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 (4) to the front and rear of the frame by following the procedures described on page 7-9.
3. Remove the inspection cover for left side step.
4. Rotate the hexagonal section on the bottom of case (5) counterclockwise using a spanner to remove case (5) from head cover (6).
5. While turning element (8), remove the element downward.
6. Replace O-ring (7) with a new one.
7. Sufficiently seat O-ring (7) in the O-ring groove on head cover (6).
8. Coat the seal surface of new element (8) with hydraulic oil. While turning element (8), completely install element (8) into head cover (6) using care not to damage the element.
9. Take care never to allow water and/or dust to enter the filter case.
10. Install case (5) into head cover (6) while rotating case (5) clockwise.

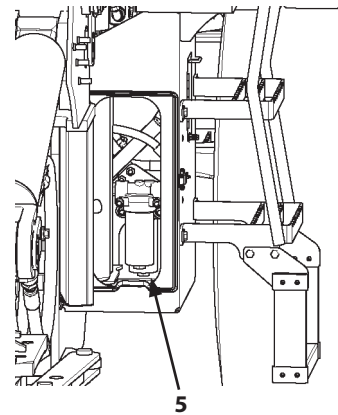
**NOTE:** Replace the element at the regular intervals to maintain clean transmission oil and extend the service life of the components.



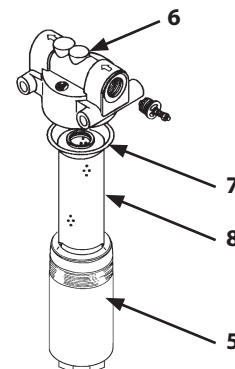
MNDB-01-001



MNDF-01-026



MNDF-07-007



M4GB-07-050



## MAINTENANCE

### 5 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 "Kind of Oils" - "Axle Oil".

#### Change Axle Oil

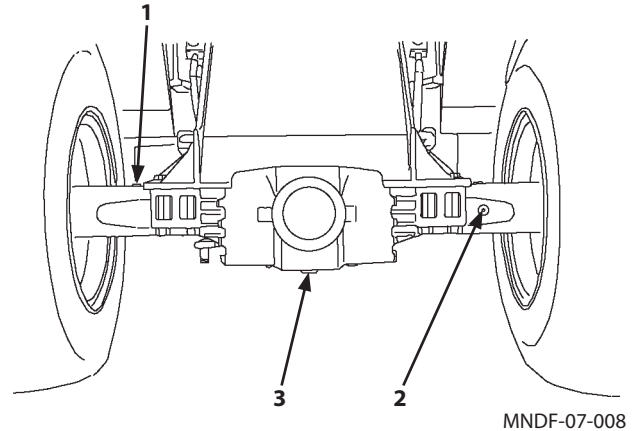
1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/maintenance work.
2. Install articulation lock bar to the front and rear of the frame by following the procedures described on page 7-9.
3. Clean the areas around drain plug (3), oil filler plug (1) and oil level plug (2).
4. Arrange a container of 30 liters capacity to receive the drain oil.
5. Remove oil filler plug (1) and oil level plug (2).
6. Remove drain plug (3) to drain the oil.
7. Securely tighten drain plug (3).
8. Refill the specified amount of oil through oil filler plug (1) hole until oil flows out of oil level plug (2) hole.

Front Axle	Rear Axle
25 liters (6.6 gallons)	25 liters (6.6 gallons)

9. Securely tighten oil filler plug (1) and oil level plug (2).

**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.**



## MAINTENANCE

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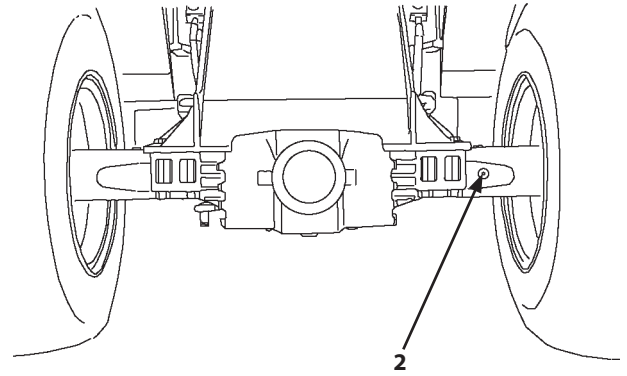
### Check Oil Level

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 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).

Oil level must be up to oil level plug (2) hole. If necessary, add oil.



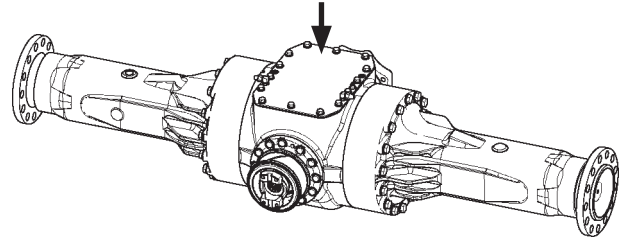
MNDF-07-008

## MAINTENANCE

### 6 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.



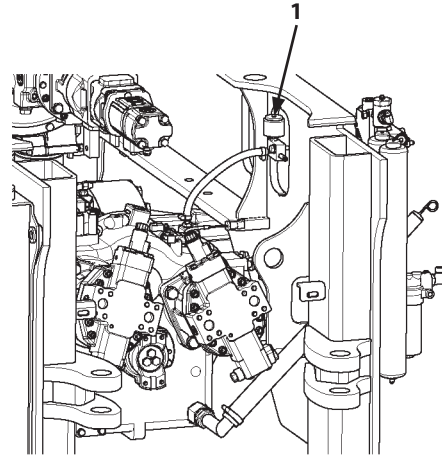
MNDF-07-009

### 7 Clean Axle Housing Air Breather

--- every 500 hours

**CAUTION:** Be sure to wear safety glasses when cleaning air breather (1) with compressed air.

1. Clean the vicinity around air breather (1) before removing air breather (1).
2. Put a cover on the air breather port to prevent foreign matter from entering.
3. Clean air breather (1) using compressed air. If completely contaminated, wash air breather (1) with a cleaning solvent and reinstall it.
4. Take care not to allow foreign matter to enter into the axle housing when reinstalling air breather (1).



MNDF-07-057

# MAINTENANCE

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## D. Hydraulic System

### Inspection and Maintenance of Hydraulic Equipment

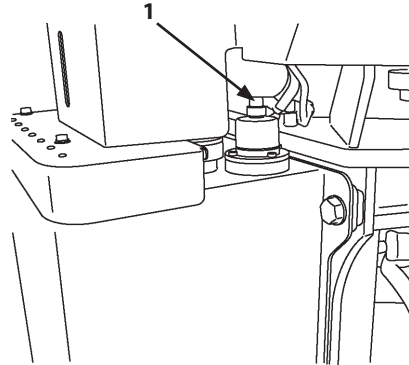
**⚠ CAUTION:** When checking and/or servicing the hydraulic components, pay special attention to the following points.

**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.



M4FC-07-025

## MAINTENANCE

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### 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 it out 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.**
- **When adding hydraulic oil, always use the same brand of oil; do not mix brands of oil. As the machine is filled with Hitachi Genuine Hydraulic Oil 5000 when it is shipped from the factory, use it as a general rule. When selecting to use another brand of oil listed in the table "Kind of Oils" - "Hydraulic Oil", be sure to completely replace the oil in the system.**
- **Do not use hydraulic oils other than those listed in the table "Kind of Oils" - "Hydraulic Oil".**
- **Never run the engine without oil in the hydraulic oil tank.**

# MAINTENANCE

1


## Check Hydraulic Oil Level

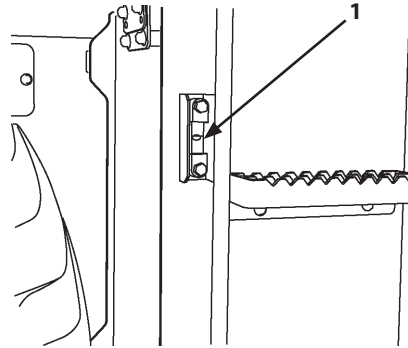
--- every 10 hours

**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.

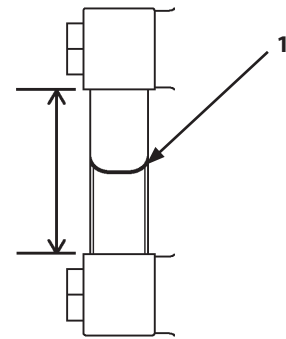
**If the oil level is higher than the level gauge, drain oil down to the appropriate level using a pump.**

1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/maintenance work.
2. Check oil level with level gauge (1) on hydraulic oil tank. The oil must be between the marks on the gauge. If necessary, add oil.

 **NOTE:** During the 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.



M4FC-07-026



M4GB-07-160

## MAINTENANCE

### 2 Change Hydraulic Oil/Clean Hydraulic Oil Tank --- every 2000 hours

#### Changing and cleaning procedure

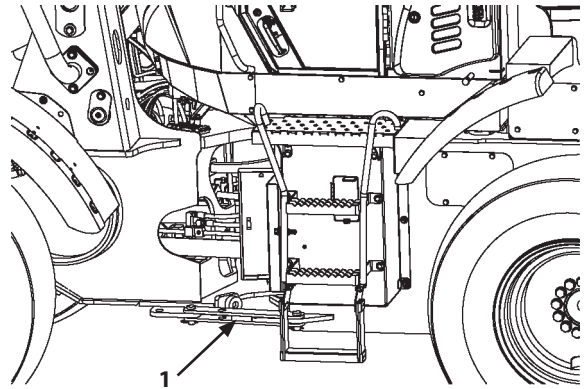
**WARNING:** Hydraulic oil becomes hot and pressurized during operation. Severe burns may result if the skin comes in contact with escaping hydraulic oil immediately after operation. Wait for the oil to cool before starting any maintenance work.

**IMPORTANT:** Do not use hydraulic oils other than listed in the "Kind of Oils" - "Hydraulic Oil".

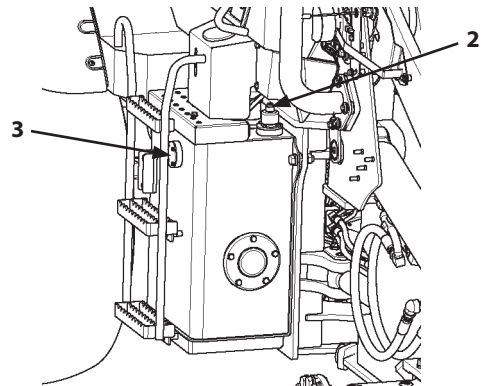
1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/maintenance work.
2. Install articulation lock bar (1) to the front and rear of the frame by following the procedures described on page 7-9.
3. Before changing the hydraulic oil, be sure to relieve the air pressure from the hydraulic oil tank 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.

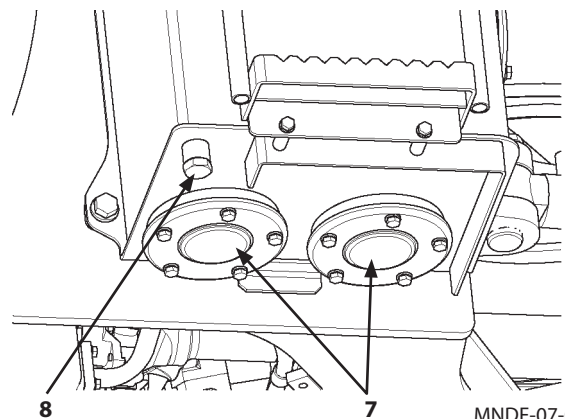
4. Remove cover (3). Arrange a container of approx. 150 liters (40 gallons). Remove drain plug (8) to drain the hydraulic oil. Put a cover on the oil supply port to prevent foreign matter from entering.
5. Remove covers (7) (2 used) of the tank bottom. Pull down suction filters (9) (2 used). Clean the tank bottom with cleaning oil. Install covers (7) and suction filters (9) to the original position after cleaning.



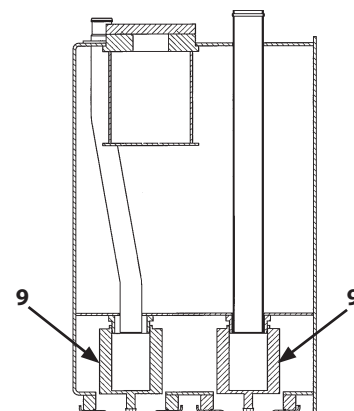
MNDF-01-026



MNDF-07-010



MNDF-07-011



M4FC-07-029

## MAINTENANCE

- Supply hydraulic oil through cover (3) hole on the hydraulic oil tank while checking the oil level at level gauge (10).

Capacity of hydraulic oil tank	: 80 liters (21 gallons)
Total capacity in the hydraulic system	: 150 liters (40 gallons)

- Install cover (3) with bolts (4 used).

Tightening torque: 40 N·m (4.0 kgf·m) (29.5 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.**

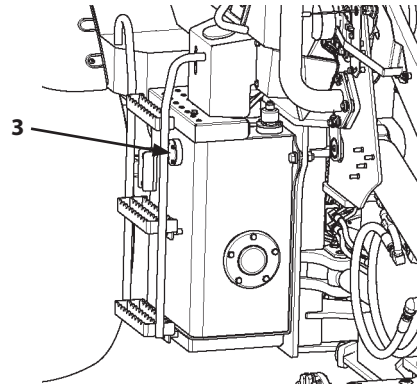
- Start the engine. Slowly raise or lower the arm and tilt the bucket forward and backward. Stop the engine. Check for any oil leakage. Check the oil level using level gauge (10).

### Bleed Air from the Hydraulic System.

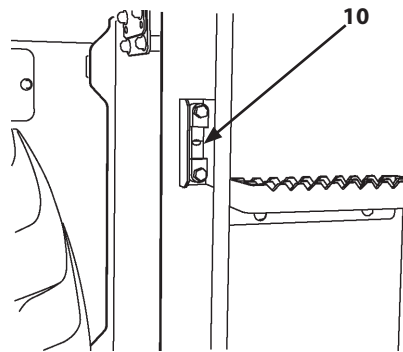
After changing hydraulic oil or replacing the return filter, pilot filter and/or suction filter, bleed air from the hydraulic system following the procedures below.

### Bleed Air from the Hydraulic Circuit.

- 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.
- Rest the bucket on the ground to resume the hydraulic oil level check position.
- Stop the engine. Check the oil level. Add oil as needed.



MNDF-07-010



M4FC-07-026



## MAINTENANCE

### 3 Clean Suction Filter

--- each time the hydraulic oil is changed.

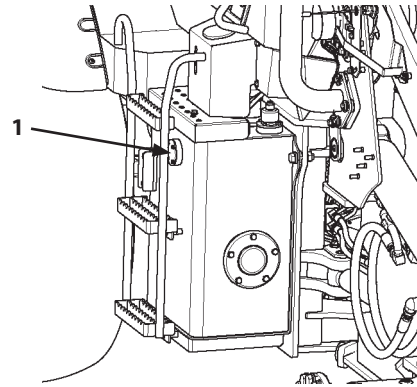
Two suction filters are located on the bottom of the hydraulic oil tank.

Clean the suction filters when changing hydraulic oil.

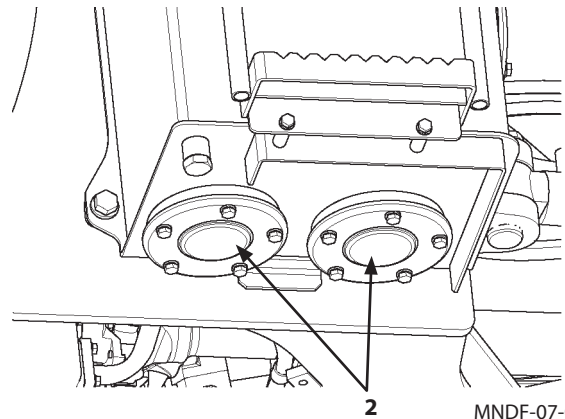
1. After draining hydraulic oil, remove covers (2). Pull down to take out suction filters (3). Put a cover over the oil supply port to prevent foreign matter from entering.  
Slowly take out filters (3) not to drop the trapped dust.
2. Clean suction filters (3) and the hydraulic oil tank inside with cleaning oil.
3. Securely insert the suction filter into pipe (5) when installing the suction filter.
4. Before installing covers (2), check that bolts (4) of the end of suction filter (3) are securely tightened. Then, install covers (2) with bolts.

Tightening torque: 50 N·m (5.0 kgf·m) (37 lbf·ft)

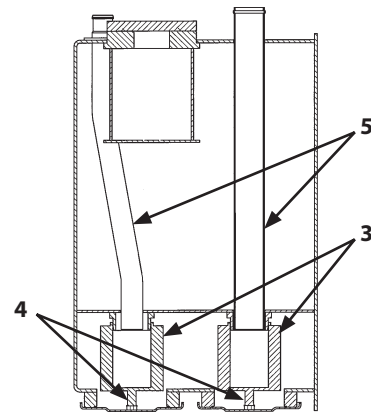
5. Supply the specified volume of oil through oil supply port (1) while checking the oil level with oil gauge (6).
6. Start the engine. While slowly raising or lowering the arm and tilting the bucket forward and backward, check for any abnormality. Stop the engine. Check the oil level using level gauge (6).



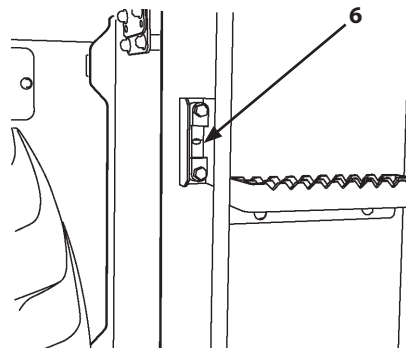
MNDF-07-010



MNDF-07-011



M4FC-07-029



M4FC-07-026

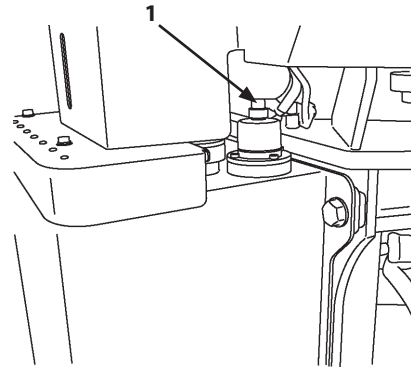
# MAINTENANCE

## 4 Replace Pilot Oil Filter --- every 2000 hours

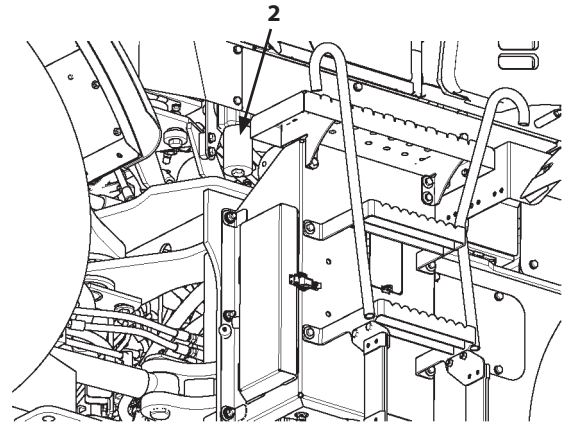
### Replace

**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.

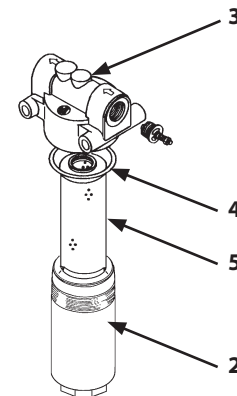
1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/maintenance work.
2. Install articulation lock bar to the front and rear of the frame by following the procedures described on page 7-9.
3. Before replacing the filter element, be sure to relieve the air pressure from the hydraulic oil tank by pressing air bleed valve (1).
4. Rotate the hexagonal section on the bottom of case (2) counterclockwise using a spanner to remove case (2) from head cover (3).
5. While turning element (5), remove the element downward.
6. Replace O-ring (4) with a new one.
7. Sufficiently seat O-ring (4) in the O-ring groove on head cover (3).
8. Coat the seal surface of new element (5) with hydraulic oil. While turning element (5), completely install element (5) into head cover (3) using care not to damage the element.



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M4GB-07-050

## MAINTENANCE

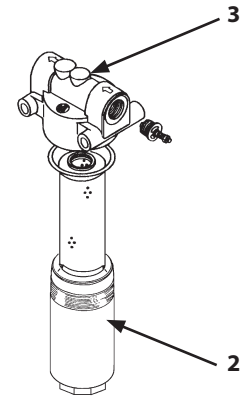
---

9. Take care never to allow water and/or dust to enter the filter case.
10. Install case (2) into head cover (3) while rotating case (2) clockwise.
11. After replacing the filter, bleed air from the hydraulic pump and check the oil level in the hydraulic oil tank.


Tightening torque: 20 to 30 N·m (2 to 3 kgf·m) (14.7 to 22 lbf·ft)

(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.



M4GB-07-050

 **NOTE:** Replace the element at the regular intervals to maintain clean hydraulic oil and extend the service life of the hydraulic components.

## MAINTENANCE

### 5 Replace Hydraulic Tank Oil Filter --- every 1000 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 the articulation lock bar to the front and rear of the frame by following the procedures described on page 7-9.
3. Remove washer tank cover (2) and deck plate (3).
4. Press air bleed valve (1), and relieve the air pressure from the hydraulic oil tank.
5. Clean the vicinity around cover (4).
6. Arrange a container and workshop towels to receive the spilled oil and element (8).
7. Loosen bolts (5) (6 used) to remove cover (4) and O-ring (6).

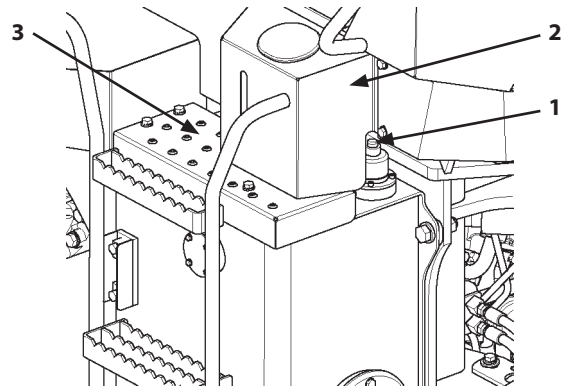
When removing cover (4), slowly remove the cover while pressing cover (4) downward so that spring (7) does not fly off.

8. Remove spring (7), valve (8) and element (9).
9. Replace element (9) and O-ring (6) with new ones. Install new element and O-ring in the hydraulic oil tank.

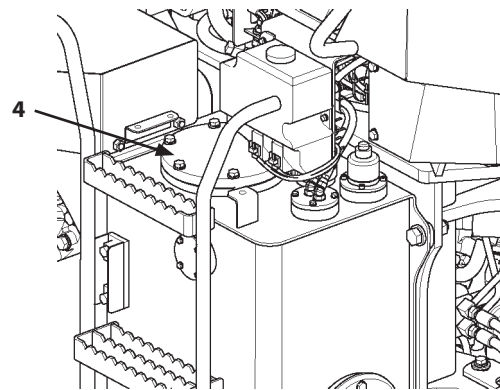
Before installing element (9), make sure that O-ring (6) is present.

