PART NO. EM8LA-2-1

HITACHI

Operator's Manual

ZV
550W
650W

Walk-behind Roller

Serial No.

ZV550W	010201 and up
ZV560W	010201 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: –15 °C to 40 °C (5 °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 nearest Hitachi dealer.

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

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

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

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

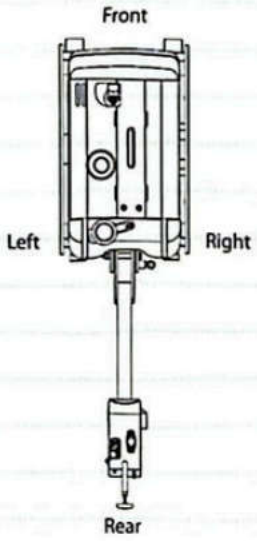
Maintenance

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 chapter are determined with the operator standing in the operating position facing forward.



MZV550-051

CONTENTS

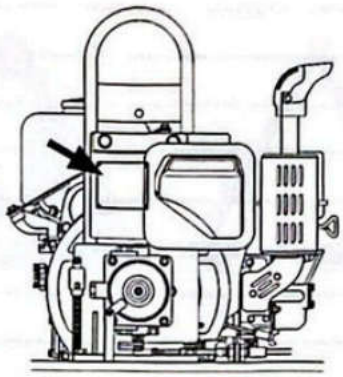
MACHINE NUMBERS

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

Machine

MODEL/TYPE:

PRODUCT IDENTIFICATION NUMBER: _____

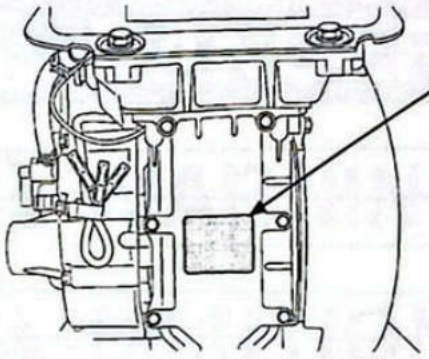


MZV550-002

Engine

TYPE:

MFG. NO.: _____



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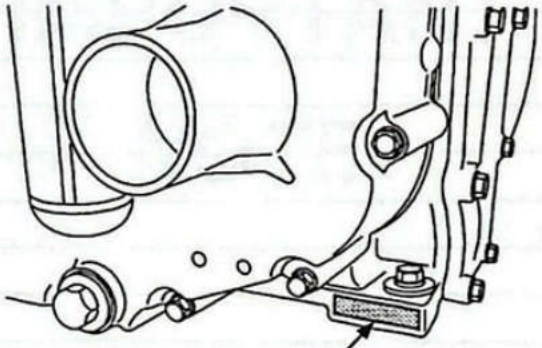


MZV550-004

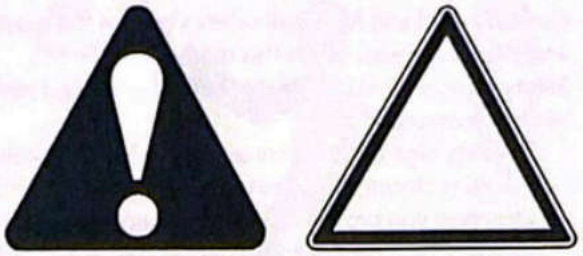
MEMO

MACHINE NUMBERS

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-688

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.

Wear Protective Clothing

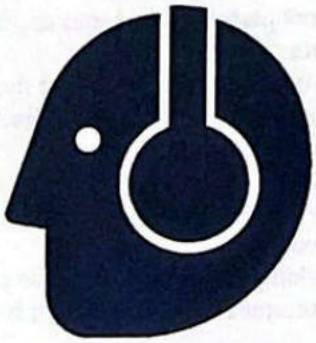
SA-438

- 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.

Protect Against Noise



SA-434

- 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.

Prevent Vibration Hazard

- Avoid prolonged use, for prevention measure of vibration hazard.

Inspect Machine

SA-435

- 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 BEFORE START THE ENGINE" chapter in the operator's manual.

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 in-tended 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

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 moving, steering, or operating the machine in congested areas. Coordinate hand signals before starting the machine. (Press the horn button with key switch ON)
  - Keep bystanders and/or obstructions clear of the machine job site.
  - Use proper illumination when working in dark places or at night.

Investigate Job Site Beforehand

- When working on a road shoulder, if the ground col-lapses, the machine may tip over or fall, possibly resulting in serious personal injury and/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.
  - Keep bystanders clear of the working and driving 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.

Provide Signals for Fobs Involving Multiple Numbers of Machines

- For jobs involving multiple numbers of 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.

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.

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.

Park Machine Safely

- To avoid accidents :
  1. Park the machine on a level surface.
  2. Check that the FNR lever is in neutral 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 accelerator lever to the Stop position to stop 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 wheels.

Handle Fluids Safely-Avoid Fires

- Handle fuel with care; it is highly flammable. If fuel ignites, an explosion and/or a fire may occur, possibly resulting in serious injury or death.
  - Do not refuel the machine while smoking or when near open flame or sparks.
  - Always stop the engine before refueling the machine.
  - Fill the fuel tank outdoors.
- All fuels, most lubricants, and some coolants are flammable.
  - Store flammable fluids well away from fire hazards.
  - Do not incinerate or puncture pressurized containers.
  - Do not store oily rags; they can ignite and burn spontaneously.
  - Securely tighten the fuel and oil filler cap.

SA-018

SA-019

Avoid Injury from Rollaway Accidents

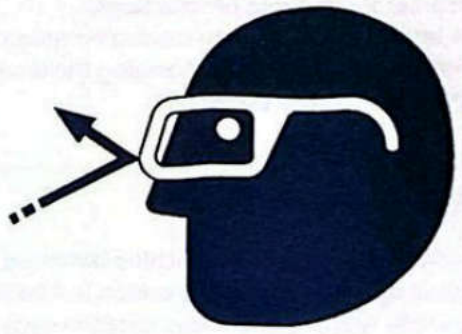
- Park the machine in the following manor to prevent the machine from running away.
  - Park the machine on a level surface.
  - Check that the FNR lever is in neutral position.
  - Apply the parking brake.
  - Run the engine at slow idle speed for about 5 minutes to allow the engine to cool down.
  - Move accelerator lever to the Stop position to stop engine.
  - Turn the key to the OFF position. Remove the key from the key switch.
  - In case parking the machine on a slope is unavoidable, wedge the front and rear of wheels.
  - Park the machine so that a reasonable distance between other machines can be given.

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

- The danger of tipping is present when loading/unloading the machine onto/from a truck or trailer bed.
  - Be sure to observe local regulations when transporting the machine on public roads.
  - Provide an appropriate truck or trailer for transporting the machine.
  - Be sure to use a signal person.
  - Take the following precautions when loading/unloading the machine.
    1) Select firm level ground.
    2) Be sure to use a loading dock or ramp.
    3) Safely load and unload the machine by following the instructions described in the transportation section.
    4) After the machine is loaded on a truck or trailer, wedge both sides of the wheels (front and rear). Securely fasten the machine to the truck or trailer with wire ropes.

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

Practice Safe Maintenance

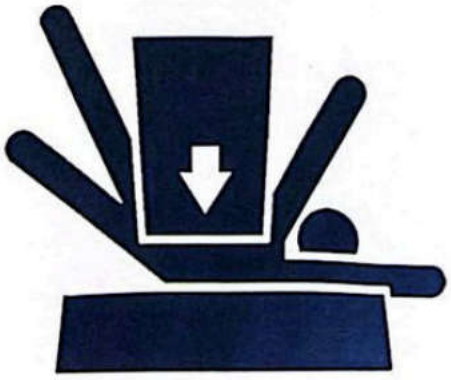
- During inspection and maintenance of the machine, there are many potential hazards such as entanglement with machine, or coming in contact with high pressure fluids and/or hot parts. Be sure to observe the precautions described below to prevent serious personal injury and death.
  - Before beginning inspection and maintenance, decide the work practice order and let the co-workers fully understand it.
  - Park the machine safely in accordance with the precautions for PARK MACHINE SAFELY.
  - Keep the work area clean and dry.
  - Attach a "Do Not Operate" tag on the handle or the control lever.
  - Do not wash sensors, connectors and the inside of the cab with water or steam. If moisture enters the electrical system, malfunction or erratic operation may result.
  - Start working only after the engine and hydraulic oil has cooled down to safe temperature.
  - Never lubricate or service the machine while it is moving.
  - Keep all parts in good condition and properly installed.
  - Use only specified tools in the correct method.
  - Always service the machine with clean tools.
  - Repair any failures immediately. Repair or replace worn or broken parts.
  - Remove adhered grease, oil, paint or any unnecessarily accumulated debris.
  - Disconnect battery ground cable (–) before making adjustments to electrical systems or before performing welding on the machine.

SA-028

SA-527

Support Machine Properly

- Never attempt to work on the machine without securing the machine first.



SA-027

Warn Others of Service Work

- Unexpected machine movement can cause serious in-jury.
  - 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.
  - Stay away from the machine when a "Do Not Operate" tag is attached.
  - Make it a rule for the inspector/service person to keep the main key until inspection/maintenance work is finished.

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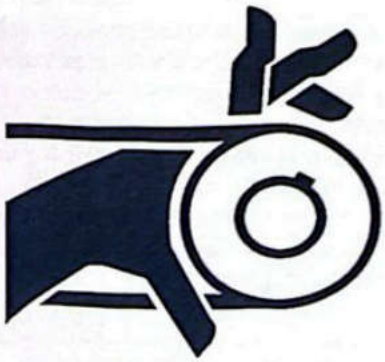
Stay Clear of Moving Parts

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



SA-026

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.
  - To 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:

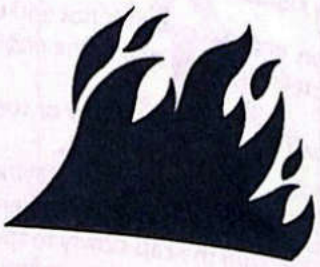
- Engine oil, gear oil and hydraulic oil also become hot during operation.
  The engine, hoses, lines and other parts become hot as well.
  - Wait for the oil and components to cool before starting any maintenance or inspection work.

SA-026

Replace Rubber Hoses Periodically

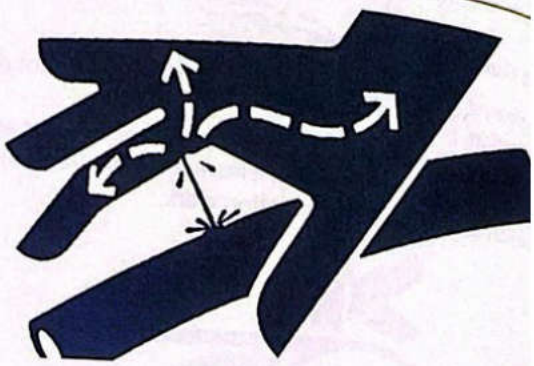
Hot Spraying Fluids:

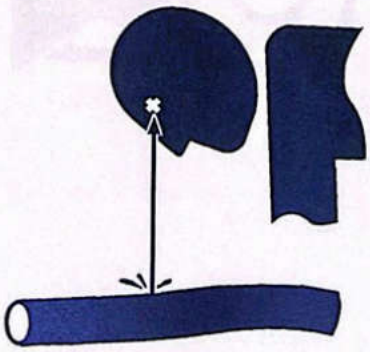
- Rubber hoses that contain flammable fluids under pressure may break due to aging, fatigue, and abrasion. It is very difficult to gauge the extent of deterioration due to aging, fatigue, and abrasion of rubber hoses by inspection alone.
- Every two years replace the rubber hoses.
- Failure to periodically 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.



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.





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 Flammables:

- Spilled fuel and oil, and trash, grease, debris, accumulated coal dust, and other flammables may cause fires.
  - Prevent fires by inspecting and cleaning the machine daily and by removing spilled or accumulated flammables immediately.
  - Store flammables well away from fire hazards.
  - Do not attempt 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 accelerator lever function before operating the machine every day:

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

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

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.
  - 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-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 material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

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.

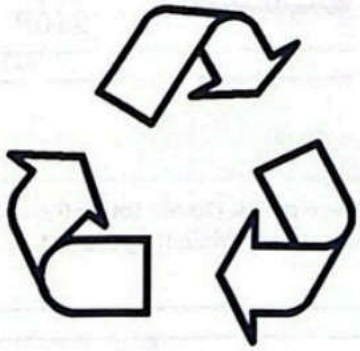
Handle Chemical Products Safely

- 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.
  - A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques.
  - Check the MSDS 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 MSDS's (available only in English) on chemical products used with your machine.

SA-039

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

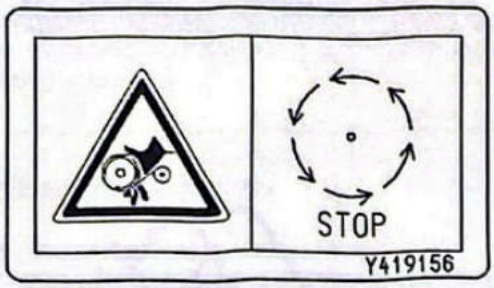


SA-226

SAFETY SIGNS

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

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



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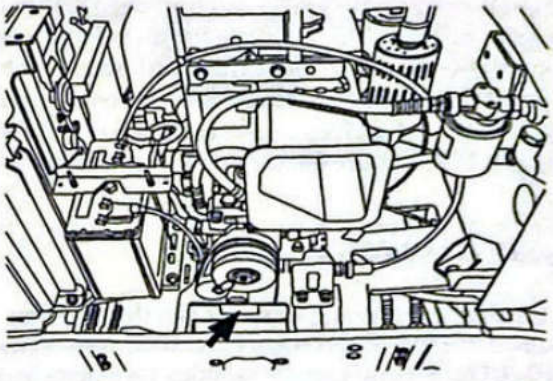
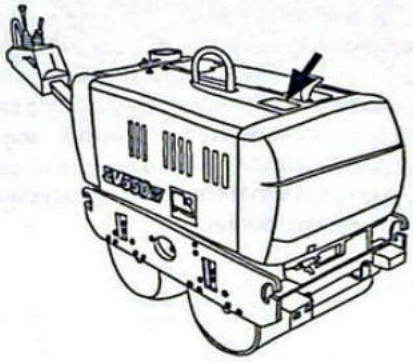


MZV550-005

- Possible severe burns. Do not touch the engine, hydraulic or muffler components while they are hot.

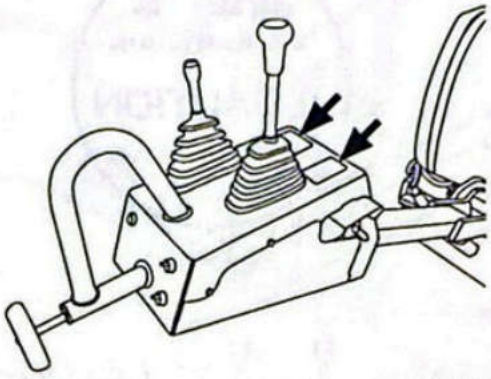
SSYJ00001611



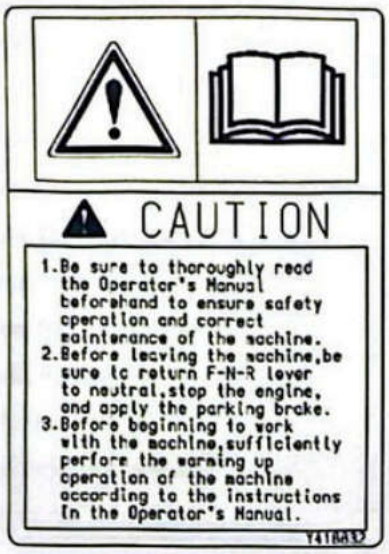
M8LA-011

- Keep away from the machine. If entangled in the machine, personal injury may result.

