

PART NO. EM1JK-1-1

**HITACHI**

# Operator's Manual

# ZAXIS

## 400R-3

## 400LCH-3

## Hydraulic Excavator

ZAXIS400R-3 • 400LCH-3 HYDRAULIC EXCAVATOR OPERATOR'S MANUAL

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

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EM1JK-1-1

Serial No.

ZAXIS400R-3 001001 and up

ZAXIS400LCH-3 001001 and up

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## INTRODUCTION

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**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 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.

- SI Units (International System of Units) are used in this manual.  
For reference MKS system units and English units are also indicated in parentheses after the SI units.  
Example : 24.5 MPa (250 kgf/cm<sup>2</sup>, 3560 psi)

**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, including satellite communication system, in a country other than a country of its intended use, it may be necessary to make modifications to it so that it complies with the local regulatory standards (including safety standards) and legal requirements of that particular country. Please do not export or operate this machine outside of the country of its intended use until such compliance has been confirmed. Please contact Hitachi Construction Machinery Co., Ltd. or any of our authorized distributor or dealer if you have any questions concerning compliance.

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.

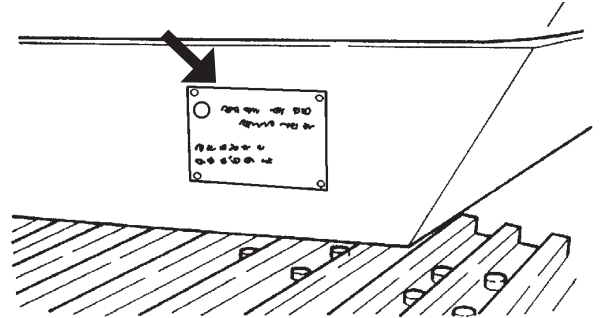
# MACHINE NUMBERS

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

CE	
Model/type	<input type="text"/>
Product Identification Number	Hydraulic Excavator
Year of Manufacturing	<input type="text"/>
Engine Power(kw)	<input type="text"/>
Mass(kg)	<input type="text"/>
Hitachi Construction Machinery Co.,Ltd. 650, Kandatsu-machi, Tsuchiura-shi, Ibaraki-ken, 300-0013 Japan	

SS3097499

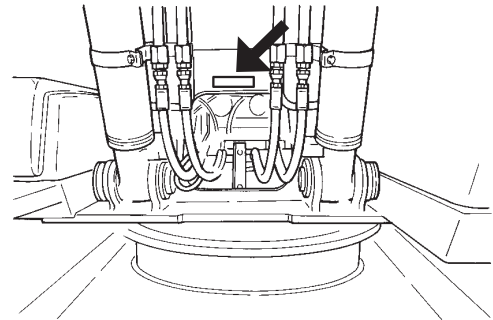


M157-00-001

1. MODEL/TYPE
2. Product Identification Number
3. Year of Manufacturing
4. Operating mass (standard version)
5. Engine power in kW according to ISO9249

## PRODUCT IDENTIFICATION NUMBER

PRODUCT IDENTIFICATION NUMBER: \_\_\_\_\_

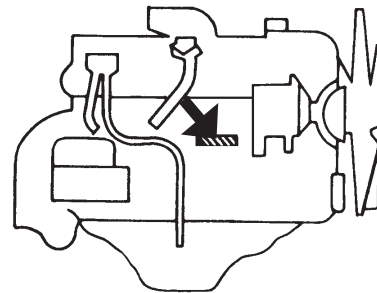


M157-12-008

**NOTE:** Marks to indicate the start and end of the PIN

\*HCM1JK00E00001001\*

PRODUCT IDENTIFICATION NUMBER (PIN)



M1V1-00-001

## ENGINE

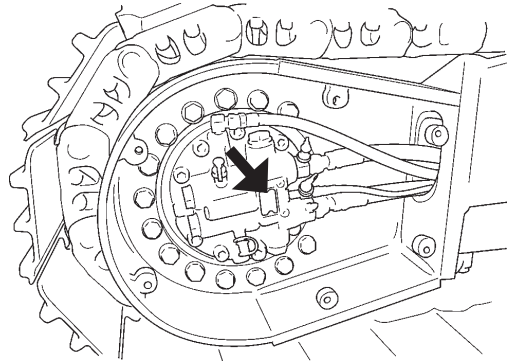
TYPE: \_\_\_\_\_  
MFG. NO.: \_\_\_\_\_

## MACHINE NUMBERS

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### TRAVEL MOTOR

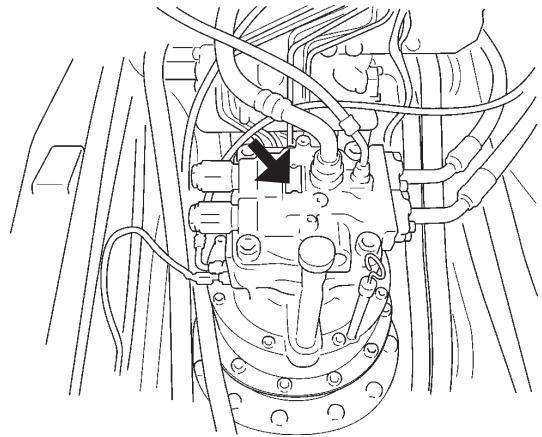
TYPE: \_\_\_\_\_  
MFG. NO.: \_\_\_\_\_



M178-07-047

### SWING MOTOR

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



M178-07-014

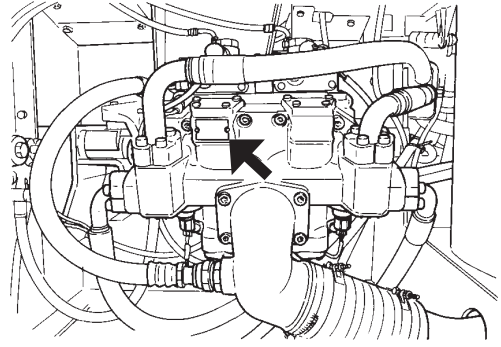
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## MACHINE NUMBERS

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### HYDRAULIC PUMP

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



M157-00-004

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## 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.



001-E01A-0001

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 don't 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

002-E01A-1223

## SAFETY

### FOLLOW SAFETY INSTRUCTIONS

- Carefully read and follow all safety signs on the machine and all safety messages in this manual.
- Safety signs should be installed, maintained and replaced when necessary.
  - If a safety sign or this manual is damaged or missing, order a replacement from your authorized dealer in the same way you order other replacement parts (be sure to state machine model and serial number when ordering).
- Learn how to operate the machine and its controls correctly and safely.
- Allow only trained, qualified, authorized personnel to operate the machine.
- Keep your machine in proper working condition.
  - Unauthorized modifications of the machine may impair its function and/or safety and affect machine life.
  - Do not modify any machine parts without authorization. Failure to do so may deteriorate the part safety, function, and/or service life. In addition, personal accident, machine trouble, and/or damage to material caused by unauthorized modifications will void Hitachi Warranty Policy.
  - Do not use attachments and/or optional parts or equipment not authorized by Hitachi. Failure to do so may deteriorate the safety, function, and/or service life of the machine. In addition, personal accident, machine trouble, and/or damage to material caused by using unauthorized attachments and/or optional parts or equipment will void Hitachi Warranty Policy.
- The safety messages in this SAFETY chapter are intended to illustrate basic safety procedures of machines. However it is impossible for these safety messages to cover every hazardous situation you may encounter. If you have any questions, you should first consult your supervisor and/or your authorized dealer before operating or performing maintenance work on the machine.



SA-003

003-E01B-0003

### 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

004-E01A-0437

# SAFETY

## WEAR PROTECTIVE CLOTHING

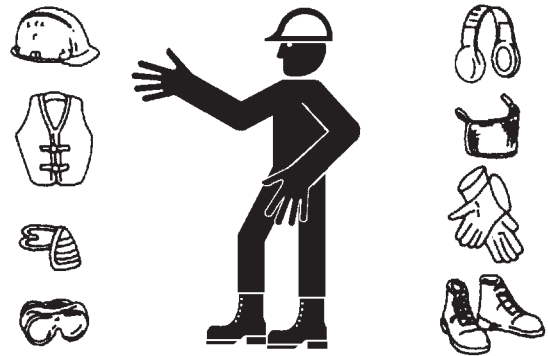
- Wear close fitting clothing and safety equipment appropriate to the job.

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

005-E01A-0438

## 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.



006-E01A-0434

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 "PRE-START INSPECTION" chapter in the operator's manual.



007-E01A-0435

SA-435

## SAFETY

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### GENERAL PRECAUTIONS FOR CAB

- Before entering the cab, thoroughly remove all dirt and/or oil 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 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.

524-E01A-0000

## 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 hand-holds.
  - 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.



008-E01A-0439

SA-439

### ADJUST THE OPERATOR'S SEAT

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



SA-378

009-E01A-0462

### ENSURE SAFETY BEFORE RISING FROM OR LEAVING OPERATOR'S SEAT

- Before rising from the operator's seat to open/close either side window or to adjust the seat position, be sure to first lower the front attachment to the ground and then move the pilot control shut-off lever to the LOCK position. Failure to do so may allow the machine to unexpectedly move when a body part unintentionally comes in contact with a control lever, possibly resulting in serious personal injury or death.
  - Before leaving the machine, be sure to first lower the front attachment to the ground and then move the pilot control shut-off lever to the LOCK position. Turn the key switch OFF to stop the engine.
  - Before leaving the machine, close all windows, doors, and access covers and lock them up.

## SAFETY

### FASTEN YOUR SEAT BELT

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

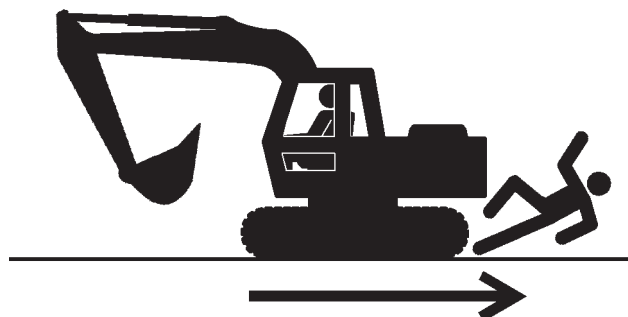


SA-237

010-E01A-0237

### 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, swinging, or operating the machine.
- Always keep the travel alarm and horn in working condition (if equipped). It warns people when the machine starts to move.
- Use a signal person when moving, swinging, 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.



SA-426

011-E01A-0398

### 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

036-E01A-0293-3



## 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 track or on ground.
- Do not start engine by shorting across starter terminals.
- Before starting the engine, confirm that all control levers are in neutral.
- Before starting the engine, confirm the safety around the machine and sound the horn to alert bystanders.



012-E01B-0431

SA-444

### JUMP STARTING

- Battery gas can explode, resulting in serious injury.
- If the engine must be jump started, be sure to follow the instructions shown in the "OPERATING THE ENGINE" chapter in the operator's manual.
- The operator must 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.



S013-E01A-0032

SA-032

### KEEP RIDERS OFF MACHINE

- Riders on machine are subject to injury such as being struck by foreign objects and being thrown off the machine.
- Only the operator should be on the machine. Keep riders off.
- Riders also obstruct the operator's view, resulting in the machine being operated in an unsafe manner.



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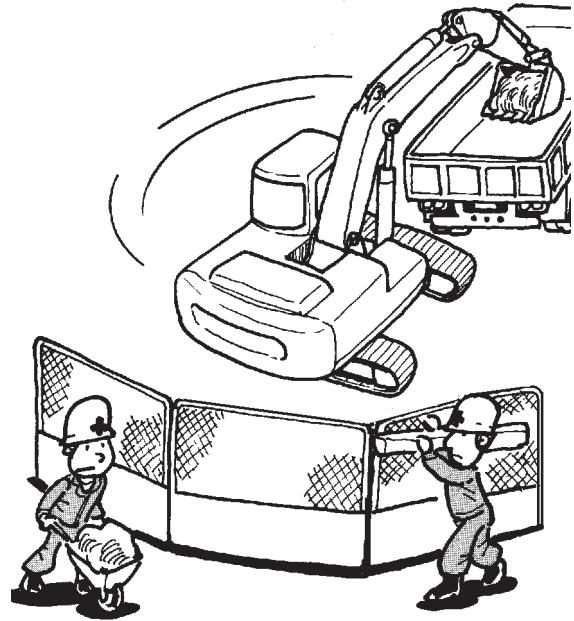
SA-379

## SAFETY

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### PRECAUTIONS FOR OPERATIONS

- Investigate the work site before starting operations.
- Be sure to wear close fitting clothing and safety equipment appropriate for the job, such as a hard hat, etc. when operating the machine.
- Clear all persons and obstacles from area of operation and machine movement.  
Always beware of the surroundings while operating. When working in a small area surrounded by obstacles, take care not to hit the upperstructure against obstacles.
- When loading onto trucks, bring the bucket over the truck beds from the rear side. Take care not to swing the bucket over the cab or over any person.



M104-05-015

## SAFETY

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### INVESTIGATE JOB SITE BEFOREHAND

- When working at the edge of an excavation or on a road shoulder, the machine could tip over, possibly resulting in serious injury or death.
  - Investigate the configuration and ground conditions of the job site beforehand to prevent the machine from falling and to prevent the ground, stockpiles, or banks from collapsing.
  - Make a work plan. Use machines appropriate to the work and job site.
  - Reinforce ground, edges, and road shoulders as necessary. Keep the machine well back from the edges of excavations and road shoulders.
  - When working on an incline or on a road shoulder, employ a signal person as required.
  - Confirm that your machine is equipped a FOPS cab before working in areas where the possibility of falling stones or debris exist.
  - When the footing is weak, reinforce the ground before starting work.
  - When working on frozen ground, be extremely alert. As ambient temperatures rise, footing becomes loose and slippery.
  - Beware the possibility of fire when operating the machine near flammable objects such as dry grass.
- Make sure the worksite has sufficient strength to firmly support the machine.

When working close to an excavation or at road shoulders, operate the machine with the tracks positioned perpendicular to the cliff face with travel motors at the rear, so that the machine can more easily evacuate if the cliff face collapses.
- If working on the bottom of a cliff or a high bank is required, be sure to investigate the area first and confirm that no danger of the cliff or bank collapsing exists. If any possibility of cliff or bank collapsing exists, do not work on the area.
- Soft ground may collapse when operating the machine on it, possibly causing the machine to tip over. When working on a soft ground is required, be sure to reinforce the ground first using large pieces of steel plates strong and firm enough to easily support the machine.
- Note that there is always a possibility of machine tipping over when working on rough terrain or on slopes. Prevent machine tipping over from occurring. When operating on rough terrain or on slopes:
  - Reduce the engine speed.
  - Select slow travel speed mode.
  - Operate the machine slowly and be cautious with machine movements.



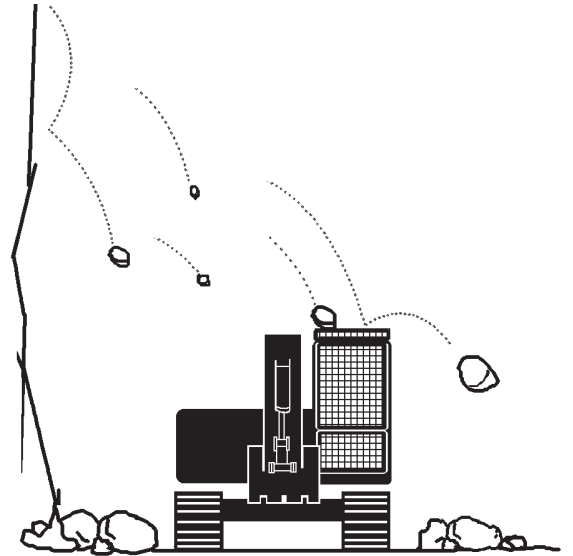
SA-380

## SAFETY

### EQUIPMENT OF HEAD GUARD, ROPS, FOPS

In case the machine is operated in areas where the possibility of falling stones or debris exist, equip a head guard, ROPS, or FOPS according to the potential hazardous conditions. (The standard cab for this machine corresponds to ROPS and FOPS.)

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



SA-490

### PROVIDE SIGNALS FOR JOBS 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.

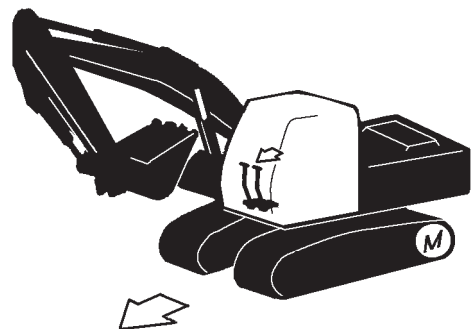


018-E01A-0481

SA-481

### CONFIRM DIRECTION OF MACHINE TO BE DRIVEN

- Incorrect travel pedal/lever operation may result in serious injury death.
- Before driving the machine, confirm the position of the undercarriage in relation to the operator's position. If the travel motors are located in front of the cab, the machine will move in reverse when travel pedals/levers are operated to the front.



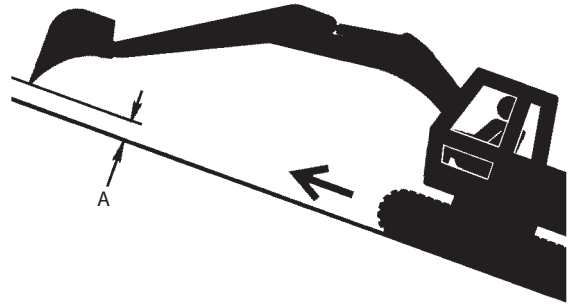
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SA-491

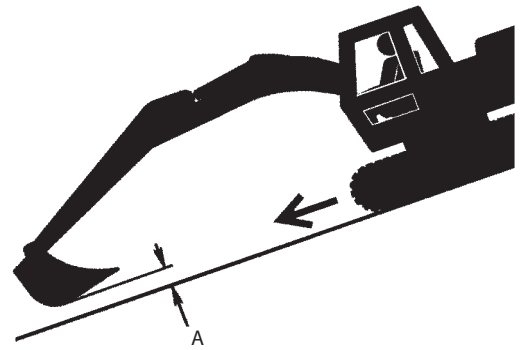
## SAFETY

### DRIVE MACHINE SAFELY

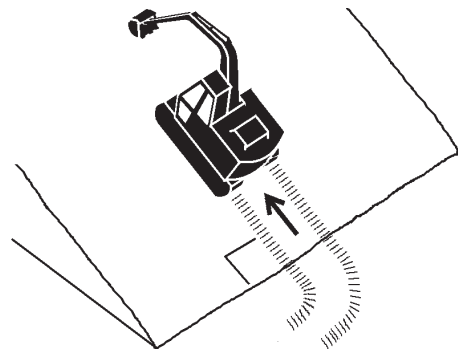
- Before driving the machine, always confirm that the travel levers/pedals direction corresponds to the direction you wish to drive.
- Be sure to detour around any obstructions.
- Avoid traveling over obstructions. Soil, fragments of rocks, and/or metal pieces may scatter around the machine. Don't allow personnel to stay around the machine while traveling.
- Driving on a slope may cause the machine to slip or overturn, possibly resulting in serious injury or death.
  - Never attempt to ascend or descend 35 degrees or steeper slopes.
  - Be sure to fasten the seat belt.
  - When driving up or down a slope, keep the bucket facing the direction of travel, approximately 0.5 to 1.0 m (A) above the ground.
  - If the machine starts to skid or becomes unstable, immediately lower the bucket to the ground and stop.



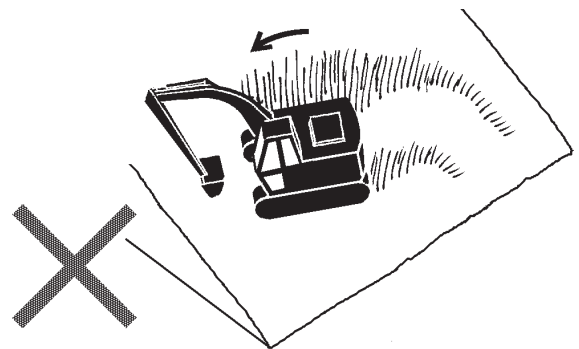
SA-657



SA-658



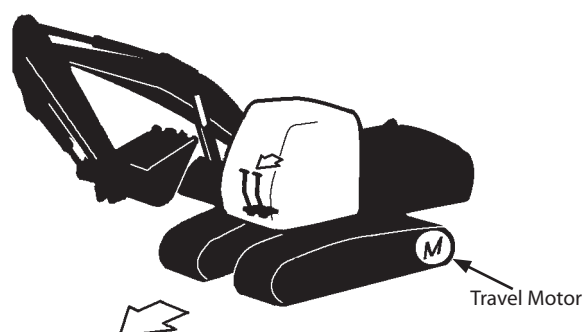
SA-441



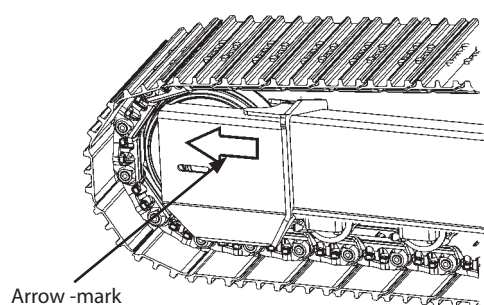
SA-442

## SAFETY

- Driving across the face of a slope or steering on a slope may cause the machine to skid or turnover. If the direction must be changed, move the machine to level ground, then, change the direction to ensure safe operation.
- Avoid swinging the upperstructure on slopes. Never attempt to swing the upperstructure downhill. The machine may tip over. If swinging uphill is unavoidable, carefully operate the upperstructure and boom at slow speed.
- If the engine stalls on a slope, immediately lower the bucket to the ground. Return the control levers to neutral. Then, restart the engine.
- Be sure to thoroughly warm up the machine before ascending steep slopes. If hydraulic oil has not warmed up sufficiently, sufficient performance may not be obtained.
- Use a signal person when moving, swinging or operating the machine in congested areas. Coordinate hand signals before starting the machine.
- Before moving machine, determine which way to move travel pedals/levers for the direction you want to go. When the travel motors are in the rear, pushing down on the front of the travel pedals or pushing the levers forward moves the machine forward, towards the idlers. An arrow-mark seal is stuck on the inside surface of the side frame to indicate the machine front direction.
- Select a travel route that is as flat as possible. Steer the machine as straight as possible, making small gradual changes in direction.
- Before traveling on them, check the strengths of bridges and road shoulders, and reinforce if necessary.
- Use wood plates in order not to damage the road surface. Be careful of steering when operating on asphalt roads in summer.
- When crossing train tracks, use wood plates in order not to damage them.
- Do not make contact with electric wires or bridges.
- When crossing a river, measure the depth of the river using the bucket, and cross slowly. Do not cross the river when the depth of the river is deeper than the upper edge of the upper roller.
- When traveling on rough terrain, reduce engine speed. Select slow travel speed. Slower speed will reduce possible damage to the machine.
- Avoid operations that may damage the track and undercarriage components.
- During freezing weather, always clean snow and ice from track shoes before loading and unloading machine, to prevent the machine from slipping.



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M178-03-001



SA-011

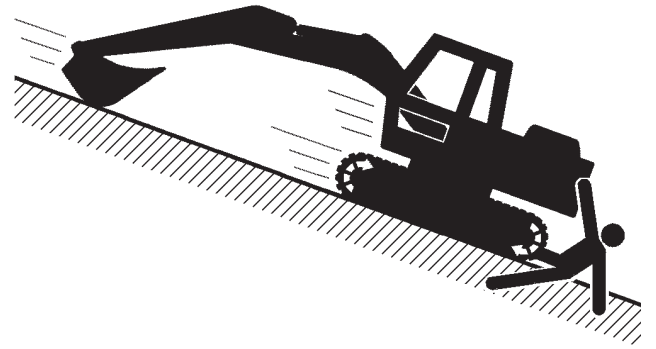
## SAFETY

### AVOID INJURY FROM ROLLAWAY ACCIDENTS

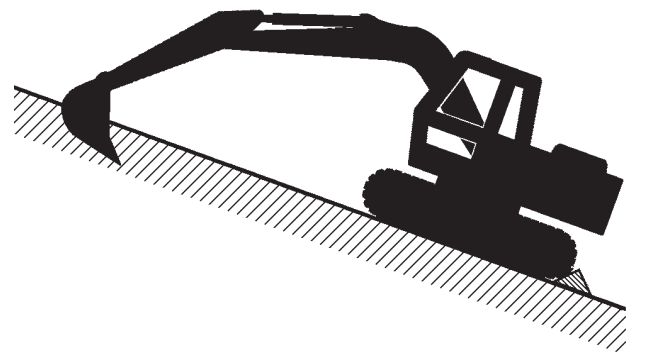
- Death or serious injury may result if you attempt to mount or stop a moving machine.

To avoid rollaways:

- Select level ground when possible to park machine.
- Do not park the machine on a grade.
- Lower the bucket and/or other work tools to the ground.
- Turn the auto-idle switch and the H/P mode switch off.
- Run the engine at slow idle speed without load for 5 minutes to cool down the engine.
- Stop the engine and remove the key from the key switch.
- Pull the pilot control shut-off lever to LOCK position.
- Block both tracks and lower the bucket to the ground. Thrust the bucket teeth into the ground if you must park on a grade.
- Position the machine to prevent rolling.
- Park a reasonable distance from other machines.



SA-391



SA-392

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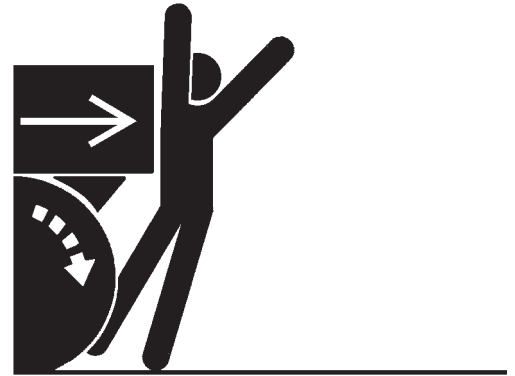
## SAFETY

### AVOID INJURY FROM BACK-OVER AND SWING ACCIDENTS

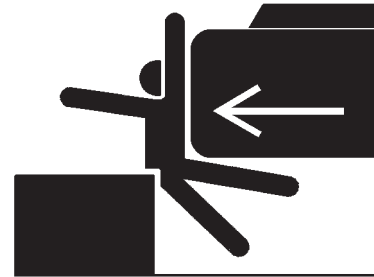
- If any person is present near the machine when backing or swinging the upperstructure, the machine may hit or run over that person, resulting in serious injury or death.

To avoid back-over and swing accidents:

- Always look around **BEFORE YOU BACK UP AND SWING 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 signalman 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-383



SA-384

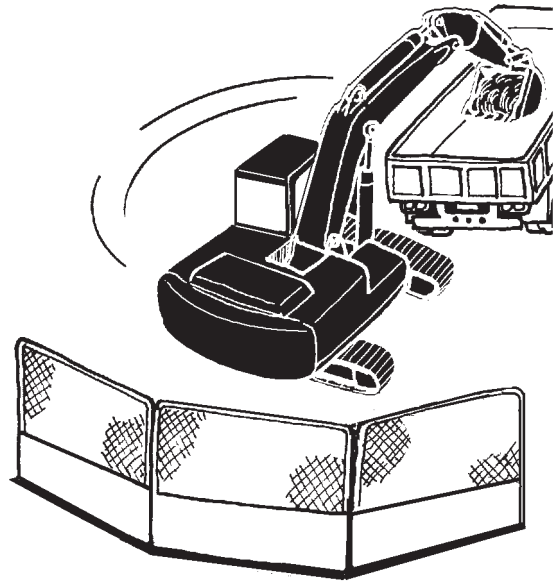
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## SAFETY

### KEEP PERSON CLEAR FROM WORKING AREA

- A person may be hit severely by the swinging front attachment or counterweight and/or may be crushed against an other 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 bucket swing radius to prevent anyone from entering the work area.



022-E01A-0386

SA-386

### NEVER POSITION BUCKET OVER ANYONE

- Never lift, move, or swing bucket above anyone or a truck cab. Serious injury or machine damage may result due to bucket load spill or due to collision with the bucket.

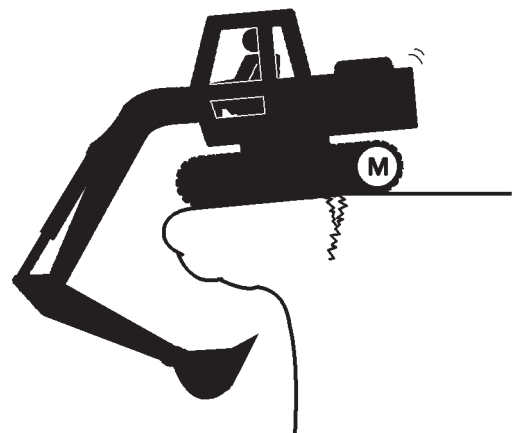


023-E01A-0487

SA-487

### AVOID UNDERCUTTING

- In order to retreat from the edge of an excavation if the footing should collapse, always position the undercarriage perpendicular to the edge of the excavation with the travel motors at the rear.
- If the footing starts to collapse and if retreat is not possible, do not panic. Often, the machine can be secured by lowering the front attachment, in such cases.



024-E01A-0488

SA-488

## SAFETY

### AVOID TIPPING

**DO NOT ATTEMPT TO JUMP CLEAR OF TIPPING MACHINE---SERIOUS OR FATAL CRUSHING INJURIES WILL RESULT**

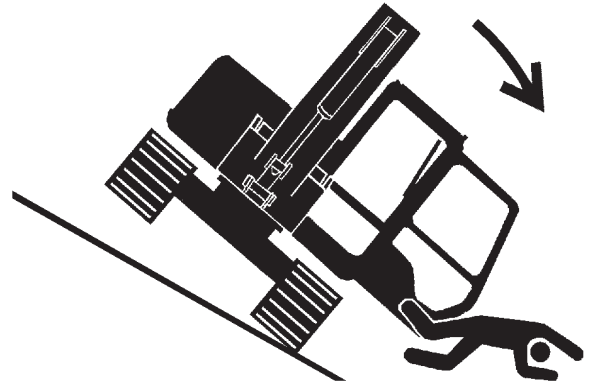
**MACHINE WILL TIP OVER FASTER THAN YOU CAN JUMP FREE**

**FASTEN YOUR SEAT BELT**

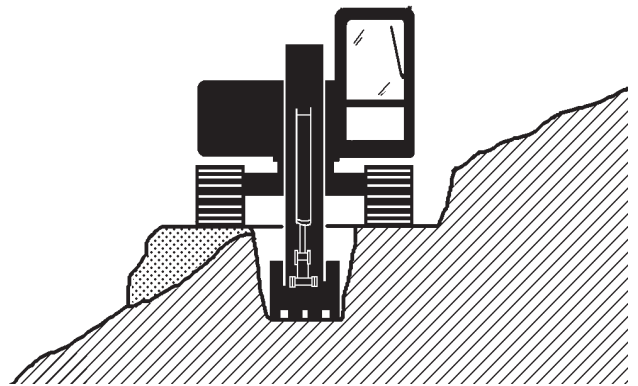
- The danger of tipping is always present when operating on a grade, possibly resulting in serious injury or death.

To avoid tipping:

- Be extra careful before operating on a grade.
  - Prepare machine operating area flat.
  - Keep the bucket low to the ground and close to the machine.
  - Reduce operating speeds to avoid tipping or slipping.
  - Avoid changing direction when traveling on grades.
  - NEVER attempt to travel across a grade steeper than 15 degrees if crossing the grade is unavoidable.
  - Reduce swing speed as necessary when swinging loads.
- Be careful when working on frozen ground.
  - Temperature increases will cause the ground to become soft and make ground travel unstable.



SA-012



SA-440

025-E03B-0463

### NEVER UNDERCUT A HIGH BANK

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



026-E01A-0519

SA-489

## SAFETY

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### DIG WITH CAUTION

- Accidental severing of underground cables or gas lines may cause an explosion and/or fire, possibly resulting in serious injury or death.
- Before digging check the location of cables, gas lines, and water lines.
- Keep the minimum distance required, by law, from cables, gas lines, and water lines.
- If a fiber optic cable should be accidentally severed, do not look into the end. Doing so may result in serious eye injury.
- Contact your local “diggers hot line” if available in your area, and/or the utility companies directly. Have them mark all underground utilities.

027-E01A-0382



SA-382

### OPERATE WITH CAUTION

- If the front attachment or any other part 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.
- Take care to avoid hitting overhead obstacles with the boom or arm.

028-E01A-0389



SA-389

## SAFETY

### AVOID POWER LINES

- Serious injury or death can result if the machine or front attachments 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.

029-E01A-0381



SA-381

### PRECAUTIONS FOR LIGHTENING

- The machine is vulnerable to lightning strikes.
- In the event of an electrical storm, immediately stop operation, and lower the bucket to the ground. 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.

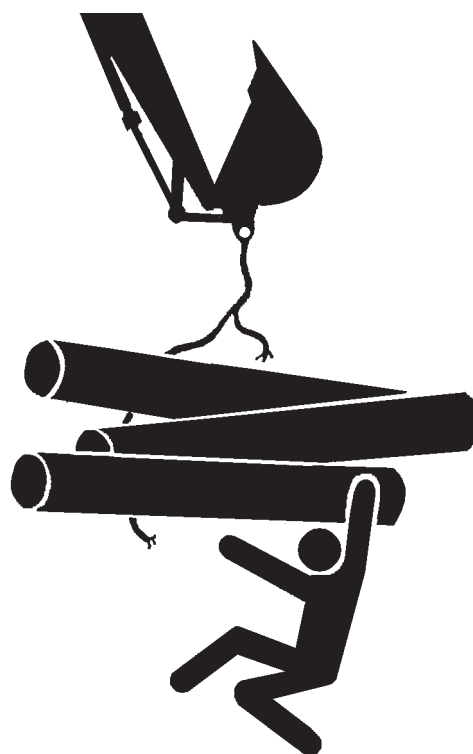


SA-1088

### OBJECT HANDLING

- If a lifted load should fall, any person nearby may be struck by the falling load or may be crushed underneath it, resulting in serious injury or death.
- When using the machine for craning operations, be sure to comply with all local regulations.
- Do not use damaged chains or frayed cables, cables, slings, or ropes.
- Before craning, position the upperstructure with the travel motors at the rear.
- Move the load slowly and carefully. Never move it suddenly.
- Keep all persons well away from the load.
- Never move a load over a person's head.
- Do not allow anyone to approach the load until it is safely and securely situated on supporting blocks or on the ground.
- Never attach a sling or chain to the bucket teeth. They may come off, causing the load to fall.

032-E01A-0132

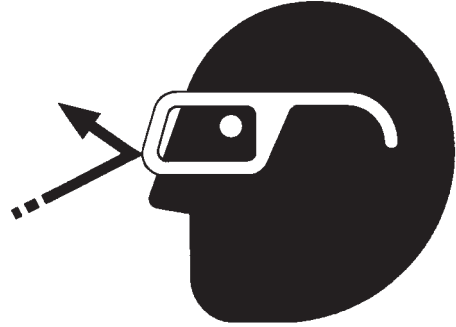


SA-014

## 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 the working area before striking any object.



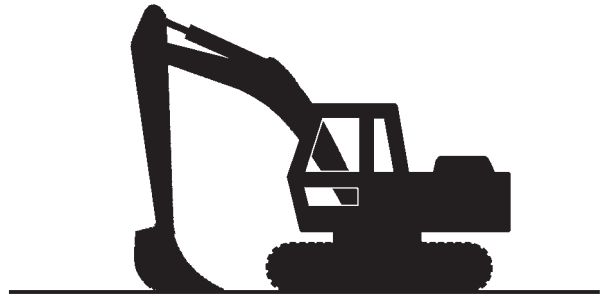
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SA-432

### PARK MACHINE SAFELY

To avoid accidents:

- Park machine on a firm, level surface.
- Lower bucket to the ground.
- Turn auto-idle switch and H/P mode switch OFF.
- Run engine at slow idle speed without load for 5 minutes.
- Turn key switch to OFF to stop engine.
- Remove the key from the key switch.
- Pull the pilot control shut-off lever to the LOCK position.
- Close windows, roof vent, and cab door.
- Lock all access doors and compartments.



SA-390

### 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



034-E01A-0496

SA-019

## SAFETY

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### TRANSPORT SAFELY

- Take care the machine may turn over when loading or unloading the machine onto or off of a truck or trailer.
  - Observe the related regulations and rules for safe transportation.
  - Select an appropriate truck or trailer for the machine to be transported.
  - Be sure to use a signal person.
  - Always follow the following precautions for loading or unloading:
    1. Select solid and level ground.
    2. Always use a ramp or deck strong enough to support the machine weight.
    3. Turn auto-idle switch OFF.
    4. Always select the slow speed mode with the travel mode switch.
    5. Never load or unload the machine onto or off a truck or trailer using the front attachment functions when driving up or down the ramp.
    6. Never steer the machine while on the ramp. If the traveling direction must be changed while the ramp, unload the machine from the ramp, reposition the machine on the ground, then try loading again.
    7. The top end of the ramp where it meets the flatbed is a sudden bump. Take care when traveling over it.
    8. Place blocks in front of and behind the tracks. Securely hold the machine to the truck or trailer deck with wire ropes.



SA-395

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

035-E07A-0454

## SAFETY

### PRACTICE SAFE MAINTENANCE

To avoid accidents:

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

Before servicing the machine:

1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.
4. Run the engine at slow idle speed without load for 5 minutes.
5. Turn the key switch to OFF to stop engine.
6. Relieve the pressure in the hydraulic system by moving the control levers several times.
7. Remove the key from the switch.
8. Attach a "Do Not Operate" tag on the control lever.
9. Pull the pilot control shut-off lever to the LOCK position.
10. Allow the engine to cool.

- If a maintenance procedure must be performed with the engine running, do not leave machine unattended.
- If the machine must be raised, maintain a 90 to 100° angle between the boom and arm. Securely support any machine elements that must be raised for service work.
- Inspect certain parts periodically and repair or replace as necessary. Refer to the section discussing that part in the "MAINTENANCE" chapter of this manual.
- Keep all parts in good condition and properly installed.
- Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.
- When cleaning parts, always use nonflammable detergent oil. Never use highly flammable oil such as fuel oil and gasoline to clean parts or surfaces.
- Disconnect battery ground cable (–) before making adjustments to electrical systems or before performing welding on the machine.

500-E02C-0520



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 control lever.  
This tag is available from your authorized dealer.

501-E01A-0287



SS3076175



SS2045102

### SUPPORT MACHINE PROPERLY

- Never attempt to work on the machine without securing the machine first.
- Always lower the attachment to the ground before you work on the machine.
- If you must work on a lifted machine or attachment, securely support the machine or attachment. Do not support the machine on cinder blocks, hollow tires, or props that may crumble under continuous load. Do not work under a machine that is supported solely by a jack.

519-E01A-0527

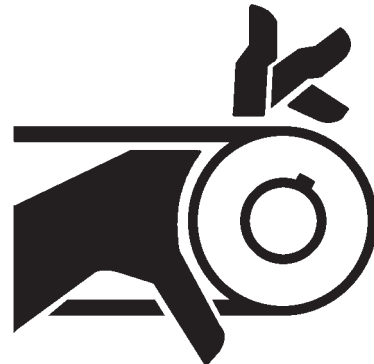


SA-527

### 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.

502-E01A-0026



SA-026



## SAFETY

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### PREVENT PARTS FROM FLYING

- Grease in the track adjuster is under high pressure. Failure to follow the precautions below may result in serious injury, blindness, or death.
  - Do not attempt to remove GREASE FITTING or VALVE ASSEMBLY.
  - As pieces may fly off, be sure to keep body and face away from valve.
  - Never attempt to disassemble the track adjuster. Inadvertent disassembling of the track adjuster may cause the parts such as a spring to fly off, possibly resulting in severe personal injury or death.
- Travel reduction gears are under pressure.
  - As pieces may fly off, be sure to keep body and face away from AIR RELEASE PLUG to avoid injury.
  - GEAR OIL is hot. Wait for GEAR OIL to cool, then gradually loosen AIR RELEASE PLUG to release pressure.



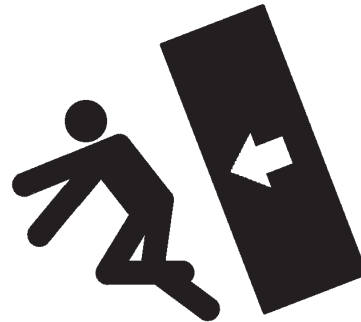
SA-344

503-E01B-0344

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### STORE ATTACHMENTS SAFELY

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



504-E01A-0034

SA-034

## 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.
- 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.



505-E01B-0498

SA-225

### REPLACE RUBBER HOSES PERIODICALLY

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



SA-019

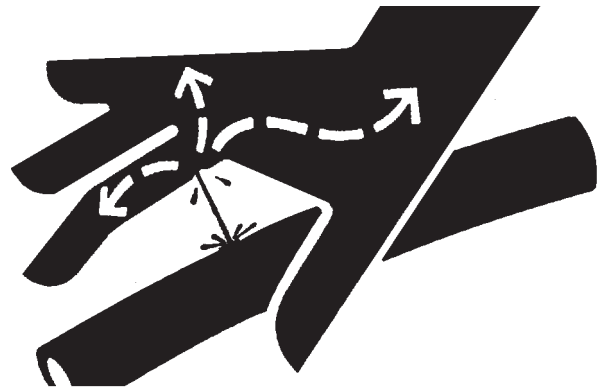
S506-E01A-0019

## SAFETY

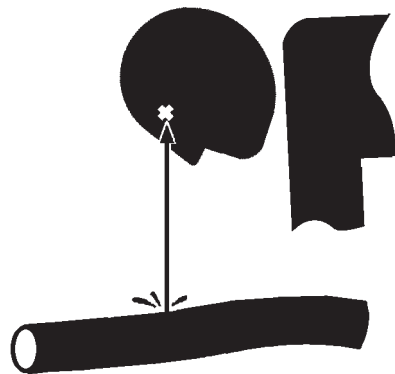
### AVOID HIGH-PRESSURE FLUIDS

- 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.

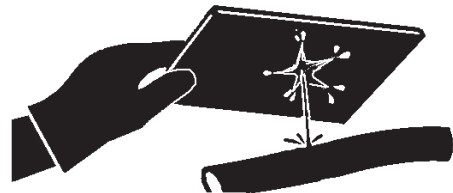
507-E03A-0499



SA-031



SA-292



SA-044

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## SAFETY

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### PREVENT FIRES

#### Check for Oil Leaks:

- Fuel, hydraulic oil and lubricant leaks can lead to fires.
  - Check for oil leaks due to missing or loose clamps, kinked hoses, lines or hoses that rub against each other, damage to the oil-cooler, and loose oil-cooler flange bolts.
  - Tighten, repair or replace any missing, loose or damaged clamps, lines, hoses, oil-cooler and oil-cooler flange bolts.
  - Do not bend or strike high-pressure lines.
  - Never install bent or damaged lines, pipes, or hoses.



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.

#### Check Key Switch:

- If a fire breaks out, failure to stop the engine will escalate the fire, hampering fire fighting.  
Always check key switch function before operating the machine every day:
  1. Start the engine and run it at 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.

508-E02B-0019

#### 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.

508-E02A-0393

## SAFETY

### EVACUATING IN CASE OF FIRE

- If a fire breaks out, evacuate the machine in the following way:
  - Stop the engine by turning the key switch to the OFF position if there is time.
  - Use a fire extinguisher if there is time.
  - Exit the machine.
- In an emergency, if the cab door or front window can not be opened, break the front or rear window panes with the emergency evacuation hammer to escape from the cab. Refer the explanation pages on the Emergency Evacuation Method.



SA-393

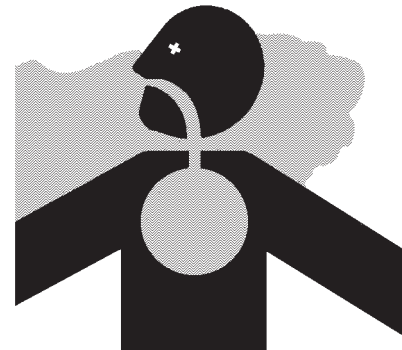


SS-1510

18-E02B-0393

### 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.



509-E01A-0016

SA-016

### PRECAUTIONS FOR WELDING AND GRINDING

- Welding may generate gas and/or small fires.
  - Be sure to perform welding in a well ventilated and prepared area. Store flammable objects in a safe place before starting welding.
  - Only qualified personnel should perform welding. Never allow an unqualified person to perform welding.
- Grinding on the machine may create fire hazards. Store flammable objects in a safe place before starting grinding.
- After finishing welding and grinding, recheck that there are no abnormalities such as the area surrounding the welded area still smoldering.



SA-818

523-E01A-0818

## SAFETY

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### AVOID HEATING NEAR PRESSURIZED FLUID LINES

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



SA-030

### 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.

510-E01B-0030

### 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

511-E01A-0029

## SAFETY

### BEWARE OF ASBESTOS DUST

- Take care not to inhale dust produced in the work site. Inhalation of asbestos fibers may be the cause of lung cancer.
  - Depending on the work site conditions, the risk of inhaling asbestos fiber may exist. Spray water to prevent asbestos from becoming airborne. Don't use compressed air.
  - When operating the machine in a work site where asbestos might be present, be sure to operate the machine from the upwind side and wear a mask rated to prevent the inhalation of asbestos.
  - Keep bystanders out of the work site during operation.
  - Asbestos might be present in imitation parts. Use only genuine Hitachi Parts.



SA-029

### PREVENT BATTERY EXPLOSIONS

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



SA-032

512-E01B-0032

### SERVICE AIR CONDITIONING SYSTEM SAFELY

- If spilled onto skin, refrigerant may cause a cold contact burn.
  - Refer to the instructions described on the container for proper use when handling the refrigerant.
  - Use a recovery and recycling system to avoid leaking refrigerant into the atmosphere.
  - Never touch the refrigerant.



513-E01A-0405

SA-405

## SAFETY

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### HANDLE CHEMICAL PRODUCTS SAFELY

- Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with your machine include such items as lubricants, coolants, paints, and adhesives.
- A 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.

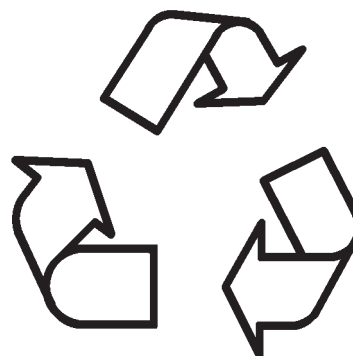


SA-309

515-E01A-0309

### DISPOSE OF WASTE PROPERLY

- Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with HITACHI equipment includes such items as oil, fuel, coolant, brake fluid, filters, and batteries.
- Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.
- Do not pour waste onto the ground, down a drain, or into any water source.
- Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.
- Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your authorized dealer.



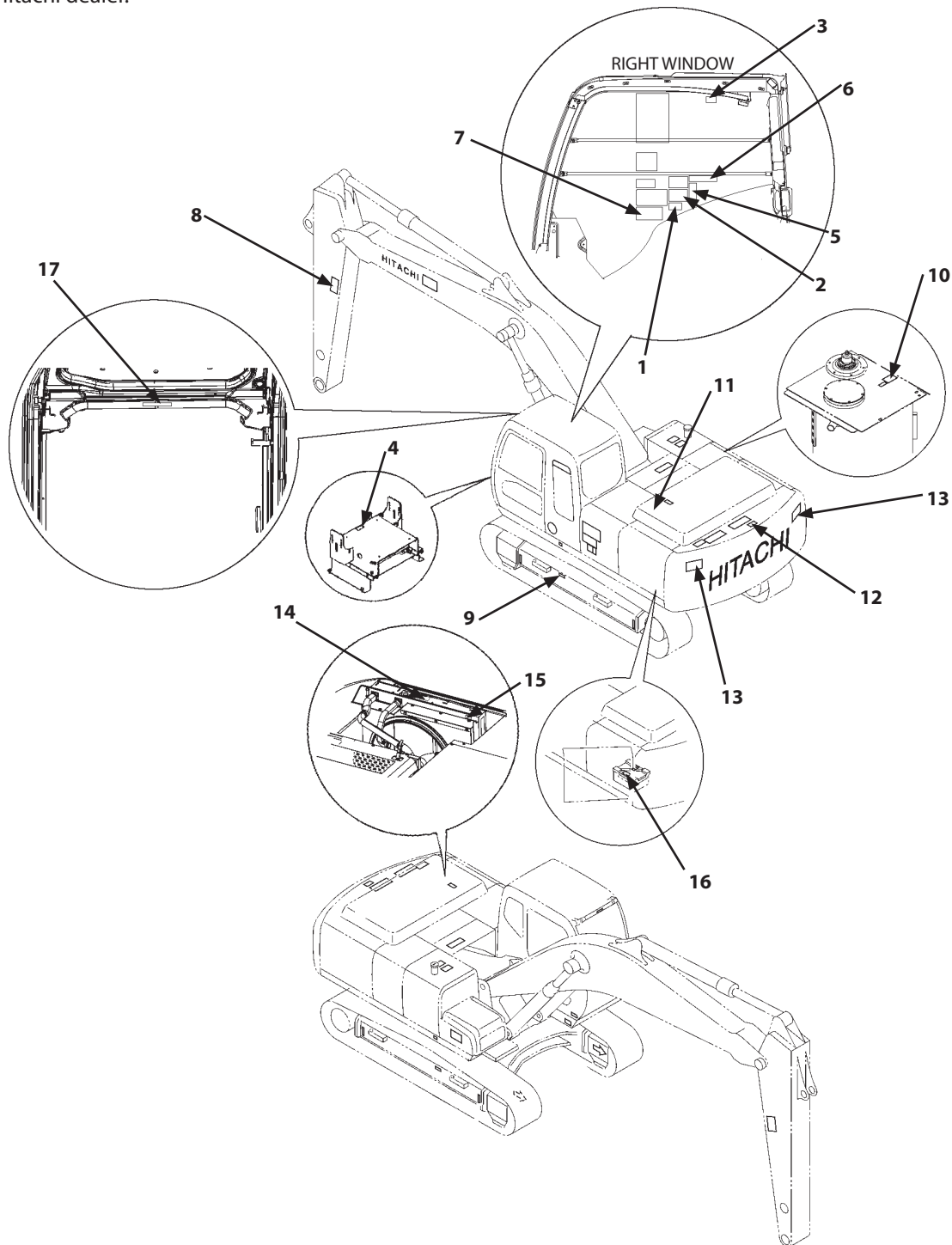
SA-226

516-E01A-0226



## SAFETY SIGNS/Oceania Model Only

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.

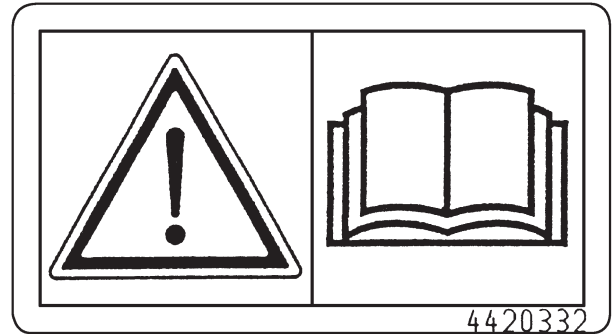


## SAFETY SIGNS/Oceania Model Only

1.

### WARNING!

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

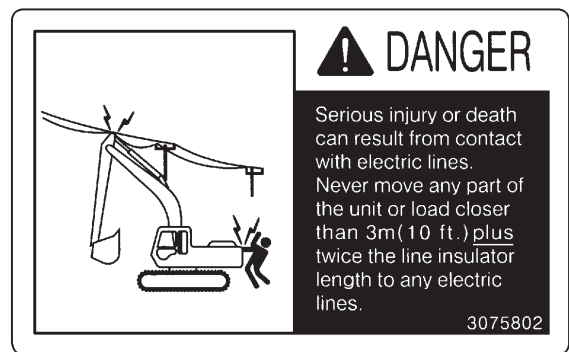


SS-1616

2.

Sign indicates an electrocution hazard if machine is brought too near electric power lines.

Keep a safe distance from electric power lines.



SS-862

3.

Sign indicates a hazard from falling window.

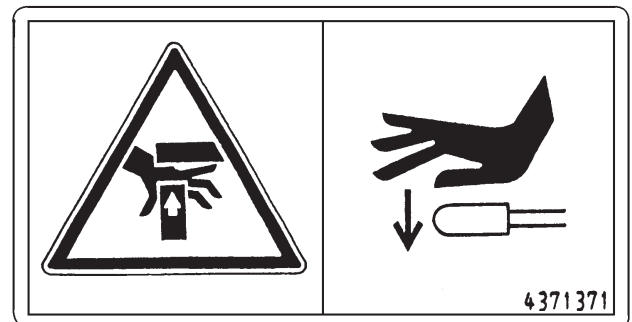
After raising window, be sure to lock it in place with lock pins.



SS-863

4

When moving the seat height/tilt lever downward, press the lever grip with a palm from the top side. Do not grasp the lever grip to operate the lever, possibly resulting in pinch of your fingers into the seat stand.



SS-955

## SAFETY SIGNS/Oceania Model Only

5.

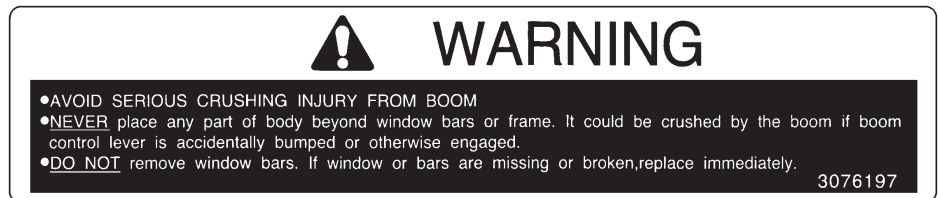
If the machine should overturn, the operator may become injured and/or throw from the cab and/or crushed by the overturning machine.



SS3088058

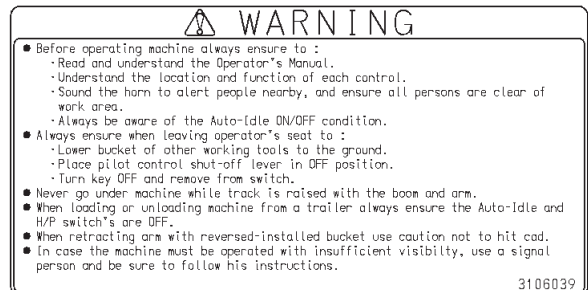
6.

Do not extend your hands or head from the window. Your hands or head may come in contact with the boom.



SS-859

7.

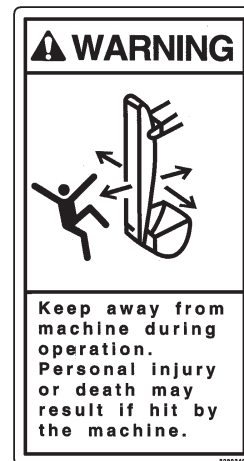


SS3106039

8.

Sign indicates a hazard of being hit by the working device of the machine.

Keep away from machine during operation.



SS3092349

## SAFETY SIGNS/Oceania Model Only

**9.**

Sign indicates a hazard of a flying plug from track adjuster that could cause injury.

Read manual before adjusting track for safe and proper handling.



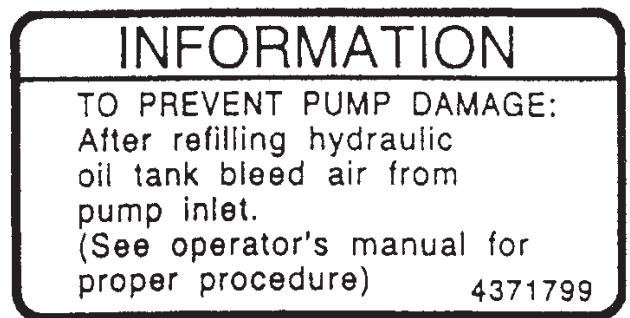
SS-408

**10.**

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

Read manual for safe and proper handling.

A



SS4371799

Sign indicates a burn hazard from spurting hot water or oil if radiator or hydraulic tank is uncapped while hot.

Allow radiator or hydraulic tank to cool before removing cap.

B



SS-864

**11.**

Sign indicates a hazard of falling.

Do not stand on this place.



SS3092351

## SAFETY SIGNS/Oceania Model Only

12.

Sign indicates a hazard of falling off the fender or hood.  
Never stand close to the edge.



SS3092350

13.

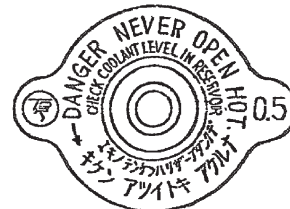
Sign indicates a crush hazard by rotation of upper structure of the machine.  
Keep away from swinging area of machine.



SS-024

14.

Sign indicates a burn hazard from spurting hot water or oil if radiator or hydraulic tank is uncapped while hot.  
Allow radiator or hydraulic tank to cool before removing cap.



SS-2828

15.

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



SS3092352

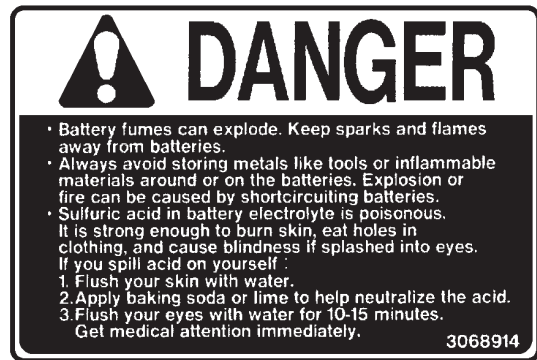
## SAFETY SIGNS/Oceania Model Only

16.

Sign indicates an explosion hazard.

Keep fire and open flames away from this area.

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



SS-411

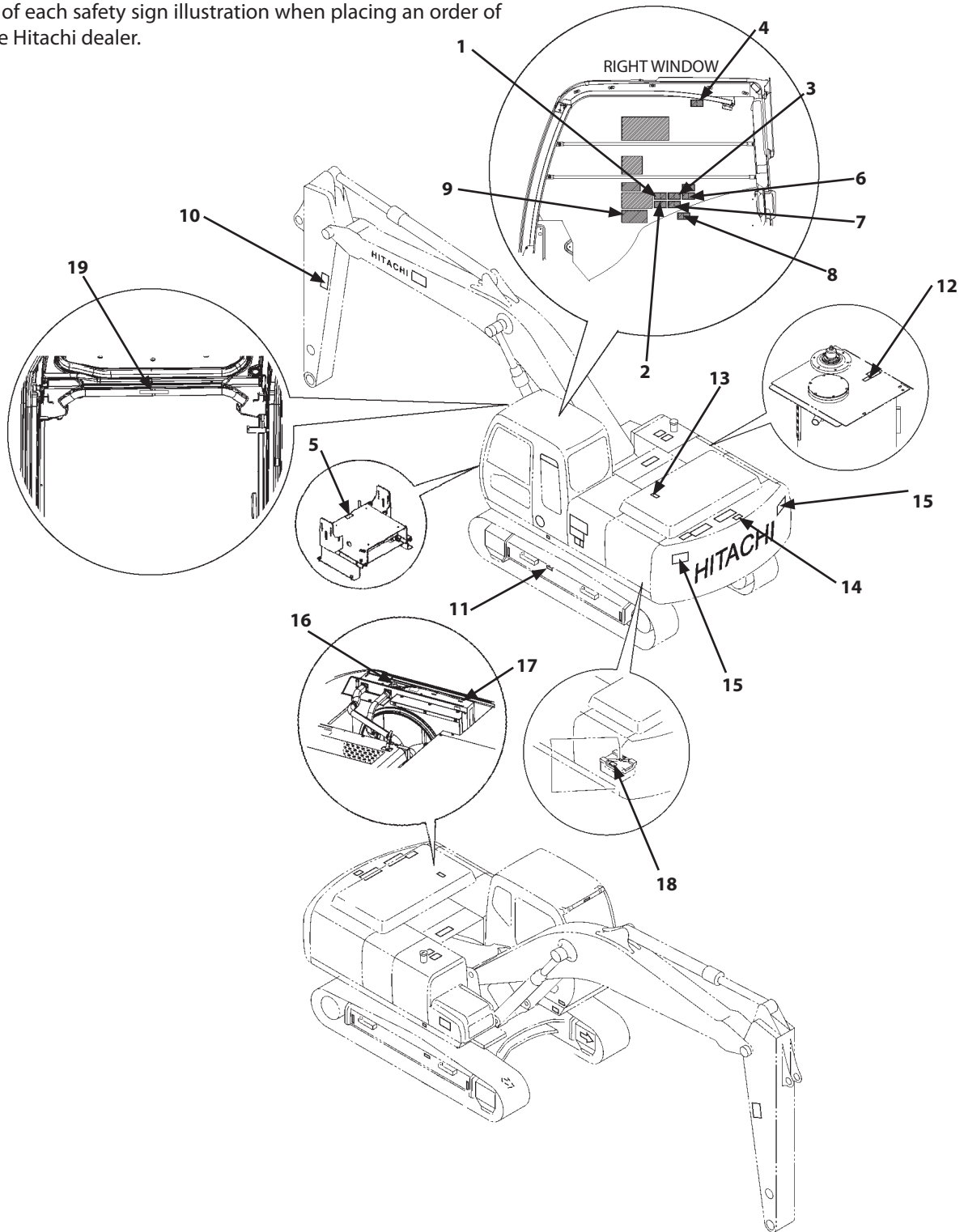
17.



SS4467093

## SAFETY SIGNS/Europe/Asia/Middle and Near East Model Only

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.

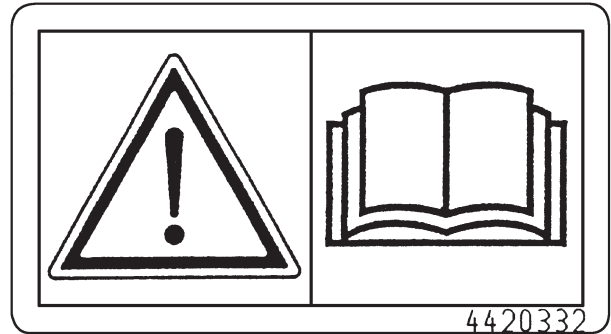


## SAFETY SIGNS/Europe/Asia/Middle and Near East Model Only

1.

### WARNING!

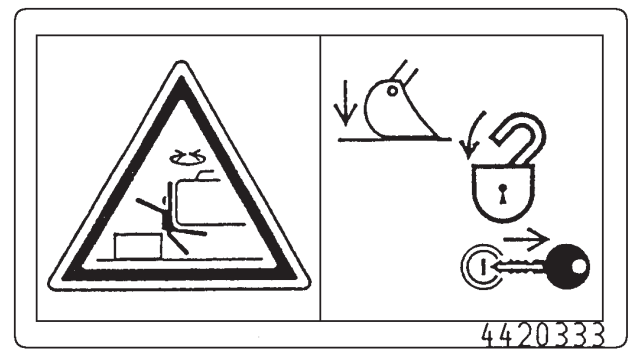
Prior to operation, maintenance, disassembling, and transportation of the machine, be sure to read and understand the Operator's Manual.



SS-1616

2.

If the parked machine is unexpectedly moved, serious injury or death due to crushing may result. Be sure to lower the front attachment to the ground, lock the control levers, and remove the engine key before leaving the machine unattended.

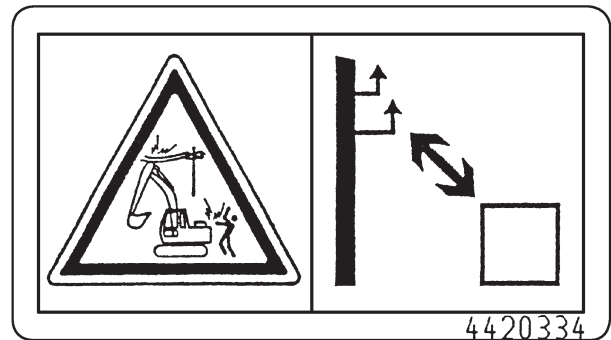


SS4420333

3.

Sign indicates an electrocution hazard if machine is brought too near electric power lines.

Keep a safe distance from electric power lines.

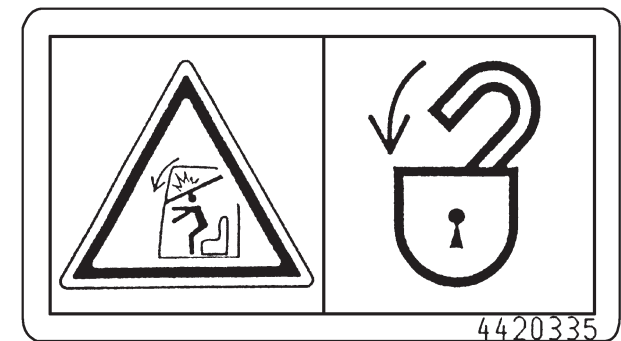


SS-1613

4.

Sign indicates a hazard from falling window.

After raising window, be sure to lock it in place with lock pins.



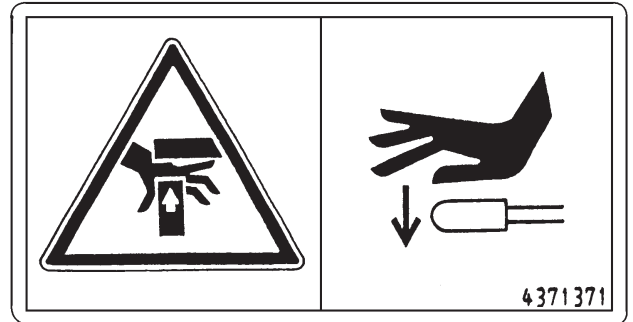
SS-1618



## SAFETY SIGNS/Europe/Asia/Middle and Near East Model Only

5.

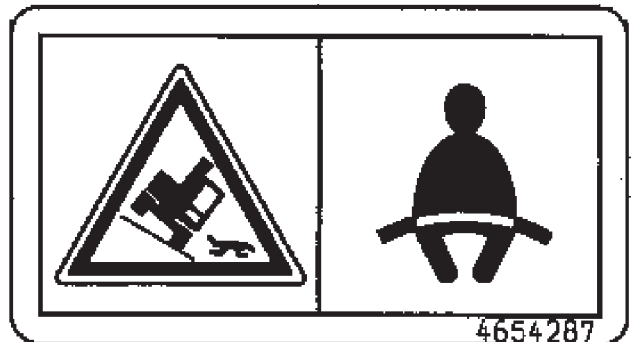
When moving the seat height/tilt lever downward, press the lever grip with a palm from the top side. Do not grasp the lever grip to operate the lever, possibly resulting in pinch of your fingers into the seat stand.



SS-955

6.

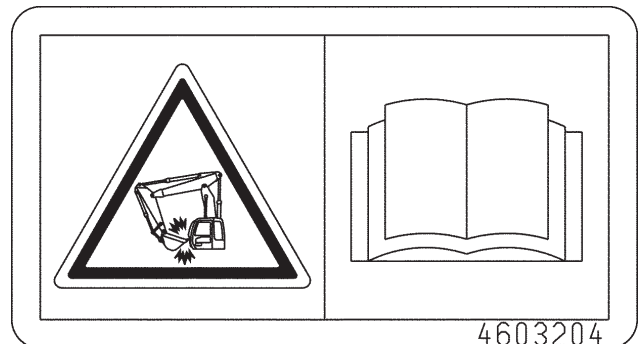
If the machine should overturn, the operator may become injured and/or throw from the cab and/or crushed by the overturning machine.



SS4654287

7.

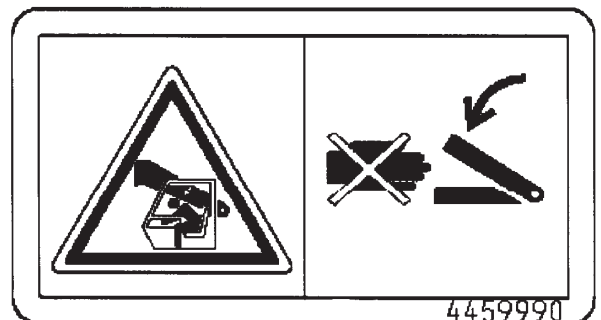
When operating, the bucket may come in contact with the cab. Operate the machine with care not to allow the tip of the bucket to hit the cab while rolling in the front attachment.



SS4603204

8.

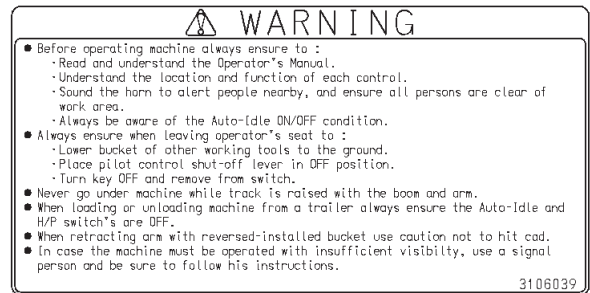
Do not extend your hands or head from the window. Your hands or head may come in contact with the boom.



SS4459990

## SAFETY SIGNS/Europe/Asia/Middle and Near East Model Only

9.



SS3106039

10.

Sign indicates a hazard of being hit by the working device of the machine.

Keep away from machine during operation.

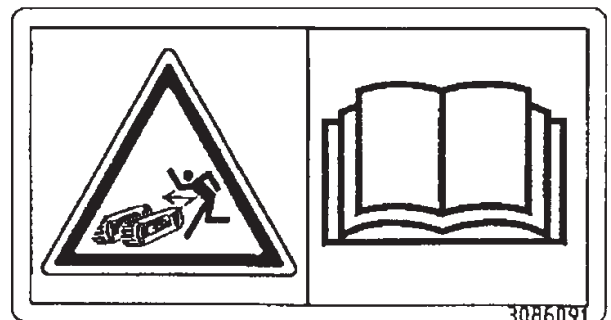


SS3089581

11.

Sign indicates a hazard of a flying plug from track adjuster that could cause injury.

Read manual before adjusting track for safe and proper handling.



SS3086091

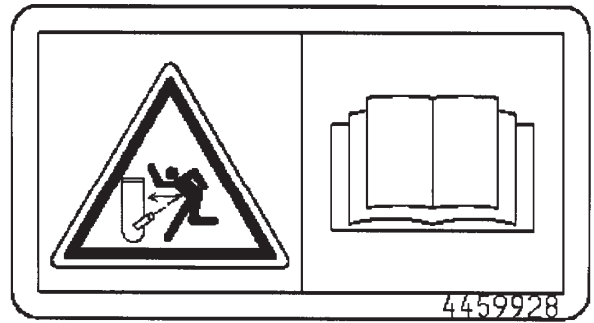
## SAFETY SIGNS/Europe/Asia/Middle and Near East Model Only

### 12.

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

Read manual for safe and proper handling.

A

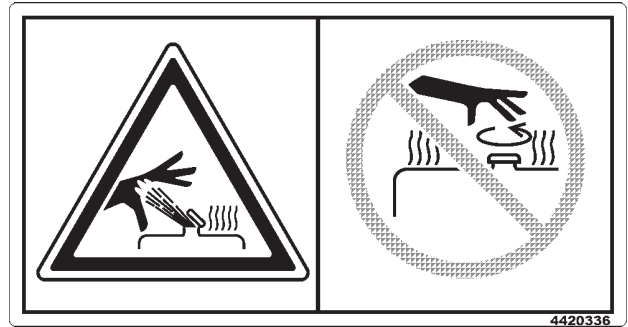


SS4459928

Sign indicates a burn hazard from spurting hot water or oil if radiator or hydraulic tank is uncapped while hot.

Allow radiator or hydraulic tank to cool before removing cap.

B



SS4420336

### 13.

Sign indicates a hazard of falling.

Do not stand on this place.



SS3092126

### 14.

Sign indicates a hazard of falling off the fender or hood.

Never stand close to the edge.



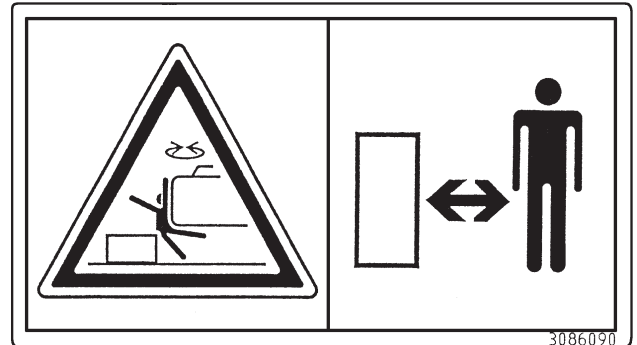
SS3092125

## SAFETY SIGNS/Europe/Asia/Middle and Near East Model Only

15.

Sign indicates a crush hazard by rotation of upper structure of the machine.

Keep away from swinging area of machine.

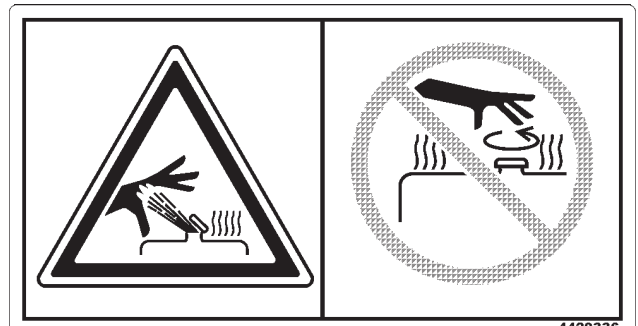


SS-1614

16.

Sign indicates a burn hazard from spurting hot water or oil if radiator or hydraulic tank is uncapped while hot.

Allow radiator or hydraulic tank to cool before removing cap.

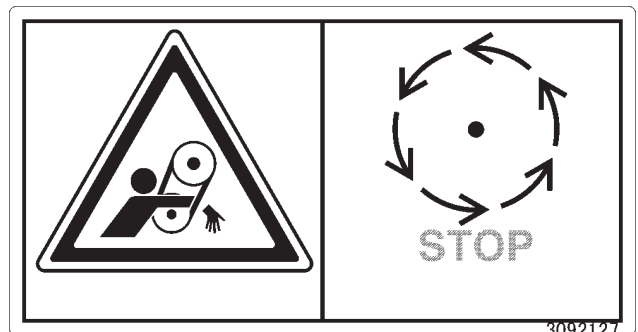


SS4420336

17.

Sign indicates a hazard of rotating parts, such as belt.

Turn off before inspection and maintenance.



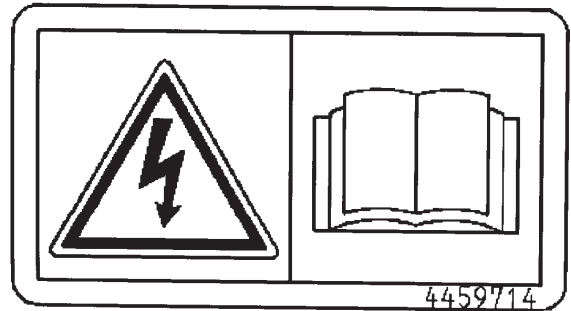
SS3092127

## SAFETY SIGNS/Europe/Asia/Middle and Near East Model Only

18.

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

A



SS4459714

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

B



SS4460067

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

C



SS4460056

19.



