

Operator's Manual

ZW

80-5B

Wheel Loader

ZW80-5B WHEEL LOADER OPERATOR'S MANUAL

ENMNCH-NA1-4

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

URL:<http://www.hitachi-c-m.com>



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Serial No. 005001 and up

INTRODUCTION

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

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

In case the machine is used under conditions other than described above, consult your nearest Hitachi 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 nearest Hitachi 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.

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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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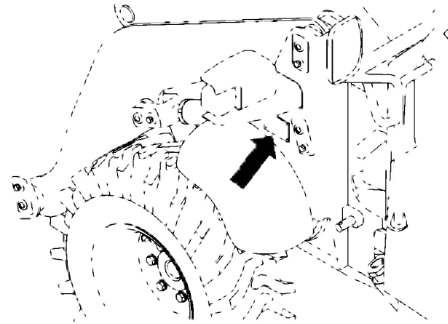
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MACHINE NUMBERS

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

TYPE : _____
PRODUCT
IDENTIFICATION
NUMBER : _____

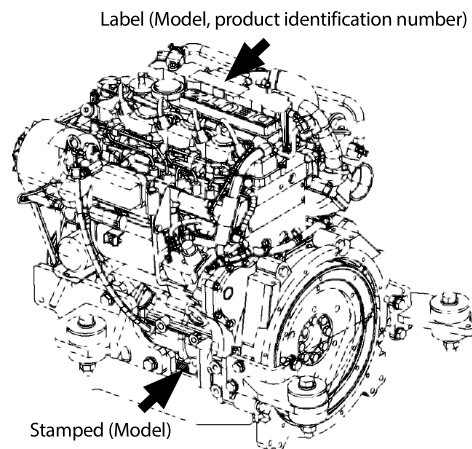


M4EK-00-001

Engine

TYPE : _____
MFG. NO. : _____

 **NOTE:** The engine model is located in 2 places, one stamped, the other a label.



Label (Model, product identification number)

Stamped (Model)

MNCH-00-001

MEMO

This image shows a full page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, typical of notebook paper. There are no margins, text, or other markings on the page.

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 do not use any of the designated signal words above after the safety alert symbol are occasionally used on this machine.
- To avoid confusing machine protection with personal safety messages, a signal word **IMPORTANT** indicates a situation which, if not avoided, could result in damage to the machine.
-  **NOTE** indicates an additional explanation for an element of information.

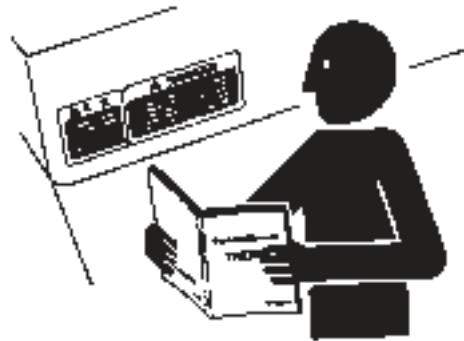


SA-1223

SAFETY

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 part safety, function, and/or service life. 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 muffler filter. Avoid giving shocks on the muffler filter by striking elements with other objects or dropping 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 if a fire starts or if an accident occurs.
 - 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

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

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

General Precautions for Cab

- Before entering the cab, thoroughly remove all dirt and/or oil such as mud, grease, soil or stones that may mess up the cab 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 mess up around the operator's seat with parts, tools, soil, stones, obstacles that may fold up or turn over, cans or lunch box. The levers or pedals become inoperable if obstacle jams in 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.
- Use proper floor mat dedicated 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

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 hand-holds.
 - Never jump on or off the machine. Never mount or dismount a moving machine.
 - Before getting on or off the machine, check the condition of the steps and handrails for sticking of slippery material like grease or mud. Thoroughly remove such material if stuck. In addition, repair the damage to the steps and/or handrails. Retighten loose bolts.
 - Never get on and off the machine with tools in your hands.



SA-439

Never Ride Attachment

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

Adjust Operator's Seat

- A poorly adjusted seat for either the operator or the work at hand may quickly fatigue the operator leading to misoperations.
 - The seat should be adjusted whenever changing the operator for the machine.
 - 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

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.

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 four years regardless of its apparent condition.



SA-237

SAFETY

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 on the cleaning of the camera and the monitor.



SA-4EK-001

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

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-4EK-002

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

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 footing is weak, reinforce the ground before starting work.
- When working on frozen ground, be extremely alert. As ambient temperatures rise, footing becomes loose and slippery.
- Beware the possibility of fire when operating the machine near flammable objects such as dry grass.



SA-4EK-003

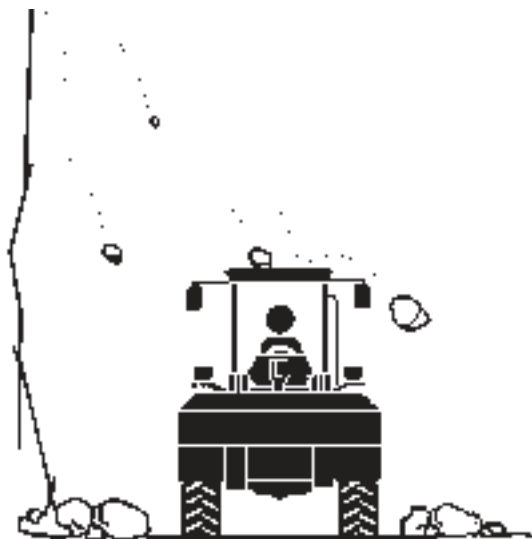
SAFETY

Equipment of Head Guard, ROPS, FOPS

In case the machine is operated in areas where the possibility of falling stones or debris exist, 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 performances and its certification will be lost.

ROPS: Roll-Over Protective Structure

FOPS: Falling Object Protective Structure



SA-521

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

Keep Riders Off Machine

- Riders on 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-4EK-004

Drive Safely

- Beware of the possibility of slipping and / or turning over the machine 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-4EK-005

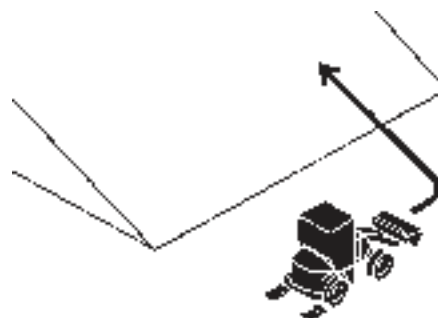
SAFETY

Drive Machine Safely (Work Site)

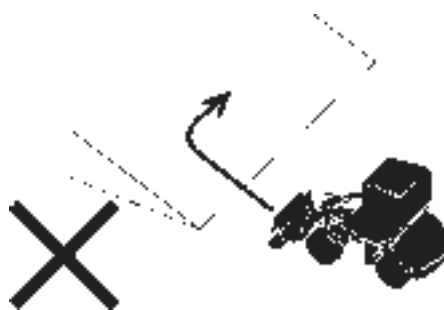
- Before driving the machine, always confirm that the steering wheel / and forward / reverse lever (switch) direction corresponds to the direction you wish to drive.
- Be sure to detour around any obstructions.
- Driving on a slope may cause the machine to slip or overturn, possibly resulting in serious 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-4EK-006



SA-4EK-007



SA-4EK-008

SAFETY

Drive Safely with Bucket Loaded

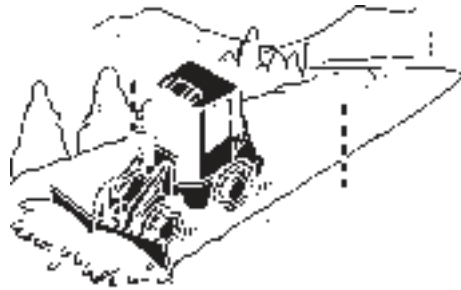
- If the machine is incorrectly operated while driving with the bucket loaded, turning over of the machine may result. Be sure to follow all the instructions indicated below.
- When driving the machine on a job site with the bucket loaded, hold the bucket as low as possible to keep the machine balanced 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-4EK-009

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. Be sure where they are 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-4EK-011

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) 300 to 400 mm (11.8 to 15.7 in) above the road surface as illustrated.



SA-4EK-010

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 (lever) in the ON (parking brake) position.
- Run the engine at low idle speed without load for 5 minutes to cool down the engine.
- Stop the engine and remove the key from the key switch.
- Turn the control lever lock switch to the lock (🔒) position.
- Block both tires and lower the bucket to the ground.
- Position the machine to prevent rolling.
- Park at a reasonable distance from other machines.



SA-4EK-012



SA-4EK-013

SAFETY

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 from 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.
- In case good visibility is not obtained, use a signal person to guide you.



SA-383



SA-312

SAFETY

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-4EK-014

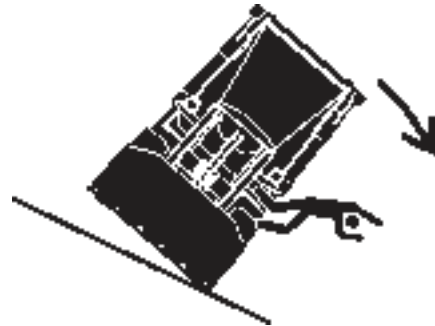
Avoid Tipping

DO NOT ATTEMPT TO JUMP CLEAR OF 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 PREDICTED, 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 grade.
 - 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 grades.
 - NEVER attempt to travel across a grade steeper than 5 degrees if crossing the grade is unavoidable.
 - 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-4EK-015

SAFETY

Never Undercut a High Bank

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



SA-4EK-016

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 should be 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-4EK-017

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-4EK-018

SAFETY

Avoid Power Lines

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

Never move any part of the machine or load closer to any electric line than 3 m (10 ft) plus twice the line insulator length.



SA-4EK-019

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.

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.



SA-4EK-020

SAFETY

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

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 goggle 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

Park Machine Safely

To avoid accidents:

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



SA-2754

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

Transport Safely

- Take 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 being on the ramp. If the traveling direction must be changed while being 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-4EK-021

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

SAFETY

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 the 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.
- Disconnect battery ground cable (-) before making adjustments to electrical systems or before performing welding on the machine.



SA-028



SA-312



SA-134



SA-527

SAFETY

- 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. In case the light bulb is broken, spilled fuel, oil, antifreeze fluid, or window washer fluid may catch fire.



SA-037

Warn Others of Service Work

- Unexpected machine movement can cause serious injury.
- Before performing any work on the machine, attach a “Do Not Operate” tag on the control lever. This tag is available from your authorized dealer.



SS2045102-4

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

Stay Clear of Moving Parts

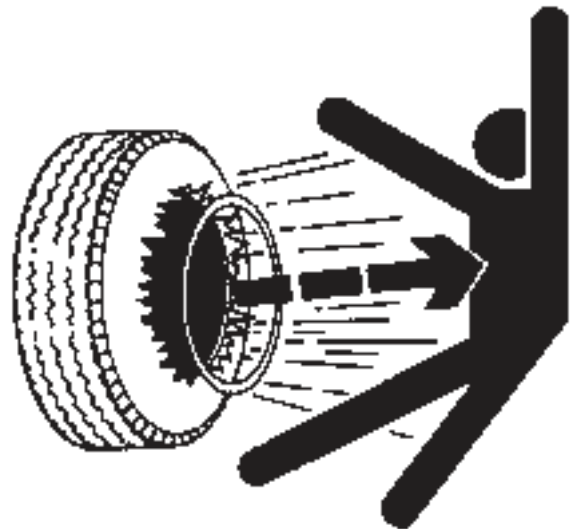
- Entanglement in moving parts can cause serious injury.
- To prevent accidents, care should be taken to ensure that hands, feet, clothing, jewelry and hair do not become entangled when working around rotating parts.



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

Prevent Parts from Flying

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



SA-344

Prevent Burns

Hot spraying fluids:

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



SA-039

Hot fluids and surfaces:

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



SA-225

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

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 wirings.

SAFETY

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.
 - White smoke may be generated during the aftertreatment device regeneration. Do not attempt to do 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.
- 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

Avoid Heating Near Pressurized Fluid Lines

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



SA-030

Avoid Applying Heat to Lines Containing Flammable Fluids

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

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 the unit, sealed gas must be released. Consult your nearest Hitachi dealer.

SAFETY

Remove Paint Before Welding or Heating

- Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch. If inhaled, these fumes may cause sickness.
 - Avoid potentially toxic fumes and dust.
 - Do all such work outside or in a well-ventilated area. Dispose of paint and solvent properly.
 - Remove paint before welding or heating:
1. If you sand or grind paint, avoid breathing the dust.
Wear an approved respirator.
 2. If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.



SA-029

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



SA-029

SAFETY

Prevent Battery Explosions

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



SA-032

Service Air Conditioning System Safely

- If 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

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.
- 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

Dispose of Waste Properly

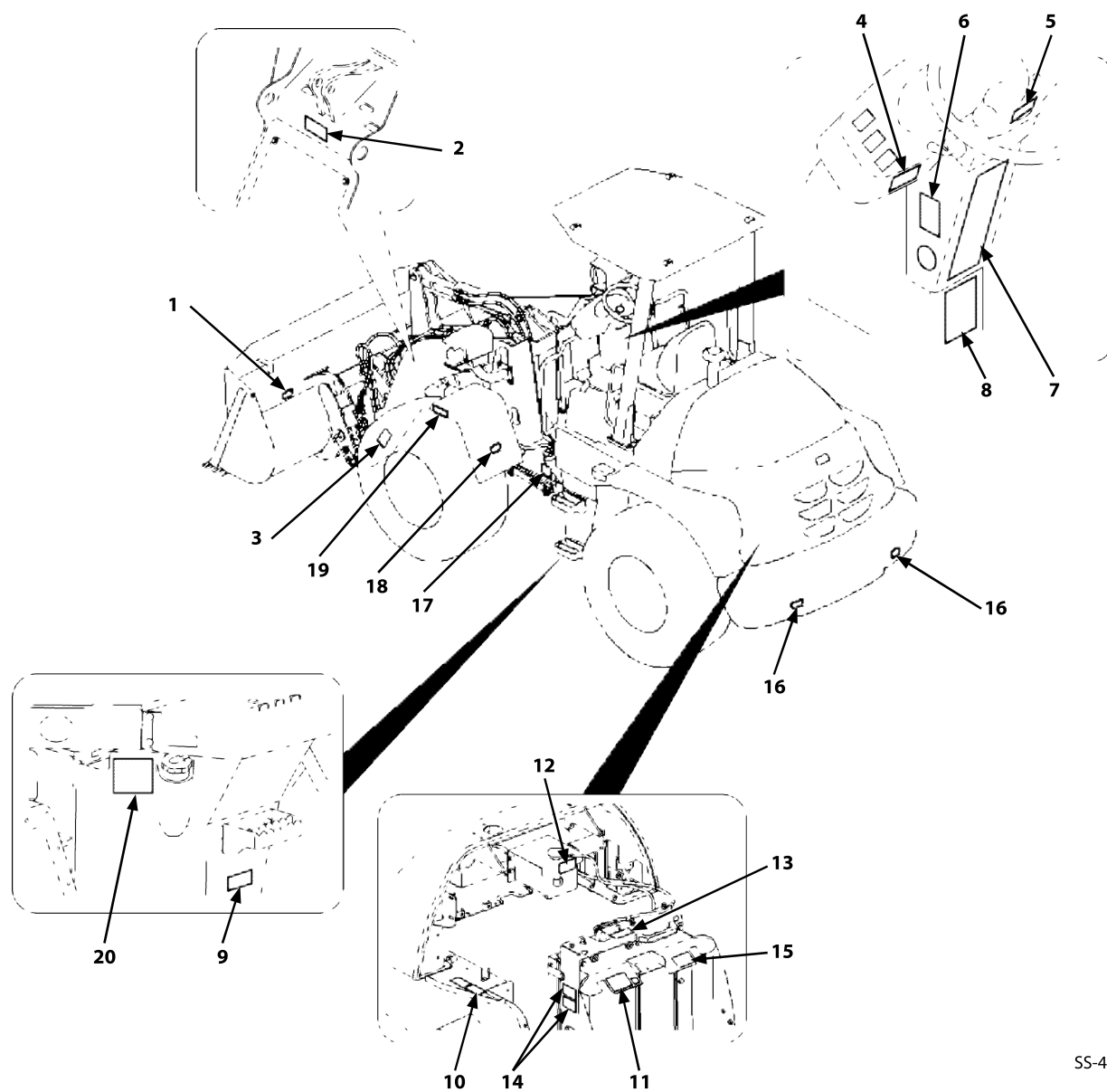
- Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with HITACHI equipment includes such items as oil, fuel, coolant, brake fluid, filters, and batteries.
- Use leakproof containers when draining fluids. Do not use food or beverage containers that 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 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 Hitachi dealer.



SS-4154

SAFETY SIGNS

1. Both sides of bucket



SS-4EK-017_E



SS-4152

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

2. Front Maintenance Access Cover for Front Frame



SS-4EK-019_E



SS-4FGE-003

- The front attachment may unexpectedly be lowered, possibly resulting in personal injury. Lower the front attachment to the ground before inspecting/maintaining the machine. In case inspection and/or maintenance work must unavoidably be performed with the front attachment raised, lock the front attachment control levers in position. Then, securely support the front attachment with safety supports and/or blocks.

3. Both sides of Lift Arm



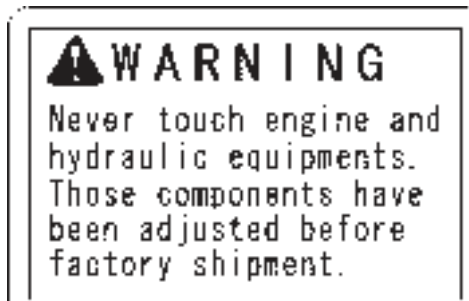
SS-4EK-020_E



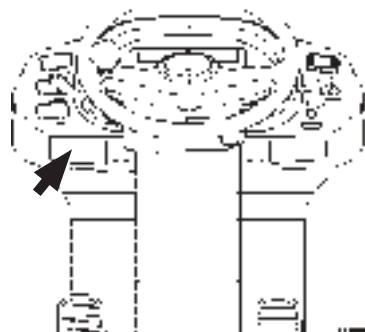
SS-4152

SAFETY SIGNS

4. Left Side of Front Console



SS-4EK-021_E

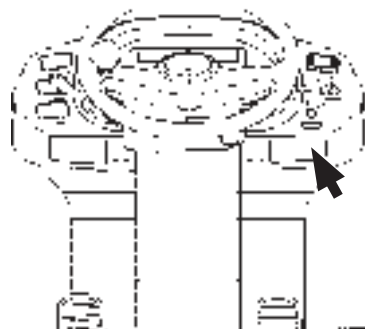


SS-4EK-005 E

5. Right Side of Front Console



SS-4EK-022_E



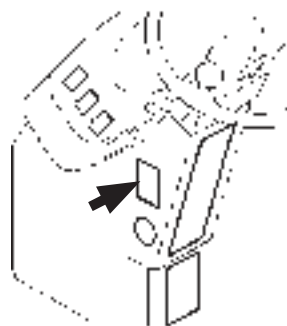
SS-4EK-005 E

6. Left side of steering wheel support

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



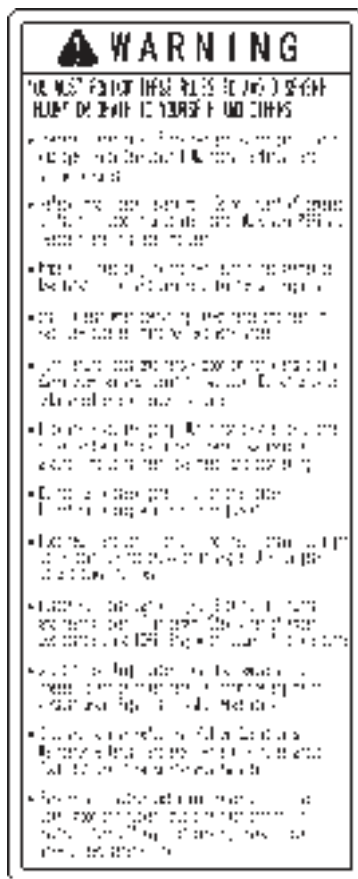
SS-4EK-023_E



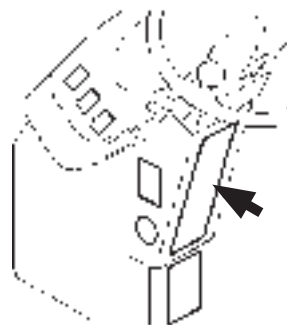
SS-4FGE-004

SAFETY SIGNS

7. Steering wheel support

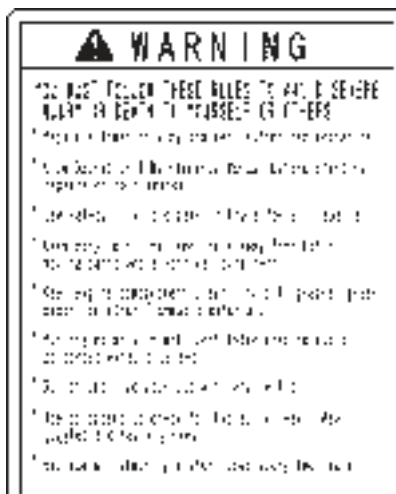


SS-4EK-026_E



SS-4FGE-004

8. Steering wheel support



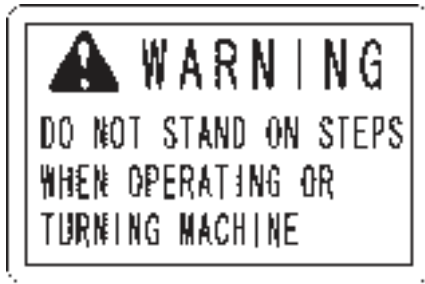
SS-4EK-024_E



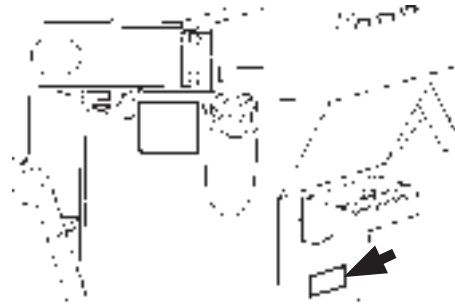
SS-4FGE-004

SAFETY SIGNS

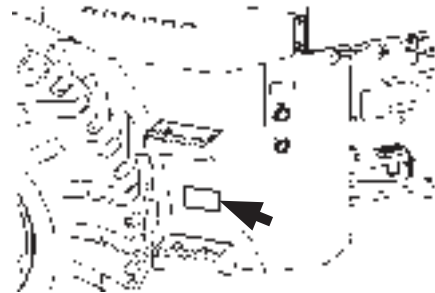
9. Both Side Vicinity of Step's



SS-4EK-027_E

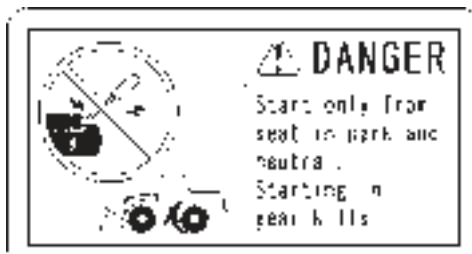


SS-4FGE-005



SS-4FGE-006

10. Left Side of Fender



SS-4EK-028_E

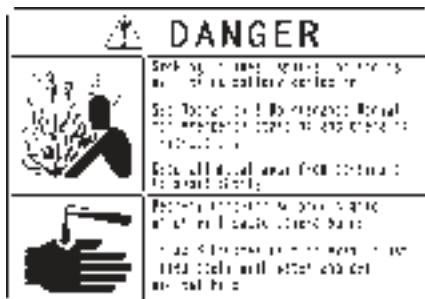


SS-4151

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

SAFETY SIGNS

11. Vicinity of Battery



SS-4EK-029_E



SS-4151

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

12. Vicinity of Radiator Cap



SS-4EK-031_E



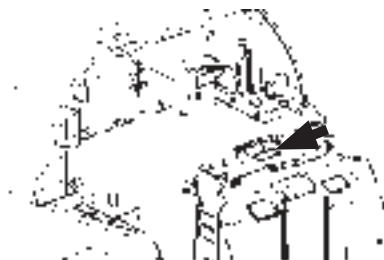
SS-4151

- 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.

13. Vicinity of Radiator Cap



SS-4EK-032_E

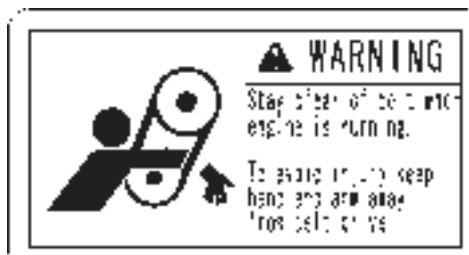


SS-4151

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

SAFETY SIGNS

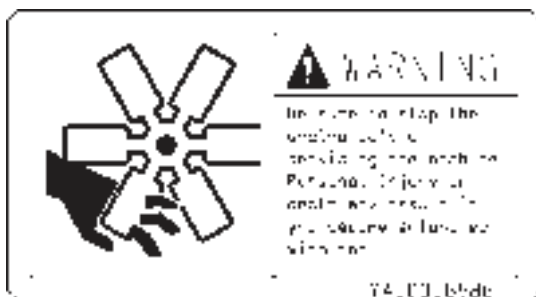
14. Both Sides of Radiator Frame



SS-4EK-033_E



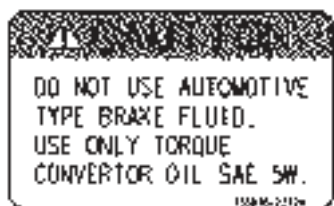
SS-4151



SS-4EK-033_E

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

15. Vicinity of Brake Oil Tank



SS-4EK-035_E



SS-4151

16. Both Sides of Counterweight



SS-4EK-039_E

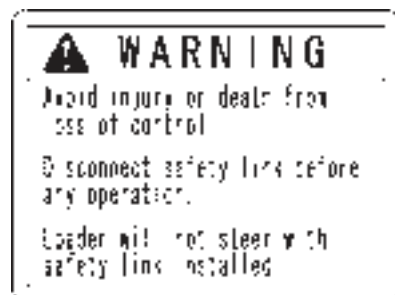


SS-4FGE-009

- Avoid machine reversing injuries. Keep everyone far away from the machine during operation.

SAFETY SIGNS

17. Left Side of Front Frame



SS-4EK-040_E



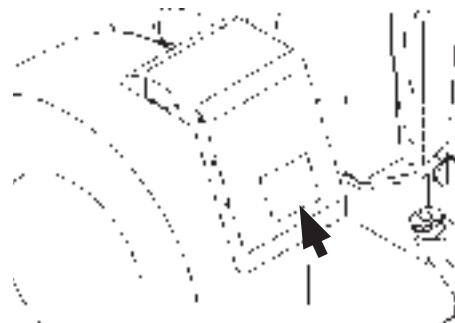
SS-4FGE-010

- The articulation area becomes a pinch point when steering the machine. Be sure to install the articulate lock bar during the inspection/maintenance work and transportation of the machine. Remove link when finished.

18. Both Sides of Front Fender



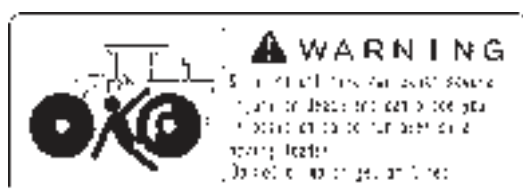
SS-4EK-041_E



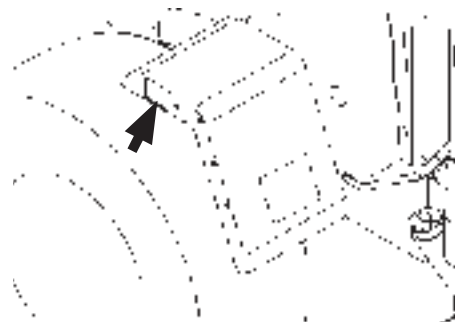
SS-4FGE-011

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

19. Both Sides of Front Fender



SS-4EK-042_E

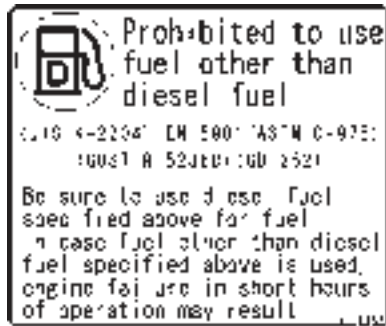


SS-4FGE-011

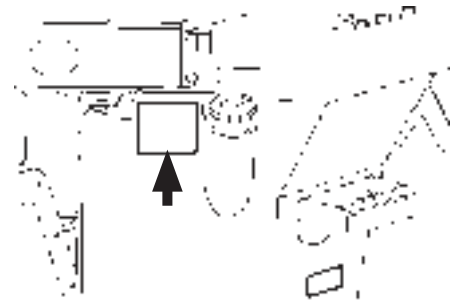
- Sign indicates a hazard of rotating parts, such as belt. Turn off before inspection and maintenance.

SAFETY SIGNS

20. Vicinity of Fuel Tank Cap



SS-4FGE-012



SS-4FGE-005

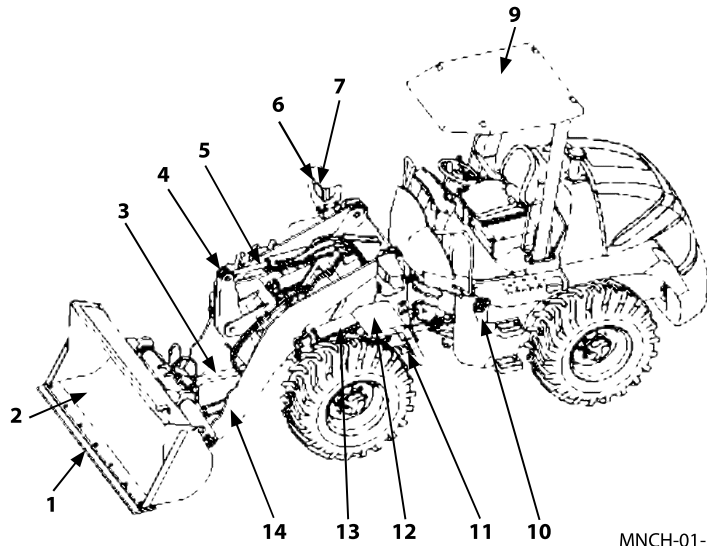
[illegible]

COMPONENTS NAME

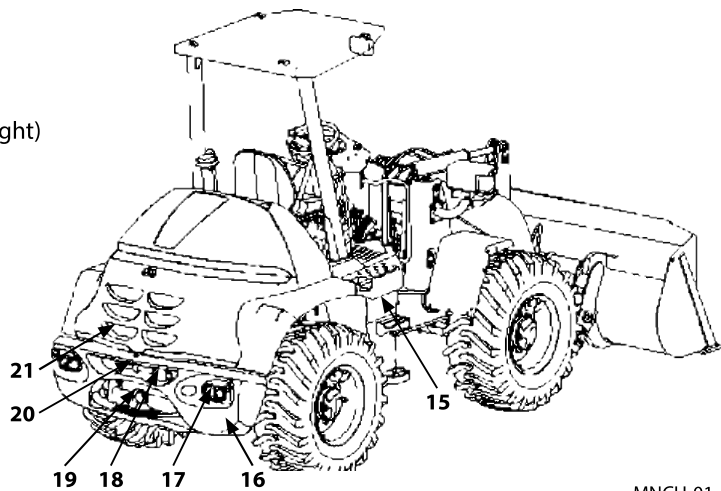
Name of Components

Canopy-Equipped Machine

- 1- Bolt-On Cutting Edge (BOC)
- 2- Bucket
- 3- Bucket Link
- 4- Bell Crank
- 5- Bucket Cylinder
- 6- Front Combination Lamp
(Turn Signal/Clearance Light/Hazard Lamp)
- 7- Headlight
- 8- Outside Rearview Mirror
- 9- Canopy
- 10- Fuel Filler Port
- 11- Articulation Lock Bar
- 12- Front Fender
- 13- Lift Arm Cylinder
- 14- Lift Arm Cylinder
- 15- Hydraulic Oil Tank
- 16- Counterweight
- 17- Rear Combination Lamp
(Turn Signal/Hazard Lamp/Taillight/Brake Light)
- 18- Backup Light
- 19- Backup Alarm
- 20- Towing Pin
- 21- Radiator, Oil Cooler



MNCH-01-543

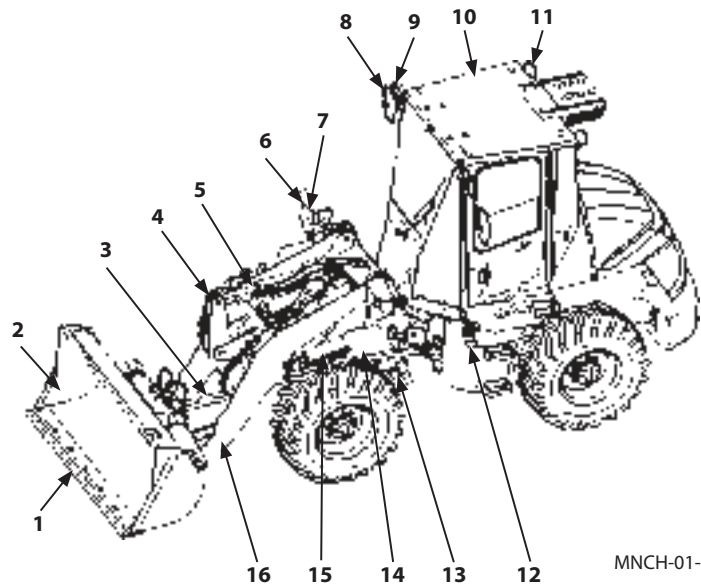


MNCH-01-544

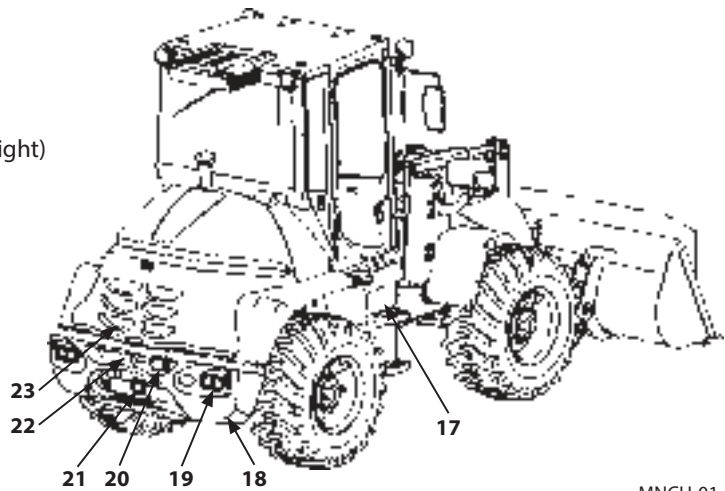
COMPONENTS NAME

Cab

- 1- Bolt-On Cutting Edge (BOC)
- 2- Bucket
- 3- Bucket Link
- 4- Bell Crank
- 5- Bucket Cylinder
- 6- Front Combination Lamp
(Turn Signal/Clearance Light/Hazard Lamp)
- 7- Headlight
- 8- Outside Rearview Mirror
- 9- Front Work Light
- 10- Cab
- 11- Rear Work Light
- 12- Fuel Filler Port
- 13- Articulation Lock Bar
- 14- Front Fender
- 15- Lift Arm Cylinder
- 16- Lift Arm Cylinder
- 17- Hydraulic Oil Tank
- 18- Counterweight
- 19- Rear Combination Lamp
(Turn Signal/Hazard Lamp/Taillight/Brake Light)
- 20- Backup Light
- 21- Backup Alarm
- 22- Towing Pin
- 23- Radiator, Oil Cooler



MNCH-01-545



MNCH-01-546

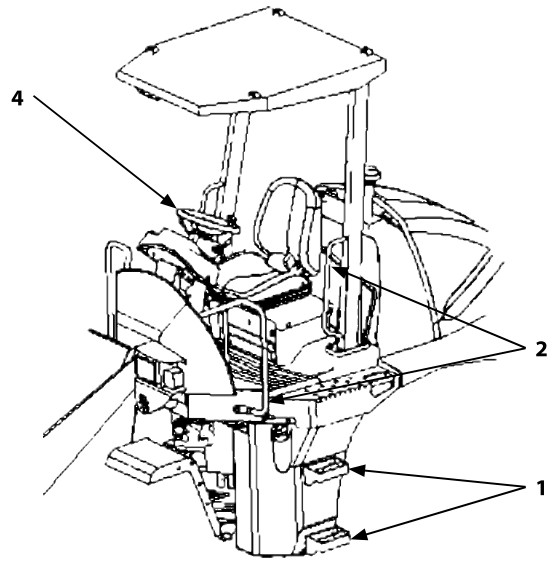
GETTING ON/OFF THE MACHINE

Getting ON and OFF the Machine

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

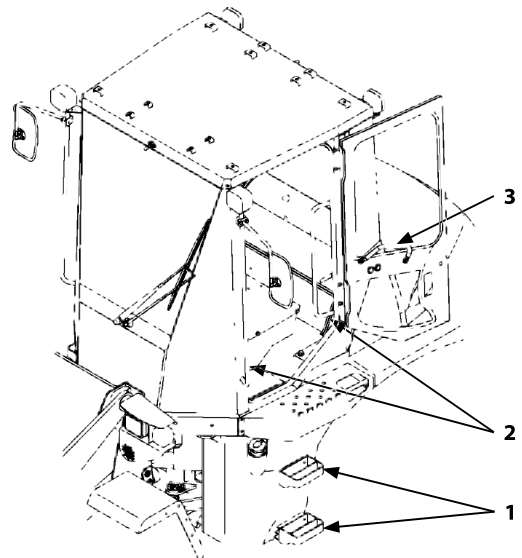
WARNING:

- When lifting the cab/main body or transporting the machine, never attach wire to footholds (1) or handrails (2).
- Door handle (3) is not a handrail. Do not use as a handrail when getting on and off the machine.
- Do not hold onto control levers, the steering wheel (4) or the F-N-R lever when getting on and off the machine.



MNCH-01-547

Canopy-Equipped Machine

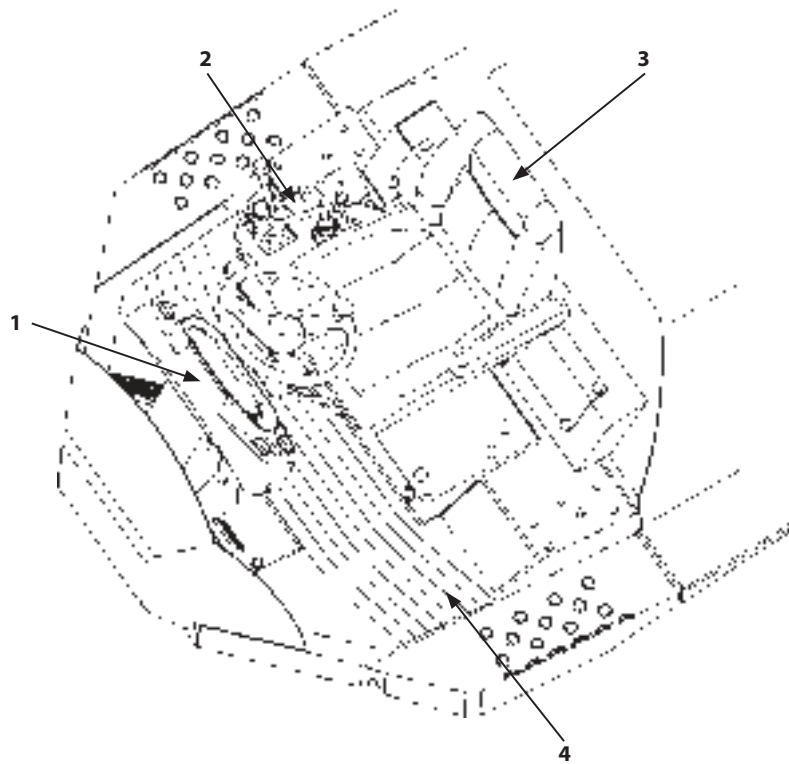


MNCH-01-506

Cab

OPERATOR'S STATION

Overall View of Operator's Cab



M4FG-01-005

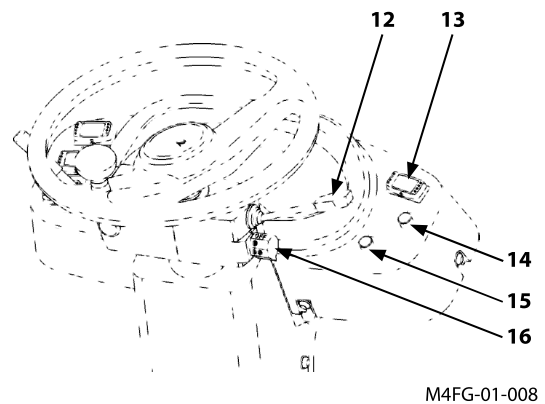
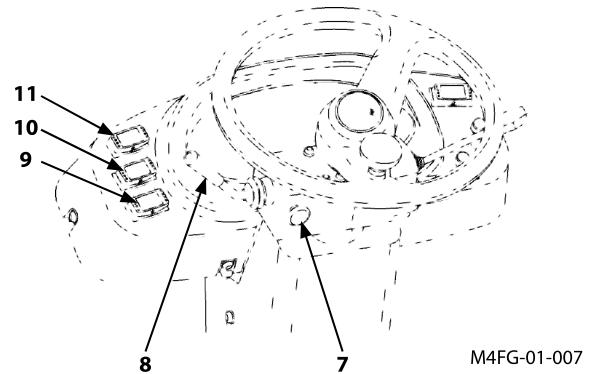
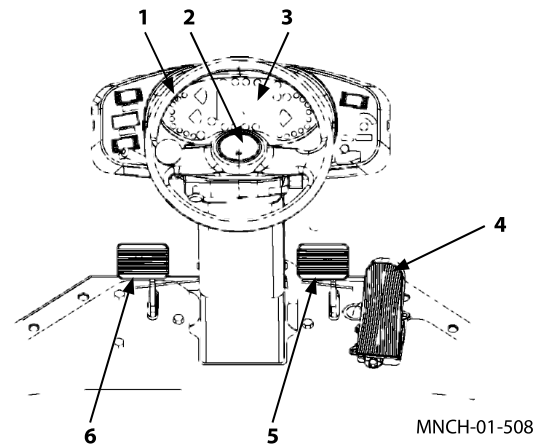
- 1- Front Console
- 2- Right Console
- 3- Operator's Seat
- 4- Floor Mat

OPERATOR'S STATION

Front Console

- 1- Steering Wheel
- 2- Horn
- 3- Monitor Panel
- 4- Accelerator Pedal
- 5- Brake, Inching Pedal (L/R Interlocked)
- 6- Brake, Inching Pedal (L/R Interlocked)
- 7- Neutral Lever Lock (for F-N-R lever)
- 8- F-N-R lever
- 9- Hi-Lo Selector Switch
- 10- Work Light Switch (Cab-Equipped Machine)
- 11- Hazard Lamp Switch
- 12- Turn Signal Lever
- 13- Parking Brake Switch
- 14- Front Wiper Switch (Cab-Equipped Machine)
- 15- Rear Wiper Switch (Cab-Equipped Machine)
- 16- Light Switch

 **NOTE:** A cab is optional equipment.

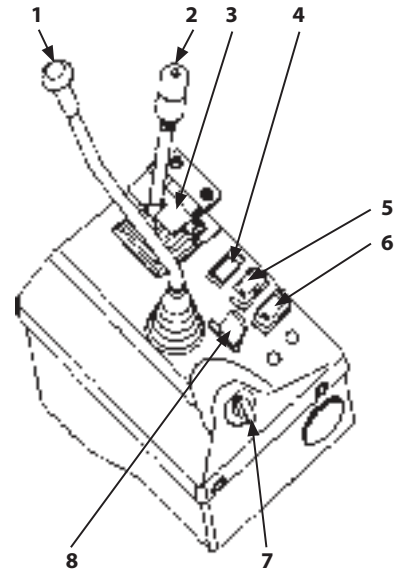


OPERATOR'S STATION

Right Console

Mono-Lever Type

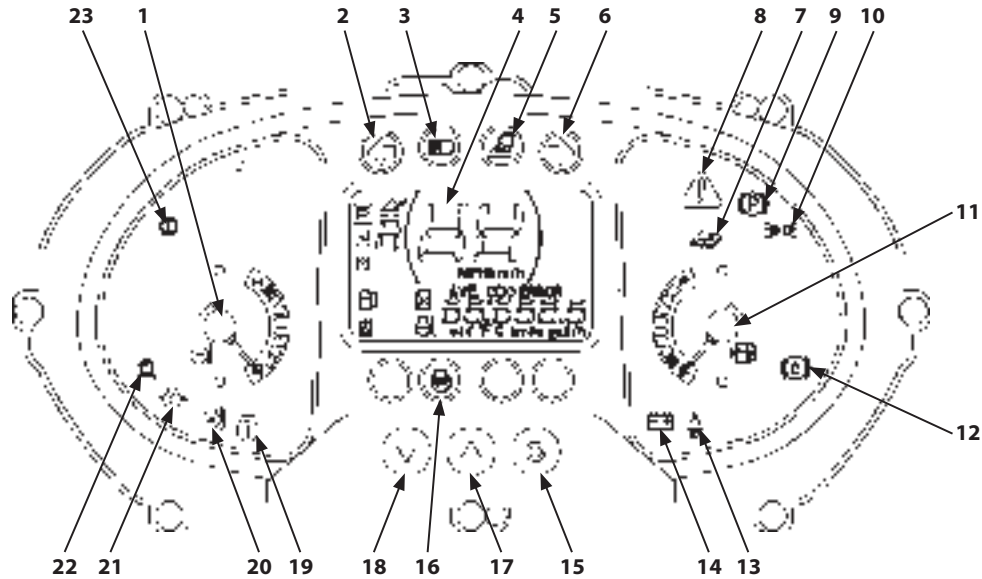
- 1- Loader Control Lever
- 2- Attachment Control Lever
- 3- Control Lever Lock (for Attachment)
- 4- Spare (Optional)
- 5- Ride Control Switch (Optional)
- 6- Throttle Limit Switch
- 7- Key Switch
- 8- Control Lever Lock (for Front Control Lever)



MNCH-01-548

OPERATOR'S STATION

Monitor Panel



MNCH-01-531

- | | |
|------------------------------------|--------------------------------------|
| 1- Coolant Temperature Gauge | 12- Brake Level Low Indicator |
| 2- Left Turn Signal Indicator | 13- (Not Being Used) |
| 3- High Beam Indicator | 14- Discharge Indicator |
| 4- Monitor Display | 15- Monitor Display Selector |
| 5- Work Light Indicator (Optional) | 16- Preheat Indicator |
| 6- Right Turn Signal Indicator | 17- Monitor Display Selector (Up) |
| 7- Maintenance Light | 18- Monitor Display Selector (Down) |
| 8- Service Indicator | 19- Engine Error Alarm |
| 9- Parking Brake Indicator | 20- Overheat Indicator |
| 10- Clearance Light Indicator | 21- Engine Oil Pressure Indicator |
| 11- Fuel Gauge | 22- Air Filter Restriction Indicator |
| | 23- HST Error Indicator |

OPERATOR'S STATION

Service Indicator (Yellow)

⚠ WARNING: To prevent potential injury and/or damage to the machine, immediately stop operating the machine if the STOP indicator lights or the alarm sounds. Then check and service the part indicated.



M4GB-01-011

The STOP indicator comes on and the buzzer sounds in the following cases. Stop working immediately and move to a safe location. Stop the machine and the engine. Consult your authorized dealer.

- If the engine oil pressure drops
- If the temperature of the engine coolant increases abnormally
- If the level of the brake fluid drops

The service indicator comes on in the following cases. Stop the engine as soon as possible and troubleshoot the cause.

- If there is a problem with the engine
- If there is a problem with the HST
- If the emergency steering system is actuated
- If the air cleaner is clogged
- If water in the fuel pre-filter exceeds the specified amount

✎ NOTE: When the key switch is turned ON, the various indicators and the service indicator  light up and the buzzer sounds for about 2 seconds, as a check for whether any lamp(s) or the buzzer is burnt out. If a lamp fails to light, it may be burnt out. If the buzzer fails to sound, the buzzer may be malfunctioning. Consult your authorized dealer.

OPERATOR'S STATION

Parking Brake Indicator (Red)

The parking brake indicator lights when the parking brake is ON.
When the parking brake is ON, if the F-N-R lever is put in Forward (F) or Reverse (R), the buzzer sounds. Return the F-N-R lever to Neutral (N) and turn the parking brake OFF.



M4GB-01-012

Brake Level Low Indicator

⚠ WARNING: Personal injury may result from continuing to operate the machine when the brake fluid level is low. If the red light comes ON, immediately stop the machine.

If the brake fluid level drops, the brake level low indicator lights, the STOP indicator lights and the buzzer sounds. Stop the machine right away and check for leaks in the brake system.



M4GB-01-014

HST Error Indicator (Red)

The indicator lights if a major problem with the HST or HST-related parts occurs. If the HST error indicator and/or the service indicator lights, move to a safe place right away, put it in its parking configuration and stop the engine. Then, consult your authorized dealer.



M4GB-01-024

OPERATOR'S STATION

Discharge Indicator (Red)

If the voltage from the alternator is low, the discharge indicator comes ON. If the voltage from the alternator is abnormally high, the discharge indicator and the service indicator turn on. Check the alternator and the battery systems.



M4GB-01-018

Engine Error Alarm (Red)

Lit:

The indicator lights if a major problem with the engine or engine-related parts occurs.

If the engine error indicator and/or the service indicator lights, move to a safe place right away, put it in its parking configuration and stop the engine. Then, consult your authorized dealer.



M4GB-01-019

Flashing:

The indicator flashes if the level in the expansion tank drops. If the engine error alarm is flashing, the overheat alarm and service indicators are lit, and the buzzer sounds, the coolant level inside the expansion tank may be low. Check the level of the coolant.

Overheat Indicator (Red)

The indicator lights if the engine coolant temperature rises abnormally high, or if the amount of coolant in the expansion tank drops. The overheat indicator and service indicator come on and the buzzer alarm sounds. Stop operations and run the engine at slow idle speed to lower the coolant temperature.



M4GB-01-020

OPERATOR'S STATION

Engine Oil Pressure Indicator (Red)

⚠ WARNING: If the engine is run with its engine oil pressure low, it may damage the engine. If the indicator comes ON, immediately stop working and stop the engine.

If the engine oil pressure drops, the engine oil pressure indicator and service indicator come ON and the buzzer sounds.

Move to a safe place right away, put the machine in its parking configuration and stop the engine. Then check the engine oil system and oil level.

✎ NOTE: The oil being cold or operating on a very steep slope may also cause the indicator to light.



M4GB-01-021

Air Filter Restriction Indicator (Red)

If the air cleaner element is restricted, both the air filter restriction indicator and the service indicator come ON. Stop the machine and the engine right away; then check the air cleaner element. Clean or replace the element as needed.



M4GB-01-023

Preheat Indicator (Yellow)

When lit, it indicates that the engine is preheating; once it goes out, preheating is complete.

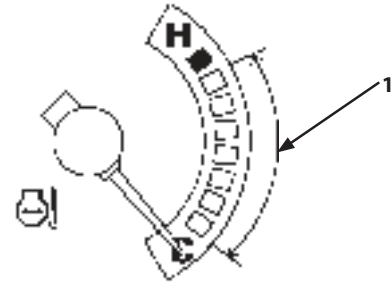


M4GB-01-031

OPERATOR'S STATION

Coolant Temperature Gauge

The engine coolant temperature is indicated with a needle. Normally the needle is within range (1) during operation. If the engine coolant temperature gets abnormally hot, the service indicator comes on and the buzzer alarm sounds. Stop operations and run the engine at slow idle speed to lower the coolant temperature. Then stop and inspect the engine. If the needle does not move at all, the electrical system may be malfunctioning. Contact your authorized dealer.

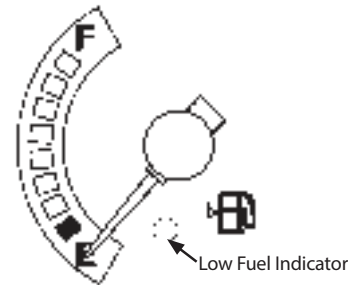


M4GB-01-028

Fuel Gauge

The amount of fuel remaining is indicated by the needle. Refuel before the needle reaches the red range (E). The low fuel indicator lights when the needle reaches the red range (E).

 **NOTE:** The low fuel indicator may light before the needle reaches the red range (E) due to the vehicle being on a slope.



MNEC-01-002

OPERATOR'S STATION

Turn Signal Indicator (Green)

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



M4GB-01-032

High Beam Indicator

When the head lights are put in the high beam position, this indicator comes on.



M4GB-01-033

Work Light Indicator (Yellow)

When the work lights are turned ON, this indicator comes ON.



MNDB-01-052

OPERATOR'S STATION

Clearance Light Indicator

When the clearance lights are turned ON, this indicator comes ON.



M4GB-01-035

Maintenance Light (Yellow)

This light indicates the time for a replacement is approaching. It lights for 30 seconds each time the key switch is turned ON, starting at 20 hours before the set time.



M4GB-01-037

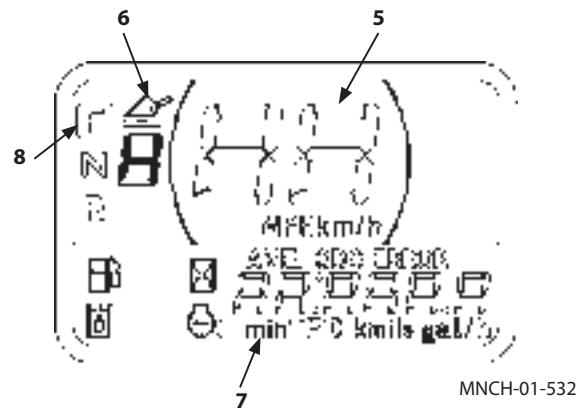
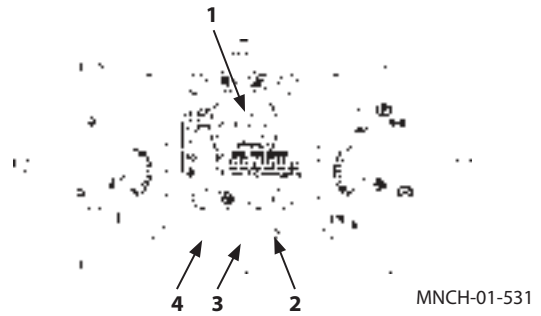
Items with Replacement Times

- Hydraulic Oil
- Hydraulic Filter 1 (Hydraulic Oil Return Filter)
- Hydraulic Filter 3 (HST Charge Filter)
- Engine Oil
- Engine Oil Filter
- Fuel Filter
- Axle Oil

OPERATOR'S STATION

Monitor Display

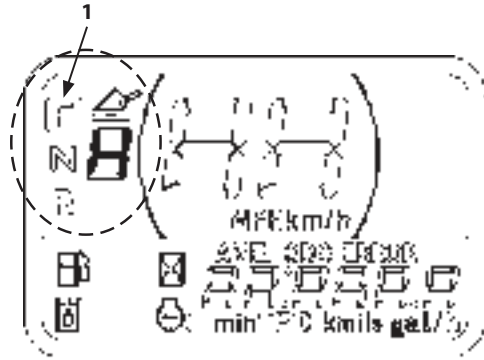
- 1- Monitor Display
- 2- Monitor Display Selector
- 3- Monitor Display Selector (Up)
- 4- Monitor Display Selector (Down)
- 5- Speedometer
- 6- Ride Control Enabled Indicator (Optional)
- 7- Vehicle Information Display
- 8- F-N-R/Shift Position Indicator



OPERATOR'S STATION

F-N-R/Shift Position Indicator

F-N-R/shift position indicator (1) displays the selected travel mode.



MNCH-01-532

F-N-R Indicator

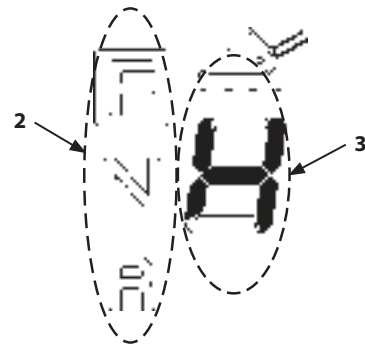
The square corresponding to the position of F-N-R lever (4), either Forward (F), Neutral (N) or Reverse (R), lights in F-N-R indicator (2).

(F-N-R always indicates the position of the F-N-R lever.)

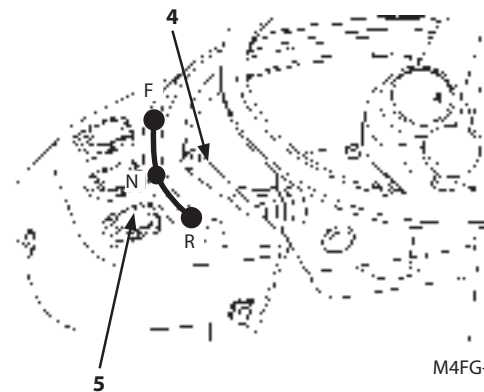
Shift Position Indicator

Shift position indicator (3) displays the speed range selected by Hi-Lo selector switch (5), when F-N-R lever (4) is in either forward or reverse.

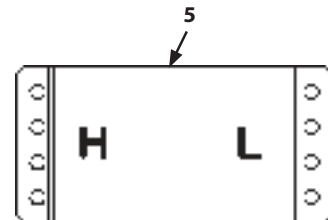
- Hi: Auto shift 2-speed mode
- Lo: 1st speed



MNCH-01-511



M4FG-01-014



MNCH-01-527

OPERATOR'S STATION

Speedometer

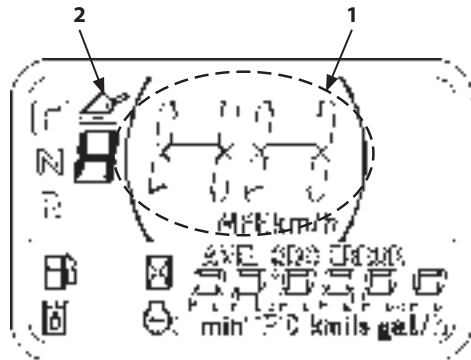
Speedometer (1) indicates the current vehicle travel speed.



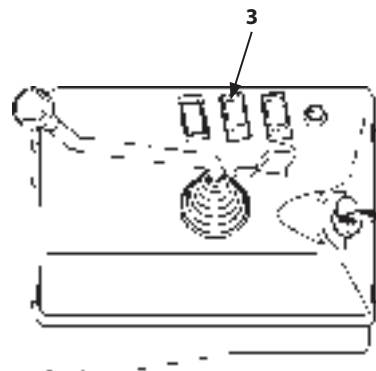
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Ride Control Enabled Indicator (Optional)

Ride control enabled indicator (2) is displayed when ride control switch (3) is ON.



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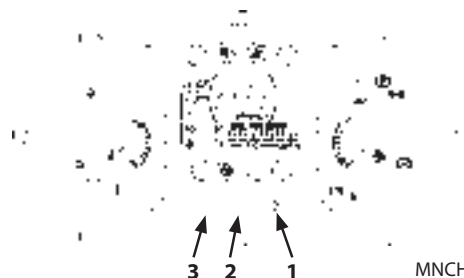


MNCH-01-533

OPERATOR'S STATION

Machine Information Display

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



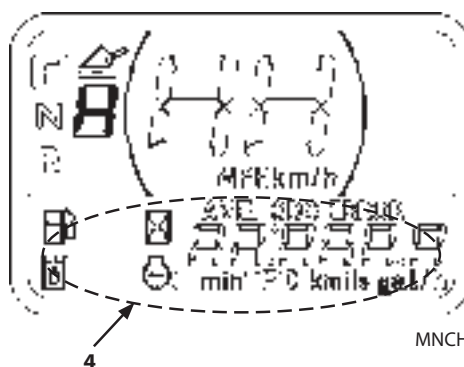
MNCH-01-531

The engine start-ready screen (5) is displayed on the machine information display when the key switch is turned ON.

Symbols disappear from the left of display (6) every 0.5 seconds.

Then hour meter (7) is displayed for 5 seconds. Each time monitor display selector (2) is pressed, the monitor toggles through the content of the machine information display, starting from hour meter (7).

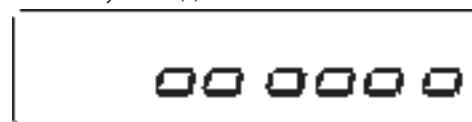
Also, when switch (3) is pressed while on the INFO display, it toggles through the INFO screens.



MNCH-01-532

- Hour Meter
- Odometer
- INFO (↓ Display Selector Switch (3))
 - Hydraulic Oil Hour Meter
 - Hydraulic Oil Filter Hour Meter 1
 - Hydraulic Oil Filter Hour Meter 3
 - Engine Oil Hour Meter
 - Engine Oil Filter Hour Meter
 - Fuel Filter Hour Meter
 - Axle Oil Hour Meter

Engine Start-Ready Screen (5)



Engine Start-Ready Screen (6)



Hour Meter (7)

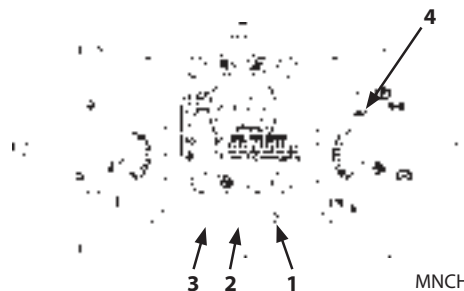


MNCH-01-512

OPERATOR'S STATION

Toggling through the Vehicle Information Display

Each time monitor display selector (2) is pressed, the monitor toggles through the content of the machine information display, starting from the hour meter.



MNCH-01-531

- Hour Meter

Indicates the number of hours the machine has been operated to the present.

