PART NO. ENMTEE-1-3

HITACHI

Reliable solutions

Operator's Manual

ZV 550WL

Walk-behind Roller

Serial No.
ZV550WL 010101 and up

INTRODUCTION

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

This standard specification machine can be operated under the following conditions without being modified.
Atmospheric Temperature: –10 °C to 40 °C (14 °F to 104 °F)
Altitude: 0 m to 1500 m (0 ft to 4900 ft)

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

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

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

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

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

Use only diesel fuel with quality specified in JIS K-2204, EN-590, ASTM D-975, GOST R52368 or GB252.
Failure to use diesel fuel with quality as specified above may allow the engine to emit exhaust gas which cleanness can not conform to the requests in various relevant regulations. In addition, serious damage to the engine may result. Consult with your authorized dealer for detailed information.

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 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 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.

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

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Correct Maintenance

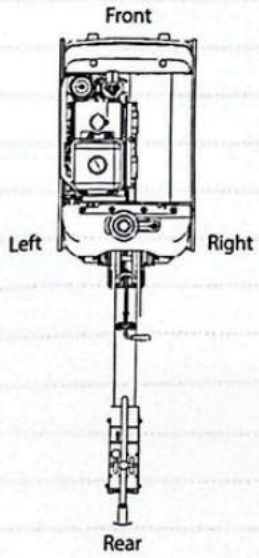
Maintenance

Items of importance in this manual are highlighted by the title IMPORTANT. Make sure that maintenance is carried out according to the instructions detailed in this manual to achieve the best performance from this machine.

Direction

Front Rear Left Right

Front, rear, left, and right directions in this manual are determined with the operator standing in the operating position facing forward.



MTEE-001

MEMO

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.

MTEE-002

Machine

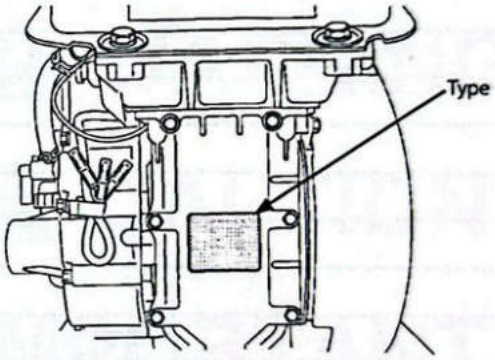
MODEL/TYPE: _____

PRODUCT
IDENTIFICATION
NUMBER: _____

Engine

TYPE: _____

MFG. NO.: _____



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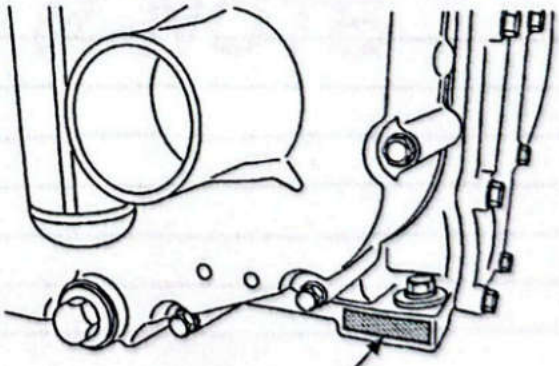
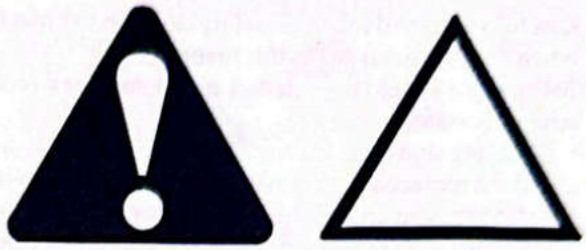


MZV550-004

MEMO

Recognize Safety Information

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



SA-2644

Understand Signal Words

- On machine safety signs, signal words designating the degree or level of hazard - DANGER, WARNING, or CAUTION - are used with the safety alert symbol.
  - **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
  - **WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
  - **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
  - **DANGER or WARNING safety signs** are located near specific hazards. General precautions are listed on **CAUTION safety signs.**
  - Some safety signs do not use any of the designated signal words above after the safety alert symbol are occasionally used on this machine.

SA-1223

- 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.

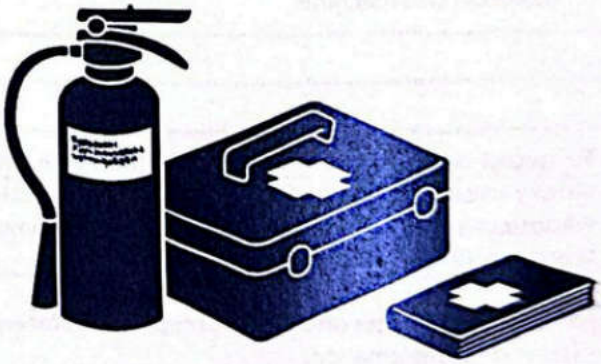
Follow Safety Instructions

- 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.
- 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

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

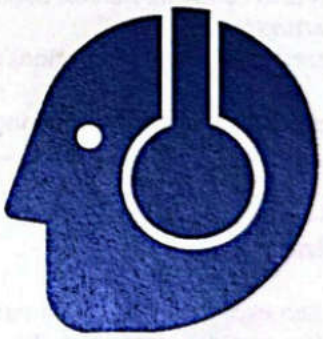
- Wear close fitting clothing and safety equipment appropriate to the job.
  You may need:
  - A hard hat
  - Safety shoes
  - Safety glasses, goggles, or face shield
  - Heavy gloves
  - Hearing protection
  - Reflective clothing
  - Wet weather gear
  - Respirator or filter mask.

  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.

SA-438

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

Prevention of Vibration Hazard

- As the basics to prevent vibration hazard, do not operate the machine continuously for a long time.

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.

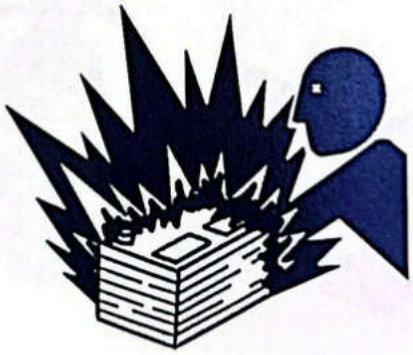
SA-435

Move and Operate Machine Safely

- Bystanders can be run over. Check safety around the machine before starting to operate the machine.
  - Check safety around the machine and sound the alarm to warn personnel around the machine before starting the engine, and driving or steering the machine.
  - Use a signal person when good visibility is not available. Constantly keep the signal person in sight of the operator.
  - Use a signal person when moving, steering, or operating the machine in congested areas. Coordinate hand signals before starting the machine.
  - Keep bystanders and/or obstructions clear of the machine job site.
  - Use proper illumination when working in dark places or at night.

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 THE ENGINE" chapter in the operator's manual.
  - The operator must stand in the operating position 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

Keep Riders off Machine

- Never attempt to ride any personnel on the machine during work.

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.
  - Keep bystanders clear of the working and traveling range.
  - 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.
  - Do not operate the machine in areas where rocks may fall.

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

Drive Machine Safely

- Before driving the machine, ensure that the area around the machine is safe. Pay extra attention when driving the machine backward and when driving the machine on slopes.
  - Do not attempt to drive diagonally across the face of a slope. The machine may tip over.
  - When driving on a slope, do not place an object on the frame, which may roll off.

Precautions for Driving

- The machine is possible to slip or tip over when driving on slopes.
- Make a detour to avoid obstructions.
- Drive at a slow speed when driving on rough terrain.
- Do not steer quickly when changing the driving direction as the machine may tip over.

Precautions for Operation on Snow

- The machine is subject to slipping and tipping over when driving on snow or frozen roads.
  - The machine may easily slide more than predicted when driving on inclined snow surfaces or frozen roads even if the inclination is small. Reduce driving speed to as slow as possible and avoid quick start, stop, and/or steering operation.

Avoid Injury from Rollaway Accidents

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

To avoid rollaways:

1. Park the machine on a level surface.
2. Check that the FNR lever is in the neutral "N" position.
3. Apply the parking brake.
4. Run the engine at slow idle speed for about 5 minutes to allow the engine to cool down.
5. Move the accelerator lever to the "STOP" position to stop the engine.
6. Turn the key to the "OFF" position to stop the engine. Remove the key from the key switch.
7. In case parking the machine on a slope is unavoidable, wedge the front and rear drums.
8. Park at a reasonable distance from other machines.

Avoid Injury from Back-Over

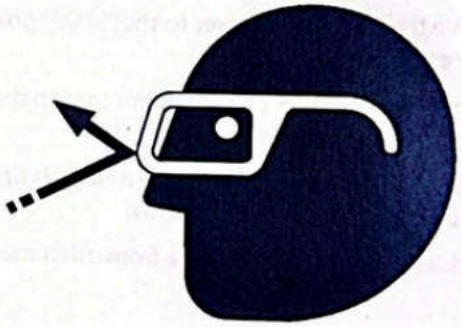
- When required to travel the machine backward, if the machine is operated from the position just behind the handle while retiring, hazardous situation such as being run over by the machine if stumbled or caught between obstructions may result. Always face the travel direction and operate the machine from either side of the handle.

Precautions for Lightning

- The machine is vulnerable to lightning strikes.
  - In the event of an electrical storm, immediately stop operation, and evacuate to a safe place far away from the machine.
  - After the electrical storm has passed, check all of the machine safety devices for any failure. If any failed safety devices are found, operate the machine only after repairing them.

Protect Against Flying Debris

- If flying debris hit eyes or any other part of the body, serious injury may result.
  - Guard against injury from flying pieces of metal or debris; wear goggles or safety glasses.
  - Keep bystanders away from the working area before striking any object.



SA-432

Park Machine Safely

- To avoid accidents :
  1. Park the machine on a level surface.
  2. Check that the FNR lever is in the neutral "N" position.
  3. Apply the parking brake.
  4. Run the engine at slow idle speed for about 5 minutes to allow the engine to cool down.
  5. Move the accelerator lever to the "STOP" position to stop the engine.
  6. Turn the key to the "OFF" position. Remove the key from the key switch.
  7. In case parking the machine on a slope is unavoidable, wedge the front and rear of drums.

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 in a place 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

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. Safely load and unload the machine by following the instructions described in the "TRANSPORTING" chapter.
4. After the machine is loaded on a truck or trailer, wedge both side of the drums (front and rear). Securely fasten the machine to the truck or trailer with wire ropes.
5. Be sure to use a crane when loading or unloading the whole machine by lifting. Never attempt to load or unload the machine by using a forklift with the forks directly inserting into the lifting ring. Failure to do so may result in personal injury and/or machine damage.

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

Practice Safe Maintenance

To avoid accidents:

- Understand service procedures before starting work.
- Keep the work area clean and dry.
- Do not wash sensors, connectors with water or steam.
- Never lubricate or service the machine while it is moving.
- Keep hands, feet and clothing away from power-driven parts.

SA-028

Before servicing the machine:

1. Park the machine on a solid level surface.
2. Place the accelerator lever in the slow idle position and perform cooling operation for 1 to 3 minutes.
3. Move the accelerator lever to the "STOP" position to stop the engine.
4. Turn the key switch to the "OFF" position.
5. Remove the key. In case maintenance must be conducted with the engine running, be sure to use a watcher.
6. Turn the fuel shut-off valve to the Close "C" position
7. Move the parking brake lever to the APPLY position.
8. Apply blocks against the front and rear drums.
9. Attach a "Do Not Operate" tag on the control lever.
10. Allow the engine to cool.

SA-527

- If a maintenance procedure must be performed with the engine running, do not leave the machine unattended.
- Securely support any machine elements that must be raised for service work.
- 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.

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

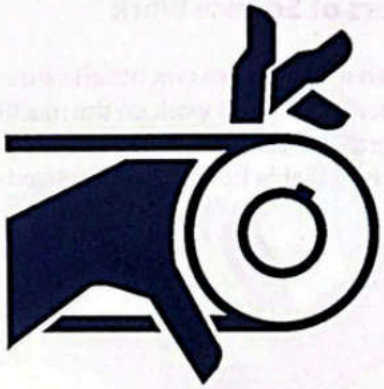
Support Machine Properly

- Never attempt to work on the machine without securing the machine first.
  - In case working under the raised machine is unavoidable, secure the machine with stays and/or blocks strong enough to support the machine weight.

SA-027

Stay Clear of Moving Parts

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



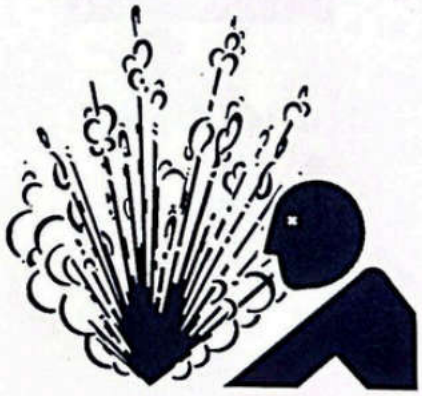
SA-026

SA-2294

Prevent Burns

Hot spraying fluids:

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



SA-039

Hot fluids and surfaces:

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

SA-225

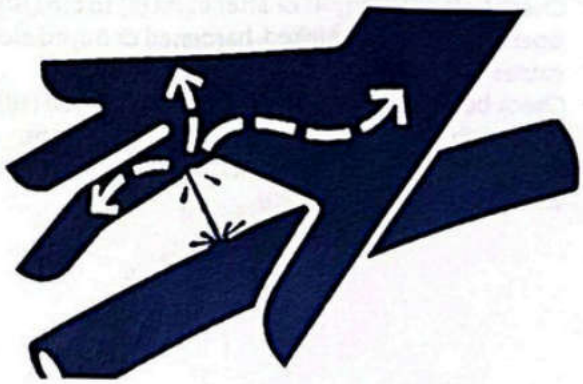
Replace Rubber Hoses Periodically

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

SA-019

Avoid High-Pressure Fluids

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



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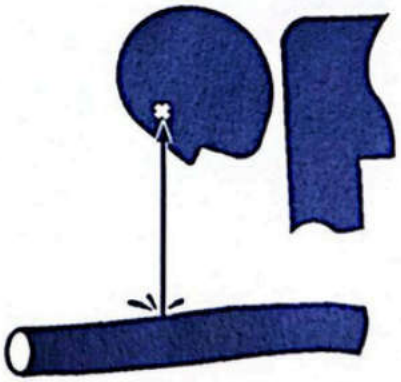


SA-292

SA-044

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.

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.

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 spilled or accumulated flammable materials immediately.
  - Store flammable materials well away from fire hazards.
  - Do not incinerate or puncture pressurized containers.
  - Do not store oily rags; they can ignite and burn spontaneously.
  - Do not cover the high temperature components like a muffler and exhaust with an easy-to-absorb oil material such as asbestos or glass wool.

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.

Check Accelerator Lever:

- If a fire breaks out, failure to stop the engine will escalate the fire, hampering fire fighting.
  - Always check the accelerator lever function before operating the machine every day:

1. Start the engine and run it at slow idle.
2. Move the accelerator lever to the "STOP" position to stop the engine.

- If any abnormalities are found, be sure to repair them before operating the machine.

Precautions for Engine Reverse Operation:

- In the unlikely event of the engine reverse rotation, engine oil will not circulate in the parts, resulting in serious damage in a short period of time.
- If the engine rotates in reverse, engine oil pressure falls to an extremely low level.
- When the engine rotates in reverse, exhaust gas will blow out to the intake air side, the air cleaner may burn and may cause of the fire.
- In case the engine rotates in reverse, immediately stop the engine. Check the air cleaner and replace it if any damage is found.

Evacuating in Case of Fire

- If a fire breaks out, evacuate the machine in the following way:
  - Stop the engine by moving the accelerator lever to the "STOP" position if there is time.
  - Use a fire extinguisher if there is time.

SA-393

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.

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

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.

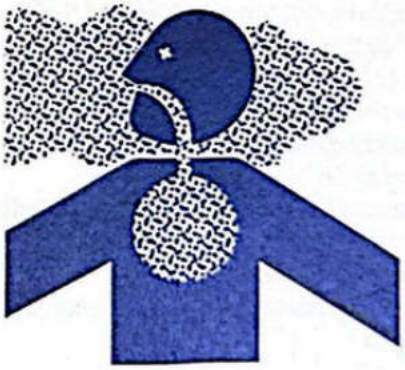
Remove Paint Before Welding or Heating

- 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 materials 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 or 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 fibers might be present in imitation parts. Use only genuine Hitachi Parts.

SA-029

Prevent Battery Explosions

- Battery gas can explode.
  - Keep sparks, lighted matches, and flame away from the top of battery.
  - Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.
  - Do not charge a frozen battery; it may explode. Warm the battery to 16 °C (60 °F) first.
  - Do not continue to use or charge the battery when electrolyte level is lower than specified. Explosion of the battery may result.
  - Loose terminals may produce sparks. Securely tighten all terminals.

SA-032

- 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.

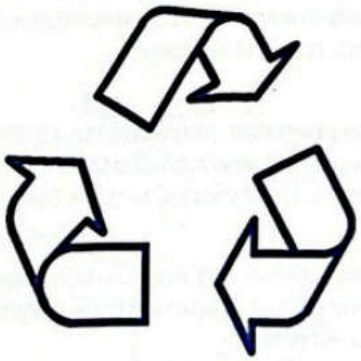
Handle Chemical Products Safely

- 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

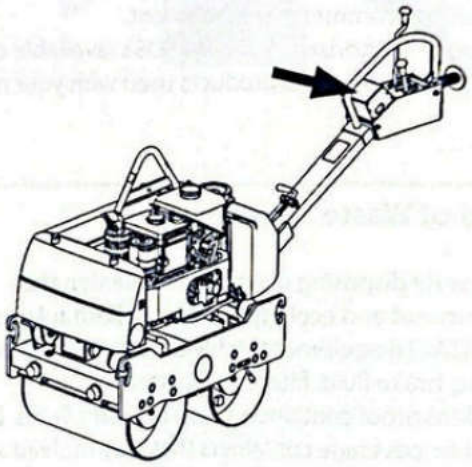
- Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with HITACHI equipment includes such items as oil, fuel, coolant, brake fluid, filters, and batteries.
  - Use leakproof containers when draining fluids. Do not use food or beverage containers that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



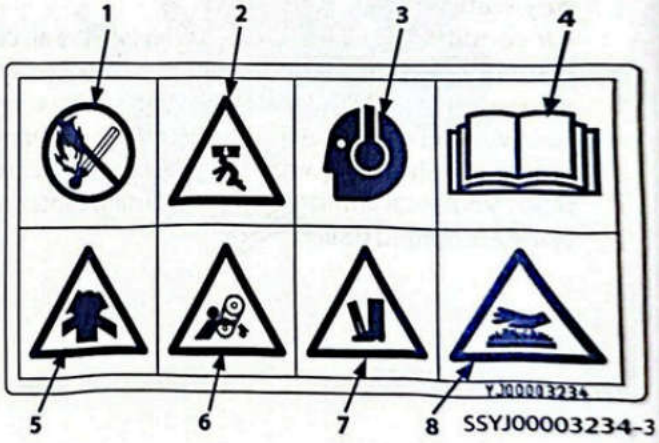
SA-226

Safety signs affixed on this machine and their locations are indicated in this section. Thoroughly acknowledge all safety instructions on the actual safety signs and handle the machine following the safety method.
Safety signs should be installed, maintained and replaced when necessary. 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.