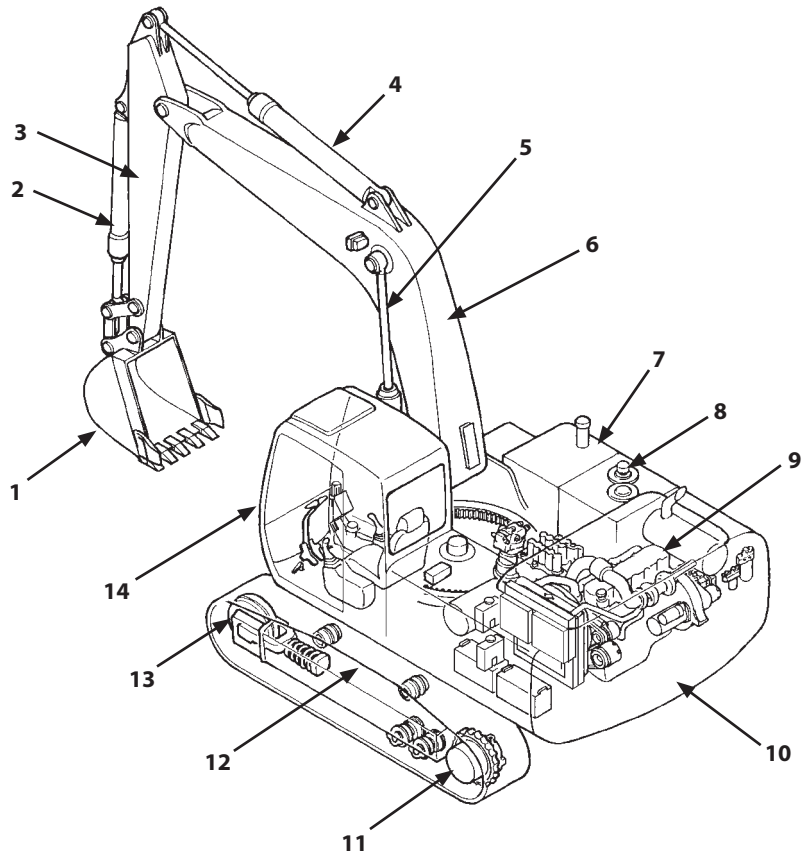
SS4467093



## COMPONENTS NAME

### COMPONENTS NAME

- 1- Bucket
- 2- Bucket Cylinder
- 3- Arm
- 4- Arm Cylinder
- 5- Boom Cylinder
- 6- Boom
- 7- Fuel Tank
- 8- Hydraulic Oil Tank
- 9- Engine
- 10- Counterweight
- 11- Travel Device
- 12- Track
- 13- Front Idler
- 14- Cab



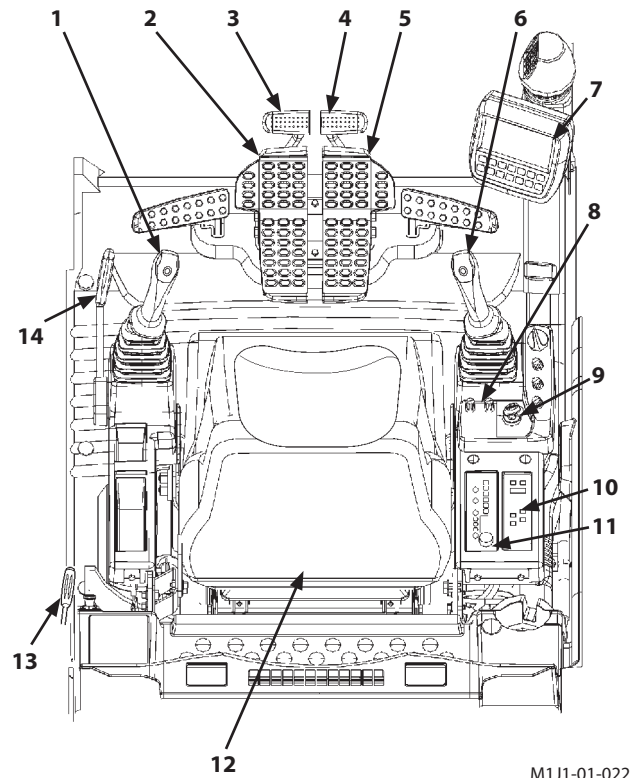
M1U1-01-005

# OPERATOR'S STATION

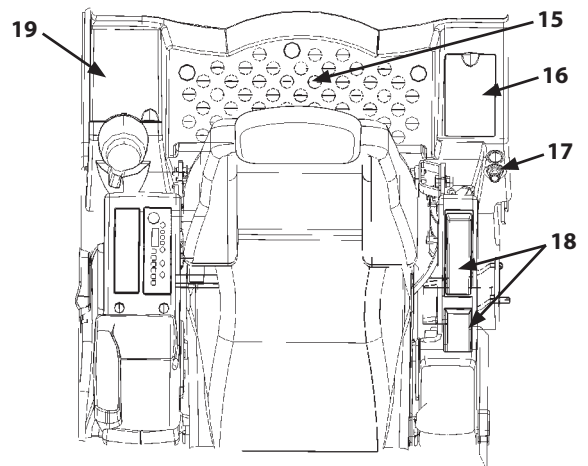
## CAB FEATURES

### Std. Model

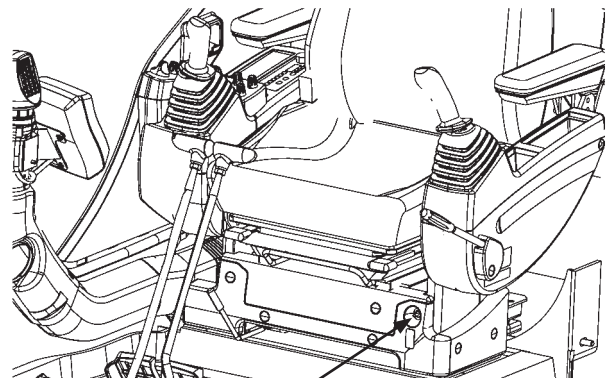
- 1- Left Control Lever/Horn Switch  
(On Top of Lever)
- 2- Left Travel Pedal
- 3- Left Travel Lever
- 4- Right Travel Lever
- 5- Right Travel Pedal
- 6- Right Control Lever/Power Boost Switch
- 7- Multi Function Monitor Panel
- 8- Switch Panel
- 9- Key Switch
- 10- Air Conditioner Panel  
Heater Panel (Optional)
- 11- Radio
- 12- Operator's Seat
- 13- Cab Door Release Lever
- 14- Pilot Control Shut-Off Lever
- 15- Glove Compartment
- 16- Fuse Box
- 17- Cigar Lighter
- 18- Switch Panel (Optional)
- 19- Hot & Cool Box
- 20- Engine Stop Switch



M1J1-01-022



M1U1-01-002



M1U1-01-029

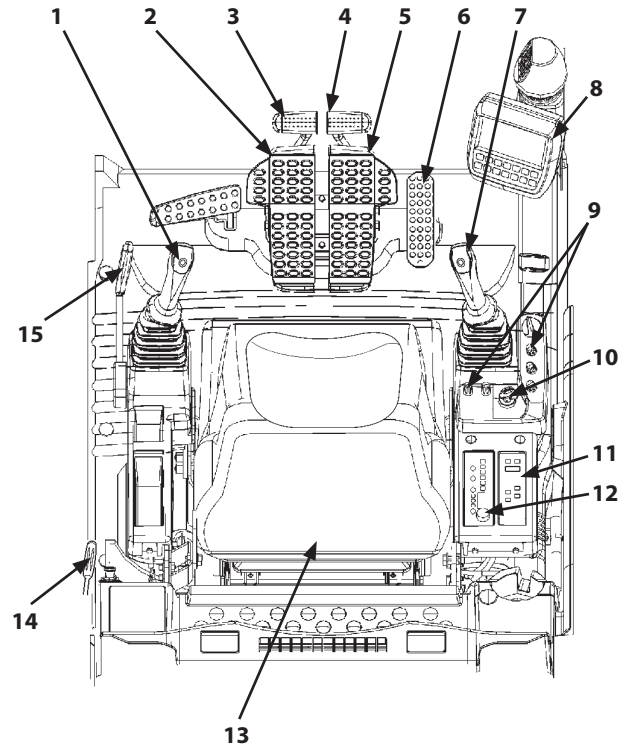


# OPERATOR'S STATION

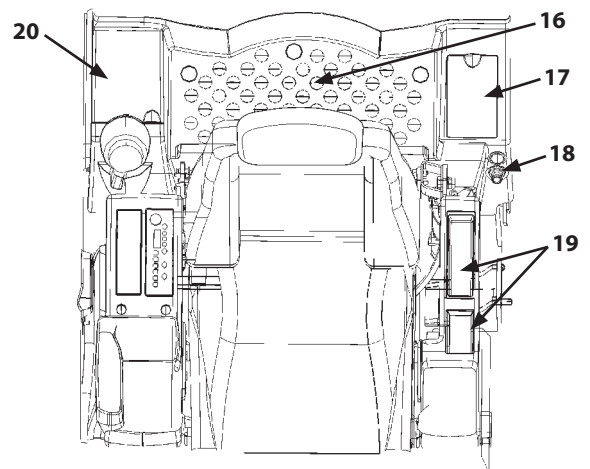
## CAB FEATURES

(Only Machines Equipped with Optional Attachments)

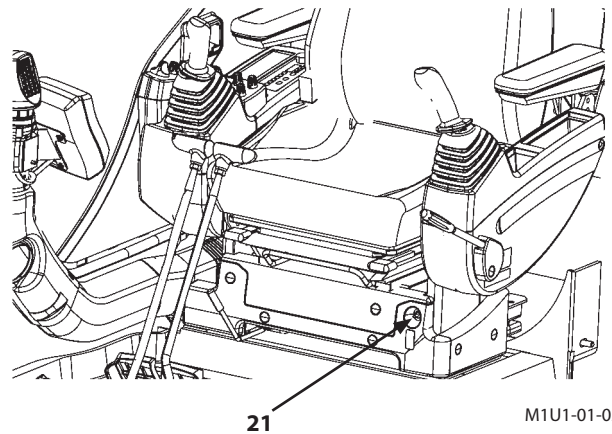
- 1- Left Control Lever/Horn Switch  
(On Top of Lever)
- 2- Left Travel Pedal
- 3- Left Travel Lever
- 4- Right Travel Lever
- 5- Right Travel Pedal
- 6- Attachment Pedal (Optional)
- 7- Right Control Lever/Power Boost Switch
- 8- Multi Function Monitor Panel
- 9- Switch Panel
- 10- Key Switch
- 11- Air Conditioner Panel  
Heater Panel (Optional)
- 12- Radio
- 13- Operator's Seat
- 14- Cab Door Release Lever
- 15- Pilot Control Shut-Off Lever
- 16- Glove Compartment
- 17- Fuse Box
- 18- Cigar Lighter
- 19- Switch Panel (Optional)
- 20- Hot & Cool Box
- 21- Engine Stop Switch



M1J1-01-026



M1U1-01-002



M1U1-01-029

# OPERATOR'S STATION

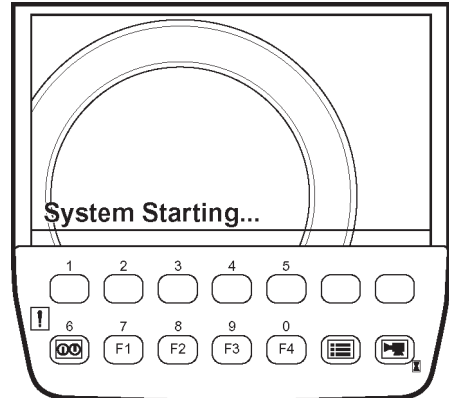
## MULTI FUNCTION MONITOR

### How To Use Screens

#### Displaying Basic Screen

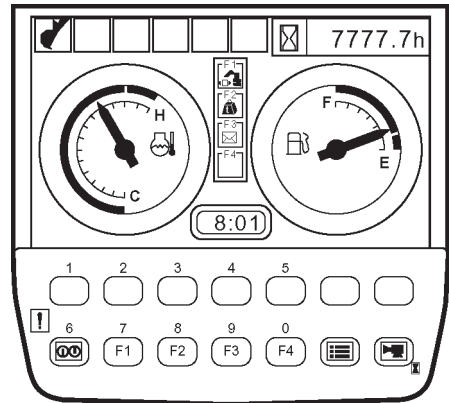
**IMPORTANT:** Start the engine after the basic screen is displayed.

When the key switch is turned to the ON position, the starting screen displays for about two seconds and the basic screen displays.



Key Switch: ON

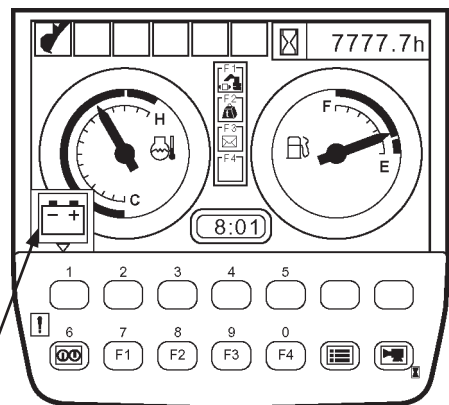
T1V1-05-01-115



Basic Screen

T1V1-05-01-123

**IMPORTANT:** After the engine starts and the alternator starts generating power. Alternator alarm is displayed on the basic screen.



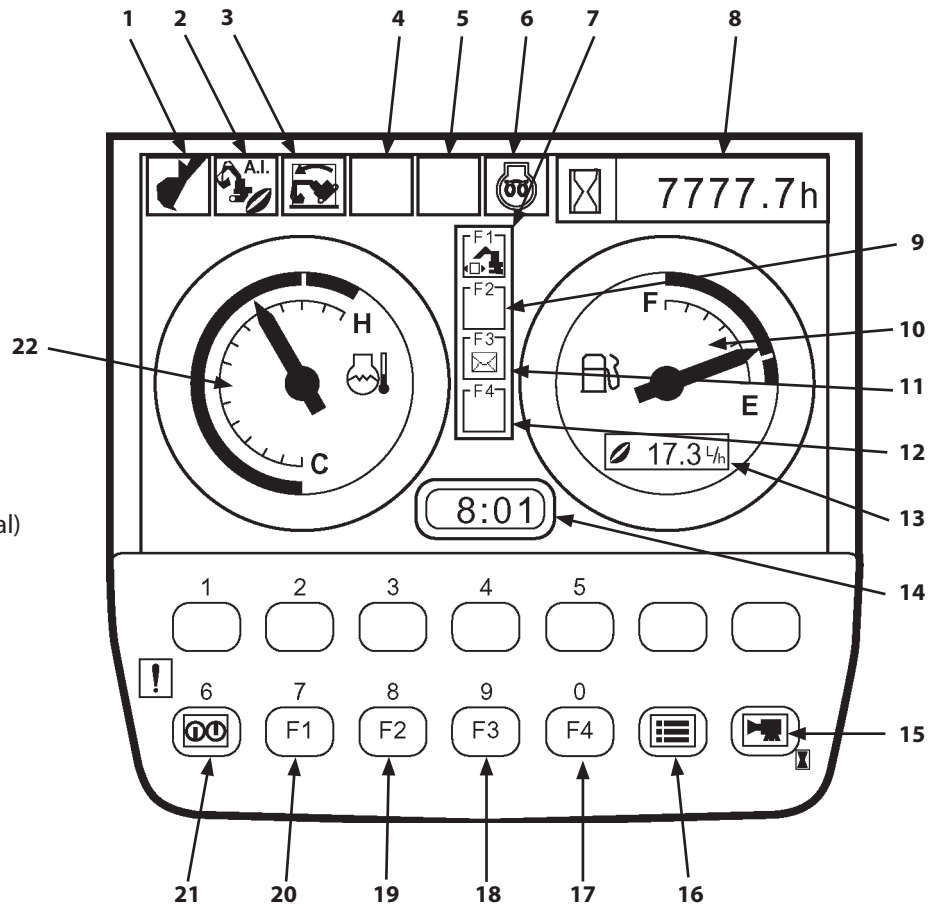
Alternator Alarm

T1V1-05-01-117

# OPERATOR'S STATION

## OUTLINE

- 1 - Work Mode Display
- 2 - Auto-Idle Display
- 3 - Overload Alarm Display (Optional)
- 4 - Auxiliary
- 5 - Auxiliary
- 6 - Preheat Display
- 7 - Work Mode Display
- 8 - Hour Meter
- 9 - Auxiliary
- 10 - Fuel Gauge
- 11 - Mail Display (Optional)
- 12 - Auxiliary
- 13 - Fuel Rate Display
- 14 - Clock
- 15 - Back Monitor Selector (Optional)
- 16 - Menu
- 17 - Auxiliary Selection
- 18 - Mail Selection (Optional)
- 19 - Auxiliary Selection (Optional)
- 20 - Work Mode Selection
- 21 - Return to Basic Screen Key
- 22 - Coolant Temperature Gauge



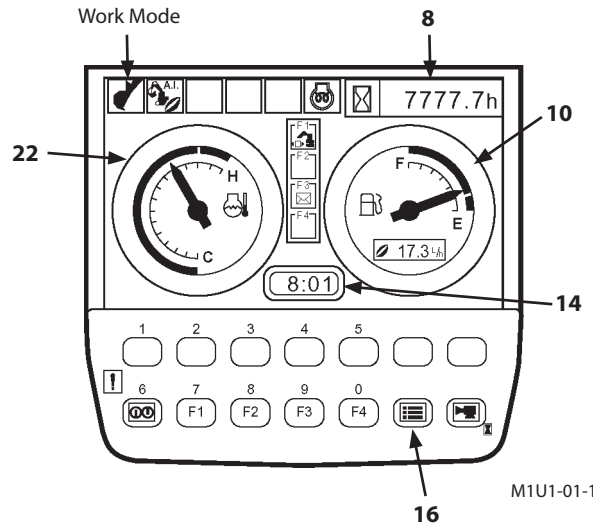
M1U1-01-111

# OPERATOR'S STATION

- Display of Meters  
Items to be displayed

- 8. Hour Meter
- 10. Fuel Consumption Gauge
- 14. Clock
- 16. Menu
- 22. Coolant Temperature Gauge

- Work Mode Display  
The attachments being used are displayed.



M1U1-01-112

## Digging Mode



T1V1-05-01-108

## Attachment Mode

### Breaker



T1V1-05-01-104

### Pulverizer



T1V1-05-01-105

### Crusher



T1V1-05-01-106

### Vibrating Hammer



T1V1-05-01-107

### Others



T1V1-05-02-003

## OPERATOR'S STATION

- Auto-Idle Display(2)

When selecting auto-idle from the switch panel, the auto-idle display (2) is displayed.

When the key is turned ON, the data blinks for 10 seconds.

- Overload Alarm Display (3) (optional)



T1V1-05-02-002

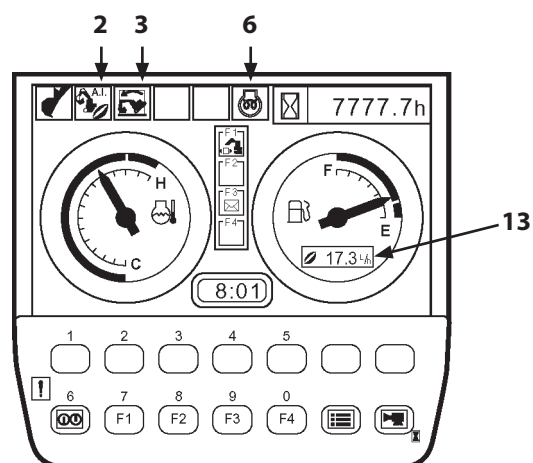
The system measures the load of suspended load from the bottom pressure of boom cylinder. When overload is detected, an alarm is displayed.

- Preheat Display (6)

- While the current is supplying to the glow plug, or the air heater the date is displayed.

- Fuel Rate Display (13)



- Fuel consumption is displayed (Reference value).

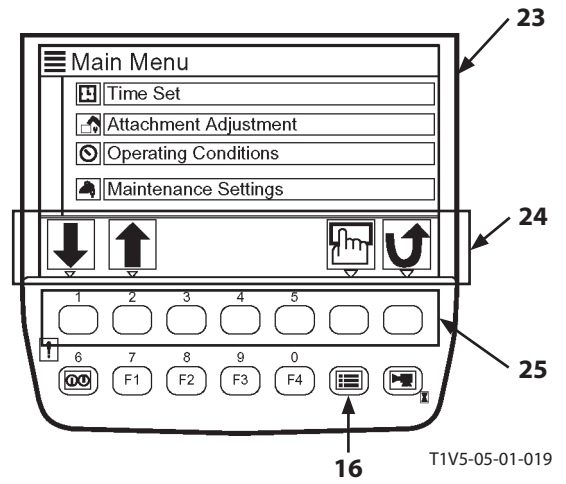


M1U1-01-113

## OPERATOR'S STATION

### Menu Screen (23)

Press menu key (16) on the basic screen to display main menu screen (23). Select the desired menu by operating key (25) located under   keys on icon display area (24).



## OPERATOR'S STATION

---

### Hour Meter

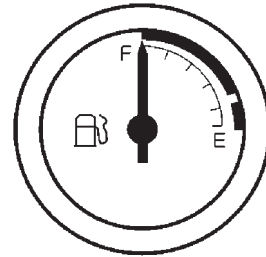
Total (accumulated) machine operation hours counted since the machine started working, are displayed in the unit of HOUR (h). One digit after the decimal point indicates the tenths of an hour (6 minutes).



M1U1-01-038

### Fuel Gauge

The fuel amount in the fuel tank is indicated. Refuel before the needle reaches "E".



M1U1-01-039

### Clock

Indicates the present time.



M1U1-01-040

### Back Monitor Selector

Shifts the monitor screen to the back view monitor screen and vice versa.



M1U1-01-041

## OPERATOR'S STATION

---

### Menu Key

Shifts the basic screen to the menu screen.



M1U1-01-042

### Optional Function Key

The desired preset optional function can be selected by operating these keys even though the menu key is not operated.

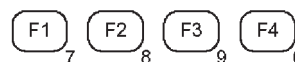
F1 : Work Mode Selection

F2 : Auxiliary

F3 : Mail (Optional)

F4 : Auxiliary

are the fixed function keys.



M1U1-01-043

### Return to Basic Screen Key

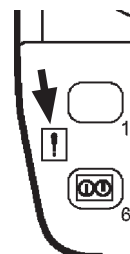
Allows any screen to return to the basic screen.



M1U1-01-044

### Alarm Light

Comes ON when any abnormality occurs.



M1U1-01-045

### Optional Function Display

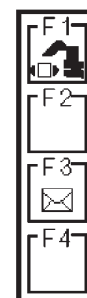
Displays the optional functions preset by the optional function key.

F1 : Work Mode Selection

F2 : Auxiliary

F3 : Mail (Optional)

F4 : Auxiliary



M1U1-01-114

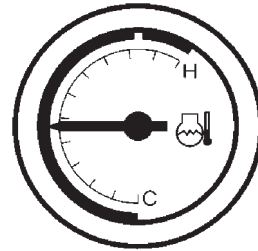


## OPERATOR'S STATION

---

### Coolant Temperature Gauge

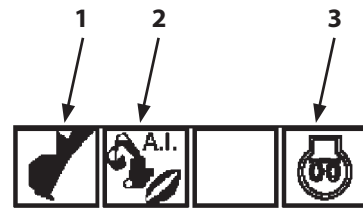
Indicates the engine coolant temperature. Normally the needle is around the center of the scale during operation.



M1U1-01-047

### Operating Status Icon Display

Displays icons indicating the current status of the attachment (1) selected at the work mode selection screen and operation modes such as the auto-idle system (2) and preheat display (3), etc when these systems are activated.



M1U1-01-065

## OPERATOR'S STATION


### Displaying Basic Screen by Password Input (Optional)

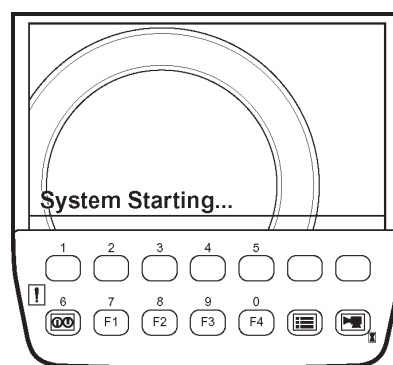
**IMPORTANT:** When required to activate the TEN-key function (ignition block system), consult your nearest Hitachi dealer.

If the password ever escapes the customer's memory, the machine must be modified. Be extra careful not to forget the password.

1. Turn the key switch ON. After the starting screen is displayed, the password input screen will be displayed.

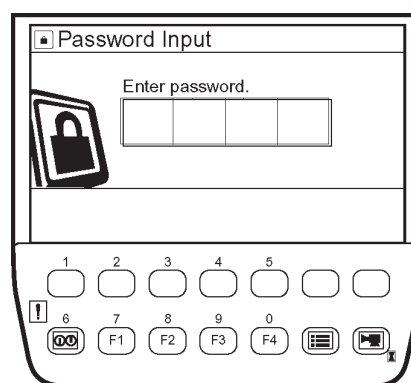
2. Input a password by using the keys located under the screen. If pushing the determination key, the monitor unit matches the input password to the registered one. If they match, the basic screen displays.

 **NOTE:** When inputting the password again, the entered characters can be erased by pushing the delete key.



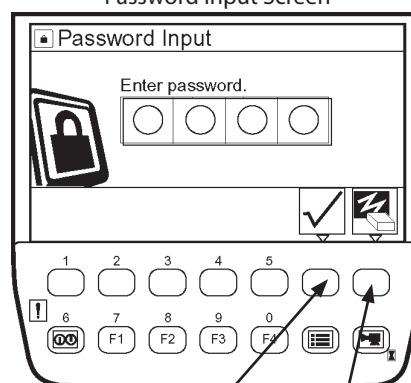
Starting Screen

T1V1-05-01-115



Password Input Screen

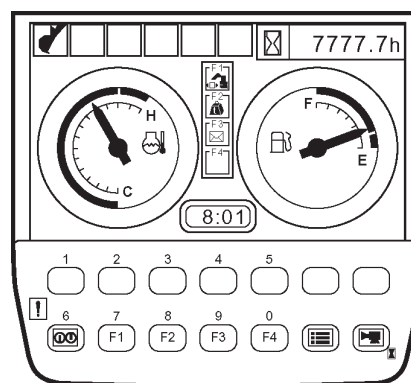
T1V5-05-01-093



Determination Key

Delete Key

T1V5-05-01-002



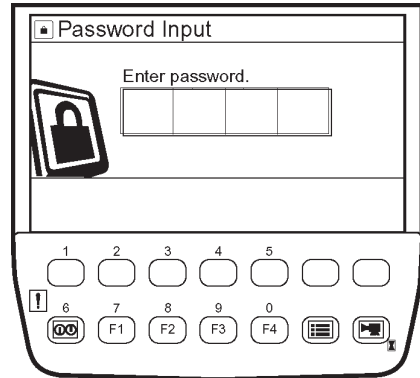
Basic Screen

T1V1-05-01-123

# OPERATOR'S STATION

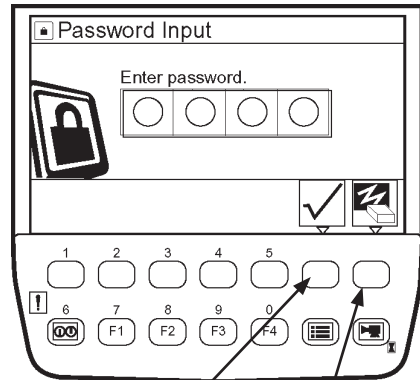
## In Case of Inputting an Incorrect Password

1. If inputting an incorrect password, the message "Password is incorrect." displays by pushing the determination key.



Password Input Screen


T1V5-05-01-093

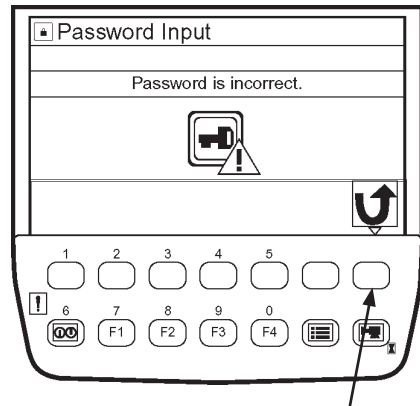


Determination Key Delete Key

T1V5-05-01-002

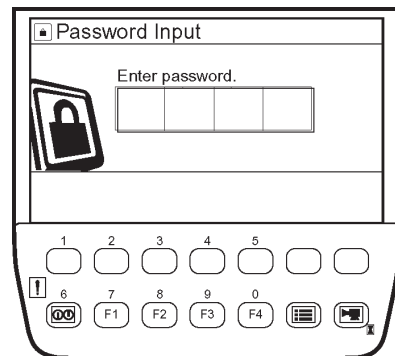
2. Return to the password input screen, by pushing the back key.

 **NOTE:** When inputting the password again, the entered characters can be erased by pushing the delete key.



Back key

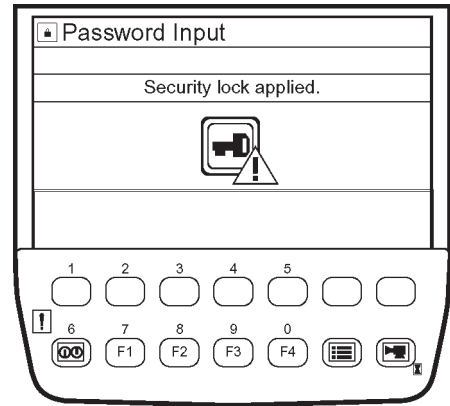
T1V5-05-01-004



T1V5-05-01-093

## OPERATOR'S STATION

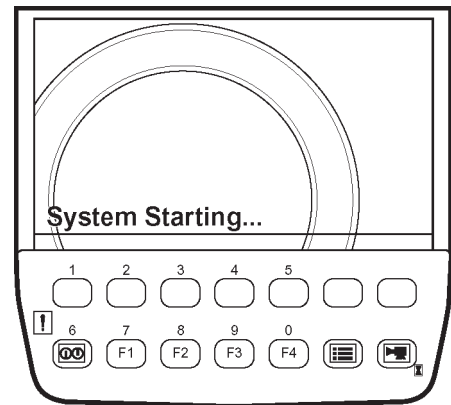
3. If inputting an incorrect password three times, a screen displays informing that the security lock has been applied, and a buzzer rings for thirty seconds. During that time, the buzzer does not stop ringing even if turning of the key switch ON/OFF.



Security Lock Screen

TIV5-05-01-005

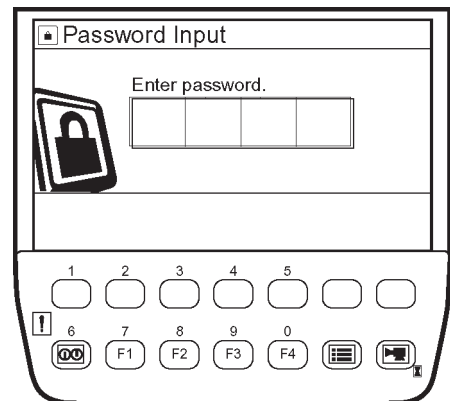
4. After thirty seconds, if the key switch is turned to the ON position, the starting screen displays and the password input screen displays again. Then a password can be input again. If inputting an incorrect password even once this time, the security lock screen displays again and a buzzer rings for thirty seconds. The buzzer does not stop ringing for thirty seconds even if turning the key switch ON/OFF.



Starting Screen

TIV1-05-01-115

5. After the buzzer stops ringing, a password can be input again. Turn the key switch to the ON position and input a password after the password input screen displays. (Refer to 1-12)
6. If inputting an incorrect password again, the security lock screen displays again. The buzzer does not stop ringing for thirty seconds even if turning the key switch ON/OFF.



Password Input Screen

TIV5-05-01-093

# OPERATOR'S STATION

## Extending Password Duration Time

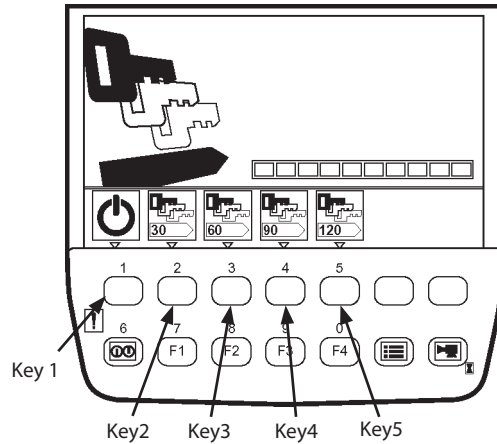
**IMPORTANT:** This operation is applicable only to those machines that display the basic screen based upon password input.

By using the password duration screen, password duration time can be set. When you restarting the machine, a password need not be input within that timeframe.

1. When turn the key switch to the OFF position, the monitor unit displays the password duration screen for ten seconds.
2. While the password duration screen is still displayed, push a relevant key, and password duration time is set. Duration time assigned to each key is as follows:
  - key 1: 0 minute
  - key 2: 30 minutes
  - key 3: 60 minutes
  - key 4: 90 minutes
  - key 5: 120 minutes

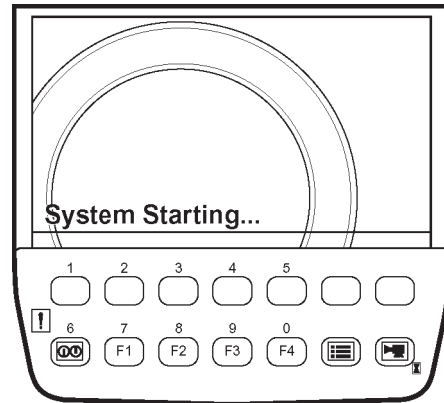
**NOTE:** If password duration time is not set explicitly, 0 minute on duration time is assumed.

3. If turning the key switch to the ON position within password duration time, the monitor unit displays the basic screen after the starting screen.



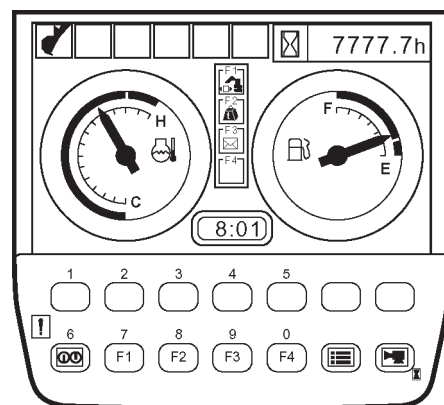
Password Duration Screen (Key Switch: OFF)

T1V1-05-01-012



Key Switch: ON

T1V1-05-01-115



Basic Screen

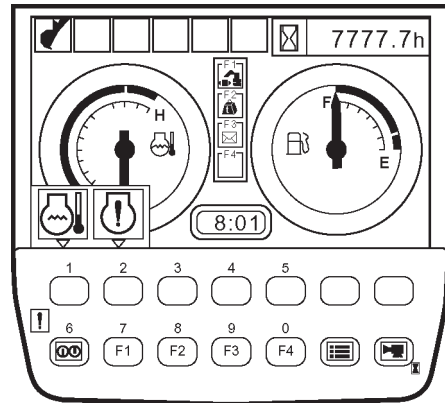
T1V1-05-01-123

## OPERATOR'S STATION

### ALARM OCCURRENCE SCREEN

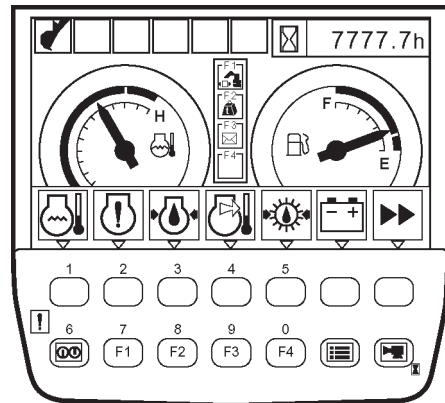
In case any abnormality occurs, the alarm marks are displayed on the basic screen.

- When the number of alarms is two or less



T1V1-05-01-095

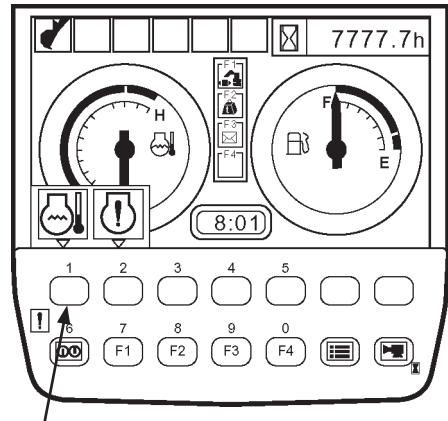
- When the number of alarms is three or more



T1V1-05-01-096

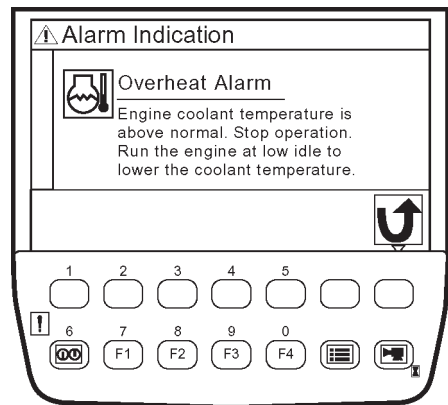
## OPERATOR'S STATION

In case any abnormality occurs, push the key located under the alarm mark. The monitor displays the corrective action to the alarm situation.



Push a Relevant Key





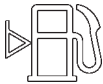




T1V1-05-01-095



T1V5-05-01-013

## OPERATOR'S STATION

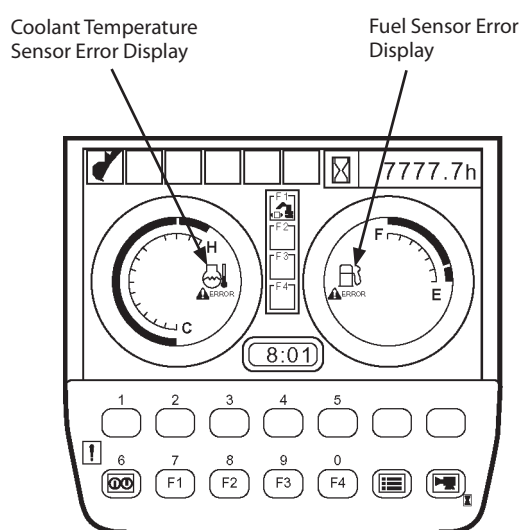
### CONTENTS OF ALARMS

Display	Contents of Alarms	Remedy
 M178-01-036	Overheat Alarm	Engine coolant temperature has abnormally increased. Stop operation. Run the engine at slow idle speed o lower the coolant temperature.
 M183-01-080	Engine Warning Alarm	Engine or engine related parts are abnormal. Consult your nearest Hitachi dealer.
 M178-01-037	Engine Oil Pressure Alarm	Engine oil pressure has decreased. Immediately stop engine. Check engine oil system and oil level.
 M183-01-071	Alternator Alarm	Electical system is abnormal. Consult your nearest Hitachi dealer.
 M178-01-034	Remaining Fuel Alarm	Fuel level is low. Refill fuel as soon as possible.
 M1CC-01-039	Hydraulic Oil Filter Alarm	Hydraulic oil filter is clogged. Clean or replace filter.
 M183-01-067	Air Filter Clogged Alarm	Air filter elements are clogged. Clean or replace air filter elements.
 T1V1-05-01-102	Work Mode Alarm	Work Mode system is abnormal. Consult your nearest Hitachi dealer.
 T1V1-05-01-103	Pilot Control Shut-Off Lever Alarm	Pilot control shut-off lever system is abnormal. Consult your nearest Hitachi dealer.



## OPERATOR'S STATION

- **Fuel Sensor Error Display**  
When the fuel sensor is faulty or if the harness between fuel sensor and monitor unit is broken, the fuel sensor error display is displayed on the fuel gauge.
- **Coolant Temperature Sensor Error Display**  
When the coolant temperature sensor is faulty or if the harness between coolant temperature sensor and monitor unit is broken, the coolant temperature sensor error display is displayed on the coolant temperature gauge.



T1V1-05-02-005

# OPERATOR'S STATION

## Clock Setting

Press menu key (2) on basic screen (1) to display main menu screen (3).

Select time set menu (4) by pressing the key located under

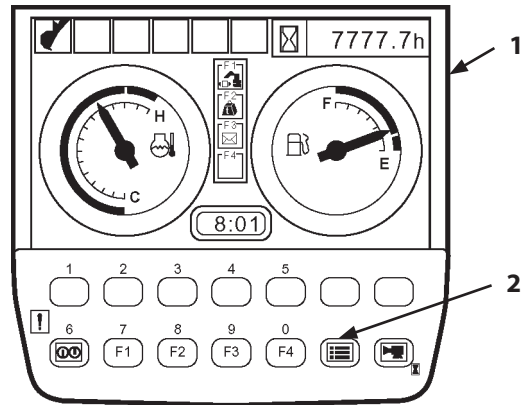


keys on icon display area and adjust the clock set.

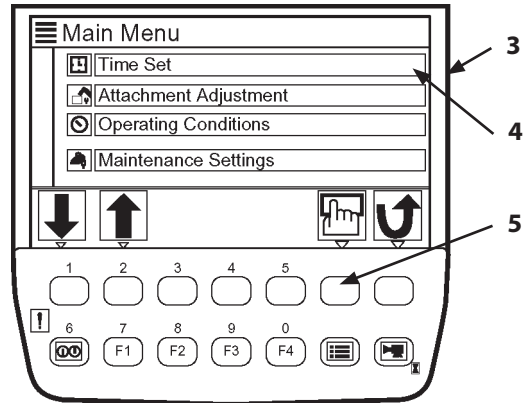
## Time Adjustment

After selecting time set menu (4) by pressing the key located under keys on icon display area, press determination key (5).

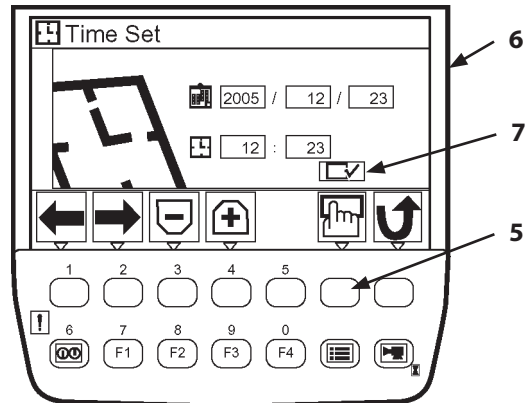
1. While pressing the key located under and keys on icon display area on time setting screen (6), select the figures for Year, Month, Day, and Time.
2. After moving the cursor to position by pressing the key located under key, press determination key (5) to define the setting.



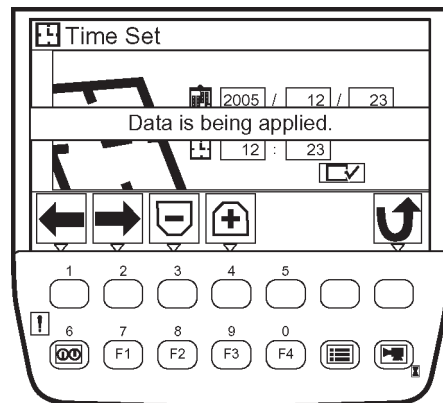
T1V1-05-01-123



T1V5-05-01-019



T1V5-05-01-021



T1V5-05-01-022

# OPERATOR'S STATION

## ATTACHMENT SELECTION (Only Machines Equipped with Optional Parts)

**IMPORTANT:** Select the attachments from the work mode screen.  
In order to display the work mode screen, push work mode selection key F1 after basic screen displays, or select from main menu.

### Selecting an Attachment by Using Work Mode Selection Key F1

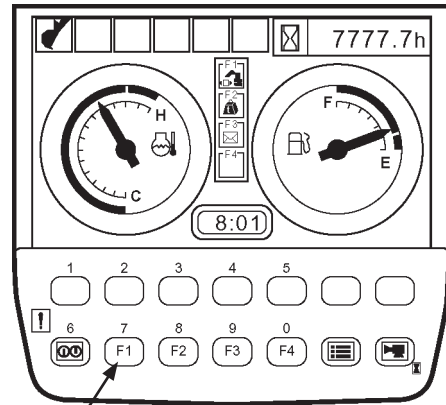
1. When the basic screen displays, push work mode selection key F1 and display the work mode screen.  
(In the right example, Crusher 1 is selected.)

**NOTE:** When selecting Digging, return to the basic screen.

3. On the attachment specification screen, confirm if specification of the installed attachment agrees with that displayed on the screen.

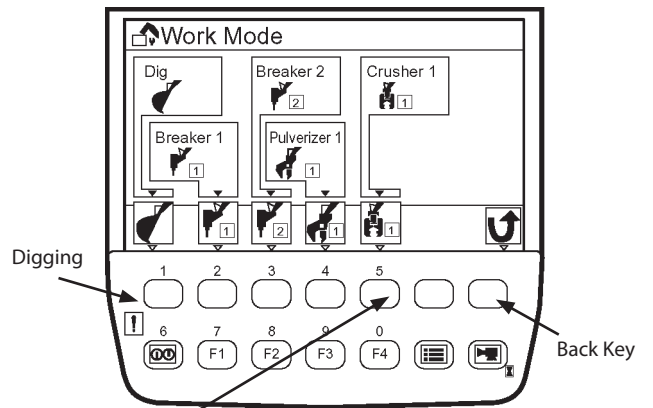
**NOTE:** When pushing the back key, return to the previous screen.

4. Push the determination key, and the basic screen displays.



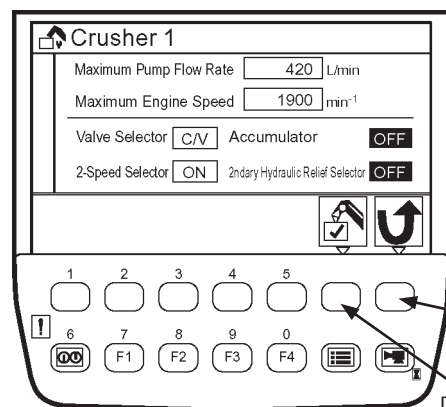
Key F1 Basic Screen

T1V1-05-01-123



Work Mode Screen  
Digging  
Select Crusher 1

T1V5-05-01-109



Attachment Specification Screen

T1V5-05-01-028

# OPERATOR'S STATION

## Selecting an Attachment from Main Menu

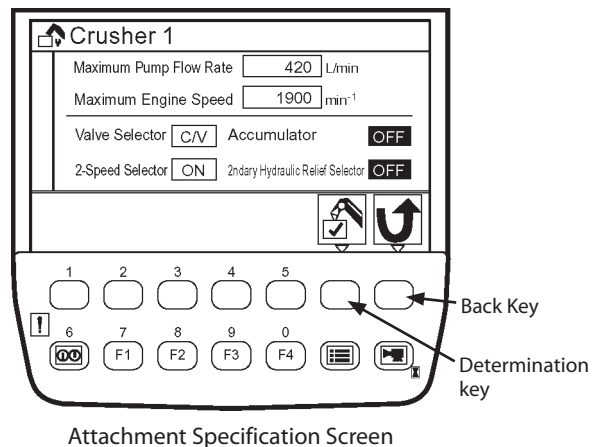
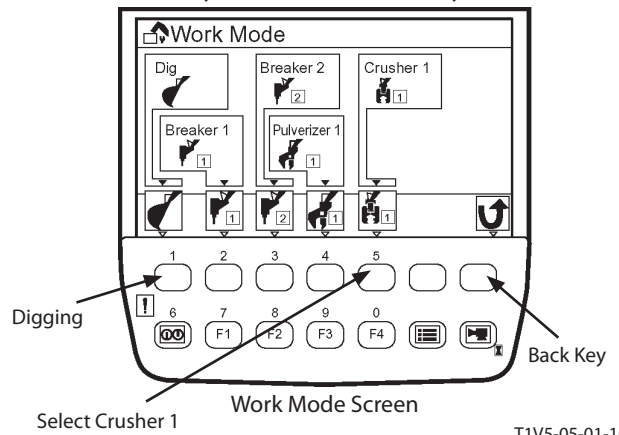
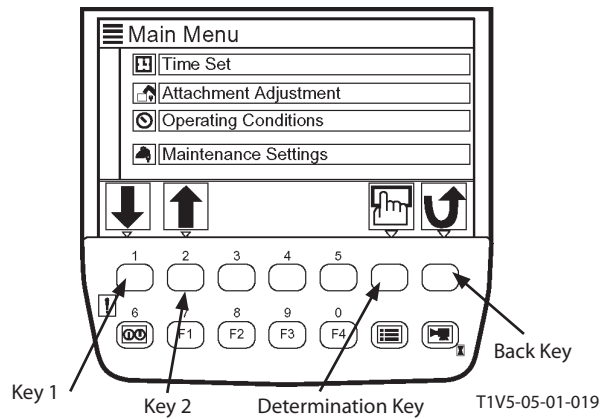
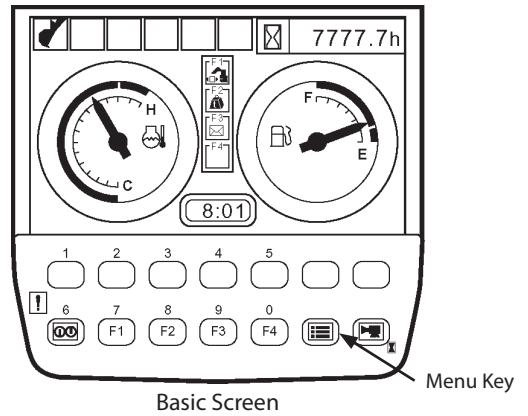
1. When the basic screen displays, push the menu key and display main menu.
2. Select work mode from main menu by using keys 1 and 2 . Push determination key. Then, the work mode screen displays.
3. Push the key located under an attachment mark to be used in order to select the attachment.  
(In the right example, Crusher 1 is selected.)

**NOTE:** When selecting Digging, return to Main Menu.

4. On the attachment specification screen, confirm if specification of the installed attachment agrees with that displayed on the screen.

**NOTE:** When pushing the back key, return to the basic screen.

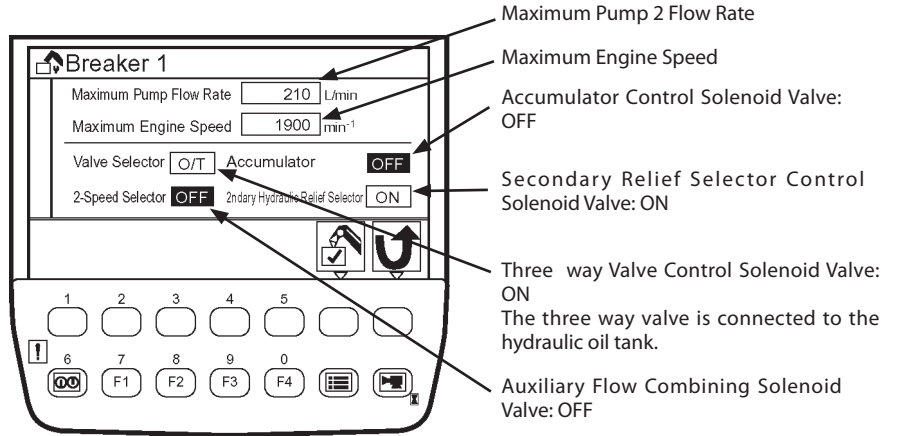
5. Push the determination key, and the basic screen displays.



# OPERATOR'S STATION

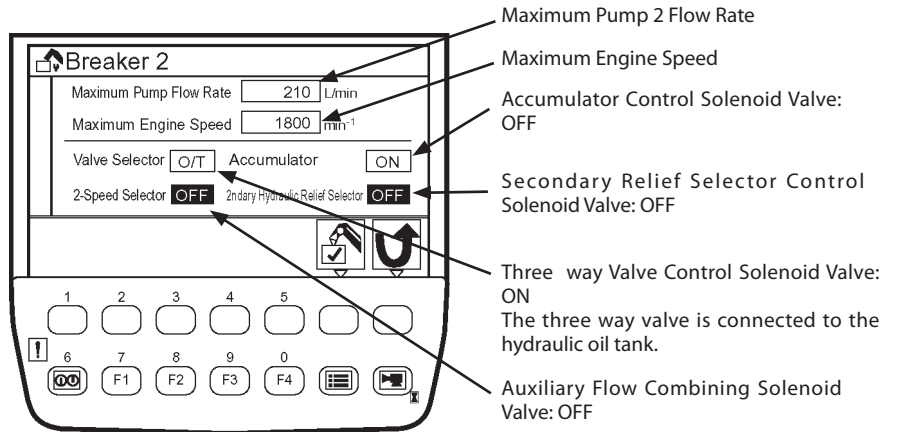
## Attachment Specification Screen

Breaker 1



T1V5-05-01-001

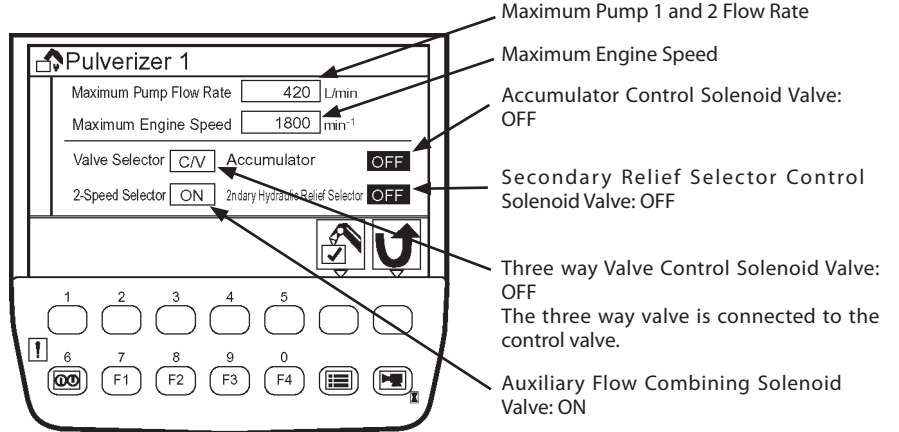
Breaker 2



T1V5-05-01-006

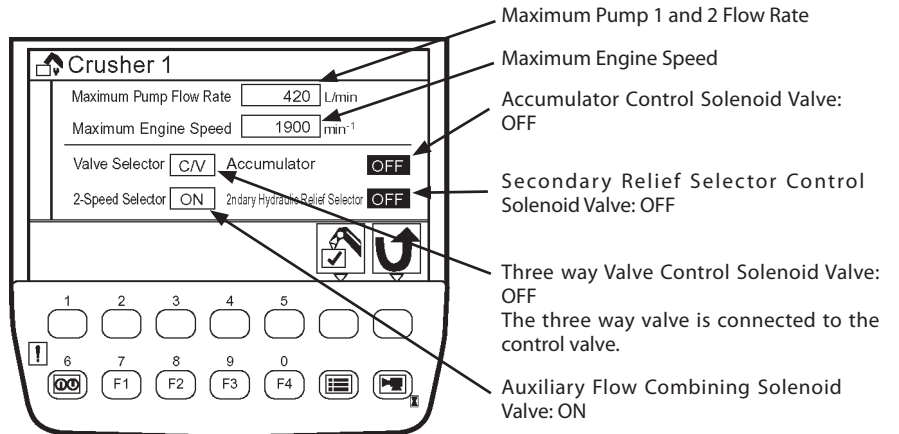
# OPERATOR'S STATION

## Pulverizer 1



T1V5-05-01-011

## Crusher 1






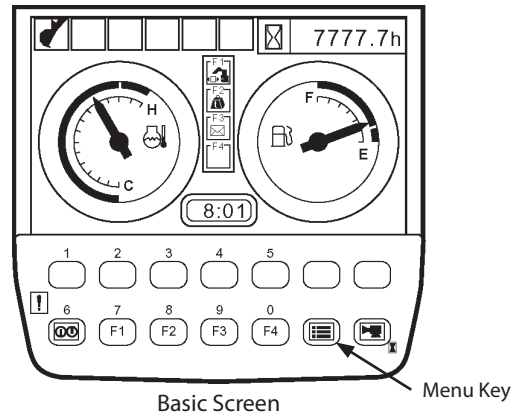
T1V5-05-01-028

## OPERATOR'S STATION

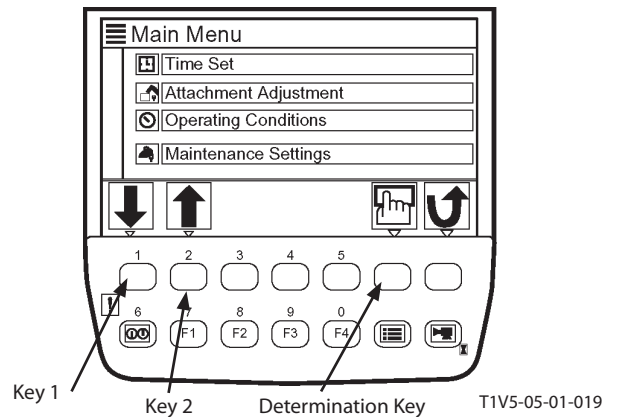
### PUMP 2 FLOW RATE ADJUSTMENT (Only Machines Equipped with Optional Parts)

**IMPORTANT:** This operation is effective when attachments are used.



1. When the basic screen displays, push the menu key and display main menu.
2. Select attachment adjustment from main menu by using keys 1  and 2 . Push determination key. Then, the attachment adjustment screen displays.
3. Push key 2 . Then, the attachment adjustment screen for currently installed attachments displays.

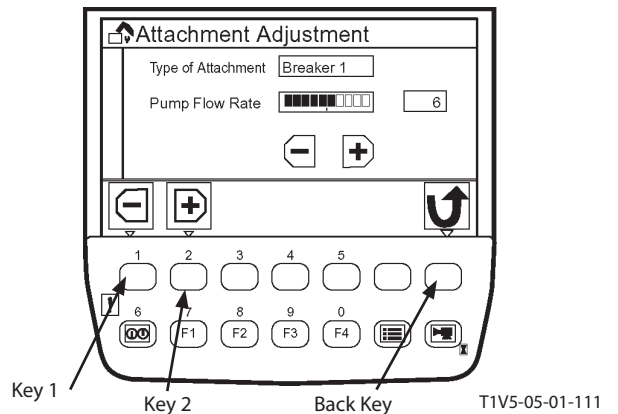


T1V1-05-01-123





T1V5-05-01-019


4. Adjust flow rate of Pump 2 by using keys 1  and 2 . When using breaker 1 or breaker 2, pushing key 1 will decrease flow rate of pump 2 and pushing key 2 will increase respectively.



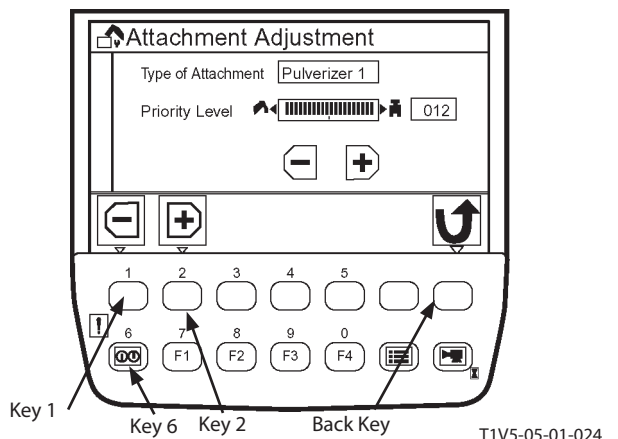
T1V5-05-01-111

When using the pulverizer or crusher, pushing key 1  will increase flow rate of boom raise, arm roll-out, swing or travel circuit.

Pushing key 2  will increase flow rate of attachment side.

 **NOTE:** When pushing the back key, return to the previous screen.

5. Push key 6 , and the basic screen displays.




T1V5-05-01-024


# OPERATOR'S STATION

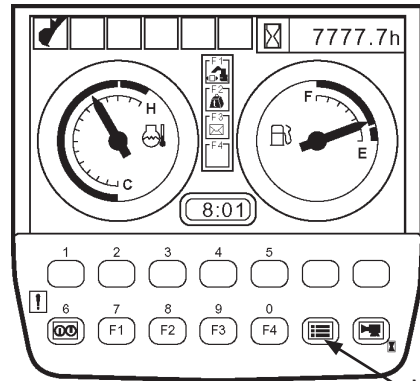
## DISPLAYING OPERATING CONDITIONS

1. When the basic screen displayed, push the menu key and display main menu.
2. Select operating conditions from main menu by using keys 1 and 2. Push the determination key. Then, the operating conditions screen displays.
3. Push the reset key, and display the data reset confirm screen.  
When reset the data, push the determination key.

 **NOTE:** When pushing the back key, return to the previous screen.

**IMPORTANT:** Total fuel consumption and fuel consumption rate depend on the operating environment and the operation method of machine. The values shown on the screen are just for reference. There could arise  $\pm 20\%$  of differences between actual fuel consumption and fuel consumption which is displayed by the monitor unit.

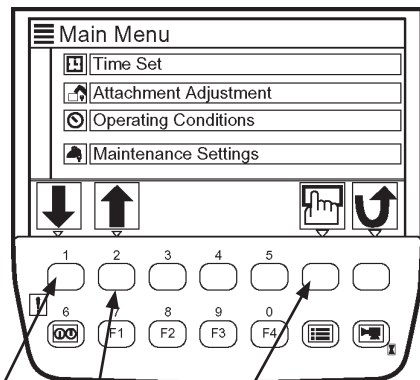
4. Push key 6 , and the basic screen displays.



Basic Screen

Menu Key

T1V1-05-01-123

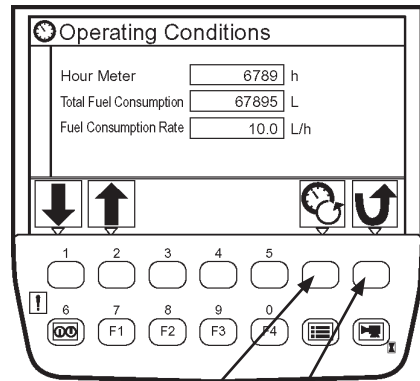


Key 1

Key 2

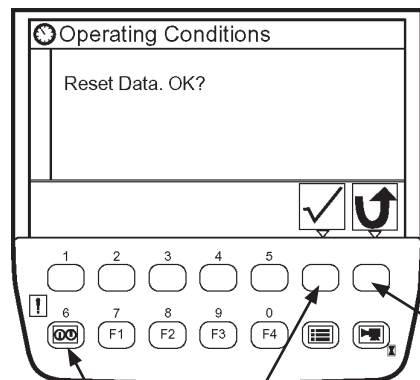
Determination Key

T1V5-05-01-019



Reset Key Back Key

T1V5-05-01-025



Key 6

Determination Key

Back Key

T1V5-05-01-026

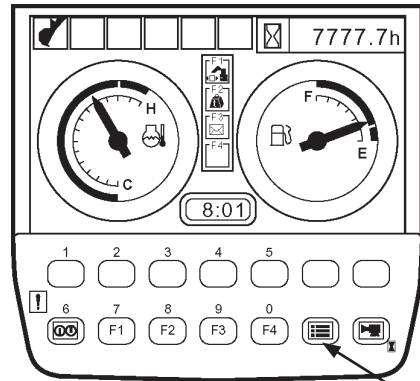


# OPERATOR'S STATION

## FUEL RATE DISPLAY/NO DISPLAY

### Fuel Rate Display

1. When the basic screen displays, push the menu key and display main menu.

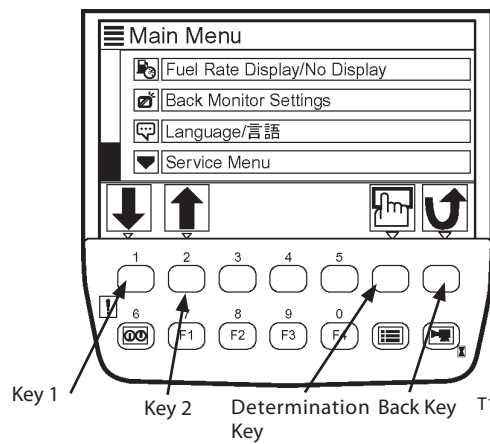


Basic Screen

Menu Key

T1V1-05-01-123

2. Select fuel rate display/No display from main menu by using keys 1 and 2. Push the determination key. Then, the fuel rate display/No display screen displays.




Key 1

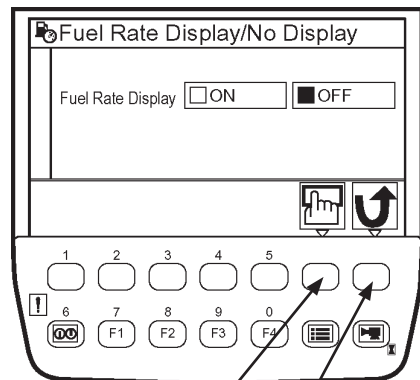
Key 2

Determination Back Key

T1V5-05-01-118

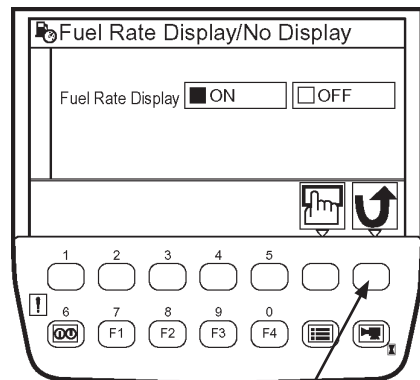
3. Push the determination key, and fuel rate display will be set to ON.

 **NOTE:** When pushing the back key, return to the previous screen.



Determination Back Key


T1V5-05-01-164

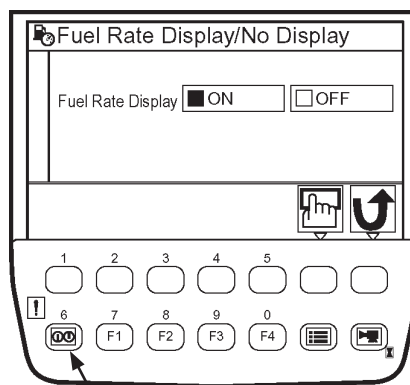


Back Key

T1V5-05-01-119

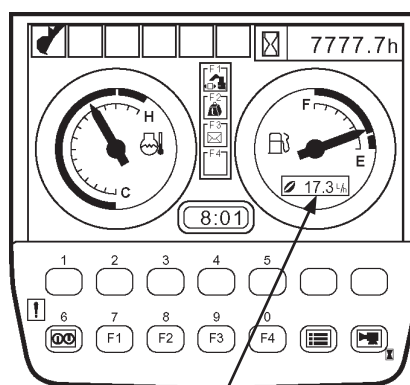
## OPERATOR'S STATION

4. Push key 6  and the fuel rate display will be added to basic screen.



Key 6

T1V5-05-01-119



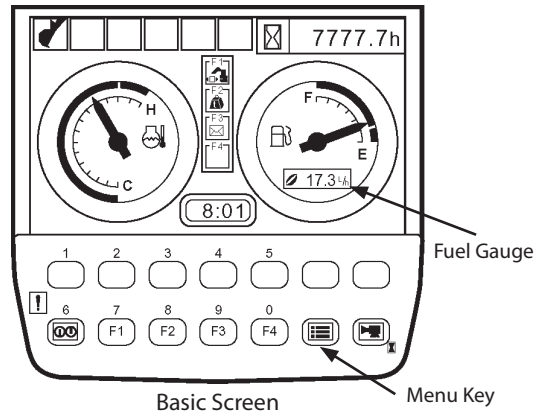
Fuel Rate

T1V1-05-01-007

# OPERATOR'S STATION

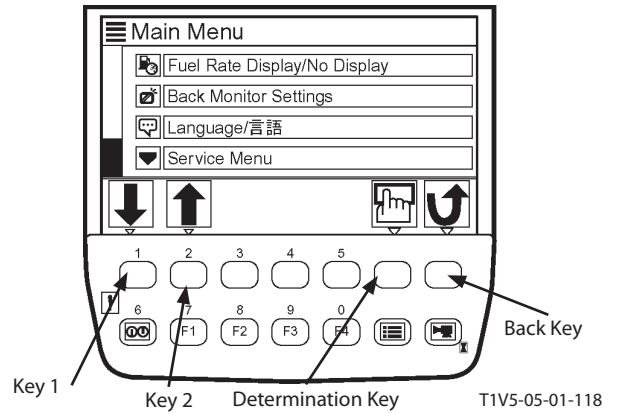
## Fuel Rate No Display

1. When the basic screen displays, push the menu key and display main menu.



T1V1-05-01-007

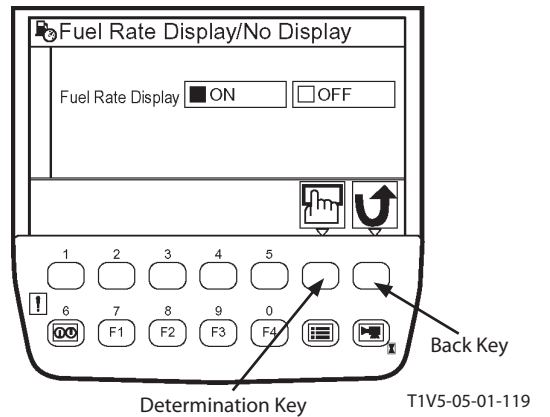
2. Select fuel rate display/No display from main menu by using keys 1 (down) and 2 (up). Push the determination key. Then, the fuel rate display/No display screen displays.



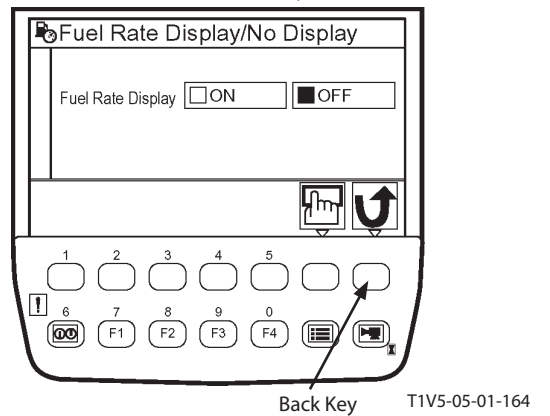
T1V5-05-01-118

3. Push the determination key, and fuel rate display will be set to OFF.

**NOTE:** When pushing the back key, return to the previous screen.




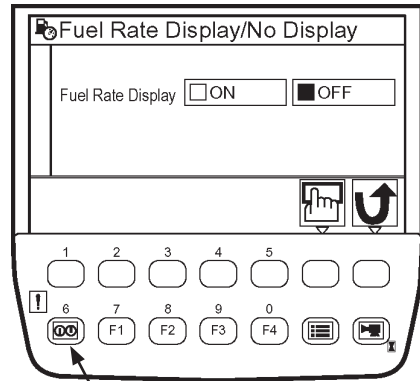
T1V5-05-01-119



T1V5-05-01-164

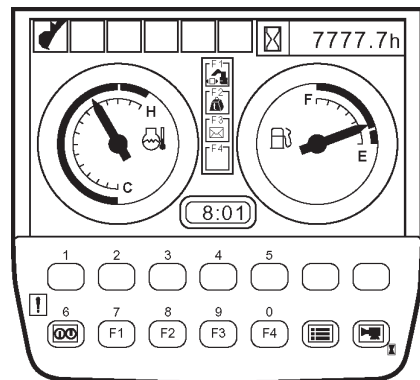
## OPERATOR'S STATION

4. Push key 6 , and return to the basic screen.



Key 6

T1V5-05-01-164



Basic Screen

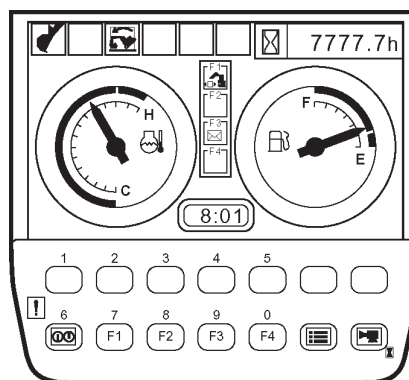
T1V1-05-01-123

## OPERATOR'S STATION

- Overload Alarm  
(Only machines equipped with optional parts)

**IMPORTANT: When using overload alarm, consult your nearest Hitachi dealer.**

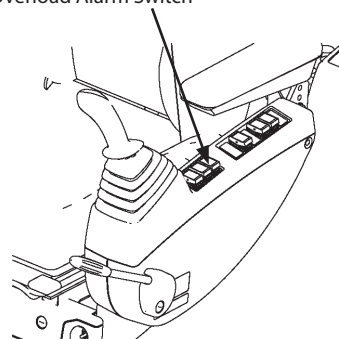
When the overload alarm switch is turned ON, the system measures load of the suspended load from bottom pressure of the boom cylinder. An alarm message is displayed and buzzer is rung, if overload is detected.



Basic Screen

T1V1-05-01-128

Overload Alarm Switch

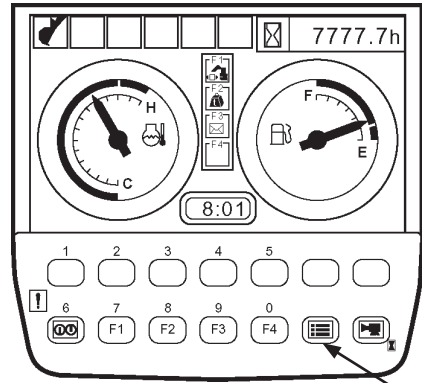


T1V1-05-02-004

# OPERATOR'S STATION

## Password Change (Optional)

1. After the basic screen is displayed, push the menu key in order to display the main menu.

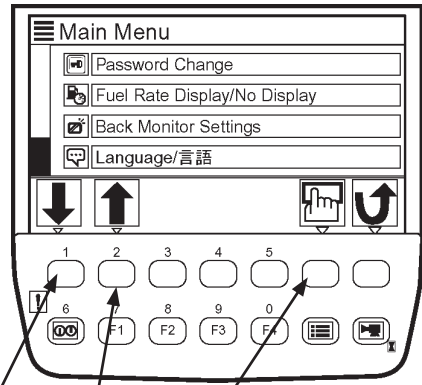


Basic Screen

Menu Key

T1V1-05-01-123

2. Select password change from main menu by using keys 1 and 2. Push the determination key. Then, the password change screen displays.

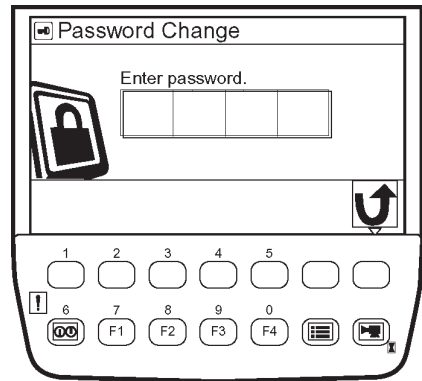


Key 1

Key 2

Determination Key

T1V5-05-01-129

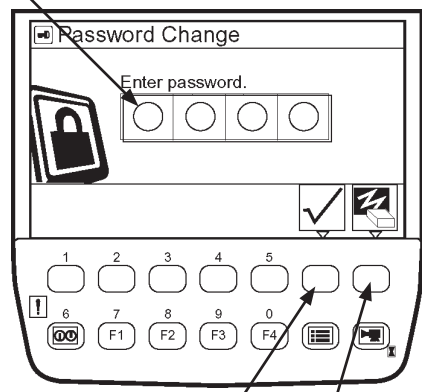


T1V5-05-01-041

3. Input the registered password and push the determination key.

4. If inputting the password again, the entered characters can be erased. By pushing the delete key.


Registered Password

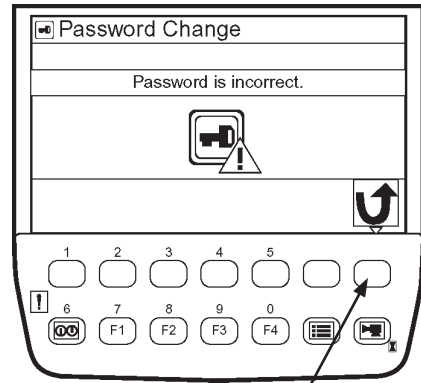


Determination Key Delete Key

T1V5-05-01-042

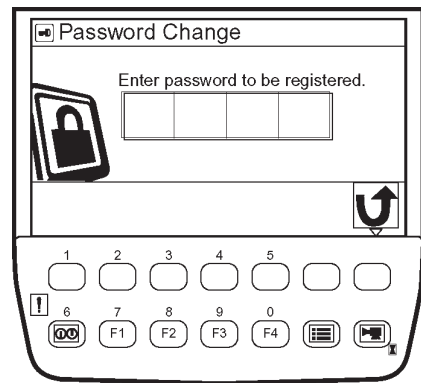
## OPERATOR'S STATION

 **NOTE:** If inputting an incorrect password after pushing the determination key, the message "Password is incorrect." displays. Push the back key and go back to the previous screen, Input the password again.



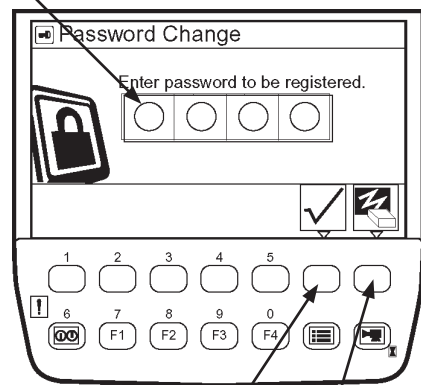
Back Key T1V5-05-01-044

5. The message "Enter password to be registered." displays. Then, input a new password with three or four digits and push the determination key.
6. If inputting the password again, push the delete key.



T1V5-05-01-130

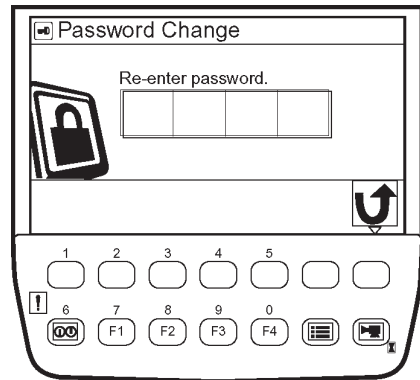
A New Password



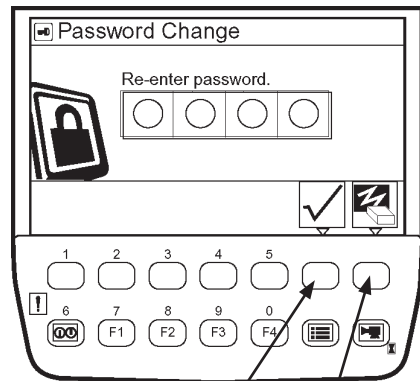
Determination Key Delete Key T1V5-05-01-131

## OPERATOR'S STATION

7. The message "Re-enter password." displays. Then, input a new password again and push the determination key.
8. If inputting the password again, push the delete key in order to delete the entered characters.

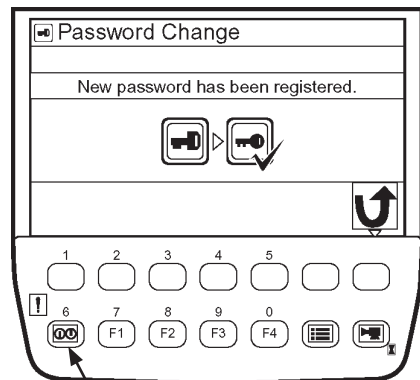


T1V5-05-01-132



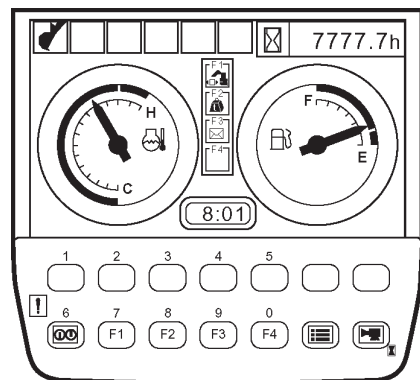
Determination Key Delete Key T1V5-05-01-133

9. The message "New password has been registered." displays. This completes the password change process.



Key 6 T1V5-05-01-043

10. Push key 6 and the basic screen displays.



Basic Screen

T1V1-05-01-123



# OPERATOR'S STATION

## BACK MONITOR SETTINGS

**IMPORTANT:** Image displayed on the back monitor is of auxiliary nature at best. When the machine is operated pay thorough attention to surrounding situation.

