

Technical Manual

Troubleshooting

EH

4000AC-3

Rigid Dump Truck

EH4000AC-3 RIGID DUMP TRUCK TECHNICAL MANUAL TROUBLESHOOTING

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

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

INTRODUCTION

To The Reader

This manual is written for an experienced technician to provide technical information needed to maintain and repair this machine.

- Be sure to thoroughly read this manual for correct product information and service procedures.

- If you have any questions or comments, or if you found any errors regarding the contents of this manual, please contact using "Service Manual Revision Request Form" at the end of this manual. (Note: Do not tear off the form. Copy it for usage.):
 - Publications Marketing & Product Support Hitachi Construction Machinery Co. Ltd.
 - TEL: 81-29-832-7084
 - FAX: 81-29-831-1162
 - E-mail: dc@hitachi-kenki.com

Additional References

Please refer to the other materials (operator's manual, parts catalog, engine technical material and Hitachi training material etc.) in addition to this manual.

Manual Composition

This manual consists of the Technical Manual, the Workshop Manual and the Engine Manual.

- Information included in the Technical Manual: Technical information needed for redelivery and delivery, operation and activation of all devices and systems, operational performance tests, and troubleshooting procedures.

- Information included in the Workshop Manual: Technical information needed for maintenance and repair of the machine, tools and devices needed for maintenance and repair, maintenance standards, and removal / installation and assemble / disassemble procedures.

- Information included in the Engine Manual: Technical information needed for redelivery and delivery and maintenance and repair of the machine, operation and activation of all devices and systems, troubleshooting and assemble / disassemble procedures.

Page Number

Each page has a number, located on the center lower part of the page, and each number contains the following information:

Example:

- Technical Manual: T 1-3-5

| | |
|---|--|
| T | Technical Manual |
| 1 | Section Number |
| 3 | Group Number |
| 5 | Consecutive Page Number for Each Group |


- Workshop Manual: W 1-3-2-5


| | |
|---|--|
| W | Workshop Manual |
| 1 | Section Number |
| 3 | Group Number |
| 2 | Sub Group Number |
| 5 | Consecutive Page Number for Each Sub Group |

INTRODUCTION


Safety Alert Symbol and Headline Notations

In this manual, the following safety alert symbol and signal words are used to alert the reader to the potential for personal injury of machine damage.

 This is the safety alert symbol. When you see this symbol, be alert to the potential for personal injury. Never fail to follow the safety instructions prescribed along with the safety alert symbol. The safety alert symbol is also used to draw attention to component/part weights. To avoid injury and damage, be sure to use appropriate lifting techniques and equipment when lifting heavy parts.

 **CAUTION:**
Indicated potentially hazardous situation which could, if not avoided, result in personal injury or death.

IMPORTANT:
Indicates a situation which, if not conformed to the instructions, could result in damage to the machine.

 **NOTE:**
Indicates supplementary technical information or know-how.


Units Used

SI Units (International System of Units) are used in this manual. MKSA system units and English units are also indicated in parentheses just behind SI units.

Example: 24.5 MPa (250 kgf/cm², 3560 psi)

A table for conversion from SI units to other system units is shown below for reference purposes.

| Quantity | To Convert From | Into | Multiply By |
|-------------|-------------------|---------------------|-------------|
| Length | mm | in | 0.03937 |
| | mm | ft | 0.003281 |
| Volume | L | US gal | 0.2642 |
| | L | US qt | 1.057 |
| | m ³ | yd ³ | 1.308 |
| Weight | kg | lb | 2.205 |
| Force | N | kgf | 0.10197 |
| | N | lbf | 0.2248 |
| Torque | N·m | kgf·m | 0.10197 |
| Pressure | MPa | kgf/cm ² | 10.197 |
| | MPa | psi | 145.0 |
| Power | kW | PS | 1.360 |
| | kW | HP | 1.341 |
| Temperature | °C | °F | °C×1.8+32 |
| Velocity | km/h | mph | 0.6214 |
| | min ⁻¹ | rpm | 1.0 |
| Flow rate | L/min | US gpm | 0.2642 |
| | mL/rev | cc/rev | 1.0 |

 **NOTE:** The numerical value in this manual might be different from the above-mentioned table.

SAFETY


Recognize Safety Information

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



SA-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.
- 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.



IMPORTANT



SA-1223

SAFETY

Follow Safety Instructions

- Carefully read and follow all safety signs on the machine and all safety messages in operator's manual.
- Safety signs should be installed, maintained and replaced when necessary.
 - If a safety sign or operator's 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.
- The safety messages in operator's manual SAFETY chapter are intended to illustrate basic safety procedures of machines. However it is impossible for these safety messages to cover every hazardous situation you may encounter. If you have any questions, you should first consult your supervisor and/or your authorized dealer before operating or performing maintenance work on the machine.



SA-003

Prepare for Emergencies

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



SA-437

SAFETY

Wear Protective Clothing

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

You may need:

- A hard hat
- Safety shoes
- Safety glasses, goggles, or face shield
- Heavy gloves
- Hearing protection
- Reflective clothing
- Wet weather gear
- Respirator or filter mask.

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

- Avoid wearing loose clothing, jewelry, or other items that can catch on control levers or other parts of the machine.
- Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating the machine.