1. Fuel is highly flammable. Keep fuel away from fire hazards.
2. Do NOT allow anyone to come close to or under the lifted machine.
3. Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortably loud noises.
4. Prior to operation, maintenance, assembling/ disassembling, and transportation of the machine, be sure to read and understand the Operator's Manual.
5. Inhaling exhaust gas may cause carbon monoxide poisoning. Do not operate the machine in a badly ventilated place.
6. Sign indicates a danger of a part of your body getting entangled in rotating parts.
7. Sign indicates a risk of crush hazard of your foot by the drum.
8. Sign indicates a burn hazard from contacting high temperature part.

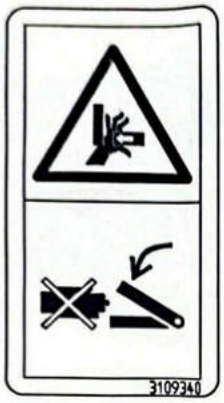


SS-3718



SSYJ00003234-3

- Sign indicates crush hazard of your hand or foot when locking/releasing the handle.



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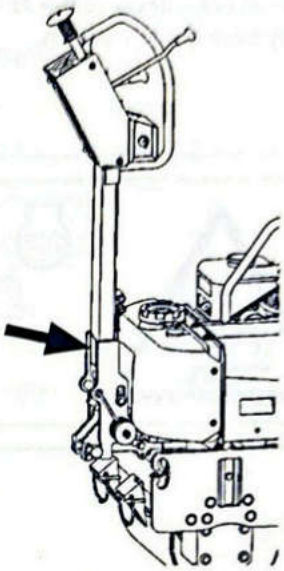
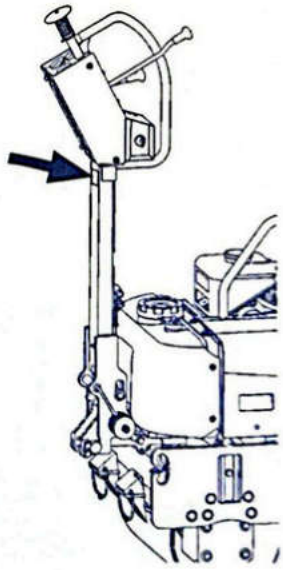


SS-3719

- Never attempt to attach a lifting tool on the handle to lift the machine.

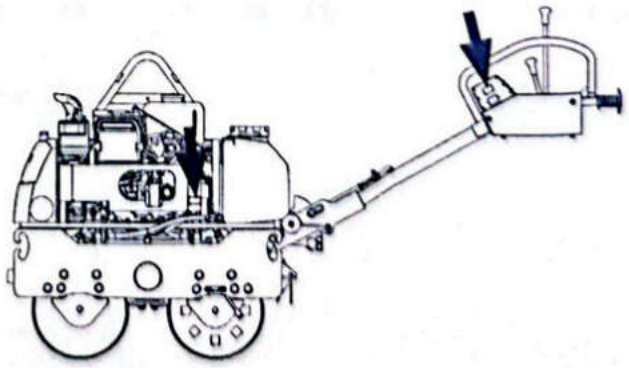
SSYJ00003166



SS-3720

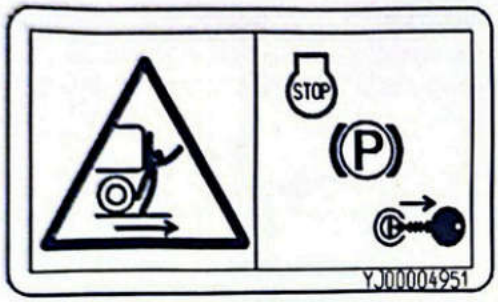
- Never attempt to use high pressure water or steam to clean electrical parts including hour meter and connectors. Otherwise, damage to the parts may result.

SSYJ00004950

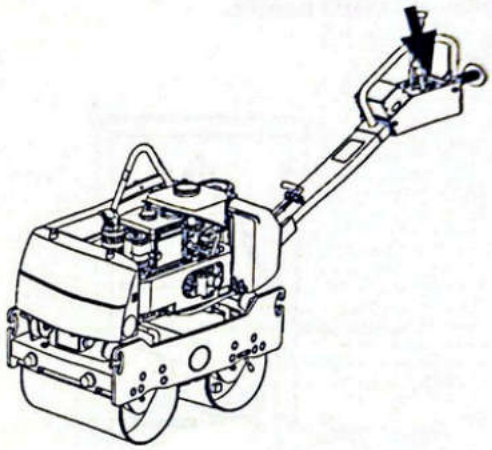


SS-3721

- Before leaving the machine, be sure to stop the engine, move the parking brake lever to the APPLY position and remove the key from the key switch.



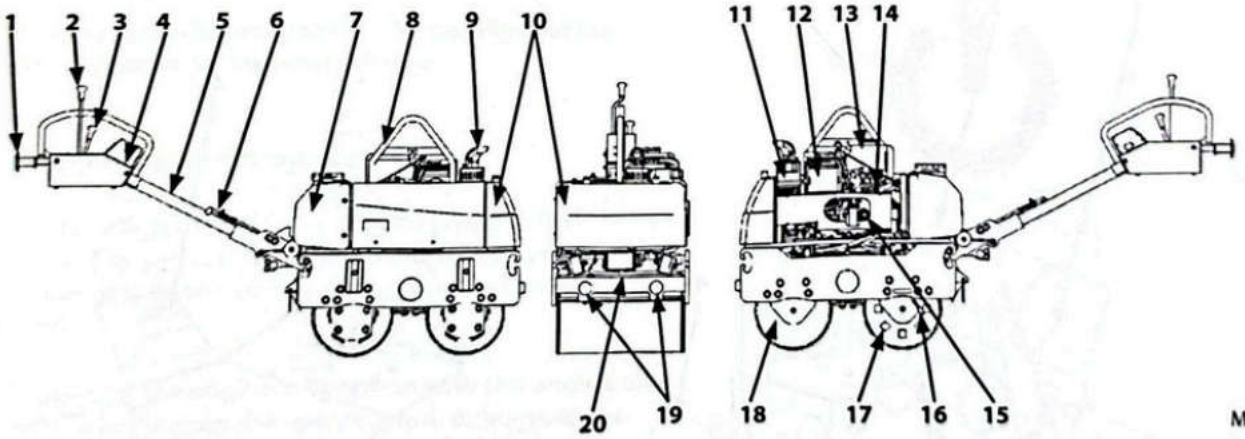
SSYJ00004951



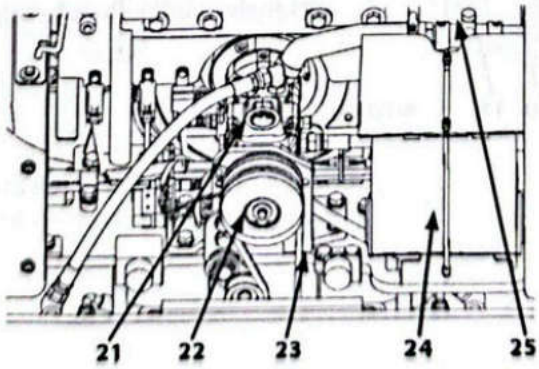
SS-37

Components Name

1. Reverse Travel Stop Knob
2. FNR Lever
3. Accelerator Lever
4. Indicator (including Hour Meter, Key Switch)
5. Handle
6. Handle Lock Lever
7. Sprinkler Tank
8. Lifting Ring
9. Muffler
10. Hydraulic Oil Tank
11. Air Cleaner
12. Radiator
13. Fuel Tank
14. Engine
15. Fuel Filter
16. Parking Brake Lever
17. Rear Drum
18. Front Drum
19. Bumper
20. Headlight
21. Hydraulic Pump
22. Magnetic Clutch
23. V-Belt
24. Battery
25. Suction Filter



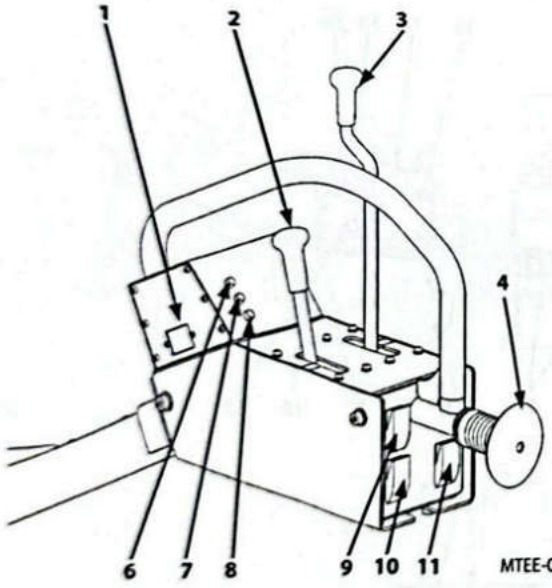
MTEE-006



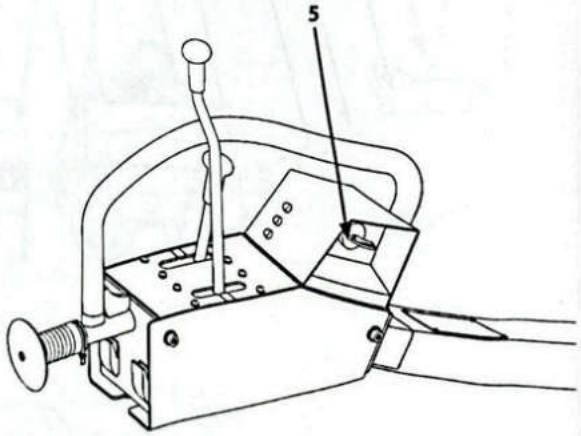
MTEE-007

Components Name (Operation Part)

1. Hour Meter
2. Accelerator Lever
3. FNR Lever
4. Reverse Travel Stop Knob
5. Key Switch
6. Power Lamp
7. Engine Oil Pressure Indicator
8. Preheat Indicator
9. Horn Switch
10. Headlight Switch
11. Vibration Switch



MTEE-008

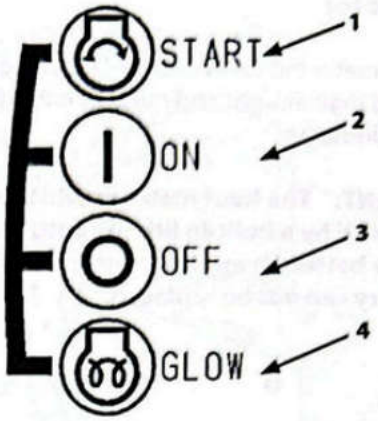


MTEE-00

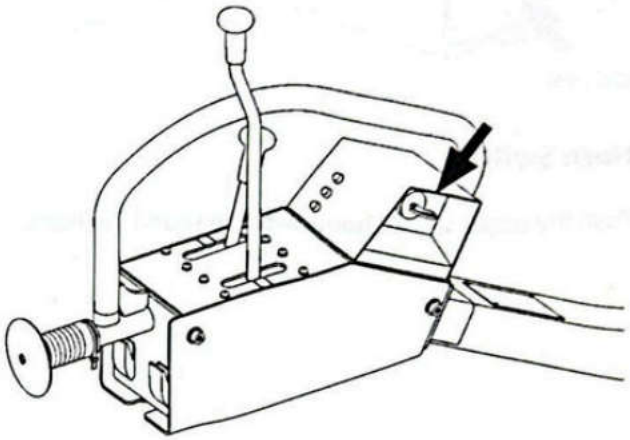
Key Switch

1. START (Engine Start)
2. ON (Power ON)
3. OFF (Power OFF)
4. GLOW (Engine Preheat)

IMPORTANT: The engine does not stop even if the key switch is turned to the "OFF" position after the engine starts. The engine stops when the accelerator lever is in the "STOP" position. The buzzer sounds when the key switch is turned to the "ON" position while the engine is stopped.



MTEE-010



MTEE-009

Power Lamp

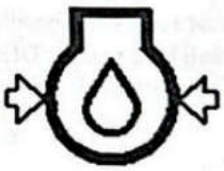
When the key switch is turned to the "ON" position and the machine is powered on, the lamp will light.

MTEE-011

Engine Oil Pressure Indicator

The indicator warns the drop in engine oil pressure. Red lamp is lit and buzzer sounds while running the engine. Check the engine oil pressure system and oil level for any abnormality.

IMPORTANT: If the engine is operated with the engine oil pressure lower than the specification, damage to the engine may result. If the engine oil pressure indicator is lit during operation, immediately stop the engine.



MTEE-012

Preheat Indicator

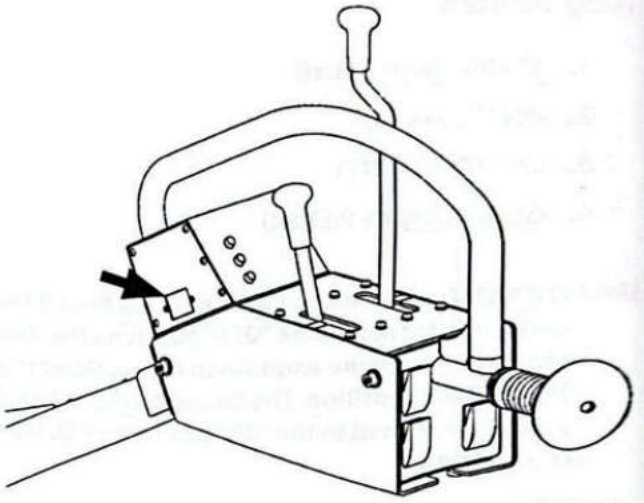
When the key switch is turned to the "GLOW" (Engine Preheat) position, the indicator will light to indicate that the engine is being preheated.

MTEE-013

Hour Meter

The hour meter indicates accumulated machine operation hours. The digit at right end number indicates tenths of an hour (6 minutes).

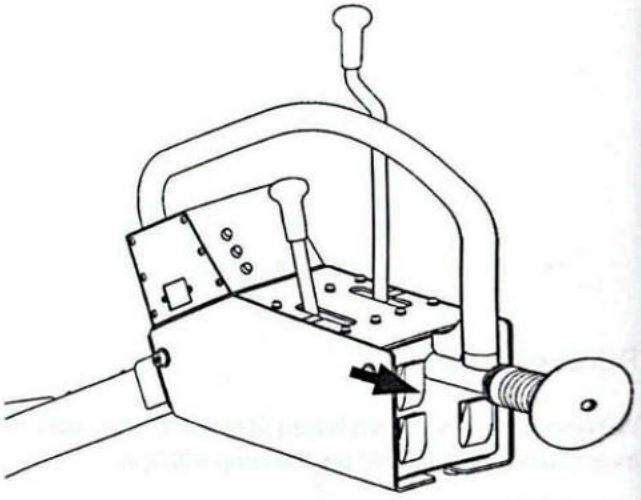
IMPORTANT: The hour meter provided on this machine is powered by a built-in lithium battery. Operating time of the battery is approximately 10 years. The built-in battery can not be replaced.



MTEE-008

Horn Switch

Push the upper side of horn switch to sound the horn.

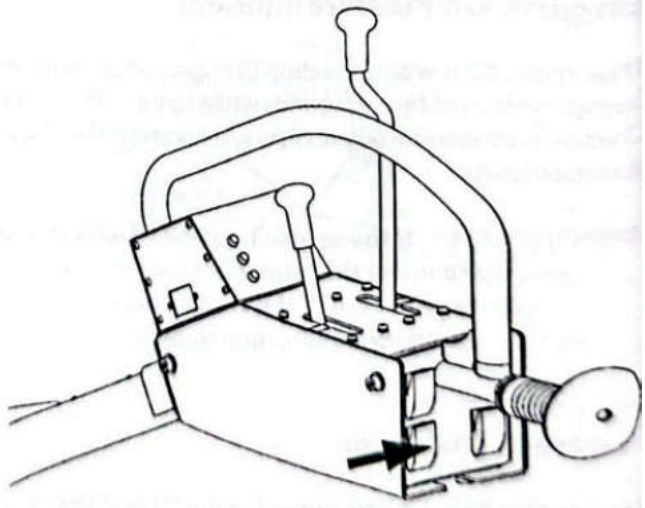


MTEE-008

Headlight Switch

When pushing the upper side of headlight switch, it will turn ON and the headlight will light.

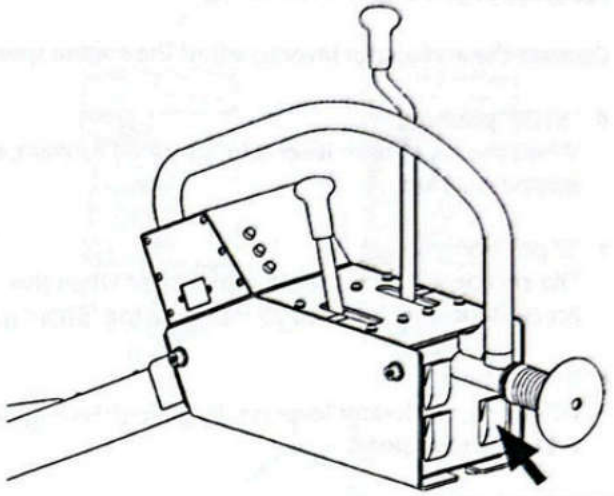
IMPORTANT: Do not turn the headlight ON unless the engine runs in full idle speed. Otherwise it may cause early battery consumption.



MTEE-00

Vibration Switch

When Pushing the upper side of vibration switch, it will turn ON and the machine will vibrate.



MTEE-008

IMPORTANT:

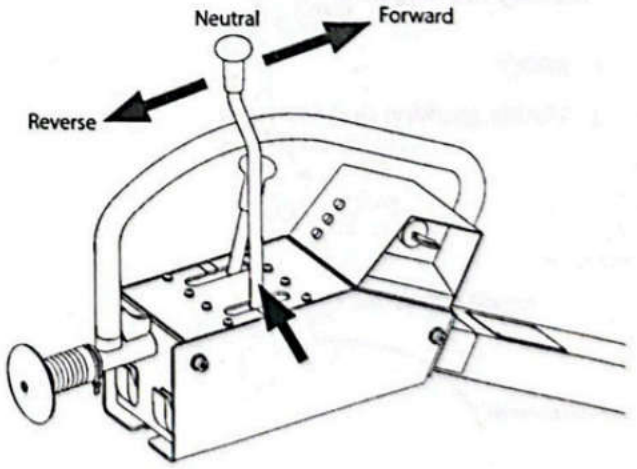
- **Before starting the engine, ensure that the vibration switch is in the OFF position.**
- **Do not vibrate the machine when stopping the machine. If the machine vibration is operated while stopping the machine, premature wear and/ or damage to the machine may result. Also, over-compaction pressure may affect the compacted surface.**
- **As operating under the following condition (s) may not only give damage to the machine and material but may also cause injury to workers and bystanders, never attempt to vibrate the machine.**
  - **Compacted road surface or soil**
  - **Frozen soils**
  - **Intensely cohesive soils**
  - **Soils that are not capable of bearing a load**
  - **Non-compactible hard soils**

FNR Lever

The FNR lever changes the machine travel direction from forward to reverse and vice versa and controls speed.

- When shifting the lever to the forward "F" position, the machine will move forward.
- When shifting the lever to the reverse "R" position, the machine will move reverse.
- When returning the lever to the neutral "N" position, the machine will stop.

The speed can be controlled steplessly from 0 km/h to the maximum speed when selecting the fast or the slow speed by moving the lever from "N" to "F" or "R" full stroke.