10. Install cover (4) with bolts (5) (6 used).

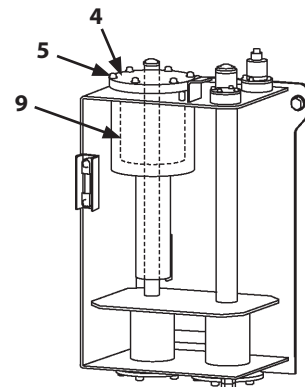
Tightening torque: 20 N·m (2.0 kgf·m) (14.7 lbf·ft)



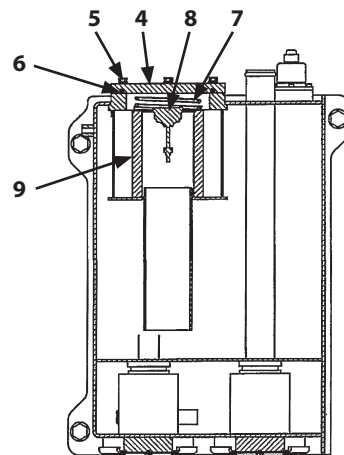
MNDF-07-013



MNDF-07-014



M4FC-07-031



M4FC-07-032


## MAINTENANCE

---

11. 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.*

## MAINTENANCE

### 6 Replace HST Charge Filter --- every 500 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.**

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).
4. Remove the cover of left side step.
5. Rotate the hexagonal section on the bottom of case (2) counterclockwise using a spanner to remove case (2) from head cover (3).
6. While turning element (5), remove the element downward.
7. Replace O-ring (4) with a new one.
8. Sufficiently seat O-ring (4) in the O-ring groove on head cover (3).
9. Coat the seal surface of new element (5) with hydraulic oil. While turning element (5), completely install element (5) into head cover (3) using care not to damage the element.
10. Take care never to allow water and/or dust to enter the filter case.
11. Install case (2) into head cover (3) while rotating case (2) clockwise.

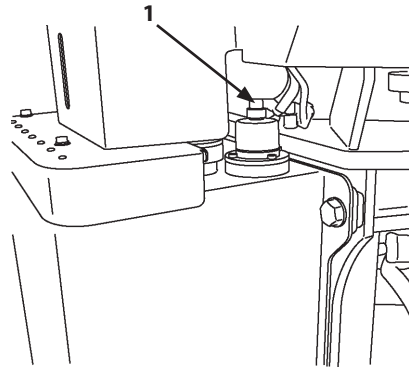
Tightening torque: 39 N·m (4.0 kgf·m) (29 lbf·ft)

12. After replacing the filter, bleed air from the hydraulic pump and check the oil level in the hydraulic oil tank.

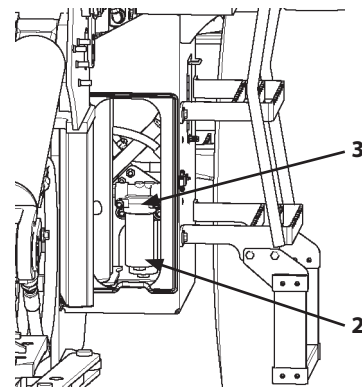
(Refer to the descriptions for "Bleed air from the hydraulic system" in item **2**.)

If the machine is operated without bleeding the air mixed in the hydraulic circuit, damage to the hydraulic pump may result.

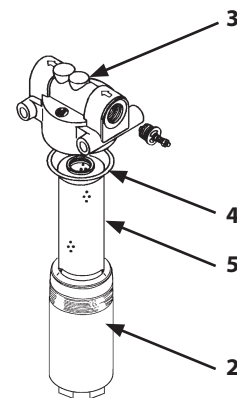
**✎ NOTE:** Replace the element at the regular intervals to maintain clean hydraulic oil and extend the service life of the hydraulic components.



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MNDF-07-007



M4GB-07-050

## MAINTENANCE

### 7 Replace Air Breather Element --- every 2000 hours

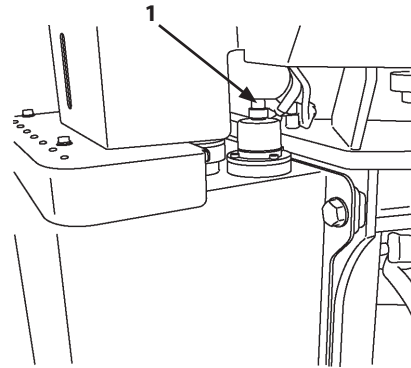
**WARNING:** Hydraulic oil becomes hot and pressurized during operation.

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.

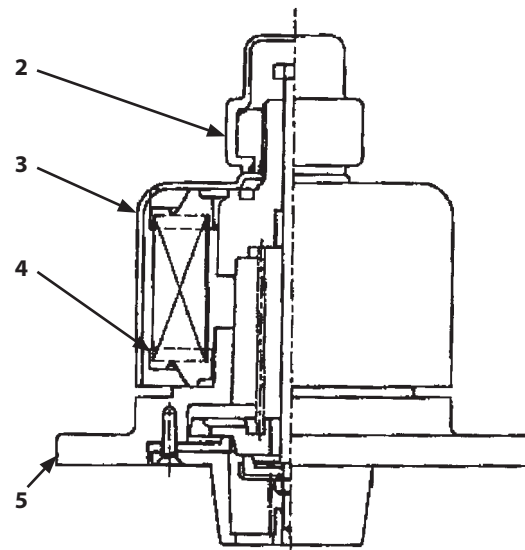
#### Replace

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. Rotate cover (3) clockwise approx. 1/4 turns. Remove cap (2) by rotating it counterclockwise.
4. Rotate cover (3) counterclockwise and remove it. Remove element (4).
5. Install new element (4). Tighten cover (3) clockwise. After cover (3) come in contact with the inside element, tighten the cover by 1/4 turn further.
6. Manually tighten cap (2) clockwise to the end. Hold cap (2) in position by hand to prevent the cap from turning. Tighten cover (3) counterclockwise 5 to 10° securely.
7. Take care not to allow water or dust to enter the clearance (air discharge port) between cover (3) and body (5).

**NOTE:** Replace the element at the recommended regular intervals to keep the hydraulic oil clean and to extend the service life of the hydraulic components.



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## MAINTENANCE

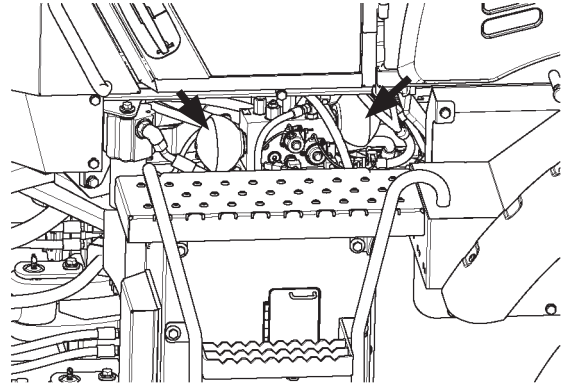
### 8 Check Pilot Circuit Accumulator Function, Gas Leakage, Looseness, and Damage

--- every 2000 hours

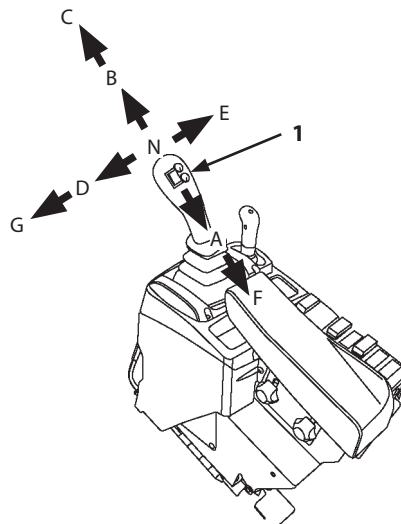
#### ⚠ WARNING:

- 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.

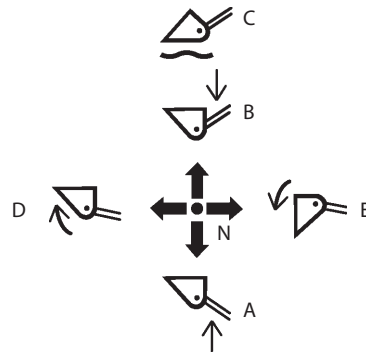
1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/maintenance work.
2. Raise the lift arm at the maximum height, and then set the lift arm control lever in the Neutral (N) position.
3. Turn the key switch OFF to stop the engine.
4. Turn the key switch ON but do NOT start the engine.
5. Confirm the safety around the machine.
6. Place control lever (1) to FLOAT position (C) and lower the bucket 1 m off the ground within 2 minutes after stopping the engine.
7. Place control lever (1) to the LOWER position (B) and lower the bucket on the ground.
8. Ensure the lift arm does not stop halfway. If the lift arm stops halfway, the accumulator function may be deteriorated. Consult your authorized dealer for check and repair.



MNDF-07-015



MNEC-01-059



M4GB-01-074



## MAINTENANCE

- 9** **Replace Pilot Circuit Accumulator**  
--- every 4000 hours or once every two years  
whichever comes first.

Consult your authorized dealer for replace.

- 10** **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.

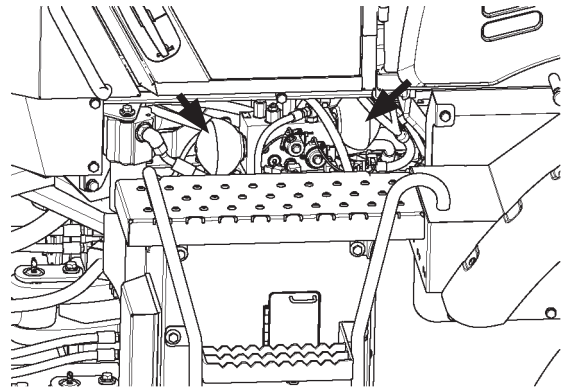
Let the machine travel with the ride control switch turned AUTO and OFF to compare the machine's vertical vibration during travel. Travel the machine at the speed faster than 5 km/h. If the machine's vertical vibration is not dampened when letting the machine travel with the ride control function activated, the accumulator may be faulty. Consult your authorized dealer for check and repair.

- 11** **Check Gas Pressure in Ride Control Accumulator**  
--- every 2000 hours

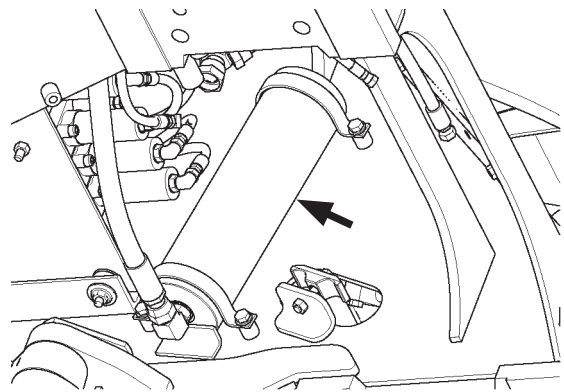
Check the gas pressure at a regular interval. Ask your authorized dealer for checking.

- 12** **Check Gas Pressure in Steering Accumulator**  
--- every 2000 hours

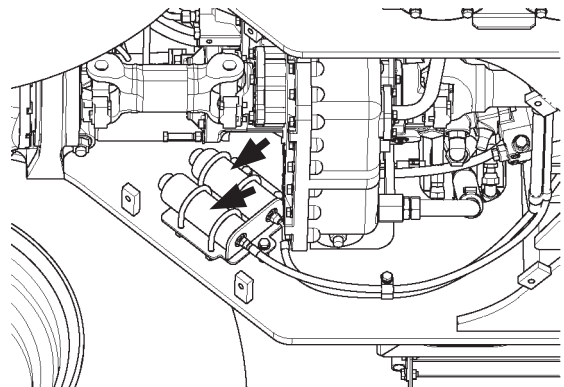
Check the gas pressure at a regular interval. Check the gas pressure in case the machine vibrates and the turning is not smooth when the steering wheel is operated. Consult your authorized dealer for checking the gas pressure.



MNDF-07-015



MNDF-07-016



MNDF-07-017

## MAINTENANCE

13

### 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 :

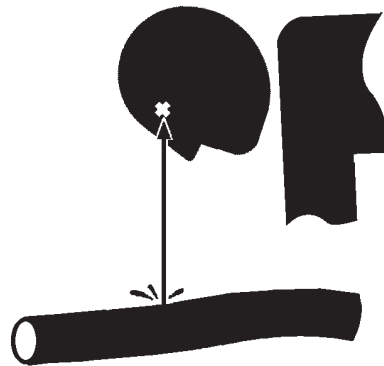
- Park the machine on a firm, level surface. Lower the bucket to the ground. Stop the engine. Remove key from the key switch. Push the control lever lock switch to the lock (🔒) position.
- Check for missing or loose clamps, kinked hoses, lines or hoses that rub against each other, damaged oil cooler, and loose oil cooler flange bolts, 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.

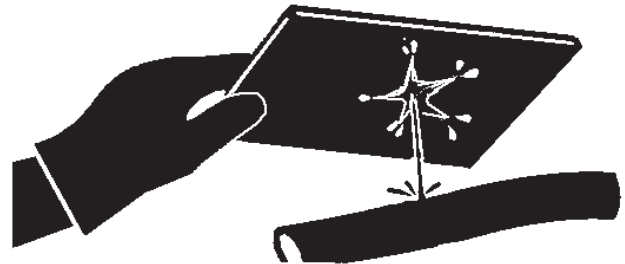
- Tighten, repair or replace any missing, loose or damaged clamps, hoses, lines, oil cooler, and loose oil cooler flange bolts. Do not bend or strike high-pressure lines.



SA-031



SA-292

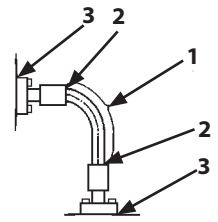


SA-044

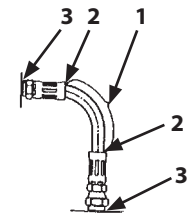
# MAINTENANCE

## Hose

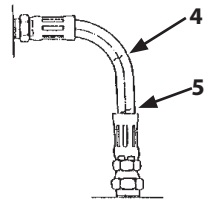
Interval (hours)	Check Points	Abnormalities	Remedies
Every 10 hours	Hose covers	Leak (1)	Replace
	Hose ends	Leak (2)	Replace
	Fittings	Leak (3)	Retighten or replace hose or O-ring
Every 250 hours	Hose covers	Leak (4)	Replace
	Hose ends	Leak (5)	Replace
	Hose covers	Exposed reinforcement (6)	Replace
	Hose covers	Blister (7)	Replace
	Hose	Bend (8), Collapse (9)	Replace
	Hose ends and Fittings	Deformation or Corrosion (10)	Replace



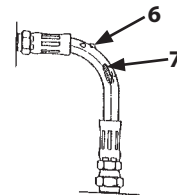
M137-07-008



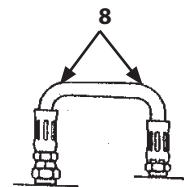
M115-07-145



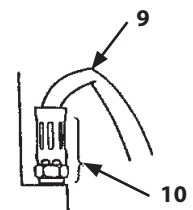
M115-07-146



M115-07-147



M115-07-148

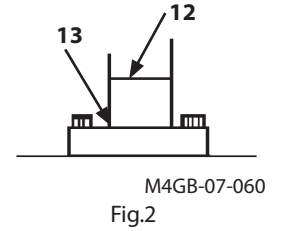
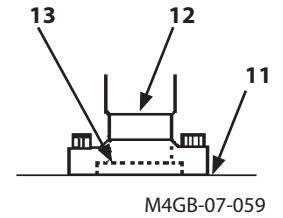


M115-07-149

Fig.1

## MAINTENANCE

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



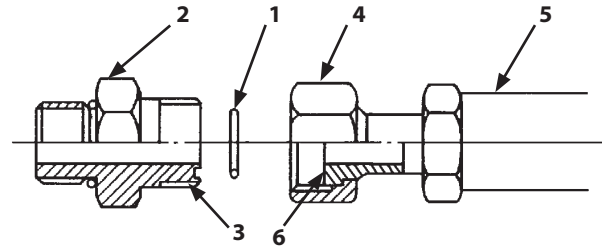
## MAINTENANCE

### 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.

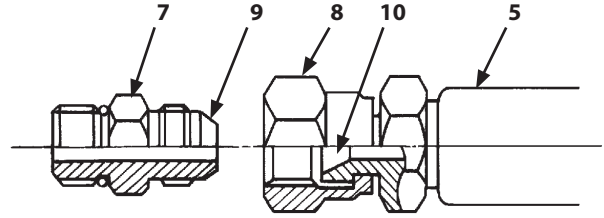
Width across flats (mm)		27	36	41	50
Tightening torque:	N·m (lbf·ft)	95 (70)	180 (133)	210 (155)	350 (258)

## MAINTENANCE

### 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.



Tightening torque:

Tighten fittings to the torque values shown below.

M202-07-051

Width across flats (mm)		17	19	22	27	36
Tightening torque:	N-m (lbf·ft)	25 (18)	30 (22)	40 (30)	80 (59)	180 (133)

## MAINTENANCE

---

### 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.

#### Recommended Fuel

Use only super high quality or high quality DIESEL FUEL (JIS K-2204) (ASTM D-975) (EN-590) which contains 15 ppm or lower sulfur.

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.

# MAINTENANCE

## 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.

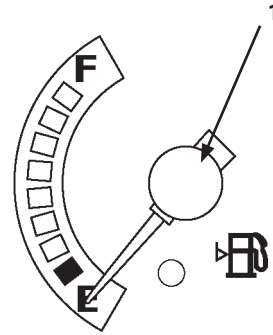
2. Check fuel gauge (1) of the monitor panel. Add fuel if necessary.

**IMPORTANT:** Keep all dirt, dust, water and other foreign materials out of the fuel system.

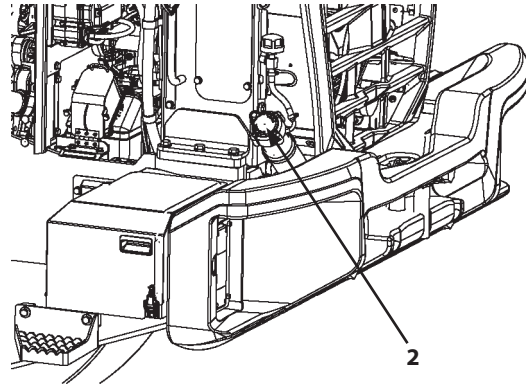
3. To avoid condensation, fill the tank at the end of each day's operation. Take care not to spill fuel on the machine or ground.

Fuel tank capacity: 205 liters (54 gallons)

4. Install and lock fill cap (2) immediately after fueling.



MNEC-01-002



MPTC-01-011

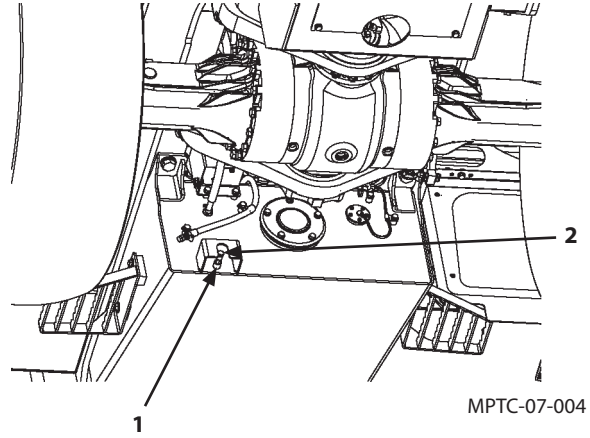


## MAINTENANCE

### **2** Drain Water and Sediment from Fuel Tank --- every 1000 hours

Before starting to operate the machine, remove plug (2) from the tip of drain valve (1) on the fuel tank bottom and open drain valve (1) to drain water and/or sediment from the fuel tank.

Plug (2) is installed to protect drain valve (1) from vandalism.



# MAINTENANCE

## 3 Drain Fuel Filter --- every 10 hours (daily)

**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 black drain hose (5) located in the tool box to drain plug (3) under fuel pre-filter (1) and the case.  
Place a container to receive water for safety.
2. Loosen drain plug (3) to drain water.
3. After draining water, securely tighten drain plug (3).

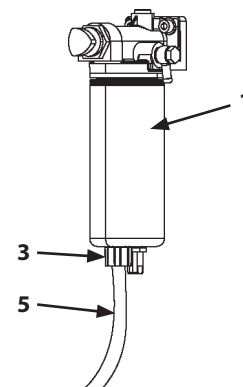
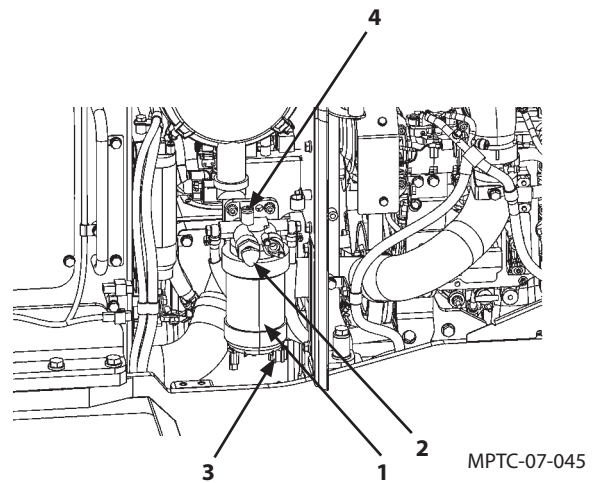
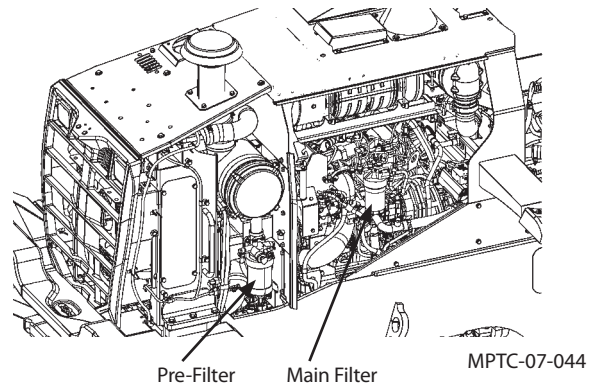
### Bleed Air from the Fuel System

**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.

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.



## MAINTENANCE

### 4 Replace Fuel Main Filter Element ---every 500 hours

#### IMPORTANT:

- Be sure to use only genuine Hitachi elements for the fuel main filter element and the pre-filter element. Failure to do so may deteriorate the engine performance and/or shorten the engine service life. Please note that all engine failures caused by using other manufacturers' elements are excluded from Hitachi Warranty Policy.
- Take care not to allow dirt and/or water to enter the fuel system.

#### 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.

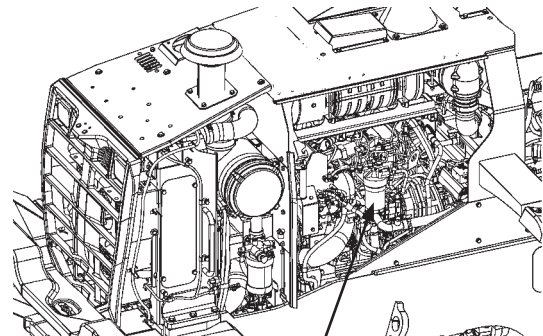
2. Apply a thin film of clean fuel to the gasket of new cartridge filter (2).
3. Turn cartridge filter (2) clockwise by hand until the gasket touches the contact area.
4. Using the filter wrench, tighten the cartridge 1/4 to 1/2 turn more.

Be careful not to overly tighten cartridge filter (2). Deformation of the cartridge may result.