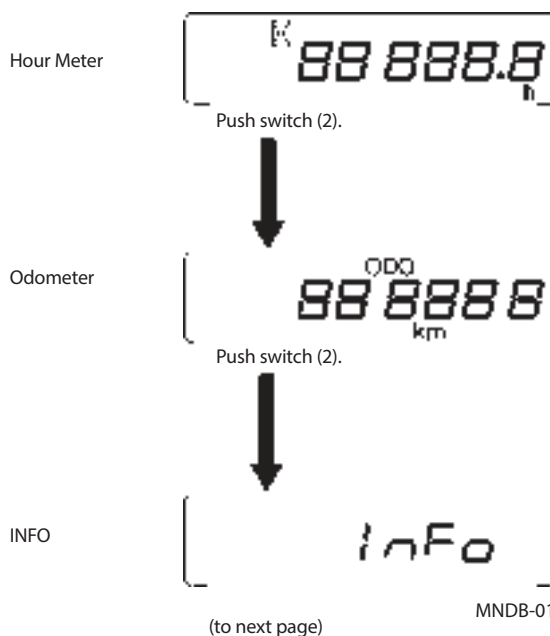
Note that if the hours exceed 99999.9, it resets and starts counting again from 0. The hour meter is locked after the 3rd time it reaches 99999.9.

When on this screen, press monitor display selector (2) once to switch to the odometer.

- Odometer

Indicates the distance traveled to the present.

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



MNDB-01-039

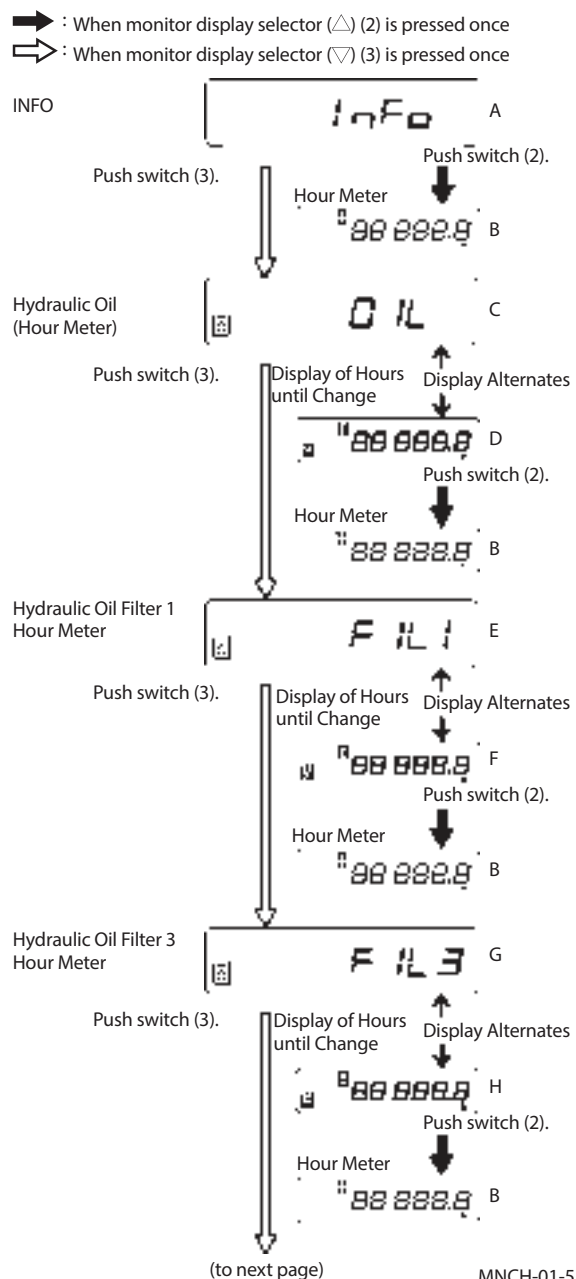
IMPORTANT: When each oil and filter is replaced, reset its hour meter by pressing monitor display selector (1) for 2 seconds or so. Please note that if monitor display selector (1) is pressed while a replacement time is displayed, the replacement time ceases to be displayed correctly.

When on this screen, if monitor display selector (2) is pressed once, it returns to the hour meter. If monitor display selector (3) is pressed, it switches to the hydraulic oil hour meter.

When on this screen, if monitor display selector (2) is pressed, it returns to the hour meter. If monitor display selector (3) is pressed, it switches to the hydraulic oil filter hour meter 1. Refer to section 1-23 for how to change the replacement interval timing.

When on this screen, if monitor display selector (2) is pressed, it returns to the hour meter. If monitor display selector (3) is pressed, it switches to the hydraulic oil filter hour meter 2. Refer to section 1-24 for how to change the replacement interval timing.

When on this screen, if monitor display selector (2) is pressed once, it returns to the hour meter. If monitor display selector (3) is pressed, it switches to the transmission oil hour meter. Refer to section 1-25 for how to change the replacement interval timing.

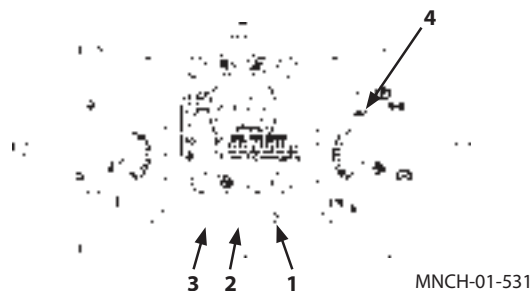


OPERATOR'S STATION

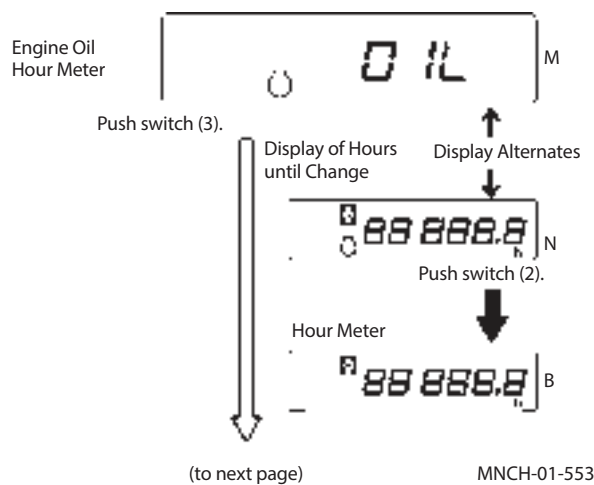
- Engine Oil Hour Meter

This display alternates with the hours to engine oil change. When the hour meter passes through 0 hours, maintenance lamp (4) lights.

When on this screen, if monitor display selector (2) is pressed once, it returns to the hour meter. If monitor display selector (3) is pressed, it switches to the engine oil filter hour meter. Refer to section 1-26 for how to change the replacement interval timing.



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MNCH-01-553

OPERATOR'S STATION

- Engine Oil Filter Hour Meter

This display alternates with the hours to engine oil filter change.

When the hour meter passes through 0 hours, maintenance lamp (4) lights.

When on this screen, if monitor display selector (2) is pressed, it returns to the hour meter. If monitor display selector (3) is pressed, it switches to the fuel filter hour meter.

Refer to section 1-27 for how to change the replacement interval timing.

- Fuel Filter Hour Meter

This display alternates with the hours to fuel filter change.

When the hour meter passes through 0 hours, maintenance lamp (4) lights.

When on this screen, if monitor display selector (2) is pressed once, it returns to the hour meter. If monitor display selector (3) is pressed, it switches to the axle oil hour meter.

Refer to section 1-28 for how to change the replacement interval timing.

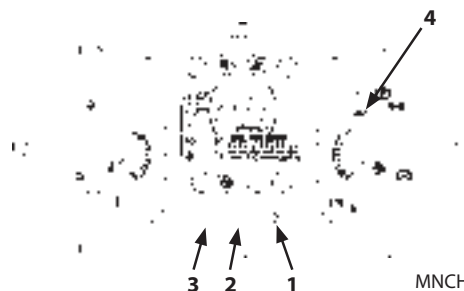
- Axle Oil Hour Meter

This display alternates with the hours to axle oil change.

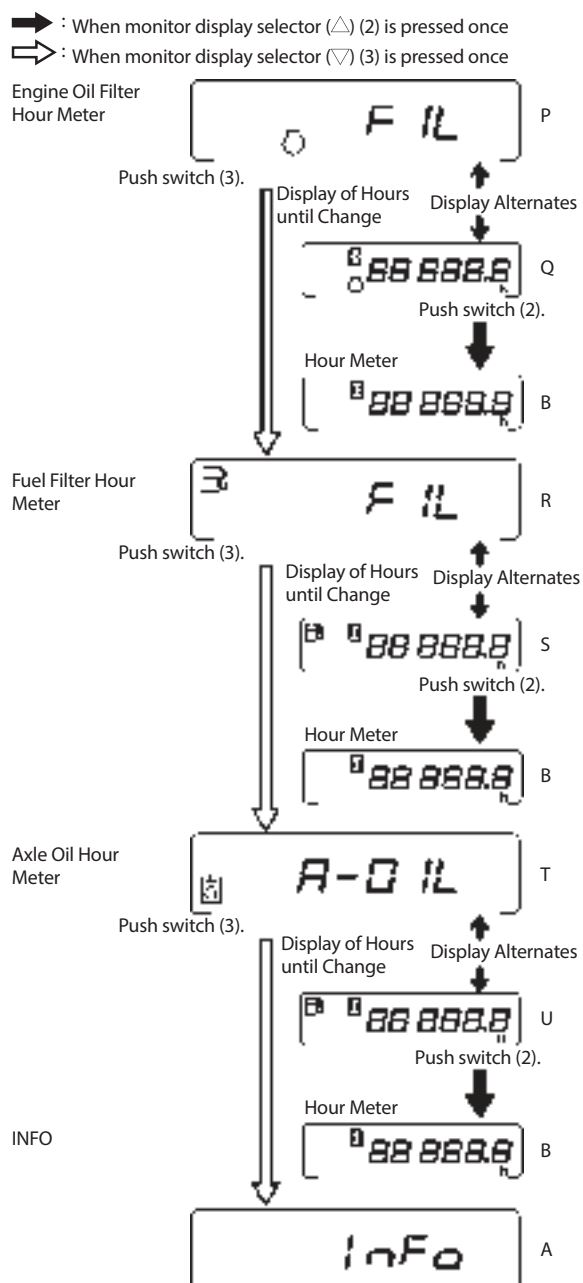
When the hour meter passes through 0 hours, maintenance lamp (4) lights.

When on this screen, if monitor display selector (2) is pressed, it returns to the hour meter. If monitor display selector (3) is pressed, it switches to the INFO screen.

Refer to section 1-29 for how to change the replacement interval timing.



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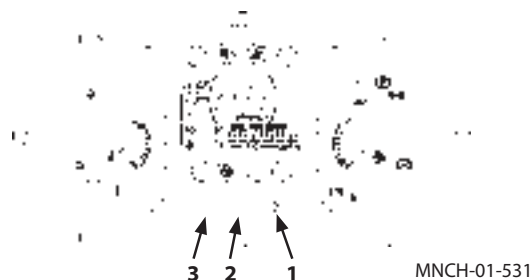


MNCH-01-554

OPERATOR'S STATION

Method of Changing Replacement Interval for Oils and Filters

The displayed interval for changing oil and filters can be changed.



MNCH-01-531

Changing the Hydraulic Oil Hour Meter

The replacement interval can be changed to 1000.0, 500.0 or 250.0 hours.

When shipped the interval is set to 1000.0 hours.

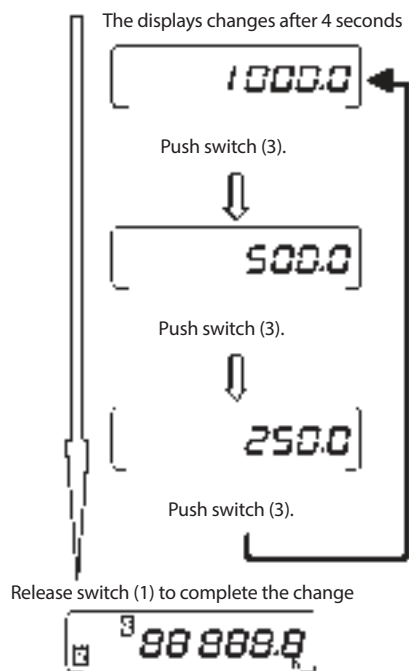
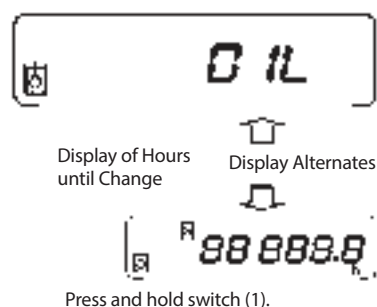
Press and hold switch (1) while the replacement interval is displayed.

 **NOTE:** Once switch (1) is released, it sets the change in hours, so do not release it until the desired replacement interval is displayed.

The display changes after 4 seconds.

Push switch (3) while still pressing down switch (1).

By pressing switch (3), the display switches between 1000.0 → 500.0 → 250.0 hours. When the desired replacement interval is displayed, release switch (1) to complete the change in hours.



MNCH-01-001

OPERATOR'S STATION

Changing Hydraulic Oil Filter Hour Meter 1

The replacement interval can be changed to 1000.0 or 500.0 hours.

When shipped the interval is set to 1000.0 hours.

Press and hold switch (1) while the replacement interval is displayed.

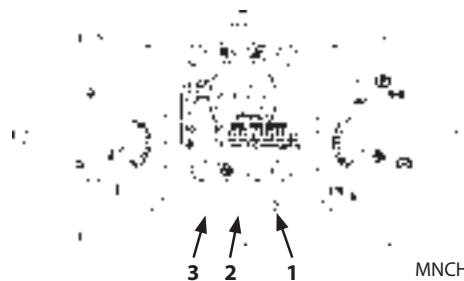
 **NOTE:** Once switch (1) is released, it sets the change in hours, so do not release it until the desired replacement interval is displayed.

The display changes after 4 seconds.

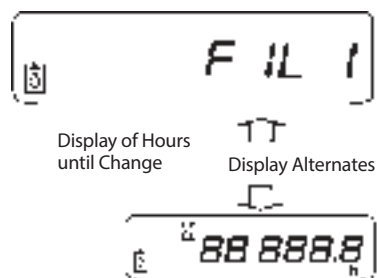
Push switch (3) while still pressing down switch (1).

By pressing switch (3), the display switches between 1000.0 → 500.0 hours.

When the desired replacement interval is displayed, release switch (1) to complete the change in hours.

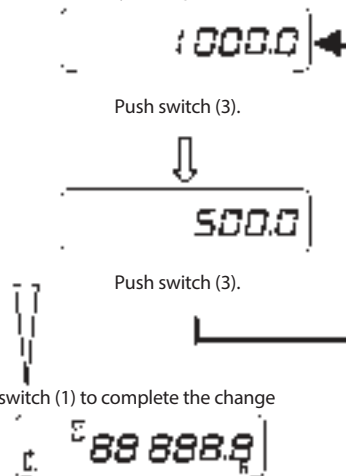


MNCH-01-531



Press and hold switch (1).

The display changes after 4 seconds



MNDB-01-044

OPERATOR'S STATION

Changing Hydraulic Oil Filter Hour Meter 3

The replacement interval can be changed to 1000.0, 500.0 or 250.0 hours. When shipped the interval is set to 1000.0 hours.

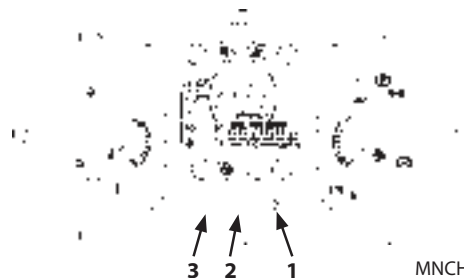
Press and hold switch (1) while the replacement interval is displayed.

 **NOTE:** Once switch (1) is released, it sets the change in hours, so do not release it until the desired replacement interval is displayed.

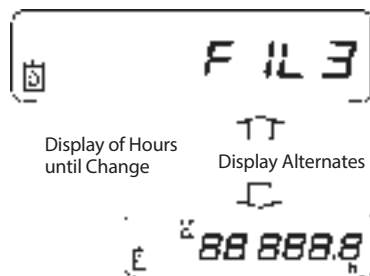
The display changes after 4 seconds.

Push switch (3) while still pressing down switch (1).

By pressing switch (3), the display switches between 1000.0 → 500.0 → 250.0 hours. When the desired replacement interval is displayed, release switch (1) to complete the change in hours.

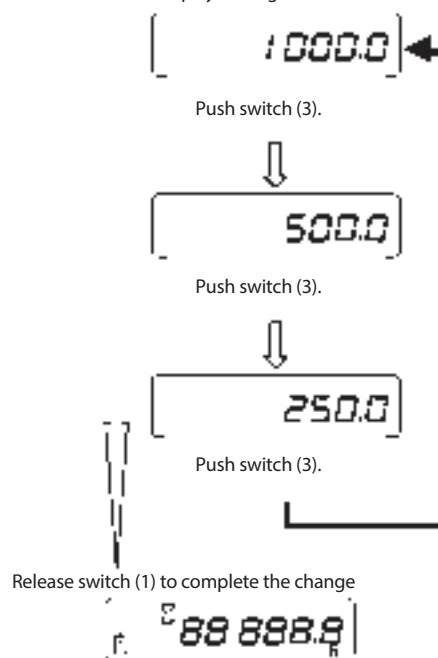


MNCH-01-531



Press and hold switch (1).

The display changes after 4 seconds



MNCH-01-515

OPERATOR'S STATION

Changing Engine Oil Hour Meter

The replacement interval can be changed to 500.0, 250.0 or 200.0 hours. When shipped the interval is set to 500.0 hours.

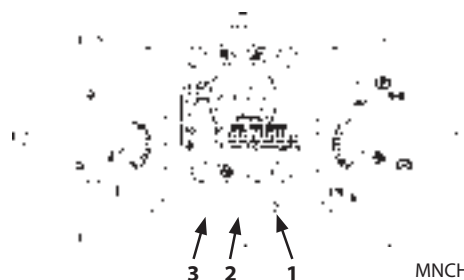
Press and hold switch (1) while the replacement interval is displayed.

 **NOTE:** Once switch (1) is released, it sets the change in hours, so do not release it until the desired replacement interval is displayed.

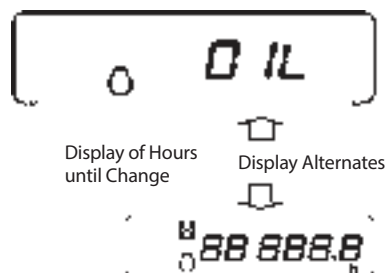
The display changes after 4 seconds.

Push switch (3) while still pressing down switch (1).

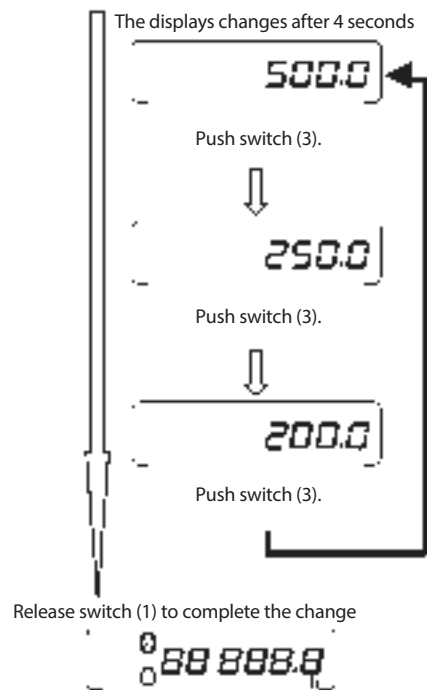
By pressing switch (3), the display switches between 500.0 → 250.0 → 200.0 hours. When the desired replacement interval is displayed, release switch (1) to complete the change in hours.



MNCH-01-531



Press and hold switch (1).



Release switch (1) to complete the change

MNDB-01-048

OPERATOR'S STATION

Changing Engine Oil Filter Hour Meter

The replacement interval can be changed to 500.0, 250.0 or 200.0 hours. When shipped the interval is set to 500.0 hours.

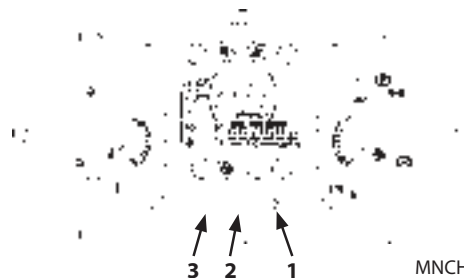
Press and hold switch (1) while the replacement interval is displayed.

 **NOTE:** Once switch (1) is released, it sets the change in hours, so do not release it until the desired replacement interval is displayed.

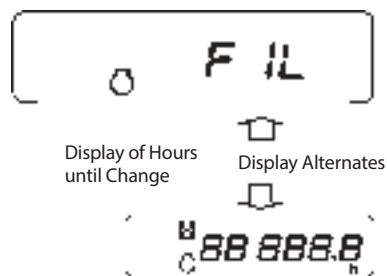
The display changes after 4 seconds.

Push switch (3) while still pressing down switch (1).

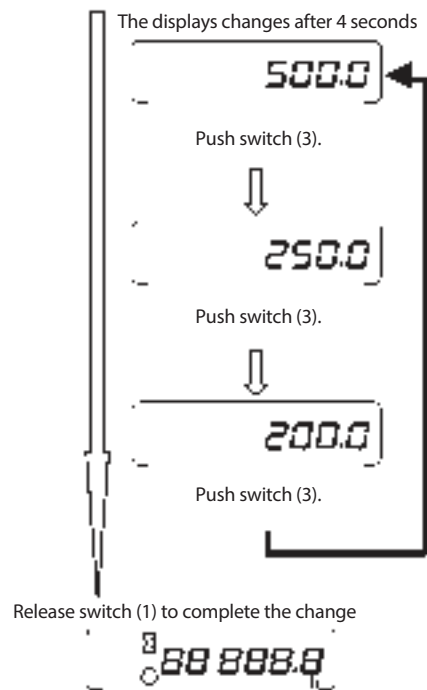
By pressing switch (3), the display switches between 500.0 → 250.0 → 200.0 hours. When the desired replacement interval is displayed, release switch (1) to complete the change in hours.



MNCH-01-531



Press and hold switch (1).



MNDB-01-049

OPERATOR'S STATION

Changing Fuel Filter Hour Meter

The replacement interval can be changed to 1000.0 or 500.0 hours. When shipped the interval is set to 1000.0 hours.

Press and hold switch (1) while the replacement interval is displayed.

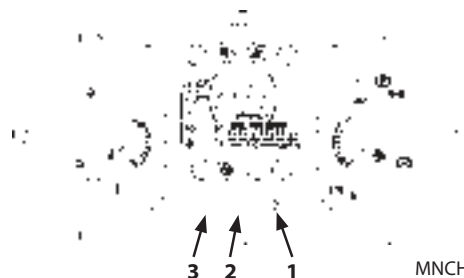
 **NOTE:** Once switch (1) is released, it sets the change in hours, so do not release it until the desired replacement interval is displayed.

The display changes after 4 seconds.

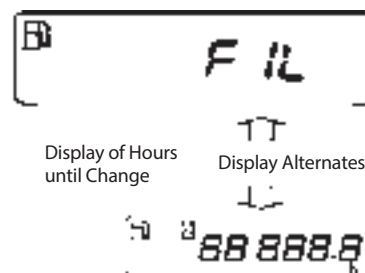
Push switch (3) while still pressing down switch (1).

By pressing switch (3), the display switches between 1000.0 → 500.0 hours.

When the desired replacement interval is displayed, release switch (1) to complete the change in hours.

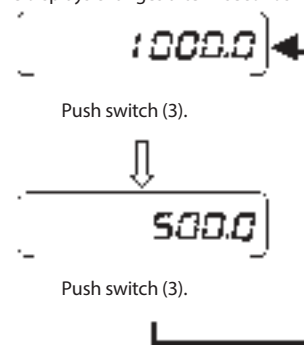


MNCH-01-531

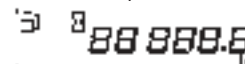


Press and hold switch (1).

**The displays changes after 4 seconds



Release switch (1) to complete the change



MNDF-01-017

OPERATOR'S STATION

Changing Axle Oil Hour Meter

The replacement interval can be changed to 1000.0, 500.0 or 250.0 hours. When shipped the interval is set to 1000.0 hours.

Press and hold switch (1) while the replacement interval is displayed.

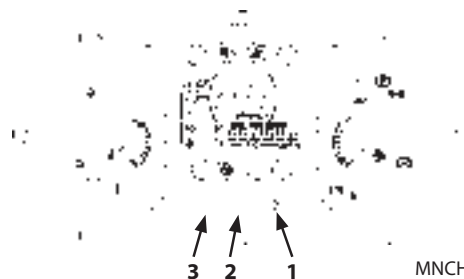
 **NOTE:** Once switch (1) is released, it sets the change in hours, so do not release it until the desired replacement interval is displayed.

The display changes after 4 seconds.

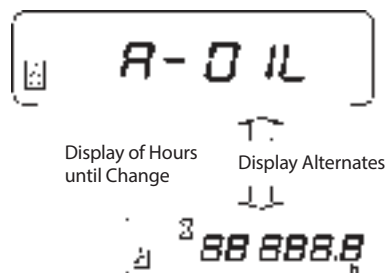
Push switch (3) while still pressing down switch (1).

By pressing switch (3), the display switches between 1000.0 → 500.0 → 250.0 hours.

When the desired replacement interval is displayed, release switch (1) to complete the change in hours.

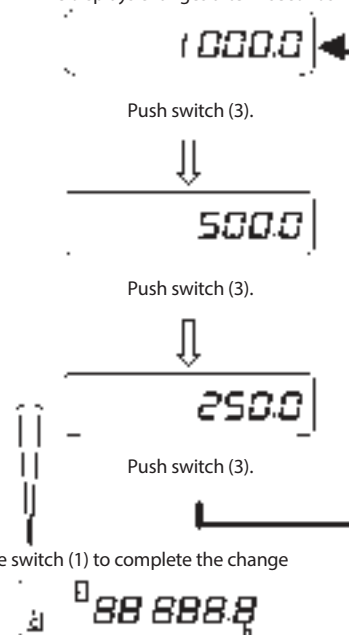


MNCH-01-531



Press and hold switch (1).

The displays changes after 4 seconds



Release switch (1) to complete the change

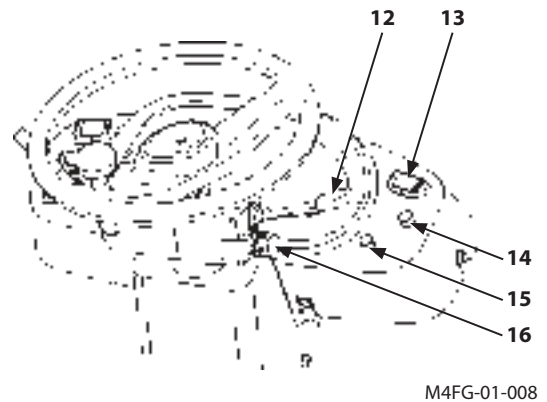
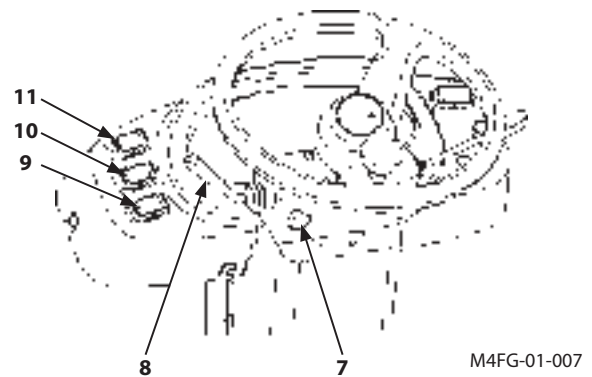
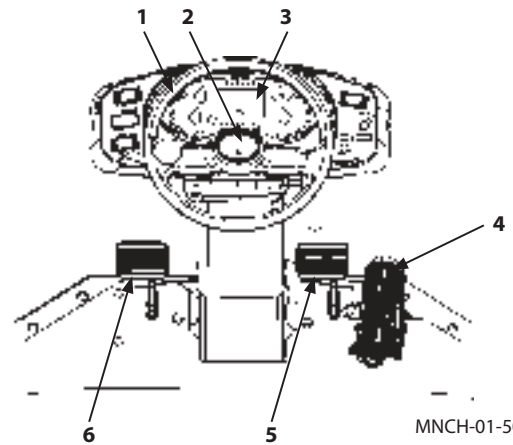
MNCH-01-516

OPERATOR'S STATION

Switches, Steering Wheel and Pedals

- 1- Steering Wheel
- 2- Horn
- 3- Monitor Panel
- 4- Accelerator Pedal
- 5- Brake, Inching Pedal (L/R Interlocked)
- 6- Brake, Inching Pedal (L/R Interlocked)
- 7- Neutral Lever Lock (for F-N-R lever)
- 8- F-N-R lever
- 9- Hi-Lo Selector Switch
- 10- Work Light Switch (Cab-Equipped Machine)
- 11- Hazard Lamp Switch
- 12- Turn Signal Lever
- 13- Parking Brake Switch
- 14- Front Wiper Switch (Cab-Equipped Machine)
- 15- Rear Wiper Switch (Cab-Equipped Machine)
- 16- Light Switch

 **NOTE:** A cab is optional equipment.



OPERATOR'S STATION

F-N-R lever

IMPORTANT: The F-N-R lever is set up so it is easy to operate. Refrain from pushing on it hard or operating it with excessive force. Doing so may damage the machine.

This lever changes the direction of the machine to forward or reverse.

Shift the F-N-R lever (1) to (F) to travel forward.

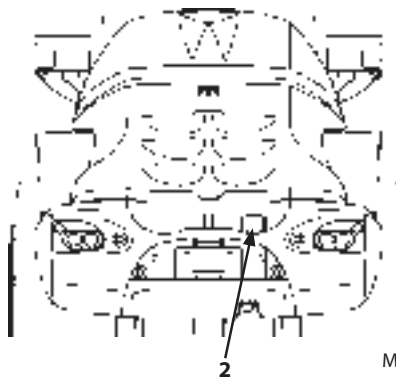
Shift the F-N-R lever (1) to (R) to travel in reverse.

When F-N-R lever (1) is in (R), backup light (2) lights and the backup buzzer sounds.

 **NOTE:** The engine will not start if F-N-R lever (1) is not in neutral (N).



M4FG-01-014



MNCH-01-517

Neutral Lever Lock (for F-N-R lever)

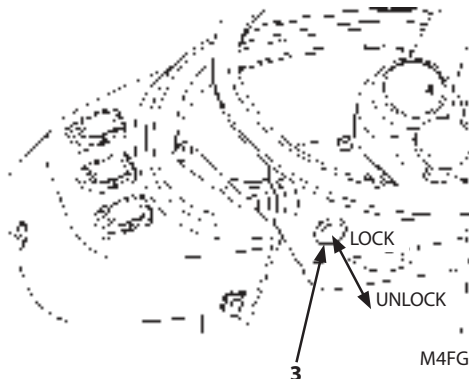
IMPORTANT: Always put the neutral lever lock in the LOCK position when parking the machine or when doing maintenance.

The lock on the F-N-R lever prevents the machine from moving even if the F-N-R lever is accidentally touched, such as by someone's body.

Put the neutral lever lock (3) in the LOCK position when starting the engine.

Pull: UNLOCK

Push: LOCK

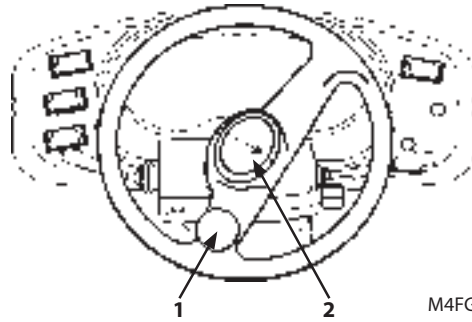


M4FG-01-014

OPERATOR'S STATION

Steering Wheel

IMPORTANT: When steering wheel (1) is turned all the way, the stoppers hit the front and rear frames, so it cannot be turned further. Trying to continue turning past that point will cause the engine to stall and/or damage the steering system.



M4FG-04-002

Horn

Pressing horn (2) makes it sound.

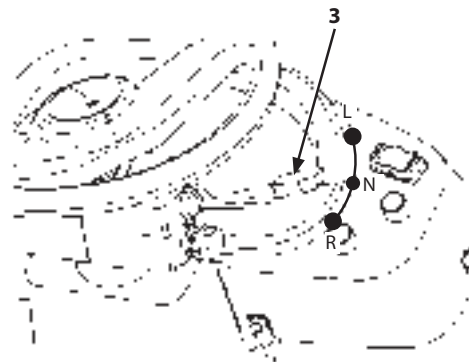
Turn Signal Lever

Operating turn signal lever (3) indicates to others the direction the vehicle will turn.

Return turn signal lever (3) to neutral (N) manually.

L: Left turn

R: Right turn



M4FG-01-020

OPERATOR'S STATION

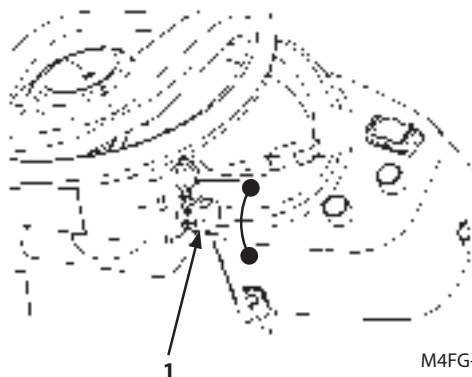
Light Switch

Light switch (1) has 2 levels and the different devices light (☀) or turn off (X) according to the level as follows.

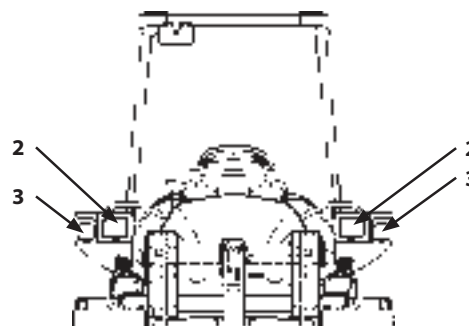
- 2- Headlight
- 3- Turn Signal Light, Hazard Lamp, Clearance Light
- 4- Turn Signal Light, Hazard Lamp
- 5- Brake Light, Tail Light

Light Switch Position	Headlight	Clearance Light	Tail Light	License Plate Light	Monitor Panel Light
OFF	X	X	X	X	X
●	X	☀	☀	☀	☀
●●	☀	☀	☀	☀	☀

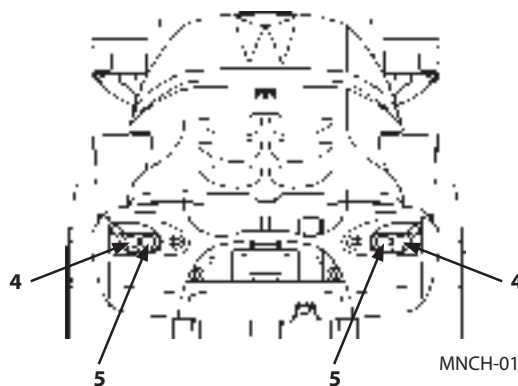
IMPORTANT: If the lights above are used for a long time after the engine is stopped, it will drain the battery.



M4FG-01-020



M4FGE-01-021



MNCH-01-517

Vehicle Inspection Equipped Machines

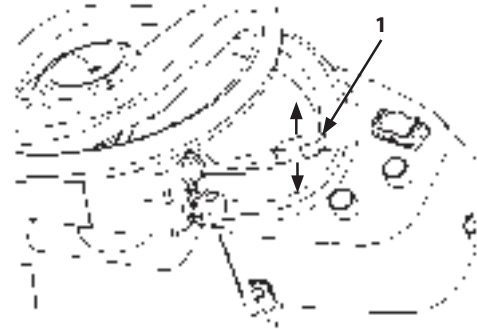
OPERATOR'S STATION

Dimmer Switch

The dimmer switch is for switching between high beam and low beam.

⚠ CAUTION: Drive with the headlights on low beam when following or meeting another vehicle.

When the headlights are ON, lowering turn signal lever (1) shifts the headlight to high beam and the high beam indicator (2) lights. Lifting it switches to low beam and the high beam indicator (2) goes off.



M4FG-01-020



MNCH-01-531

OPERATOR'S STATION

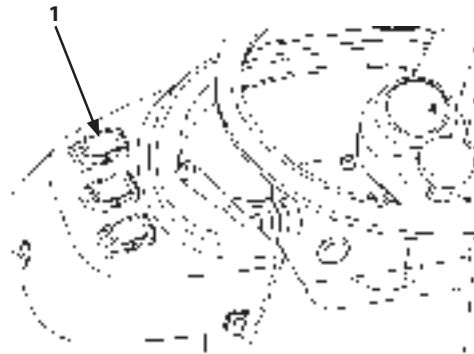
Hazard Lamp Switch

IMPORTANT: If hazard lamp switch (1) is left for a long time in the  position with the engine stopped, it will drain the battery. Take care to avoid this.

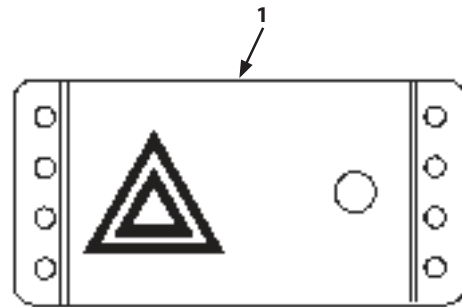
This switch is for indicating to other vehicles that the machine presents a hazard, such as when it has broken down.

Pressing the  side of hazard lamp switch (1) makes the front and rear signal indicators on both sides and hazard lamp (2) flash.

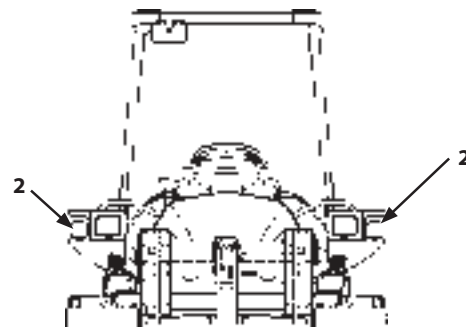
Press the other side to turn it off.



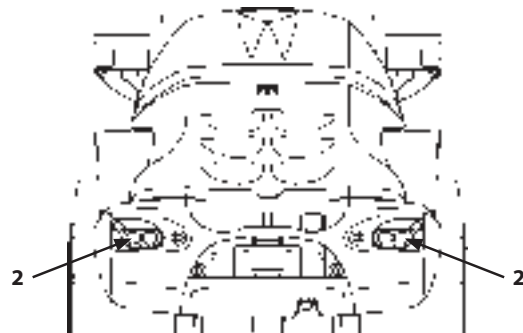
M4FG-01-014



M4GB-01-065



M4FGE-01-021



MNCH-01-517

OPERATOR'S STATION

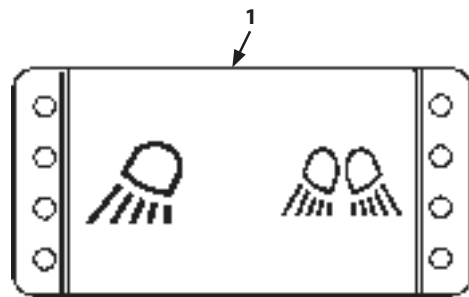
Work Light Switch (Cab-Equipped Machine)

The light switch has two positions, ● and ●●. Pressing switch (1) on the  side turns the front work light (2) ON. The rear work light (3) does not light. Pressing the  side turns the front (2) and rear (3) work lights ON.

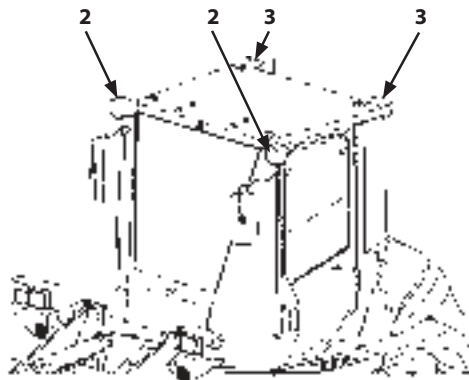
CAUTION: When traveling on a normal road, do not turn the work lights on.



M4FG-01-014



M4GB-01-067



M4FG-01-022

OPERATOR'S STATION

Hi-Lo Selector Switch

Switch (1) is used to select the travel speed. Select the position according to the travel or work situation.

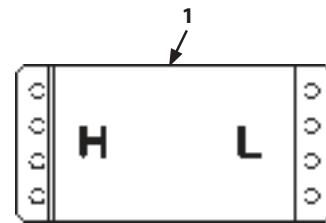
- Lo : 0 to 12 km/h (0 to 7.5 mph)
- Hi : 0 to 34 km/h (0 to 21.1 mph)

 **NOTE:** When the Hi-Lo selector switch (1) is in the Hi position and throttle limit switch (2) is ON, the travel speed is as follows.

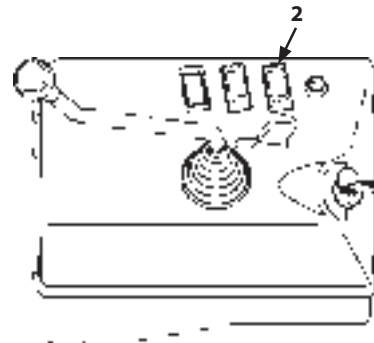
0 to 30 km/h (0 to 18.6 mph)



M4FG-01-014



MNCH-01-527



MNCH-01-533

OPERATOR'S STATION

Parking Brake Switch

WARNING:

- Always apply the parking brake when parking or leaving the machine to prevent an accident from it running away.
- Do not apply the parking brake while the machine is moving, except in emergency.
- Apply the parking brake after the machine stops.
- Applying while moving is dangerous due to the rapid deceleration. Doing so also hastens parking brake wear and may damage it. If the parking brake is used in an emergency while traveling, contact your authorized dealer to inspect the parking brake.

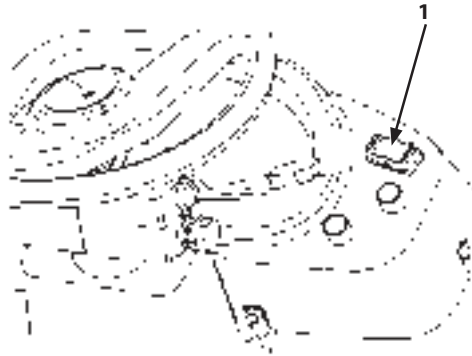
Putting parking brake switch (1) in the ON position actuates the parking brake and lights parking brake indicator (2) and service indicator (3).

To release the brake, press the OFF side of parking brake switch (1). Press twice so it clicks and then make sure parking brake indicator (2) and service indicator (3) have gone out.

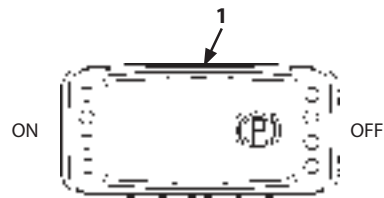
NOTE:

- The parking brake can only be released when the engine is running (via hydraulic pressure).
- To ensure safety, the machine will not travel even if the F-N-R lever is put in F or R when the parking brake is applied.
- To ensure safety, even if parking brake switch (1) is in the OFF position, the parking brake is actuated when the engine stops.

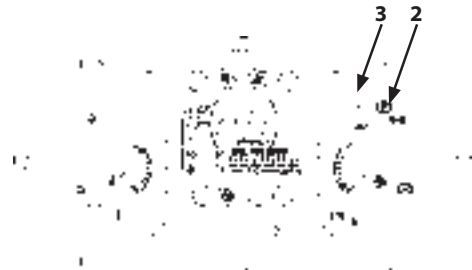
To restart the engine, make sure the F-N-R lever is in neutral (N) and turn parking brake switch (1) ON.



M4FG-01-020



M4EK-01-025A



MNCH-01-531

OPERATOR'S STATION

Wiper Switch

Using the Wipers

IMPORTANT: Note that the surface of the glass and parts of the wiper system, such as the wiper blades, wiper motors and relays may be damaged or malfunction due to the state of the wipers and glass (when dry or frozen).

- Remove any snow or dust that accumulates on the windows prior to operating the wipers; if frozen, use a defroster or the like to remove the ice.
- Use a washer fluid with antifreeze.
- When the glass is dry, spray washer fluid on the window before starting the wiper. Also, when windows are partially dry, (light snow or rain), operating the wipers continuously will damage them. Pay attention to the conditions and either use them intermittently or turn them off when not needed.
- If the vehicle is equipped with an electric defroster embedded in the glass and the switch is left on for a long time, it may scorch the wiper blade.

OPERATOR'S STATION

Front Wiper Switch (Cab-Equipped Machine)

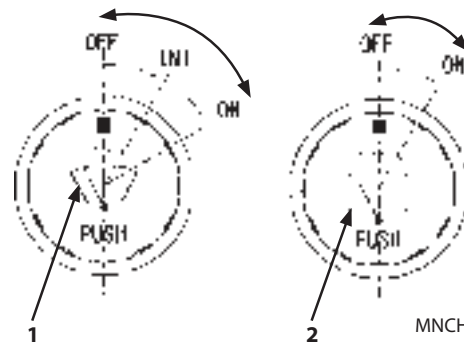
Actuating front wiper switch (1) turns the wiper on the front window ON.

IMPORTANT: The motor in the washer tank may burn out if washer fluid is used continuously for more than 20 seconds, or if operated when washer fluid is not being sprayed. Pay attention to how long and whether fluid is being sprayed.

- OFF : The wiper returns to its position before actuation and stops.
- INT : Operates the wiper intermittently.
- ON : The wiper operates.
- PUSH : As long as switch (1) is pressed, washer fluid is sprayed from the nozzle.



M4FG-01-020



MNCH-01-534

Rear Wiper Switch (Cab-Equipped Machine)

Actuating rear wiper switch (2) turns the wiper on the rear window ON.

IMPORTANT: The motor in the washer tank may burn out if washer fluid is used continuously for more than 20 seconds, or if operated when washer fluid is not being sprayed. Pay attention to how long and whether fluid is being sprayed.

- OFF : The wiper returns to its position before actuation and stops.
- ON : The wiper operates.
- PUSH : As long as switch (2) is pressed, washer fluid is sprayed from the nozzle.

OPERATOR'S STATION

Accelerator Pedal

Depressing accelerator pedal (1) accelerates the engine speed and releasing it lowers engine speed.

Brake, Inching Pedal

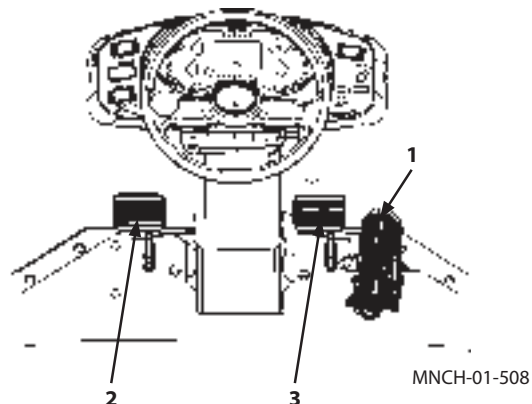
WARNING:

- **Avoid braking suddenly while driving as doing so is dangerous. It may unbalance the machine.**
- **To prevent wear on the brake discs do not rest a foot on the pedal, except when needed.**
- **Do not allow dirt, dust or other debris to accumulate around where the brake pedal is mounted.**
- **If dirt, dust or other debris has accumulated around where the brake pedal is mounted, clean it out before operating the machine. Failure to do so may inhibit use of the brakes.**

The brakes are actuated by depressing brake/inching pedals (2) and/or (3).

When a pedal is depressed, inching (4) is actuated, the HST pump goes to neutral, resulting in HST deceleration (braking); depressing it further engages normal braking (5) and the combination produces a greater braking effect.

When the pedal is fully depressed, the machine brakes (stops) regardless of whether the F-N-R lever is in forward or reverse; engine output is transmitted only to the work equipment. At such time, depressing accelerator pedal (1) and operating the front control lever allows the operator to concentrate on operating the work equipment.

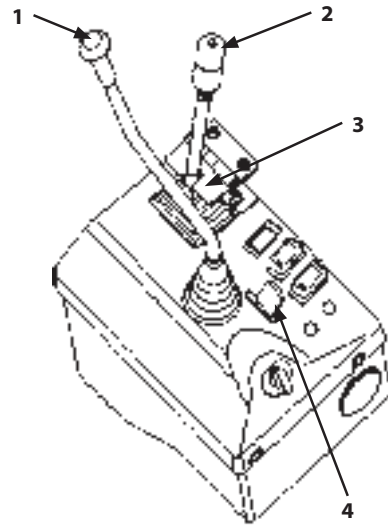


OPERATOR'S STATION

Right Console (Work Equipment-Related)

Mono-Lever Type

- 1- Loader Control Lever
- 2- Attachment Control Lever
- 3- Control Lever Lock (for Attachment)
- 4- Control Lever Lock (for Front Control Lever)



MNCH-01-548

OPERATOR'S STATION

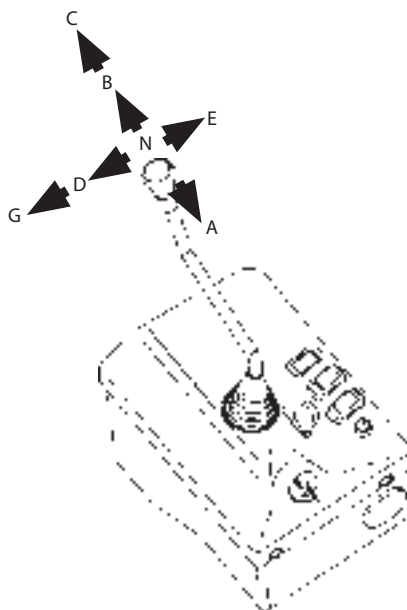
Front Control Lever

Mono-Lever Type

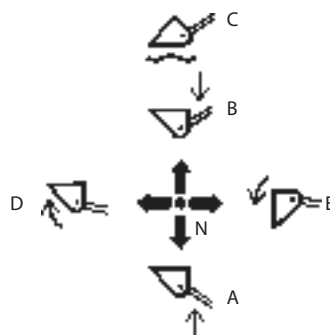
This lever is used to operate the lift arm and bucket.

Lever Position	Bucket Action
C	Float: The lift arm falls freely; once on the ground, the bucket is free to move in response to external forces.
B	Lower Lift Arm
N	Neutral (Hold): The lift arm stops and maintains that position.
A	Raise Lift Arm
G	Detent: The detent holds the lever in position when it is moved from the bucket dump to the tilt position.
D	Tilt Bucket: Tilts the bucket back into the position for transport.
N	Neutral (Hold): The bucket stops and maintains that position.
E	Dump Bucket: Tilts the bucket forward to dump material.

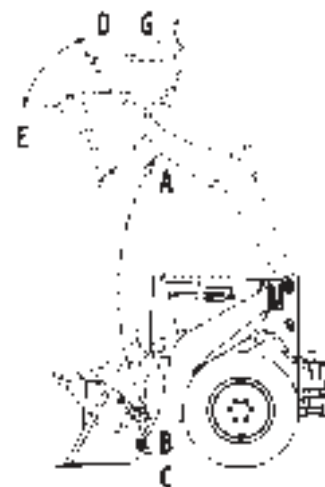
 **NOTE:** After dumping the bucket, if front control lever (1) is shifted past the TILT position (D), the lever is held in position (G). Once the bucket reaches the position set by the auto-leveler function, it automatically returns the lever to the HOLD position (N).



MNCH-01-535



M4GB-01-074



M4EJ-01-031A

OPERATOR'S STATION

Control Lever Locks

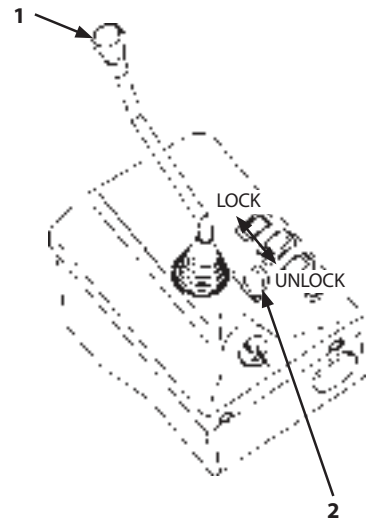
WARNING:

- When locking the lever, put control lever locks (2) and (4) all the way into their LOCK positions. If in an intermediate position, they are not locked, which is dangerous.
- When leaving the machine, stop the engine and put control lever locks (2) and (4) in their LOCK positions.

Put them into their LOCK positions after finishing work and for transport.

For details, refer to section 5-2.

Control lever locks (2) and (4) function to prevent the machine from being mistakenly operated if the operator accidentally touches front control lever (1) or attachment lever (3) when getting on or off the machine. When in the UNLOCK position, front control lever (1) and attachment lever (3) can be operated.



MNCH-01-535

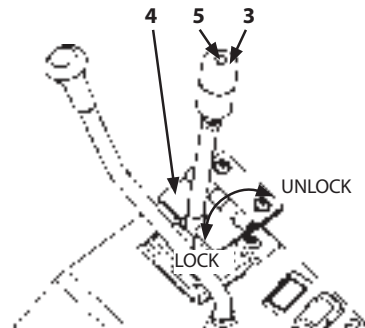
Differential Lock

IMPORTANT: Use the differential lock momentarily only when added traction is required, such as driving on slippery, soft, muddy, or uneven surfaces.

 **CAUTION:** Avoid using differential lock while steering. When using differential lock button (5), be sure to place control lever lock (4) in the LOCK position.

Press differential lock button (5) to engage the wet clutch to lock up the front differential.

The differential lock instantly works and keeps engaging while depressing the lock button (5) to maintain traction.

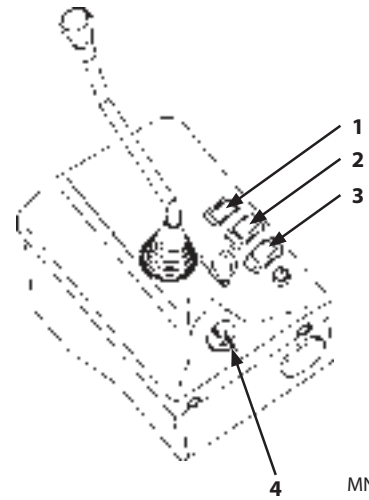


MNCH-01-549

OPERATOR'S STATION

Right Console/Switch Panel

- 1- Spare (Optional)
- 2- Ride Control Switch (Optional)
- 3- Throttle Limit Switch
- 4- Key Switch



MNCH-01-535

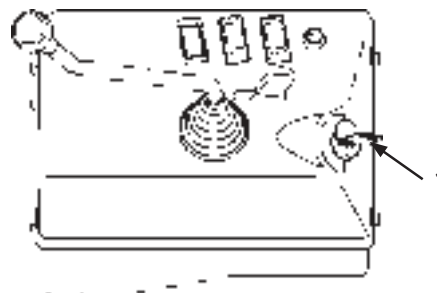
OPERATOR'S STATION

Key Switch

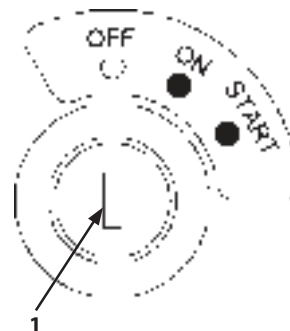
WARNING:

- Before starting the engine, put the F-N-R lever in the neutral (N) position, actuate the parking brake, lock the neutral lever lock and the front control lever. For further details, see Operating the Engine.
- Do not turn key switch (1) OFF during travel. Doing so actuates the parking brake and makes the steering wheel unusable, so it is extremely dangerous. It may also cause electrical and/or mechanical failures.

A : OFF (Engine Off)
B : ON (Electrical System On)
C : START (Engine Start)



MNCH-01-533



MNCH-01-528

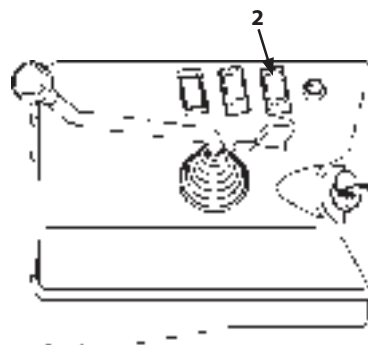
Throttle Limit Switch

When throttle limit switch (2) is turned ON, it restricts the maximum engine speed.

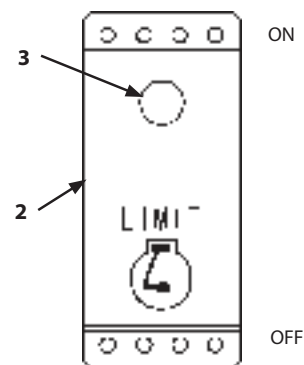
By doing so,

- It allows reduced noise levels.
- It reduces tire slipping and wear during work like snow removal and around livestock by reducing towing force.

When throttle limit switch (2) is ON, its orange lamp (3) comes ON.



MNCH-01-533



MNCH-01-518

OPERATOR'S STATION

Ride Control Switch (Optional)

Ride control switch (1) dampens vertical pitching of the work equipment during travel, to provide a more comfortable ride. It also provides a more stable ride, which helps prevent spilling of the material in the bucket.

WARNING:

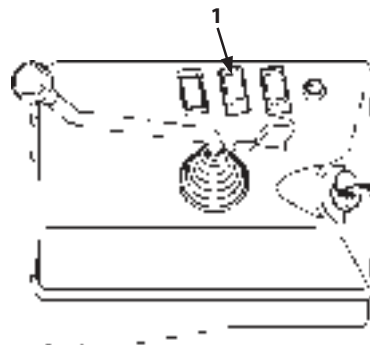
- Turn ride control switch (1) **OFF** when using work equipment in the float mode (scooping, grading, snow removal), during travel and during maintenance and inspections with work equipment raised. Some conditions may cause the arm to raise or lower and the movement of the machine to be unstable, resulting in personal injury.
- When working with the ride control activated, slow down considerably. If a sudden load is applied to the front attachment, it puts a great deal of pressure on the ride control accumulator, which may cause a leak of gas.

Operating the Ride Control

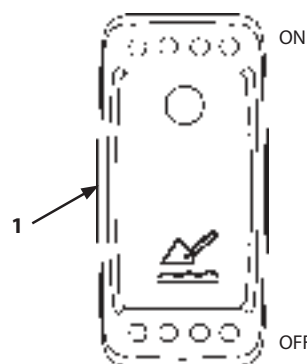
 **WARNING:** To ensure safety, stop the machine and lower the bucket to the ground before operating ride control switch (1).

Turning ride control switch (1) ON activates the vehicle speed sensor and controller, and once the vehicle exceeds 6 km/h, ride control starts working automatically. When the travel speed drops below 4 km/h, ride control stops working. When ride control switch (1) is turned ON, ride control indicator (2) on the monitor display come on. When ride control switch (1) is turned OFF, ride control indicator (2) on the monitor display goes off and ride control ceases to work.

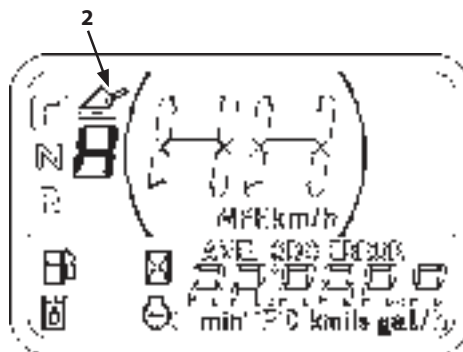
If ride control switch (1) is turned ON when the key switch is OFF, the ride control system will not operate. Similarly, when the engine is stopped with ride control switch (1) ON, the ride control system is turned off.



MNCH-01-533



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OPERATOR'S STATION

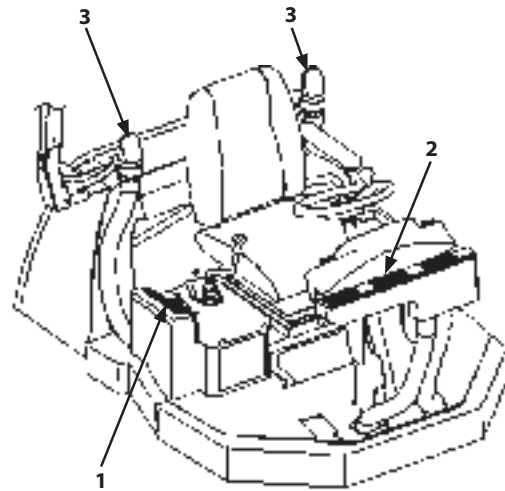
Air Conditioner Operation (Optional on Cab-Equipped Machines)

Name of Components

- 1- Control Panel
- 2- Defroster Vent
- 3- Rear Vents

Name of Parts on the Control Panel

- 4- LCD Panel
- 5- AC Switch
- 6- Power Switch
- 7- Fan Switch
- 8- Temperature Control Switch

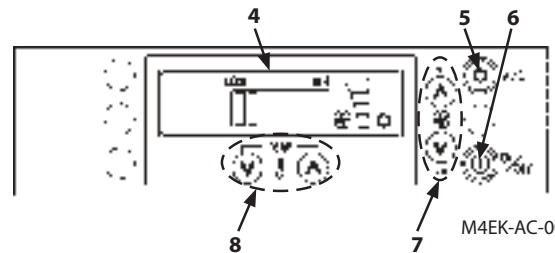


MNCH-01-542



NOTE:

- Air flow direction can be adjusted by moving the louvers on the rear vents (3). The louvers can also be opened or closed manually.
- The vents provide both warm and cold air, as desired.



M4EK-AC-001

Control Panel

OPERATOR'S STATION

Control Panel Names and Functions

Power Switch (6)

Pressing switch (6) lights the temperature setting and fan speed indicators on LCD panel (4) and starts the fan. To turn it OFF, press switch (6).