MTEE-009

IMPORTANT:

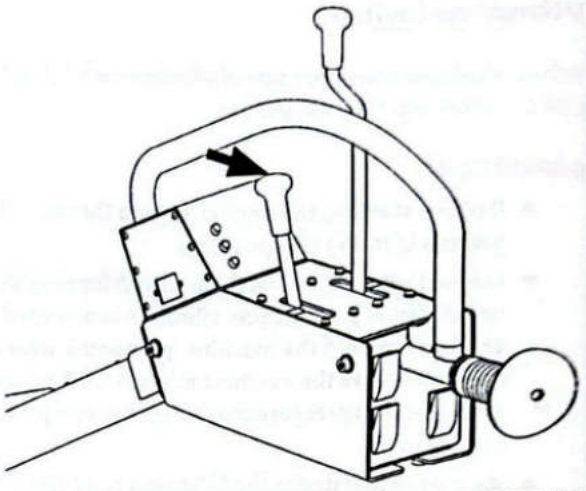
- **When traveling the machine without holding the *FNR lever*, appropriate machine speed may not be maintained.**

Accelerator Lever

Operate the accelerator lever to adjust the engine speed.

- "STOP" position:
  When the accelerator lever is fully pushed forward, the engine will stop.
- "L" position:
  The engine will be set to slow idle speed when the accelerator lever is pulled 20 mm from the "STOP" position.
- "H" position:
  When the accelerator lever is fully pulled, the engine will be set to full idle speed.

IMPORTANT: Do not turn the headlight ON unless the engine runs in full idle speed. Otherwise it may cause early battery consumption.

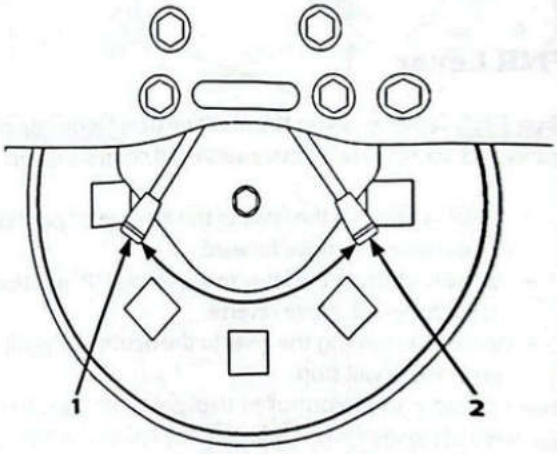


MTEE-008

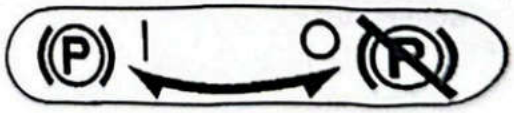
Parking Brake Lever

WARNING: To prevent machine rollaway accidents, be sure to apply the parking brake whenever parking or leaving the machine.

1. APPLY
2. TRAVEL (parking brake release)



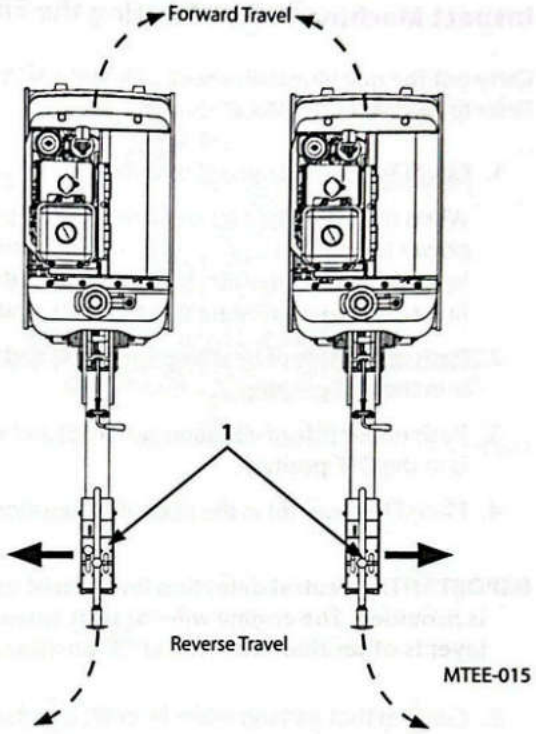
MTEE-014



SSYJ0000402

Handle

Swing handle (1) left and right to change the machine travel direction to leftward and rightward.



MTEE-015

Release/Lock the Handle

⚠WARNING: Be sure to support the handle when it is released to set to the working position. The handle can suddenly fall, causing personal injury.

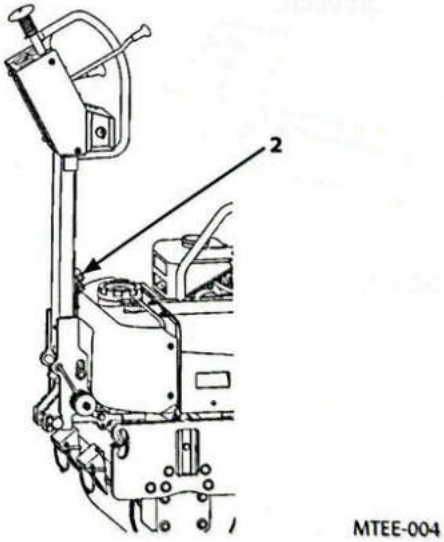
⚠WARNING: Take care not to let your hand get caught in the handle lock lever when locking the handle.

Release: It is to set the handle to the working position.

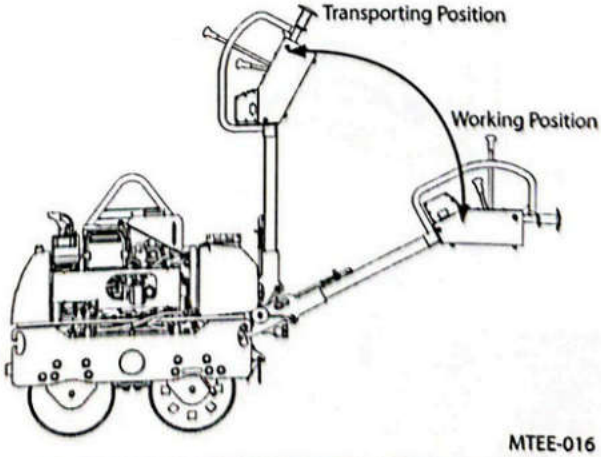
1. Release the lock by lifting up handle lock lever (2) while lightly pushing handle (1) to the machine side.
2. Handle (1) leans backward and contacts with the handle holder where it becomes the working position. At the same time, handle (1) is locked.

Lock: It is to bring the handle to the transporting position.

1. Lift up handle lock lever (2) to release the lock.
2. Stand handle (1) upright while lifting up handle lock lever (2). Release a hand from handle lock lever (2). If handle (1) is lightly pushed to the machine side, it will be locked and becomes the transporting position.



MTEE-004



MTEE-016

Inspect Machine Before Starting the Engine

Carry out the machine daily check before starting the engine. Refer to the "MAINTENANCE" chapter.

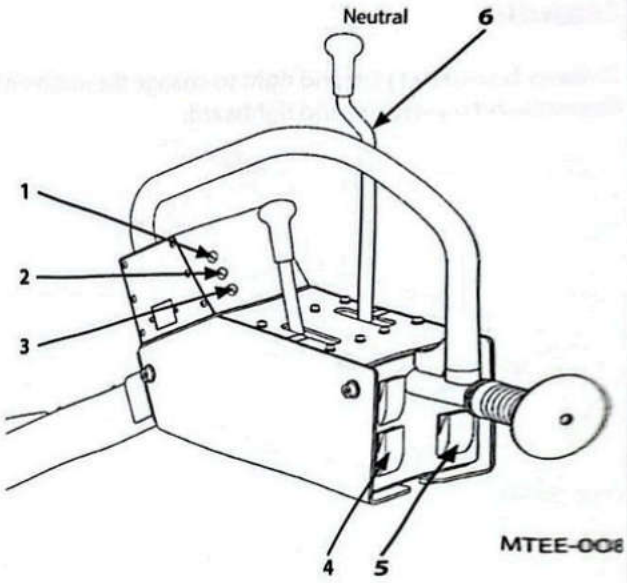
1. Check for burned out indicator lights

   When the key switch is turned to the "ON" position, power lamp (1), engine oil pressure indicator (2) will light. If any indicator except preheat indicator (3) which fails to light may indicate that the bulb is burned out.

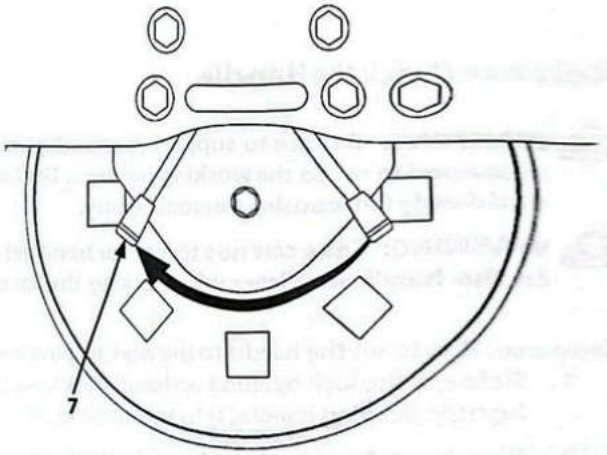
2. Push under side of headlight switch (4) and ensure that it is in the OFF position.
3. Push under side of vibration switch (5) and ensure that it is in the OFF position.
4. Place FNR lever (6) in the neutral "N" position.

IMPORTANT: Neutral detection function of the FNR lever is provided. The engine will not start when the FNR lever is other than the neutral "N" position.

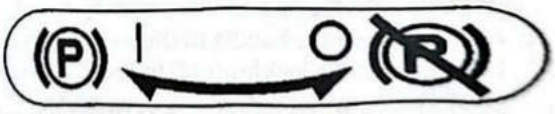
5. Confirm that parking brake lever (7) is in the APPLY position.



MTEE-008



MTEE-014



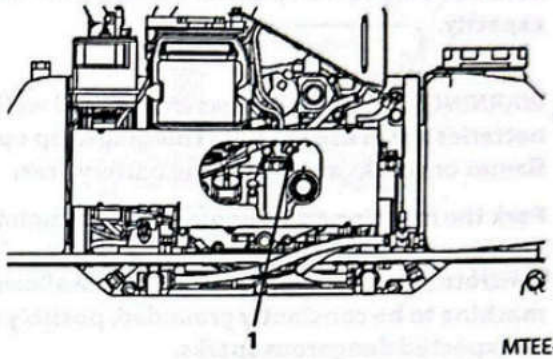
SSYJ00004021

Starting the Engine

Start the engine as follows:

IMPORTANT: Never operate the starter for more than 10 seconds at a time. If the engine fails to start, return the key to the "OFF" position. After waiting for more than 30 seconds, try again. Failure to follow this instruction may cause the starter to fail and/or the battery to become discharged.

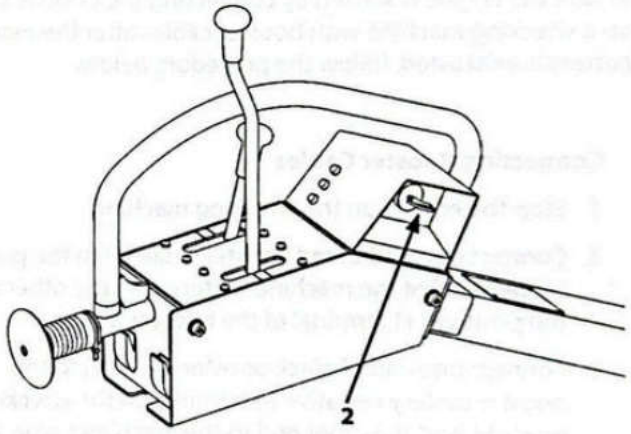
Neutral detection function of the FNR lever is provided. The engine will not start when the FNR lever is other than the neutral "N" position.



MTEE-017

1. Turn fuel shut off valve (1) to the Open "O" position.
2. Insert key (2) into the key switch. Turn key (2) to the "ON" position.
3. Push horn switch (3) and sound the horn to alert bystanders.
4. Turn key (2) to the "GLOW" (Engine Preheat) position to preheat the engine for the time as shown below.

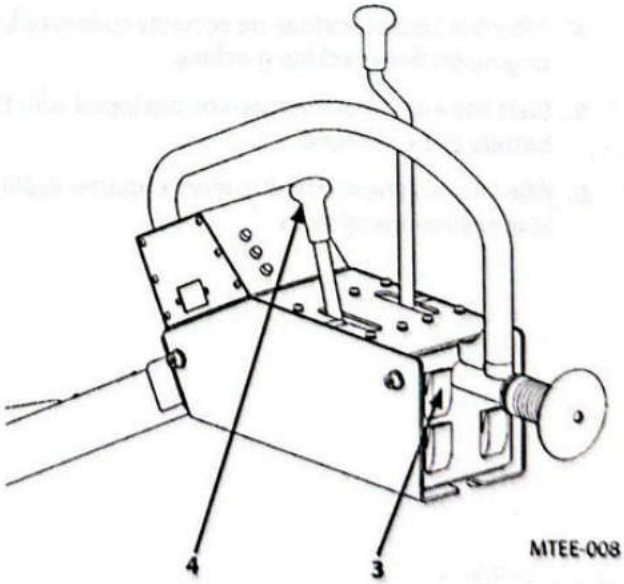
Air Temperature	Preheat Time
-5 °C or higher	5 seconds
Less than -5 °C	10 seconds



MTEE-009

5. Fully pull accelerator lever (4) to the full idle position.
6. Turn key (2) to the "START" position. The starter will rotate and the engine will start.
7. As soon as the engine starts, release key (2). Key (2) will automatically return to the "ON" position.
8. Slightly reduce the engine speed, perform warming up operation for approximately 5 minutes.

⚠ WARNING: To prevent accidents due to running away of the machine, do not leaving the machine when the engine is running.



MTEE-008

Jump Starting

IMPORTANT: The machine electrical system is a 12-volt. Use only 12-volt booster battery with sufficient capacity.

⚠ WARNING: An explosive gas is produced while batteries are in use or being charged. Keep open flames or sparks away from the battery area.

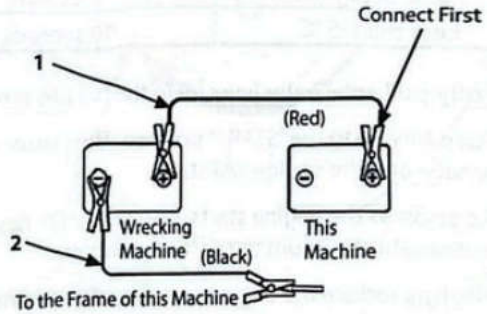
Park the machine and a booster battery mounted machine (wrecking machine) on a dry ground or concrete surface. Parking on steel plate allows the machine to be constantly grounded, possibly creating unexpected dangerous sparks.

Never connect a positive (+) terminal to a negative (-) terminal, as a dangerous short circuit will occur.

In case the engine is started by connecting the booster battery on a wrecking machine with booster cables after the machine battery is exhausted, follow the procedure below.

Connecting Booster Cables

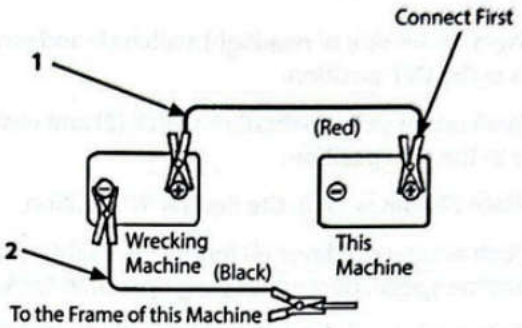
1. Stop the engine on the wrecking machine.
2. Connect one end of red booster cable (1) to the positive (+) terminal of the machine battery, and the other end to the positive (+) terminal of the booster battery.
3. Connect one end of black booster cable (2) to the booster battery negative (-) terminal on the wrecking machine and the other end to the machine frame. In the last connection to the frame, sparks may be produced. Be sure to connect the cable end to a point as far away from the batteries as possible.
4. After the booster cables are securely connected, start the engine on the wrecking machine.
5. Start the engine of the machine equipped with the battery to be charged.
6. After the engine starts, disconnect booster cables (1 and 2) in the following steps.



M503-03-002

Disconnecting Booster Cables

1. Disconnect black negative (-) cable (2) from the machine frame first.
2. Disconnect the other end of black booster cable (2) from the negative terminal of the booster battery.
3. Disconnect one end of red booster cable (1) from the positive terminal of the booster battery.
4. Disconnect the other end of red booster cable (1) from the positive terminal of the machine battery.

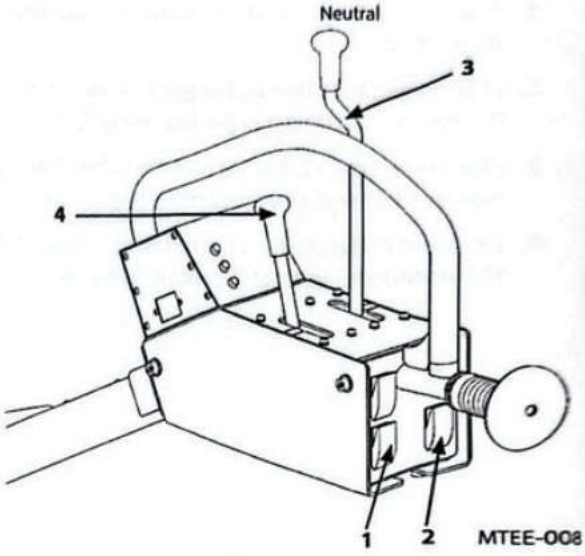


M503-03-002

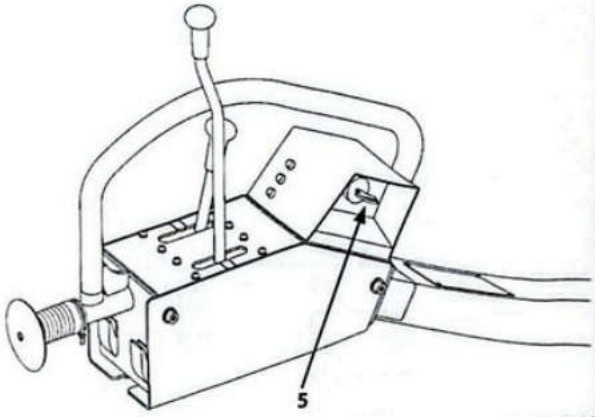
Stopping the Engine

1. Push under side of headlight switch (1) and ensure that it is in the OFF position.
2. Push under side of vibration switch (2) and ensure that it is in the OFF position.
3. Place FNR lever (3) in the neutral "N" position.
4. Push accelerator lever (4) forward to slightly reduce the engine speed, perform cooling operation for 5 minutes.
5. Fully push accelerator lever (4) forward to the "STOP" position to stop the engine.
6. Turn key (5) to the "OFF" position to stop the engine.

IMPORTANT: If key (5) is in the "ON" position after stopping the engine, the buzzer will sound. Do not leave key (5) in the "ON" position after stopping the engine. Otherwise, the battery runs out.