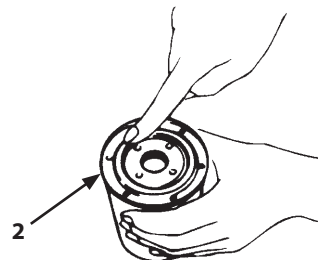
5. Bleed Air from the Fuel System

After replacing the fuel filter, bleed air from the fuel system.

(Refer to "Bleed Air from the Fuel System" in item **3**.)



MPTC-07-044



M4GB-07-066

## MAINTENANCE

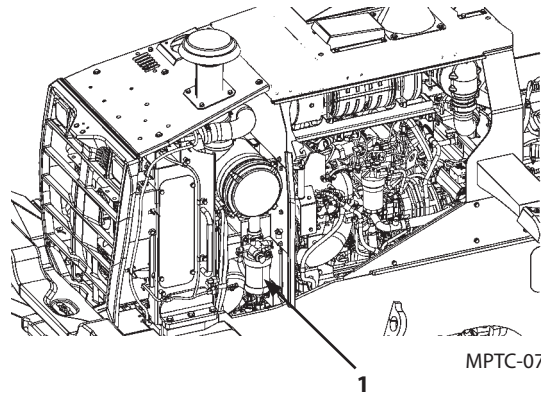
### 5 Replace Fuel Pre-Filter Element ---every 500 hours

#### IMPORTANT:

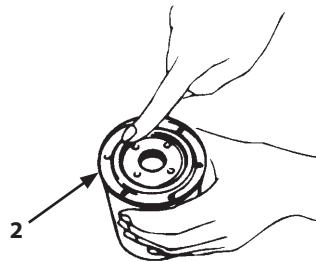
- Be sure to use only genuine Hitachi elements for the main fuel filter and the pre-filter. Failure to do so may deteriorate the engine performance and/or shorten the engine service life. Please note that all engine failures caused by using other manufacturers' elements are excluded from Hitachi Warranty 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**.)



MPTC-07-044



M4GB-07-066

## MAINTENANCE

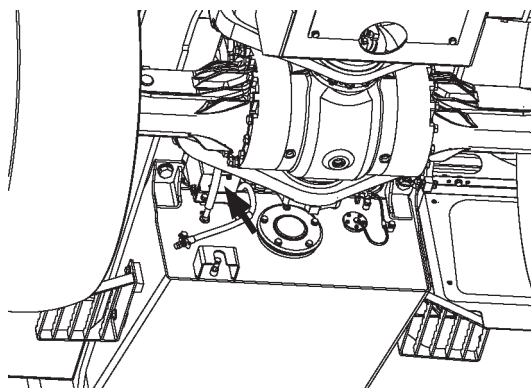
**6**

### Clean Fuel Solenoid Pump Strainer

--- every 1000 hours

#### Cleaning

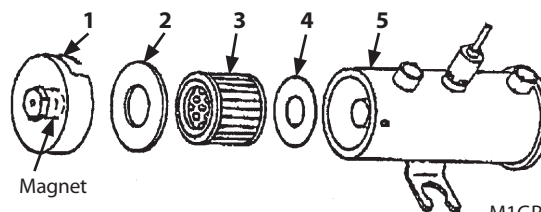
When the strainer is disassembled, be sure to replace the gasket. Install the cover and the magnet only after sufficiently cleaning them. After being assembled, closely check the air-tightness of the strainer.



MPTC-07-004

#### Disassembling/ Assembling

To remove cover (1), loosen it 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. Then, securely tighten cover (1) to pump (5) using a spanner.



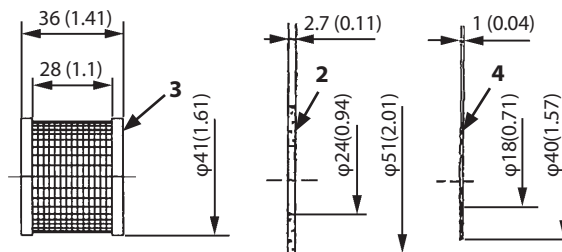
Magnet

M1GR-07-004

**NOTE:** Wrench size: 17 mm

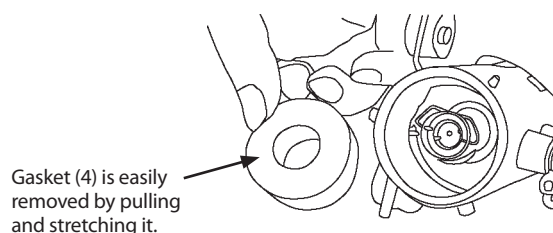
#### IMPORTANT:

- Only do the 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.



Unit: mm (in)

M1U1-07-006

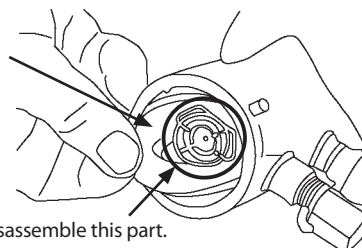


Gasket (4) is easily removed by pulling and stretching it.

MDAA-07-054

Stretch gasket (4) to remove.

Do not disassemble this part.



MDAA-07-053

# MAINTENANCE

## 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.**

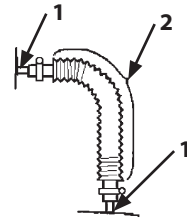
**Repair or replace any loose or damaged hoses.**

**Never reinstall bent or damaged hoses.**

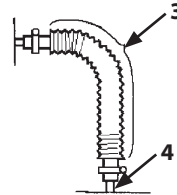
According to the check points shown below, check hoses for oil leaks and damage.  
If any abnormality is found, replace or retighten as instructed in the table.

Hose

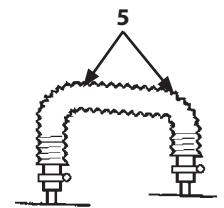
Interval (hours)	Check Points	Abnormalities	Remedies
Every 10 hours	Hose ends Hose covers	Leak (1) Wear, crack (2)	Retighten or replace
Every 250 hours	Hose covers	Crack (3)	Replace
	Hose ends	Crack (4)	Replace
	Hose Hose fittings	Bend (5), Collapse (6) Corrosion (7)	Replace Replace Replace



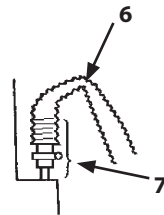
M4GB-07-071



M4GB-07-072



M4GB-07-073



M4GB-07-074

# MAINTENANCE

## F. Air Cleaner

### 1 Clean and Replace Air Cleaner Element

**Clean --- when the monitor indicator is lit.**

**Replace --- after cleaning six times or after one year.**

Air cleaner (1) is comprised of double elements, the outer element and inner element.

1. Park the machine following the same procedure 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.

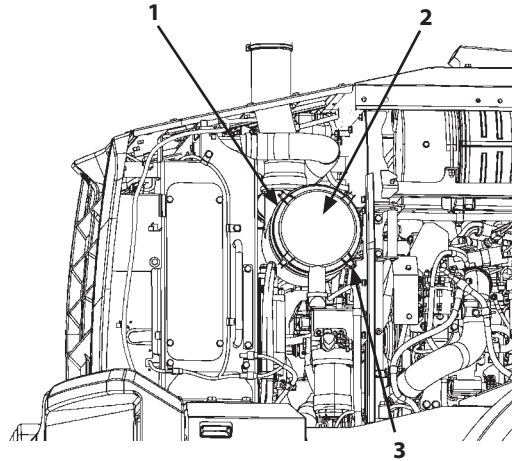
**CAUTION: Wear goggles or safety glasses when using compressed air [less than 0.69 MPa (7 kgf/cm<sup>2</sup>) (100 psi)].**

**IMPORTANT: To clean elements (5) (6), avoid giving shocks or striking element with other objects.**

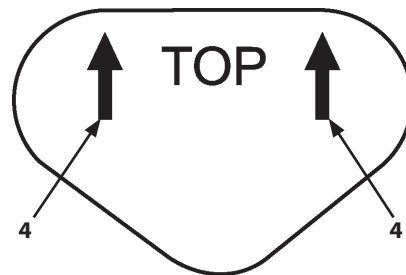
3. Clean outer element (6) by blowing compressed air [less than 0.69 MPa (7 kgf/cm<sup>2</sup>) (100 psi)] outward from the inside of the filter element. After cleaning, be sure to check element (6) for any damage. If any damage is found, replace the element with a new one.

**IMPORTANT: Do not reuse inner element (5).**

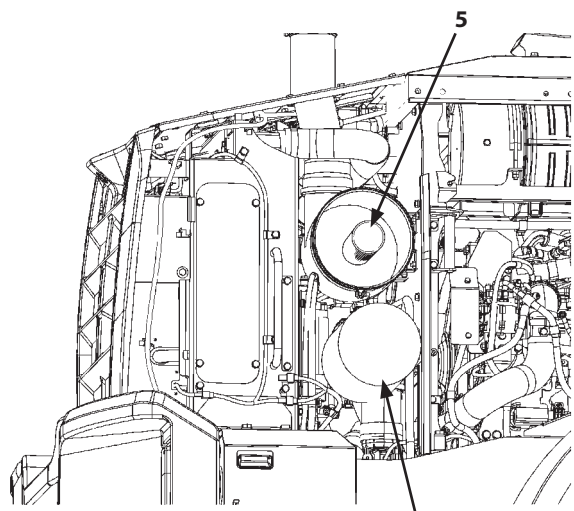
4. In case the air filter restriction indicator lights soon after cleaning outer element (6) even if the cleaning times are less than 6 times, replace both outer and inner elements with new ones.
5. Install dust cap (2) in the original position so that arrow marks (4) (↑TOP↑) point upward.
6. After cleaning is complete, run the engine at slow speed. Then, check that the air filter restriction indicator is not ON.



MPTC-07-024



M4FC-07-037



6 MPTC-07-025

# MAINTENANCE

## G. Cooling System

### Coolant

Use soft water or demineralized water as a coolant. Do not use strongly acid or strongly alkaline water. Use the coolant with Hitachi genuine coolant mixed by 50 %.

### Precautions for handling antifreeze

 **WARNING: Antifreeze is poisonous.**

- **Antifreeze is poisonous; if ingested, it can cause serious injury or death. Induce vomiting and get emergency medical attention immediately.**
- **If antifreeze is accidentally splashed into eyes, flush with water for 10 to 15 minutes and get emergency medical attention.**
- **When storing antifreeze, be sure to keep it in a clearly marked container with a tight lid. Always keep antifreeze out of the reach of children.**
- **Pay attention to fire hazards. LLC is specified as a dangerous substance in the fire protection law.**
- **When storing or disposing of antifreeze, be sure to comply with all local regulations.**

Mixing ratio [%]	Coolant Capacity: 20 L (5.28 gallons)	
	LLC [liter (gallon)] *	Soft Water [liter (gallon)]
50	10.0 (2.64)	10.0 (2.64)

 **NOTE:** \* Use concentrate type coolant.

*If the premix 50/50 type is used, do not mix with water.*



# MAINTENANCE

1

## Check Coolant Level

--- every 10 hours (daily) (before starting the engine)

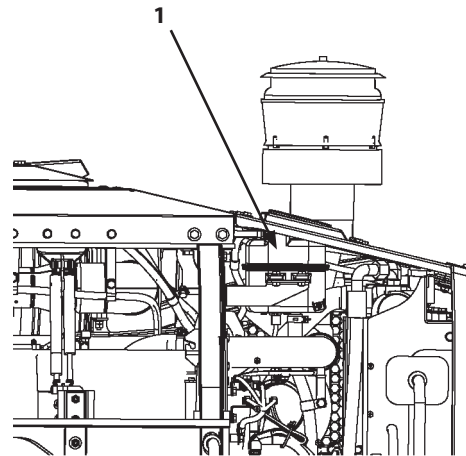
**WARNING:** Do not remove cap (2) until the coolant temperature in the radiator is cool. Hot steam may spout out, possibly causing severe burns. After the coolant temperature cools, slowly loosen cap (2) to release the inside air pressure before removing cap (2).

The coolant level must be at FULL (3) mark on expansion tank (1).

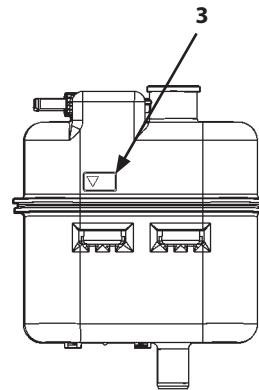
If the coolant level is below FULL (3) mark, remove cap (2) from expansion tank (1) and refill coolant.

If expansion tank (1) is empty, add coolant to the radiator and then to expansion tank (1).

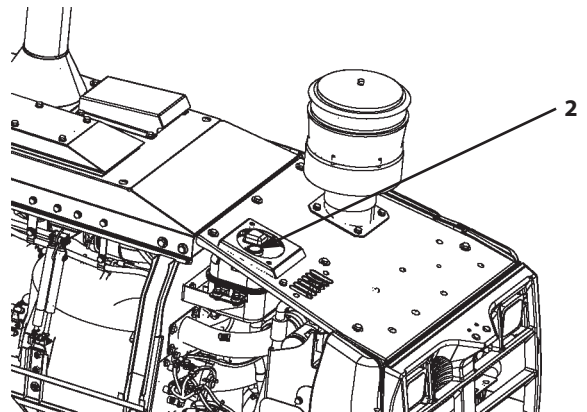
- When refilling a long life coolant (LLC), use the same brand product and the same mixture ratio as already used in the machine.
- If only water is refilled, the mixture ratio in the long life coolant (LLC) is diluted so that anti-rust and antifreeze effect in the coolant will become deteriorated.



MPTC-07-007



MPTC-07-042



MPTC-07-008

## MAINTENANCE

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**2** **Check Drive Belt**  
--- every 10 hours

Check the drive belt for any abnormality. If any cracks are found, replace the belt with a new one.


## MAINTENANCE

### 3 Check Drive Belt Tensioner --- every 1000 hours or once a year

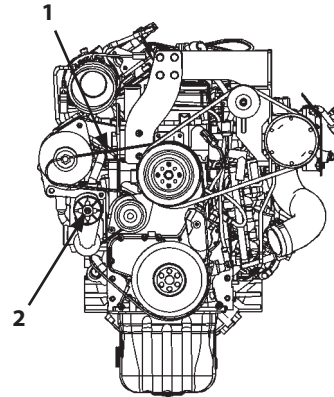
1. Park the machine following the same procedures as described on page 7-7 for preparation of inspection/maintenance work.
2. Install articulation lock bar to the front and rear of the frame by following the procedures described on page 7-9.
3. Open the side cover to access the engine.
4. With the belt 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.

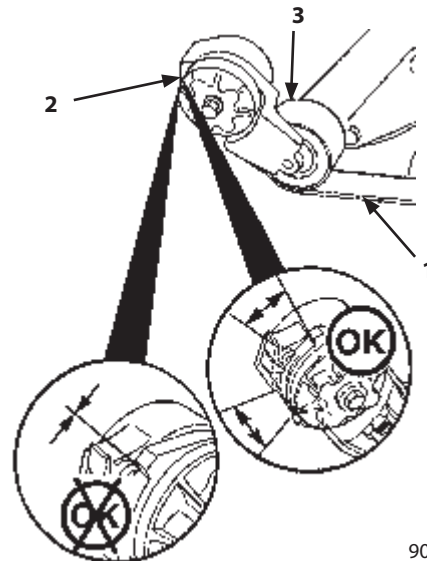
5. Check tensioner (2) for cracks on arm, pulley, and stops. If any cracks are observed, the drive belt tensioner must be replaced.

 **NOTE:** Consult your authorized dealer for the drive belt tensioner replacement.

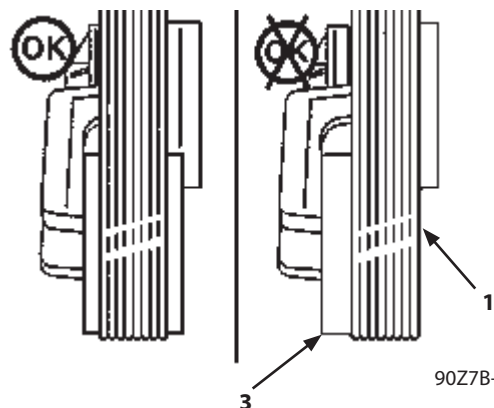
6. Check belt tensioner pulley (3) for any dirt or damage. If it is dirty or damaged, contact your nearest authorized dealer for cleaning or replacement.
7. Check the location of drive belt on belt tensioner pulley (3).  
The belt must be centered on, or close to the middle of, the pulley.  
Misaligned belts, either too far forward or backward, can cause belt wear, belt roll-off failures, or increase uneven tensioner bushing wear.



MPTC-07-013



90Z7B-7-77-2



90Z7B-7-77-3

## MAINTENANCE

4

### Change Coolant

--- every 2000 hours or two years

**CAUTION:** 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 cap (1) to release the inside air pressure before removing cap (2).

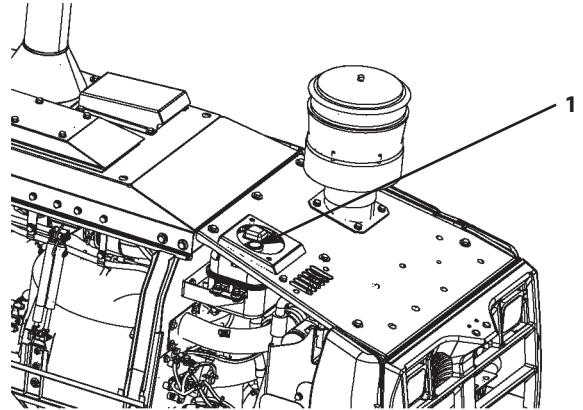
**IMPORTANT:** Use Hitachi genuine coolant. Change the coolant every two years or 2000 hours whichever comes first.

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. Remove expansion tank cap (1). Turn up rubber cover (2). Open radiator drain cock (3) and engine water jacket drain plug to completely drain the coolant. Remove impurities such as scale at the same time.
4. Close radiator drain cock (3). Supply low impurity soft water or tap water together with the specified LLC up to the radiator filler port. When adding coolant, do so slowly to avoid mixing in the system.

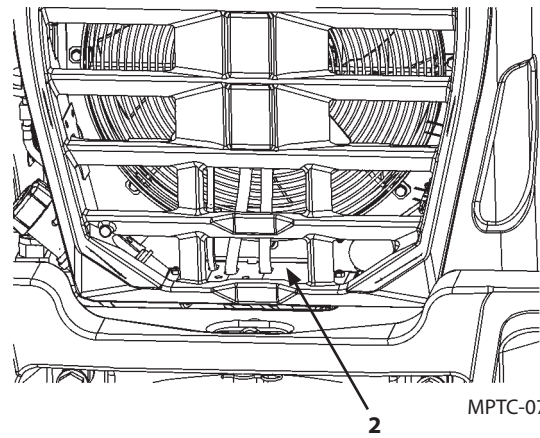
Start the engine and sufficiently bleed air from the cooling system.

**NOTE:** When refilling a long-life coolant, pour it at flow rate 10 L/min or below. If flow rate is larger than the above, air does not bleed, being unable to fill the specified amount.

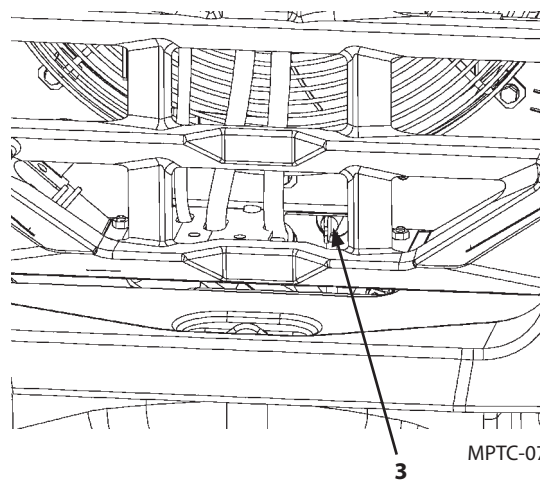
5. After adding coolant, operate the engine for several minutes. Check the coolant level again and add coolant if necessary.



MPTC-07-008



MPTC-07-016



MPTC-07-017

## MAINTENANCE

### 5 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/cm<sup>2</sup>) (30 psi)].

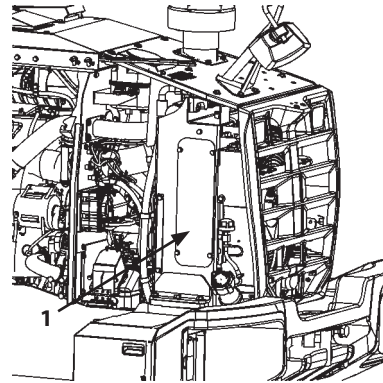
**IMPORTANT:** If compressed air with the pressure of more than 0.2 MPa (2 kgf/cm<sup>2</sup>) (30 psi) or tap water with high delivery pressure is used for cleaning, damage to the radiator/oil cooler fins may result.

Keep the nozzle away from the core surface more than 500 mm.

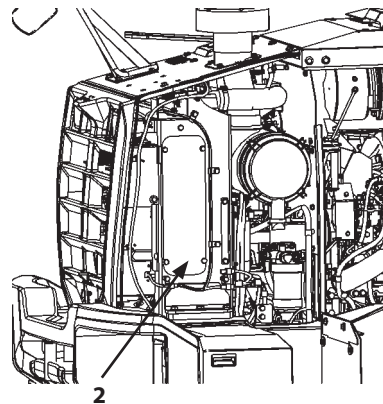
Remove left and right access covers (1) and (2) to clean radiator (5), oil cooler (3) and intercooler (4) from the hydraulic driven fan side.

Remove cover (6) to clean air conditioner condenser (7).

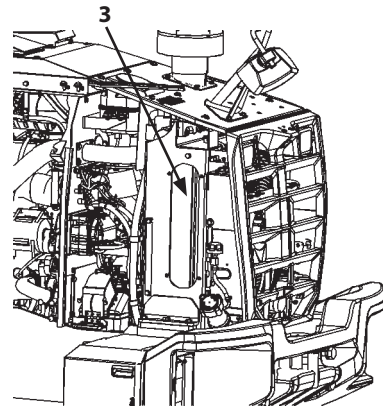
If dirt or dust is accumulated on them, cooling system performance decreases. Clean the radiator/oil cooler cores with compressed air pressure (lower than 0.2 MPa (2 kgf/cm<sup>2</sup>) (30 psi)) or tap water. It will prevent a reduction in cooling system performance.



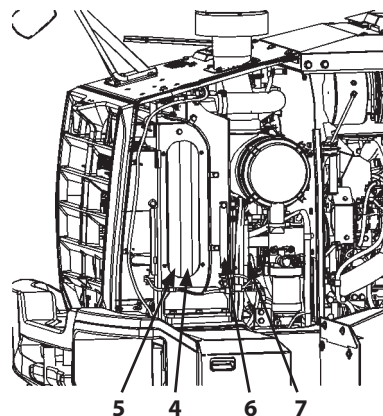
MPTC-07-009



MPTC-07-010



MPTC-07-011



MPTC-07-012

# MAINTENANCE

## 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.

Also, improper installation of electrical equipment may cause machine failure and/or a fire on the machine.