Fan Switch (7)

The fan can be adjusted to 3 levels from Lo to Hi. The fan speed is indicated on the right side of LCD panel (4).

- Increasing Fan Speed
Press the upper side  (Hi) of fan switch (7) to raise the fan speed 1 level.
- Reducing Fan Speed
Press the lower side  (Low) of fan switch (7) to lower the fan speed 1 level.

Temperature Control Switch (8)

Allows the temperature to be adjusted to 5 levels.

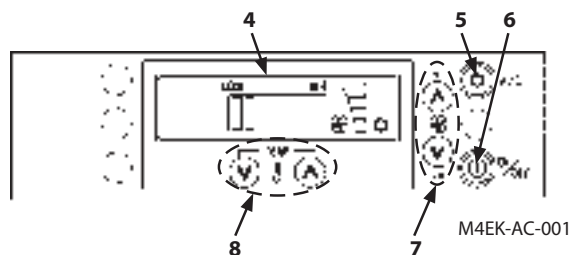
The temperature setting is indicated by the lit segments (5 steps) (COOL to HOT) in the center of the LCD panel.

- Raising the Temperature
The temperature setting increases one level each time the right side  of temperature control switch (8) is pressed.
- Lowering the Temperature
The temperature setting decreases one level each time the left side  of temperature control switch (8) is pressed.

A/C Switch (5)

The air conditioner (cooling/dehumidify) turns ON and the symbol on the right side of the LCD panel lights when switch (5) is pressed.

To turn it OFF, press switch (5).



 **NOTE:** If the A/C switch (5) is OFF and power switch (6) is turned ON, the ventilation fan operates.

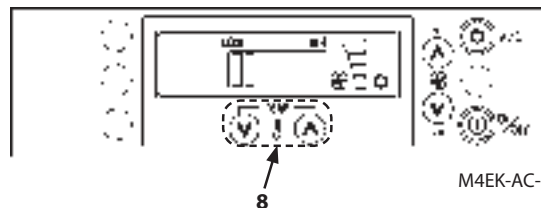
OPERATOR'S STATION

Tips for Optimal Air Conditioner Usage

For Rapid Cooling

The temperature in the cab may rise to over 80 °C (176 °F) when the machine is left in the sun in the summer. In such case, the quickest way to cool it down is to open the door and allow the hot air inside the cab to escape. After starting the engine, set temperature control switch (8) to maximum cooling.

Let the engine run in this state at a slightly above idle (1200 min⁻¹ or higher) for 2 to 3 minutes and then close the door. After the temperature in the cab comes down, set the temperature as desired with temperature control switch (8).



M4EK-AC-001

When the Windows are Fogged Up

If the insides of the windows fog up due to high temperature inside the cab, such as during rainy season, operate the air conditioner to clear the windows. When the atmosphere is very damp, and if the air conditioner has run excessively, the outside of the windows may fog up. If this happens, turn off the air conditioner to adjust the temperature in the cab.

Off-Season Air Conditioner Maintenance

To protect the parts of the compressor from a lack of lubricant, turn the air conditioner on at least once a month for several minutes with the engine running at a slow speed during the off-season. During the winter, if the cab temperature is 15 °C (59 °F) or below, the air conditioner may not operate. In such case, warm the cab with the heater first.

IMPORTANT:

- During the break-in of the air conditioner, keep the engine speed down.
- Keep fire away from the control panel.
- For information on filter maintenance, refer to the section **Cleaning and Replacing Air Conditioner Internal Filter** in the chapter **Inspections and Maintenance**.

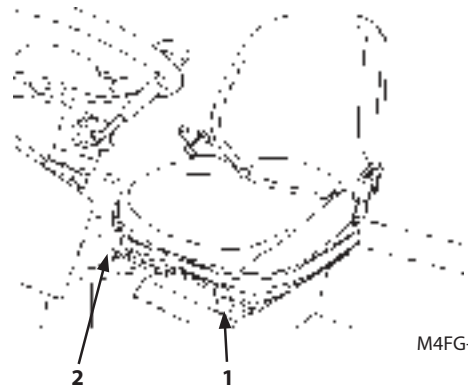
OPERATOR'S STATION

Adjusting the Operator's Seat (Standard Seat)

CAUTION: Adjust the seat to a position that allows pedals, levers and switches to be operated easily. Adjust the seat while the machine is parked.

Name of Components

- 1- Damper Adjustment
- 2- Slide Lever

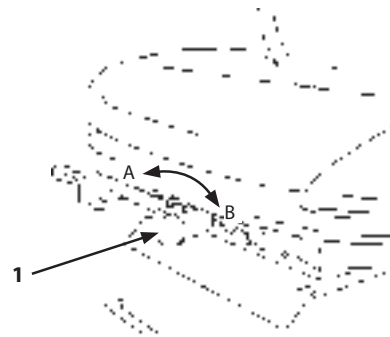


M4FG-01-026

1. Damper Adjustment

The stiffness of the damper can be adjusted in 5 levels to suit the work and road conditions. Lift up lever (1), put it in the desired position and let it back down.

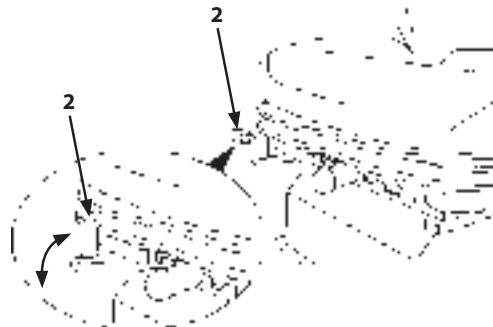
- A : Hard
- B : Soft



M4FG-01-027

2. Fore-Aft Adjustment

The seat can be adjusted forward or backward. Lift up slide lever (2) and slide the seat to the desired position; it can be adjusted in 15 mm (0.6 in) increments across a range of 195 mm (7.7 in). Release the lever when in the desired position and then make sure the seat is locked and does not move.



M4FG-01-028

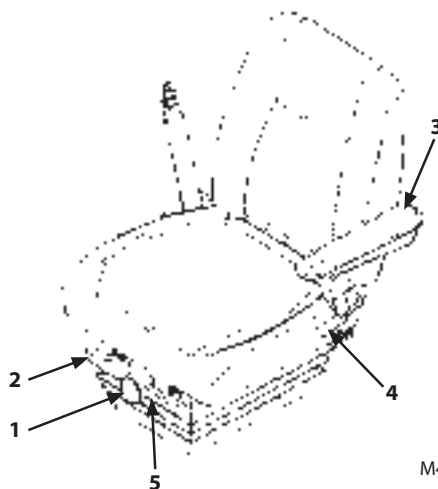
OPERATOR'S STATION

Adjusting the Operator's Seat (Full Suspension Seat)

CAUTION: Adjust the seat to a position that allows pedals, levers and switches to be operated easily. Adjust the seat while the machine is parked.

Name of Components

- 1- Suspension Handle
- 2- Slide Lever
- 3- Armrest
- 4- Backrest Lever
- 5- Indicator



M4GB-01-155

1. Adjusting the Suspension

Adjust the suspension seat in order to protect the body of the operator.

Adjustment Procedure

1. Sit on the seat.
2. Turn suspension handle (1) to the right to raise it, or to the left to lower it.
3. Make sure indicator (5) is in the green range. If it is in the red range, turn the suspension handle again and readjust the height.

Adjustable range: 50 kg to 120 kg (115 lb to 265 lb)

NOTE: If the indicator is in the red range on the top, the seat will be too hard, making it uncomfortable.

If in the red range on the bottom, the seat will be too soft to support the operator's weight and will bottom out.

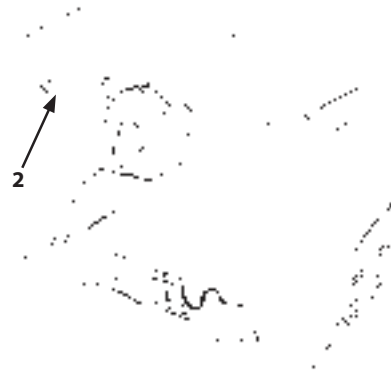


M4GB-01-156

OPERATOR'S STATION

2. Fore-Aft Adjustment

The seat can be adjusted forward or backward. Lift up slide lever (2) and slide the seat to the desired position; it can be adjusted in 10 mm increments across a range of 160 mm. Release the lever when in the desired position and then make sure the seat is locked and does not move.



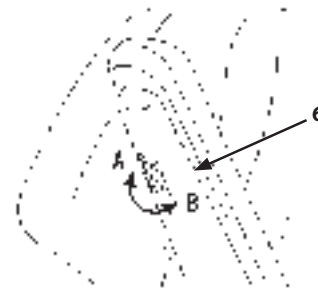
M4GB-01-157

3. Armrest Angle Adjustment

The angle of the armrest can be adjusted by turning dial (6) on the bottom of the armrest.

A: Higher angle

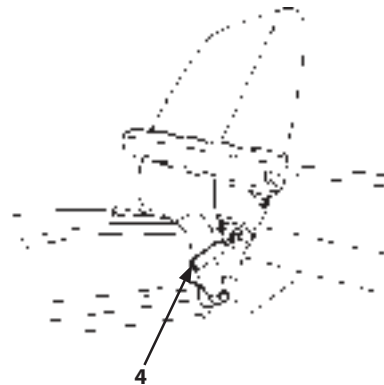
B: Lower angle



M4FG-01-046

4. Backrest Angle Adjustment

The angle of the backrest can be adjusted from 66 ° forward to 72 ° backward by lifting the backrest lever (4). Release the backrest lever when in the desired position and then make sure the backseat is locked and does not move.



M4FG-01-047

OPERATOR'S STATION

Seat belt

⚠ WARNING: Always fasten the seat belt when operating the machine.

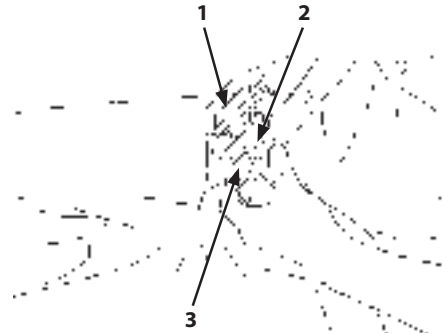
Before operating the machine, be sure to examine the seat belt and its hardware for any failure. If any damage and/or wear are found, replace the part concerned.

Replace the seat belt every 4 years, regardless of appearance.

1. A retractable seat belt (1) is provided on this machine.
2. Confirm that seat belt (1) is not twisted. Securely insert the end of the seat belt into buckle (2).

✎ NOTE: When trying to insert seat belt (1) into buckle (2), if the belt stops partway out and does not come any further out, allow it to retract fully and then pull it out again.

3. Push button (3) on buckle (2) to unfasten seat belt (1).

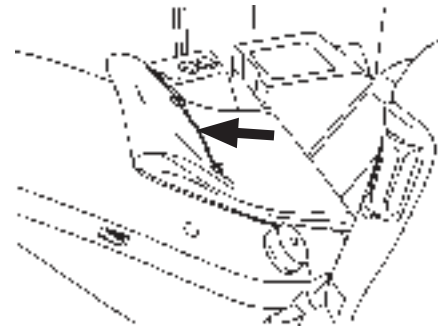


M4FG-01-050

Seat Back Pocket

A pocket is provided on the back of the operator's seat. Keep the user's manual and other information in the pocket.

✎ NOTE: The pocket is not completely waterproof. For canopy-equipped machines, use a plastic bag or the like to keep it dry.



M4GB-01-139



M4GB-01-139

OPERATOR'S STATION

Fuse Box

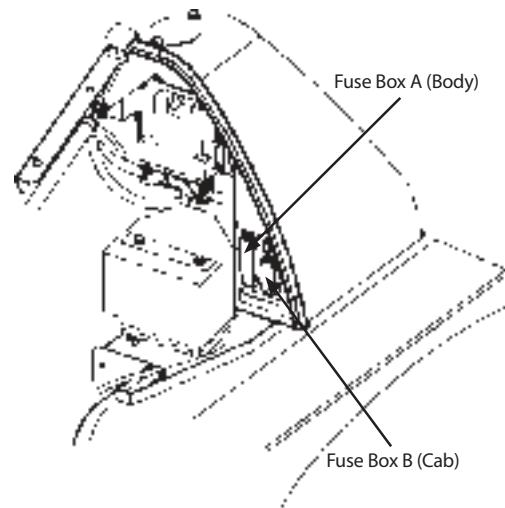
IMPORTANT: If a fuse blows, turn the key switch OFF and investigate the problem with the power off. Replace the fuse with a new one.

The purpose of fuses is to provide a safety valve for the electrical system and prevent excessive current from flowing through its circuits; slow blow fuses (1) and (2) are used. The capacity varies with the circuit concerned, so replace with a fuse of the rated capacity. When checking the fuses, check them in the order of fuse box A, B, slow blow fuse (1) and (2).

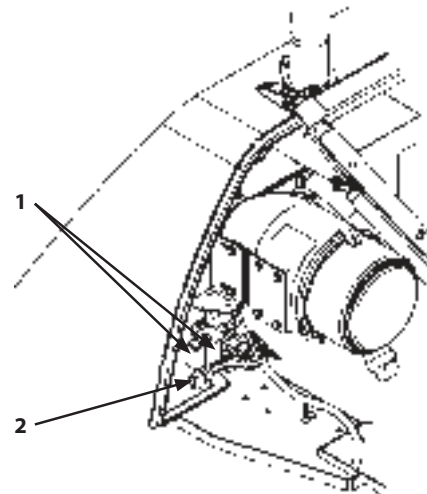
Slow Blow Fuse Capacities

1- 120 A x 2

2- 75 A



MNCH-01-537

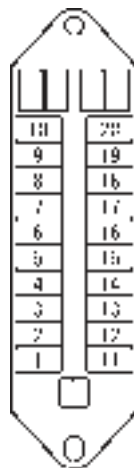


MNCH-01-521

OPERATOR'S STATION

Fuse Box A (Body)

10- SPARE -	20- HI BEAM 15 A
9- SPARE -	19- HEAD LAMP 15 A
8- SPARE -	18- ROOM LAMP (CAB) 5 A
7- RIDE CONTROL (OPT.) (10 A)	17- FLASHER 10 A
6- HST 2 5 A	16- CONTROLLER 5 A
5- HST 1 15 A	15- ECM 30 A
4- C/V DETENT 5 A	14- FUEL PUMP 20 A
3- STOP LAMP 20 A	13- POWER ON 10 A
2- FNR 10 A	12- PARKING 10 A
1- LIGHTING 10 A	11- POSITION 5 A



Fuse Box A (Body)



Fuse Box B (Cab)

MNCH-01-550

Fuse Box B (Cab)

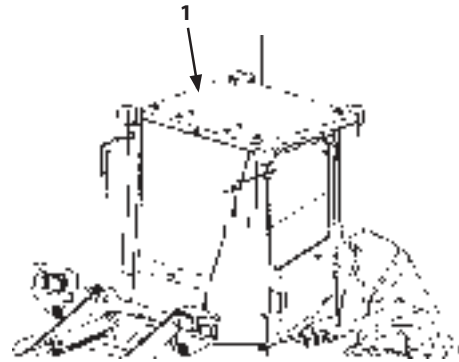
5- AC 1 30 A	10- WIPER FRONT 30 A
4- AC 2 20 A	9- WIPER REAR 20 A
3- SPARE -	8- RADIO 10 A
2- SPARE -	7- WORKING LAMP FRONT 15 A
1- -	6- WORKING LAMP REAR 15 A

OPERATOR'S STATION

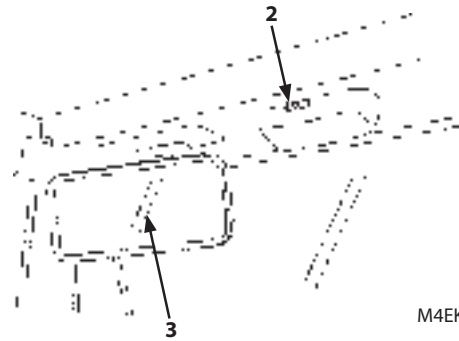
ROPS Cab

- 1- ROPS Cab
- 2- Room Light
- 3- Rearview Mirror
- 4- Sun Visor

 **NOTE:** Vehicles with special specifications, such as snow removal equipment, may not be so equipped.



M4FG-01-032



M4EK-01-030

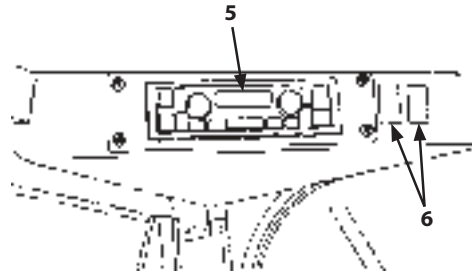


M4FG-01-055

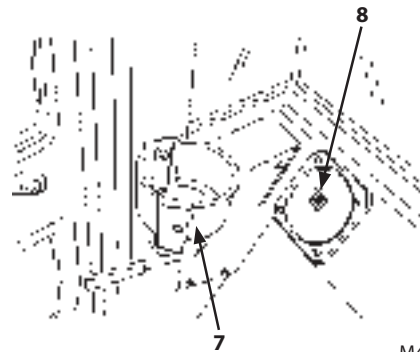
OPERATOR'S STATION

(Continued from previous page)

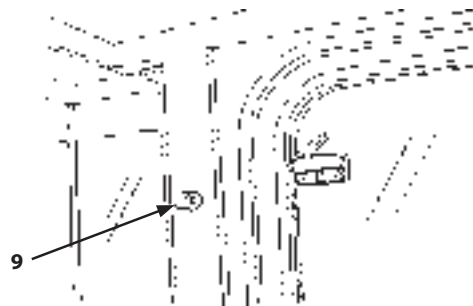
- 5- Radio(Optional)
- 6- Cab Switch Panel(Optional)
- 7- Drink Holder
- 8- Speaker(Optional)
- 9- Coat hook



M4EK-01-066



M4EK-01-032



M4EK-01-033

OPERATOR'S STATION

Room Light

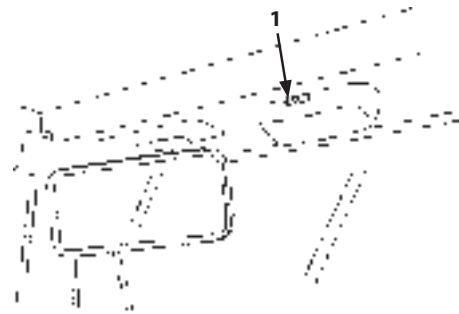
Room light (1) comes ON when in the ON position and goes off in the Neutral position.

When the left cab door is opened and the switch is in the DOOR position, room light (1) comes ON; it turns OFF when the door is closed.

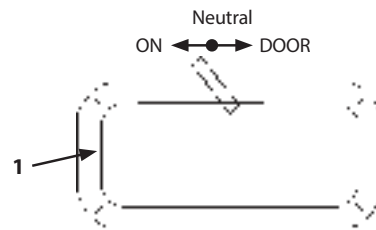
IMPORTANT: If room light (1) is on for a long time, it may drain the battery.

 **NOTE:**

- Room light (1) only functions by the opening/closing of the left cab door when in the DOOR position.
- It stays lit as long as the left cab door is open, even if the key switch is in the OFF position.



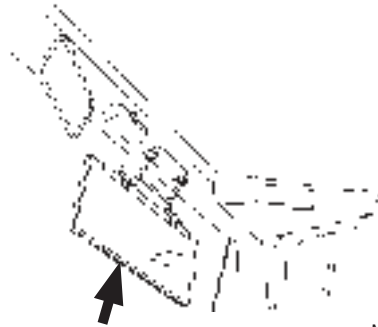
M4EK-01-030



M4EK-01-034A

Sun Visor

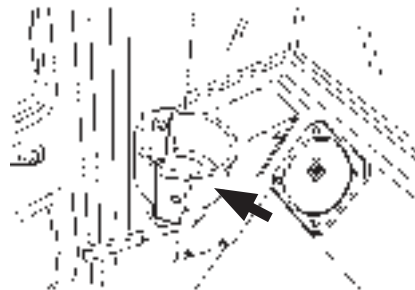
Use the sun visor by lowering it to block strong sunlight from above the cab.



M4FG-01-055

Drink Holder

IMPORTANT: Put a cap or lid on drink bottles when using the holder.

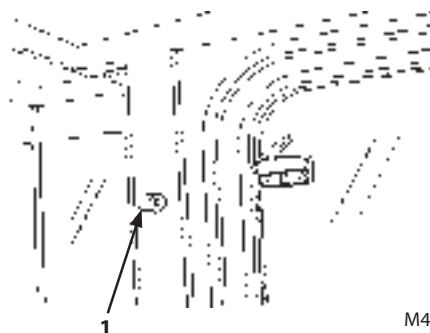


M4EK-01-032

OPERATOR'S STATION

Coat Hook

Use coat hook (1) for hanging up clothing, like jackets and hats.



M4EK-01-033

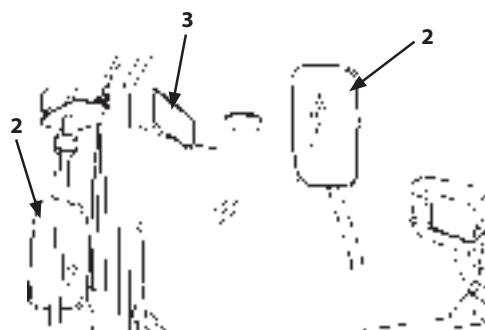
Rearview Mirror

⚠ WARNING: Do not rely solely on rearview mirror (2) when backing up. Use the rearview mirror as an aid and look behind when backing up.

Sit in the operator's seat and adjust it so the rear of the vehicle can be visually checked.

Adjust the mounting of the mirror so that a person (1 meter tall, 30 cm diameter) can be detected on either the left or right-rear of the machine.

Always keep it clean.



Cab-Equipped Machine Canopy-Equipped Machine

M4FG-01-033

Rearview Mirror

Always keep rearview mirror (3) clean.

OPERATOR'S STATION

AM/FM Radio Operation (Optional)

Serial No. 005001 to 005315

Radio Controls

1- PWR/SRC Button

Pressing button (1) turns the power ON. Pressing button (1) for 2 seconds or so when the power is ON turns it back OFF. Each time the audio input source button (1) is pressed, it toggles through the sources in the order Radio→AU1 (AUX1)→AU2 (AUX2).

2- Tone Button

Each time button (2) is pressed, it toggles through BA, TR, BL. Buttons (10) can be used to adjust the tone: BA is bass, TR is treble and BL is balance between the L/R speakers.

3- Display

Indicates the frequency, time, etc.

4- DIRECT Buttons

5- BAND Button

Each time button (5) is pressed, it toggles through the bands in the order AM1→AM2→FM1→FM2.

 **NOTE:** When a station is received in stereo, stereo indicator (13) lights.

6- AS Button

7- SEEK Buttons

8- MUTE Button

Pressing button (8) switches to the mute mode.

9- ALARM Button

10- VOL Buttons

Pressing the + button (10) increases the volume and pressing the - button lowers it.

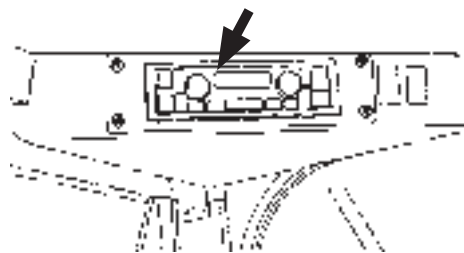
11- DISP/CLOCK Button

Pressing button (11) changes what is displayed.

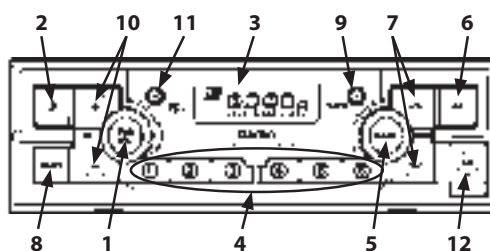
12- AUX1 Input Terminal

Press button (1) to set the display to AU1 (AUX1). Input terminal (12) can be used to listen to a music source by connecting a portable audio device.

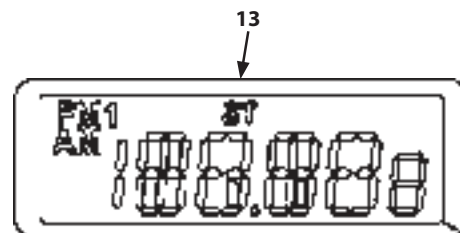
 **NOTE:** Use a 3.5 mm (0.14 in) mini-stereo plug to connect to the radio.



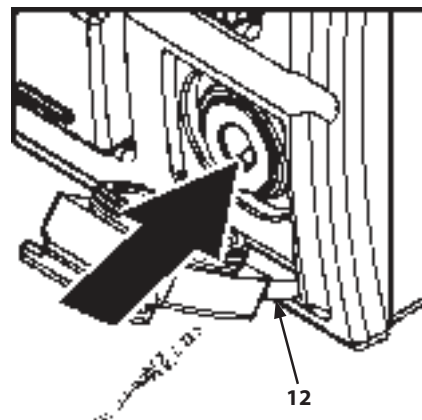
M4EK-01-066



M4EK-01-067



M4EK-01-068



M4EK-01-069

OPERATOR'S STATION

Tuning

- **Manual Tuning Procedure**
Press SEEK button (7) briefly (less than 1 second) to tune to the desired frequency. The frequency changes 1 step each time the button is pressed (in AM, by 9 kHz; FM by 0.1 MHz at a time).
To tune to a higher frequency, press the  side.
To tune to a lower frequency, press the  side.
- **Automatic Search Function**
Long-pressing a SEEK button (7) (over 1 second), starts a search and it stops automatically and beeps when a station is tuned.
To tune to a higher frequency, press the  side.
To tune to a lower frequency, press the  side.

 **NOTE:** Tune manually in locations where Auto Seek does not work, due to weak signal reception, such as between buildings.

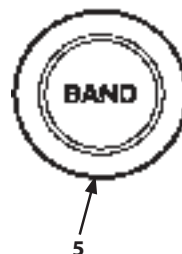


M4EK-01-070

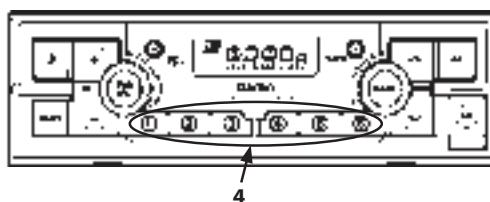
Setting Preset Stations

A total of 24 stations can be preset on AM1, AM2, FM1 and FM2 (6 stations each).

1. Press BAND button (5) and set to the desired frequency band.
2. Press a SEEK button (7) to tune the frequency of the desired station.
3. Press and hold the desired DIRECT button (4) for about 2 seconds to preset the station.



M4EK-01-071



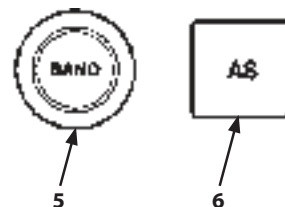
M4EK-01-067

OPERATOR'S STATION

Using the Auto-Preset Function

This function registers stations tuned using auto-tuning to preset memory.

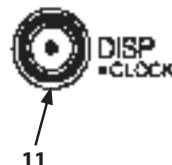
1. Press BAND button (5) and select to tune either AM or FM.
2. The radio beeps when AS button (6) is pressed, then registers the 6 stations with the best reception automatically.



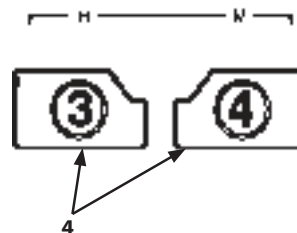
M4EK-01-073

Setting the Clock

1. Press and hold DISP/CLOCK button (11) until it beeps and the clock display flashes. It is then ready to be set. If no changes are made for 15 seconds, it cancels the clock setting.
2. Use the H and M buttons of the DIRECT buttons (4) to select the hour and the minute, respectively.
3. Press SEEK button (7) to set the time.
4. Pressing DISP/CLOCK button (11) sets the time.



M4EK-01-074



M4EK-01-075

Setting the Alarm

An alarm can be set to sound at any time desired. The radio toggles between alarm set and cancel each time ALARM button (9) is pressed.

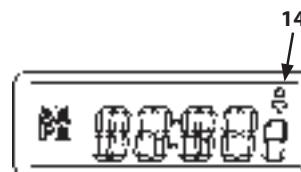
1. Long press ALARM button (9) until it beeps. The alarm symbol (14) flashes, meaning an alarm can be set. If no changes are made for 15 seconds, it cancels the alarm setting.
2. Set a time for the alarm in the same way as in steps 2 and 3 for setting the clock.
3. Pressing ALARM button (9) sets the time and the alarm symbol (14) stays lit.
4. The alarm sounds for 3 minutes straight when the set time is reached. To stop the alarm, press ALARM button (9).



M4EK-01-070



M4EK-01-076



M4EK-01-077

OPERATOR'S STATION

Radio Unit (Optional)

Serial No.005316 and up

Control Panel

1- POWER button

Turns the device ON/OFF.

2- SRC button

Switches the source
(FM1→FM2→AM→Bluetooth®→USB).

3- Search button

Makes auto presets (FM/AM).

4- Return button

Returns to the previous screen while setting operation.

5- Hands-Free button

Receives mobile phone signal. Makes a redial call.

6- Rotary switch

Adjust the volume.

Switches between menu items and makes various settings.

7- SEEK BAND+/SEEK BAND- buttons

Adjusts radio frequency.

8- PRESET buttons ([1] to [6])

Calls up/registers preset frequencies.

Operates the connected Bluetooth®/USB device.

9- MIC

Microphone for hands-free operation.

10- USB port

Connect a USB device.

11- LCD

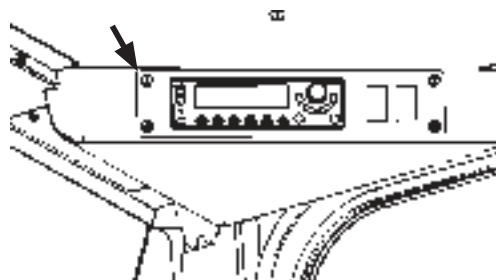
Refer to the following page.

12- Power Connector

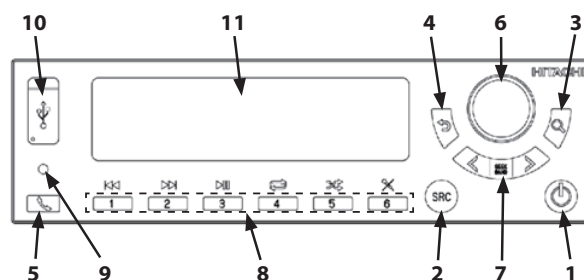
Power inlet and machine information input.

13- Antenna Port (for Analog Radio)

Connect the antenna to receive AM/FM radio.



MNCH-01-551



MNUD-01-402



Rear View

MPTC-01-088

OPERATOR'S STATION

LCD Display

1- Information section

Indicates the source name, frequency, service name, etc. in characters and/or numbers.

2- Source label

Indicates the selected source name.

3- ST label

Lights to indicate stereo reception when FM are selected.

4- USB label

Lights when a USB device is connected.

5- Bluetooth® label

Lights when connected to a Bluetooth® compatible device.

6- Clock

Current time in 24 h format.

7- REPEAT label

Lights when Bluetooth®/USB device is playing in repeat mode.

8- RANDOM label

Lights when Bluetooth®/USB device is playing in random mode.

9- Folder No.

Indicates the USB memory folder No.

10- Track No.

Indicates the USB memory track No.

11- Menu/List title

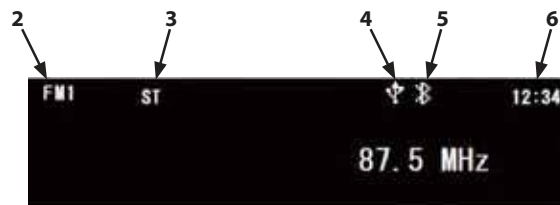
Indicates the title of the selected menu, source, program type.

12- List No.

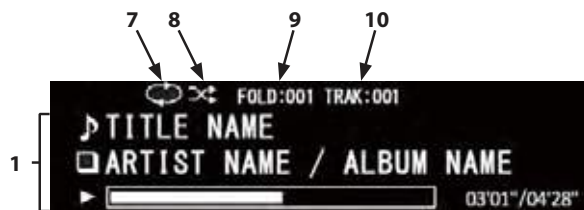
Indicates the selected list number among total selections.

13- Volume display

Indicates the volume of currently selected source.



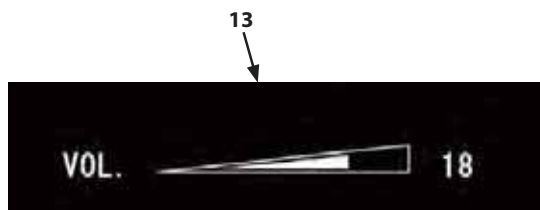
MNUD-01-448



MNUD-01-404



MNUD-01-406



MNUD-01-405

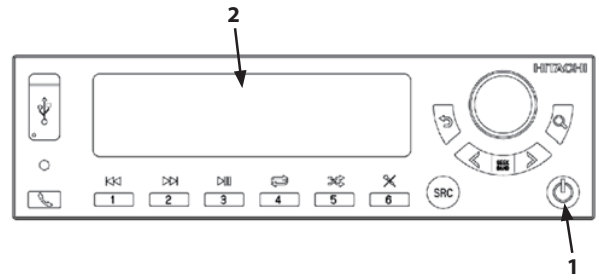
OPERATOR'S STATION

Basic Operation

Turn ON the device

When the machine starter key is set to ON or ACC, the previously selected source is displayed on LCD (2). If the LCD displays nothing, press power button (1). The previously selected source appears on the LCD.

 **NOTE:** When the starter key is turned to OFF when the radio unit is in the standby mode, the radio unit starts up in the standby mode when the key is turned to ON or ACC. Refer to "Turn OFF the device" for the standby mode.



MNUD-01-402

Turn OFF the device

When the machine starter key is set to ON or ACC, the pressing power button (1) turns off the LCD. The power button (1) remains lit on (standby mode).

When the machine starter key is set to OFF with the radio unit is powered on, power button (1) and LCD (2) are both turned off.

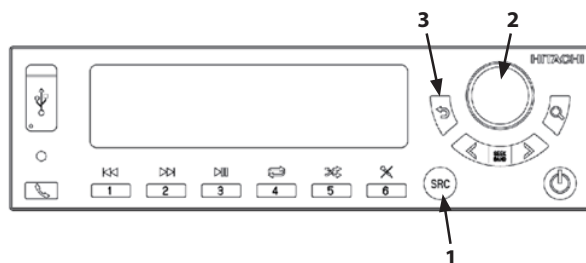
OPERATOR'S STATION

Selecting Source

Long depressing SRC button (1) displays the source selection screen (4).

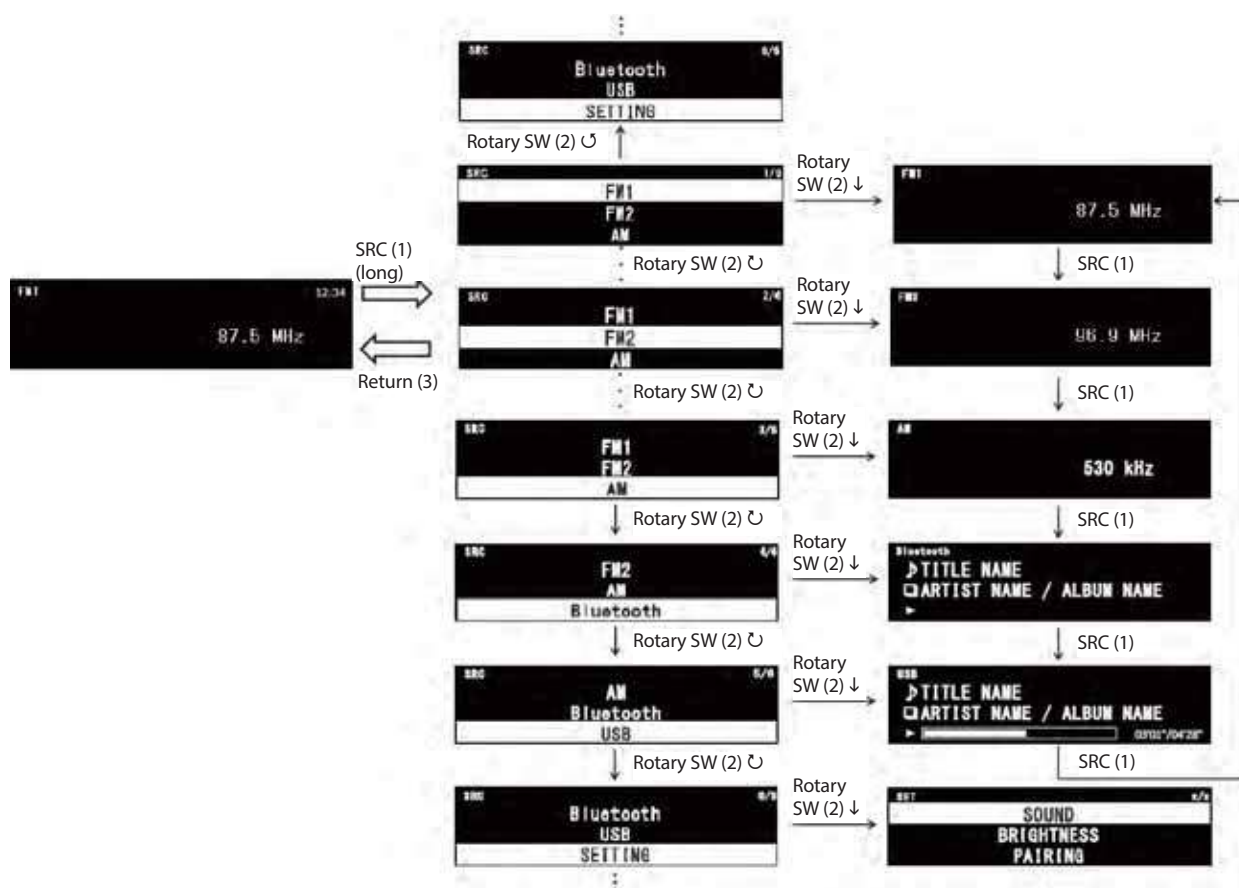


MNU01-450



MNU01-402

- Rotate rotary switch (2) to highlight a desired source (FM1↔FM2↔AM↔Bluetooth®↔USB↔SETTING↔FM1).
- Press rotary switch (2) while selecting a source to display its sub-sources.
- Pressing SRC button (1) on each source screen moves to the screen to the next source screen (FM1→FM2→AM→Bluetooth®→USB→FM1).



MNU01-449US

OPERATOR'S STATION

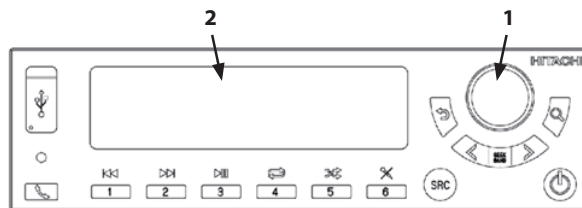
Volume Control

The volume control can be done individually for each source and for hands-free calling.

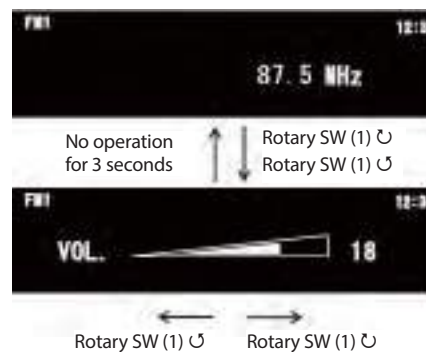
Rotating rotary switch (1) clockwise increases the volume. Rotating rotary switch (1) counterclockwise decreases the volume.

The volume level is selected between 0 (mute) and 32.

 **NOTE:** The screen returns to the source screen when no operation is made for 3 seconds.



MNUD-01-402



MNUD-01-416

OPERATOR'S STATION

About Trademark

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CAUTION:

- **Do not operate the radio or other audio equipment while driving or working.**
- **The speaker volume may vary depending on the source, radio, USB audio input, Bluetooth® audio or handsfree phone. Adjust to an appropriate volume, such as by changing the volume of the Bluetooth® compatible device.**

IMPORTANT: This device cannot connect to more than 1 Bluetooth® compatible device at a time.

OPERATOR'S STATION

FM/AM Radio Operation

CAUTION: Refrain from listening to the radio while operating the machine.

Receives both FM and AM radio.

NOTE: The only difference between FM1 and FM2 is the grouping of preset numbers; the function is the same.

Control Panel

1- POWER button

Turns the radio ON/OFF.

2- SRC button

Switches the source
(FM1→FM2→AM→Bluetooth®→USB).

3- Search button

FM/AM auto presets.

4- Rotary switch

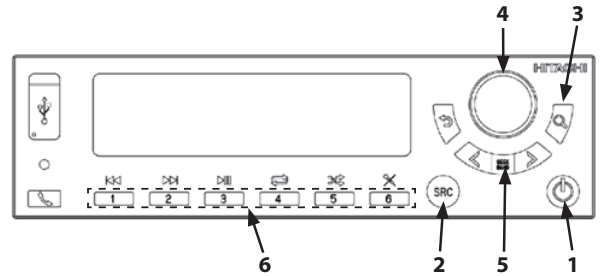
Adjust the volume.

5- SEEK BAND+/SEEK BAND- buttons

Adjusts radio frequency.

6- PRESET buttons ([1] to [6])

Calls up/registers preset frequencies.

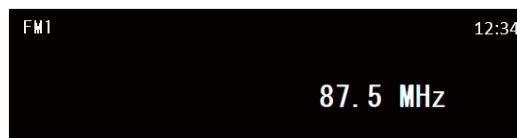
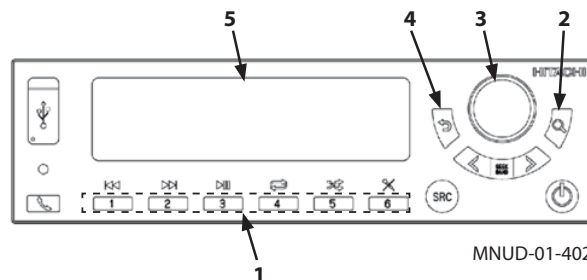


MNUD-01-402

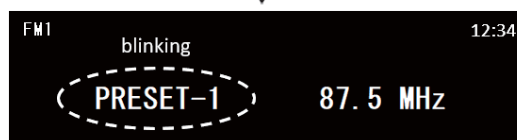
OPERATOR'S STATION

Station Presetting Procedure

1. Select the desired station. Refer to the following page "Tuning Procedure".
2. Press and hold a desired PRESET button (1) for more than 1 second. The current station is preset to the selected number of button. When the station is preset, the "PRESET-x" blinks for 3 seconds on LCD (5). Once the presetting is complete for a PRESET button, the radio will be tuned to the preset station when the PRESET button is pressed.
3. To change the preset station, follow the same steps 1 and 2.

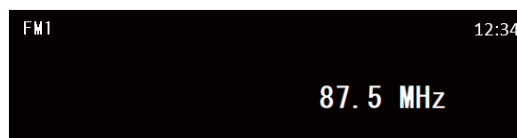


↓ [1] (long)

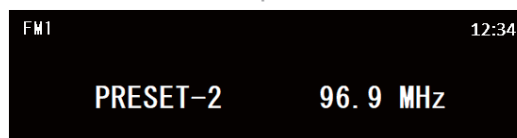


Calling up Preset Stations

Press any of PRESET buttons (1) to tune and receive the registered station frequency. "PRESET-x" with the selected number is displayed on LCD (5).



↓ [1]



Factory Default Setting

PRESET	AM (kHz)	FM (MHz)
1	530	87.5
2	910	96.9
3	1000	97.9
4	1100	98.9
5	1540	106.9
6	1710	107.9

IMPORTANT: The PRESET data will not be erased even disconnected from the battery. The changed PRESET data is stored in the internal memory at ACC OFF, however, if ACC and battery are both OFF at the same time, the changed data is not stored.

Auto-Preset Function

By keep depressing search button (2), up to 6 stations with best reception can be automatically registered to PRESET buttons (1) (auto-preset function).

"AUTO PRESET" blinks on LCD (5) while auto-preset is running.

The station frequency is registered from No. 1 through No. 6 in frequency order.



OPERATOR'S STATION

Tuning Procedure

- Automatic Search Function (Auto Seek)

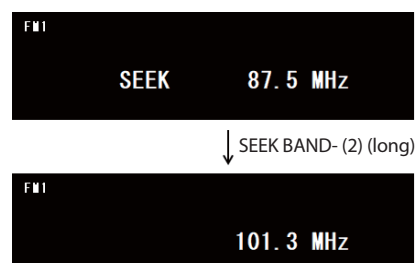
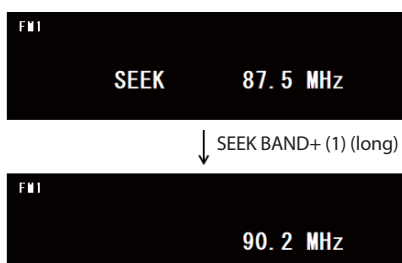
Press and hold SEEK BAND+ button (1) and/or SEEK BAND- button (2) for more than half a second, then release. Automatic search for the station starts to run and stops when a station is received.

Press SEEK BAND+ button (1) to search a higher frequency.
Press SEEK BAND- button (2) to search a lower frequency.

If no stations with good reception can be found after searching the entire band, the radio continues searching.
Press either SEEK BAND button (1)(2) to cancel the searching operation.



NOTE: If the receiving radio waves are weak, i. e. such as when the machine is located between high rising buildings, etc., use the manual tuning procedure to select the desired station.



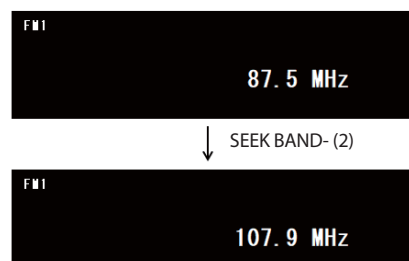
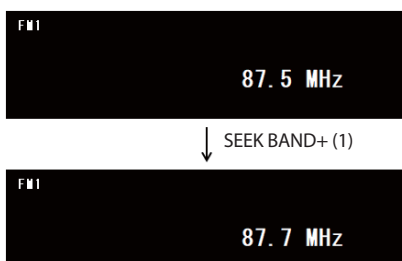
MNUD-01-414US

- Manual Tuning Procedure (Manual Seek)

Press SEEK BAND+ button (1) and/or SEEK BAND- button (2) until the desired station is reached.
Each time SEEK BAND buttons (1)(2) is pressed, the frequency changes at an interval.

Press SEEK BAND+ button (1) to increase the frequency.
Press SEEK BAND- button (2) to decrease the frequency.

NOTE: AM frequency interval: 10 kHz
FM frequency interval: 0.2 MHz



MNUD-01-415US

OPERATOR'S STATION

Bluetooth® Input

IMPORTANT: A special Bluetooth® unit is necessary to use this function.

Specified Characteristics

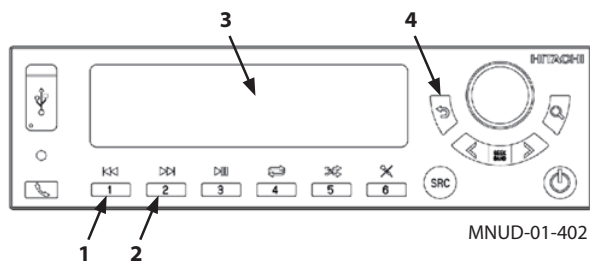
Frequency	2.4 GHz
Version	3.0
Class	2
Applicable profile	A2DP, AVRCP, HFP, HSP, SPP
Max. Number of Pairing Device	16

The audio files can be played via Bluetooth® connection with a cell phone or Bluetooth® audio playback device.

 **NOTE:** Refer to page 1-84 for pairing.
Refer to page 1-86 for device connection.

The track title, artist name, album name are displayed on LCD (3).

If they are too long to display in one line, separately displayed as shown to the right. Press return button (4) to change the screens.



MNUD-01-418

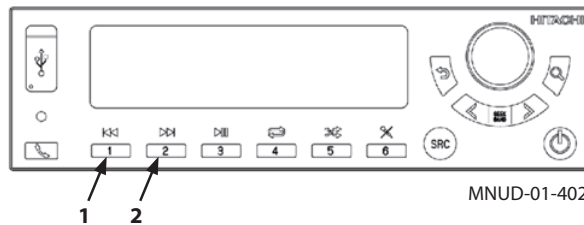
OPERATOR'S STATION

Change Track

Press [2] button (2) to start playing the next track.

Press [1] button (1) to play the previous track.

According to the connected device setting, pressing [1] button (1) returns to the top of the currently playing track. Then press [1] again to play the previous track.

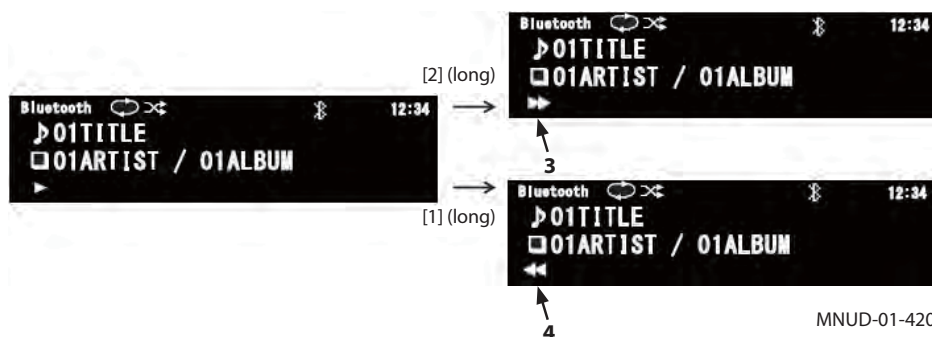


MNUD-01-402

Fast-forward/Fast-rewind

While playing a track, depressing [2] button (2) fast-forwards the track until releasing [2] button. Fast-forward label (3) is displayed while depressing [2] button.

While playing a track, depressing [1] button (1) fast-rewinds the track until releasing [1] button. Fast-rewind label (4) is displayed while depressing [1] button.



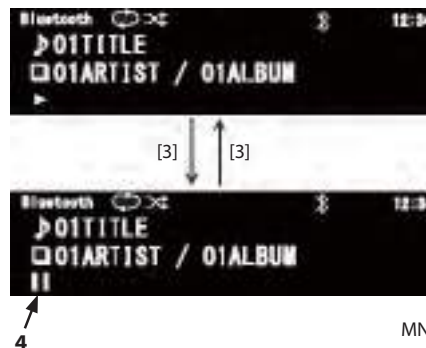
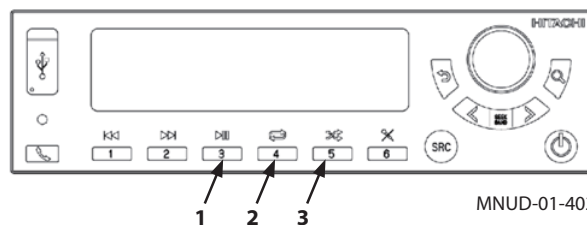
MNUD-01-420

OPERATOR'S STATION

Pause/Playback

Pressing [3] button (1) while playing a track pauses playback. PAUSE label (4) is displayed.

Pressing [3] button (1) again starts playing from where it was paused.

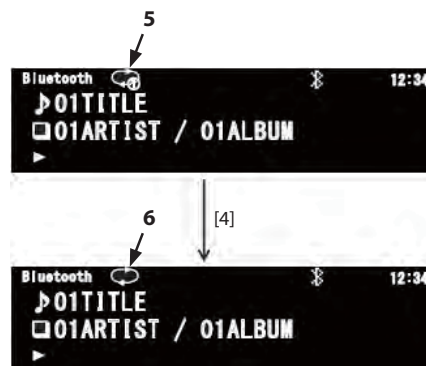


Repeat

Pressing [4] button (2) plays the same track repeatedly. REPEAT label (5) is displayed.

Pressing [4] button (2) again plays the same album or folder repeatedly. REPEAT label (6) is displayed.

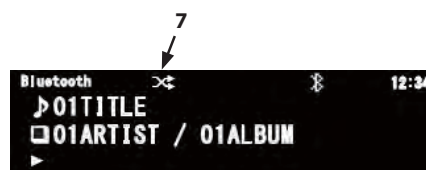
 **NOTE:** This function is not applicable depending on the connected device.



Random

Pressing [5] button (3) plays the tracks in random order. RANDOM label (7) is displayed.

 **NOTE:** This function is not applicable depending on the connected device.



OPERATOR'S STATION

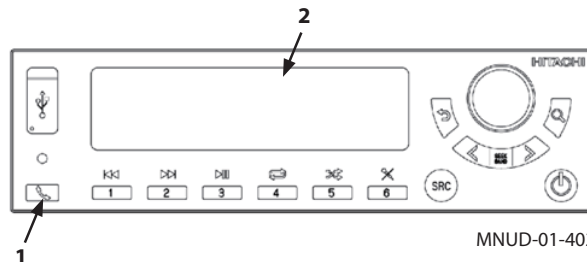
Hands-free Call

IMPORTANT: A special Bluetooth® connected cellphone is necessary to use this function.

Allows handsfree conversations when using a Bluetooth® (HFP protocol) compatible cellphone.

- **Making a Call**
When calling from the cellphone, "DIALING" is displayed on LCD (2) and the sound from dialing is heard from the speakers. The voice of the other end party is heard from the speakers when connected.
- **Redial**
Regardless of the band (or operation), long pressing Hands-Free button (1) dials to the last incoming dial number since the ACC was turned ON.
"DIALING" is displayed on LCD (2) and the sound from dialing is heard from the speakers. The voice of the other end party is heard from the speakers when connected. Pressing Hands-Free button (1) during talk ends call.

 **NOTE:** The redial function may not work if the length of the previous incoming call was short.



OPERATOR'S STATION

- Incoming Call

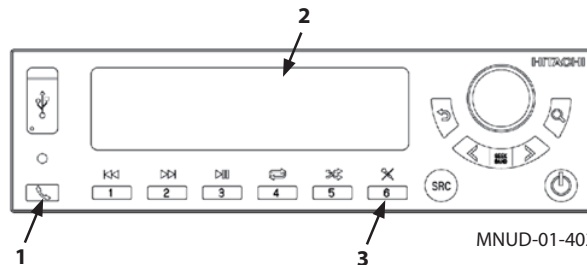
When a call comes in, "CALLING" is displayed on LCD (2), regardless of the band (or operation), and the speaker rings with the call.

Press Hands-Free button (1) to answer.



NOTE:

- Even if the source of the radio unit is OFF when a call comes in, the source automatically turns ON, and "CALLING" is displayed and the speaker sounds ringing.
- According to the setting, auto-answer to the incoming call is possible. Refer to page 1-85 for the setting procedure.



MNUD-01-402

- Reject call

When a call comes in, keep depressing Hands-Free button (1) rejects and ends the call. The radio returns to the band (or operation) before the call.



MNUD-01-424

- MIC Mute

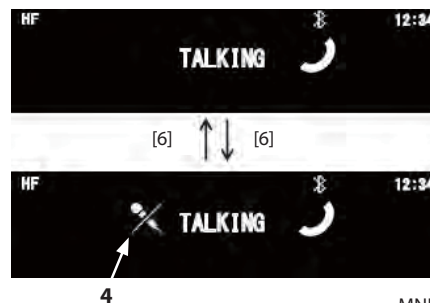
A microphone for hands-free talking is built-in the front panel of the radio unit.

Pressing [6] button (3) turns ON/OFF this microphone.

When the microphone is OFF, MUTE label (4) is displayed.



NOTE: MIC mute is canceled at each call.



MNUD-01-425

OPERATOR'S STATION

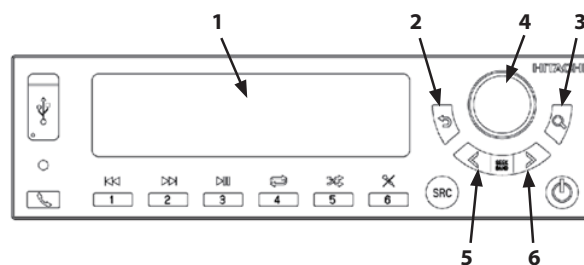
USB Device Input

Plays audio files via USB connection with a cell phone or audio playback device.

USB Specifications

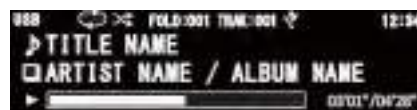
Rated Current	Max. 2 A
Output Voltage	5.00 V when USB cable is not connected.
Applicable Data Format	MP3, WMA, AAC, WAV

 **NOTE:** MP4 or other formatted files may not be played and skipped. If accepted, it may not be played in good enough quality.



MNUD-01-402

IMPORTANT: The basic functions provided with this radio unit are explained in this section. It may not be applicable to the USB device depending on its specifications and application. Refer to the instruction manual of the USB connected device.



MNUD-01-427

The track title, artist name, album name are displayed on LCD (1).

If they are too long to display in one line, they are separately displayed on different screens. Press return button (2) to change the screens.

Select Play List

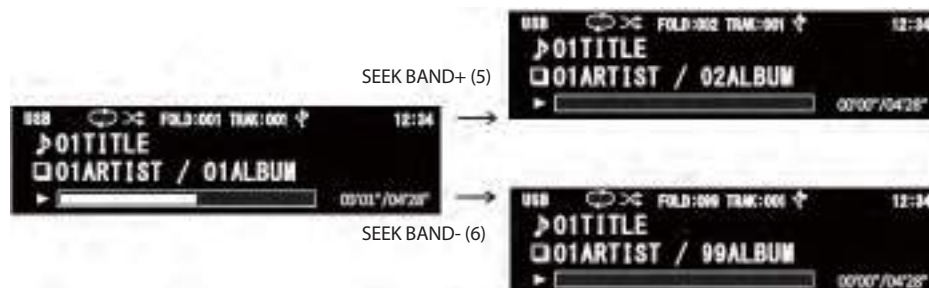
Pressing search button (3) may import the playlist from the specified device such as iPhone.

Select a desired track and play, if available, using rotary switch (4).

Select Folder/Album

Press SEEK BAND+ button (5) moves to the next folder or album stored in the USB device.

Press SEEK BAND- button (6) moves to the previous folder or album stored in the USB device.



MNUD-01-426

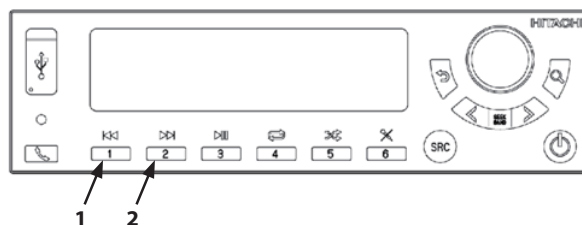
OPERATOR'S STATION

Change Track

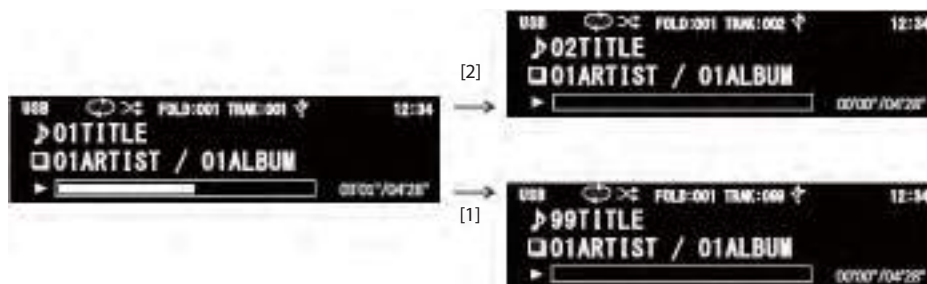
Press [2] button (2) to start playing the next track.

Press [1] button (1) to play the previous track.

According to the connected device setting, pressing [1] button (1) returns to the top of the currently playing track. Then press [1] again to play the previous track.



MNUD-01-402

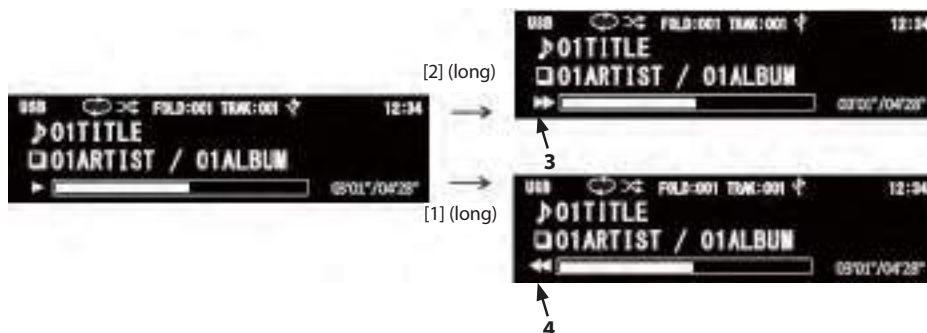


MNUD-01-428

Fast-forward/Fast-rewind

While playing a track, depressing [2] button (2) fast-forwards the track until releasing [2] button. Fast-forward label (3) is displayed while depressing [2] button.

While playing a track, depressing [1] button (1) fast-rewinds the track until releasing [1] button. Fast-rewind label (4) is displayed while depressing [1] button.



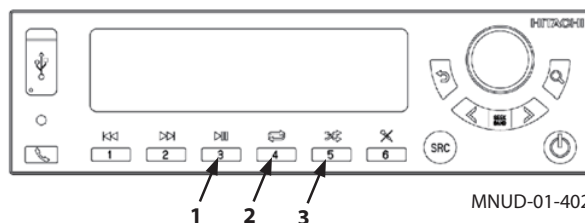
MNUD-01-429

OPERATOR'S STATION

Pause/Playback

Pressing [3] button (1) while playing a track pauses playback. PAUSE label (4) is displayed.