MTEE-008



MTEE-009

Traveling the Machine

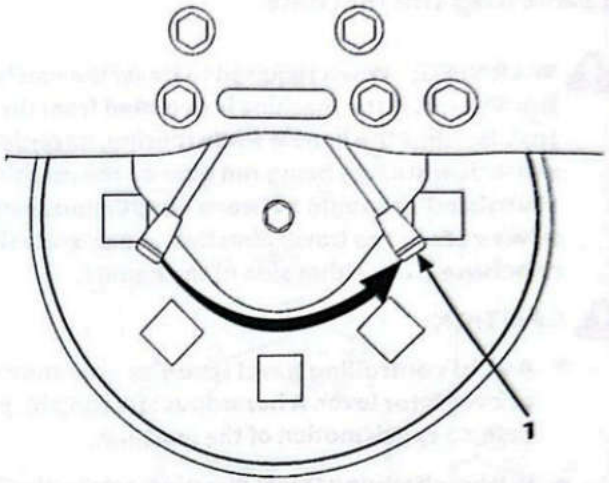
⚠ WARNING: When required to travel the machine backward, if the machine is operated from the position just behind the handle while retiring, hazardous situation such as being run over by the machine if stumbled or caught between obstructions may result. Always face the travel direction and operate the machine from either side of the handle.

⚠ CAUTION:

- **Avoid controlling travel speed by operating the accelerator lever. A hazardous situation may occur due to quick motion of the machine.**
- **When changing travel direction, return the FNR lever to the neutral "N" position. After the machine completely stops, shift the FNR lever. If changing travel direction is quickly performed, the machine may lose balance, possibly creating a hazardous situation.**
- **In order to prevent vibration hazard, do not continuously operate the machine for a long time. Take vibration preventive measures such as using anti-vibration belt.**
- **When operating the machine in a dusty area, sprinkle water or wear an approved respirator.**
- **Avoid quick steering and traverse on a slope. Failure to do so may cause machine to turn over.**
- **Always hold the handle with your hands when operating the machine.**
- **Compacted material may fly in all directions during operation. Confirm the safety around the machine.**
- **In case the machine gets stuck in a mud or hollow and can not move, lift the machine to escape. Before lifting the machine, thoroughly read precautions for lifting the machine in the "TRANSPORTING" chapter.**
- **The machine turn over angle is defined based on a condition that a machine is parked on a firm flat ground. The machine may tip over due to various operating conditions on the slope such as soft ground, machine travel direction, operating the vibrator, losing a balance due to water in the sprinkler tank or high speed travel.**
- **When operating the machine on a slope, do NOT operate the machine back and forth, left and right at inclination angle more than 20 °. Failure to do so may cause the engine burn-out.**

1. Turn parking brake lever (1) to the TRAVEL (parking brake release) position to release the parking brake.
2. Confirm that accelerator lever (2) is fully pulled to the full idle position.
3. Slowly move FNR lever (3) to either the forward "F" or reverse "R" position to run the engine at the desired speed.

NOTE: Machine speed varies according to the operation of FNR lever (3) and the accelerator lever (2).



MTEE-014

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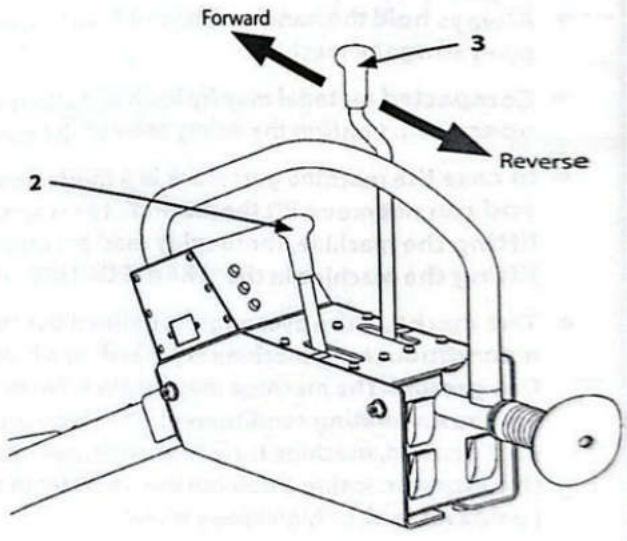
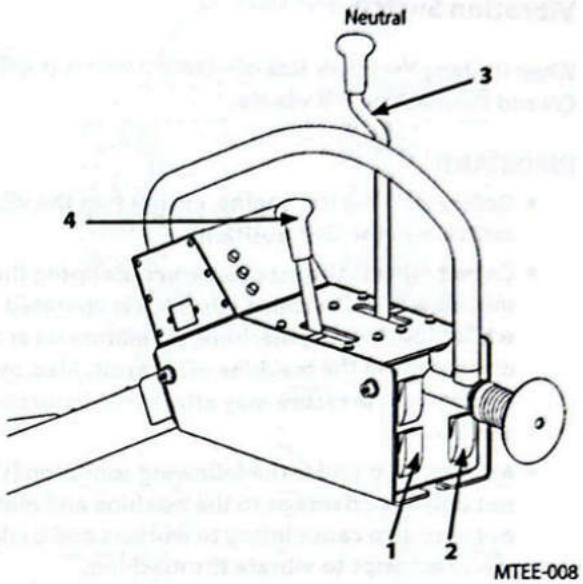


MTEE-00

Parking

⚠ WARNING: Wedge the front and rear drums to prevent the machine from moving. When parking the machine for a long time, also use wedges.

1. Park the machine on level and solid ground. Avoid parking the machine on slopes, which may result in a serious accident.
2. Push under side of headlight switch (1) and ensure that it is in the OFF position.
3. Push under side of vibration switch (2) and ensure that it is in the OFF position.
4. Place FNR lever (3) in the neutral "N" position.
5. Push accelerator lever (4) forward to slightly reduce the engine speed, perform cooling operation for 5 minutes.
6. Turn parking brake lever (5) to the APPLY position.
6. Fully push accelerator lever (4) forward to the "STOP" position to stop the engine.
8. Turn key (6) to the "OFF" position to stop the engine.



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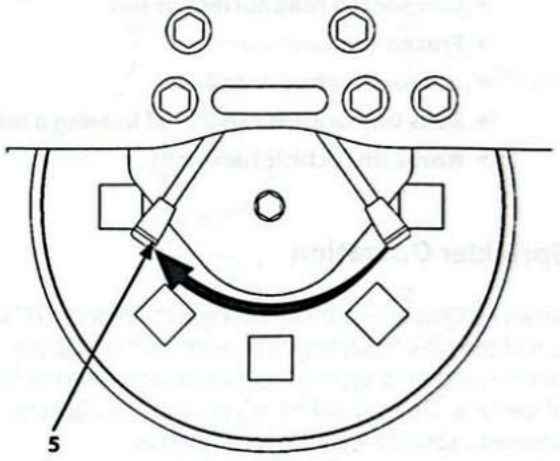

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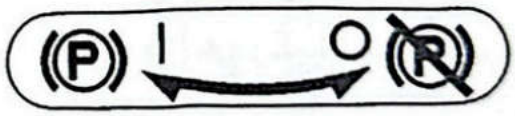

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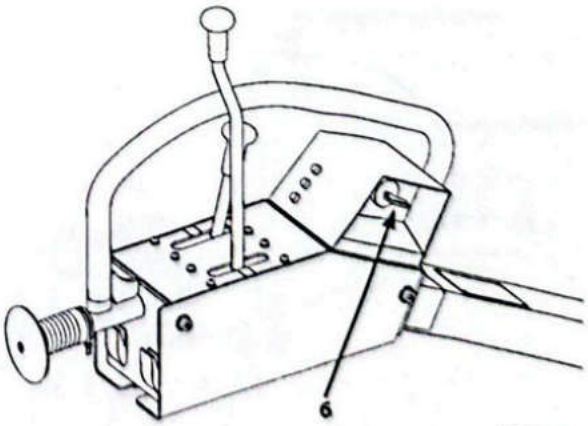
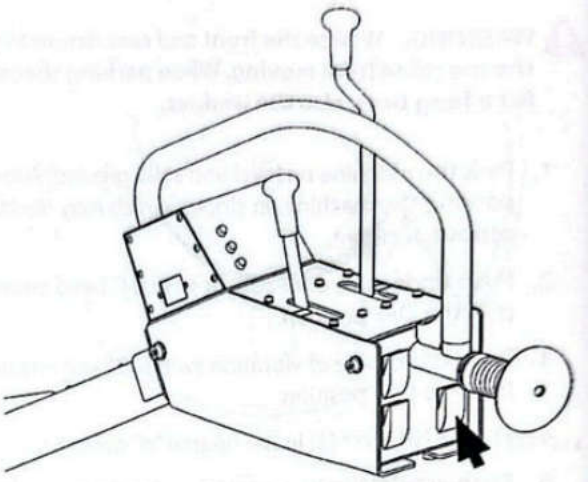


MTEE-009

Vibration Switch

When Pushing the upper side of vibration switch, it will turn ON and the machine will vibrate.



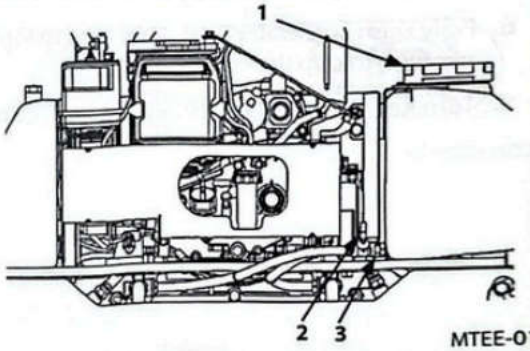
MTEE-008

IMPORTANT:

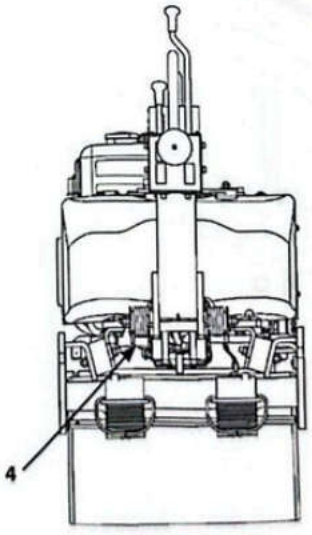
- **Before starting the engine, ensure that the vibration switch is in the OFF position.**
- **Do not vibrate the machine when stopping the machine. If the machine vibration is operated while stopping the machine, premature wear and/ or damage to the machine may result. Also, over-compaction pressure may affect the compacted surface.**
- **As operating under the following condition (s) may not only give damage to the machine and material but may also cause injury to workers and bystanders, never attempt to vibrate the machine.**
  - **Compacted road surface or soil**
  - **Frozen soils**
  - **Intensely cohesive soils**
  - **Soils that are not capable of bearing a load**
  - **Non-compactible hard soils**

Sprinkler Operation

When refilling the sprinkler tank water, open cap (1) on the top of the tank to supply clean water such as tap water. Drain water as required by removing drain cap (4) on the bottom of the tank. Open sprinkler valves (2, 3) located at the side of engine to sprinkle the drums with water.



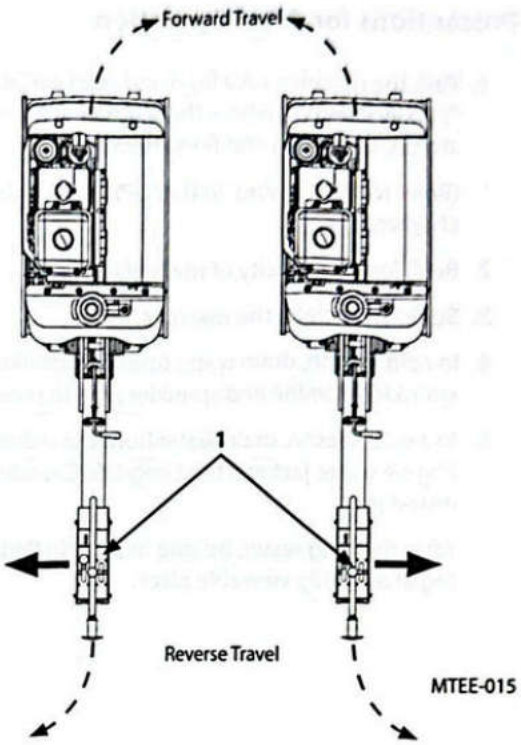
MTEE-017



MTEE-019

Handle

Swing handle (1) left and right to change the machine travel direction to leftward and rightward.



MTEE-015

Release/Lock the Handle

⚠ WARNING: Be sure to support the handle when it is released to set to the working position. The handle can suddenly fall, causing personal injury.

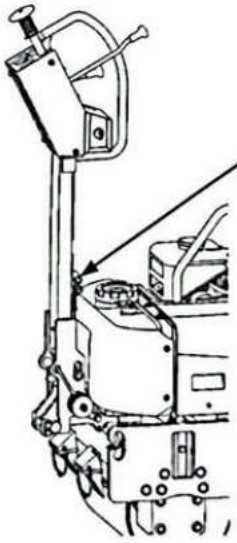
⚠ WARNING: Take care not to let your hand get caught in the handle lock lever when locking the handle.

Release: It is to set the handle to the working position.

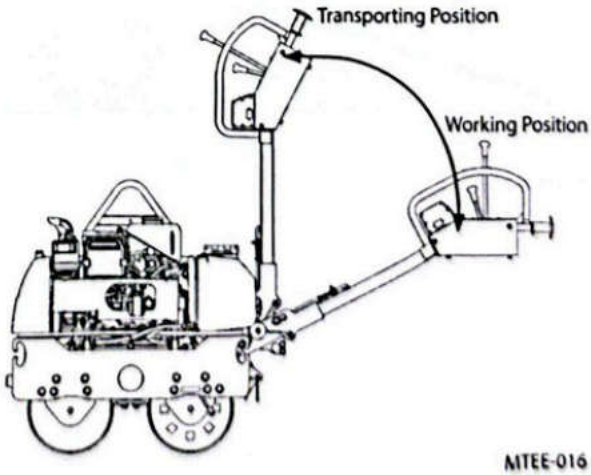
1. Release the lock by lifting up handle lock lever (2) while lightly pushing handle (1) to the machine side.
2. Handle (1) leans backward and contacts with the handle holder where it becomes the working position. At the same time, handle (1) is locked.

Lock: It is to bring the handle to the transporting position.

1. Lift up handle lock lever (2) to release the lock.
2. Stand handle (1) upright while lifting up handle lock lever (2). Release a hand from handle lock lever (2). If handle (1) is lightly pushed to the machine side, it will be locked and becomes the transporting position.



MTEE-004



MTEE-016

Precautions for After Operation

1. Park the machine on a level and solid surface by "Parking" section where there is no danger of falling stones, landslides and flood damage.

   (Refer to the "Parking" in the "OPERATING THE MACHINE" chapter.)

2. Refill fuel to capacity of the fuel tank.
3. Sufficiently clean the machine.
4. In cold season, drain water from the sprinkler tank, sprinkler pipeline and sprinkler pipe to prevent freezing.
5. In a cold season, drain water from the radiator and engine water jacket if the Long-Life Coolant (LLC) is not mixed in.

   After draining water, be sure to put "No Radiator Coolant" tag at an easily viewable place.

Transporting by Road

When transporting the machine on public roads, be sure to first understand and follow all local regulations.

- When transporting using a truck or trailer, check the width, height, length and weight of the trailer with the machine loaded.
  Be careful not to overloaded the trailer. Check the machine mass (weight) shown in the specification table.
- Investigate the conditions of the route to be driven, such as dimensional limits, weight limits, and traffic regulations beforehand.
  Consult your authorized dealer for any unclear points for transportation.

Loading/Unloading on a Trailer

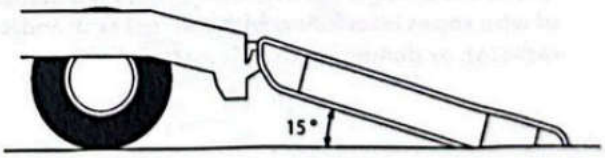
Always load and unload the machine on a firm, level surface.

⚠ WARNING:

- **Be sure to use a loading dock or a ramp for loading/ unloading the machine.**
- **Never steer the machine while traveling up or down the loading ramp as this can be extremely dangerous. If repositioning is necessary, first return the machine to the ground or flatbed, change the travel direction, and then begin to travel again.**
- **The top end of the ramp where it meets the flatbed there is a sudden bump. Take care when traveling over it.**
- **Always drive the machine slowly.**

Ramp/Loading Dock

- Before loading the machine, thoroughly clean the ramp and flatbed. Dirty ramps or flatbeds with oil, mud, or ice on them are slippery and dangerous.
- Place blocks against the truck and trailer wheels while using a ramp or loading dock.
- Ramps must be sufficient in width, length, and strength. Be sure that the incline of the ramp is less than 15 degrees.
- Loading docks must be sufficient in width and strength to support the machine and have an incline of less than 15 degrees.
- Use a trailer equipped with a winch to ensure safe transportation.



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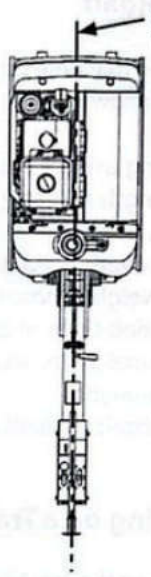
Loading

1. Load the machine so that the longitudinal center line of the machine aligns with the center line of the trailer.
2. Travel the machine slowly on the ramp.
3. Park the machine at the specified position. Apply the parking brake.
4. Stop the engine. Remove the key from the key switch.



MTEE-002

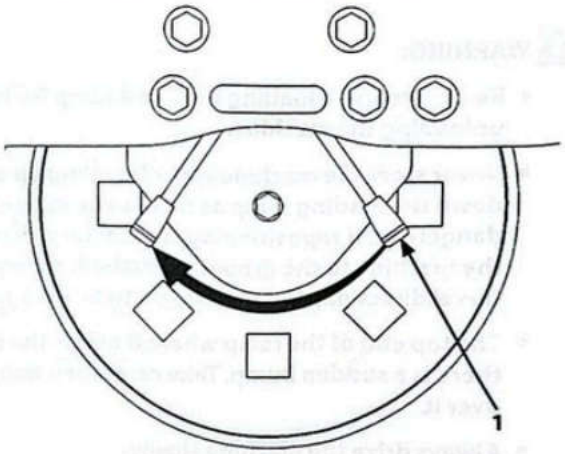
Fastening Machine for Transporting

⚠ WARNING:

- **Be sure to secure the machine to the flatbed with wire ropes.**
- **Before transporting the machine, securely tighten the filler plug and close the fuel shut off valve.**
- **Put the machine on a level surface for transportation.**

The machine may vibrate or move in all directions during transporting.

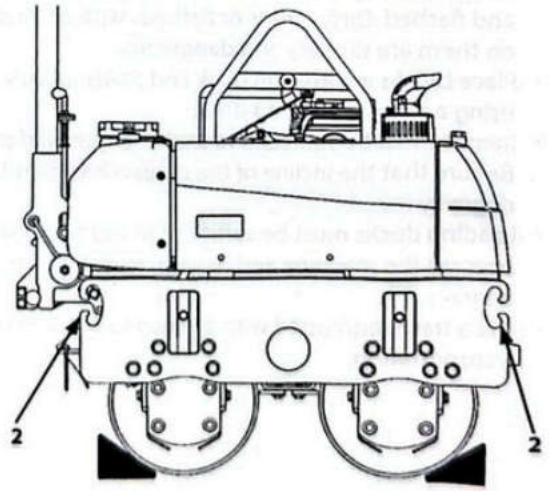
1. Check if the parking brake lever (1) is in the APPLY position.
2. Wedge in front of and behind the drums to secure the machine.
3. Attach wire ropes on securing hooks (2) at the front and rear of the frame and fasten the machine to the trailer.