### Auto-Control: ON

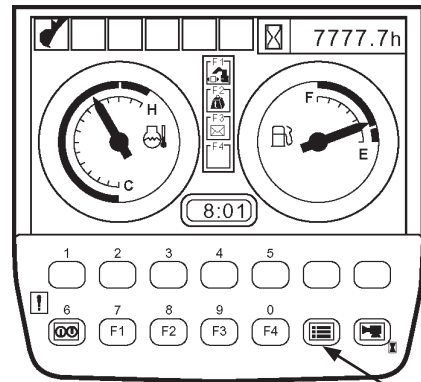
Image on the monitor unit when traveling is automatically switched to that of the back monitor.

1. When the basic screen displays, push the menu key and display main menu.
2. Select back monitor settings from main menu by using keys 1 (↓) and 2 (↑). Push the determination key. Then, the back monitor settings screen displays.

3. Select auto-control by using keys 1 (↓) and 2 (↑). Push the determination key. Then, auto-control is set to ON.

 **NOTE:** When pushing the back key, return to the basic screen.

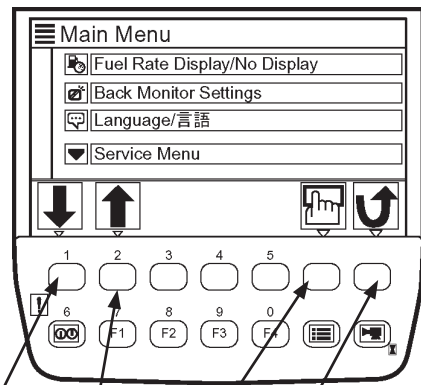
4. Push key 6 (⏪), and return to the basic screen.
5. If travel operation is done, backward image is displayed on the screen of monitor unit.



Basic Screen

Menu Key

T1V1-05-01-123



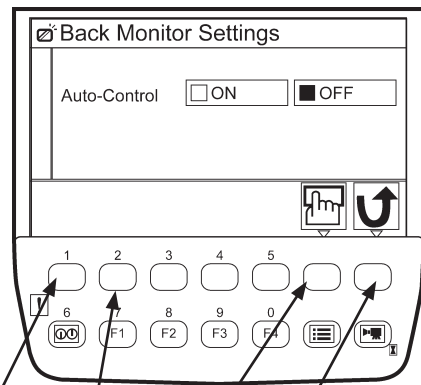
Key 1

Key 2

Determination Key

Back Key

T1V5-05-01-114



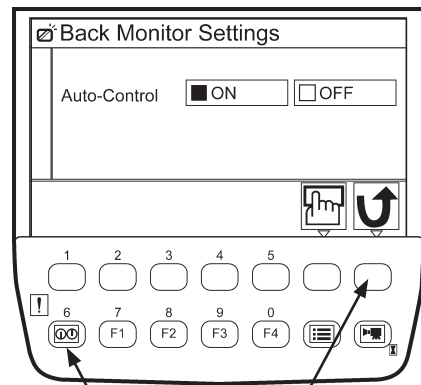
Key 1

Key 2

Determination Key

Back Key

T1V5-05-01-173



Key 6

Back Key

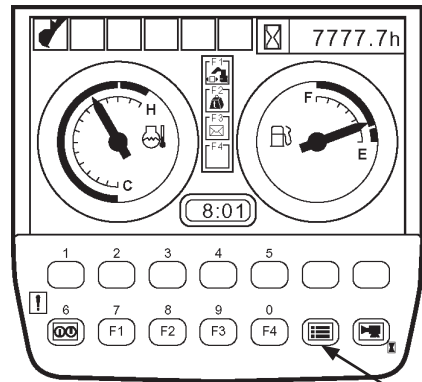
T1V5-05-01-174

# OPERATOR'S STATION

## Auto-Control: OFF

Set automatic switching function of images between monitor unit and back monitor when traveling to OFF.

1. When the basic screen displays, push the menu key and display main menu.

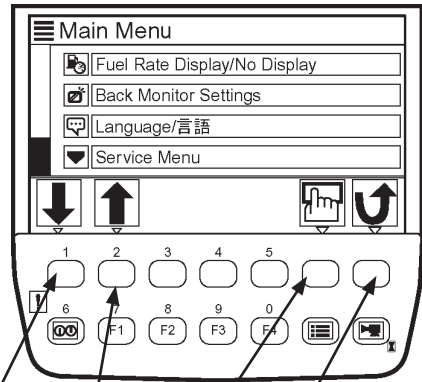


Basic Screen

Menu Key

T1V1-05-01-123

2. Select back monitor settings from main menu by using keys 1 and 2. Push the determination key. Then, the back monitor settings screen displays.



Key 1


Key 2

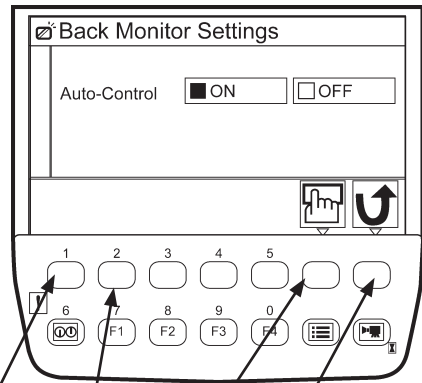
Determination Key Back Key

T1V5-05-01-118

3. Select auto-control by using keys 1 and 2. Push the determination key. Then, auto-control is set to OFF.

**NOTE:** When pushing the back key, return to the previous screen.

4. Push key 6 , and return to the basic screen.

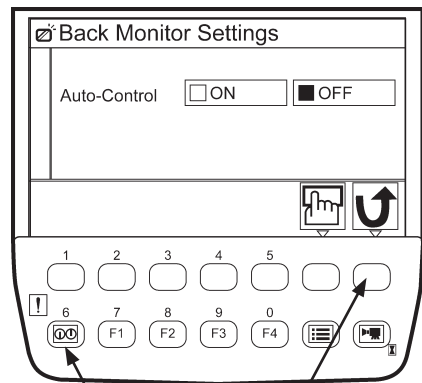


Key 1

Key 2

Determination Key Back Key

T1V5-05-01-174



Key 6

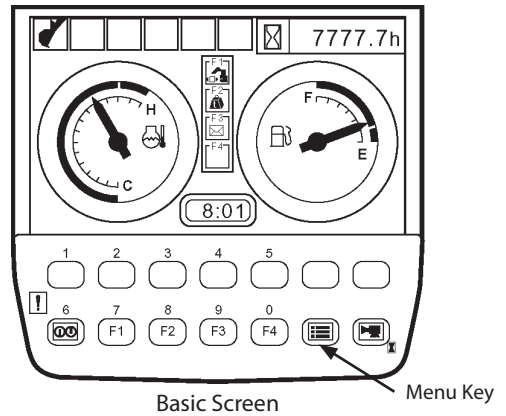
Back Key

T1V5-05-01-173

# OPERATOR'S STATION

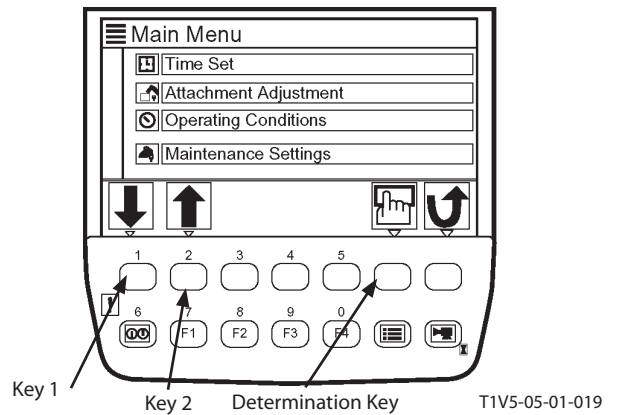
## MAINTENANCE SETTINGS

1. When the basic screen displays, push the menu key and display main menu.



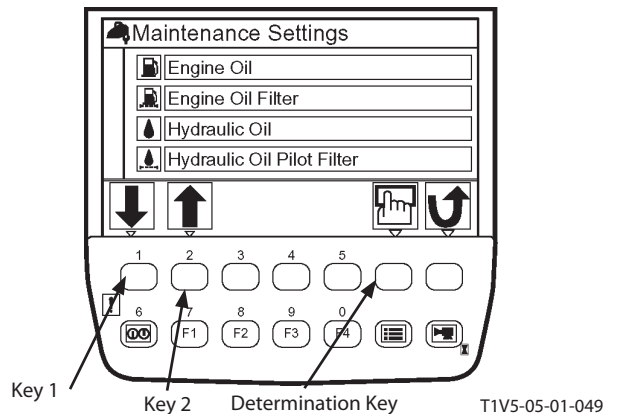
T1V1-05-01-123

2. Select maintenance settings from main menu by using keys 1 (↓) and 2 (↑). Push the determination key. Then, the maintenance settings screen displays.



T1V5-05-01-019

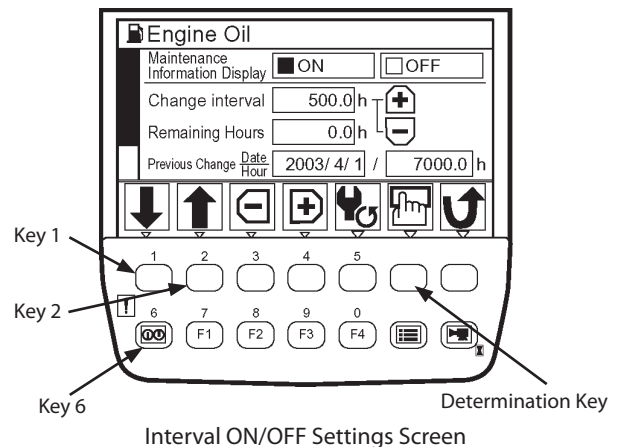
3. Select an item to be set from among the list of maintenance settings screen by using keys 1 (↓) and 2 (↑). Push the determination key. Then, the Interval ON/OFF settings screen displays. (In the right example, Engine Oil is selected.)



T1V5-05-01-049

## Maintenance Information Display ON/OFF

1. Select ON or OFF for maintenance information display by using keys 1 (↓) and 2 (↑). Push the determination key.
  - ON: When time comes to change, a information message is displayed on the screen.
  - OFF: No information message is displayed.
2. In order to complete setting, push key 6 (00). Then, the basic screen displays.



Interval ON/OFF Settings Screen

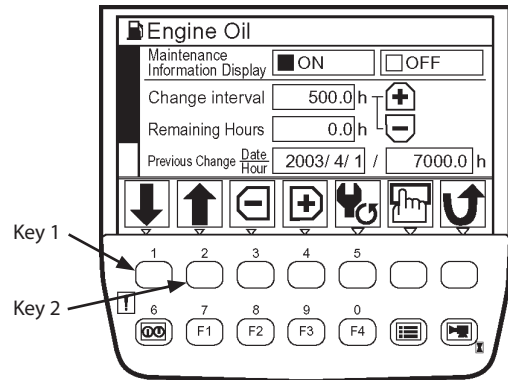
T1V5-05-01-052

# OPERATOR'S STATION

## Change Interval Settings

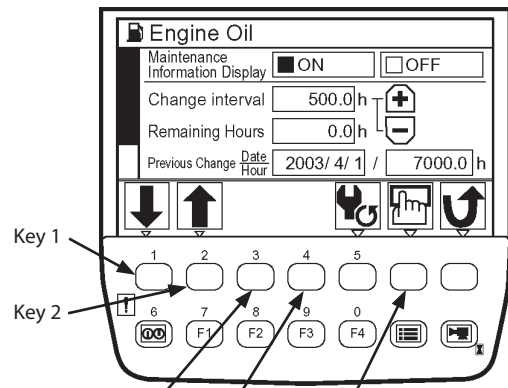
**IMPORTANT: Change interval can only be set when maintenance information display is set to ON.**

1. Select change interval by using keys 1 and 2 .
2. Set time for change interval by using keys 3 and 4 .
3. Select remaining hours by using keys 1 and 2 , and push determination key.
4. The message "Adjust remaining hours to new change interval. OK?" displays. Then, push the determination key.
5. Push key 6 , and the basic screen displays.



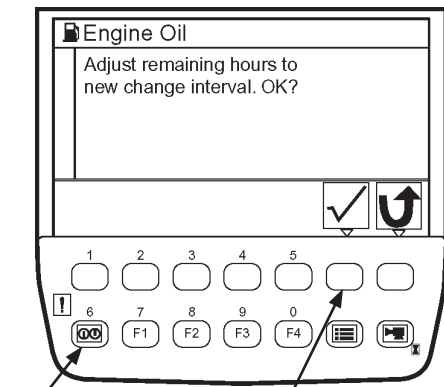
Interval ON/OFF Settings Screen

T1V5-05-01-052



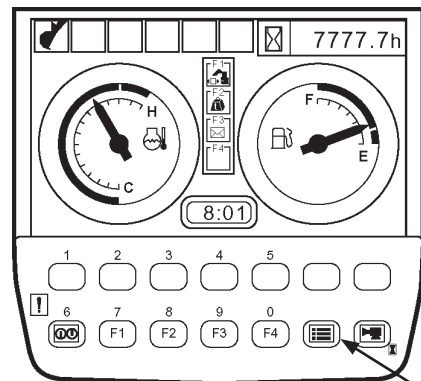
Key 3 Key 4 Determination Key

T1V5-05-01-138



Key 6 Determination Key

T1V5-05-01-139



Basic Screen

Menu Key

T1V1-05-01-123

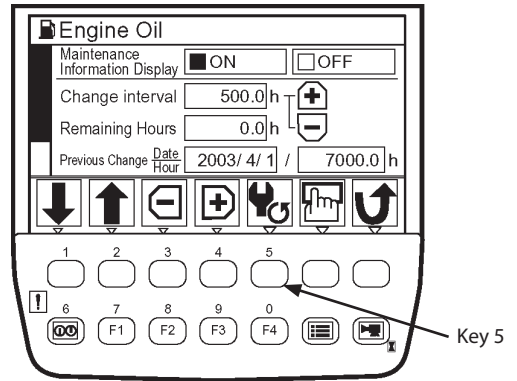
# OPERATOR'S STATION

## Resetting Data

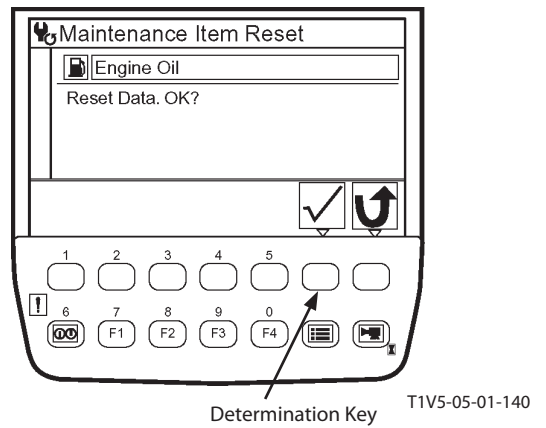
If data is reset, push key 5  on the Interval ON/OFF settings screen.

The message "Reset Data. OK?" displays. Then, push the determination key.

The value of remaining hours is reset to that of change interval. Previous change date/hour is updated with current date and time.



T1V5-05-01-052



T1V5-05-01-140

# OPERATOR'S STATION

## Screen Display when Maintenance Information Display is ON

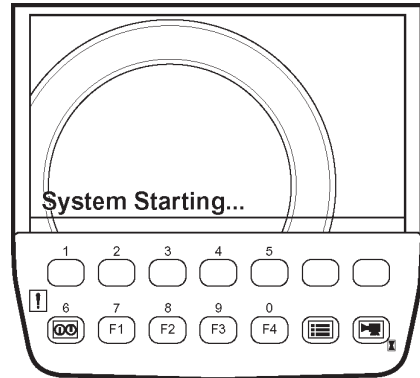
- When only one item displays
  1. If turning the key switch to the ON position, the starting screen displays. Then, the scheduled maintenance screen for the item whose change interval has expired displays for three to ten seconds. Finally the basic screen displays. (In the right example, Hydraulic Oil applies.)

**NOTE:** For a machine which the basic screen is displayed according to a password on, the scheduled maintenance screen for the item whose change interval has expired displays for three to ten seconds, after the password is input successfully and the determination key is pushed. And then the basic screen displays.

2. If data is reset, push the reset key while the scheduled maintenance screen is displayed. The message "Reset Data. OK?" displays. Then, push the determination key. The value of remaining hours is reset to that of change interval. Previous time change date/hour is updated with current date and time.

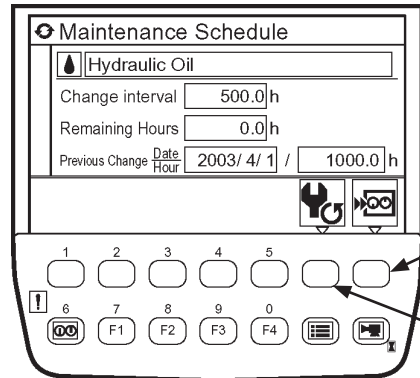
**NOTE:** When pushing the back key while the maintenance information display screen is displayed, return to the basic screen.

**NOTE:** When pushing the back key while reset screen is displayed, return to the maintenance information display screen.



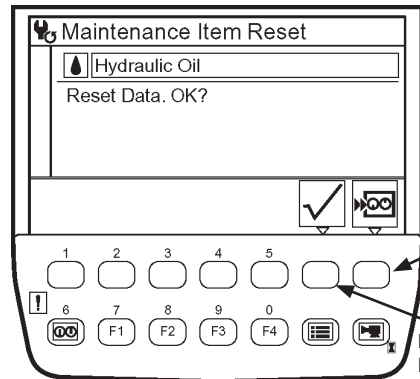
Starting Screen

T1V1-05-01-115



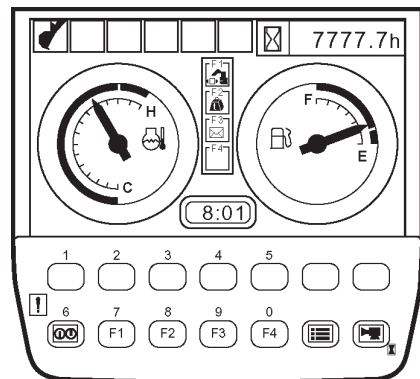
Maintenance Information Display Screen

T1V5-05-01-170



Reset Screen

T1V5-05-01-171



Basic Screen

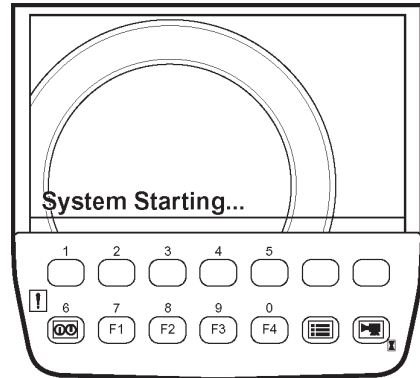
T1V1-05-01-123

# OPERATOR'S STATION

- When more than two items apply

- If turning the key switch to the ON position, the starting screen displays. Then, the scheduled maintenance screen for the items whose change interval has expired displays for three to ten seconds. Finally the basic screen displays.

**NOTE:** For a machine which the basic screen is displayed according to a password on, the scheduled maintenance screen for the items whose change interval has expired displays for three to ten seconds, after the password is input successfully and the determination key is pushed. And then the basic screen displays.

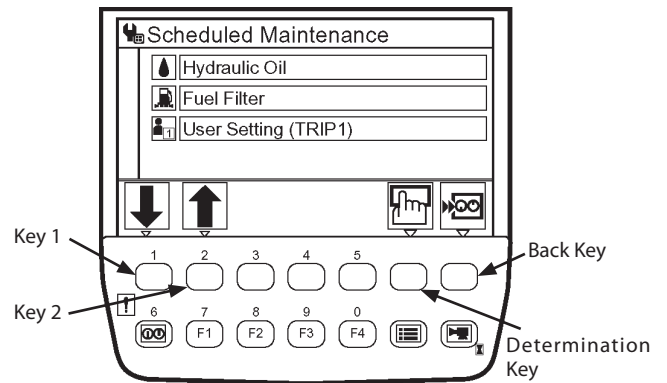


Starting Screen

T1V1-05-01-115

- If data is reset, while the scheduled maintenance screen is displayed, select desired item by using keys 1 (↓) and 2 (↑). Push the determination key. Then, the maintenance information display screen for the selected item displays. (In the right example, Hydraulic Oil is selected.)

**NOTE:** When pushing the back key while the scheduled maintenance screen is displayed, the basic screen displays.



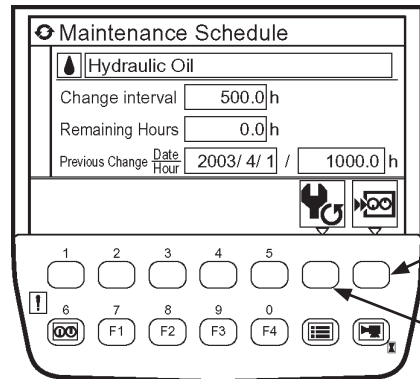
Scheduled Maintenance Screen

T1V5-05-01-169

- Push the reset key while the maintenance information display screen is displayed. The message "Reset Data. OK?" displays. Then, push the determination key. The value of remaining hours is reset to that of change interval. Previous change date/hour is updated with current date and time.

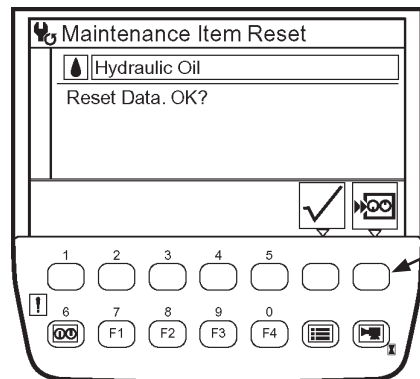
**NOTE:** When pushing the back key while the maintenance information display screen is displayed, return to the scheduled maintenance screen.

**NOTE:** When pushing the back key while the reset screen is displayed, return to the maintenance information display screen.



Maintenance Information Display Screen

T1V5-05-01-170



Reset Screen


T1V5-05-01-171

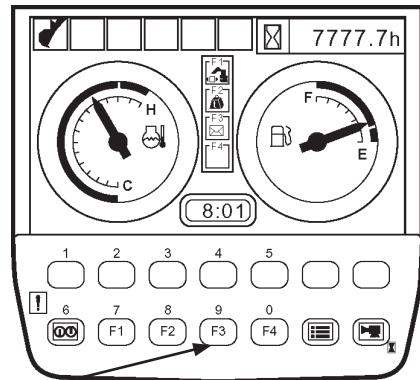
## OPERATOR'S STATION

### Mail (Optional)

**IMPORTANT:** This function is available only to a machine equipped with a satellite terminal. When using the mail function, consult your nearest Hitachi dealer.

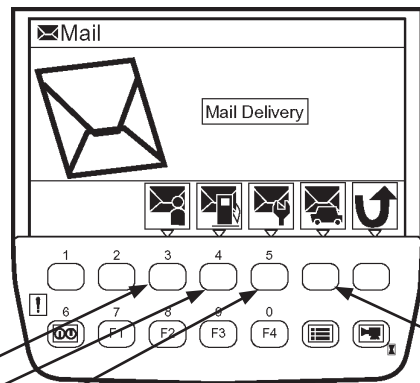
1. When the basic screen displays, push mail selection key F3 and display mail screen.
2. If pushing a relevant request key, mail information is sent to ICF.
  - 1 - General Request
  - 2 - Fuel Replenishment Request
  - 3 - Service Maintenance Request
  - 4 - Forwarding Request
3. While mail information is sent to ICF, the message "Mail is being delivered." is displayed on the screen.
4. When ICF completes receives mail information, the message "Mail delivery successful." is displayed on the screen. When pushing the back key, return to the mail screen.
5. Then, a mail is sent from the satellite terminal to the central server via the satellite.

 *NOTE: Depending on machine's operating environment or position of the satellite on its orbit, the mail may not be sent.*



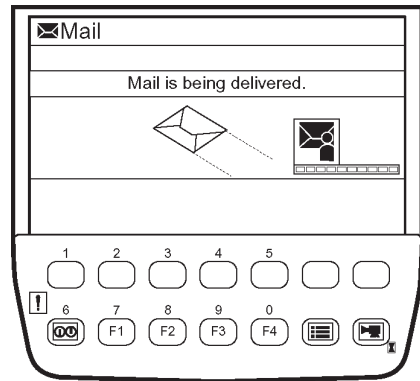
Key F3  
Basic Screen

T1V1-05-01-123

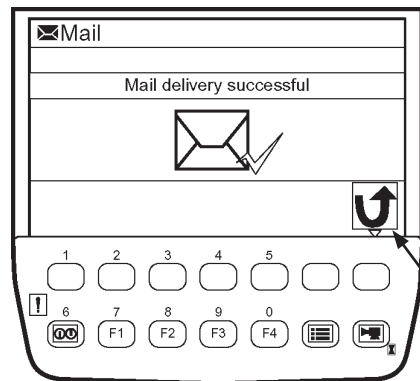


1 2 3 4  
Mailing Screen

T1V5-05-01-037



T1V5-05-01-038




Back Key

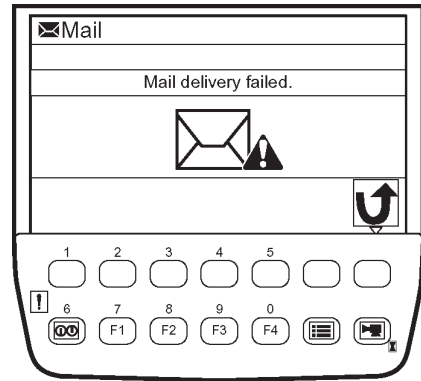
T1V5-05-01-039



## OPERATOR'S STATION

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 **NOTE:** When satellite terminal could not receive the mail, the message "Mail delivery failed." is displayed on the screen.



T1V5-05-01-040

# OPERATOR'S STATION

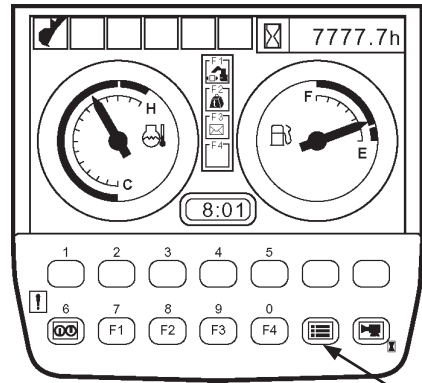
## LANGUAGE SETTINGS

1. When the basic screen displayed, push the menu key and display main menu.
2. Select language from main menu by using keys 1 (↓) and 2 (↑). Push the determination key. Then, the language settings screen displays.
3. Select a desired language by using keys 1 (↓) and 2 (↑). Push the determination key.

**REMARKS:** Languages to be displayed on the screen of monitor unit have been selected from twelve languages, namely display languages 1 or 2, at the time of shipping from the factory. (Refer to the next section)

**NOTE:** When pushing the back key, return to the previous screen.

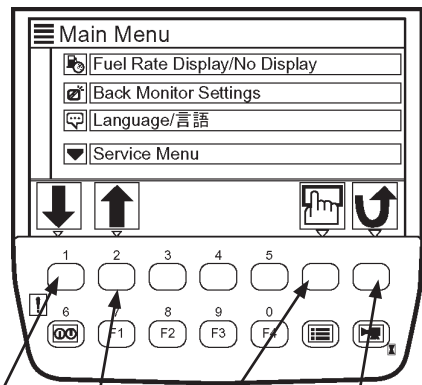
4. Push key 6 (⏪), and the basic screen displays.



Basic Screen

Menu Key

T1V1-05-01-123



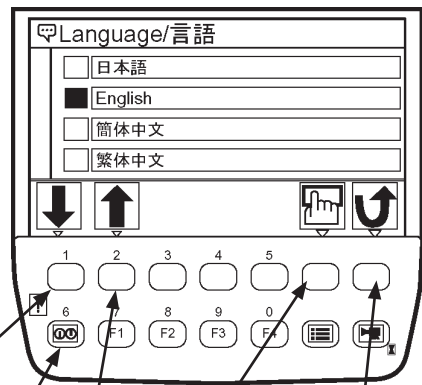
Key 1

Key 2

Determination Key

Back Key

T1V5-05-01-114



Key 1

Key 6

Key 2

Determination Key

Back Key

T1V5-05-01-137

## OPERATOR'S STATION

### Lists of Display Language

#### Display Languages 1

Language	Screen Display	
Japanese	日本語	TIV1-05-01-141
English	English	TIV1-05-01-142
Chinese (Simplified)	简体中文	TIV1-05-01-143
Chinese (Traditional)	繁體中文	TIV1-05-01-144
Korean	한국어	TIV1-05-01-145
Indonesian	Bahasa Indonesia	TIV1-05-01-146
Thai	ภาษาไทย	TIV1-05-01-147
Vietnamese	Tiếng Việt	TIV1-05-01-148
Myanmarese	မြန်မာစာ	TIV1-05-01-149
Arabic	اللغة العربية	TIV1-05-01-150
Persian	اللغة الفارسية	TIV1-05-01-151
Turkish	Türkçe	TIV1-05-01-152

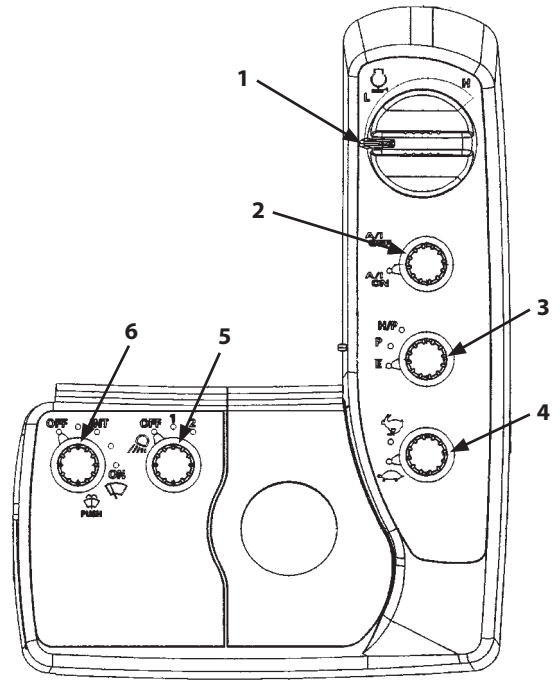
#### Display Languages 2

Language	Screen Display	
English	English	TIV1-05-01-142
Spanish	Español	TIV1-05-01-153
Italian	Italiano	TIV1-05-01-154
French	Français	TIV1-05-01-155
German	Deutsch	TIV1-05-01-156
Dutch	Nederlands	TIV1-05-01-157
Russian	Русский	TIV1-05-01-158
Portuguese	Português	TIV1-05-01-159
Finnish	Suomi	TIV1-05-01-160
Swedish	Svensk	TIV1-05-01-161
Norwegian	Norsk	TIV1-05-01-162
Danish	Dansk	TIV1-05-01-163

# OPERATOR'S STATION

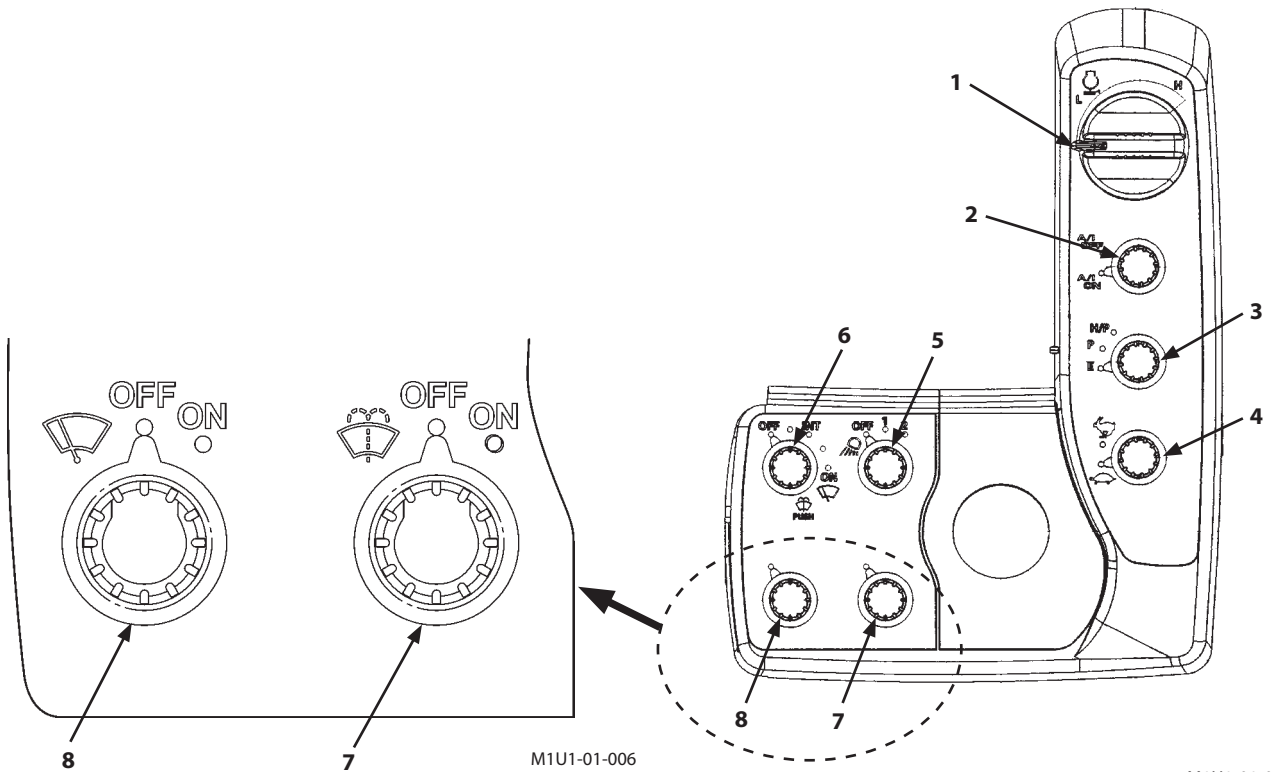
## SWITCH PANEL

- 1-Engine Control Dial
- 2-Auto-Idle Switch
- 3-Power Mode Switch
- 4-Travel Mode Switch
- 5-Work Light Switch
- 6-Wiper/Washer Switch
- 7-Overhead Window Washer Switch (Optional)
- 8-Overhead Window Wiper Switch (Optional)



M1U1-01-015

Std. Model



M1U1-01-006

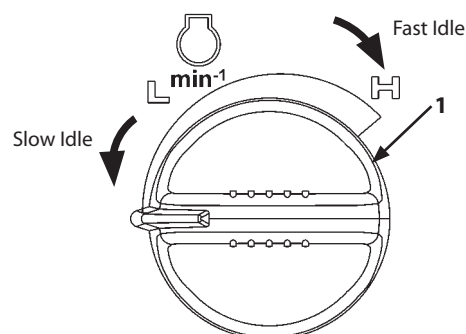
M1U1-01-016

## OPERATOR'S STATION

### ENGINE CONTROL DIAL

Use engine control dial (1) to adjust engine speed.  
Turn it clockwise to increase engine speed or counterclockwise to decrease engine speed.

- The fully clockwise position : Fast idle
- The fully counterclockwise position : Slow idle



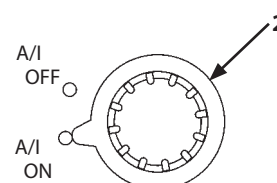
M1U1-01-033

### AUTO-IDLE SWITCH

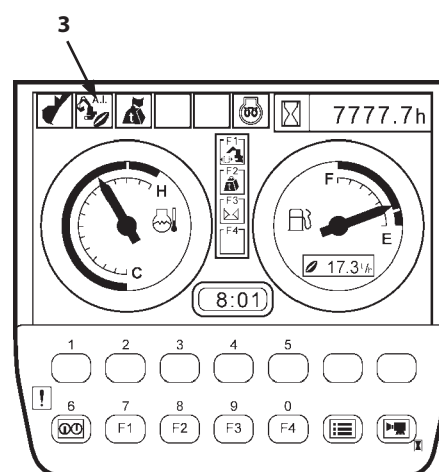
The auto-idle Switch (2) sets the engine speed control mode to either Auto-Idle.

- Auto-Idle Mode

When the auto-idle is turned to the A/I ON position, the engine speed is reduced to slow idle speed 4 seconds after releasing all control levers (neutral), reducing the fuel consumption. When the auto-idle mode is selected, auto-idle indicator (3) on the monitor panel lights.



M1U1-01-017



M1U1-01-004

## OPERATOR'S STATION

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### POWER MODE SWITCH

Three engine speed modes, E, P, and H/P modes, are selected by operating the power mode switch.

- E (Economy) Mode

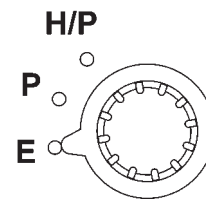
Although production is slightly reduced more than in the P mode, the fuel consumption and noise levels are reduced, allowing the machine to operate efficiently.

- P Mode

Use the P mode when general digging work is needed.

- H/P (High Power) Mode

Use the H/P mode when extra horsepower is needed, i.e. when rolling in the arm in excavation work, etc.



M178-01-013

### TRAVEL MODE SWITCH

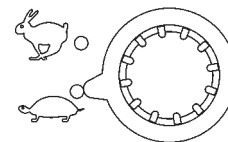
Two travel modes, FAST and SLOW, are selected by turning the travel mode switch to either position.



Mark (Fast Speed Mode)



Mark (Slow Speed Mode)



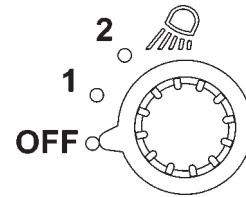
M178-01-096

## OPERATOR'S STATION

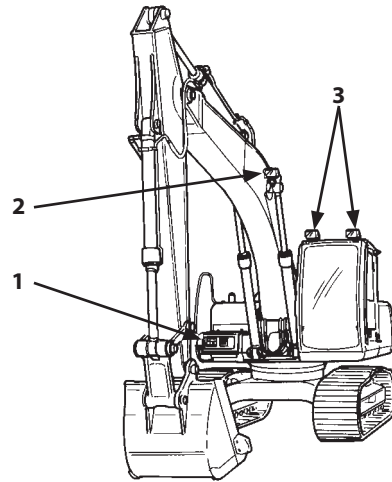
### WORK LIGHT SWITCH

Work light switch has the following positions:

- 1 Position  
Work light (1) on the base machine will light. Also, the instrument panel illumination will light.
- 2 Position  
Work light (2), (3) will light in addition.
- OFF Position  
Work lights (1), (2), (3) and the instrument panel illumination will turn off.



M178-01-015



M16J-01-007

## OPERATOR'S STATION

### WIPER/WASHER SWITCH

The wiper and the window washer are operated using the wiper/washer switch.

- Wiper

Turn the wiper/washer switch to the specified position to operate the wiper.

OFF Position: The wiper stops and is retracted.


INT Position: The wiper operates intermittently at the interval selected by the switch position as described below.

INT (Slow): The wiper operates at 8-second interval.

INT (Mid): The wiper operates at 6-second interval.

INT (Fast): The wiper operates at 3-second interval.

ON Position: The wiper operates continuously.

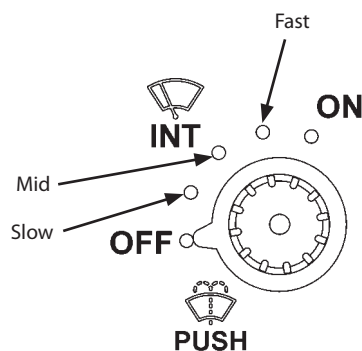
 **NOTE:** (1) When the front window (upper) is opened, the wiper and washer will not operate. Even if the front window (upper) is closed, the wiper and washer will not operate until the lock pin on the right side is placed in the lock position. If the front window is opened while during operating the wiper, the wiper will be retracted and the washer function is deactivated.

(2) In case either the wiper or washer is operated with the front window (upper) opened, or if front window (upper) is opened while operating either the wiper or washer, the front window opening alarm buzzer will sound intermittently at one-second intervals. Close the front window (upper).

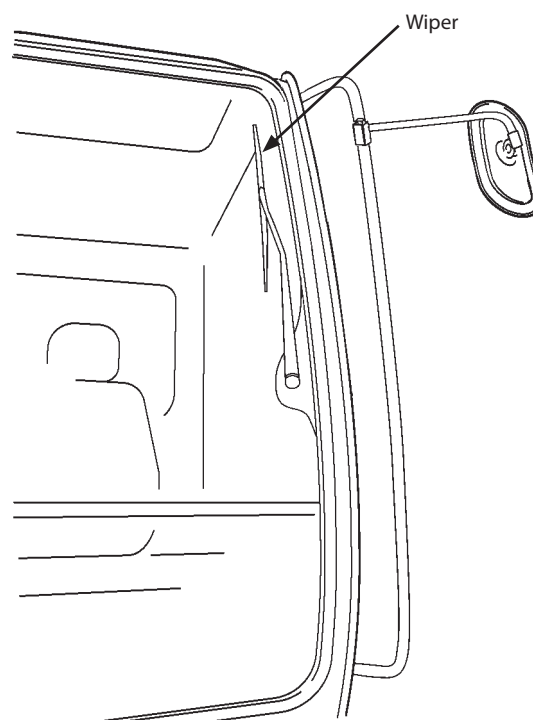
- Washer (Std. Model)

Press and hold the wiper/washer switch to squirt washer fluid onto the front window. When the wiper/washer switch is pressed for more than 2 seconds, the wiper operates until the switch is released. When the wiper/washer switch is released, the wiper automatically retracts. While operating the wiper in the INT mode, when the wiper/washer switch is pressed, the wiper operation mode is changed to the continuous operation mode.

**IMPORTANT: Washer motor may be damaged if wiper/washer switch is held for more than 20 seconds, or continually operated with no fluid in the washer tank.**



M178-01-016



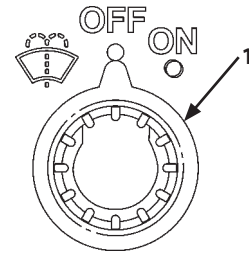
M1U1-01-018



## OPERATOR'S STATION

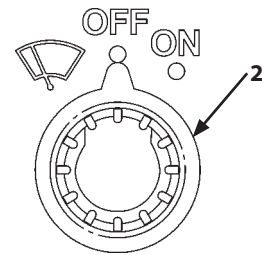
- Washer (Overhead Window: Optional)

As long as the wiper washer switch (1) is held down, washer fluid will be squirted from the nozzles on the front window and overhead window. Continue holding the wiper washer switch (1) for more than 2 seconds to automatically operate the front window wiper. Release the wiper washer switch to stop fluid from being squirted from the nozzles and to automatically stop and retract the wipers. While the wiper is operating in the INT position, when the wiper washer switch is pushed, the wiper will change to operate continuously.



M1U1-01-007

**IMPORTANT: The washer motor in the washer fluid tank may be damaged if washer fluid is kept squirted for more than 20 seconds or the motor is continuously operated with the washer fluid tank empty. Monitor the washer fluid squirting time and the fluid level in the washer reservoir.**



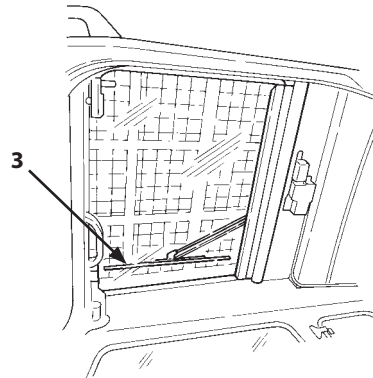
M1U1-01-008

### Wiper Switch (2) (Overhead Window: Optional)

Wiper switch has two positions as follows:

ON Position .....Overhead window wiper (3) operates.


OFF Position.....Overhead window wiper (3) stops.



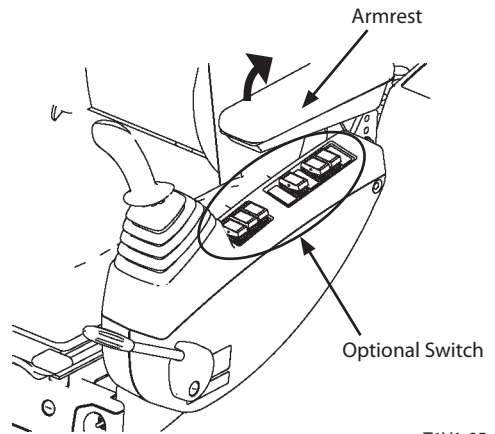
M157-01-081

# OPERATOR'S STATION

## SWITCH PANEL (Optional)

-  **NOTE:** • The optional switch locations differ depending on the kinds of optional devices are equipped. Before using the switches on the switch panel, make sure what kind of optional devices are equipped. All available optional devices are shown below.
- Raise the armrest when operating the optional switch.

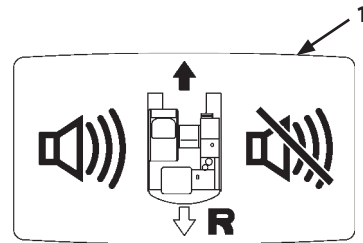
- Travel Alarm Deactivation
- Swing Alarm Deactivation
- Rear Light
- Overload Alarm Device Switch
- Seat Heat Switch
- Rotating Lamp
- Electric Type Control Lever



T1V1-05-02-004

### Travel Alarm Deactivation Switch (Optional)

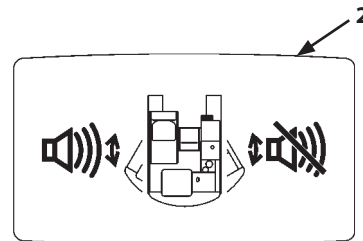
The travel alarm buzzer sounds during travel operation. When push the travel alarm deactivation switch (1), the travel alarm buzzer function is deactivated.



M1U1-01-035

### Swing Alarm Deactivation Switch (Optional)

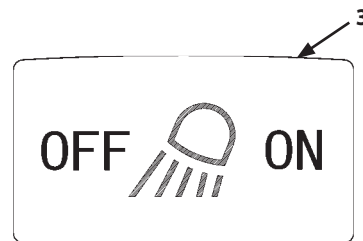
The swing alarm system sounds the buzzer and turns the beacon light ON during swing operation. When push the swing alarm deactivation switch (2) is set to the OFF position, the swing alarm buzzer function is deactivated.



M1U1-01-036

### Rear Light Switch (Optional)

When rear light switch (3) is turned ON. The rear light at the rear of the cab roof comes ON.

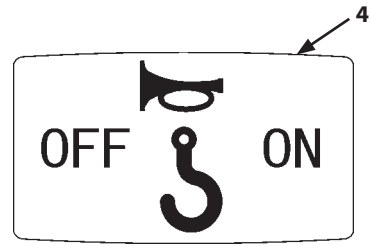


M1U1-01-009

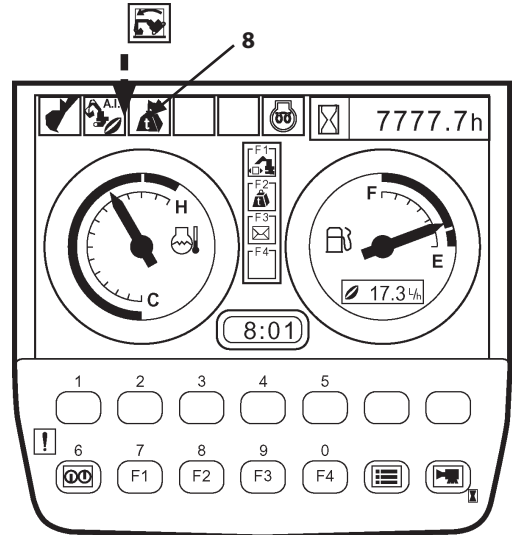
# OPERATOR'S STATION

## Overload Alarm Switch (Optional)

During lifting load work with overload alarm switch (4) ON, if overloading is detected, the buzzer sounds and overload alarm indicator (8) on the multi-monitor comes ON. Turn the overload alarm switch OFF to deactivate the overload alarm system function.



M1U1-01-010



T1V1-05-01-094

## Seat Heater Switch

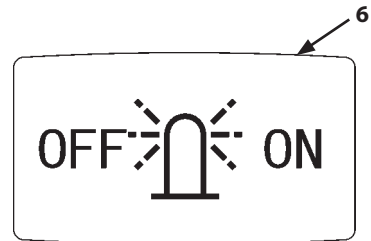
When seat heater switch (5) is turned ON, the seat surface is heated so that the seat section becomes warm. When the temperature of the seat section is raised to the specified temperature, heating is automatically stopped.



M1U1-01-011

## Revolving Light Switch (Optional)

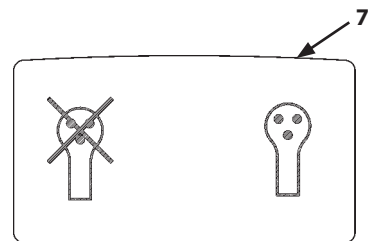
When the revolving light switch (6) is turned ON, the revolving light provided at the rear on the cab roof comes ON.



M1U1-01-012

## Electrical Control Main Switch (Optional)

When the (⚡) mark side of electrical control main switch (7) is pressed, the electrical control (grip switch) system becomes operable. When there is no need to use the electrical control (grip switch) system, press the (⊗) mark side of the main switch to avoid mis-operation.

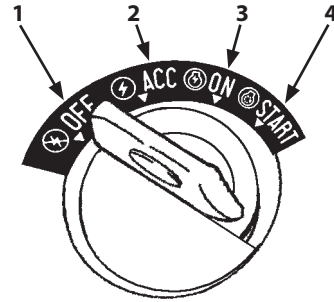


M1U1-01-013

# OPERATOR'S STATION

## KEY SWITCH

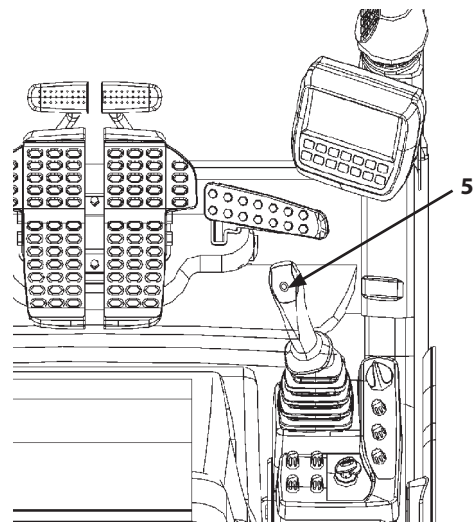
- 1- OFF (Engine Off)
- 2- ACC (Horn, Radio etc.)
- 3- ON (Engine On)
- 4- START (Engine Start)



M178-01-049

## POWER BOOST SWITCH

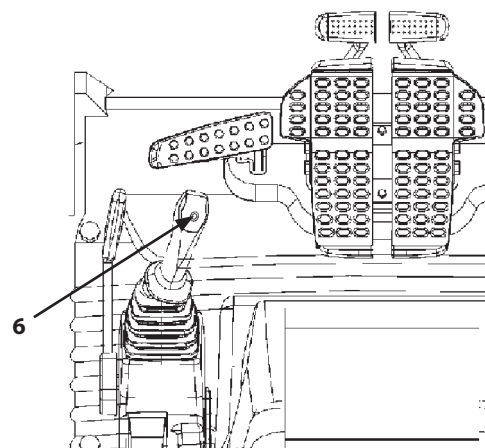
Power boost switch (5) is used to gain maximum digging power, and is located on the top of the right control lever.



M1J1-01-024

## HORN SWITCH

Horn switch (6) is provided on the top of the left control lever. The horn continuously sounds as long as the switch is pressed.



M1j1-01-025

## OPERATOR'S STATION

### CIGAR LIGHTER

#### Operation

**IMPORTANT:** In case cigar lighter (2) does not pop out automatically 30 seconds after pushing cigar lighter (2) in, pull out cigar lighter (2) manually. Then, consult the your nearest Hitachi dealer.

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

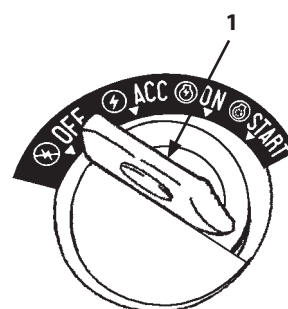
#### Using Cigar Lighter (2) Port as External Power Source

Use cigar lighter (2) port to supply power to lighting equipment for servicing the machine.

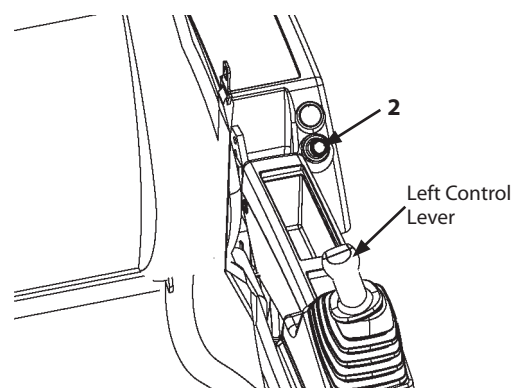
**IMPORTANT:** Only 24 V electric power is available from the cigar lighter port on this machine. Never connect accessories that use power other than 24 V. Damage to the batteries and accessories may result.

**Do not supply power to accessories for a long time without running the engine. Failure to do so may discharge the batteries.**

1. Pull lighter (2) knob out.
2. Correctly insert the accessory socket into cigar lighter (2) port.
3. Turn key switch (1) to the ACC or ON position. Power is supplied to the connected accessory.
4. After using the accessory, disconnect the accessory socket and insert cigar lighter (2) into the port.



M178-01-049



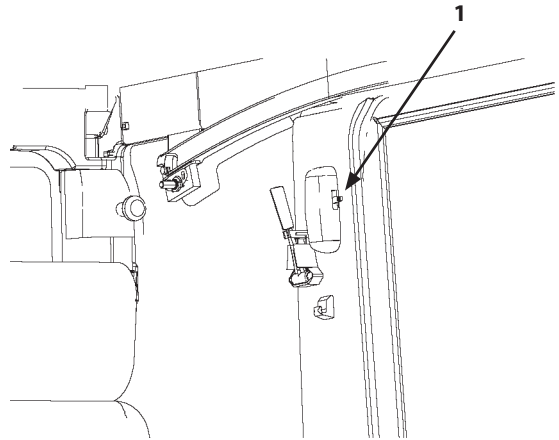
M1U1-01-021

## OPERATOR'S STATION

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### CAB LIGHT

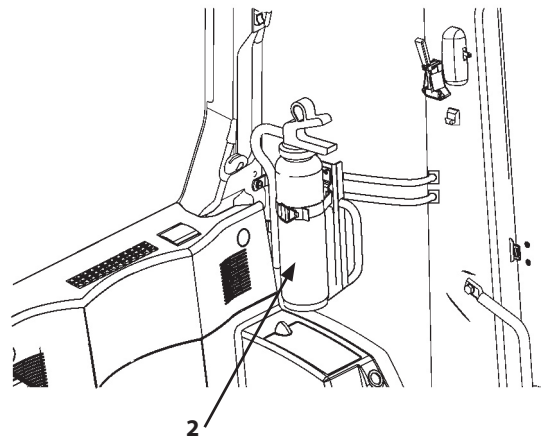
Turn the cab light ON or OFF by using switch (1).



M178-01-022

### INSTALLING FIRE EXTINGUISHER (Optional)

A fire extinguisher (2) can be installed at the right rear corner inside the cab. Consult your nearest HITACHI dealer to install a fire extinguisher.



M1J1-01-029

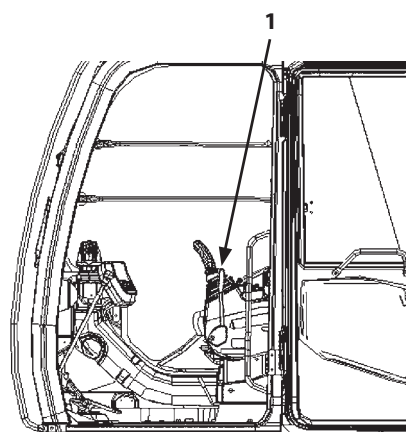
## OPERATOR'S STATION

### PILOT CONTROL SHUT-OFF LEVER

Pilot control shut-off lever (1) functions to prevent the machine from being mistakenly operated when the operator is getting on or off the machine.

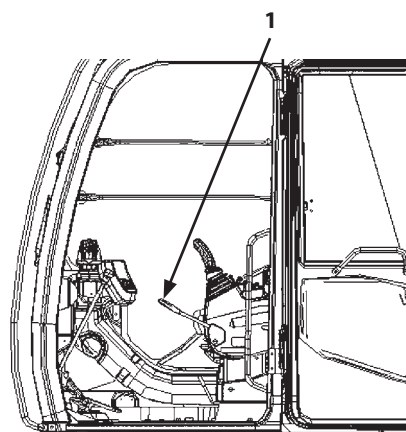
#### WARNING:

- Pilot control will not be shut-off unless pilot control shut-off lever (1) is completely pulled-up to the LOCK position.
- Before leaving the operator's seat, always stop the engine and pull the pilot control shut-off lever up to the LOCK position.
- Also, pull the pilot control shut-off lever up to the LOCK position when transporting the machine or when the day's work is complete.
- Confirm that the pilot control shut-off lever is in the LOCK position before starting the engine.
- Confirm that the actuator does not move with the pilot control shut-off lever in the Lock position in order to confirm that the solenoid valve is stuck.



LOCK Position

M1U1-01-025

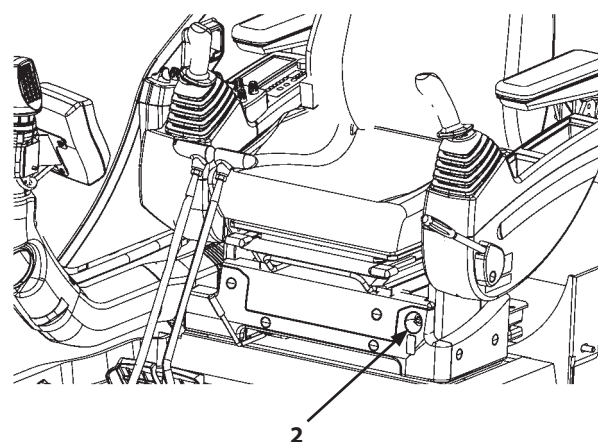


UNLOCK Position

M1U1-01-024

### ENGINE STOP SWITCH

In case the engine does not stop even if the key switch is turned OFF due to failure of the machine, move switch (2) located at the front-left side of the seat stand downward to stop the engine. After operating switch (2), be sure to return the switch back to the upward position.

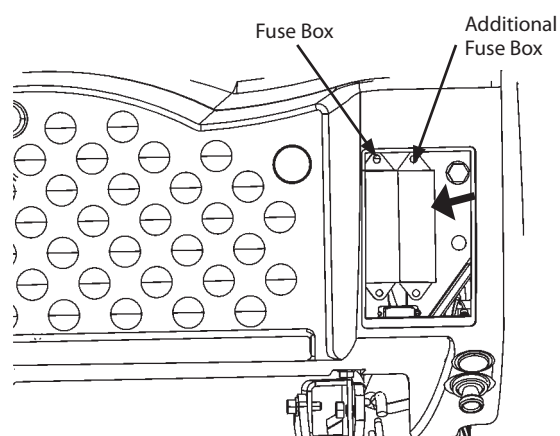


M1U1-01-029

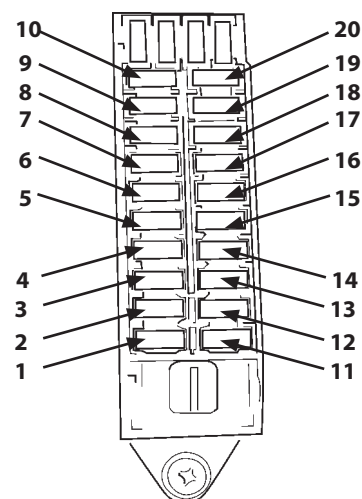
## OPERATOR'S STATION

### FUSE BOX

10- CONTROLLER 5A	20- OPTION3 5A
9- BACKUP 10A	19- SW. BOX 5A
8- ECM 30A	18- POWER ON 5A
7- LUBRICATOR 10A	17- AIRCON 5A
6- OPTION2 10A	16- GLOW. R 5A
5- OPTION1 5A	15- AUXILIARY 10A
4- SOLENOID 10A	14- FUEL PUMP 5A
3- HEATER 20A	13- LIGHTER 10A
2- WIPER 10A	12- RADIO 5A
1- LAMP 20A	11- HORN 10A



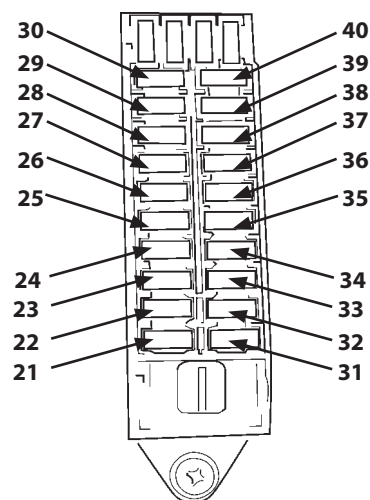
M1J1-01-021



### ADDITIONAL FUSE BOX

30- SPARE	40- SPARE
29- SPARE	39- SPARE
28- SPARE	38- SPARE
27- AUXILIARY3 5A	37- SPARE
26- QYICK HITCH 5A	36- SPARE
25- IMOBI 5A	35- SPARE
24- 12V UNIT 10A	34- AUXILIARY2 10A
23- CAB LAMP REAR 10A	33- WARNING LAMP 10A
22- CAB LAMP FRONT 10A	32- CAB LAMP FRONT+2 10A
21- SEAT HEATER 10A	31- SEAT COMPR. 10A

M1GR-01-003



M1GR-01-003

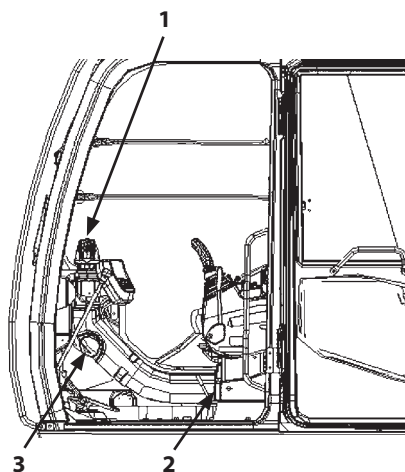


## OPERATOR'S STATION

### AUTO AIR CONDITIONER

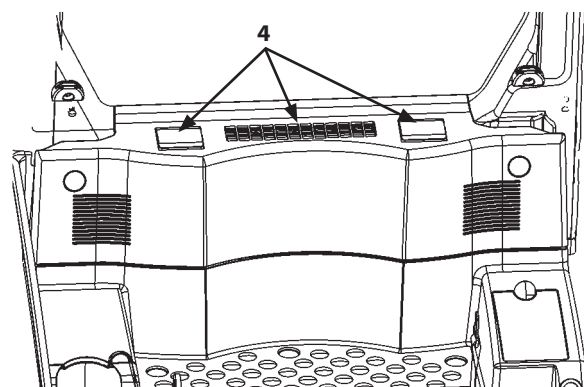
#### Distinctive Feature

- Temperature Control:  
Automatically controls the cab temperature to maintain the temperature set by the temperature control switch regardless of outside air temperature and insolation.
- Max. Cooling and Heating:  
Maximum cooling or heating can be obtained by moving the temperature control switch to the full right or left respectively.
- Preheating:  
During preheating the cab in winter with the foot vent selected, the air volume is reduced to Low until the coolant temperature rises to prevent cool air from entering the cab.




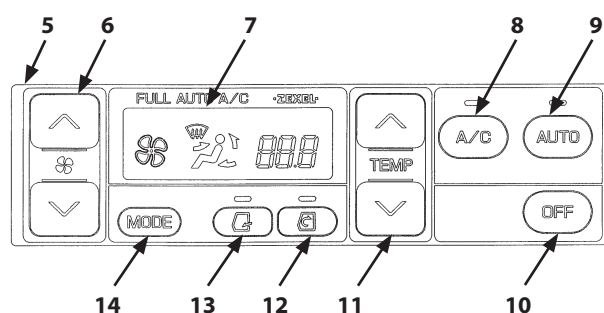
M1U1-01-025

- 1- Front Vent
- 2- Foot Vent
- 3- Defroster Vent
- 4- Rear Vent
- 5- Control Panel
- 6- Blower Switch
- 7- Liquid-Cristal Display (LCD)
- 8- Air Conditioner Switch
- 9- AUTO Switch
- 10- OFF Switch
- 11- Temperature Control Switch
- 12- Circulation Mode Switch
- 13- Fresh Air Mode Switch
- 14- Mode Switch



M1U1-01-027

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







M178-01-073

# OPERATOR'S STATION

## Control Panel Designation and Function



- Mode Switch (14):  
Selects the air vent. The selected air vent is indicated on LCD (7).

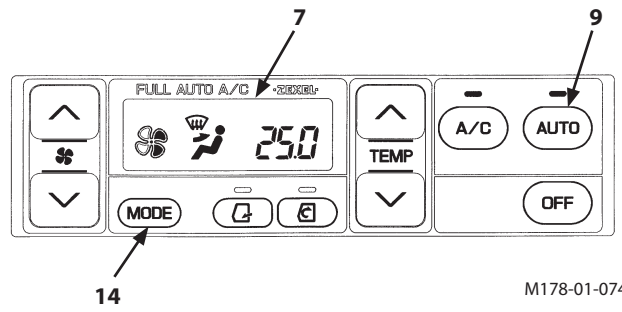
-  Air flows out of front vent and the defroster vents.
-  Air flows out of the front and rear vents and the defroster vents.
-  Air flows out of the front and foot vents and the defroster vents.
-  Air flows out of the foot vents.

Each time mode switch (14) is pressed, the vent location can be changed in four stages as illustrated below.

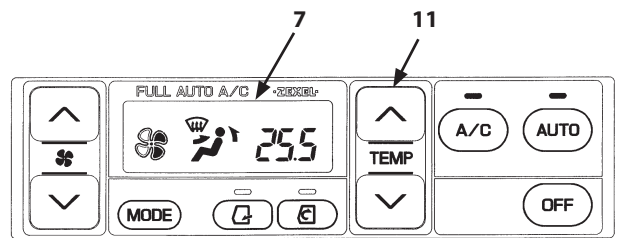


- When AUTO switch (9) is selected the AUTO, the air vent location is automatically selected.
- Temperature Control Switch (11):  
Sets temperature in the cab from 18.0 to 32.0°C or 63 to 91 °F) by 0.5°C or 1°F step. The set-temperature is displayed on LCD (7).

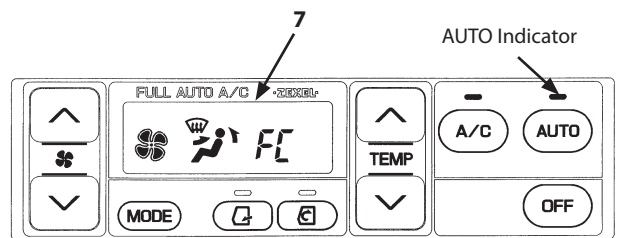
- FC (Full-Cool)  
Push the  button after setting air temperature to 18°C or 63°F. Air flow temperature is set to the lowest and the "FC" symbol is displayed on LCD (7).
- FH (Full-Heat)  
Push the  button after setting air temperature to 32°C or 91°F. Air flow temperature is set to the highest and the "FH" symbol is displayed on LCD (7).
- When the AUTO indicator is ON, air temperature at the vents is automatically set together with the blower speed and vent locations.
- When the AUTO indicator is OFF, only air temperature at the vents is automatically set.
- When the "FC" symbol is displayed on LCD (7), air temperature at the vent, air vent (front and rear vents) locations, recirculation air suction port, and blower speed are maintained at the lowest cooling conditions. However, in case the circulation indicator is ON before the "FC" symbol is displayed, circulation operation is maintained.



Display when AUTO switch (9) is pressed:



Display when the  button is pressed after displaying 25.0°C (77°F).



Display when the LCD displays 「FC」 symbol.

## OPERATOR'S STATION





- When the "FH" symbol is displayed on LCD (7), air flow-in temperature at the vent, air vent (front and rear vents) locations, fresh air suction port, and blower speed are maintained at the highest heating conditions. However, in case the circulation indicator is ON before the "FH" symbol is displayed, circulation operation is maintained.

### Selecting Display Between Celsius And Fahrenheit


- While depressing both A/C (8) and mode (14) switches, turn the key switch "ON".
- The LCD will display "Sd" for approx. 5 seconds.
- After display "Sd" is deleted, all LED will come ON.
- After all LED come ON, repeat to press the blower switch (6) four times.
- Sequentially, press the A/C (8) and blower (6) switches at the same time.
- Then, the selection mode between celsius and fahrenheit starts.  
Each time the fresh air mode switch (13) is pressed, the display is shifted between celsius and fahrenheit. When celsius is displayed, the LED displays "C." When fahrenheit is displayed, the LED displays "F." Select either one to be preferred.
- After selection is complete, end by turning the key switch "OFF".

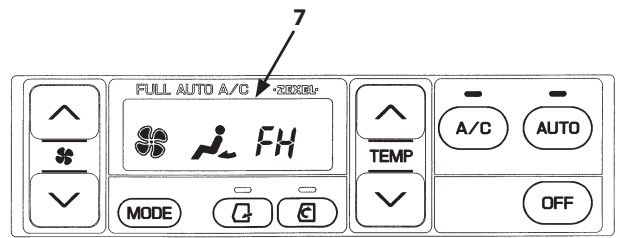
The LED will display in the selected mode when the machine is operated next time.

	Display on LCD
Celsius (°C)	18.0 to 32.0
Fahrenheit (°F)	63 to 91

- Blower Switch (6)
  - When the AUTO indicator is ON, the blower speed is automatically controlled.
  - When the AUTO indicator is OFF, the blower speed is controlled in 4 steps. When the  button is pressed with the blower OFF, the blower starts running in the HI mode. Then, each time the  button is pressed, the blower speed is reduced by one step. The LCD indicates the blower fan speed. When the  button is pressed with the blower OFF, the blower starts running in the LO mode. Then, each time the  button is pressed, the blower speed is increased by one step. The LCD indicates the corresponding blower fan speed.
- Circulation Mode Switch (12):
- Fresh Air Mode Switch (13):

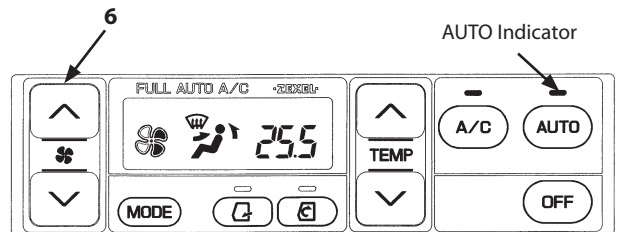
Changes the air circulation mode and automatically selects the air vent. When fresh air mode switch (13) is pressed, the indicator comes ON and the fresh air circulation mode is selected, allowing fresh air to flow in. When fresh air mode switch (13) is pressed again, the indicator goes OFF and the fresh air suction port is closed. When circulation mode switch (12) is pressed, the indicator comes ON and the circulation mode is selected. When circulation mode switch (12) is pressed again, the indicator goes OFF and the fresh air suction port is opened.

 **NOTE:** Operating the above switches controls the fresh air suction port manually or automatically. Therefore, even if the AUTO switch is turned ON, the fresh air suction port status will not be changed.

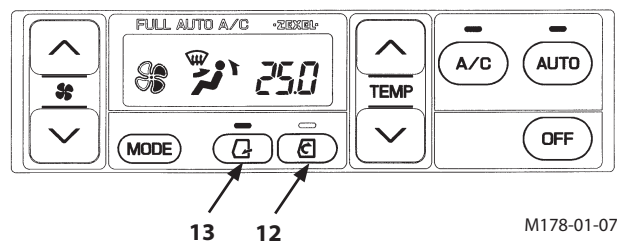


M178-01-077

Display when the LCD displays 「FH」 symbol.



M178-01-075



M178-01-078

Display when fresh air vent switch (13) is pressed.

## OPERATOR'S STATION

- Air Conditioner (A/C) Switch (8)

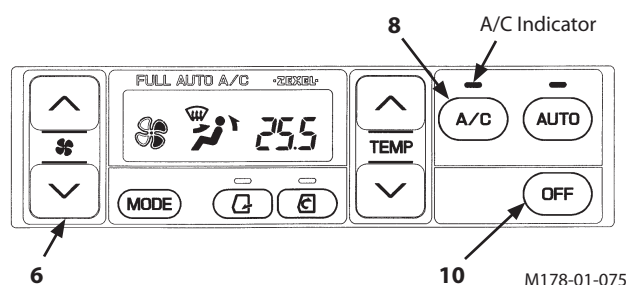
Press A/C switch (8) to turn the air conditioner and the A/C indicator ON. However, unless the blower is running (the fan display of blower switch (6) is lit), the air conditioner will not be turned ON.

- OFF Switch (10)

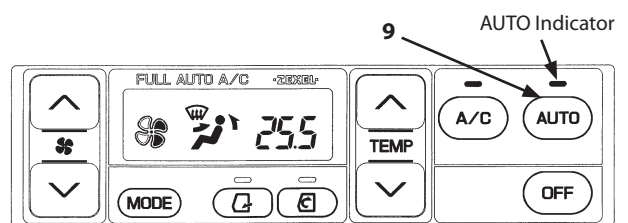
Press OFF switch (10) to turn the blower and the air conditioner OFF.

- AUTO Switch (9)

Press AUTO switch (9) to turn the AUTO and the A/C indicators ON so that the air flow-in temperature at the vent, blower speed, vent locations, and fresh air suction port are automatically controlled.



Display when Air Conditioner Switch (8) is pressed:



Display when AUTO Switch (9) is pressed:

## CAB HEATER OPERATION

1. Operate the AUTO switch.

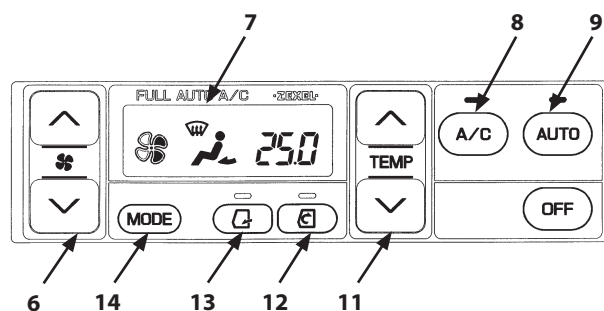
According to signals sent from various sensors, the air conditioner amplifier automatically selects the air flow-in vents, air suction ports, and air flow-in temperature at the vent, and controls the blower speed.

2. Operate Temperature Control Switch (11).

Set temperature control switch (11) so that 「25.0」 is indicated on LCD (7). Control air temperature inside cab using this switch as necessary.

3. As Necessary:

- Operate Mode switch (14) to manually select the air vent.
- Operate blower switch (6) to manually control the blower speed.
- Operate fresh air mode switch (13) to maintain the air vent in the fresh air circulation mode.
- Operate circulation mode switch (12) to maintain the air suction port in the circulation mode.



When the A/C indicator is ON, the air conditioner functions dehumidifier. Press A/C switch (8) to turn OFF the dehumidifier function.

## OPERATOR'S STATION

### COOLING OPERATION

1. Press AUTO Switch (9)

The AUTO and the A/C indicators come ON. Then, the air temperature at the vent, blower speed, vent locations, and air suction ports are automatically controlled by the air conditioner amplifier according to signals sent from various sensors.

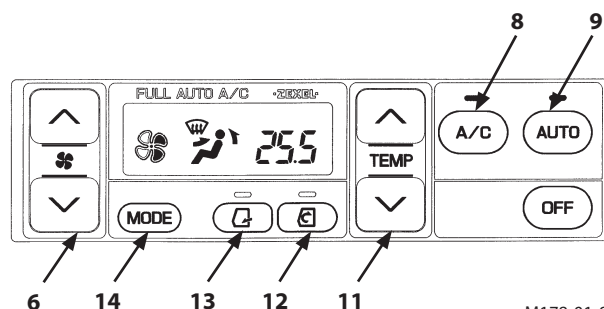
2. Operate Temperature Control Switch (11).

Set temperature control switch (11) so that 「25.0」 is indicated on LCD (7). Control air temperature inside the cab using this switch as necessary.

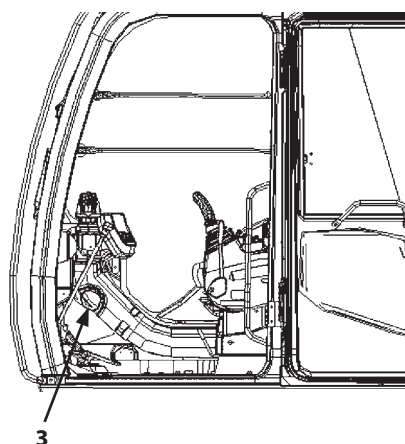
3. As Necessary:

- Operate Mode switch (14) to manually select the air vent.
- Operate blower switch (6) to manually control the blower speed.
- Operate fresh air mode switch (13) to maintain the air vent in the fresh air circulation mode.
- Operate circulation mode switch (12) to maintain the air suction port in the circulation mode.

In case the front window (lower) becomes clouded, manually close the defroster vent (3).



M178-01-075



M1U1-01-025

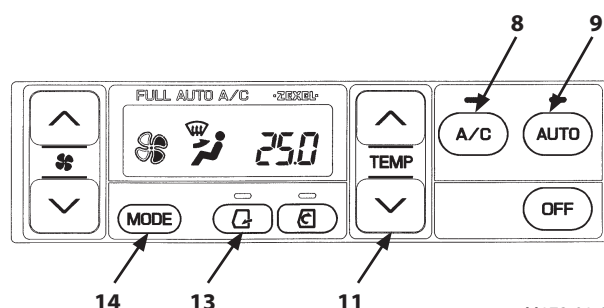
### DEFROSTER OPERATION

1. Press AUTO Switch (9). Temperature-controlled air blows out. During cold weather season when starting the engine, the engine coolant temperature and air temperature in the cab are low. Then, cool air is restricted not to flow in the cab to the minimum (LO) by the Heater Start-Operation Control System.
2. Set temperature control switch (11) so that 「25.0」 is indicated on LCD (7). Set fresh air vent switch (13) in the fresh air circulation mode.