Pressing [3] button (1) again starts playing from where it was paused.

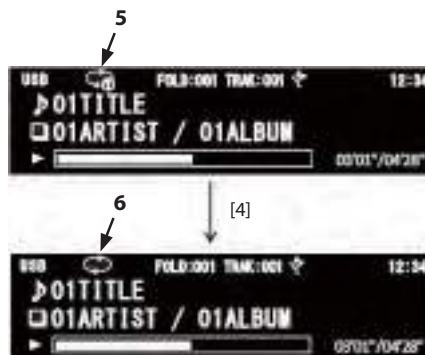


Repeat

Pressing [4] button (2) plays the same track repeatedly. REPEAT label (5) is displayed.

Pressing [4] button (2) again plays the same album or folder repeatedly. REPEAT label (6) is displayed.

 **NOTE:** This function is not applicable depending on the connected device.



Random

Pressing [5] button (3) plays the tracks in random order. RANDOM label (7) is displayed.

 **NOTE:** This function is not applicable depending on the connected device.



OPERATOR'S STATION

Setting Screens

Allow changes to the various settings.

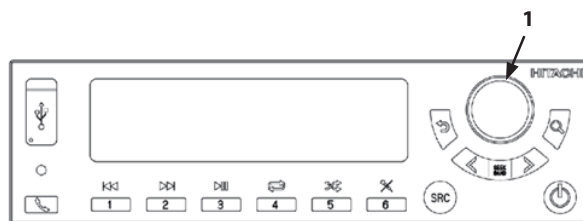
Press rotary switch (1) from any source screen to display setting screen (2).

Or select SETTING from the source selection operation.
Refer to page 1-67 "Selecting Source" for details.

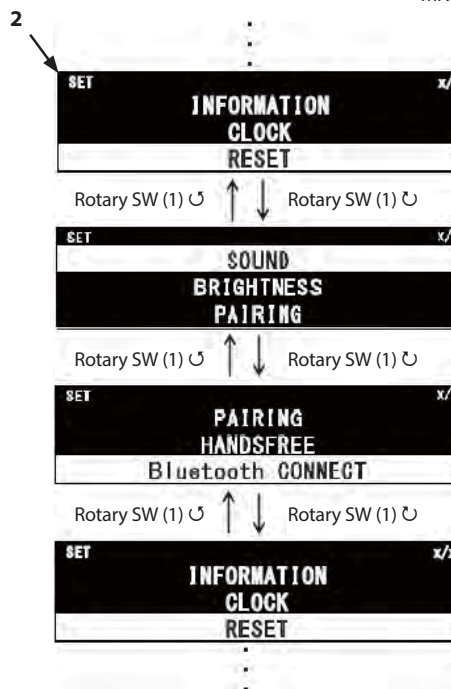
There are 7 setting menu and their submenu.

Rotate rotary switch (1) and highlight a desired menu to set, and push rotary switch (1) to display its submenu.

SOUND	* BALANCE	0
	* TREBLE	0
	* BASS	0
	* LOUDNESS	OFF
BRIGHTNESS	* DISPLAY	0
	* SWITCHES	0
PAIRING		
HANDSFREE	* AUTO ANSWER	OFF
Bluetooth® CONNECT	* AUTO CONNECT	ON
	SELECT	
	DELETE	
INFORMATION	SOUND	
	BRIGHTNESS	
	HANDSFREE	
	Bluetooth® CONNECT	
	REGION	
	VERSION	
CLOCK	* DISP	OFF
RESET	TIME	



MNUD-01-402



MNUD-01-451

Reset Settings

To reset the setting values, select RESET and press rotary switch (1). "RESET ALL SETTINGS?" appears.

Highlight "YES" by rotating rotary switch (1) and press rotary switch (1). The setting for all the items with an asterisk mark (*) in the above chart will be reset to the default setting.

Select "NO" to cancel the setting reset.

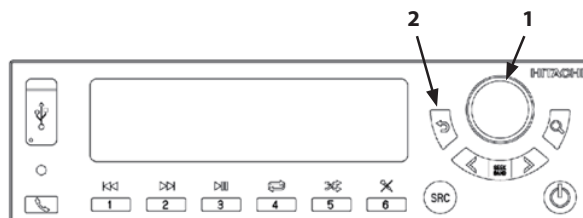


MNUD-01-434

OPERATOR'S STATION

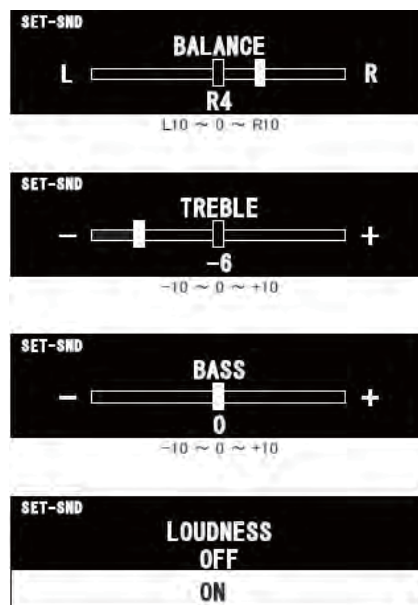
Sound Setting

1. From "SOUND" setting menu, highlight the desired item to adjust by rotating rotary switch (1) and push rotary switch (1).
2. The setting screen appears.
3. Make adjustment by rotating rotary switch (1).
4. Push rotary switch (1) to fix the adjustment.
5. Pressing return button (2) cancels the setting and it returns to the Menu screen.



MNU01-01-402

- **Left/Right Output Balance Adjustment**
Adjusts the output balance between the left and right speakers.
There are 21 steps to this adjustment: L10 (left only) to L1, 0 (Center) and R1 to R10 (right only).
- **Treble Output Adjustment**
Adjusts the high frequency part of the sound tone output to the speakers.
There are 21 steps to this adjustment: +10 to 0 to -10.
- **Bass Output Adjustment**
Adjusts the low frequency part of the sound tone output to the speakers.
There are 21 steps to this adjustment: +10 to 0 to -10.
- **Loudness Setting**
Adjusts the bass and treble ranges to be increased at low volumes to enhance hearing of those ranges.
The setting is either ON or OFF.

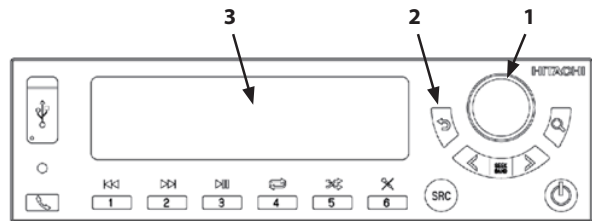


MNU01-01-435

OPERATOR'S STATION

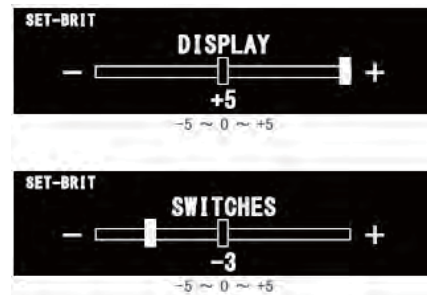
Brightness Adjustment

1. From "BRIGHTNESS" setting menu, highlight the desired item to adjust by rotating rotary switch (1) and push rotary switch (1).
2. The setting screen appears.
3. Make adjustment by rotating rotary switch (1).
4. Push rotary switch (1) to fix the adjustment.
5. Pressing return button (2) cancels the setting and it returns to the Menu screen.



MNU01-402

- **LCD Brightness**
Adjusts the brightness of LCD (3).
There are 11 steps to this adjustment: +5 to 0 to -5.
- **Switch Brightness**
Adjusts the brightness of activated switches.
There are 11 steps to this adjustment: +5 to 0 to -5.



MNU01-436

OPERATOR'S STATION

Pairing

The pairing authenticates up to 16 Bluetooth® devices for use with this radio unit.

 **NOTE:** When the pairing is tried for the 17th device, it replaces any of the current 16 devices. To delete a Bluetooth® device, refer to page 1-87 for procedure.

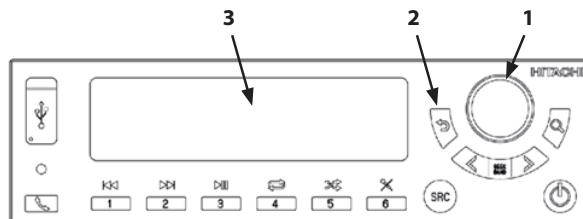
1. Highlight "PAIRING" menu by rotating rotary switch (1) and push rotary switch (1).
2. "PAIRING START?" message appears on LCD (3).
3. Push rotary switch (1) to start the pairing.
Push Return button (2) to cancel the pairing.

IMPORTANT: The pairing should be completed within 180 seconds after pairing starts.

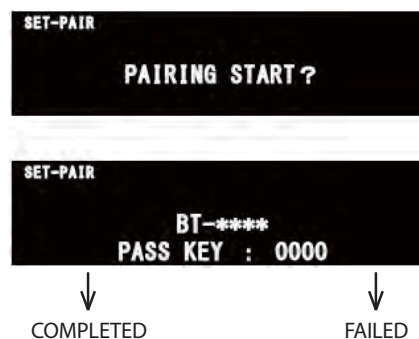
4. Once the Bluetooth® module of the radio unit completes preparations, "PASS KEY: 0000" and "BT-****" are displayed on the screen.

 **NOTE:** "****" is the smallest 4-digit of the Bluetooth® module address.

5. If pairing is successful, "COMPLETED" is displayed. The Bluetooth® device operation is possible on this radio unit. Refer to page 1-73 for each operation.
6. If pairing fails due to timeout, etc., "FAILED" is displayed. Repeat the above steps again for pairing.



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MNUD-01-438

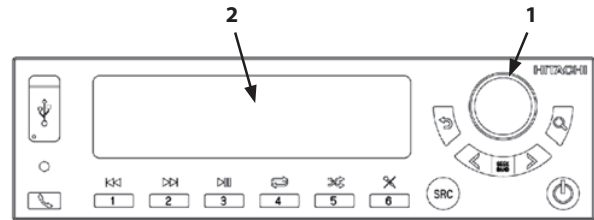
OPERATOR'S STATION

Handfree Setting

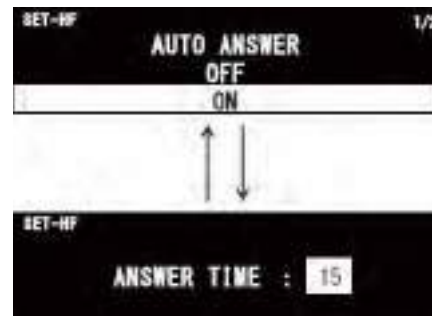
1. Highlight "HANDSFREE" menu by rotating rotary switch (1) and push rotary switch (1).
2. AUTO ANSWER setting appears on LCD (2).
3. Select "OFF" and push rotary switch (1) to disable the auto-answering to an incoming call.
4. Select "ON" and push rotary switch (1).
The time period before answering can be set among 1 to 30 seconds. Rotating rotary switch (1) clockwise increases the time by one second. Rotating rotary switch (1) counterclockwise decreases the time by one second. Push rotary switch (1) to fix the time.

This will automatically answer to an incoming call in the specified time period.

 **NOTE:** The call quality may vary depending on the connected device.



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MNUD-01-439

OPERATOR'S STATION

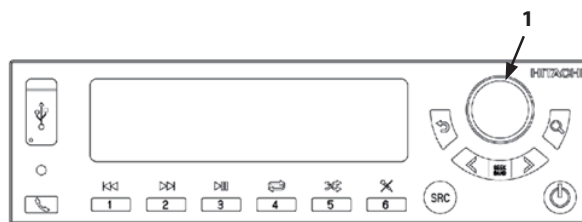
Bluetooth® Connection

This specifies the connection method to the device after Bluetooth® pairing.

1. From "Bluetooth® CONNECT" menu, highlight "AUTO CONNECT" by rotating rotary switch (1) and push rotary switch (1).

2. Select either OFF or ON and push rotary switch (1).

- OFF: Disable auto-connection to a Bluetooth® device.
- ON: Automatically connect to the available device for which pairing in Bluetooth® is completed.



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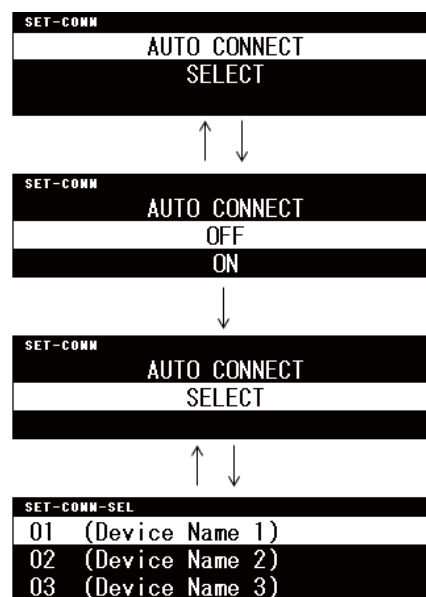
3. If "OFF" is selected in step 2, highlight "SELECT" from Bluetooth® CONNECT menu and push rotary switch (1).

NOTE: *SELECT is effective only when AUTO CONNECT setting is OFF.*

4. The available Bluetooth® device name or the device address are listed.
5. Select a device to connect by rotating rotary switch (1). Pressing rotary switch (1) starts connection to the selected device.

NOTE:

- If there is no device to connect in Bluetooth®, "NO DEVICE" is displayed.
- The device name is obtained when connecting the first time to the device after ACC ON. If the device name is changed after connection, the listed device name will not be updated.



MNUD-01-440

OPERATOR'S STATION

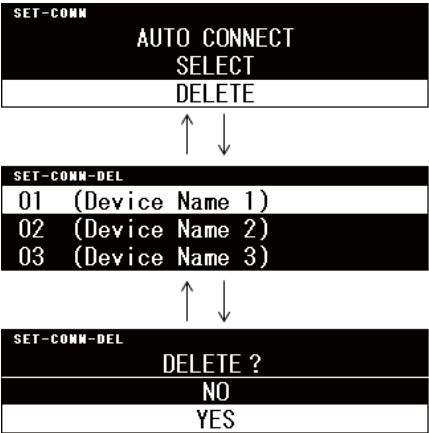
Deleting Bluetooth® Device

The selected device is deleted from the device list from Bluetooth® CONNECT - DELETE menu.

Highlight a desired device and push rotary switch (1). Select "YES" and push rotary switch (1) to delete the selected device.



MNU01-402



MNU01-441

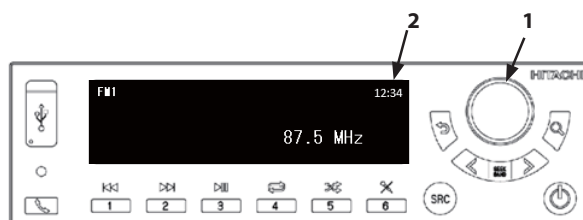
OPERATOR'S STATION

Clock Display

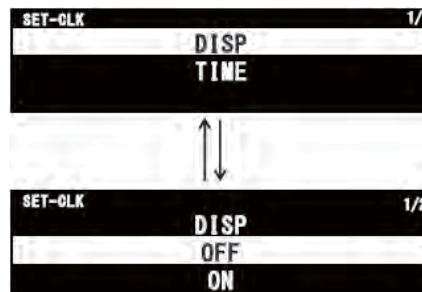
The current time is displayed on LCD (2).

1. From "CLOCK" menu, highlight "DISP" by rotating rotary switch (1) and push rotary switch (1).
2. Highlight a desired setting and push rotary switch (1).

OFF: No time display
ON: Time display in 24-hour format



MNU01-402

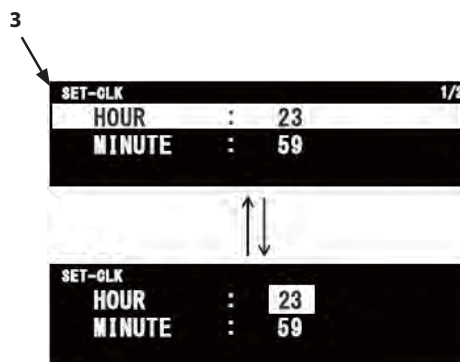


MNU01-442

Time Adjustment

 **NOTE:** When the machine battery runs out, the clock becomes 00:00.

1. From "CLOCK" menu, highlight "TIME" by rotating rotary switch (1) and push rotary switch (1).
2. The time setting screen (3) appears.
3. Highlight "HOUR" and push rotary switch (1). The hour can be set between 0 and 23.
Rotating rotary switch (1) clockwise increases number.
Rotating rotary switch (1) counterclockwise decreases number.
4. Push rotary switch (1) to fix the hour and returns to the time setting screen (3).
5. Adjust "MINUTE" in the same manner. The minute can be set between 0 and 59.



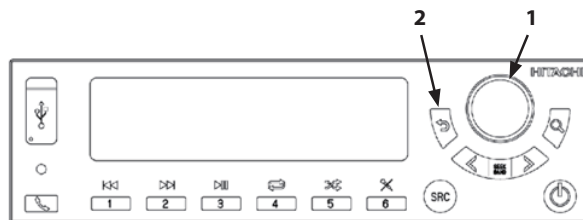
MNU01-444

OPERATOR'S STATION

Information

The current setting values are displayed.

1. From "INFORMATION" menu, highlight a desired setting by rotating rotary switch (1) and push rotary switch (1).
2. The current setting(s) are displayed. If there are 4 or more submenu, rotate rotary switch (1) to display them.



MNUD-01-402

NOTE: The **REGION** setting and **VERSION** information are additionally displayed in this menu.

- **Region Display**

Make sure the region displayed is "US."

AE: Europe, Asia, Australia

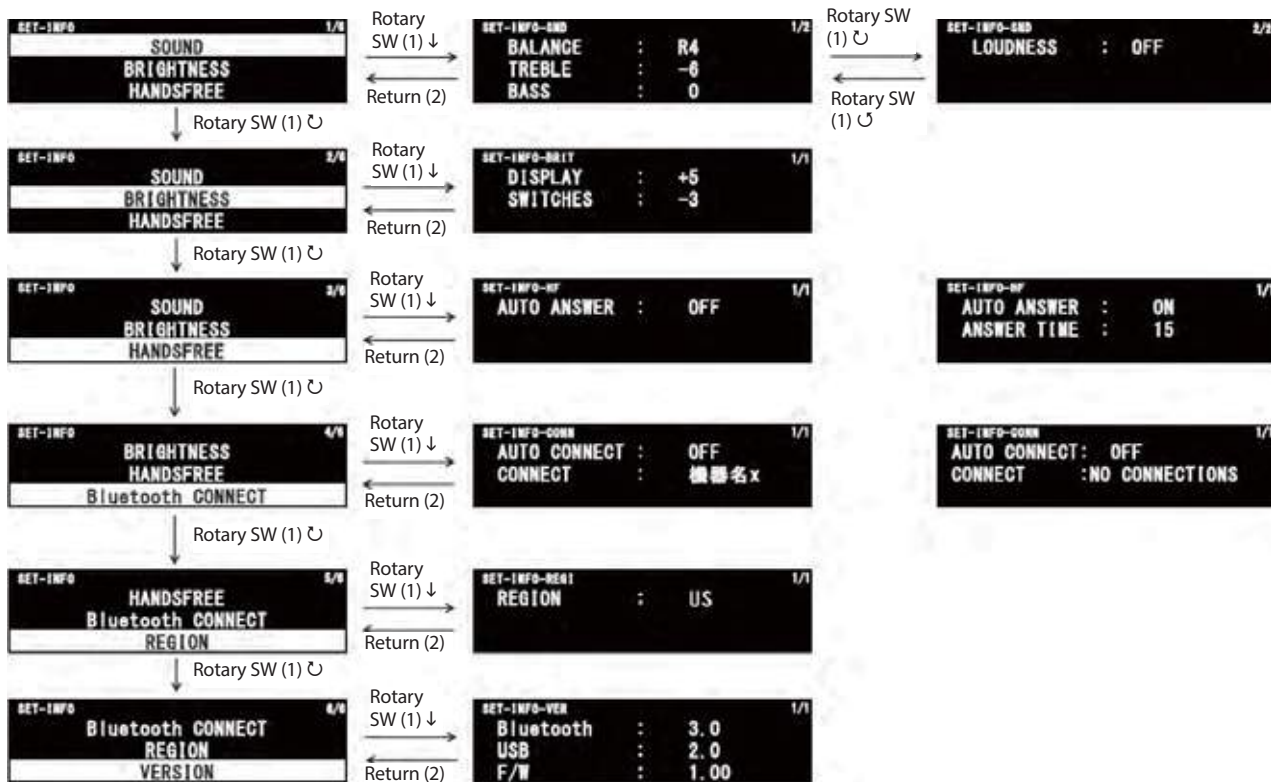
JP: Japan

US: USA, Canada

SA: Latin America

- **Version Display**

Displays the version of the radio unit's firmware, Bluetooth®, and USB protocol.

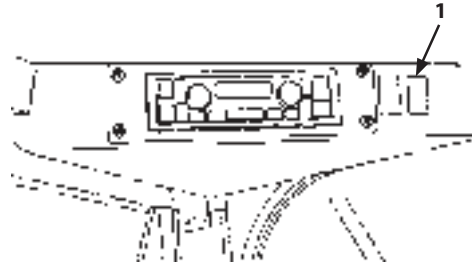


MNUD-01-445US

OPERATOR'S STATION

Overhead Switch Panel (Optional)

1- Reserved



M4EK-01-066

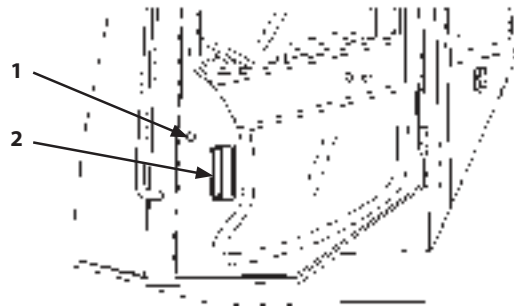
OPERATOR'S STATION

Cab Door

⚠ CAUTION: Close the door securely when shutting it. It is dangerous if it opens suddenly.

When getting down from the operator's seat onto the ground, lock the cab door with it fully open.

- 1- Door Lock Key
- 2- Door Opening Lever



M4EK-01-045

OPERATOR'S STATION

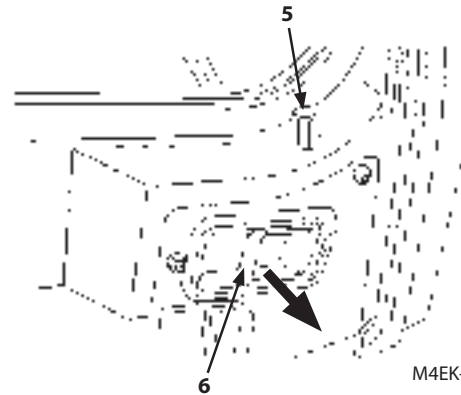
Door Lock Knob

CAUTION: After locking the door, make sure it has locked.

Press door lock knob (5) down to lock the door.

Door Opening Lever

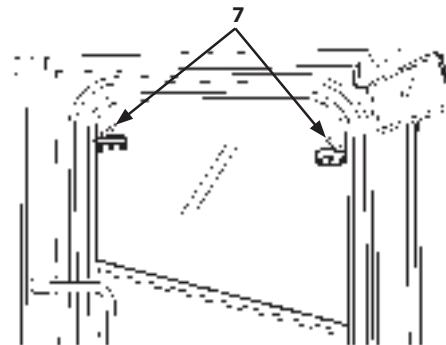
To open the door, lift up door lock knob (5) to unlock it and then pull lever (6).



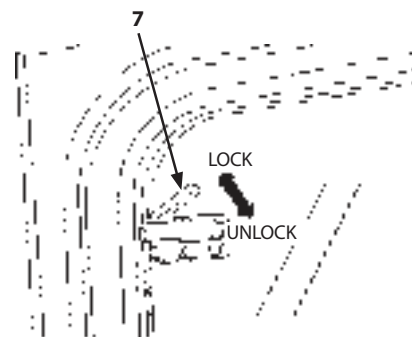
M4EK-01-046

Window Release Levers

Press both the left and right window release levers (7) at the same time to unlock the window so it can be moved. When the window release levers (7) are released, their stoppers catch at the nearest level and secure the window.



M4EK-01-047



M4EK-01-048

OPERATOR'S STATION

To Fully Open the Door

To open the door all the way (180 °), open the door and press it against the outside of the cab.

Door Lock Release Lever

CAUTION: When leaving the door open, open it until it securely locks in latch (8) on the cab.

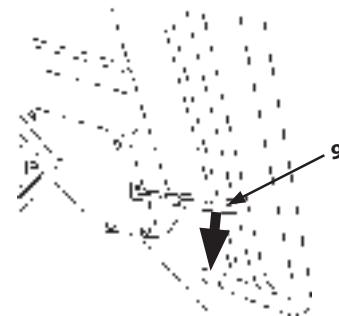
To unlock the door, push down on door lock release lever (9) or (10).



M4EK-01-049

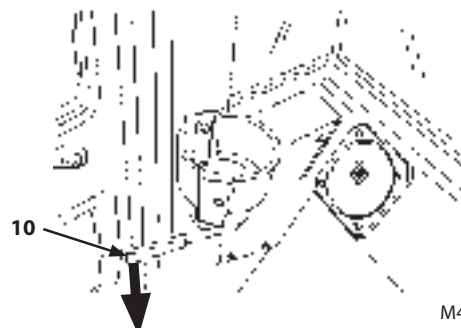


M4EK-01-051



Left Door Lock Release Lever

M4EK-01-050



Right Door Lock Release Lever

M4EK-01-032

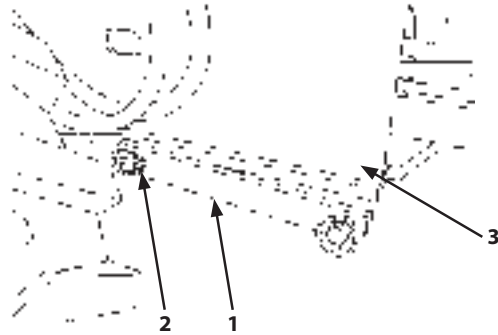
OPERATOR'S STATION

Articulation Lock Bar

⚠ WARNING: Always lock the articulation lock bar (1) prior to maintenance or transport.

Before traveling or operating the machine, always remove articulation lock bar (1) from the rear frame (4) side, then mount it on the front frame (3) and secure it with a ring pin (2).

Articulation lock bar (1) is a mechanism for locking front frame (3) to rear frame (4) to prevent the frames from articulating during maintenance or transport.



M4FG-01-034

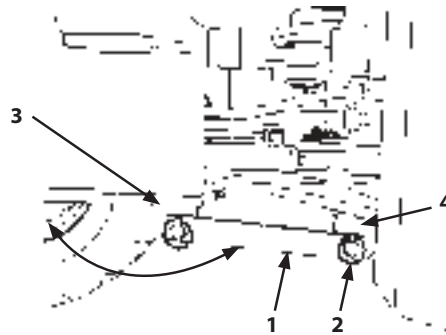
Towing Pin

⚠ WARNING: As towing entails risks, do so only in a crisis or emergency situation.

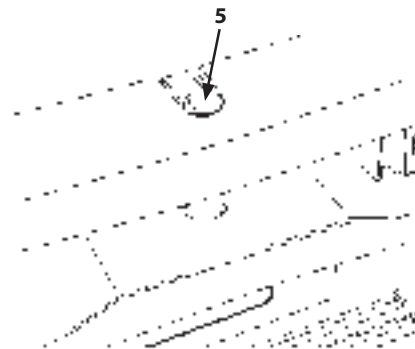
IMPORTANT: The maximum towing speed is as follows:
To avoid abnormal wear on the tires, do not tow at a speed faster than that allowed.

Maximum Towing Speed: 10 km/h or less

Towing pin (5) is mounted on the rear of the machine. It is used for towing another machine or to secure the machine during transport.



M4FG-01-035



M4FG-01-036

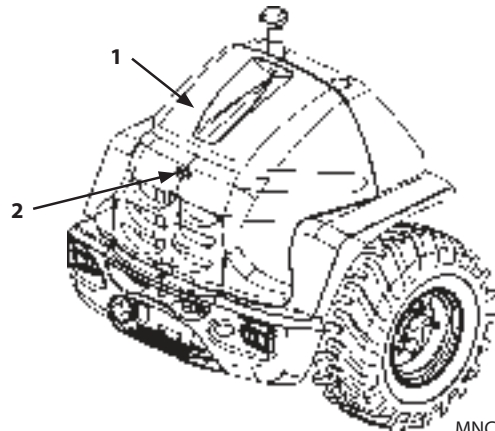
OPERATOR'S STATION

Engine Cover

WARNING:

- Allow the engine to cool before performing any inspections around it.
- Only open or close engine cover (1) when the engine is stopped. Getting caught in the fan of the engine is extremely dangerous.

Make sure engine cover (1) will not open while traveling.



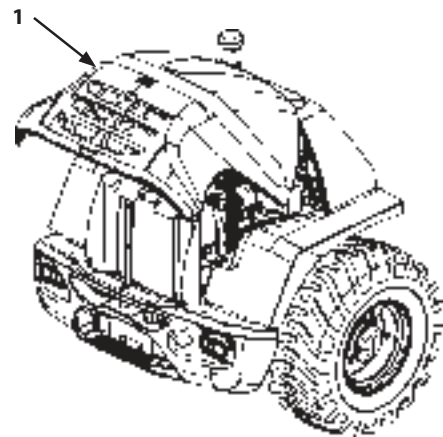
MNCH-01-523

Opening the Engine Cover

Press in lock key (2) of engine cover (1) and open it upwards for daily checks.

Closing the Engine Cover

Press engine cover (1) in gently until it clicks.



MNCH-01-524

Side Inspection Covers

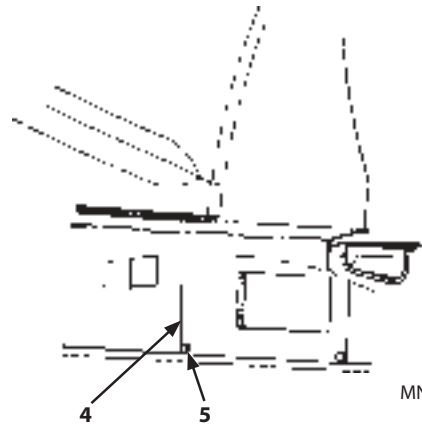
WARNING:

- Allow the engine to cool before performing any inspections around it.
- Only open or close side cover (4) when the engine is stopped. Getting caught in moving parts is extremely dangerous.

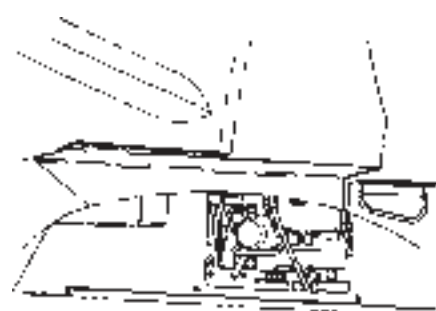
Install side cover (4) before traveling or operating the machine.

When opening side cover (4), remove the 4 bolts (5).

 NOTE: There are side covers (4) on both sides of the machine. Removing side cover (4) on the right side allows work like replacing the engine oil filter to be done.



MNCH-01-525



MNCH-01-526

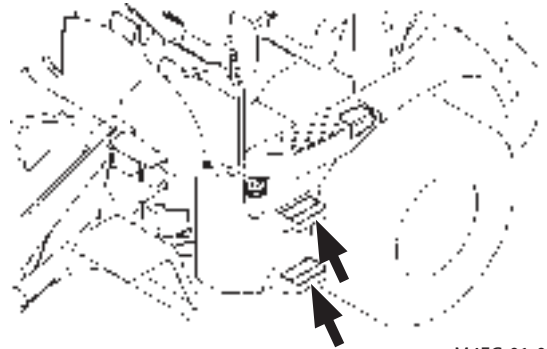
OPERATOR'S STATION

Steps

⚠ WARNING: Use both hands when getting on and off the machine and maintain at least 3 points of contact.

It is easy to slip when getting on/off with 2 or fewer points of contact, and may result in falling off.

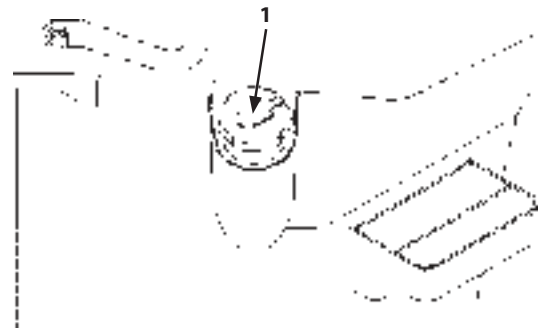
Although there are steps on both sides of the machine (left and right), it is best to use those on the left side. The front control levers block easy access from the right side.



M4FG-01-052

Anti-Vandalism Devices

The fuel tank cap (1) and engine cover (2) can be locked with a key.



M4FG-01-042



M4FG-01-052

OPERATOR'S STATION

Battery Disconnect Switch

IMPORTANT: Do not turn the battery disconnect switch OFF while the engine is running or the key switch is in any position other than OFF. Doing so may damage the electrical system.

The battery disconnect switch differs from the engine start key switch. When the battery disconnect switch is turned OFF, the electrical system is cut off, so no electric current flows in the entire circuit.

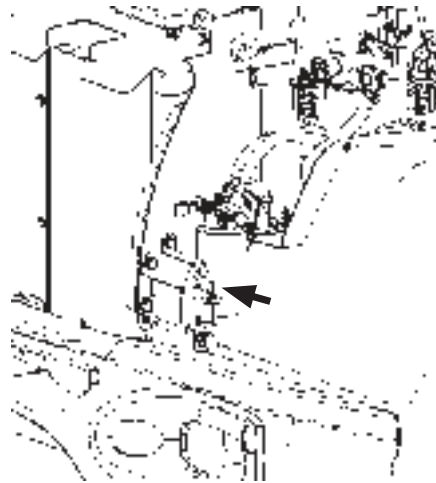
Before turning the battery disconnect switch OFF, be sure to turn the key switch OFF and wait at least 5 minutes after the engine stops. If the battery disconnect switch is turned OFF within 5 minutes after the engine stops, it may result in malfunction of the electrical system. Also, when the battery disconnect switch is turned from OFF to ON, the preset data of the radio or clock may be initialized, so reset them.

Use the battery disconnect switch for the following purposes only.

- Before maintaining or servicing the electrical system
- If the machine will not be used for a long period of time (storage)
- Before welding on the machine body
- Before replacing the battery

IMPORTANT:

- **The reason for turning the battery disconnect switch OFF for long-term storage is because doing so cuts off the small amount of current consumed by the radio and communication equipment, thus reducing battery discharge.**
- **It does not prevent self-discharge or deterioration of the battery. Perform periodic battery maintenance according to the section Inspection and Maintenance of the Electrical System and Battery in the user's manual of the vehicle.**



MNCH-01-538

OPERATOR'S STATION

Switch Operation

1. Open the engine cover.

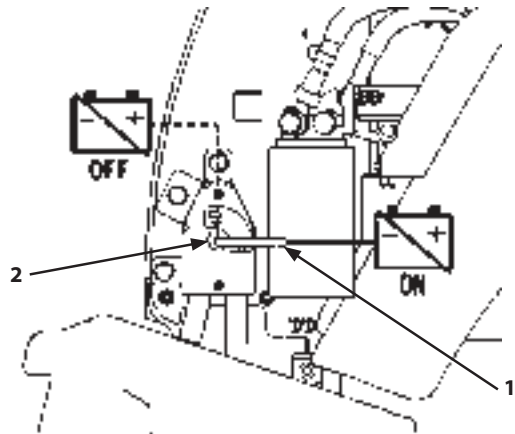
When lever (1) is pointing to the right, battery disconnect switch (2) is ON. When lever (1) is pointing to the right, lever (1) cannot be removed.

To operate the machine with battery disconnect switch (2) in the ON position, close the engine cover.

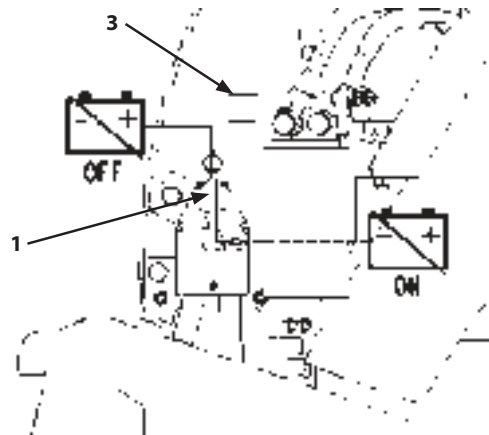
2. When lever (1) is turned 90 ° counterclockwise so it points up, battery disconnect switch (2) turns OFF. Lever (1) can be removed from battery disconnect switch (2) when it is in the OFF position.

Take care not to lose it.

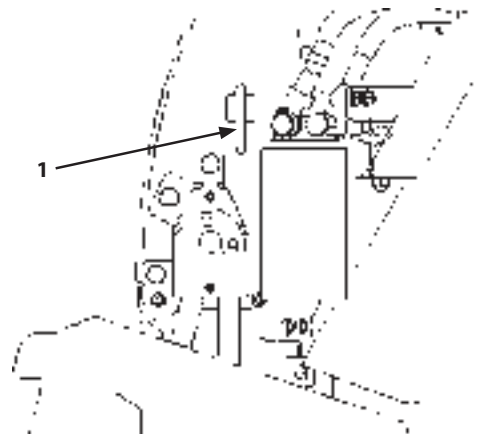
3. After removing lever (1) from battery disconnect switch (2), insert it in its holder (3) for safe keeping.



MNCH-01-539



MNCH-01-540



MNCH-01-541

BREAK-IN

Break-in Operation for New Machine

IMPORTANT: If the machine is heavily loaded without performing break-in operation, damage to the machine such as seizure and/or scoring may result by which the machine life will be remarkably shortened. Be sure to sufficiently perform break-in operation.

Machine life and performance will be greatly affected by the extent of operation and maintenance of the machine during the initial operation. Perform break-in operation for the first 100 hours.

- Check the machine before starting the engine.
- After starting the engine, sufficiently perform warm up operation.
- Avoid sudden starting, sudden acceleration and sudden braking while traveling the machine.
- Avoid heavy load for the front attachment.

MEMO

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OPERATING ENGINE

Inspect Machine Daily Before Starting

Perform required operation and daily checks before starting the engine.

- Refer to the "Maintenance" section for detailed information.

Check Points	Check For
1. Braking System	1. Brake travel must be appropriate, the brakes must work properly and braking must not be uneven. 2. The parking brake must work properly. 3. Level and leaks of the brake fluid tank.
2. Tires	1. Air pressure of tires must be appropriate. 2. No cracks or damage. 3. No abnormal wear. 4. No fragments of metal, stones or other foreign matter.
3. Wheels	Must be nothing abnormal in the mounting of the discs or wheels.
4. Lighting and Turn Signals	Must be no faults in lighting or flashing and must not be dirty or damaged.
5. Rearview and Other Mirrors	Must be no problems with view.
6. Reflectors, Vehicle Registration Display or License Plate Number	Must not be dirty or damaged.
7. Points where a problem was recognized the previous day of operation	Must be no problems in that point.
8. Engine	1. Levels and dirtiness of engine oil and coolant 2. Looseness and damage to alternator drive belt 3. Ease of starting, exhaust color, and noise 4. Oil and water leaks, damage to hoses and pipes 5. Clogging and damage to radiator, oil cooler 6. Loose and/or missing mounting bolts and nuts

OPERATING ENGINE

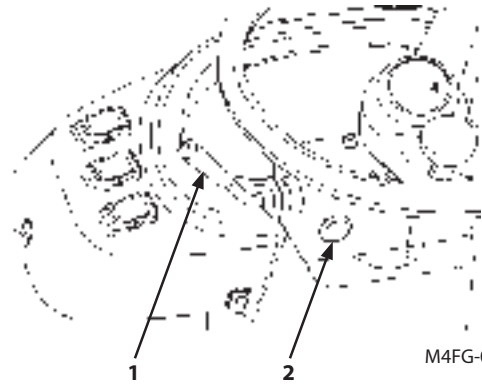
Check Points	Check For
9. Chassis	1. Oil leaks from the transmission or axles 2. Fuel level, leaks and contamination of fuel in tank, drain water 3. Level and leaks of hydraulic oil tank 4. Movement, play and operating force of all control levers and steering wheel 5. Operation of all hydraulic components, oil leaks and damage to pipes and hoses 6. Deformity, breakage, and abnormal noise at each part 7. Window washer fluid (cab-equipped machines)
10. Work Equipment	1. Check cylinders, pipes and hoses for oil leaks and damage 2. Looseness, wear, missing cutting edge 3. Wear and damage to the bucket 4. Condition of lubrication of loader front equipment 5. Damage to pin lock bolts, stoppers or links 6. Loose and/or missing mounting bolts and nuts
11. Miscellaneous	1. Operation of instruments, switches, and horn 2. Damage or deformation of canopy or cab 3. Abnormal appearance of machine 4. Loose battery terminals 5. Wear and damage to seat belt 6. Damage to steps or handrails

OPERATING ENGINE

Before Starting the Engine

1. Check and make sure that F-N-R lever (1) is in neutral (N) and neutral lever lock (2) is in its LOCK position.

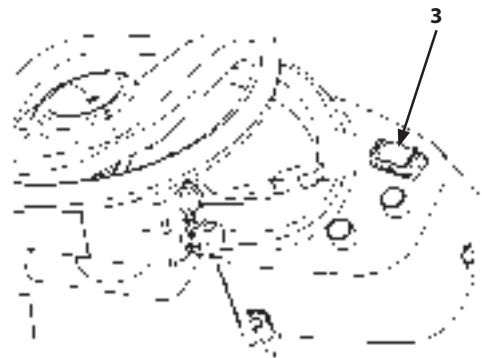
 **NOTE:** The engine will not start if F-N-R lever (1) is not in neutral (N).



M4FG-01-014

2. Make sure parking brake switch (3) is in the ON position.

When starting the engine, after checking (section 3-5) for burned out bulbs, make sure parking brake indicator (4) is lit.



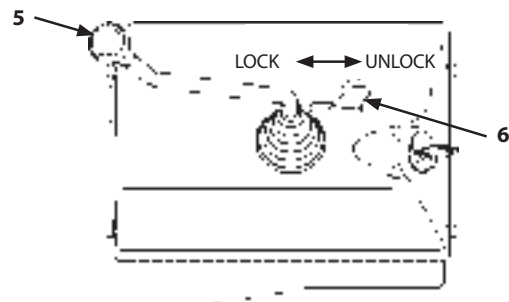
M4FG-01-020

3. Make sure front control lever (5) is in neutral.

4. Make sure control lever lock (6) is in LOCK.



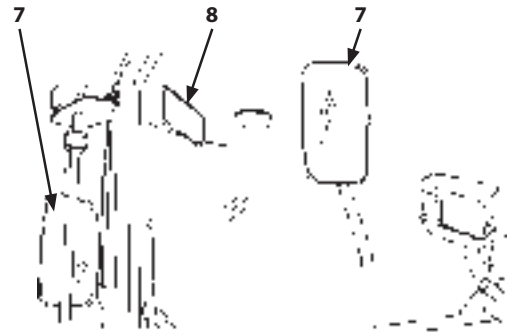
MNCH-01-531



M4FG-01-015

OPERATING ENGINE

5. Adjust the rearview mirrors outside (7) and inside the cab (8) to the position that provides the best view to the rear.



Cab-Equipped Machine

Canopy-Equipped Machine

6. Sit in the operator's seat so your back is against the backrest and adjust the various seat functions so the brake pedal can be fully depressed.



7. Fasten the seat belt.

SA-462



SA-237

OPERATING ENGINE

Starting the Engine

Start the engine in the following order.

1. Make sure F-N-R lever (2) is in neutral (N).
2. Make sure parking brake switch (1) is in the ON position.
3. Turn key switch (3) to the ON position.
4. Check for burned out bulbs.

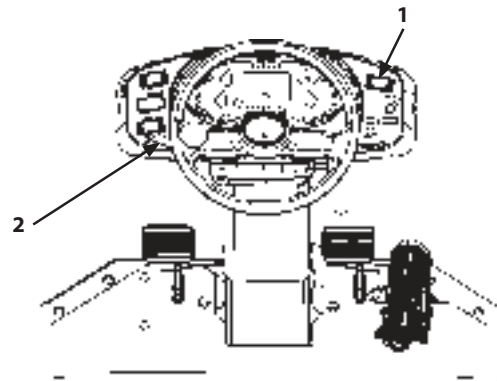
When key switch (3) is put in the ON position, indicators and warnings lamps light for about 2 seconds and then go off. Any indicators or warnings that fail to light are burned out.

However, the charge lamp (4) and engine oil pressure indicator (7) stay lit until after the engine is started.

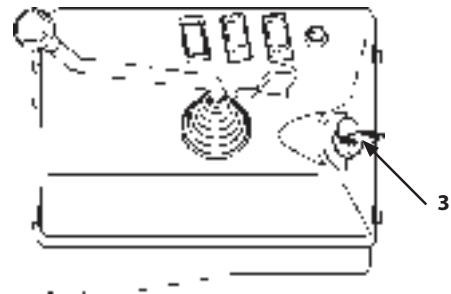
5. Make sure parking brake indicator (5) is lit and then once preheating is complete and preheat indicator (6) goes off, sound the horn to warn anyone in the area.

NOTE:

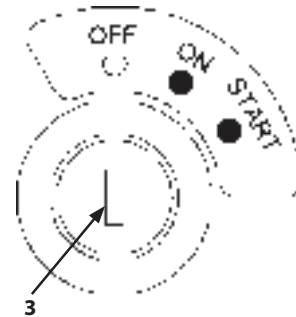
- Preheating operates automatically before starting the engine, according to engine coolant temperature.
- The monitor display turns off momentarily when starting the engine, but this is normal.



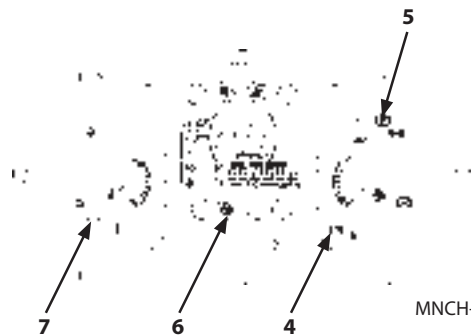
MNCH-01-508



MNCH-01-533



MNCH-01-528



MNCH-01-531

OPERATING ENGINE

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

Failure to follow instructions may cause damage to the starter and/or discharge the batteries.

7. Turn key switch (3) to the START position to rotate the starter. The engine will start.

Do not operate accelerator pedal (7) when starting the engine.

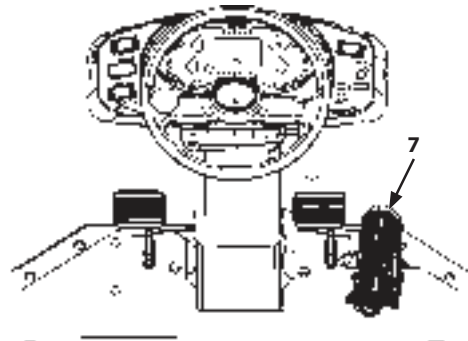
8. Release the key right after the engine starts. The key returns to the ON position automatically.

Do not operate accelerator pedal (7) after starting the engine (do not press it down); allow it to run at idle during warmup.

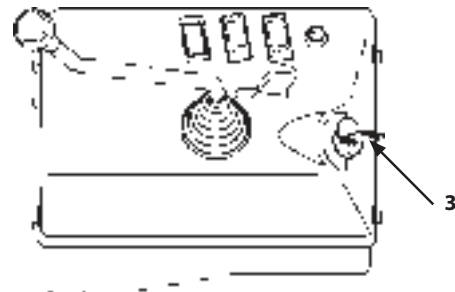
WARNING: After starting the engine, make sure the engine speed is changed by operating accelerator pedal (7), and then start working or travel.

Failure to take this step may result in an accident, such as a collision, due to the machine starting to move unexpectedly or sudden movement of the front attachment.

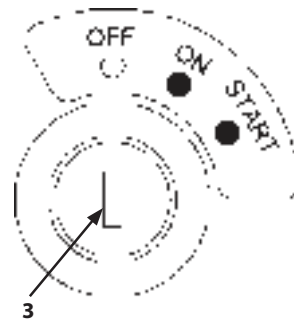
NOTE: White smoke may be emitted for several minutes after the engine starts, this is not a malfunction.



MNCH-01-508



MNCH-01-533



MNCH-01-528

OPERATING ENGINE

Starting in Cold Weather

Preheating

1. Turn key switch (2) to the ON position. The coolant temperature sensor detects the temperature of the coolant and automatically actuates engine preheating.
2. Preheat indicator (1) lights. The engine is preheating as long as preheat indicator (1) is lit.

 **NOTE:** The time it takes to preheat depends on the coolant temperature.

3. As soon as preheat indicator (1) goes OFF, turn switch (2) to the START position to turn the starter. Release the key right away once the engine starts. The key returns to the ON position automatically.

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

Do not operate accelerator pedal (3) after starting the engine (do not press it down); allow it to run at idle during warmup.

Warm up the machine after starting the engine, as per 3-11.

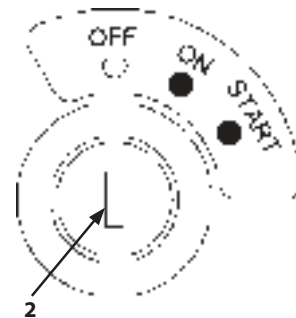
 **WARNING:** After starting the engine, make sure the engine speed is changed by operating accelerator pedal (3), and then start working or travel.

Failure to take this step may result in an accident, such as a collision, due to the machine starting to move unexpectedly or sudden movement of the front attachment.

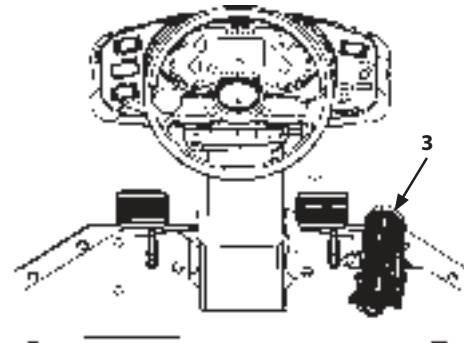
 **NOTE:** When it is cold, the head lights and room light may dim while the engine preheating function is operating.



MNCH-01-531



MNCH-01-528



MNCH-01-508

OPERATING ENGINE

Check Instruments After Starting the Engine

IMPORTANT: If any abnormality is noticed on the monitor unit, immediately stop the engine. Investigate the cause of the problem.

Monitor Operation Checks

1. Check that discharge indicator (3) is OFF.

If the discharge indicator stays ON, immediately stop the engine. Inspect the alternator and battery system for any abnormality.

2. Has engine oil pressure indicator (2) gone OFF?

If the engine oil pressure indicator stays ON, immediately stop the engine. Inspect the engine oil pressure system and the oil level.

3. Is coolant temperature gauge (1) indicating within the blue range?

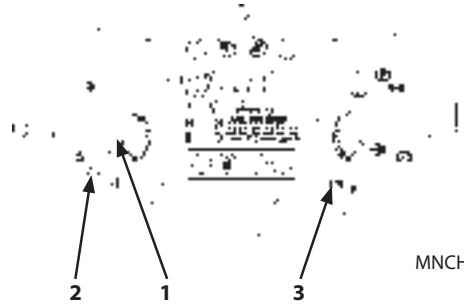
 **NOTE:** When the key switch is turned ON, the various indicators light up and the buzzer sounds for about 2 seconds, as a check for whether any lamp (s) are burnt out.

Check Engine Noise and Exhaust Gas Color

Check that the engine noise and exhaust gas color are normal.

 **NOTE:**

- Check the exhaust gas color as follows. (After warm-up operation, run the engine under no load.)
No color or light blue: Normal (complete combustion)
Black: Abnormal (imperfect combustion, fuel system problem)
White: Abnormal (oil in the combustion chamber, fuel system problem)
- White smoke may be emitted for several minutes after the engine starts, this is not a malfunction.



MNCH-01-531

OPERATING ENGINE

Starting with Booster Cables

IMPORTANT: The electrical system of the machine is 12 volt DC. Only jump from a machine with a 12 volt DC system that has enough extra 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 the electrolyte level is lower than specified. Explosion of the battery may result.
- Park the machine and the machine providing the jump on a dry or concrete surface, not on steel plates. Parking a machine on steel plates may result in sparking unexpectedly.
- Never connect a positive terminal to a negative terminal. Doing so may cause a short.

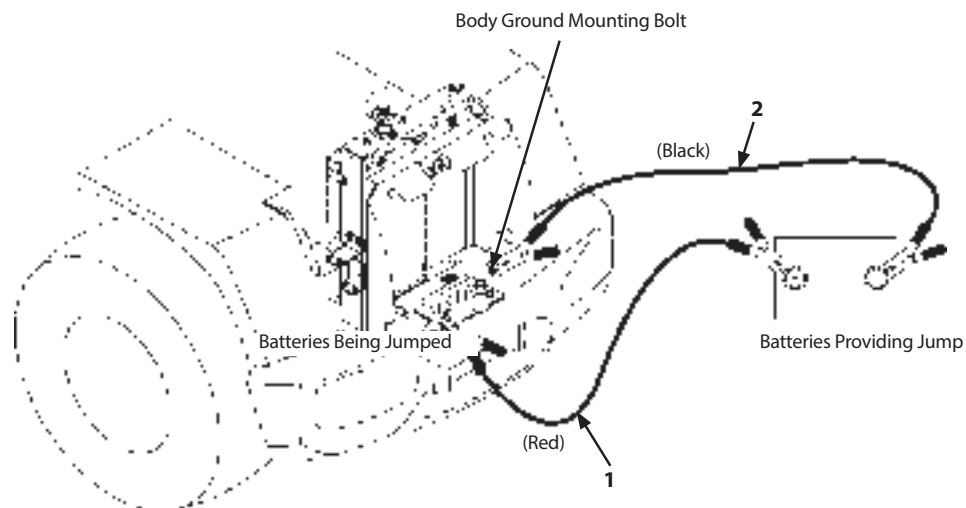
When the machine's batteries are dead, start the engine by connecting booster cables to the batteries of the jumping vehicle as shown below.



SA-032

OPERATING ENGINE

1. Connecting the Booster Cables
 - 1.1. Stop the engine of the machine providing the jump.
 - 1.2. Connect one end of red cable (1) to the positive (+) terminal of the machine batteries, and the other end to the positive (+) terminal of the booster battery.
 - 1.3. Connect one end of black cable (2) to the negative (-) terminal of the battery providing the jump, and then attach the other end to a radiator mounting bolt of the machine being jumped. As sparks may fly when the last connection is made, connect the cable as far away from batteries as possible.
 - 1.4. After securely connecting the booster cables, start the engine of the machine providing the jump.
 - 1.5. Start the engine of the machine with the dead batteries.
 - 1.6. After the engine starts, disconnect cables (2) and (1) as follows.
2. Disconnecting the Booster Cables
 - 2.1. Disconnect black booster cable (2) where it is connected to the radiator mounting bolt of the machine.
 - 2.2. Disconnect the other end of black negative (-) cable (2) from the booster batteries.
 - 2.3. Disconnect the end of red positive (+) cable (1) from the booster batteries.
 - 2.4. Disconnect the other end of red positive (+) cable (1) from the batteries receiving the jump.



M4FG-03-001

OPERATING ENGINE

Warming Up Operation

⚠ WARNING: After starting the engine, make sure the engine speed is changed by operating accelerator pedal (3), and then start working or travel.

Failure to take this step may result in an accident, such as a collision, due to the machine starting to move unexpectedly or sudden movement of the front attachment.

⚠ CAUTION: Using this machine without first allowing it to warm up may result in scorching or otherwise damaging the engine, and/or damage to hydraulic equipment. It is also necessary to perform warmup to ensure safety, such as by preventing accidents due to poor functioning of hydraulic equipment.

Sudden operation of hydraulic equipment when the hydraulic oil is below 20 °C may damage it. Start the engine and then perform the following warmup procedure completely to warm up the hydraulic oil to 20 °C before starting work.

1. Allow the engine to idle for about 3 to 5 minutes under no load; refrain from operating accelerator pedal (3) (do not depress it.)

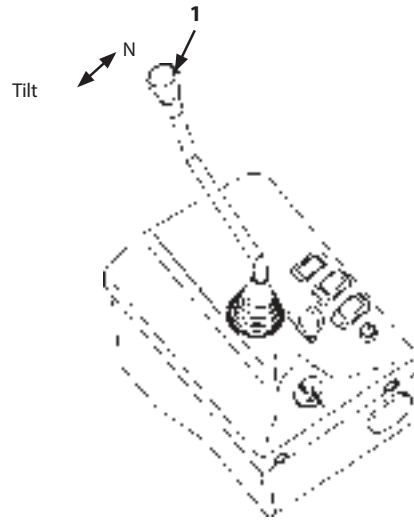
If the coolant temperature is 20 °C (68 °F) or less, the machine goes into its warmup mode, automatically raising the engine speed from slow idle to 1300 min⁻¹ (rpm).

The warmup mode is canceled and engine speed returns to slow idle in any of the following cases.

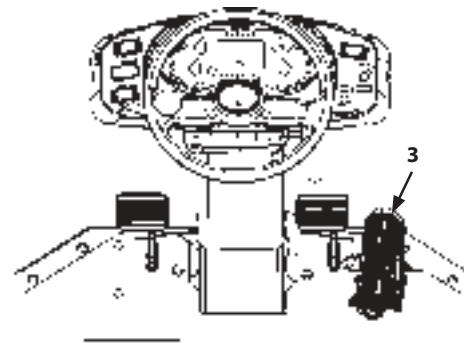
- If the parking brake switch is turned OFF
- If the coolant temperature exceeds 40 °C (104 °F)
- At the end of 10 minutes since entering the warmup mode

(Do not operate the machine until the needle of coolant temperature gauge (2) starts swinging.)

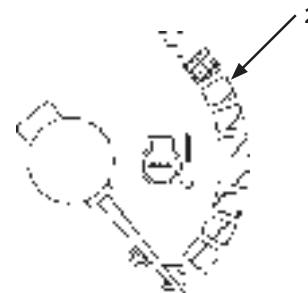
2. Set the engine to a medium speed and lift the bucket off the ground. Hold control lever (1) in the bucket tilt position and return it to the neutral position. Treat this as 1 cycle and repeat it within 10 seconds. (When doing so, do not perform any operation other than tilt.)



MNCH-01-535



MNCH-01-508



MNEC-03-002

OPERATING ENGINE

Warming Up in Cold Weather

⚠ WARNING: After starting the engine, make sure the engine speed is changed by operating accelerator pedal (3), and then start working or travel.

Failure to take this step may result in an accident, such as a collision, due to the machine starting to move unexpectedly or sudden movement of the front attachment.

⚠ CAUTION: When the hydraulic oil is cold, perform the warmup operation and wait until the work equipment operating speed is normal before operating the machine. Using this machine without first allowing it to warm up may result in scorching or otherwise damaging the engine, and/or damage to hydraulic equipment. It is also necessary to perform warmup to ensure safety, such as by preventing accidents due to poor functioning of hydraulic equipment.

💡 NOTE: When it is cold, the head lights and room light may dim while the engine preheating function is operating.

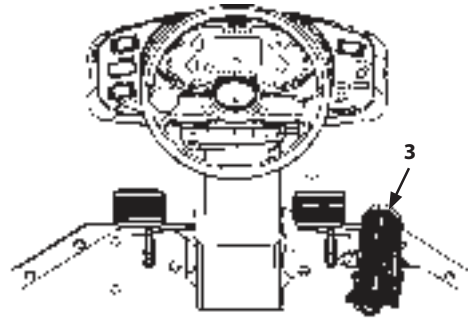
1. Run the engine at idle for at least 5 minutes.

If the coolant temperature is 20°C (68 °F) or less, the machine goes into its warmup mode, automatically raising the engine speed from slow idle to 1300 min⁻¹ (rpm).

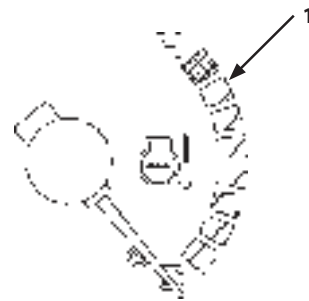
The warmup mode is canceled and engine speed returns to slow idle in any of the following cases.

- If the parking brake switch is turned OFF
- If the coolant temperature exceeds 40°C (104 °F)
- At the end of 10 minutes since entering the warmup mode

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



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OPERATING ENGINE

2. Run the engine at a medium speed for 5 minutes.

IMPORTANT: At such time, do not run the engine at high or low speed.

3. Slowly lift the bucket about 1 meter off the ground.
4. Slowly extend the bucket cylinder to stroke end.

IMPORTANT: When doing so, do not continue relieving the control lever for over 10 seconds.

5. Slowly contract the bucket cylinder to stroke end.

IMPORTANT: When doing so, do not continue relieving the control lever for over 10 seconds.

6. Repeat steps 2 to 4 above until the bucket cycle time is normal. Run the engine at medium speed for longer to warm the machine when the outside air temperature is 0 °C or lower.

OPERATING ENGINE

Stopping the Engine

Stop the engine in the following order.

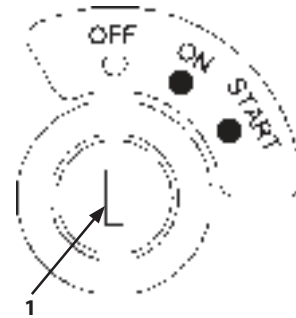
IMPORTANT: Do not stop the engine during travel.

Stopping the engine not only makes the steering wheel unusable, it also actuates the parking brake, so doing so is dangerous. It may also cause damage to the electrical and/or mechanical systems.