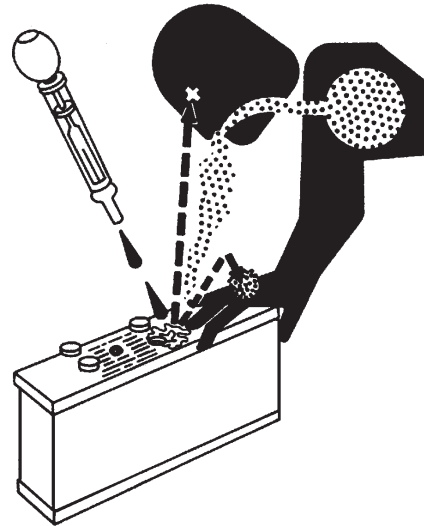
Be sure to consult your authorized dealer when installing radio communication equipment or additional electrical parts, or when replacing electrical parts.

- Never attempt to disassemble or modify the electrical/electronic components. If replacement or modification of such components is required, contact your authorized dealer.

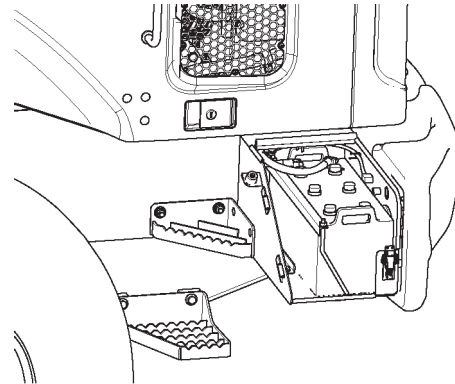
### 1 Batteries

#### ⚠ WARNING:

- Battery gas can explode. Keep sparks and flames away from batteries.
- 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.



SA-036



MNDF-07-028

## MAINTENANCE

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### 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 15 to 30 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: In case 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.*

# MAINTENANCE

## Electrolyte Level Check --- every 100 hours

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).

In case 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.

### 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. Therefore, when the electrolyte level is flush with the U.L, the level is judged to be proper. Then, referring to the right illustrations, 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.

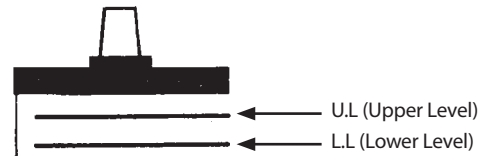
After refilling, securely tighten the filler caps.

Be sure to refill with distilled water before recharging (operating the machine).

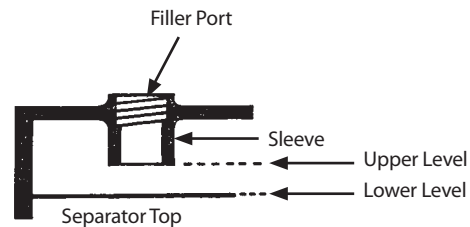
### 3.3 When an indicator is available to check the level, follow its check result.

4. Always keep around the battery terminals clean to prevent battery discharge.

Check the terminals for loose and/or rust. Coat the 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.

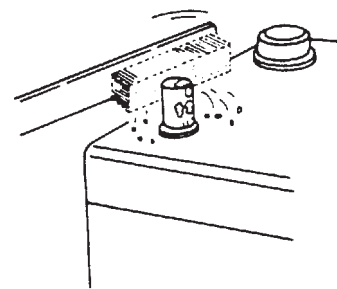
M146-07-111

#### 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



# MAINTENANCE

## 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, call 911, then:

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 15 to 30 minutes. Get medical attention immediately.

### If acid is swallowed, call 911, then:

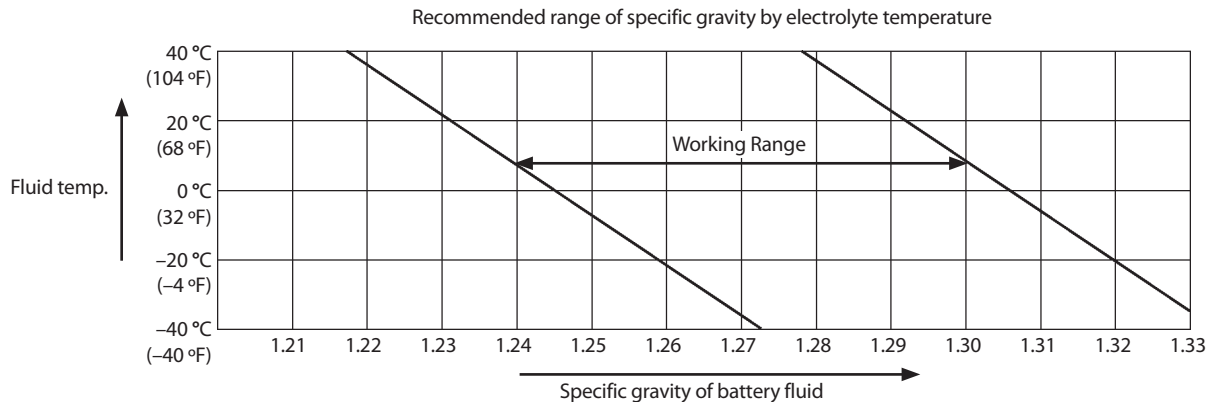
1. Do not induce vomiting.
2. Drink large amounts of water or milk.
3. Get medical attention immediately.

### **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

# MAINTENANCE

---

## Replace Batteries

**IMPORTANT:** Before adjusting the electrical system or welding on the machine, disconnect the negative (-) wiring from the battery. If the machine is equipped with the battery disconnect switch, turn the disconnect switch OFF.

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

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 when normal and to the red range when abnormal.

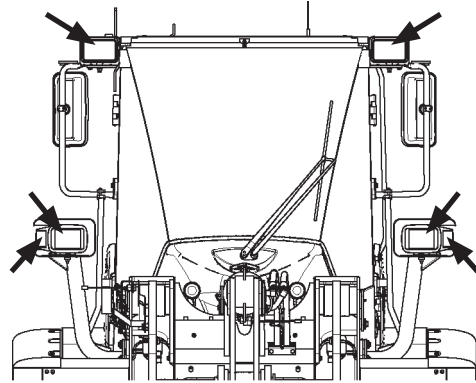
Refer to the Section of Operator's Station in Chapter 1 for more information.

## MAINTENANCE

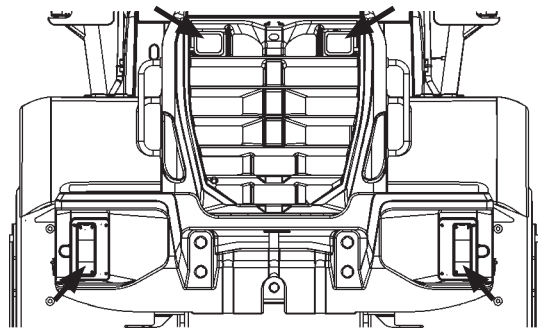
### 3 Check Lights --- every 10 hours (daily)

**CAUTION:** If any burned-out light is found, immediately replace it with a new one.

Visually check all lights that they normally light and/or flash from the front and rear sides of the machine.



MNDF-07-029

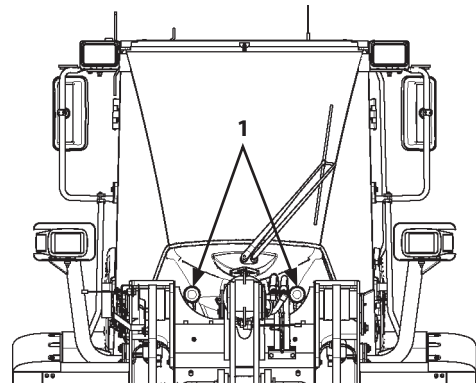


MPTC-01-007

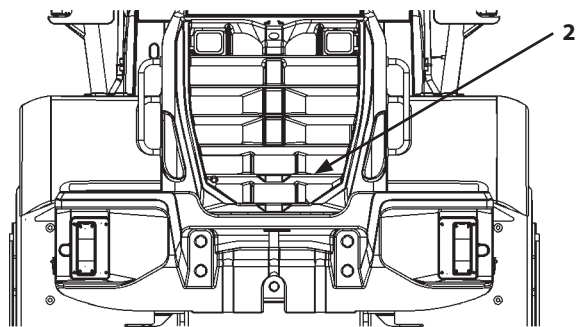
### 4 Check Horn and Reverse Buzzer --- every 10 hours (daily)

**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. In case the machine is equipped with a multi-function joystick lever, the horn switch is located on the multi-function joystick lever. Horn (1) is located on the front frame. Reverse buzzer (2) is located at the left side of the rear grille. Check that reverse buzzer (2) correctly sounds by operating either the forward/reverse lever or the forward/reverse switch to the reverse drive side.



MNDF-07-029



MPTC-01-007

## MAINTENANCE

### 5 Check Electrical Harnesses and Fuses --- every 50 hours

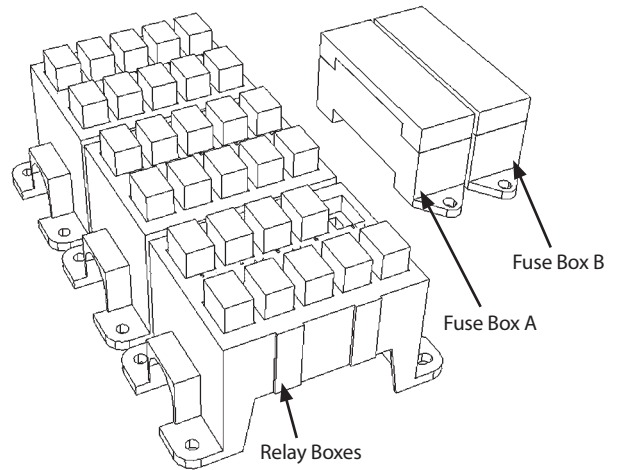
**CAUTION:** If dirt or dust is adhered on the wirings or relays, it may cause fire on the machine.

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 your authorized dealer.

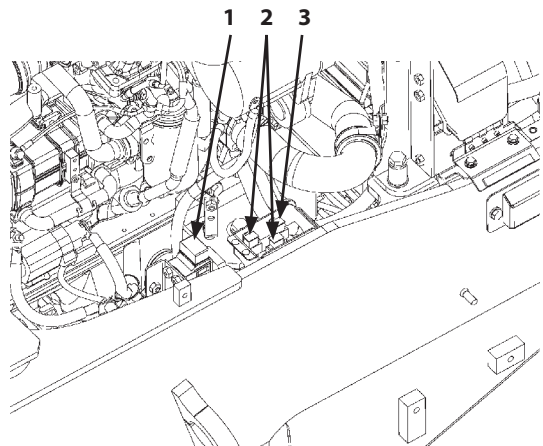
#### Replace Fuse:

1. If any electrical equipment becomes inoperable, first check the fuses in the fuse boxes (A, B) located in the left console in the operator's station.
2. One each spare fuse for respective fuse capacities is provided in the fuse boxes (A, B).
3. Finally, check slow blow fuses (1) (2) (3) located on the left side of the base machine.

- 1- 100A × 2
- 2- 65A × 2
- 3- 45A × 1



MNEK-07-017

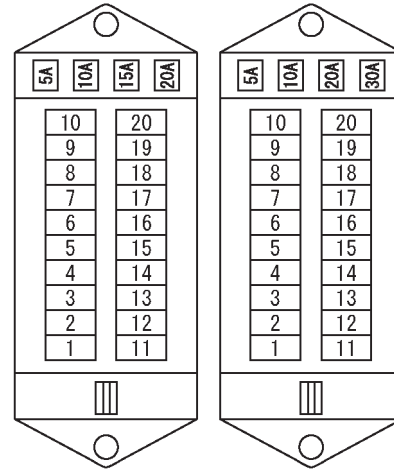


MPTC-01-021

# MAINTENANCE

## Fuse Box A

10- PARKING 5 A	20- OPTION 4 (ACC3) (10 A)
9- AC1 10 A	19- OPTION 3 (ACC2) (15 A)
8- STOP LAMP 5 A	18- DEF HEATER 15 A
7- BACK ALARM 5 A	17- DEF SUPPLY 15 A
6- HST 2 5 A	16- DEF SENSOR 15 A
5- HEAD LAMP LH 5 A	15- AC2 20 A
4- WORKING LAMP FRONT 20 A	14- ROTARY BEACON 10 A
3- WIPER FRONT 15 A	13- SEAT HEATER 20 A
2- SOCKET 10 A	12- OPTION 2 (ACC1) (20 A)
1- HEAD LAMP RH 5 A	11- RADIO 10 A



Fuse Box A

Fuse Box B

MNDB-01-062

## Fuse Box B

10- HST 1 15 A	20- SECONDARY STEERING 5 A
9- MC 10 A	19- HI BEAM 10 A
8- ECM 30 A	18- WIPER REAR 10 A
7- CONTROLLER 10 A	17- WORKING LAMP REAR 20 A
6- FLASHER 10 A	16- LOADER CONTROL 10 A
5- HORN 10 A	15- FUEL PUMP 5 A
4- OPTION 1 (BT) (15 A)	14- POWER ON 2 10 A
3- CAB DOME LAMP 5 A	13- POWER ON 1 10 A
2- LIGHTING 10 A	12- POSITION 2 5 A
1- DC-DC UNIT 20 A	11- POSITION 1 5 A

# MAINTENANCE

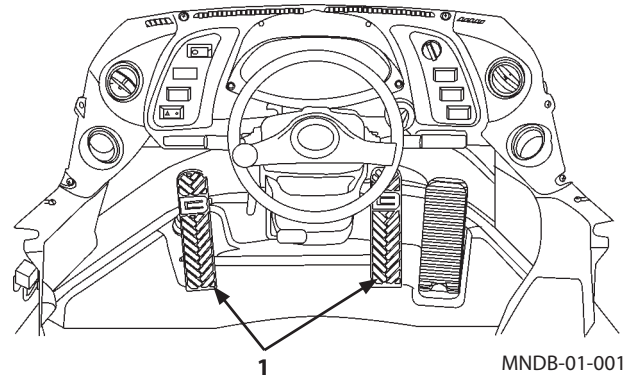
## I. Brake System

### 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 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.



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 (3) of the brake pedal, remove the accumulated dust and/or soil.

#### Check Brake Performance

The machine must be stopped within 5 m range after the brake is applied while driving at the speed of 20 km/h on a flat dry paved surface road.

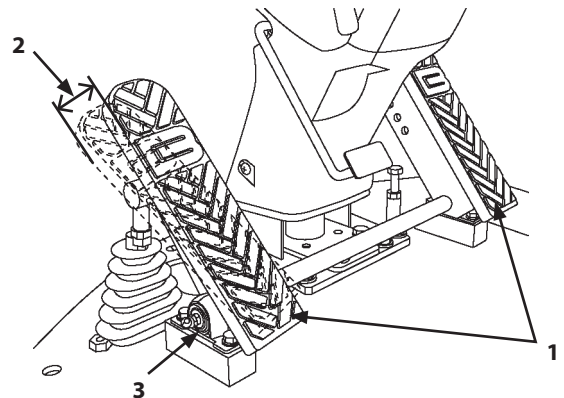
#### Check Play in Brake Pedal Stroke

Measure the pedal stroke at pedal tip by pressing the pedal with your hand until you feel an intermittent feedback from the pedal.

Correct Play (2) : 0 to 5 mm (0 to 0.2 in)

If the play is outside the specified range, consult your authorized dealer.

In case abnormal pedal operation and/or performance is noticed, consult your authorized dealer. Get the machine checked and repaired.



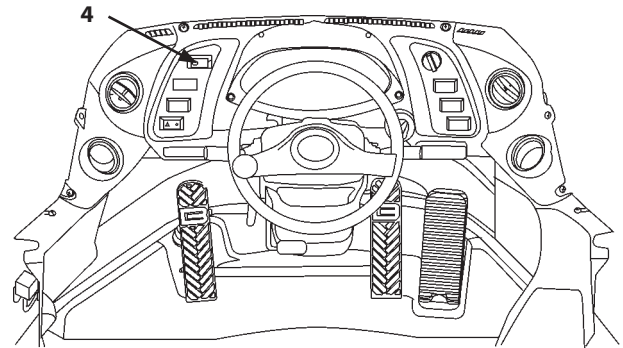
## MAINTENANCE

### 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 parking brake switch (4) ON. Should the machine move during inspection, consult your authorized dealer. Get the brake system checked and repaired.



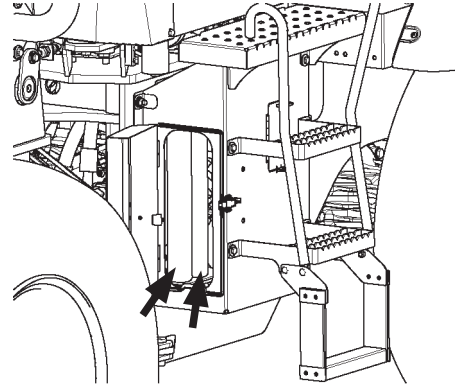
MNDB-01-001

## MAINTENANCE

- 3** Check 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.



MNDF-07-030

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 monitor indicators come 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 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 monitor indicators come ON with the key switch ON and the engine stopping.

Three points described above must be normally confirmed. Besides the above points, check the accumulator for gas leakage, looseness, and damage. If any abnormality is found, immediately consult your authorized dealer.



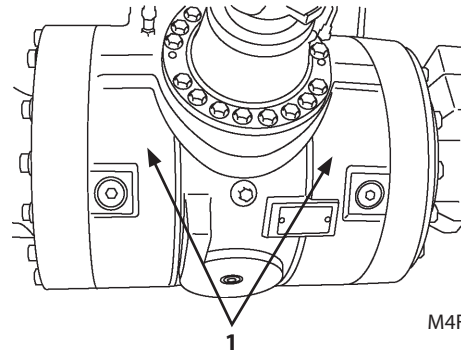
## MAINTENANCE

### 4 Check Gas Pressure in Accumulator --- every 2000 hours

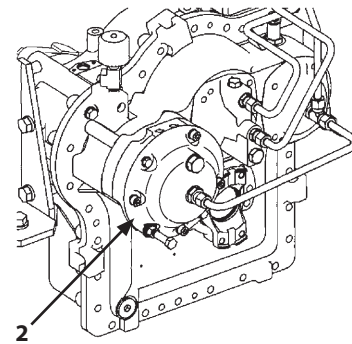
Check the gas pressure at a regular interval. If the machine is operated with the gas pressure lower than specified value, normal brake operation and/or loading operation may not be achieved, possibly creating very hazardous situations. Ask your authorized dealer for checking.

### 5 Check Brake Disks (Service and Parking) --- every 2000 hours

Service brake (1) is a closed wet type brake. Parking brake (2) is a wet type disk brake. Parking brake (2) is mounted on the transmission side. Consult your authorized dealer for checking.



M4FC-07-023



M4FC-06-001

# MAINTENANCE

## J. Tire

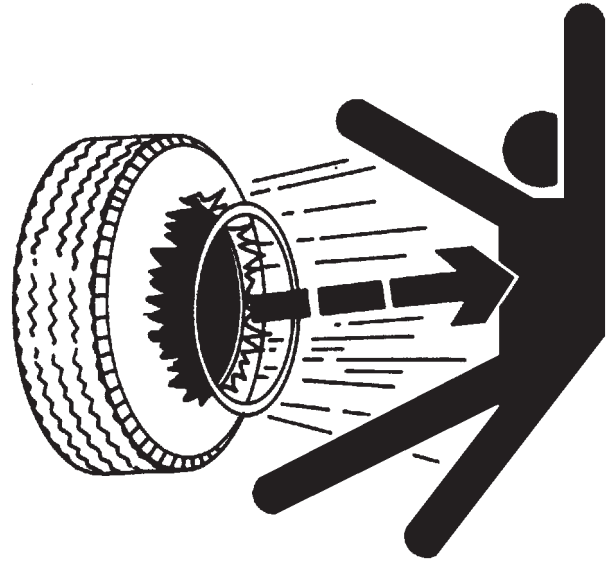
- 1** Check and Replace Tire (Tire Pressure)  
Check appearance --- every 10 hours (daily)  
Replace --- as necessary

**⚠ 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.

Standard Tire	Standard Air Pressure
20.5 R 25	400 kPa (4.00 kgf/cm <sup>2</sup> )

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 a score, an accident due to puncture or burst of the tire may occur, possibly resulting in personal injury or death.

Check the external appearance of tires for any damage.

## MAINTENANCE

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 in the tightening direction.

Tightening torque: 890 N·m (91 kgf·m) (655 lbf·ft)

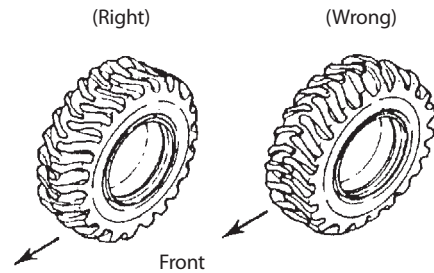
#### Replace Tire

**WARNING:** Secure the front and rear frames with the articulation lock bar and pins.

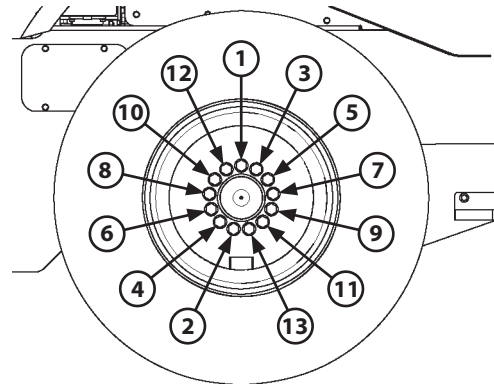
**IMPORTANT:** Height of the machine may change according to the types of tires to be installed.

**Do not change the specifications of the registered machine by using unauthorized tire sizes.**

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 specification in the order as illustrated to the right.




M4GB-07-104



MNDF-07-031

## MAINTENANCE


### Applicable Tire Size

 **NOTE:** Consult your authorized Hitachi 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.

Applicable Tire Size

Tire		Model	
		ZW140-6	ZW150/150PL-6
Standard Size	Radial	20.5R25	20.5R25
Standard Air Pressure	Radial	400 kPa (58 PSI)	400 kPa (58 PSI)
Standard Tire	Radial	20.5R25 L3	20.5R25 L3
Optional	Bias Ply	20.5-25-12PR L2	20.5-25-12PR L2
	Bias Ply	17.5-25-12PR L2	-
	Radial	17.5R25 L2	-

 **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 your 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: ... Radial ply tire: Stand pressure  
Bias ply tire: Slightly lower than standard pressure

Standard air pressure adjustment range: 400 to 450 kPa  
(58 to 65 PSI)

# MAINTENANCE

## Tire Rotation

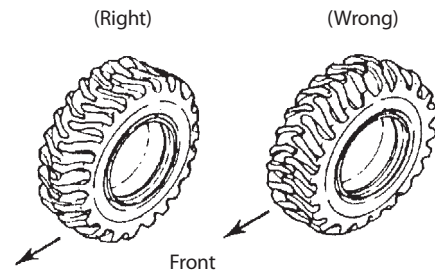
Rotate tires when uneven or abnormal wear is recognized on either front or rear, or right and left tire. Tire rotation is recommended to achieve uniformity of wear on tires or equalization of tire service life.