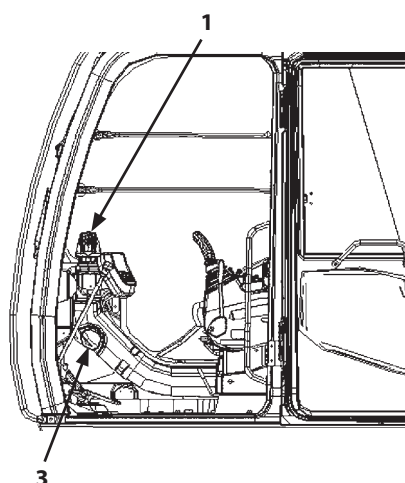
3. Select the front vents  or the front and rear vents  using MODE switch (14).

Control air flow direction by adjusting the louvers at the front vent (1) and the defroster vent (3).

Control air temperature in the cab by operating temperature control switch (11). If the windowpanes become clouded in rainy season or when dehumidifying, turn the indicator of A/C switch (8) ON.



M178-01-074




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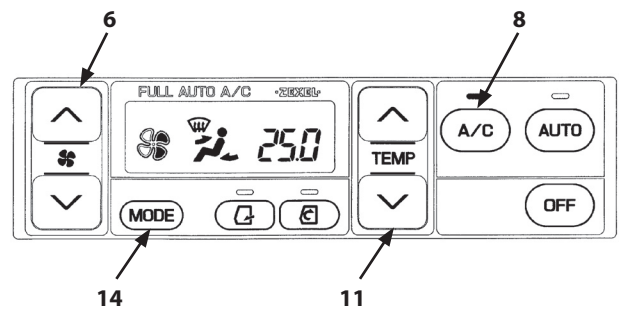
## OPERATOR'S STATION

### Cool Head / Warm Feet Operation

Cool and warm air is simultaneously supplied to the head vents and feet vents respectively.

1. Press blower switch (6) to adjust the blower speed.
2. Press MODE switch (14) to display the front and rear vent  mark on the liquid crystal panel. Then, turn A/C switch (8) ON (indicator lights).

Control air temperature inside the cab by operating temperature control switch (11).



M178-01-080

## OPERATOR'S STATION

### TIPS FOR OPTIMAL AIR CONDITIONER USAGE

#### For Rapid Cooling

Temperature in the cab may rise over 80°C (176°F) when the machine is exposed to sun light in the summer.

In this case, ventilate air in the cab first by opening the windows for rapid cooling. After starting the engine, press AUTO switch (9). Set temperature to 「18.0」 on LCD (7) using temperature control switch (11). Turn circulation mode switch (12) ON.

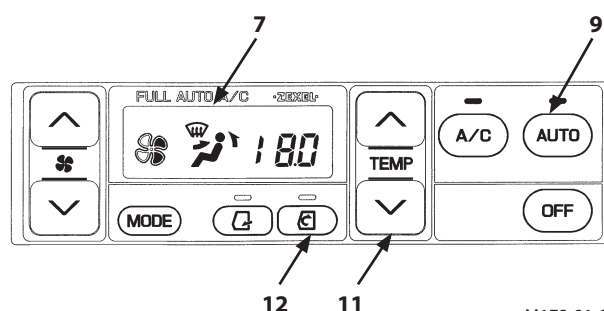
#### When Windows Become Clouded

If the insides of the windows become clouded during rainy weather or on humid days, operate the air conditioner to aid in keeping the windows clear. When the atmosphere is very damp, and if the air conditioner has run excessively, the outside of the windows may become clouded. If this happens, turn off the air conditioner to adjust the temperature in the cab.

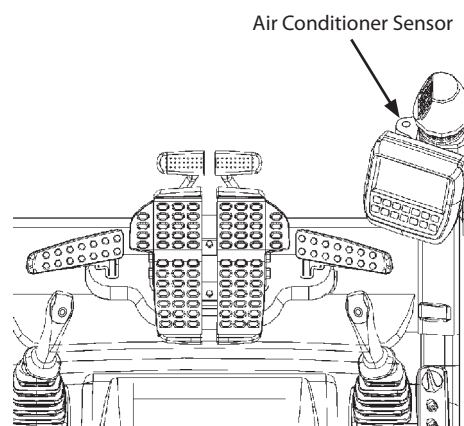
#### Off-Season Air Conditioner Maintenance

To protect each part of the compressor from a lack of lubricant, operate the air conditioner at least once a month for several minutes with the engine running at a slow speed during off-season. When the cab temperature is lower than 15°C (59°F), the air conditioner may not operate. If this happens, warm the cab using the heater first.

- IMPORTANT:**
- Do not suddenly increase the engine speed.
  - Refer to the item "Check Air Conditioner Filter" in the Maintenance Section for maintenance of the air conditioner filters.
  - Always clean the auto air conditioner sensor for effective air conditioner performance. Avoid placing any obstructions around the sensor.



M178-01-081



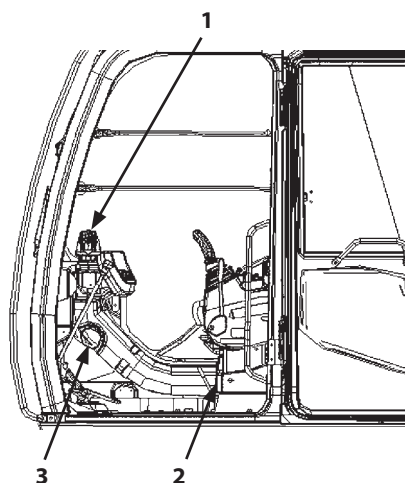
M1J1-01-028

## OPERATOR'S STATION


### CAB HEATER (Optional)

#### Part Name and Location

- 1- Front Vent
- 2- Foot Vent
- 3- Defroster Vent
- 4- Rear Vent
- 5- Control Panel
- 6- Mode Switch
- 7- Fresh Air Vent Switch
- 8- Temperature Control Switch
- 9- Blower Switch
- 10- OFF Switch






M1U1-01-025

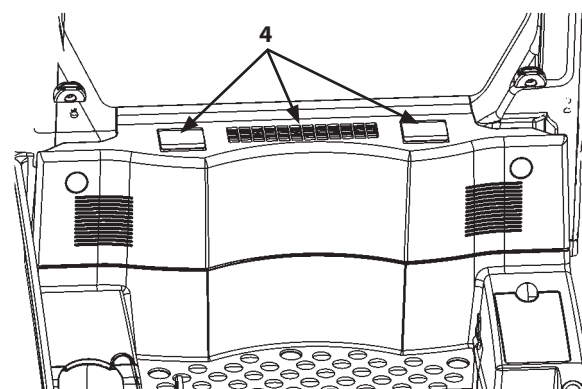
 **NOTE:** Air flow direction can be changed by controlling the louvers at all air vents except for the foot vents. The louvers at the front and defroster vents can be manually opened or closed.

#### Control Panel Designation and Function

- Mode Switch (6):

Selects the air vent.

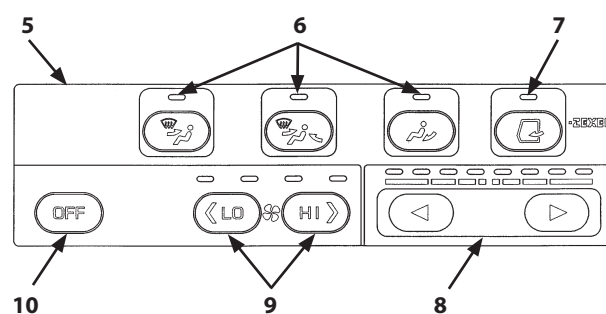
-  Air flows out of the front vents and the defroster vents.
-  Air flows out of the front and rear vents and the defroster vents.
-  Air flows out of the foot vents.



#### Temperature Control Switch (8)

One of 8 indicators is lit. The air flow temperature at the vent is lower or higher as the indicator closer to the left or right end is lit respectively. Both warmed and cooled air flow out of the same air vent.

M1U1-01-027



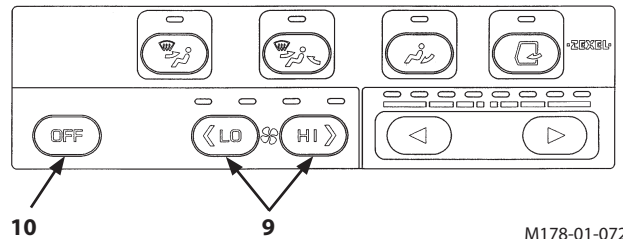
M178-01-072



## OPERATOR'S STATION

- Blower Switch (9)

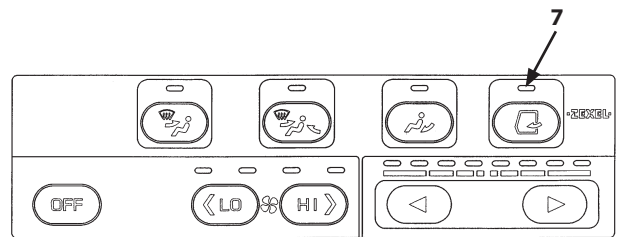
The blower speed is controlled from Lo to Hi in 4 steps. When the (HI >) button is pressed first, the blower starts running in the HI mode. Then, each time the (< LO) button is pressed, the blower speed is reduced by one step. The blower speed indicator corresponding to the blower speed is lit. When the (< LO) button is pressed first, the blower starts running in the LO mode. Then, each time the (HI >) button is pressed, the blower speed is increased by one step. Press blower OFF switch (10) to stop the blower operation.



M178-01-072

- Fresh Air Mode Switch (7):

Changes the air circulation mode. When fresh air vent switch (7) is pressed, the indicator comes ON and the fresh air circulation mode is selected, allowing fresh air to flow in. When fresh air mode switch (7) is pressed again, the indicator goes OFF and the circulation mode is selected.



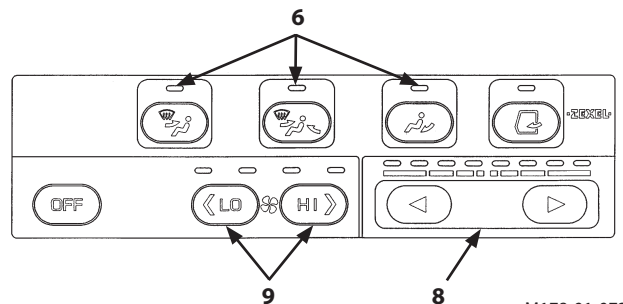
M178-01-072

### CAB HEATER OPERATION

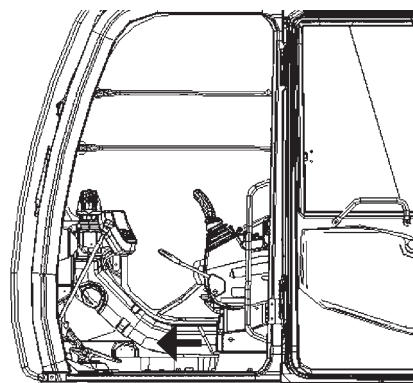
When any mode switches (6) are pressed (⌂), (⌂), (⌂), warm air will flow out from the corresponding vent. However, the foot vent mode (⌂) is commonly used for cab heating.

Press foot mode (⌂) switch (6). Set temperature control switch (8) to the right end position.

Press blower switch (9) to blow warm air out of the foot vents. Adjust the air temperature in the cab by operating temperature control switch (8) and blower switch (9). When required to quickly increase air temperature in the cab, select the air recirculation mode. However, if air recirculation mode is used for a long time, the windowpanes will become clouded due to a difference in temperature between outside and inside the cab. Occasionally ventilate the cab. (When the fresh air circulation mode is selected, the windowpanes will be prevented from becoming clouded.)





M178-01-072



M1U1-01-024

## OPERATOR'S STATION

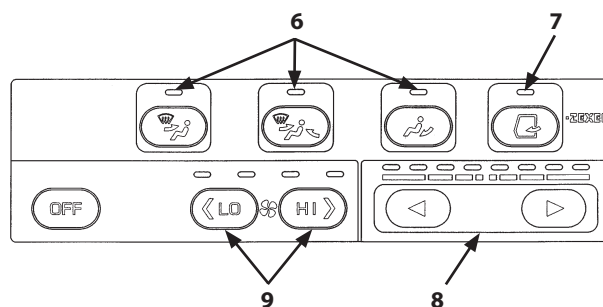
### DEFROSTER OPERATION

Press mode switch (6) (either the front  or front/rear vent mode  switch). Set temperature control switch (8) to the heat operation position. Press fresh air mode switch (7).

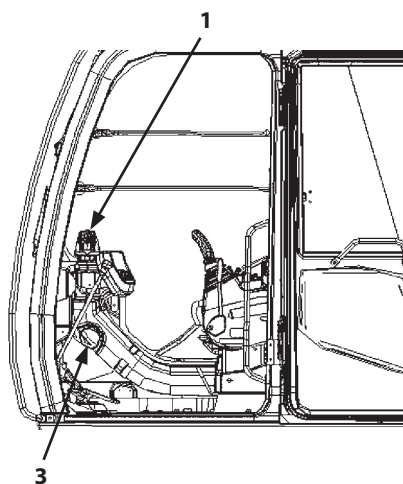
Press blower switch (9). Warm air will blow out from the front or front/ rear vents.

Adjust air flow direction from front vent (1) and defroster vent (3) by controlling the louver direction.

Use temperature control switch (8) and blower switch (9) to adjust air temperature in the cab.



M178-01-072



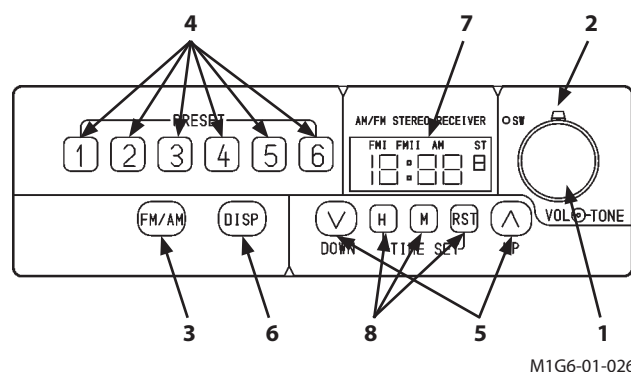
M1U1-01-025

## OPERATOR'S STATION

### AM/FM RADIO OPERATION

#### Controls on the radio


- 1- Power Switch/Volume Control Knob
- 2- Tone Adjustment Ring
- 3- AM/FM Switch
- 4- Station Presets
- 5- Tuning Switches
- 6- Display Mode Change Switch
- 7- Digital Display
- 8- Time Set Switches





M1G6-01-026

#### Tuning Procedure

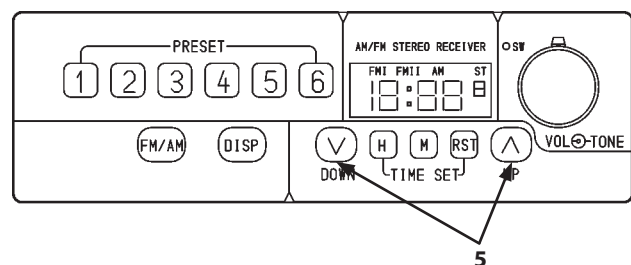
- Manual Tuning Procedure  
Repeatedly tap one of tuning switches (5) until the desired station is reached.  
Each time the tuning switch is pressed, the frequency changes at an interval.

Tap the tuning switch [UP] () to increase the frequency.

Tap the tuning switch [DOWN] () to decrease the frequency.

- Automatic Search Function  
Press and hold one tuning switch (5) for more than half a second, then release. The frequency display will move up to the next higher frequency station.  
To go up to the next higher frequency station, press and hold the tuning switch [UP] ().  
To go down to the next lower frequency station, press and hold the tuning switch [DOWN] ().

In order to deactivate the automatic search function while it is operating (while searching the next available frequency station), simply tap tuning switch (5) again. If the receiving radio waves are weak, i. e. such as when the machine is located between high rising buildings, etc., use the manual tuning procedure to select the desired station.



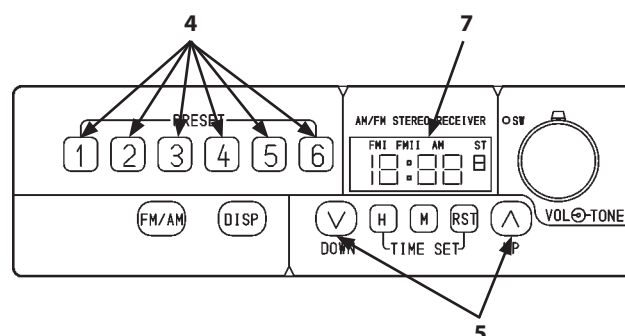
M1G6-01-026

## OPERATOR'S STATION

### Station Presetting Procedure


1. Select the desired station using tuning switches (5). (Refer to the "Tuning Procedure" section.)
2. Press and hold one station preset (4) for more than 1 second until an electronic tone is heard. Now, the selected station is preset for the selected station preset. The frequency of the preset station will be indicated on digital display (7).

Once the presetting is complete for a station preset (4), the radio will be tuned to the preset station when station preset (4) is pressed (for less than 1 second).



M1G6-01-026

### DIGITAL CLOCK SETTING PROCEDURE

 **NOTE:** In order to set the clock, digital display (7) must be in the time display mode.

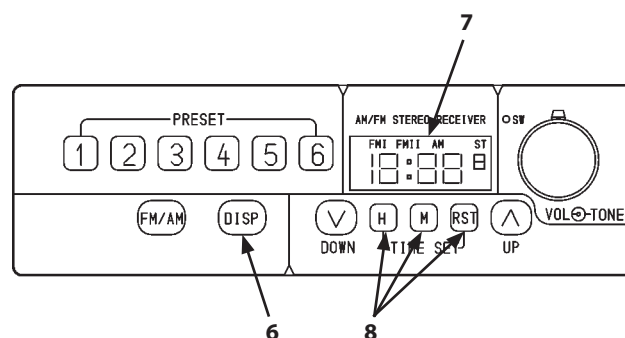
1. Press display mode button (6) to indicate the hour display on digital display (7).
2. Press and hold time set button (RST) (8) for longer than 1 second. The hour display will start flashing and the time set mode will be selected.
3. Press time set button (H or M) (8) to set the clock. Each time time set button (H or M) (8) is pressed, the time display will increase by one. If time set button (H or M) (8) is pressed and held, the time display will change continuously.

- When setting the hour, press time set button (H) (8).
- When setting the minute, press time set button (M) (8).

The time is displayed in 12 hour standard.

If either of the switches (H) or (M) is pressed and held, the hour or minute display will change continuously until the switch is released.

4. When the hour display is "12," if time set button (H) (8) is pressed, the hour display will be reset to "1." When the minute display is "59," if time set button (M)(8) is pressed, the minute display will be reset to "00." However, the hour display remains unchanged in this case.
5. After the clock setting is complete, press and hold time set button (RST)(8) again for longer than 1 second, or turn the radio switch OFF to end the clock time setting procedure. Digital display (7) stops flashing and changes to stay ON.



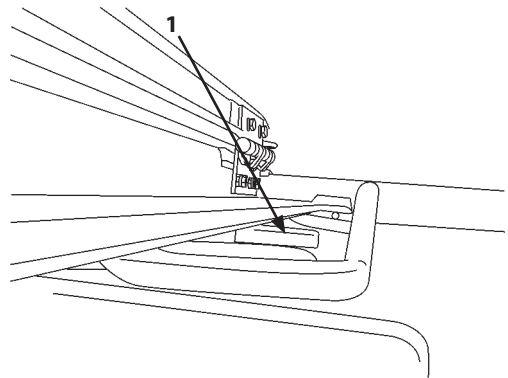
M1G6-01-026

## OPERATOR'S STATION

### CAB DOOR RELEASE LEVER

**CAUTION:** Open the cab door all the way until it securely locks in the latch on the side of the cab.

To unlock the door from this position, push down on lever (1).



### OPENING UPPER FRONT WINDOW (Optional)

**WARNING:** Open or close the upper-front cab window only after pulling up the pilot control shut-off lever to the LOCK position. Failure to do so may allow the machine to move unexpectedly if a control lever is touched a part of the body by mistake, possibly resulting in personal injury or death.

1. Press lock release lever (2) at the upper center to release the upper front window lock.

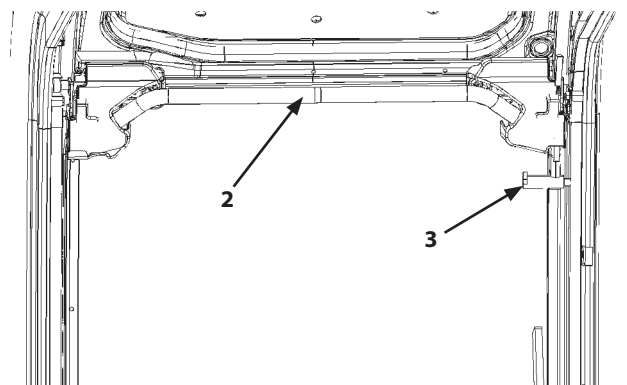
**NOTE:** Use caution when releasing the lock. The upper section of the upper front window will move approx. 10 cm inward.

2. Holding the upper and lower handles (one each) on the upper front window, pull the upper front window up and back until it securely catches into auto lock (4).

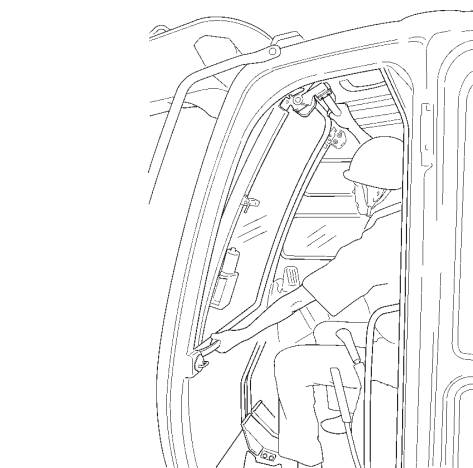
**CAUTION:** Always secure lock pin (3) in the lock position after the upper front window is opened.

3. After confirming that the window securely catches into auto lock (4), slide lock pin (3) into the left bracket boss hole to lock the window in position.

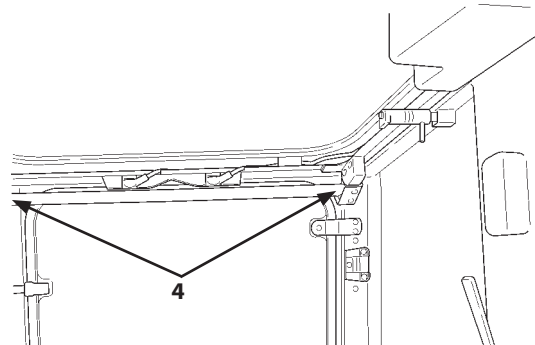
**NOTE:** When the upper front window is opened, the wiper and washer are inoperable.



M1J1-07-051



M1U1-01-028



M1CC-01-115

M1CC-01-031

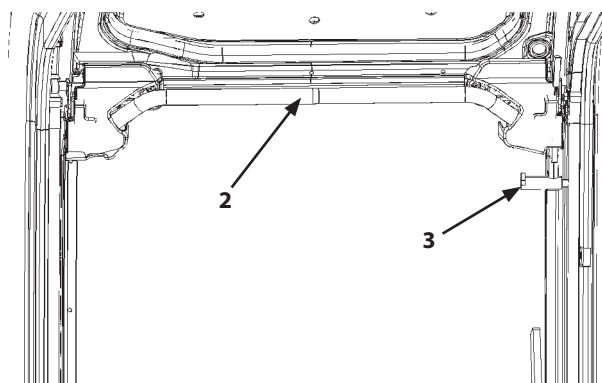
## OPERATOR'S STATION

### CLOSING UPPER FRONT WINDOW (Optional)

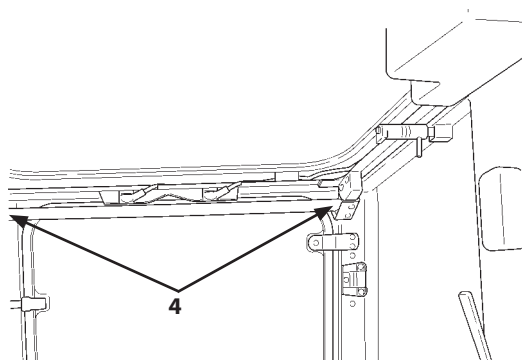
**CAUTION:** Avoid possible injury while closing window. Upper front window comes down very forcefully. Close window only when sitting in the operator's seat. Guide window down slowly.

1. Pull out lock pin (3) to unlock window.
2. Slightly move the window forward while pushing lock release levers (2) to release auto lock (4).
3. Pull window down slowly until it securely catches into auto lock (4).

**NOTE:** The wiper and washer will not operate until the upper front window is completely closed.



M1U1-01-028



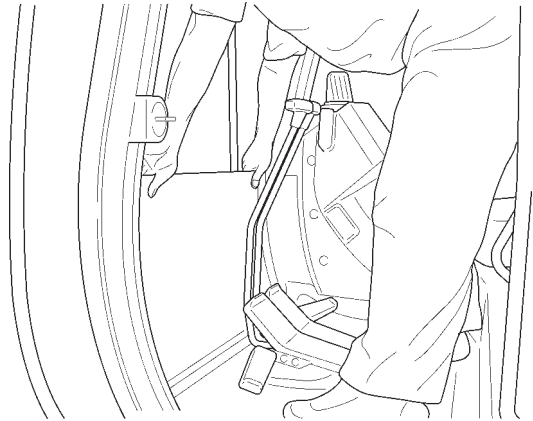
M1CC-01-031

## OPERATOR'S STATION

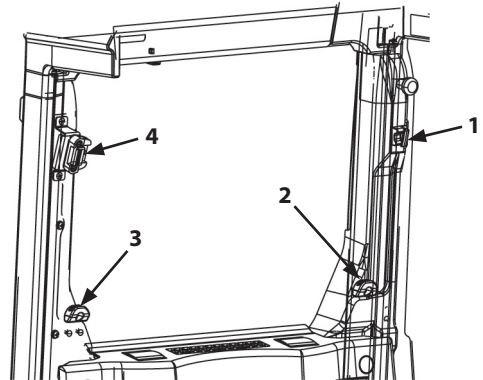
### REMOVING AND STORING LOWER FRONT WINDOW (Optional)

**CAUTION:** Take care not to pinch your fingers when handling the lower front window.

1. Open the upper front window beforehand when removing the lower front window.
2. While pulling the lower front window inward, raise it to remove.
3. Store the removed windowpane in the storing position. After inserting the windowpane into rubbers (2 and 3), slide it sideways securely into rubber (1). Then, push fastener (4) to lock.



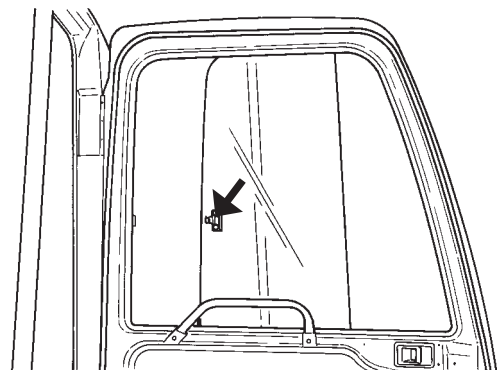
M1CC-01-022



M1U1-01-056

### OPENING SIDE WINDOWS

Opening Cab Door Window  
Slide rear pane to the front.



Cab Door Window

M178-01-061

## OPERATOR'S STATION

### OPENING/CLOSING OVERHEAD WINDOW (Optional)

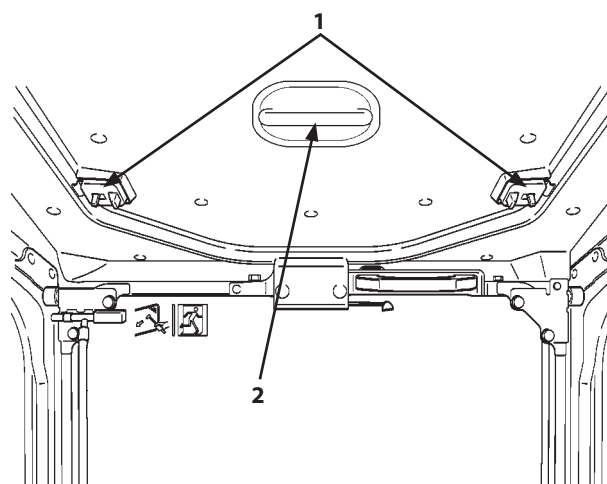
#### Opening

1. Move lock levers (1) toward center of window.
2. Hold handle (2) and lift window until it rises upright. With the window positioned upright, it will be secured in position by dampers (3).

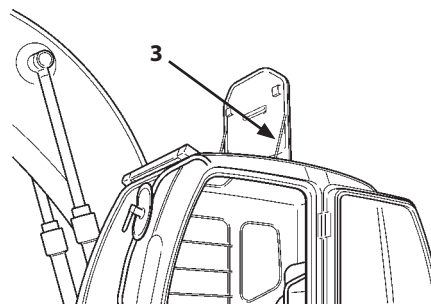
#### Closing

1. Hold handle (2) and pull window down until "click" sound is heard from locks (1).

Note that the overhead window can be used as an emergency exit.



M1U1-01-053



M1U1-01-054

### OPENING/CLOSING OVERHEAD WINDOW (Clear Hatch: Optional)

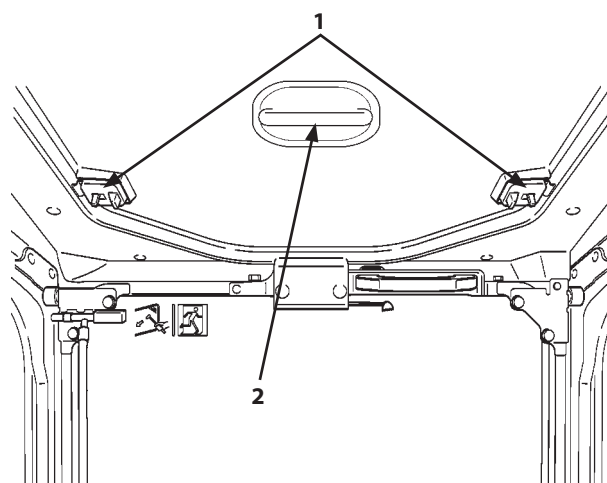
#### Opening

1. Move lock levers (1) toward center of window.
2. Hold handle (2) and lift window until it rises upright. With the window positioned upright, it will be secured in position by dampers (3).

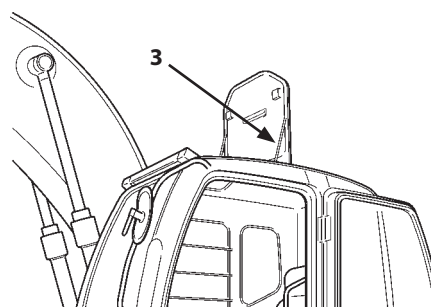
#### Closing

1. Hold handle (2) and pull window down until "click" sound is heard from locks (1).

Note that the overhead window can be used as an emergency exit.



M1U1-01-055



M1U1-01-054

#### IMPORTANT:

- Replace the clear hatch with a new one every 5 years even if undamaged. In case it was remarkably damaged or has received severe shock loads, replace it even if it has been not in use for 5 years.
- When cleaning the clear hatch, use a neutral detergent. If acidic or alkaline detergent is used, the clear hatch may become discolored or crack.
- Keep organic solvent away from the clear hatch. Failure to do so may cause the clear hatch to become discolored or crack.



## OPERATOR'S STATION

### EMERGENCY EXIT

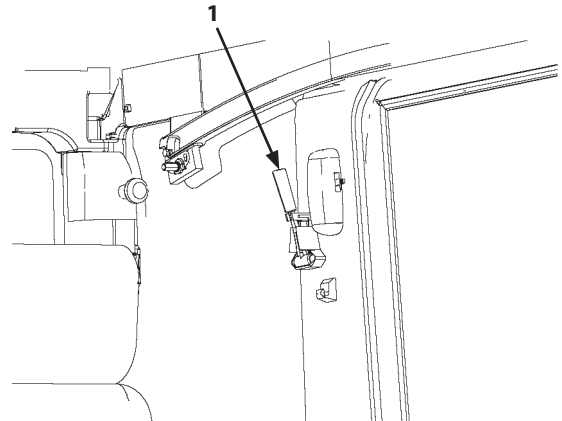
#### (Std. Model)

If the operator's cab door should not open in an emergency, escape in the following methods:

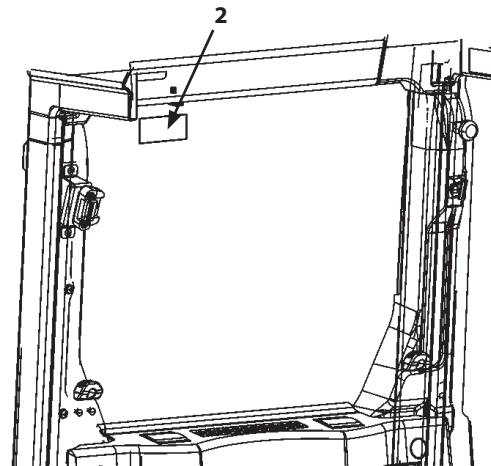
1. Break the rear window glass using the emergency evacuation tool (1). Then, escape through the broken window.

**⚠ WARNING: Take care not be injured pieces of broken glass.**

**✎ NOTE: Emergency exit decals (2) are affixed to the rear windows.**



M1U1-01-022




M1J1-01-023

## OPERATOR'S STATION

### EMERGENCY EXIT (Optional)

If the operator's cab door should not open in an emergency, escape in the following methods:


1. Open the front windows. Escape through the windows.

 **NOTE:** See page "OPENING UPPER FRONT WINDOW" for the opening method of the front windows.

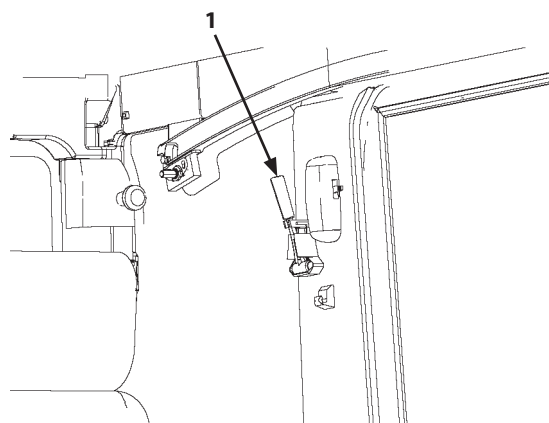
 **CAUTION:** Take care not be injured with pieces of broken glass.

2. If the front window is difficult to open, break the front window glass using the emergency evacuation tool (1). Then, escape through the broken window.

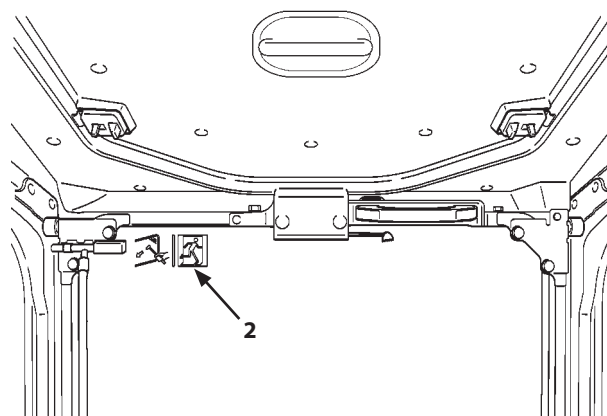
3. If the front window is not available for escaping, break the rear window glass using the emergency evacuation tool. Then, escape through the broken window.

 **NOTE:** Emergency exit decals (2) are affixed to the front and rear windows.

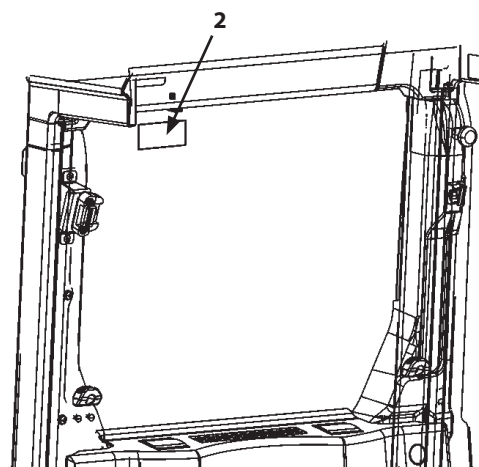
4. If neither of front and rear windows are available for emergency exit, open the overhead window to escape from the cab.



M1U1-01-022



M1U1-01-053



M1J1-01-023

## OPERATOR'S STATION

### ADJUSTING THE MECHANICAL SUSPENSION SEAT

(Std. Model)

#### Seat Height and Angle Adjustment

Seat height adjustment range is 60 mm (2.4 in) with steps every 15 mm (0.6 in) (5 positions in total). Moreover, the height of the front part and the rear part of the seat are adjusted independently, thus allowing the angle of the seat to be adjusted.

**CAUTION: Avoid possible injury while operating lever (1). When pushing down lever (1), do not grab it. Fingers may be pinched between lever (1) and the seat stand. Be sure to push on the upper face of lever (1).**

Use lever (1) to adjust the seat height and/or seat angle as follows:

- To adjust the front part of the seat:  
Push down lever (1) while sitting on the seat, and apply or remove body weight to obtain the desired height. When the desired height is obtained, release lever (1).
- To adjust the rear part of the seat:  
Pull up lever (1) while sitting on the seat, and apply or remove body weight to obtain the desired height. When the desired height is obtained, release lever (1).

#### Console and Seat Fore-aft Adjustment

Pull lever (2) to the right to adjust the seat and both right and left consoles to desired distance from the travel pedals and levers. Release lever to lock seat and consoles into position.

**NOTE:** Seat and console fore-aft adjustment range is 120 mm (4.7 in) with steps every 20 mm (0.8 in).

#### Seat Fore-Aft Adjustment

Pull lever (3) to unlock the seat from both consoles. With lever (3), slide the seat to the desired distance from pilot control levers. Release the lever.

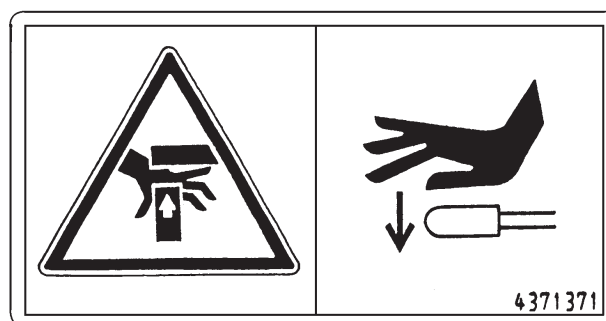
**NOTE:** Seat fore-aft adjustment range is 160 mm (6.3 in) with steps every 16 mm (0.8 in).

#### Suspension Adjustment

Turn knob (4) clockwise to increase suspension stiffness. Turn knob (4) counterclockwise to decrease suspension stiffness.

#### Backrest Adjustment

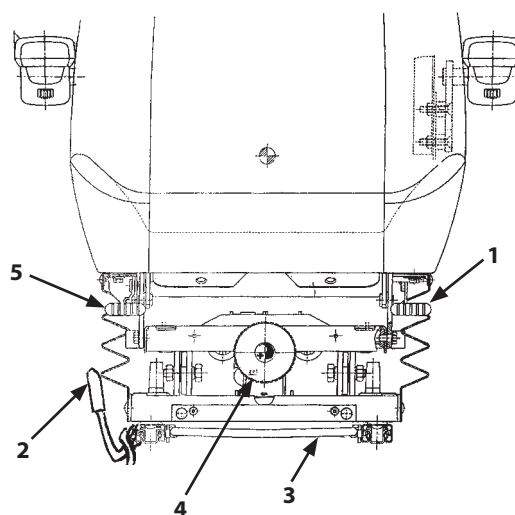
Pull up lever (5) to release backrest lock. Move backrest to the desired position and release the lever.



Caution: Possibility of pinched fingers

Push down with the palm.

SS-955



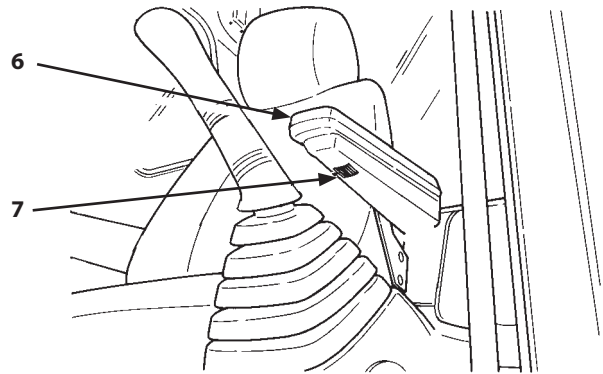
M178-01-065

## OPERATOR'S STATION

### Armrest Adjustment

Armrest (6) can be pulled upright by hand to get on and off the machine easily.


The angle of armrest (6) can be adjusted to the desired position by turning adjusting dial (7) located on the bottom of armrest (6).



M1G6-01-017

### SEAT WITH A BUILT-IN HEATER

The heater installed inside the seat activates by operating seat heater switch (8) on the optional equipment control switch panel.

 **NOTE:** Depending on what kinds of optional equipments are installed, the switch button function may differ. Use the switch only after confirming the kinds of the installed optional equipment.



M1U1-01-011

## OPERATOR'S STATION

### ADJUSTING THE AIR-SUSPENSION SEAT (Optional)

#### Seat Height and Angle Adjustment

Seat height adjustment range is 60 mm (2.4 in) with steps every 15 mm (0.6 in) (5 positions in total). Moreover, the height of the front part and the rear part of the seat are adjusted independently, thus allowing the angle of the seat to be adjusted.

**CAUTION: Avoid possible injury while operating lever (1). When pushing down lever (1), do not grab it. Fingers may be pinched between lever (1) and the seat stand. Be sure to push on the upper face of lever (1).**

Use lever (1) to adjust the seat height and/or seat angle as follows:

- To adjust the front part of the seat:  
Push down lever (1) while sitting on the seat, and apply or remove body weight to obtain the desired height. When the desired height is obtained, release lever (1).
- To adjust the rear part of the seat:  
Pull up lever (1) while sitting on the seat, and apply or remove body weight to obtain the desired height. When the desired height is obtained, release lever (1).

#### Console and Seat Fore-aft Adjustment

Pull lever (2) to the right to adjust the seat and both right and left consoles to desired distance from the travel pedals and levers. Release lever to lock seat and consoles into position.

**NOTE:** Seat and console fore-aft adjustment range is 120 mm (4.7 in) with steps every 20 mm (0.8 in).

#### Seat Fore-Aft Adjustment

Pull lever (3) to unlock the seat from both consoles. With lever (3), slide the seat to the desired distance from pilot control levers. Release the lever.

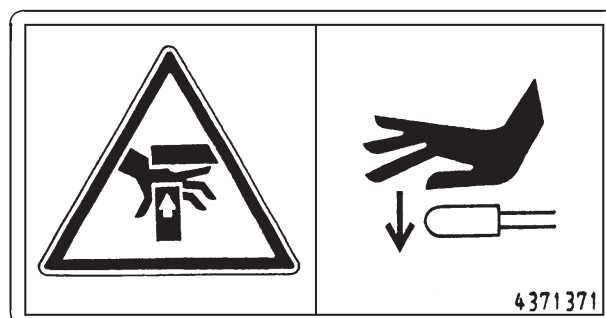
**NOTE:** Seat fore-aft adjustment range is 160 mm (6.3 in) with steps every 16 mm (0.8 in).

#### Suspension Adjustment

Push knob (4) to increase suspension stiffness.  
Pull knob (4) to decrease suspension stiffness.

#### Backrest Adjustment

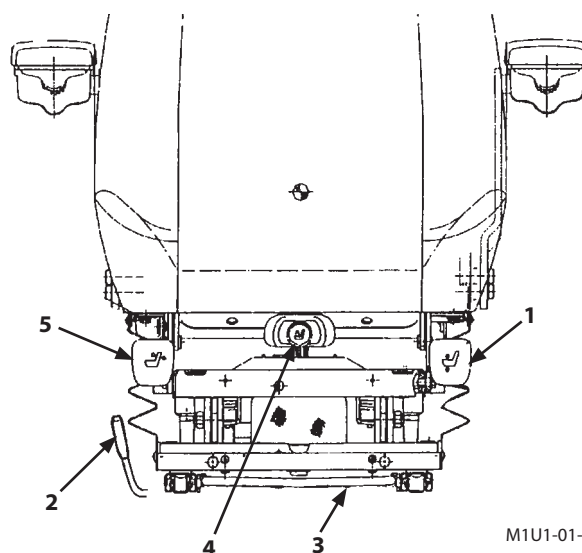
Pull up lever (5) to release backrest lock. Move backrest to the desired position and release the lever.



Caution: Possibility of pinched fingers

Push down with the palm.

SS-955



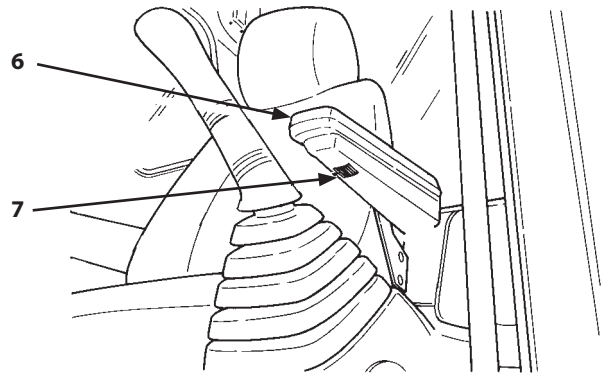
M1U1-01-014

## OPERATOR'S STATION

### Armrest Adjustment

Armrest (6) can be pulled upright by hand to get on and off the machine easily.


The angle of armrest (6) can be adjusted to the desired position by turning adjusting dial (7) located on the bottom of armrest (6).



M1G6-01-017

### SEAT WITH A BUILT-IN HEATER

The heater installed inside the seat activates by operating seat heater switch (8) on the optional equipment control switch panel.

 **NOTE:** Depending on what kinds of optional equipments are installed, the switch button function may differ. Use the switch only after confirming the kinds of the installed optional equipment.



M1U1-01-011

## OPERATOR'S STATION

### ADJUSTING THE FIXED SEAT (Optional)

#### Seat Height and Angle Adjustment

Seat height adjustment range is 60 mm (2.4 in) with steps every 15 mm (0.6 in) (5 positions in total). Moreover, the height of the front part and the rear part of the seat are adjusted independently, thus allowing the angle of the seat to be adjusted.

**CAUTION:** Avoid possible injury while operating lever (1). When pushing down lever (1), do not grab it. Fingers may be pinched between lever (1) and the seat stand. Be sure to push on the upper face of lever (1).

Use lever (1) to adjust the seat height and/or seat angle as follows:

- To adjust the front part of the seat:  
Push down lever (1) while sitting on the seat, and apply or remove body weight to obtain the desired height. When the desired height is obtained, release lever (1).
- To adjust the rear part of the seat:  
Pull up lever (1) while sitting on the seat, and apply or remove body weight to obtain the desired height. When the desired height is obtained, release lever (1).

#### Console and Seat Fore-aft Adjustment

Pull lever (2) to the right to adjust the seat and both right and left consoles to desired distance from the travel pedals and levers. Release lever to lock seat and consoles into position.

**NOTE:** Seat and console fore-aft adjustment range is 120 mm (4.7 in) with steps every 20 mm (0.8 in).

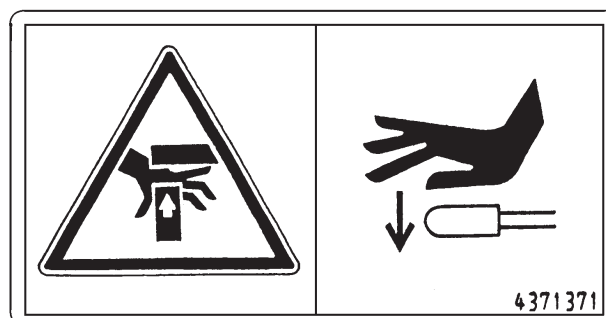
#### Seat Fore-Aft Adjustment

Pull lever (3) to unlock the seat from both consoles. With lever (3), slide the seat to the desired distance from pilot control levers. Release the lever.

**NOTE:** Seat fore-aft adjustment range is 160 mm (6.3 in) with steps every 16 mm (0.8 in).

#### Backrest Adjustment

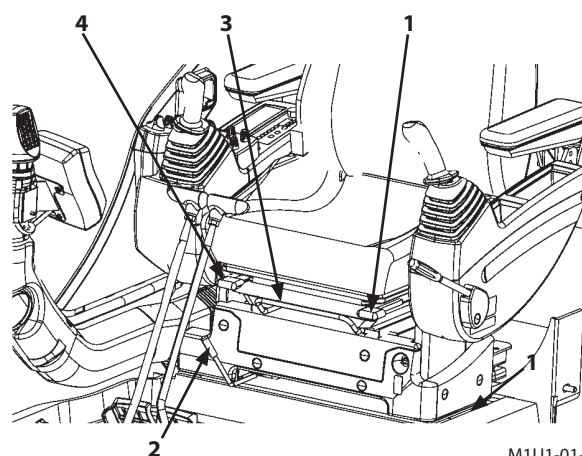
Pull up lever (4) to release backrest lock. Move backrest to the desired position and release the lever.



Caution: Possibility of pinched fingers

Push down with the palm.

SS-955



M1U1-01-029

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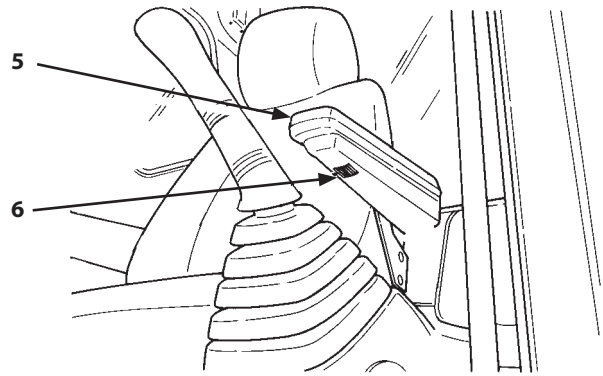
## OPERATOR'S STATION

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### Armrest Adjustment

Armrest (5) can be pulled upright by hand to get on and off the machine easily.

The angle of armrest (5) can be adjusted to the desired position by turning adjusting dial (6) located on the bottom of armrest (5).



M1G6-01-017



## OPERATOR'S STATION

### ADJUSTING CONSOLE HEIGHT

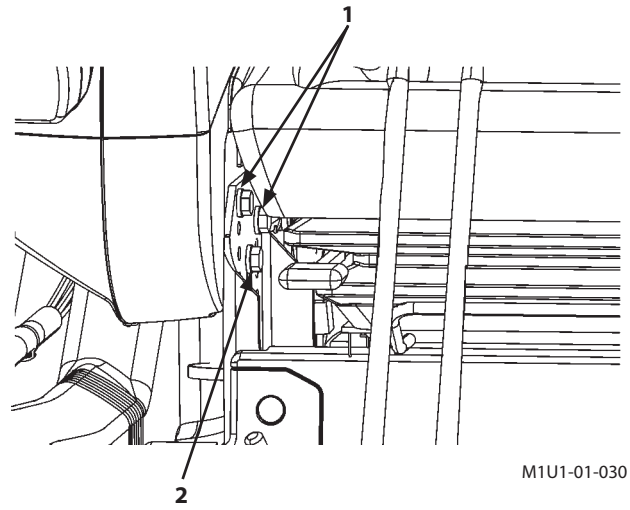
Adjust the console height to the operator's comfort and/or work conditions. Adjusting console height can be achieved using three positions provided vertically at 20 mm intervals.

**CAUTION:** Before loosening the console, support the console. Otherwise, the console may suddenly drop, possibly causing personal injury.

#### Adjusting Procedures

1. Lower the bucket to the ground. Stop the engine.
2. Move the pilot control shut-off lever to the LOCK position.
3. Remove left and right console holding bolts (1). Loosen bolts (2) to adjust the console height.
4. After adjusting, tighten bolts (1) and (2).

Tightening Torque: 49 N·m (5 kgf·m)



M1U1-01-030

## OPERATOR'S STATION

### SEAT BELT

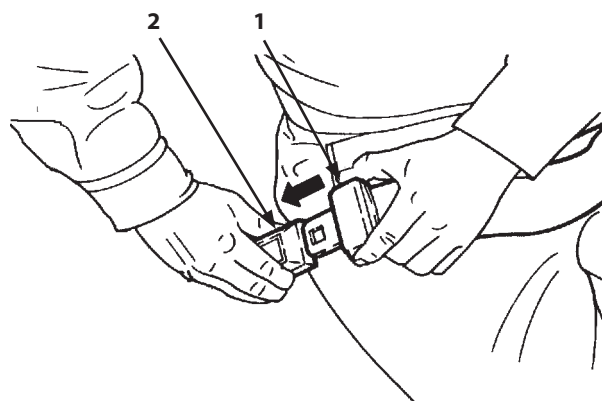
**CAUTION:** Be sure to use the seat belt when operating the machine.

Before operating the machine, be sure to examine seat belt (1), buckle (2), and attaching hardware. Replace seat belt (1), buckle (2), or attaching hardware if they are damaged, or worn.

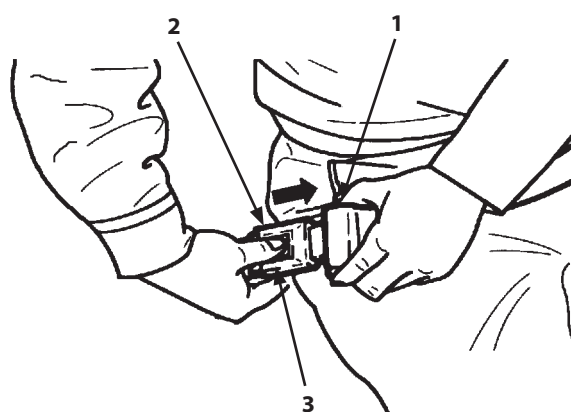
Replace seat belt (1) every three years, regardless of appearance.

#### Seat Belt

1. Confirm that seat belt (1) is not twisted. Securely insert the end of seat belt (1) into buckle (2). Lightly pull on the belt to confirm that the buckle latches securely.
2. Push button (3) on buckle (2) to unfasten seat belt (1).



M1U1-01-031



M1U1-01-032

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## BREAK-IN

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### OBSERVE ENGINE OPERATION CLOSELY

**IMPORTANT: Be extra cautious during the first 50 hours, until you become thoroughly familiar with the sound and feel of your new machine.**

1. Operate the machine only in economy (E) mode and limit the engine horsepower up to about 80 % of full load.
2. Avoid excess engine idling.
3. Check indicator lights and gauges frequently during operation.

### EVERY 8 HOURS OR DAILY

1. Perform 8-hour or daily service. (See Maintenance guide -- 8 hours.)
2. Watch for fluid leaks.
3. Lubricate working tool pivots every 8 hours for the first 50 hours, and every 8 hours when working in mud and water.

### AFTER THE FIRST 50 HOURS

1. Perform 50-hour service. (See Maintenance guide -- 50 hours.)
2. Check accessible hardware torque. (See Hardware Torque Specifications in Maintenance chapter.)

### AFTER THE FIRST 100 HOURS

Perform 50-hour and 100-hour service. (See Maintenance Guide -- 50 hours and 100 hours.)



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## OPERATING THE ENGINE

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### INSPECT MACHINE DAILY BEFORE STARTING

#### ELECTRICAL SYSTEM

Check for worn or frayed wires and loose connections.

#### BOOM, BUCKET, SHEET METAL, TRACKS

Check for bent, broken or missing parts.

#### HARDWARE

Check for loose or missing parts.

#### FUEL SYSTEM

Drain water and deposits from fuel tank.

#### HYDRAULIC SYSTEM

Check for leaks, kinked hoses, and lines or hoses that rub against each other or other parts.

#### LUBRICATION

Check lubrication points on the Periodic Service Chart.

#### PROTECTIVE DEVICES

Check guards, fenders.


#### SAFETY

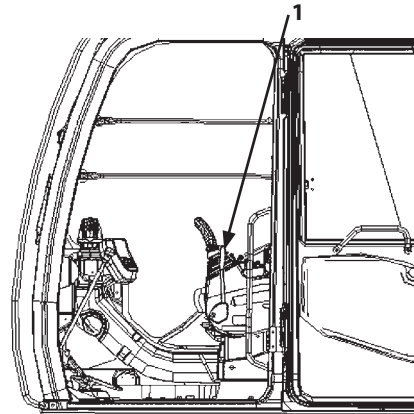
Walk around machine to clear all bystanders/obstacles from machine area.

## OPERATING THE ENGINE

### BEFORE STARTING ENGINE

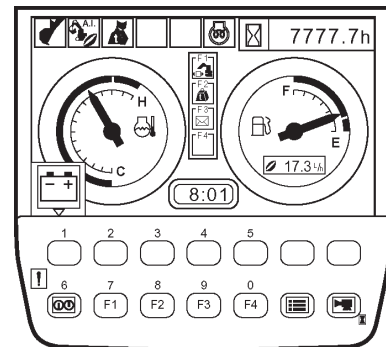
1. Confirm that pilot control shut-off lever (1) is in the LOCK position.
2. Confirm that all control levers are placed in neutral.
3. Adjust the seat to allow full pedal and control levers stroke with operator's back against the backrest. Fasten the seat belt.

 **NOTE:** Use a wet cloth when wiping dust off monitor or switch panels to prevent damaging the panel face. Rubber is used on the switch parts. Take care not to tear the rubber-made parts with sharp-edged tool, such as a screwdriver.




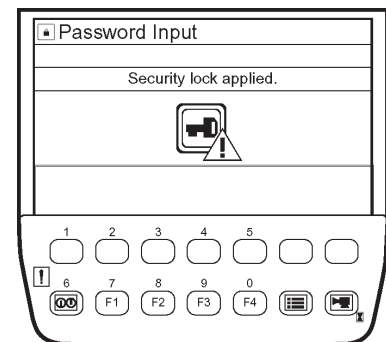
LOCK Position

M1U1-01-025



T1V1-05-01-117

 **CAUTION:** If the security lock screen is displayed when turn the key switch to ON position, return key switch to OFF. Wait for more than 30 seconds (the buzzer stopped), then try again. If the security lock screen is displayed again, contact your nearest HITACHI dealer.



Security Lock Screen

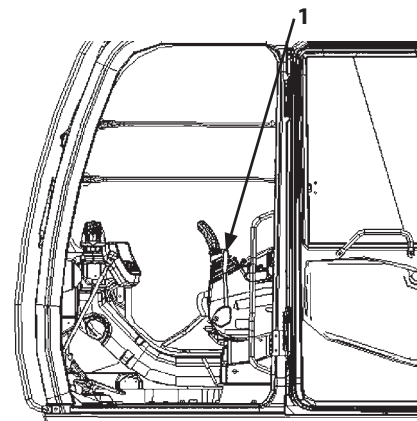
T1V5-05-01-005

## OPERATING THE ENGINE

### STARTING THE ENGINE IN ORDINARY TEMPERATURE

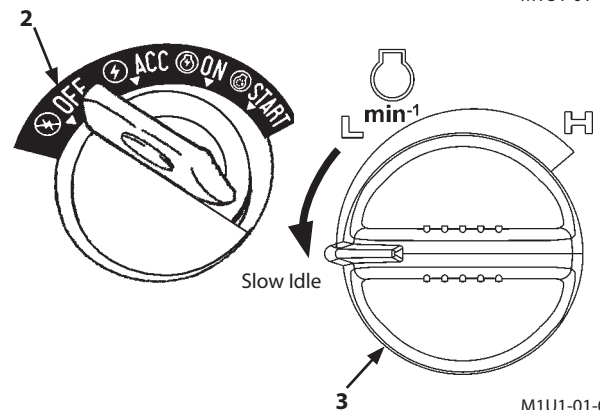
1. Pull the pilot control shut-off lever (1) up to the LOCK position.
2. Turn engine control dial (3) to the slow idle position.
3. Sound horn to alert bystanders.
4. Insert key switch (2). Turn it ON position.
5. "Wait-screen (nothing is displayed)" is displayed on the monitor for 2 seconds. Regardless of the pilot control shut-off lever position, the engine can not be cranked during this duration.
6. When the password input screen is displayed on the monitor, input the password. Unless the TEN-key function (ignition block system) is activated, this screen is not displayed.

**IMPORTANT:** When required to activate the TEN-key function (ignition block system), consult your nearest Hitachi dealer.



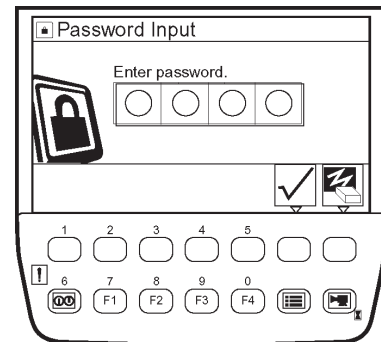
LOCK Position

M1U1-01-025



M178-01-049


M1U1-01-033



Password Input Screen

T1V5-05-01-002

## OPERATING THE ENGINE

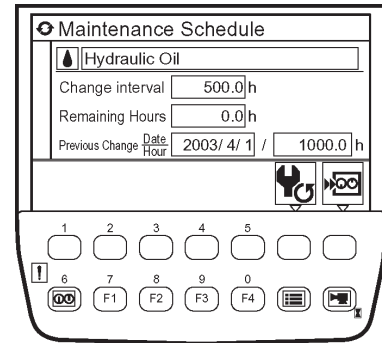
 **NOTE:** When maintenance information display is ON with maintenance setting, the scheduled maintenance screen for the item whose change interval has expired displays for three to ten seconds. Then, the basic screen displays.

7. The basic screen will be displayed on the monitor. Check that the preheat indicator (4) is OFF at this time.
8. Turn key switch (2) to start engine.

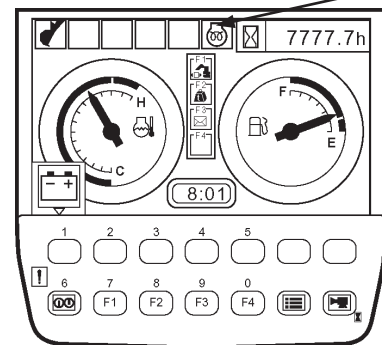
**IMPORTANT: Prevent starter damage.**

**Never operate starter motor for more than 10 seconds at a time. If engine fails to start, return key switch to OFF. Wait for more than 30 seconds, then try again. After a false start, do not turn key switch until engine stops or starter may be damaged.**

9. Release key switch (2) immediately after the engine has started. It will return to ON position.



T1V5-05-01-170



Basic Screen

M1U1-03-001



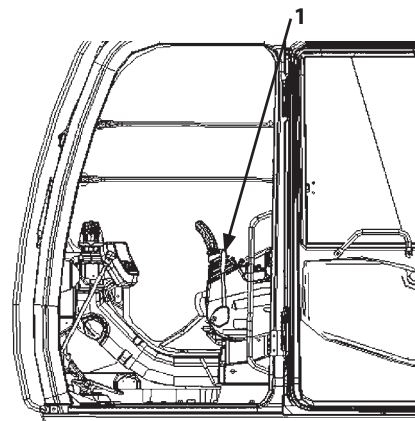
# OPERATING THE ENGINE

## STARTING IN COLD WEATHER

### Preheating

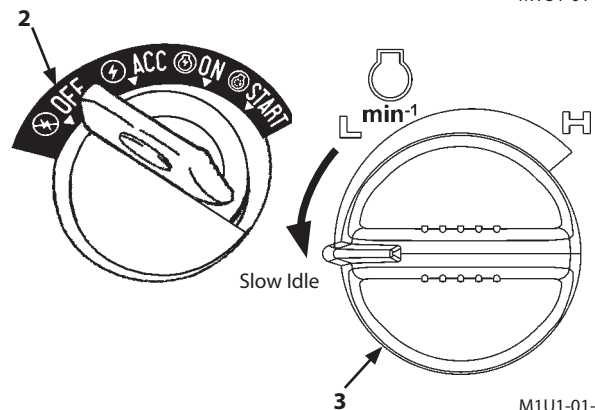
1. Pull the pilot control shut-off lever (1) up to the LOCK position.
2. Turn engine control dial (3) to around the middle between the L and H positions.
3. Sound horn to alert bystanders.
4. Insert key switch (2). Turn it ON position.
5. "Wait-screen (nothing is displayed)" is displayed on the monitor for 2 seconds. Regardless of the pilot control shut-off lever position, the engine can not be cranked during this duration.
6. When the password input screen is displayed on the monitor, input the password. Unless the TEN-key function (ignition block system) is activated, this screen is not displayed.

**IMPORTANT: When required to activate the TEN-key function (ignition block system), consult your nearest Hitachi dealer.**



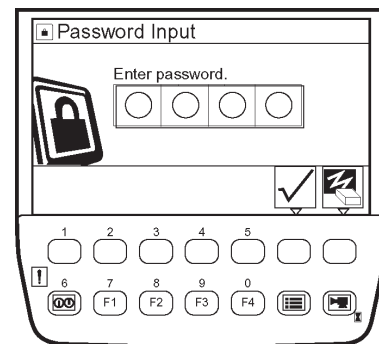
LOCK Position

M1U1-01-025



M178-01-049


M1U1-01-033




Password Input Screen

T1V5-05-01-002

## OPERATING THE ENGINE

 **NOTE:** When maintenance information display is ON with maintenance setting, the scheduled maintenance screen for the item whose change interval has expired displays for three to ten seconds. Then, the basic screen displays.

- The basic screen will be displayed on the monitor. The machine will automatically check if preheating is required or not. When preheating is required, preheat indicator (4) is lit for automatically.

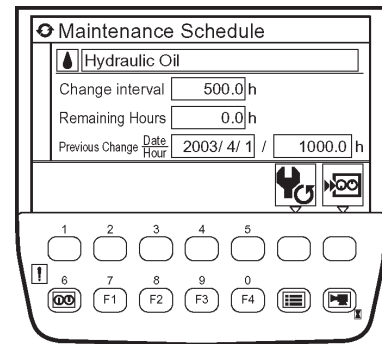
 **NOTE:** In case, preheat indicator (4) does not come ON, preheating is not required.

- As soon as preheat indicator (4) goes OFF, turn the key switch (2) to the START position to rotate the starter.

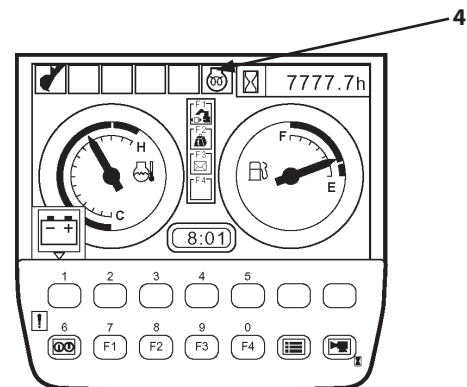
**IMPORTANT: Prevent starter damage.**

**Never operate starter motor for more than 10 seconds at a time. If engine fails to start, return key switch to OFF. Wait for more than 30 seconds, then try again. After a false start, do not turn key switch until engine stops or starter may be damaged.**

- Release the key switch (2) immediately after the engine has started. It will return to ON position.



T1V5-05-01-170



Basic Screen

M1U1-03-001

## OPERATING THE ENGINE

### CHECK INSTRUMENTS AFTER STARTING

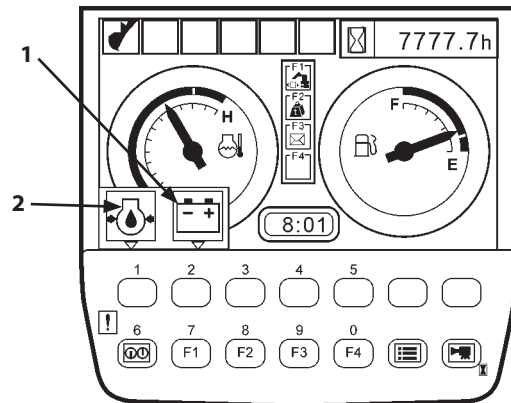
Checking Instruments through Monitor Functions.  
After starting the engine, check the following points through the monitor functions.

#### Check that

1. Alternator indicator (1) is off.
2. Engine oil pressure indicator (2) is off.
3. Engine noise and exhaust gas are normal.

**IMPORTANT: Prevent possible damage to engine. If indicator lights do not go out after starting engine, IMMEDIATELY STOP THE ENGINE and correct the cause.**

**Operate machine at less-than-normal loads and speeds until engine is at normal operating temperature.**



M1U1-03-002

## OPERATING THE ENGINE

### USING BOOSTER BATTERIES

#### WARNING:

- An explosive gas is produced while batteries are in use or being charged. Keep flames or sparks away from the battery area. Charge the batteries in a well ventilated area.  
Do not continue to use or charge the battery when electrolyte level is lower than specified. Explosion of the battery may result.  
Park the machine on a dry, firm or concrete surface, not on steel plates, if the machine is parked on steel plates, dangerous sparks may be unexpectedly created on the machine.  
Never connect a positive terminal to a negative terminal, as a dangerous short circuit will occur.
- 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.



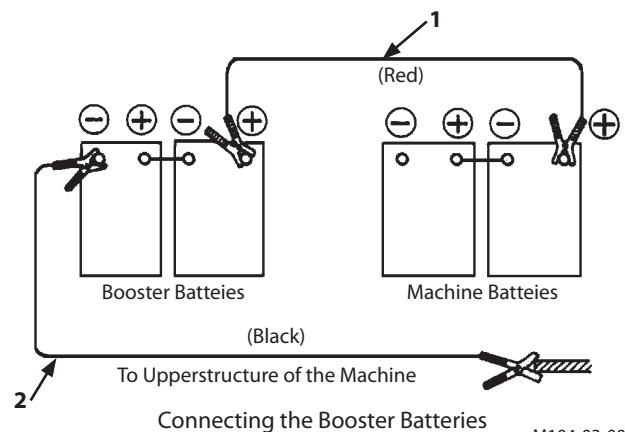
SA-032

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

When the machine batteries are exhausted, start the engine using booster batteries as shown below.

#### Connecting the booster batteries

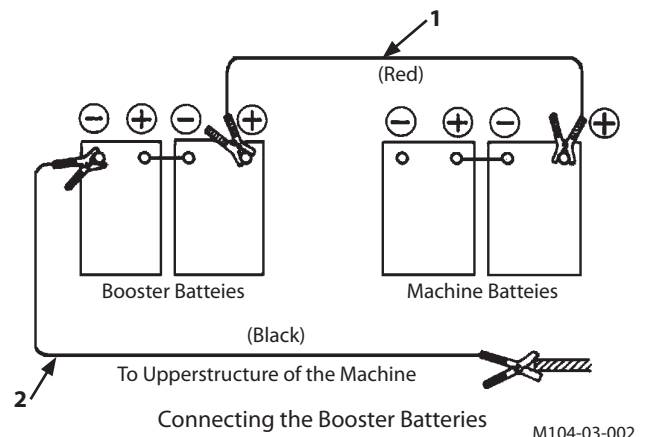
1. Stop the engine of the machine on which booster batteries are mounted.
2. Connect one end of red cable (1) to the positive (+) terminal of the machine batteries, and the other end to the positive (+) terminal of the booster batteries.
3. Connect one end of black cable (2) to the negative (-) terminal of the booster batteries, and then make ground connection to the frame of the machine to be started with the other end of black (-) cable (2). In the last connection to frame, be sure to connect the cable end as far away from the machine batteries as possible.
4. Start the engine of the machine on which booster batteries are mounted.
5. Start the engine of the troubling machine.
6. After the engine starts, disconnect cables (2) and (1), following the procedure below.



## OPERATING THE ENGINE

### Disconnecting the booster batteries

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



# OPERATING THE ENGINE

## STOPPING THE ENGINE

### Engine stop procedure

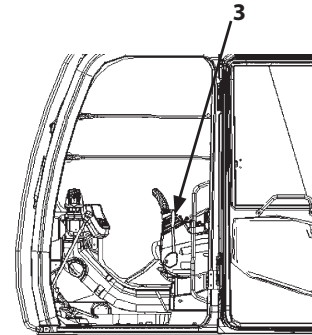
1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn engine control dial (1) to the slow idle position and run the engine for 5 minutes to cool the engine.



SA-390

**IMPORTANT: Turbocharger may be damaged if the engine is not properly shut down.**

4. Turn key switch (2) OFF. Remove the key from the key switch.
5. Pull pilot control shut-off lever (3) to the LOCK position.

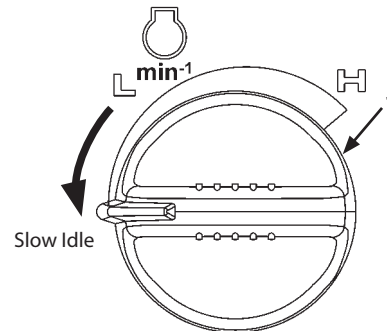


M1U1-01-025

**If the engine does not stop with the key switch turned in the OFF position**

In case the engine does not stop even if the key switch is turned OFF due to failure of the machine, move engine stop switch (4) downward to stop the engine.

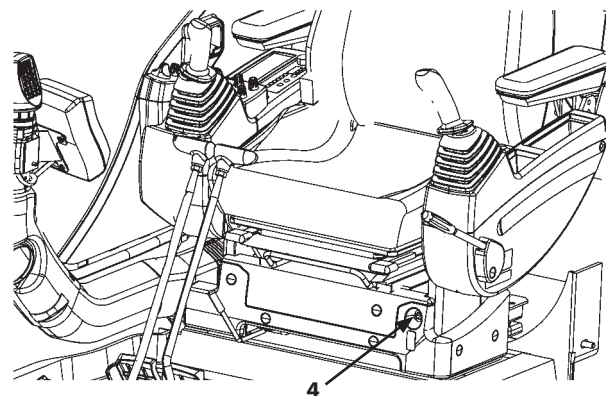
**CAUTION: Do not use the emergency stop switch, except when unavoidable. Moreover, Do not operate the machine until repair is completed when stopping the engine with the failure of the machine.**



M1U1-01-033



M178-01-049



M1U1-01-029

## DRIVING THE MACHINE

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### DRIVE THE MACHINE CAREFULLY

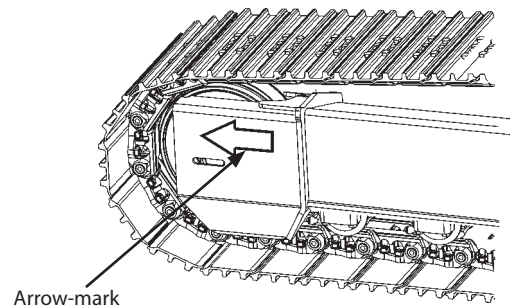
**IMPORTANT:** During freezing weather, park machine on a hard surface to prevent tracks from freezing to the ground. Clean debris from tracks and track frame.

**If tracks are frozen to the ground, raise tracks using boom, move machine carefully to prevent damage to drive train and tracks.**

Select a route that is as flat as possible. Steer machine as straight as possible making small, gradual changes in direction.

When driving over rough terrain, reduce engine speed to lessen possibility of undercarriage damage.

 **NOTE:** An arrow-mark seal is stuck on the inside surface of the side frame to indicate the machine front direction.



M178-03-001

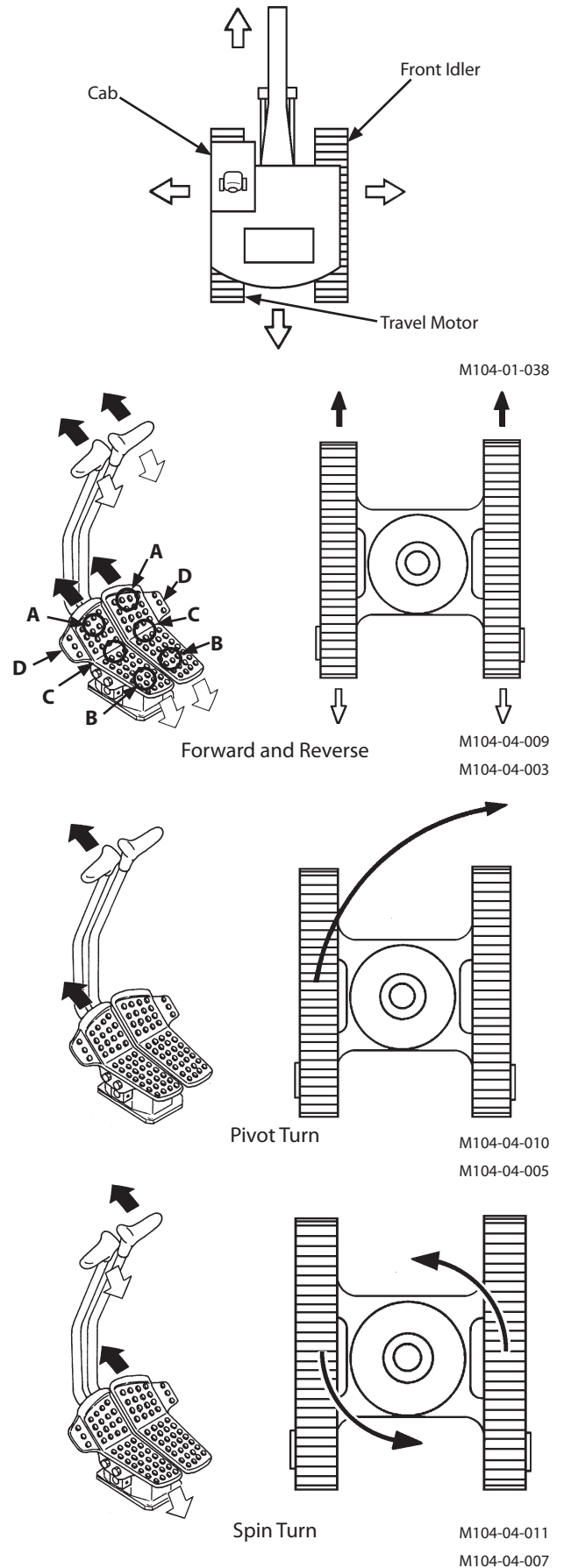
# DRIVING THE MACHINE

## STEERING THE MACHINE USING PEDALS

**WARNING:** In the standard travel position, the front idlers are positioned at the front of the machine and the travel motors at the rear. If the travel motors are positioned at the front of the machine, the control actions of the travel pedals will be reversed. Be sure to confirm the position of the travel motors before traveling.