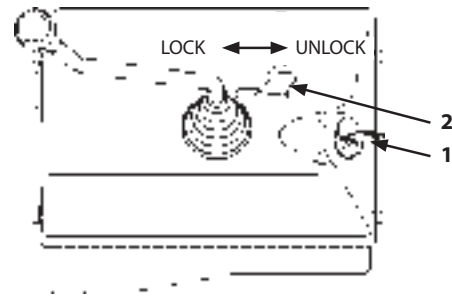
1. Before stopping the engine, lower the bucket to the ground so it is level.

IMPORTANT: If as the engine is equipped with a turbocharger, if it is stopped without first performing the cool down operation, the lubricant on the turbocharger bearing surfaces may dry out due to the intense heat, possibly causing damage to the turbocharger.

2. Run the engine at slow idle for 5 minutes to cool it.
3. Put control lever lock (2) in the LOCK position.
4. Turn key switch (1) OFF to stop the engine.



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M4FG-01-015

DRIVING MACHINE

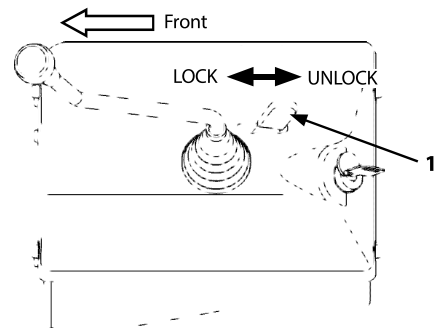
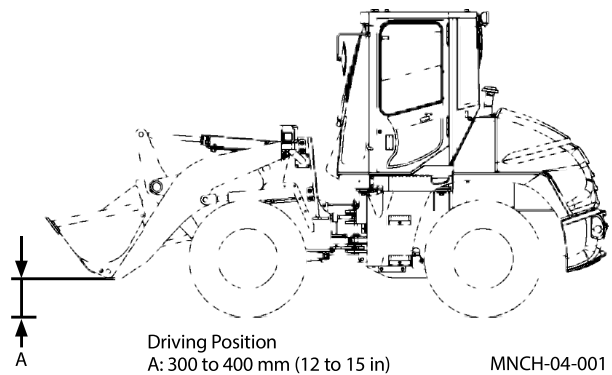
Driving Machine

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 place loader control lever lock (1) in the LOCK position so that the attachment will not move even if the control levers are accidentally operated.
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 warming up operation.



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.

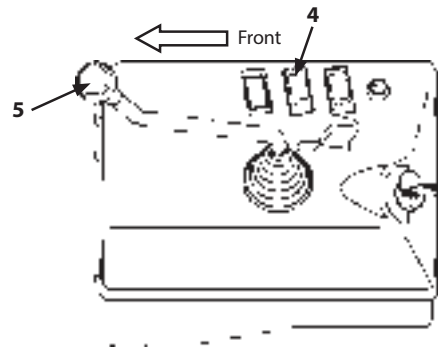
Never turn ride control switch (4) (Optional) to ON position while traveling the machine or raising the front attachment. Before turning the ride control switch ON, stop the machine and confirm safety around the bucket. If ride control switch (4) (Optional) is turned ON while traveling the machine, the lift arm will move upward or downward, possibly creating a dangerous situation.

Refer to page 1-47 for ride control switch (4) (Optional).

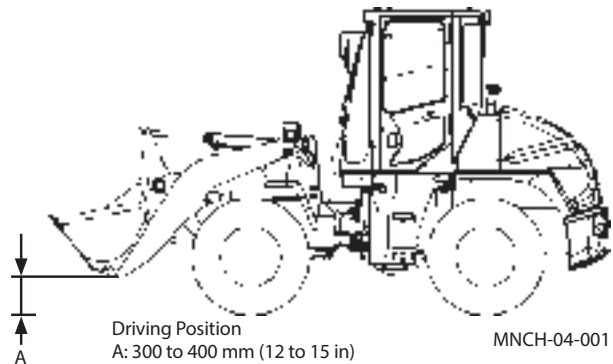
1. Check that none of the warning indicators except service indicator (2) and parking brake indicator (3) on the monitor panel (1) are ON.
2. Set the front attachment in the driving position by operating loader control lever (5).
3. Press neutral lever lock (6) to the UNLOCK position.



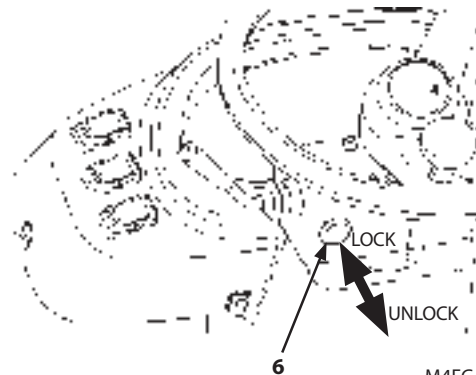
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MNCH-04-001



M4FG-01-014

DRIVING MACHINE

4. Step on brake pedal (9) and depress parking brake switch (7) to the OFF position to release the parking brake. Check that at this time service indicator (2) and parking brake indicator (3) go OFF.
5. Move F-N-R lever (10) to either forward (F) or reverse (R) position.
6. Shift the travel speed stage by using Hi-Lo selector switch (11) to match the desired travel/work mode.

Hi-Lo Selector Switch

Switch (11) is used to shift the travel speed stage. Auto shift 2-Speed mode or 1-Speed mode is selected.

Lo : To be used for excavation and loading work

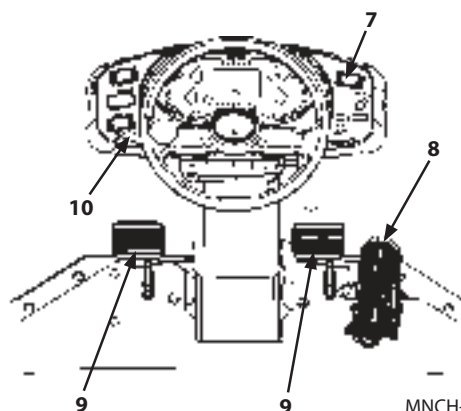
Hi : To be used for traveling the machine

CAUTION: When traveling on rough terrain, slopes, mud or snow, select the travel mode switch in Lo position and drive the machine at slow speed.

7. Release brake pedal (9) and step on accelerator pedal (8).



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DRIVING MACHINE

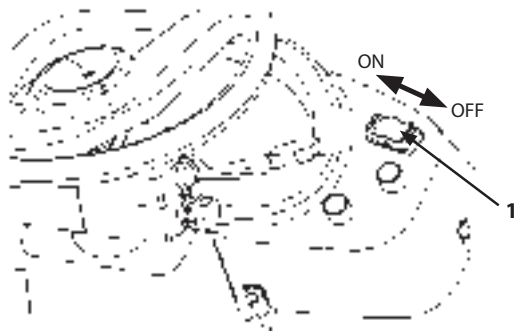
Parking Brake Switch

⚠ WARNING: To prevent the occurrence of accidents due to runaway of the machine, be sure to apply the parking brake when parking the machine and before leaving the machine.
Never apply the parking brake switch (1) while the machine is moving except in an emergency. Premature wear and/or damage to the parking brake may result. If the parking brake was applied while traveling the machine because of an emergency, have the parking brake inspected by your nearest authorized dealer.

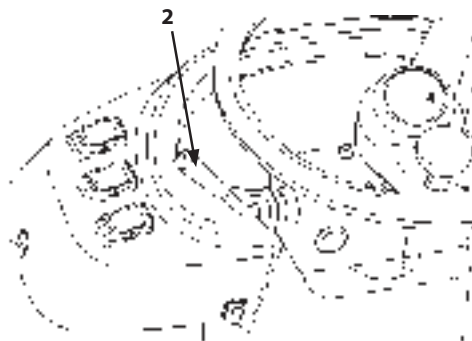
- Press the OFF side of parking brake switch (1) to release the parking brake. Check that parking brake indicator (5) and service indicator (4) go OFF by pressing the switch twice. Press the ON side of parking brake switch (1) to apply the parking brake.
Operate the parking brake after parking the machine on level ground.

🔧 NOTE: While running the engine, when the parking brake is applied with F-N-R lever (2) in neutral, parking brake indicator (5) come ON.

- While running the engine, when the parking brake is applied with F-N-R lever (2) in either the forward (F) or reverse (R) position, parking brake indicator (5) come ON, and the alarm buzzer sounds. The monitor display indicates (3) "N" not "F" and "R". The monitor display will not indicate "F" and "R" until the parking brake is released.
- In order to ensure safe operation, the parking brake is automatically applied when the engine is stopped even though parking brake switch (1) is OFF.
In this case even after the engine is restarted, the parking brake will not be released. After starting the engine, push OFF position of parking brake switch (1) to release the parking brake.



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DRIVING MACHINE

Drive Speed Change

Travel speed of this machine is automatically shifted.
Auto shift 2-Speed mode or 1-Speed mode is selected by using Hi-Lo selector switch (1).

Lo : 1-Speed mode. To be used for excavation and loading work

Hi : Auto shift 2-Speed mode. To be used for traveling the machine.

IMPORTANT: While traveling at high speed, avoid quick deceleration by operating Hi-Lo selector switch (1).
Change the travel speed only after the machine decelerates by releasing the accelerator pedal.



M4FG-01-014

Changing Forward/Reverse Drive Direction

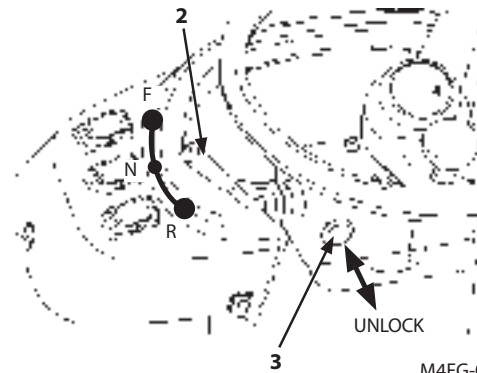
⚠ WARNING: Before changing the drive direction, confirm that the direction of travel is clear.
To ensure operator's safety and ensure the longevity of the power train system, change the machine drive direction only after sufficiently reducing the drive speed.

1. Pull neutral lever lock (3) to the UNLOCK position.
2. Press the OFF position of parking brake switch (4).
3. Move F-N-R lever (2) to the desired position.

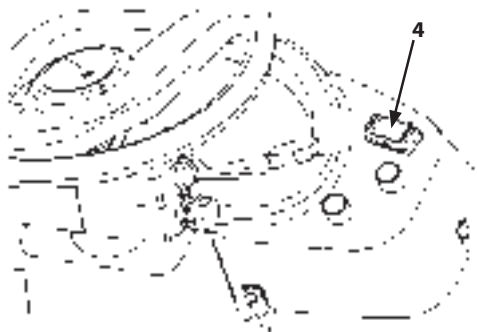
F: Forward Driving

N: Neutral

R: Reverse Driving



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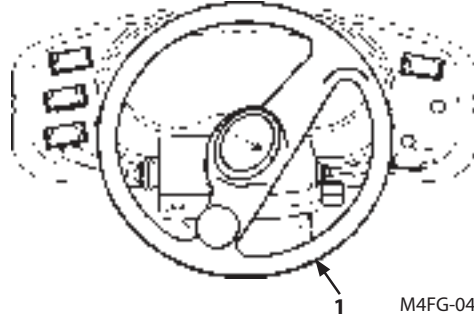
DRIVING MACHINE

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.



M4FG-04-002

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

Stop and Restart of Travel

Follow the tips described below when required to provisionally stop or restart driving.

1. Slowly release the accelerator pedal. Depress the service brake pedal to stop the machine.
2. Slowly depress the accelerator pedal while releasing service brake pedal to move the machine again.
3. When it is required to park the machine for a long period of time, return the F-N-R lever to neutral, 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 machine, return the F-N-R lever to neutral, apply the parking brake by turning the parking brake switch ON. Then, after rectifying the drive position, begin driving the machine again. Always allow the machine to maintain correct drive position.

Precautions for Traveling

During drive operation, observe the operation best practices and the precautions described below to ensure safe and correct operation.



WARNING: Use care to the following points:

- **In case a tire becomes 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 operator may lose steering control, possibly creating a serious accident.
Never apply the brake quickly if a tire is punctured.**
- **Never mount or dismount a moving machine. Never allow any personnel other than the operator to ride on the machine when driving.**

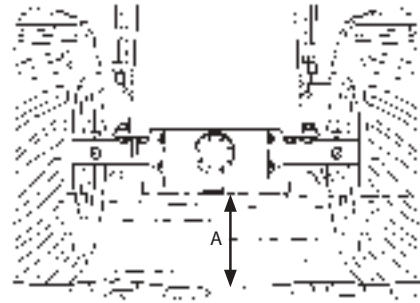
DRIVING MACHINE

- 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, vibration, or smell is noticed during drive operation, immediately stop the engine and inspect the machine for any trouble.
- Avoid using sudden steering or braking as much as possible because not only your 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 of the opposite driving lane.

Traveling in Water or on Soft Ground

IMPORTANT: 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. Contact your nearest authorized dealer.

- Do not submerge the front and rear axles, transmission, parking brake, 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.



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 **NOTE:** After operation is complete, be sure to wash and lubricate all submerged areas.

DRIVING MACHINE

Precautions for Driving on Slopes

WARNING:

- **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 loader front to increase the machine stability. Do not steer on a steep slope. Failure to do so may possibly cause the machine to turn over.

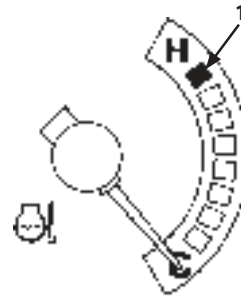
When descending a slope, travel the machine in the slow drive gear range using sufficient engine braking.

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. After moving the forward/reverse selector lever to neutral, restart the engine. The parking brake is automatically applied when the engine stops. Turn the parking brake switch ON before restarting the engine.

When continuously ascending a slope, the engine coolant temperature may increase in a short period of time according to the inclination pitch.

When the coolant temperature gauge indicates red zone (1) while ascending a slope, immediately stop the machine and run the engine at slow idle speed. Restart the machine when the coolant temperature falls in the center range.

- 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.



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DRIVING MACHINE

Precautions for Driving Speeds

⚠ CAUTION: Descend the machine on a steep slope with the Hi-Lo selector switch in Lo while applying engine brake sufficiently. Apply the normal brakes only when absolutely required.

Traveling for a long time without reducing the speed will create the causes of various machine troubles.

When the machine travels faster than the warning travel speed, the 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.



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Speed Control Function

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

Warning Setting Speed	Service Indicator (1) HST Warning Indicator (2)	Buzzer
Approx. 36 km/h (22.4 mph)	Flashing	Intermittent

DRIVING MACHINE

Precautions to be Taken if Machine Failure Occurs

- Keep alert. While paying attention to the vehicles following you, slowly reduce the travel speed and park the machine on the road shoulder as closely to the shoulder edge as possible. When any machine failure is recognized in a short tunnel, park the machine outside the tunnel as long as possible.
- Indicate using a sign that the machine is failure. Unless a sign is used, collision with a following vehicle from behind may result. Be sure to indicate the sign of the machine failure using one of the following methods.
 - Use a parking signboard.
 - Turn the hazard lights ON.
 - Use an emergency signal instrument (emergency signal light).
 - Use a red flag or light.
 - Tie a piece of cloth like a handkerchief to an easy-to-see place such as the door or the rear end of the machine.
- Check the failed part. If possible, repair the machine by yourself while ensuring safety and paying attention to the traffic conditions of other vehicles.



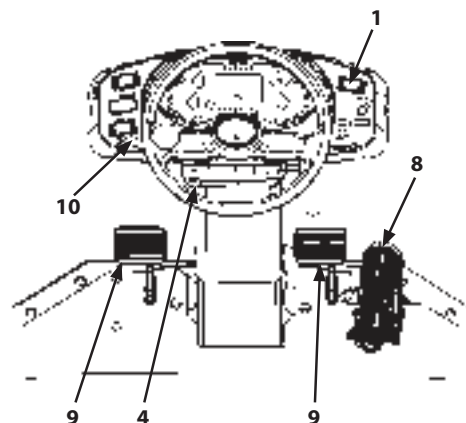
WARNING: Do not spill oil on the road surface. Failure to do so may cause the following vehicle to slide, possibly creating a serious accident.

- 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, consult your nearest authorized dealer.
- Repair work in the tunnel is very dangerous. Avoid working outside the vehicle even simple tasks.

DRIVING MACHINE

Stop

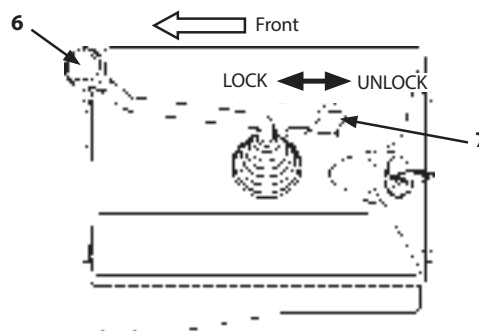
1. Avoid sudden deceleration. Smoothly reduce travel speed.
Release accelerator pedal (8) and step on brake pedal (9) to stop the machine.
2. Return F-N-R lever (10) to neutral (N).
Place neutral lever lock (4) to the LOCK position.
3. Turn parking brake switch (1) ON.
4. Level the bucket with the ground surface and lower the bucket to the ground by operating loader control lever (6).
5. Move the lock position of loader control lever lock (7).



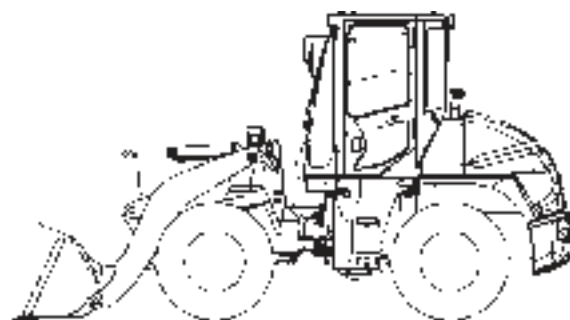
MNCH-01-508

IMPORTANT: This machine is equipped with a turbocharged engine. Therefore if the engine is stopped without cooling down, the lubricant on the turbocharger bearing surfaces may dissipate due to the intense heat, possibly damaging to the turbocharger.

6. Run the engine at low idle speed to cool the engine for 5 minutes. Do not idle for excessively long periods. Observe local and federal idling regulations.



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Stop and Parking Position

MNCH-04-002

DRIVING MACHINE

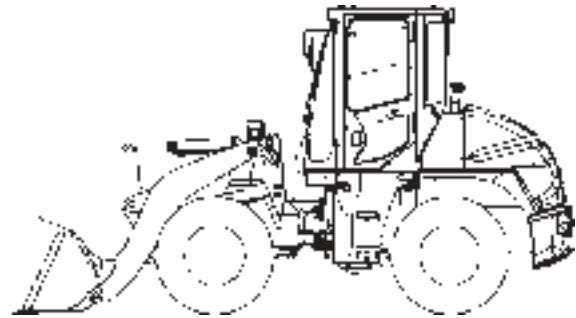
Parking

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 doors when parking the machine. When parking a canopy vehicle, cover the electrical components and the operator's seat with plastic covers to protect them from bad weather.

1. Stop and park the machine on level surface. Lower the bucket to the ground.
2. Check that loader control lever (3) is in the neutral (N) position and that neutral lever lock (2) is in the lock position.
3. Turn parking brake switch (1) ON.
4. Level the bucket with the ground surface and lower the bucket to the ground by operating loader control lever (4).
5. Move the lock position of loader control lever lock (5).

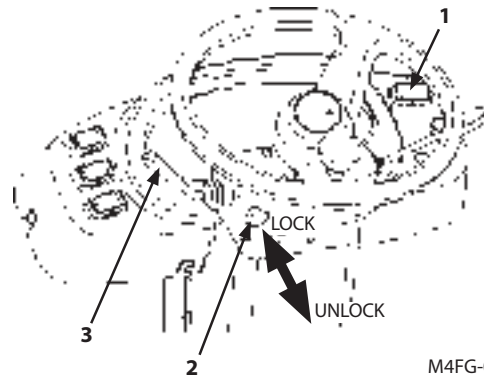
IMPORTANT: This machine is equipped with a turbocharged engine. Therefore if the engine is stopped without cooling down, the lubricant on the turbocharger bearing surfaces may dissipate due to the intense heat, possibly damaging to the turbocharger.

6. Run the engine at low idle speed to cool the engine for 5 minutes. Do not idle for excessively long periods. Observe local and federal idling regulations.

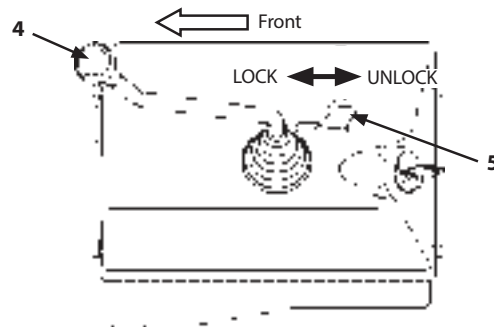


Stop and Parking Position

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M4FG-01-007



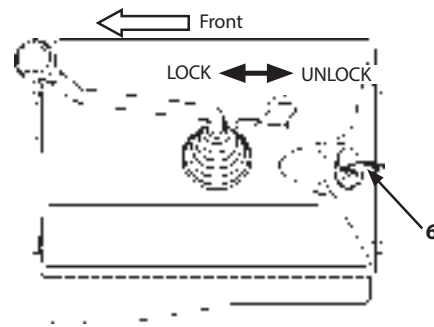
M4FG-01-015

DRIVING MACHINE

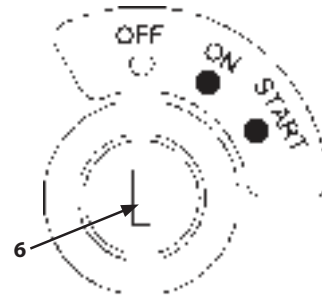
IMPORTANT: If the key switch (6) is left in ON position, the batteries will discharge.

Be sure to turn key switch to OFF position before leaving the machine.

7. Turn the key switch (6) to OFF position to stop the engine. Remove the key from the switch.
8. Before leaving the machine, close all access covers and lock them.
If the machine is equipped with the cab, close and lock all the windows, cab doors, and access covers and lock them before leaving the machine.



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DRIVING MACHINE

Emergency Evacuation

When the Engine Has Stalled During Driving

The service brake applies by depressing the brake pedal and the pressurized oil in the master cylinder acts on the brake system.

If the machine does not stop even if the brake pedal is applied, press the parking brake switch ON side to stop the machine.

As the hydraulic system becomes deactivated, the steering system becomes very difficult to operate.

In the event any symptom mentioned above occurs, immediately trace the cause of the problem.
In case a complicated failure has occurred, consult your nearest authorized dealer.

MEMO

This image shows a full page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, typical of notebook paper. There are no margins, text, or other markings on the page.

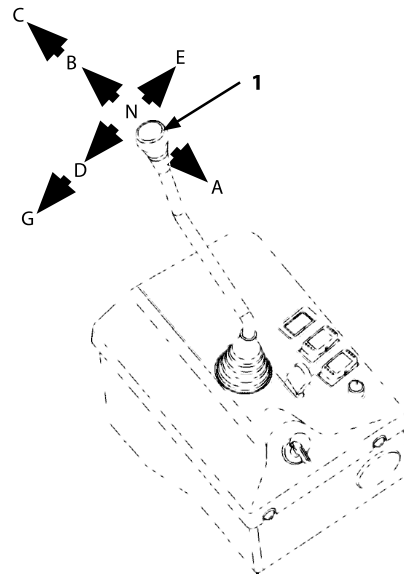
OPERATING MACHINE

Front Control Lever

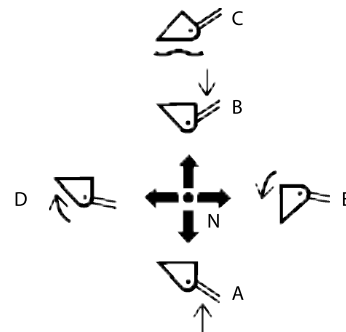
This lever is used to operate the lift arm and bucket.

Lever Position	Lift Arm/Bucket Action
C	Float: The lift arm falls freely; once on the ground, the bucket is free to move in response to external forces.
B	Lower Lift Arm
N	Neutral (Hold): The lift arm stops and maintains that position.
A	Raise Lift Arm
G	Detent: The detent holds the lever in position when it is moved from the bucket dump to the tilt position.
D	Tilt Bucket: Tilts the bucket back into the position for transport.
N	Neutral (Hold): The bucket stops and maintains that position.
E	Dump Bucket: Tilts the bucket forward to dump material.

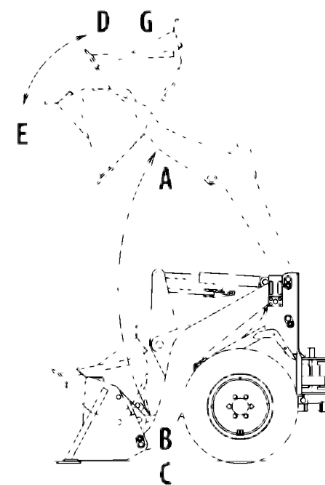
NOTE: After dumping the bucket, if front control lever (1) is shifted past the TILT position (D), the lever is held in position (G). Once the bucket reaches the position set by the auto-leveler function, it automatically returns the lever to the HOLD position (N).



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M4GB-01-074



M4EJ-01-031A

OPERATING MACHINE

Control Lever Locks

⚠ WARNING: When locking the loader control lever and the auxiliary control lever (3) (optional), securely shift lever locks (2), (4) to the LOCK position. Unless lever locks (2), (4) are fully moved to the LOCK position, the control levers are not locked, possibly creating a hazardous situation.

Before leaving the operator's seat, be sure to stop the engine. Then, move lever locks (2), (4) to the LOCK position.

After completing operation of the machine or transporting the machine, be sure to move lever locks to the LOCK position.

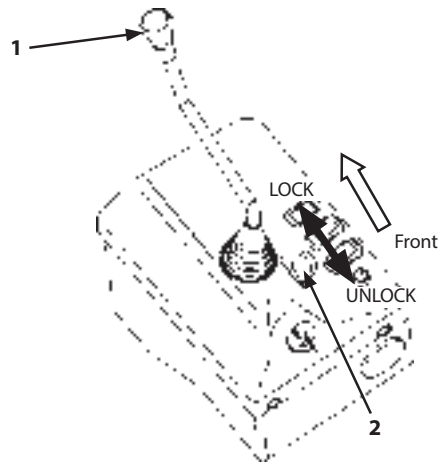
Lever locks (2), (4) are provided to prevent the machine from being unexpectedly operated if the operator mistakenly comes in contact with loader control lever (1) or auxiliary control lever (3) (if equipped) when getting on or off the machine. When loader control lever (1) and auxiliary control lever (3) (optional) are placed in the UNLOCK position, the levers become operable.

Loader Control Lever Lock Operation

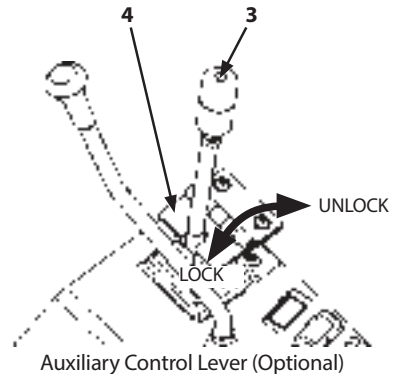
- When leaving the operator's seat:
 1. Park the machine on solid level ground. Lower the bucket to the ground. Return all levers to neutral. Stop the engine.
 2. Be sure to move lever lock (2) in the LOCK position.
Be sure to place lever lock (4) in the LOCK position when auxiliary control lever (3) is not in use.
- Before starting operation:

Before starting operation, check that lever lock (2) is in the UNLOCK position.

Be sure to place lever lock (4) in the UNLOCK position when auxiliary control lever (3) is in use.



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MNCH-01-549

OPERATING MACHINE

Ride Control Switch (Optional)

Ride control switch (1) dampens vertical pitching of the work equipment during travel, to provide a more comfortable ride. It also provides a more stable ride, which helps prevent spilling of the material in the bucket.

WARNING:

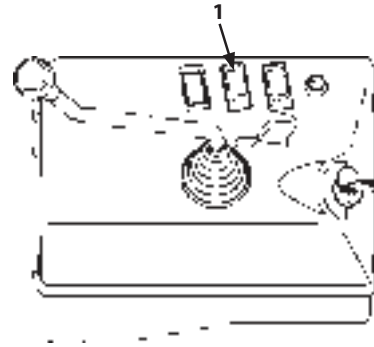
- Turn ride control switch (1) **OFF** when using work equipment in the float mode (scooping, grading, snow removal), during travel and during maintenance and inspections with work equipment raised. Some conditions may cause the arm to raise or lower and the movement of the machine to be unstable, resulting in personal injury.
- When working with the ride control activated, slow down considerably. If a sudden load is applied to the front attachment, it puts a great deal of pressure on the ride control accumulator, which may cause a leak of gas.

Operating the Ride Control

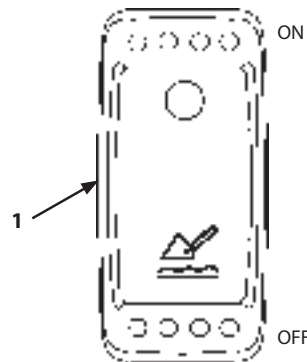
 **WARNING:** To ensure safety, stop the machine and lower the bucket to the ground before operating ride control switch (1).

Turning ride control switch (1) ON activates the vehicle speed sensor and controller, and once the vehicle exceeds 6 km/h, ride control starts working automatically. When the travel speed drops below 4 km/h, ride control stops working. When ride control switch (1) is turned ON, ride control indicator (3) on the monitor display come on. When ride control switch (1) is turned OFF, ride control indicator (3) on the monitor display goes off and ride control ceases to work.

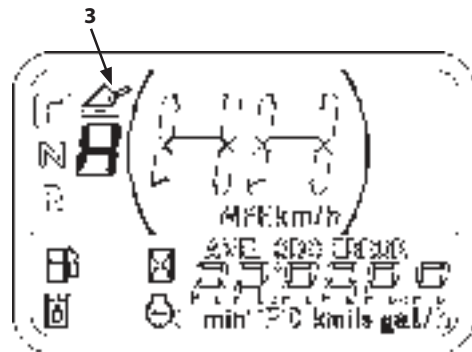
If ride control switch (1) is turned ON when the key switch is OFF, the ride control system will not operate. Similarly, when the engine is stopped with ride control switch (1) ON, the ride control system is turned off.



MNCH-01-533



MNCH-01-536



MNCH-01-532

OPERATING MACHINE

Adjustment of Bucket Auto Leveler

⚠ WARNING: Be careful to avoid personal injury and/or death when adjusting the bucket auto leveler.

Stop the engine. Lower the loader front attachment to the ground to release the remaining pressure in the hydraulic circuits.

Apply the parking brake to prevent the machine from moving unexpectedly. Chock wheels with blocks. Keep bystanders away from the vicinity of the machine.

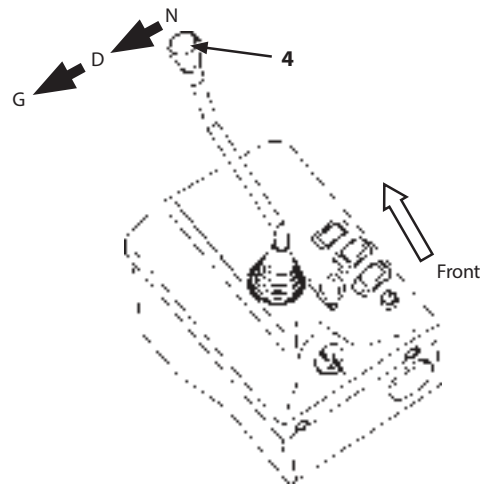
The bucket auto leveler automatically stops the bucket movement at the preset digging angle. (When the machine is shipped from the factory, the bucket positioner is preset so that the bucket is stopped with the bucket bottom parallel with the road surface.)

For example, after discharging the handling materials onto a truck or into a hopper, when loader 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 neutral (N).

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



M4FG-05-004



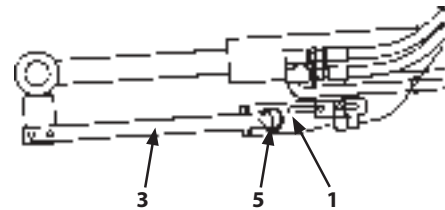
MNCH-01-535

Adjustment Procedures

IMPORTANT: Do not operate the machine with the bucket dumped more than 10 degrees.

Avoid applying great downward force to the bucket cutting edge.

1. After moving the bucket to the desired digging angle, stop the engine.
2. Loosen lock nuts (2) (2 used) of proximity switch mounting bracket (1). Slide bracket (1) up to the end edge of leveler bar (3) moves to the center of the sensitive area (orange color) (5). Then, tighten lock nuts (2) (2 used).
3. After adjustment start the engine. Check that the bucket can be stopped at the preset angle position.



M4EJ-05-003

OPERATING MACHINE

Before Operation



WARNING:

- Be sure to install only authorized buckets and other work tools on the front attachment.
- Never modify or increase the capacity of the bucket or other work tools without first receiving authorization. Do not overload the machine by installing additional counterweights. Failure to do so may result in personal injury and/or machine trouble.

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

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 traveling 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 traveling forward.
2. After the bucket has sufficiently penetrated the soil, raise the lift arm while traveling forward further and occasionally tilt the bucket back to fill 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.



M4EK-05-001



M4EK-05-002



M4EK-05-003



M4EK-05-004

OPERATING MACHINE

Digging and Loading Level Ground

IMPORTANT: While excavating with the bucket or fork, never apply excessive force to the tooth tips with the bucket or fork tilted more than 10 degrees.

This may result in cracking or damaging the work tools.

Slightly position the bucket teeth downward (0 to 10 degrees) and dig the ground while traveling 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 traveling forward, tilt the bucket so that the ground surface is gradually separated.
3. Adjust the digging depth by operating the lift arm.
4. Carry material with the bucket tilted backward fully and held at the lowest possible position.



M4EK-05-005



M4EK-05-006



M4EK-05-007



M4EK-05-008

OPERATING MACHINE

Grading

⚠ WARNING: Turn the ride control switch OFF, if the machine is so-equipped, when using work equipment in the float mode (scooping, grading, snow removal). If it is left ON, the work equipment may rise or come down during ride control operation.

1. After filling soil into the bucket, dump the bucket gradually to disperse soil while traveling in reverse.
2. Lower the bucket teeth tips onto the ground. Grade and level the ground surface while traveling 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, traveling in reverse with the lift arm held in the FLOAT position.



M4EK-05-009



M4EK-05-010



M4EK-05-011

OPERATING MACHINE

Loading

IMPORTANT:

- **Always maintain a clean travel surface.**
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 surface conditions. Travel 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 banging the bucket with the bucket stopper as much as possible when removing stuck 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

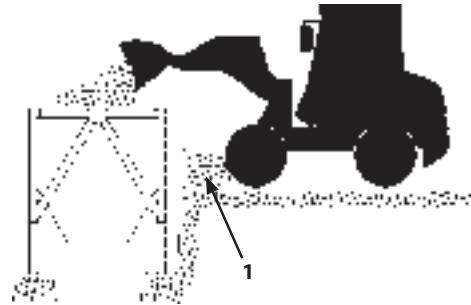
Load and Carrying Method

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 material loss.

Raising the lift arm on the slope possibly result in personal injury.

- When approaching the machine to a hopper with the lift arm raised to a high enough position, travel slowly. Never steer the machine while approaching a hopper to prevent turning over.



M4FG-05-001

A wheel loader performs work process of loading, carrying, and dumping in sequence. Generally, when the carrying distance is 30 to 100 m (33 to 109 yd), this method is employed.

Make an upgrade slope of approx. 3 degrees around a hopper when dumping into the hopper. Be sure to provide a level area 10 m apart from the hopper and tire stopper (1) at the hopper edge. Reduction in travel speed will assist operator's braking effort.

OPERATING MACHINE

Loader and Dump Truck Combination Method

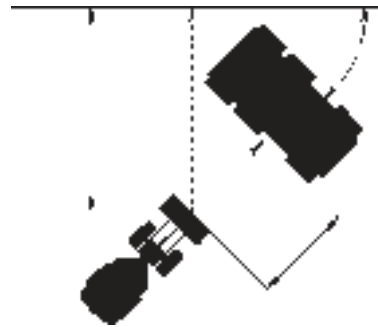
⚠ WARNING: Be aware of the following points:

- **Always maintain a flat work site surface. Avoid rapid swing 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 an accident.**

A loader carries out loading and carrying and dumping is carried out by a dump truck. 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 degrees angle toward the loading face. 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. 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.
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.



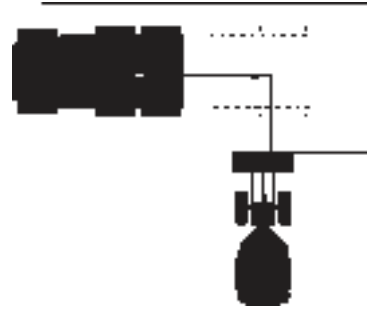
M4EJ-05-016

OPERATING MACHINE

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 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.



M4EJ-05-017

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.**



M4EJ-05-018

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 important 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.



M4EJ-05-019

OPERATING MACHINE

Removing Snow

⚠ WARNING: When operating the 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.



M4EJ-05-020

Precautions for removing snow

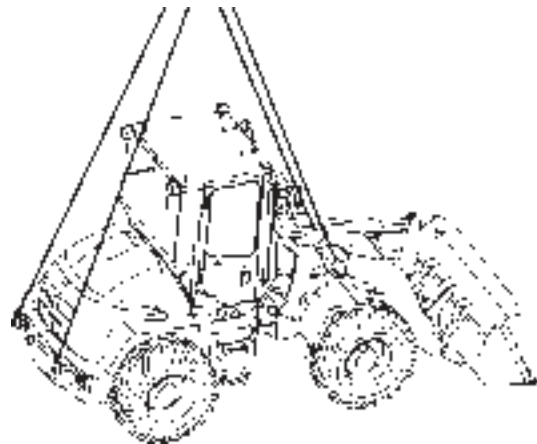
- Avoid sudden starting and stopping as well as rapid steering of the machine.
- Use tire chains on all four wheels.
- Pay attention to the presence of the utility facilities such as fire hydrants, manholes, curbs, roadside drains, etc. The facilities or the machine may be damaged.

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.



M4FG-05-002

OPERATING MACHINE

Precautions for After Operation

1. After finishing operation, move the machine to 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 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.

3. Clean the machine.
4. If anti-freeze or long life coolant is not used in cold weather, be sure to drain coolant from the radiator and the engine jacket.

Also, be sure to put a "No Water in Radiator" tag in a visible place after the coolant has been drained.

5. Maintenance for long term machine storage after engaging in snow removal

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.

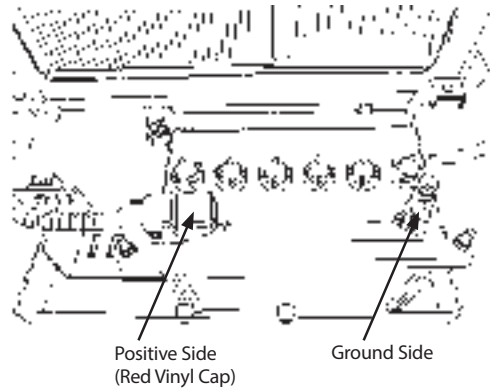
IMPORTANT: Take care not to spray water directly to electrical parts except for kinds of lights such as the headlights, work lights, and turn signal lights.

- 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" in the "MAINTENANCE" chapter.

OPERATING MACHINE

⚠ CAUTION: When removing the batteries, first disconnect the ground cable from the battery terminal.

- 4.4 Remove the batteries and store them in a dry cool place. Do not put the batteries on the ground. When the batteries are not removed, disconnect the ground terminal cable.



M4FG-07-042

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TRANSPORTING

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 be necessary.

Transporting by Trailer

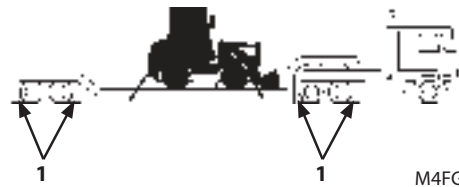
Provide an appropriate trailer while referring to the weight and dimensions shown in the specifications. When transporting the machine within the weight and dimensions shown in the specifications by a trailer, it is possible to transport the machine without disassembling. If the machine width, height or weight is enlarged due to installing an attachment, consult your nearest authorized dealer.

TRANSPORTING

Loading/Unloading on Trailer

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

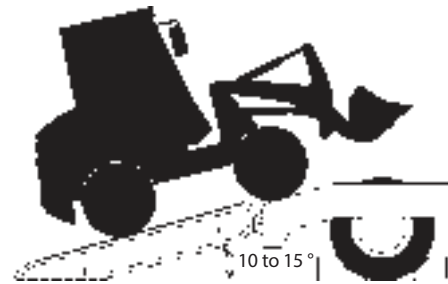
Always load and unload the machine on a firm, level surface.



M4FG-06-001

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. Chock (1) the trailer wheels so that the trailer does not move 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 degrees.
4. Loading docks must be sufficient in width and strength to support the machine and have an incline of less than 15 degrees.



M4FG-06-002

TRANSPORTING

Loading/Unloading

⚠ WARNING: Be aware of the following points:

- **NEVER** steer while driving up or down a ramp as it is extremely dangerous and may cause the machine to turn over. If the travel direction must be changed on a slope, back the machine to flat ground. Then, after changing the travel direction, begin to move again.

Loading

1. Load the machine so that the machine width center aligns with the trailer deck width center.
2. Slowly drive the machine on the ramp.
3. Lower the bucket onto the trailer deck.
4. Stop the engine. Remove the key from the key switch.
5. Operate the loader control lever several strokes to relieve pressure in the cylinders.
6. Place the loader control lever lock in the LOCK position.
7. Cover the electrical components and the operator's seat to protect them from bad weather. For the cab machine, close cab windows and doors to prevent entry of wind and water.
8. Install the articulation lock bar (1) to the rear frame side to prevent the machine from articulating.



TRANSPORTING

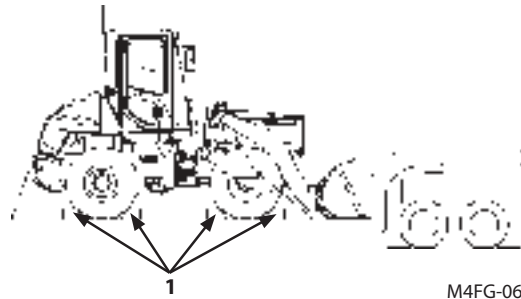
Transporting

⚠ CAUTION: Securely fasten the machine to the trailer flatbed with appropriate accessories (wire ropes/chains, tighteners.)

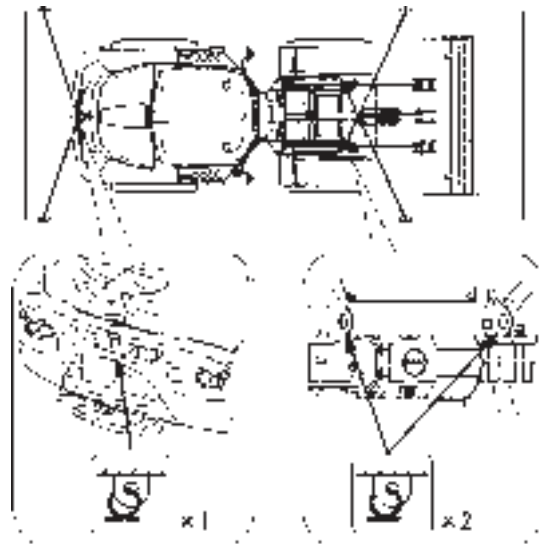
The machine may move back and forth and/or laterally during transportation.

1. Apply the parking brake. Slowly rest the bucket on the trailer deck or load-carrying platform.
2. Chock securely (1) behind each tire to fasten the machine in position.
3. Securely fasten the machine to the truck or trailer platform using appropriate accessories (wire ropes/chains, tighteners.)

✎ NOTE: When transporting the machine, it is necessary to cover the exhaust pipe to prevent entry of anything into the exhaust pipe.



M4FG-06-003



M4FG-06-008

TRANSPORTING

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 nearest 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 nearest 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.

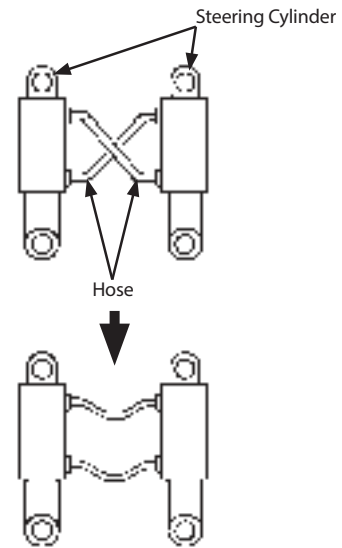
IMPORTANT: Do not tow the machine with the parking brake applied. Damage to the parking brake may result.

- When the engine is operable:
Keep the engine running to maintain the steering and brake systems operable and then, release the parking brake.
- When the engine does not operate:
 - When it is impossible for the parking brake to be released, manually release the parking brake. (Refer to the “Releasing Parking Brake” on page 6-8.)
And then, relieve the HST hydraulic pressure. (Refer to the “Relieving HST Hydraulic Pressure” on page 6-9.)

TRANSPORTING

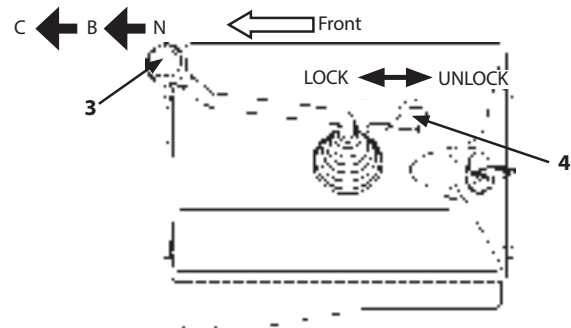
- If the engine becomes inoperable, steering operation becomes impossible. Switch the hydraulic hose connections between the rod end side and the head end side on one of the steering cylinders. Articulation between the front frame and the rear frame will be easily performed while towing of the machine.

 **NOTE:** Oil may pour out from the hose when disconnecting hoses. Be sure to catch the oil.



M4GB-06-007

- In case the bucket is being rested on the ground, raise the bucket above the ground following the procedures below.
1. Place loader control lever (3) in FLOAT position (C).
 2. Using a jack or a crane, lift the bucket or the lift arm.
 3. Move loader control lever (3) to neutral (N) position and loader control lever lock (4) to LOCK position to maintain the bucket in position above the ground.



M4FG-01-015

TRANSPORTING

Releasing Parking Brake

⚠ WARNING: Once the parking brake is released, the machine becomes impossible to stop with the parking brake system, possibly resulting in personal injury or death.
Before releasing the parking brake, wedge the tire wheels.

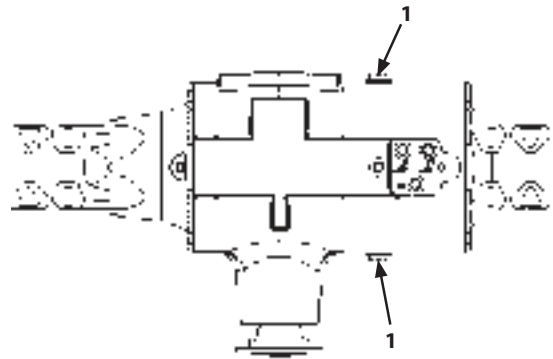
⚠ CAUTION: As soon as towing operation is complete, connect the parking brake.
Moving the machine by means of towing shall be made in a short distance until the machine reaches an appropriate location for inspection and/or maintenance. Do not tow the machine for a long distance.

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

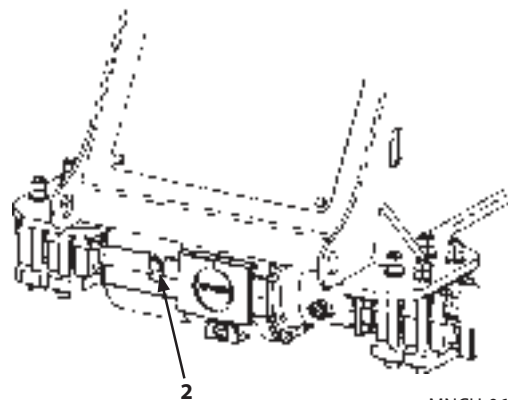
Procedures

- ⚠ WARNING:**
- Once the parking brake is manually released, the machine braking system is completely deactivated.
 - Before releasing the parking brake manually, chock all tires to prevent the machine from moving.
 - Before operating the machine again after releasing the parking brake manually, have the parking brake readjusted by your nearest authorized dealer.

Loosen plugs (1) (2 used) on the right side of the front axle center, remove the spacers (2) (2 used), and then tighten plugs (1) (2 used) at the same time to release the parking brake.



M4FG-06-005



MNCH-06-001

TRANSPORTING

Relieving HST Hydraulic Pressure

CAUTION: Do not tow the machine at travel speed faster than 2 km/h (1.2 mph) and in a distance longer than 1 km.

The HST hydraulic pressure must be reset to the original set pressure after towing is complete. Contact your nearest authorized dealer for machine inspection:

Procedures

The HST hydraulic pressure is manually relieved only when the machine must be towed with the engine inoperable.

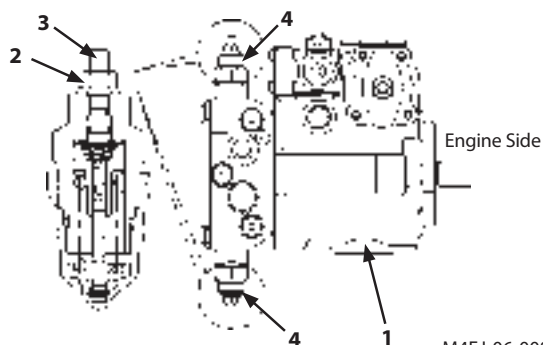
WARNING:

- Before relieving the HST hydraulic pressure, chock the tires to prevent the machine from moving.
- Before operating the machine again after resetting the HST hydraulic pressure, have the HST system readjusted by your nearest authorized dealer.

1. If required to tow the machine with the engine inoperable, the hydraulic pressure in the HST pump/motor closed circuit must be relieved.
2. Remove the floor mat and the maintenance access cover from the base of the operator's seat. Wait for HST pump (1) to cool until it becomes touchable with a bare hand.
3. Remove caps from two high pressure relief valves on HST pump (1). Loosen lock nuts (2). Tighten adjust screws (hexagon socket head) (3) until the screw head becomes flush with the top surface of lock nuts (2).
4. Tighten lock nuts (2).
5. After towing is complete, return adjust screws (hexagon socket head) (3) to their original position and secure with lock nuts (2).



M4FG-06-007



M4EJ-06-008

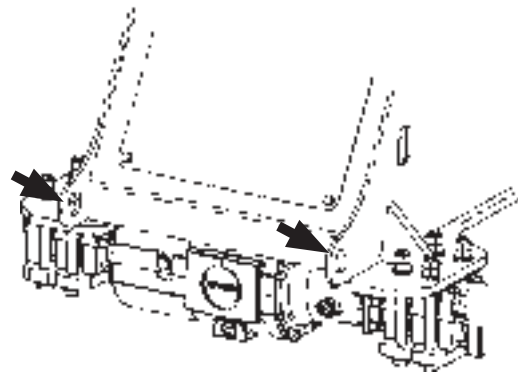
TRANSPORTING

Towing Method

⚠ CAUTION: Use wire rope having the strength more than approx. 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 frame.
Always use soft material at the corners between the front frame and wire ropes to prevent damage to wire ropes.
- Towing from the rear side of the machine;
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.

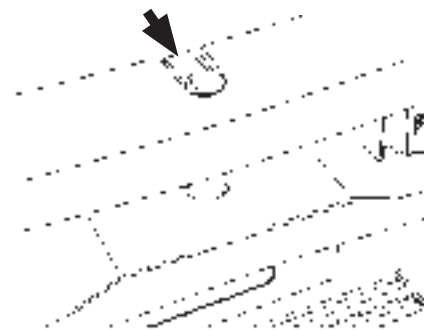
Attach wire ropes to the machine as illustrated when the machine must be unavoidably towed, such cases when the machine can not be removed from soft ground under its own power.



MNCH-06-001



M4FG-01-039



M4FG-01-036

TRANSPORTING

Lifting Machine



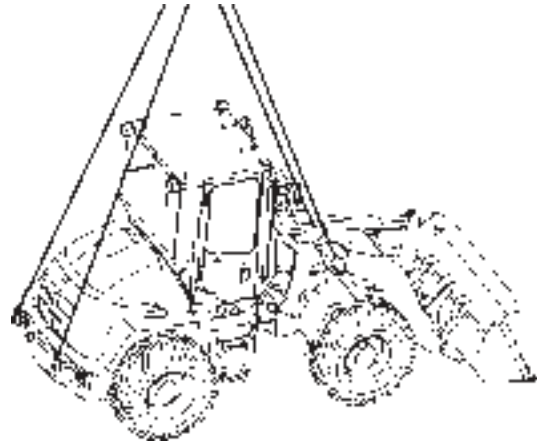
WARNING: Be aware of the following points:

- The lifting tools are option. Install specific lifting tools at your nearest authorized dealer.
- Use lifting cables and other lifting tools free from any damage and/or aging, and having sufficient strength.
- Consult your nearest authorized dealer for correct lifting procedures, and size and types of lifting cable and tools.
- Before lifting the machine, move the loader control lever lock 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 can not articulate.
- If the machine is incorrectly lifted or if lifting wire ropes are incorrectly attached to the machine, the machine may move when lifted, possibly resulting in an accident and/or damage to the machine.
- Never apply impact loads to the lifting cables and tools.
- Do not allow anyone to enter the area under the lifted machine.

TRANSPORTING

Lifting

1. Straighten the machine and horizontally rest the bucket on the ground.
2. Move the loader control lever lock to 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. Use cables long enough so that the cables come in contact with the machine chassis when the machine is lifted.
Cover the cables with cloth as needed to protect the machine from being damaged. Be sure to use the specified lifting tools.
6. Set a crane in an appropriate position.
7. Attach the cable to the front attachment and the lifting tools.



M4FG-05-002

MAINTENANCE

Inspection and Maintenance

IMPORTANT: Never disassemble parts of the engine fuel system or try to adjust hydraulic equipment. Do not disassemble electronic parts (controller). Doing so will result in failure and/or damage.

Proper inspections and maintenance are necessary for getting the most out of your machine's functions and extending its service life. Pay particular attention to the following items.

- Do controls and instruments operate normally?
- Any problems with the amount, leakage of or dirtiness of coolant, fuel or hydraulic oil?
- Any abnormal noise, heat or in its appearance?
- Any loose or missing mounting bolts or nuts?
- Any damaged, worn or missing structures or parts?
- Do all parts operate normally?

If anything abnormal is found during inspections or during operation, investigate the cause and repair it immediately. Consult your authorized dealer if the cause cannot be determined, as well as for disassembly of fuel system components and adjustment of hydraulic equipment.

Warnings about Inspections & Maintenance

- Pay close attention to safety.
- Before working in a high place, prepare a multi-level work platform or the like to ensure a safe work environment.
- Perform inspections and maintenance in line with the usage conditions and environment.
- Use the specified fuel, lubricating oil and antifreeze.
- **Do not mix poor quality diesel fuel, drainage agents, fuel additives, gasoline, kerosene, alcohol, or any other type of lubricating oil with the specified diesel fuel. Using the wrong fuel may deteriorate performance of fuel filters, can cause problems in the lubricated parts of the injector. It can also affect the parts of the engine and muffler, leading to malfunction.**
- Only use genuine Hitachi parts. Using anything other the genuine Hitachi products may lead to a serious accident or breakdown.
- Use Hitachi genuine high performance fuel filters.
- Do not adjust anything whose method of adjustment is not listed, such as the engine and hydraulic equipment.
- Protect electrical parts (including sensors and connectors) from water and steam. Do not wash or steam clean anything inside the operator's cab except the floor mats.
- Do not expose the transmission oil fill port or air breather area to high pressure water or steam.
- Do not modify the machine without authorization.
- Breakdowns due to using parts other than those specified or improper handling invalidate the warranty.

MAINTENANCE

- Handling of the Body Information Controller

This machine provides a body information controller that stores machine operation information for preventive maintenance.

During the course of maintaining the machine, our authorized service personnel may download the stored information.

Consult with your authorized dealer for details on the function of this device.

- Handling of the Communication Terminal

It is not necessary to check or operate the communication terminal; however if you sense there is a problem with it, consult your authorized dealer.

Before installing any attachment that covers the roof, such as a head guard, consult your authorized dealer.

Never spray water on the communication terminal or the wiring.

- Inquire with your local environmental or recycling center or your authorized dealer, for the proper way to recycle or dispose of oils, fuel, coolant, filters, batteries and other waste.

MAINTENANCE

Check the Hour Meter Regularly

Refer to the Maintenance Guide for information about lubricants, check and adjustment intervals. A maintenance guide table is affixed on the inside of the steps on the left side. (Refer to page 7-5)

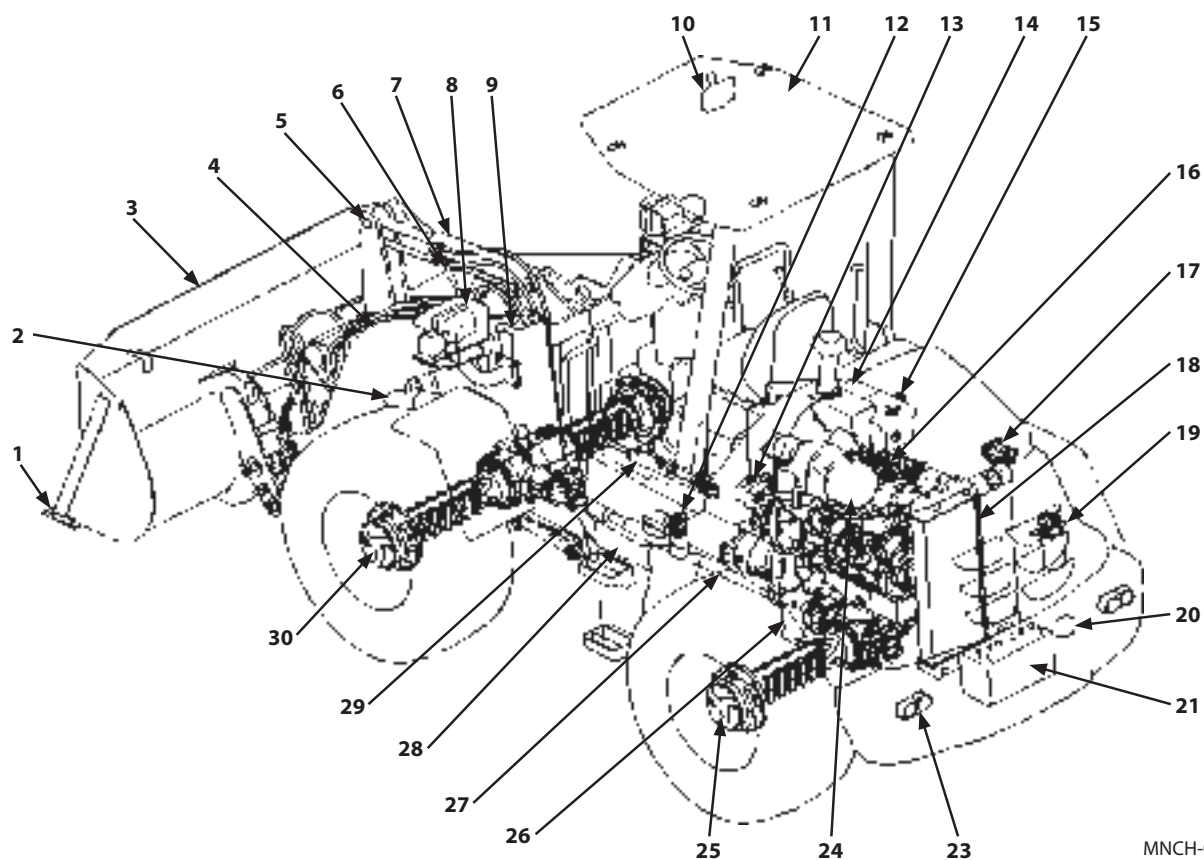
This manual recommends grouping the intervals into three categories as follows:

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

Inspection and maintenance intervals shown in this manual are those for machines operated under normal conditions. If a machine is operated under more severe conditions, shorten the intervals.