MTEE-014

⚠ WARNING: In case the handle falls over and sticks out from the trailer while transporting, possibly resulting in serious injury or death. Securely fasten the machine in the longitudinal direction.

⚠ CAUTION: Never attempt to use the lifting ring to fasten the machine to the trailer. There is a danger of wire ropes interfering with the fuel tank and/or radiator, or damaging the lifting ring.



MTEE-040

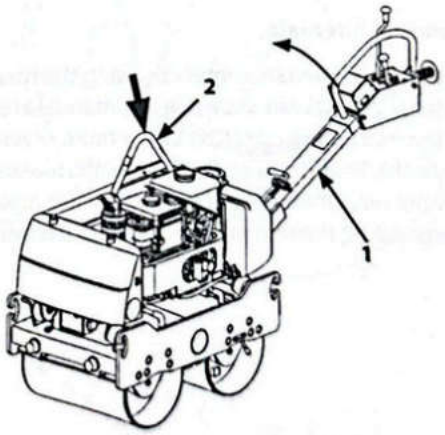
Hoisting the Machine

An operator who hoists the machine by using a crane must be licensed by local law.

- **Make sure that you use lifting cables and other lifting tools that are not damaged or deteriorated and that have sufficient capacity required for the work.**
- **Incorrect lifting procedure and/or incorrect wire rope attachment will cause the machine to move (shift) while being lifted, resulting in machine damage and/ or personal injury.**
- **Ensure there are no cracks and damages at lifting ring (2) and welded part of the machine before lifting.**
- **Be sure to attach wire ropes correctly.**
- **NEVER place loads on the lifting cables and tools too quickly.**
- **Do NOT allow anyone to come close to or under the lifted machine.**
- **Never attach wires on the handle to lift the machine. Failure to do so may cause personal injury or damage to the machine.**
- **If a mobile crane is used to lift the machine, never attempt to travel the crane while lifting.**
- **Never attempt to lift the machine by using a forklift with the forks directly inserting into the lifting ring. Failure to do so may result in personal injury and/or machine damage.**

Lifting the Machine

1. Lock handle (1).
2. Attach wire ropes or lifting hook to lifting ring (2), lift the machine vertically.
3. Operate the lifting machine with extra care to prevent impact landing or the machine spin at partially landing part.



MTEE-003

Maintenance

To utilize the full functions of the machine and extend the machine service life as long as possible, it is required for the machine to be thoroughly checked and serviced. Especially, always use care concerning the following points:

- Check parking brake device.
- Check travel system.
- Check controls and instruments.
- Check coolant, fuel and hydraulic oil levels and check for contamination and/or leaks.
- Check for abnormal machine appearance, noise and heat.
- Check for loose nuts and bolts.
- Check structural parts and components for damage, wear and missing.
- Check for malfunction in all actuators.

IMPORTANT: Never adjust the engine speed. Malfunction and/or damage may result.

If any abnormality is found during operation or maintenance, immediately check the cause of the problem and take the appropriate corrective action. In case tracing the cause of the problem is difficult, or adjustment of the engine fuel system and/or hydraulic components is required, consult your authorized dealer.

IMPORTANT: Precautions for Check and Maintenance

- **Make safety your priority.**
- **Perform check and maintenance appropriate to operational conditions and circumstances.**
- **Use specified fuel and lubricants.**
- **Use only genuine HITACHI parts.**
- **Do NOT modify the machine without authorization.**
- **Machine failure due to use of other than specified parts and components and/or conduct of incorrect maintenance will be exempted from HITACHI warranty policy.**
- **Stop the engine before doing inspection and maintenance of the machine other than items specified otherwise.**
- **Protect electrical parts including sensors, connectors and hour meter from water and steam.**

Maintenance Intervals

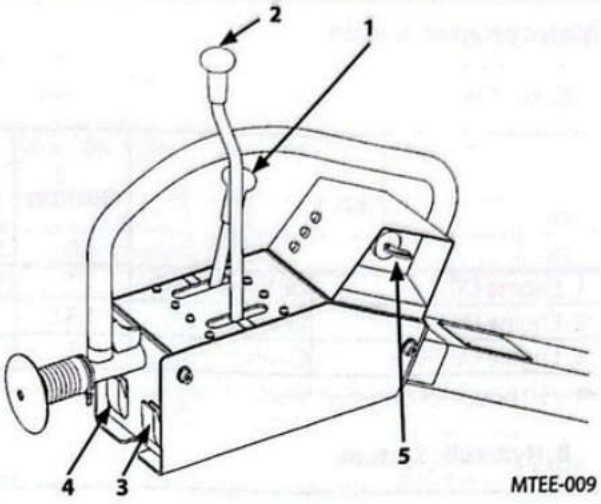
- Decide the maintenance intervals using the hour meter reading.
- Maintenance intervals shown in this manual are those for the machines to be operated under normal conditions. In case the machine is operated under more severe conditions, shorten the intervals.
- Refer to the "Maintenance Guide" for information about lubricants, check and adjustment intervals.
- When the hour meter reading arrives in the replacement time of lubricant and/or elements, conduct the corresponding maintenance work when performing daily or monthly inspection.

Prepare Machine for Maintenance

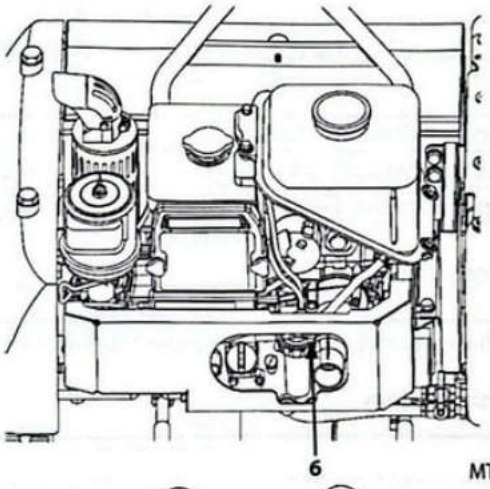
1. Park the machine on a solid and level surface.
2. Place accelerator lever (1) in the slow idle position and perform cooling operation for 1 to 3 minutes.

IMPORTANT: Move FNR lever (2) to the neutral "N" position and turn vibration switch (3) and headlight switch (4) OFF.

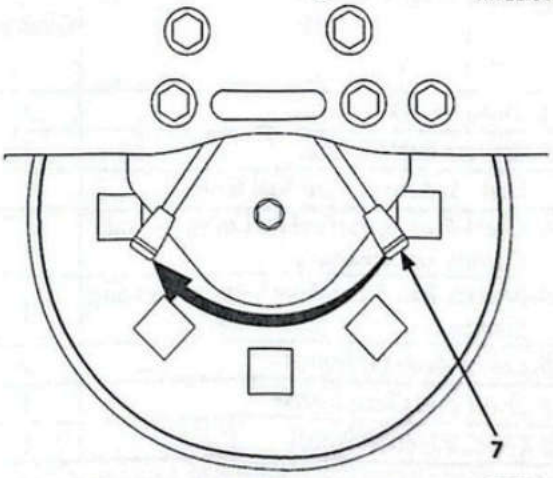
3. Move accelerator lever (1) to the "STOP" position to stop the engine.
4. Turn key (5) to the "OFF" position.
5. Remove the key. In case maintenance must be conducted with the engine running, be sure to use a watcher.
6. Turn fuel shut-off valve (6) to the Close "C" position.
7. Move parking brake lever (7) to the APPLY position.
8. Apply blocks against the front and rear drums.
9. Start maintenance only after attaching a "Do Not Operate" tag in an easy-to-see place on the control lever.



MTEE-009



MTEE-019

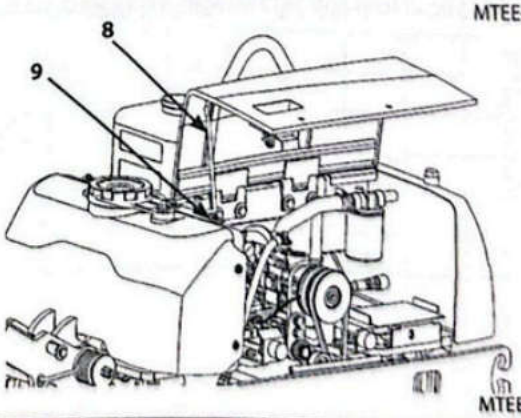


MTEE-014

Access Cover

WARNING: Do not keep the access cover open while the wind is blowing hard. The access cover may close accidentally, possibly resulting in personal injury. When opening or closing the access cover, be careful not to pinch your fingers between the base machine and the access cover.

After the access cover is opened, be sure to lock the cover in the open position by inserting rod (8) into cover lock hole (9).



MTEE-020

Maintenance Guide

A. Engine

Parts		Quantity	Interval (hours)									Page
			Check Before Starting	50	100	250	500	1000	1500	2000	3000	
1. Engine Oil	Oil Level Check	1	■									28
2. Engine Oil	Change	1.3 L		★	■							29
3. Engine Oil Filter	Clean	1		★	■							29

★ : 50 hours for only first time.

B. Hydraulic System

Parts		Quantity	Interval (hours)									Page
			Check Before Starting	50	100	250	500	1000	1500	2000	3000	
1. Check Hydraulic Oil Level		1	■									32
2. Change Hydraulic Oil		16 L						★		★		32
3. Replace Suction Filter		1					■					34
4. Check Fuel Hoses	(for Leaks, Looseness, etc.)	-	■									35
	(for Cracks, Bend, etc.)	-				■						35

★ : Changing interval differs according to the brand of hydraulic oil used.

C. Fuel System

Parts	Quantity	Interval (hours)									Page
		Check Before Starting	50	100	250	450	500	800	1500	3000	
1. Clean Fuel Oil Filter	1			■							39
2. Replace Fuel Oil Filter	1					■					39
3. Drain Sediment from Fuel Tank	1			■							39
4. Check Fuel Pipes, Fuel Return Pipes and Clamps for Looseness	1			■							40
5. Replace Fuel Pipes, Fuel Return Pipes and Clamps	1	Every 2 years									40
6. Adjust Valve Clearance	2							*			40
7. Check and Clean Nozzle	1								*		40
8. Check Injection Pump	1									*	40

* : As special tool and service skill is required, consult your authorized dealer.

D. Air Cleaner

Parts		Quantity	Interval (hours)										Page
			Check Before Starting	50	100	150	200	250	300	350	400	450	
1. Air Cleaner Element	Clean	1		★									41
	Replace		After cleaning 6 times										41

★ : When operating the machine in a dusty area, clean everyday.

E. Cooling System

Parts		Quantity	Interval (hours)										Page
			Check Before Starting	50	100	150	200	250	300	350	400	450	
1. Check Coolant Level		1											44
2. Check Fan V-Belt	Check	1		★									44
	Replace	1	Every 500 hours or 2 years whichever comes first*										44
3. Change Coolant		1	Every 2 years										45
4. Check Cracks on Cooling Fan		1		★									46

★ : 50 hours for only first time.

* : As special tool and service skill is required, consult your authorized dealer.

IMPORTANT: Use soft water for the coolant. Avoid using strong acid or alkaline water.
Be sure to use the coolant with genuine Hitachi Long-Life Coolant (LLC) mixed by 50 %.

F. Electrical System

Parts	Quantity	Interval (hours)										Page
		Check Before Starting	50	100	150	200	250	300	350	400	450	
1. Battery	1											47
2. Replacing Fuses	2	As necessary										49

G. Miscellaneous

Parts	Quantity	Interval (hours)										Page
		Check Before Starting	50	100	150	200	250	300	350	400	450	
1. Check General Appearance, Noise, Heat	1											50
2. Check V-Belt Tension, Replace V-Belt	1	100 hours or 1 year whichever comes first										50
3. Check and Replace Cushion Rubbers	4											50
4. Clean Sprinkler Nozzles	2											51
5. Adjust Control Force of FNR Lever	1											52
6. Adjust Neutral Position of FNR Lever	1											52
7. Check Clutch	1											53
8. Check Bolts and Nuts for Looseness	-											54

Periodic Replacement of Parts

To ensure safe operation, be sure to conduct periodic inspection of the machine. In addition, replace the parts listed below at the regular intervals to increase safety of the machine further.
These parts may cause serious safety/fire hazards due to deterioration, wear, or fatigue being attributed to material aging or repeated operation. It is difficult to gauge the residual service life of these parts through visual check or operating feeling. If any of these parts are found to be defective at the periodic check/maintenance, immediately replace regardless of the specified replacement intervals.
Consult your authorized dealer for correct replacement.

Periodic Replacement Parts		Replacement Intervals
Engine	Fuel Hose	Every 2 years
Hydraulic System	Main Hose	
	Suction Hose	
	Drain Hose	

NOTE: Be sure to replace clips when replacing the fuel horses.

Kinds of Lubricants

Engine Oil

IMPORTANT: Use only as shown below engine oil. Failure to do so may deteriorate the engine performance and/or shorten the engine service life.

Please be noted that all engine failures caused by using engine oil other than specified are excluded from Hitachi Warranty Policy.

Consult your authorized dealer for the unclear points.

Brand Names of Recommended Engine Oil

Kind of Oil / Application / Air Temp. / Standard / Manufacturer	Engine Oil
Application	Engine Crank Case
Air Temp.	-20 to 30 °C (-4 to 86 °F)
Standard	SAE 10W-30 class CD
Idemitsu Kosan	★ Apolloil Motive CF-M (10W-30)

NOTE: The machine shipped from the factory is filled with engine oil marked ★.

Hydraulic Oil

Brand Names of Recommended Hydraulic Oil

Kind of Oil	Hydraulic Oil			
Application	Hydraulic System			
Change Interval	2000 hours		1000 hours	
Air Temp. / Manufacturer	-20 to 40 °C (-4 to 104 °F)	-10 to 40 °C (14 to 104 °F)	-20 to 40 °C (-4 to 104 °F)	-10 to 40 °C (14 to 104 °F)
HITACHI	Super EX 46HN			
Idemitsu Kosan	★ Super Hydro 46HN		Super Hydro LW46	
			Super Hydro46X, WR46	
JX Nippon Oil & Energy			HYDLUX ES46	
SHELL Oil	Tellus Oil R46 (XHVI)		Tellus Oil ST46	
COSMO Oil	COSMO SUPER EPOC ES46		COSMO HYDRO HV46	COSMO HYDRO AW46
Exxon Mobil			-	DTE25
Remarks	Anti-wear type Hydraulic Oil			

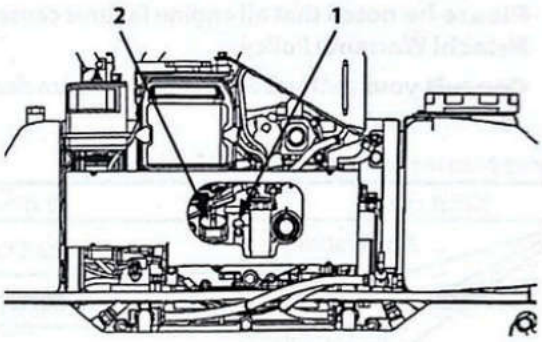
NOTE: The machine shipped from the factory is filled with hydraulic oil marked ★.

A. Engine

1 **Engine Oil Level**
--- check before starting

⚠ CAUTION: Engine oil and components may be hot immediately after operation. Wait for the oil and components to cool before starting any maintenance work.

⚠ CAUTION: Do not spill oil while changing oil. Wipe off any spilled oil. Spilled fuel and oil may cause fire.



MTEE-017

Check the oil level before starting the engine.
Remove engine oil level dipstick (1). Clean the tip of the dipstick. Insert it and then remove it again.
The oil level should be between the upper and lower marks on engine oil level dipstick (1).
If necessary, add the specified engine oil via oil filler (2). After adding engine oil, check the oil level again.

2 Change Engine Oil

3 Clean Engine Oil Filter

--- every 100 hours (50 hours for only first time)

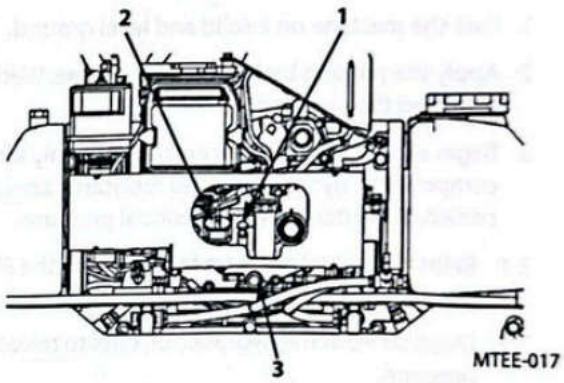
⚠ CAUTION: Engine oil and components may be hot immediately after operation. Wait for the oil and components to cool before starting any maintenance work.

⚠ CAUTION: Do not spill oil while changing oil. Wipe off any spilled oil. Spilled fuel and oil may cause fire.

IMPORTANT: Use API Class SE or higher grade engine oil. Use appropriate oil according to the outside temperature, referring to the table below.

Air Temperature	Engine Oil
15 °C or less	10W30 (for all season)
15 °C or higher	30 or 10W-30

Use 10W-30 in a cold season.



1. Arrange a container of 2 liters (0.5 US gal) capacity to receive the drain oil.
2. Remove oil filter (3) and oil drain plug. Drain engine oil.
3. Wash removed oil filter (3) with light oil. Install and tighten oil filter (3).
4. Refill new engine oil through oil filler (2) to the level between the upper and lower marks on dipstick (1).

B. Hydraulic System

Inspection and Maintenance of Hydraulic Components

⚠ WARNING: When inspecting and maintaining hydraulic components, use special care on the following points.

1. Park the machine on a solid and level ground.
2. Apply the parking brake. Stop the engine. Wedge the front and the rear drums.
3. Begin servicing hydraulic components only after components, hydraulic oil and lubricants are completely cooled, and after releasing residual pressure.

3.1 Release residual pressure by operating the FNR lever several times.

3.2 Bleed air from the hydraulic oil tank to release internal pressure.

3.3 Components, hydraulic oil and lubricants are heated and pressurized just after operation. Be sure to wait for each part to cool before starting inspection and maintenance.

Note that servicing heated and pressurized hydraulic components may cause hot parts and/or oil to fly off or escape suddenly, possibly resulting in personal injury. Hydraulic components may be pressurized even when cooled.

Keep your body and face away from plugs or screws, slowly loosen plugs or screws while releasing inside pressure, and then remove them.

3.4 When the machine is on a slope, the travel motor circuit is in high pressure due to the machine weight even if internal pressure of the hydraulic oil tank is bled.

Do not inspect and maintain the machine on a slope.