- FORWARD TRAVEL  
Push down on front (A) of both pedals.
- REVERSE TRAVEL  
Push down on rear (B) of both pedals.
- NEUTRAL POSITION (C)  
When the travel pedals are placed in neutral, travel brakes automatically will stop and/or hold the machine.
- RIGHT TURN  
Push down on front of left pedal.
- LEFT TURN  
Push down on front of right pedal.
- SHORT TURN (Spin turn)  
Push down the front of one pedal and the rear of the other.

**NOTE:** For long-term traveling, push down on pedal tabs (D) and rest feet on footrests.





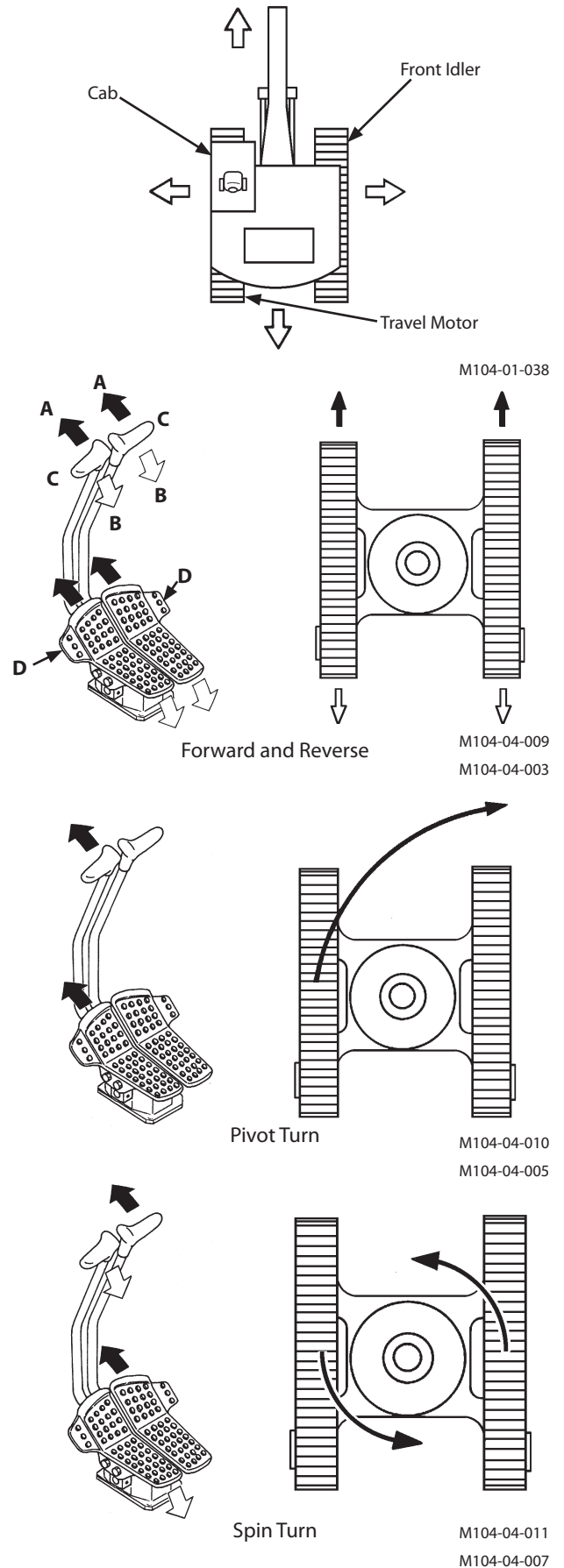
# DRIVING THE MACHINE

## STEERING THE MACHINE USING LEVERS

**WARNING:** In the standard travel position, the front idlers are positioned at the front of the machine and the travel motors at the rear. If the travel motors are positioned at the front of the machine, the control actions of the travel levers will be reversed. Be sure to confirm the position of the travel motors before traveling.

- FORWARD TRAVEL  
Push both levers forward (A).
- REVERSE TRAVEL  
Pull both levers rearward (B).
- NEUTRAL POSITION (C)  
When the travel levers are placed in neutral, travel brakes automatically will stop and/or hold the machine.
- RIGHT TURN  
Push left lever forward.
- LEFT TURN  
Push right lever forward.
- SHORT TURN (Spin turn)  
Push one lever forward and pull the other rearward.

**NOTE:** For long-term traveling, push down on pedal tabs (D) and rest feet on footrests.





## DRIVING THE MACHINE

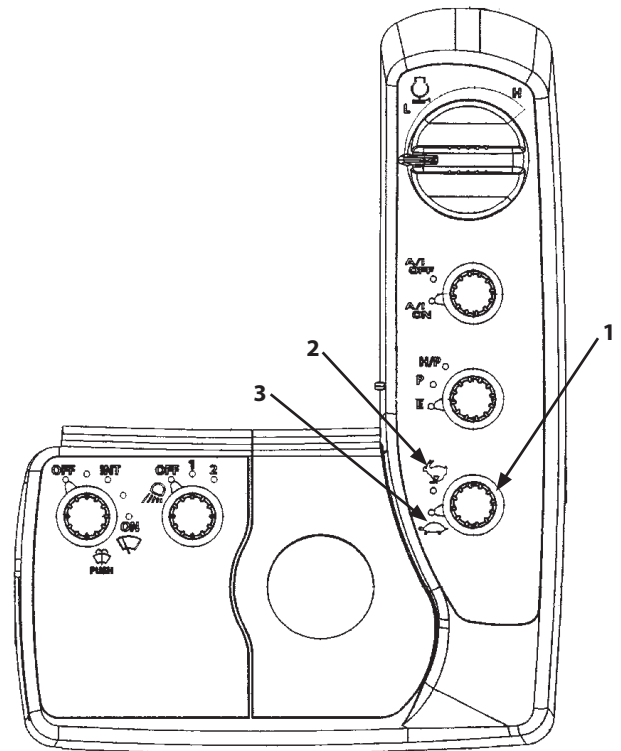
### TRAVEL MODE SWITCH

**⚠ WARNING:** Tipping-over accidents can cause serious personal injury. Do not change travel mode while traveling; especially, changing to the fast mode when descending slopes will create a very dangerous situation. Always stop the machine before changing the travel speed mode.

Turn travel mode switch (1) on the switch panel to the specified position to select the travel mode (Fast/Slow).

- Fast Mode: Turn travel mode switch (1) to  mark (2) position.
- Slow Mode: Turn travel mode switch (1) to  mark (3) position.

-  Mark (Fast Speed Mode)
-  Mark (Slow Speed Mode)



M1U1-01-015

### TRAVEL ALARM (Optional)

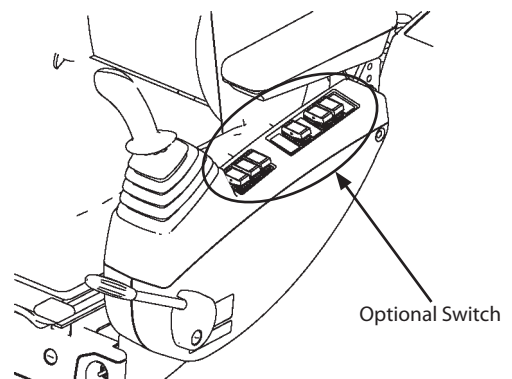
During travel operation, the travel alarm sounds the buzzer to warn the people near the machine that the machine is traveling.

#### Deactivating Travel Alarm

More than 12 seconds after starting to travel the machine, raise the armrest and push the travel alarm deactivation switch to stop the travel alarm. (Within 12 seconds, the travel alarm deactivation switch is inoperable.)

Once the machine stops traveling and when restarting to travel, the travel alarm will sound again. If desired to stop the alarm, operate the deactivation switch once more.

**📎 NOTE:** The optional switch locations differ depending on what kinds of optional devices are equipped. Before using the switches, make sure what kinds of optional devices are equipped.

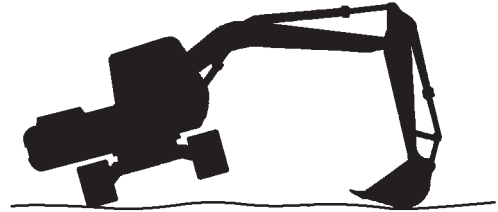


T1V1-05-02-004

## DRIVING THE MACHINE

### OPERATING ON SOFT GROUND

- Avoid traveling on very soft ground that does not have sufficient strength to firmly support the machine.
- If the machine is operated on very soft ground or becomes stuck, it may be necessary to clean the track frame area.
- Swing the upperstructure 90° and lower the bucket to raise one track off the ground. Make sure to keep the angle between the boom and arm 90 to 110° and position the bucket's round side on the ground.
- Rotate the raised track back and forth to remove mud and dirt.
- After lowering the track to the ground, select slow travel speed. Carefully move the machine to firm ground.
- Utilize the boom and arm functions to pull the machine toward firm ground.
- Tow the machine if the machine becomes stuck but only if the engine is still operating. Be sure to attach a tow line correctly. (Refer to the "TOWING MACHINE A SHORT DISTANCE" section on the next page.)



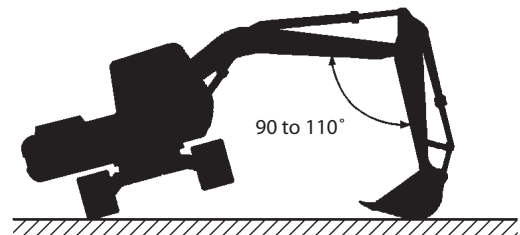
M104-05-012

### RAISE ONE TRACK USING BOOM AND ARM

**⚠ WARNING: Keep the angle between boom and arm 90 to 110° and position the bucket's round side on the ground.**

Swing the upperstructure 90° and lower the bucket to raise track off ground. Do not dig bucket teeth into the ground when using the hoe bucket reversed.

Place blocks under machine frame to support the machine.



M104-12-007

## DRIVING THE MACHINE

### TOWING MACHINE A SHORT DISTANCE

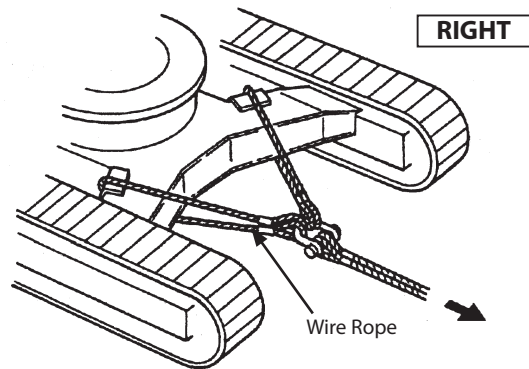
**CAUTION:** Cables, straps, or ropes can break causing serious injury. Do not tow machine with damaged chains, frayed cables, slings, straps, or wire ropes. Always wear gloves when handling cable, straps or wire ropes.

When your machine becomes stuck but the engine is still operational, attach wire ropes to the machine as illustrated at right, and slowly tow your machine to firm ground using another machine.

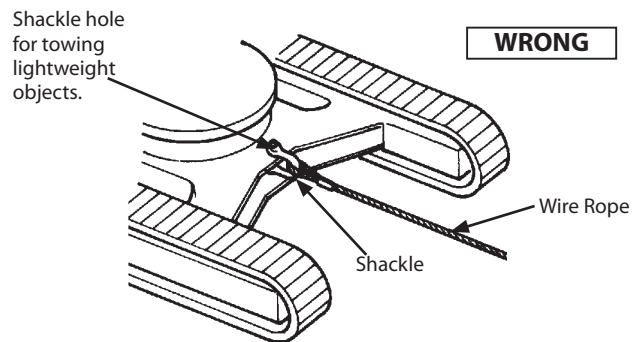
Be sure to attach the wire ropes around the track frames of both machines as illustrated.

To prevent the wire ropes from being damaged, place some protective material between the track frame and the wire ropes.

**IMPORTANT:** Do not use the shackle holes on the track frame for towing the machine. A center shackle hole on the track frame is provided to pull only lightweight objects. Refer to the instructions on page 5-33 for using the center shackle hole appropriately.



M104-05-010



M104-05-011

## DRIVING THE MACHINE

### OPERATING IN WATER OR MUD

The machine can be operated in water up to the upper edge of the upper rollers only if worksite footing has sufficient strength to prevent the machine from sinking past the upper edge of the upper roller, and only if the water is flowing slowly.

When operating in such conditions, check the machine's position often. Reposition the machine if necessary.

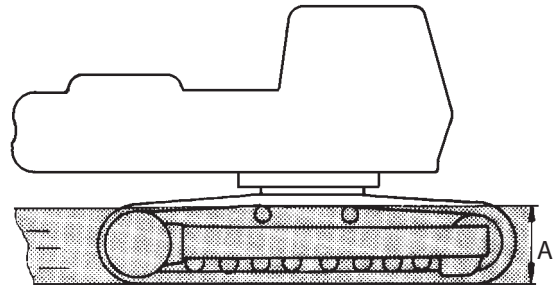
Avoid submerging the swing bearing, swing gears and center joint.

If the swing bearing, swing gears and center joint are submerged, remove the drain plug to drain mud and water. Clean swing area. Install plug. Lubricate swing internal gear and swing bearing.

Swing Internal Gear Capacity

ZAXIS400R-3, 400LCH-3: 19 L (5.0 US gal)

Lubricate swing bearing. (See Maintenance Guide, 500 hours)



M104-05-009

Model	A mm (in)
ZAXIS400R-3, 400LCH-3	930 mm (36.6 in)

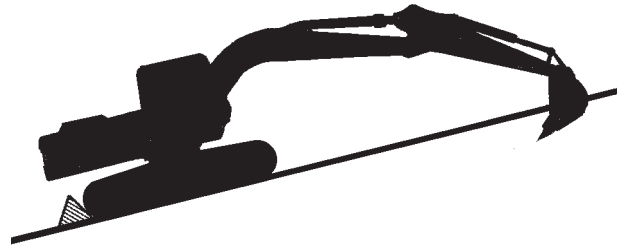
## DRIVING THE MACHINE

### PARKING THE MACHINE ON SLOPES

**⚠ WARNING: Avoid parking machine on slopes. The machine may tip over, possibly resulting in personal injury.**

If parking the machine on a slope is unavoidable:

- Thrust the bucket teeth into the ground.
- Return the control levers to neutral and pull the pilot control shut-off lever to the LOCK position.
- Block both tracks.



M104-05-014

### PARKING THE MACHINE

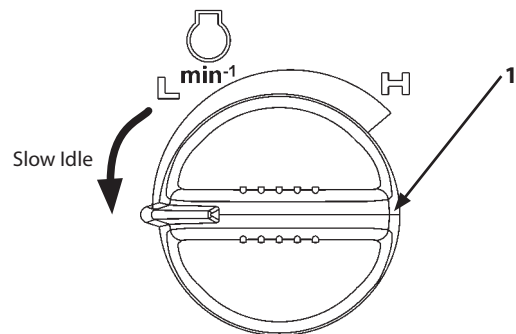
1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

**IMPORTANT: Turbocharger may be damaged if the engine is not properly shut down.**

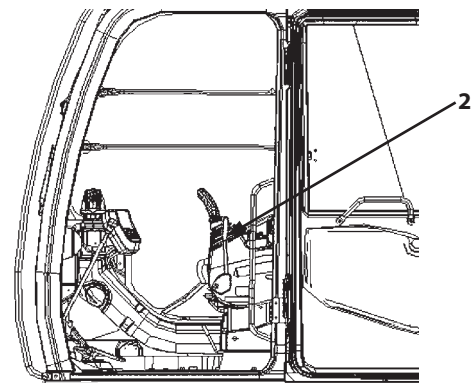
4. Turn engine control dial (1) counterclockwise to the stop (the slow idle position). Run the engine approximately 5 minutes to cool the engine.
5. Turn the key switch to OFF. Remove the key from the key switch.
6. Pull pilot control shut-off lever (2) to the LOCK position.

**IMPORTANT: Protect cab electrical components from bad weather. Always close windows, roof vent and cab door when parking the machine.**

7. Close windows, roof vent, and cab door.
8. Lock all access doors and compartments.



M1U1-01-033



Lock Position

M1U1-01-025

## OPERATING THE MACHINE

### CONTROL LEVER (ISO PATTERN)

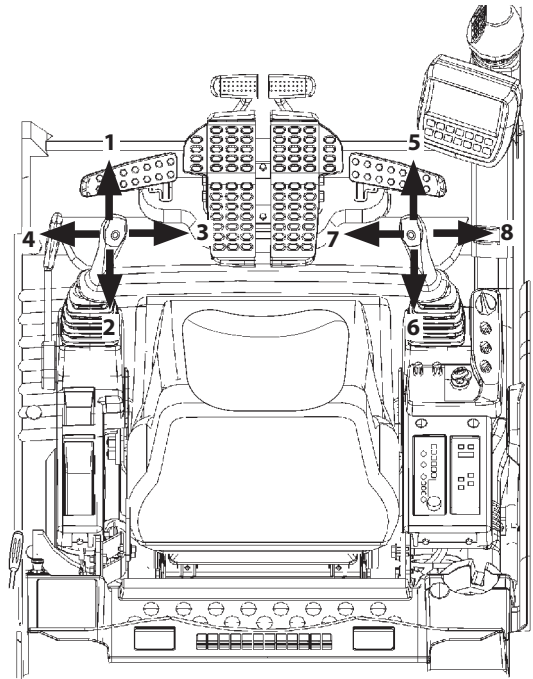
- ⚠ WARNING:** Never place any part of body beyond window frame. It could be crushed by the boom if boom control lever is accidentally bumped or otherwise engaged. If window is missing or broken, replace immediately.
- Prevent possible injury from unexpected machine movement.
- Make sure you know the location and function of each control before operating.

The machine is equipped with a label showing the control patterns of the levers and pedals.

- IMPORTANT:** When digging, avoid hitting tracks with boom cylinders.
- When digging over the end of the tracks, travel motors should be at the rear to maximize machine stability and lift capacity.

When a lever is released, it will automatically return to neutral, and that machine function will stop.

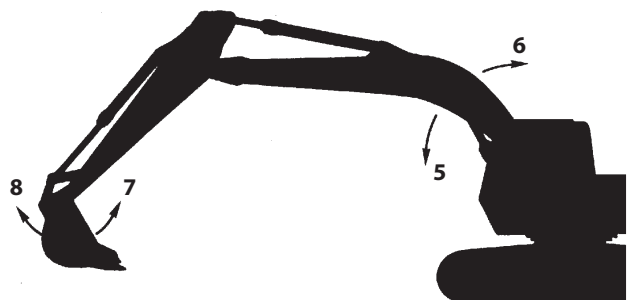
- 1- Arm Roll-Out
- 2- Arm Roll-In
- 3- Swing Right
- 4- Swing Left
- 5- Boom Lower
- 6- Boom Raise
- 7- Bucket Roll-In.
- 8- Bucket Roll-Out.



M1J1-01-022



M104-05-001



M104-05-002

## OPERATING THE MACHINE

### CONTROL LEVER (HITACHI PATTERN) (OPTIONAL)

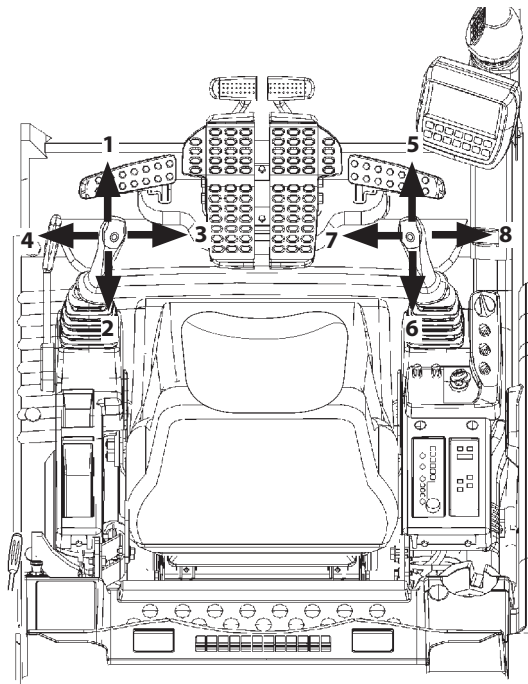
- ⚠ WARNING:** Never place any part of body beyond window frame. It could be crushed by the boom if boom control lever is accidentally bumped or otherwise engaged. If window is missing or broken, replace immediately.
- Prevent possible injury from unexpected machine movement.
- Make sure you know the location and function of each control before operating.

The machine is equipped with a label showing the control patterns of the levers and pedals.

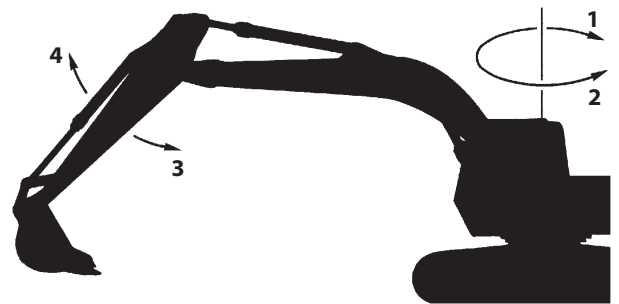
- IMPORTANT:** When digging, avoid hitting tracks with boom cylinders.
- When digging over the end of the tracks, travel motors should be at the rear to maximize machine stability and lift capacity.

When a lever is released, it will automatically return to neutral, and that machine function will stop.

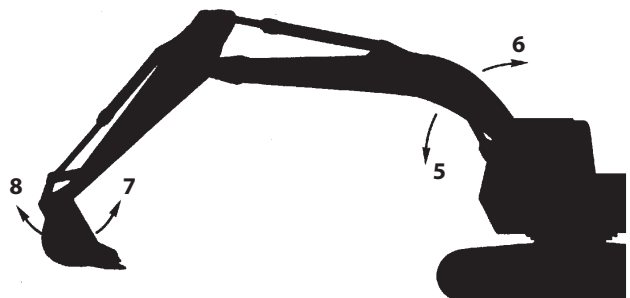
- 1- Swing Right
- 2- Swing Left
- 3- Arm Roll-In
- 4- Arm Roll-Out
- 5- Boom Lower
- 6- Boom Raise
- 7- Bucket Roll-In.
- 8- Bucket Roll-Out.



M1J1-01-022



M104-05-001



M104-05-002



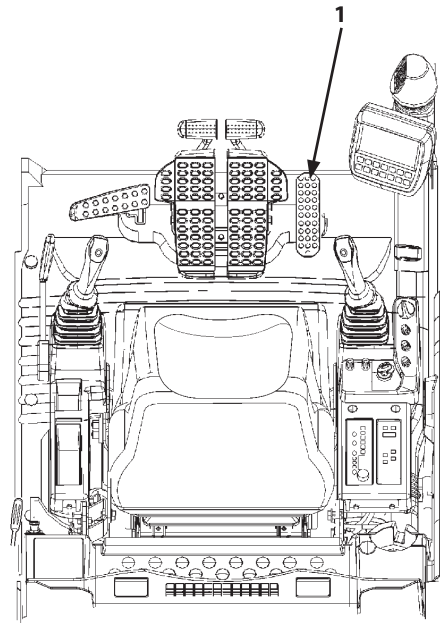
## OPERATING THE MACHINE

### ATTACHMENT PEDAL (HYDRAULIC BREAKER) (OPTIONAL)

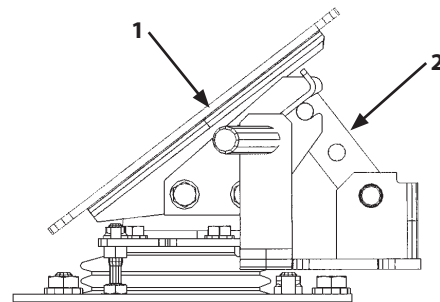
When operating a hydraulic breaker, use attachment pedal (1) located at the right-front position of the operator's seat as illustrated to the right. Two types of attachment pedals are available, "Accelerator type" and "Common use type".

**⚠ WARNING: When not required to operate the attachment pedal (accelerator type or common use type), place pedal lock (2) in the LOCK position. Do not place your foot on the pedal except when operating the attachment pedal (accelerator type or common use type). When operating a breaker, be sure to select the breaker mode in the work mode menu. Failure to do so may allow the hydraulic pump to supply excess oil flow, possibly resulting in failure of the hydraulic components and/or hydraulic breaker. (Refer to the description of "Work mode" for more detailed information.)**

According to the type of breaker to be operated, the different breaker mode must be selected. Select the most appropriate operation mode while referring to the description of "Work mode".

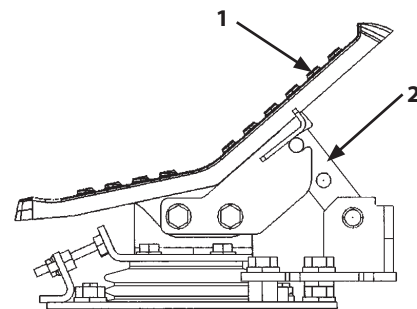


M1J1-01-026



Attachment pedal (accelerator type) in the LOCK position

M1J1-13-005



Attachment pedal (common use type) in the LOCK position

M1J1-13-002

## OPERATING THE MACHINE

### ATTACHMENT PEDAL (ACCELERATOR TYPE)

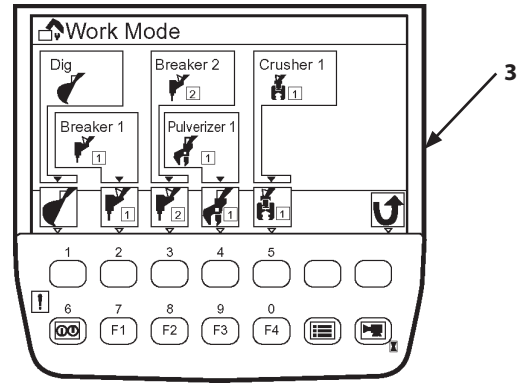
This pedal has been exclusively designed to operate a breaker so that the pedal can be tilted forward only.

1. Select "BREAKER" on monitor work mode screen (3). Refer to "Work mode" on page 5-11 for work mode-set operation.
2. Check that bolt (4) is contact with cover (5) when attachment pedal (accelerator type) (1) is locked.

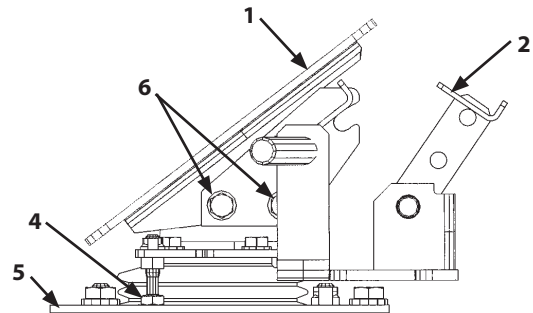
**WARNING:** Unless bolt (4) is not in contact with cover (5), attachment pedal (accelerator type) (1) may fall back, causing hydraulic oil to flow in reverse. Failure of the breaker may result.

3. Tilt pedal lock (2) forward to unlock the pedal.
4. Press attachment pedal (accelerator type) (1) forward to operate the breaker.
5. When attachment pedal (accelerator type) (1) is released, the breaker stops operation.
6. When not required to operate attachment pedal (accelerator type) (1), place pedal lock (2) in the LOCK position.

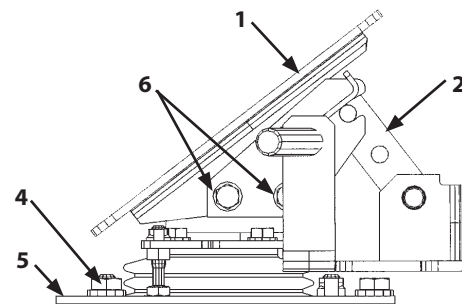
**NOTE:** The positioning angle of attachment pedal (accelerator type) (1) is possible to adjust as needed by loosening bolts (6) (3 used). After adjustment is complete, tighten bolts (6) (3 used).



T1V5-05-01-109



Attachment pedal (accelerator type) in the UNLOCK position  
M1J1-13-004



Attachment pedal (accelerator type) in the LOCK position  
M1J1-13-005

## OPERATING THE MACHINE

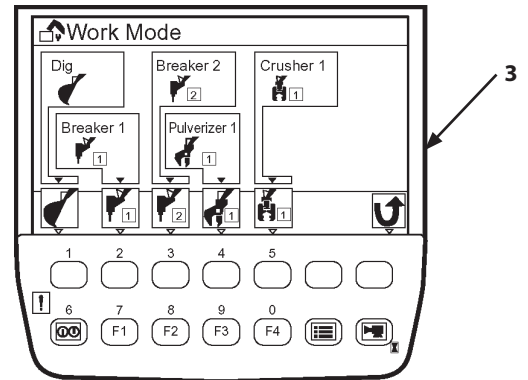
### ATTACHMENT PEDAL (COMMON USE TYPE) IN THE UNLOCK POSITION

This pedal is a seesaw type and commonly used to operate a breaker and a crusher.

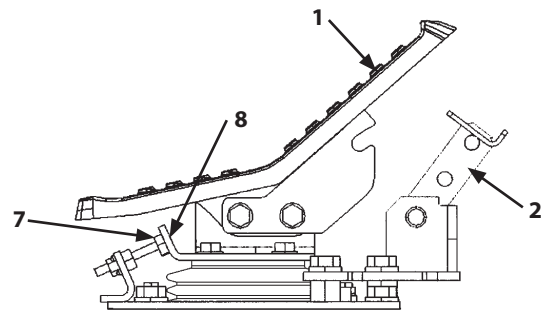
1. Select "BREAKER" on monitor work mode screen (3). Refer to "Work mode" on page 5-11 for work mode-set operation.
2. Tilt pedal lock (2) forward to unlock the pedal.
3. Press attachment pedal (common use type) (1) forward to operate the breaker.

**WARNING:** Unless stopper bolt (7) is not in contact with bracket (8), attachment pedal (common use type) (1) may fall back, causing hydraulic oil to flow in reverse. Failure of the breaker may result.

4. When attachment pedal (common use type) (1) is released, the breaker stops operation.
5. When not required to operate attachment pedal (common use type) (1), place pedal lock (2) in the LOCK position.

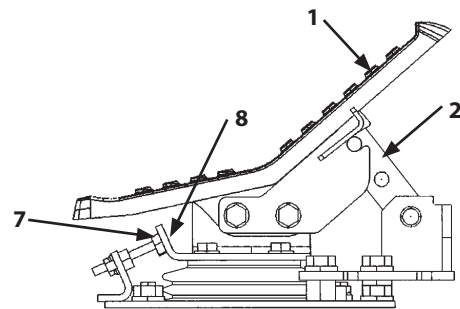


T1V5-05-01-109



Attachment pedal (common use type) in the UNLOCK position

M1J1-13-003



Attachment pedal (common use type) in the LOCK position

M1J1-13-002

## OPERATING THE MACHINE

### ATTACHMENT PEDAL (HYDRAULIC CRUSHER)

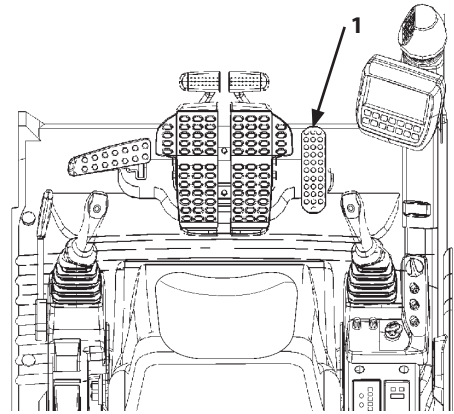
**(Optional)**

Machine stability, applicable hydraulic oil pressure and oil quantity for crusher, etc. must be examined when selecting a crusher. Be sure to consult your authorized dealer when selecting a crusher.

For operational instructions, refer to the crusher instruction manual.

**Operation**

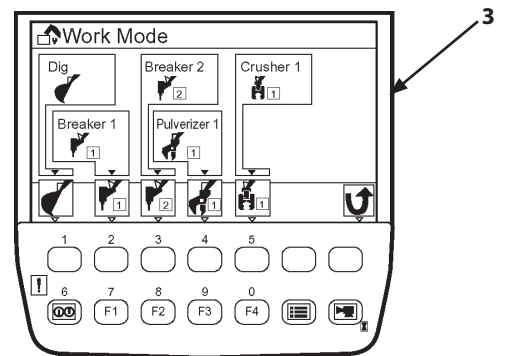
The crusher can be operated using attachment pedal (1) located on the right front of the seat, as illustrated.



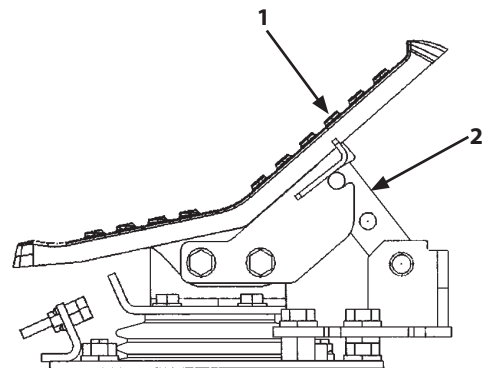
M1U1-05-008

**CAUTION:** Be sure to lock attachment pedal (1) with pedal lock (2) when the attachment pedal is not in use.

1. Select the hydraulic crusher icon on monitor work mode selection screen (3). Refer to the descriptions about the work mode on page 5-11 for work mode setting procedures.
2. Move pedal lock (2) forward to unlock attachment pedal (1).
3. Push down on attachment pedal (1) either forward or backward to open or close the crusher.
4. Remove foot from attachment pedal (1) to stop the crusher.
5. Always keep attachment pedal (1) locked with pedal lock (2) when attachment pedal (1) is not in use.

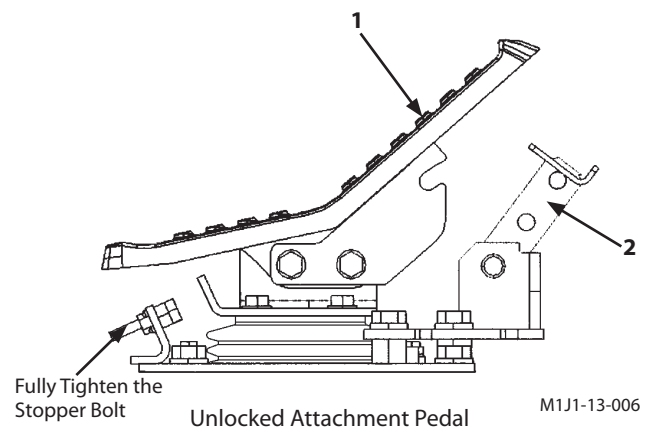


T1V5-05-01-109



Locked Attachment Pedal

M1J1-13-009



Fully Tighten the Stopper Bolt

Unlocked Attachment Pedal

M1J1-13-006

## OPERATING THE MACHINE

### PILOT CONTROL SHUT-OFF LEVER

Pilot control shut-off lever (1) functions to prevent misoperation of the machine from occurring if the control levers are accidentally moved when leaving the operator's seat or when entering the cab.

#### **⚠ WARNING:**

- **Always pull pilot control shut-off lever (1) into the full LOCK position. The pilot control shut-off function will not be activated otherwise.**
- **When leaving the machine:**
  - **Stop the engine.**
  - **Then, pull the pilot control shut-off lever up to the LOCK position.**
- **Always check to be sure that the pilot control lever is pulled up to the LOCK position before:**
  - **Transporting the machine.**
  - **Leaving the machine at the end of the shift.**
  - **To check that the solenoid valve is not sticking, check that the actuator does not move with the pilot control shut-off lever in the LOCK position.**

#### **Pilot Control Shut-Off Lever Operation**

Before Leaving the Machine:

1. Park the machine on a firm, level surface. Lower the bucket to the ground. Return all control levers to neutral. Properly shut down the engine.
2. Pull pilot control shut-off lever (1) up into the full LOCK position.

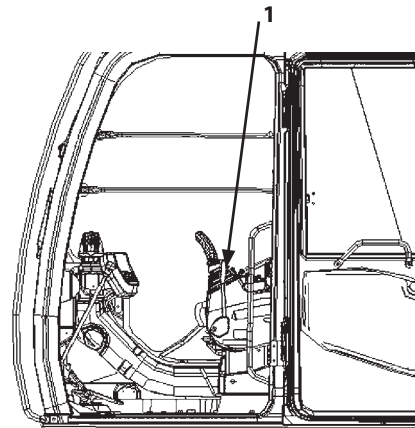
Before Starting Operation:

1. Confirm that pilot control shut-off lever (1) is pulled up to the LOCK position.

After starting the engine:

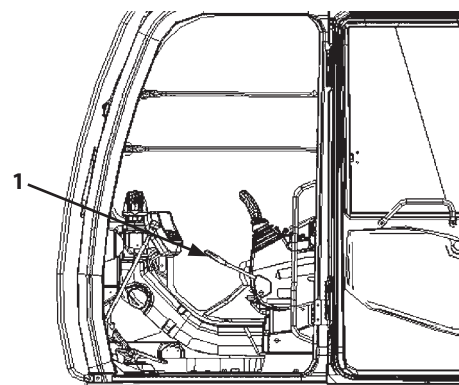
1. Confirm that all control levers and pedals are in neutral and that no part of the machine is in motion.
2. Lower pilot control shut-off lever (1) to the UNLOCK position.

If any part of the machine (any actuator) moves when the pilot control shut-off lever is lowered to the UNLOCK position despite the fact that all controls are placed in neutral, the machine is malfunctioning. Immediately pull the pilot control shut-off lever back to the LOCK position, and stop the engine. Then, see your authorized dealer.



LOCK Position

M1U1-01-025



UNLOCK Position

M1U1-01-024

## OPERATING THE MACHINE

### Warming-up Operation


In cold weather, warm up the machine until coolant and hydraulic oil temperature increases to the appropriate operating temperature.

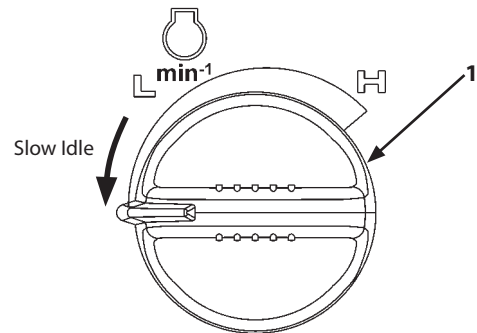
**IMPORTANT: The appropriate hydraulic oil operating temperature on this machine is 50 to 80°C. Hydraulic components may be seriously damaged if the machine is operated with low temperature hydraulic oil. In case warming up the machine by relieving the hydraulic system, continuously relieve the relief valve for 10 to 15 seconds while taking a pause for 5 to 10 seconds.**

1. Run the engine with engine control dial (1) turned to the slow idle position.

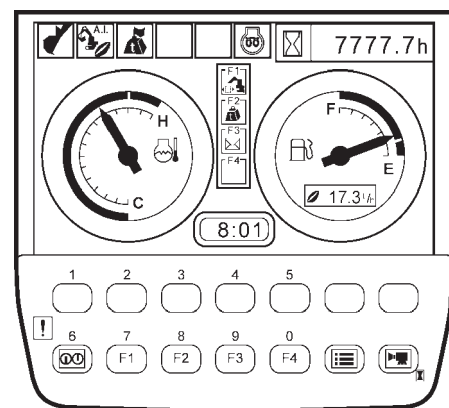
Do not operate the machine until the needle of coolant temperature gauge (2) starts swinging.

2. After the needle of coolant temperature gauge (2) starts swinging, turn engine control dial (1) to approx. medium position.
3. Operate the boom, arm and bucket cylinders slowly to each stroke end several times.
4. Operate the travel and swing functions slowly to allow hydraulic oil to circulate through the systems.
5. Warming up operation ends after the above operation is completed.

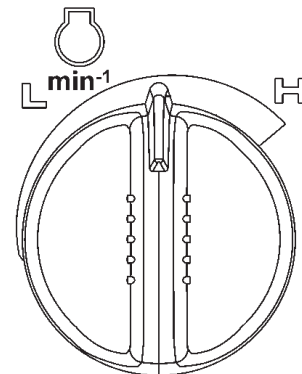
 **NOTE:** During cold weather season, the warm-up operation system automatically operates so that the engine speed increases for a moment even though the engine control dial is in the slow idle position.



M1U1-01-033



M1U1-01-004



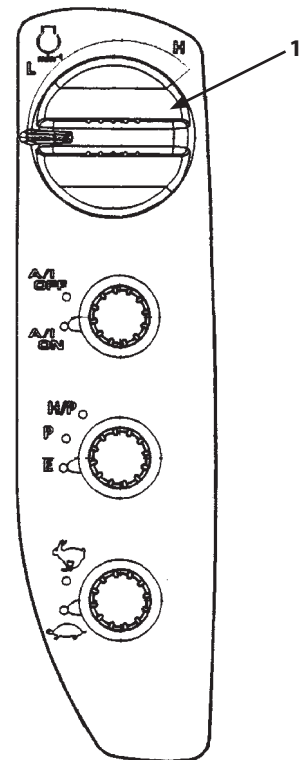
M1U1-03-006

## OPERATING THE MACHINE

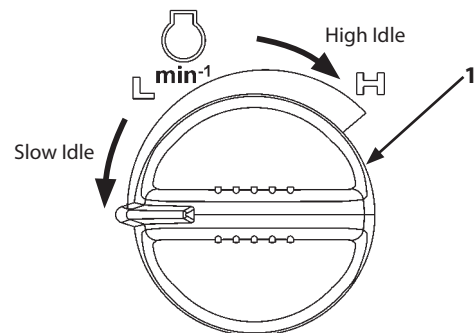
### ENGINE SPEED CONTROL

Increase and decrease the engine speed using engine control dial (1) located on the right console, as illustrated.

- Turn engine control dial (1) clockwise to increase the engine speed. Turn engine control dial (1) counterclockwise to decrease the engine speed.
- Note that the auto-idle function will be deactivated if engine control dial (1) is operated while the engine is running at the auto-idle setting.
- Before stopping the engine, always turn engine control dial (1) counterclockwise to the stop (to the slow idle setting). Run the engine five minutes to cool the engine. Then, turn key switch to OFF position to stop the engine.



M1V1-01-001



M1U1-01-033

## OPERATING THE MACHINE

### AUTO-IDLE

With auto-idle selector (3) turned to the A/I ON position, approximately 4 seconds after all control levers are returned to neutral, the engine speed decreases to the auto-idle setting to save fuel consumption. The engine speed will immediately increase to the speed set by engine control dial (2) when any control lever is operated.

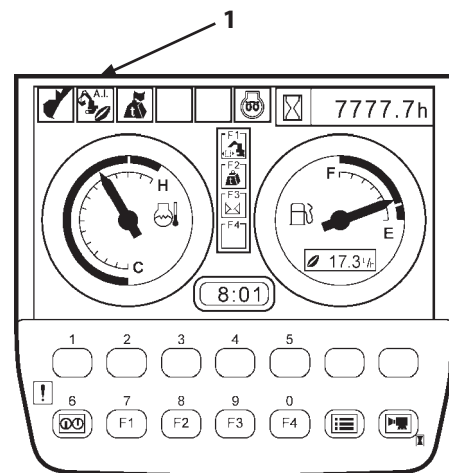
- IMPORTANT:**
- Always check if auto-idle indicator (1) is turned on or off before starting operation. If the indicator is on, the auto-idle function will be activated.
  - Always be aware of engine control dial setting when auto-idle selector (1) turned to the A/I ON position. If the engine speed is set high with engine control dial (2), and if the operator is not aware of the high engine speed setting, the engine speed will unexpectedly increase when any control lever is operated, causing unexpected machine movement, thus possibly resulting in serious personal injury.

**WARNING:** Prevent the machine from unexpected movement. Be sure to turn off auto-idle selector (3) when unexpected machine movement is undesirable, especially when loading/unloading the machine for transportation.

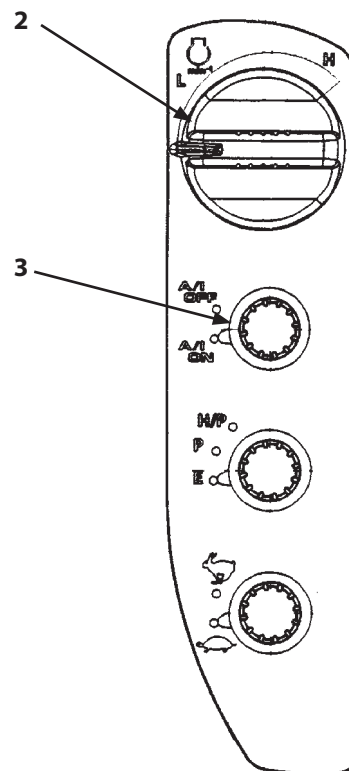
Note that auto-idle function can be turned on or off only when the key switch is in ON position. Always check if the auto-idle function is turned on or off with auto-idle indicator (1).

Auto-Idle Function ON : Auto-Idle Indicator (1) ON  
Auto-Idle Function OFF : Auto-Idle Indicator (1) OFF

- When auto-idle selector (3) is turned OFF with auto-idle indicator (1) ON, indicator (1) will go OFF and the auto-idle system is deactivated.
- Even if the engine is stopped by turning the key switch with auto-idle selector (3) in the A/I ON position [indicator (1) ON], the auto-idle system is not deactivated. When the engine is restarted, the auto-idle system remains activated, allowing auto-idle indicator (1) to flash for 5 seconds and stay ON later.



M1U1-01-004



M1V1-01-001



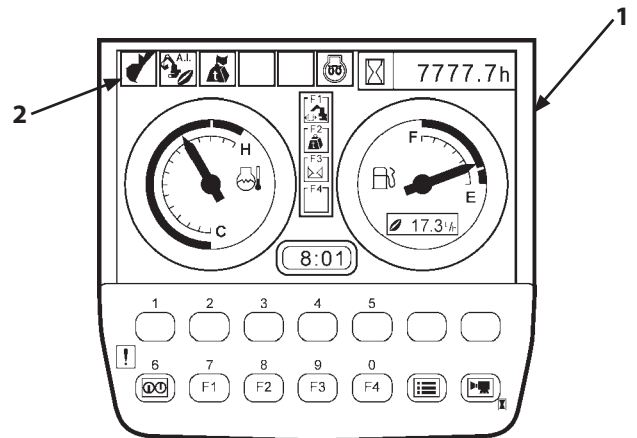
## OPERATING THE MACHINE

### WORK MODE

Five work modes can be selected for most appropriate hydraulic circuit and pump flow rate for the front attachment.

When the engine is started, the digging mode is automatically set. Each time work mode switch is pressed, the five following modes are selected alternately.

- Digging Mode
- Breaker 1
- Breaker 2
- Pulverizer 1
- Crusher 1



M1U1-01-004

The selected work mode is indicated by attachment mode indicator (2) of basic screen (1). Select the work mode corresponding to the work in which the machine is engaged while referring to the table below.

	Work Mode	Description
	Digging Mode	Select this mode when using bucket or fork grapple.
	Breaker 1 Mode	Select this mode when using breakers other than NPK breaker.
	Breaker 2 Mode	Select this mode when using NPK breaker.
	Pulverizer 1 Mode	Select this mode when using pulverizer.
	Crusher 1 Mode	Select this mode when using crusher.

**NOTE:** Five work modes shown above are designated as the standard specifications. Up to five attachment modes other than the digging mode can be designated. Consult your nearest Hitachi dealer for adding or changing the designation of the attachment modes.

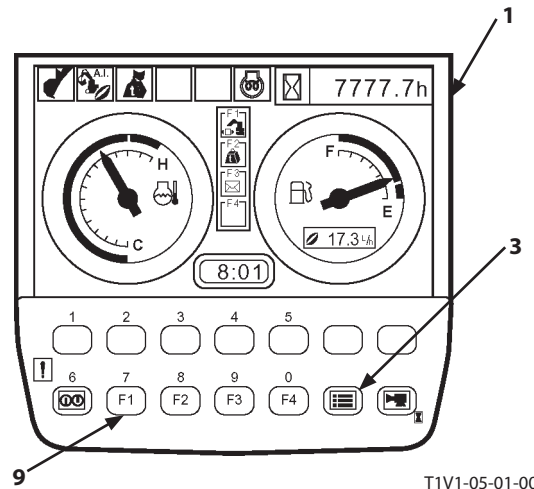
# OPERATING THE MACHINE

## WORK MODE SELECT

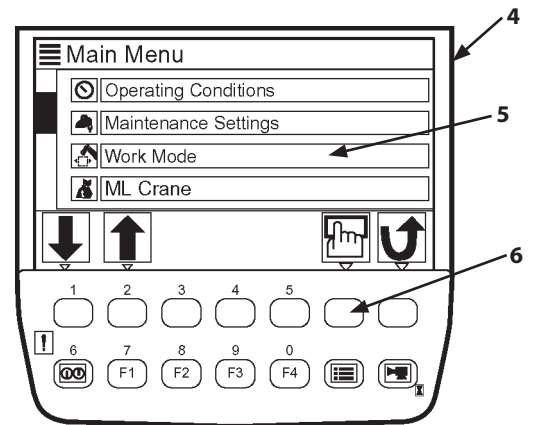
Press menu key (3) on basic screen (1) to display main menu screen (4). Select work mode (5) by operating  $\downarrow$   $\uparrow$  key on menu screen (4). Then, press determination key (6). Select the work mode matching the work to be done by pressing bottom key (8) on work mode selection screen (7). Then, press determination key (6).

### Selecting Work Mode By Pressing Key F1

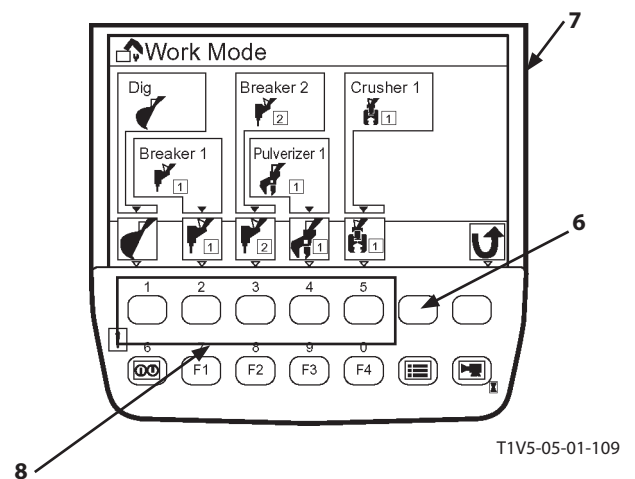
Press Key F1 (9) on basic screen (1). Then, the work mode selection screen (7) is displayed. Set the work mode by following procedure mentioned above.



T1V1-05-01-008



T1V5-05-01-121



T1V5-05-01-109

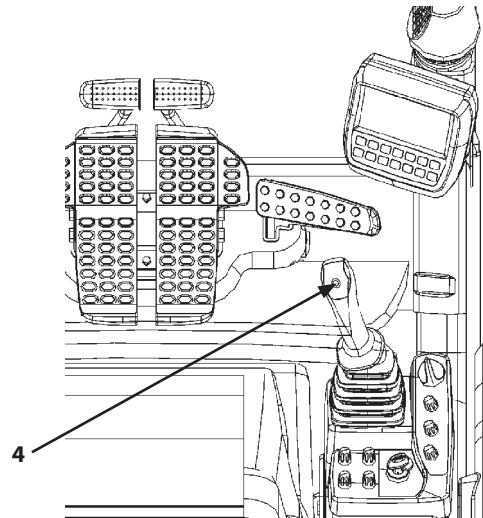
## OPERATING THE MACHINE

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### POWER BOOST

The power boost switch (4) is used to gain maximum digging power, and is located on the top of the right control lever.

When the power boost switch (4) is pushed, increased front attachment power will be supplied for about 8 seconds.



M1J1-01-024

## OPERATING THE MACHINE

### POWER MODE

One of three engine speed modes, E, P or H/P mode, can be selected using power mode switch (1).

- E (Economy) Mode

Even if the engine speed is reduced in the E mode, digging force remains unchanged from that in the P mode. Although production is reduced slightly more than in the P mode, the fuel consumption and noise levels are reduced, allowing the machine to operate most efficiently.

- P Mode

Operate the machine in this mode when performing normal work.

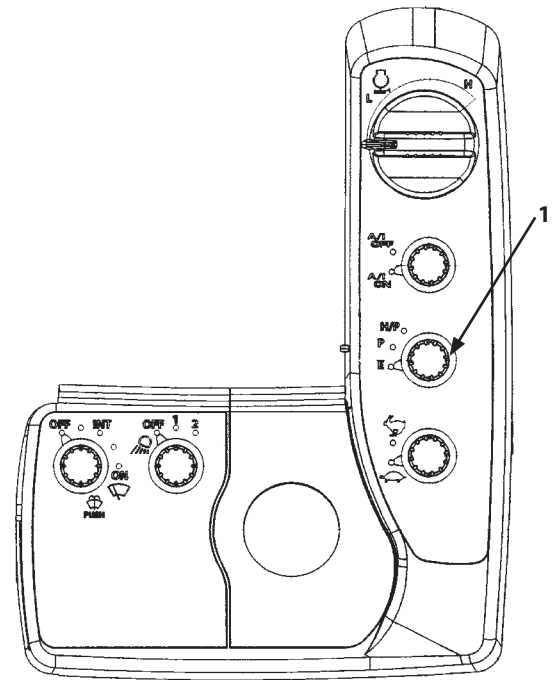
- H/P (High Power) Mode

**⚠ WARNING: In the H/P mode, the engine speed will change quickly. To ensure safety, be sure to turn power mode switch (1) to the P or E mode position before starting such works as loading the machine on or off a trailer or lifting a load with the front attachment, which may result in personal accidents if the engine speed is suddenly changed.**

When rolling in the arm while digging deep trenches for example, more power may be required. In such cases, use the H/P mode. The maximum power of the machine can be utilized in this mode, increasing work efficiency when more power is required than in the P mode.

The H/P mode is activated and the engine speed is increased when the boom raise or the arm rolled-in operation is made with the engine fast idle speed set at faster than approx.  $1650 \text{ min}^{-1}$ .

**✎ NOTE:** In the H/P mode, the engine speed changes depending on load applied to the machine.

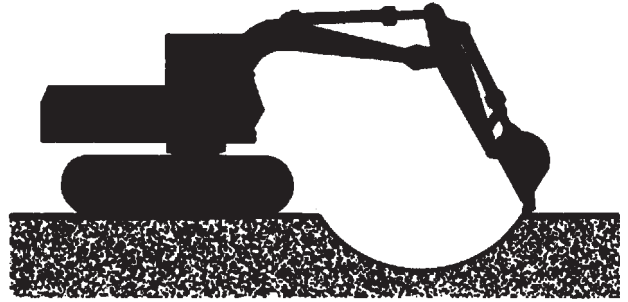


M1U1-01-015

## OPERATING THE MACHINE

### OPERATING BACKHOE

1. Place the bucket teeth on the ground with the bottom of the bucket at a 45 degree angle to the ground.
2. Pull the bucket toward the machine using the arm as the main digging force.
3. When soil sticks to the bucket, remove it by moving the arm and/or bucket rapidly back and forth.
4. When trenching a straight line, position the tracks parallel to the trench. After digging to the desired depth, move the machine as required to continue the trench.



M107-05-037

**IMPORTANT: When lowering the boom, avoid sudden stops that may cause shock load damage to the machine.**

**When operating the arm, avoid bottoming the cylinder to prevent cylinder damage.**

**When digging at an angle, avoid striking the tracks with the bucket teeth.**

**When digging a deep excavation, avoid striking the boom or bucket cylinder hoses against the ground.**

### GRADING OPERATION

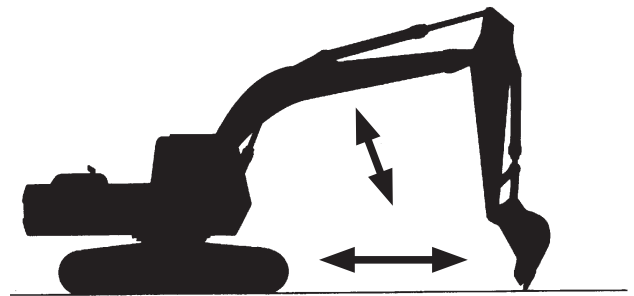
**IMPORTANT: Do not pull or push dirt with the bucket when traveling.**

Select grading mode when finishing work is required.

Position the arm slightly forward of the vertical position with bucket rolled back, as shown.

Operate arm roll-in function while slowly raising the boom. Once the arm moves past, the vertical position slowly lower the boom to allow the bucket to maintain a smooth surface.

Grading operation can be more precisely done by operating the boom, arm and bucket simultaneously.



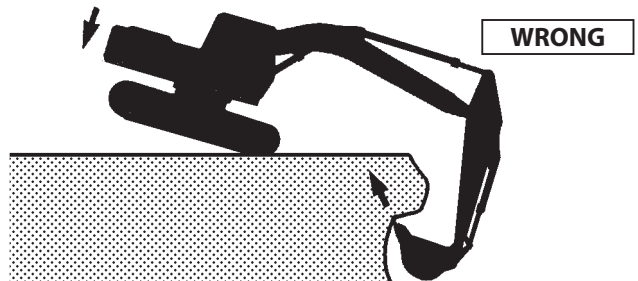
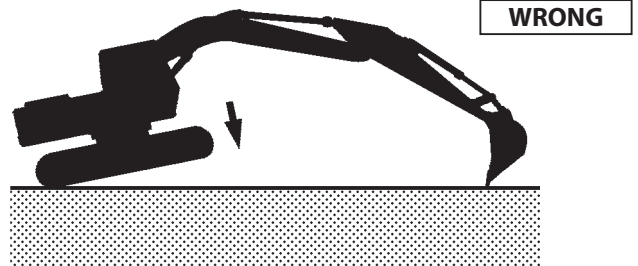
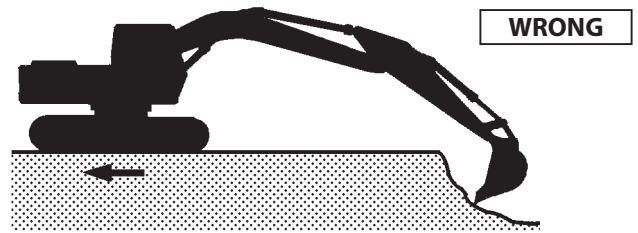
M104-05-017

## OPERATING THE MACHINE

### AVOID ABUSIVE OPERATION

Do not use travel as an additional digging force. Severe machine damage may result.

Do not raise rear of machine to use the machine's weight as additional digging force. Severe machine damage may result.



M104-05-018

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## OPERATING THE MACHINE

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### OPERATING TIPS

Do not hit the track with the bucket when digging.  
Whenever possible, position your machine on a level surface.  
Do not use the bucket as a hammer or pile driver. Do not attempt to shift rocks and break walls using swing motion.

**IMPORTANT: To avoid damaging cylinders, do not strike the ground with the bucket nor use the bucket for tamping with the bucket cylinder fully extended (the bucket completely curled under).**

Adjust the length and depth of each cut to produce a full bucket with every pass.

Full loads on every pass is more productive than a faster cycle with a partially filled bucket.

Full load should be the first objective, followed by speed, to increase productivity.

**IMPORTANT: Do not attempt to break ledge rock by extending the arm to maximum reach and dropping the front of the bucket on the bucket teeth for penetration. Serious damage to the machine can result.**

Once the trench is open, ledge rock can be broken by pulling the bucket up under the layers. The top layers are pulled out first, with one or two layers being lifted at a time.

Do not side load the bucket. For example, do not swing the bucket to level material or do not strike objects from the side with the bucket.

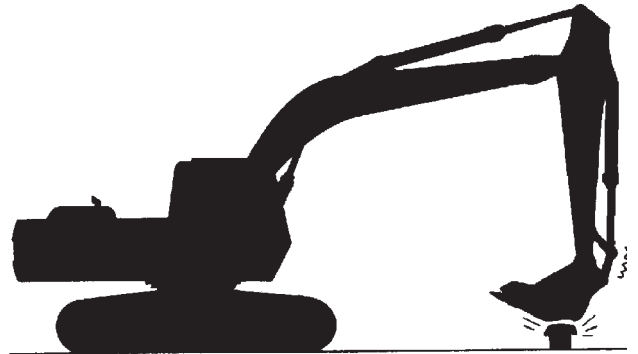
### SELECT CORRECT TRACK SHOES

**IMPORTANT: Using wide track shoes on rough ground may result in shoe bending and/or loosening, and may damage other undercarriage components.**

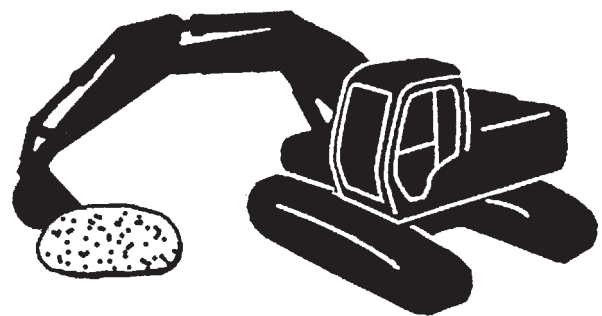
Never use wide track shoes on rough ground such as rocks, sand or gravel. Wide track shoes are designed for soft ground.

Track shoe bolts should be checked periodically for tightness.

**WRONG**



M104-05-019



M161-05-006

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## OPERATING THE MACHINE

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### HYDRAULIC BREAKER AND HYDRAULIC CRUSHER

Select a breaker or crusher that is the correct size and weight for your machine. See your authorized dealer for correct breaker information.

Carefully study the operation manuals of the machine, breaker and crusher, and perform the required checks and/or inspection before connecting the breaker or the crusher to the arm.

**IMPORTANT: Precautions for connecting breaker or crusher piping.**

- **Do not allow impurities to enter into the system when switching the breaker or the crusher with the bucket.**
- **When the breaker or crusher is not used, apply the cover to the pipe opening on the arm top and install the plug into the hose end of the breaker or the crusher to prevent impurities from entering the system.**

**Be sure to provide spare covers and plugs in the tool box so that they will be available when needed.**

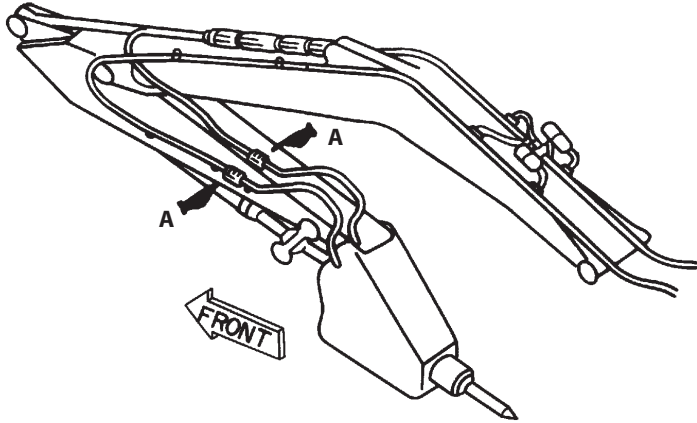
- **After connecting, check the connecting seal fitting for oil leakage, and pipe clamp bolts for looseness.**



# OPERATING THE MACHINE

## PIPING FOR BREAKER AND CRUSHER

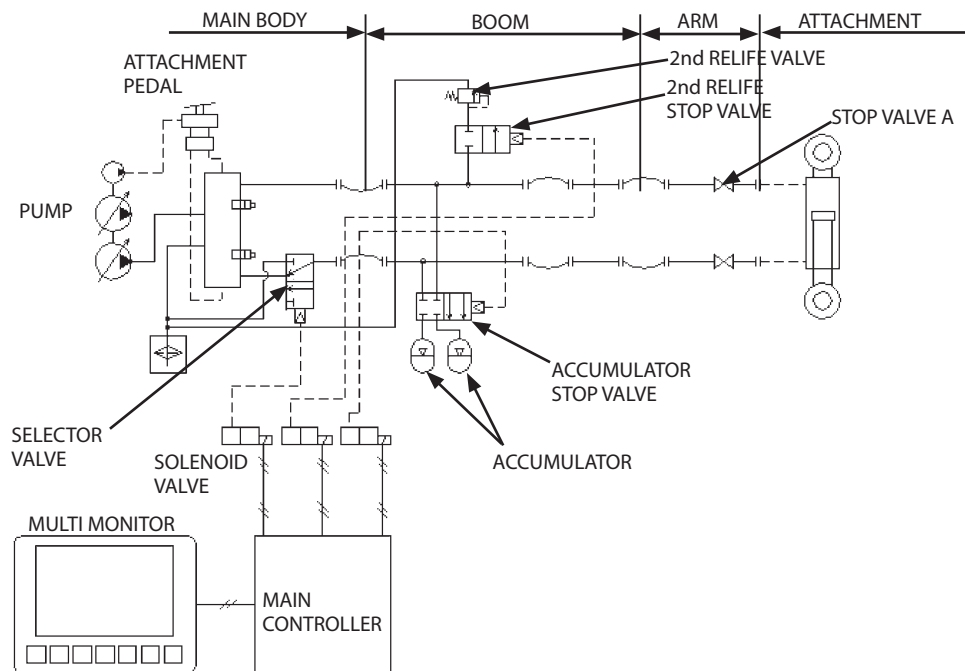
Operational procedures for stop valves and selection valve.



A Stop Valves	Close
A Stop Valves	Open

<b>Stop Valves A</b>
Close : When not using attachment or is detached.
Open : When using attachment

M1U1-05-007



M1U1-05-005

## OPERATING THE MACHINE

### SECONDARY RELIEF PRESSURE ADJUSTMENT

When attaching the breaker other than the NPK, it is necessary to install the secondary relief valve in line. For this purpose, the boom piping for the attachment is provided with a part to which the secondary relief valve is connected.

Pressure is set to A when shipped from HITACHI.

Model	Set Pressure A
ZAXIS400R-3, 400LCH-3	19.6MPa (200 kgf/cm <sup>2</sup> )

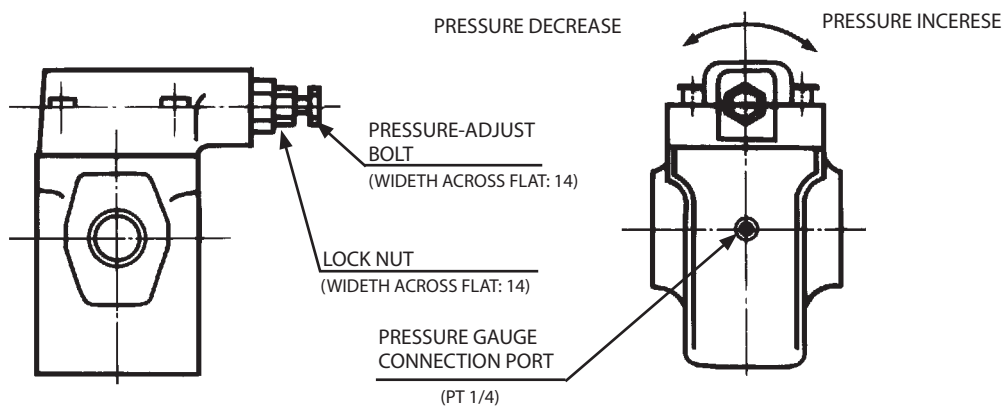
After completing piping, reset this pressure to the specified level of each breaker.

Adjust the pressure as follows :

1. Attach the pressure gauge to the pressure gauge port.
2. Loosen the lock nut, then gradually turn the pressure-adjust screw clockwise to increase the pressure, or counterclockwise to reduce the pressure.  
One turn of the screw changes about 4.9MPa (50 kgf/cm<sup>2</sup>) in pressure.
3. After adjusting the pressure, make sure to tighten the lock nut.

Two methods are available to measure the pressure. Measure the pressure as follows.

1. Measuring the pressure at the relief valve :
  - (1) Attach a pressure gauge to the pressure gauge connection port (see the figure below)
  - (2) Close the stop valves at the arm end. Depress the attachment pedal to pressure the line.
  - (3) Adjust the pressure to 1 to 1.5MPa (10 to 15 kgf/cm<sup>2</sup>) higher the setting pressure.



M107-05-005

2. Measuring the pressure at the arm end.
  - (1) Remove the attachment connection hose and connect a pressure gauge to the connection fitting at the arm end.
  - (2) Adjust the pressure to the setting pressure.

## OPERATING THE MACHINE

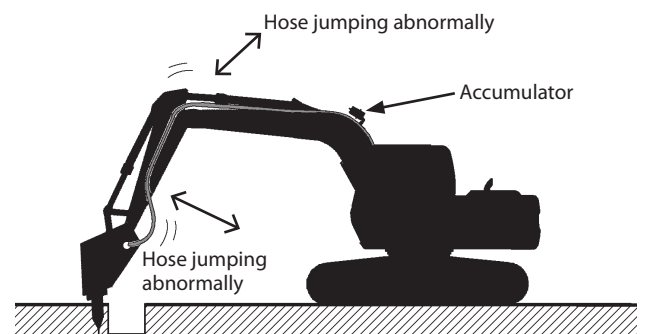
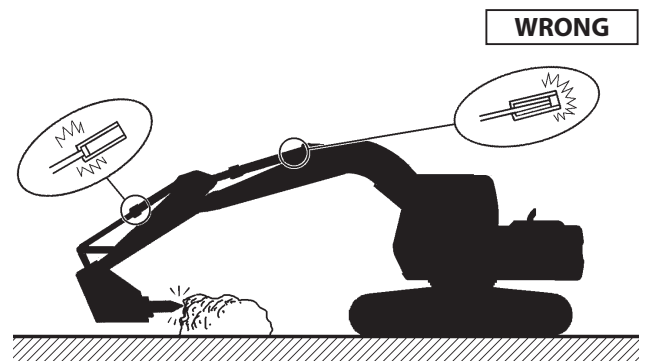
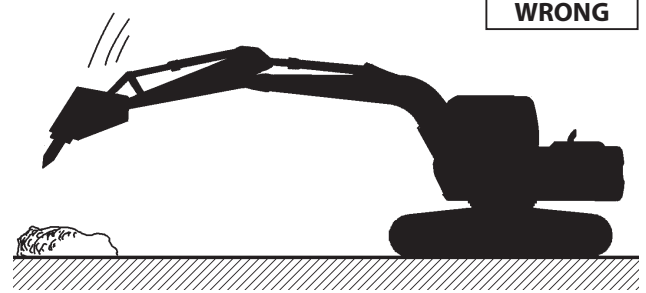
### PRECAUTIONS FOR BREAKER OPERATION

**WARNING:** Machine stability is reduced as the breaker is much heavier than the bucket. When using a breaker, the machine is more apt to tip over. Also, flying objects may hit the cab or other part of the machine. Observe the following precautions and take any other precautions necessary to prevent accidents and machine damage from occurring.

- Avoid hitting objects with breaker. The breaker is heavier than the bucket, causing the breaker to lower faster. Take care not to hit any objects with breaker. Doing so will result in damage to the breaker, the front attachment, and/or the upperstructure. Always move (lower) the breaker slowly to position the tip of the chisel on the object to be broken before starting breaker operation.
- Do not use the breaker and/or the swing function to move objects. Damage to the boom, arm, and/or breaker may result.

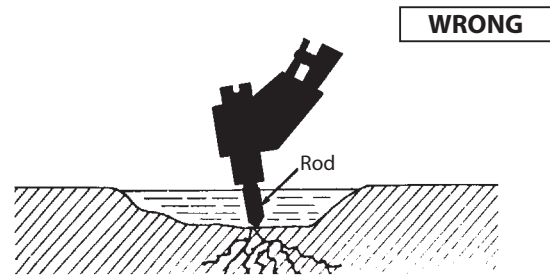
- To prevent cylinder/machine damage, do not operate the breaker with the hydraulic cylinder rod fully retracted or fully extended.

- Stop operation if breaker hydraulic hoses jump abnormally. Change in breaker accumulator pressure or a damaged accumulator will cause abnormal hose jumping and may cause breaker and/or machine damage. Immediately contact your authorized dealer if this happens.



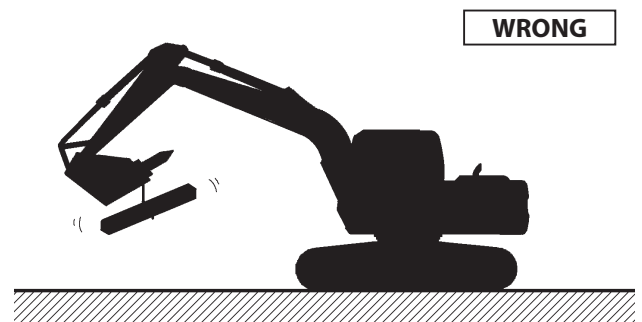
## OPERATING THE MACHINE

- Do not operate the breaker in water. Doing so will cause rust and seal damage, resulting in damage to the hydraulic system components.



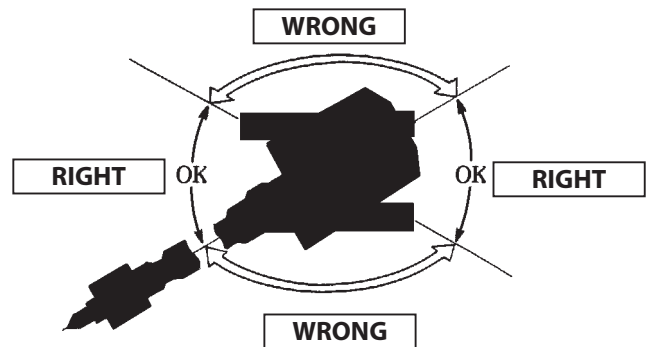
M104-05-059

- Do not use breaker for lifting operation. The machine tipping over and/or breaker damage may result.



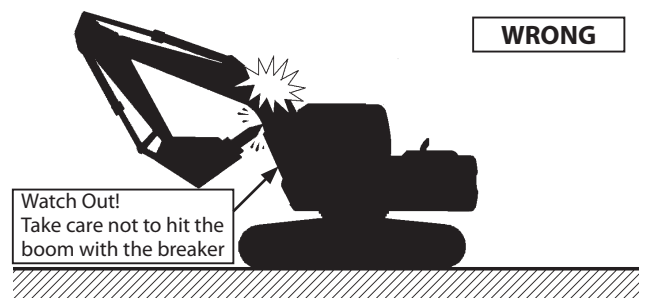
M104-05-060

- Do not operate the breaker to the side of the machine. The machine may become unstable and undercarriage component life may shorten as a result from operating the breaker to the side of the machine.



M104-05-061

- Operate the hydraulic excavator carefully to avoid hitting the boom.



M104-05-062

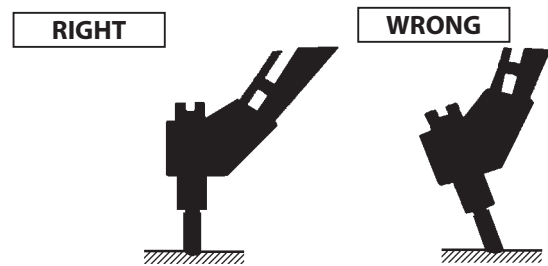
## OPERATING THE MACHINE

- Do not operate breaker with the arm positioned vertically. Excessive vibration to the arm cylinder will occur, causing oil leakage.



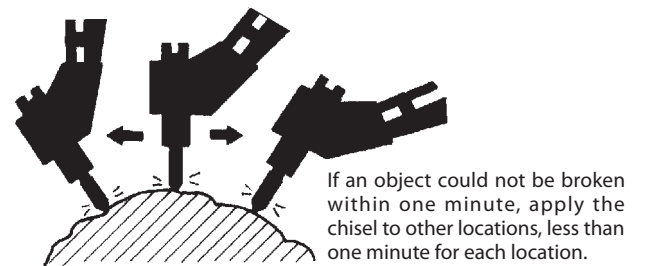
M147-05-013

- Press the breaker so that the chisel (the axis) is positioned and thrust perpendicular to the object.



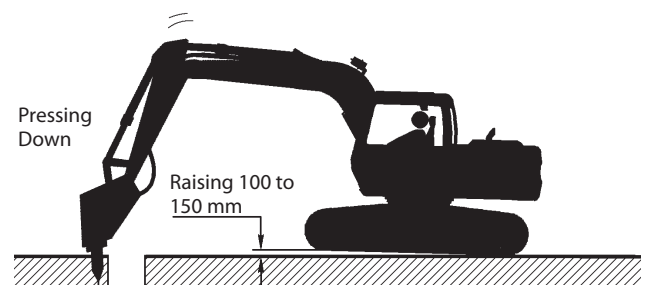
M147-05-014

- Do not operate the breaker continuously longer than one minute. Excessive chisel wear will result. If an object could not be broken within one minute, apply the chisel to other locations, less than one minute for each location.



M147-05-015

- Raising the front part of the undercarriage by pressing down the breaker may cause damage to the front attachment. Although raising the front edge of the undercarriage up to 150 mm (6 in) is tolerable, do not practice this method more than necessary. Never raise the front edge of the undercarriage higher than 150 mm (6 in) by pressing the breaker down.



M147-05-016

# OPERATING THE MACHINE

## BREAKER MAINTENANCE

### Change Hydraulic Oil and Replace Hydraulic Oil Tank Filter

Hydraulic breaker operation subjects the hydraulic system to become contaminated faster and to quickly deteriorate the hydraulic oil. For this reason, hydraulic oil must be changed and the hydraulic oil tank filter must be replaced more often than the machine equipped with a bucket. Failure to do so may result in damage to the breaker, hydraulic oil pump, and other

related hydraulic system components. Recommended changing intervals are shown below. (For filter replacement and oil changing intervals are shown below. (For filter replacement and oil changing procedures, refer to the "Hydraulic System" in the "MAINTENANCE" Section.)