## Rotation Procedure

**⚠ WARNING:** Install a 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

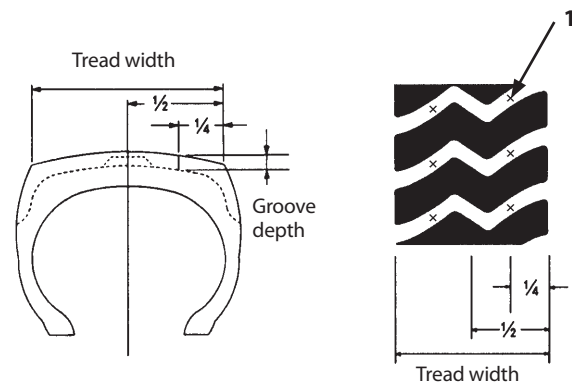
## How to Check Wear Amount (Tread Design Groove Depth):

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. In case extreme uneven wear or exposed rubbing strips are found, replace the tire even before reaching 85 %.

**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.



MNEC-07-122

## MAINTENANCE

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### Removal and Installation of Tire

**⚠ WARNING:** Wheel with tire is a very heavy part so that 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 your authorized dealer or a professional tire sales shop for tire removal and installation work.

In case 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 (90.8 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 and/or personal accidents.

# MAINTENANCE

## 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:** In case the machine is operated at a dusty job site, clean or replace the filter element earlier than the normal interval.

### Clean Fresh Air Filter

#### 1. Remove the filter:

The fresh air 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). Remove fresh air filter (4).

 **CAUTION:** When using compressed air pressure, wear safety glasses or goggles.

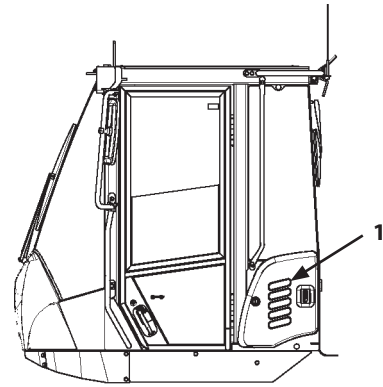
**IMPORTANT:** If compressed air delivery pressure is high, damage to the filter fins may result. Always use compressed air at the lower pressure than 0.2 MPa (2kgf/cm<sup>2</sup>) (30 PSI). Keep the nozzle more than 500 mm (20 in) away from the core surface.

#### 2. Clean fresh air filter (4).

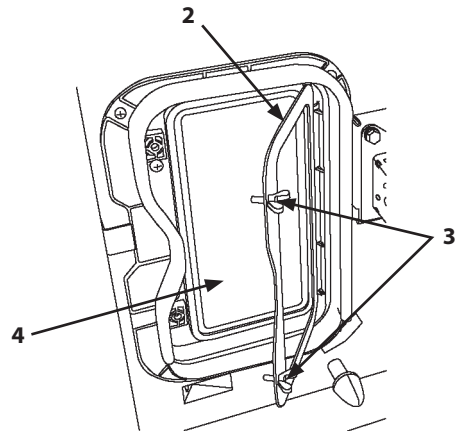
Clean fresh filter (4) using compressed air or by washing with water.

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-01-532



MNEC-07-043

## MAINTENANCE

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**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 fresh air filter or a new filter by following the filter removal procedure described in step 1 in the reverse order.



# MAINTENANCE

## Clean and Replace Double Filter (Optional)

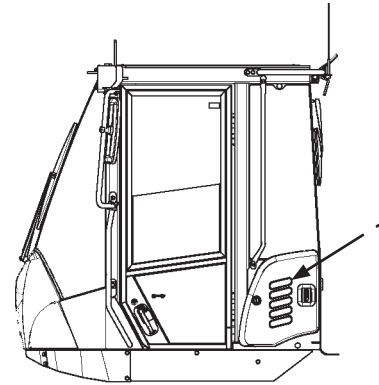
### --- When cleaning fresh air filter

#### 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).



MNEC-01-532

**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 (2kgf/cm<sup>2</sup>) (30 PSI). Keep the nozzle more than 500 mm (20 in) away from the core surface.

#### 2. Clean double filter (7).

Clean double filter (7) using compressed air or by washing with water.

Washing procedure with water is as follows:

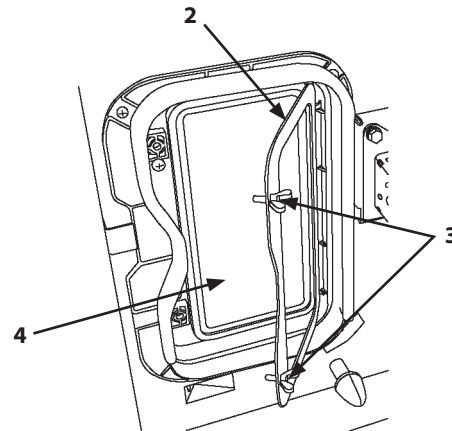
##### 2.1 Use tap water.

2.2 Submerge the filter in water containing a neutral detergent for about 5 minutes

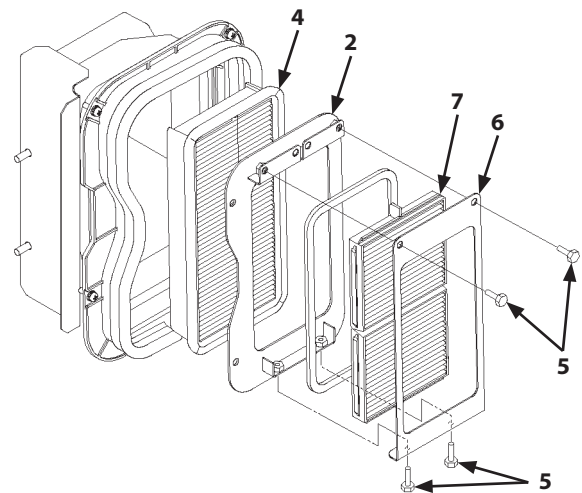
2.3 Clean the filter with water again.

2.4 Sufficiently dry the filter.

3. Install the cleaned double filter or a new filter by following the filter removal procedure described in step 1 in the reverse order.



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MNHE-07-048

## MAINTENANCE

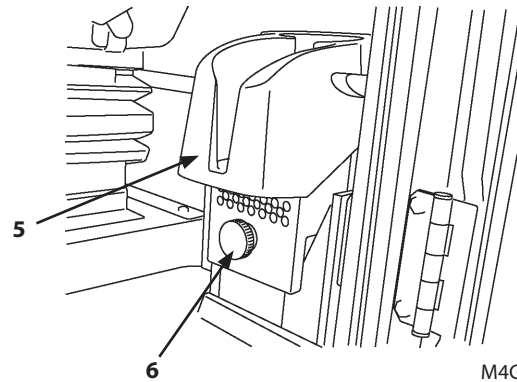
### Clean Circulation Air Filter

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).

**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 (2kgf/cm<sup>2</sup>) (30 PSI). Keep the nozzle away from the core surface more than 500 mm (20 in).



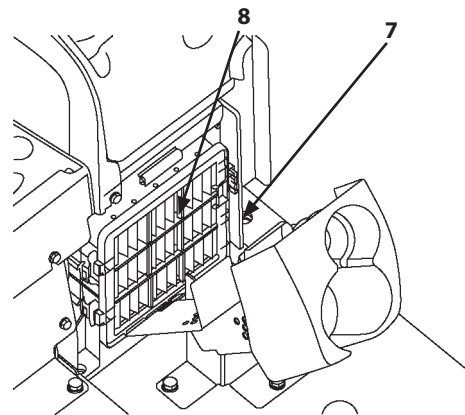
M4GB-07-108

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.


## MAINTENANCE

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### **2** Check Air Conditioner

--- every 6 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 6 months

 **CAUTION:** If any leakage is found, repair or replace the corresponding pipes. Tighten the joint bolts to specification.

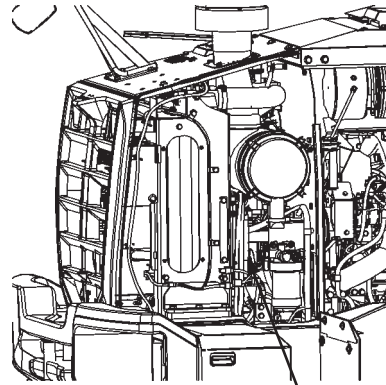
**Do NOT overly tighten piping.**

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.

## MAINTENANCE

### 4 Check Air Conditioner Condenser --- every 6 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. In case the condenser has been severely contaminated, use a soft brush. Do not use a hard brush, which may damage the fins.



1 MPTC-07-012

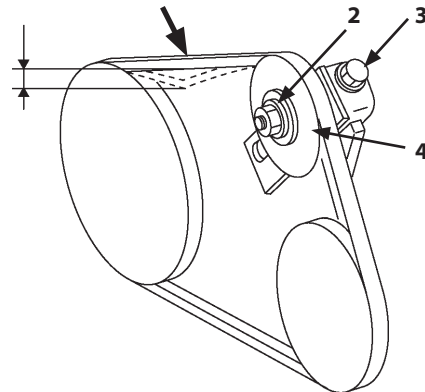
### 5 Check Air Conditioner Fan Belt --- every 6 months

Check the belt for abnormal deflection and damage. Check fan belt tension by depressing the midpoint shown with ↓ mark in the illustration with the thumb. Deflection must be as follows with a depression force of approximately 98 N (10 kgf) (22 lbf).

Deflection : approx. 6 mm (0.24 in)

#### Belt Tension Adjustment Procedure

1. Loosen lock nut (2) of tension pulley (4).
2. Move tension pulley (4) to adjust belt tension by turning belt tension adjustment bolt (3).
3. Securely tighten nut (2).



M4GB-07-111

## MAINTENANCE

### 6 Check Refrigerant --- every 6 months

Start the engine and run at approximately 1500 min<sup>-1</sup> (rpm). 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 on the monitor screen). Operate the air conditioner 2 to 3 minutes. Check if cool air comes out from the vent in the cab.

Type	Refrigerant No.	Quantity kg (lb)
HFC	R134a	0.8±0.05 (1.76±0.11)

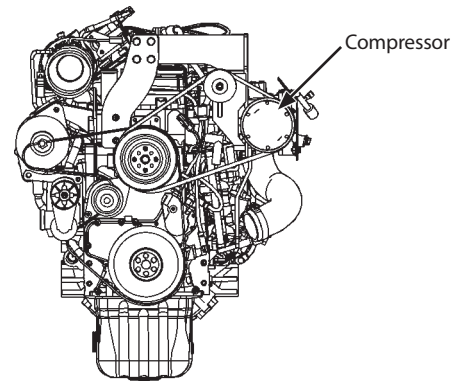
**IMPORTANT: If recovery or refill of refrigerant is required during the machine maintenance (including disposing the machine), contact your refrigerant supplier or your authorized dealer.**

### 7 Check Compressor and Pulley --- once a year

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.



MPTC-07-013

# MAINTENANCE

## L. 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.**

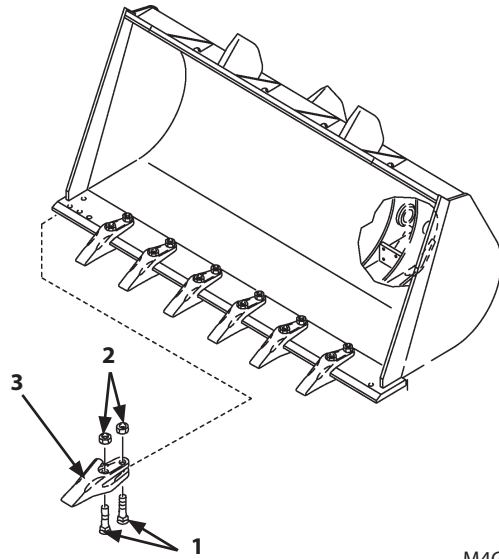
1. Raise the bucket to an appropriate height with the bucket bottom parallel to the ground. Insert blocks under the bucket to support it. Stop the engine.
2. Loosen bolts (1) and nuts (2). Remove bucket teeth (3) or cutting edge (4).
3. Install new teeth (3) or cutting edge (4). If the reverse side of 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

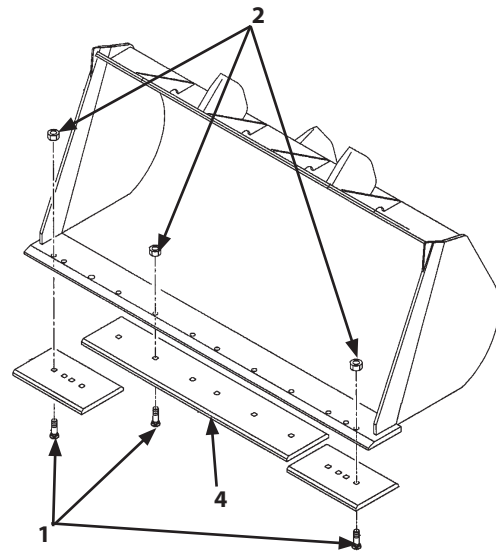
Cutting edge : 1068 N·m (109 kgf·m) (788 lbf·ft)

Bucket teeth : 1068 N·m (109 kgf·m) (788 lbf·ft)

5. Retighten mounting nuts (2) after a few hours of operation.



M4GB-07-115



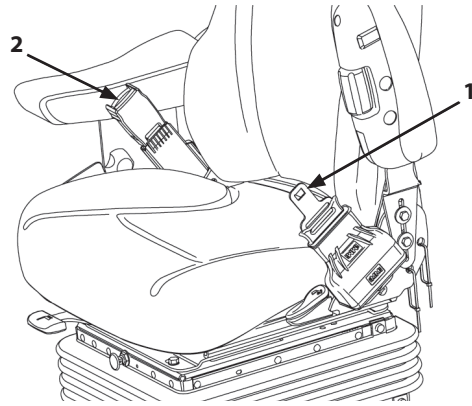
M4GB-07-116

## MAINTENANCE

### **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.

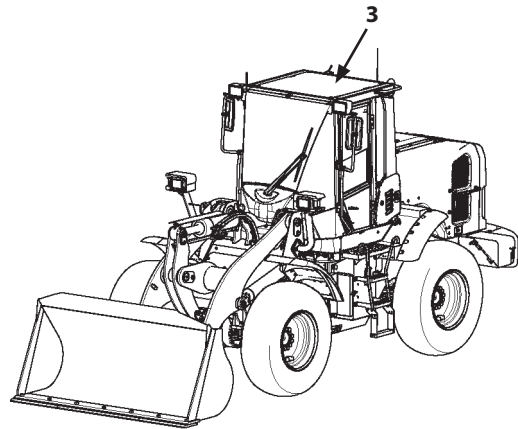
Replace seat belt every 3 years, regardless of appearance. Inspect the seat for large play or damage. Replace it if necessary.



90Z7-7-96-1

### **3** Check ROPS cab Mounting Bolts --- every 10 hours (daily)

Check the appearance of ROPS cab (3) for any abnormal damage or deformation.

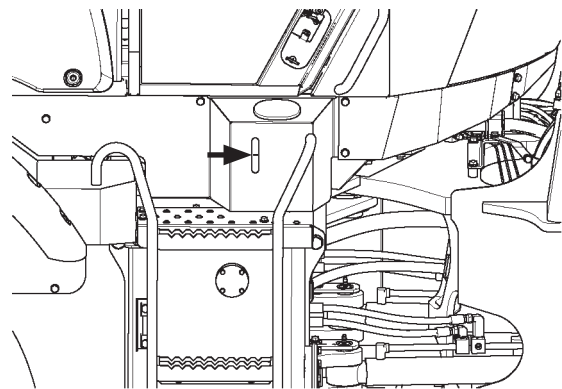


MNDF-07-033

### **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.



MNDF-07-034

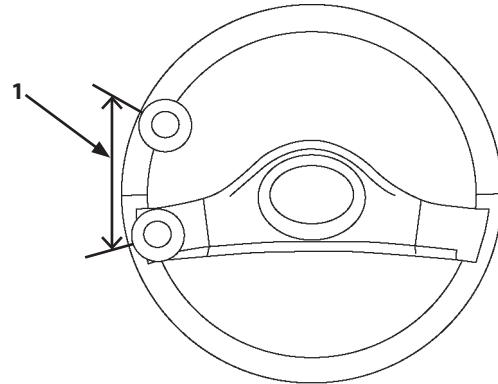
## MAINTENANCE

### 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.

Check that play (1) in steering wheel stroke is correct and that steering column tilt telescopic lever (2) and pedal (3) are securely held.

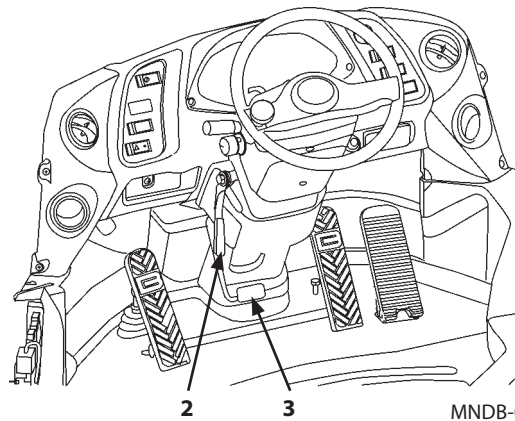
In addition, check that the steering wheel column normally comes in contact with the stopper when the steering wheel is fully turned and that the steering cylinder operates normally.



MNEC-07-050

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)



MNDB-01-002

**✎ NOTE:** If too much play amount of the steering wheel is found or if the steering wheel does not move smoothly, consult your authorized dealer for checking.



## MAINTENANCE

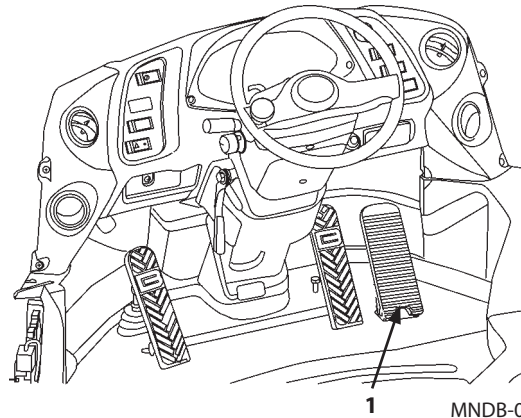
### 6 Check Accelerator Pedal Operation, and Exhaust Gas Color and Noise

--- 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. Then, 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.



MNDB-01-002

#### 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 the engine that meets Stage IIIB emission requirements. Never attempt to modify the inlet and exhaust system.

Exhaust gas color is normally transparent or light blue.

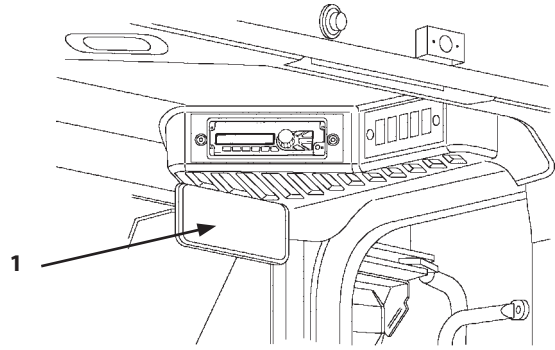
Although exhaust gas color slightly becomes white immediately after the engine is started or quickly accelerated, this symptom is not abnormal.

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.

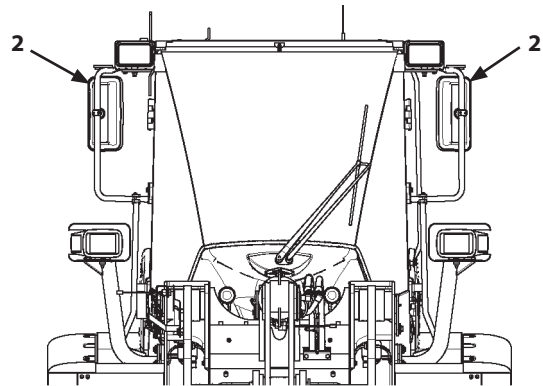
## MAINTENANCE

### 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.



MNDF-01-051

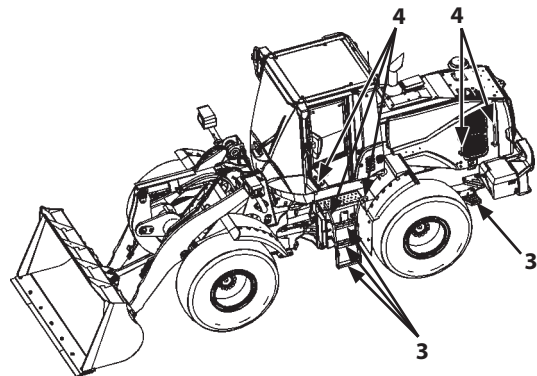


MNDF-07-029

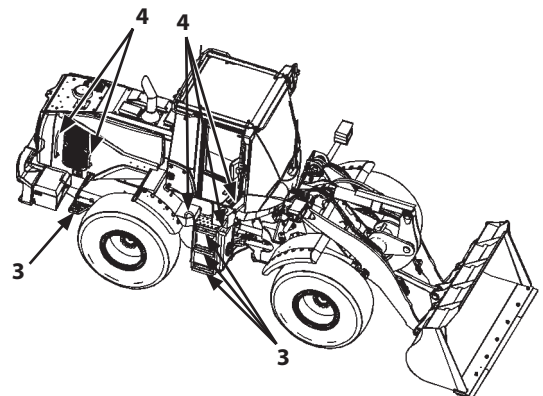
### 8 Check Steps and Handrails for Damage and Looseness

--- every 10 hours (daily)

Check steps (3) and handrails (4) for any damage, looseness and contamination. If any slippery matter such as machine lubricants or mud becomes adhered to steps (3) and/or handrails (4), remove such contaminant. If steps (3) and/or handrails (4) become damaged or loosened so that getting on and off the machine is difficult, immediately repair or replace.



MPTC-07-014



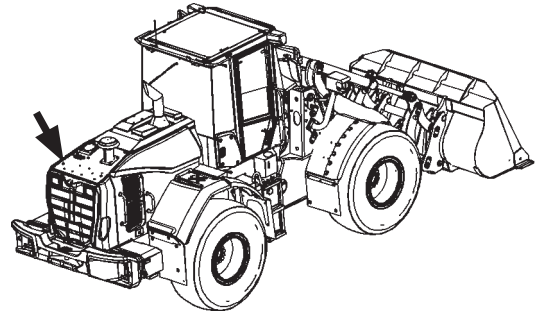
MPTC-07-015

## MAINTENANCE

### 9 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.

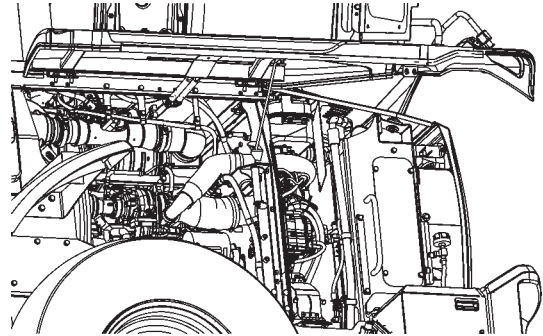


MPTC-01-003

### 10 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 your authorized dealer for repair.



MPTC-01-018

## MAINTENANCE

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### **11** Check and Adjust Valve Clearance --- every 5000 hours

Consult your authorized dealer for check and repair.

### **12** 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 (Front)	Rear Axle Support Mounting Bolt (Rear)
785±150 N·m (80±15 kgf·m) (579±110 lbf·ft)	550±110 N·m (55±10 kgf·m) (406±81 lbf·ft)	950±170 N·m (97±17 kgf·m) (700±125 lbf·ft)

## MAINTENANCE

### 13 Tightening and Retightening Torque of Nuts and Bolts

--- every 2000 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 2000 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 7-110.