SSY419154



MZV550-048



SSY418832

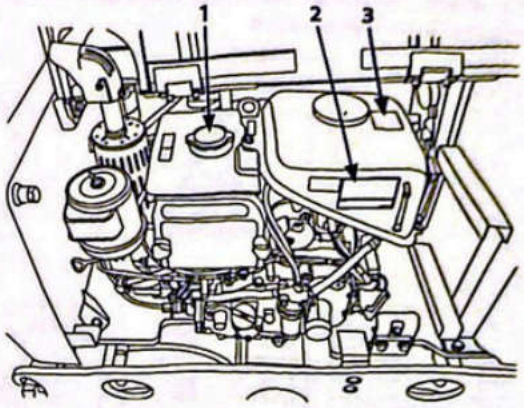
- Handle fuel with care; it is highly flammable, keep fuel away from open flame or sparks.

SSY419174

MZV550-047

1.

MZV550-009



MZV550-012

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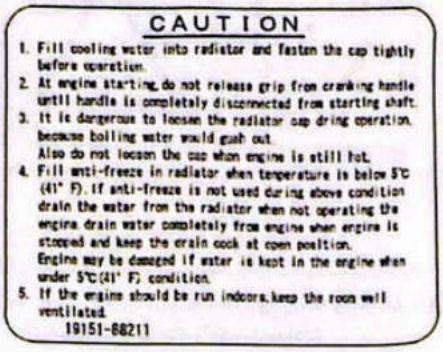
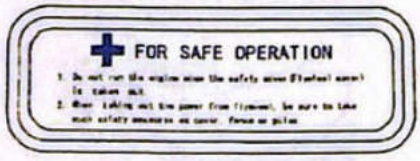


M8LC-008

3.

M8LC-009

4.



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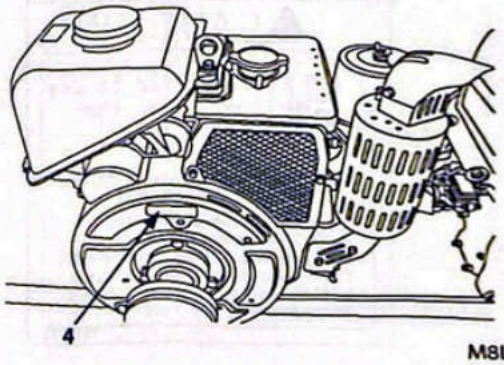
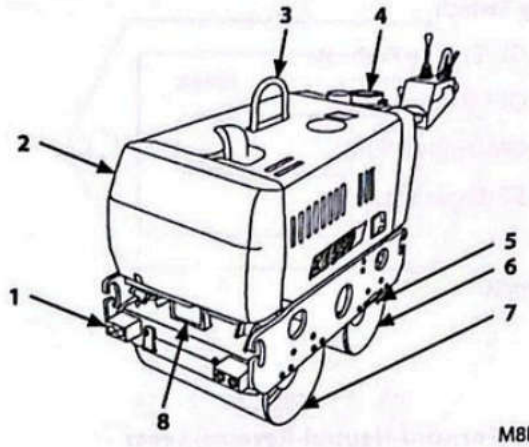


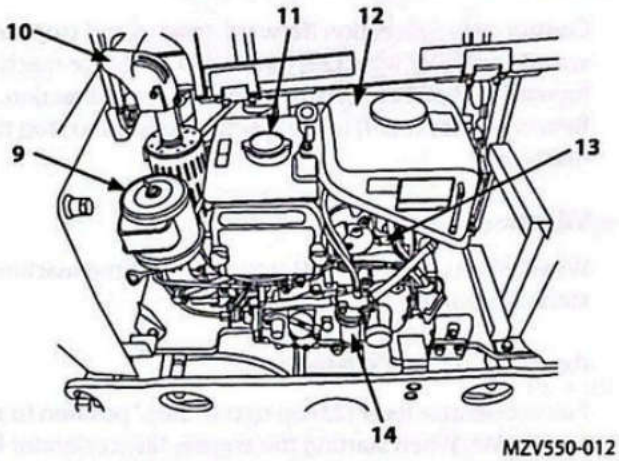
M8LC-012

Components Name

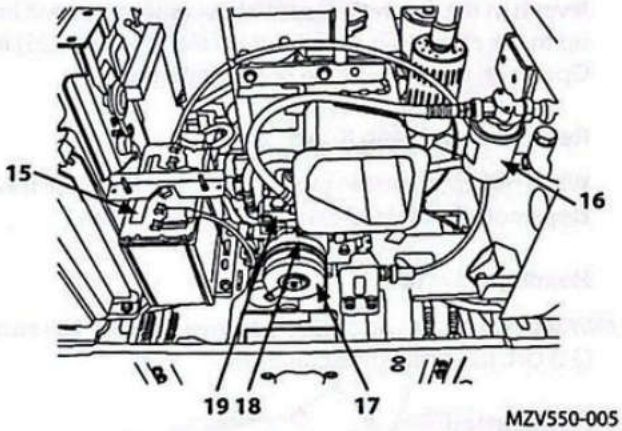
1- Bumper
2- Hydraulic Oil Tank
3- Lifting Lug
4- Sprinkler Tank
5- Parking Brake Lever
6- Rear Drum
7- Front Drum
8- Head Light
9- Air Cleaner
10- Muffler
11- Radiator
12- Fuel Tank
13- Engine
14- Fuel Filter
15- Battery
16- Hydraulic Oil Filter
17- Magnetic Clutch
18- Vibration Belt
19- Hydraulic Pump
20- Hour Meter
21- Reverse Travel Stop Knob
22- Horn Button
23- Accelerator Lever
24- FNR Lever
25- Key Switch
26- Vibration Switch
27- Head Light Switch



M8LA-001



MZV550-012



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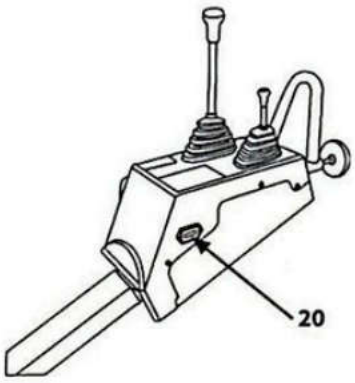

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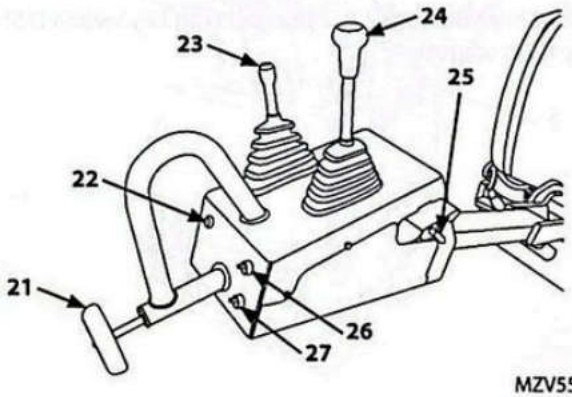
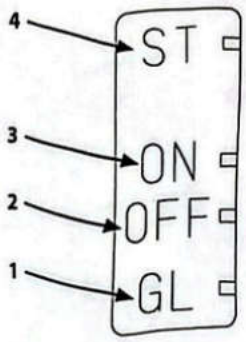


MZV550-049

Key Switch

1. GL (Engine Preheat)
2. OFF (Engine Stop)
3. ON (Engine Run)
4. ST (Engine Start)



M8LA-002

FNR (Forward-Neutral-Reverse) Lever

Controls travel direction (forward, reverse and stop) and speed. Push FNR lever (24) forward to travel the machine forward and pull backward to travel reverse direction. Return FNR lever (24) to the Neutral position to stop the machine.

Vibration Switch

When vibration switch (26) is turned "ON", the machine starts vibrating.

Accelerator Lever

Pull accelerator lever (23) up to the "Stop" position to stop the engine. When starting the engine, tilt accelerator lever (23) forward up to the "H" position. When the accelerator lever is in the Operation position, engine speed will increase up to the maximum speed. Set accelerator lever (23) in the Operation position during normal operation.

Reverse Travel Stop Knob

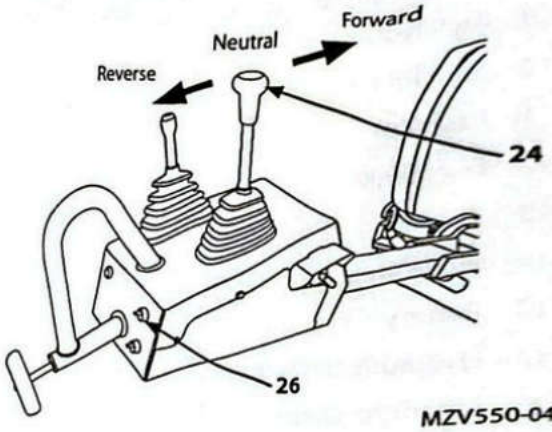
While reverse traveling the machine, push reverse travel stop knob (21) to stop reverse travel operation.

Headlight Switch

When headlight switch (27) is turned ON with key switch (25) ON, the headlights come ON.

Horn Button

When horn Button (22) is pressed with key switch (25) ON, the horn sounds.



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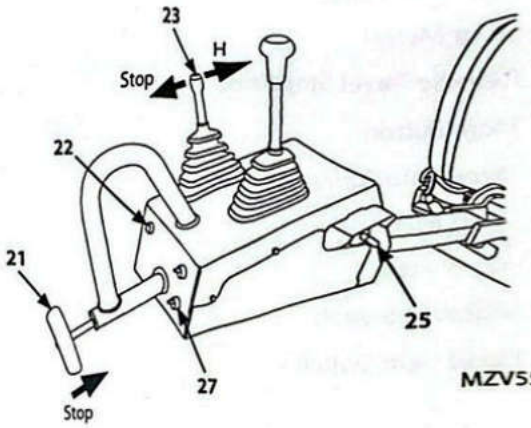
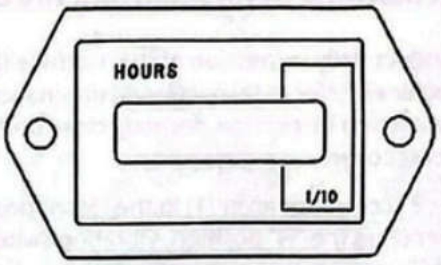


MZV550-049

Hour Meter

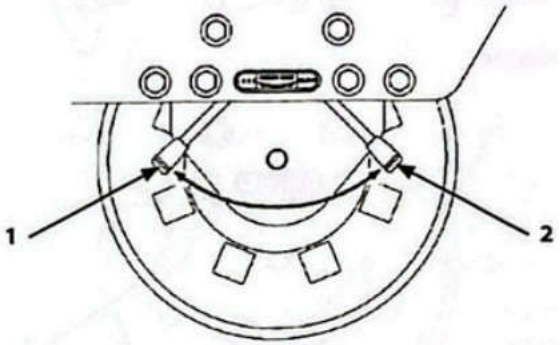
Shows the accumulated machine operation hours. The right-hand one digit number indicates tenths of an hour (6 minutes).



MZV550-016

Parking Brake Lever

1. LOCK (The parking brake is applied.)
2. RELEASE (The parking brake is released.)

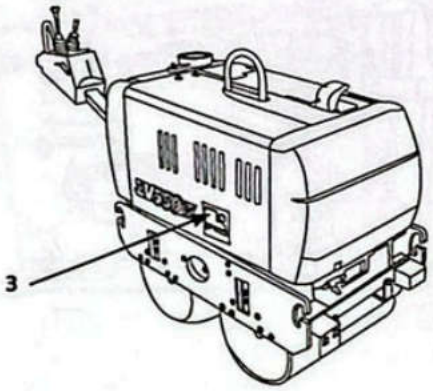


M8LA-003

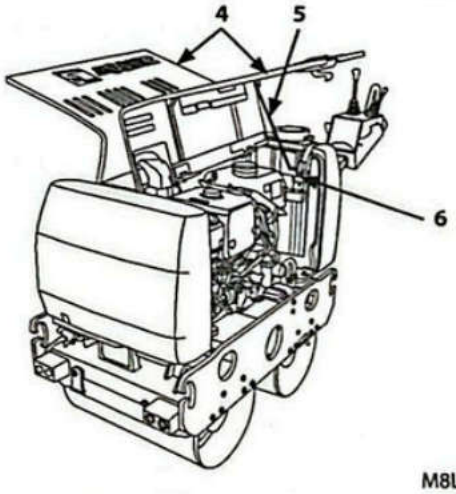
Access Covers

Both side access covers can be opened and when closed, locked with a key. Pull the lever of latch (3) to unlock covers (4). After opening covers (4), install rods (5) into cover lock holes (6) to secure the covers in position.

M8LA-004



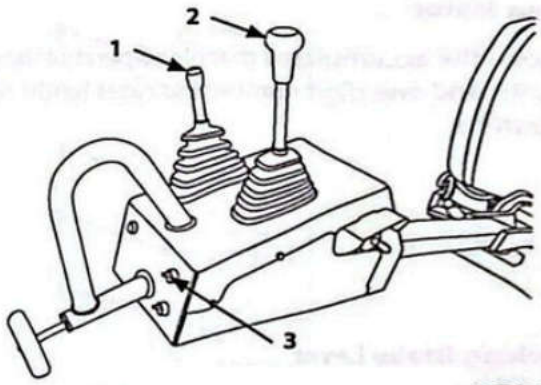
M8LA-005



M8LA-006

Inspect Machine Before Starting the Engine

1. Conduct daily inspection of the machine (before starting machine). Refer to Inspection/Maintenance section. After completing inspection, securely close both sides of the access covers.
2. Place accelerator lever (1) in the "Stop" position, FNR lever (2) in the "N" position, vibration switch (3) in the "OFF" position and parking brake lever (4) in the "LOCK" position.



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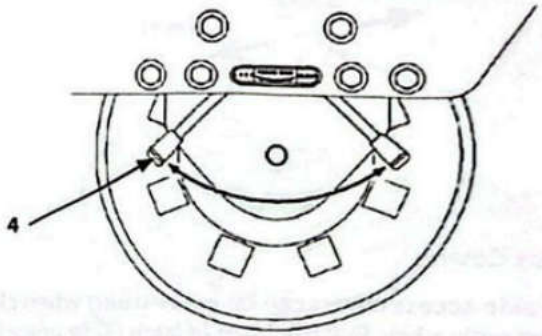


M8LA-003

Starting the Engine

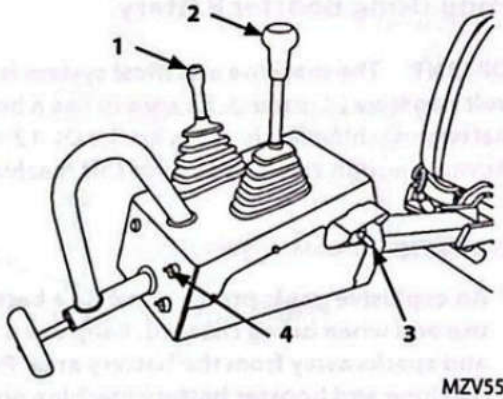
1. Check that FNR lever (2), vibration switch (4), Accelerator lever (1) and parking lever (5) are all in the "N", "OFF", "Stop" and "LOCK" positions respectively.
2. Turn fuel shut off valve (6) to the "O" (open) position.
3. Fully move accelerator lever (1) forward up to the "H" position.
4. Insert key (3) into the key switch. Turn the key switch to preheat the engine for the time as shown below.