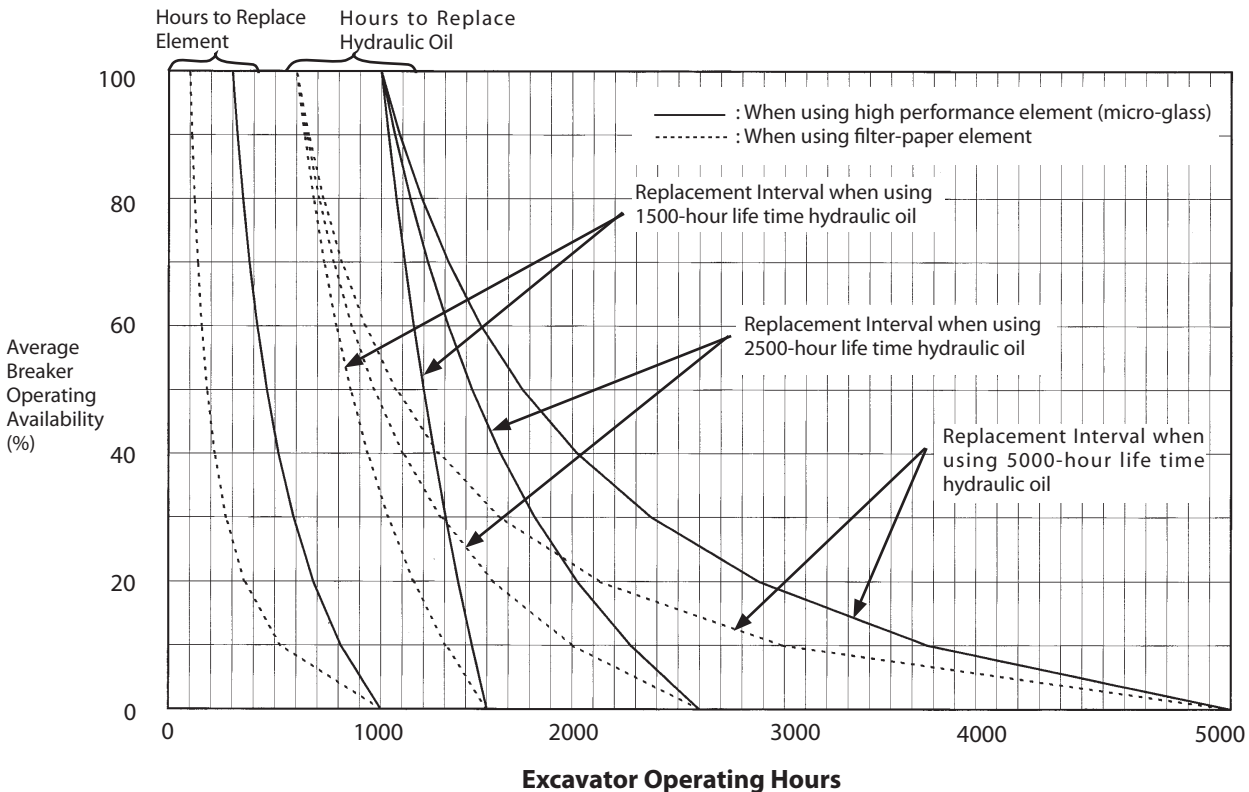
Changing intervals (Hours)

Attachment	Availability	*Hydraulic Oil	Full Flow Filter Element	**Element Type
Bucket	100%	1500	1000	Standard Filter Paper High Performance Element
		2500		
		5000		
Hydraulic Breaker	100%	600	100	Standard Filter Paper
		1000	300	High Performance Element

\* : Replacement intervals differ depending on the brand of hydraulic oil used. Refer to the Hydraulic System in the MAINTENANCE section.

\*\* : Use the high performance element (micro-glass) on excavators engaged in demolition work.

Replacement Intervals (Hours) of Hydraulic Oil and Full Flow Filter Element



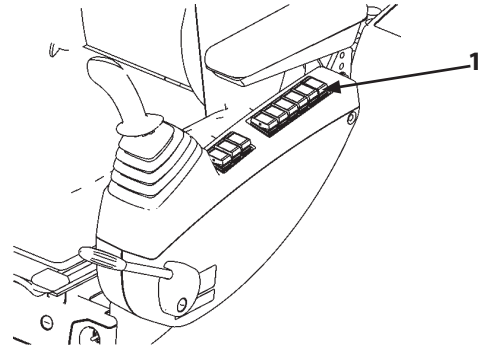
**IMPORTANT:** Use a high performance element (micro-glass) on excavators engaged in demolition work. In case using a filter-paper element is unavoidable, replace hydraulic oil and the filter element at the intervals as illustrated with dotted lines.

**NOTE:** Full-flow filter restriction indicator is optional. If a filter-paper element is used, this indicator doesn't operate. (Refer to the Hydraulic System in the Maintenance section.)

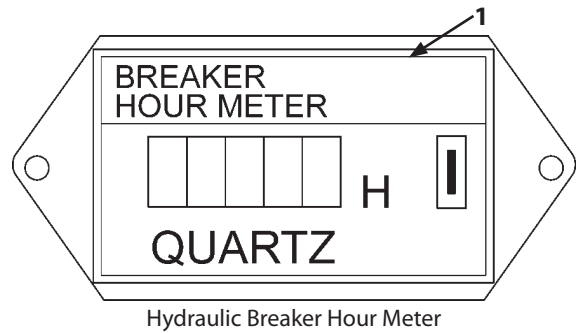
## OPERATING THE MACHINE

In case of the machine equipped with the hydraulic breaker, hydraulic breaker hour meter (1) is equipped inside the cab. Hydraulic breaker hour meter (1) operates when depressing the hydraulic breaker pedal.

- In case of the specialized machine equipped with the hydraulic breaker (hydraulic breaker operating rate: 100%) Replace hydraulic oil and the full-flow filter element according to hydraulic breaker hour meter (1) equipped for the machine.



M1J1-03-001



M1J1-13-008

## OPERATING THE MACHINE

### PRECAUTIONS FOR CRUSHER OPERATION

Prevent machine tipping over and damage to the front attachment. Observe the following precautions for crusher operation.

**WARNING:** Machine stability is reduced as crusher is much heavier than bucket.

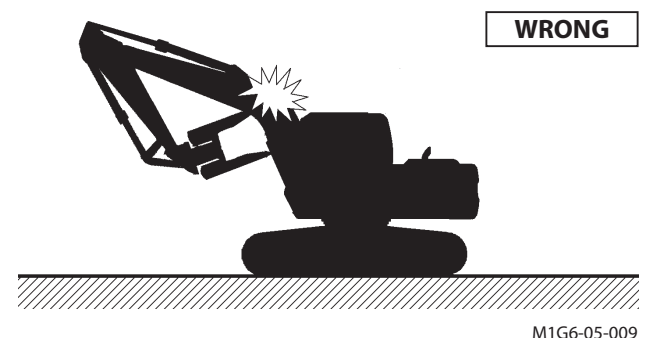
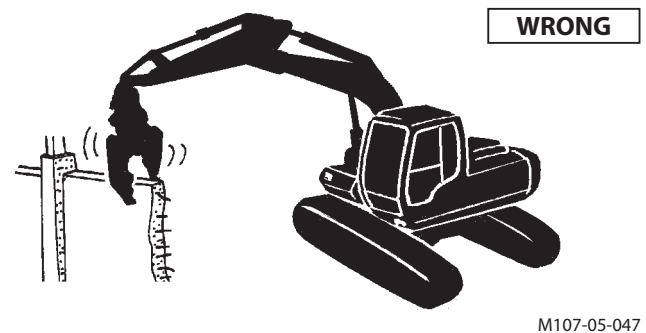
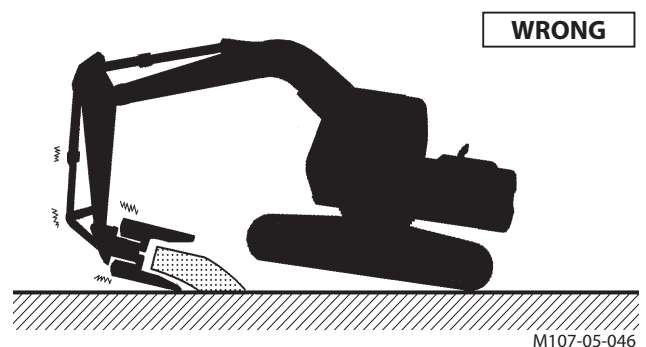
**When operating with a crusher, the machine is more apt to tip over. Also, falling or flying objects may hit the cab or other part of the machine. Observe the following precautions and take any other precautions necessary to prevent accidents and machine damage from occurring.**

- Do not allow the machine's weight to be supported by the crusher or bucket cylinder with the bucket cylinder fully extended or retracted. Doing so may damage the front attachment. In particular, avoid doing so with the bucket cylinder fully extended, as the front attachment will be easily damaged.

Take care to prevent this from happening when dismantling foundation structures using the crusher.

- Using the front attachment, don't raise the base machine off the ground with the arm cylinder fully extended. Failure to do so may result in damage to the arm cylinder.
- When a heavyweight attachment such as a crusher is installed, avoid quickly starting or stopping the front attachment. Failure to do so may result in damage to the front attachment.
- Do not attempt to perform crushing on either side of the machine. Always perform crushing operations to the fore or rear, parallel with the tracks. Otherwise, tipping over may occur.

- Operate the hydraulic excavator carefully to avoid hitting the boom, and cab.





## OPERATING THE MACHINE

When operating the crusher up high with the boom fully raised, be careful of falling objects.

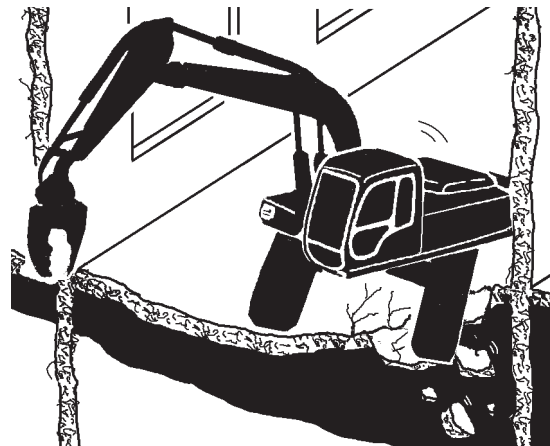
**WRONG**



M107-05-048

- When operating the crusher on a floor in a building, first confirm that the floor has sufficient strength to support the load caused by crushing, in addition to the machine weight.
- Always operate the crusher on a stable, level surface, not on a slope or on crushed scraps.
- Do not use the crusher to haul or load crushed scraps.
- If a multiple number of attachments, such as crusher and bucket, or crusher and breaker, are used, replacing them with each other at intervals, impurities are more apt to enter the hydraulic system and the hydraulic oil deteriorates quickly. For this reason, replace the hydraulic oil tank filter and change the hydraulic oil at the intervals specified in the breaker time sharing diagram in the previous section. Read the breaker time sharing diagram supposing that time sharing percentage of attachment (s) other than the crusher is that of the breaker.
- Always remove the crusher from the excavator before transporting the machine. Do not fully extend the bucket cylinder when transporting, as this may damage the front attachment, when vibrations arise during transportation.

**WRONG**



M107-05-049

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## OPERATING THE MACHINE

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### ATTACHMENT

#### Allowable Weight Limits of Installed Attachment

- When an attachment other than the standard bucket is installed on the machine, the machine stability will be different. If a heavy attachment is used, not only will controllability be affected but also machine stability will be reduced, possibly causing safety hazard.
- Before installing attachments such as hydraulic breaker, crusher (concrete crusher), or pulverizer, take machine controllability into account when selecting the weight of the attachment by referring to the table below.

Unit: kg (lb)

Base Machine		Breaker		Crusher/Pulverizer	
Model	Arm	Std. Weight	Max. Weight	Std. Weight	Max. Weight
ZAXIS400R-3	Std.	2750 (6050)	3000 (6600)	3250 (7150)	3800 (8360)
ZAXIS400LCH-3	Std.	2800 (6160)	3050 (6710)	3350 (7370)	3900 (8580)

## OPERATING THE MACHINE

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- Breaker operation speed is faster than crusher operation so that the recommended breaker max. weights are reduced more than those of the crushers.
- The weight is not the only factor to be considered when selecting a breaker. Select proper manufacturers' breaker models while referring to the table on the next page.
- Avoid installing an attachment with a long overall length. Damage to the front attachment may result.
- When an attachment of the max. weight is installed, always operate the attachment over the front or rear side of the machine. In addition, avoid operating the attachment at the maximum reach.
- Crushers are heavier than breakers. Slowly move the control lever when operating a crusher.

## OPERATING THE MACHINE

### Attachments

Example commercial attachment models (breakers and crushers) for excavators are shown in the following table. Among the crusher models, some models are heavier than the recommended weight on the previous page. Before installing them, sufficiently coordinate with the attachment manufacture. Always contact your nearest HITACHI dealer before installing attachments shown with this mark \*.

When the machine is operated with an attachment other than bucket, generally heavier loads are applied to the base machine comparing with bucket only operation. Therefore, unless the machine is properly operated, damage not only the attachment but to the base machine may result. Thoroughly read and understand the base machine operator's manual and the attachment manual to prevent accidents.

#### Breaker (ZAXIS400R-3, 400LCH-3)

Maker	HITACHI	NPK	NPK	Okada	Furukawa	Mitsubishi	Toukuu	Matsuda	MON-TABERT	STK	Ranma	GERMANY KRUPP
Model	HSB80	H-16X	E218	OUB318	HB30G	MKB2000N	TNB22E	THBB2000	BRV43	SIB318	S83	HM150CS
Weight kg (lb)	2430 (5360)	1545 (3410)	1500 (3310)	2400 (5290)	2210 (4870)	2000 (4410)	2400 (5290)	2290 (5050)	2480 (5470)	2100 (4630)	2200 (4850)	2100 (4630)
Flow Rate (L/min)	160~230	175~225	200~250	140~210	150~190	130~175	180~220	150~200	180~250	160~210	160~230	120~180
Operating Pressure MPa (kgf/cm <sup>2</sup> )	11.8~15.6 (120~160)	12.7~14.7 (130~150)	16.7~18.6 (170~190)	13.7~16.7 (140~170)	15.7~17.6 (160~180)	14.7~17.6 (150~180)	12.7~16.7 (130~170)	14.7~17.6 (150~180)	15.2 (155)	13.7~16.7 (140~170)	13.7~ (140~)	15.7~17.6 (160~180)
Secondary Relief Valve Set Pressure MPa (kgf/cm <sup>2</sup> )	21.6 (220)	—	—	18.6 (190)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)		19.6 (200)	17.6 (180)	19.6 (200)

## OPERATING THE MACHINE

### Crusher (ZAXIS400R-3, 400LCH-3)

Maker	SANGO JYUKI	NPK*	Oosumi*	STK*
Model	TS110RD	S-35X	MR1500	CX100
Weight kg (lb)	2940 (6480)	3500 (7720)	4200 (9260)	2650 (5840)
Overall Length mm (ft-in)	2700 (8'10")	2824 (9'3")	2950 (9'8")	2450 (8'0")
Rated Pressure MPa (kgf/cm <sup>2</sup> )	27.4 (280)	27.4 (280)	31.4 (320)	
Maximum Opening Width mm (ft-in)	1100 (3'7")	1100 (3'7")	1500 (4'11")	1100 (3'7")
Swing Method	Free	Hydraulic	Free	Free
Jaw Tip Crushing Force	kN (tf·f) 1180 (120)	1230 (125)		
Jaw Center Crushing Force	kN (tf·f)	1770 (180)		

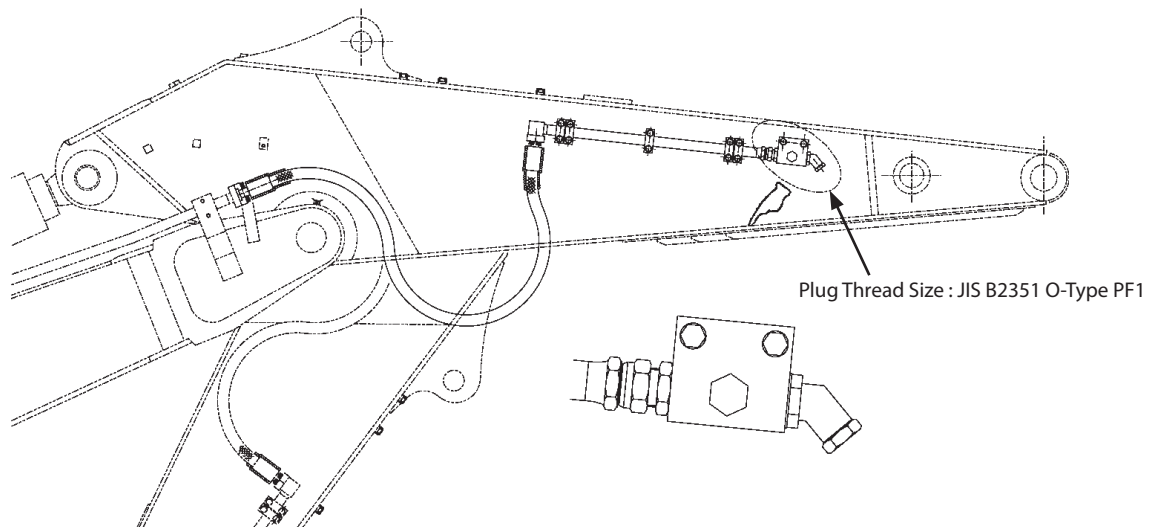
## OPERATING THE MACHINE

### ATTACHMENT CONNECTION PARTS

The attachment hydraulic line and connection parts are located as illustrated below. When the attachment is disconnected, be sure to install caps or plugs to the ends of both the arm and attachment side hydraulic lines to prevent dust from entering or from sticking.

Adapter tightening torque:

PF1      205 N·m (21 kgf·m)



M1JK-05-001

Part No. List (Fill attachment manufacturer's part Nos. in the blank spaces.)

Maker	Adapter Size	Adapter	Cap	Plug	Hose
Form / Size	Male-Type PF-UNF				
	PF1X1-5/16UN	4214444	4222712	4222265	
Form / Size	Female-Type PF-PF30°				
	PF1XPF1	4042034	9718917	4168177	
Form / Size	Male-Type PF-PF30°				
	PF1XPF1	4456118	4222716	4222045	

## OPERATING THE MACHINE

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### PRECAUTION FOR ARM ROLL-IN/BUCKET ROLL-IN COMBINED OPERATION

#### --- If Headguard-Integrated Cab or Raingard is Equipped

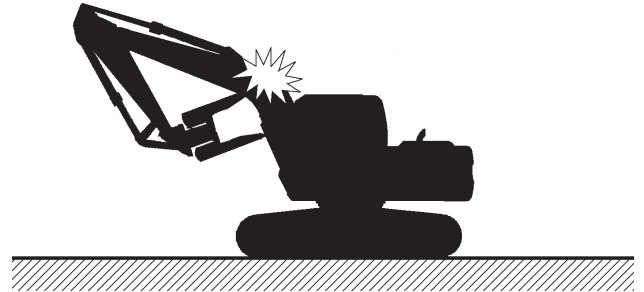
- !** **WARNING:** The bucket teeth will hit the headguard or raingard if the bucket is rolled in with the arm fully rolled in, as illustrated. When performing combined operation of long arm roll-in/bucket roll-in or when rolling in the bucket with the arm fully retracted, be careful not to hit the headguard or raingard with the bucket teeth.



M107-05-072

### WHEN INSTALLING AN ATTACHMENT LONGER THAN STANDARD BUCKET

- !** **WARNING:** When an attachment (such as a hydraulic breaker or crusher), the overall length of which is longer than that of the bucket, is installed, the attachment may come in contact with the cab and/or the boom. Operate the machine with care not to allow the tip of the front attachment to hit the cab and/or the boom while rolling in the front attachment.



M1G6-05-009

## OPERATING THE MACHINE

### SHACKLE HOLE USAGE

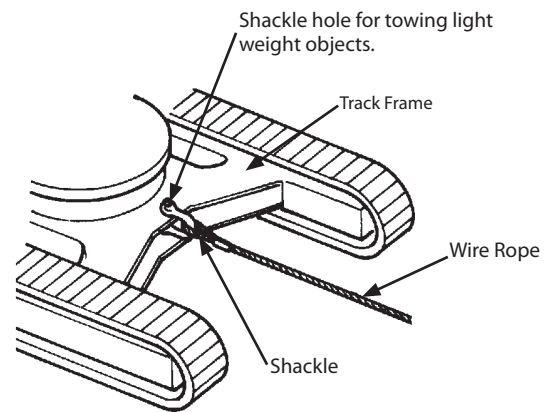
A shackle hole is provided on the track frame to tow light weight objects as specified below.

**IMPORTANT: Be sure to conform to the restrictions and precautions stated below when towing a light weight object using the shackle hole provided on the track frame. The track frame and/or the shackle hole may be damaged otherwise.**

- The maximum drawbar pull.

Model	Maximum Drawbar Pull
ZAXIS400R-3, 400LCH-3	108000 N (11.0 tf)

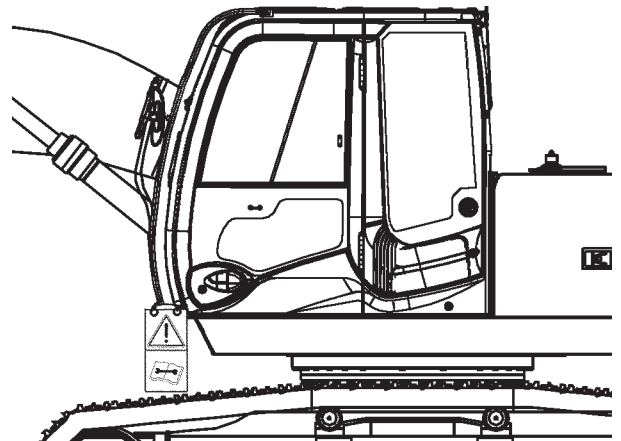
- Be sure to use a shackle.
- Keep the tow line horizontal, straight, and parallel to the tracks.
- Select the slow travel mode. Slowly drive the machine when towing.



M104-05-011

### OVERNIGHT STORAGE INSTRUCTIONS

1. After finishing the day's operation, drive the machine to a firm, level ground where no possibility of falling stones, ground collapse, or floods. Park the machine referring to the "PARKING THE MACHINE" in the "DRIVING THE MACHINE" section.
2. Fill the fuel tank with fuel.
3. Clean the machine.
4. If anti-freeze or long life coolant is not used in cold weather, be sure to drain coolant from the radiator and the engine jacket. Also, be sure to put a tag in a visible place if the coolant has been drained.



M1U1-05-003



## OPERATING THE MACHINE

### EMERGENCY BOOM LOWERING PROCEDURE (Without hose-rupture safety valve)

**⚠ WARNING: Prevent personal injury. Confirm that no one is under the front attachment before starting the procedure below.**

If the engine stalls and cannot be restarted, lower the boom to lower the bucket to the ground referring to the emergency boom lowering procedure stated below.

1. Loosen lock nut (1). Loosen screw (2) one half of a turn. The boom will start to lower. The boom lowering speed can be somewhat adjusted by loosening screw (2) more.

**✎ NOTE:** Never loosen screw (2) more than 2 turns. Screw (2) may come off.

2. After the bucket is lowered to the ground, retighten screw (2), then lock nut (1) to the specifications below.

#### Lock Nut (1)

Tool : 13 mm

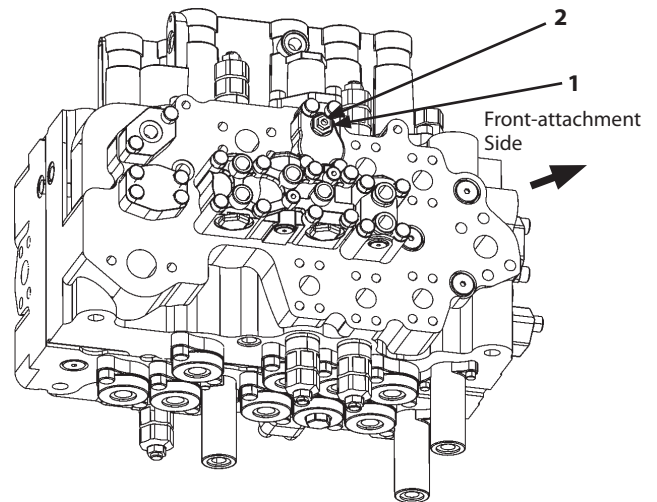
Torque : 13 N•m (1.3 kgf•m, 9.4 lbf•ft)

#### Screw (2)

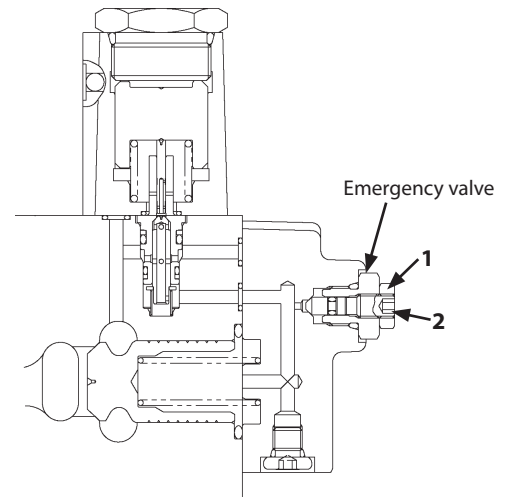
Tool : 4 mm (Hexagonal wrench)

Torque : 7.0 N•m (0.7 kgf•m, 5.0 lbf•ft)

**✎ NOTE:** Excessive leakage may result if the screw and the lock nut are tightened insufficiently. Be sure to retighten the screw and the lock nut to specifications.



T1V1-03-03-073



T1V1-03-03-038

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## OPERATING THE MACHINE

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### OBJECT HANDLING --- IF EQUIPPED

**! WARNING:** When you use machine for object handling, be sure to comply with all local regulations. Cables, straps, or ropes can break, causing serious injury. Do not use damaged chains, frayed cables, slings, straps, or ropes to crane.

**Never move the load suddenly. Never move load over a person's head. Do not allow any persons near load.**

**Keep all persons away from wire-rope-attached load, lifted or sitting on the ground unless it is securely sitting on blocks or on the ground.**

**Position upperstructure so that the travel motors are at the rear.**

**Do not attach sling/chain to the bucket teeth.**

- Secure sling/chain tightly to the load being lifted. Wear gloves when securing sling/chain.
- Fasten sling/chain to bucket loop, with the bucket curled and arm retracted.
- Coordinate hand signals with your signal man before starting.
- Be aware of the location of all persons in the working area.
- Attach a hand line to load and make sure person holding it is well away from load.
- Before lifting, test your load.
  1. Park your machine close to load.
  2. Attach load to the machine.
  3. Raise load 50 mm (2 in) above the ground.
  4. Swing the load all the way to one side.
  5. While keeping load close to the ground, move it away from machine.
  6. If there is any indication of reduced stability of your machine, lower load to the ground.
- Lift load only as high as necessary.



SA-014

## OPERATING THE MACHINE

### OBJECT HANDLING --- IF EQUIPPED

**⚠ WARNING:** When using machine for object handling operation, be sure to comply with EN 474-5, which prescribes that the machine must be equipped with the rated lifting-load table, lifting hook, overload alarm device, and hose rupture safety valve when applied to object handling.

Lifting hook, cables, straps, or ropes can break, causing serious injury. Do not use damaged chains, lifting hook, frayed cables, slings, straps, or ropes to crane.

Never move the load suddenly. Never move load over a person's head. Do not allow any persons near load.

Keep all persons away from raised load until blocks are supporting it or load is sitting on the ground.

Position upperstructure so that the travel motors are at the rear.

Do not attach sling/chain to the bucket teeth.

Be sure that the maximum lifting load does not exceed the rated load as shown in the lifting load table plate or operator's manual.

The overload alarm device warns the operator with a buzzer sound when the lifting load exceeds the lifting capacity. If the buzzer sounds, immediately move the load into the safety range, or lower the load on the ground.

Be sure to turn the overload alarm device switch ON while the machine is used for object handling.

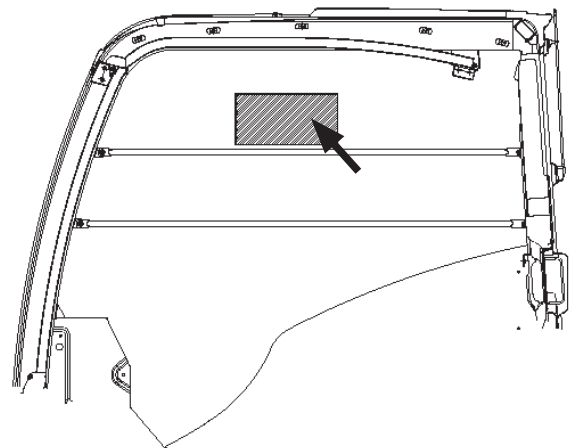
When the machine specifications are modified from the original specifications of the machine delivered, for example, changing the front attachment or track shoes, changing or new installing the overload alarm device may be require. Be sure to consult your authorized Hitachi dealer.

Check that the specifications of the front and machine to be used meet the specifications shown on the rated lifting load table. If any discrepancies between them are found, replace the rated lifting load table so that no discrepancy is found.

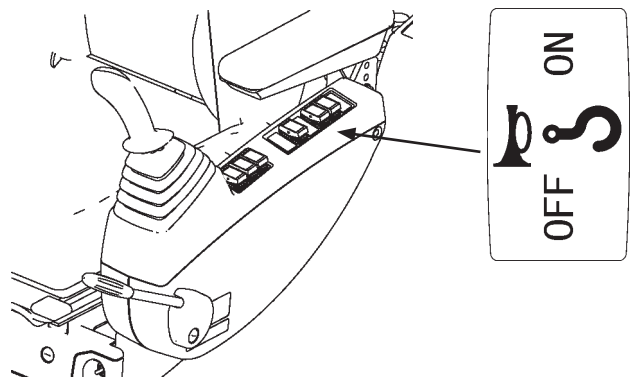


Rated lifting load table

SA-014



M1U1-05-004



T1V1-05-02-004

M1U1-01-010

## OPERATING THE MACHINE

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1. Secure sling/chain tightly to the load being lifted. Wear gloves when securing sling/chain.
2. Fasten sling/chain to bucket loop, with the bucket curled and arm retracted.
3. Coordinate hand signals with your signal man before starting.
4. Be aware of the location of all persons in the working area.
5. Attach a hand line to load and make sure person holding it is well away from load.
6. Before lifting, test your load.
  - Park your machine close to load.
  - Attach load to the machine.
  - Raise load 50 mm above the ground.
  - Swing the load all the way to one side.
  - While keeping load close to the ground, move it away from machine.
  - If there is any indication of reduced stability of your machine, lower load to the ground.
7. Lift load only as high as necessary.

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## TRANSPORTING

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### TRANSPORTING BY ROAD

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

- When transporting using a trailer, check the width, height, length and weight of the trailer with the machine loaded. Note that transporting the weight and dimensions may vary depending on the type of shoe or front attachments installed.
- Investigate beforehand the conditions of the route to be traveled, such as dimensional limits, weight limits, and traffic regulations.



M111-06-029

In some cases, disassemble the machine to bring it within dimensional limits or weight limits of local regulations.

### LOADING/UNLOADING ON A TRAILER

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

**⚠ WARNING: Be sure to use a loading dock or a ramp for loading/unloading. Never load or unload the machine onto or off a truck or trailer using the front attachment functions when driving up or down the ramp.**

#### Ramp/Loading Dock:

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

## TRANSPORTING

### Loading/Unloading

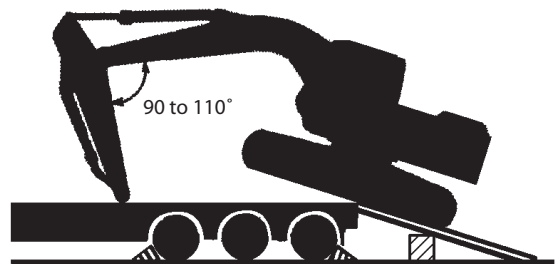


#### WARNING:

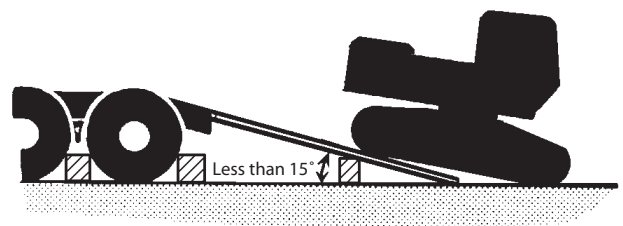
- Always turn the auto-idle/acceleration switch OFF and the power mode switch OFF when loading or unloading the machine, to avoid unexpected speed increase due to unintentional operation of a control lever.
- Always select the slow speed mode with the travel mode switch. In the fast speed mode, travel speed may automatically increase.
- NEVER steer while driving up or down a ramp as it is extremely dangerous. If repositioning is necessary, first move back to the ground or flatbed, modify traveling direction, and begin to drive again.
- The top end of the ramp where it meets the flatbed is a sudden bump. Take care when traveling over it.
- Prevent possible injury from machine tipping while the upperstructure is rotating. Keep the arm tucked under and rotate the upperstructure slowly for best stability.

### Loading

1. The machine direction should be as follows:  
With the front attachment: Travel forward with the front attachment at the front.  
Without the front attachment: Travel in reverse, as illustrated.
2. The centerline of the machine should be over the centerline of the trailer.
3. Drive the machine onto the ramp slowly.  
With the front attachment:
  - Position the bucket with its flat surface resting on the trailer. Angle of the arm to boom should be 90 to 110°.
  - Rest the bucket on the trailer just before the machine begins to tip forward onto the trailer. Slowly travel forward until the tracks are firmly on the trailer.
  - Slightly raise the bucket. Keeping the arm tucked under, slowly rotate the upperstructure 180°.
  - Lower the bucket onto blocks.



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## TRANSPORTING

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4. Stop the engine. Remove key from switch.
5. Move the control levers several times until hydraulic pressure in the cylinders is released.
6. Pull pilot control shut-off lever to LOCK position.
7. Close cab windows, roof vent and door, and cover the exhaust opening, to prevent entry of wind and water.

 *NOTE: In cold weather, be sure to warm up the machine before loading or unloading it.*

## TRANSPORTING

### Transporting

**WARNING:** Fasten chains or cables to the machine frame. Do not place chains or cables over or against the hydraulic lines or hoses.

1. Place blocks in front of and behind the tracks.
2. Fasten each corner of the machine and front attachment to the trailer with a chain or cable.



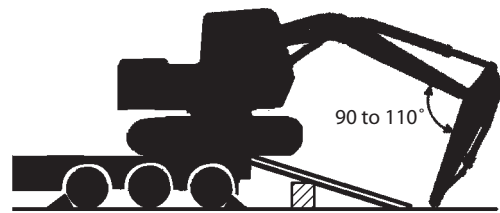
M1V1-06-002

### Unloading

**WARNING:** The rear end of the flatbed where it meets the ramp is a sudden bump. Take care when traveling over it.

**IMPORTANT:** Prevent possible damage to the front attachment. Always position the arm at 90° to the boom when unloading the machine. Unloading the machine with the arm tucked in may cause machine damage.

1. To move the machine over end of the trailer onto the ramp, rest the flat surface of the bucket on the ground. Angle of the arm to the boom should be 90 to 110°.



M111-06-034

**IMPORTANT:** Prevent possible damage to the hydraulic cylinders. Do not allow the machine to hit the ground hard with the bucket.

2. The bucket must be on the ground before the machine begins to tip forward.
3. As the machine moves forward, raise the boom and extend the arm until the machine is completely off the ramp.



M111-06-035



## TRANSPORTING

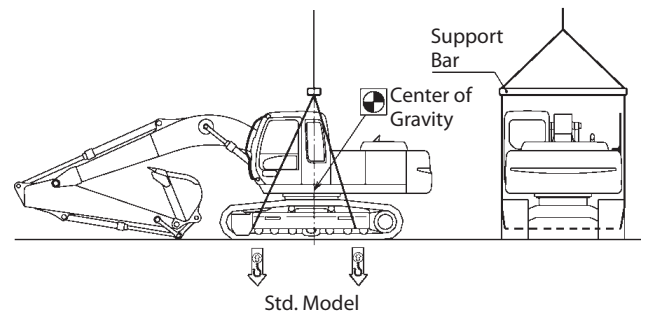
### MACHINE LIFTING PROCEDURE



#### WARNING:

- Lifting wire ropes and other lifting tools can break, possibly causing serious personal injury. Do not use damaged or deteriorated wire ropes or lifting tools.
- Be sure to contact your authorized dealer for correct lifting procedure, and size and kinds of lifting wire ropes and lifting tools.
- Pull the pilot control shut-off lever to the LOCK position so that the machine does not accidentally move while being lifted.
- Incorrect lifting procedure and/or incorrect wire rope attachment will cause the machine to move (shift) while being lifted, resulting in machine damage and/or personal injury.
- Do not lift the machine quickly. Excessive load will be applied to the lifting wire ropes and/or lifting tools, possibly causing them to break.
- Do not allow anyone to come close to or under the lifted machine.
- The indicated gravity center is for the standard specification machine. The gravity center will vary depending on the kinds of attachments and/or optional equipment to be installed or their position to be taken. Therefore, take care not to lose the balance of the machine while lifting.

1. Fully extend the arm and bucket cylinders. Lower the boom until the bucket comes in contact with the ground.
2. Pull the pilot control shut-off lever to the LOCK position.
3. Stop the engine. Remove the key from the key switch.
4. Use wire ropes and support bar of sufficient length so that they do not come in contact with the machine while lifting.  
Wrap some protectors around wire ropes and/or support bar as required to prevent the machine from being damaged.
5. Drive a crane to an appropriate position for lifting.
6. Thread the wire rope through and under both sides of the track frames as illustrated. Attach the wire ropes to the crane.



M1G6-06-001



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## MAINTENANCE

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### CORRECT MAINTENANCE AND INSPECTION PROCEDURES

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

Inspect machine daily before starting.

- Check controls and instruments.
- Check coolant, fuel and oil levels.
- Check for leaks, kinked, frayed or damaged hoses and lines.
- Walk around machine checking general appearance, noise, heat, etc.
- Check for loose or missing parts.

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

- IMPORTANT:**
- **Use only recommended fuel and lubricants.**
  - **Be sure to use only genuine Hitachi parts. Failure to do so may result in serious injury or death and/or machine breakdown.**
  - **Use only genuine HITACHI parts.**
  - **Failure to use recommended fuel, lubricants, and genuine Hitachi parts will result in loss of Hitachi product warranty.**
  - **Never adjust engine governor or hydraulic system relief valve.**
  - **Protect electrical parts from water and steam.**
  - **Never disassemble electrical components such as main controller, sensors, etc.**



SA-005

## MAINTENANCE

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

### CHECK THE HOUR METER REGULARLY

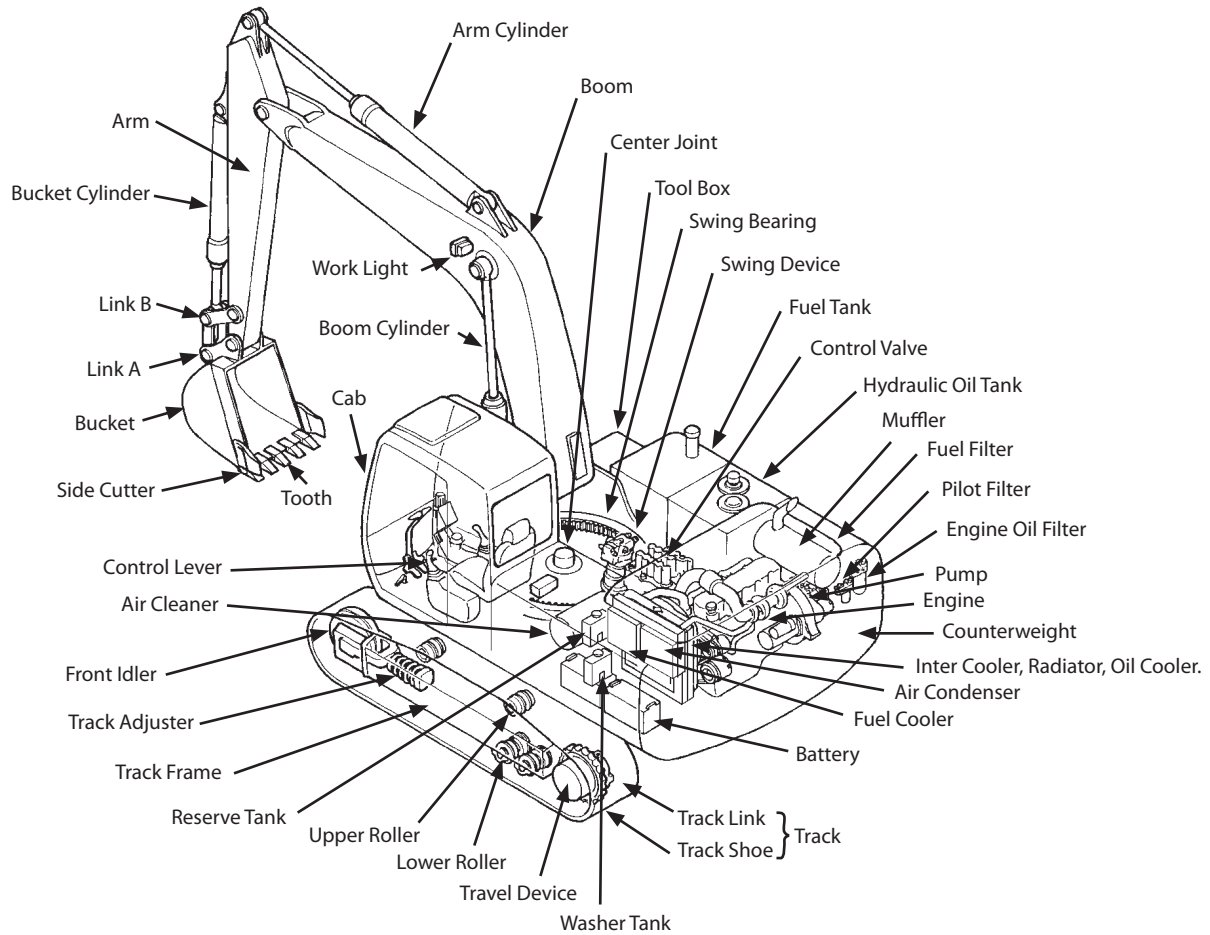
- Intervals on the periodic maintenance chart are for operating in normal conditions. If you operate your machine in more adverse conditions, you should service it at SHORTER INTERVALS.
- Lubricate, make service checks and adjustments at intervals shown on periodic maintenance guide table (see page 7-4 and 7-5).

### USE CORRECT FUELS AND LUBRICANTS

**IMPORTANT: Always use recommended fuels and lubricants.  
Failure to do so will result in machine damage and loss of Hitachi product warranty.**

# MAINTENANCE

## LAYOUT












M1U1-01-005

## MAINTENANCE

### MAINTENANCE GUIDE TABLE

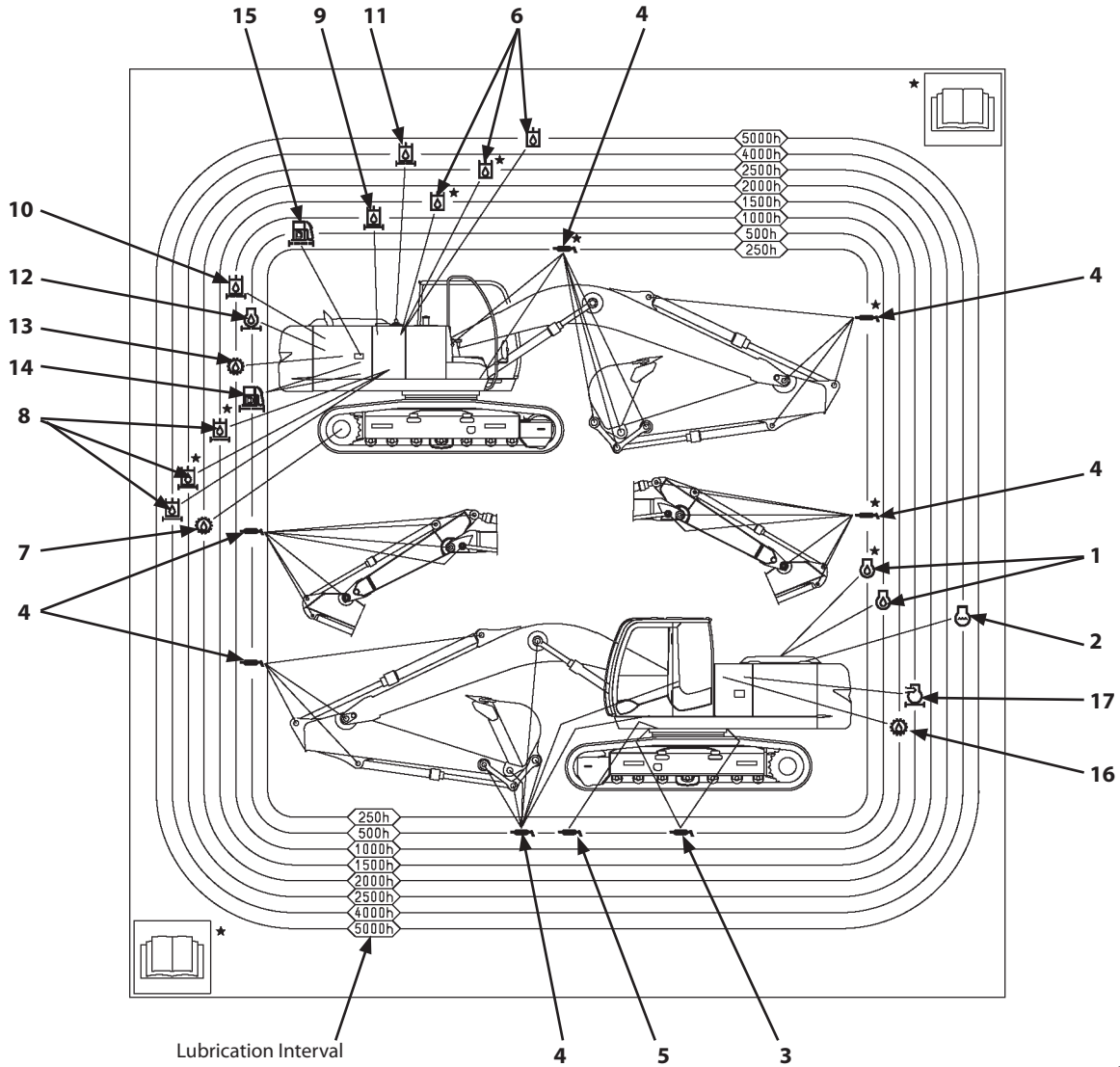
The maintenance guide table is affixed to the reverse side of the tool box cover. Lubricate and/or service the parts at the intervals as instructed in the table so that all necessary maintenance can be performed regularly.

- **Symbol Marks**  
The following marks are used in the maintenance guide table.

	Grease (Front Joint Pin, Swing Bearing, Swing Gear)		Hydraulic Oil Filter (Pilot Filter, Hydraulic Oil Tank Filter, Suction Filter)
	Gear Oil (Travel Reduction Device, Swing Reduction Device)		Air Cleaner Element
	Engine Oil		Coolant (Long-Life Coolant)
	Engine Oil Filter		Fuel Filter (Fuel Filter Cartridge)
	Hydraulic Oil		

# MAINTENANCE

**Maintenance Guide Table (ZAXIS400LCH-3)**



M1G6-07-012

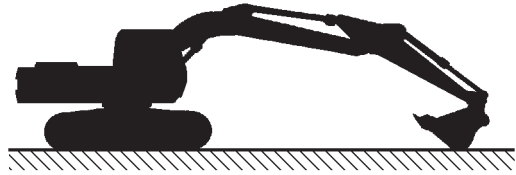
Item	Page	Item	Page
1 Engine Oil	7-18	10 Hydraulic Oil Filter (Pilot)	7-33
2 Coolant (Long-Life Coolant)	7-53	11 Hydraulic Oil Filter (Air Breather)	7-34
3 Grease	7-16	12 Engine Oil Filter	7-19
4 Grease	7-14	13 Gear Oil (Pump Transmission)	7-21
5 Grease	7-17	14 Fuel Filter (Main/Pre)	7-47
6 Hydraulic Oil	7-28	15 Fuel Solenoid Pump Strainer	7-49
7 Gear Oil (Travel Device)	7-23	16 Gear Oil (Swing Device)	7-22
8 Hydraulic Oil Filter (Suction)	7-29	17 Air Cleaner Element	7-51
9 Hydraulic Oil Filter (Main)	7-32		

## MAINTENANCE

### PREPARE MACHINE FOR MAINTENANCE

Before performing the maintenance procedures given in the following chapters, park the machine as described below, unless otherwise specified.

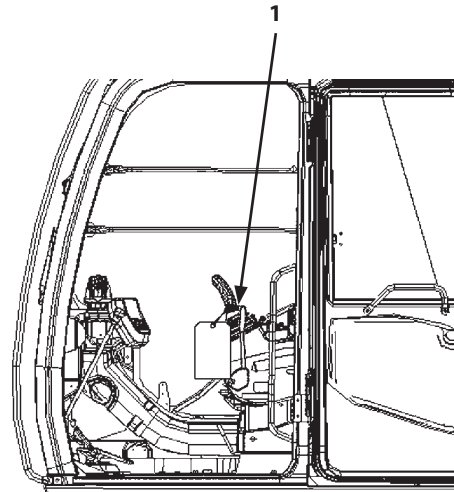
1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle/auto acceleration selector switch off.



M104-07-021

**IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.**

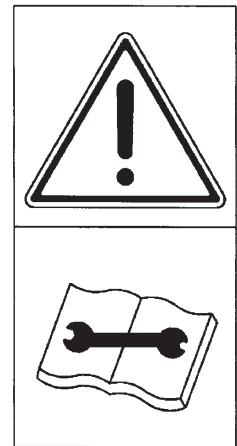
4. Run the engine at slow idle speed without load for five minutes.
5. Turn the key switch OFF. Remove key from switch. (If maintenance must be performed with engine running, do not leave machine unattended.)
6. Pull the pilot control shut-off lever (1) to the LOCK position.
7. Before performing any work on the machine, attach a tag on the right control lever.



M1V1-07-001



SS3076175



SS2045102



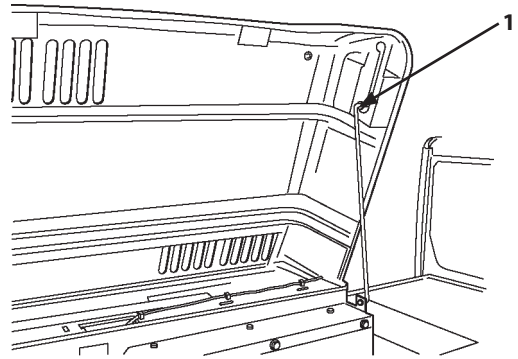
# MAINTENANCE

## HOOD AND ACCESS COVERS



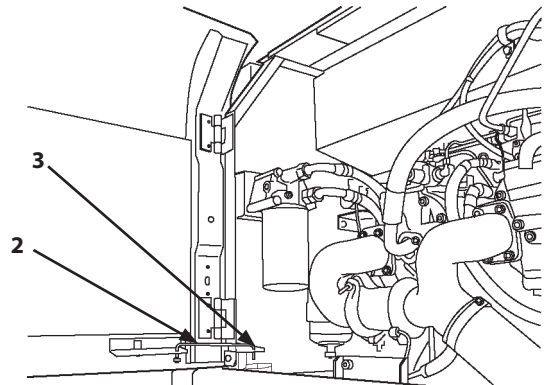
### WARNING:

- Do not keep the hood and access covers open when the machine is parked on a slope, or while the wind is blowing hard. The hood or access covers may close accidentally, possibly resulting in personal injury.
  - When opening or closing the hood and access covers, take extra care not to catch fingers between the base machine and the hood or access covers.
- 
- Remove locks (2 used) to open the engine access cover. Holding the handle on the access cover, raise the cover until the cover is secured with catch (1).
  - After opening the right and/or left access cover, be sure to insert rod (2) into cover lock hole (3) to hold the cover.
  - When opening the rear left cover, open the front left cover first. Then, pull to open the rear left cover as illustrated.



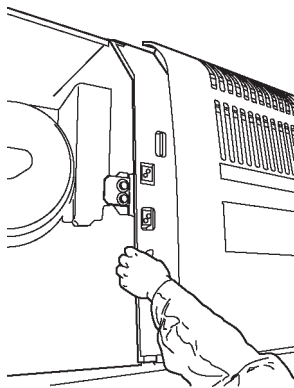
Engine Cover

M1U1-07-030



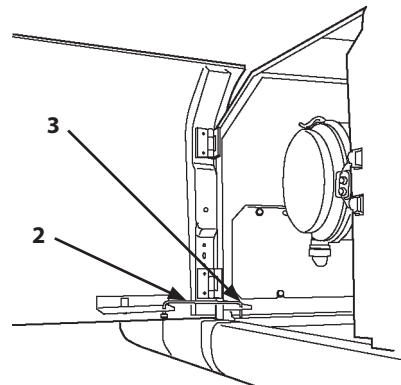
Right Cover

M1U1-07-032



Rear Left Cover

M1U1-07-033



Front Left Cover

M1U1-07-031

## MAINTENANCE

### PERIODIC REPLACEMENT OF PARTS

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

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

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

Consult your authorized dealer for correct replacement.

Periodic Replacement Parts		Replacement Intervals	
Engine	Fuel hose (Fuel tank to Supply pump)	Every 2 years	
	Oil filter hose (Engine to oil filter)	Every 2 years	
	Heater hose (Heater to engine)	Every 2 years	
Hydraulic System	Base Machine	Pump suction hose	Every 2 years
		Pump delivery hose	Every 2 years
		Swing hose	Every 2 years
		Travel high pressure hose	Every 2 years
	Front Attachment	Boom cylinder line hose	Every 2 years
		Arm cylinder line hose	Every 2 years
		Bucket cylinder line hose	Every 2 years
Seat belt		Every 3 years	


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

# MAINTENANCE

## MAINTENANCE GUIDE


### A. GREASING (ZAXIS400R-3)(See Page 7-14)

Parts		Quantity	Interval (hours)						
			10	50	100	250	500	1000	2000
1. Front Joint Pins	Bucket and Link Pins	8	★						
	Others	11	★						
2. Swing Bearing		2							
3. Swing Internal Gear		1					★★		

-  **NOTE:** ★ Grease every 10 hours for first 100 hours.  
Maintenance required when operating in water or mud.
- ★★ Check and add grease.

### (ZAXIS400LCH-3)

Parts		Quantity	Interval (hours)						
			8	50	100	250	500	1000	2000
1. Front Joint Pins	Bucket and Link Pins	9	★			★★			
	Others	11	★			★★			
2. Swing Bearing		2							
3. Swing Internal Gear		1					★★★		


-  **NOTE:** ★ Maintenance required when operating in the water or mud and under extremely severe condition.
- ★★ Maintenance required only during first time check.
- ★★★ Check and add grease.

**IMPORTANT: Grease all front attachment joint pins every day until break-in operation of 50 hours is complete. Grease the two bucket joint pins every 250 hours of operation when the following type buckets are used:**

- (1) Genuine Hitachi hoe buckets for use of the Hitachi excavator model 5 or before.
- (2) Buckets other than genuine Hitachi hoe buckets.

### B. ENGINE (See Page 7-29)

Parts		Quantity	Interval (hours)						
			8	50	100	250	500	1000	2000
1. Engine Oil	Oil Level Check	-							
2. Engine Oil	Change	41.0 L (10.8 US gal)				★			
3. Engine Oil Filter	Replacement	1				★			

-  **NOTE:** ★ Change 250 operating hours, if the content of sulfur of fuel is 2000 ppm or more.  
Consult your nearest Hitachi dealer for the details.


### C. TRANSMISSION (See Page 7-32)

Parts		Quantity	Interval (hours)						
			8	50	100	250	500	1000	2000
1. Pump Transmission	Oil Level Check	1							
	Change	1.4 L (1.5 US qt)							
2. Swing Reduction Gear	Oil Level Check								
	Change	17.0 L (4.5 US gal)							
3. Travel Reduction Gear	Oil Level Check	2							
	Change	11.0 L x2 (2.9 US gal x2)							

## MAINTENANCE

### D. HYDRAULIC SYSTEM (See Page 7-36)

Parts		Quantity	Interval (hours)											
			8	50	100	250	300	500	1000	1500	2500	5000		
1. Check Hydraulic Oil Level		1												
2. Change Hydraulic Oil		298 L (78.7 US gal)								*	*	*	*	
3. Suction Filter Cleaning		1	When changing hydraulic oil											
4. Replace Hydraulic Tank Oil Filter	Std. Model	1						*	*					
	K Model	1					★							
5. Replace Pilot Oil Filter		1												
6. Replace Air Breather Element		1												
7. Check Hoses and Lines	for leaks	–												
	for cracks, bend, etc.	–												

 **NOTE:** \* Hydraulic oil changing interval differs according to the kind of hydraulic oil used. See recommended oil chart.

★ Change at an interval of every 300 hours.

### E. FUEL SYSTEM (See Page 7-52)

Parts		Quantity	Interval (hours)							
			8	50	100	250	500	1000	2000	
1. Drain Fuel Tank Sump		1								
2. Check Water Separator		1	Check daily before working							
3. Replace Main Fuel Cartridge Filter		1								
4. Replace Pre-Fuel Cartridge Filter		1								
5. Clean Fuel Solenoid Pump Strainer		1								
6. Check Fuel Hoses	for leaks, cracks, etc.	–								
	for cracks, bend, etc.	–								


### F. AIR CLEANER (See Page 7-63)

Parts		Quantity	Interval (hours)							
			8	50	100	250	500	1000	2000	
1. Air Cleaner Outer Element	Cleaning	1	(Or when indicator lit)							
	Replacement	1	After cleaning 6 times or 1 year							
2. Air Cleaner Inner Element	Replacement	1	When outer element is replaced							

## MAINTENANCE

### G. COOLING SYSTEM (See Page 7-65)

Parts		Quantity	Interval (hours)						
			8	50	100	250	500	1000	2000
1. Check Coolant Level		1							
2. Check and Adjust Fan Belt Tension		1		★★					
3. Change Coolant		32 L (8.5 US gal)	Twice a year * <sub>1</sub>						
4. Clean Inter Cooler, Oil Cooler and Radiator Core	Outside	1					* <sub>2</sub>		
	Inside	1	Once a year						
5. Clean Oil Cooler Front Screen		1					* <sub>2</sub>		
6. Clean Air Conditioner Condenser		1					* <sub>2</sub>		
7. Clean Inter Cooler Front Screen		1					* <sub>2</sub>		
8. Clean Air Conditioner Front Screen (Opt.)		1					* <sub>2</sub>		

 **NOTE:** ★★ Maintenance required only during first time check.  
 \*<sub>1</sub> Change every two years or 4000 operating hours, whichever comes first.  
 \*<sub>2</sub> Shorten the maintenance interval when the machine is operated in dusty areas.

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

### H. ELECTRICAL SYSTEM (See Page 7-71)

Parts		Quantity	Interval (hours)					
			8	50	100	250	500	1000
1. Battery	Level Check	2	Every month					
	Specific Gravity	2	Every month					
2. Replace Fuse		—	As required					

### I. MISCELLANEOUS (See Page 7-77)

Parts		Quantity	Interval (hours)							
			8	50	100	250	500	1000	2000	4000
1. Check Bucket Teeth for Wear and Looseness		—								
2. Change Bucket		—	As required							
3. Adjust Bucket Linkage		1	As required							
4. Remove Travel Levers		2	As required							
5. Check and Replace Seat Belt		1		Every 3 years (Replace)						
6. Check Windshield Washer Fluid Level		1	As required							
7. Check Track Sag		2								
8. Check Air Conditioner Filter	Circulating Air Filter	Cleaning	1							
		Replacement	1	After cleaning 6 times or one year						
	Fresh Air Filter	Cleaning	1							
		Replacement	1	After cleaning 6 times or one year						
9. Check Air Conditioner		—								
10. Clean Cab Floor		—	As required							
11. Retighten Cylinder Head Bolt		—	*As required							
12. Inspect and Adjust Valve Clearance		—					*			
13. Check Fuel Injection Timing		—	*As required							
14. Measure Engine Compression Pressure		—					*			
15. Check Starter and Alternator		—					*			
16. Check Water Pump		—								*
17. Check Tightening Torque of Bolts and Nuts		—		★★★						

 **NOTE:** ★★★ Maintenance required only during first time check.  
 \* Contract your authorized dealer for maintenance.

## MAINTENANCE

Brand Names of Recommended Grease

Where to be applied	Bucket, Arm and Boom, Swing Gear, Swing Bearing, etc.	
Manufacturer	-20 to 40 °C (-4 to 104 °F)	
Nippon Koyu	SEP 2	*1
British Petroleum	BP Energrease	LS-EP2
Caltex Oil	Multifax	EP2
Esso	Beacon	EP2
Idemitsu Kosan	Daphne Coronex Grease	EP2
Mobil Oil	Mobilux	EP2
Nippon Oil	Epinoc Grease	AP2
Shell Oil	Shell Alvania	EP2 *2

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

- \*1 Front Joint Pin and Swing Bearing
- \*2 Swing Gear

### Recommended Engine Oil

**IMPORTANT:** Use only genuine Hitachi engine oil as shown below or engine oil equivalent to DH-1 specified in JASO. 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 nearest Hitachi dealer for the unclear points.

Brand Names of Recommended Engine Oil

Kind of Oil	Engine Oil		
Application	Engine Crank Case		
Air Temp.	-20 to 30 °C (-4 to 86 °F)	-15 to 40 °C (5 to 104 °F)	
Manufacturer			JASO
Hitachi	Super wide DH-1 10W-30	Super wide DH-1 15W-40	DH-1

## MAINTENANCE

### Brand Names of Recommended Oil

Application	Swing and Travel Reduction Gear		Pump Transmission		
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 5px;">Kind of Oil</div> <div style="margin-bottom: 5px;">Air Temp.</div> </div>	Gear oil		Engine Oil		
	-20 to 40 °C (-4 to 104 °F)		-20 to 40 °C (-4 to 104 °F)	-10 to 35 °C (14 to 95 °F)	-25 to 40 °C (77 to 104 °F)
Manufacturer	BP Gear oil	SAE80W-90	/	BP Vanellus C3	
British Petroleum				30	40
Caltex Oil	Thuban	SAE 90	/	RPM DELO 300 Oil	
				30	40
Esso	Esso Gear Oil	GP80W-90	/	Essolube D-3	
				30	40
Idemitsu Kosan	Apollo Gear	HE90	Apoloil super wide 15W-40	Apoloil diesel motive	
				S-330	S-340
Mobil Oil	Mobilube	GX80W-90	/	Mobil Delvac	
				1330	1340
Nippon Oil	Gear Lube SP90	*2	15W-40 *1	Hidiesel S3	
				-20 to 35 °C (-4 to 95 °F)	/
				10W-30	
Shell Oil	Shell Spirax	EP90	Rymla D		
				30	40
Remarks	API GL 4 Class		API CD Class		

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

\*1 Engine oil for pump transmission

\*2 Gear oil for swing and travel reduction device.

### Brand Names of Recommended Hydraulic Oil

Kind of Lubricant	Hydraulic Oil					
Where to be applied	Hydraulic System					
Change Interval	5000 hours		2500 hours		1500 hours	
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 5px;">Environmental</div> <div style="margin-bottom: 5px;">Temp.</div> </div>	-20 to 40°C (-4 to 104°F)	-10 to 40°C (14 to 104°F)	-20 to 40°C (-4 to 104°F)	-10 to 40°C (14 to 104°F)	-20 to 40°C (-4 to 104°F)	-10 to 40°C (14 to 104°F)
	Manufacturer	Super EX 46HN		Super Hydro 46 WRHU		Bartran HV46
Hitachi						
Idemitsu Kosan						
British Petroleum						
Caltex Oil					Rando Oil HD46	
Texaco INC.					Rando Oil HD46	
Chevron U.S.A INC.					Chevron AW46	
Esso					NUTO H46	
Mobil Oil					DTE 25	
Shell Oil			Tellus Oil S46		Tellus Oil 46	
Remarks	Anti-wear type hydraulic oil					

**NOTE:** Use proper hydraulic oil in accordance with the atmospheric temperature.

The machine shipped from the factory is filled with oil marked   .

When the atmospheric temperature is between -40°C and +20°C: Use the proper hydraulic oil having high and low temperature characteristics by referring to the values shown below.

Low Temperature Viscosity: Less than 4000cSt at -40°C

High Temperature Viscosity: More than 6.5cSt at +80°C

The above values are approximately equivalent to ISO viscosity grade #22. However, low temperature viscosity will differ depending on each product. Contact each hydraulic oil manufacture directly.

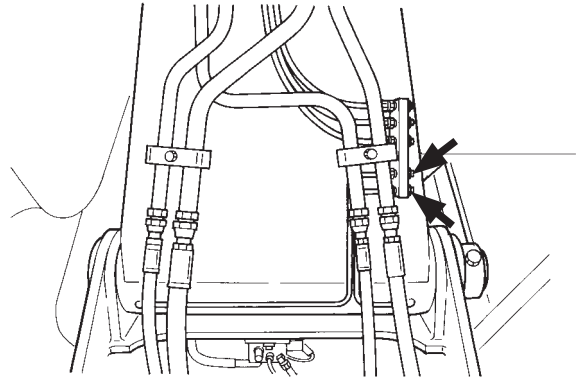
When the atmospheric temperature is below -40°C: Contact your authorized dealer.

# MAINTENANCE

## A. GREASING

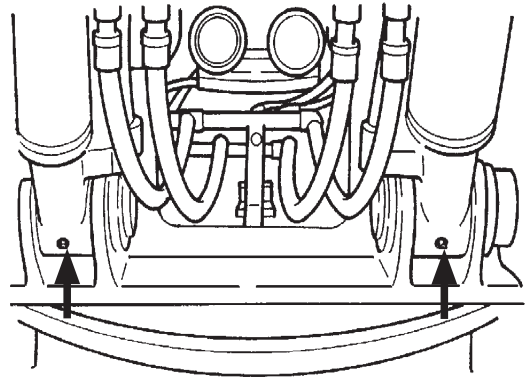
### 1 Front Joint Pins (ZAXIS400R-3) --- every 50 hours

- Boom Foot



M157-07-155

- Boom Cylinder Bottom



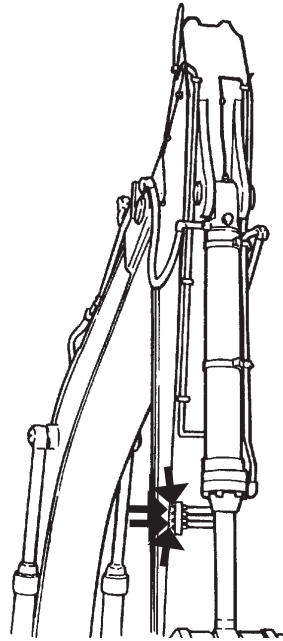
M157-07-156



## MAINTENANCE

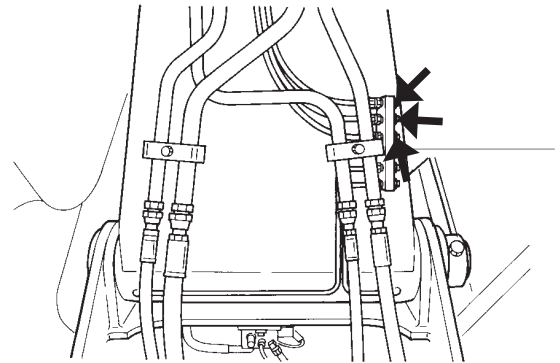
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- Boom and Arm Joint Pin, Arm Cylinder Rod Pin and Bucket Cylinder Bottom Pin



M111-07-008

- Boom Cylinder Rod Pins and Arm Cylinder Bottom Pin

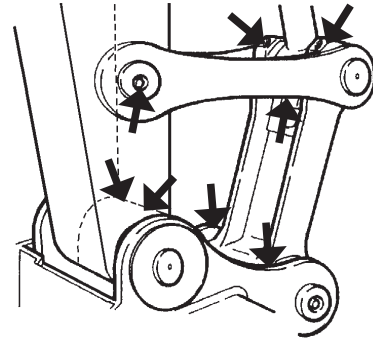


M157-07-155

## MAINTENANCE

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- Bucket and Link Pin  
Grease every 10 hours.

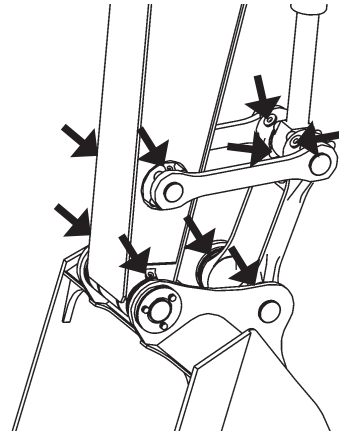


M162-07-002

## MAINTENANCE

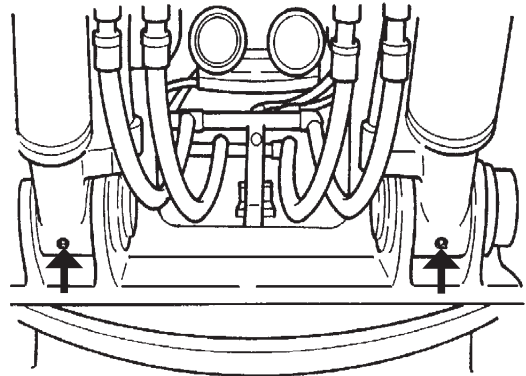
### 1 Front Joint Pins (ZAXIS400LCH-3) --- every 500 hours

Apply grease to all grease fittings as illustrated.



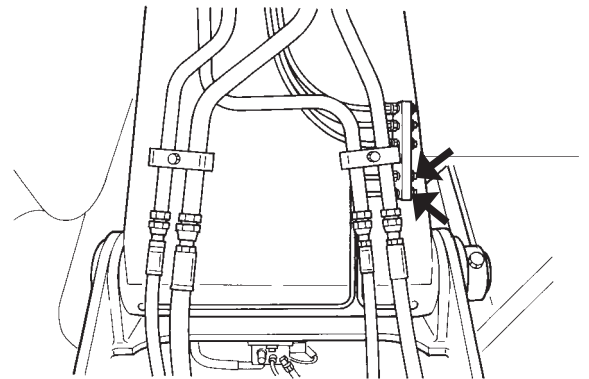
M178-07-007

- Boom Cylinder Bottom End



M157-07-156

- Boom Foot

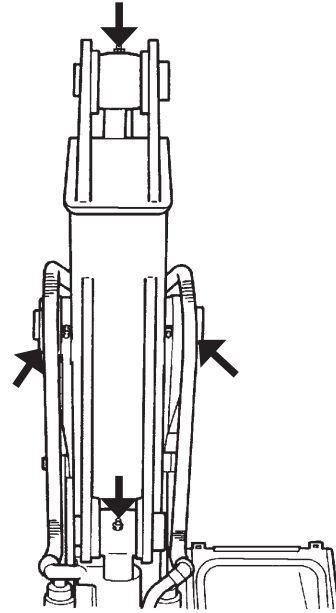


M157-07-155

## MAINTENANCE

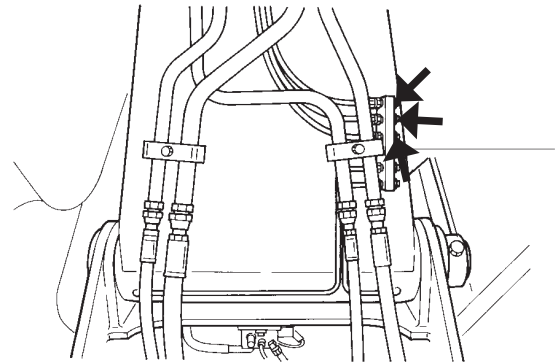
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- Boom and Arm Joint Pin, Arm Cylinder Rod Pin and Bucket Cylinder Bottom Pin



M157-07-157

- Boom Cylinder Rod Pins and Arm Cylinder Bottom Pin



M157-07-155

## MAINTENANCE

### 2 Swing Bearing --- every 500 hours



**CAUTION:** Lubricating both the swing bearing and gear and rotating the upperstructure must be done by one person. Before you lubricate the swing bearing, clear the area of all persons.

Each time you leave the cab

- Lower the bucket to the ground.
- Stop the engine.
- Pull the pilot control shut-off lever to the LOCK position.
- Use handrails.

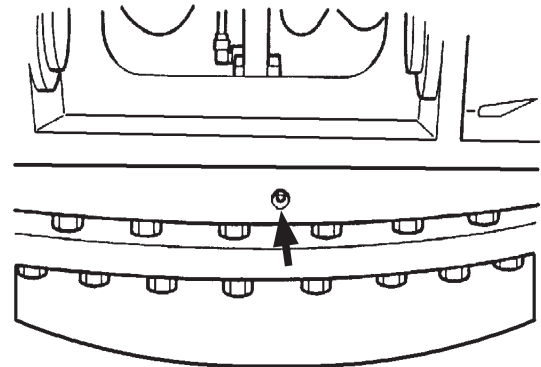
1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

**IMPORTANT:** The turbocharger may be damaged if the engine is not properly shut down.

4. Run the engine at slow idle speed without load for five minutes.
5. Turn the key switch OFF. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.
7. With the upperstructure stationary, apply grease via the two grease fittings.
8. Start the engine. Raise the bucket several inches off the ground and rotate the upperstructure 45° (1/8 turn).
9. Lower the bucket to the ground.
10. Repeat the procedure three times, beginning with step 3.
11. Apply grease to the swing bearing until grease can be seen escaping from the swing bearing seals.

Model	Capacity
ZAXIS400R-3, 400LCH-3	0.40 L

12. Take care not to supply excessive grease.



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## MAINTENANCE

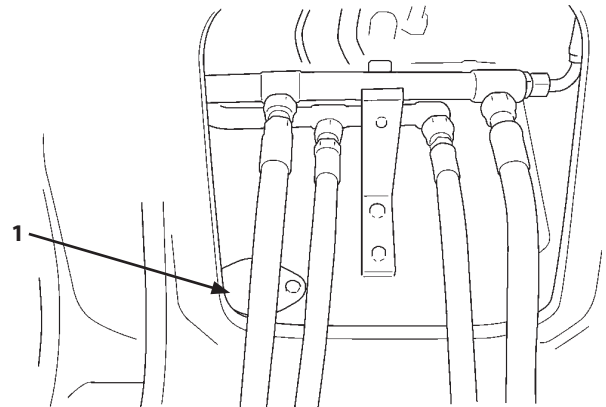
### 3 Swing Internal Gear --- every 500 hours



**CAUTION:** Adding or changing swing internal gear grease and rotating the upperstructure must be done by one person. Before you start, clear the area of all persons.

Each time you leave the cab

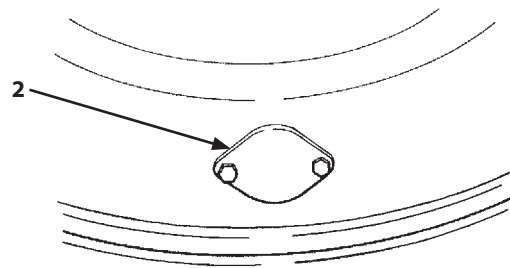
- Lower the bucket to the ground.
- Stop the engine.
- Pull the pilot control shut-off lever to the LOCK position.
- Use handrails.



M178-07-008

1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

**IMPORTANT:** The turbocharger may be damaged if the engine is not properly shut down.



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4. Run the engine at slow idle speed without load for five minutes.
5. Turn the key switch OFF. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.
7. Open the tool box cover on the upperstructure and remove cover (1).
8. Grease must be to the top of all internal gear teeth of the swing bearing and be free of contamination. Add approximately 0.5 kg of grease, if required. If the grease is contaminated, remove grease and replace with clean grease.

**IMPORTANT:** If water or mud is found in the swing gear area, see **Operating in Water or Mud** in the "Driving the Machine" section.

9. Install the cover.
10. If grease shows any sign of water or mud, replace all the grease on the internal gear. Remove cover (2) from the bottom of the swing gear housing, located near the center joint.


Model	Capacity
ZAXIS400R-3, 400LCH-3	19 L (5.0 US gal)


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## MAINTENANCE

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### ELECTRIC GREASE GUN

 **CAUTION:** The electric grease gun is not a water-proof type. Don't expose the grease gun to rain and water. Refrain from using the grease gun while raining. Failure to do so may cause unexpected trouble such as an electricity leak. No specified daily maintenance is required. Take care not to collide the gun, the motor section especially, with an other object, or not to leave the gun dirty. Failure to do so may result in unexpected injury such as an electric shock. Be sure to keep the electric grease gun clean by wiping off after use. If left contaminated, the grease gum may slip out of your hand, possibly causing a foot injury.

 **WARNING:** Never operate electric grease gun in explosive atmosphere. Electric power tool can create sparks which may ignite flammable liquids, dust or fumes. Do not use battery charger in damp or wet locations.

 **WARNING:** Grease gun can develop high pressure-up to 41.4 MPa (422 kgf/cm<sup>2</sup>). Use safety glasses and gloves for protection during operation.