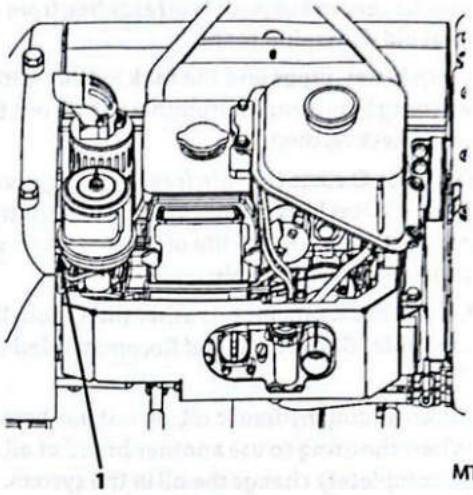
IMPORTANT:

- **When connecting hydraulic hoses and pipes, take special care to keep seal surfaces free from dirt and to avoid damaging them.**
- **Wash hoses, pipes and the tank interior with a washing liquid and thoroughly wipe it out before reconnecting them.**
- **Only use O-rings that are free of damage or defects. Do not allow high pressure hoses to twist when connecting them. The life of twisted hoses will be shortened considerably.**
- **Do not use hydraulic oils other than those listed in the table "Brand Names of Recommended Hydraulic Oil".**
- **When adding hydraulic oil, do not mix brands of oil. When choosing to use another brand of oil, be sure to completely change the oil in the system.**
- **Super Hydro 46HN is fed for the new machine as a hydraulic oil. When adding or changing the hydraulic oil, use the same brand of oil.**
- **Never run the engine without oil in the hydraulic oil tank.**

1 Check Hydraulic Oil Level
--- check before starting

Park the machine on a solid and level ground. Stop the engine.

1. Check the oil level through level gauge (1) at the left side of the hydraulic oil tank that is installed in the front frame. The normal hydraulic oil level must be between the marks on level gauge (1).



MTEE-019

2 Change Hydraulic Oil
--- every 1000 or 2000 hours

⚠ WARNING: Just after operation, hot oil may spout, possibly causing severe burns. Wait for the oil to cool before changing the oil.

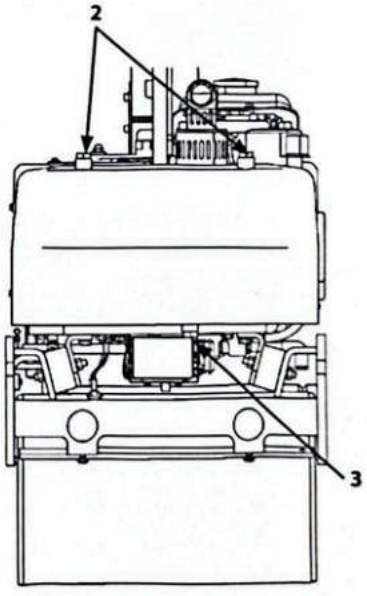
IMPORTANT: Changing interval differs according to the brand of hydraulic oil used.

Change Hydraulic Oil

Park the machine on a solid and level ground. Stop the engine.

1. Gradually loosen filler port plugs (2) located at the top of the hydraulic oil tank to release inside pressure from the hydraulic oil tank. Then remove filler port plugs (2) (2 used).
2. Prepare an empty container with the capacity of about 20 liters (5.3 US gal). Remove drain plug (3) at the bottom of hydraulic oil tank. Drain oil into the container.
3. After cleaning drain plug (3), securely tighten drain plug (3) in the original position.

   Tightening torque : 95 N·m (9.5 kgf·m)
4. Fill the oil through the oil filler on the top of the hydraulic oil tank. Supply oil while checking the oil level with level gauge (1).



MTEE-021

IMPORTANT: Care should be taken to prevent dirt, water and sand from entering into the tank when changing hydraulic oil.

5. Install filler port plugs (2) onto the oil filler.

   Tightening torque : 95 N·m (9.5 kgf·m)

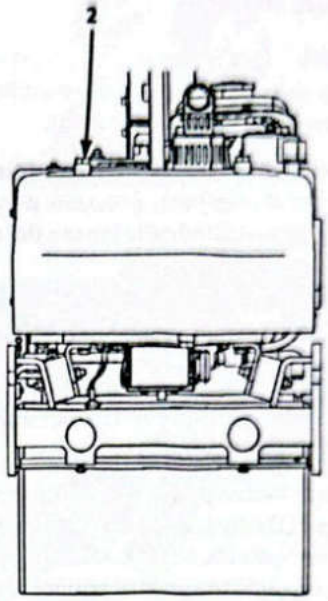
Bleeding Air from Hydraulic System

IMPORTANT: The hydraulic pump may be damaged if the engine is started without bleeding the air from the pump. Be sure to bleed air from the pump before starting the engine.

After changing the hydraulic oil, bleed air by the following procedures.

Bleeding air from hydraulic circuit

- After filling oil, loosen one of filler port plugs (2).
- Start the engine. Release the parking brake. Then slowly operate the FNR lever to travel the machine forward and reverse. Repeat the operation until the machine moves smoothly.
- Stop the engine. Check the oil level. Add oil as needed and tighten filler port plug (2).



MTEE-021

3 Replace Suction Filter
--- every 500 hours

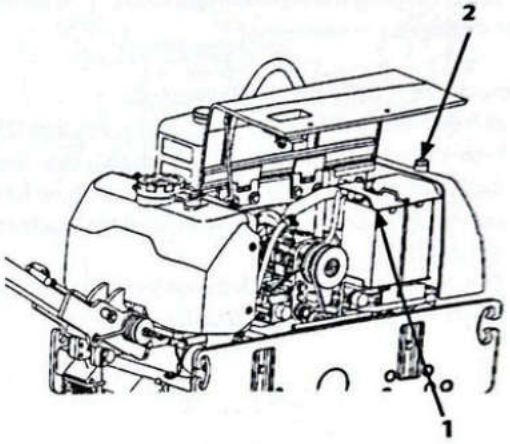
⚠ WARNING: Just after operation, hot oil may spout, possibly causing severe burns. Wait for oil to cool before replacing suction filter (3).

⚠ WARNING: When turning suction filter (3) suddenly, it may fly out due to inner pressure, possibly resulting in personal injury. Gradually loosen the suction filter to release the inner pressure.

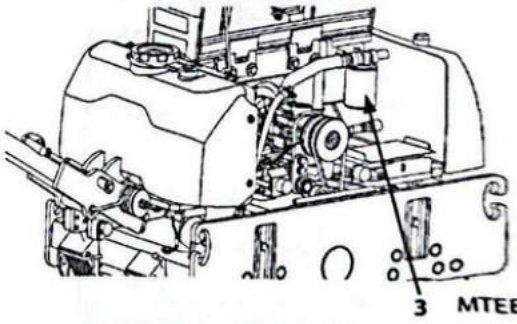
1. Park the machine on a solid and level ground. Stop the engine.
2. Remove battery cables and battery securing parts from battery (1). Remove battery (1).
3. Gradually loosen one of filler port plugs (2) located at the top of the hydraulic oil tank to release inner pressure from the hydraulic oil tank. After bleeding air, install filler port plug (2) to the original position.
4. Rotate the bottom part of suction filter (3) counterclockwise by using a filter wrench to remove suction filter (3).
5. Coat the sealing section on new suction filter (3) with clean hydraulic oil. Rotate and install suction filter (3) while taking care not to damage it. Tighten suction filter (3) to secure.

   Tightening Torque : 25 N·m (2.5 kgf·m)
6. Take extra care never to allow water or dust to enter suction filter (3).
7. Install the battery. Be sure to connect [+] (positive) battery cable first, and then connect [-] (negative) cable. Take care to correctly connect the cables.
8. After finishing the work, bleed the air referring to 2 "Bleeding Air from Hydraulic System".

IMPORTANT: Replace suction filter (3) at the regular interval to keep hydraulic oil clean and to extend the service life of the hydraulic components.



MTEE-022



MTEE-039

4 Check Hoses and Lines

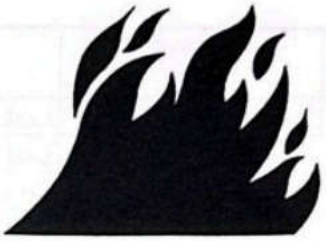
--- check before starting

--- every 250 hours

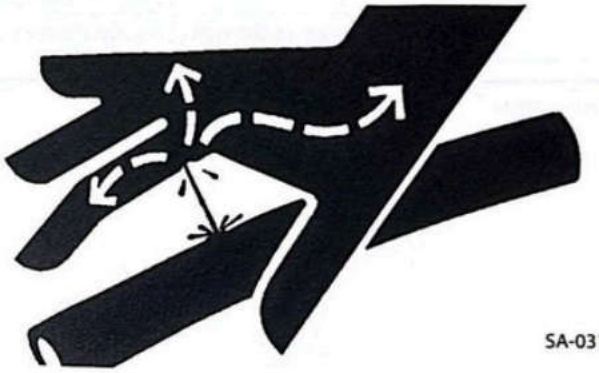
⚠ WARNING:

- **Hydraulic oil and lubricant leaks can lead to fire that may result in serious injury. Check for missing or loose clamps, kinked hoses, lines or hoses that rub against each other, damaged oil cooler, and loose oil cooler flange bolts, for leaks.**
- **Escaping fluid under pressure can penetrate the skin causing serious injury. To avoid this hazard, search for leaks with a piece of cardboard. Take care to protect hands and body from high-pressure fluids. If an accident occurs, see a doctor familiar with this type of injury immediately.**
- **Tighten, repair or replace any missing, loose or damaged clamps, hoses, and lines.**
- **Do not bend or strike high-pressure lines.**
- **Never install bent or damaged hoses or lines.**

According to the checkpoints shown below, check hoses and lines for oil leaks and damage.
If any abnormality is found, replace or retighten as instructed in the table.



SA-019



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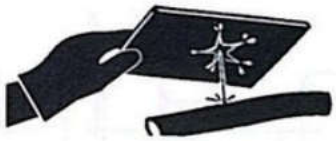
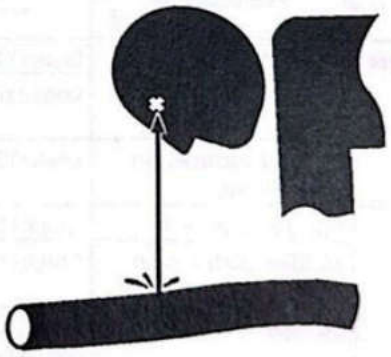


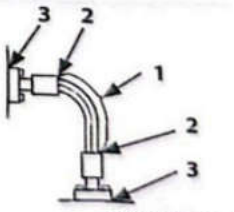
SA-044



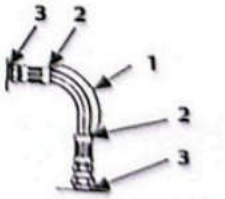
SA-292

Hoses

Interval (hours)	Check Points	Abnormalities	Remedies
Check before starting	Hose covers	Leak (1)	Replace
	Hose ends	Leak (2)	Replace
	Hose fittings	Leak (3)	Retighten or replace hose or O-ring

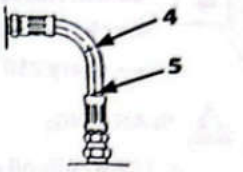


M137-07-008



M115-07-145

Interval (hours)	Check Points	Abnormalities	Remedies
Every 250 hours	Hose covers	Leak (4)	Replace
	Hose ends	Leak (5)	Replace
	Hose covers	Exposed reinforcement (6)	Replace
	Hose covers	Blister (7)	Replace
	Hoses	Bend (8), Collapse (9)	Replace
	Hose and Hose fittings	Deformation or corrosion (10)	Replace



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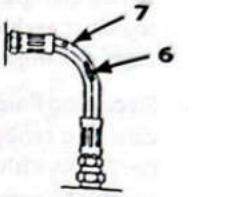

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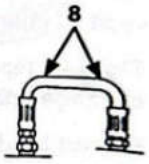

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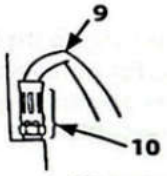
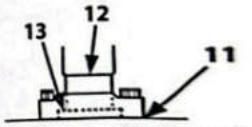


M115-07-149

Lines

Interval (hours)	Check Points	Abnormalities	Remedies
Check before starting	Contact surfaces of flange joints	Leak (11)	Replace
		Loose or leak (11)	Retighten bolts 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, Deformation, or Loose bolt	Replace or retighten



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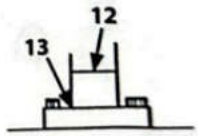
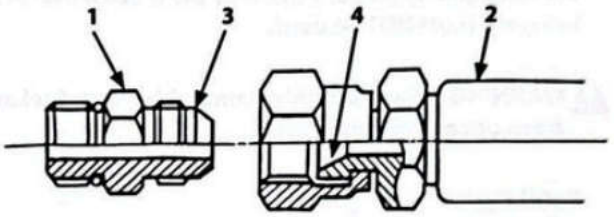


M137-07-007

Service Recommendations for Hydraulic Fittings

- Metal Face Seal Fittings

Tight contact between metal flare seat (3) on adaptor (1) and metal flare seat (4) of hose (2) prevents pressure oil leakage. This type of fittings is used on smaller diameter joint.



M202-07-051

Precautions for Use

Connect or disconnect fittings with care not to damage metal flare seats (3 and 4).

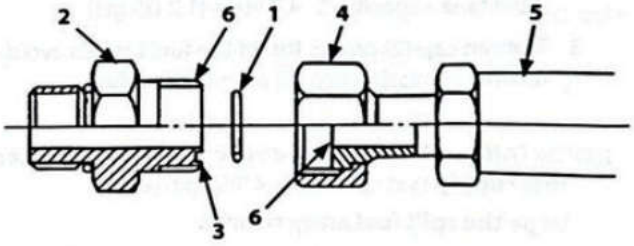
Tightening Torque

Tighten the connection with the torque values shown below:

Wrench Size (mm)		19	22	27	36
Tightening Torque	N·m	30	40	95	180
	(kgf·m)	(3)	(4)	(9.5)	(18)

- Flat Face O-ring Seal Fitting (ORS Fitting)

O-ring (1) is located on the sealing surface of adaptor (2) to prevent oil leakage.



M104-07-033

Precautions for use

1. Replace O-ring (1) with a new one when reassembling the fitting.
2. Check that O-ring (1) is properly fitted in O-ring groove (3). Tighten union (4).

   Tightening union (4) with O-ring (1) out of the groove may damage O-ring (1) and cause oil leak.
3. When assembling fitting, take care not to make a dent on O-ring groove (3) of adaptor (2) and sealing surface (6) on hose (5) or valve side. Failure to do so may result in damage to O-ring (1), leading to oil leak.
4. If oil leaks from a loose connection of union (4), do not tighten fitting. Open the connection, replace O-ring (1) with a new one and check that O-ring (1) is correctly seated in O-ring groove (3) before tightening the connection.

Tighten the connection with the torque values shown below:

Wrench Size (mm)		27
Tightening Torque	N·m	95
	(kgf·m)	(9.5)

C. Fuel System

Recommended Fuel

Use high quality DIESEL FUEL only (JIS K-2204) (ASTM 2-D).
Kerosene must NOT be used.

⚠ WARNING: Fuel is highly flammable. Keep fuel away from open flame or sparks.

Refill Fuel

1. Park the machine on a level ground. Stop the engine. Check the fuel level with fuel gauge (1).

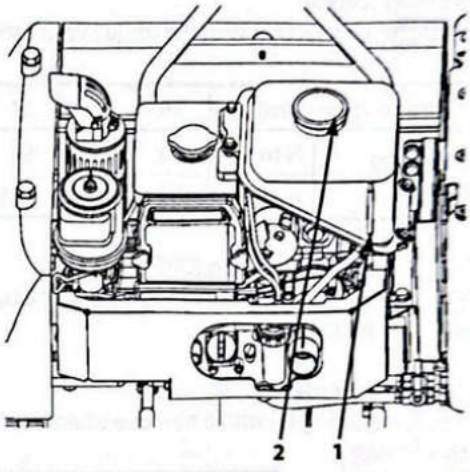
   Remove cap (2) on the top of the fuel tank and refill fuel if necessary.

   Be sure to install strainer to prevent dirt or foreign matter from entering the fuel system when refilling fuel.

2. Make it a rule to fully refill fuel after completing the daily work shift.

   Fuel tank capacity : 4.7 liters (1.2 US gal)

3. Tighten cap (2) on the top of the fuel tank to avoid water mixing or missing cap (2) after refilling fuel.



MTEE-019

IMPORTANT: Do not allow dirt and/or water to enter the fuel supply system when refilling fuel.

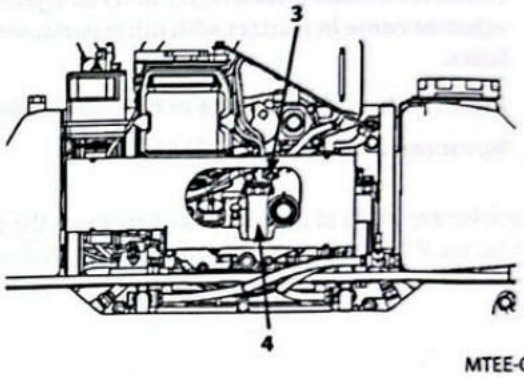
Wipe the spilt fuel away cleanly.

1 **Clean Fuel Oil Filter**
--- every 100 hours

2 **Replace Fuel Oil Filter**
--- every 450 hours

⚠ CAUTION: Take care not to contaminate the filter with dirt or dust. If dirt or dust enters into the fuel, the fuel injection pump and/or injection nozzle may become worn.

1. Turn fuel shut off valve (3) to the Close "C" position.
2. Remove the ring screw and filter cup (4).
3. Remove the fuel filter. Wash the fuel filter and inside of the filter cup with light oil.
4. Install washed or new fuel filter and filter cup (4).
5. After installation, turn fuel shut off valve (3) from the Close "C" to Open "O" position. Waite for 20 seconds. Air bleeding will automatically be finished.



MTEE-017

3 **Drain Sediment From Fuel Tank**
--- every 100 hours

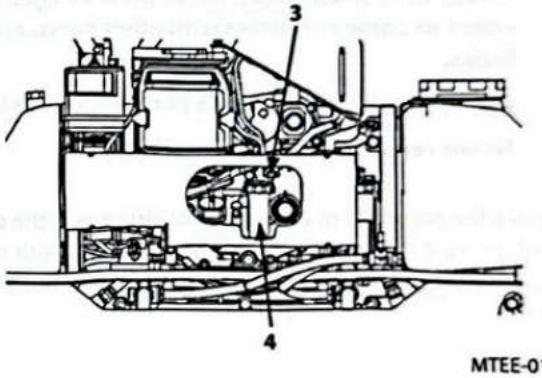
Drain sediment from the fuel tank.

1 **Clean Fuel Oil Filter**
--- every 100 hours

2 **Replace Fuel Oil Filter**
--- every 450 hours

⚠ CAUTION: Take care not to contaminate the filter with dirt or dust. If dirt or dust enters into the fuel, the fuel injection pump and/or injection nozzle may become worn.

1. Turn fuel shut off valve (3) to the Close "C" position.
2. Remove the ring screw and filter cup (4).
3. Remove the fuel filter. Wash the fuel filter and inside of the filter cup with light oil.
4. Install washed or new fuel filter and filter cup (4).
5. After installation, turn fuel shut off valve (3) from the Close "C" to Open "O" position. Waite for 20 seconds. Air bleeding will automatically be finished.



MTEE-017

3 **Drain Sediment From Fuel Tank**
--- every 100 hours

Drain sediment from the fuel tank.

4 **Check Fuel Pipes, Fuel Return Pipes and Clamps for Looseness**

--- every 100 hours

5 **Replace Fuel Pipes, Fuel Return Pipes and Clamps**

--- every 2 years

⚠ WARNING: Escaping fuel can lead to fire.

Check for kinked hoses, hoses that rub against each other or come in contact with other parts, and any fuel leaks.

Repair or replace any loose or damaged hoses.

Never reuse bent or damaged hoses.

Check for any signs of oil leakage or damage in the piping and hoses. If it has, replace the piping or hose with new one. Replace them after every 2 years regardless of the frequency of use.