MAINTENANCE

Names of Components



MNCH-07-064

- | | | |
|---------------------------------------|---------------------------------------|-----------------------|
| 1- Cutting Edge | 14- Hydraulic Oil Tank/Suction Filter | 27- Propeller Shaft |
| 2- Lift Arm Cylinder Pin | 15- Brake Oil Tank | 28- Fuel Tank |
| 3- Bucket | 16- Engine | 29- Steering Cylinder |
| 4- Bell Crank Pin | 17- Fuel Pre-Filter | 30- Front Axle |
| 5- Bucket Cylinder Pin | 18- Radiator/Oil Cooler | |
| 6- Bucket Auto-Leveler | 19- Fuel Filter | |
| 7- Bucket Cylinder | 20- Backup Light | |
| 8- Head Light/Front Combination Light | 21- Battery | |
| 9- Lift Arm Pin | 22- Backup Alarm | |
| 10- Rear View Mirror | 23- Rear Combination Light | |
| 11- ROPS Canopy | 24- Air Cleaner | |
| 12- HST Oil Filter | 25- Rear Axle | |
| 13- Return Filter | 26- Transmission | |

MAINTENANCE

Maintenance Guide Table

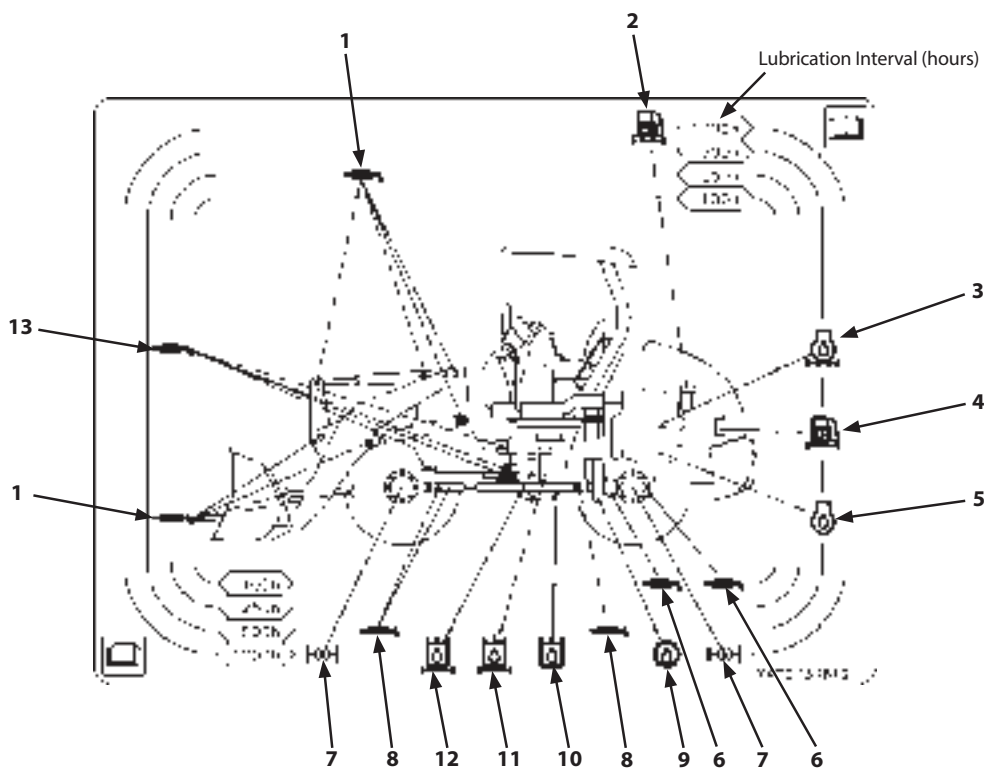
A maintenance guide table is affixed on the inside of the steps on the left side. Lubricate and/or service parts at the intervals indicated in the table so that all necessary maintenance can be performed regularly.

- Symbols
The following symbols are used in the maintenance guide table.

	Grease (Front joint pins, axle support pin, propeller shaft, frame center hinge pin)		Hydraulic Oil
	Engine Oil		Hydraulic Oil Filters (HST filter, return filter)
	Engine Oil Filter		Gear Oil (Final reduction gear, differential)
	Transmission Oil (Transmission oil)		Fuel Filter (Main Fuel Filter and Fuel Pre-Filter)

MAINTENANCE

- Explanation of Maintenance Guide Table



MNCH-07-002

Item	Page	Item	Page
1 Grease (Front Joint Pins)	7-22	8 Grease (Propeller Shaft)	7-24
2 Fuel Pre Filter	7-54	9 Transmission Oil	7-28
3 Engine Oil Filter	7-26	10 Hydraulic Oil	7-36
4 Main Fuel Filter	7-53	11 Hydraulic Oil Filter (Return)	7-41
5 Engine Oil	7-26	12 HST Oil Filter	7-39
6 Grease (Axle Support Pin)	7-24	13 Grease (Frame Center Hinge Pin)	7-23
7 Axle Oil (Final reduction gear, differential)	7-29		

MAINTENANCE

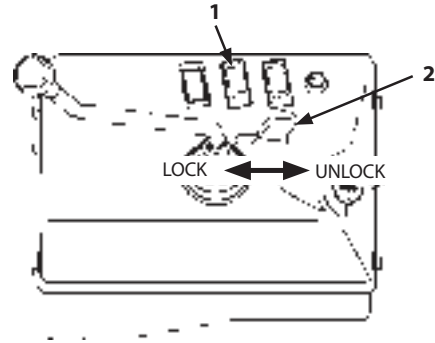
Preparation for Inspection and Maintenance

Warning: The lift arm may rise if ride control switch (1) is left ON. If turned OFF, take care to avoid an accident due to the lift arm moving unexpectedly.

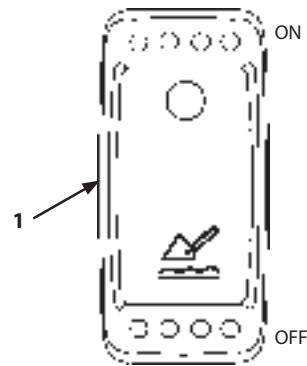
CAUTION: A serious accident may occur due to unexpected movement of the machine. Always apply the parking brake after stopping the machine.

Except as directed otherwise, park the machine as indicated below before servicing the machine.

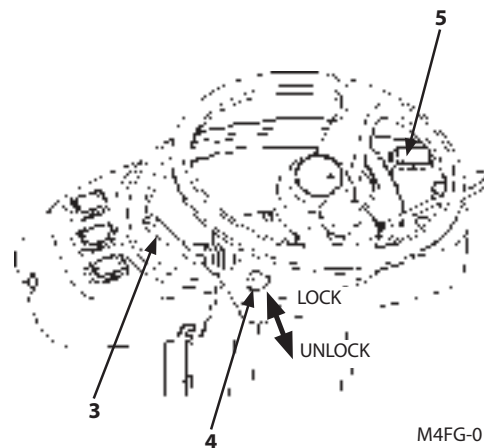
1. Park the machine on a firm, level surface.
2. Lower the bucket so it sits level on the ground.
3. Turn ride control switch (1) (optional) OFF.
4. Put F-N-R lever (3) in neutral (N) and neutral lever lock (4) in its LOCK position.
5. Apply the parking brake. (Parking brake switch (5) ON position)
6. Chock the tires.
7. Run the engine for 5 minutes to cool it, turn the key switch OFF to stop the engine. Remove the key. Operate the front control lever 3 to 4 times full stroke up and down to relieve residual pressure in the hydraulic system. If inspection or maintenance that can only be done with the engine running is required, have someone watch during the procedure.
8. Put control lever lock (2) securely into the LOCK position.



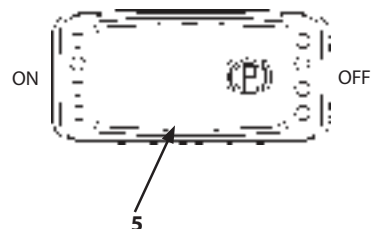
MNCH-01-533



MNCH-01-536



M4FG-01-007



M4EK-01-025a

MAINTENANCE

9. Turn key switch (6) OFF to stop the engine. Remove the key.
10. Put a sign saying "Being Serviced" in an easy-to-notice place on the door or front control lever before starting work.

⚠ WARNING: To prevent accidents, never attempt to perform maintenance on the machine when the engine is running. If maintenance work with the engine running is unavoidable, strictly comply with the following items.

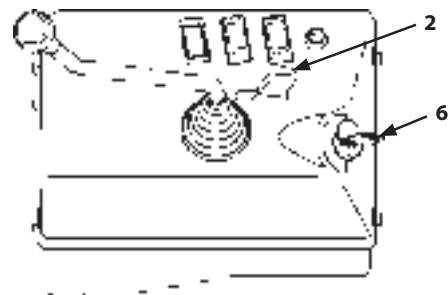
- One person should take the operator's seat and be ready to stop the engine at any time, while communicating with other workers.
- When working around moving parts is unavoidable, pay special attention to ensure that hands, feet, and clothing do not become entangled.
- If parts or tools are dropped or inserted into the fan or the belt, they may fly off or be cut off. Do not drop or insert parts or tools into moving parts.
- Put control lever lock (2) in the LOCK position.
- Take care not to touch the control levers, handles and pedals. If operating the control levers or pedals is unavoidable, signal co-workers to evacuate to a safe place.



SA-2294



SA-026



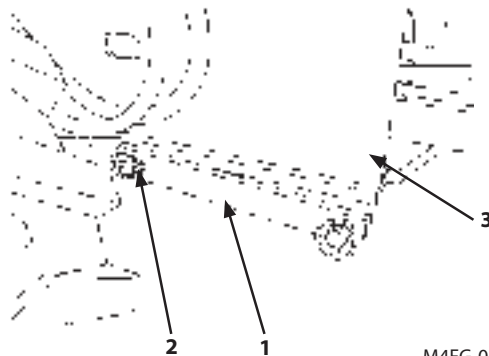
MNCH-01-533

MAINTENANCE

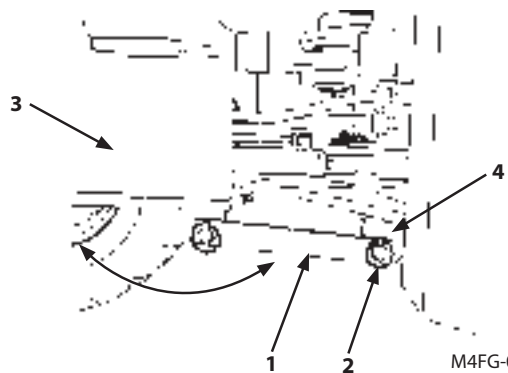
Frame Lock

⚠ WARNING: Prior to working around the joint between frames (3) and (4), mount articulation lock bar (1) to secure front and rear frames (3) and (4). This is to prevent an accident due to the machine moving unexpectedly.

1. Position the machine so its front and rear frames (3) and (4) are directly in line.
2. Remove ring pin (2) and remove articulation lock bar (1) from the front pin of front frame (3).
3. Put articulation lock bar (1) onto the mounting pin of rear frame (4). Install ring pin (2) to secure articulation lock bar (1).



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M4FG-01-035

MAINTENANCE

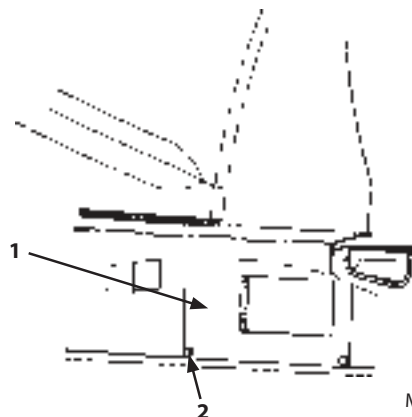
Side Inspection Covers

⚠ CAUTION: Only open or close side cover (1) when the engine is stopped. Getting caught in moving parts is extremely dangerous.

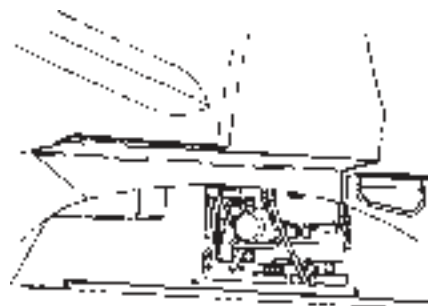
Install side cover (1) before traveling or operating the machine.

When opening side cover (1), remove the 4 bolts (2).

✎ NOTE: There are side covers (1) on both sides of the machine. Removing side cover (1) on the right side allows replacement of the engine oil filter.



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MAINTENANCE

Engine Cover

⚠ WARNING: Only open or close engine cover (1) when the engine is stopped. Getting caught in the fan of the engine is extremely dangerous.

Make sure engine cover (1) will not open while traveling.

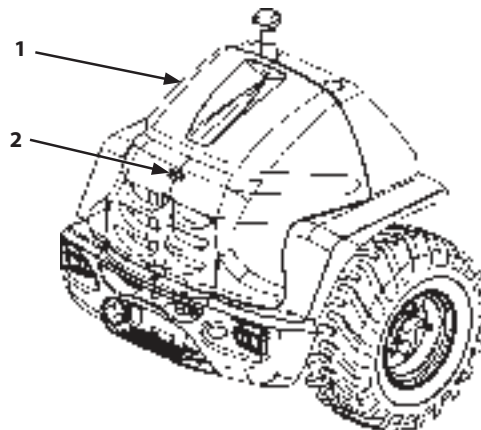
Opening the Engine Cover

Press in lock key (2) of engine cover (1) and open it upwards for daily checks.

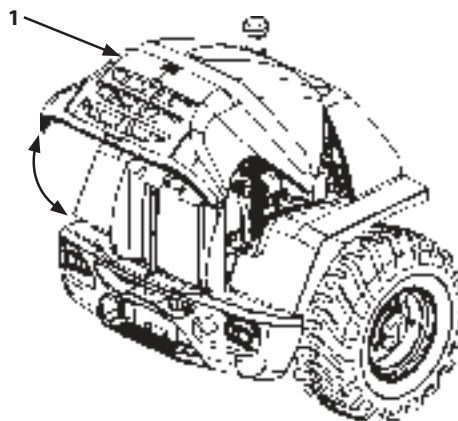
Closing the Engine Cover

Press engine cover (1) in gently until it clicks.

✎ NOTE: Engine cover (1) can be locked with a key.



MNCH-01-523



MNCH-01-524

MAINTENANCE

Maintenance Guide

The shaded parts in the table indicate inspection timing.

A. Greasing

Inspection/Maintenance Items		Qty.	Interval (Hours)						Page
			10	50	100	250	500	1000	
1.	Bucket Pin	2	★			★★			7-22
2.	Bucket Link Pin	2	★			★★			7-22
3.	Bucket Cylinder Pin	1	★			★★			7-22
4.	Bucket Cylinder Rod Pin	1	★			★★			7-22
5.	Bell Crank Pin	1	★			★★			7-22
6.	Lift Arm Cylinder Rod Pin	2	★			★★			7-23
7.	Lift Arm Cylinder Pin	2	★			★★			7-23
8.	Lift Arm Pivot Pin	2	★			★★			7-23
9.	Steering Cylinder Rod Pin	2	★			★★			7-23
10.	Steering Cylinder Pin (Serial No. 005001 to 005209)	2	★			★★			7-23
11.	Steering Cylinder (Serial No. 005210 and up)	2	★			★★			7-23
12.	Frame Center Hinge Pin	2				★★			7-23
13.	Axle Support Pin	2							7-24
14.	Propeller Shaft Universal Joint	2					★★★		7-24
15.	Propeller Shaft Spline	1					★★★		7-24

- ★ : Add grease daily during first 50 hours of operation.
If excavation is performed in mud, water or snow, grease the pin after operation is complete.
- ★★ : Add grease every 250 hours after the first 50 hours of operation.
When working under severe conditions or continuous operation, shorten the lubrication interval.
- ★★★ : When working under severe conditions or continuous operation, shorten the lubrication interval.

IMPORTANT: Grease the bucket and link pins during the first 50 hours of operation.

MAINTENANCE

B. Engine

IMPORTANT: Use the specified oil and replace at the specified interval. Using anything other than the specified oil or continued use after the replacement interval will result in major malfunctions and/or damage to the engine.

Inspection/Maintenance Items			Qty.	Interval (Hours)						Page
				10	50	100	250	500	1000	
1.	Engine Oil	Check Oil Level	-							7-25
2.	Engine Oil	Replace	9 L (9.5 US gal)							7-26
3.	Engine Oil Filter	Replace	1					★		7-26

★ : Replace the engine oil filter at the same time as the engine oil.

C. Powertrain

IMPORTANT: Use the specified oil and replace at the specified interval. Using anything other than the specified oil or continued use after the replacement interval will result in major malfunctions and/or damage to the transmission, axle and other parts.

Inspection/Maintenance Items			Qty.	Interval (Hours)						Page
				10	50	100	250	500	1000	
1.	Transmission Oil	Replace	1.0 L (1.1 US qt)				★			7-28
2.	Axle Oil	Replace (Front)	6.2 L (1.6 US gal)				★			7-29
		Replace (Rear)	6.4 L (1.7 US gal)				★			7-29
3.	Clean the Oil Breather		1							7-31
4.	Check for Oil Leaks Around the Axle and Cover		-							7-32
5.	Clean the Air Breather on the Axle Housing		1 Front and Rear							7-32

★ : At 250 hours the 1st time only.

MAINTENANCE

D. Hydraulic System

IMPORTANT: Use the specified oil and replace at the specified interval. Using anything other than the specified oil or continued use after the replacement interval will result in major malfunctions and/or damage to the hydraulic system.

Inspection/Maintenance Items		Qty.	Interval (Hours)						Page
			10	50	100	250	500	1000	
1.	Check Hydraulic Oil Level	-							7-35
2.	Replace Hydraulic Oil/Clean Hydraulic Oil Tank	72 L (19.0 US gal)							7-36
3.	Suction Filter Cleaning	1	Each time hydraulic oil is changed						7-38
4.	Replace HST Oil Filter Element	1			★				7-39
5.	Replace Return Filter	1			★				7-41
6.	Check Hoses and Lines for leaks, loose	-							7-43
	Inspect Hoses and Lines (Cracks, Bending, etc.)	-							7-43

★ : At 100 hours the 1st time only.

E. Fuel System

IMPORTANT: Use the specified fuel. Failure to do so may result in poor performance, malfunction and/or damage to the engine.

Inspection/Maintenance Items		Qty.	Interval (Hours)						Page
			10	50	100	250	500	1000	
1.	Amount of Fuel in the Tank	-							7-48
2.	Drain Fuel Tank of Water and Sediment	1	(or when indicator lit)						7-50
3.	Drain Fuel Pre-Filter	1							7-51
4.	Replace Main Fuel Filter Element	1							7-53
5.	Replace Fuel Pre-Filter Element	1							7-54
6.	Check Fuel Hoses for leaks, cracks	-							7-55
	Check Fuel Hoses for cracks, bend, etc.	-							7-55

F. Air Cleaner

Inspection/Maintenance Items			Qty.	Interval (Hours)						Page
				10	50	100	250	500	1000	
1.	Air Cleaner Filter	Clean	1	(or when indicator lit)						7-56
		Replace	1					★		7-56

★ : 1 year or after cleaning 6 times.

MAINTENANCE

G. Cooling System

Inspection/Maintenance Items		Qty.	Interval (Hours)						Page
			10	50	100	250	500	1000	
1.	Check Coolant Level	-							7-58
2.	Check the Drive Belt	-							7-59
3.	Replace the Drive Belt	-							7-59
4.	Change Coolant	14.8 L (3.9 US gal)	*						7-60
5.	Clean the Radiator and Oil Cooler	1					★		7-61

★ : Shorten the maintenance interval when the machine is operated in dusty areas.

* : When genuine Hitachi Long-Life Coolant (LLC) is used, change every 1 year or 1,000 operating hours, whichever comes first.

IMPORTANT: Use fresh or tap water in the coolant. Do not use strongly acidic or alkaline water. When using genuine Hitachi coolant, do so at a ratio of 30 to 50%. If Genuine Hitachi coolant is used at a concentration below 30%, it will shorten the service life of devices in the cooling system due to freezing or corrosion of the devices.

If water with a high mineral content is used in the coolant, deposits will accumulate inside the engine and the radiator, resulting in poor cooling performance and overheating.

H. Electrical System

Inspection/Maintenance Items			Qty.	Interval (Hours)						Page
				10	50	100	250	500	1000	
1.	Battery	Check Electrolyte Level	2							7-64
		Electrolyte Specific Gravity	2							7-65
2.	Monitor Functions, Instrument Operation		-							7-66
3.	Lamps Light or Flash		-							7-67
4.	Check Horn, Reverse Buzzer and Light		-							7-67
5.	Check Electrical Wiring and Fuses		-							7-68

I. Brake System

Inspection/Maintenance Items		Qty.	Interval (Hours)							Page
			10	50	100	250	500	1000	2000	
1.	Check Brake Oil Level	-								7-70
2.	Check Braking (Left/Right Interlocked)	-								7-71
3.	Check the Parking Brake	-								7-72
4.	Check Brake Discs (Regular and Parking)	-								7-72
5.	Replace Brake Oil	0.4 L (0.4 US qt)								7-72

MAINTENANCE

J. Tires

Inspection/Maintenance Items			Qty.	Interval (Hours)						Page
				10	50	100	250	500	1000	
1.	Check/Adjust Tire Pressure	Inspect	4							7-73
		Adjust	4	As required						7-73
2.	Check for Damage to Tires	Inspect	4							7-74
3.	Retighten Wheel Nuts	Adjust	4		★					7-74

★ : 50 hours the first time only.

K. Air Conditioner (Optional on Cab-Equipped Machines)

Inspection/Maintenance Items				Qty.	Interval (Hours)						Page	
					10	50	100	250	500	1000		2000
1.	Air Conditioner	Circulating Air Filter	Clean	1				★				7-78
			Replace	1	After Cleaning 6 Times						7-78	
2.	Check Air Conditioner Unit			-	★★Every 250 hours or 3 months						7-79	
3.	Check Lines			-	★★Every 250 hours or 3 months						7-79	
4.	Check Air Conditioner Condenser			1	★★Every 250 hours or 3 months						7-80	
5.	Check the AC Drive Belt			1	★★Every 250 hours or 3 months						7-80	
6.	Check Refrigerant Level			1	★★Every 250 hours or 3 months						7-81	
7.	Check the Compressor and Pulley			1	★★Every 250 hours or 3 months						7-81	
8.	Switch Operation			-	★★Every 250 hours or 3 months						7-81	

★ : Every 250 hours or once/month, whichever comes first.
When used on dusty work sites, clean and replace sooner.

★★: The Fluorocarbons Emission Control Law requires an inspection at least once every 3 months and inspection/maintenance records must also be kept. In addition, operators who leak 1,000 or more CO₂ tons of CO₂ equivalents of CFCs per year must report it to the government.
For details, refer to the website of the Ministry of the Environment or the Ministry of Economy, Trade and Industry, or contact the nearest handler of CFCs or your authorized dealer.



NOTE: GWP (Global Warming Potential) is a value that indicates how many times the greenhouse effect of CO₂ a substance has.

MAINTENANCE

L. Miscellaneous

	Inspection/Maintenance Items	Qty.	Interval (Hours)						Page
			10	50	100	250	1000	4500	
1.	Check for Looseness/Wear to the Bucket's Bolt-On Cutting Edge	-							7-82
2.	Check and Replace Seat Belt	1		Every 4 years					7-83
3.	Damage or Deformation of Canopy or Cab, Loose Bolts	-							7-83
4.	Check Level of Washer Fluid (Cab-Equipped Machines)	-							7-83
5.	Check Steering Wheel Play	-							7-84
6.	Accelerator Pedal Operation, Color and Sound of Exhaust	-							7-85
7.	Damage or Looseness of Rearview Mirrors	-							7-86
8.	Damage or Looseness of Steps or Handrails	-							7-86
9.	Clean Engine Compartment and Hood	-							7-86
10.	Inspect Sound Dampening Mat around Engine	-							7-87
11.	Retighten Engine Cylinder Head Bolts*	-					★★		7-87
12.	Measure Engine Compression*	-					★★		7-87
13.	Check and Clean Starter and Alternator	-							7-87
14.	Retighten Nuts, Front Axle Mounting Nuts, Rear Axle and Transmission Mounting Nuts	-		★					7-88
15.	Check and Replace EGR Device	-							7-88
16.	Clean EGR Cooler	-							7-88
17.	Check Turbocharger	-							7-88
18.	Check and Clean Injector Nozzle	-							7-88
19.	Tightening and Retightening Torque of Nuts and Bolts	-		★					7-89

 **NOTE:** For items with asterisks (*), contact your authorized dealer for maintenance.

★ : At 50 hours the 1st time only.

★★ : Every 1000 hours or 1 year, whichever comes first

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.

System/Equipment		Replacement Part	Interval
Engine	Fuel Tank	Hose	Every 2 years or 2000 hours
	Heater	Hose	
	Muffler	Lagging cover	Every 2000 hours
	Pump	Pump coupling	Every 8000 hours
Brake system	Brake valve	Various seals (Rubber parts)	Every 1 year
	Wet brake	Piston O-ring	Every 4 years
	Brake piping	Hose	Every 2 years or 2000 hours
	Stop light	Switch	Every 2 years
Steering system	Steering piping	Hose	Every 2 years or 2000 hours
	Steering cylinder	Various seals (Rubber parts)	Every 4 years
	Steering valve	Various seals (Rubber parts)	Every 2 years
Hydraulic System	Pump	Suction hose	Every 4 years or 4000 hours
		Delivery hose	
		HST line hose	
		HST oil cooler line hose	
	Working system	Bucket cylinder line hoses	Every 4 years or 4000 hours
		Lift arm cylinder line hoses	
		Hydraulic oil tank return hose	
		Hydraulic oil cooler line hose	
Operator's Seat	Seat belt	Seat belt	Every 4 years

 **NOTE:** When replacing hoses, replace O-rings and gaskets used with them at the same time.

MAINTENANCE

Kind of Oils

Grease

Oil Manufacturer Outside Temperature (In Random Order)	Type of Grease	Multi-Purpose Lithium Grease Extreme Pressure System
	Place Used	Front Joint Pins and Other
	Outside	-20 to 40 °C (-4 °F to 104 °F)
	Genuine Hitachi Product	Hitachi Genuine Grease SEP2 Hitachi Genuine Grease EP-2
Miscellaneous	Specifications	Extreme Pressure Lithium Grease No.2 for Construction Machinery

IMPORTANT: Use the genuine Hitachi product as it was selected for use in this machine, based on testing.

We recommend using genuine Hitachi products. If a genuine Hitachi product is not used, use a grease that conforms to the above specification. Do not use a non-conforming product as doing so may result in damage to the machine. If a problem arises due to using a non-conforming product, it invalidates the warranty. If there are any unclear points, consult your authorized dealer.

MAINTENANCE

Engine Oil

IMPORTANT: Use the genuine Hitachi product as it was selected for use in this machine, based on testing. We recommend using genuine Hitachi products. Use an engine oil equivalent to JASO standard DH-2. Using any other engine oil may impact the performance or life of the engine or aftertreatment device. Do not use a non-conforming product as doing so may result in damage to the machine. If a problem arises due to using a non-conforming product, it invalidates the warranty. If there are any unclear points, consult your authorized dealer.

Kind of Oil		Engine Oil	
Manufacturer (In Random Order)	Place Used	Engine Crank Case	
	Outside temperature	-20 to 40 °C (-4 °F to 104 °F)	
	Standard		JASO
	Genuine Hitachi Product	Super Wide DH-2 10W40	DH-2

Axle Oil, Transmission Oil

Kind of Oil		API GL5, LSA, MIL2105B
Manufacturer	Application	Transmission and Axle
	ELF	* SF3

IMPORTANT: When shipped the machine is using the oil marked with *.

As this oil was selected based on tests made for use in this machine, use the oil marked with * (hereafter, the recommended product) unless it is not available; otherwise use an oil listed above other than the recommended product.

Note that using an oil other than the recommended product may result in a shorter brake life and abnormal noise, depending on usage conditions. Do not use any oil other than those above as doing so may result in damage to the machine.

If an oil other than those above is used and it results in a problem with the machine, it will not be covered by the warranty. If you have any questions, consult your authorized dealer.

MAINTENANCE

Hydraulic Oil

Kind of Oil		Wear-resistant hydraulic oil	
Oil Manufacturer (In Random Order)	Place Used	Hydraulic Equipment (Hydraulic Oil Tank)	
	Outside temperature	-20 to 40 °C (-4 °F to 104 °F)	
	Genuine Hitachi Construction Machinery	Super EX46HN	
Miscellaneous			JCMAS HK VG46W compliant products
Change Interval		1000 Hr	

IMPORTANT: Use the genuine Hitachi product as it was selected for use in this machine, based on testing. We recommend using genuine Hitachi products. If a genuine Hitachi product is not used, use an oil that conforms to JCMAS HK VG46W. Do not use a non-conforming product as doing so may result in damage to the machine. If a problem arises due to using a non-conforming product, it invalidates the warranty. If there are any unclear points, consult your authorized dealer.

 **NOTE:**

- Products that conform to JCMAS HK VG46W may require a replacement interval different to genuine Hitachi products. If there are any unclear points, consult your authorized dealer.
- For information on JCMAS HK VG46W conforming oils, refer to the Japan Lubricating Oil Society (JALOS) home page.

Coolant

Kind of Oil	Long-Life Coolant
Place Used	Radiator
Brand, Standard	DEUTZ Recommended Product, ASTM D-6210 or ASTM D-6211

Air Temperature [°C]	Long-Life Coolant Ratio [%]	Total Capacity: 14.8 L			
		Long-Life Coolant		Soft Water	
		liters	US gal	liters	US gal
-10 °C (14 °F) or higher	30	4.4	1.2	10.4	2.7
-15 °C (5 °F) or higher	35	5.2	1.4	9.6	2.5
-20 °C (-4 °F) or higher	40	5.9	1.6	8.9	2.4
-30 °C (-22 °F) or higher	50	7.4	2.0	7.4	2.0

Brake Oil

Place Used		Level and Leaks of the Brake Oil Tank	
Oil Manufacturer (In Random Order)	Kind of Oil	Brake Oil (Mineral Oil)	
	Outside temperature	-20 to 40 °C (-4 °F to 104 °F)	
	Genuine Hitachi Construction Machinery	Brake Oil	
Miscellaneous	Standard	Engine Oil SAE 5W-20 (Mineral Oil)	

IMPORTANT: Use the genuine Hitachi product as it was selected for use in this machine, based on testing. We recommend using genuine Hitachi products. If a genuine Hitachi product is not used, use an oil (mineral oil) that conforms with the above standard.

Do not use a non-conforming product as doing so may result in damage to the machine. If a problem arises due to using a non-conforming product, it invalidates the warranty. If there are any unclear points, consult your authorized dealer.

MAINTENANCE

A. Greasing

⚠ WARNING: Engage the parking brake and secure the front and rear frames with the articulation lock bar.

✎ NOTE:

- Grease daily during first 50 hours of break-in operation to establish smooth run-in.
- If excavation is performed in mud, water or snow, grease after operation is complete.
- Supply sufficient high-quality grease via the grease fittings. Clean around the grease fittings prior to supplying grease. After adding new grease, wipe off any old grease that is extruded.

1. Bucket pins (1) left and right (2 pins)
--- every 250 hours
(During daily checks in the first 50 hours)
2. Bucket link pins (2) (2 pins)
--- every 250 hours
(During daily checks in the first 50 hours)
3. Bucket cylinder pin (3) (1 pin)
--- every 250 hours
(During daily checks in the first 50 hours)
4. Bucket cylinder rod pin (4) (1 pin)
--- every 250 hours
(During daily checks in the first 50 hours)
5. Bell crank pin (5) (1 pin)
--- every 250 hours
(During daily checks in the first 50 hours)



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MAINTENANCE

6. Lift arm cylinder rod pins (6) (left and right, 1 pin each)

--- every 250 hours

(During daily checks in the first 50 hours)

7. Lift arm cylinder pins (7) (left and right, 1 pin each)

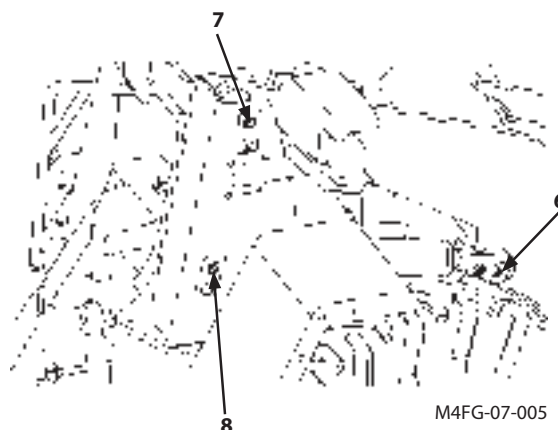
--- every 250 hours

(During daily checks in the first 50 hours)

8. Lift arm pivot pins (8) (left and right, 1 pin each)

--- every 250 hours

(During daily checks in the first 50 hours)



9. Steering cylinder rod pins (left and right, 1 pin each)

--- every 250 hours

(During daily checks in the first 50 hours)

9- Cylinder left/front

10- Cylinder right/front

10. Steering cylinder pins (left and right, 1 pin each)

(Serial No. 005001 to 005209)

--- every 250 hours

(During daily checks in the first 50 hours)

11- Left, rear

12- Right, rear



11. Steering Cylinders (left and right, 1 cylinder each)

(Serial No. 005210 and up)

--- every 250 hours

(During daily checks in the first 50 hours)

13- Left, rear

14- Right, rear



12. Frame center hinge pins (top and bottom, 1 pin each)

--- every 250 hours

15- Top

16- Bottom



MAINTENANCE

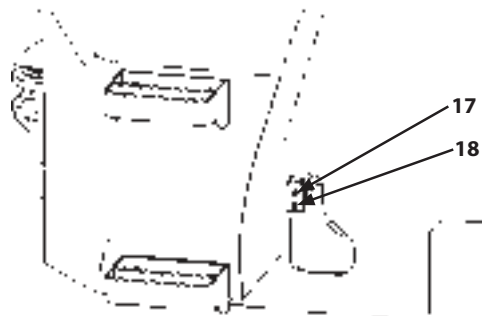
13. Axle support pin (front and rear, 1 pin each)

--- every 100 hours

17- Front

18- Rear

Grease with molybdenum grease.



M4FG-07-008

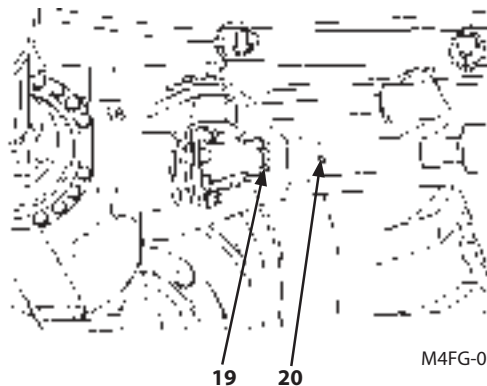
14. Propeller shaft universal joint (19) 2 places

--- every 500 hours

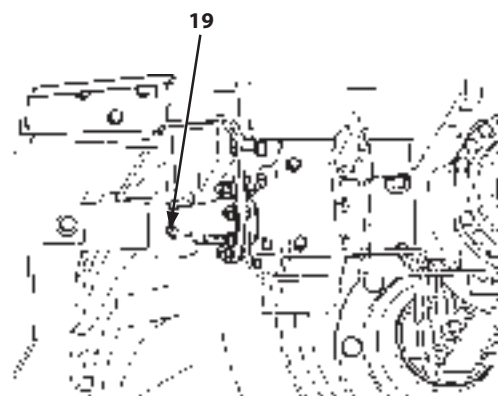
 **NOTE:** When working under severe conditions or continuous operation, grease more frequently.

15. Propeller shaft spline (20) 1 place

--- every 500 hours



M4FG-07-009



M4FG-07-010

MAINTENANCE

B. Engine

1

Engine Oil Level

...every 10 hours (check daily) (before starting the engine)

IMPORTANT: If the engine oil level is anything other than that specified, it may cause problems with the engine. (The oil level should be between the high and low marks on oil level gauge (1).)

If the engine oil level exceeds the upper limit, adjust it to the proper quantity before starting the engine.

Check the oil level before starting the engine. Pull out oil gauge (1) and check for contamination and how dirty the oil is. Wipe off the end with a clean cloth. Insert oil gauge (1), then remove it again and check the level. The oil level is fine if it is within the specified range on oil level gauge (1). If low, add the recommended engine oil via oil filler (2). Check the oil level again after adding oil.

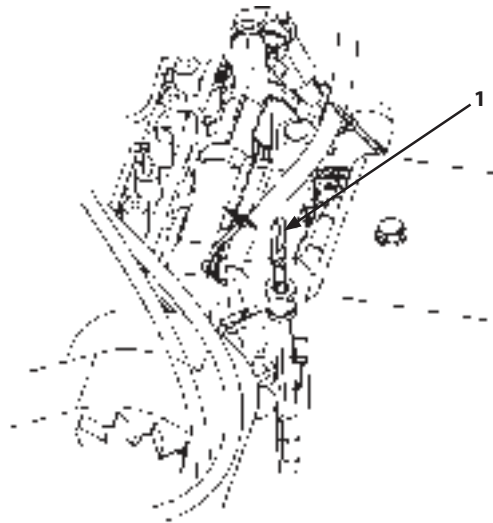
 **NOTE:** The engine must be level when adding and checking the oil level.

When checking the level after operating the machine, do so at least 15 minutes after the engine stops.

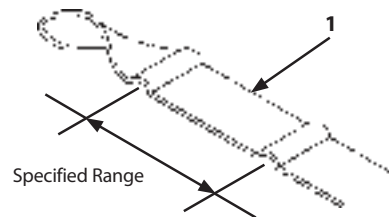
(When the oil level has stabilized in the oil pan after coming back from the engine.)

If the oil is greatly discolored or dirty, or if contaminated, change the oil.

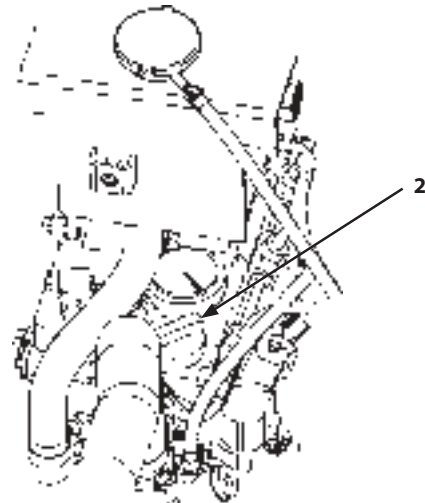
 **WARNING:** Avoid spillages when adding oil. Things that burn readily, such as fuel, oil, debris, grease, accumulated coal dust, etc. can cause a fire.



MNCH-07-003



MNCH-07-004



MNCH-07-005

MAINTENANCE

2

Change Engine Oil

3

Replace Engine Oil Filter

--- every 500 hours



WARNING:

- Engine oil may be hot just after operation. Wait for oil to cool before starting work. Failure to do so may result in a burn.
- When engine oil filter cartridge (4) is loosened, oil drips onto oil tray (1) and there is a risk of oil getting on muffler (2). Have a 15 mm diameter hose (6) on hand to prevent oil from getting on muffler (2).



NOTE: Never dump waste illegally as doing so destroys our global environment.

Contact a recovery specialist or your authorized dealer to dispose of old oil and filters.

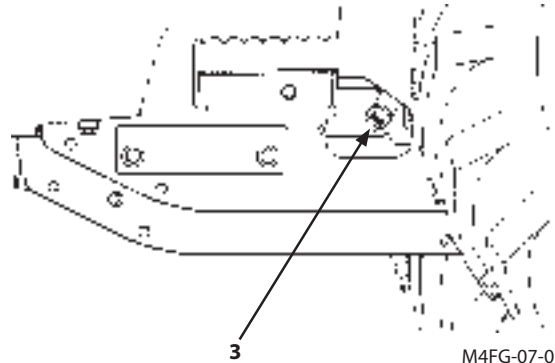
Replace engine oil filter cartridge (4) at the same time as the engine oil.

1. Park the machine according to 7-7 for Preparations for Inspection and Maintenance.
2. Clean the areas around drain plug (3) and where engine oil filter cartridge (4) is mounted.
3. Have a 10-liter container (5) on hand to catch oil as it drains.
4. Remove drain plug (3) next to the fuel tank and drain the oil.
5. Securely tighten drain plug (3) after draining the engine oil.

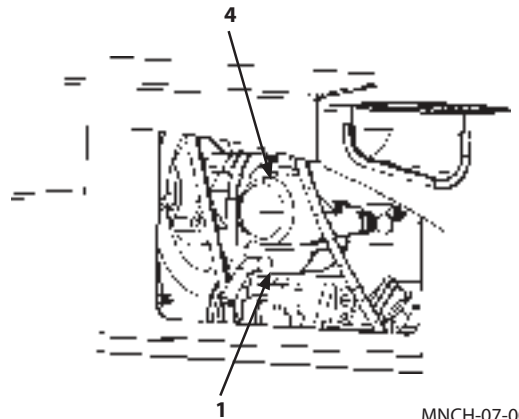
IMPORTANT:

- Take care to keep dust and any other foreign matter out of the oil filter.
 - Take care not to damage the body of the oil filter during installation and removal.
 - The cartridge element cannot be reused.
6. Turn cartridge element (4) counterclockwise to remove it.

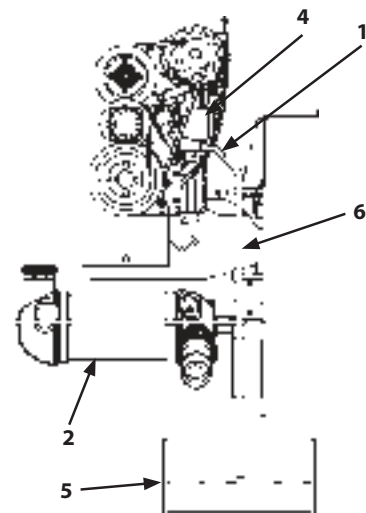
Make sure the gasket is not stuck and left behind on the seal face.



M4FG-07-012



MNCH-07-006



MNCH-07-007

MAINTENANCE

7. Apply a thin film of engine oil to the gasket and O-ring of the new cartridge and then hand tighten the cartridge filter clockwise until its gasket touches the seal face.

8. From that point, tighten it a further 3/4 to 1 turn.

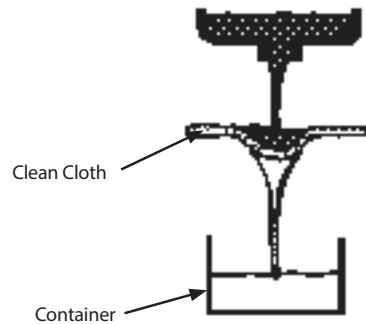
Tightening Torque: 16.0 N·m (1.6 kgf·m, 12.0 lbf·ft)

Take care not to overtighten the cartridge as doing so will deform it.

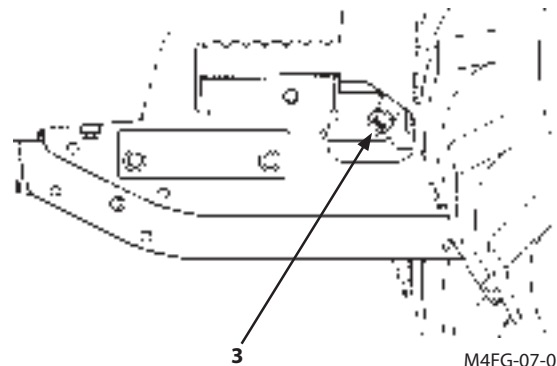
 **NOTE:** Take care that the gasket does not become misaligned and damaged during installation.

Make sure no oil is leaking from around the filter mounting surface.

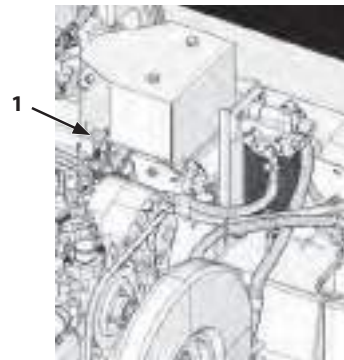
9. Strain the oil with a clean cloth and check it for any debris, such as small pieces of metal.
10. Securely tighten drain plug (3).
11. Remove oil filler cap (2) and fill with the specified amount of engine oil.
Specified amount: 9-liters (16 US gal)
12. Make sure the oil level is between the marks on oil gauge (1) before starting the engine.
13. After starting the engine, check and make sure no oil is leaking from the seal.
14. Run the engine at slow idle for 5 minutes and then stop the engine. After 15 minutes, recheck the oil level and add as needed.



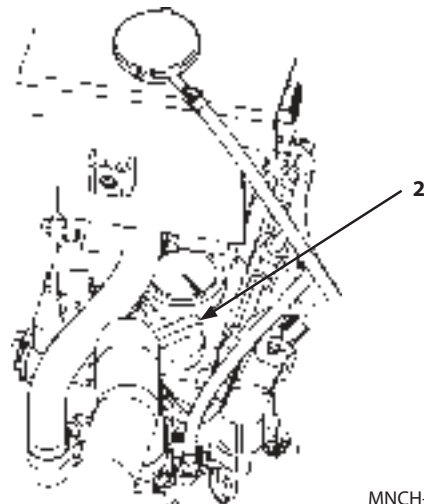
M4GB-07-020



M4FG-07-012



MNCH-07-046



MNCH-07-005

MAINTENANCE

C. Powertrain

1

Change Transmission Oil

--- every 1000 hours (first time only, at 250 hours)



WARNING:

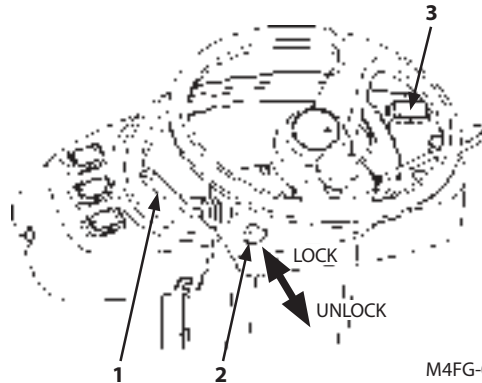
- A serious accident may occur due to unexpected movement of the machine. After stopping the machine, put F-N-R lever (1) in (N), put neutral lever lock (2) in LOCK, actuate parking brake (3) and stop the engine.
- There is a risk of being burned immediately after operation. Wait for the oil to cool before starting any maintenance work.
- Secure the front and rear frames with articulation lock bar (4).

IMPORTANT: Do not use any brand of transmission oil other than that listed under Kinds of Oils.

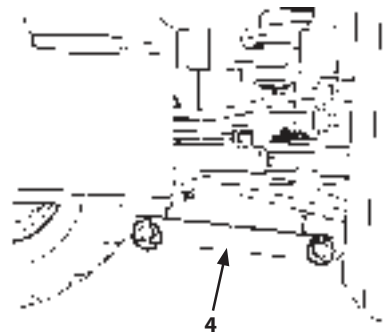
1. Park the machine according to Preparations for Inspection and Maintenance (7-7).
2. Mount articulation lock bar (4) on the front and rear frames according to section 7-9.
3. Turn the key switch OFF to stop the engine. Let the machine sit for 10 minutes.
4. Clean the areas around drain plug (5) and where oil level plug (6) is mounted.
5. Have a 2-liter container on hand to catch oil as it drains.
6. Remove drain plug (5) under the transmission and drain the oil. Dispose of the used oil as required.
7. Securely tighten drain plug (5).
8. Fill with the specified amount of oil via the hole of oil level plug (6). Amount of oil: 1.0-liter
9. The amount is correct when the oil reaches the hole of oil level plug (6). Add oil if it is low.



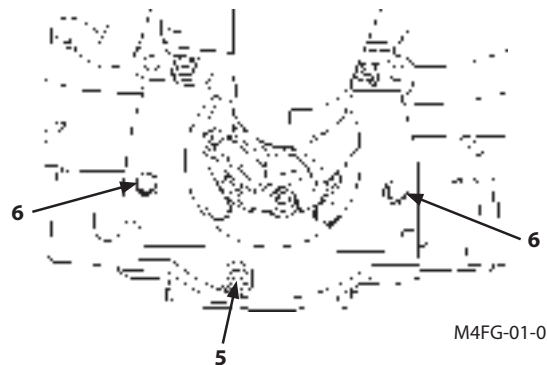
NOTE: Finally, make sure no oil is leaking from around the drain plug.



M4FG-01-007



M4FG-01-035



M4FG-01-013

MAINTENANCE

2

Replace Axle Oil

--- every 1000 hours (first time only, at 250 hours)



WARNING:

- There is a risk of being burned immediately after operation. Wait for the oil to cool before starting any maintenance work.
- Secure the front and rear frames with the articulation lock bar.

IMPORTANT: Do not use any brand of axle oil other than that listed under Kinds of Oils.

Replace Axle Oil

1. Park the machine according to Preparations for Inspection and Maintenance (7-7).
Stop the machine so oil level plug (1) of the axle is toward the ground (bottom).
2. Mount the articulation lock bar on the front and rear frames according to section 7-9.
3. Clean the areas around drain plugs (2) and (4), and where oil level plugs (1) (3) and (5) are mounted.
4. Have a 10-liter container on hand to catch oil as it drains.
5. Remove drain plugs (2) and (4) on the bottom of the axles and oil level plug (1) and drain the oil. Dispose of the used oil as required.

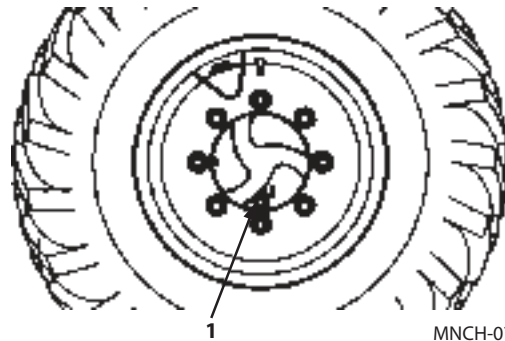
IMPORTANT: Do not use a seal tape on the drain plugs. Doing so may damage the case and/or cause a leak.

6. Apply Loctite #572 or the equivalent to drain plugs (2) and (4) and tighten them securely.
7. Fill with the specified amounts of oil via the holes of oil level plugs (1), (3) and (5).

Front and Rear Axles (1)	Front Axle (3)	Rear Axle (5)
0.9-liter (16 US gal)	4.4-liter (16 US gal)	4.6-liter (16 US gal)

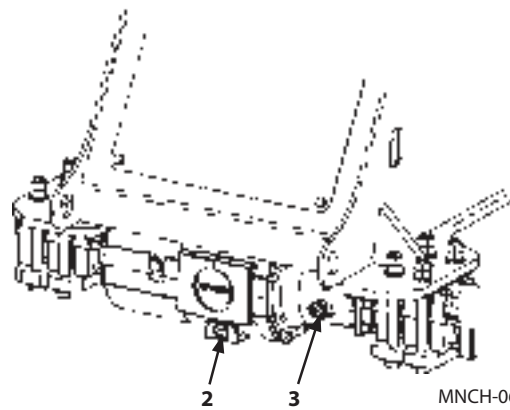
IMPORTANT: It takes time for the oil to fully spread out.

Install the plugs, drive the machine around for a few minutes, then stop the engine and check for oil leaks.



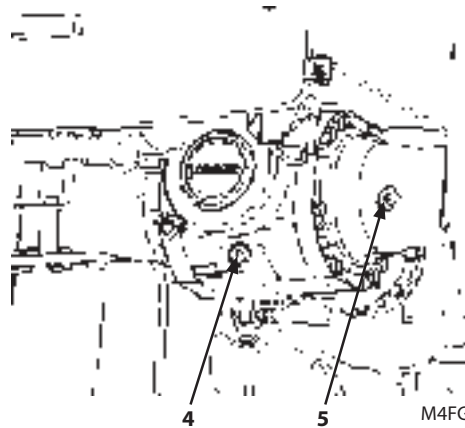
Front and Rear Axles

MNCH-07-038



Front Axle

MNCH-06-001



Rear Axle

M4FG-01-077

MAINTENANCE

8. Check the oil level according to the procedure.
9. Use the same procedure to replace the oil in the remaining 3 oil level plugs (1) on the front and rear axles.

Check Oil Level

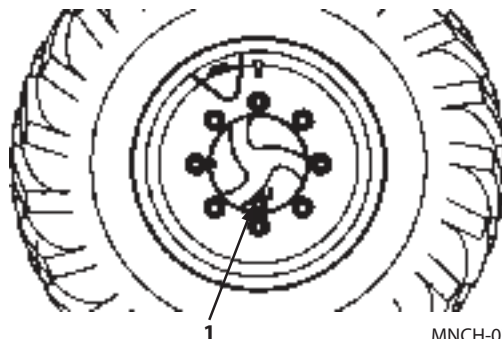
1. Park the machine according to Preparations for Inspection and Maintenance (7-7).

Stop the machine so oil level plug (1) of the axle is level with the ground.

2. Mount the articulation lock bar on the front and rear frames according to section 7-9.
3. Clean the areas around where oil level plugs (1) (3) and (5) are mounted.
4. The amount is correct when the oil reaches the holes of oil level plugs (1), (3) and (5).

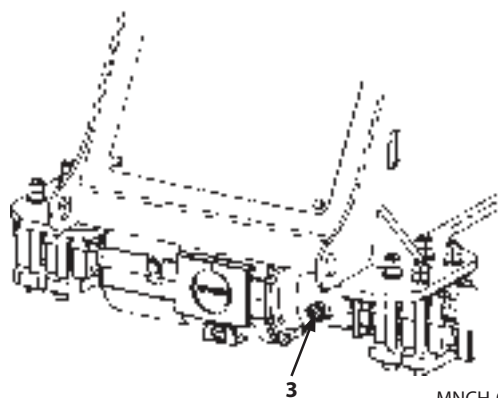
Add oil if it is low.

5. Use the same procedure to check the oil in the remaining 3 oil level plugs (1) on the front and rear axles.



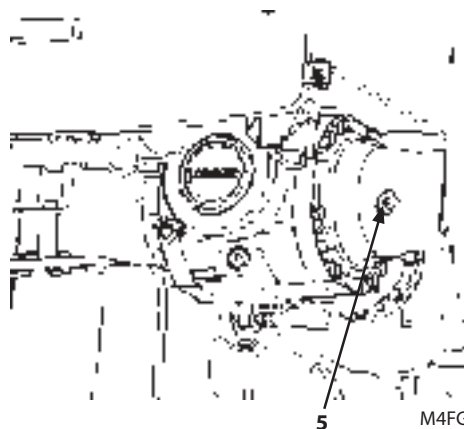
Front and Rear Axles

MNCH-07-038



Front Axle

MNCH-06-001



Rear Axle

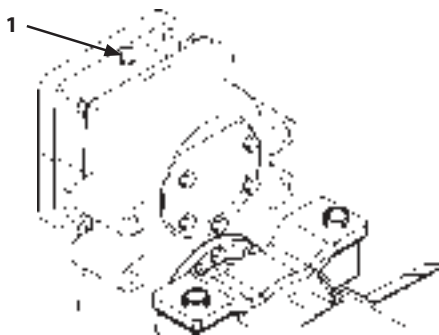
M4FG-01-077

MAINTENANCE

- 3** Clean the Oil Breather of the Transmission
--- every 500 hours or 6 months

⚠ CAUTION: When cleaning with compressed air, wear safety glasses or goggles.

1. Wipe clean the area around where air breather (1) is mounted and then remove it.
2. Put a cover over where it mounts so no debris gets inside.
3. Clean air breather (1) with compressed air and if it is very dirty, wash it clean with detergent.
4. During installation, take care that no foreign matter gets inside.



M4FG-07-016

MAINTENANCE

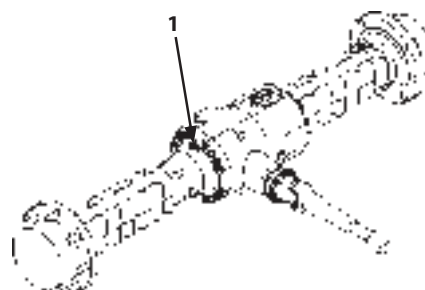
4 Check for Oil Leaks Around the Axle and Cover --- every 10 hours (check daily)

Check for oil leaks around the axle and cover. Check the bolt(s) where there are oil leaks and retighten them if loose.

5 Clean the Air Breather on the Axle Housing --- every 500 hours

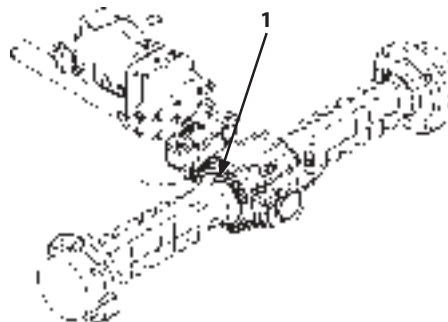
CAUTION: When cleaning with compressed air, wear safety glasses or goggles.

1. Wipe clean the area around where air breather (1) is mounted and then remove it.
2. Put a cover over where it mounts so no debris gets inside.
3. Clean air breather (1) with compressed air and if it is very dirty, wash it clean with detergent.
4. During installation, take care that no foreign matter gets inside.



Front Axle

M4FG-07-017



Rear Axle

M4FG-07-018

MAINTENANCE

D. Hydraulic System

Inspection and Maintenance of Hydraulic Equipment



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

The hydraulic equipment gets extremely hot while this machine is operating. Allow the machine to cool before inspection or maintenance.

1. Park the machine according to 7-7 for Preparations for Inspection and Maintenance.
2. Prior to inspecting or servicing the hydraulic system, relieve the residual pressure and allow the parts to cool.
 - 2.1 Release the residual pressure.
 - 2.2 Allow the machine to cool down. Be careful as servicing hot and pressurized hydraulic components may cause plugs, screws and/or oil to fly off or escape suddenly, potentially resulting in personal injury.
 - 2.3 Keep body parts and your face away from the front of plugs or screws when removing them. Hydraulic components may be pressurized even when cooled.
 - 2.4 Do not inspect or service hydraulic equipment on a slope. The hydraulic equipment will be under high pressure due to the machine's own weight.

MAINTENANCE

IMPORTANT:

- **When attaching hydraulic hoses and pipes, pay close attention to avoiding scratching or getting foreign matter on the joint faces of hydraulic parts.**
- **Wash hoses, pipes, and the tank interior with a washing liquid and thoroughly wipe off before reconnecting.**
- **Use O-rings that are not scratched or deformed. Take care not to scratch them during assembly.**
- **Do not allow high pressure hoses to twist when connecting them. The life of twisted hoses will be shortened considerably.**
- **Take care not to overtighten the clamps of low-pressure hoses.**
- **Use the same brand of hydraulic oil when replenishing it. Do not use a mixture of different brands of hydraulic oils. When shipped the machine is using genuine Hitachi hydraulic oil WP46, so always use the same product. To use a different brand, replace all of the hydraulic oil.**
- **Do not use any brand of hydraulic oil other than that listed under Kinds of Oils.**
- **Do not start the engine without oil in the hydraulic oil tank.**

MAINTENANCE

1

Check Hydraulic Oil Level

--- every 10 hours (check daily)

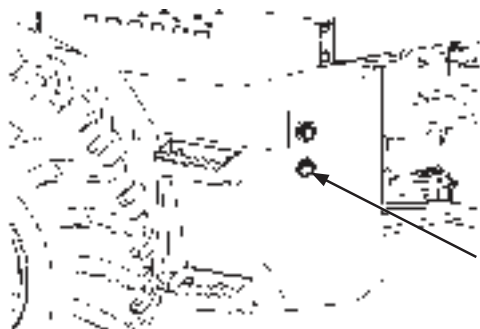
IMPORTANT: If the oil level is not visible in the level gauge, immediately replenish it to the proper level. Using it as-is will cause serious damage to the hydraulic system.

If the oil level as seen from the level gauge is too high, use a pump to remove some to the proper level.

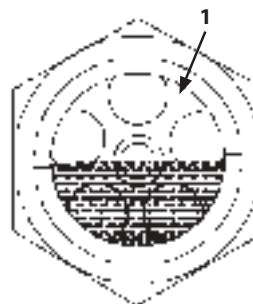
1. Park the machine according to Preparations for Inspection and Maintenance (7-7).
2. Check the oil level with level gauge (1) on the hydraulic oil tank. The amount is correct if it is in the middle of the gauge.



NOTE: When it is cold, refer to the section Warm Up Operation and warm up the hydraulic oil before checking its level.



M4FG-07-021



M4EJ-07D-002

MAINTENANCE

2 Replace Hydraulic Oil/Clean Hydraulic Oil Tank --- every 1000 hours

Replacing and Cleaning

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

IMPORTANT: Do not use any brand of hydraulic oil other than that listed under Kinds of Oils.

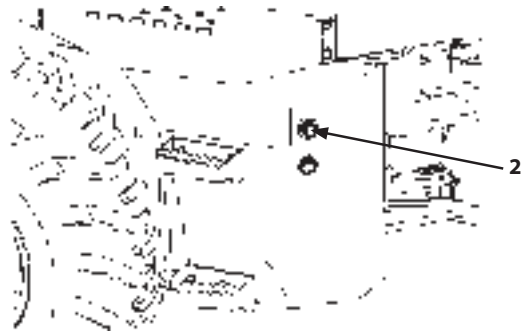
1. Park the machine according to Preparations for Inspection and Maintenance (7-7).
2. Mount articulation lock bar (1) on the front and rear frames according to section 7-9.
3. Loosen oil fill plug (2) and gradually bleed off air in the hydraulic oil tank.

IMPORTANT: Take care when changing the hydraulic oil that nothing, such as water or sand, gets inside the tank.

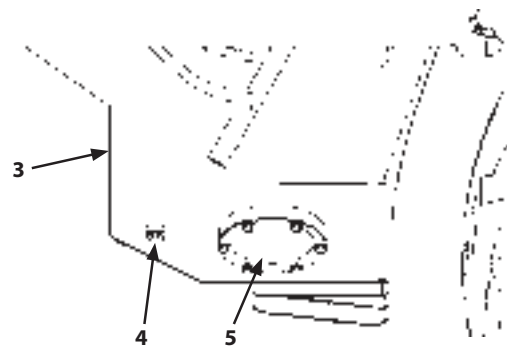
4. Clean the area around drain plug (4) on the bottom of hydraulic oil tank (3).
5. Have a 80-liter container on hand to catch oil as it drains.
6. Remove drain plug (4) and drain the hydraulic oil.
7. Remove cleaning cover (5) on the bottom of hydraulic oil tank (3). Clean the tank bottom with cleaning oil. Reinstall the cover in its original position after cleaning.
8. Securely tighten drain plug (4).