Atmospheric Temperature	Preheat Time
-5 °C or over	5 seconds
-5 to –20 °C	10 seconds

5. Turn key switch (3) to the "ST" position to start the engine. Release key switch (3) as soon as the engine starts. Key switch (3) automatically returns to the "ON" position.

IMPORTANT: Never operate the starter for more than 10 seconds at a time. If the engine fails to start, return the key switch to OFF. Wait for more than 30 seconds, and then try again. Failure to follow this procedure may result in damage to the starter or discharge of the battery.

6. After the engine starts, conduct warm up operation of the engine for approx. 5 minutes.



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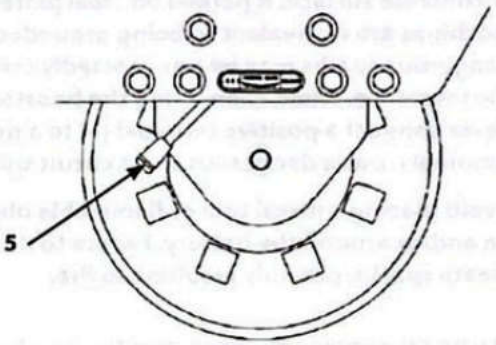
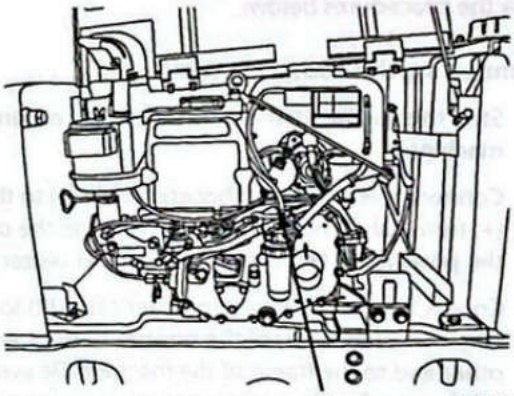


M8LA-007



MZV550-023

Starting Using Booster Battery

IMPORTANT: The machine electrical system is a DC 12 volt negative (-) ground. Be sure to use a booster battery machine equipped with the DC 12 volt system having enough capacity to start this machine.

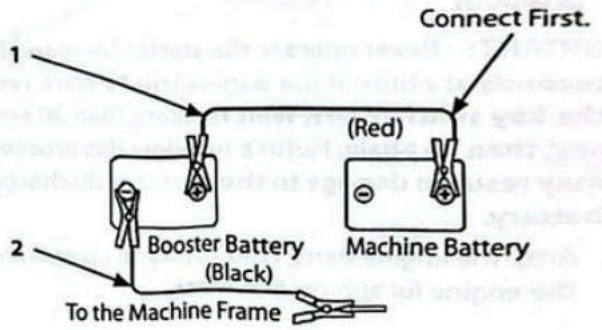
⚠ WARNING:

- **An explosive gas is produced while a battery is in use and when being charged. Keep open flames and sparks away from the battery area. Park the machine and booster battery machine on a dry soil or concrete surface. If parked on steel plates, the machines are equivalent to being grounded so that dangerous sparks may be unexpectedly created on the machines. When connecting the booster cables, never connect a positive terminal (+) to a negative terminal (-), as a dangerous short circuit will occur.**
- **Avoid placing a metal tool or flammable objects on and/or around the battery. Failure to do so may create sparks, possibly resulting in fire.**

When starting the engine by connecting the booster battery cables after the machine battery has become exhausted, follow the procedures below.

Connecting the Booster Battery

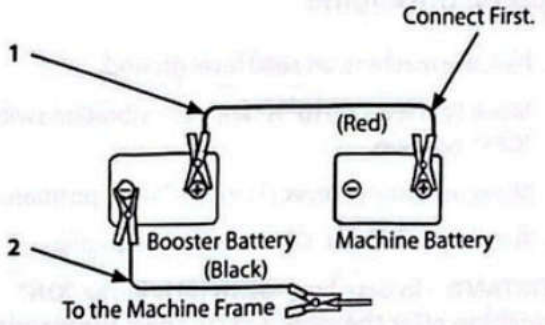
1. Stop the engine on the booster battery mounted machine.
2. Connect one end of red booster cable (1) to the positive (+) terminal of the machine battery, and the other end to the positive (+) terminal of the booster battery.
3. Connect one end of black booster cable (2) to the negative (-) terminal of the booster battery, and the other end to the frame of the machine. Be aware that sparks may fly when making this last connection so choose a point on the frame as far as possible from the machine battery.
4. After securely connecting the booster cables, start the engine on the booster battery mounted machine.
5. Start the engine on the machine.
6. After the engine starts, disconnect booster cables (1 and 2) in the following steps.



M503-03-002

Disconnecting the Booster Cables

1. Disconnect black booster cable (2) from the machine frame.
2. Disconnect the other end of black booster cable (2) from the negative terminal of the booster battery.
3. Disconnect 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.

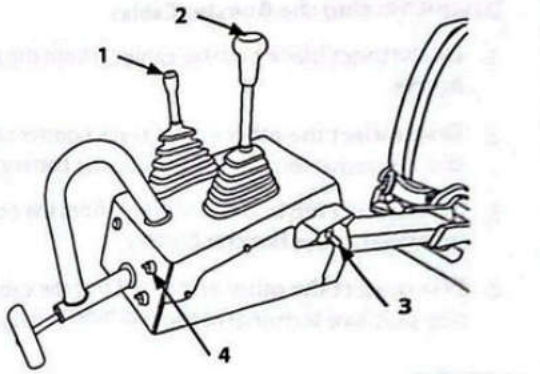


M503-03-002

Stopping the Engine

1. Park the machine on solid level ground.
2. Move FNR lever (2) to "N" and turn vibration switch (4) "OFF" position.
3. Move accelerator lever (1) to the "Stop" position.
4. Turn key switch (3) "OFF" to stop the engine.

IMPORTANT: In case key switch (3) is in the "ON" position after the engine is stopped, the warning buzzer sounds. If key switch (3) is kept left in the "ON" position, the battery may become discharged.



MZV550-049

Driving 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.

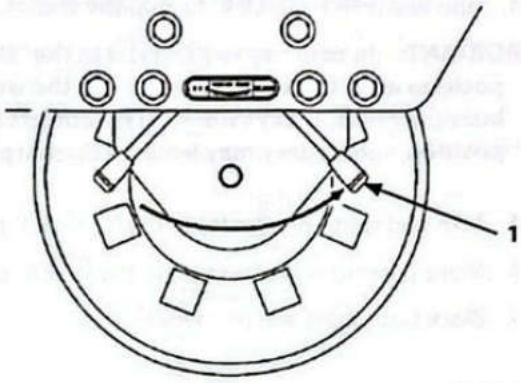
1. Move parking brake lever (1) to the "RELEASE" position.
2. During operation, hold accelerator lever (2) in the "H" position.

⚠ CAUTION: Avoid controlling travel speed by operating accelerator lever (2). A hazardous situation may occur due to quick motion of the machine. Control travel speed using FNR lever (3).

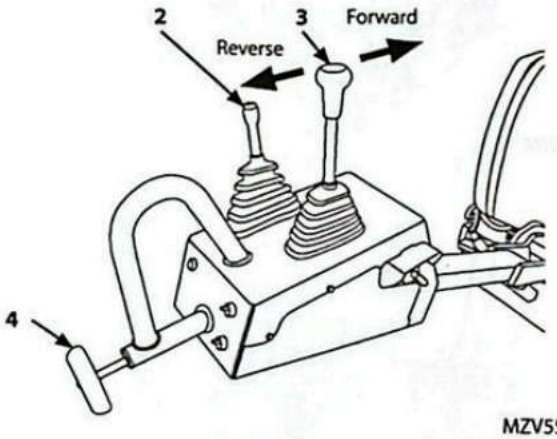
⚠ CAUTION: When changing travel direction, return FNR lever (3) to neutral. After the machine completely stops, shift FNR lever (3). If changing travel direction is quickly performed, the machine may lose balance, possibly creating a hazardous situation.

3. Push FNR lever (3) forward to travel the machine forward and pull to travel reverse.
4. After moving FNR lever (3) to the Reverse position, check that the machine stops by pushing reverse travel stop knob (4).
5. Change machine travel direction by operating the handle.

⚠ WARNING: When working on slopes, operate the machine on a slope with 8 degrees or less.



M8LA-008



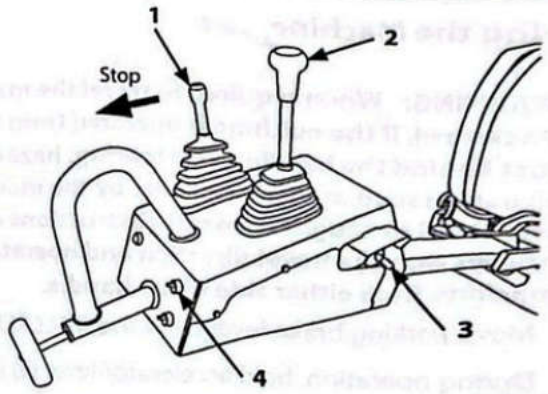
MZV550-049

Parking

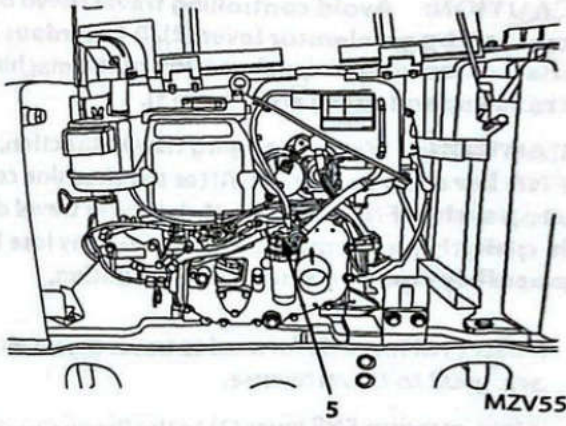
1. Park the machine on solid level surface.
2. Move FNR lever (2) to "N" and turn vibration switch (4) "OFF" position.
3. Move accelerator lever (1) to the "Stop" position.
4. Turn key switch (3) "OFF" to stop the engine.

IMPORTANT: In case key switch (3) is in the "ON" position after the engine is stopped, the warning buzzer sounds. If key switch (3) is kept left in the "ON" position, the battery may become discharged.

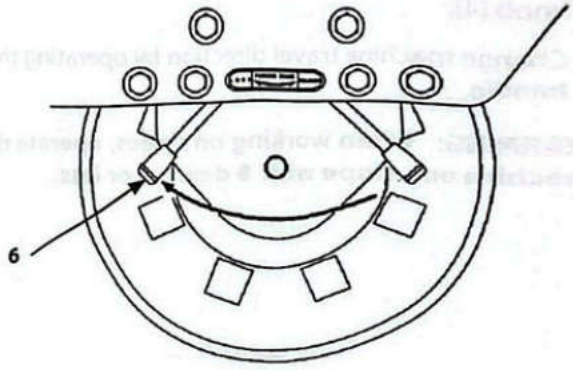
5. Turn fuel shut off valve (5) to the "C (close)" position.
6. Move parking brake lever (6) to the "LOCK" position.
7. Block both front and rear wheels.



MZV550-049



MZV550-023

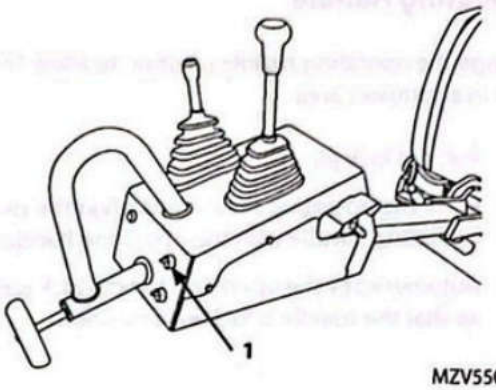


M8LA-009

Vibrating Operation

Turn vibration switch (1) "ON" position to vibrate the machine.

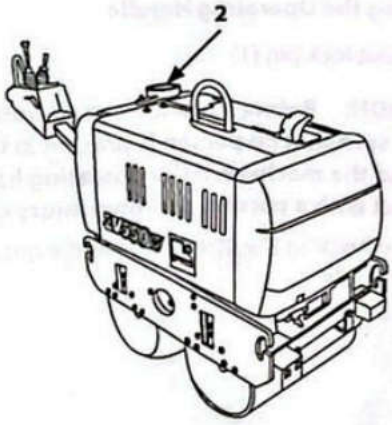
IMPORTANT: Don't vibrate the machine with the access covers kept open.



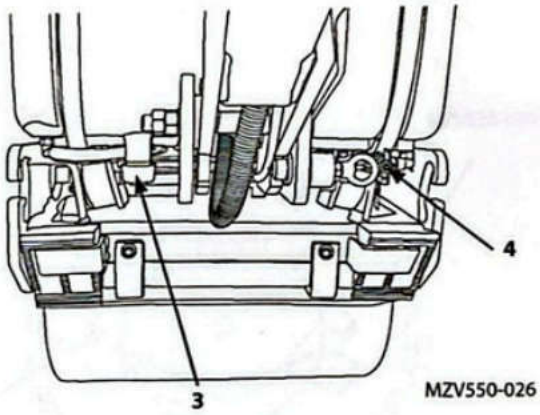
MZV550-049

Sprinkler Operation

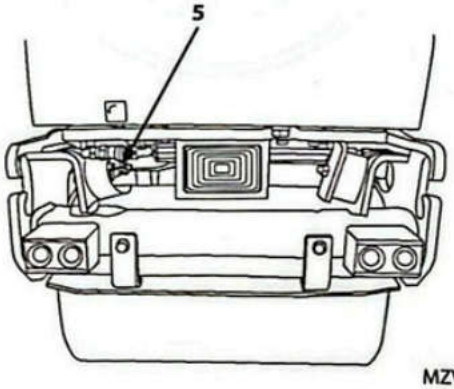
When refilling the sprinkler tank water, open cap (2) on the top of the tank to supply clean water such as tap water. Drain water as required by removing drain cap (3) on the bottom of the tank. Open sprinkler valves (4 and 5) located at the front and rear of the machine to sprinkle the rollers with water.



M8LA-005



MZV550-026

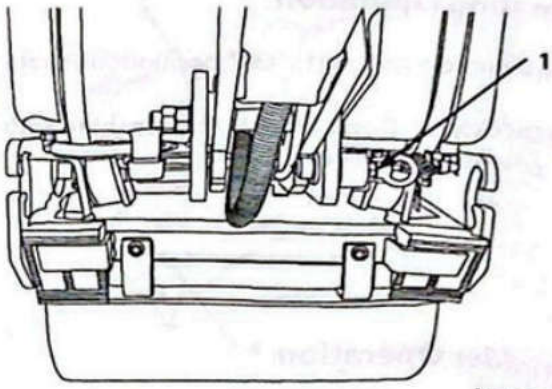


MZV550-027

Operating Handle

Change the operating handle position to allow the machine to park in a compact area.

1. Pull out lock pin (1).
2. Raise the operating handle and align the pin hole on the operating handle with the operating handle lock pin.
3. Automatically the operating handle lock pin is engaged so that the handle is locked in position.