SA-438

Protect Against Noise

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



SA-434

Inspect Machine

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



SA-435

SAFETY

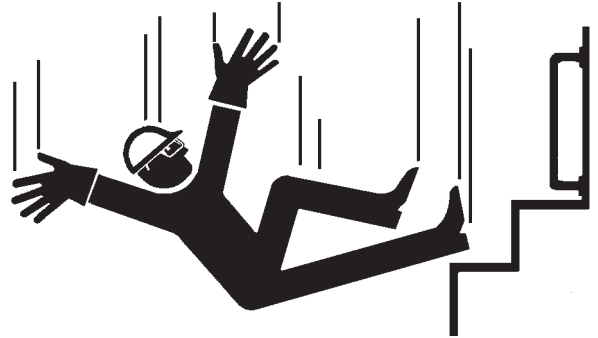
General Precautions for Cab

- Before entering the cab, thoroughly remove all dirt and/or oil such as mud, grease, soil or stones that may mess up the cab from the soles of your work boots. If any controls such as a pedal is operated while with dirt and/or oil on the soles of the operator's work boots, the operator's foot may slip off the pedal, possibly resulting in a personal accident.
- Do not mess up around the operator's seat with parts, tools, soil, stones, obstacles that may fold up or turn over, cans or lunch box. The pedals become inoperable if obstacle jams in operation stroke of the accelerator pedal, electric brake pedal or service brake pedal, which may result in serious injury or death.
- Do not leave parts and/or tools lying around the operator's seat. Store them in their specified locations.
- Avoid storing transparent bottles in the cab. Do not attach any transparent type window decorations on the windowpanes as they may focus sunlight, possibly starting a fire.
- Refrain from listening to the radio, or using music headphones or mobile telephones in the cab while operating the machine.
- Keep all flammable objects and/or explosives away from the machine.
- After using the ashtray, always cover it to extinguish the match and/or tobacco.
- Do not leave cigarette lighters in the cab. When the temperature in the cab increases, the lighter may explode.
- Use proper floor mat dedicated to the machine. If another floor mat is used, it may be displaced and contact with the accelerator pedal, electric brake pedal or service brake pedal during operation, resulting in serious injury or death.
- When operator drives the machine with decreased attentiveness, resulting in serious injury or death.
- Never operate the machine in the state with drinking alcohol or drug.

SAFETY

Use Handholds and Steps

- Falling is one of the major causes of personal injury.
 - When you get on and off the machine, always face the machine and maintain a three-point contact with the steps and handrails.
 - Do not use any controls as handholds.
 - Never jump on or off the machine. Never mount or dismount a moving machine.
 - Be careful of slippery conditions on platforms, steps, and handrails when leaving the machine.
 - Do not step or climb on surfaces, which are not intended for walking. Step only on the areas provided with the slip resistant surfaces.

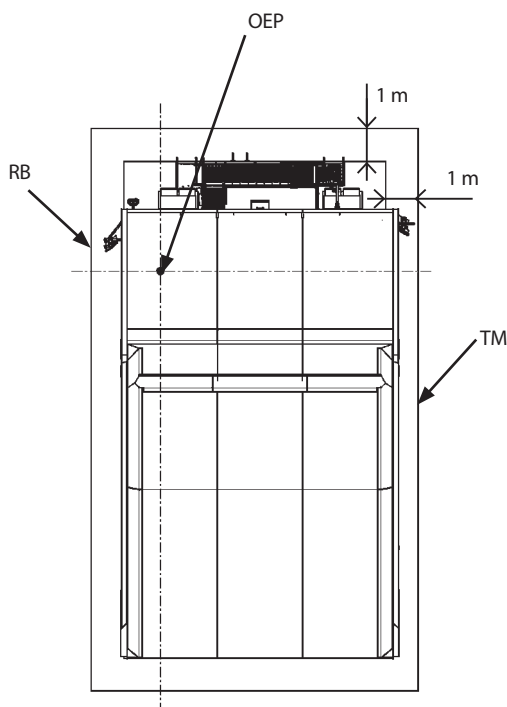


SA-439

SAFETY

Operator's Visibility

- This machine is equipped with mirrors and cameras to see around the machine. Adjust the view mirrors and cameras position so that the best visibility is obtained from the operator's seat. If the mirrors and cameras are dirty, immediately clean them. Also see carefully around the machine while moving your viewpoint as need arises.
- The view mirrors and cameras position should be adjusted whenever changing the operator for the machine. Always take extra attention for surrounded area during operating.
- When the machine is modified or fitted with equipment that influences visibility, it is necessary to check again the operator's visibility according to the ISO 5006. Contact your authorized dealer before modifying the machine.
- This machine has the blind area created because of parts of the base machine and/or its equipment from the operator's seat by direct.
- Operate the machine safely with sufficient recognition this machine has blind area from the operator's seat by direct.
- The operator's visibility according to the ISO 5006 of this machine with standard mirrors and cameras is as follows.