No.	Locations	Bolt Diameter	Quantity	Wrench Size	Torque N·m (kgf·m, lbf·ft)	
1	Front axle mounting bolt	24	8	36	785 (80±15, 580±110)	
2	Rear axle support mounting bolt	Front	4	30	550 (55±11, 410±81)	
		Rear	4	36	950 (97±17, 700±126)	
3	Wheel rim mounting bolt	24	52	36	890 (91, 655)	
4	Propeller shaft mounting bolt	10	20	14	*74±3.4 (7.5, 54)	
5	Propeller shaft support bearing mounting bolt	16	2	24	210 (21, 155)	
6	Transmission mounting bolt: Bracket	16	8	24	*210 (21, 155)	
7	Transmission mounting bolt: Cushion rubber	18	4	27	315 (32, 230)	
8	HST motor mounting bolt	16	8	24	210 (21, 155)	
9	HST pump mounting bolt	16	6	24	210 (21, 155)	
10	Engine mounting bolt: Bracket	Front	12	19	*90 (9, 66)	
		Rear	6	19	*90 (9, 66)	
11	Engine mounting bolt: Cushion rubber	16	4	24	210 (21, 155)	
12	Aftertreatment device mounting nut (Double)	10	16	17	50 (9, 66)	
13	Counterweight mounting bolt	30	4	46	1510 (154, 1115)	
14	Top center pin upper flange lock	16	3	24	*210 (21, 155)	
15	Bottom center pin lock	16	1	24	210 (21, 155)	
16	Loader front pin lock	ZW140-6	16	3	24	210 (21, 155)
		ZW150-6	12	10	17	90 (9, 66)
		ZW150PL-6	12	6	17	90 (9, 66)
			12	20	19	90 (9, 66)
			16	10	24	210 (21, 155)
17	Steering cylinder pin lock	12	4	19	90 (9, 66)	
18	Radiator frame mounting bolt	16	6	24	*154 (16, 115)	
19	Radiator mounting bolt	8	2	13	17.6 (1.8, 13)	
20	Intercooler mounting bolt	8	1	13	17.6 (1.8, 13)	
21	Oil cooler mounting bolt	10	4	17	36.2 (4, 27)	
22	Air conditioner condenser mounting bolt	8	4	13	12.5 (1, 9)	
23	Air conditioner compressor mounting bolt	8	4	6	24.5 to 29.4 (2.5 to 3, 18 to 22)	
24	Cab cushion rubber mounting bolt	16	4	24	*205 (21, 151)	
25	Bucket tooth mounting bolt (Optional)	**1"	14	11/2	1068 (109, 790)	
26	Cutting edge mounting bolt	**1"	7	11/2	1068 (109, 790)	

 NOTE: \* Apply "LOCTITE® 262" to the threads.

Figures with \*\* mark are shown in Inch.

## MAINTENANCE

### Tightening Torque Chart

Bolt Dia. mm (in)	Hexagon Wrench						Socket Bolt			
	 		 		 		Wrench Size mm	Socket Bolt		Wrench Size mm
	N·m (lbf·ft)		N·m (lbf·ft)		N·m (lbf·ft)			N·m	(lbf·ft)	
6 (0.24)					3.3 to 4.2 (2.4 to 3.1)		10			5
8 (0.31)	30	(22)	20	(14.8)	10	(7.4)	13	20	(14.8)	6
10 (0.39)	65	(48)	50	(36.9)	20	(14.8)	17	50	(36.9)	8
12 (0.47)	110	(81)	90	(66.4)	35	(25.8)	19	90	(66.4)	10
14 (0.55)	180	(133)	140	(104)	55	(40.6)	22	140	(104)	12
16 (0.63)	270	(199)	210	(155)	80	(59)	24	210	(155)	14
18 (0.71)	400	(295)	300	(221)	120	(88.5)	27	300	(221)	14
20 (0.79)	550	(406)	400	(295)	170	(125)	30	400	(295)	17
22 (0.87)	750	(553)	550	(406)	220	(162)	32			
24 (0.94)	950	(700)	700	(516)	280	(207)	36			
27 (1.06)	1400	(1033)	1050	(774)	400	(295)	41			
30 (1.18)	1950	(1438)	1450	(1069)	550	(406)	46			
33 (1.30)	2600	(1918)	1950	(1438)	750	(553)	50			
36 (1.42)	3200	(2360)	2450	(1807)	950	(700)	55			

**⚠ CAUTION:** If counterweight mounting bolts are loosened, consult your nearest authorized dealer.

#### IMPORTANT:

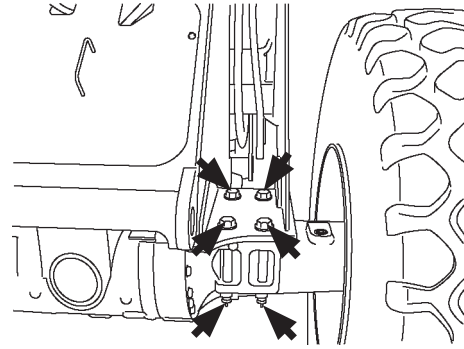
- Apply lubricant to bolts and nuts to lower friction except plated bolts and nuts.
- Remove soil, dust, and/or dirt from the nut and bolt thread surfaces before tightening.
- Tighten nuts and bolts to specifications. If tightened with excessively low or high torque, missing or breakage of nuts and/or bolts may result.

## MAINTENANCE

### 1. Front axle mounting bolt & nut (Double)

Bolt dia. mm (in)	24 (0.9)
Quantity	8

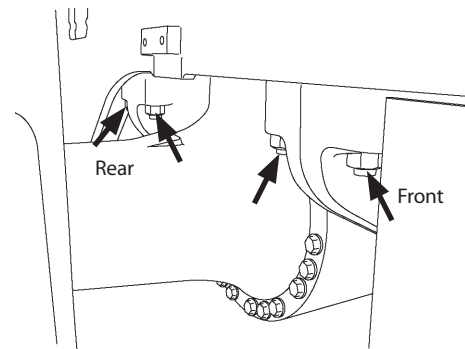
Nut dia. mm (in)	24 (0.9)
Quantity	16



MPTC-07-046

### 2. Rear axle support mounting bolt

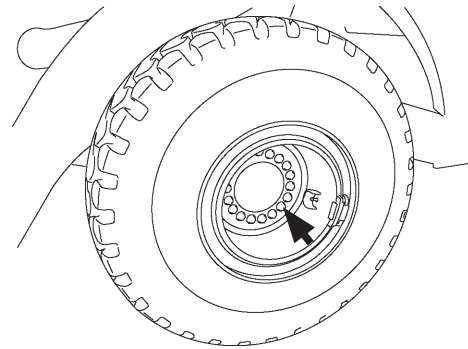
	Front	Rear
Bolt dia. mm (in)	20 (0.8)	24 (0.9)
Quantity	4	4



M4GB-07-125

### 3. Wheel rim mounting bolt

Bolt dia. mm (in)	24 (0.9)
Quantity	52



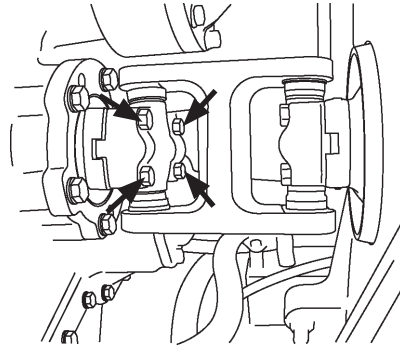
M4GB-07-127

## MAINTENANCE

### 4. Propeller shaft mounting bolt

Bolt dia. mm (in)	10 (0.4)
Quantity	20

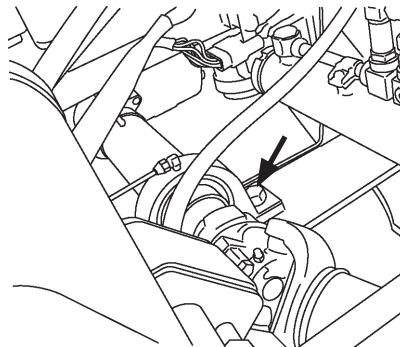
 NOTE: Apply LOCTITE#262 or equivalent.



M4FC-07-066

### 5. Propeller shaft support bearing mounting bolt

Bolt dia. mm (in)	16 (0.6)
Quantity	2

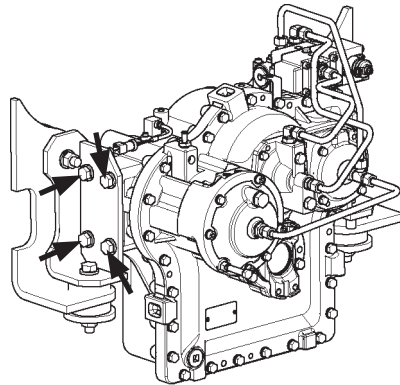


M4FC-07-011

### 6. Transmission mounting bolt: Bracket

Bolt dia. mm (in)	16 (0.6)
Quantity	8

 NOTE: Apply LOCTITE#262 or equivalent.



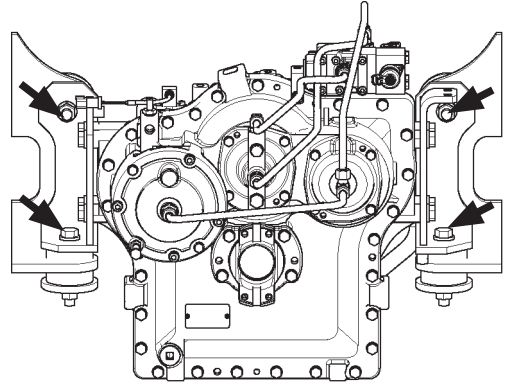
MNDF-07-039



# MAINTENANCE

## 7. Transmission mounting bolt: Cushion rubber

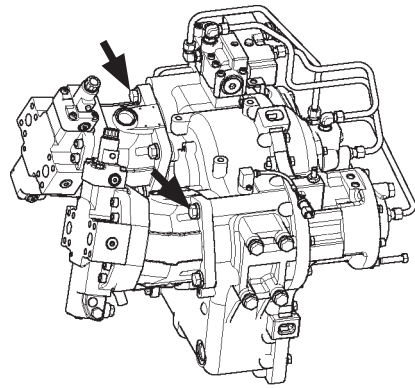
Bolt dia. mm (in)	18 (0.7)
Quantity	4



MNDF-07-040

## 8. HST motor mounting bolt

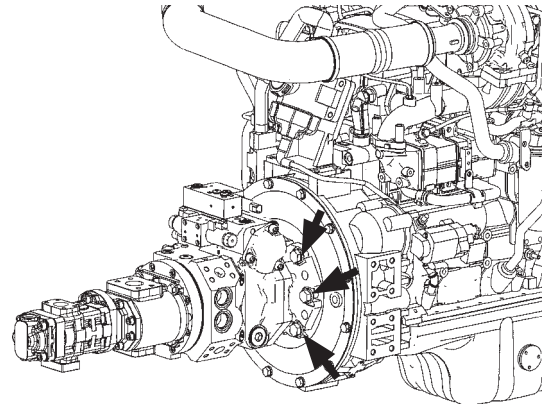
Bolt dia. mm (in)	16 (0.6)
Quantity	8



MNDF-07-041

## 9. HST pump mounting bolt

Bolt dia. mm (in)	16 (0.6)
Quantity	6



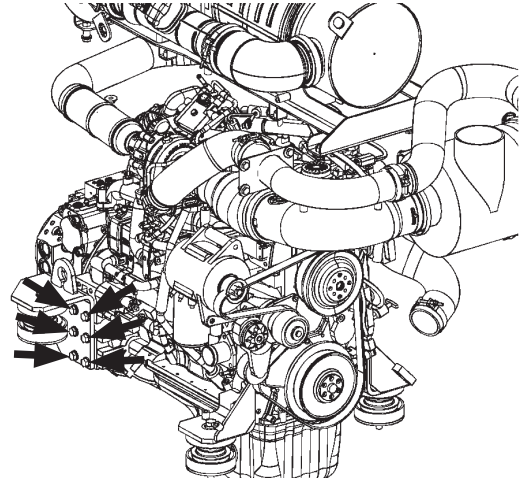
MPTC-07-043

# MAINTENANCE

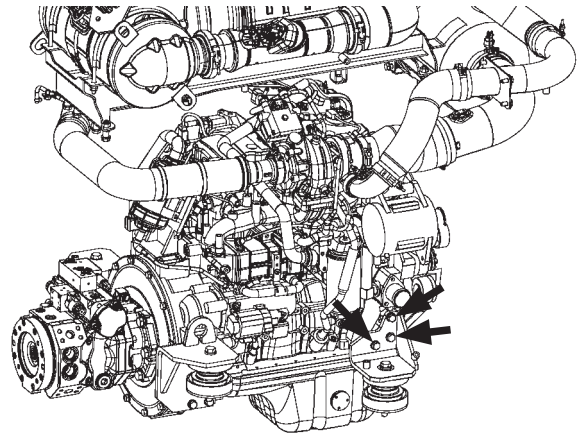
## 10. Engine mounting bolt: Bracket

	Front	Rear
Bolt dia. mm (in)	12 (0.5)	12 (0.5)
Quantity	12	6

 NOTE: Apply LOCTITE#262 or equivalent.



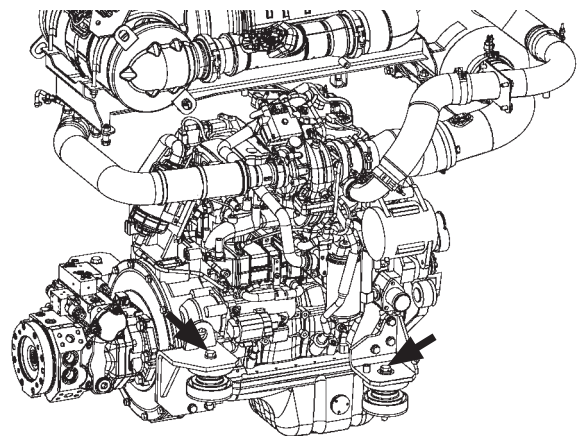
MPTC-07-028



MPTC-07-029

## 11. Engine mounting bolt: Cushion rubber

Bolt dia. mm (in)	16 (0.6)
Quantity	4

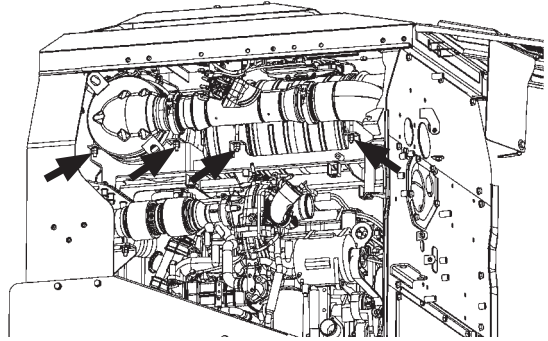


MPTC-07-029

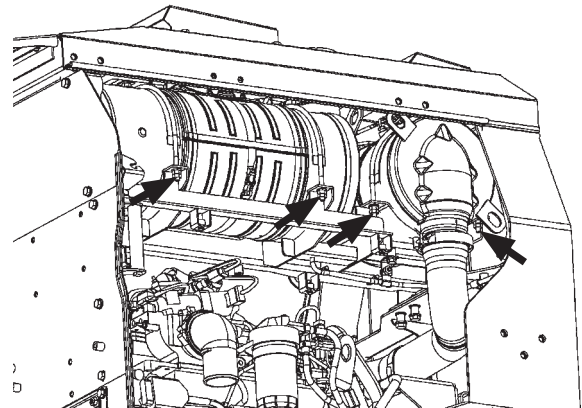
# MAINTENANCE

## 12. Aftertreatment device mounting nut (Double)

Nut dia. mm (in)	10 (0.4)
Quantity	16



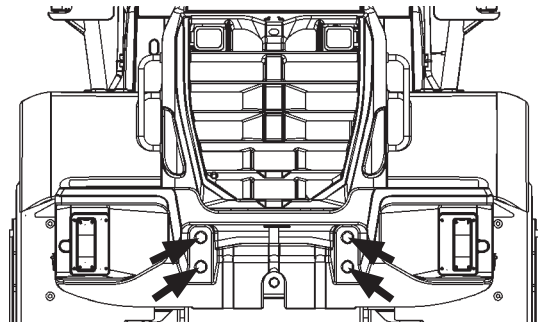
MPTC-07-035



MPTC-07-036

## 13. Counterweight mounting bolt

Bolt dia. mm (in)	30 (1.2)
Quantity	4

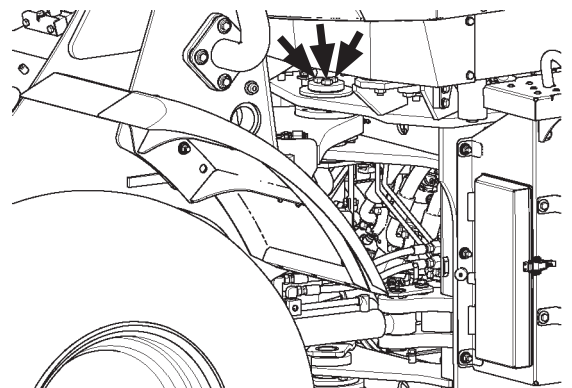


MPTC-01-007

## 14. Top center pin upper flange lock

Bolt dia. mm (in)	16 (0.6)
Quantity	3

 NOTE: Apply LOCTITE#262 or equivalent.

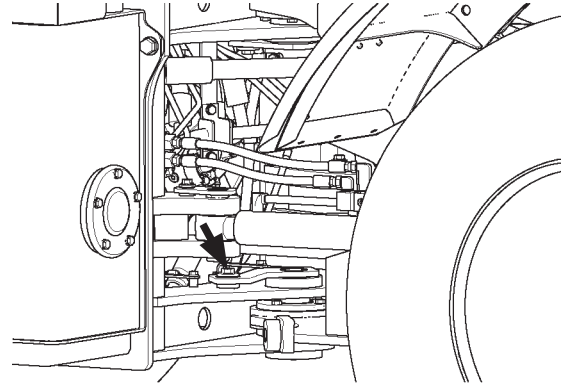


MNDF-07-045

# MAINTENANCE

## 15. Bottom center pin lock

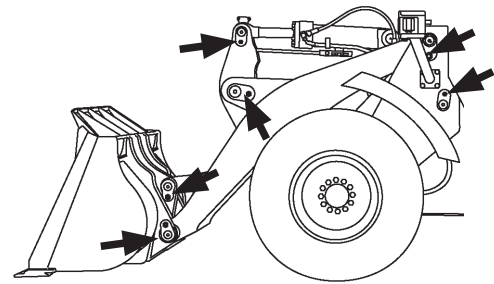
Bolt dia. mm (in)	16 (0.6)
Quantity	1



MNDF-07-046

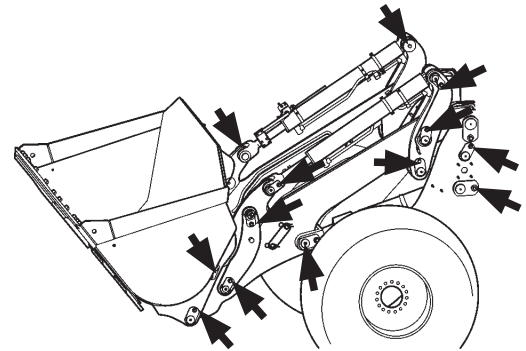
## 16. Loader front pin lock

	ZW140/150-6		ZW150PL-6	
Bolt dia. mm (in)	16 (0.6)	12 (0.5)	16 (0.6)	12 (0.5)
Quantity	3	10	10	26



ZW140/150-6

M4FC-07-075

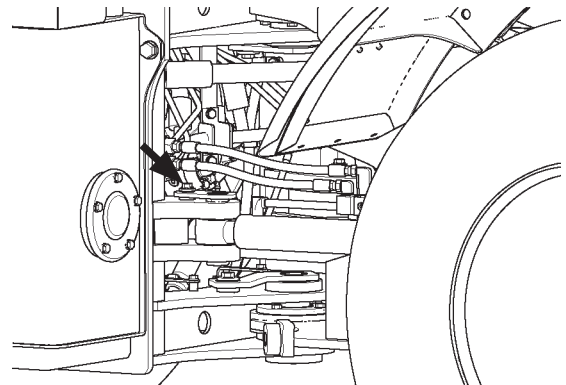


ZW150PL-6

M4GB-07-180

## 17. Steering cylinder pin lock

Bolt dia. mm (in)	12 (0.5)
Quantity	4



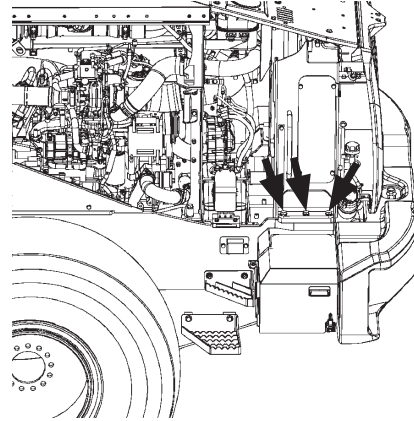
MNDF-07-046

# MAINTENANCE

## 18. Radiator frame mounting bolt

Bolt dia. mm (in)	16 (0.6)
Quantity	6

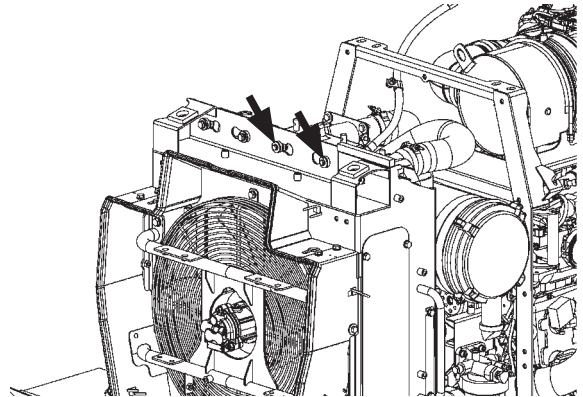
 NOTE: Apply LOCTITE#262 or equivalent.