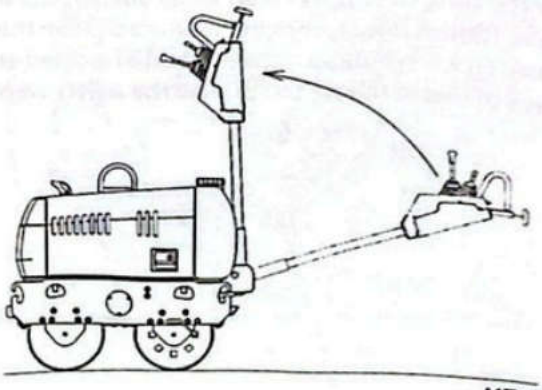
MZV550-026

Lowering the Operating Handle

1. Pull out lock pin (1).

⚠ CAUTION: Before lowering the operating handle, make sure that no person is present in the vicinity around the machine. If the operating handle comes in contact with a person, personal injury may result.

2. While holding the operating handle grip, slowly lower the handle.



MZV550-028

Transportation

Loading / unloading on a truck and transporting by road

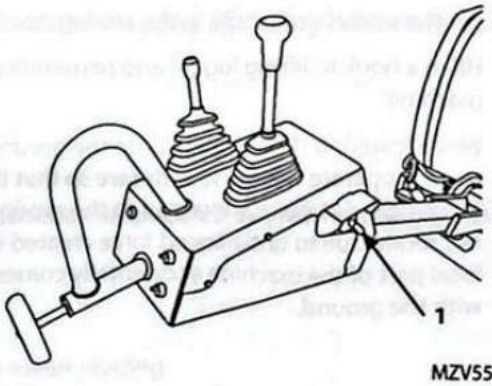
⚠ WARNING: Use a loading dock or a ramp for loading / unloading.

Ramp / Loading Dock

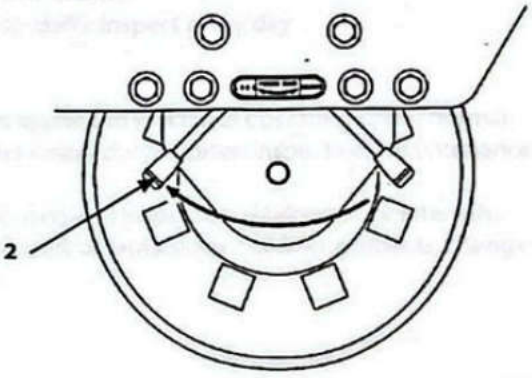
1. Maintain the flatbed, ramp and/or loading dock clean. Dirty flatbed, ramps and/or loading dock with oil, mud, or ice on them are slippery and dangerous.
2. Place blocks against the truck wheels while using a ramp or loading dock.
3. Ramps must be sufficient in length, width and strength. Be sure to securely connect the ramps with an inclination less than 15 degrees.
4. In case loading docks are used, they must be sufficient in length, width and strength with an inclination less than 15 degrees.

Loading / Unloading on a Truck

1. Load the machine on a truck while aligning the machine centerline with the centerline of the truck flatbed.
2. Drive the machine slowly onto the ramp.
3. After the machine reaches the desired position on the flatbed, stop the machine.
4. Stop the engine. Remove the key from key switch (1).
5. Move parking brake lever (2) to the "LOCK" position.
6. Secure the machine by placing blocks against the front and rear wheels.
7. Securely fasten the machine to the flatbed with wire ropes.



MZV550-049

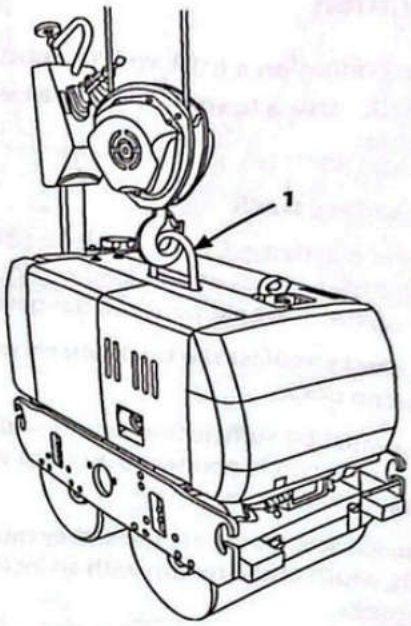


M8LA-009

Machine Lifting Procedures

⚠ CAUTION: Beware of the following points.

- **Incorrect lifting procedure and/or inappropriate wire rope attachment may cause the machine to move while being lifted, possibly resulting in machine damage and/or personal injury.**
- **Use only lifting wire ropes and other lifting tools having sufficient strength, without damage and/or deterioration.**
- **Do not allow anyone to come close or under the lifted machine.**
- **Check that no personnel are present in the vicinity around the lifted the machine.**
- **Avoid applying impact loads to the lifting wire ropes and/or lifting tools.**



M8LA-010

Lifting

1. Set the operation handle in the storing position.
2. Hitch a hook to lifting lug (1) and perpendicularly lift the machine.
3. When lowering the machine onto the ground or onto a truck, operate the crane with care so that the lifted machine is not quickly lowered to the ground, or does not rotate due to unbalanced force created when the local part of the machine accidentally comes in contact with the ground.

Inspection and Maintenance

Inspection and maintenance of the machine must be conducted to operate the machine as much as efficiently and extend the machine operating life as long as possible. Always pay attention to the following points:

- 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.

In case any abnormality is found during inspection or operation, immediately check the cause of the problem and repair it. If it is difficult to trace the cause of the problem, or readjustment of the engine governor and/or hydraulic component setting is required, contact your nearest Hitachi dealer.

IMPORTANT: Precautions for Inspection and Maintenance

- **Always use extra care about safety.**
- **Conduct inspection and maintenance appropriate to the encountered machine operating conditions and circumstances.**
- **Use only recommended fuel, lubricants and ant-freeze.**
- **Use only genuine HITACHI parts.**
- **Never allow unauthorized machine modification.**
- **Machine trouble caused by using fuel, lubricants, anti-freeze other than specified or incorrect operation will void Hitachi Warranty Policy.**

Inspection/Maintenance Intervals

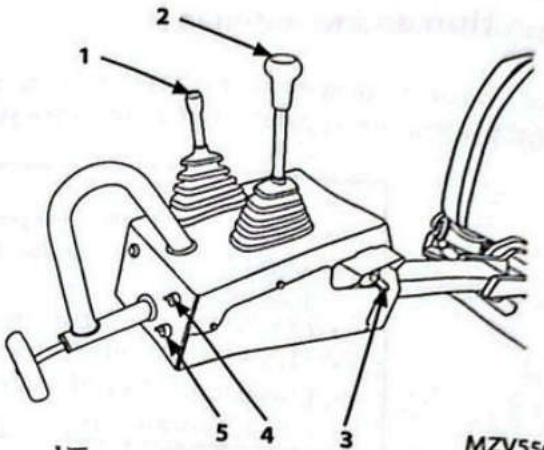
- Decide the inspection/maintenance intervals according to the hour meter reading.
  In this manual, the inspection / maintenance interval guides are as follows:
  Daily Inspection (to be performed before starting each operation shift): Inspect every day
  Monthly Inspection: Inspect once a month
  Annual Inspection (every 12 months): Inspect once a year
- Inspection / maintenance intervals described in this manual are applied to machines operating under normal working conditions. In case the machine is operated under more heavy duty, shorten inspection / maintenance intervals.
- Refer to the Inspection / Maintenance Chart for lubricants to be used and Inspection /Maintenance intervals.
- When the hour meter indicates the time for change of lubricants and/or replacement of filter elements, change and/or replace them when performing daily or monthly inspection.

Prepare Machine for Maintenance

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

IMPORTANT: Move FNR lever (2) to neutral and turn vibration switch (4) and headlight switch (5) OFF.

3. Move accelerator lever (1) to the STOP position to stop the engine.
4. Turn key switch (3) OFF.
5. Remove the key. In case inspection/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 the parking brake lever to the Parking position.
8. Apply blocks against the front and rear wheels.
9. Start Inspection / Maintenance only after attaching an Inspection / Maintenance tag in an easy-to-see place on the control lever.



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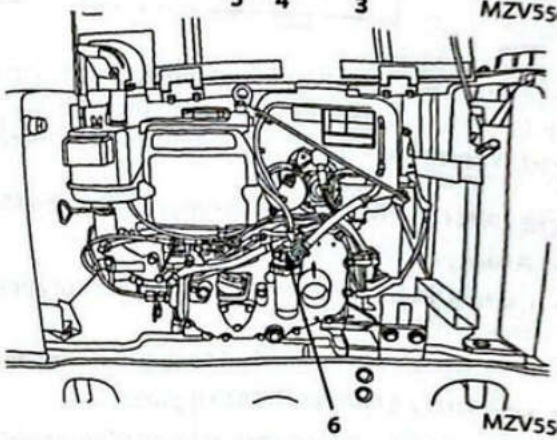
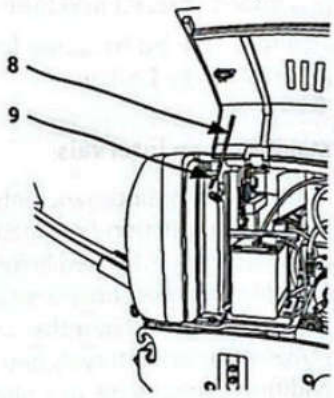


MZV550-023

Access Covers

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

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).



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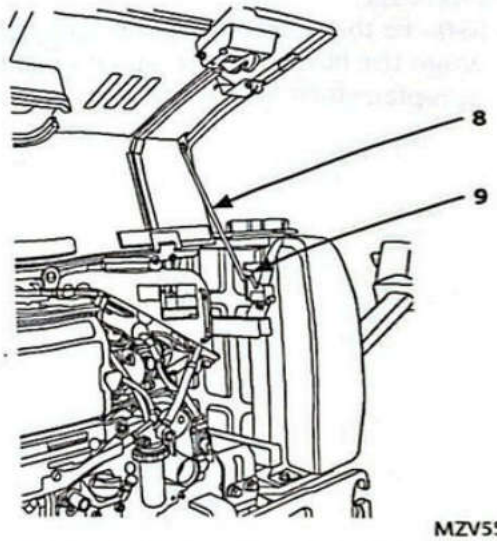


MZV550-031

A. Daily Inspection Points (to be performed before starting each operation shift)

Inspection Points	Inspection Procedures
1. Brake System	1. Check that the parking brake is securely applied.
2. Rollers (Front and Rear Wheels) (Steel Rollers)	1. Check that no cracks and/or damage are present. 2. Check for any abnormal wear. 3. Check that no abnormal materials such as metal pieces and stone fragments are present.
3. Lighting System	Check that light ON/OFF function is normal. Check for any contamination and/or damage.
4. Section where any abnormality was fond during operation on the previous day.	Check that no abnormality is present in the corresponding section.
5. Engine	1. Engine oil and coolant levels and contamination. 2. Starting easiness, exhaust color, noise 3. Oil and coolant leaks in all sections and damage to the hoses and pipe lines 4. Damage to the radiator 5. Loose and missing mounting nuts and bolts
6. Base Machine	1. Oil leaks from the driving system 2. Loose and missing mounting nuts and bolts 3. Fuel level in the fuel tank and fuel leaks 4. Hydraulic oil level in the hydraulic tank and hydraulic leaks 5. Operational functions, play amounts and control forces of all controls and handle 6. Operational functions of all hydraulic components, damage and leaks from pipe lines and hoses 7. Cracks and damage to the rubber vibration insulators 8. Wear, cracks and damage to the vibration belt 9. Deformation and damage to all structures and emitting of abnormal noise
7. Others	1. Operational functions of all instruments, switches and horn 2. Abnormality in appearance of the instruments 3. Loose battery terminal 4. Loose and missing sprinkler mounting nuts and bolts 5. Condition of the sprinkler nozzle

B. Monthly Inspection

Inspection Points		Inspection Procedures
Brake System	Parking Brake	Operational function
Travel System	Rollers (Front and Rear Wheels) (Steel Rollers) Frame	1. Cracks and damage to the rollers 2. Abnormal wear on the rollers 3. Presence of foreign matters such as metal pieces and/or stone fragments on the rollers 4. Deformation and/or damage to the frames 5. Oil level, oil contamination and driving system noise 6. Loose and missing mounting nuts and bolts 7. Traveling conditions
Power Train System	Pump and Motor	Oil leaks
Electrical System	Battery	Electrolyte level
	Electrical Wiring	Loose and damage to all connectors in the electrical wirings
Engine	Base Machine	1. Starting easiness and noise 2. Conditions in acceleration and deceleration 3. Status of exhaust 4. Conditions of the air cleaner element 5. Damage to the fuel hose 6. Loose and missing mounting nuts and bolts
	Lubrication System	1. Oil leaks 2. Oil level, and oil and filter contamination
	Fuel System	1. Fuel leaks 2. Contamination and clogging of the fuel filter
	Cooling System	1. Coolant level 2. Damage to the radiator

Inspection Points	Inspection Procedures
Lighting System	Operational functions
Frame	1. Oil level, contamination, mixing of foreign matter in the hydraulic oil tank and oil leaks from the tank. 2. Contamination and clogging of the hydraulic oil filter 3. Operational functions, play amounts and control forces of all controls and handle 4. Oil leaks from and damage to pipe lines and hoses 5. Deformation and damage to all structures and emitting of abnormal noise 6. Loose, short circuits and damage to all connectors in the electrical wirings 7. Loose and missing of the mounting nuts and bolts
Others	1. Operational status of all instruments, and switches 2. Operational status of the horn and lighting system 3. Loose and missing sprinkler mounting nuts and bolts 4. Condition of the sprinkler nozzle 5. Operational status and noise of the vibration system 6. Condition of the scraper

C. Annual Inspection (Conduct the following check points in addition to the monthly inspection points)

Inspection Points		Inspection Procedures
Brake System	Rod	Looseness, play and damage
Travel System	Rollers (Front and Rear Wheels) (Steel Rollers)	Play in bearing
Electrical System	Battery	1. Electrolyte specific gravity 2. Terminal connecting conditions
Engine	Engine Body	1. Tightness of cylinder head and manifold installation 2. Compression pressure 3. Valve clearances
	Lubrication System	Clogging of the oil filter
	Fuel System	1. Injection pump conditions* 2. Throttle valve conditions* 3. Injection pressure and injection nozzle spray pattern* 4. Clogging of fuel filter 5. Injection timing and volume 6. Feed pump operational function
	Cooling System	1. Coolant leaks 2. Radiator cap function
Horn		Operational function
Instrument		Operational function
Muffler		1. Looseness and damage to muffler installation 2. Muffler function
Vibration System		Oil leaks and oil level
Base Machine		Looseness and damage

*NOTE: *: Contact your nearest HITACHI dealer for inspection / maintenance.*

Inspection/Maintenance List

Location	Interval (hours)						
	Daily	50 (1 month)	100 (3 month)	250 (6 month)	500 (1 year)	800 (year and a half)	1000 (2 year)
A. Engine	Refer to Engine Operation Manual.						
B. Check for bolt tightness.	■						
C. Check the vibration belt.	■						
D. Clean and adjust the scraper.		■					
E. Clean the sprinkler tank.		■					
F. Clean the sprinkler nozzle.		■					
G. Check the clutch.		■					
H. Adjust operation force of the FNR lever.			■				
I. Adjust the neutral position of the FNR lever.						■	
J. Check hydraulic oil level	■						
K. Replace the hydraulic oil filter.					■		
L. Change hydraulic oil.							■
M. Replace the hoses.				■			
N. Replace fuse. As required	As required						

Periodic Replacement of Parts

To ensure safe and long operational life of the machine, be sure to conduct periodic inspection / maintenance of the machine. In addition, the parts listed below are recommended to periodically replace as they are closely related to safe operation. If their materials change due to aging and/or receiving repeated loads, their deterioration, wear and/or fatigue are unavoidable. Accordingly, serious personal injury and/or physical damage / fire hazards may be posed. Since it is very difficult to gauge the remaining service lifetime of these parts via operational feeling or external inspection, replace these parts with new ones at the intervals shown in the table below even if no abnormality is found. In case any of these parts are found to be defective at the time of the regular inspection / maintenance, replace such parts regardless of their specified replacement intervals. Contact your nearest HITACHI dealer for correct replacement.