SA-2552

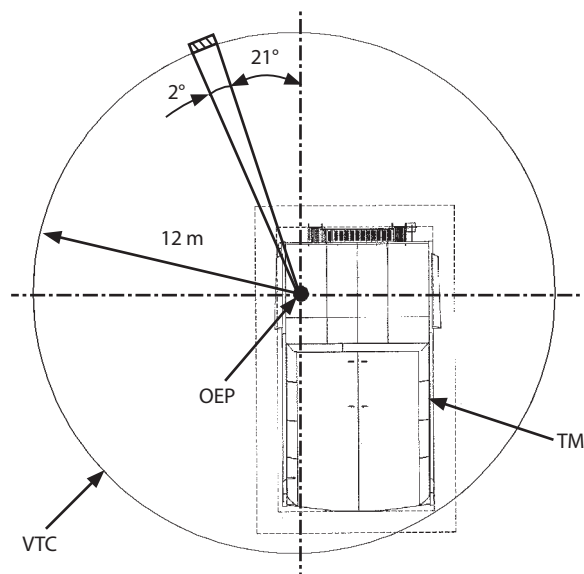
Operator's visibility on a rectangular 1 m boundary close around the machine

Operator can see the entire circumference of the height 1.5 m located at 1 m distance from the outside rectangular boundary of the machine as illustrated.

Operator's visibility on a 12 m visibility test circle

The hatched areas shown in the right illustration are interrupted from visibility by the section of the machine equipped with the view mirrors and cameras. Operate the machine safely with sufficient recognition this machine has blind area from the operator.

TM: test machine
 RB: rectangular 1 m boundary
 VTC: visibility test circle with 12 m radius
 OEP: operator's eye point



SS-3232

SAFETY

Adjust Operator's Seat

- A poorly adjusted seat for either the operator or the work at hand may quickly fatigue the operator leading to misoperations.
 - The seat should be adjusted whenever changing the operator for the machine.
 - The operator should be able to fully depress the pedals and to correctly operate the steering wheel with his back against the seat back.
 - If not, move the seat forward or backward, and check again.
 - Adjust the mirror position so that the best rear visibility is obtained from the operator's seat. If the mirror is broken, immediately replace it with a new one.



SA-462

Fasten Your Seat Belt

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

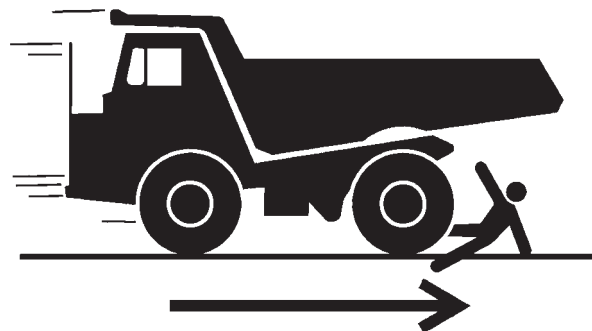


SA-237

SAFETY

Move and Operate Machine Safely

- Bystanders can be run over.
 - Take extra care not to run over bystanders. Confirm the location of bystanders before moving, or operating the machine.
 - Always keep the backup alarm and horn in working condition (if equipped). It warns people when the machine starts to move.
 - Use a signal person when moving, or operating the machine in congested areas. Coordinate hand signals before starting the machine.
 - Use appropriate illumination. Check that all lights are operable before operating the machine. If any faulty illumination is present, immediately repair it.
 - Always keep the cab door closed while operating the machine.
 - Check the mirrors and the monitors in the CAB for problems. If there are problems, replace the problem parts or clean the mirrors, cameras and monitors. Refer to Camera Monitor section on the cleaning of the camera and monitor.



SA-1598

Handle Starting Aids Safely

Starting fluid:

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



SA-293

SAFETY

Operate Only from Operator's Seat

- Inappropriate engine starting procedures may cause the machine to runaway, possibly resulting in serious injury or death.
 - Start the engine only when seated in the operator's seat.
 - NEVER start the engine while standing on the platform.
 - Do not start engine by shorting across starter terminals.
 - Check that the parking brake switch is turned ON.
 - Before starting the engine, confirm that shift lever is in the NEUTRAL position.
 - Before starting the engine, confirm the safety around the machine and sound the horn to alert bystanders.



SA-1599

Jump Starting

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



SA-032

SAFETY

Avoid Injury Caused by High Tension Electric Shock

- Never attempt to open any electrical component covers displaying a decal with the words "HIGH VOLTAGE." You may receive an electric shock, possibly resulting in personal injury or death.
- Never attempt to touch or grab any high tension electrical components or the power cable with wet hands. You may receive an electric shock, possibly resulting in personal injury or death.



SA-112

Investigate Job Site Beforehand

- When working on a road shoulder, the machine could tip over, possibly resulting in serious injury or death.
 - Investigate the configuration and ground conditions of the job site beforehand to prevent the machine from falling and to prevent the ground, stockpiles, or banks from collapsing.
 - Make a work plan. Use machines appropriate to the work and job site.
 - Reinforce ground, edges, and road shoulders as necessary. Keep the machine well back from the edges of excavations and road shoulders.
 - When working on an incline or on a road shoulder, employ a signal person as required.
 - When the footing is weak, reinforce the ground before starting work.
 - When working on frozen ground, be extremely alert. As ambient temperatures rise, footing becomes loose and slippery.
 - Beware the possibility of fire when operating the machine near flammable objects such as dry grass.
 - Driver should try to travel the road once to understand potential danger.