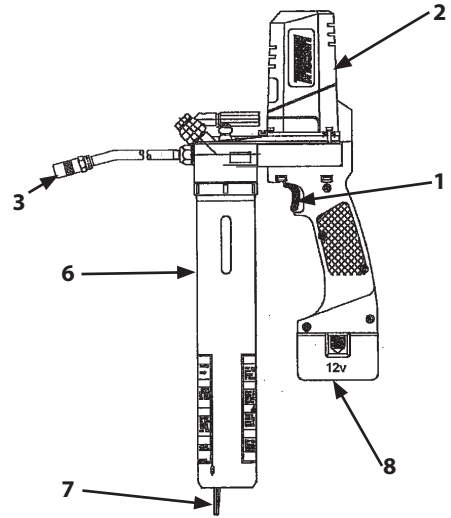
**IMPORTANT:**

- Do not continue to hold down trigger if grease gun is stalled. This could damage the motor or cause fire.
- When battery pack is not in use, keep it away from other metal objects like: paper clips, coins keys, nails, screws, or other small metal objects that can make a connection from one terminal to another. Shorting battery terminals together may cause sparks, burns, or fire.
- Use battery operated tool only with specifically designed battery pack. Use of any other batteries may create a risk of fire.

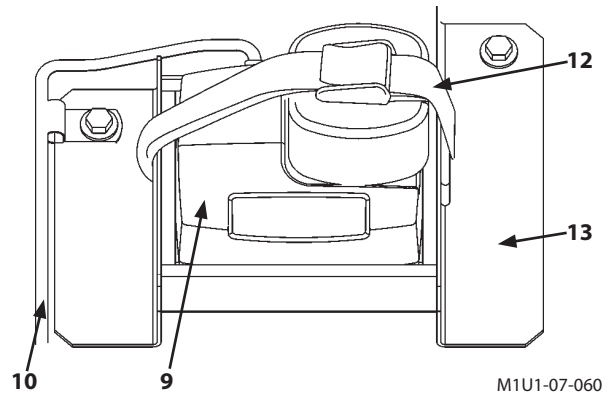
# MAINTENANCE

## Part Name

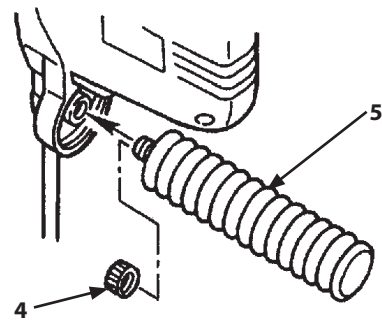
- 1- Switch
- 2- Motor Unit
- 3- Nozzle (CPN-2)
- 4- Cap
- 5- Grease Cartridge
- 6- Oil Cylinder
- 7- Chain
- 8- Battery
- 9- Battery Charger
- 10- Code
- 11- Plug
- 12- Band
- 13- Bracket



M16J-07-044



M1U1-07-060



M16J-07-043



## MAINTENANCE


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### CHARGER OPERATION

#### CHARGING THE BATTERY PACK GENERAL

Before using your electric grease gun for the first time, the battery pack should be charged for 12 hours. If the battery pack is installed in the electric grease gun, remove it by following instructions under INSTALLING OR REMOVING BATTERY PACK.

As a battery pack approaches the discharged state, you will notice a sharp drop in tool performance. When the tool is unable to perform the task at hand, it is time to recharge the battery pack. Recharging the battery pack before this condition is reached will reduce the total work life of the pack. Discharging the pack beyond this point can damage the pack.

 *NOTE: Battery temperature will increase during and shortly after use. Batteries may not accept a full charge if they are charged immediately after use. Allow the battery pack to cool to room temperature before charging for best result.*

 **CAUTION: Vent slots in top and bottom of charger must not be obstructed. Do not charge battery when temperature is BELOW 0 °C (32°F) or ABOVE 40 °C (104 °F).**

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## MAINTENANCE

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### **NORMAL CHARGING**

Make sure power circuit voltage is the same as that shown on the charger specification plate, Connect charger to power source.

The first charge should be for 12 hours before use. Insert battery pack into charger. The red light should glow indicating the battery is charging. After the red light goes out indicating a fully charged battery pack the green trickle charge light should glow indicating that the charger has switched to trickle charge mode. The battery pack may be left on the trickle charge until you are ready to use. Disconnect charger from power source when not in use.

### **INSTALLING OR REMOVING BATTERY PACK**

#### **TO REMOVE BATTERY PACK**

Depress the two battery release buttons (one button on each side of battery pack) and pull battery pack out of electric grease gun.

#### **TO INSTALL BATTERY PACK**

Align battery pack with opening in electric grease gun handle and push battery pack into handle until it locks in place.

### **POWER**

Insert the plug in the cigarette lighter socket of 12V or 24V outputs in the power supply of BATTERY CHARGER.

## MAINTENANCE

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- IMPORTANT:**
- To reduce the risk of injury, chargers should only be used to charge attached battery pack. Other types of batteries may burst causing personal injury and damage. Do not charge attached battery packs with any other charger.
  - Do not expose charger to rain, snow or frost.
  - Do not abuse cord. Never carry charger by cord or yank it to disconnect from receptacle. Pull by plug rather than cord when disconnecting charger. Have damaged or worn power cord and strain reliever replaced immediately. Do not operate charger with damaged cord or plug. **DO NOT ATTEMPT TO REPAIR POWER CORD.**
  - Do not disassemble charger or battery pack. Incorrect reassembly may result in risk of electrical shock or fire.
  - Do not incinerate battery pack. It can explode in a fire.
  - Do not attempt to charge any other cordless tool or battery pack with the charger.
  - Do not short across the terminals of the battery pack. **EXTERMELY HIGH TEMPERATURES COULD CAUSE PERSONAL INJURY OR FIRE.**
  - Dispose of expended batteries properly. The battery pack contains rechargeable, nickel cadmium batteries. These batteries must be recycled or disposed of properly. Drop off expended battery packs at your local replacement battery retailer, or your recycling center.

## MAINTENANCE

### Preparation

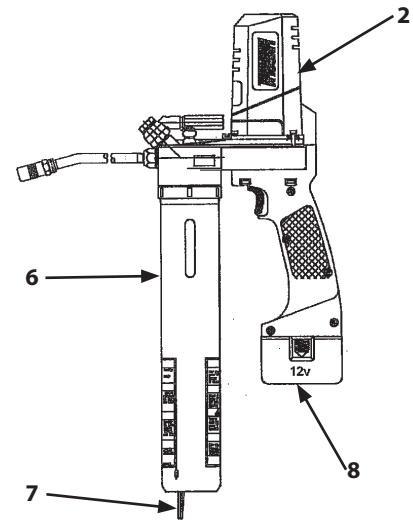
#### Install Cartridge Grease

**IMPORTANT: Take care not to allow soil and/or dust to become mixed into grease when installing grease cartridge (5).**

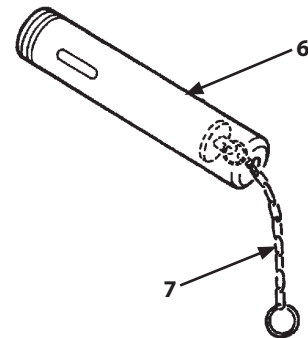
1. Rotate to remove oil cylinder (6) from motor unit (2).
2. Pull chain (7) all the way out of oil cylinder (6) and hang the chain on the notch on the bottom groove of oil cylinder (6).
3. Remove cap (4) from grease cartridge (5). Install grease cartridge (5) into the screw hole on motor unit (2).

**IMPORTANT: If grease cartridge (5) is diagonally or forcibly tightened, damage to the screw threads may result so that grease cartridge (5) may not be properly installed to motor unit (2).**

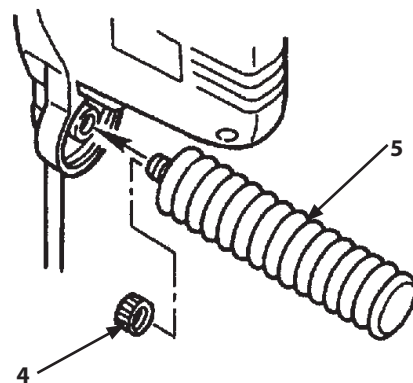
4. Install oil cylinder (6) in the original position on motor unit (2). Unhinge chain (7) from the notch.



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M16J-07-042




M16J-07-043

## MAINTENANCE


### Greasing

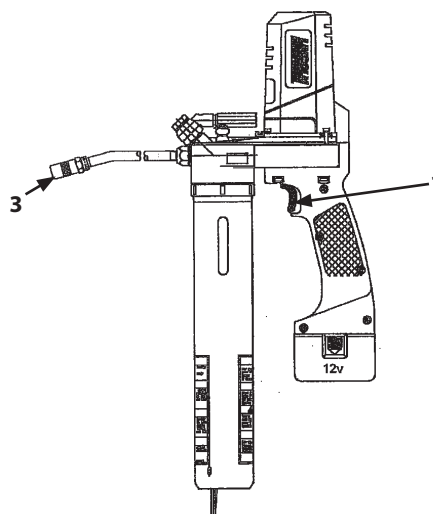
**IMPORTANT:** When grease is sufficiently supplied in a closed section, the motor speed becomes slow. Release switch (1) to end greasing. If grease is kept supplied further, seizure of the motor may result.

1. Pull switch (1) to drive the motor. Grease will be delivered from nozzle (3).

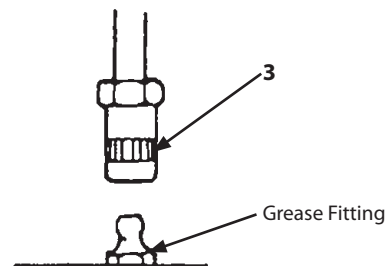
 **NOTE:** When using the grease gun first time, it takes time for air to be bled before grease is delivered.

2. After cleaning the grease fitting to be greased and the tip of grease gun nozzle (3), install the tip of nozzle (3) onto the grease fitting.
3. Pull switch (1) to supply grease. When grease is normally supplied, old grease will be pushed out of the clearances around the grease fitting.
4. After greasing is complete, bleed the pressure remaining in the grease gun by tilting the nozzle before disconnecting nozzle (3) from the grease fitting. A small amount of grease will spout at this moment.

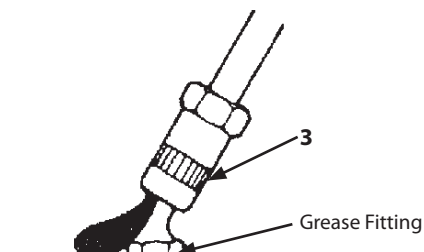
 **NOTE:** If the motor speed becomes extremely slow or stops, immediately release the switch. Since the grease gun operates at high speed, a small amount of grease may leak from the plunger. However, this is not a failure.



M16J-07-044



M16J-07-045



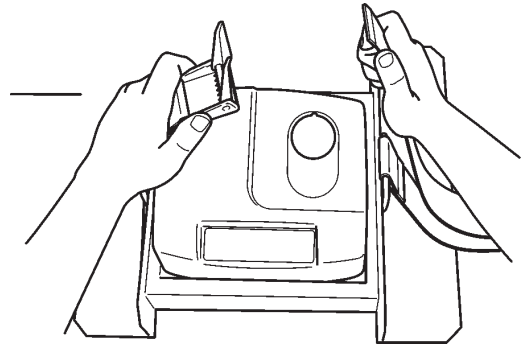
M16J-07-046

## MAINTENANCE

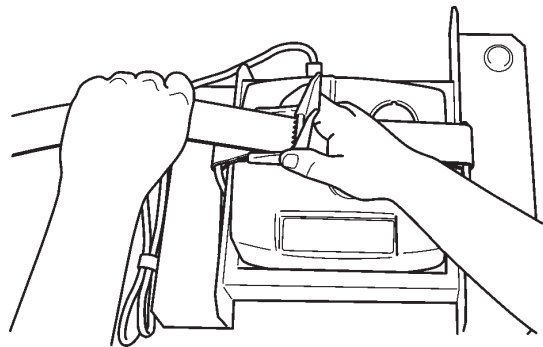
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After the battery charger is used

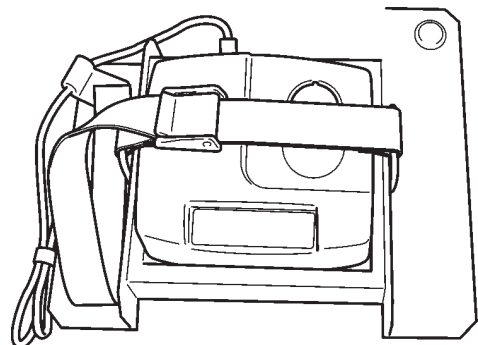
**IMPORTANT:** Securely fasten the battery charger or the battery installed battery charger to the holding bracket with a band so that the battery charger does not come off the bracket. Failure to do so may cause the battery or battery charger to come off the holding bracket, possibly damaging the battery and/or battery charger.



M1U1-07-061



M1U1-07-062



M1U1-07-063

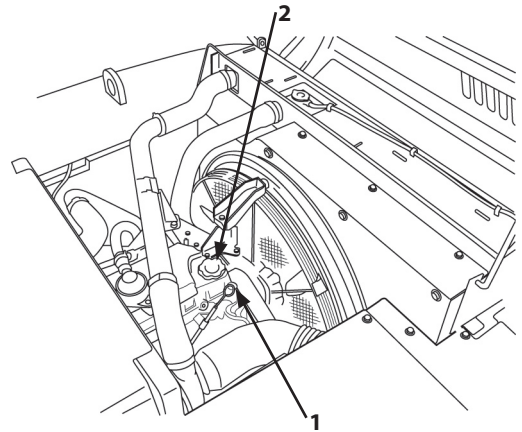
## MAINTENANCE

### B. ENGINE


#### 1 Engine Oil Level --- check daily

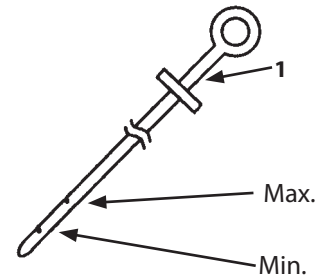
**IMPORTANT:** For most accurate readings, check the oil level every day before starting the machine. Be sure the machine is on a level surface.

1. Remove dipstick (1). Wipe oil off with a clean cloth. Reinsert dipstick (1).
2. Remove dipstick (1) again. Read level. Oil level must be between the circle marks.
3. If necessary, add oil via oil filler cap (2).  
Be sure to use only recommended oil (see Recommended Engine Oil Chart).



M1U1-07-044

 **NOTE:** Checking the oil level immediately after shut down will result in inaccurate readings. Be sure to allow the oil to settle for at least 10 minutes before checking.



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## MAINTENANCE

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

**IMPORTANT:** Change 250 operating hours, if the content of sulfur of fuel is 2000 ppm or more. Consult your nearest Hitachi dealer for the details.

### 3 Replace Engine Oil Filter --- every 500 hours

**IMPORTANT:** Change 250 operating hours, if the content of sulfur of fuel is 2000 ppm or more. Consult your nearest Hitachi dealer for the details.

1. Run the engine to warm oil.  
DO NOT run the engine until oil is hot.
2. Park the machine on a level surface.
3. Lower the bucket to the ground.
4. Turn the auto-idle switch off.

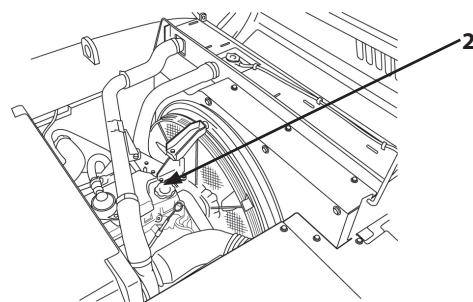
**IMPORTANT:** The turbocharger may be damaged if the engine is not properly shut down.

5. Run the engine at slow idle speed without load for five minutes.
6. Turn the key switch OFF. Remove the key from the key switch.
7. Pull the pilot control shut-off lever to the LOCK position.

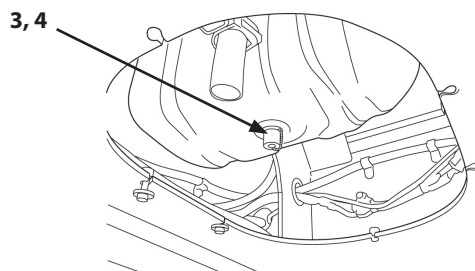
**CAUTION:** Engine oil may be hot. Take extra care to avoid burns.

**IMPORTANT:** Install drainer (5) to the drain valve slowly. Oil may exhaust in large quantities when suddenly tightened.

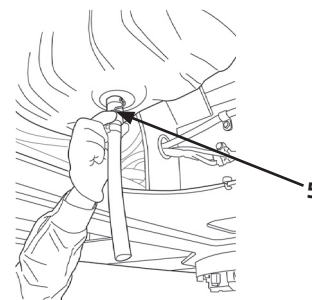
8. Remove oil filler cap (2).
9. Remove cap (4) from oil pan drain valve (3). Install drainer (5) to the drain valve.
10. Screw drainer (5) into drain valve. Drain valve (3) will be opened to drain oil.
11. Remove oil filler cap (2). Then, allow oil to drain through a clean cloth into a 50-liter (13 US gal) container.
12. After all oil has been drained, inspect the cloth for any debris such as small pieces of metal.
13. Remove drainer (5). Install cap (4) to drain valve (3).



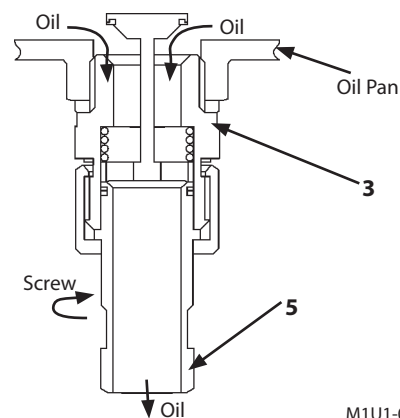
M1U1-07-044



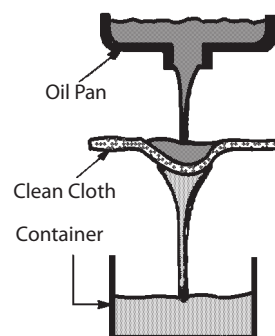
M1U1-07-045



M1U1-07-046



M1U1-07-002




M104-07-010

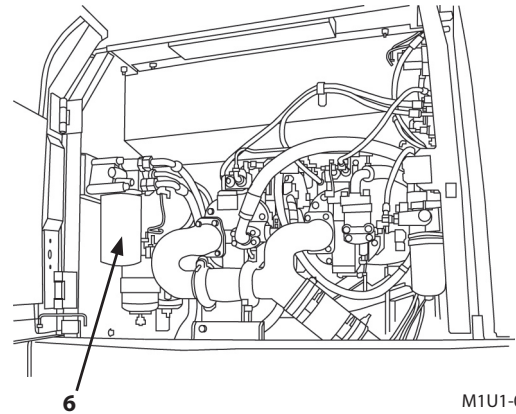


## MAINTENANCE

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14. Open the right access cover and secure the cover with rod.
15. Remove the filter cartridges of engine oil filter (6) by turning it counterclockwise with the filter wrench.
16. Clean the filter gasket contact area on the engine.
17. Apply a thin film of clean oil to the gasket of the new filter.
18. Install new filter. Turn the filter cartridge clockwise by hand until the gasket touches the contact area. Be sure not to damage the gasket when installing the filter.
19. Tighten engine oil filter (6) 3/4 to 1 turn more using the filter wrench. Be careful not to overtighten.
20. Remove the oil filler cap. Fill the engine with recommended oil. Check that oil level is between the circle marks on the dipstick after 15 minutes.
21. Install the oil filler cap.
22. Start the engine. Run the engine at slow idle for 5 minutes.
23. Check that the engine oil pressure indicator on the monitor panel goes out immediately. If not, stop the engine immediately and find the cause.
24. Stop the engine. Remove the key from the key switch.
25. Check for any leakage at the drain plug.
26. Check oil level on the dipstick.

 **NOTE:** Do not re-use the cartridge element.



M1U1-07-014

## MAINTENANCE

### C. TRANSMISSION

#### 1 Pump Transmission

##### Check Oil Level --- every 250 hours

1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

**IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.**

4. Run the engine at slow idle speed without load for five minutes.
5. Stop the engine. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.
7. Remove dipstick (1). Oil must be within the specified range.
8. If necessary, remove filler plug (2) and add oil. (See gear oil chart)
9. Recheck oil level.

##### Change Oil --- every 1000 hours

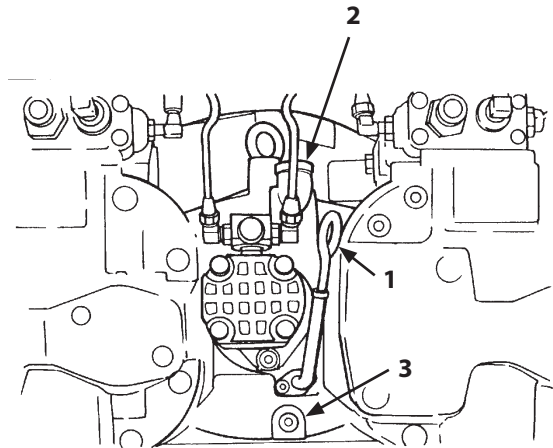
1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

**IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.**

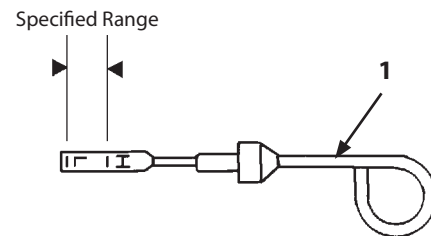
4. Run the engine at slow idle speed without load for five minutes.
5. Stop the engine. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.

**CAUTION: Oil may be hot. Wait for oil to cool before starting work.**

7. Remove filler plug (2).
8. Remove drain plug (3). Allow oil to drain through a clean cloth into a 2 liter (0.52 US gal) container.
9. After all oil has drained, inspect cloth for any debris such as small pieces of metal.
10. Reinstall the drain plug (3).
11. Add oil via filler plug (2) until it is within the specified range on dipstick (1).
12. Reinstall filler plug (2).



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M1G6-07-004

## MAINTENANCE

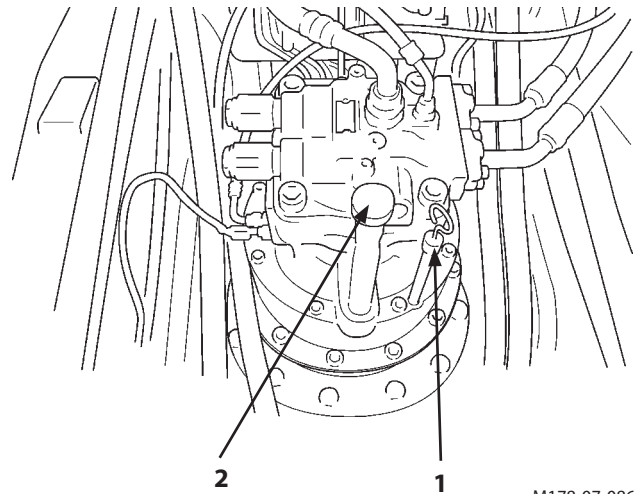
### 2 Swing Reduction Gear

#### Check Oil Level --- every 250 hours

1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

**IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.**

4. Run the engine at slow idle speed without load for five minutes.
5. Stop the engine. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.
7. Remove dipstick (1). Oil must be between marks.
8. If necessary, remove oil filler cap (2) and add oil. (See gear oil chart)
9. Recheck oil level.



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#### Change Gear Oil --- every 1000 hours

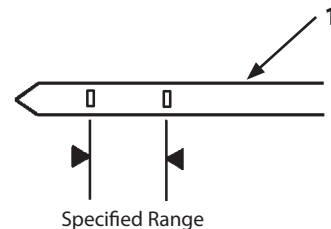
1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

**IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.**

4. Run the engine at slow idle speed without load for five minutes.
5. Stop the engine. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.

**CAUTION: Gear oil may be hot. Wait for gear oil to cool before starting work.**

7. Remove the drain plug mounted on the end of drain pipe to drain oil.
8. Reinstall the drain plug.
9. Remove oil filler cap (2) and add oil until it is between the marks on dipstick (1).
10. Reinstall the oil filler cap.



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## MAINTENANCE

### 3 Travel Reduction Gear

#### Check Oil Level --- every 250 hours

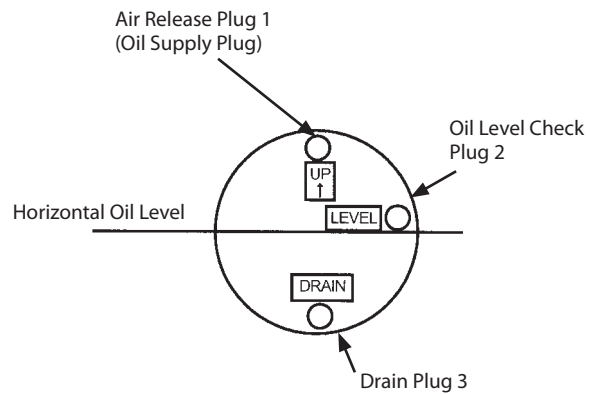
1. Park the machine on a level surface.
2. Rotate the travel motor until the imaginary line through plug (1) and plug (3) is vertical.
3. Lower the bucket to the ground.
4. Turn the auto-idle switch off.

**IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.**

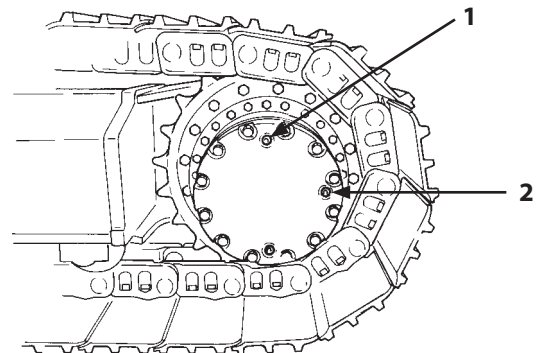
5. Run the engine at slow idle speed without load for five minutes.
6. Stop the engine. Remove the key from the key switch.
7. Pull the pilot control shut-off lever to the LOCK position.

**! WARNING: Keep body and face away from the air release plug. Gear oil is hot. Wait for gear oil to cool and then gradually loosen the air release plug to release pressure.**

8. After gear oil has cooled, slowly loosen air release plug (1) to release pressure.
9. Remove air release plug (1) and oil level check plug (2). Oil must be up to the bottom of hole.
10. If necessary, add oil until oil flows out of the oil level check plug hole. (See gear oil chart)
11. Wrap the plug threads with sealing-type tape. Install plugs (1) and (2).  
Tighten plugs (1) and (2) to 69 N•m (7.0 kgf•m).
12. Check the gear oil level in the other travel reduction gear.



M104-07-019



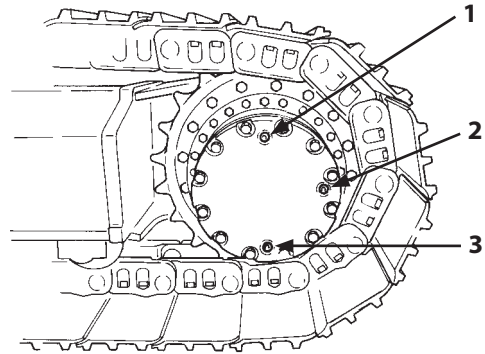
M157-07-170

## MAINTENANCE

### Change Gear Oil --- every 2000 hours

1. Park the machine on a level surface.
2. Rotate the travel motor until the imaginary line through plug (1) and plug (3) is vertical.
3. Lower the bucket to the ground.
4. Turn the auto-idle switch off.

**IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.**



M107-07-096

5. Run the engine at slow idle speed without load for five minutes.
6. Stop the engine. Remove the key from the key switch.
7. Pull the pilot control shut-off lever to the LOCK position.

**⚠ WARNING: Keep body and face away from the air release plug. Gear oil is hot. Wait for gear oil to cool and then gradually loosen the air release plug to release pressure.**

8. After gear oil has cooled, slowly loosen air release plug (1) to release pressure, and temporarily retighten plug (1).
9. Remove drain plug (3) and plug (1), in that order, to drain oil.
10. Clean drain plug (3). Wrap the threads of the drain plug with sealing-type tape. Install the plug.  
Tighten the plug.  
Tightening Torque  
50 N·m (5.1 kgf·m)
11. Remove oil level check plug (2).
12. Add oil until oil flows out of the oil level check plug hole.  
(See gear oil chart)
13. Clean plugs (1) and (2). Wrap the threads of oil level check plug (2) and air release plug (1) with sealing-type tape. Reinstall the plugs.  
Tighten the plug.  
Tightening Torque: 69 N·m (7.0 kgf·m)
14. Repeat steps 8. to 13. for the other travel reduction gear.

---

## MAINTENANCE

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### D. HYDRAULIC SYSTEM

#### INSPECTION AND MAINTENANCE OF HYDRAULIC EQUIPMENT



**CAUTION: During operation, the parts of the hydraulic system become very hot. Allow the machine to cool down before beginning inspection or maintenance.**

1. Be sure that the machine is parked on a level, firm surface before servicing hydraulic equipment.
2. Lower the bucket to the ground and stop the engine.
3. Begin servicing hydraulic components only after components, hydraulic oil and lubricants are completely cooled, and after releasing residual pressure.
  - 3.1 Bleed air from the hydraulic oil tank to release internal pressure.
  - 3.2 Allow the machine to cool down.

Note that servicing heated and pressurized hydraulic components may cause hot parts and/or oil to fly off or escape suddenly, possibly resulting in personal injury.
  - 3.3 Keep body parts and face away from plugs or screws when removing them.

Hydraulic components may be pressurized even when cooled.
  - 3.4 Never attempt to service or inspect the travel and swing motor circuits on slopes. They are highly pressurized due to self-weight.
4. When connecting hydraulic hoses and pipes, take special care to keep seal surfaces free from dirt and to avoid damaging them. Keep these precautions in mind:
  - 4.1 Wash hoses, pipes, and the tank interior with a washing liquid and thoroughly wipe it out before reconnecting them.
  - 4.2 Only use O-rings that are free of damage or defects. Be careful not to damage them during reassembly.
  - 4.3 Do not allow high pressure hoses to twist when connecting them. The life of twisted hoses will be shortened considerably.
  - 4.4 Carefully tighten low pressure hose clamps. Do not overtighten them.

## MAINTENANCE

---

5. When adding hydraulic oil, always use the same brand of oil; do not mix brands of oil. As the machine is filled with Super EX 46HN when it is shipped from the factory, use it as a general rule. When selecting to use another brand of oil listed in the table "Brand names of recommended hydraulic oil", be sure to completely replace the oil in the system.
6. Do not use hydraulic oils other than those listed in the table "Brand names of recommended hydraulic oil".
7. Never run the engine without oil in the hydraulic oil tank.

# MAINTENANCE

## BREAKER MAINTENANCE

### Change Hydraulic Oil and Replace Hydraulic Oil Tank Filter

Hydraulic breaker operation subjects the hydraulic system to become contaminated faster and to quickly deteriorate the hydraulic oil. For this reason, hydraulic oil must be changed and the hydraulic oil tank filter must be replaced more often than the machine equipped with a bucket. Failure to do so may result in damage to the breaker, hydraulic oil pump, and other

related hydraulic system components. Recommended changing intervals are shown below. (For filter replacement and oil changing intervals are shown below. (For filter replacement and oil changing procedures, refer to the "Hydraulic System" in the "MAINTENANCE" Section.)

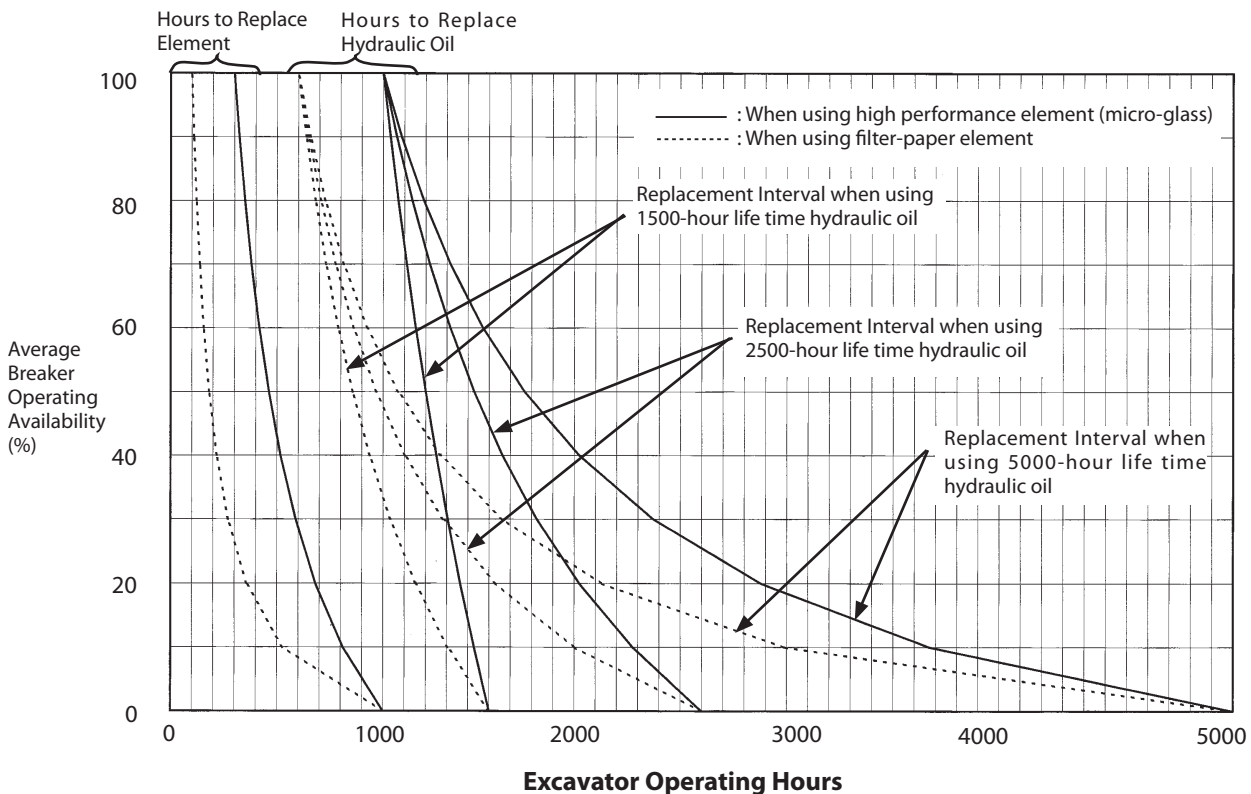
Changing intervals (Hours)

Attachment	Availability	*Hydraulic Oil	Full Flow Filter Element	**Element Type
Bucket	100%	1500	1000	Standard Filter Paper High Performance Element
		2500		
		5000		
Hydraulic Breaker	100%	600	100	Standard Filter Paper
		1000	300	High Performance Element

\* : Replacement intervals differ depending on the brand of hydraulic oil used. Refer to the Hydraulic System in the MAINTENANCE section.

\*\* : Use the high performance element (micro-glass) on excavators engaged in demolition work.

Replacement Intervals (Hours) of Hydraulic Oil and Full Flow Filter Element



**IMPORTANT:** Use a high performance element (micro-glass) on excavators engaged in demolition work. In case using a filter-paper element is unavoidable, replace hydraulic oil and the filter element at the intervals as illustrated with dotted lines.

**NOTE:** Full-flow filter restriction indicator is optional. If a filter-paper element is used, this indicator does not operate. (Refer to the Hydraulic System in the Maintenance section.)



## MAINTENANCE

### 1 Check Hydraulic Oil Level --- daily

**IMPORTANT: Never run the engine without oil in hydraulic oil tank.**

1. Park the machine on a level surface.
2. Position the machine with the arm cylinder fully retracted and the bucket cylinder fully extended.
3. Lower the bucket to the ground.
4. Turn the auto-idle switch off.

**IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.**

5. Run the engine at slow idle speed without load for five minutes.
6. Turn the key switch OFF. Remove the key from the key switch.
7. Pull the pilot control shut-off lever to the LOCK position.
8. Open the access door in front of the main pump. Check oil level with level gauge (1) on hydraulic oil tank. Oil must be between marks on the gauge. If necessary, add oil.

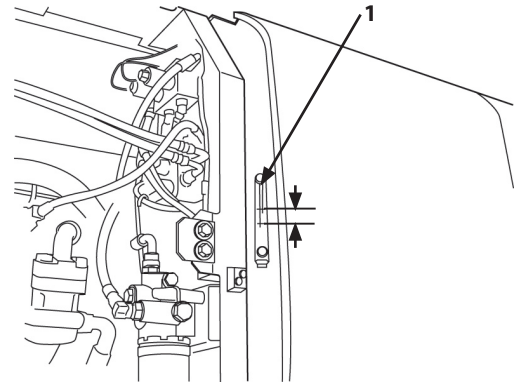
**CAUTION: The hydraulic oil tank is pressurized. Push the pressure release button on the tank cap to release pressure, and carefully remove the cap.**

To add oil:

9. Push the pressure release button on the air breather to release pressure. Remove the cover.
10. Add oil. Recheck oil level with level gauge (1).
11. Install the cover. Make sure the filter and rod assembly is in correct position.



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M1U1-07-048

## MAINTENANCE

### 2 Change Hydraulic Oil

### 3 Suction Filter Cleaning --- every 5000 hours, 2500 hours or 1500 hours

**CAUTION:** Hydraulic oil may be hot. Wait for oil to cool before starting work.



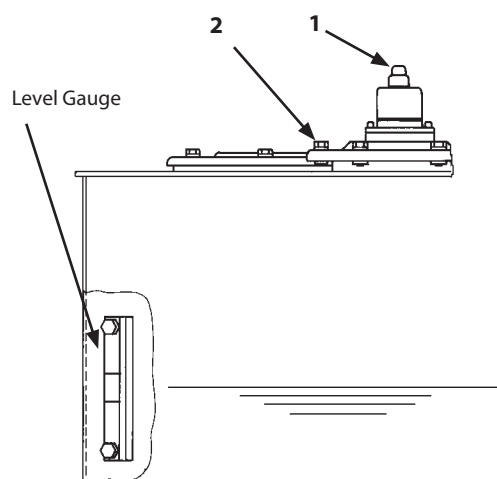
M104-07-117

**IMPORTANT:** Hydraulic oil changing intervals differ according to kind of hydraulic oils used. (See Recommended Oil Chart in this group)

1. Park the machine on a level surface with the upperstructure rotated 90° for easier access.
2. Position the machine with the arm cylinder fully retracted and the bucket cylinder fully extended.
3. Lower the bucket to the ground.
4. Turn the auto-idle switch off.

**IMPORTANT:** The turbocharger may be damaged if the engine is not properly shut down.

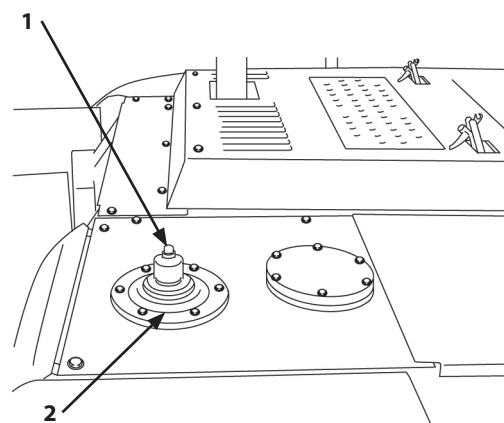
5. Run the engine at slow idle speed without load for five minutes.
6. Stop the engine. Remove the key from the key switch.
7. Pull the pilot control shut-off lever to the LOCK position.
8. Clean the top of the hydraulic oil tank to keep dirt out of the hydraulic system.



M157-07-016

**CAUTION:** The hydraulic oil tank is pressurized. Push the pressure release button on the air breather before removing the air breather.

9. Push pressure release button (1) on the air breather.
10. Remove cover (2).
11. Remove oil using a suction pump. The hydraulic oil tank capacity, up to specified oil level, is approximately A.



M1U1-07-042

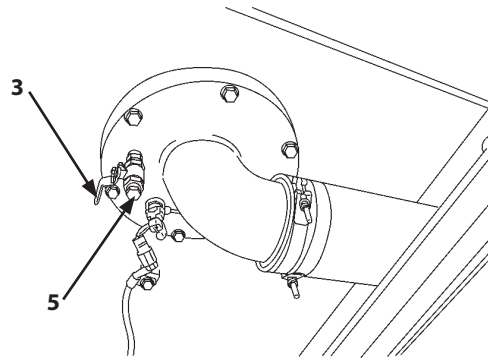
Model	A
ZAXIS400R-3, 400LCH-3	298 L (78.7 US gal)

## MAINTENANCE

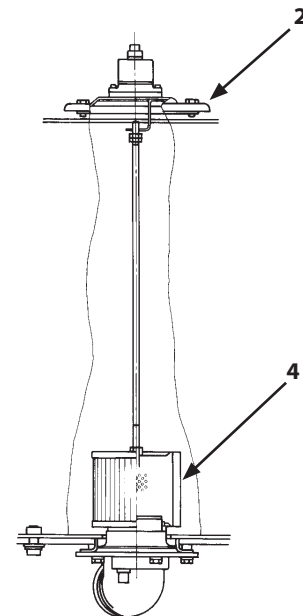
12. Remove drain plug (5) and open drain cock (3). Allow oil to drain.
13. Remove suction filter and rod assembly (4).
14. Clean the filter and tank interior. If the filter is to be replaced, install new filter on the rod as shown. Tighten nut to 14.5 to 19.5 N·m (1.5 to 2.0 kgf·m, 11.0 to 14.5 lbf·ft).

Model	A
ZAXIS400R-3, 400LCH-3	869 mm (34.2 in)

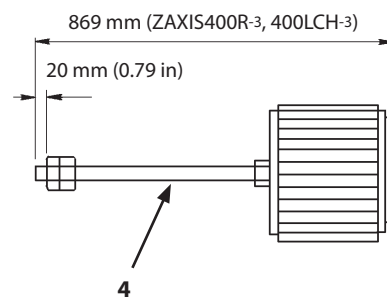
15. Install filter and rod assembly (4). Make sure the filter is positioned correctly on the outlet.
16. Replace the hydraulic tank oil filter. (See "Maintenance Every 500 Hours" Section)
17. Clean, install and tighten drain plug (3).
18. Add oil until it is between the marks on the oil level gauge.
19. Install cover (2). Make sure filter and rod assembly (4) are in correct positions. Tighten the bolts to 49 N·m (5 kgf·m, 36 lbf·ft).
20. Be sure to bleed air from the system following the procedures shown next page.



M1J1-07-037



M157-07-062



M107-07-070

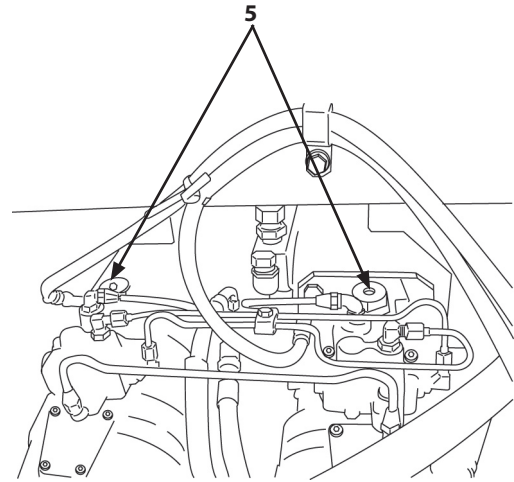
## MAINTENANCE

### Air Bleeding Procedures

**IMPORTANT: If the hydraulic pump is not filled with oil, it will be damaged when the engine is started.**

The machine is equipped with two main pumps. Bleed air from these pumps after changing hydraulic oil.

1. Remove air bleed plugs (5) on each pumps.
2. Fill the pump with oil through air bleed plugs (5) port on each pumps until oil flows out of air bleed plug (5) hole.
3. Temporarily tighten air bleed plugs (5) on each pumps, start the engine and run at slow idle. Loosen one of air bleed plugs (5) slightly until oil flows from plug port to release trapped air completely. Tighten air bleed plug (5). Repeat this step for the rest of plugs.
4. Purge air from the hydraulic system by running the engines at slow idle and operating the control levers slowly and smoothly for 15 minutes.
5. Position the machine as illustrated in the oil level checking procedure.
6. Lower the bucket to the ground.
7. Turn the auto-idle switch off.
8. Stop the engines. Remove the key from the key switches.
9. Pull the pilot control shut-off lever to the LOCK position
10. Check the hydraulic oil tank gauge. Remove cover (2) to add oil if necessary.



M1U1-07-035

## MAINTENANCE

### 4 Replace Hydraulic Tank Oil Filter --- every 1000 hours

#### Standard Model

1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

**IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.**

4. Run the engine at slow idle speed without load for five minutes.
5. Stop the engine. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.

**CAUTION:** The hydraulic oil tank is pressurized. Push the pressure release button on the air breather before removing the air breather.

7. Push the pressure release button on the hydraulic oil tank to release pressure.

**NOTE:** There is spring tension under the cover. Hold down the cover when removing last two bolts.

8. Hold down filter cover (2) against light spring load when removing the last two bolts (1). Remove filter cover (2).

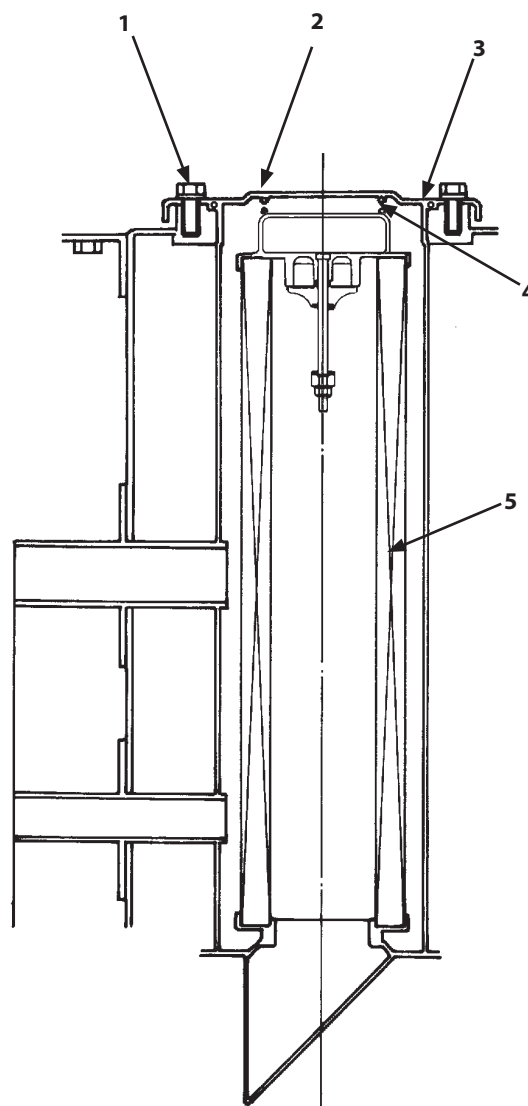
9. Remove spring (4), and element (5).

**NOTE:** Remove the element and inspect for metal particles and debris in the bottom of the filter can. Excessive amounts of brass and steel particles can indicate a failed hydraulic pump, motor, valve or an impending failure. A rubber type of material can indicate cylinder packing failure.

10. Discard element (5) and O-ring (3).
11. Install a new element (5) and spring (4).
12. Install filter cover (2) with a new O-ring (3).
13. Install and tighten bolts (1) to 49 N•m (5 kgf•m, 36 lbf•ft).



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M178-07-069

## MAINTENANCE

### 4 Replace Hydraulic Tank Oil Filter --- every 300 hours

#### Demolition front attachment equipped machines (Optional)

In case the hydraulic filter indicator on the monitor panel comes ON, immediately replace the filter element even if machine operating hours are shorter than the filter element replacement interval of 300 hours.

**CAUTION:** Hot hydraulic oil may spout immediately after operation, possibly causing scalding. Start working on only after the hydraulic oil cools.

**IMPORTANT:** Oil changing interval depends on the brand of hydraulic oil and the type of filter element to be used and the frequency the front attachment is in operation.

#### IMPORTANT:

##### Information on Filter Element:

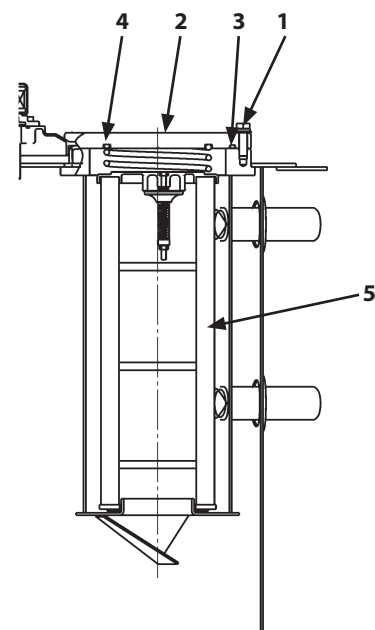
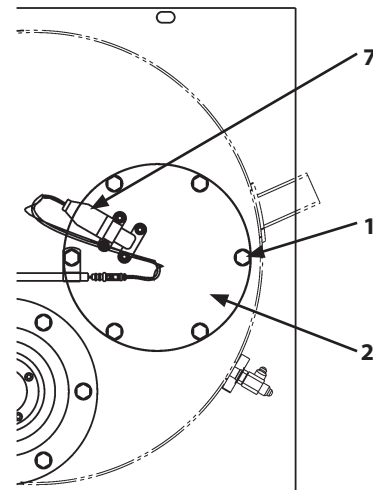
1. A high performance element (micro glass) is used as the hydraulic tank oil filter for the demolition front attachment equipped machines (optional). Use the same type of a high performance element when replacing the element. In case a paper element is unavoidably used, change hydraulic oil and replace the hydraulic tank oil filter in accordance with the instruction for "Change hydraulic oil and replace the hydraulic tank oil filter" in the Operation section.
2. In case the same paper element is used as those used on the standard models, the filter restriction warning system does not function. Insulate the cable of warning device (7).

#### Replacement procedures

1. Park the machine on solid and level ground. Fully extend the bucket cylinder, fully retract the arm cylinder, and lower the bucket to the ground. Stop the engine.
2. Before replacing the element, be sure to release air pressure from the hydraulic oil tank by pressing the air bleed valve on the hydraulic oil tank.
3. Loosen bolts (1) (6 used) to remove cover (2) and O-ring (3). When removing cover (2), spring (4) may fly out. While pressing cover (2) downward, slowly remove cover (2).
4. Remove spring (4) and element (5).
5. Replace element (5) and O-ring (3) with new ones. Install them in the hydraulic oil tank.
6. Install cover (2) with bolts (1) (6 used).  
Tightening torque: 50 N·m (5.1 kgf·m, 37 lbf·ft)



SA-039



M175-07-035

## MAINTENANCE

### 5 Replace Pilot Oil Filter --- every 1000 hours

1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

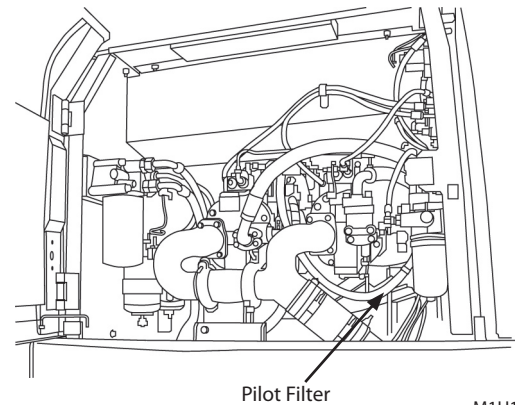
**IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.**

4. Run the engine at slow idle speed without load for five minutes.
5. Stop the engine. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.

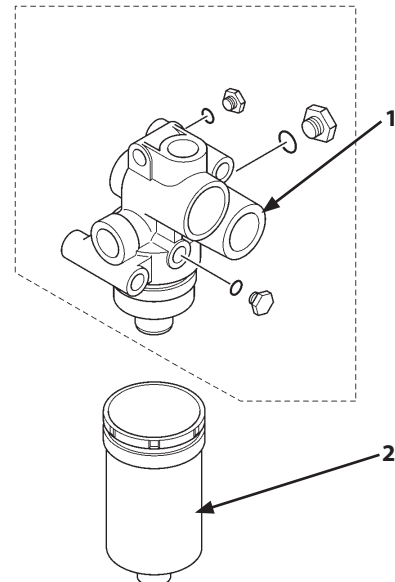
**CAUTION: The hydraulic oil tank is pressurized. Push the pressure release button on the air breather before removing the air breather.**

7. Remove the filter cartridges of pilot oil filter (2) by turning it counterclockwise with the filter wrench.
8. Clean the filter o-ring contact area on the filter head (1).
9. Apply a thin film of clean oil to the gasket of the new filter.
10. Install new filter. Turn the filter cartridge clockwise by hand until the o-ring touches the contact area. Be sure not to damage the o-ring when installing the filter.

**NOTE:** Do not re-use the filter cartridge.



M1U1-07-014



M1U1-07-050

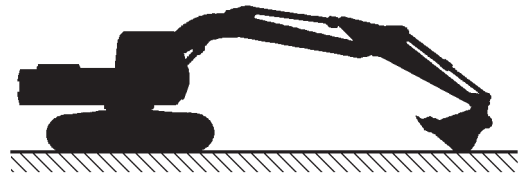
## MAINTENANCE

### 6 Replace Air Breather Element --- every 4000 hours

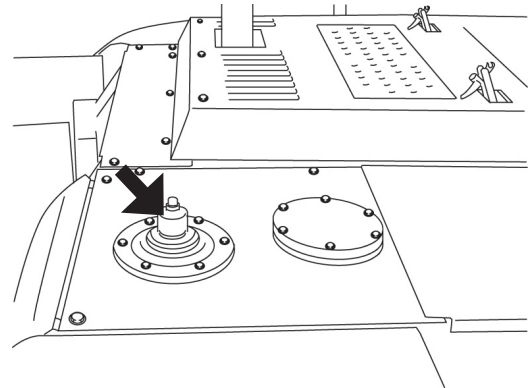
**CAUTION:** Hydraulic oil may be hot just after operation. Hot hydraulic oil may spout, possibly causing severe burns. Be sure to wait for oil to cool before starting work.

#### Replacement Procedures

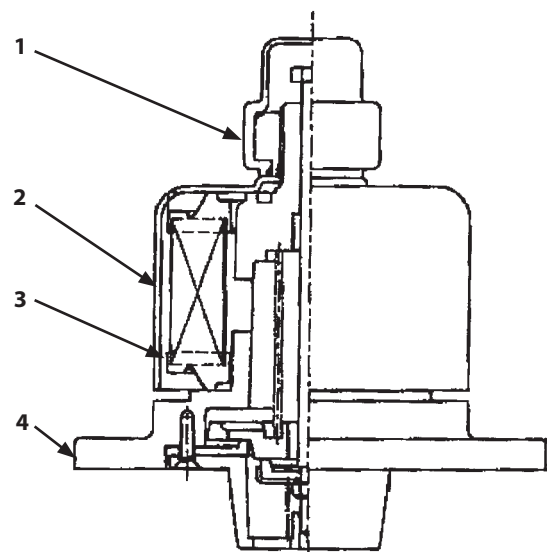
1. Park the machine on solid and level ground. Fully extend the bucket cylinder, fully retract the arm cylinder, and lower the bucket to the ground as illustrated to the right. Stop the engine.
2. Before replacing the element, be sure to bleed air pressure from the hydraulic oil tank by pressing the air bleed valve on the hydraulic oil tank.
3. Turn cover (2) clockwise about 1/4 turn. Turn cap (1) counterclockwise to remove it.
4. Turn cover (2) counterclockwise to remove it. Then, remove element (3).
5. Install new element (3). Tighten to install cover (2) until cover (2) comes in contact with the element. Then, further tighten the cover 1/4 turn.
6. Securely tighten cap (1) clockwise by hand. While holding cap (1) by hand so that cap (1) does not rotate, securely tighten cover (2) by rotating counterclockwise 5 to 10° by hand.
7. Take care never to allow water and/or contaminant to stay between cover (2) and body (4) (air breathing port).
8. Replace the element periodically to keep hydraulic oil clean and to extend hydraulic components service life.



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M1U1-07-042



M1G6-07-001



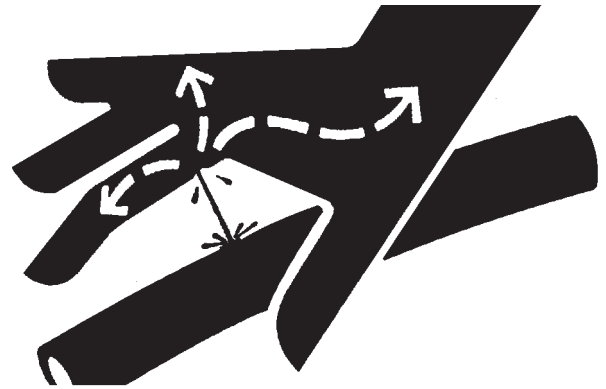
## MAINTENANCE

### 7 Check Hoses and Lines

--- daily

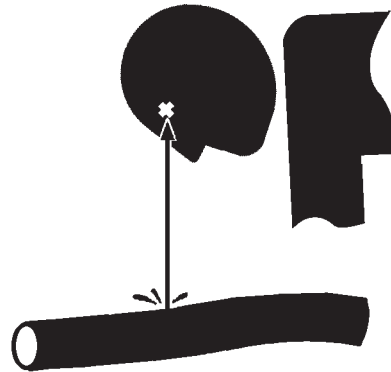
--- every 250 hours

- ⚠ CAUTION:** Escaping fluid under pressure can penetrate the skin causing serious injury. To avoid this hazard, search for leaks with a piece of cardboard. Take care to protect hands and body from high-pressure fluids. If an accident occurs, see a doctor familiar with this type of injury immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.

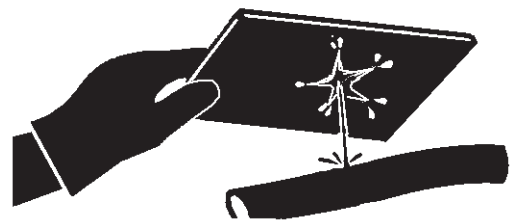


SA-031

- ⚠ CAUTION:** Hydraulic oil and lubricant leaks can lead to fire that may result in serious injury. To avoid this hazard :
- Park the machine on a firm, level surface. Lower the bucket to the ground. Stop the engine. Remove key from the key switch. Pull the pilot control shut-off lever to the LOCK position.
  - Check for missing or loose clamps, kinked hoses, lines or hoses that rub against each other, damaged oil cooler, and loose oil cooler flange bolts, for leaks. Check hoses, lines and oil cooler at the check points indicated below for leaks and other damage that may result in future leaks. If any abnormalities are found, replace or retighten them, as shown in Tables 1-3.
  - Tighten, repair or replace any missing, loose or damaged clamps, hoses, lines, oil cooler, and loose oil cooler flange bolts. Do not bend or strike high-pressure lines. Never install bent or damaged hoses or lines.



SA-292




SA-044

# MAINTENANCE

Table 1. Hoses

Interval(hours)	Check Points	Abnormalities	Remedies
Daily	Hose covers Hose ends Fittings	Leak (1) Leak (2) Leak (3)	Replace Replace Retighten or replace hose or O-ring
Every 250 hours	Hose covers Hose ends	Crack (4) Crack (5)	Replace Replace
	Hose covers Hose covers	Exposed reinforcement (6) Blister (7)	Replace Replace
	Hose	Bend (8)	Replace
	Hose	Collapse (9)	Replace (Use proper bend radius)
	Hose ends and fittings	Deformation or Corrosion (10)	Replace

 **NOTE:** Refer to the illustrations in Fig.1 for each check point location or for a description of the abnormality. Use genuine Hitachi parts.

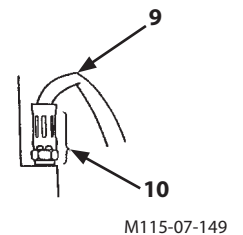
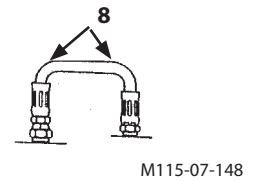
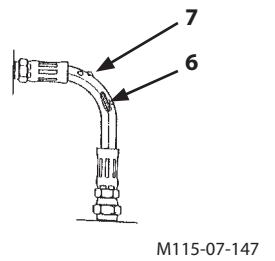
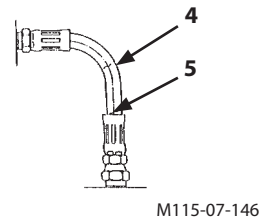
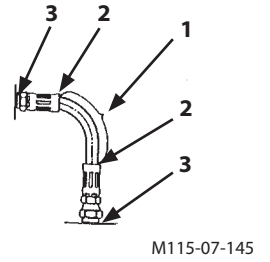
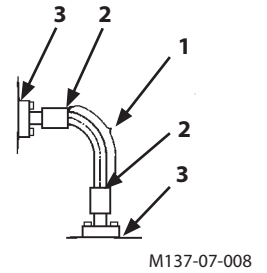
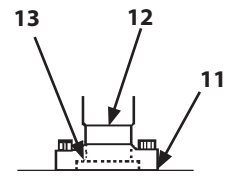


Fig.1

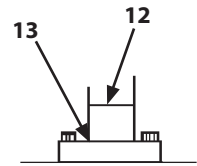
# MAINTENANCE

Table 2. Lines

Interval(hours)	Check Points	Abnormalities	Remedies
Daily	Contact surfaces of flange joints	Leak (11)	Replace O-ring and/or retighten bolts
	Welded surfaces on joints	Leak (12)	Replace
Every 250 hours	Joint neck Welded surfaces on joints Clamps	Crack (13)	Replace
		Crack (12)	Replace
		Missing	Replace
		Deformation Loose	Replace Retighten



M137-07-001



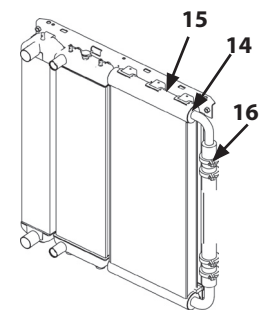
M137-07-007

**NOTE:** Refer to the illustrations in Fig.2 for each check point location or for a description of the abnormality. Use genuine Hitachi parts

Fig.2

Table 3. Oil cooler

Interval(hours)	Check Points	Abnormalities	Remedies
Every 250 hours	Contact surfaces of flange joints	Leak (14)	Replace O-ring and/or retighten bolts
	Oil cooler Coupling and rubber hose	Leak (15)	Replace
		Leak (16)	Retighten or replace



M1U1-07-051

Fig.3

**NOTE:** Refer to the illustrations in Fig.3 for each check point location.

## MAINTENANCE

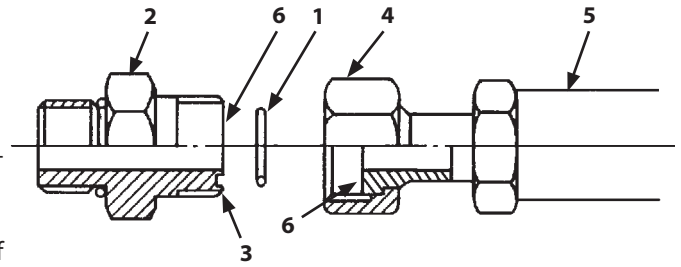
### SERVICE RECOMMENDATIONS FOR HYDRAULIC FITTINGS

Two hydraulic fitting designs are used on this machine.

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

An O-ring is used on the sealing surfaces to prevent oil leakage.

1. Inspect fitting sealing surfaces (6). They must be free of dirt or defects.
2. Replace O-ring (1) with a new one when assembling fittings.
3. Lubricate O-ring (1) and install it into groove (3) using petroleum jelly to hold it in place.
4. Tighten fitting (2) by hand, pressing the fitting joint together to ensure O-ring (1) remains in place and is not damaged.
5. Tighten fitting (2) or nut (4) to the torque values shown. Do not allow hose (5) to twist when tightening fittings.
6. Check for leaks. If oil leaks from a loose connection, do not tighten fitting (2). Open the connection, replace O-ring (1) and check for correct O-ring position before tightening the connection.



M104-07-033

Torque specifications ±10%

Width across flats (mm)	27	32	36	41,46
Fastening torque	N•m	95	140	180
	(kgf•m)	(9.5)	(14)	(18)

## MAINTENANCE

### Metal Face Seal Fittings

Fittings are used on smaller hoses and consist of a metal flare and a metal flare seat.

1. Inspect flare (10) and flare seat (9). They must be free of dirt or obvious defects.

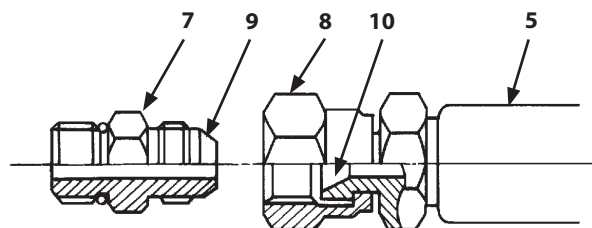
**IMPORTANT: Defects in the tube flare cannot be repaired. Overtightening a defective flare fitting will not stop a leak.**

2. Tighten fitting (7) by hand.
3. Tighten fitting (7) or nut (8) to the torque values shown. Do not allow hose (5) to twist when tightening fittings.

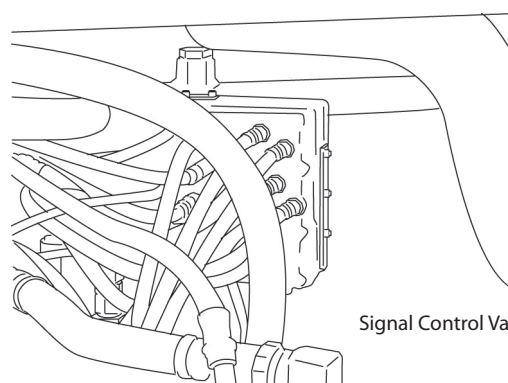
Width across flats (mm)		17	19	22	27
Fastening torque	N•m	25	30	40	80
	(kgf•m)	(2.5)	(3)	(4)	(8.0)

### Pilot Piping Fittings (For Signal Control Valve)

Width across flats (mm)		19
Fastening torque	N•m	35
	(kgf•m)	(3.5)



M202-07-051



Signal Control Valve

M1U1-07-043

# MAINTENANCE

## E. FUEL SYSTEM

### Recommended Fuel

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

### Refueling

1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

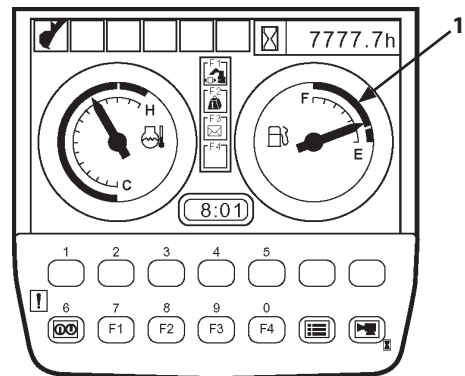
**IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.**

4. Run the engine at slow idle speed without load for five minutes.
5. Stop the engine. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.

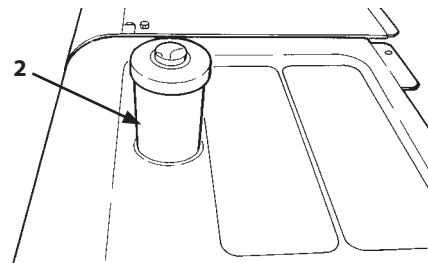
**CAUTION:** Handle fuel carefully. Shut the engine off before fueling. Do not smoke while you fill the fuel tank or work on fuel system.

7. Check fuel level gauge (3) or fuel gauge (1) of the monitor panel. Add fuel if necessary.

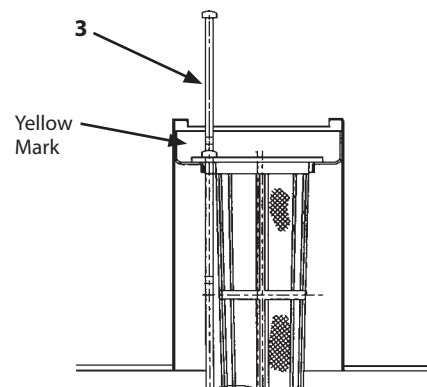
**IMPORTANT: Keep all dirt, dust, water and other foreign materials out of the fuel system.**



T1V1-05-01-123



M178-07-087



M157-07-060

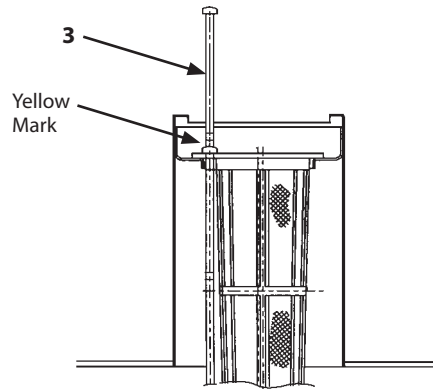
## MAINTENANCE

8. To avoid condensation, fill the tank at the end of each day's operation. Take care not to spill fuel on the machine or ground.

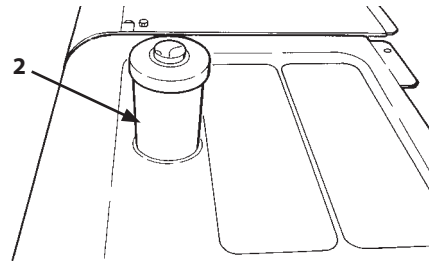
Model	Tank Capacity
ZAXIS400R-3, 400LCH-3	630 L (166 US gal)

Do not fill the tank more than specified. Stop filling when a yellow mark on fuel level gauge (3) becomes visible. Be sure to position the fuel service nozzle so that any part of the nozzle does not obstruct rising of the float-type fuel level gauge (3).

9. Reinstall filter cap (2) on the filler tube. Be sure to lock filter cap (2) with the key to prevent the cap from being lost as well as to prevent vandalism.

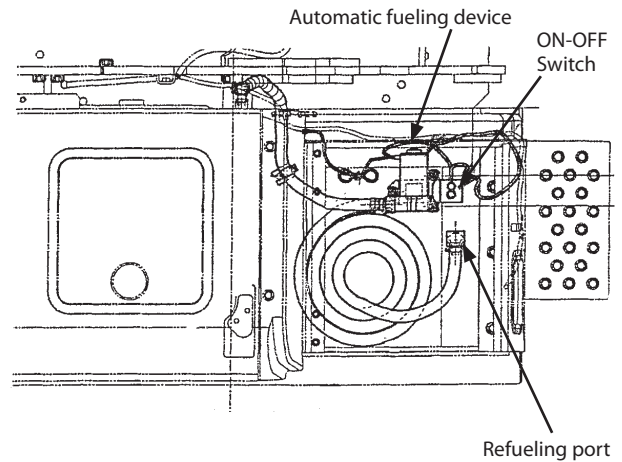


M157-07-060



M178-07-087

**NOTE:** Take precautions for Fueling with Automatic Fueling Device (Optional). Avoid overfilling. Never fail to remove filler cap (2) when refueling with the automatic fueling device and be sure to stop fueling when the yellow mark on the float becomes visible.



M1G6-07-014

## MAINTENANCE

### 1 Drain Fuel Tank Sump --- daily

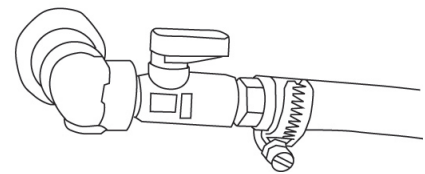
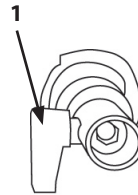
1. Park the machine on a level surface with the upperstructure rotated 90° for easier access.
2. Lower the bucket to the ground.
3. Turn the auto-idle off.



M104-07-117

**IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.**

4. Run the engine at slow idle speed without load for five minutes.
5. Turn the key switch OFF. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.
7. Open drain cock (1) for several seconds to drain water and sediment. Close the drain cock.



M1U1-07-015



## MAINTENANCE

### 2 Check Water Separator

--- daily

Water separator (4) separates any water that may get mixed with the fuel. Water separator (4) contains a float which rises as water accumulates.

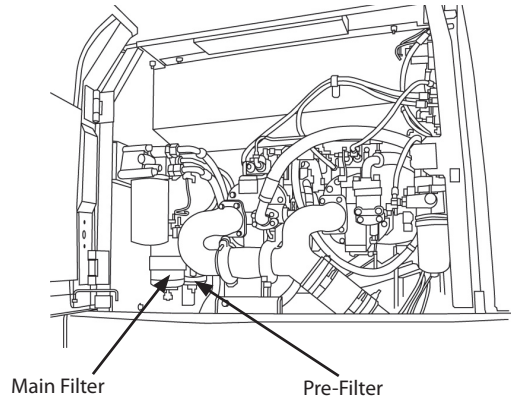
Be sure to drain the sediment when the float rises up to the "Drain Water" mark written on the outside of water separator (4).

**IMPORTANT: If the fuel contains an excessive amount of water, shorten the interval between water separator checks.**

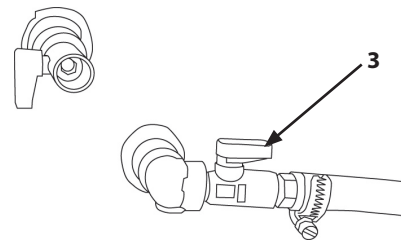
#### Draining Procedures (Main Filter)

1. Place 0.5 liters or larger capacity container under drain plug (3) to collect the drained water.
2. Shut off the fuel supply by closing cock (3) on the bottom of the fuel tank.
3. Loosen plug (1) on the top of the fuel main filter.
4. Rotate drain plug (2) on the bottom of the filter about 4-turns counterclockwise to drain the water accumulated in the filter.
5. After draining water, securely tighten drain plug (2) and plug (1). Return fuel cock (3) to the original position.
6. Start the engine. Check drain plug (3) and plug (1) for fuel leaks.

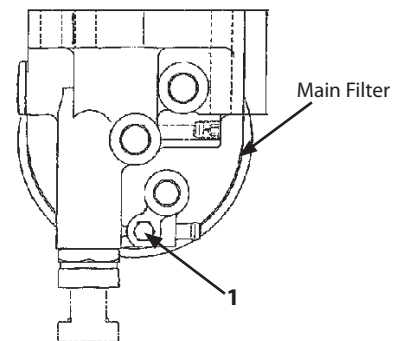
Wrench size: 10 mm



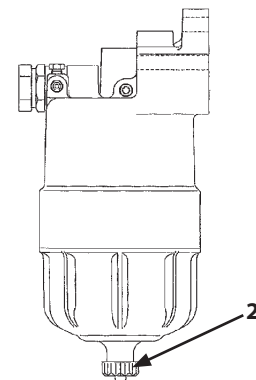
M1U1-07-014



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M1GR-07-010




M1GR-07-002

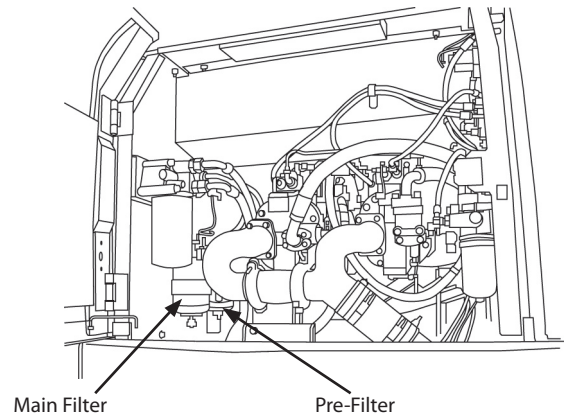
## MAINTENANCE

### Draining Procedures (Pre-Filter)

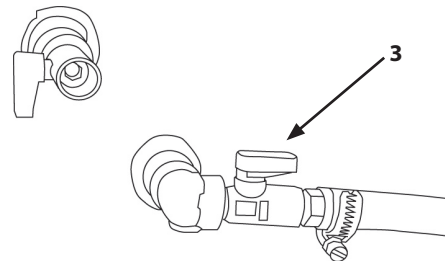
1. Place 0.5 liters or larger capacity container under drain plug (5) to collect the drained water.
2. Shut off the fuel supply by closing cock (5) on the bottom of the fuel tank.
3. Loosen plug (4) on the top of the fuel pre-filter.
4. Rotate drain plug (5) counterclockwise to completely drain water.
5. After draining water, securely tighten drain plug (5) and plug (3). Return fuel cock (3) to the original position.
6. Start the engine. Check drain plug (5) and plug (4) for fuel leaks.

 **NOTE:** After draining water mixed in fuel, bleed air from the fuel supply system.

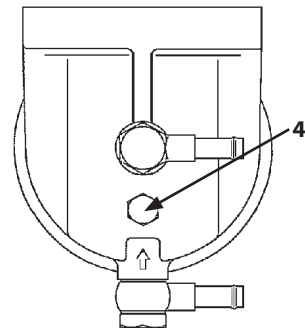
Wrench size: 14 mm



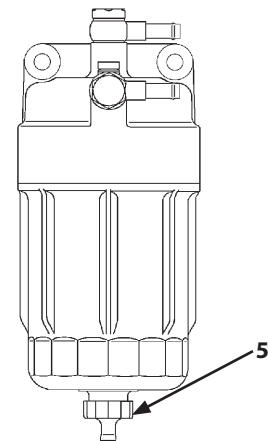
M1U1-07-014



M1U1-07-015



M1U1-07-004



M1U1-07-005

## MAINTENANCE

### Air Bleeding Procedures

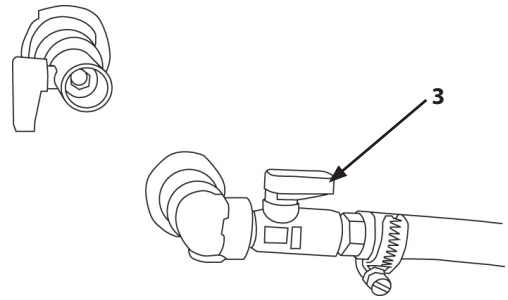
**IMPORTANT:** Air in the fuel system may make the engine hard to start or make it run irregularly. After draining water and sediment from the water separator, replacing the fuel filter, cleaning the fuel solenoid pump strainer or running the fuel tank dry, be sure to bleed the air from the fuel system.