Location		Parts to be Replaced	Intervals
Engine	Fuel hose Fuel hose	Between tank and filter Between filter and injection pump	Every 2 years
Hydraulic System	Pump	Suction hose Delivery hose Return hose	Every 2 years
Vibration System		Vibration belt	Every 2 years

A. Engine

According to the table below, conduct Inspection / Maintenance. Refer to the Engine Operation Manual for the detailed procedures.

Periodical Inspection List

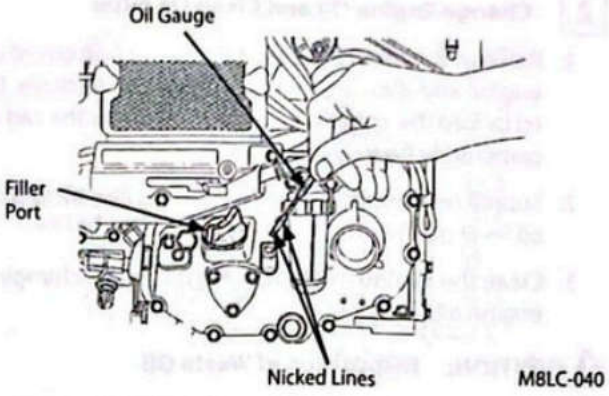
No.	Inspection/Maintenance Item	Intervals (Hours)													Every year	Every 2 years
		50	100	150	200	250	300	350	400	450	500	800	1500	3000		
1	Change engine oil	◉		O		O		O		O						
2	Clean oil filter	◉		O		O		O		O						
3	Clean fuel filter	O		O		O		O		O						
4	Replace fuel filter element									O						
5	Remove sediment in fuel tank					O				O						
6	Check fuel supply/return pipes and clamps for tightness	O		O		O		O		O						
7	Replace fuel supply/return pipes and clamps														O	
8	Clean air cleaner element	O		O		O		O		O						
9	Replace air cleaner element														O After cleaning 6 times	
10	Clean inside of radiator									O						
11	Check electrolyte level and specific gravity	O		O		O		O		O						
12	Replace battery															O
13	Check and adjust fan belt tension	◉		O		O		O		O						
14	Replace fan belt															O or every 500 hours
15	Check cooling fan for cracks	O		O		O		O		O						
16	Change coolant															O
17	Check electrical wiring for damage, contamination and/ or loose connectors	O		O		O		O		O						
18	*Adjust valve clearance											O				
19	*Check and clean nozzles												O			
20	*Check injection pump													O		

1. ◉: Be sure to conduct 50 hours after break-in operation.
2. Conduct items 1 to 11, 13, 15 and 17 at the same intervals after 500 hours. Conduct items 12, 14 and 16 every 2 years. Conduct items 18, 19 and 20 at intervals of 800, 1500 and 3000 hours respectively.
3. Conduct item 6 every 6 months even if the machine is not operated.
4. Replace the fan belt every 500 hours or 2 years whichever comes first.
5. Check the electrolyte every one-year in case annual operation hours are shorter than 100 hours.
6. Consult your nearest HITACHI dealer for Inspection / Maintenance of items with mark * and follow their instructions.

1 Check Engine Oil Level

1. Check engine oil level before starting the engine or about 5 minutes later after stopping the engine.
2. Remove the oil gauge and clean the tip of the oil gauge. Reinstall the oil gauge. Remove the oil gauge again and check that oil level is between two nicked lines correctly.
3. If necessary, add the specified engine oil via the oil filler.

   Crank Case (Oil): 1.3 L



IMPORTANT:

- **Too much supplied lubricant may decrease the engine output or spill out of the breather pine, possibly causing the surroundings to become stain and/or overrunning. To the contrarily, short of lubricant may cause seizure of the turning and/or sliding parts in the engine. Be sure to control the oil level not to exceed the upper and lower limit.**
- **Always check the appropriate oil level using the oil gauge.**
- **Before checking the oil level, park the machine on a level surface. Otherwise, correct oil level will not be detected.**
- **When required to use a different brand of oil from that used up to now, supply new brand oil only after thoroughly draining the used oil in the system.**

Engine Oil

IMPORTANT: Use only as shown below engine oil equivalent to CF specified in API. 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 anthorized dealer for the unclear points.

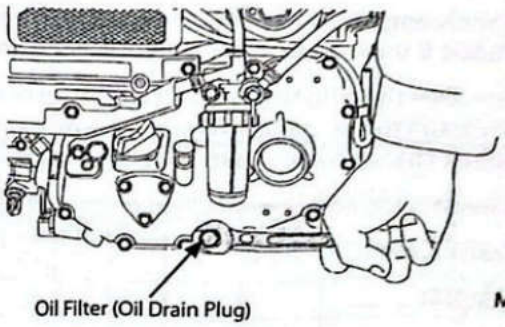
Brand Names of Recommended Engine Oil

Kind of Oil / Application / Air Temp / Standard / Manufacturer	Engine Oil Engine Crank Case	
	-20 to 30 °C (-4 to 86 °F)	-15 to 40 °C (5 to 104 °F)
	API-CF	
British Petroleum	BP Vanellus C3 SAE 10W-30	BP Vanellus C3 SAE 10W-40
Caltex Oil	RPM DELO 300 Oil SAE 10W-30	RPM DELO 300 Oil SAE 10W-40
Esso	Essolube D-3 SAE 10W-30	Essolube D-3 SAE 10W-40
Idemitsu Kosan	*Apolloil Diesel Motive SAE 10W-30	Apolloil Diesel Motive SAE 10W-40
Mobil Oil	Mobil Delvac SAE 10W-30	Mobil Delvac SAE 10W-40
Nippon Oil	Diesel CF SAE 10W-30	Diesel CF SAE 10W-40
Shell Oil	Rymla D Multi SAE 10W-30	Rymla D Multi SAE 10W-40

NOTE: The machine shipped from the factory is filled with lubricants marked with.

2 Change Engine Oil and Clean Oil Filter

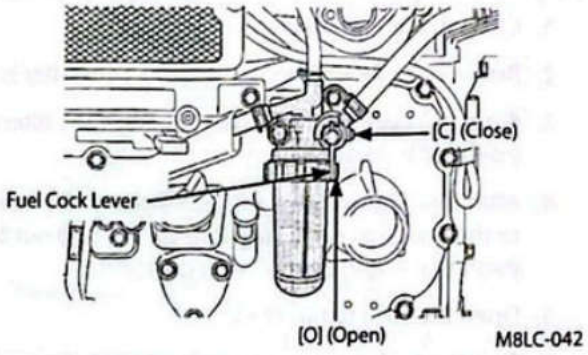
1. Remove the drain plug located on the bottom of the engine and thoroughly allow the old oil to drain. Drain oil before the engine cools down to allow the old oil to completely flow out.
2. Supply new engine oil up to the level line nicked on the oil level gauge.
3. Clean the oil filter with cleaning oil before changing engine oil.



⚠ CAUTION: Disposition of Waste Oil

Be sure to receive the old engine oil with a container. Dispose the waste oil in accordance with local environmental standard to prevent the occurrence of environmental problem.

Fuel



⚠ CAUTION: Avoid fires.

Fuel is highly flammable. Keep sparks and open flames away from fuel.

Recommended Fuel

Use only DIESEL FUEL (JIS K-2204). Refer to the table below for selecting the appropriate kinds of diesel fuel to be used depending on the air temperature ranges. However, diesel fuel specifications vary according to the seasons and/or territory in use so that diesel fuel may freeze even if the fuel matching the requirements in the table below is selected. Using coarse quality fuel may cause engine troubles.

Kind of diesel fuel	Guide for applicable air temperature
JIS Class 2	–10 °C and over
JIS Class 3	Over –20 °C up to –15 °C
JIS Special Class 3	Over –30 °C up to –25 °C

Refueling

Use a diesel fuel conforming to JIS standards. Quality of a substitute fuel is unclear. The cetane value of kerosene is very low, resulting in adverse effect to the engine performance. Do not use both of them.
Fuel tank capacity: 4.8 L

IMPORTANT:

- **Supply fuel via a filtering net. Unless fuel is sufficiently filtered, the fuel injection pump may become malfunctioning due to dirt or soil mixed in the fuel.**
- **Once the fuel tank becomes empty, air may be mixed in the fuel supply system. Possibly the engine will not start smoothly unless air is completely bled.**

Bleeding Air in the Fuel System

1. Air bleeding is required in the following cases.

- After the fuel filter and/or pipe lines are removed:
- After empting the fuel tank:
- After the engine is kept unused for a long time:

Fully refill the fuel tank with fuel and open the cock.
Bleeding Air in the Fuel System

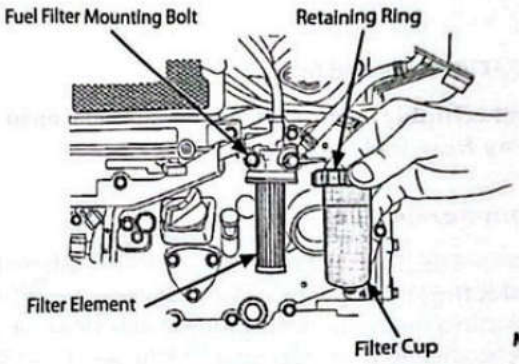
1. Turn fuel cock lever from the "CLOSE (C)" position to the "OPEN (O)" position. Wait approx. 20 seconds. (Since an automatic air bleed device is provided, air is automatically expelled from the pipe lines and filter.
2. Operate the device with the fuel cock lever kept in the "OPEN (O)" position.

3 Clean Fuel Filter

1. Close the fuel filter cock.
2. Remove the retaining ring to remove the filter cup.
3. Rinse the element in cleaning oil. Wash the filter cup inside with cleaning oil.
4. After cleaning, reinstall the element and the filter cup to their original positions while taking care not to allow them to come in contact with dust/dirt.
5. Open the cock to bleed air.
6. Turn the fuel cock lever from the "CLOSE (C)" position to the "OPEN (O)" position. Wait approx. 20 seconds. (Since an automatic air bleed device is provided, air is automatically expelled from the pipe lines and filter.)

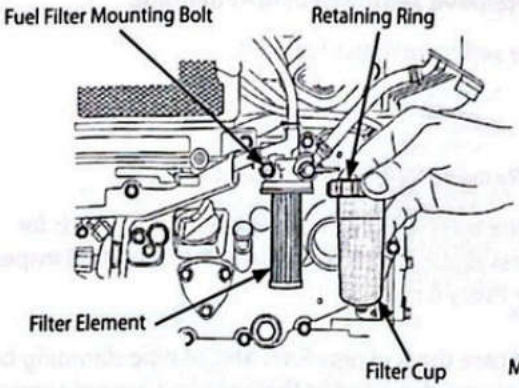
   Operate the device with the fuel cock lever kept in the "OPEN (O)" position.

IMPORTANT: Mixed dust/dirt in fuel may cause the fuel injection pump and/or nozzles to wear. Periodically clean the fuel filter cup. If the element is bored, replace it with a new one. Failure to do so may allow dust to be included in the fuel, resulting in shorter service life of the injection pump and nozzles.



4 Replace Fuel Filter Element

1. Close the fuel filter cock.
2. Remove the retaining ring to remove the filter cup.
3. Replace the filter element.
4. Reinstall the element and filter cup to their original positions while taking care not to allow them to come in contact with dust/dirt.
5. Mixed dust/dirt in fuel may cause the fuel injection pump and/or nozzles to wear. Periodically clean the fuel filter cup.
6. If the element is bored, replace it with a new one. Failure to do so may allow dust to be included in the fuel, resulting in shorter service life of the injection pump and nozzles.



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5 Remove Sediment in the Fuel Tank

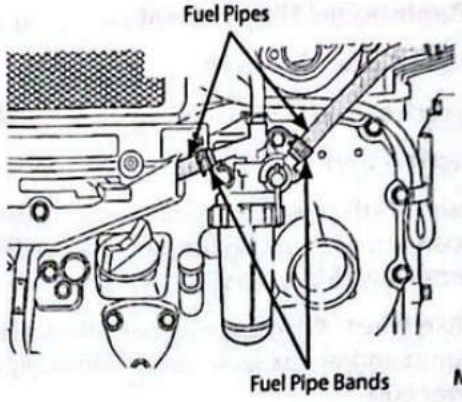
Remove sediment in the fuel tank.

6 Remove Sediment in the Fuel Tank

Check the fuel pipe lines and pipe clamping bands for looseness at the intervals shown in the periodical inspection table or every 6 months.

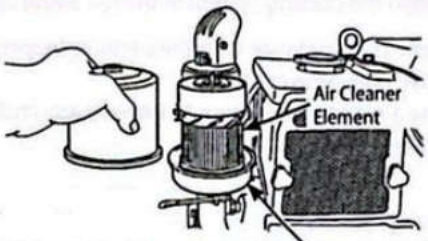
1. In case the fuel pipe lines and/or pipe clamping bands become damaged or the fuel pipes are not correctly connected, replace or repair them at the earliest possible.
2. The fuel pipes are made of rubbers, which are consumable products so that they may become obsolete due to aging without using. Replace the fuel pipes with new ones every 2 years together with the clamping bands at the same time. Make sure to correctly tighten the clamping bands.
3. After replacing, bleed air from the fuel pipe lines.

IMPORTANT: After removing pipes, plug both pipe ends with clean cloths or papers to prevent dirt from coming into the pipes. Contamination of the fuel pipes may cause malfunction of the fuel injection pump.



7 Clean Air Cleaner Element

1. Remove the element tightening wingnut.
2. Remove the dust cup.
3. Remove dust adhered to the air cleaner element and/or dust cup.
4. Reinstall the dust cup. Tighten the element tightening wingnut.



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IMPORTANT: Precautions for the Air Cleaner Maintenance

A dry type element is used. Do not supply oil. Remove dust from the element and the dust cup once a week in normal operation site or every day in case the operation area is especially dusty. When the element becomes dirty or wet, wipe to clean the element with a clean towel. Avoid touching the element unless required for cleaning. Clean the element in accordance with the periodic inspection table while referring to the caution plate affixed on the element. Generally, replace the element every year or after cleaning 6 times. If the element becomes severely stained, replace it at a shorter interval. Securely tighten the element tightening wingnut after correctly installing the element. If insufficiently tightened, dirty air may be drawn in, possibly causing the cylinder liners and/or pistons to wear quickly so that the engine output power may be reduced.

8 Replace Air Cleaner Element

1. Remove the air cleaner element tightening wingnut.
2. Remove the cup.
3. Replace the air cleaner element.
4. Install the cup. Retighten the element tightening wingnut.

9 Clean Radiator Interior

1. Clean the cooling system in the following cases.

- Clean in accordance with the periodic inspection table.
- When changing coolant:

2. Use a radiator detergent to remove accumulated water scale.

Cleaning Procedure:

1. Mix up the radiator cleaner with clean water in the ratio described on the cleaner box in a container (coolant capacity: 1.2L). Pour the mixture into the radiator through the radiator filler port.