SA-1601

Provide Signals for Jobs Involving Multiple Machines

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

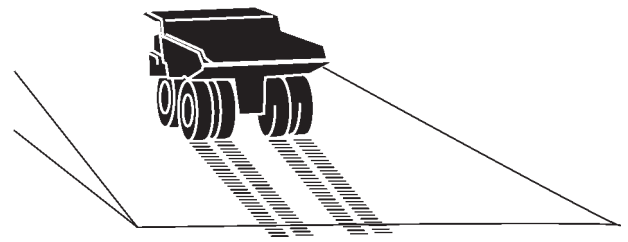


SA-481

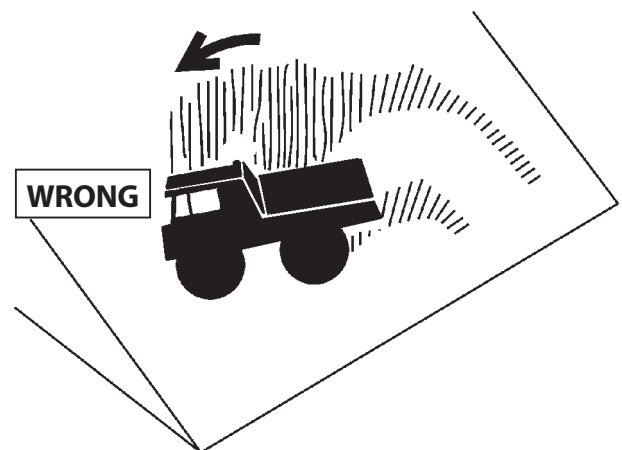
SAFETY

Drive Machine Safely

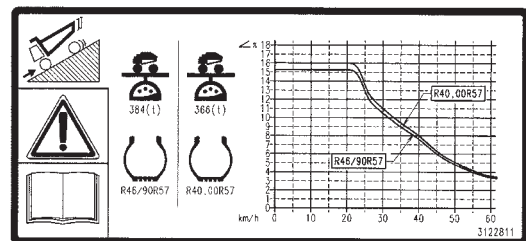
- Before driving the machine, always confirm that the shift lever direction corresponds to the direction you wish to drive.
 - Be sure to detour around any obstructions.
 - Avoid traveling over obstructions. Soil, fragments of rocks, and/or metal pieces may scatter around the machine. Do not allow personnel to stay around the machine while traveling.
 - If the engine stops while driving, the steering function becomes inoperative. Immediately stop the machine by applying the service brake to prevent personal accident.
 - Do not inertia run with the shift lever in Neutral position. Because engine speed is in the slow idling state, the cooling capability of the rear wet disk brake reduces. The brake unit may be seriously damaged if the machine continues to drive with the shift lever in Neutral position.
- Driving on a slope may cause the machine to slip or overturn, possibly resulting in serious injury or death.
 - Driving across the face of a slope or steering on a slope may cause the machine to skid or overturn. If the direction must be changed, move the machine to level ground, then, change the direction to ensure safe operation.
- The “Electric Brake Performance Decal” is provided in the cab as a general guideline for proper downgrade operation of the loaded machine. Warning, understand downhill speed operation thoroughly before operation. Machine road speed is reduced during downhill operation. When electric brake operation with overloaded machine on the steep downgrade continues for more than 2 minutes continuously, grid box resistance will be electrical overload. Pay attention that electric brake torque reduces.
 - Overloaded machine reduces the electric brake performance. Observe strictly the Hitachi loading policy while driving.
 - Before descending on a slope, decelerate the machine sufficiently using electric brake.
 - When descending on a slope, drive the machine slowly using electric brake.
- Driving on a rough road may cause the machine to slip or overturn, possibly resulting in serious injury or death.
 - When driving on a rough road or soft ground, reduce speed sufficiently.
 - Driving on a wet road may cause the machine to slip, possibly resulting in serious injury or death. Avoid applying the electric brake for quick stops.



SA-1602



SA-1603

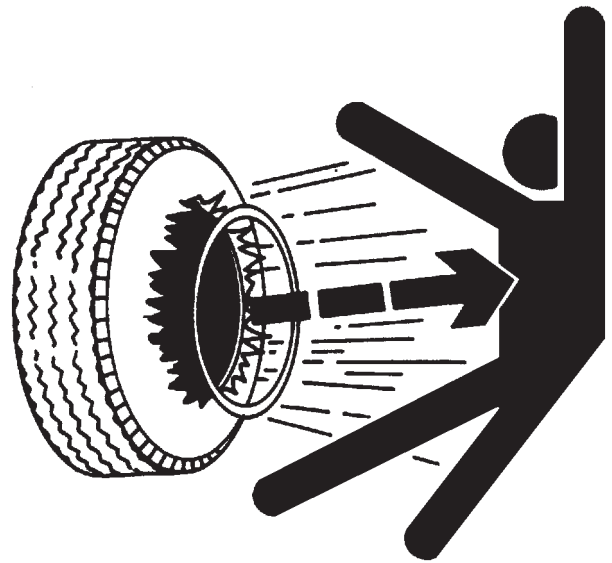


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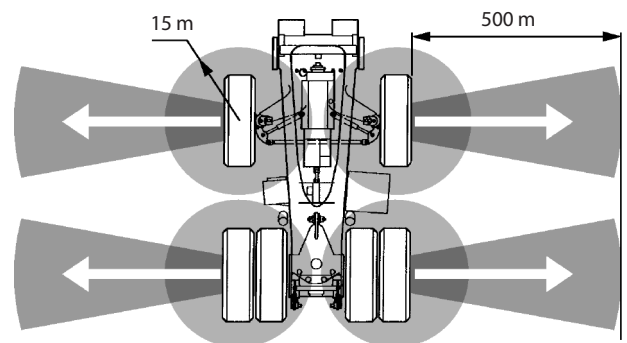
SAFETY