6 **Adjust Valve Clearance**

— every 800 hours

As special tool and service skill is required, consult your authorized dealer.

7 **Check and Clean Nozzle**

— every 1500 hours

As special tool and service skill is required, consult your authorized dealer.

8 **Check Injection Pump**

— every 3000 hours

As special tool and service skill is required, consult your authorized dealer.

D. Air Cleaner

1 **Clean and Replace Air Cleaner Element**
Clean --- every 50 hours
Replace --- after cleaning 6 times

Clean and Replace Air Cleaner Element

⚠ WARNING: Wear goggles or safety glasses when using compressed air (less than 0.2 MPa, 2 kgf/cm²).

IMPORTANT:

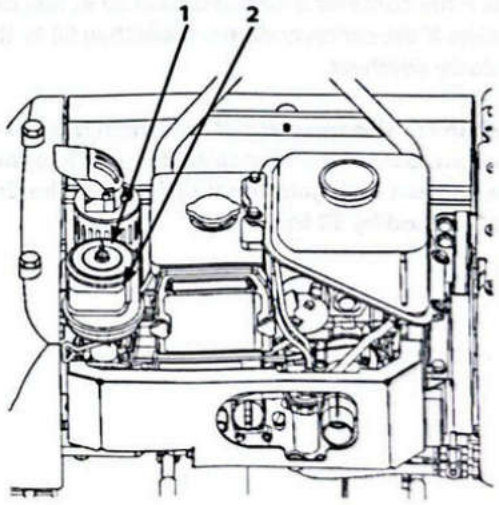
- **Clean the cover to prevent dirt and water from entering into the air inlet of the air cleaner. The engine may be damaged if dirt and water enter into the engine.**
- **Do not hit or clash the element against other object to clean the element.**
- **As dry-type element is used, do not feed oil.**
- **When operating the machine in a dusty area, clean the element everyday.**

1. When maintaining the element, stop the engine.
2. Remove element fixing butterfly nut (1). Remove cover (2).
3. Remove the element. Allow compressed air pressure [less than 0.2 MPa (2 kgf/cm²)] to blow out of the inside of the element to clean.

   After cleaning, check damage on the element. If any damage is found, replace it with a new one.

   Also clean the inside of cover and the element mounting place.
4. Install the element and cover (2) to the original place. Tighten element fixing butterfly nut (1).

IMPORTANT: Be sure to correctly install the element and securely tighten element fixing butterfly nut (1). If the element is not securely tightened, dust or water may enter in the engine, damage to the engine may result.



MTEE-019

E. Cooling System

Coolant

Use fresh water or normal tap water as a coolant. Do not use strong acid or alkaline water.
(Water in which soap can easily lather is soft water.)

Anti-corrosive Agent

Anti-corrosive agent protects the cooling system from rust and corrosion.
Add anti-corrosive agent in the coolant.
When antifreeze is used, addition of anti-corrosive agent is not required.

Antifreeze

Antifreeze prevents the cooling system from freezing and protects the cooling system from corrosion.
When the ambient temperature is expected to become to lower than 0 °C, use antifreeze.
Normally, use the antifreeze with a concentration of 30 to 50 %. If the concentration is less than 30 %, rust can easily develop. If the concentration is more than 50 %, the engine can easily overheat.

IMPORTANT: Use fresh water or normal tap water as a coolant. Do not use strong acid or alkaline water. Use the coolant with genuine Hitachi Long-Life Coolant (LLC) mixed by 30 to 50 %.

Kinds of Antifreeze

Antifreeze falls under two categories, normal and Long-Life Coolant (LLC) types. The machine is filled with LLC type coolant when shipped from the factory.

Precautions for handling antifreeze

⚠ WARNING: Antifreeze is poisonous.

- **If ingested, it can cause serious injury or death. Induce vomiting and get emergency medical attention immediately.**
- **If antifreeze is accidentally splashed into eyes, flush with water for 10 to 15 minutes and get emergency medical attention.**
- **When storing antifreeze, be sure to keep it in a clearly marked container with a tight lid. Always keep ANTIFREEZE out of the reach of children.**
- **Antifreeze is flammable. Keep it well away from fire hazards.**
- **When storing or disposing of antifreeze, be sure to comply with all local regulations.**

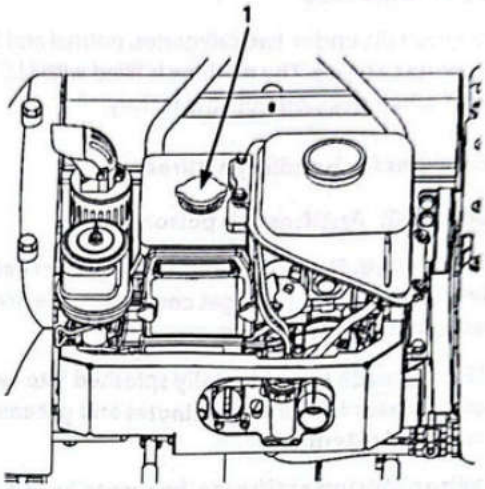
1 **Check Coolant Level**

--- check before starting

⚠ WARNING: Do not remove radiator cap (1) until the coolant temperature in the radiator becomes cool. Hot steam may spout out, possibly causing severe burns. After the coolant temperature cools, slowly loosen radiator cap (1) to release the inside air pressure before removing radiator cap (1).

Open radiator cap (1). Check if coolant level is over the top of fin in the tank.
If the coolant level is below the top of fin, remove radiator cap (1) and add coolant.

⚠ CAUTION: If too much coolant is added, it may flow out of the breather while operating the engine.



MTEE-019

2 **Check Fan V-Belt**

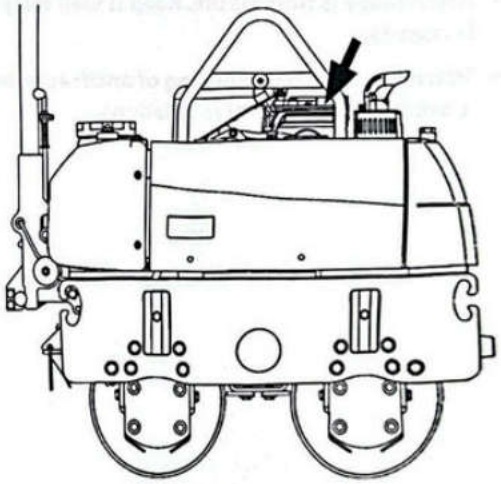
— every 100 hours (50 hours for only first time)

Check the fan V-belt before starting the engine. If any damage is found, contact your authorized dealer for repair.

Replace Fan V-Belt

— every 500 hours or 2 years whichever comes first

As special tool and service skill is required, consult your authorized dealer.



Fan V-Belt Position MTEE-023

3 Change Coolant
--- every 2 years

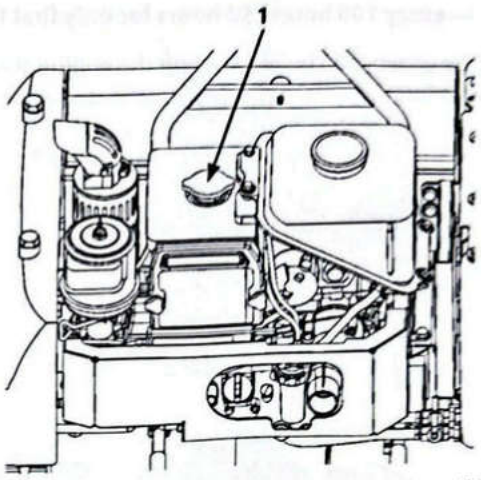
⚠ WARNING: Do not remove radiator cap (1) until the coolant temperature in the radiator becomes cool. Hot steam may spout out, possibly causing severe burns. After the coolant temperature cools, slowly loosen radiator cap (1) to release the inside air pressure before removing radiator cap (1).

NOTE: The machine shipped from the factory is filled with coolant added the Hitachi Long-Life Coolant (LCC).

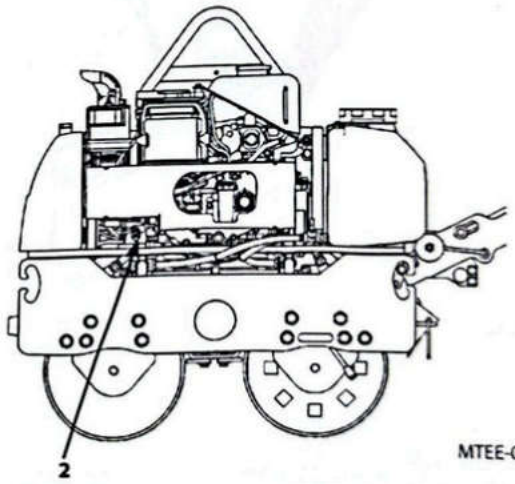
Change Coolant

1. Park the machine on a solid and level ground. Apply parking brake and stop the engine. Wedge the front and rear drums.
2. Slowly turn radiator cap (1) to release the inner pressure, and remove radiator cap (1).
3. Open coolant drain cock (2). Completely drain coolant. Also discharge sediment like water scale.
4. Close drain cock (2). Fill the radiator with soft water containing fewer impurities or tap water and a radiator cleaner agent. Run the engine at a speed slightly higher than slow idle for about 10 minutes.
5. Stop the engine and open drain cock (2). Flush out the cooling system with soft water containing fewer impurities or tap water until draining water is clear. This helps remove rust and sediment like water scale.
6. Close drain cock (2). Fill the radiator with soft water containing less impurities or tap water up to the radiator cap. At this time, mix the antifreeze or anti-rust agent. Slowly add coolant to avoid mixing air bubbles in the system.

   Start the engine and sufficiently bleed air from the cooling system.
7. After adding coolant, run the engine for several minutes. Recheck the coolant level. Add coolant if necessary.



MTEE-019

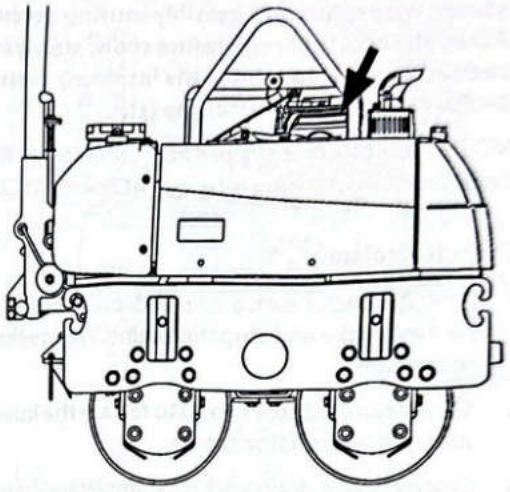


MTEE-024

4 **Check Cracks on Cooling Fan**

--- every 100 hours (50 hours for only first time)

Check the cooling fan before starting the engine. If any damage is found, contact your authorized dealer for repair.



Cooling Fan Position MTEE-023

F. Electrical System

IMPORTANT: Never attempt to disassemble or modify the electrical/electronic components. If replacement or modification of such components is required, contact your authorized dealer.

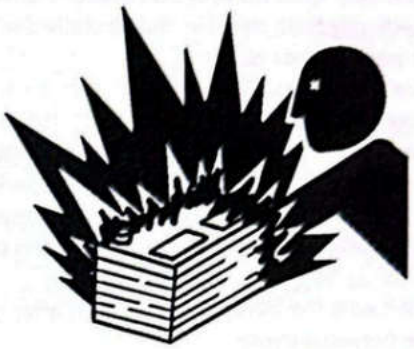
1 Battery

⚠ WARNING:

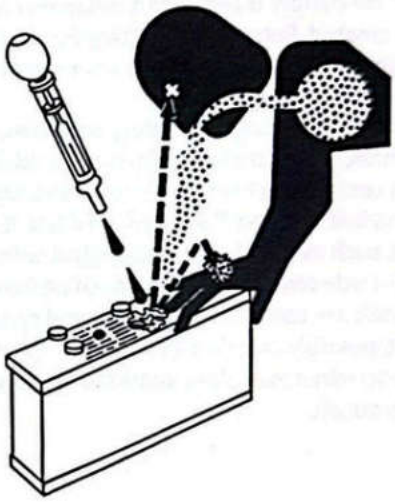
- **Battery gas can explode. Keep sparks and open flames away from battery.**
- **Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into the eyes.**

To avoid danger:

1. **Charge battery in a well ventilated place.**
2. **Wear protective glasses and gloves.**
3. **Do not spill or drop electrolyte.**
4. **If the engine must be started using jumper cable, be sure to follow correct instructions.**



SA-032



SA-036

IMPORTANT:

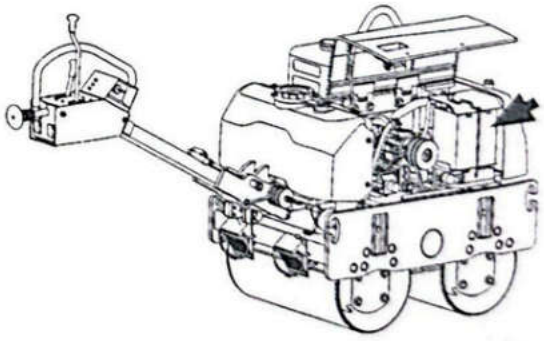
- **This machine is equipped with maintenance free and vibration proof battery. Checking of electrolyte level and specific gravity are not required on this battery.**
- **Before replacing the battery, thoroughly read attached operation manual.**

If you spill acid on yourself:

1. **Flush your skin with water.**
2. **Apply baking soda or lime to help neutralize the acid.**
3. **If splashed in eyes, flush with water for 10 to 15 minutes. Get medical attention immediately.**

If acid is swallowed:

1. **Drink large amounts of water or milk.**
2. **Then drink milk of magnesia, beaten eggs, or vegetable oil.**
3. **Get medical attention immediately.**



Location to Install Battery

MTEE-025

Check and Clean --- check before starting

1. Check the battery for cracks, breakings and chips. Replace it if any abnormality is found.
2. Check brackets, battery terminals and cables for looseness. Retighten if loosened parts are found.
3. If the vent plugs are clogged by mud, wash with water. Otherwise, the battery may be broken due to inside pressure increase.

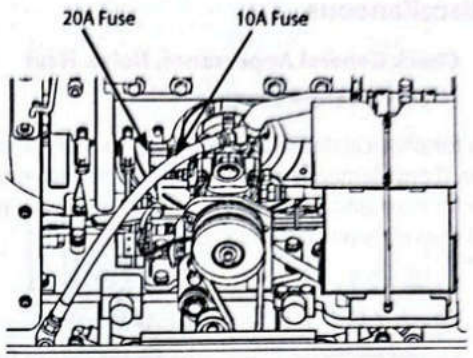
Precautions for Handling Battery

- If electrolyte spills on your skin and/or clothes, immediately flush the skin and/or clothes with water and then wash further with soap.
  If splashed in eyes, flush with water for approximately 15 minutes and seek immediate medical attention.
- Avoid using fire hazards such as matches lighters and tobacco near the battery. Do not allow sparks to fly.
- Check or service the battery only after stopping the engine, turning the key OFF and removing the battery caps.
- Contact with the battery immediately after operation may cause personal injury.
  Wait for the battery to cool.
- When the battery is recharged, inflammable hydrogen gas is created. Remove the battery from the base machine. Recharge the battery after removing the caps in a well ventilated area.
- When disconnecting the battery terminals, first disconnect the ground line [minus (-)] side terminal. When connecting the battery terminals, connect the ground line [minus (-)] side terminal last. If a piece of metal, such as a tool comes in contact with the battery plus (+) side terminal and the machine frame when both terminals are connected, the electrical system may short-circuit, possibly creating a dangerous situation.
- Loose terminal may allow sparks to fly. Securely tighten the terminals.

2 Replacing Fuses --- as necessary

If any electrical equipment fails to operate, first check the fuses.

1. Open the fuse holder cover.
2. Check fuses. If blown fuse is found, replace it with a new one.
3. Close the fuse holder cover.



MTEE-026

G. Miscellaneous

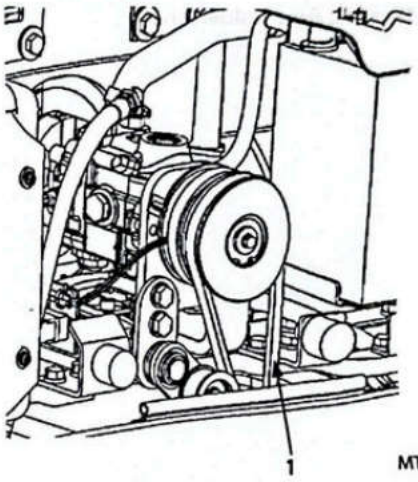
1 **Check General Appearance, Noise, Heat**
--- check before starting

Check for physical damage of the machine before starting the engine. If any damages are found, fix them beforehand. Check for any abnormal sound from the engine or muffler. If any abnormality is found, fix it before running it.

2 **Check V-Belt Tension, Replace V-Belt**
--- 100 hours or 1 year whichever comes first

If the V-belt (1) is loosened or damaged, slipping sound will be heard when starting the vibration operation. Replace V-belt (1) with a new one.

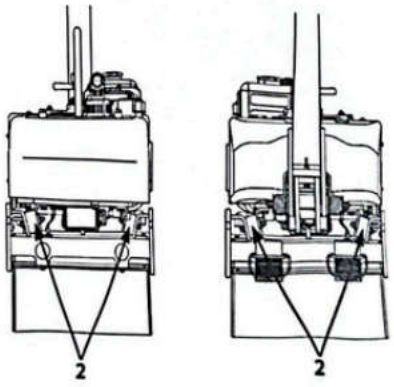
IMPORTANT: If the cushion rubber deforms, the tension of V-belt (1) becomes loose, and it will frequently come off. If cushion rubber (2) deforms, replace it by referring "Check and Replace Cushion Rubbers".



MTEE-027

3 **Check and Replace Cushion Rubbers**
--- check before starting

Check cushion rubbers (2) for cracks, damages and deformation. If any abnormality is found, replace with a new one.

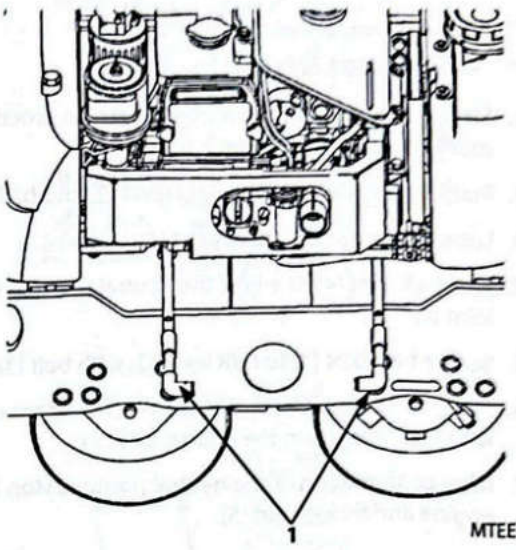


MTEE-028

4 Clean Sprinkler Nozzles
--- every 50 hours

⚠ WARNING: Wear goggles or safety glasses when using compressed air (less than 0.2 MPa, 2 kgf/cm²).

1. Twist sprinkler nozzles (1) for 90 degrees and pull them out.
2. Remove the end cap of sprinkler nozzles (1). Allow compressed air to blow out of the inside of nozzles to clean.
3. If the nozzle holes are still clogged, use a round bar with φ2 mm or less diameter to clean.
4. Install the caps after cleaning.
5. Insert sprinkler nozzles (1) into the tees which are fixed on the sprinkler bracket until they come to the end. Twist them so that the elbows will face downward.