   (Before pouring the mixture, check inside the radiator tube for build-up dirt through the filler port.)

   (Never use chlorine cleaner when using a commercial cleaner product.)

2. Lightly operate the machine for 4 to 5 hours with the cleaner in the radiator.

3. Cool the radiator until it becomes touchable; then place a proper container under drain cock and open the drain cock. (Do not dispose waste onto the ground, into rivers or any other natural source of water.)

4. When the drain speed decreased, open the radiator cap to completely drain the water

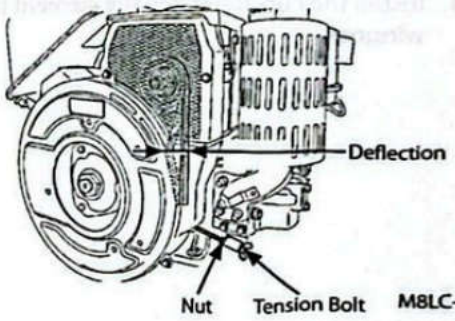
5. After the cleaner is completely drained, pour tap water into the radiator from the filler port to wash out the sediment and cleaner from the radiator. (Wash other parts such as rubber packing of the cap with tap water.)

10 Check Fan Belt Tension

Replace the fan belt if any wear or cracks are found on the fan belt, or replace the fan blade if any damage or cracks are found on the fan blade.

1. Depress the mid point of the belt with your thumb. When fan belt tension is correct, the belt deflection will be approximately 5 to 10 mm.

2. In case the deflection is not within specifications, adjust belt tension by loosening the tension pulley-mounting bolt to move the tension pulley. After adjustment is complete, securely tighten the bolt.



11 Replace Fan Belt

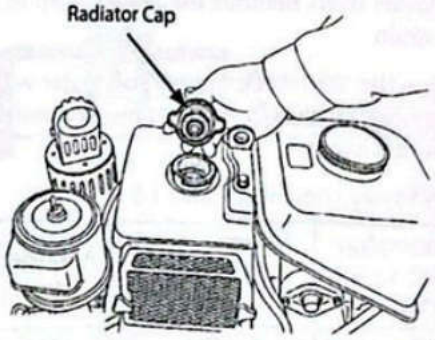
Consult your nearest Hitachi dealer for replacement.

12 Check Cooling Fan for Cracks

Replace the cooling fan in case the wear and/or cracks are found.

13 Check Coolant Level

1. Open the radiator cap. Check if coolant is filled up to the coolant filler port.
2. In case coolant level is lower due to evaporation of the coolant, refill only fresh water (soft water) such as tap water. If the coolant level is lower due to leakage of the coolant, fill fresh water mixed with antifreeze at the specified mixing ratio.



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⚠ CAUTION: Do not loosen the radiator cap until coolant in the radiator becomes cool. Skin contact with escaping hot steam can cause scald. Slowly loosen the cap to release pressure only after coolant is cool.

- Areas to check and action to be taken when coolant abnormally decreases
  1. Check if dust is clogged in between the radiator and tube; clean them if necessary.
  2. Check the fan belt tension. Tighten if necessary.
  3. Check inside of the radiator tube for dirt accumulation. Clean the radiator with cleaner if necessary.

- Clean radiator core (Exterior)

⚠ CAUTION: If accumulation of dirt is found between the fin and the tube, wash out them by pressurized tap water. Do not use a hard tool such as a scraper or a screw driver for cleaning. Failure to do so may scratch the special fin or tube, causing drop in cooling system's performance and coolant leakage.

14 Change Coolant

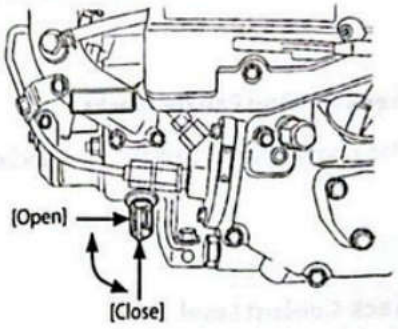
*NOTE: * The machine shipped from the factory is filled with coolant mixed with Hitachi Long Life Coolant (LLC). When Hitachi Long Life Coolant is used, change coolant every two years.*

CAUTION: Do not loosen the radiator cap until coolant in the radiator becomes cool. Skin contact with escaping hot steam can cause scald. Slowly loosen the cap to release pressure only after coolant is cool.

1. Open the drain cock located at the lower section of the cylinder head. Remove the radiator cap to allow coolant to drain.
2. Close the drain cock. Supply soft water with fewer impurities included. At that time, add anti-freeze and antirust agent.

   Necessary coolant volume: 1.2 L

Air temperature at operation site [°C]	Mixing ratio of antifreeze [%]	Antifreeze [cc]	Soft water [cc]
-5	10	120	1080
-20	35	420	780
-40	50	600	600



M8LC-047

15 16 Check Battery Electrolyte and Replace Battery

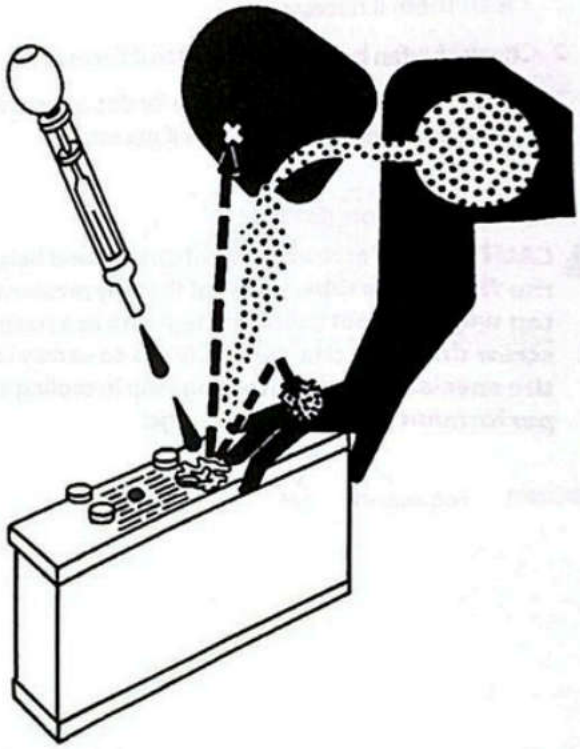
WARNING:

- **Explosive gas is generated while the battery is in use or being charged. Keep sparks and open flames away from battery.**
- **Do not continue to use or charge the battery when electrolyte level is lower than specified. Explosion of the battery may result. Charge the battery in a well-ventilated area.**
- **The battery electrolyte is dilute sulfuric acid, which is strong enough to burn skin, eat holes in clothing, and corrode metals. Use extra care when handling the electrolyte.**

SA-032

IMPORTANT: If the battery is used with the electrolyte level lower than the specified lower level, the battery may quickly deteriorate. Do not refill electrolyte more than the specified upper level. Electrolyte may spill, damaging the painted surfaces and/or corroding other machine parts.

NOTE: In case electrolyte is refilled more than the specified upper level or beyond the bottom end of the sleeve, remove the excess electrolyte until the electrolyte level is down to the bottom end of the sleeve using a pipette. After neutralizing the removed electrolyte with sodium bicarbonate, flush it with plenty of water or consult the battery manufacturer.



SA-036

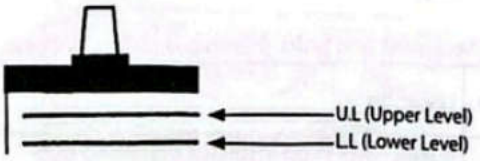
Check Battery Electrolyte Level: every month

Check the battery electrolyte level at least once a month.

1. Park the machine on a level surface. Stop the engine.
2. Check the electrolyte level.

2.1 When checking the level from the battery side:

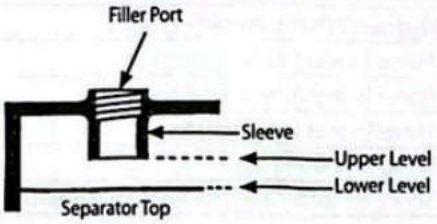
Clean around the level check lines with a wet towel. Check if the electrolyte level is between U.L (Upper Level) and L.L (Lower Level). Do not use a dry towel. Static electricity may be developed, causing the battery gas to explode. In case the electrolyte level is lower than the middle level between the U.L and the L.L, immediately refill distilled water or commercial battery fluid. Be sure to refill distilled water or commercial battery fluid before charging the battery (operating the machine). After refilling, securely tighten the filler plug.



M146-07-109

2.2 When impossible to check the level from the battery side or no level check mark is indicated on the side:

After removing the filler plug from the top of the battery, check the electrolyte level by viewing through the filler port. As it is difficult to judge the accurate electrolyte level in this case, the level is judged to be proper when the electrolyte level is flush with the U.L. Referring to the illustrations and instruction shown to the right, check the level. When the electrolyte level is lower than the bottom end of the sleeve, refill with distilled water or commercial battery fluid to the bottom end of the sleeve. Be sure to refill distilled water or commercial battery fluid before charging the battery (operating the machine). After refilling, securely tighten the filler plug.



M146-07-110

Proper

Since the electrolyte surface touches the bottom end of the sleeve, the electrolyte surface is raised due to surface tension so that the electrode ends are seen curved.

M146-07-111

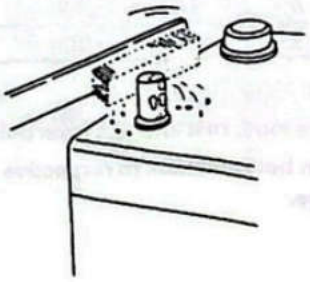
Lower

When the electrolyte surface is lower than the bottom end of the sleeve, the electrode ends are seen straight.

M146-07-112

2.3 When an indicator is available to check the level, follow its check result.

3. Always keep around the battery terminals clean to prevent battery discharge. Check terminals for looseness and/or rust. Coat terminals with grease or petroleum jelly to prevent corrosion build up.



M409-07-072

B. Check Tightening Torque of Nuts and Bolts

--- Daily

Check nuts and bolts shown below for tightness.

No	Location	Screw Size	Q'ty	Wrench Size	Torque	
					N·m	(kgf·m)
1	Rubber vibration insulator mounting nuts	12	8	19	90	(9.0)
2	Engine mounting bolts	10	4	17	50	(5.0)
3	Hydraulic oil tank mounting bolts	10	4	17	50	(5.0)
4	Hydraulic pump mounting bolts	10	2	17	65	(6.5)
5	Pump bracket holding bolts	10	4	17	65	(6.5)
6	Roller bearing mounting bolts	12	24	19	90	(9.0)
7	Travel motor mounting bolts	10	8	17	50	(5.0)
8	Scraper holding bolts	10	8	17	50	(5.0)
9	Sprinkler tank-band holding double nuts	8	4	13	10	(1.0)

Tightening Torque Chart

Bolt Dia. mm	Hexagon Head Bolt						Wrench Size mm	Socket Bolt		
	10.9 T		8.8 H		7 M			Socket Bolt		Wrench Size mm
	N·m	(kgf·m)	N·m	(kgf·m)	N·m	(kgf·m)		N·m	(kgf·m)	
6					3.3~4.2	(0.3~0.4)	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)	35	(3.5)	19	90	(9)	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
18	400	(40)	300	(30)	120	(12)	27	300	(30)	14
20	550	(55)	400	(40)	170	(17)	30	400	(40)	17

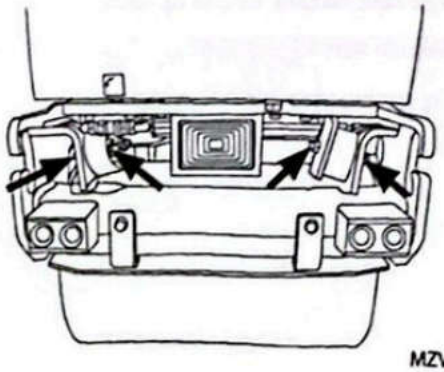
IMPORTANT:

- **Remove mud, rust and dirt from bolt and nut threads before tightening.**
- **Tighten bots and nuts to respective specification. Failure to do so may cause bolt and/or nut to come off or damage.**

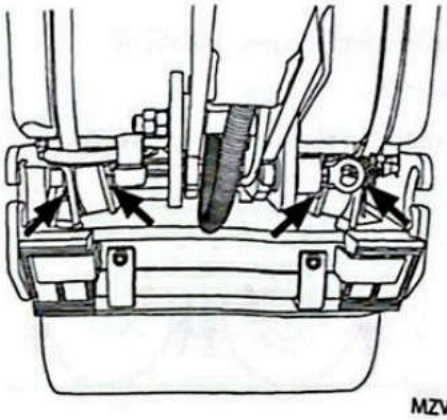
1. Rubber vibration insulator mounting nuts

   Wrench size: 19 mm

   Tightening torque: 90 N·m (9 kgf·m)



MZV550-027

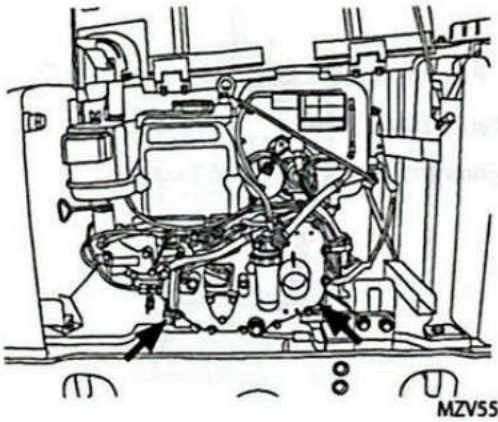


MZV550-026

2. Engine mounting bolts

   Wrench size: 17 mm

   Tightening torque: 50 N·m (5 kgf·m)

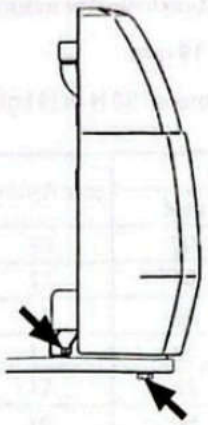


MZV550-023

3. Hydraulic oil tank mounting bolts

   Wrench size: 17 mm

   Tightening torque: 50 N·m (5.0 kgf·m)

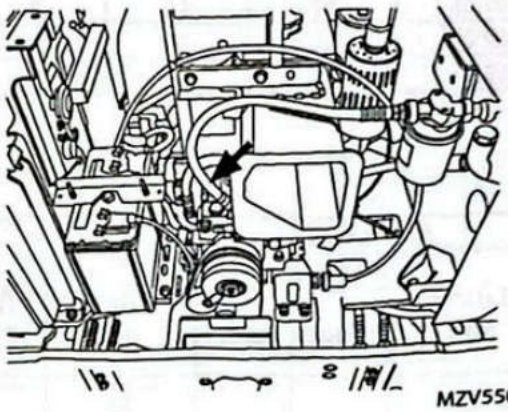


MZV550-032

4. Hydraulic pump mounting bolts

   Wrench size: 17 mm

   Tightening torque: 65 N·m (6.5 kgf·m)

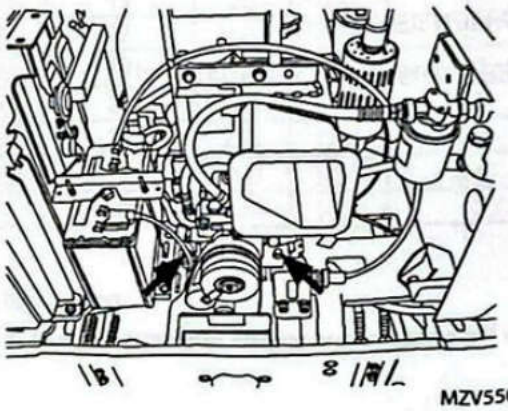


MZV550-005

5. Pump bracket holding bolts

   Wrench size: 17 mm

   Tightening torque: 65 N·m (6.5 kgf·m)