Wheel Maintenance

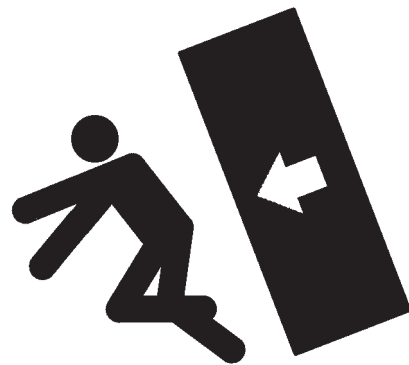
- Mishandling of a tire and rim parts can cause serious injury or death.
 - Inspect tires and wheels daily. Do not operate with low pressure, cuts, bubbles, damaged rims, or missing lug bolts and nuts.
 - When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and not in front of or over the tire assembly. Use a safety cage if available. Contact your authorized dealer for tire replacement.
 - Always maintain the correct tire pressure. DO NOT inflate tire above the recommended pressure.
 - Explosions of air inflated tires have resulted from heat-induced gas combustion inside the tires. Explosions can be caused by heat that is generated by welding, by heating rim components, by external fire, or by excessive use of brakes. Explosions differ from punctures or tire bursts because the destructive force is extremely large. This could result in tire explosion which could propel projectiles in excess of 500 m (1640 ft) from the machine. Both the force of the explosion and the flying debris can cause property damage, personal injury, or death. If tire overheating is suspected or noticed, do not approach the tire within any area included in the shaded area (15 m in radius) in the illustration and restrict access underneath the truck, until the tire has cooled down sufficiently.
- Store tires safely.
 - Store tires in the place where tires are not exposed to the direct sunlight, rain, water and oil. Avoid near external heat source or electric sparks hazard.
 - Stand tire on level ground, and block it securely so that it cannot roll or fall over.
 - Store the tires in a warehouse in which unauthorized persons cannot enter. If the tires are stored outside, always erect a fence around the tires and put up "No Entry" and other warning signs that even young children can understand.



SA-249



SA-2298

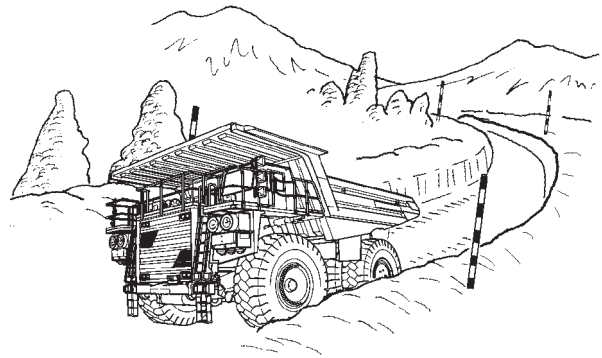


SA-034

SAFETY

Drive on Snow Safely

- Beware of the possibility of slipping or overturning the machine when traveling on frozen snow surfaces.
- The machine may slip more easily than expected on frozen snow surfaces even if the inclination is small. Reduce speed when driving. Avoid fast starts, stops and quick turns.
- Road shoulder and/or set-up utilities covered with snow are difficult to locate. Be sure where they are before removing snow.
- Avoid applying the brake for quick stops on snow.



SA-1578

Avoid Injury from Rollaway Accidents

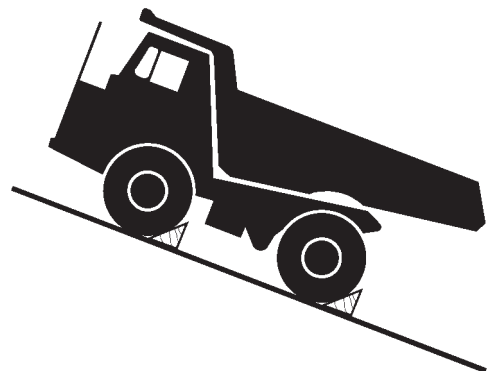
- Death or serious injury may result if you attempt to mount or stop a moving machine.

To avoid rollaways:

1. Select level ground when possible to park the machine.
2. Do not park the machine on a grade.
3. Lower the dump body to the frame rail.
4. Place the shift lever in the Neutral position and switch the parking brake switch ON.
5. Run the engine at slow idle speed without load for 5 minutes to cool down the engine.
6. Stop the engine and remove the key from the key switch.
7. Chock the wheels if you must park on a grade.
8. Position the machine to prevent rolling.
9. Park at a reasonable distance from other machines.



SA-1579



SA-1580

SAFETY

Avoid Injury from Back-Over Accidents

- If any person is present near the machine when backing the machine, the machine may hit or run over that person, resulting in serious injury or death.

To avoid back-over accidents:

- Always look around BEFORE YOU BACK UP THE MACHINE. BE SURE THAT ALL BYSTANDERS ARE CLEAR.
- Keep the travel alarm in working condition (if equipped). ALWAYS BE ALERT FOR BYSTANDERS MOVING INTO THE WORK AREA. USE THE HORN OR OTHER SIGNAL TO WARN BYSTANDERS BEFORE MOVING MACHINE.
- USE A SIGNAL PERSON WHEN BACKING UP IF YOUR VIEW IS OBSTRUCTED. ALWAYS KEEP THE SIGNAL PERSON IN VIEW.
- Use hand signals, which conform to your local regulations, when work conditions require a signal person.
- No machine motions shall be made unless signals are clearly understood by both signal person and operator.
- Learn the meanings of all flags, signs, and markings used on the job and confirm who has the responsibility for signaling.
- Keep windows, mirrors, and lights clean and in good condition.
- Dust, heavy rain, fog, etc., can reduce visibility. As visibility decreases, reduce speed and use proper lighting.
- Read and understand all operating instructions in the operator's manual.