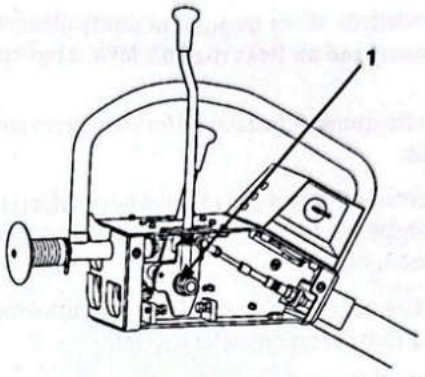


MTEE-029

IMPORTANT: Be sure to install sprinkler nozzles (1) so that the elbows will face downward. Otherwise water may not be sprayed or sprinkler nozzles (1) may be drawn out during machine operation.

5 Adjust Control Force of FNR Lever
--- every 100 hours

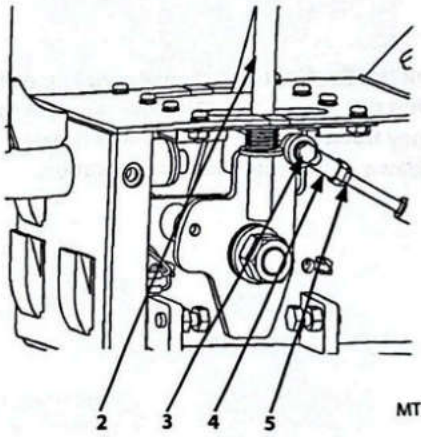
Turn nut (1) to adjust the control force of FNR lever so that the control force becomes within the range of 20 to 30 N (2 to 3 kgf).



MTEE-030

6 Adjust Neutral Position of FNR Lever
--- every 400 hours

1. Stop machine operation according to the procedures for maintenance preparation.
2. Remove bolt (3) fastening FNR lever (2) and ball joint (4).
3. Loosen lock nut (5) of ball joint (4).
4. Turn ball joint (4) to adjust the neutral position of ball joint (4).
5. Secure ball joint (4) to FNR lever (2) with bolt (3).
6. Start the engine. Check that the machine does not travel with FNR lever (2) in the neutral position.
7. After confirmation of the neutral position, stop the engine and fix lock nut (5).

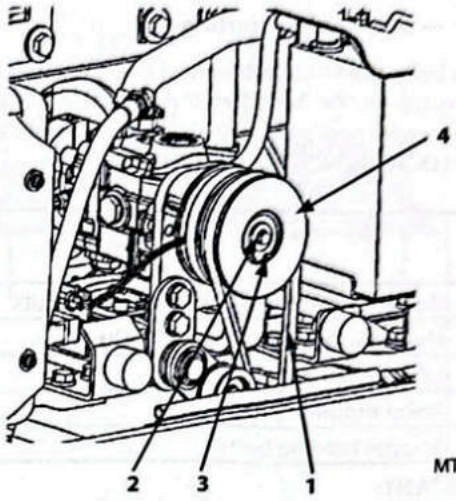


MTEE-031

7 Check Clutch

--- every 100 hours

- Turn the vibration switch to the ON position. Ensure that magnetic clutch operates and V-belt (1) rotates.
- If the magnetic clutch operates but V-belt (1) does not operate, adjust the clutch clearance by following instruction.



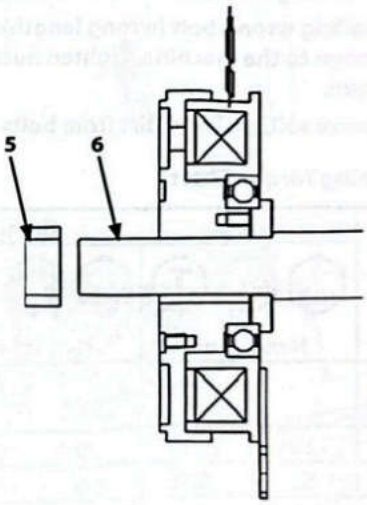
MTEE-027

Adjustment Method

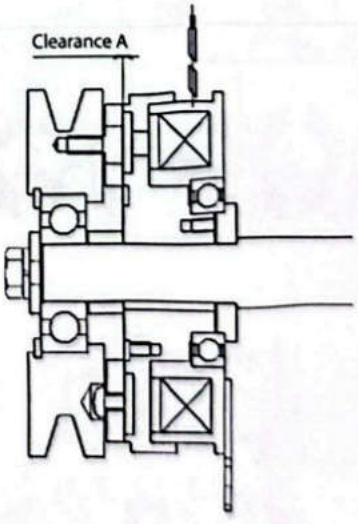
1. Remove V-belt (1).
2. Remove bolt (2) and snap ring (3).
3. Remove pulley (4) by using a puller.
4. Remove collar (5).
5. Install shims on shaft (6) to adjust the clearance "A" between lining and armature to 0.2 mm.
6. Tighten snap ring (3) and bolt (2).

   Apply LOCTITE 242

   Tightening Torque : 10 N·m (1.0 kgf·m)



MTEE-032



MTEE-033

8 Check Bolts and Nuts for Looseness --- check before starting

Check bolts and nuts for looseness and missing parts before starting the engine. Retighten the loose nuts and bolts and be sure to supply new ones if missing nuts and bolts are found. Apply LOCTITE #242 for locking bolts and nuts.

No.	Descriptions	Bolt Dia	Quantity	Wrench Size	Torque	
		mm	Pcs.	mm	N·m	(kgf·m)
1.	Rubber vibration insulator mounting nuts	12	8	19	35	(3.5)
2.	Hydraulic oil tank mounting bolts	10	4	17	50	(5.0)
3.	Lifting ring mounting bolts	12	4	19	90	(9.0)
4.	Roller mounting bolts	14	20	22	140	(14)
5.	Scraper holding bolts	10	8	17	50	(5.0)

IMPORTANT:

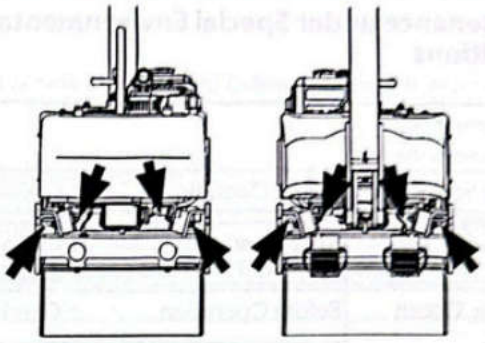
- **If removing a bolt not shown in the figure, measure the bolt length and install it to the original position. Installing wrong bolt (wrong length) or tightening with incorrect torque may cause missing part and damage to the machine. Tighten nuts and bolts to specifications. Tighten nuts and bolts to the specified torque.**
- **Remove soil, rust and dirt from bolts or nuts before tightening them.**

Tightening Torque Chart

Bolt Dia. mm	Hexagon Head Bolt						Wrench Size mm	Socket Bolt		Wrench Size mm
	10.9 Ⓣ T		8.8 Ⓗ H		7 M			Socket Bolt		
	N·m(kgf·m)		N·m(kgf·m)		N·m(kgf·m)			N·m	(kgf·m)	
6					3.3 to 4.2 (0.3 to 0.4)		10			5
8	30	(3.0)	20	(2.0)	10	(1.0)	13	20	(2.0)	6
10	65	(6.5)	50	(5.0)	20	(2.0)	17	50	(5.0)	8
12	110	(11)	90	(9.0)	35	(3.5)	19	90	(9.0)	10
14	180	(18)	140	(14)	55	(5.5)	22	140	(14)	12
16	270	(27)	210	(21)	80	(8.0)	24	210	(21)	14

1. Rubber vibration insulator mounting nuts

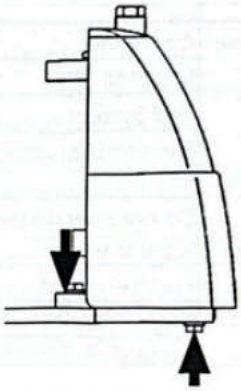
Wrench size:	19 mm
Tightening torque:	35 N·m (3.5 kgf·m)
Quantity:	8 pieces



MTEE-028

2. Hydraulic oil tank mounting bolts

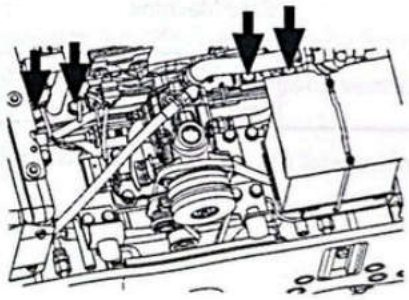
Wrench size:	17 mm
Tightening torque:	50 N·m (5.0 kgf·m)
Quantity:	4 pieces



MTEE-034

3. Lifting ring mounting bolts

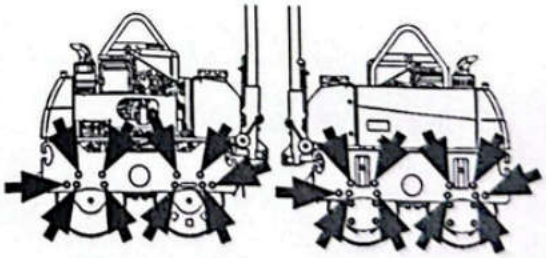
Wrench size:	19 mm
Tightening torque:	90 N·m (9.0 kgf·m)
Quantity:	4 pieces



MTEE-035

4. Roller mounting bolts

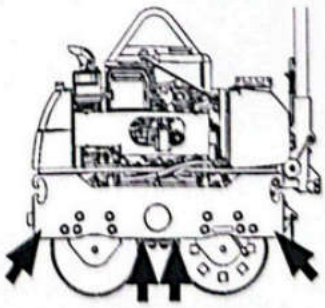
Wrench size:	22 mm
Tightening torque:	140 N·m (14 kgf·m)
Quantity:	20 pieces



MTEE-036

5. Scraper holding bolts

Wrench size:	17 mm
Tightening torque:	50 N·m (5.0 kgf·m)
Quantity:	8 pieces



MTEE-037

Maintenance under Special Environmental Conditions

Operating Conditions	Precautions for Maintenance	
Muddy Soil, Rainy or Snowy Weather	Before Operation	: Check the tightness of plugs and all drain cocks.
	After Operation	: Clean the machine and check for cracks, damaged, loose or missing bolts and nuts. Lubricate all necessary parts without delay.
Near the Ocean	Before Operation	: Check the tightness of plugs 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 fins to prevent clogging of the radiator.
	Fuel 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	Do not operate this machine in areas where possibility of falling stones may contact the workers (operator).	
Freezing Weather	Fuel/Lubricant	: Use high quality low viscosity.
	Engine Coolant	: Be sure to use antifreeze.
	Battery	: Fully charge the battery at shorter intervals. If not fully charged, electrolyte may freeze.
	Base Machine	: Remove soil adhered to the base machine, and protect the base machine from freezing damage.
	Sprinkler Tank Sprinkler Nozzle	: Drain water from the sprinkler tank and sprinkler nozzle. If inside water freeze up, the tank or nozzle may be cracked.

Precautions for Long-Term Machine Storage

When storing the machine for longer than one month, prepare the machine as instructed below to make the machine readily available when needed.

Precautions for Long-Term Machine Storage

	Maintenance Practice
Washing	Sufficiently wash the machine to remove stuck soil and dust from the machine.
Fuel System	Empty the fuel tank.
Tools	Inspect and repair, then store.
Lubrication	Check lubricants for level and contamination. Add or change as necessary.
Battery	Remove the battery from the machine. Then, store the battery after fully charging, or if not removed, disconnect the negative battery cable from the (-) terminal.
Coolant	Be sure to mix an anti-rust agent into the coolant. In case the air temperature is expected to fall below 0 °C, add more antifreeze, or completely drain the coolant. (Be sure to attach a "NO COOLANT in radiator" tag in this case.)
Protection Against Dust and Moisture	Cover the machine with a sheet cover. Store the machine in a dry indoor place.
Operation to circulate lubricants	If oil film on part surfaces breaks, the parts may rust, possibly resulting in abnormal wear when the machine operation is resumed. Operate the machine once a month at the regular interval to circulate lubricants. Make sure the coolant and lubricant levels are correct before operation and charge the battery as needed at this time.
Sprinkler Device	Drain water from tank and each drain cock.

NOTE: Lubricating operation is a series of warm-up, travel and vibration operation carried out repeatedly for few cycles.

WARNING: In case lubrication operation must unavoidably be carried out indoors, ensure good ventilation by opening windows and doors to prevent asphyxiation.

Even though the machine is stored, the lubricant quality will deteriorate. Carefully check the lubricants before operating the machine again.

Engine Auxiliary Parts:

Problem	Cause	Solution
No battery charging	Damaged battery separator	Replace
	Faulty regulator	Replace
	Faulty ground line	Repair
	Faulty alternator	Repair or Replace
Battery quickly discharges even after charging.	Short-circuited wiring	Repair or Replace
	Short-circuited battery separator	Repair or Replace
	Much sediments in the battery	Replace

Engine Will Not Start:

Problem	Cause	Solution
Starter rotates but the engine does not start.	No fuel	Refill fuel.
	Air in the fuel system	Bleed air.
	Faulty fuel injection pump or nozzle	Adjust or replace.
	Clogged fuel supply system	Replace the fuel filter cartridge, Clean the strainer.
	Insufficient intake air	Clean or replace the air cleaner element.
	Insufficient compression air	Replace the cylinder and/or piston ring.
	Poor quality fuel	Change fuel.
	Broken glow plug	Replace the glow plug.
Starter motor does not rotate.	Low battery power	Charge or replace the battery.
	Malfunction of starter or starter relay	Repair or replace
	Damaged key switch	Replace
	Faulty wire harness	Repair or replace
	FNR lever is not neutral.	Return to the neutral position.
Even though the engine is started, the engine stalls soon.	Deteriorated engine oil	Change engine oil.
	Contaminated injection nozzle	Replace
	Clogged fuel filter	Replace
	Incorrectly adjusted engine control cable	Readjust

Accelerator Lever

Problem	Cause	Solution
Moves hard	Incorrectly installed engine control cable	Readjust
	Rusted ball joint	Repair or replace
Too much play	Faulty engine control cable	Replace
	Worn joint	Repair or replace

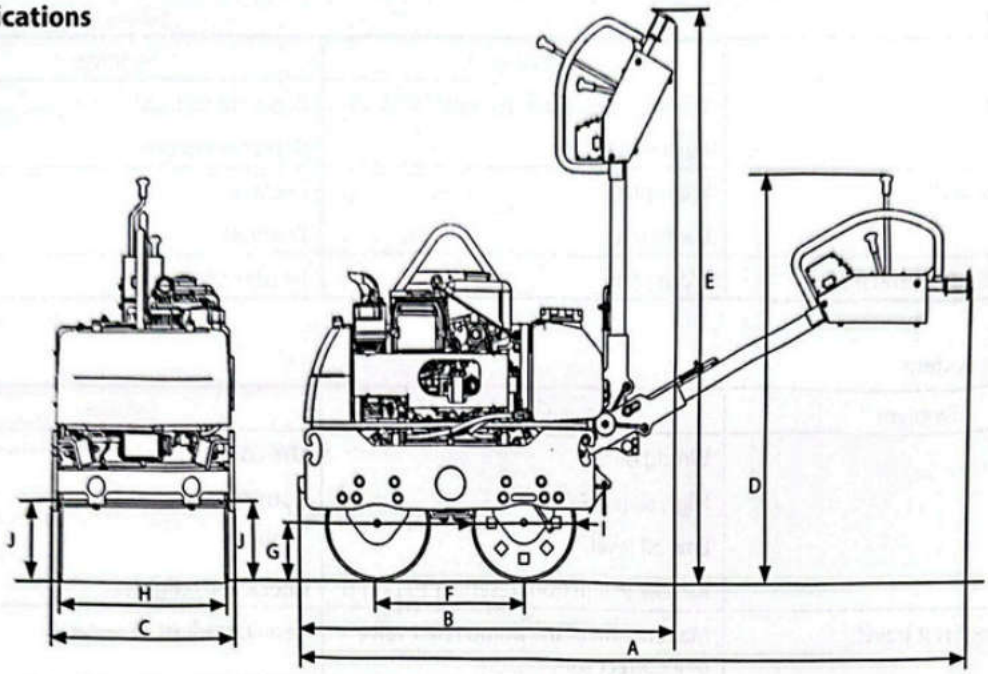
FNR Lever

Problem	Cause	Solution
Moves hard	Damage to the pump control section	Repair or replace
	Rusted ball joint	Repair or replace
Lever is returned.	Worn plate	Replace
	Loose nut	Readjust
Difficult to find neutral position	Worn plate	Readjust bolts

Hydraulic System

Problem	Cause	Solution
Oil foams.	Wrong oil	Use correct oil.
	High oil level	Correct level.
	Low oil level	Refill
	Air leak in line from reservoir to pump	Check and retighten
Machine does not travel.	Malfunction of the pump relief valve or incorrect set-pressure	Repair, readjust or replace
Travel power is insufficient and slow in acceleration when traveling at low speed.	Mixed air in oil	Inspect, repair or replace engine.
	Insufficient engine power	
	Reduced performance due to worn pump or motor	
	Damaged pump relief valve or reduced set pressure	
Noisy	Mixed air in oil	Refer to the descriptions on foam in oil.
	Damaged hydraulic pump or motor	Repair, readjust or replace
Oil leaks from low pressure hose	Loose joint	Retighten

Specifications



MTEE-038

Model				ZV550WL
Mass	Operating Mass		kg	600
		Front Drum	kg	232
		Rear Drum	kg	368
	Machine Mass		kg	565
		Front Drum	kg	228
		Rear Drum	kg	337
Linear Pressure	Static Linear Pressure: Machine Mass	Front Drum	N/cm (kgf/cm)	38.2 (3.9)
		Rear Drum	N/cm (kgf/cm)	56.3 (5.7)
	Dynamic Linear Pressure: Machine Mass	Front Drum	N/cm (kgf/cm)	122 (12.4)
		Rear Drum	N/cm (kgf/cm)	140 (14.3)
Dimension	A: Overall Length		mm	2275
	B: Overall Length (Stored)		mm	1280
	C: Overall Width		mm	630
	D: Overall Height		mm	1250
	E: Overall Height (Stored)		mm	1780
	F: Center Distance between Front and Rear Drums		mm	500
	G: Minimum Ground Clearance		mm	180
	H: Front/Rear Drum Width		mm	586
	I: Front/Rear Drum Diameter		mm	356
	J: Curve Clearance	Right	mm	220
		Left	mm	220
Performance	Travel Speed	Forward	km/h	0-3.5
		Reverse	km/h	0-3.0
	Gradeability		Degree (%)	20 (36)
	Exciter Performance	Number of Vibration	Hz (vpm)	55 (3300)
		Vibration Force	kN (kgf)	9.8 (1000)
Engine	Model			KUBOTA E7S-E3-NB3
	Piston Displacement (Total Cubic Displacement)		L(cc)	0.325(325)
	Rated Horsepower		kW/min^{-1} (PS/rpm)	4.0/2500 (5.5/2500)
	Max. Torque		N·m/min^{-1} (kgf·m/rpm)	18.1 or more/2000 (1.85 or more/2000)
	Fuel Tank Capacity		L	4.8
Sprinkler Tank Capacity			L	35

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