MPTC-07-030

## 19. Radiator mounting bolt

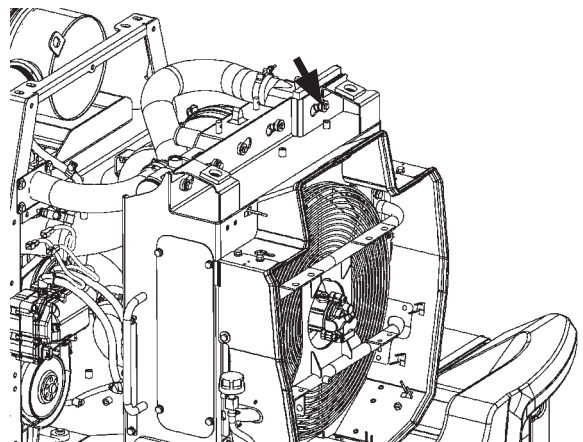
Bolt dia. mm (in)	8 (0.3)
Quantity	2



MPTC-07-031

## 20. Intercooler mounting bolt

Bolt dia. mm (in)	8 (0.3)
Quantity	1

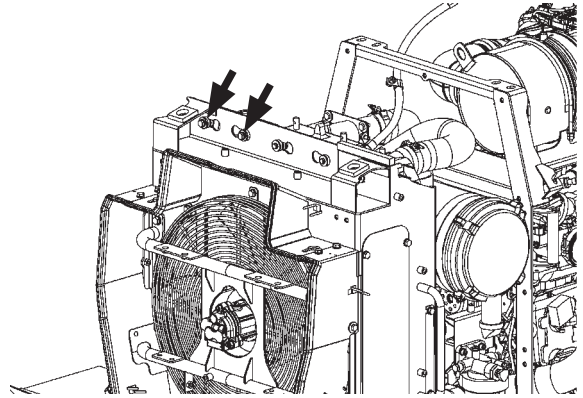


MPTC-07-032

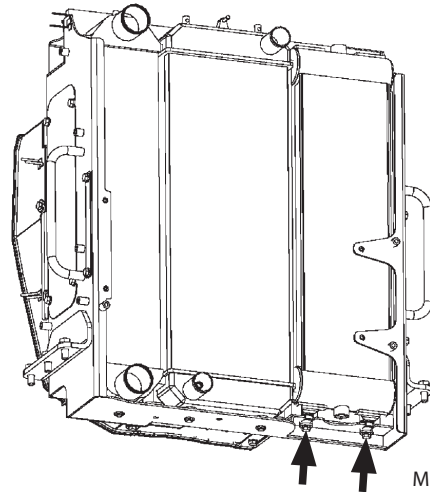
## MAINTENANCE

### 21. Oil cooler mounting bolt

Bolt dia. mm (in)	10 (0.4)
Quantity	4



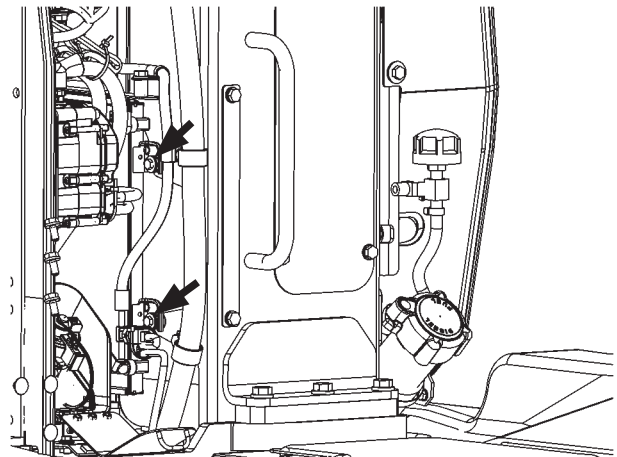
MPTC-07-031



MPTC-07-037

### 22. Air conditioner condenser mounting bolt

Bolt dia. mm (in)	8 (0.3)
Quantity	4

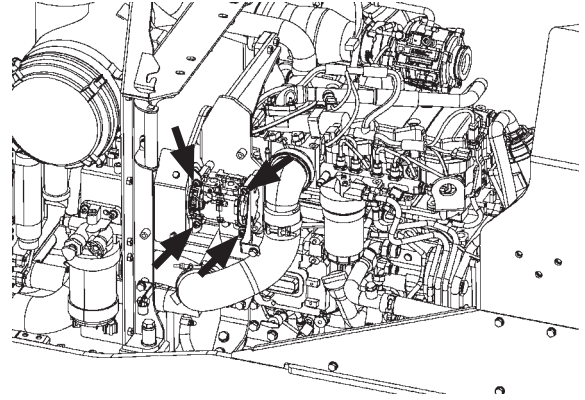


MPTC-07-033

# MAINTENANCE

## 23. Air conditioner compressor mounting bolt

Bolt dia. mm (in)	8 (0.3)
Quantity	4

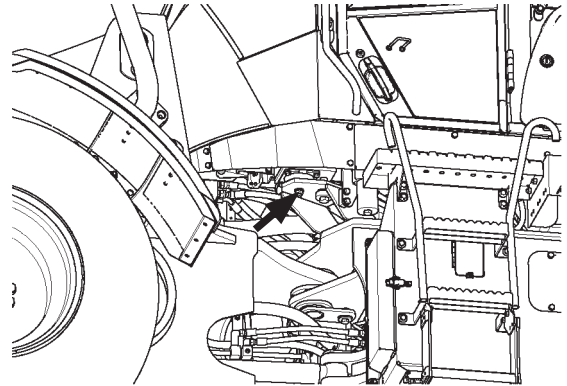


MPTC-07-034

## 24. Cab cushion rubber mounting bolt

Bolt dia. mm (in)	16 (0.6)
Quantity	4

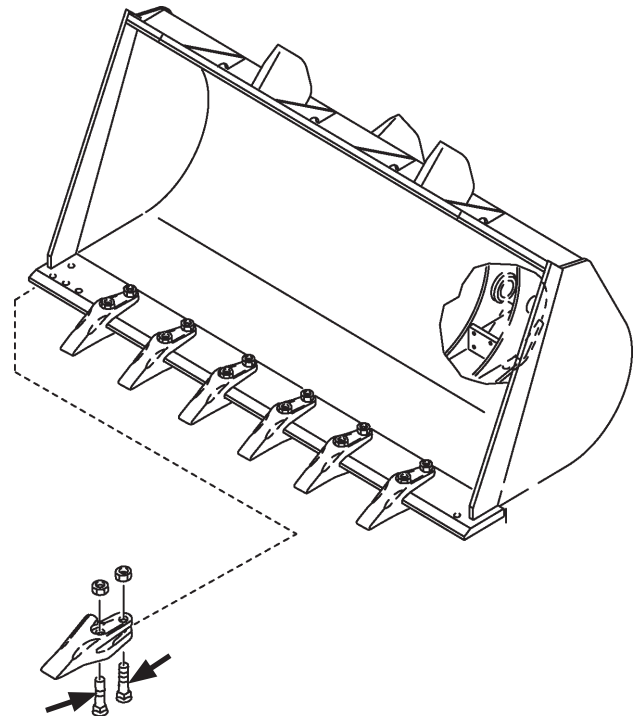
 NOTE: Apply LOCTITE#262 or equivalent.



MNDF-07-052

## 25. Bucket tooth mounting bolt (Optional)

Bolt dia. in	1"
Quantity	14



M4GB-07-115

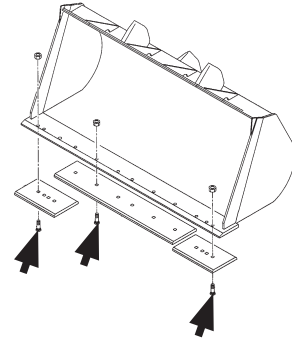


## MAINTENANCE

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### 26. Cutting edge mounting bolt

Bolt dia. in	1"
Quantity	7



M4GB-07-116



# MAINTENANCE

## M. Aftertreatment Device

- 1** Check and Clean Aftertreatment Device  
--- as required

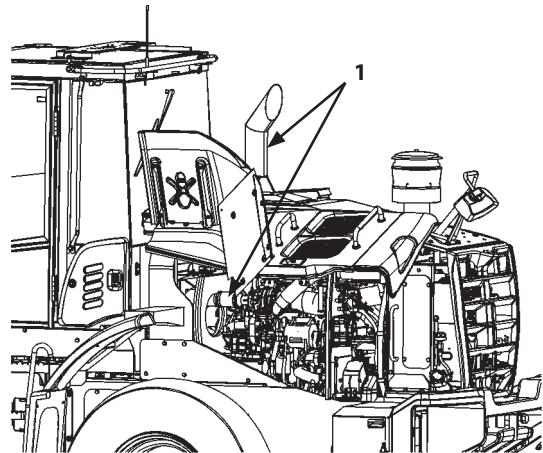
### IMPORTANT:

- Check and clean flammable materials on the area around the Aftertreatment device.
- Condensation for dew may blow out from the exhaust outlet of the aftertreatment device and black deposition may be observed; it is not a malfunction.

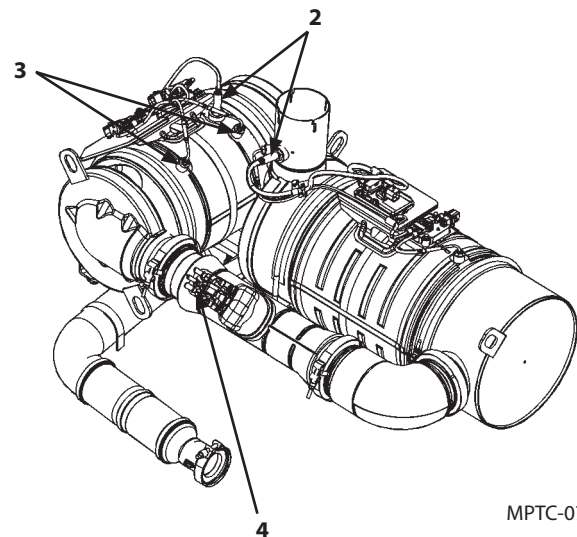
Do not disassemble the base machine support parts and sensors.

When the machine is operated in dusty areas, refer to the page 9-1 "Maintenance Under Special Environmental Conditions".

1. Open the right and left side cover.
2. Check exhaust pipe (1) for cracks.  
Check the aftertreatment device units for loose or disconnection.
3. Check the connectors and harnesses of NOx sensors (2), temperature sensors (3) and dosing module (4) for abnormality.
4. Close the side cover.



MPTC-07-018



MPTC-07-019

## MAINTENANCE

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### N. Urea SCR System

 **WARNING:** Fill specified DEF/AdBlue® into the DEF/AdBlue® tank.


**If improper DEF/AdBlue® is refilled, fire or system failure may result. If improper liquid is refilled in the DEF/AdBlue® tank, consult your authorized dealer for check or repair.**

Specified DEF/AdBlue®

Refill DEF/AdBlue® 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/AdBlue® tank, fire or system failure may result. The specified DEF/AdBlue® is colorless and odorless solution (urea 32.5%, water 67.5%) which begins to freeze at -11 °C (12 °F). Store the DEF/AdBlue® in -10 to 30°C (14 to 86 °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:** AdBlue® 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/AdBlue® 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/AdBlue® with clean water when it contacts on the skin.**
- **If you swallow DEF/AdBlue® by mistake, drink 1 or 2 cups of water or milk and seek immediate medical attention.**
- **If DEF/AdBlue® is accidentally splashed into eyes, flush with water for 15 minutes or longer and get emergency medical attention.**

## MAINTENANCE

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### **IMPORTANT:**

- **Use dedicated container recommended by the business entity who is handling DEF/AdBlue® to store DEF/AdBlue®. Do not use general container, a container used for other purpose and contaminated container because the quality of DEF/AdBlue® deteriorates.**
- **The DEF/AdBlue® is non-combustible, however, move DEF/AdBlue® to a safe place when fire occurs.**
- **Wash out spilled DEF/AdBlue® with clean water.**
- **Seal the container and store it in a well ventilated place. If DEF/AdBlue® freezes, the quality does not change just after freezing.**
- **As long as sealed by an airtight stopper, unless water evaporates DEF/AdBlue® will not deteriorate within the guarantee period.**
- **Do not pour waste DEF/AdBlue® and its containers onto the ground, and do not allow waste to flow into rivers and/or lakes. When disposing DEF/AdBlue®, make sure to let authorized industrial waste disposal contractor dispose of it appropriately.**

## MAINTENANCE

### 1 Check DEF/AdBlue® --- every 10 hours (daily)

Park the machine on a level surface. Lower the bucket to the ground. Check the DEF/AdBlue® level with DEF/AdBlue® gauge (1).

If necessary, stop the engine and add DEF/AdBlue®.

#### Refill DEF/AdBlue®



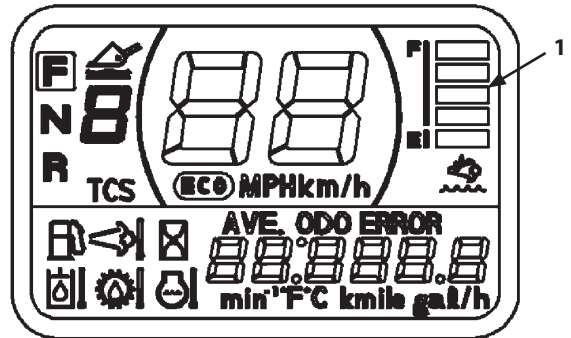
#### CAUTION:

- Refill DEF/AdBlue® which meets Japanese Industrial Standards (JIS K2247), International Organization for Standardization (ISO 22241) or Deutsche Industrie Normen (DIN 70070) in DEF/AdBlue® tank (2). If low density DEF/AdBlue® is refilled, alarm will be generated, restricting machine operation. Do not dilute DEF/AdBlue® with water.
- Wear safety equipment such as safety glasses or goggles, rubber gloves appropriate to the job. Wash DEF/AdBlue® with clean water when it contacts on the skin. If DEF/AdBlue® is accidentally splashed into eyes, flush with water for 15 minutes or longer and get emergency medical attention.

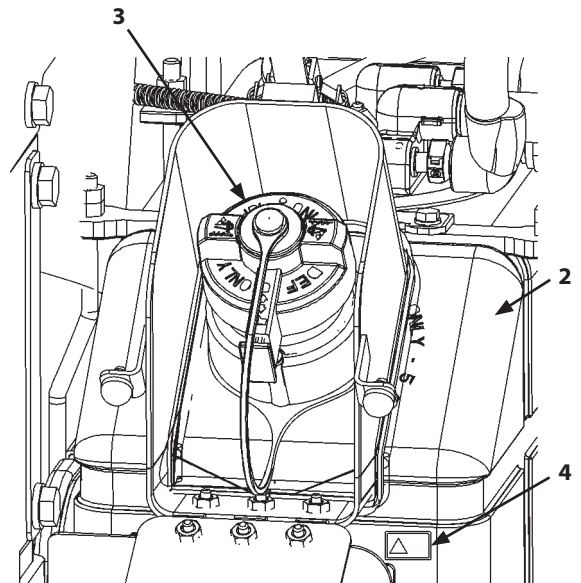
1. Park the machine according to the instruction on "Preparations for Inspection and Maintenance" (7-7).
2. DEF/AdBlue® tank (2) is located in the cover at left rear of the machine. Open the DEF/AdBlue® tank cover.
3. Clean dust and mud around the filler port of DEF/AdBlue® tank with clean cloth.
4. Remove cap (3) from DEF/AdBlue® tank (2) and refill DEF/AdBlue®. Be sure to stop refilling before "FULL" line (4).

#### IMPORTANT:

- Take care not to allow dust and/or water to enter the DEF/AdBlue® tank when refilling.
- If DEF/AdBlue® is filled above "FULL" line (4), the system may be damaged during operation or tank (2) may be broken when frozen.



MPTC-01-020



MPTC-07-020

## MAINTENANCE

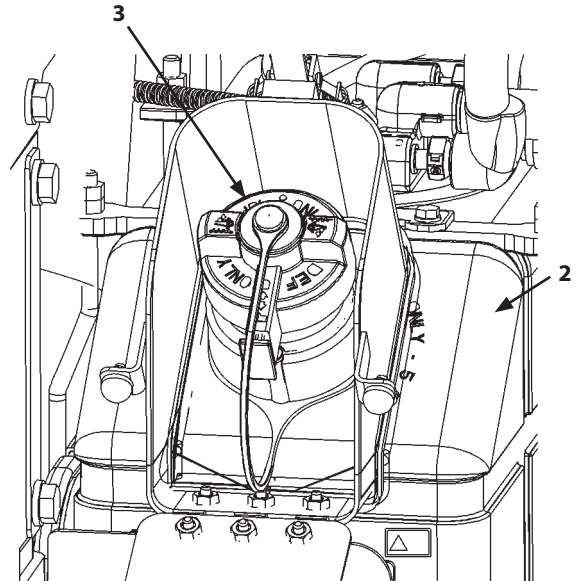
5. Install cap (3) after refilling DEF/AdBlue®. Close the DEF/AdBlue® tank cover.

### IMPORTANT:

- **Do not get on top of DEF/AdBlue® tank (2) or sensors and piping on the tank. Failure to do so may damage the machine.**
- **White deposits may be observed when DEF/AdBlue® is dried naturally; it is normal. Wash out DEF/AdBlue® deposits with soft water. Never use a high pressure washer.**

### NOTE:

- Wipe spilled DEF/AdBlue® 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/AdBlue® from piping to the tank, not a malfunction.
- DEF/AdBlue® will freeze at low temperature, and deteriorate (ammonification) at high temperature. Store DEF/AdBlue® at temperature between -10 and 30°C (14 to 86 °F).
- Use dedicated container (purchased container) to store or carry DEF/AdBlue®. Alternatively use a polyethylene resin tank, or stainless steel tank.



MPTC-07-020

## MAINTENANCE

### 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.

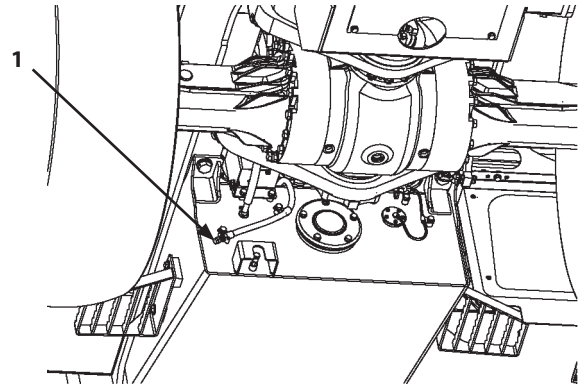
1. Place a 20 liter (5 gallons) or larger capacity container under drain plug (1).
2. Slowly loosen drain plug (1) to drain DEF.
3. Tighten drain plug (1) after draining DEF.

Wrench size: 11/16"-5/8"

Tightening torque: 30 N·m (3 kgf·m) (22 lbf·ft)

4. Remove the cap from DEF tank and refill DEF.  
(Refer to **1** "Check DEF")

DEF amount: 16 liters (4.2 gallon)



MPTC-07-004

## MAINTENANCE

### 2 Replace DEF/AdBlue® Supply Module Main Filter --- every 4500 hours

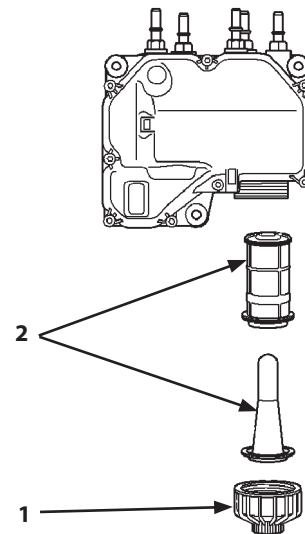
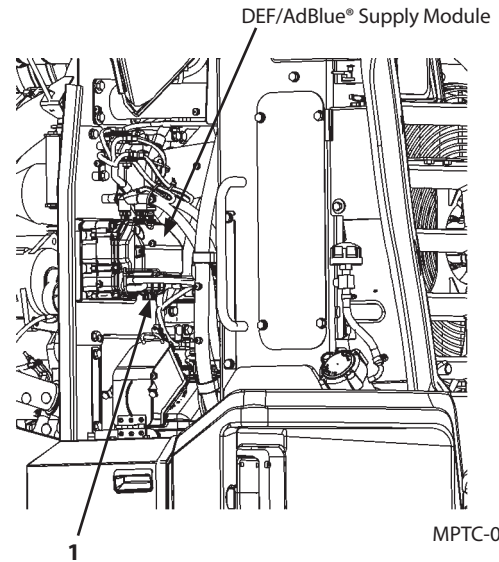
A filter (2) is mounted in the DEF/AdBlue® supply module.  
Periodically replace filter (2).

**CAUTION:** Use rubber glove for protection during operation. Wash DEF/AdBlue® with clean water when it contacts on the skin.

#### IMPORTANT:

- Take care not to allow dirt and/or water to enter the DEF/AdBlue® tank while replacing filter (2).
- Check for leaks around the mounting position after replacement.
- White deposition may be observed when DEF/AdBlue® is dried naturally; it is normal. Wash out DEF/AdBlue® deposition with clean water. Never use a high pressure washer.

1. Park the machine according to the instruction on Preparations for Inspection and Maintenance (7-7).
2. Open the side cover.
3. Remove cap (1) from the DEF/AdBlue® supply module by using a 27 mm bihexagon wrench.
4. Pull out filter (2) inside the supply module. As it is tightly mounted, it can not be pulled by hands. Use tools such as a pliers. Replace filter (2) assembly when replacing filter (2) of DEF/AdBlue® supply module.
5. Install new filter (2), and tighten cap (1) with  $20\pm 5$  N·m ( $14.7\pm 3.7$  lbf·ft) torque.



## MAINTENANCE UNDER SPECIAL ENVIRONMENTAL CONDITIONS

### 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, 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 : Clean the element regularly 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 your 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/AdBlue® : 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 your 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 your authorized dealer when the machine is operated under special condition(s).**



## MAINTENANCE UNDER SPECIAL ENVIRONMENTAL CONDITIONS

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### Precautions for Maintenance During Cold Weather Season

Before the atmospheric temperature becomes down below -0 °C, 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 in the engine crankcase 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.

## MAINTENANCE UNDER SPECIAL ENVIRONMENTAL CONDITIONS

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 **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.



## STORAGE

### Storing the Machine

**⚠ WARNING:** In case lubrication operation is unavoidably performed 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-TIME 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. If the machine is equipped with the battery disconnect switch, turn the disconnect switch OFF.
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.
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 at least once a month to lubricate the parts. At this time, check the coolant and lubrication oil levels. Charge the batteries.
DEF/AdBlue®	DEF/AdBlue® may become ammonia when storing it under 40°C for one month or longer. Change DEF/AdBlue® 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.

## STORAGE

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### 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 by following the procedure below.
  1. Crank the engine without injection input (operate by starter motor) for three seconds and stop 10 seconds. Repeat this process three times.
  2. Start the engine. 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.

## STORAGE

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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 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 "Inspect Machine Daily before Starting" on page 3-1. Sufficiently perform the warm up operation.

# STORAGE

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## MEMO

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## TROUBLESHOOTING

### 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 your authorized dealer.

Do NOT attempt to adjust or disassemble hydraulics, electrical and electronic parts.

#### Engine

Consult your 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 your authorized dealer.



## TROUBLESHOOTING

### 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 selector 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 your authorized dealer.

### Control Lever

Symptom	Cause	Solution
Hard to move	Rusted joint	* Lubricate, Repair
	Worn pusher	* Replace
Does not move smoothly	Worn pusher	* Repair, Replace
	Faulty pilot valve	* Replace
Does not return to neutral	Faulty pilot valve	* Replace
The lever is tilted in the neutral position due to increase in play	Worn joint	* Repair, Replace
	Faulty pilot valve	* Replace
The lever is not held with magnetic detent.	Faulty magnetic solenoid	* Replace
	Faulty sensor	* Replace

\* Consult your authorized dealer.

## TROUBLESHOOTING

### 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 your authorized dealer.

## TROUBLESHOOTING

### 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 your authorized dealer.

#### Accelerator Pedal

Symptom	Cause	Solution
Heavy to operate	Rusted joint	* Lubricate, Repair
Accelerator pedal play is excessive.	Worn joint	* Repair, replace

\* Consult your authorized dealer.

#### Parking Brake

Symptom	Cause	Solution
Parking brake is dragging.	Oil leak due to worn parking brake piston D-ring	* Repair, Replace
	Faulty disk brake	* 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

\* Consult your authorized dealer.

## TROUBLESHOOTING

### 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 your 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 your 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 your 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 your authorized dealer.

### Others

If there is a problem with the machine, a noise, excessive vibration, and abnormal smells may occur. Always be aware of the machine conditions during operation.