SA-1581



SA-1582

Keep Person Clear from Working Area

- A person may be hit severely by the machine and/or may be crushed against another object, resulting in serious injury or death.
- Keep all persons clear from the area of operation and machine movement.
- Before operating the machine, set up barriers to the sides and rear area of the working area to prevent anyone from entering the work area.



SA-1583

SAFETY

Avoid Tipping

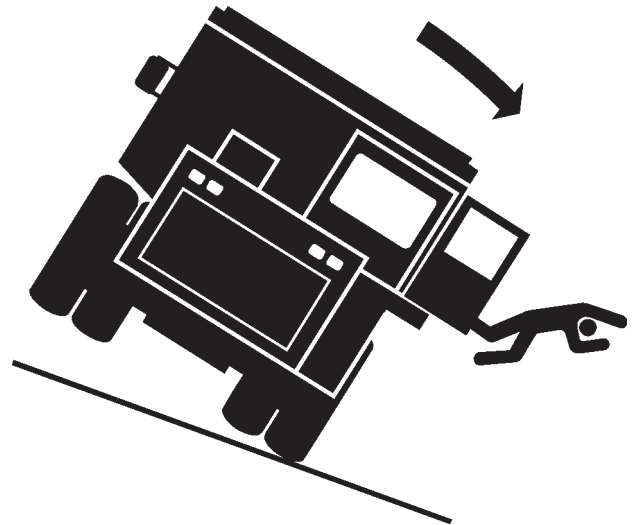
**DO NOT ATTEMPT TO JUMP CLEAR OF TIPPING MACHINE ---
SERIOUS OR FATAL CRUSHING INJURIES WILL RESULT
MACHINE WILL TIP OVER FASTER THAN YOU CAN JUMP
FREE
THEREFORE, HOLD FIRMLY ONTO THE STEERING WHEEL IF
THE MACHINE SHOULD TIP OR ROLL OVER. DO NOT JUMP.**

FASTEN YOUR SEAT BELT

- The cab, cab mounting structure and frame are designed for the protection of the operator and it meets the requirements for Roll-Over Protective Structures (ROPS) according to the adopted standard for this machine.

IMPORTANT:

- **Never make any unauthorized modifications or alterations to the Roll-Over Protective Structures (ROPS) such as; welding on fire extinguisher brackets, CB antenna brackets, or fire suppression systems. Such unauthorized modifications will affect the structural limits of the ROPS and will void the certification and could result in loss of protection to the operator.**
Contact your authorized dealer for modification or repair of ROPS.
- **Do not convert Hauler into Water Truck. (This cab has not been certified to meet specified requirements according to ISO 3471 Tractor.)**



SA-1584

The Roll-Over Protective Structures (ROPS) has been certified to meet specified requirements according to ISO 3471 Hauler.

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


To avoid tipping:

- Be extra careful before operating on a grade.
 - Keep the machine at a safe distance from the edge of cliffs and slide areas.
 - Reduce operating speeds to avoid tipping or slipping.
 - Avoid changing direction when driving on grades.
 - Use the seat belt during operation.
 - When operating the machine, both doors should be closed at all times.
- Be careful when working on frozen ground.
 - Temperature increases will cause the ground to become soft and make ground travel unstable.

SAFETY

Protect Against Falling Stones and Debris

- Stay in your cab while truck is being loaded. Stepping out of the cab could result in possible injury.
- Do not place your head and/or arms outside of the window.

 **NOTE:** The cab is for the protection of the operator and it meets the requirements for Falling-Object Protective Structures (FOPS) according to the adopted standard for this machine.



SA-1585

Operate with Caution

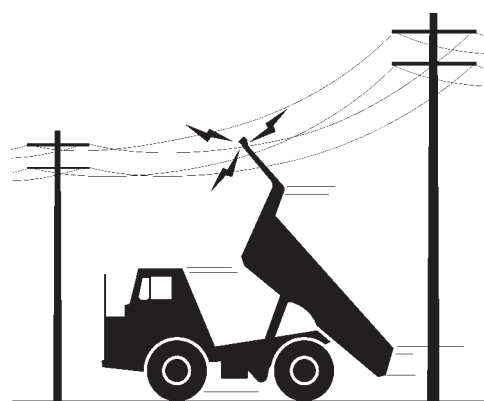
- If the dump body (vessel) of the machine hits against an overhead obstacle, such as a bridge, both the machine and the overhead obstacle will be damaged, and personal injury may result as well. Do not drive the machine while the dump body is raising or raised.
- Take care to avoid hitting overhead obstacles with the dump body.



SA-1604

Avoid Power Lines

- Serious injury or death can result if the machine or dump body are not kept a safe distance from electric lines.
- When operating near an electric line, NEVER move any part of the machine or load closer than 3 m plus twice the line insulator length.
- Check and comply with any local regulations that may apply.
- Wet ground will expand the area that could cause any person on it to be affected by electric shock. Keep all bystanders or co-workers away from the site.