M4FG-01-035



M4FG-07-021



M4FG-07-022

MAINTENANCE

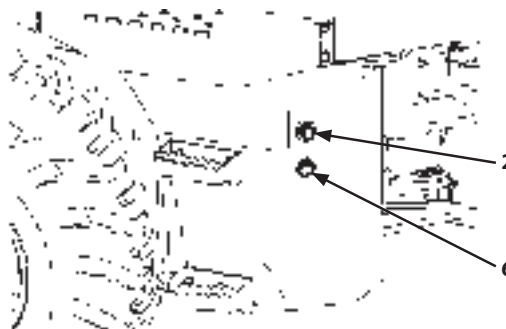
9. Remove oil filler port plug (2) and refill with hydraulic oil.

Use oil level gauge (6) to monitor the level while filling the tank.

Oil Tank Only (Total Amount of Hydraulic Oil)

Total Amount of Oil: 50 Liters, 13.2 US gal (72 Liters, 19.0 US gal)

10. Install oil filler port plug (2).
11. Start the engine and slowly move the arm up and down, and tilt the bucket forward and backward. Stop the engine and check for leaks; use oil level gauge (6) to check the amount of oil.



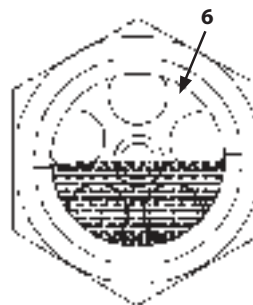
M4FG-07-021

Bleed Air from the Hydraulic System

After changing the hydraulic oil, the return filter, HST oil filter or the suction filter, bleed air from the hydraulic system by following the procedures below.

Bleeding Air From Hydraulic Circuits

1. After filling with oil, start the engine and operate the bucket and lift cylinders several times each to bleed air. Do not operate the cylinders full stroke to their ends.
2. Set the bucket down level on the ground and resume the position for checking hydraulic oil level.
3. Stop the engine, check the oil level and add if needed.



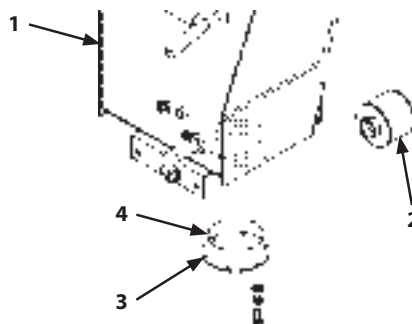
M4EJ-07D-002

MAINTENANCE

3 Clean the Suction Filter---at each hydraulic oil change

The suction filter is mounted at the bottom of the hydraulic oil tank. Clean the suction filter when changing hydraulic oil.

1. After draining the hydraulic oil, remove cleaning cover (3) on the bottom of hydraulic oil tank (1). Carefully remove suction filter (2) from the opening. Dirt it has trapped will fall off.
2. Clean the inside of the hydraulic oil tank and suction filter (2) with a cleaning oil.
3. Install suction filter (2) inside the tank. Make sure O-ring (4) is not twisted or damaged and mount cleaning cover (3) with the 6 bolts.
4. Use oil level gauge (5) to monitor the level while filling the tank via the oil fill port with the specified amount of oil.
5. Start the engine and slowly move the arm up and down, and tilt the bucket forward and backward. Make sure nothing is abnormal. Stop the engine and use oil level gauge (5) to check the amount of oil.



M4FG-07-023



M4EJ-07D-002

MAINTENANCE

4

Replace HST Oil Filter Element

--- every 1000 hours (first time only, at 100 hours)

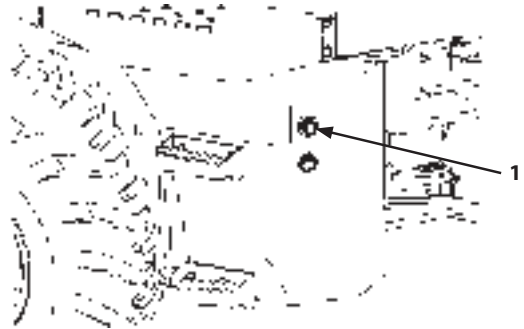
WARNING: The hydraulic oil gets hot and is under high pressure during operation of the machine. Severe burns may result if skin comes in contact with escaping hydraulic oil just after operation. Wait for the oil to cool before starting any maintenance work.

The HST oil filter is on the front left of the HST pump. Replace the element when changing the hydraulic oil.

1. Park the machine according to Preparations for Inspection and Maintenance (7-7).
2. Mount the articulation lock bar on the front and rear frames according to section 7-9.
3. Have a tray and rags ready to catch spilled oil and the element.
4. Loosen oil fill plug (1) and gradually bleed off air in the hydraulic oil tank.

IMPORTANT:

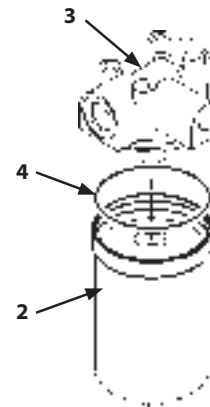
- Take care to keep dust and any other foreign matter out of cartridge element (2).
 - Take care not to damage the body of cartridge element (2) during installation and removal.
 - Cartridge element (2) cannot be reused.
5. Rotate the hexagonal part on the bottom of cartridge element (2) counterclockwise with a wrench or the like to remove cartridge element (2) from filter head (3).



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M4FG-07-025



M4FG-07-025

MAINTENANCE

6. Fill cartridge element (2) with fresh hydraulic oil.
7. Apply a thin film of hydraulic oil onto O-ring (4) of new cartridge element (2) and then use a tool (wrench) on the hexagonal part on the bottom of cartridge element (2) to install it until gasket (4) touches the seal face of filter head (3). Then tighten it a further 3/4 of a turn.

Tightening Torque: 25.0 N·m (2.5 kgf·m, 18.4 lbf·ft)

 **NOTE:** Take care that O-ring (4) does not twist or get damaged during installation.

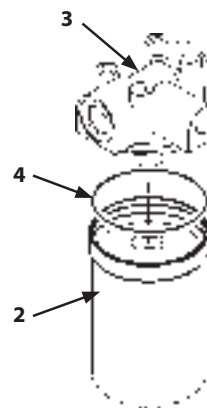
Make sure no oil is leaking from around the cartridge element (2) mounting surface.

8. After replacing the filter element, air bleed the hydraulic system and check the level of oil in the hydraulic oil tank.

(Refer to Bleeding Air from the Hydraulic System of [2](#).)

If the machine is operated with air mixed in the hydraulic system, damage to the pump will result.

 **NOTE:** Replace the element at the specified interval. The element cleans the hydraulic oil and extends the life of hydraulic equipment.



M4FG-07-025

MAINTENANCE

5

Replace Return Filter

--- every 1000 hours (first time only, at 100 hours)

Replacement Guide

⚠ WARNING: The hydraulic oil gets hot and is under high pressure during operation of the machine. Severe burns may result if skin comes in contact with the hot, escaping hydraulic oil just after operation. Wait for the oil to cool before starting any maintenance work.

Before starting work, stop the engine, apply the parking brake and block the wheels.

The return filter is on the front right of the HST pump. Replace the element when changing the hydraulic oil.

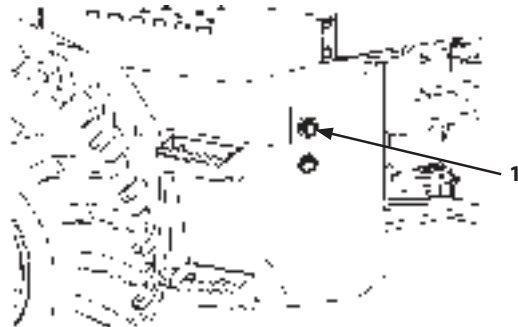
1. Park the machine according to Preparations for Inspection and Maintenance (7-7).
2. Mount the articulation lock bar on the front and rear frames according to section 7-9.
3. Have a tray and rags ready to catch spilled oil and the element.
4. Loosen oil fill plug (1) and gradually bleed off air in the hydraulic oil tank.

IMPORTANT:

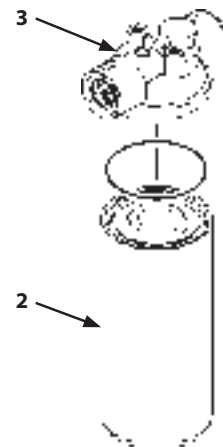
- Take care to keep dust and any other foreign matter out of cartridge element (2).
 - Take care not to damage the body of cartridge element (2) during installation and removal.
 - Cartridge element (2) cannot be reused.
5. Rotate cartridge element (2) counterclockwise to remove it from filter head (3).



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M4FG-07-021



M4FG-07-030

MAINTENANCE

6. Fill cartridge element (2) with fresh hydraulic oil.
7. Apply a thin film of hydraulic oil onto O-ring (4) of new cartridge element (2) and screw it on until O-ring (4) touches the seal face of filter head (3). Then tighten it a further 3/4 of a turn. Be careful not to overtighten it as doing so will deform cartridge element (2).

Tightening Torque: 49.0 N·m (4.9 kgf·m, 36 lbf·ft)

 **NOTE:** Take care that O-ring (4) does not twist or get damaged during installation.

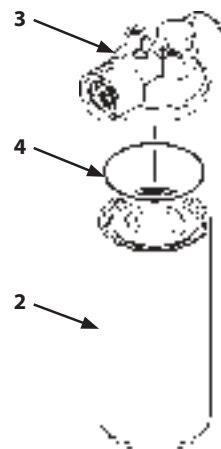
Make sure no oil is leaking from around the filter mounting surface.

8. After replacing it, bleed air from the pump and check the level in the hydraulic oil tank.

(Refer to Bleeding Air from the Hydraulic System of [2](#).)

If the machine is operated with air mixed in the hydraulic system, damage to the pump will result.

 **NOTE:** Replace the element at the specified interval. The element cleans the hydraulic oil and extends the life of hydraulic equipment.



M4FG-07-030

MAINTENANCE

6

Check Hoses and Lines

--- every 10 hours/250 hours

WARNING:

- Escaping oil under pressure can penetrate the skin, causing serious injury. To avoid this hazard, use a piece of cardboard when searching for oil leaks. Take care to protect hands and body from high-pressure fluids. If oil penetrates your skin, immediately get treatment from a doctor familiar with how to treat such an injury.

If any kind of liquid penetrates the skin, it must be surgically removed within several hours or gangrene may set in.

WARNING: Leaks of hydraulic oil or lubricating oil may cause a fire and cause serious damage.

Pay attention to the following points to avoid such risks.

- Park the machine on hard, level ground. Lower the bucket to the ground and stop the engine. Remove the key from the key switch and put the control lever lock in the LOCK position.
- Check for missing or loose clamps, whether hoses are kinked or rubbing against each other, for damage to the oil cooler, for loose flange bolts for the oil cooler and for leaks.

Check whether there are any places on hoses, pipes and the oil cooler that oil leaks or damage is likely to occur in the future. If anything abnormal is found, replace or retighten parts as per Table 1-2.

- Retighten, repair or replace missing, loose or damaged clamps, hoses, pipes or oil cooler and loose oil cooler flange bolts. Do not bend or strike any high pressure lines.



SA-031



SA-292

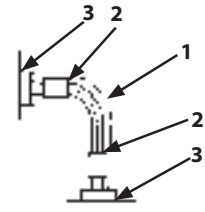


SA-044

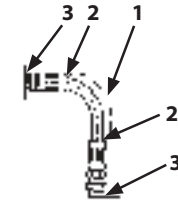
MAINTENANCE

Hose

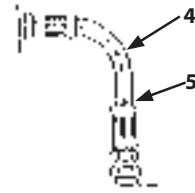
Interval (Hours)	Check Points	Check For	Remedies
Every 10 hours	Hose covers	Leak (1)	Replace
	Hose ends	Leak (2)	Replace
	Fittings	Leak (3)	Retighten or replace hose or O-ring
Every 250 hours	Hose covers	Leak (4)	Replace
	Hose ends	Leak (5)	Replace
	Hose covers	Exposed reinforcement (6)	Replace
	Hose covers	Crack or blister (7)	Replace
	Hose	Bend (8), Collapse (9)	Replace
	Hose ends and fittings	Deformation or corrosion (10)	Replace



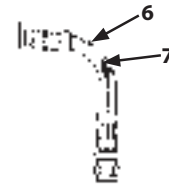
M137-07-008



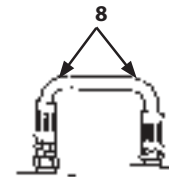
M115-07-145



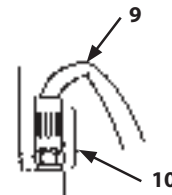
M115-07-146



M115-07-147



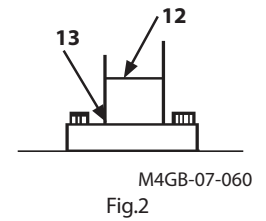
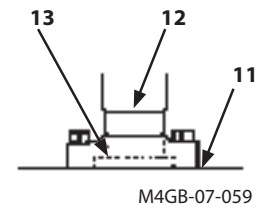
M115-07-148



M115-07-149
Fig.1

MAINTENANCE

Interval (Hours)	Check Points	Check For	Remedies
Daily	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, deformed or loose	Replace or retighten



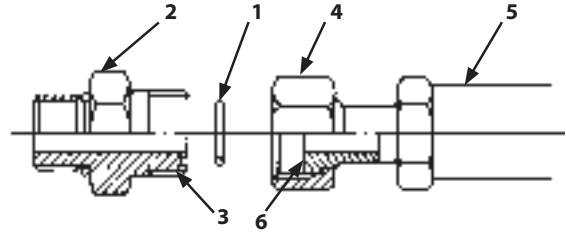
MAINTENANCE

Types of Hydraulic Fittings

Two hydraulic fitting designs are used on this machine.

1. Flat Face O-ring Seal Fittings (ORS Fittings)

O-ring (1) is used on the sealing surfaces of adapter (2) to prevent oil leakage.



M104-07-033

Precautions for Use

1. Check seat face (6). Make sure there is no grime or damage on the seat face.
2. Replace O-rings with new ones when assembling fittings.
3. Apply grease to O-ring (1) and fit it into O-ring groove (3) so it will not come out.
4. Once O-ring (1) is properly seated, press the fitting together while tightening adapter (2) by hand.
5. Tighten adapter (2) and union (4) to the torque values shown in the table below. Do not allow hose (5) to twist during tightening.
6. Check for oil leaks. If an oil leak from the fitting is found, do not tighten adapter (2) further. Open the fitting and replace the O-ring. Before tightening the fitting again, make sure the O-ring is seated in the correct place.

Tightening Torque

Tighten fittings to the torque values shown below.

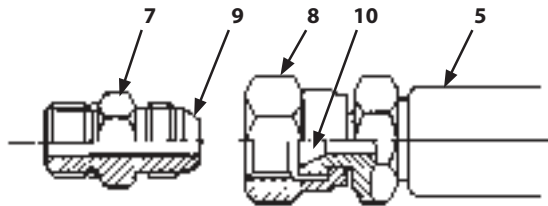
Wrench size		27 mm (1.1 in)	36 mm (1.4 in)	41 mm (1.6 in)	50 mm (2.0 in)
Tightening Torque	N·m	93	175	205	330
	(kgf·m)	(9.3)	(17.5)	(20.5)	(33.0)
	(lbf·ft)	(68.6)	(129.1)	(151.2)	(243.4)

MAINTENANCE

2. Metal Face Seal Fittings

Metal face seal fittings are used on small diameter hoses and consist of an adapter seat face (9) and a hose seat face (10).

1. Tighten adapter (7) by hand.
2. Tighten adapter (7) and nut (8) to the torque values shown in the table below. Do not allow hose (5) to twist.



M202-07-051

Tightening Torque

Tighten fittings to the torque values shown below.

Wrench size		17 mm (0.7 in)	19 mm (0.7 in)	22 mm (0.9 in)	27 mm (1.1 in)	36 mm (1.4 in)
Tightening Torque	N·m	24.5	29.5	39	93	175
	(kgf·m)	(2.5)	(3.0)	(3.9)	(9.3)	(17.5)
	(lbf·ft)	(18.0)	(22.0)	(29.0)	(69)	(129)

MAINTENANCE

E. Fuel System

1

Amount of Fuel in the Tank

---every 10 hours



CAUTION: Danger of Fire

Fuel is dangerous as it can burn easily. Keep away from fire.

IMPORTANT: Use the specified diesel in the fuel tank.

Using any other fuel will cause engine problems as well as making the engine difficult to start.

Specified Fuel

Use either low or ultra-low sulfur diesel (JIS K-2204). Use the following as a guide to the lowest temperature for each type of fuel.

However, note the specifications for diesel may vary by season and/or region, so it may congeal even within the noted ranges.

Using poor 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 problems 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 muffler, which may result in malfunction.

Type of Oil	Usable Temperature
JIS Special 1	5 °C (32.9 °F) or higher
JIS 1	0 °C (32 °F) or higher
JIS 2	-5 °C (31.1 °F) or higher
JIS 3	-15 °C (5 °F) or higher
JIS Special 3	-20 °C (-4 °F) or higher

MAINTENANCE

Refueling

1. Park the machine according to 7-7 for Preparations for Inspection and Maintenance.

IMPORTANT: The turbocharger may be damaged if the correct procedure is not used in stopping the engine.

Danger: Handle fuel carefully. Stop the engine before refueling. Never smoke while refueling the fuel tank or doing fuel-related work.

2. Check fuel gauge (1). If the fuel is low, add fuel.

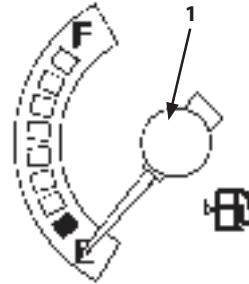
IMPORTANT: Keep dust, dirt, water and other foreign matter out of the fuel system.

3. To avoid condensation, be sure to fill the tank at the end of each day's work. Be careful not to spill fuel on the machine or the ground.

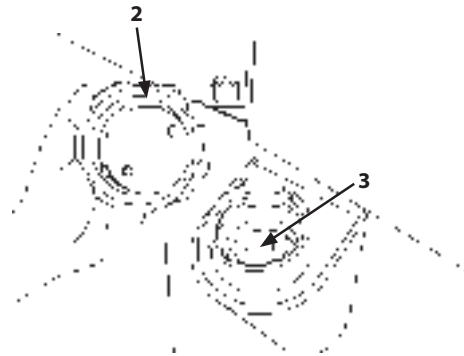
Fuel Tank Capacity: 82 L (21.7 US gal)

4. Just after fueling, install and lock filler cap (2) on the top of the tank to prevent vandalism and loss.

NOTE: Never remove strainer (3) from the fuel fill port when refueling. Take care not to allow dirt or water to enter the fuel tank while refueling.



M4GB-01-030

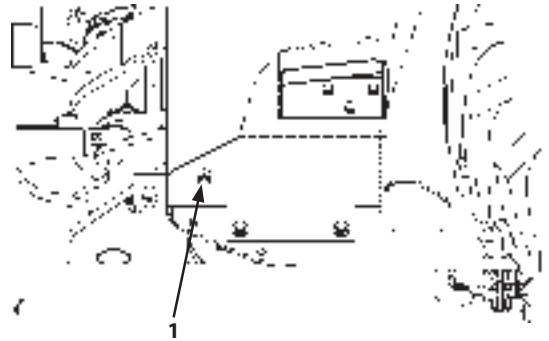


M4FG-07-027

MAINTENANCE

2 Drain Fuel Tank of Water and Sediment ---when indicator is lit

Before starting work, loosen drain plug (1) on the bottom of the fuel tank and drain off water and sediment.



M4FG-07-028

MAINTENANCE

3

Drain Fuel Pre-Filter

--- Daily check (before starting operation)

IMPORTANT: Drain fuel pre-filter daily before starting operation. The engine may be damaged if you do not drain the fuel pre-filter daily.

Fuel pre-filter (1) is a device that separates water mixed into the fuel and acts as a water drain. If an engine error alarm is flashing, drain the water.

Drain Procedure

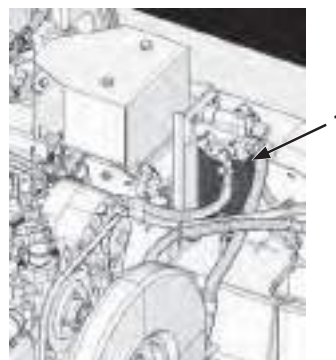
1. Loosen drain plug (2) on the bottom of the case of fuel pre-filter (1) and drain off water that has collected inside.

To ensure safety, use a container to catch the water.

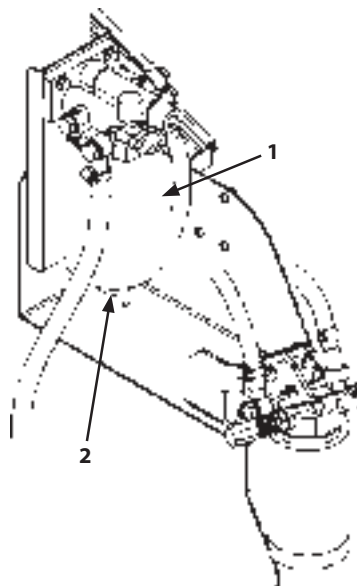
2. After draining off the water, tighten plug (2).

Tightening Torque: 1.6 N·m (0.2 kgf·m, 1.2 lbf·ft)

IMPORTANT: After draining water mixed in the fuel, perform Bleeding Air from the Fuel System.



MNCH-07-046



MNCH-07-009

MAINTENANCE

Bleeding Air from the Fuel System

Air in the fuel system may make the engine hard to start or run irregularly.

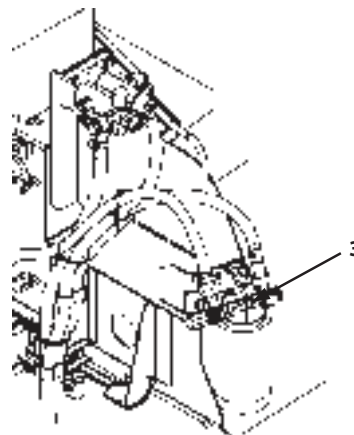
After draining water and sediment from the fuel filter, replacing the main fuel filter or fuel pre-filter, or running the fuel tank dry, be sure to bleed the air from the fuel system.

Bleeding Air

1. Loosen air bleed plug (3) on the main fuel filter and turn the key switch to its ON position.
2. After the electric pump stops running, turn the key switch back to its OFF position and wait at least 30 seconds before turning it ON again.
3. After bleeding off the air, tighten air bleed plug (3).

Tightening Torque: 6.5 N·m (0.7 kgf·m, 4.8 lbf·ft)

4. Start the engine and check the fuel supply system for fuel leaks.



MNCH-07-063

MAINTENANCE

4

Replace Main Fuel Filter Element

--- every 500 hours

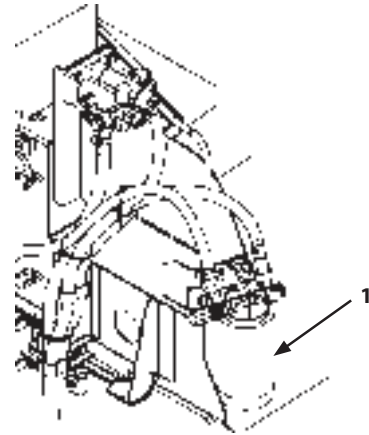
IMPORTANT:

- Use genuine Hitachi elements for the fuel main filter element and the pre-filter element. Using a different element may adversely affect engine performance and/or shorten the engine service life. Note: any engine failure caused by using other manufacturers' elements is excluded from the Hitachi Warranty Policy.
- Take care to keep dirt and water out of the system during replacement.
- Do not fill the new cartridge filter element with fuel ahead of time.

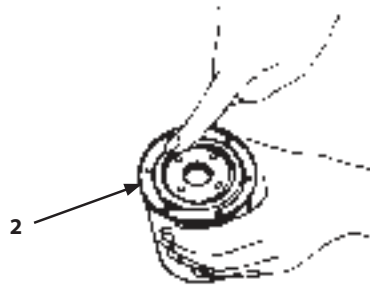
Replacement Guide

1. Park the machine according to Preparations for Inspection and Maintenance (7-7).
2. Remove cartridge filter (2) of fuel filter (1).
To ensure safety and to avoid contaminating the ground, use a container to catch the fuel.
3. Apply a thin film of fuel to the gasket of new cartridge filter element (2).
4. When installing cartridge filter element (2), hand tighten it until the gasket touches the seal.
5. From that point, tighten it a further 2/3 of a turn.
Tightening Torque: 11 N·m (1.1 kgf·m, 8.1 lbf·ft)
Take care not to overtighten cartridge filter (2) as doing so will deform it.
6. Bleed air from the fuel system.
After replacing the fuel filter element, bleed air from the fuel supply system.

(Refer to section 7-53 "Bleeding Air from the Fuel System".)



MNCH-07-063



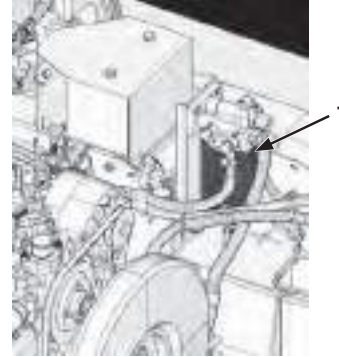
M4GB-07-066

MAINTENANCE

5 Replace Fuel Pre-Filter Element --- every 1000 hours

IMPORTANT:

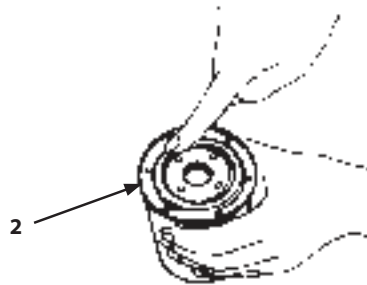
- Use genuine Hitachi elements for the fuel main filter element and the pre-filter element. Using a different element may adversely affect engine performance and/or shorten the engine service life. Note: any engine failure caused by using other manufacturers' elements is excluded from the Hitachi Warranty Policy.
- Take care to keep dirt and water out of the system during replacement.
- Take care to keep moisture out of the fuel pre-filter.



MNCH-07-046

Replacement Guide

1. Park the machine according to Preparations for Inspection and Maintenance (7-7).
2. Remove cartridge filter (1).
To ensure safety and to avoid contaminating the ground, use a container to catch the fuel.
3. Apply a thin film of fuel to the gasket of new cartridge filter element (2).
4. When installing cartridge filter element (2), hand tighten it until the gasket touches the seal.
5. From that point, tighten it a further 3/4 of a turn.
Tightening Torque: 17 N·m (1.7 kgf·m, 12.5 lbf·ft)
Take care not to overtighten cartridge filter (1) as doing so will deform it.
6. Bleed air from the fuel system.
After replacing the pre-fuel filter element, bleed air from the fuel supply system.
(Refer to section 7-53 "Bleeding Air from the Fuel System".)



M4GB-07-066

MAINTENANCE

6

Check Fuel Hoses

--- every 10 hours/250 hours



WARNING: Fuel leaks can lead to fires that may result in serious injury.

Check for twisted hoses, hoses that rub against each other or other parts and any fuel leaks.

Repair or replace any loose or damaged hoses.

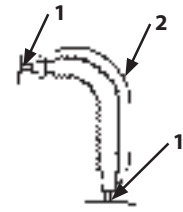
Never reinstall bent or damaged hoses.

According to the check points shown below.

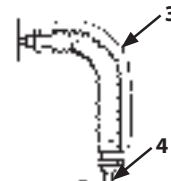
If any abnormality is found, replace or retighten as instructed in the table.

Hose

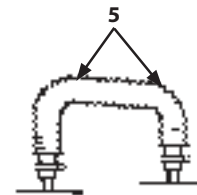
Interval (Hours)	Check Points	Check For	Remedies
Every 10 hours	Hose ends Hose covers	Leak (1) Wear, crack (2)	Retighten or replace
Every 250 hours	Hose covers Hose ends Hose Hose fittings	Crack (3) Crack (4) Bend (5), Collapse (6) Corrosion (7)	Replace Replace Replace Replace



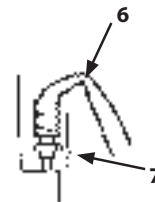
M4GB-07-071



M4GB-07-072



M4GB-07-073



M4GB-07-074

MAINTENANCE

F. Air Cleaner

1 Clean or Replace Air Cleaner Element

Clean --- when indicator is lit

Replace --- every 500 hours (after cleaning 6 times or after one year)

Air cleaner (1) is a double element, consisting of an outer element and an inner element. Normally the outer element is cleaned.

1. Park the machine according to 7-7 for Preparations for Inspection and Maintenance.

IMPORTANT: Be careful not to get any debris into the engine when cleaning and replacing parts.

2. Loosen clip band (3), remove dust cap (2) and remove dust inside the cap.

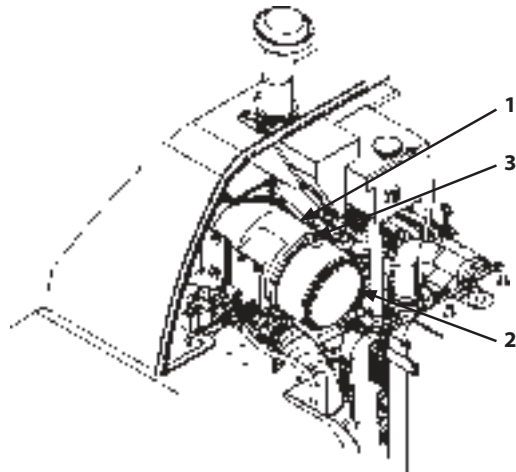
CAUTION: When using compressed air (no higher than 0.2 MPa (2 kgf/cm², 29 psi)), wear safety glasses or goggles.

IMPORTANT: When cleaning, do not hit or strike the element with another object.

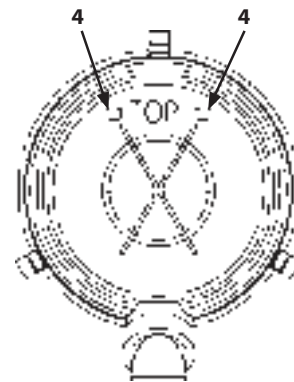
3. Clean outer element (6) by blowing compressed air [less than 0.2 MPa (2 kgf/cm², 29 psi)] from the inside of the element. After cleaning, be sure to check outer element (6) for damage. If any damage is found, replace the element with a new one.

IMPORTANT: Do not clean and reuse inner element (5).

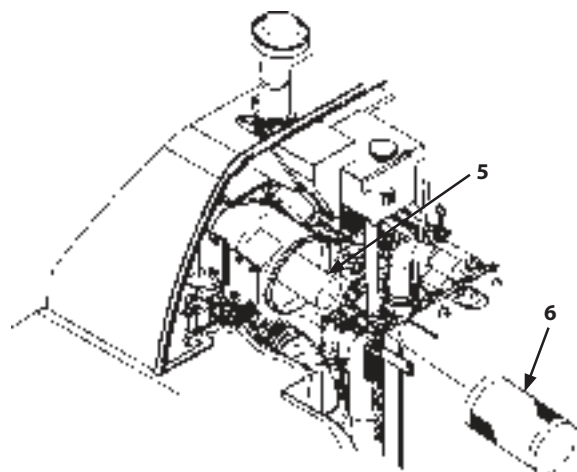
4. If the air filter restriction indicator lights soon after cleaning outer element (6) even if it has been cleaned less than 6 times, replace both outer (6) and inner (5) elements with new ones.
5. Reinstall dust cap (2) back in its original place with its arrows (4) (↑TOP↑) pointing upwards.
6. After cleaning, run the engine at low-speed and make sure the indicator does not light.



MNCH-07-010



MNCH-07-012



MNCH-07-011

MAINTENANCE

G. Cooling System

Coolant

Use soft water as a coolant. Do not use strong acid or alkaline water. Use a coolant mixed with genuine Long-Life Coolant (LLC) at a concentration of 30 to 50%.

If the temperature outside is 0°C or below, mix genuine Long-Life Coolant (LLC) with soft water and fill the cooling system with it.

In general, Long-Life Coolant (LLC) is used at a concentration of 30 to 50%. At under 30%, rust may develop, and at over 50%, the machine becomes prone to overheating.

Precautions for Handling Antifreeze

⚠ WARNING: Antifreeze is poisonous.

- If accidentally ingested, it can cause serious injury or death. Induce vomiting and get emergency medical attention immediately.
- If antifreeze is accidentally splashed into the eyes, immediately 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.
- Antifreeze is specified as a dangerous substance in the fire protection law (Class 4, Petroleum type 3).
- When disposing of antifreeze, be sure to comply with all local regulations. When storing or disposing of antifreeze, be sure to comply with all local regulations.

Air Temperature [°C]	Long-Life Coolant Ratio [%]	Total Capacity: 14.8 L			
		Long-Life Coolant		Soft Water	
		liters	US gal	liters	US gal
-10 °C (14 °F) or higher	30	4.4	1.2	10.4	2.7
-15 °C (5 °F) or higher	35	5.2	1.4	9.6	2.5
-20 °C (-4 °F) or higher	40	5.9	1.6	8.9	2.4
-30 °C (-22 °F) or higher	50	7.4	2.0	7.4	2.0

MAINTENANCE

1 Check Coolant Level --- every 10 hours

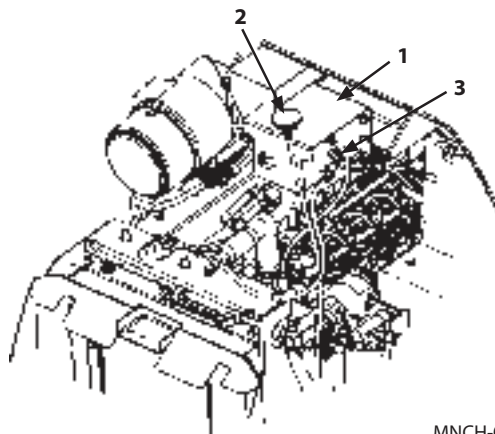
⚠ WARNING: Do not remove cap (2) until the coolant in the radiator cools down. Hot steam may spout out, possibly causing severe burns. After the coolant cools down, slowly loosen cap (2) to release the air pressure inside before removing it.

Make sure the level of coolant in expansion tank (1) is correct. The level is correct if the coolant reaches the top of sight glass (3) when cool.

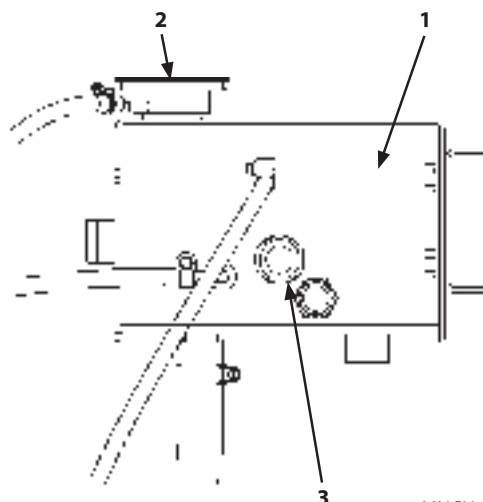
The coolant is low if the level can be seen in sight glass (3), or if it cannot be seen at all; in such case, fill with coolant to the top of sight glass (3).

When coolant in expansion tank (1) is below the appropriate level, remove cap (2) on expansion tank (1) and add coolant.

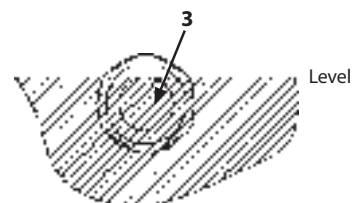
- When filling with Long-Life Coolant (LLC), use the same brand name as existing antifreeze and at the same concentration.
- If only water is added, it dilutes the mixture ratio of the Long-Life Coolant (LLC) and decreases the anti-rust and antifreeze effects of the coolant.



MNCH-07-013



MNCH-07-014



MNCH-07-014

MAINTENANCE

2 Check the Drive Belt

--- every 10 hours (check daily)

Check drive belts (1) and (2) for damage and replace with new ones if they are cracked. If loose, tighten the belt according to the section on adjusting belt tension.

IMPORTANT: A loose belt may result in insufficient battery charging, engine overheating, as well as a rapid, abnormal belt wear. If the belt is too tight, it can damage both the belt and the bearings of the water pump and alternator.

Adjust tension of belts (1) and (2) so they deflect 7 to 9 mm when pressed at their midpoints (A,B) with about 10 kgf of force.

Adjusting Drive Belt (1)

1. Loosen the 2 mounting bolts (4) of alternator (3).
2. Move alternator (3) back and forth and adjust to the correct belt tension.
3. Securely tighten mounting bolts (4) (2 bolts).

Adjusting Drive Belt (2)

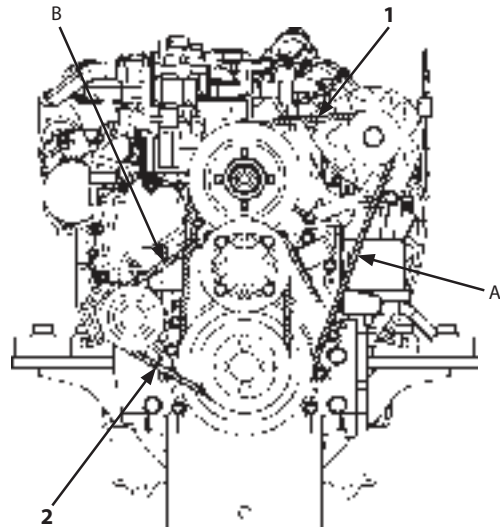
1. Loosen the 2 mounting bolts (6) of tensioner pulley (5).
2. Insert a socket wrench into C and move it up/down to adjust the belt to the correct tension.
3. Securely tighten the 2 mounting bolts (6).

 **NOTE:** When a new belt is installed, be sure to re-adjust the tension after operating the engine for about 3 to 5 minutes at slow idle speed to be sure that the new belt is seated correctly.

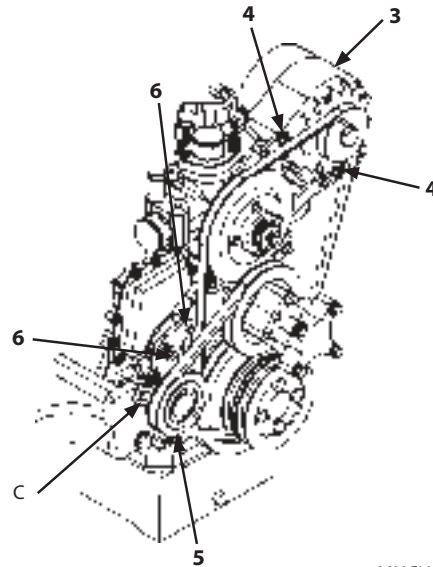
3 Replace the Drive Belt

--- every 1000 hours or when the belt has cracks

Replace drive belts (1) and (2) with new ones. Do so as indicated in the section on adjusting belt tension.



MNCH-07-016



MNCH-07-017

MAINTENANCE

4

Change Coolant

--- replace every 1000 hours or 1 year



WARNING: Do not remove cap (1) until the coolant in the radiator cools down. Hot steam may spout out, possibly causing severe burns. After the coolant cools down, slowly loosen cap (1) to release the air pressure inside before removing it.

IMPORTANT: Use genuine Hitachi coolant. Replace at 1,000 hours or 1 year, whichever comes first.

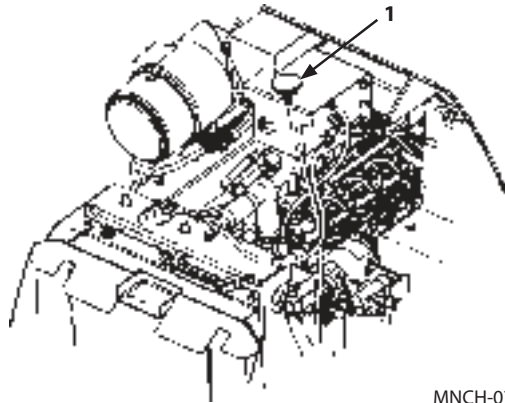
1. Park the machine according to 7-7 for Preparations for Inspection and Maintenance.
2. Attach the articulation lock bar to the front and rear frames according to the instructions on page 7-9.
3. Remove cap (1) and open drain cock (2) of the radiator to drain the coolant. Remove impurities such as scale and sludge at the same time.
4. Close radiator drain cock (2) and fill with soft or tap water with few impurities and while doing so, mix in LLC at the specified ratio. When adding coolant, do so slowly to avoid mixing air bubbles into the system.

Run the engine to sufficiently bleed air from the cooling system.

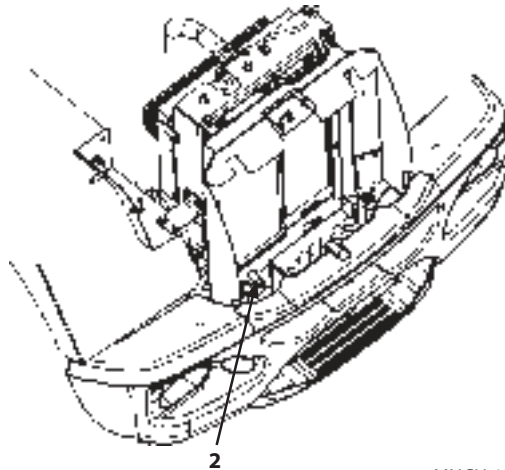


NOTE: When adding Long Life Coolant, do so at a rate of 10 L/min or less. If added too quickly, air cannot escape and the specified amount cannot be added.

5. After filling the radiator and running the engine for several minutes, check the level again and add coolant if needed.



MNCH-07-018



MNCH-07-019

MAINTENANCE

5

Clean the Radiator and Oil Cooler

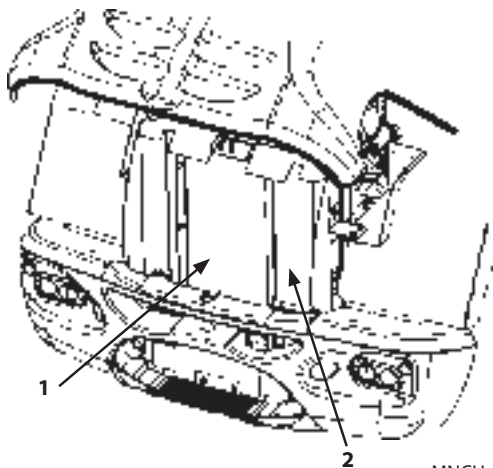
--- every 500 hours or when clogged

CAUTION: When using compressed air (no higher than 0.2 MPa (2 kgf/cm², 29 psi)), wear safety glasses or goggles.

IMPORTANT: If compressed air (0.2 MPa (2 kgf/cm², 29 psi) or lower), or tap water at high pressure is used for cleaning, damage to the radiator or oil cooler fins may result.

Keep the nozzle at least 500 mm away from the core surface.

If dust or dirt are on them, clean radiator (1) and oil cooler (2) with compressed air (0.2 MPa (2 kgf/cm², 29 psi) or lower) or tap water. This prevents a drop in performance of the cooling system.



MNCH-07-020

MAINTENANCE

H. Electrical System

IMPORTANT:

- Improper radio communication equipment and associated parts, and/or improper installation of radio communication equipment may affect the machine's electronic parts, causing unintended movement of the machine.
- Improper installation of electrical equipment may cause machine failure and/or a fire on the machine.
- Consult your authorized dealer when installing radio communication equipment or additional electrical parts.
- Never attempt to disassemble or modify electrical or electronic components. If replacement or modification of such components is required, consult your authorized dealer.

1 Battery

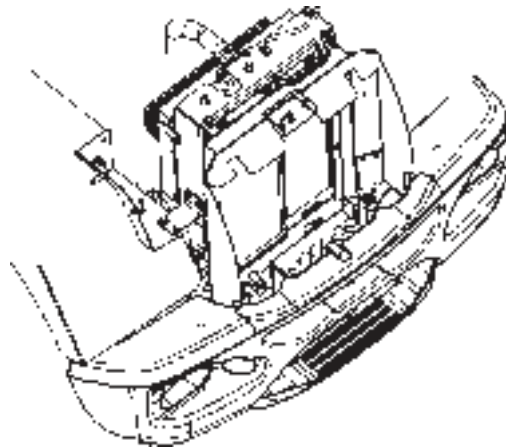


WARNING:

- Gas produced by the battery can be explosive. Keep sparks and flames away from batteries.
- Do not keep tools, metals or flammable materials around the battery or inside the battery chamber. 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 the electrolyte level is lower than specified. Explosion of the battery may result.
- Charge the batteries in a well ventilated location.
- Sulfuric acid is used in the battery electrolyte. It is strong enough to burn skin and eat holes in clothing. It can cause blindness if splashed into the eyes.



SA-036



MNCH-07-019

MAINTENANCE

Avoid hazards by:

1. Charge the batteries in a well ventilated location.
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 it gets in your eyes, rinse them out for 15 to 30 minutes and 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:

- When adding water to batteries in freezing weather, do so before you begin operating your machine for the day, or before charging 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 above the specified upper level. Electrolyte may spill, damaging painted surfaces and/or corroding other machine parts.



NOTE: If electrolyte is refilled above the specified upper level line or beyond the bottom end of the sleeve, use a pipette to remove the excess electrolyte until the electrolyte level is down to the bottom end of the sleeve. After neutralizing the wiped up electrolyte with baking soda (sodium bicarbonate), flush it with plenty of water. Or, 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 To check the level from the side of the battery:

Clean the area around the level lines with a water-dampened cloth. Do not use a dry towel. Static electricity may develop, causing the battery gas to explode. Check if the electrolyte level is between U.L (Upper Level) and L.L (Lower Level).

If the electrolyte level is lower than the middle level between the U.L and L.L, immediately refill with distilled water or commercial battery fluid.

Refill with before charging (operating the machine).

After refilling, securely tighten the filler plug.

3.2 If checking from the side of the battery is not possible, or if there are no level marks 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 electrolyte level accurately in this case, so judge its level as shown in the diagrams. 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 plug.

Refill with before charging (operating the machine).

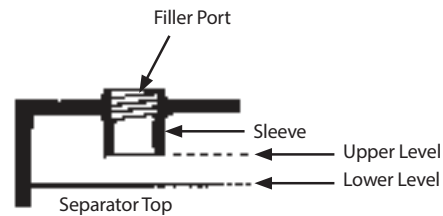
3.3 If the level can be checked with an indicator, etc., follow its instructions.

4. Keep the area around the battery terminals clean. This prevents the battery from discharging.

Check terminals for looseness and/or rust. Coat terminals with grease or petroleum jelly to prevent corrosion build up.



M146-07-109



M146-07-110

Good



When electrolyte reaches the bottom of the sleeve, surface tension makes the electrodes appear bent.

M146-07-111

Low



When the electrolyte surface is lower than the bottom end of the sleeve, the electrode ends appear straight.

M146-07-112



M409-07-072

MAINTENANCE

Check Electrolyte Specific Gravity---every 250 hours



WARNING:

- Gas produced by the battery can be explosive. 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 hazards by:

1. Charge the batteries in a well ventilated location.
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 it gets in your eyes, rinse them out for 15 to 30 minutes and get medical attention immediately.

If acid is swallowed:

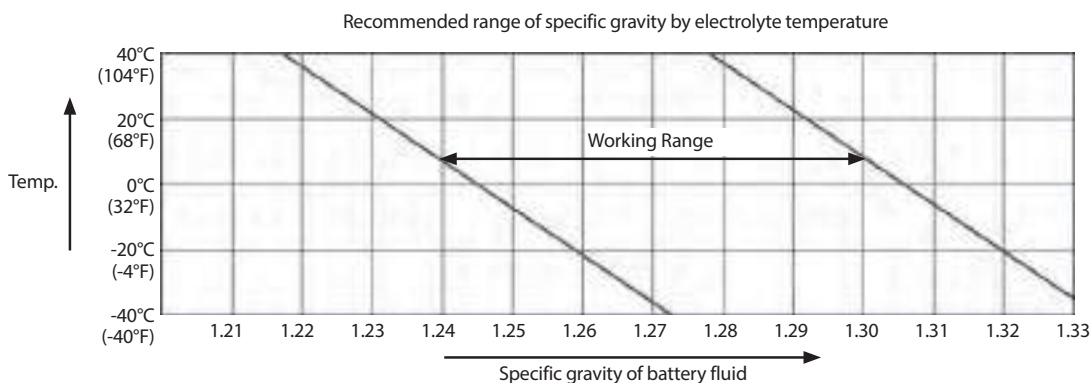
1. Do not induce vomiting.
2. Drink large amounts of water or milk.
3. Get medical attention immediately.

IMPORTANT: Check the specific gravity of the electrolyte after it is cooled, not immediately after operation.

Immediately after operation the electrolyte is still changing, so it cannot be measured accurately.

Check the electrolyte specific gravity in each battery cell.

The lower limit of the specific gravity varies with 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 Battery

IMPORTANT: When making adjustments to the electrical system or welding on the machine, disconnect the negative cable from the battery. Turn the battery disconnect switch (optional) to OFF.

This machine is equipped with one 12V battery, which is negatively grounded.

2 Monitor Functions, Instrument Operation --- every 10 hours

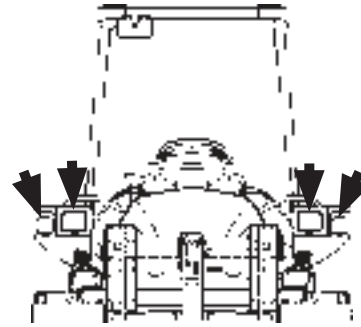
Check each device with the engine at slow idle. On the monitor, red indicators are used for alarms, orange ones for cautions, and blue or green ones as operation checks. Turn the key switch ON and check if the needles of instruments move; if it points to the red, there is a problem. For details, refer to items in the operator's cab in section 1.

MAINTENANCE

3 Lamps Light or Flash --- every 10 hours (check daily)

CAUTION: Replace burned out lamps as soon as possible with new ones.

Check whether the various lamps light or flash, starting in the front of the machine, and then check the rear.

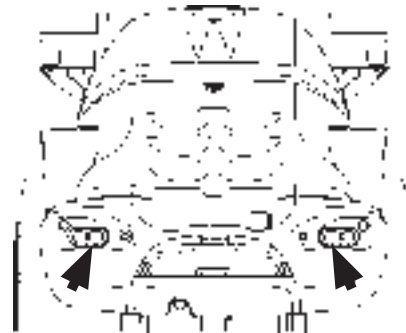


M4FGE-01-021

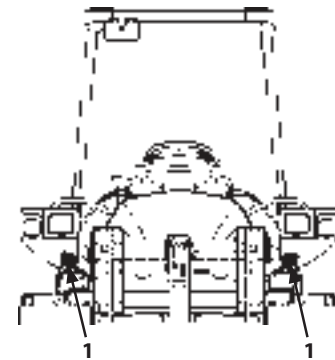
4 Check Horns, Reverse Buzzer and Light --- every 10 hours (check daily)

WARNING: When checking the operation of the horns and reverse buzzer and lights, engage the parking brake and do so in a location with no one around.

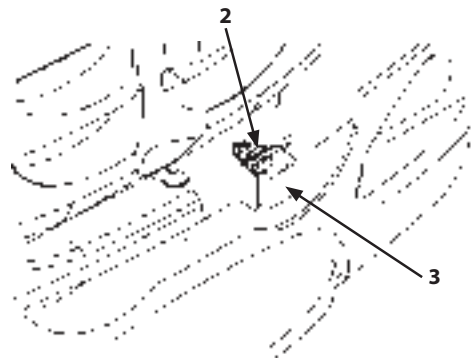
Check the sound of horns (1) by pressing their button, in the center of the steering wheel. Horns (1) are mounted on the left and right front lamp brackets. Check whether reverse buzzer (2) sounds and reverse light (3) lights when the F-N-R Lever is put in reverse (R). Reverse light (3) is in the middle-right of the weight and reverse buzzer (2) is mounted behind it.



M4FG-01-019



M4FGE-01-021



MNCB-07-014

MAINTENANCE

5 Check Electrical Wiring and Fuses --- every 50 hours

CAUTION: If electrical parts such as wiring and relays have dirt or dust on them, they may cause a fire.

Check the battery, battery relays, starter motor, alternator wiring and terminals for looseness and check the contact of wiring (damage to coating). Clean off any dirt or dust sticking to them.

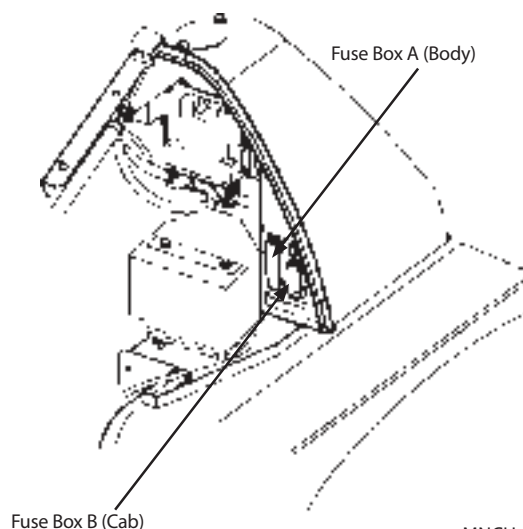
Consult your authorized dealer if any wiring is burned or smells unusual.

Check/Replace Fuses

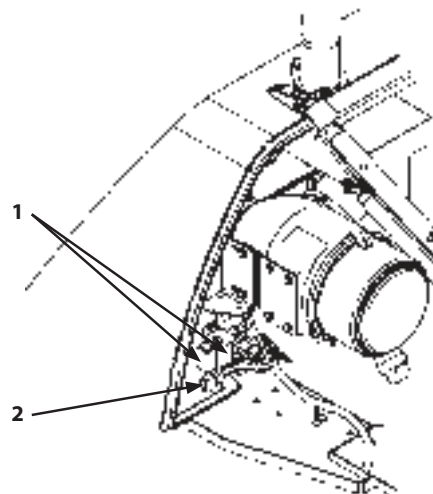
1. If any electrical equipment fails to operate, first check the fuses in fuse boxes (A, B) on the right side of the engine compartment.
2. One spare fuse for each fuse capacity is provided in the fuse box.
3. Finally, check the slow blow fuses (1) and (2) on the left side of the engine compartment.

Slow Blow Fuse Capacities

- 1- 120A x 2
- 2- 75A



MNCH-01-537

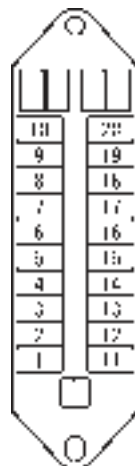


MNCH-01-521

MAINTENANCE

Fuse Box A (Body)

10- SPARE -	20- HI BEAM 15 A
9- SPARE -	19- HEAD LAMP 15 A
8- SPARE -	18- ROOM LAMP (CAB) 5 A
7- RIDE CONTROL (OPT.) (10 A)	17- FLASHER 10 A
6- HST 2 5 A	16- CONTROLLER 5 A
5- HST 1 15 A	15- ECM 30 A
4- C/V DETENT 5 A	14- FUEL PUMP 20 A
3- STOP LAMP 20 A	13- POWER ON 10 A
2- FNR 10 A	12- PARKING 10 A
1- LIGHTING 10 A	11- POSITION 5 A



Fuse Box A (Body)



Fuse Box B (Cab)

MNCH-01-550

Fuse Box B (Cab)

5- AC 1 30 A	10- WIPER FRONT 30 A
4- AC 2 20 A	9- WIPER REAR 20 A
3- SPARE -	8- RADIO 10 A
2- SPARE -	7- WORKING LAMP FRONT 15 A
1- -	6- WORKING LAMP REAR 15 A

MAINTENANCE

I. Brake System

- 1** Check Brake Oil Level
--- every 10 hours (check daily)
or when the indicator lights

⚠ WARNING: If the brake level low indicator (1) lights on the monitor, stop the machine immediately and check the level in brake oil tank (2) and the braking system. Continuing to use the machine as-is runs the risk of the brakes not working and causing a serious accident.

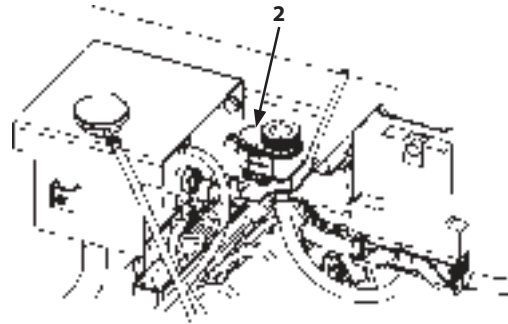
IMPORTANT:

- Brake level low indicator (1) on the monitor lights if the level in brake oil tank (2) drops below the MIN level. Stop the machine immediately and check the braking system for leaks; fill the tank with brake oil to the specified level.
- Use the same brand of brake oil (mineral oil type) listed in the section Kinds of Oils.
- Using any other kind of oil (plant-based oil) may lead to brake malfunction and/or damage.

1. Park the machine according to Preparations for Inspection and Maintenance (7-7).
2. Brake oil tank (2) is at the front left of the engine compartment. The brake oil level is correct if it is between the MAX and MIN on the left side of brake oil tank (2).
3. If the level in brake oil tank (2) is below MIN, open cap (3) of the tank and fill to the correct level with the specified brake oil.
Securely tighten cap (3) after filling.
4. Make sure brake level low indicator (1) on the monitor is not lit before driving the machine again.



MNCH-01-531



MNCH-07-021



MNCH-07-036

MAINTENANCE

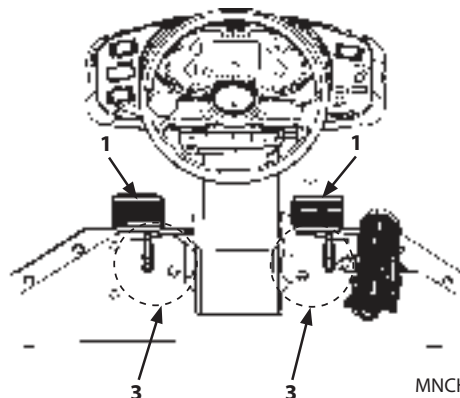
2 Check Braking (Left/Right Interlocked) --- every 10 hours (check daily)

WARNING:

- Set up a warning sign to stay and someone to monitor safety at a range of 100 m to the front.
- Do not allow dirt, sand or other debris to accumulate around where brake pedal (3) is mounted. Failure to do so may inhibit use of the brakes.

Depress brake pedal (1) and check whether the pedal feels abnormal and if the brakes work normally; check the amount of pedal play.

If dirt, sand or other debris has accumulated around (3) the brake pedal mount, clean it out.



MNCH-01-508

Braking Effectiveness

Braking is acceptable if it takes less than 5 meters to stop from an initial speed of 15 km/h with no load on a flat, dry, paved road surface.

Brake Pedal Play

Push the pedal by hand and measure how far the end of the pedal moves until resistance is felt.

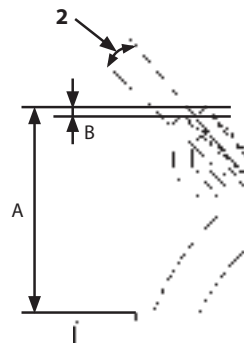
Amount of A: 185 mm (7.3 in)

Play (2)

B: 10 mm (0.4 in)

Consult your authorized dealer if pedal play is outside the allowance.

Consult your authorized dealer if anything abnormal is felt in brake pedal operation or effectiveness. Have the dealer check and/or repair the machine.



M4FG-07-046

MAINTENANCE

3 Check the Parking Brake --- every 10 hours (check daily)

⚠ WARNING: Conduct checks where no one is around or is in the direction the machine will travel.

Also, do not allow anyone to approach the area.

The parking brake is acceptable if the machine does not move with parking brake switch (1) ON, under no load, on a dry slope of 20% (11.3°).

Consult your authorized dealer if the machine moves during the check. Have the dealer check and/or repair the brake.

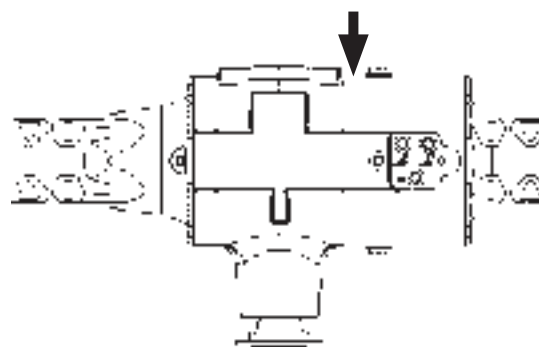


M4FG-01-008

4 Check Brake Discs (Regular and Parking) --- every 1000 hours

The regular brakes and the parking brake are a closed, wet disc type that is mounted on the front axle.

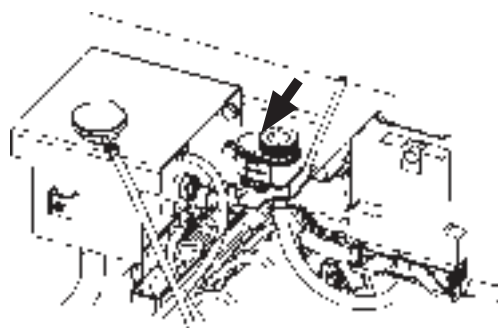
Consult your authorized dealer for inspections.



M4FG-01-005

5 Replace Brake Oil --- every 1000 hours

Contact your authorized dealer for replacing brake oil and for repairs.



MNCH-07-021

MAINTENANCE

J. Tires

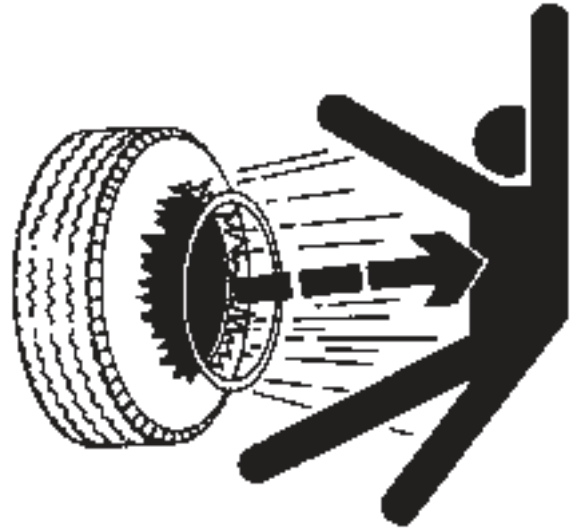
- 1** Check/Adjust Tire Pressure
Check --- every 10 hours
Adjust---as required

⚠ WARNING:

- Secure the front and rear frames with the articulation lock bar and pin.
- When inflating a tire, stand on the side of the tire where the tread is and use a self-attaching chuck.
- Be careful when welding near the tire as it may cause the tire to explode.
- It is very dangerous as a tire may explode in cases like it becoming hot from the machine being on fire, if the tires are smoking, or when the tires become very hot and there is the smell of rubber burning, or if there is some other sign of the tire bead burning.