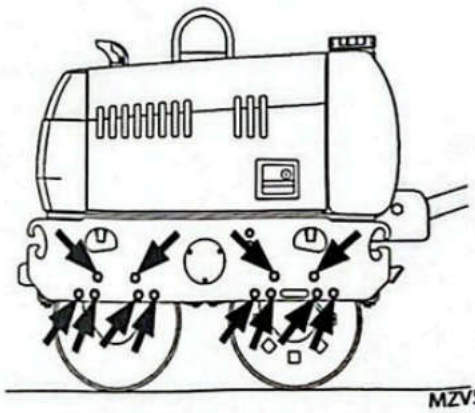


MZV550-005

6. Roller bearing mounting bolts

   Wrench size: 19 mm

   Tightening torque: 90 N·m (9.0 kgf·m)

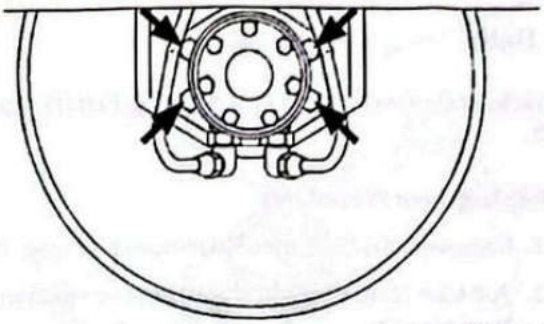


MZV550-033

7. Travel motor mounting bolts

   Wrench size: 17 mm

   Tightening torque: 50 N·m (5.0 kgf·m)

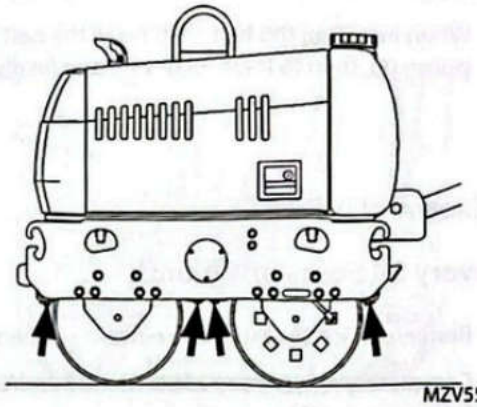


MZV550-034

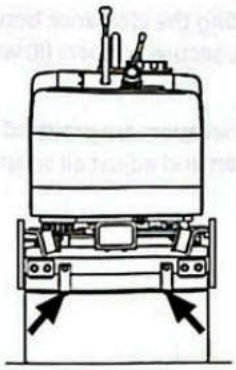
8. Scraper holding bolts

   Wrench size: 17 mm

   Tightening torque: 50 N·m (5.0 kgf·m)



MZV550-033

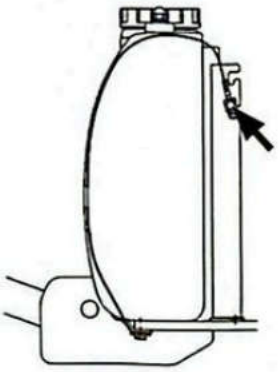


MZV550-035

9. Sprinkler tank-band holding double nuts

   Wrench size: 13 mm

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



MZV550-036

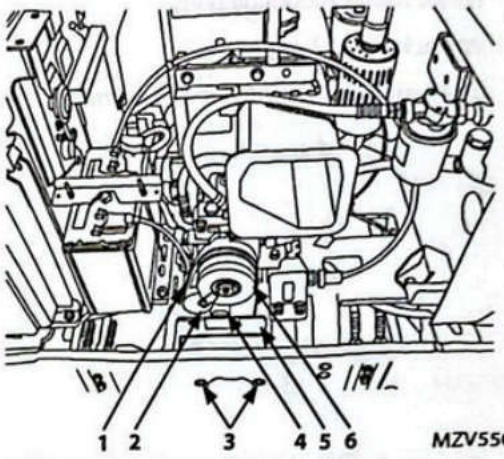
C. Check Vibration Belt

--- Daily

If cracks and/or wear are found on driving belt (1), replace the belt.

Replacement Procedures

1. Remove bolts (3) (2 used) to remove belt cover (5).
2. Pull idler (2) to the right side to remove vibration belt (1) from idler (2).
3. Remove vibration belt (1) from lower pulley (4).
4. When installing the belt, first install the belt to upper pulley (6), then to lower pulley (4) and finally to idler (2).

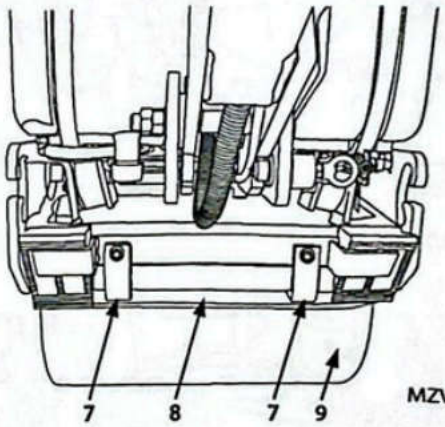


MZV550-005

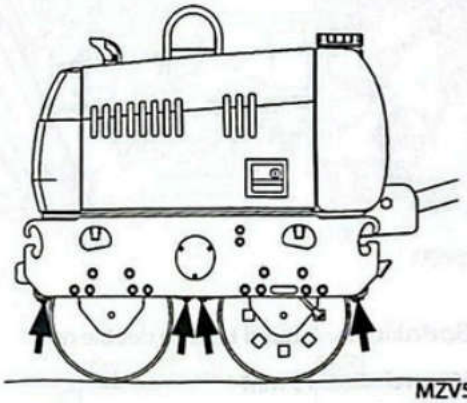
D. Clean and Adjust Scraper

--- every 50 hours or 1 month

1. Remove bolts (7) (2 used) to remove scrapers (8).
2. Completely remove any adhered mud and/or asphalt from scrapers (8).
3. After adjusting the clearance between drum (9) and scrapers (8), secure scrapers (8) with bolts (7) (2 used) in position.
4. Two sets of scrapers are provided on the front and rear wheels. Clean and adjust all scrapers.



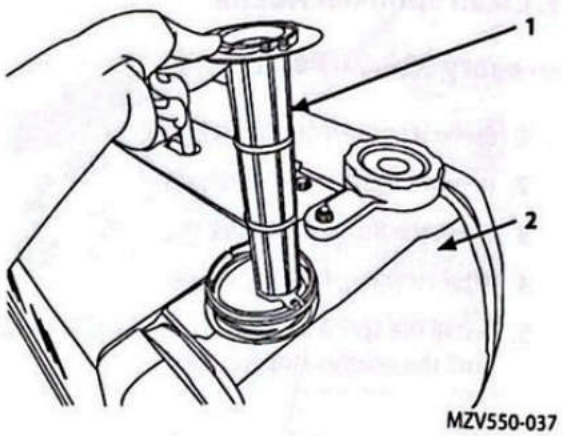
MZV550-026


MZV550-033

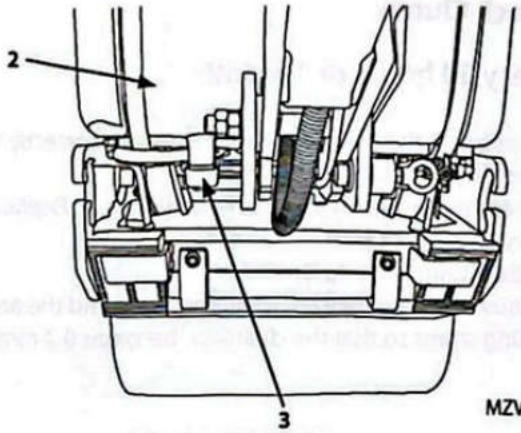
E. Clean Sprinkler Tank

--- every 50 hours or 1 month

1. Remove strainer (1) and clean it.
2. Remove drain cap (3) on the bottom of sprinkler tank (2). Drain water from sprinkler tank (2).
3. Clean the inside of sprinkler tank (2).
4. After cleaning, tighten drain cap (3).



MZV550-037

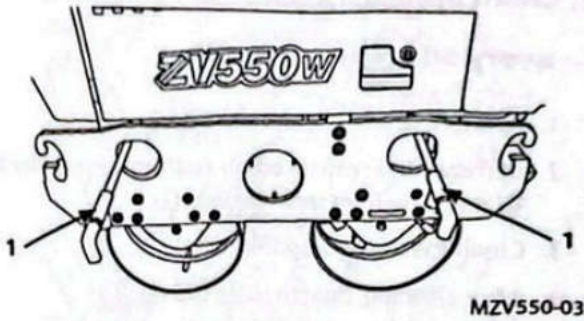


MZV550-026

F. Clean Sprinkler Nozzle

--- every 50 hours or 1 month

1. Pull out sprinkler nozzles (1) straight.
2. Remove the caps on nozzles (1).
3. Clean the inside of nozzles (1).
4. After cleaning, install the caps.
5. Install the sprinkler nozzles into the tees in the bracket until the nozzles stop moving.

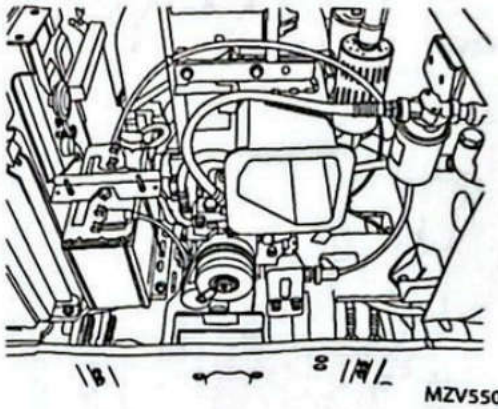


MZV550-038

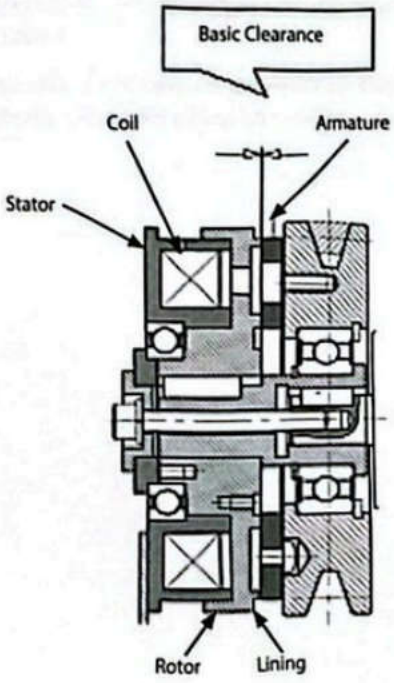
G. Check Clutch

--- every 50 hours or 1 month

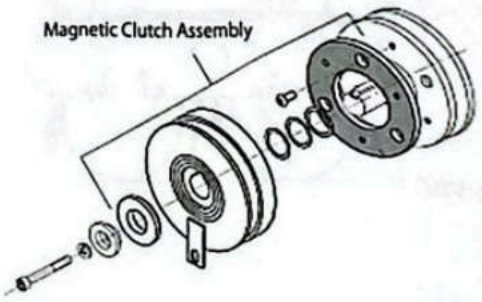
- Check that the magnetic clutch operates correctly with the vibration switch turned ON.
- Check the V-belt for any cracks and/or wear. Replace if any. (Size: A-32 Red)
- Adjust Clutch.
  Adjust the clearance between the lining and the armature using shims so that the clearance becomes 0.2 mm.



MZV550-005



MZV550-039

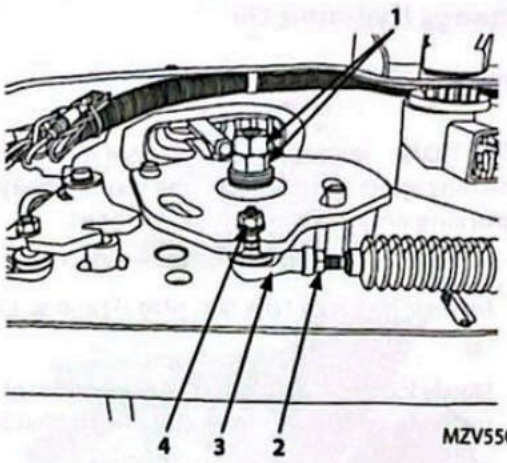


MZV550-040

H. Adjust Control Force of FNR Lever

--- every 100 hours or 3 month

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

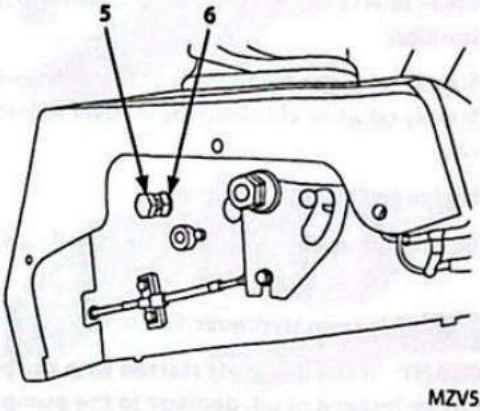


MZV550-041

I. Adjust the Neutral Position of FNR Lever

--- every 800 hours or year and a half

1. Stop machine operation according to the procedures for Inspection / Maintenance preparation.
2. Remove nut (4) fastening the FNR lever and ball joint (3).
3. Loosen lock nut (2) of ball joint (3).
4. Turn ball joint (3) to adjust the neutral position of ball joint (3). In case if the neutral position is difficult to find, loosen nut (5) and tighten bolt (5). While moving FNR lever (1) back and forth, adjust the neutral position. Tighten nut (6).
5. Connect ball joint (3) to the FNR lever and tighten nut (4).
6. Start the engine. Move the accelerator lever to the Operation position. Check that the machine does not travel with the FNR lever in the neutral position.
7. After checking is complete, start the engine. Tighten lock nut (2).

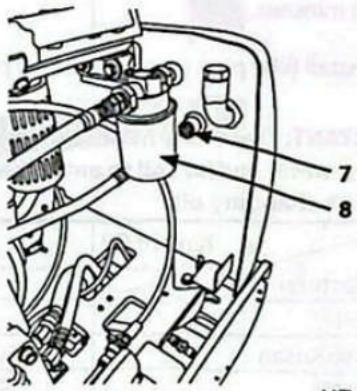


MZV550-042

J. Check Hydraulic Oil Level

--- Daily

Check oil level with level gauge (7) on right side of hydraulic oil tank. Oil must be between marks on gauge (7).



MZV550-021

K. Replace Hydraulic Oil Filter

--- every 500 hours or 1 year

⚠ **CAUTION: Immediately after operation, hot hydraulic oil may spout out, possibly causing burns. Always start working only after allowing oil to cool.**

1. Place an appropriate container under hydraulic oil filter cartridge (8) to prevent spilled oil from contaminating the ground.
2. Replace hydraulic oil filter cartridge (8) with a new one.
3. Check the hydraulic oil level with hydraulic oil level gauge (7). Add as required.