SA-1586

SAFETY

Precautions for Lightning

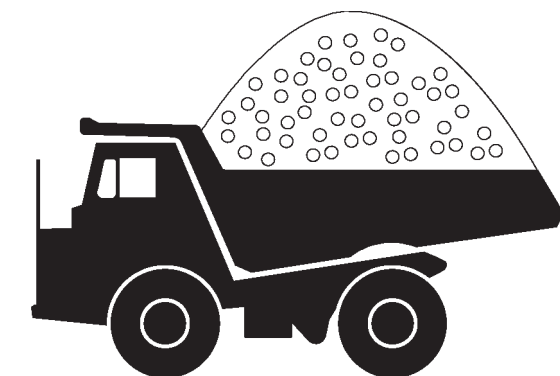
- Lightning may strike the machine.
If lightning comes close, immediately stop the operation, and take the following action.
 - When you are around the machine or operating cab-less machine, evacuate to a safe place far away from the machine.
 - When you are in the cab, stay in the cab until lightning has passed and safety is secured. Close the cab doors and windows. Lower the dump body to the frame rail, and stop the engine. Put your hands on your lap to avoid contact with any metal surfaces. Never go out of the cab.
 - If lightning strikes the machine or near the machine, check all of the machine safety devices for any failure after lightning has passed and safety is secured. If any trouble is found, operate the machine only after repairing it.



SA-1798

Avoid Overloading

Do not exceed the maximum allowed payload (1.2×nominal payload). The overloading raises the center of gravity position and may cause overturning or long braking distance. It is very dangerous and serious injury or death may result. Obey the loading policy of Hitachi rigid dump truck. (Refer to the page 12-2 in the operator's manual.)

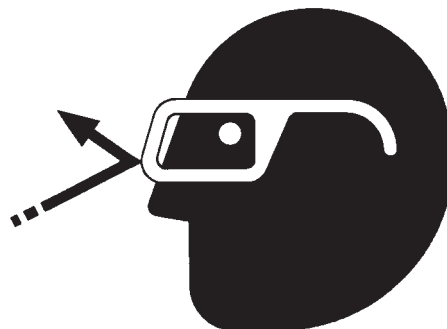


SA-1797

SAFETY

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 any working area before striking any object.

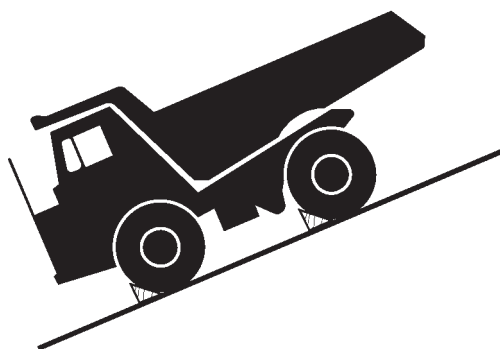


SA-432

Park Machine Safely

To avoid accidents:

1. Park the machine on a level surface. When parking on a grade cannot be avoided, chock blocks must also be used for extra security.
2. Lower the dump body to the frame rail.
3. Place the shift lever in the NEUTRAL position.
4. Press the parking brake switch ON position. Load/Dump brake is not a parking brake. If the Load/Dump brake is applied and the key switch turned to the OFF position, the Load/Dump brake would be released. Always apply the parking brake when leaving the cab of the machine.
5. Run the engine at slow idle speed without load for 5 minutes.
6. Make sure the hoist lever is in the Float position.
7. Check that all switches and controls are in the OFF position.
8. Turn the key switch to the OFF position to stop the engine.
9. Remove the key from the key switch.
10. Close the windows and cab doors.
11. Lock all access doors and compartments.
12. Park at a reasonable distance from other machines.



SA-1587

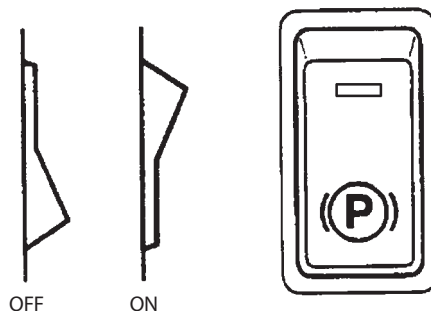
SAFETY

Prevent Unintended Machine Movement

Be careful not to accidentally actuate controls when co-workers are present.

Lower the dump body during stopping the work. Place the shift lever in the Neutral position, then press the parking brake switch to the ON position to stop the engine before allowing anyone to approach the machine.

Follow these same precautions before standing up, leaving the operator's seat, or exiting the machine.



M8R8-01-054

Handle Fluids Safely - Avoid Fires

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



SA-018



SA-019

SAFETY

Practice Safe Maintenance

To avoid accidents:

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

Before servicing the machine:

1. Park the machine on a level surface.
 2. Lower the dump body to the frame rail.
 3. Place shift lever in the NEUTRAL position.
 4. Apply the parking brake to ensure that the parking brake is holding the machine.
 5. Run the engine at slow idle speed without load for 5 minutes.
 6. Make sure the hoist lever is in the FLOAT position.
 7. Check that all switches and controls are in the OFF position.
 8. Turn the key switch to the OFF position to stop engine.
 9. Ensure hydraulic system pressure relieves to tank.
 10. Remove the key from the key switch.
 11. Attach a "Do Not Operate" tag to the steering wheel.
 12. Allow the engine to cool.
- If a maintenance procedure must be performed with the engine running, do not leave the machine unattended.
 - If the dump body must be raised, securely support the dump body by using the prop cable or pins.
 - Inspect certain parts periodically and repair or replace as necessary. Refer to the section discussing that part in the "MAINTENANCE" chapter of operator's manual.
 - Keep all parts in good condition and properly installed.
 - Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.
 - When cleaning parts, always use nonflammable detergent oil. Never use highly flammable oil such as fuel oil and gasoline to clean parts or surfaces.
 - Pull the battery disconnect switch down to the OFF position before starting maintenance for electrical systems or before performing welding on the machine.