# TROUBLESHOOTING

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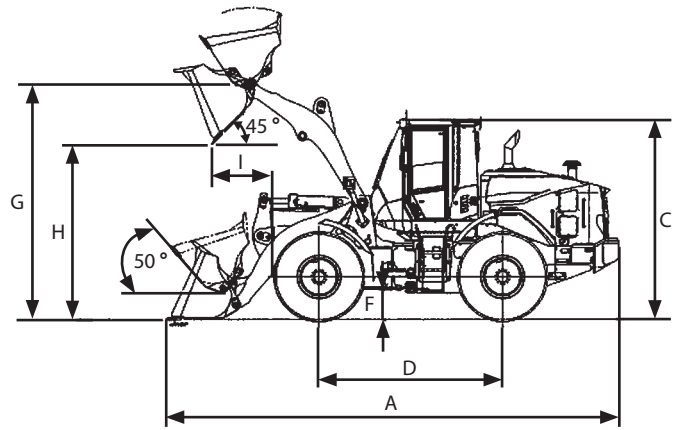
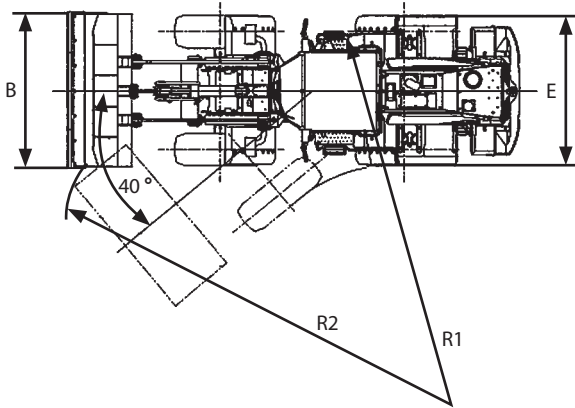
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## MEMO

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# SPECIFICATIONS

## Specifications



MPTC-12-001

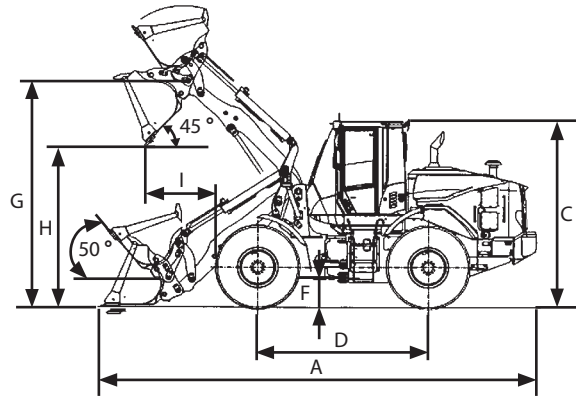
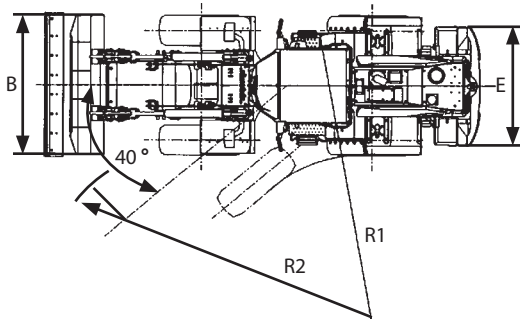
Model	-	ZW150-6	ZW140-6
Bucket Capacity: heaped	m <sup>3</sup> (Y <sup>3</sup> )	*2.4 (3.1)	*2.1 (2.7)
Operating Weight	kg (lbs)	12250 (27010)	11630 (25640)
Tipping Load (full turn)	kg (lbs)	9070 (20000)	7990 (17700)
Engine	-	CUMMINS QSB4.5	
A: Overall Length	mm (in)	7530 (296)	7280 (287)
B: Overall Width (Bucket)	mm (in)	2560 (101)	2560 (101)
C: Overall Height	mm (in)	3265 (129)	3265 (129)
D: Wheel Base	mm (in)	3000 (118)	3000 (118)
E: Tread	mm (in)	1930 (76)	1930 (76)
F: Ground Clearance	mm (in)	430 (17)	430 (17)
G: Bucket Hinge Height	mm (in)	3835 (151)	3835 (151)
H: Dumping Clearance (45 °)	mm (in)	2830 (111)	2890 (114)
I: Dumping Reach (45 °)	mm (in)	1040 (41)	975 (38)
R1: Minimum Rotation Radius	mm (in)	5085 (200)	5085 (200)
R2: Minimum Rotation Radius	mm (in)	5955 (234)	5940 (234)
Travel Speed Forward/Reverse	km/h (mph)	39 (24.2)/39 (24.2)	39 (24.2)/39 (24.2)
Transmission Speeds (F/R)	-	4/4	
Articulation Angle (Left/Right) deg	(°)	40	
Tire Size	-	20.5 R25 (L3)	

NOTE: • \* BOC (Bolt-On Cutting Edge)

• These specifications are subject to change without notice.


# SPECIFICATIONS

## Specifications



MPTC-12-002

Model	-	ZW150PL-6
Bucket Capacity: heaped	m <sup>3</sup> (Y <sup>3</sup> )	*2.1 (2.7)
Operating Weight	kg (lbs)	13100 (28880)
Tipping Load (full turn)	kg (lbs)	7760 (17200)
Engine	-	CUMMINS QSB4.5
A: Overall Length	mm (in)	7875 (310)
B: Overall Width (Bucket)	mm (in)	2535 (100)
C: Overall Height	mm (in)	3265 (129)
D: Wheel Base	mm (in)	3000 (118)
E: Tread	mm (in)	1930 (76)
F: Ground Clearance	mm (in)	430 (17)
G: Bucket Hinge Height	mm (in)	3980 (157)
H: Dumping Clearance (45 °)	mm (in)	2800 (110)
I: Dumping Reach (45 °)	mm (in)	1250 (49)
R1: Minimum Rotation Radius	mm (in)	5085 (200)
R2: Minimum Rotation Radius	mm (in)	5980 (235)
Travel Speed Forward/Reverse	km/h (mph)	39 (24.2)/39 (24.2)
Transmission Speeds (F/R)	-	4/4
Articulation Angle (Left/Right) deg	( ° )	40
Tire Size	-	20.5 R25 (L3)

 NOTE: • \* BOC (Bolt-On Cutting Edge)

• These specifications are subject to change without notice.

# OPTIONAL ATTACHMENTS

## Hydraulic Type Quick Coupler Operation

### Hydraulic Type Quick Coupler Operation

#### ZW140/150-6

A quick coupler is a system by which a front attachment work tool such as a bucket can be easily replaced with other type of a work tool.

**WARNING:** During replacement work, keep personnel away from the machine. Removal and installation of pins can be achieved from the operator's seat.

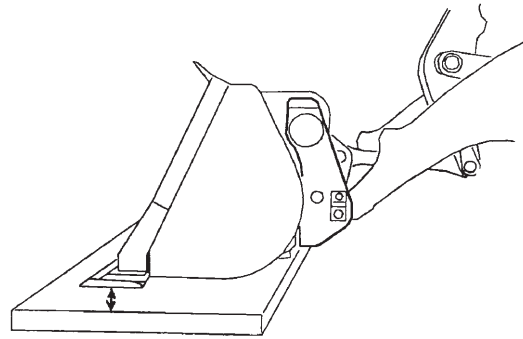
#### Removal:

Before removing a work tool, disconnect hydraulic hoses from the attachment cylinders other than disconnecting hydraulic hoses from the bucket and lift arm cylinders. (Refer to page 13-5 for information on hydraulic hose connection and disconnection.) Put the bucket (attachment) to be removed on a support such as a pallet if available.

1. Horizontally lift the bucket by approx. 20 cm above the pallet.

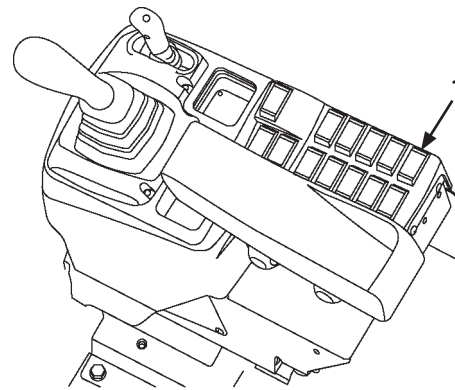
**WARNING:** Before leaving the machine apply the parking brake.

2. Operate the quick coupler cylinder with hydraulic coupler switch (1) to remove pin (4).
3. While pulling to slide lock switch (2), continue to press switch removal position (3) to remove the coupler cylinder pin (4).
4. To allow the quick coupler pin to be removed, position the bucket (attachment) as closely to the rear of the pallet as possible.
5. While slowly lowering the lift arm, slightly tilt the bucket forward by operating the bucket cylinder to allow the bucket to come off the quick coupler.

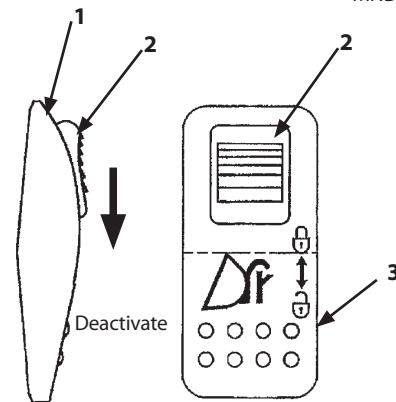


Horizontally lift the bucket

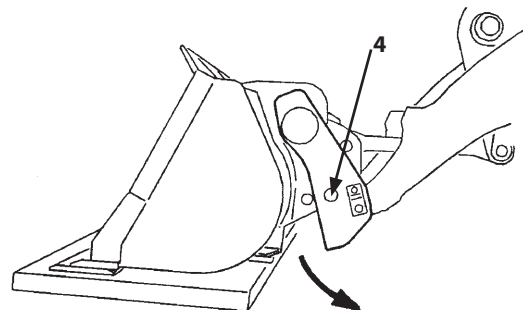
M4GB-13-001



MNDF-01-006



M4GB-01-175



M4GB-13-002



# OPTIONAL ATTACHMENTS

## Hydraulic Type Quick Coupler Operation

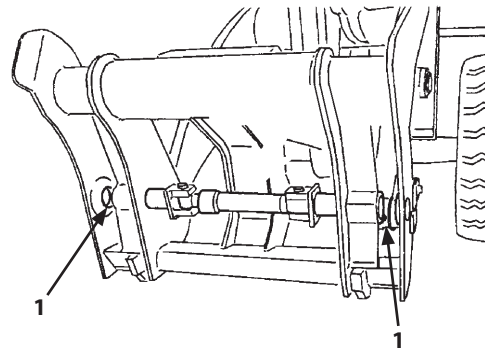
### Installation

**⚠ WARNING:** Complete installation work only after checking that both right and left coupler pins (1) have been correctly installed.

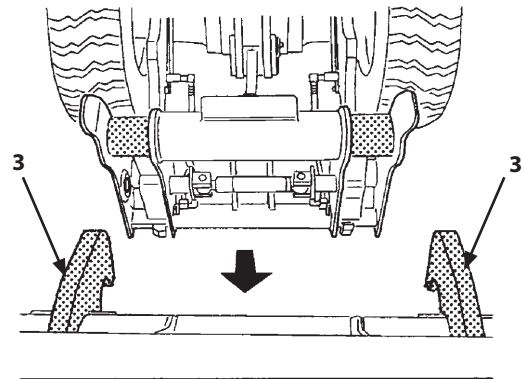
**⚠ WARNING:** Before leaving the machine apply the parking brake.

1. After checking that coupler pin (1) is removed, slowly bring the machine close to bucket (attachment) hook (3) and install the quick coupler to the hook.
2. Slightly raise lift arm (4). Slowly tilt the bucket (attachment) backward by operating the bucket cylinder until stopper (5) comes in contact with the coupler.
3. While pulling to slide lock switch, continue to press switch installation position to install coupler cylinder pin (1).

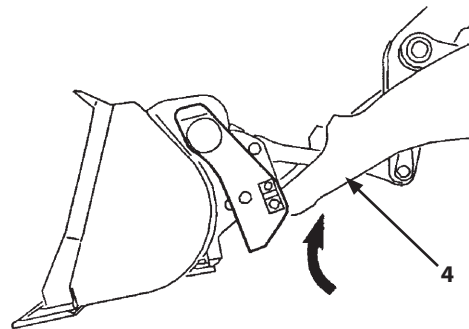
**✎ NOTE:** In case the newly installed attachment uses an additional hydraulic cylinder other than the bucket and/or lift arm being already installed, connect the hydraulic hoses to the additional cylinder in advance.



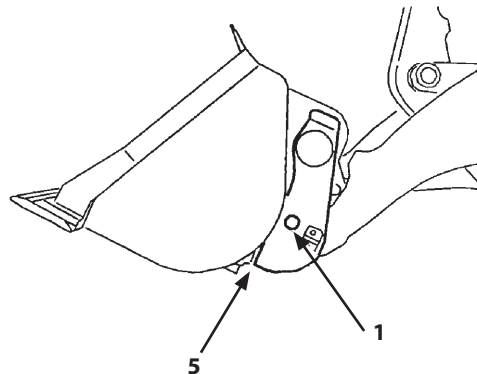
M4GB-13-003



M4GB-13-004



M4GB-13-005



M4GB-13-006

# OPTIONAL ATTACHMENTS

## Hydraulic Type Quick Coupler Operation

### Hydraulic Type Quick Coupler Operation

#### ZW150PL-6

A quick coupler is a system by which a front attachment work tool such as a bucket can be easily replaced with other type of a work tool.

**WARNING:** During replacement work, keep personnel away from the machine. Removal and installation of pins can be achieved from the operator's seat.

#### Disconnecting:

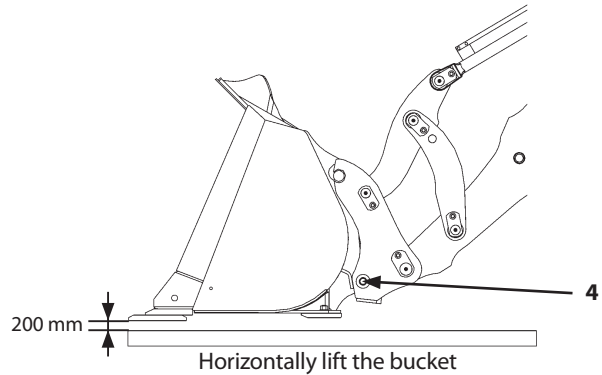
Before removing a work tool, disconnect hydraulic hoses from the attachment cylinders other than disconnecting hydraulic hoses from the bucket and lift arm cylinders. (Refer to page 13-5 for information on hydraulic hose connection and disconnection.) Put the bucket (attachment) to be removed on a support such as a pallet if available.

1. Horizontally lift the bucket (attachment) by approx. 200 mm above the pallet.

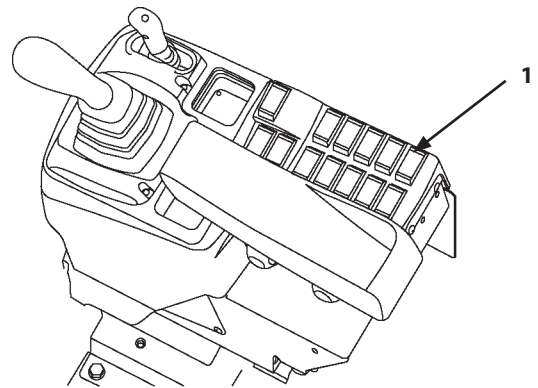
**WARNING:** Before leaving the machine apply the parking brake.

**Operate the quick coupler switch with engine speed at low idle.**

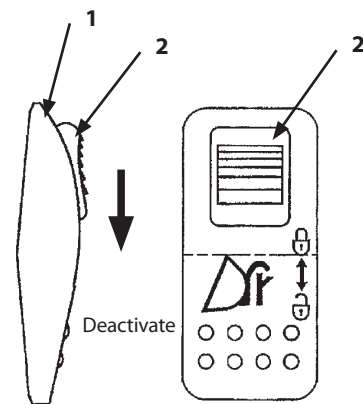
2. Operate the quick coupler cylinder with hydraulic coupler switch (1) to remove pin (4).
3. While pulling to slide lock switch (2), continue to press switch removal position to remove the coupler cylinder pin (4). Check that the pin has been in the unlock position by using an indicator bar (5).
4. To allow the quick coupler pin to be removed, position the bucket (attachment) as closely to the rear of the pallet as possible.
5. While slowly lowering the lift arm, slightly tilt the bucket forward by operating the bucket cylinder to allow the bucket to come off the quick coupler.



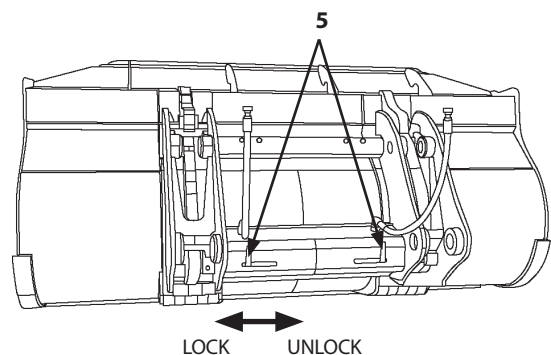
M4GB-13-029



MNDF-01-006



M4GB-01-175



M4GB-07-186

# OPTIONAL ATTACHMENTS

## Hydraulic Type Quick Coupler Operation

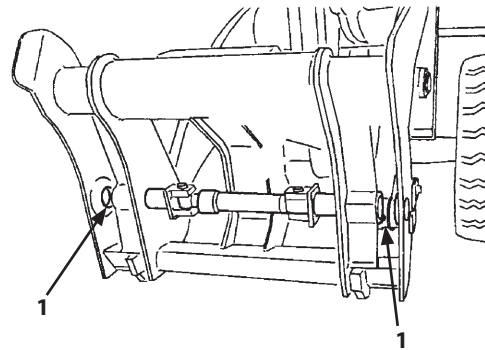
### Installation

**⚠ WARNING:** Before leaving the machine apply the parking brake.

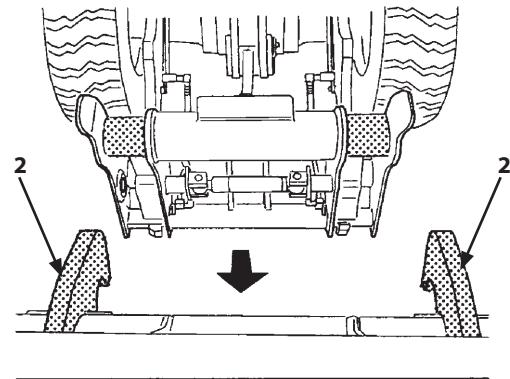
1. After checking that coupler pin (1) is removed, slowly bring the machine close to bucket (attachment) hook (3) and install the quick coupler to the hook.
2. Slightly raise lift arm (4). Slowly tilt the bucket (attachment) backward by operating the bucket cylinder until its end is 20 cm (8 in) high.
3. While pulling to slide lock switch, continue to press switch installation position to install coupler cylinder pin (1).

**IMPORTANT:** After completing installation work, check that coupler pins (1) have been installed into both right and left sides by using an indicator bar (2).

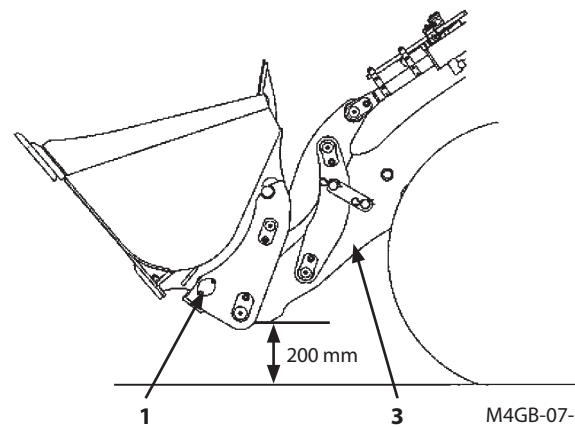
**✎ NOTE:** In case the newly installed attachment uses an additional hydraulic cylinder other than the bucket and/or lift arm being already installed, connect the hydraulic hoses to the additional cylinder in advance.



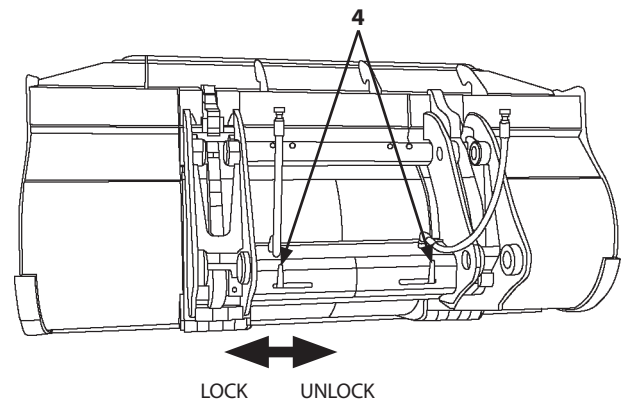
M4GB-13-003



M4GB-13-004



M4GB-07-183



M4GB-07-186

# OPTIONAL ATTACHMENTS

## Hydraulic Type Quick Coupler Operation

### Disconnecting/connecting hydraulic hose

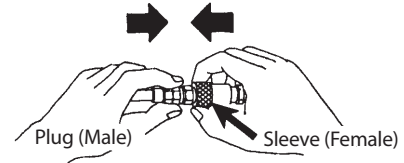
When activating an attachment with a hydraulic cylinder other than the lift arm cylinder or bucket cylinder using the machine hydraulic pressure oil, hydraulic hoses must be connected or disconnected. At this time, connect or disconnect the hydraulic hoses following the procedures below.

#### Procedures

**CAUTION:** Before starting to work, apply the parking brake and stop the engine. Operate the attachment control lever several strokes to release any hydraulic oil pressure remaining in the circuits.

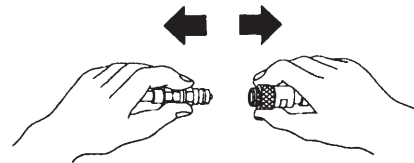
**IMPORTANT:** Thoroughly remove dirt or stains from the hydraulic hose connectors.

- Connect the attachment hydraulic hoses to the machine hydraulic pipe lines.
- After connecting the hydraulic hoses, start the engine. While operating the attachment control lever, slowly move the attachment. Check that no oil leaks from the hydraulic hose connectors.
- When the attachment is removed, joint the attachment hose female end to the male end. Put dust caps to the machine hydraulic pipe line female and male ends to prevent the pipe line ends from becoming contaminated.



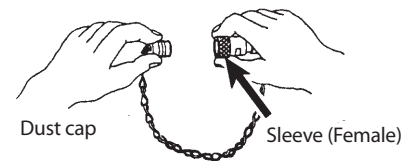
When connecting hoses, insert the plug while pulling the sleeve. When the sleeve is returned, the hose connectors are automatically locked and connected.

M4GB-13-007



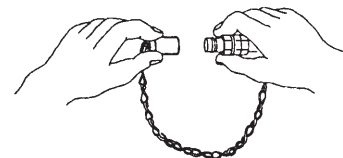
When disconnecting the hoses, pull the sleeve. The connectors are instantaneously separated.

M4GB-13-008



When installing the dust cap to or removing the dust cap from the female type hose end, pull on the sleeve.

M4GB-13-009



When installing the dust cap to the male type hose end, just connect it to the hose end.

M4GB-13-010



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