IMPORTANT:

- Always keep the tires at the correct air pressure.
- Replace any tire that has even one bald spot with a new one. Inspect the tires for cracks, damage and foreign matter before starting work.
- Even if replacing just one tire, install a tire with the same groove pattern, maker and specifications as the other tires.



SA-249

Checking the Air Pressure

1. Check air pressure before work when the tires are cold.

Standard Tire Size : 17.5/65-20-10PR
Standard Air : 240 kPa (2.45 kgf/cm²,
Pressure 34.8 psi)

2. Check for damage and excessive wear to the tires.

MAINTENANCE

2 Check for Damage to Tires --- every 10 hours (check daily)

WARNING: Tires with cuts or other damage can cause a puncture or the tires to burst. This may lead to a serious accident and/or injury and death.

Inspect the appearance of tires for cuts, damage, metal fragments and other foreign matter.

3 Retighten Wheel Nuts --- every 500 hours or 6 months (50 hours the first time only)

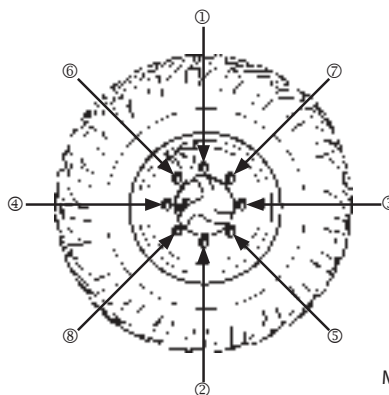
Tighten in a pattern around the wheel.
Tightening Torque: 440 N·m (44 kgf·m, 320 lbf·ft)

Replacing Tires

WARNING: Secure the front and rear frames with the articulation lock bar.

IMPORTANT: The overall height of the machine may change with the kind of tire.
That specification must not be altered for machines that are registered as vehicles.

1. Lower the bucket and lift arm to the ground and engage the parking brake.
2. Mount the articulation lock bar on the front and rear frames according to section 7-9.
3. Loosen all the wheel nuts of one tire one turn.
Pay attention to the direction of the tread pattern.
4. Place blocks under the frame to support the machine securely when lifted.
5. Remove the wheel nuts and replace the tire.
6. With the tire off the ground, hand tighten the wheel nuts in the order illustrated at right.
7. Lower the machine and tighten to the specified torque in the order illustrated at right.



M4FG-07-032

MAINTENANCE

Usable Tire Sizes



NOTE: Consult your authorized dealer about the tire patterns of optional tires.

Some tire may vibrate during travel due to their tread pattern. This resonance is due to the tire pattern and is not a fault.

		Tire Size
Standard Size	Bias	17.5/65-20-10PR
Standard Tire	Bias	17.5/65-20-10PR L2
Standard Air Pressure	Bias	17.5/65-20-10PR L2 240 kPa (2.4 kgf/cm ² , 34.8 psi)
OPTION	Bias (Snow)	17.5/65-20-10PR 240 kPa (2.4 kgf/cm ² , 34.8 psi)



NOTE: Any tire pattern can be used at the tire sizes, type and air pressures listed above.

Adjust the air pressure to the kind of work being done.
For details, contact your authorized dealer.

- Public Roads ... Standard
- Loading and digging on normal road surface ... Standard or slightly higher
- Heavy excavation work ... Slightly higher than standard
- Work on soft or sandy ground ... Standard

Range of Usable Tire Pressures: 240 to 260 kPa (2.4 to 2.6 kgf/cm², 34.8 to 37.7 psi)

MAINTENANCE

Tire Rotation

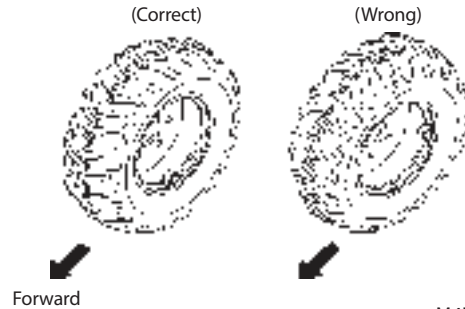
Rotate tires when uneven or abnormal wear is recognized on either front or rear, or right and left tires. The aim of rotating the tires is uniform wear on tires and to even out their service life.

Rotation Method

⚠ WARNING: Only mount tires without external damage, such as cuts or abnormal wear.

Because a much greater load is imposed on tires during work (loading) and operation, this kind of damaged tire can result in a puncture or the tire blowing out. This may lead to a serious accident and/or injury and death.

- Only switch tires between front and rear on the same side, and not across (diagonal).
- Make sure the tire pattern is facing the direction of rotation. This is particularly important for L2 tires (optional), which have a traction pattern; this impacts not only tire economy but also safety of operation.



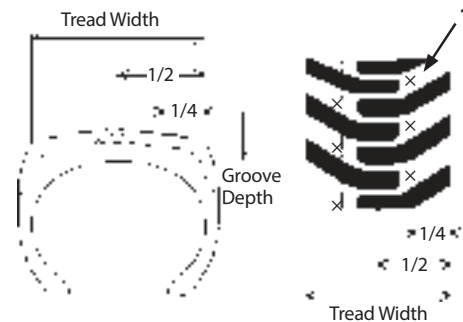
M4EJ-07J-001

Checking Wear (Groove Depth)

IMPORTANT: If the machine is operated with tires at either rear or front being extremely worn or different in type, construction, or size, the powertrain, such as axles or transmission will be adversely affected, which may lead to mechanical failure. Use them as follows.

When replacing tires, use the same tires in type, construction and size on all four wheels. It is recommended to replace all four tires at the same time.

Measure groove depth at a point 1/4 across the tread width (marked by X (1) in the figure).



M4EJ-07J-002

The service limit (time to replace) is when 15% is worn from when new. However, if there is extremely uneven wear or cords showing, replace them even before they reach 85%.

MAINTENANCE

Tire Removal and Mounting

 **WARNING:** The tires and wheels are extremely heavy and this work is dangerous and difficult. In addition, a crane is required to lift the tires for removal and installation, so have your authorized dealer or a professional tire shop perform this work.

If the machine must be jacked up, strictly follow the instructions below.

- Select a hard, level location with a dry surface.
- The work must be performed by at least 2 people.
- One person to perform the work, the other to assist and ensure safety.
- Do not lift the front wheels with the bucket.
- Do not jack up the vehicle any higher than necessary.
- When jacking up the front wheels (rear), chock the rear (front) tires.
- When the vehicle is jacked up, keep it securely supported. Never leave it supported just by the jacks.
- Because the rear wheel can swing, brace between the axle and the frame to keep them from moving.
- When removing the wheel nuts, leave the nut at the top for last. Remove the last nut once the wheel is lifted by a crane.
- Refer to the section 3 Retighten Wheel Nuts for the torques to tighten the wheel nuts.

Wheels

 **WARNING:** Always have a professional disassemble tires and wheels.

After a tire and wheel have been disassembled and reassembled, the inflation of the tire must be done by a trained professional.

Remove any rust on the wheel. Replace the wheel if it has severe rust, as this can lead to cracks and an accident.

MAINTENANCE

K. Air Conditioner (Cab-Equipped Machines)

1

Clean and Replace Circulating Air Filter

Clean Circulating Air Filter

---every 250 hours or once/month, whichever comes first

Replace Circulating Air Filter

---after cleaning 6 times (or when severely clogged)

 **NOTE:** When work sites are dusty, clean and replace sooner.

Cleaning the Circulating Air Filter

 **CAUTION:** When using compressed air, wear safety glasses or goggles.

IMPORTANT: If the outlet pressure of the compressed air is too high, it damages the filter. Only use compressed air at a pressure at or below 0.2 MPa (2 kgf/cm²). Keep the nozzle at least 500 mm away from the core surface.

1. Removing the filter

Circulating filter (1) is mounted on the left side of the seat support.

Remove the 2 screws (2) and then cover (3). Remove clamp (4) from the inlet and then circulating filter (1).

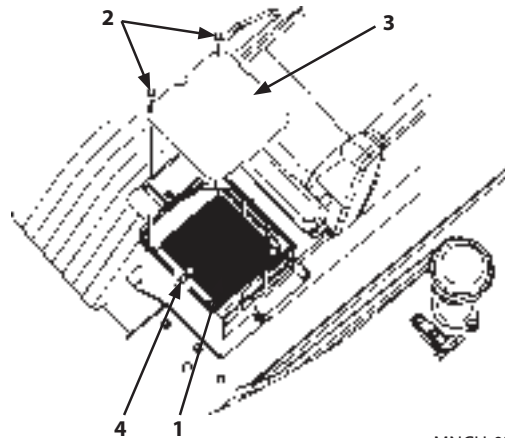
2. Clean circulating filter (1).

Clean circulating filter (1) with compressed air.

3. When installing the cleaned circulating air filter or a new filter, follow the reverse order of the Removing Filter procedures described in step 1.

IMPORTANT: If the filter is not fitted properly, dust and debris can get inside the AC unit, resulting in poor performance and/or damage.

First clean out any dirt around its seat and then mount it with all due care.



MNCH-07-023

MAINTENANCE

2

Check Air Conditioner Unit

--- every 250 hours or 3 months

Check the mounts of the AC switch panel, the AC unit and condenser, as well as the and hoses for damage and anything abnormal.



NOTE: Inspect the AC unit before the season when it is needed to ensure it can be used whenever required.

When the AC is not used for a long time, operate it once a week on cold to keep it from running out of oil.

Steam Cleaning



WARNING: Do not steam clean the compressor or receiver tank.

Doing so increases the pressure of the refrigerant and may cause the hose to burst.

3

Check Lines

--- every 250 hours or 3 months

Inspect lines for abnormal deformation or damage.

If a joint in a line is dirty with oil or the like, it means a leak or refrigerant, so inspect it with a gas leak detector.



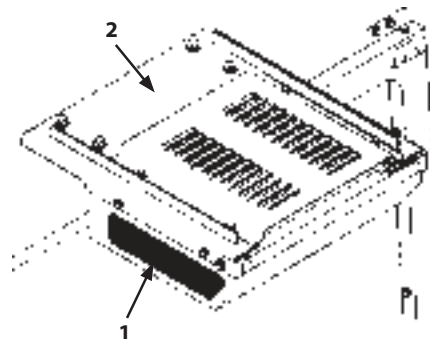
CAUTION: Repair or replace if there is a leak and tighten to the specified torque.

Do not simply retighten a joint.

MAINTENANCE

4 Check Air Conditioner Condenser --- every 250 hours or 3 months

If condenser (1) become clogged with dirt or insects, their cooling efficiency is compromised.
Remove cover (2) on the top of condenser (1). Use tap water to wash away dirt and debris from the fins of condenser (1). Use a soft brush on stubborn dirt. Never use a hard brush as it will damage the fins.



M4EK-AC-005

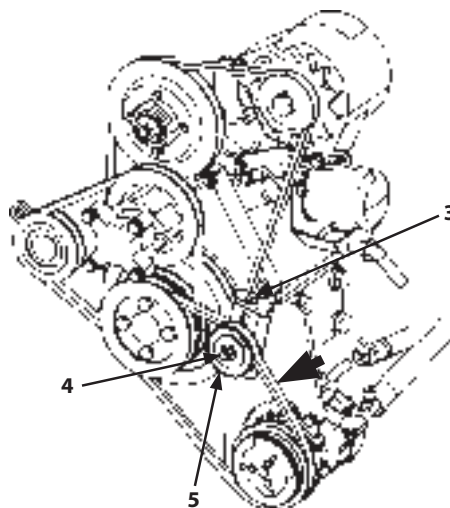
5 Check the AC Drive Belt --- every 250 hours or 3 months

Check belt deflection and for damage.
Measure belt deflection by pressing down with 98 N (10 kgf) of force in the middle of the belt with a finger, as illustrated by the arrow↓, with the engine stopped.

Deflection: Approx. 4 mm (0.2 in)

Adjusting Compressor Drive Belt Tension

1. Loosen lock nut (4) of tensioner pulley (5).
2. Move tensioner pulley (5) by turning tension adjustment bolt (3) until belt tension is correct.
3. Securely tighten nut (4).



MNCH-07-024

MAINTENANCE

6 Check Refrigerant Level --- every 250 hours or 3 months

Raise engine RPM to 1500 min⁻¹ and run on cold for 2 to 3 minutes, then check sight glass (1).

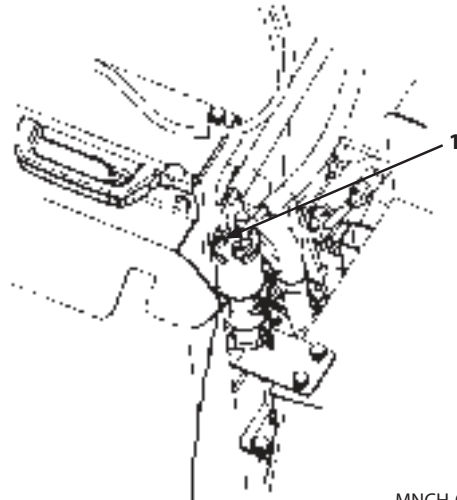
This machine uses the new R134a as its refrigerant.

To achieve the correct amount, collect all of the refrigerant from the cooler cycle and then fill with the correct amount.

If there is a problem with the air conditioner, consult with your authorized dealer.

Type	Refrigerant No.	Quantity kg (lb)
HFC	R134a	1.0±0.05 (2.2±0.1)

IMPORTANT: For collection/refilling of refrigerant during checks and maintenance (including disposal), contact a company certified to handle refrigerant or your nearest Hitachi representative.



MNCH-07-025

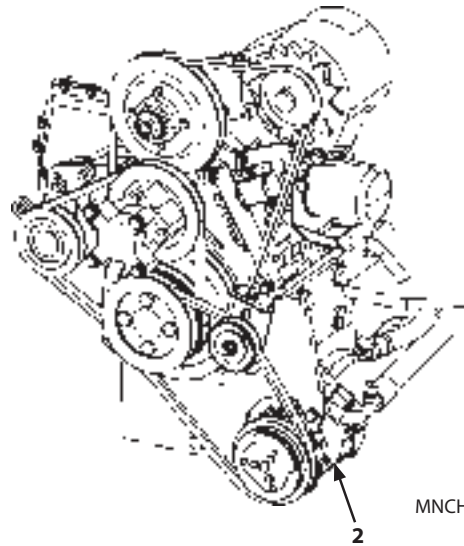
7 Check the Compressor and Pulley --- every 250 hours or 3 months

Check around compressor (2) for grime, its mounting condition, operation and gas leaks; listen for any abnormal noise from the pulley.

Checking the Compressor

After operating the air conditioner for 5 to 10 minutes, touch both the high pressure pipe and the low pressure pipe.

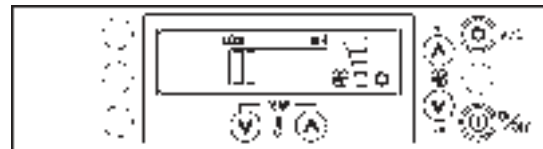
If normal, the high pressure side pipe will be hot, and the low pressure side cold.



MNCH-07-026

8 Switch Operation --- every 250 hours or 3 months

Operate each switch and make sure it operates normally. Use the switches in a combination of ways to check the functioning of the air conditioner. (Refer to the Operation Guide)



M4EK-AC-001

MAINTENANCE

L. Miscellaneous

1 Check for Looseness/Wear to the Bucket's Bolt-On Cutting Edge

--- every 10 hours (check daily)

Check bucket cutting edge for wear and looseness.

Replacement Guide

⚠ WARNING: Guard against injury from flying pieces of metal.

Wear goggles or safety glasses, and safety equipment appropriate for the job.

1. Lift the bucket to an appropriate height and wedge a block under it so the bucket will not come down.

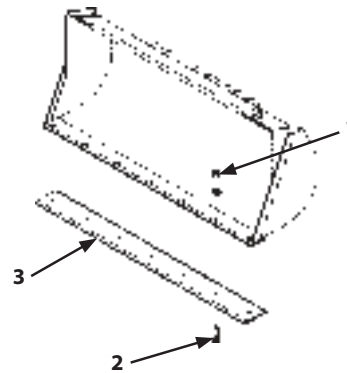
✎ NOTE: Lift the bucket so its bottom is level.

2. Remove bolts (2), nuts (1) and then cutting edge (3).
3. Mount a new cutting edge (3) on the bucket. When cutting edge (3) is worn, flip it over and remount it. When both sides are worn, replace it with a new one.

Tighten nuts (1) to the specified torque.

Tightening torque: 245 to 300 N·m (24.5 to 30.0 kgf·m, 180 to 220 lbf·ft)

4. After a few hours of work, retighten the mounting bolts.



M4FG-07-062

MAINTENANCE

- 2 Check and Replace Seat Belt**
Check--- every 10 hours (check daily)
Replace --- every 4 years

Examine tang (1), buckle (2) and the condition of the belt. If any part is damaged or worn, replace them. Check the retracting mechanism as well.

Replace the seat belt every 4 years regardless of its apparent condition.

Also, check the condition of the seat itself for any looseness or damage. If damaged, replace it with a new one.



M4FG-07-068

- 3 Damaged Canopy or Cab, Loose Bolts**
--- every 10 hours (check daily)

Check the plastic roof of the canopy or the appearance of the cab for abnormal damage or deformation, as well as mounting bolts (3) for looseness.



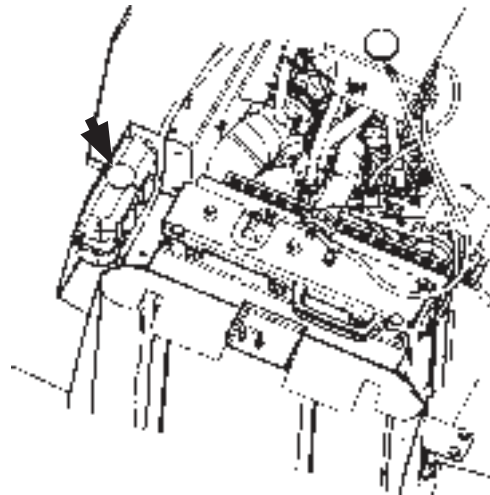
M4FG-07-063

- 4 Check Level of Washer Fluid (Cab-Equipped Machines)**
--- every 10 hours (check daily)

IMPORTANT: When refilling, take care that no foreign matter gets inside.

Use a washer fluid with antifreeze in cold areas.

Check the level of washer/wiper fluid and add if low.



MNCH-07-027

MAINTENANCE

5

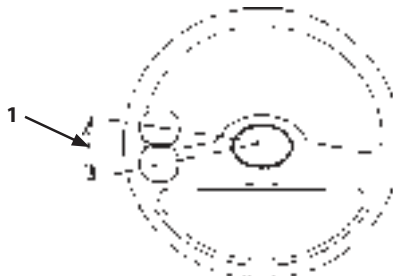
Check Steering Wheel Play

--- every 10 hours (check daily)



WARNING: Turning the steering wheel makes the area between the front and rear frames narrower, presenting the risk of someone getting caught in between. Do not allow anyone nearby during this inspection.

Check whether steering wheel play (1) is acceptable. Check that when the steering wheel is turned all the way, the chassis hits the stoppers and nothing is abnormal in steering cylinder operation.



M4EJ-07L-004

1. Start the engine.
Put the parking brake switch in the ON position.
2. Lift the bucket slightly off the ground.
Put the control lever lock in the LOCK position.
3. With the engine at a slow speed, lightly turn the steering wheel knob back and forth. Measure how far the steering wheel moves on its circumference before it actuates the steering cylinder both left and right (check via movement of the bucket or tires).

Amount :20 to 40 mm
of Play (1) (0.8 to 1.6 in)



NOTE: Have your authorized dealer inspect the steering if there is too much play or the cylinder fails to actuate smoothly.

MAINTENANCE

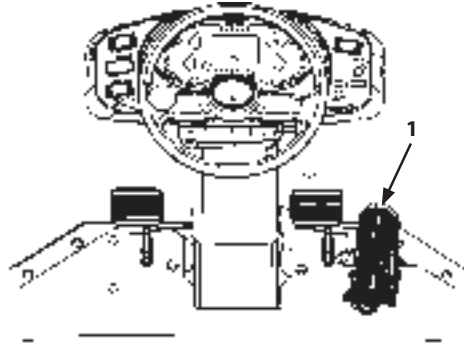
6

Accelerator Pedal Operation, Color and Sound of Exhaust

--- every 10 hours (check daily)

⚠ WARNING: Put the F-N-R lever in neutral, engage the parking brake, set the bucket on the ground level, and chock the tires.

Operate accelerator pedal (1), gradually pressing it in; the engine speed should increase smoothly. Similarly, the engine speed should drop smoothly as the pedal returns. If dirt, sand or other debris has accumulated around accelerator pedal (1), clean it out.



MNCH-01-508

Color and Sound of Exhaust

Check the condition and sound of the exhaust.

⚠ Danger: Provide sufficient ventilation when warming up the machine indoors. Doing so in a closed environment may lead to exhaust poisoning and death.

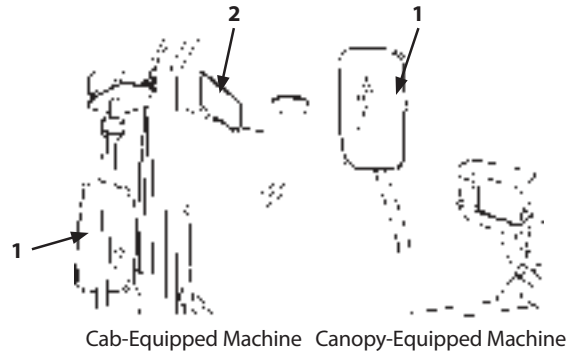
The color of exhaust is normally transparent or light blue. The exhaust may appear white briefly when the engine is started due to water vapor, but this is normal. If the exhaust is black, white, brown or gray, check the engine oil level, the fuel supply system, etc. Also, listen to the sound from the engine and muffler for any abnormal noises.

MAINTENANCE

7 Damage or Looseness of Rearview Mirrors

--- every 10 hours (check daily)

Check that inside rearview mirror (1) and outside rearview mirror (2) (cab-equipped machines) are facing in the correct direction and check for dirt or damage.



M4FG-01-033

8 Damage or Looseness of Steps or Handrails

--- every 10 hours (check daily)

Check steps (3) and handrail (4) for damage, looseness and dirtiness. If something slippery like oil or mud is on the steps and/or handrail, remove it. If they are so damaged or loose that getting on/off the machine is difficult, repair or replace them.



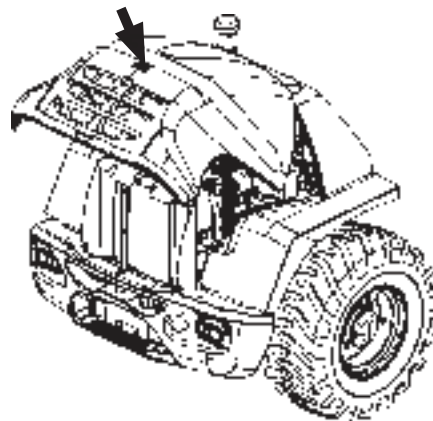
MNCH-07-037

9 Clean Engine Compartment and Hood

--- every 10 hours (check daily)

CAUTION: If dirt, wood chips or the like accumulate around the hood or engine compartment, they may come in contact with hot parts there and lead to a fire.

Remove any dirt or wood chips on the hood. Open the hood and check for debris or wood chips inside the engine compartment and on top of the engine; remove any accumulated debris.



MNCH-01-524

MAINTENANCE

- 10** **Inspect Sound Dampening Mat around Engine**
--- every 1000 hours

⚠ CAUTION: If the sound dampening mat inside the engine compartment peels, it may touch hot parts inside the compartment, leading to a fire.

Check that the sound dampening mat around the engine has not peeled. If the mat has peeled, immediately consult your authorized dealer for repairs.



M4EK-01-056

- 11** **Tighten Cylinder Head Bolts**
--- every 1000 hours or 1 year, whichever comes first

Consult your authorized dealer for repairs.

- 12** **Measure Engine Compression Pressure**
--- every 1000 hours or 1 year, whichever comes first

Consult your authorized dealer for repairs.

- 13** **Check and Clean Starter and Alternator**
--- every 1000 hours or every year

Consult your authorized dealer for repairs.

MAINTENANCE

14 Retighten Front Axle Mounting Nuts, Rear Axle and Transmission Mounting Nuts

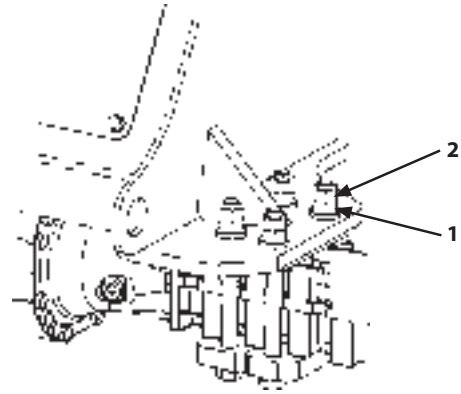
--- **every 1000 hours (first time only, at 50 hours)**

Check for looseness of front axle mounting nuts, rear axle and transmission mounting nuts.

Torques when Retightening Front Axle Mounting Nuts, Rear Axle and Transmission Mounting Nuts

Front Axle Mounting Nuts (1) (2)	Rear Axle, Transmission Mounting Nuts
(1) 459 to 561 N·m (46 to 56 kgf·m, 340 to 410 lbf·ft)	400 N·m (40 kgf·m, 300 lbf·ft)
(2) 376 to 460 N·m (38 to 46 kgf·m, 275 to 340 lbf·ft)	

 **NOTE:** The front axle is secured with double nuts, as in nuts (1) and (2).



MNCH-07-028

15 Check and Replace EGR Device

--- **every 4500 hours**

Consult your nearest authorized dealer for check and repair.

16 Clean EGR Cooler

--- **every 4500 hours**

Consult your nearest authorized dealer for check and repair.

17 Check Turbocharger

--- **every 4500 hours**

Consult your nearest authorized dealer for check and repair.

18 Check and Clean Injector Nozzle

--- **every 4500 hours**

Consult your nearest authorized dealer for check and repair.

MAINTENANCE

19 Tighten and Retighten Nuts and Bolts --- every 250 hours (first time only, after 50 hours)

Tighten or retighten nuts and bolts used on this machine in accordance with the torque values shown in the following table. Also, replace any damaged nuts or bolts. Check daily for loose or missing nuts and bolts before and after work; retighten if loose and be sure to supply replacements if missing. Locations to be retightened other than those in the table should be tightened according to the Tightening Torque Chart in section 7-90. Places marked with an asterisk * in the torque column require the use of Loctite #262.

	Place to Retighten		Bolt Diameter	Qty.	Tool Wrench Size	Torque		
						N·m	(kgf·m)	(lbf·ft)
1	Front axle mounting Nuts	Top nut	20	8	30	459 to 561	(46 to 56)	(340 to 410)
		Bottom nut		8		376 to 460	(38 to 46)	(275 to 340)
2	Rear axle, transmission mounting nuts		20	4	30	*400	(40)	(300)
3	Wheel rim mounting nuts		22	32	32	440	(44)	(320)
4	Propeller shaft mounting bolts		10	16	17	*65	(6.5)	(48)
5	HST motor mounting bolts		16	4	24	210	(21.0)	(155)
6	HST pump mounting bolts		16/12	2/4	24/17	210/90	(21.0/9.0)	(155/66)
7	Engine mounting bolts; Bracket	Front	12	8	19	*90	(9.0)	(66)
		Rear	14/12	4/4	22/19	*140/90	(14.0/9.0)	(103/66)
8	Engine mounting bolts; rubber cushion		18	4	27	375	(38)	(275)
9	Muffler mounting nuts		10	4	17	50	(5.0)	(37)
10	Counterweight mounting bolt		20	4	30	440	(44)	(320)
11	Upper center pin	Mounting nuts	24	1	36	*650	(65)	(480)
		Retainer fixing nuts	10	6	17	*50	(5.0)	(37)
12	Lower center pin rotation block		12	1	19	90	(9.0)	(66)
13	Loader front pin rotation block		12	13	19	90	(9.0)	(66)
14	Steering cylinder pin rotation block		12	4	19	90	(9.0)	(66)
15	Radiator frame mounting bolts		12/10	4/8	19/17	90/50	(9.0/5.0)	(66/37)
16	Cutting edge mounting nuts		16	7	24	210	(21.0)	(155)
17	Canopy mounting bolts		16	6	24	210	(21.0)	(155)
18	Cab rubber cushion		16	10	24	210	(21.0)	(155)

MAINTENANCE

Tightening Torque Chart

Bolt Dia. mm	Hexagon Wrench									Socket Bolt				
	  			  			  			Wrench size mm	Socket Bolt			Wrench size mm
	N·m	(kgf·m)	(lbf·ft)	N·m	(kgf·m)	(lbf·ft)	N·m	(kgf·m)	(lbf·ft)		N·m	(kgf·m)	(lbf·ft)	
6							3.3 to 4.2	(0.3 to 0.4)	(2.4 to 3.1)	10				5
8	30	(3.0)	(22)	20	(2.0)	(15)	10	(1.0)	(7.4)	13	20	(2.0)	(15)	6
10	65	(6.5)	(48)	50	(5.0)	(37)	20	(2.0)	(15)	17	50	(5.0)	(37)	8
12	110	(11)	(81)	90	(9)	(66)	35	(3.5)	(26)	19	90	(9)	(66)	10
14	180	(18)	(133)	140	(14)	(103)	55	(5.5)	(41)	22	140	(14)	(103)	12
16	270	(27)	(200)	210	(21)	(155)	80	(8.0)	(59)	24	210	(21)	(155)	14
18	400	(40)	(300)	300	(30)	(220)	120	(12)	(89)	27	300	(30)	(220)	14
20	550	(55)	(410)	400	(40)	(300)	170	(17)	(125)	30	400	(40)	(300)	17
22	750	(75)	(550)	550	(55)	(410)	220	(22)	(162)	32				
24	950	(95)	(700)	700	(70)	(520)	280	(28)	(205)	36				
27	1400	(140)	(1030)	1050	(105)	(770)	400	(40)	(300)	41				
30	1950	(195)	(1440)	1450	(145)	(1070)	550	(55)	(410)	46				
33	2600	(260)	(1920)	1950	(195)	(1440)	750	(75)	(550)	50				
36	3200	(320)	(2360)	2450	(245)	(1810)	950	(95)	(700)	55				

⚠ CAUTION: If counterweight mounting bolts are loosened, consult your nearest authorized dealer.

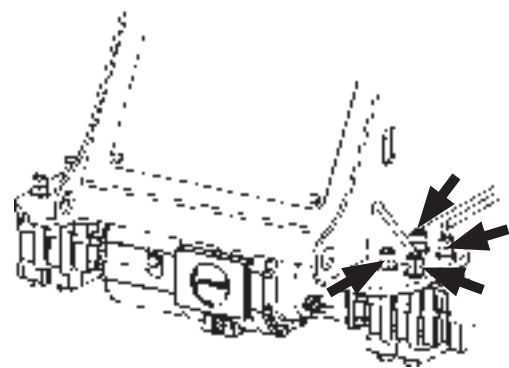
IMPORTANT:

- Apply lubricant to bolts and nuts to lower friction.
- 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.

MAINTENACE

1. Front Axle Mounting Nuts

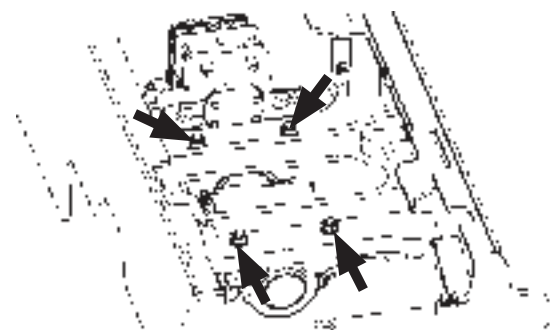
Bolt Diameter (in)	20 (0.8)
Qty.	16



MNCH-07-029

2. Rear Axle, Transmission Mounting Nuts

Bolt Diameter (in)	20 (0.8)
Qty.	4



M4FG-07-051

3. Wheel Rim Mounting Nuts

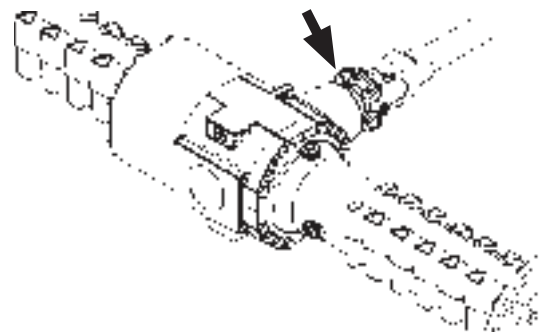
Bolt Diameter (in)	22 (0.9)
Qty.	32



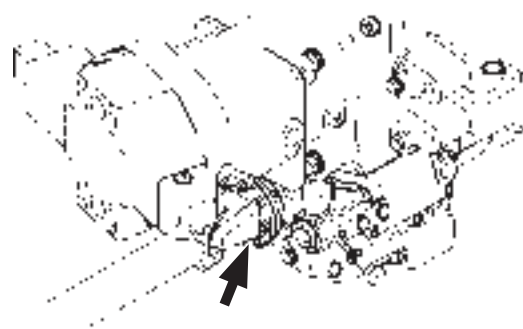
M4FG-07-032

MAINTENACE

4 Propeller Shaft Mounting Bolts	
Bolt Diameter (in)	10 (0.4)
Qty.	16



M4FG-07-052



M4FG-07-070

5. HST Motor Mounting Bolts	
Bolt Diameter (in)	16 (0.6)
Qty.	4



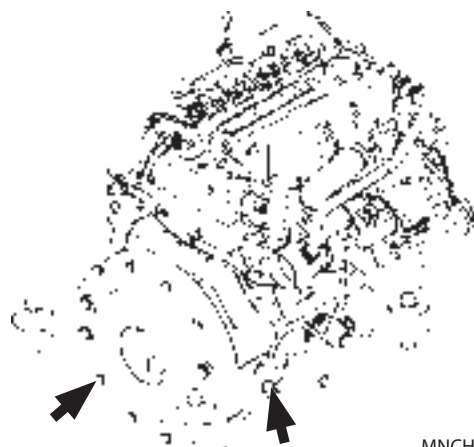
MNCH-07-030

6. HST Pump Mounting Bolts	
Bolt Diameter (in)	16 (0.6)/12 (0.5)
Qty.	2/4

MAINTENACE

7. Engine Mounting Bolts; Bracket

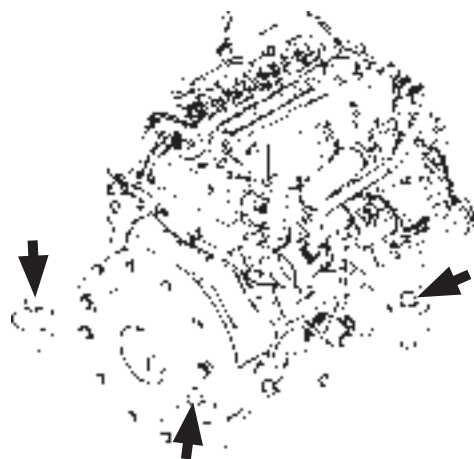
	Front	Rear
Bolt Diameter (in)	12 (0.5)	14 (0.6)/12 (0.5)
Qty.	8	4/4



MNCH-07-031

8. Engine Mounting Bolts; Rubber Cushion

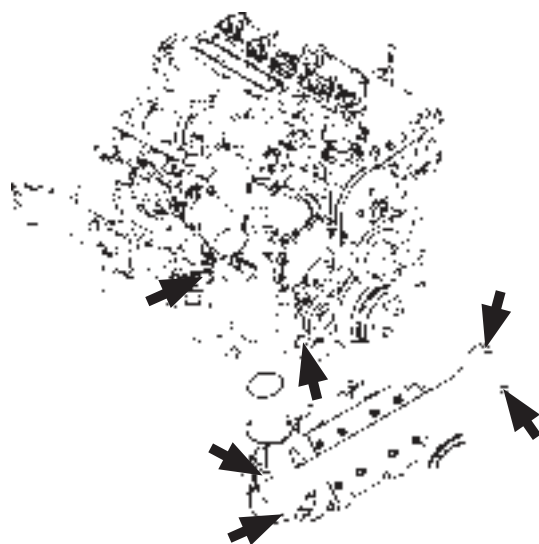
Bolt Diameter (in)	18 (0.7)
Qty.	4



MNCH-07-031

9. Muffler Mounting Nuts

Bolt Diameter (in)	10 (0.4)
Qty.	4

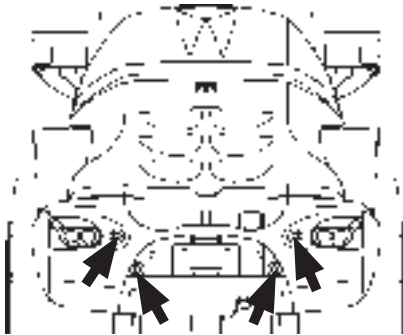


MNCH-07-032

MAINTENACE

10. Counterweight Mounting Bolts

Bolt Diameter (in)	20 (0.8)
Qty.	4



MNCH-01-517

11. Upper Center Pin

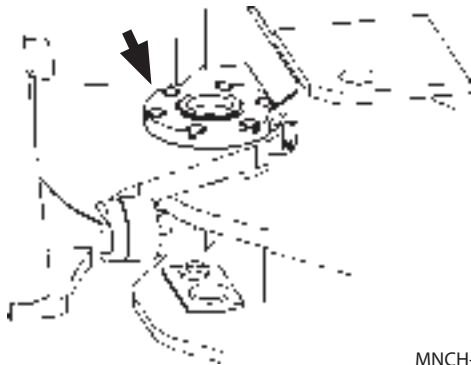
	Mounting nuts	Retainer fixing nuts
Bolt Diameter (in)	24 (0.9)	10 (0.4)
Qty.	1	6



MNCH-07-033

12. Lower Center Pin Rotation Block

Bolt Diameter (in)	12 (0.5)
Qty.	1



MNCH-07-034

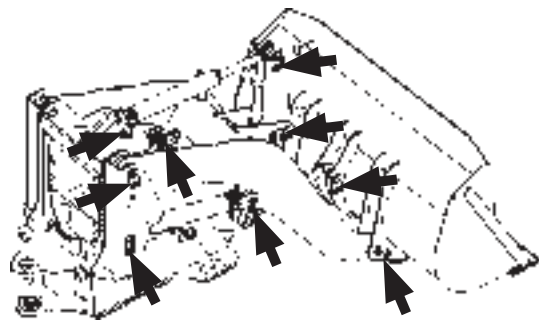


MNCH-07-035

MAINTENACE

13. Loader Front Pin Rotation Blocks

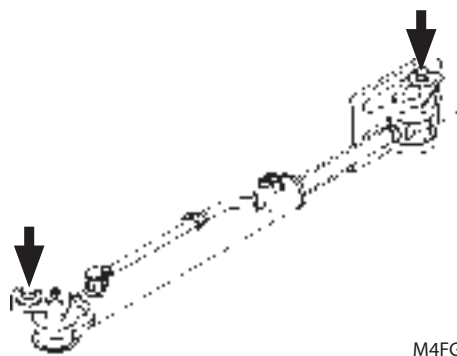
Bolt Diameter (in)	12 (0.5)
Qty.	13



M4FG-07-059

14. Steering Cylinder Pin Rotation Blocks

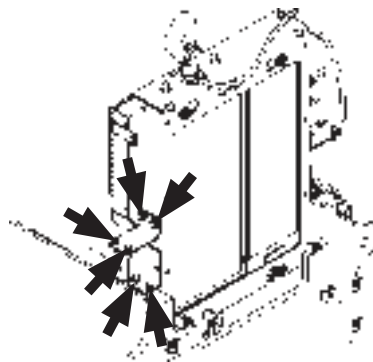
Bolt Diameter (in)	12 (0.5)
Qty.	4



M4FG-07-060

15. Radiator Frame Mounting Bolts

Bolt Diameter (in)	12 (0.5)/10 (0.4)
Qty.	4/8

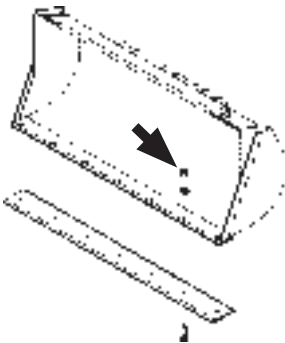


M4FG-07-061

MAINTENACE

16. Cutting Edge Mounting Nuts

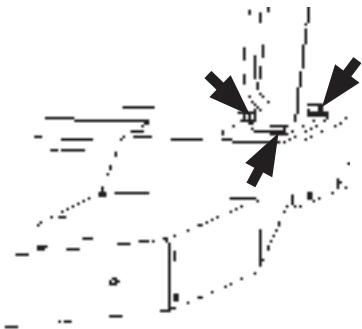
Bolt Diameter (in)	16 (0.6)
Qty.	7



M4FG-07-062

17. Canopy Mounting Bolts

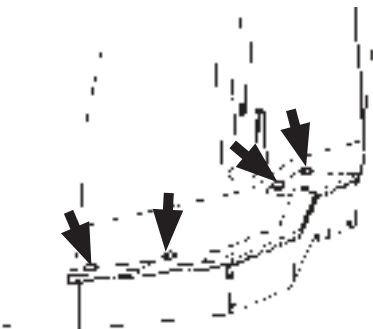
Bolt Diameter (in)	16 (0.6)
Qty.	6



M4FG-07-063

18. Cab Rubber Cushion

Bolt Diameter (in)	16 (0.6)
Qty.	10



M4FG-07-064

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 goes into deep water above the bottom surface of the axle housing, water may get in its brakes (parking brake), making them less effective, so be particularly careful when starting to drive.
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.
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.

IMPORTANT: If material to be handled is a substance that causes corrosion such as salt or chemical, consult your nearest 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 nearest authorized dealer when the machine is operated under special condition(s).

MAINTENANCE UNDER SPECIAL ENVIRONMENTAL CONDITIONS

Precautions for Maintenance During Cold Weather Season

Before the atmospheric temperature lowers below -0 °C (32 °F), note 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 advisement below:

1. Refill fluids such as water and lubricants prior to operation.
2. Mix LLC (long life coolant) in the radiator (coolant). When this machine is shipped from the factory, LLC is supplied.
3. Change the engine oil in the engine crankcase to cold weather type oil.
4. Use fuel (diesel-#1) of an antifreeze type. To prevent condensation in the fuel tank, fully refill the fuel tank with #1 diesel fuel after each shift.
5. If the electrolyte solution 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. Run cooling cycle for five minutes.

Another option is to, dismount the batteries and store them in a warm place. When it is possible to measure and adjust the specific gravity of the electrolyte solution, 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.



WARNING: Ventilate the shop with fresh air when carrying out warm-up operation indoor. Failure to do so may cause intoxication by exhaust gas, possibly resulting in death or serious injury.

7. After preheating the engine, start the engine. Perform warm-up.

MAINTENANCE UNDER SPECIAL ENVIRONMENTAL CONDITIONS

8. After warming up the engine, cycle the front attachment system. Slowly operate the loader control lever to move the cylinders full stroke several times.
9. Road surfaces covered with snow, especially when snow has been compacted, will be 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 wipers may freeze. Keep other parts away from the rubber parts. Thoroughly heat cab prior to operating machine.
 - Remove packed snow from around the undercarriage and inside the machine with a bar or brush. Be careful not to damage electrical wiring.
 - 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.

MEMO

[illegible]

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. Turn the battery disconnect switch to the OFF position. If the battery is removed, or if just the negative terminal is disconnected, charge the battery once every 3 months. Either disconnect the negative terminal or remove the battery and store it in a fully charged state.
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, including the air conditioner, at least once a month to lubricate the parts. At this time, check the coolant and lubrication oil levels. Charge the batteries.

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

Removing the Machine from Storage

⚠ 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.

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 lubrication running is not performed for more than three months, start the engine by following the procedure below.

Start the engine and keep it at slow idle for at least 3 minutes, then lubricate parts like the cylinders.

Failing to do this and just suddenly starting the engine and operating the cylinders will cause problems like scorching the engine.

STORAGE

1. Remove the 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 the alternator and fan belt tension.
5. Check the oil level. Add oil as needed.
6. Install the battery.
Turn the battery disconnect switch to the ON position.
7. Start the engine. Run the engine at half speed for several minutes before full load operation.
8. Repeat the process several times.
9. Stop the engine. Check each device for oil leaks.
10. Replace the fuel filter and engine oil filter with a new one as needed. Change engine oil.
11. Check clamps of the suction hoses, air cleaner hoses and radiator hoses. Retighten them as needed.

Before operating the machine, thoroughly perform "Daily Check before Starting the Engine" on page 3-3. Sufficiently perform the warm up operation.

MEMO

[illegible]

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 nearest authorized dealer.

Do NOT attempt to adjust or disassemble hydraulics, electrical and electronic parts.

Engine

Consult your nearest 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 nearest 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 nearest 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 nearest 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 nearest 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 nearest 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 nearest 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
	Faulty parking brake solenoid valve	* Repair, Replace
Parking brake does not work properly.	Worn or damaged brake spring in brake piston	* Replace
	Faulty disk brake	* Replace
	Seized piston, worn disk	* Repair, Replace
	Faulty parking brake solenoid valve	* Repair, Replace

* Consult your nearest 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 nearest 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 nearest 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 nearest 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 nearest authorized dealer.

Others

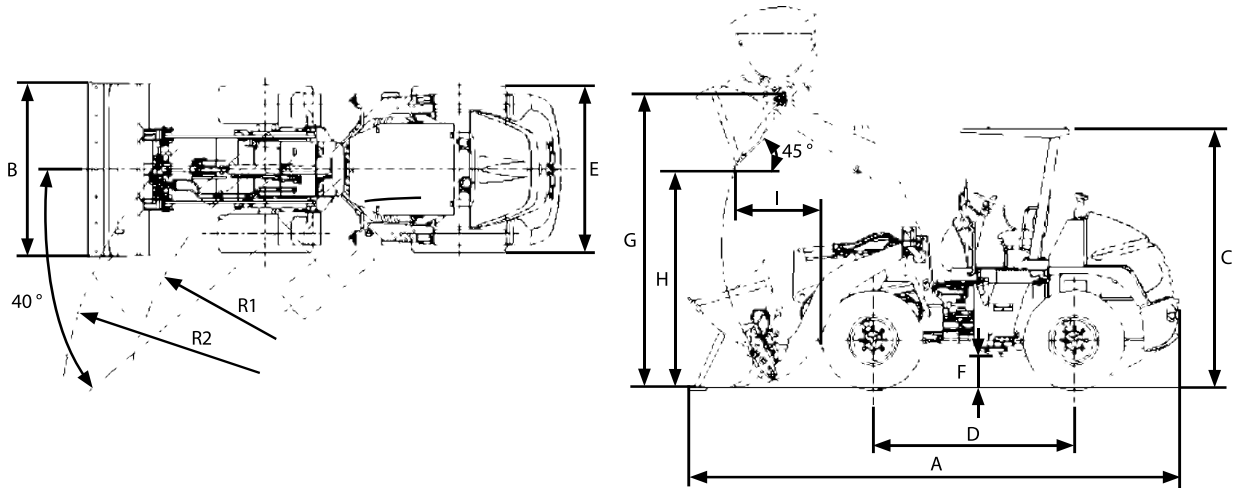
The machine may have a noise, excessive vibration, and abnormal smell when any trouble occurs.
Always beware of the machine conditions during operation.

MEMO

This image shows a full page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, typical of notebook paper. There are no margins, text, or other markings on the page.

SPECIFICATIONS

Specifications (Canopy)



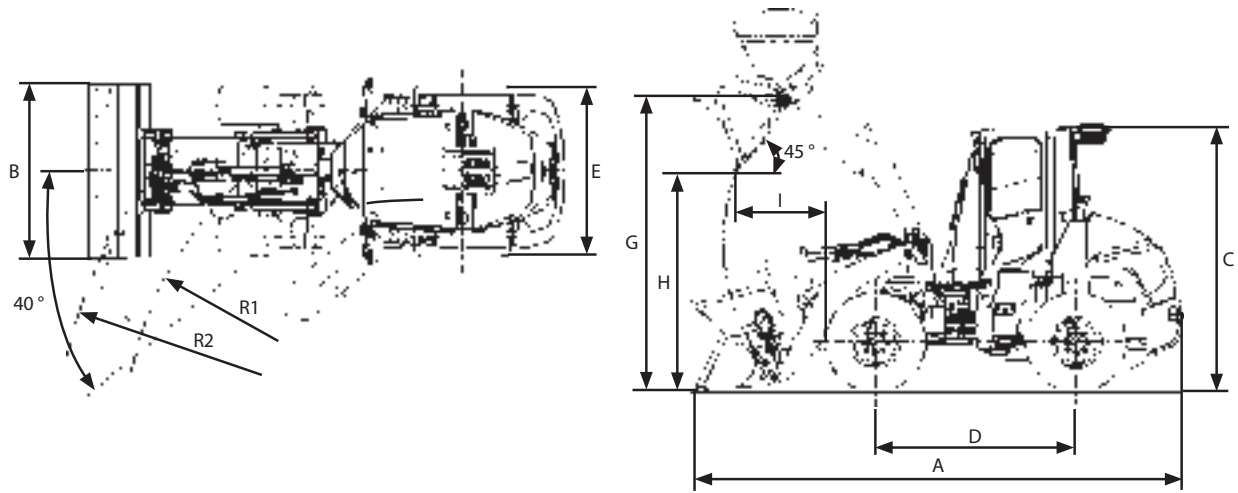
MNCH-12-003

Model		ZW80-5B
Bucket Type		-
Bucket Capacity (heaped)		m ³ (yd ³)
Operating Weight		kg (lb)
Static Tipping Load	Straight	kgf (lbf)
	Full 40 degree turn	kgf (lbf)
Engine		-
A: Overall Length		mm (ft-in)
B: Overall Width (Bucket)		mm (ft-in)
C: Overall Height		mm (ft-in)
D: Wheel Base		mm (ft-in)
E: Tread		mm (ft-in)
F: Ground Clearance		mm (ft-in)
G: Bucket Hinge Height		mm (ft-in)
H: Dumping Clearance (45 °)		mm (ft-in)
I: Dumping Reach (45 °)		mm (ft-in)
R1: Minimum Rotation Radius Outer Ring Center		mm (ft-in)
R2: Minimum Rotation Radius End of Bucket		mm (ft-in)
Travel Speed Forward/Reverse		km/h (mph)
Transmission Speeds (F/R)		-
Articulation Angle (Left/Right) deg		(°)
Tire Size		-

 NOTE: The specifications can change at any time.

SPECIFICATIONS

Specifications (Cab)



MNCH-12-004

Model		ZW80-5B
Bucket Type		-
Bucket Capacity (heaped)		m ³ (yd ³)
Operating Weight		kg (lb)
Static Tipping Load	Straight	kgf (lbf)
	Full 40 degree turn	kgf (lbf)
Engine		DEUTZ TD2.9L4 49 kW/2200 rpm (67 PS/2200rpm)
A: Overall Length	mm (ft-in)	5395 (17'8")
B: Overall Width (Bucket)	mm (ft-in)	1990 (6'6")
C: Overall Height	mm (ft-in)	2890 (9'5")
D: Wheel Base	mm (ft-in)	2200 (7'3")
E: Tread	mm (ft-in)	1470 (4'10")
F: Ground Clearance	mm (ft-in)	340 (1'1")
G: Bucket Hinge Height	mm (ft-in)	3165 (10'5")
H: Dumping Clearance (45 °)	mm (ft-in)	2390 (7'10")
I: Dumping Reach (45 °)	mm (ft-in)	990 (3'3")
R1: Minimum Rotation Radius Outer Ring Center	mm (ft-in)	3795 (12'5")
R2: Minimum Rotation Radius End of Bucket	mm (ft-in)	4540 (14'11")
Travel Speed Forward/Reverse		km/h (mph)
Transmission Speeds (F/R)		-
Articulation Angle (Left/Right) deg		(°)
Tire Size		-

 NOTE: The specifications can change at any time.

OPTIONAL ATTACHMENTS

Quick Coupler

Quick Coupler

The quick coupler systems make it easy to change from one work attachment, such as a bucket or plow, to another one. Quick couplers may be either hydraulic. A hydraulic quick coupler allows an attachment to be changed by operating the attachment lever or a hydraulic coupler switch from the operator's seat.

IMPORTANT:

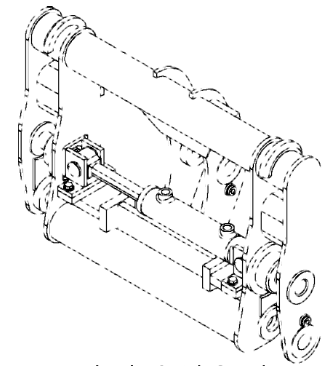
- **Check the operation of the quick coupler and the coupler pin every day before starting work. Look in particular for damage like deformation or cracking of the connecting parts.**
- **It may not be possible to attach any extra buckets purchased or already owned buckets if the stopper is not adjusted. In such case, contact your authorized dealer.**

Notes on Mounting and Removal of Attachments

CAUTION:

- **Change attachments on hard, level ground where the wheel loader and the attachments will not move or tilt during the job.**
- **Prior to removing and mounting attachments, decide who will do what and try to prevent danger.**

When working with someone to provide signals for aligning the coupler and hooks, agree with the person on how to make signals.



Hydraulic Quick Coupler

MNCH-13-002

OPTIONAL ATTACHMENTS

Quick Coupler

Working with a Quick Coupler (Hydraulic)

⚠ WARNING: Do not allow anyone in the area during this job.

The quick coupler systems make it easy to change from one work attachment, such as a bucket, to another one. It may not be possible to attach any extra buckets purchased or already owned buckets if the stopper is not adjusted. In such case, contact your authorized dealer.

Removal

⚠ WARNING: Apply the parking brake before getting down off the machine.

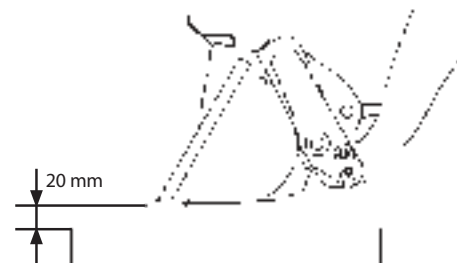
Prior to removal, disconnect all hydraulic hoses to the attachment cylinders, other than those for the bucket and lift arm cylinders.

Connect the removed hydraulic hoses to the quick coupler cylinder. (Refer to page 13-5 for removal and mounting of hydraulic hoses.)

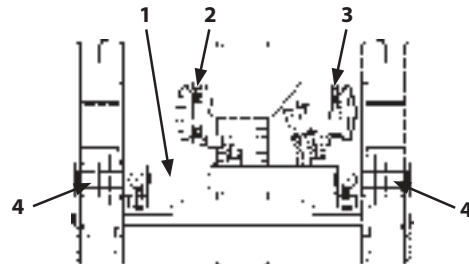
Whenever possible, put the attachment to be removed on a platform, such as a pallet.

1. Raise the bucket (attachment) so it is level and about 20 cm above the platform.
2. Make sure hydraulic hoses (2) and (3) from the machine are connected to coupler cylinder (1) of the quick coupler.

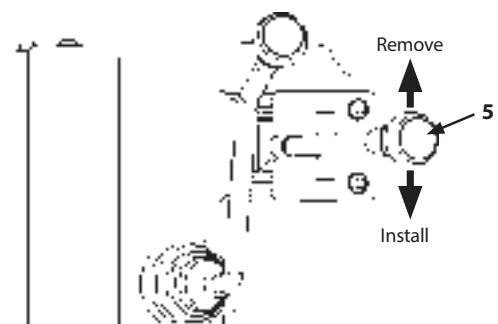
✎ NOTE: Attaching hydraulic hoses (2) and (3) from the machine to coupler cylinder (1) of the quick coupler makes it possible to mount/remove an attachment by operating attachment control lever (5).



M4EK-13-001



M4EK-PLOW-065

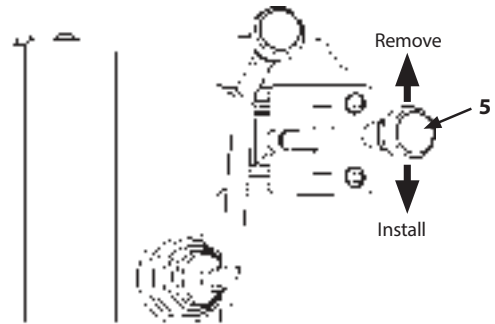


M4EK-PLOW-063

OPTIONAL ATTACHMENTS

Quick Coupler

3. Move attachment control lever (5) forward to Remove to withdraw coupler cylinder pins (4) (left and right).
4. Lowering the arm slightly and tilting the attachment forward allows the bucket (attachment) to be removed from the quick coupler. Take your time and proceed carefully when doing so. This completes removal.



M4EK-PLOW-063



M4EK-13-003

OPTIONAL ATTACHMENTS

Quick Coupler

Installation

WARNING:

- Mounting an attachment is complete only after confirming that coupler pins (6) (left and right) are in position.
- Apply the parking brake before getting down off the machine.

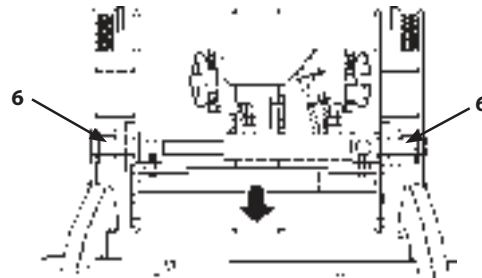
IMPORTANT: Grease the surfaces of coupler pins (6) before mounting an attachment to prevent galling. Greasing the pins also prevents rust.

1. Make sure coupler cylinder pins (6) are out of the way and then slowly bring the machine closer to the hooks of the bucket (attachment) and insert the quick coupler.

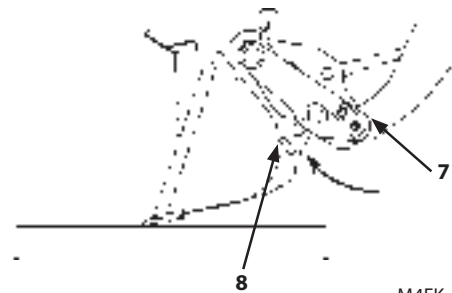
IMPORTANT: Be careful that no hydraulic hoses get caught between the quick coupler and the attachment.

2. Raise lift arm (7) slightly and then slowly tilt the bucket (attachment) backwards until it hits the stopper (8).
3. Move attachment control lever (9) backward to install to insert coupler cylinder pins (6) (left and right).

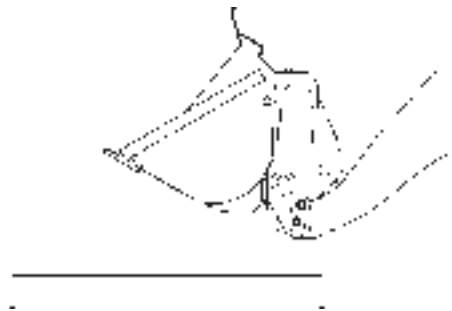
 **NOTE:** Remove the hydraulic hoses from the quick coupler cylinder and connect them to the attachment cylinders.



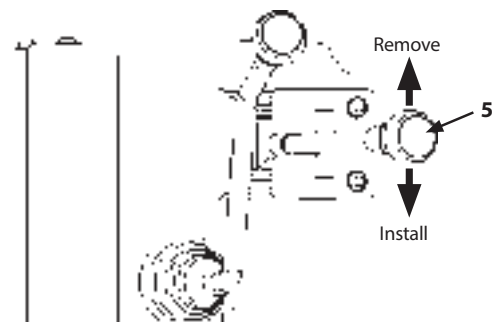
M4EK-PLOW-066



M4EK-13-004



M4EK-13-005



M4EK-PLOW-063

OPTIONAL ATTACHMENTS

Quick Coupler

Connecting Hydraulic Hoses

It is necessary to connect and disconnect hydraulic hoses in order to use the hydraulic pressure from the machine, when an attachment is equipped with hydraulic cylinders other than lift arm and bucket cylinders. To do so, follow the steps below for connecting and disconnecting hydraulic hoses.

Connecting and Disconnecting Hoses

CAUTION: Apply the parking brake and stop the engine before connecting hoses. Operate the attachment lever several times to relieve any pressure in the lines.

IMPORTANT: Thoroughly remove any dirt or grime on the connectors of the hydraulic hoses.

- Connect the hydraulic hoses from the machine to the hoses to the attachment.
- After connecting the hydraulic hoses, start the engine. Operate the attachment lever and move the attachment slowly while making sure no oil is leaking from the hydraulic hose connectors.
- To prevent contamination after disconnecting the hose (s) of an attachment, insert its plug into its sleeve and then put a dust cap on the lines on both the male and female sides on the machine.



When connecting a hose, pull back the sleeve and insert the plug. It locks automatically when the sleeve returns to position.

MNCH-13-005



When disconnecting a hose, pull back the sleeve and the connectors disconnect instantaneously.

M4GB-13-038



To insert or remove a dust cap on a female end, pull back on its sleeve.

MMCH-13-006



With the male end, simply insert it into the dust cap.

M4GB-13-040

MEMO

[illegible]

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