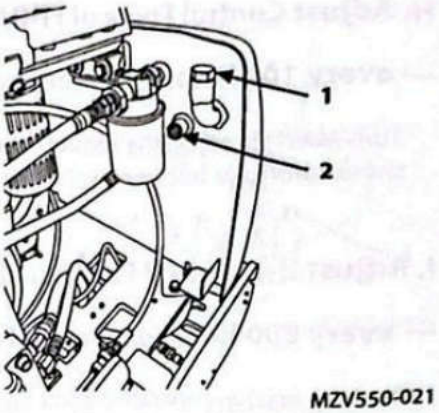
L. Change Hydraulic Oil

--- every 1000 hours or 2 year

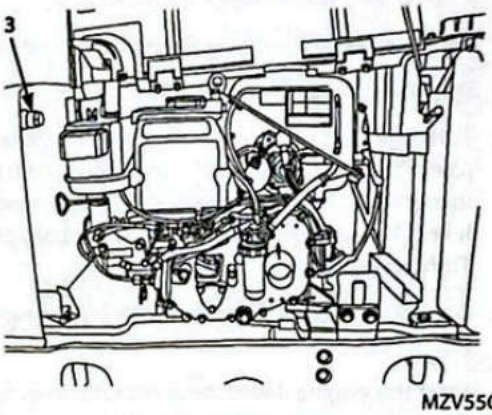
⚠ CAUTION: Immediately after operation, hot hydraulic oil may spout, possibly causing burns. Always start working only after allowing oil to cool.

1. Park the machine on a solid level surface.
2. Remove hydraulic tank filler plug (1) and air bleed plug (3).
3. Slowly loosen drain plug (4) on the bottom of the hydraulic oil tank to completely drain hydraulic oil.
4. Clean the inside of the hydraulic oil tank.
5. Clean drain plug (4). Securely re-install it to its original position.
6. Supply oil to the hydraulic tank through the filler port. Supply oil while checking the oil level with level gauge (2).

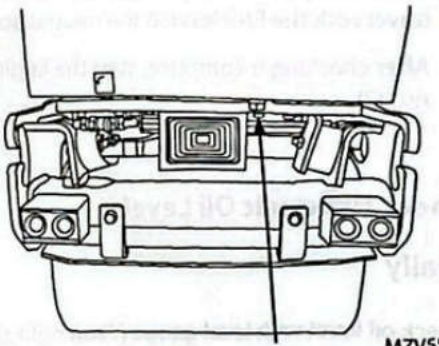
   Hydraulic Oil Quantity: 20 litters
7. Bleed air from the hydraulic system as described below.



MZV550-021



MZV550-023



MZV550-027

Bleeding Air from Hydraulic System

IMPORTANT: If the engine is started with the pump filled with air instead of oil, damage to the pump may result. Be sure to bleed air from the hydraulic system.

- After placing the FNR in the neutral position, the vibration lever in the OFF and the accelerator lever in the Operation position respectively, operate the machine for 10 minutes.

8. Install filler plug (1) and air bleed plug (3).

IMPORTANT: Take care not allow foreign matter such as dirt, water and/or soil to enter the hydraulic oil tank when changing oil.

Kind of Oil / Manufacturer	Hydraulic Oil
HITACHI	
Idemitsu Kosan	* Super Hydro, HN46
Caltex Oil	Rando Oil HD46
Texaco INC.	Rando Oil HD46
Chevron U.S.A INC.	Chevron AW46
Esso	NUTO H46
Mobil Oil	DTE25
Shell Oil	Tellus Oil 46
Remarks	Anti-wear type Hydraulic Oil

*NOTE: * This hydraulic oil is filled in new machines when shipped from the factory.*

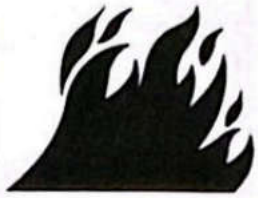
M. Check Hoses and Pipe Lines

--- every 250 hours or 6 month

CAUTION: Pay attention to the following points.

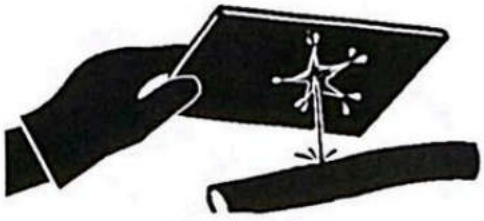
- **Flammable fluid leaks can lead to fire. Check for missing or loose clamps, kinked hoses, pipe lines or hoses that rub against each other, or come in contact with other parts, or oil leaks.**
- **Escaping fluid under pressure can penetrate the skin causing serious injury. Search for leaks with a piece of cardboard. Carefully protect hands and body from high-pressure fluids. If any fluid is injected into the skin, see a doctor familiar with this type of injury immediately.**
- **Repair or replace any missing, loose or damaged clamps, hoses or lines.**
- **Do not bend or strike high-pressure line-pipes.**
- **Never install bent or damaged hoses or line-pipes.**

According to the checkpoints as shown below, check hoses and line-pipes for oil leaks and damage. If any abnormalities are found, replace or retighten them as shown in the Tables below.

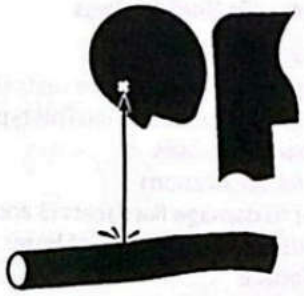


SA-019

SA-031



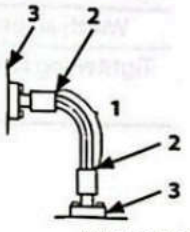
SA-044



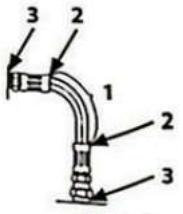
SA-292

Hoses

Interval (hours)	Check Points	Abnormalities	Remedies
Daily	Hose covers	Leak (1)	Replace
	Hose ends	Leak (2)	Replace
	Hose joint	Leak (3)	Retighten or replace hose and O-rings

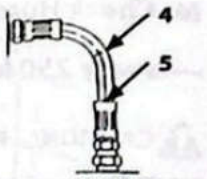


M137-07-008



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
	Hose	Bend (8), Collapse (9)	Replace
	Hose ends and fittings	Deformation or corrosion (10)	Replace



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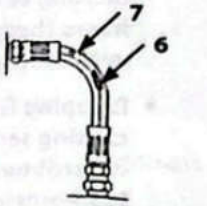

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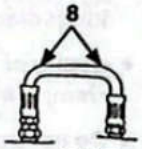
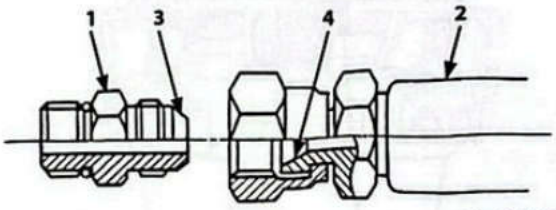


M115-07-148

M115-07-149

Kinds of Hydraulic Hose Fittings

- Metal Face Seal Fitting
  Tight contact between metal flare seats (3 and 4) on adaptor (1) and hose (2) seals pressure oil. This type of fitting is used on smaller diameter hoses.
  Precautions for applications
  Take care not to damage flare seats (3 and 4) during connection/disconnection work of hoses and line-pipes.
  Tightening Torque
  Tighten to the torque specifications in the table below.



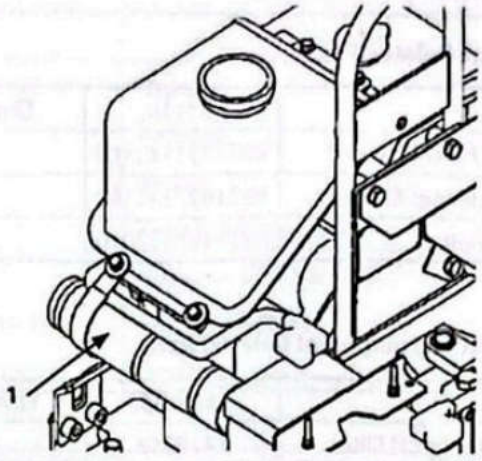
M202-07-051

Width across flats (mm)		19	22	27
Tightening torque	N·m	29.5	39	93
	(kgf·m)	(3)	(4)	(9.5)

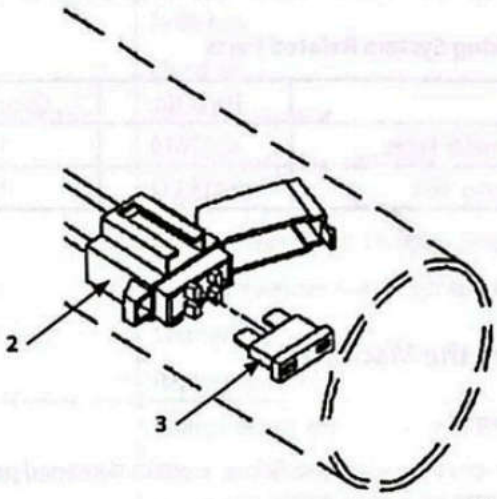
N. Replace Fuse

If any electrical equipment fails to operate, first open fuse holder (2) in rubber sheet (1) installed on the fuel tank and check fuse (3).

- Fuse
  In case the starter does not rotate even if the key is turned to the Start position, blown fuse (3) may be the cause of the trouble. Check the fuse and replace as needed.
- 30A 1 piece



MZV550-054



MZV550-055

Consumable Parts Lists

Engine Related Parts

	Parts No.	Quantity
Fuel Filter Element	KBT1523143560	1
Air Cleaner Element	KBT1497111180	1
Fan Belt	KBT1497197010	1

Hydraulic Equipment Related Parts

	Parts No.	Quantity
Hydraulic Oil Filter	Y418748	1

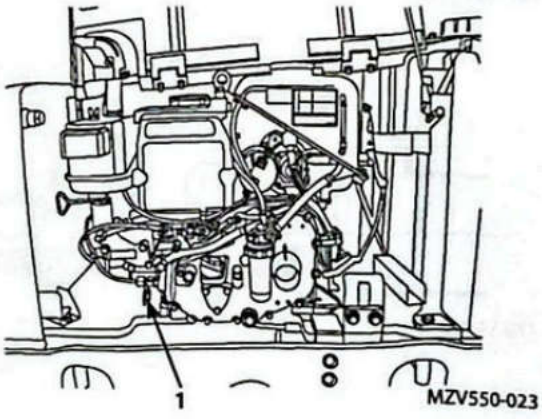
Working System Related Parts

	Parts No.	Quantity
Sprinkler Filter	4372619	1
Driving Belt	Y418322	1

Storing the Machine

Storage

1. Inspect the machine. Repair worn or damaged parts. Install new parts if necessary.
2. Thoroughly remove fuel from the fuel tank.
3. Open water drain cock (1) to drain coolant from the radiator.
4. Clean the machine.
5. After fully charging the battery, remove them from the machine and store them in a dry protected place. In case the battery is not removed, disconnect the negative battery cable from the (-) terminal.
6. Cover the machine with a waterproof cover. Store the machine in a dry protected place.
7. Attach a "No Water in Radiator" tag on the machine.



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 fuel filter cartridge, Clean the strainer
	Insufficient intake air	Clean or replace air cleaner element
	Insufficient compression air	Replace cylinder and/or piston ring
	Poor quality fuel	Change fuel
	Broken glow plug	Replace glow plug
Starter motor does not rotate.	Low battery power	Charge or replace the battery
	Mal function of starter or starter relay	Repair or replace
	Damaged key switch	Replace
	Faulty wire harness	Repair or replace
	Travel 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

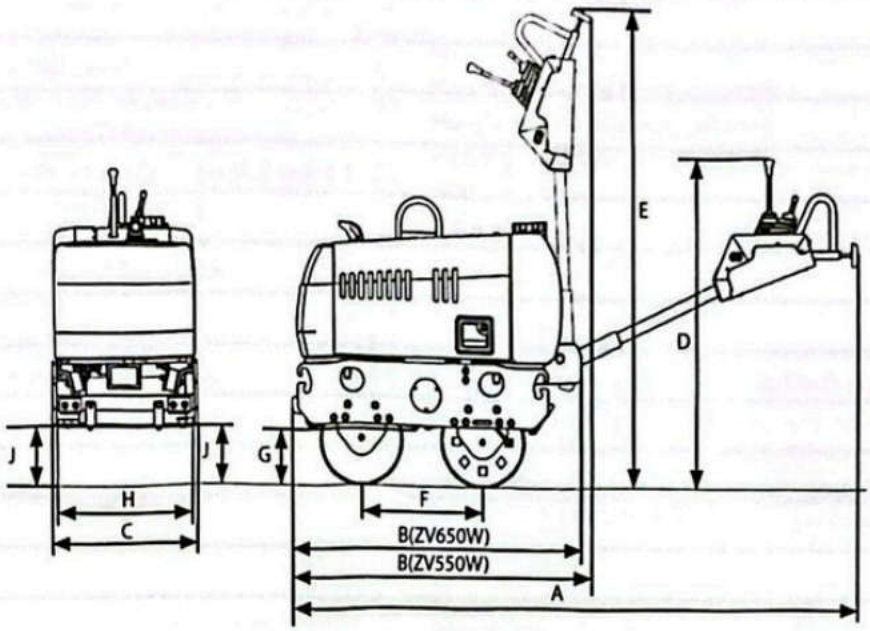
FNR Lever

Problem	Cause	Solution
Moves hard	Damage to the pump control section	Repair or replace
	Rusted ball joints	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



MZV550-056

				ZV550W	ZV650W
		Model			
Mass	Operating Mass		kg	640	720
		Front Wheel	kg	245	275
		Rear Wheel	kg	395	445
	Machine Mass		kg	585	665
		Front Wheel	kg	263	292
		Rear Wheel	kg	322	373
Linear Pressure	Static Linear Pressure: Machine Mass	Front Wheel	N/cm(kgf/cm)	44.0(4.5)	44.0(4.5)
		Rear Wheel	N/cm(kgf/cm)	53.8(5.5)	56.2(5.7)
		Average	N/cm(kgf/cm)	48.9(5.0)	50.1(5.1)
	Dynamic Linear Pressure: Machine Mass	Average	N/cm(kgf/cm)	133(13.6)	133(13.6)
Dimension	A: Overall Length		mm	2400	2555
	B: Overall Length (Stored)		mm	1280	1270
	C: Overall Width		mm	630	700
	D: Overall Height		mm	1265	1265
	E: Overall Height (Stored)		mm	1820	1950
	F: Center Distance between Front and Rear Wheels		mm	560	560
	G: Minimum Ground Clearance		mm	219	248
	H: Front/Rear Wheel Width		mm	586	650
	I: Front/Rear Wheel Diameter		mm	356	406
	J: Curve Clearance	Right	mm	235	260
		Left	mm	235	260
Performance	Travel Speed		km/h	0~3.7	
	Gradeability		Degree (%)	20(36)	
	Exciter Performance	Number of Vibration	Hz (vpm)	55(3300)	
		Vibration Force	kN (kgf)	9.8(1000)	10.8(1100)
		Amplitude	mm	0.3	0.25
Engine	Model			KUBOTA E75-E3-NB3	
	Piston Displacement (Total Cubic Displacement)		L (cc)	0.325(325)	
	Rated Horsepower	kW/min^{-1}(PS/rpm)		4.6/2500(6.3/2500)	
	Max. Torque		N·m/min^{-1} (kgf·m/rpm)	18.1 or more /2000(1.85 or more /2000)	
	Fast Idle Speed		min^{-1} (rpm)	2680	
	Fuel Tank Capacity		L	4.8	
Sprinkler			L	55	

MEMO

INDEX

CALIFORNIA

Proposition 65 Warning

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

Hitachi Construction Machinery Co., Ltd.

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