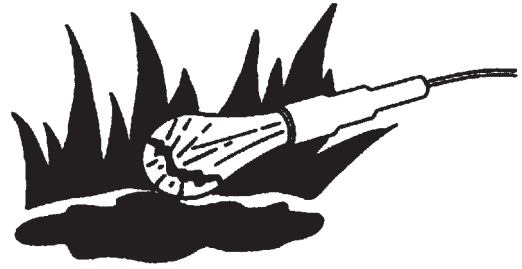
SA-028



SA-527

SAFETY

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



SA-037

Warn Others of Service Work

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



SA-287

Support Machine Properly

- Never attempt to work on the machine without securing the machine first.
 - Always lower the dump body to the frame rail before you work on the machine. If you must work on a raised dump body, securely support the dump body by using the prop cable or pins.
 - If you must work on a lifted machine or dump body, securely support the machine or dump body. Do not support the machine on cinder blocks, hollow tires, or props that may crumble under continuous load.

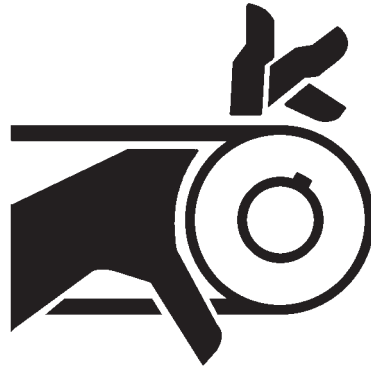


SA-527

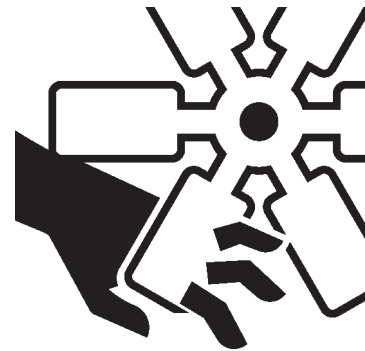
SAFETY

Stay Clear of Moving Parts

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



SA-026



SA-2294

Prevent Parts From Flying

- Accumulators and hydraulic components are under high pressure. Failure to follow the precautions below may result in serious injury, blindness, or death.
 - Do not attempt to remove plugs or hoses until pressure is fully relieved.
 - As pieces may fly off, be sure to keep body and face away from accumulator and hydraulic components to avoid injury.
- Travel reduction gears are under pressure.
 - As pieces may fly off, be sure to keep body and face away from AIR RELEASE PLUG to avoid injury.
 - GEAR OIL is hot. Wait for GEAR OIL to cool, then gradually loosen AIR RELEASE PLUG to release pressure.
- Tires are under pressure. When removing the air valve, as pieces may fly off, be sure to keep body and face away from tires to avoid injury.



SA-344

SAFETY

Prevent Burns

Hot spraying fluids:

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



SA-039

Hot fluids and surfaces:

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



SA-225

Replace Rubber Hoses Periodically

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



SA-019

SAFETY

Avoid High-Pressure Fluids

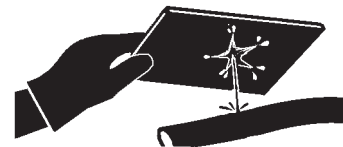
- Fluids such as diesel fuel or hydraulic oil under pressure can penetrate the skin or eyes causing serious injury, blindness or death.
- Avoid this hazard by relieving pressure before disconnecting hydraulic or other lines.
- Tighten all connections before applying pressure.
- Search for leaks with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



SA-031



SA-292



SA-044

SAFETY

Prevent Fires

Check for Oil Leaks:

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



SA-019

Check for Shorts:

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

Clean up Flammable Materials:

- Spilled fuel, oil, antifreeze fluid and window washer fluid, and trash, grease, debris, accumulated coal dust, and other flammable materials may cause fires.
 - Prevent fires by inspecting and cleaning the machine daily, and by removing spilled or accumulated flammable materials immediately. Check and clean high temperature parts such as the exhaust outlet and muffler earlier than the normal interval.
 - Do not wrap high temperature parts such as a muffler or exhaust pipe with oil absorbents.
 - Do not store oily cloths as they are vulnerable to catching fire.
 - Keep flammable materials away from open flames.
 - Do not ignite or crush a pressurized or sealed container.

SAFETY

Check Key Switch:

- If fire breaks out, failure to stop the engine will escalate the fire, hampering fire fighting.

Always check key switch function before operating the machine every day:

1. Start the engine and run it at slow idle.
2. Turn the key switch to the OFF position to confirm that the engine stops.

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

Check Emergency Engine Stop Switch:

- If a fire breaks out, failure to stop the engine will escalate fire, hampering fire fighting.

- Check the emergency engine stop switch function every 250 hours:

- 1) Start the engine and run it at slow Idle.
- 2) Push the emergency engine stop switch to stop the engine.
- 3) Confirm that engine stops.

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

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