This machine is equipped with a fuel solenoid pump.

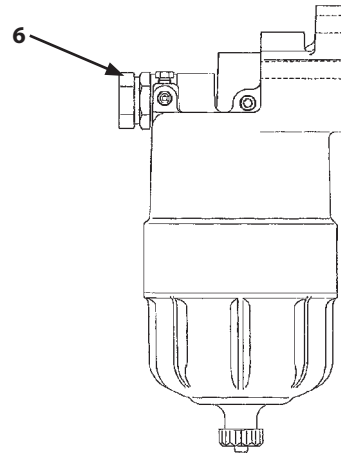
**CAUTION:** Fuel leaks may lead to fires.

1. Check that fuel cock (3) on the bottom of the fuel tank is opened.
2. Turn the key switch ON and hold it in that position for approx. 3 minutes. Thereby, the electrical fuel pump operates, starting to bleed air.
3. While holding the key switch in the ON position, reciprocate fuel main filter priming pump (6). After air is bled from the main filter, return priming pump (6) to the original position.
4. After the main filter is filled with fuel, hold the key switch in the ON position for 30 seconds.
5. Start the engine. Check the fuel supply system for fuel leaks.

**CAUTION:** Even if air is not thoroughly bled, do not hold the key switch in the ON position for more than 5 minutes. In case air is not thoroughly bled, first return the key switch to the OFF position. Then, after waiting for more than 30 seconds, turn the key switch ON again. Failure to do so may cause damage to the electrical pump and/or discharging the batteries.



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M1GR-07-002

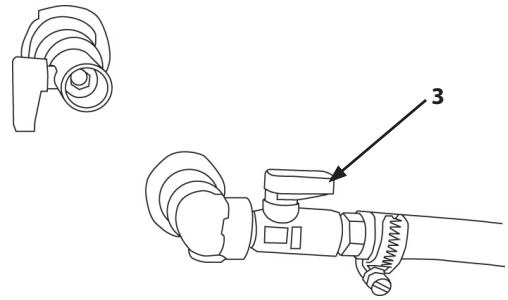
## MAINTENANCE

### Air Bleeding by Priming Pump

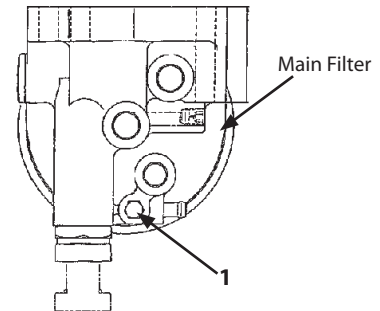
In case air is not bled due to malfunction of the fuel solenoid pump, operating the priming pump only can bleed air.

1. Check that fuel cock (3) on the bottom of the fuel tank is opened.
2. Loosen air bleed plug (1) on the fuel main filter.
3. Supply fuel by reciprocating priming pump (6). After no air bubbles are spouted through air bleed plug (1), tighten air bleed plug (1).
4. After tightening air bleed plug (1), reciprocate priming pump (6) approx. 150 strokes.
5. Wipe off any spilled fuel.
6. Start the engine. Check that no fuel leaks are present. If the engine does not start, repeat the above procedures from step .

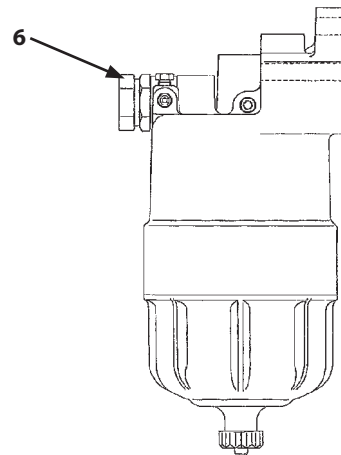
Wrench size: 10 mm



M1U1-07-015



M1GR-07-010



M1GR-07-002

## MAINTENANCE

### 3 REPLACE FUEL MAIN FILTER ELEMENT --- every 500 hours

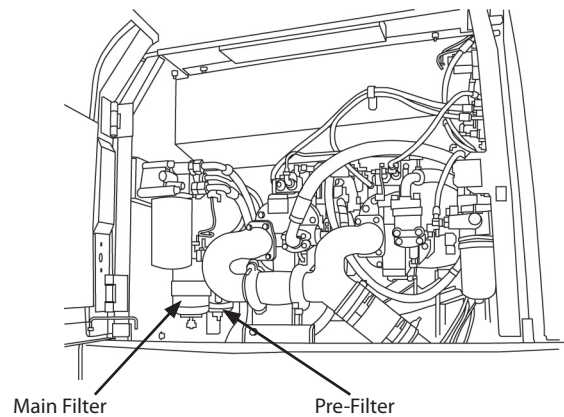
**IMPORTANT:** Be sure to use only genuine Hitachi elements for the main fuel cartridge and the pre-cartridge. Failure to do so may deteriorate the engine performance and/or shorten the engine service life. Please be noted that all engine failures caused by using other manufacturers' elements are excluded from Hitachi Warranty Policy.

#### Procedures:

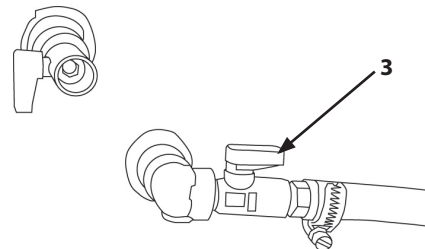
1. Close cock (3) on the bottom of the fuel tank.
2. Place a 1-liter or larger capacity drain container under drain plug (2).
3. Loosen air bleed plug (1) and drain plug (2). Drain fuel until fuel does not flow out of the filter.
4. Remove transparent filter case (7) using the exclusive tool.
5. When transparent filter case (7) is removed, the element is exposed. Remove the element by hand.
6. Install a new element. Tighten transparent filter case (7) to  $29.4 \pm 2$  N-m using the exclusive tool.
7. Tighten air bleed plug (1) and drain plug (2).
8. Open cock (5) on the bottom of the fuel tank.
9. Bleed air from the fuel supply system.

After replacing the fuel filter element, bleed air from the fuel supply system. (Refer to the air bleed procedures described on page 7-45.)

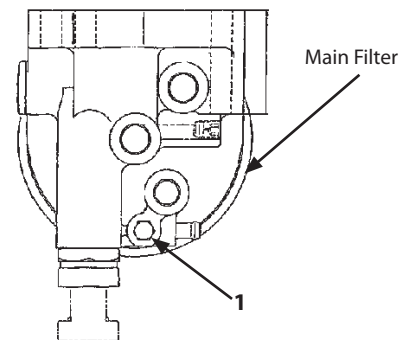
Wrench size: 10 mm



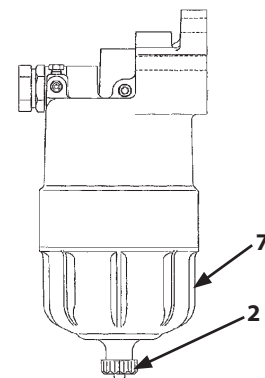
M1U1-07-014



M1U1-07-015



M1GR-07-010



M1GR-07-002

## MAINTENANCE

### 4 REPLACE FUEL PRE-FILTER ELEMENT --- every 500 hours

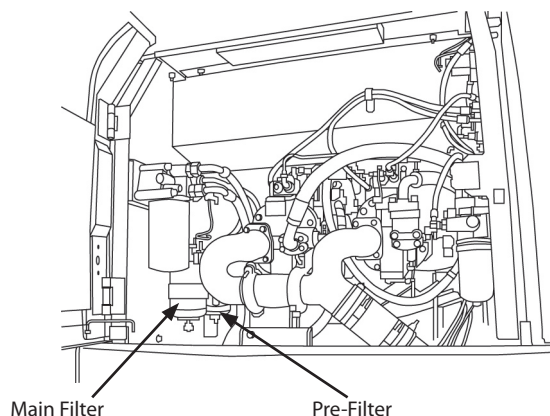
**IMPORTANT:** Be sure to use only genuine Hitachi elements for the main fuel cartridge and the pre-cartridge. Failure to do so may deteriorate the engine performance and/or shorten the engine service life. Please be noted that all engine failures caused by using other manufacturers' elements are excluded from Hitachi Warranty Policy.

#### Procedures:

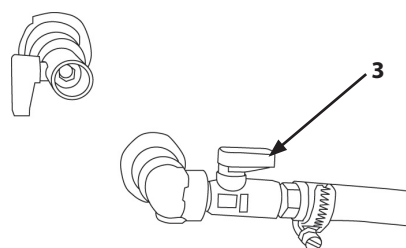
1. Close cock (3) on the bottom of the fuel tank.
2. Place a 1-liter or larger capacity container under drain plug (5).
3. Loosen air bleed plug (4) and drain plug (5). Drain fuel until fuel does not flow out of the filter.
4. Remove transparent filter case (8) using an exclusive tool.
5. When transparent filter case (8) is removed, the element is exposed. Remove the element by hand.
6. Install a new element. Tighten transparent filter case (8) to  $30 \pm 2$  N-m using the exclusive tool.
7. Tighten air bleed plug (4) and drain plug (5).
8. Open cock (3) on the bottom of the fuel tank.
9. Bleed air from the fuel supply system.

After replacing the fuel filter element, bleed air from the fuel supply system. (Refer to the air bleed procedures described on page 7-45.)

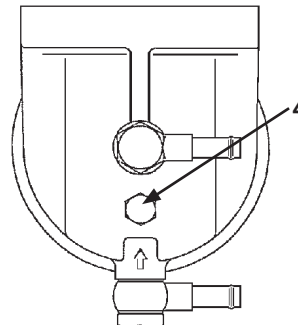
Wrench size: 14 mm



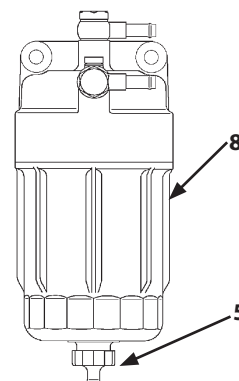
M1U1-07-014



M1U1-07-015



M1U1-07-004



M1U1-07-005

## MAINTENANCE


### 5 CLEAN FUEL SOLENOID PUMP STRAINER: --- every 500 hours

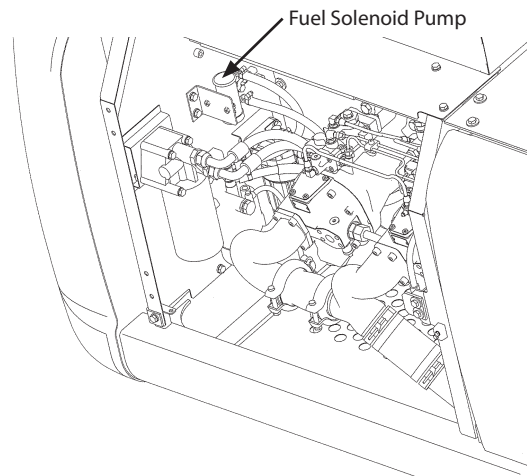
#### Cleaning

When the strainer is disassembled, be sure to replace the gasket. Install the cover and the magnet only after sufficiently cleaning them. After being assembled, closely check the air-tightness of the strainer.

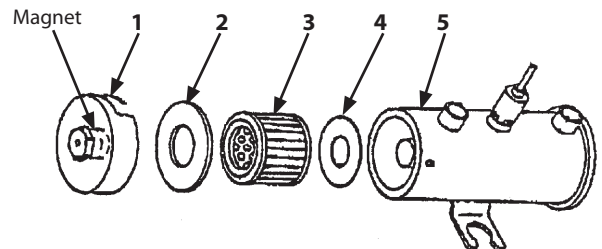
#### Disassembling/ Assembling

To remove cover (1), loosen with a spanner. After the cover is removed, gasket (2), strainer (3), and gasket (4) are easily removed in order. Wash removed strainer (3) with light oil. Install the strainer in the reverse order of disassembling. At that time, install gasket (2) into cover (1) first. Then, securely tighten cover (1) to pump (5) using a spanner.

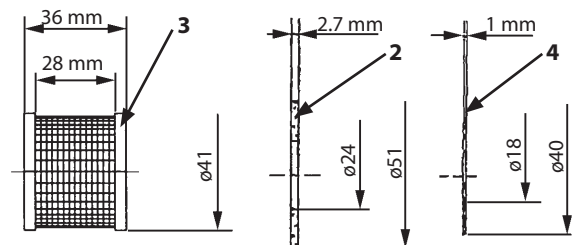
 NOTE: Wrench size: 17 mm



M1U1-07-074



M1GR-07-004



M1U1-07-006

## MAINTENANCE

### 6 Check Fuel Hoses

--- daily  
--- every 250 hours

**CAUTION:** Fuel leaks can lead to fires that may result in serious injury.  
To avoid this hazard :

1. Park the machine on a firm, level surface. Lower the bucket to the ground. Stop the engine. Remove key from the key switch. Pull the pilot control shut-off lever to the LOCK position.
2. Check for kinked hoses, and hoses that rub against each other parts for leaks. Check hoses at the check points indicated below for leaks and other damage that may result in future leaks. If any abnormalities are found, replace or retighten them, as shown in Table 4.
3. Repair or replace any loose or damaged hoses. Never install bent or damaged hoses.

Table 4. Hoses

Interval(hours)	Check Points	Abnormalities	Remedies
Daily	Hose ends	Leak (1)	Retighten or replace
	Soutache braid hose	Friction (2) Crack (2)	Replace Replace
Every 250 hours	Soutache braid hose	Crack (3)	Replace
	Hose ends	Crack (4)	Replace
	Hose	Bend (5)	Replace
	Hose	Collapse (6)	Replace (Use proper bend radius)
	Hose ends and fittings	Deformation or Corrosion (7)	Replace

**NOTE:** Refer to the illustrations in Fig.1 for each check point location or for a description of the abnormality. Use genuine Hitachi parts.

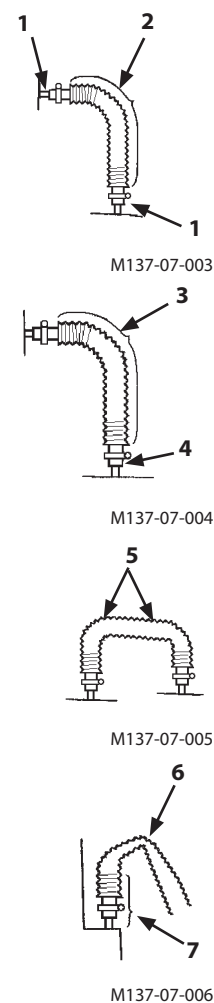


Fig. 1



## MAINTENANCE

### F. AIR CLEANER

- 1** Clean the Air Cleaner Outer Element  
--- every 250 hours or when the restriction indicator comes ON
- 2** Replace the Air Cleaner Outer and Inner Elements  
--- after cleaning six times or after one year

1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

**IMPORTANT:** The turbocharger may be damaged if the engine is not properly shut down.

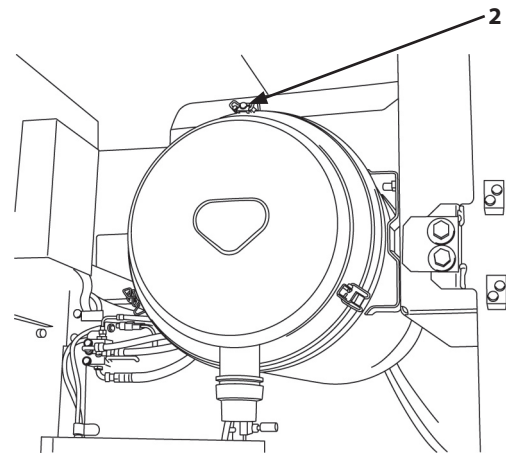
4. Run the engine at slow idle speed without load for five minutes.
5. Stop the engine. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.
7. Loosen clamps (2) to remove the cover.

**IMPORTANT:** Do not install the element and/or the cover forcibly when installing the clamps. Failure to do so may result in deformation of the clamps, element, and/or cover.

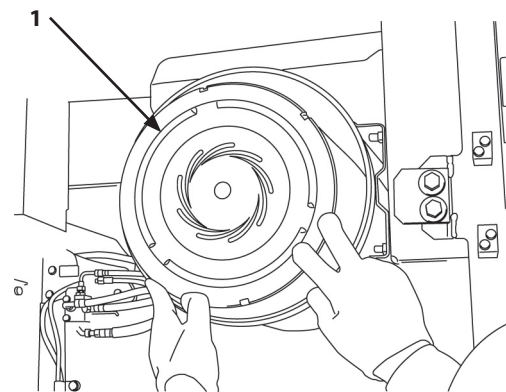
8. Remove outer element (1).
9. Tap outer element (1) with the palm of your hand, NOT ON A HARD SURFACE.

**CAUTION:** Use reduced compressed air pressure. (Less than 0.2 MPa, 2 kgf/cm<sup>2</sup>). Clear area of bystanders, guard against flying chips, and wear personal protection equipment including goggles or safety glasses.

10. Clean outer element (1) using compressed air. Direct the air to the inside of the filter element, blowing out.
11. Clean the filter interior before installing outer element (1).
12. Install outer element (1).
13. Install cover and tighten clamps (2).
14. Start the engine and run at slow idle.
15. Check the air filter restriction indicator on the monitor panel. If the air filter restriction indicator comes ON, stop the engine and replace the outer element (1).



M1U1-07-027



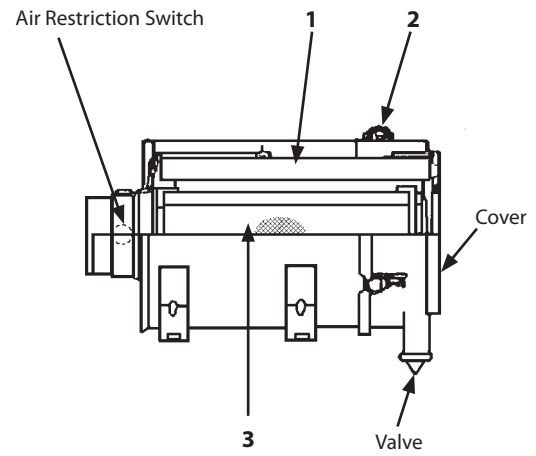
M1U1-07-028

## MAINTENANCE

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16. When replacing the air cleaner filter element, replace both outer (1) and inner (3) elements together. Remove outer element (1). Clean the filter interior before removing inner element (3). Remove inner element (3). First install inner element (3) and then install outer element (1).

**IMPORTANT: Do not reuse the inner element. Always replace the new one.**



M157-07-061

## MAINTENANCE

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### G. COOLING SYSTEM

#### Coolant

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

If the air temperature is expected to fall below 0°C (32°F), fill the cooling system with an genuine Hitachi Long-Life Coolant (LLC) and soft water mix. As a general rule, the ratio of LLC should range between 30% and 50% as shown in the table below. If the ratio is below 30%, the system may develop rust, and if it is above 50%, the engine may overheat.

## MAINTENANCE

LLC Mixing Table

Air temperature		Mixing ratio	Refill capacities	
			LLC	Soft water
°C	°F	%	liters	liters
-1	30	30	9.6	22.4
-4	25	30	9.6	22.4
-7	19	30	9.6	22.4
-11	12	30	9.6	22.4
-15	5	35	11.2	20.8
-20	-4	40	12.8	19.2
-25	-13	45	14.4	17.6
-30	-22	50	16.0	16.0



**CAUTION:**

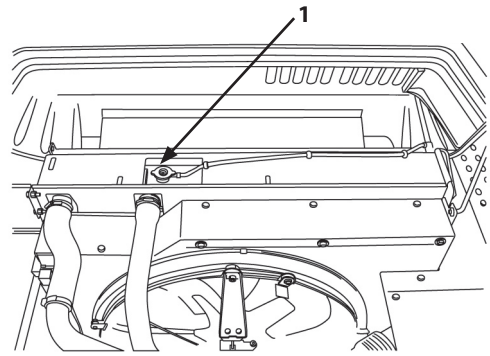
- Antifreeze is poisonous; if ingested, it can cause serious injury or death. Induce vomiting and get emergency medical attention immediately.
- When storing antifreeze, be sure to keep it in a clearly marked container with a tight lid. Always keep ANTIFREEZE out of the reach of children.
- If antifreeze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

## MAINTENANCE

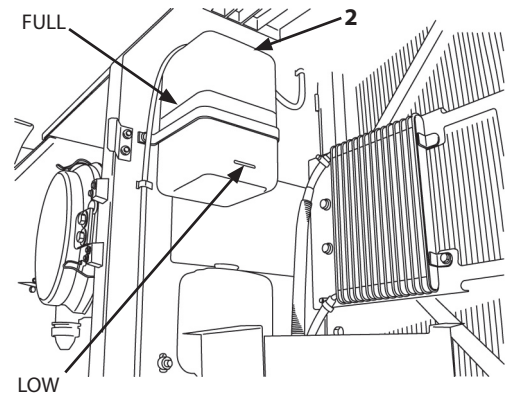
### 1 Check Coolant Level --- daily

**CAUTION:** Do not loosen radiator filler cap (1) unless the system is cool. Loosen the cap slowly to the stop. Release all pressure before removing the cap.

With the engine cold, the coolant level must be between the FULL and LOW marks on coolant reservoir (2), located behind the radiator access door. If the coolant level is below the low mark, add coolant to coolant reservoir (2). If coolant reservoir (2) is empty, add coolant to the radiator and then to coolant reservoir (2).



M1U1-07-024



M1U1-07-022

## MAINTENANCE

### 2 Check and Adjust Fan Belt Tension --- every 100 hours (first time after 50 hours)

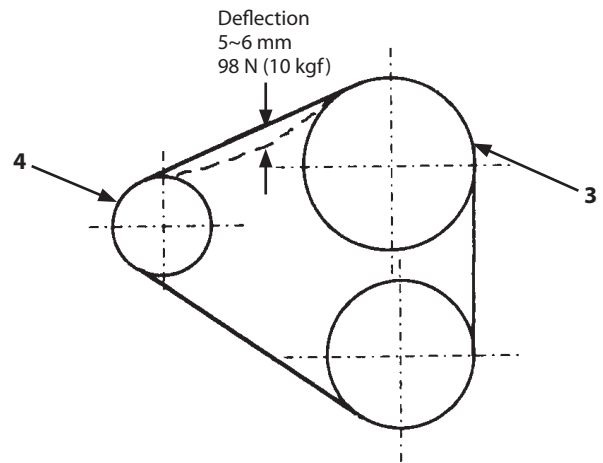
**IMPORTANT:** Loose fan belt may result in insufficient battery charging, engine overheating as well as a rapid, abnormal belt wear. Belts that are too tight, however, can damage both bearings and belts.

Visually check the belt for wear. Replace if necessary. Check fan belt tension by depressing the midpoint between fan pulley (3) and alternator pulley (4) with the thumb. Deflection must be 5 to 6 mm with a depressing force of approximately 98 N (10 kgf, 22 lbf).

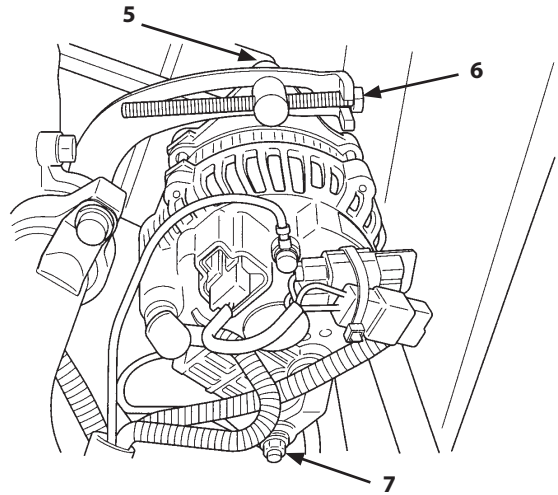
Model	A
ZAXIS400R-3, 400LCH-3	5 to 6 mm (0.2 to 0.24 in)

If tension is not within specifications, loosen nuts (5) and (7) for the adjusting plate and alternator bracket. Move the alternator by bolt (6) until tension is correct. Tighten the adjusting plate and nuts (5) and (7).

**NOTE:** When a new belt is installed, be sure to re-adjust the tension after operating the engine for 3 to 5 minutes at slow idle speed to be sure that the new belt is seated correctly.



M1HM-07-001



M197-07-072

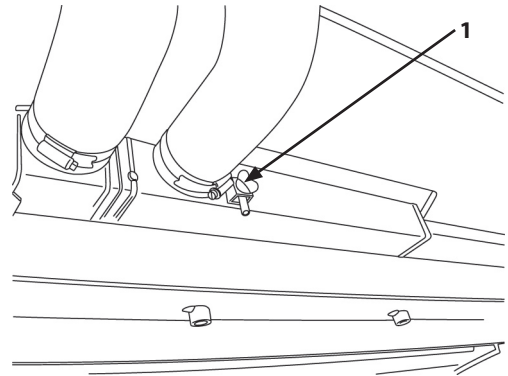
## MAINTENANCE

### 3 Change Coolant --- every two years or 4000 hours whichever comes first.

**CAUTION:** Do not loosen the radiator cap until the system is cool. Loosen the cap slowly to the stop. Release all pressure before removing the cap.

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

1. Remove the radiator cap. Open drain cocks (1) on the radiator to allow the coolant to drain completely.
2. Close drain cocks (1). Fill the radiator with tap water and a radiator cleaner agent. Start the engine and run at a speed slightly higher than slow idle; when the needle of the temperature gauge reaches the green zone, run the engine for about ten more minutes.
3. Stop the engine and open drain cock (1). Flush out the cooling system with tap water, until draining water is clear. This helps remove rust and sediment.
4. Close drain cock (1). Fill the radiator with tap water and LLC at the specified mixing ratio. When adding coolant, do so slowly to avoid mixing air bubbles in the system.
5. Run the engine to sufficiently bleed the air from the cooling system.
6. After adding coolant, operate the engine for several minutes. Check the coolant level again, and add coolant if necessary.



M1U1-07-029

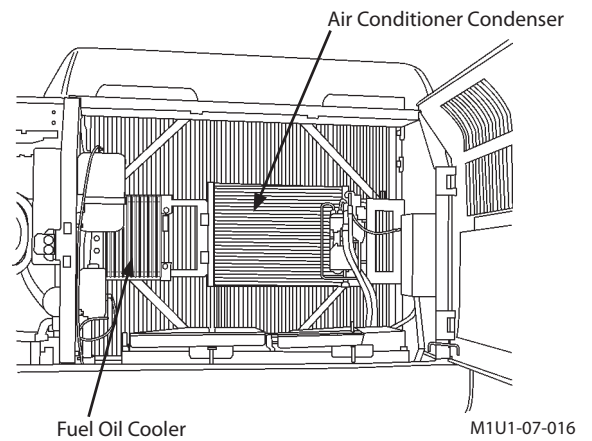
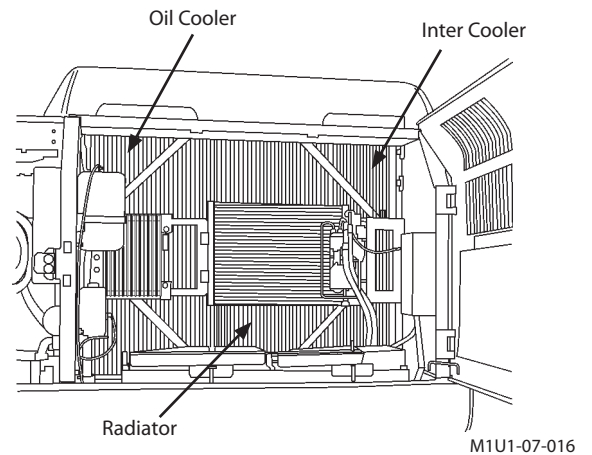
## MAINTENANCE

- 4 **Clean Radiator, Oil Cooler Core and Inter Cooler Outside --- every 500 hours**
- 5 **Clean Oil Cooler, Radiator and Inter Cooler Front Screen --- every 500 hours**
- 6 **Clean Air Conditioner Condenser --- every 500 hours**
- 7 **Clean Fuel Oil Cooler --- every 500 hours**
- 8 **Clean Air Conditioner Front Screen (Opt.) --- every 500 hours**

**CAUTION:** Use reduced compressed air pressure (Less than 0.2 MPa, 2 kgf/cm<sup>2</sup>) for cleaning purposes. Clear the area of bystanders, guard against flying chips, and wear personal protection equipment including eye protection.

**IMPORTANT:** When operating the machine in a dusty environment, check the screen every day for dirt and clogging. If clogged, remove, clean and reinstall the screen.

1. Open the radiator access door and hood.
2. Clean the air conditioner condenser.
3. Remove the oil cooler front screen and clean it.
4. Clean both the radiator and oil cooler using compressed air (Less than 0.2 MPa, 2 kgf/cm<sup>2</sup>) or water.





# MAINTENANCE

## H. ELECTRICAL SYSTEM

**IMPORTANT:** Improper radio communication equipment and associated parts, and/or improper installation of radio communication equipment effects the machine's electronic parts, causing involuntary movement of the machine.

Also, improper installation of electrical equipment's may cause machine failure and/or a fire on the machine.

Be sure to consult your authorized dealer when installing a radio communication equipment or additional electrical parts, or when replacing electrical parts.

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

### Batteries

**CAUTION:** Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check the battery electrolyte level.

Do not continue to use or charge the battery when electrolyte level is lower than specified. Explosion of the battery may result.

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into the eyes.

Avoid hazard by:

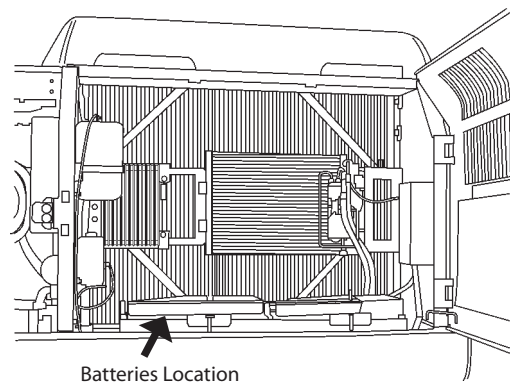
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Using proper booster battery starting procedures.

If you spill acid on yourself:

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



SA-036



M1U1-07-016

## MAINTENANCE

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**If acid is swallowed:**

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

**IMPORTANT:** Add water to batteries in freezing weather before you begin operating your machine for the day, or else charge the batteries.

**IMPORTANT:** If the battery is used with the electrolyte level lower than the specified lower level, the battery may deteriorate quickly.

**IMPORTANT:** Do not refill electrolyte more than the specified upper level. Electrolyte may spill, damaging the painted surfaces and/or corroding other machine parts.

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

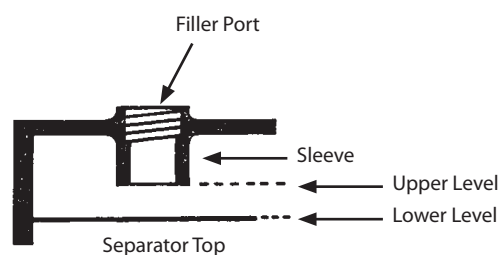
## MAINTENANCE

### Electrolyte Level Check --- every one month

1. Check the electrolyte level at least once a month.
2. Park the machine on level ground and stop the engine.
3. Check the electrolyte level.
  - 3.1 When checking the level from the battery side:  
Clean around the level check lines with a wet towel. Don't use a dry towel. Static electricity may be developed, causing the battery gas to explode. Check if the electrolyte level is between U.L (Upper Level) and L.L (Lower Level). In case the electrolyte level is lower than the middle level between the U.L and L.L, immediately refill distilled water or commercial battery fluid. Be sure to refill with distilled water before recharging (operating the machine). After refilling, securely tighten the filler plug.
  - 3.2 When impossible to check the level from the battery side or no level check mark is indicated on the side:  
After removing the filler plug from the top of the battery. Check the electrolyte level by viewing through the filler port. It is difficult to judge the accurate electrolyte level in this case. Therefore, when the electrolyte level is flush with the U.L, the level is judged to be proper. Then, referring to the right illustrations, check the level. When the electrolyte level is lower than the bottom end of the sleeve, refill with distilled water or commercial battery fluid up to the bottom end of the sleeve. Be sure to refill with distilled water before recharging (operating the machine). After refilling, securely tighten the filler plug.
  - 3.3 When an indicator is available to check the level, follow its check result.
4. Always keep around the battery terminals clean to prevent battery discharge. Check terminals for loose and/or rust. Coat terminals with grease or petroleum jelly to prevent corrosion build up.



M146-07-109



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.

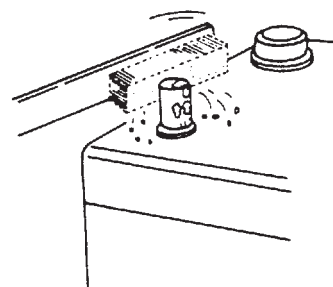
M146-07-111

Lower



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

M146-07-112



M409-07-072

## MAINTENANCE

### Check electrolyte specific gravity

**CAUTION:** Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check the battery electrolyte level.

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into the eyes.

Never check the battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.

Always remove the grounded (–) battery clamp first and replace it last.

Avoid hazard by:

1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Using proper booster battery starting procedures.

If you spill acid on yourself:

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

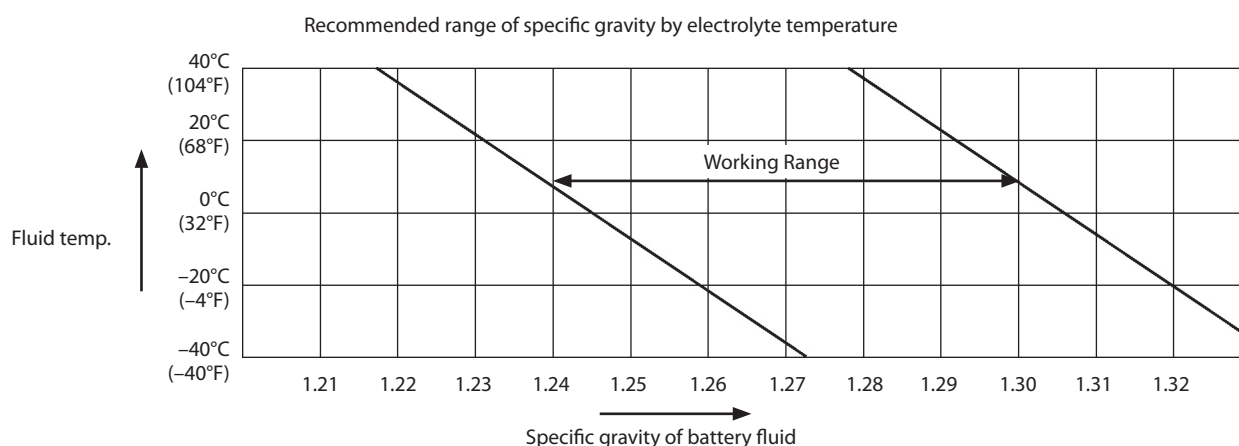
If acid is swallowed:

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

**IMPORTANT:** Check the specific gravity of the electrolyte after it is cooled, not immediately after operation.

Check the electrolyte specific gravity in each battery cell.

The lowest limit of the specific gravity for the electrolyte varies depending on electrolyte temperature. The specific gravity should be kept within the range shown below. Charge the battery if the specific gravity is below the limit.



M104-07-054

## REPLACE BATTERIES

Your machine has two 12-volt batteries with negative (–) ground.

If one battery in a 24-volt system has failed but the other is still good, replace the failed battery with one of the same type. For example, replace a failed maintenance-free battery with a new maintenance-free battery. Different types of batteries may have different rates of charge. This difference could overload one of the batteries and cause it to fail.

# MAINTENANCE

## 2 REPLACING FUSES

If any electrical equipment fails to operate, first check the fuses. Fuse box is located behind the operator's seat. A fuse location/specification decal is attached to the fuse box cover.

Remove the fuse box cover by lifting it upward. Spare fuses are located on the underside of the cover.

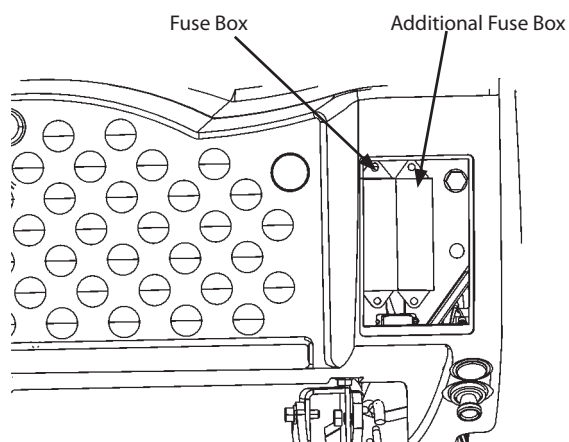
**IMPORTANT: Be sure to install fuses with correct amperage ratings to prevent electrical system damage due to overload.**

### FUSE BOX

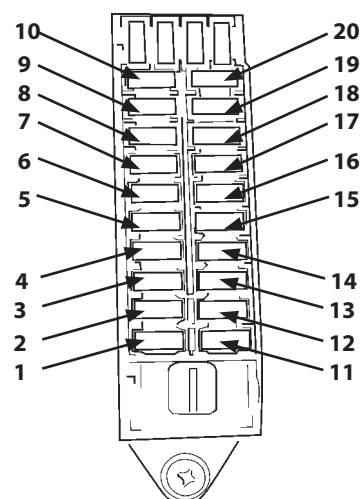
10- CONTROLLER 5A	20- OPTION3 5A
9- BACKUP 10A	19- SW. BOX 5A
8- ECM 30A	18- POWER ON 5A
7- LUBRICATOR 10A	17- AIRCON 5A
6- OPTION2 10A	16- GLOW. R 5A
5- OPTION1 5A	15- AUXILIARY 10A
4- SOLENOID 10A	14- PCV 15A
3- HEATER 20A	13- LIGHTER 10A
2- WIPER 10A	12- ROOM LAMP/RADIO 5A
1- LAMP 20A	11- HORN 10A

### ADDITIONAL FUSE BOX

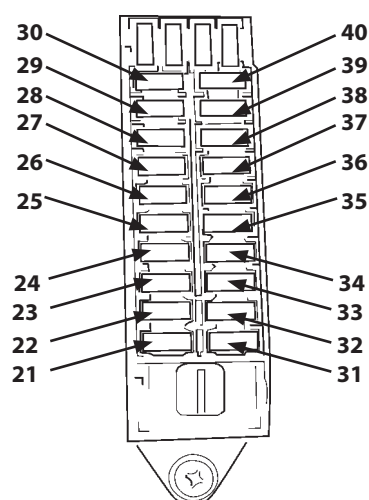
30- SPARE	40- SPARE
29- SPARE	39- SPARE
28- SPARE	38- SPARE
27- AUXILIARY3 5A	37- SPARE
26- QYICK HITCH 5A	36- SPARE
25- IMOBI 5A	35- SPARE
24- 12V UNIT 10A	34- AUXILIARY2 10A
23- CAB LAMP REAR 10A	33- WARNING LAMP 10A
22- CAB LAMP FRONT 10A	32- CAB LAMP FRONT+2 10A
21- SEAT HEATER 10A	31- SEAT COMPR. 10A



M1J1-01-021



M1GR-01-003



M1GR-01-003

## MAINTENANCE

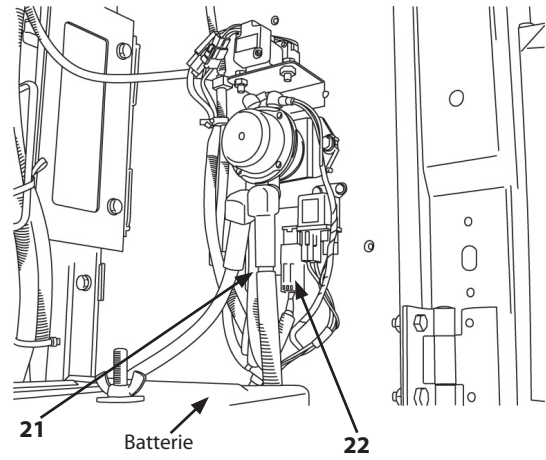
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- Fusible Link (Main Fuse)

In case the starter will not rotate even if the key switch is turned to the START position, fusible link may be the cause of the trouble. Remove the cover next to the engine coolant reservoir to check the fuse. Replace it if blown.

21- + Side (Red)                      45A

22- - Side (Black)                    65A



M1U1-07-023

# MAINTENANCE

## I. MISCELLANEOUS

### 1 Check Bucket Teeth --- daily

#### Check the bucket teeth for wear and looseness

Check for wearing and looseness of the Bucket tooth points.

#### 1. Replacement intervals

Replace tooth point (1) wear beyond the service limit, replace them.

	Dimension A in mm (in)	
	New	Limit of Use
Rock Bucket	254 (10.0")	120 (4.7")
Rock Bucket (Lime Stone)	225 (8.9")	120 (4.7")

**NOTE:** When tooth point (1) is used in excess of the service limit, a hole will be made on the tooth point, which makes the nose exposed and worn out, and will eventually break or let the tooth point fall off.

#### 2. Replacement

**WARNING:** Guard against injury from flying pieces of metal. Wear goggles or safety glasses.

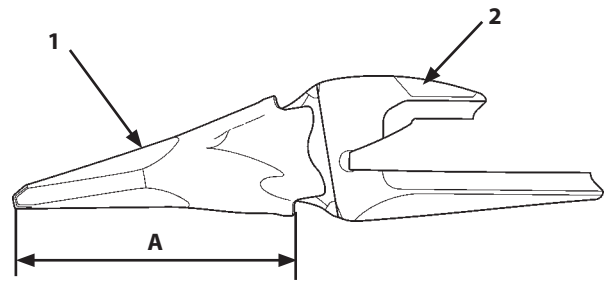
#### (1) Removing the tooth point

##### (a) Preparations for removing tooth point.

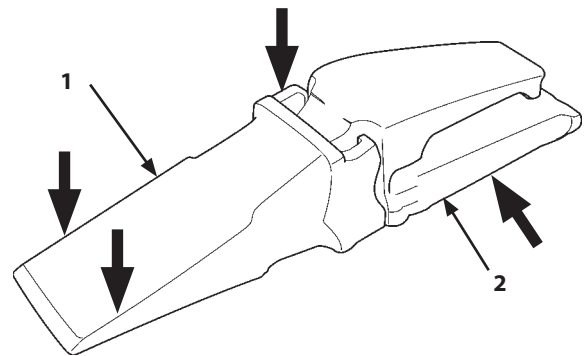
Hit the left and right top ends and the left and right lugs of tooth point (1) alternately with hammer to knock off pebbles, soil, etc., stuck in the gap between tooth point (1) and adapter (2).

##### (b) Inserting lock removal tool.

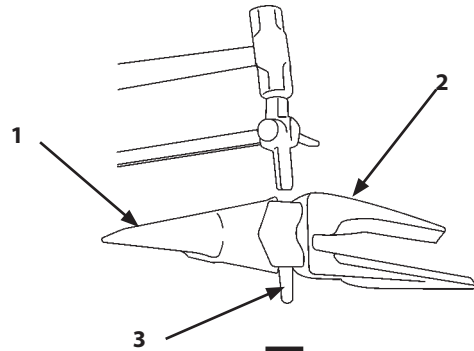
Remove pebbles, dirt, etc., completely from the gap between lock pin (3) and adapter (2). Place pin-removing jig on the top end of lock pin (3) and hit it with hammer to remove lock pin (3). When driving out the pin, first hit with a shorter jig until top end of lock pin (3) comes to the upper end position of the lug of tooth point (1), and then use the longer jig to remove lock pin (3).



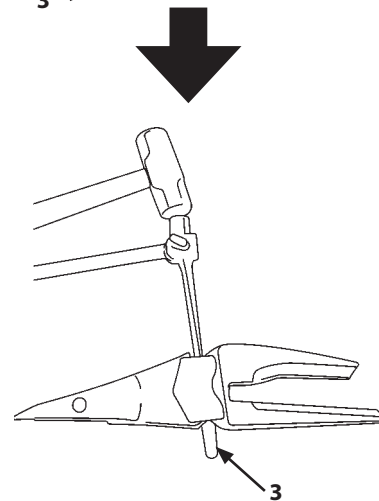
M1J1-07-065



M1J1-07-066



M1J1-07-067



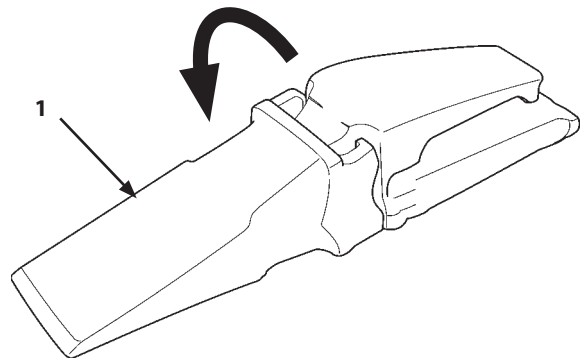
M1J1-07-068

## MAINTENANCE

(c) Removing the tooth point

Turn tooth point (1) to the left, twist and pull it toward you to remove it.

Remove the plug, and check if rubber has cracking; if it has, replace the rubber with new one. While the pin and plug can withstand several replacements of the tooth point, be sure to check whether they are usable or not when replacing tooth point (1).



(2) Mounting the tooth point

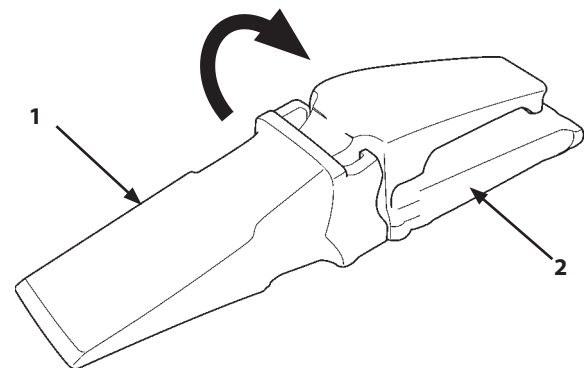
(a) Mounting the tooth point

Clean the top end of the adapter (2) nose. If pebbles, dirt, etc., are stuck to the adapter nose, tooth point (1) will not insert properly and the pin cannot be driven in.

Also check that lock pin (3) has no cracks.

Insert tooth point (1) slowly until the tooth point comes to the end of the adapter (2) nose while twisting and turning it to the right.

M1J1-07-066



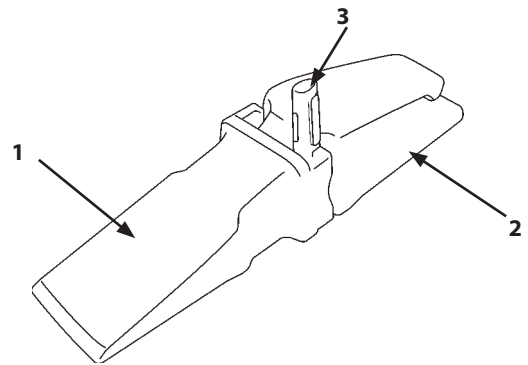
M1J1-07-066



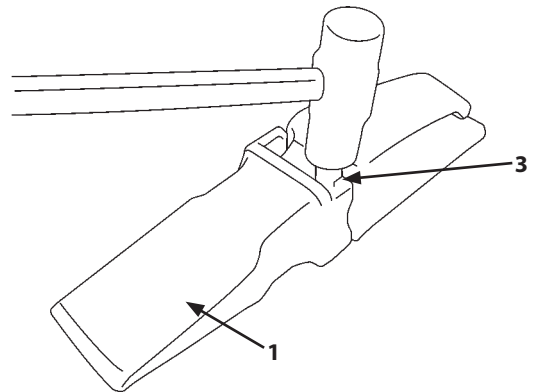
## MAINTENANCE

### b. Inserting the pin


- (1) Insert lock pin (3) facing toward the adapter nose.
- (2) With tooth point (1) fully inserted onto the adapter (2), tap lock pin (3) into the tooth point (1) with a hammer until the top of lock pin (3) comes flat with the nose surface. (i.e. until the lock pin (3) fits into the grooves of tooth point (1).)

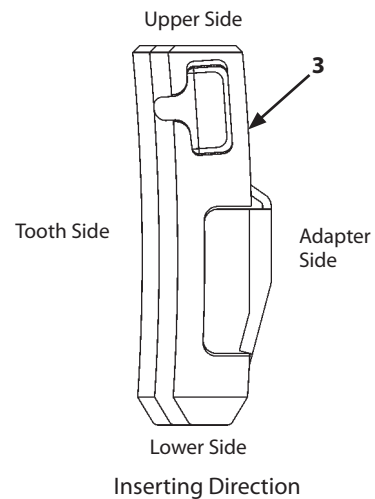


M1J1-07-070



M1J1-07-071

-  **NOTE:** (1) Since rubber is susceptible to corrosion, do not use grease, oil and other oily materials when inserting the lock pin (3).
- (2) In mounting welding-type nose and adapter (2) onto the bucket, the lock pin (3) should be removed from the nose when preheating and welding. Otherwise, the rubber will be spoiled.



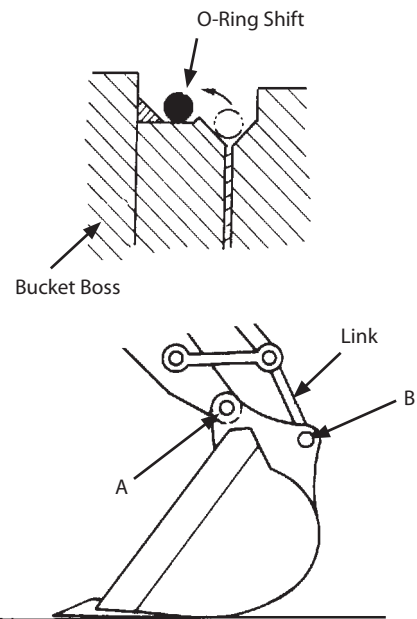
M1J1-07-077

## MAINTENANCE

### 2 Change Bucket

**CAUTION:** When driving the connecting pins in or out, guard against injury from flying pieces of metal or debris; wear goggles or safety glasses, and safety equipment appropriate to the job.

1. Park the machine on a level surface. Lower the bucket to the ground and position it with the flat surface resting on the ground. Be sure the bucket will not roll when the pins are removed.
2. Slide the O-rings out of the way, as shown.
3. Remove bucket pins A and B to separate the arm and bucket. Clean the pins and pin bores. Apply sufficient grease to the pins and pin bores.
4. Align the arm and alternate bucket. Be sure the bucket will not roll.
5. Install bucket pins A and B.
6. Install the locking pins and snap ring on pins A and B.
7. Adjust bucket linkage clearance for pins A. See adjusting bucket linkage clearance procedure.
8. Apply grease to pin joints A and B.
9. Start the engine and run at slow idle. Slowly operate the bucket in both directions to check for any interference in bucket movement. Do not operate a machine that has any movement interference. Correct interference problem.




M104-07-063

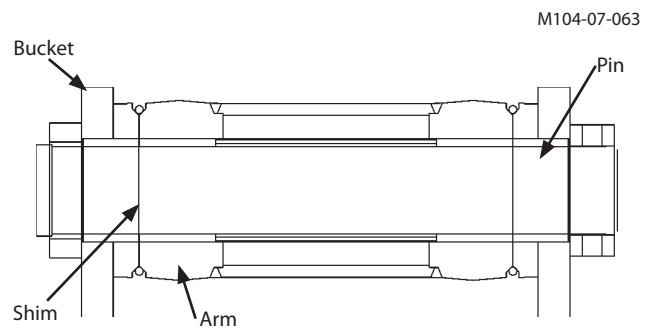
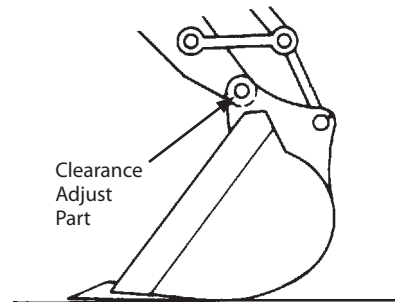
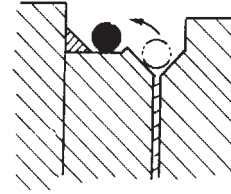
## MAINTENANCE

### 3 Adjust the Bucket Linkage (Backhoe)

When play in the linkage increases, remove and install shims as follows:

1. Park the machine on a level surface. Lower the bucket to the ground with the flat side down so that the bucket will not roll.
2. Run the engine at slow idle. With the bucket on the ground, slowly swing counterclockwise slightly until the top of the left bucket boss contacts the arm.
3. Stop the engine. Pull the pilot control shut-off lever to the LOCK position.
4. Adjust the clearance between arm and bucket to become from 0.5mm to 1mm (0.02 – 0.04 in) by Shims.

 **NOTE:** The product is shipped with shims (1mm (0.04 in) : 2 pieces, 1.6mm (0.063 in): 1 piece) from the factory.




M1J1-07-072

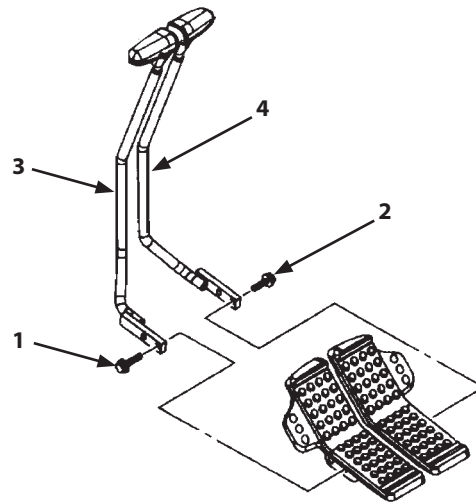
## MAINTENANCE

### 4 Remove the Travel Levers

The travel levers may be removed if desired.

1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.
4. Turn the key switch OFF. Remove the key.
5. Pull the pilot control shut-off lever to the LOCK position.
6. Remove bolts (1) and (2) to remove levers (3) and (4) from brackets.

 **NOTE:** Wrench size: 17 mm  
Tightening torque: 50N·m (5.1 kgf·m, 37 lbf·ft)



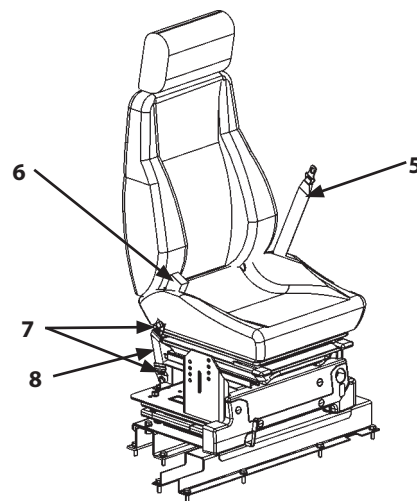
M178-07-077

### 5 Check and Replace Seat Belt Check --- daily Replace --- every 3 years

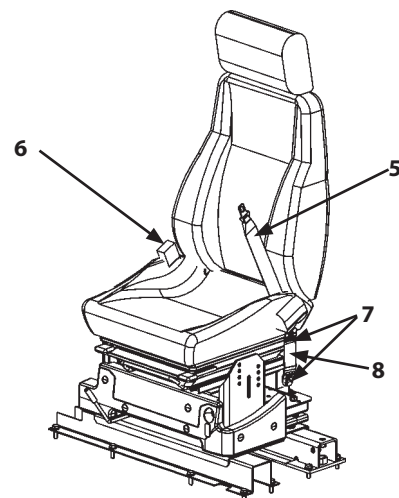
Always maintain the seat belt in a functional condition and replace when necessary to ensure proper performance.

Prior to operating the machine, thoroughly examine belt (5), buckle (6) and attaching hardware (7) and tether belt (8). If any item is damaged or materially worn, replace the seat belt or component before operating the machine.

We recommend that the seat belt be replaced every three years regardless of its apparent condition.



M1U1-07-008



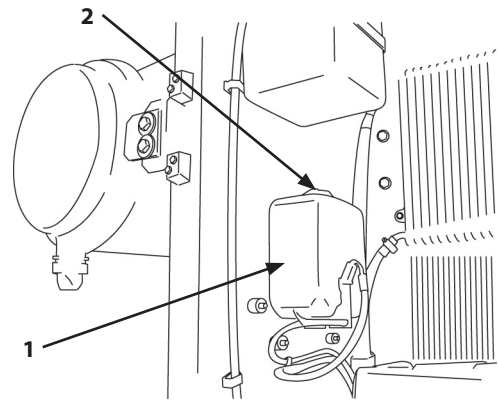
M1U1-07-009

## MAINTENANCE

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### 6 Check Windshield Washer Fluid Level --- as required.

Check fluid in windshield washer tank (1).  
If the fluid level is low, remove cap (2) and add fluid via the opening.  
During winter season, use all season windshield washer which will not freeze.



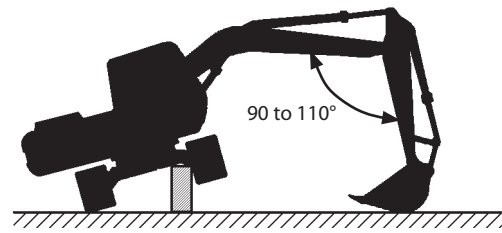
M1U1-07-036

## MAINTENANCE

### 7 Check Track Sag --- every 50 hours

Swing the upperstructure 90° and lower the bucket to raise the track off the ground as shown.

Keep the angle between the boom and arm 90 to 110° and position the bucket's round side on the ground. Place blocks under the machine frame to support the machine. Rotate the raised track in reverse two full rotations and then forward two full rotations.

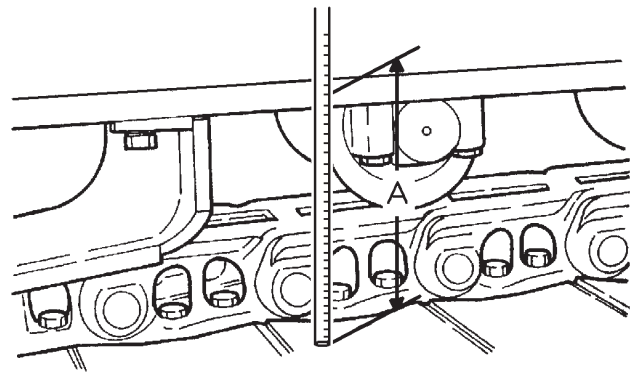


M104-07-067

Measure distance (A) at the middle of the track frame from the bottom of the track frame to the back face of the track shoe.

#### Track sag specifications

Model	Dimension A
ZAXIS400R-3	340 to 380 mm (13.4 to 15.0 in)
ZAXIS400LCH-3	380 to 430 mm (15.0 to 17.0 in)



M107-07-068

**NOTE:** Check track sag after thoroughly removing soil stuck on the track area by washing.

#### Adjust Track Sag

##### Precautions for Adjusting Track Sag

1. If track sag is not within specifications, loosen or tighten the track following the procedures shown on the next page.
2. When adjusting track sag, lower the bucket to the ground to raise one track off the ground. Repeat this procedure to raise the other track. Each time, be sure to place blocks under the machine frame to support the machine.
3. After adjusting track sag of both tracks, move the machine back and forth several times.
4. Check track sag again. If track sag is not within specifications, repeat adjustment until correct sag is obtained.

## MAINTENANCE

### Loosen the Track

**CAUTION:** Do not loosen valve (1) quickly or loosen it too much as high-pressure grease in the adjusting cylinder may spout out. Loosen carefully, keeping body parts and face away from valve (1). Never loosen grease fitting (2).

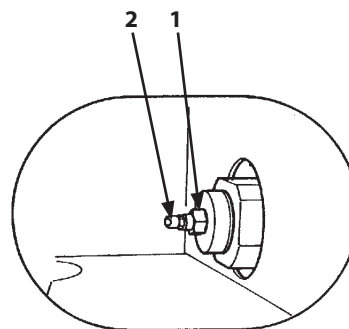
**IMPORTANT:** When gravel or mud is packed between sprockets and track links, remove it before loosening.

1. To loosen the track, slowly turn valve (1) counterclockwise using long socket 24; grease will escape from the grease outlet.
2. Between 1 to 1.5 turns of valve (1) is sufficient to loosen the track.
3. If grease does not drain smoothly, slowly rotate the raised track.
4. When proper track sag is obtained, turn valve (1) clockwise and tighten to 90 N·m (9.2 kgf·m, 67 lbf·ft).

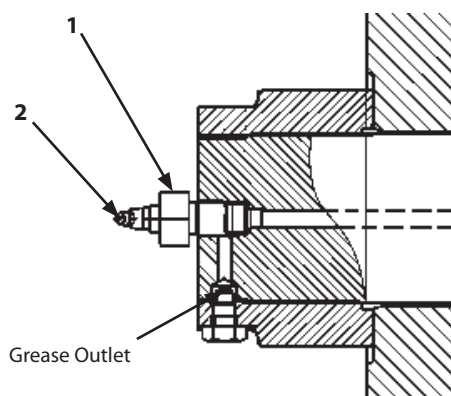
### Tighten the Track

**CAUTION:** It is abnormal if the track remains tight after turning valve (1) counterclockwise or if the track is still loose after charging grease to fitting (2). In such cases, NEVER ATTEMPT TO DISASSEMBLE the track or track adjuster, because of dangerous high-pressure grease inside the track adjuster. See your authorized dealer immediately.

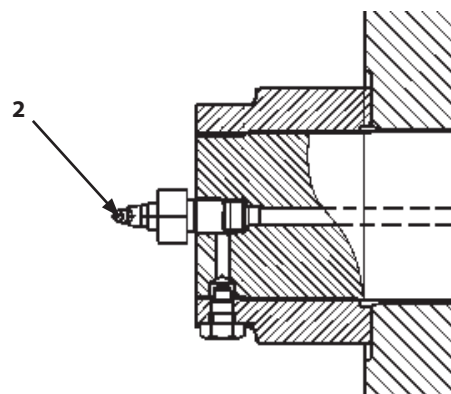
To tighten the track, connect a grease gun to grease fitting (2) and add grease until the sag is within specifications.



M116-07-093



M16J-07-083

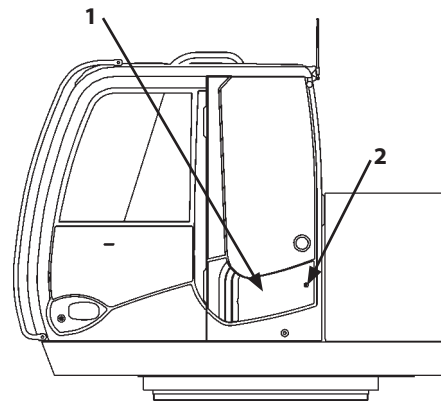


M16J-07-083

## MAINTENANCE

- 8 Clean and Replace Air Conditioner Filter**  
**Clean Filter**  
**Circulating Air Filter --- every 500 hours**  
**Fresh Air Filter --- every 500 hours**

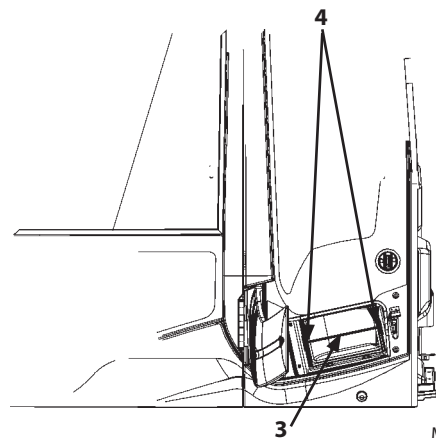
**Replace Filter**  
**Circulating Air Filter --- After cleaning 6 times or so**  
**Fresh Air Filter --- After cleaning 6 times or so**



M1U1-07-010

### Removing Fresh Air Filter

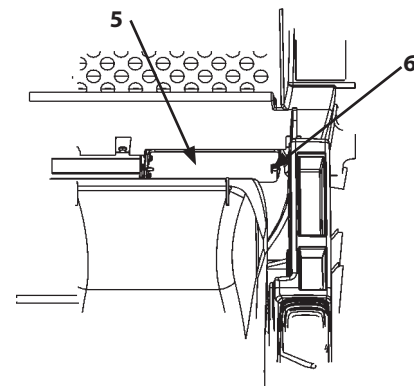
1. Insert the key into keyhole (2) on left cab side cover (1). Then, rotate the key counterclockwise to unlock the key. Open cover (1).
2. While pressing knobs (4) on both sides of fresh air filter (3) inward, horizontally remove the fresh air filter.



M1U1-07-011

### Removing Recirculation Filter

1. Recirculation filter (5) is located under the rear deck.
2. Holding grips (6), pull them toward you to remove.



M1U1-07-012



## MAINTENANCE

**CAUTION:** Use reduced compressed air pressure (less than 0.2 MPa, 2 kgf/cm<sup>2</sup>) for cleaning purposes. Clear the area of bystanders, guard against flying chips, and wear personal protection equipment including eye protection.

### Cleaning

Clean both the external and internal filters by blowing compressed air or washing with water.

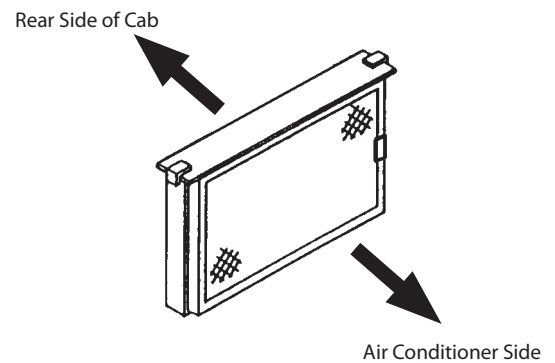
When washing the filters with water, follow the procedures below:

1. Wash with tap water.
2. Soak the filters in neutral detergent-mixed water for approx. 5 minutes.
3. Wash the filters with water again.
4. Dry the filters.

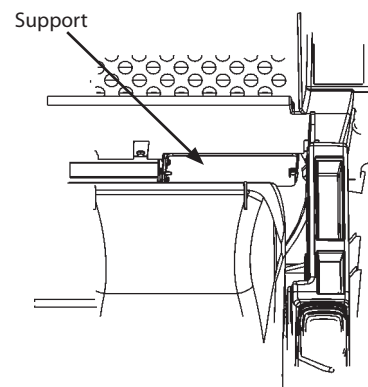
### Installation

When installing the cleaned recirculation and/or ventilation filter or new filters, follow the reverse order of the Removing Filter procedures described on the front page.

- **Ventilation Filter**  
Use attention when installing the filter so that the notch faces the back of the cab and the stamped arrows face the air conditioner unit. After installing the filter, install the upper cover while aligning it with the duct.
- **Recirculation Filter**  
While contacting the attached filter plate onto the duct, install the filter so that the clips align with the duct mounting holes.



M1U1-07-013

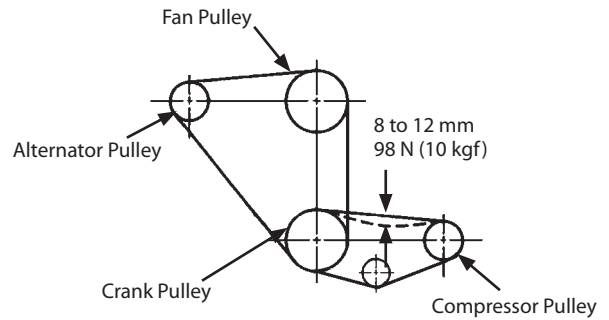


M1U1-07-012

## MAINTENANCE

### 9 Check the Air Conditioner --- daily

1. Check pipe connections for refrigerant gas leakage.  
If oil seepage is found around pipe connections, it indicates possible gas leakage.
2. Check the condenser.  
If the condenser fins become clogged with dirt or insects, the cooling effect will be decreased. Be sure to keep it clean at all times. (Refer to "Clean Radiator Core" in Maintenance Section.)
3. Check the compressor  
After operating the air conditioner for 5 to 10 minutes, touch the high-pressure side and low-pressure side pipes with your hand. If normal, the high-pressure side pipe will be hot, and the low-pressure side cold.
4. Check mounting bolts for looseness.  
Confirm that the compressor mounting bolts and other mounting/fastening bolts are securely tightened.
5. Inspect belt, check and adjust tension.  
Visually check the compressor and fan belts for wear.  
Check and adjust belt tension, referring to the illustration (right).



M1GR-07-007


If cool air does not come out, or any other abnormalities are found in air conditioner system, see your authorized dealer for inspection.

## MAINTENANCE

### Adjust Compressor Belt Tension

Visually check the belt for wear. Replace if necessary. Check compressor belt tension by depressing the midpoint between compressor pulley and crank pulley with the thumb. Deflection must be 9 to 12 mm (0.35 to 0.47 in) with a depressing force of approximately 98 N (10 kgf, 22 lbf).

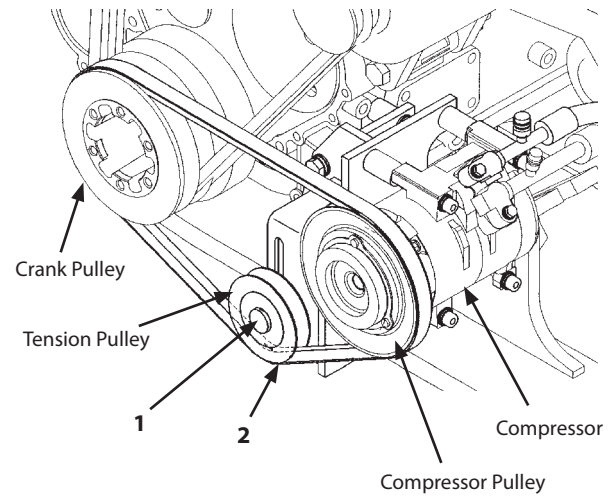
If tension is not within specifications, loosen bolt (1). Move the tension pulley by bolt (2) until tension is correct. Tighten bolt (1).

 **NOTE:** When a new belt is installed, be sure to re-adjust the tension after operating the engine for 3 to 5 minutes at slow idle speed to be sure that the new belt is seated correctly.

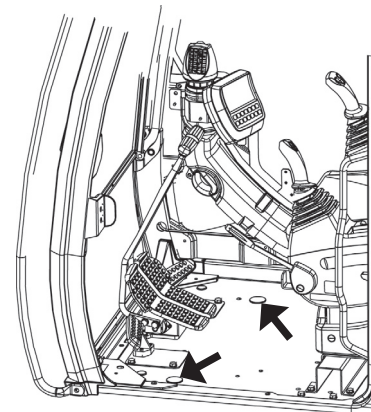
### 10 Clean Cab Floor --- as necessary

**IMPORTANT:** When cleaning the cab floor with tap water, spray the floor only. Take care not to splash the surrounding area. Do not increase water spray speed by restricting the hose end, and don't use high pressure steam for cleaning. Be sure to completely remove any moisture from the surrounding area.

1. Park the machine on solid and level surface. Lower the bucket to the ground. Before cleaning, stop the engine.
2. Sweep the cab floor clean using a brush, and brush dust from the cab floor while spraying water.
3. When cleaning the floor mat, sweep dust (water) along the grooves on the floor mat.
4. When cleaning after removing the floor mat, sweep dust (water) through two cleaning holes.



M1G6-07-013



M1U1-07-052

## MAINTENANCE

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**11 Retighten Cylinder Head Bolt**  
--- **As required**

See your authorized dealer.

**12 Inspect and Adjust Valve Clearance**  
--- **every 1 000 hours**

See your authorized dealer.

**13 Check Fuel Injection Timing**  
--- **As required**

See your authorized dealer.

**14 Measure Engine Compression Pressure**  
--- **every 1 000 hours**

See your authorized dealer.

**15 Check Starter and Alternator**  
--- **every 1 000 hours**

See your authorized dealer.

**16 Check Water Pump**  
--- **every 4 000 hours**

See your authorized dealer.

## MAINTENANCE

### 17 Check Tightening Torque of Bolts and Nuts --- every 250 hours (first time after 50 hours)

Check tightness after the first 50 hours then every 250 hours. Tighten to torque shown if any are loose. Bolts and nuts should be replaced with those of the same or higher grade.










For tightening nuts and bolts other than specified in the table below, refer to the Tightening Torque Chart at the end of this section.

**IMPORTANT: Check and tighten bolts and nuts using a torque wrench.**

No.	Descriptions	Bolt Dia	Q'ty	Wrench Size (mm)	Torque		
		mm			N·m	(kgf·m)	
1	Engine cushion rubber mounting bolt	18	4	27	400	(40)	
2	Engine bracket mounting bolt (Pump side)	12	8	19	110	(11)	
	Engine bracket mounting bolt (Fan side)	10	10	17	65	(6.5)	
3	Hydraulic oil tank mounting bolt	18	4	27	400	(40)	
4	Fuel tank mounting bolt	20	4	30	550	(55)	
5	Radiator mounting bolt (Upper side)	10	6	17	65	(6.5)	
	Radiator mounting bolt (Lower side)	16	4	24	270	(27)	
6	Pump mounting bolt	10	8	17	65	(6.5)	
7	Control valve mounting bolt	16	4	24	210	(21)	
	Control valve bracket mounting bolt	16	4	24	270	(27)	
8	Swing device mounting bolt	22	14	32	650	(65)	
9	Swing motor mounting bolt	12	8	12	90	(9)	
10	ORS fittings for hydraulic hoses and piping			17	25	(2.5)	
				19	30	(3)	
				22	40	(4)	
				27	95	(9.5)	
				32	140	(14)	
				36	180	(18)	
		41	210	(21)			
		50	260	(26)			
11	Hycolin tube mounting nut	-	-	17	35	(3.5)	
12	Battery mounting bolt	10	4	17	25	(2.5)	
13	Cab mounting nut	16	4	24	210	(21)	
	Cab mounting anchor bolt	22	2	32	550	(55)	
	Cab cushion rubber mounting bolt	12	12	19	110	(11)	
14	Cover mounting bolt	6	-	10	10	(1)	
		10	-	17	50	(5.1)	
		12	-	17	90	(9.2)	
15	Flexible master coupling of piping	-	5 pairs	13	10.3 to 12.4	(1.05 to 1.26)	
	T-bolt clamp of high pressure piping	-	8	17	20.5 to 22.6	(2.07 to 2.30)	
16	Swing bearing mounting bolt to	(Upperstructure)	27	36	41	1226	(125)
		(Undercarriage)	27	36	41	1226	(125)
17	Travel device mounting bolt	22	40	32	750	(75)	
	Travel reductuin device cover mounting bolt	16	12	24	270	(27)	
	Sprocket mounting bolt	22	48	32	750	(75)	
18	Upper roller mounting bolt	18	16	27	400	(40)	
19	Lower roller mounting bolt	22	64	32	750	(75)	
20	Track shoe bolt	ZAXIS400R-3	24	368	32	1400	(140)
		ZAXIS400LCH-3	24	392	32	1400	(140)
21	Track guard mounting bolt	ZAXIS400R-3	22	28	32	750	(75)
		ZAXIS400LCH-3	22	44	32	750	(75)
22	Front pin-retaining bolt	18	6	27	400	(41)	
	Front pin-retaining nut	20	6 pairs	30	550	(56)	
		22	1 pair	32	750	(75)	
23	Counterweight mounting bolt	36	6	55	2840	(290)	

## MAINTENANCE

Tightening Torque Chart

Bolt Dia.	Wrench Size	Hexagon Wrench Size	   <small>M552-07-091</small>			   <small>M552-07-090</small> Socket Bolt			   <small>M157-07-225</small>		
			N•m	(kgf•m)	(lbf•ft)	N•m	(kgf•m)	(lbf•ft)	N•m	(kgf•m)	(lbf•ft)
M8	13	6	30	(3.1)	(22)	20	(2.0)	(15.0)	10	(1.0)	(7.4)
M10	17	8	65	(6.6)	(48)	50	(5.1)	(37)	20	(2.0)	(15.0)
M12	19	10	110	(11.0)	(81)	90	(9.2)	(66)	35	(3.6)	(26.0)
M14	22	12	180	(18.5)	(135)	140	(14.0)	(103)	55	(5.6)	(41)
M16	24	14	270	(27.5)	(200)	210	(21.5)	(155)	80	(8.2)	(59)
M18	27	14	400	(41.0)	(295)	300	(30.5)	(220)	120	(12.0)	(89)
M20	30	17	550	(56.0)	(410)	400	(41.0)	(295)	170	(17.0)	(125)
M22	32	17	750	(76.5)	(550)	550	(56.0)	(410)	220	(22.5)	(162)
M24	36	19	950	(97.0)	(700)	700	(71.5)	(520)	280	(28.5)	(205)
M27	41	19	1400	(143)	(1030)	1050	(107)	(770)	400	(41.0)	(295)
M30	46	22	1950	(200)	(1440)	1450	(148)	(1070)	550	(56.0)	(410)
M33	50	24	2600	(265)	(1920)	1950	(200)	(1440)	750	(76.5)	(550)
M36	55	27	3200	(325)	(2360)	2450	(250)	(1810)	950	(97.0)	(700)

**⚠ CAUTION:** If fixing bolts for counterweight are loosened, consult your nearest authorized dealer.

**IMPORTANT:** Make sure bolt and nut threads are clean before installing.  
 Apply lubricant (e. g. white zinc B solved into spindle oil) to bolts and nuts to stabilize their friction coefficient.

**🔧 NOTE:** Tightening torque required is shown in N•m.  
 For example, when tightening a bolt or nut with a wrench of 1 m length, turning the end of it with a force of 120 N, the torque produced will be:

$$1\text{ m} \times 120\text{ N} = 120\text{ N}\cdot\text{m}$$

To produce the same torque with a wrench of 0.25 m:

$$0.25\text{ m} \times \boxed{\phantom{000}}\text{ N} = 120\text{ N}\cdot\text{m}$$

Necessary force will be:

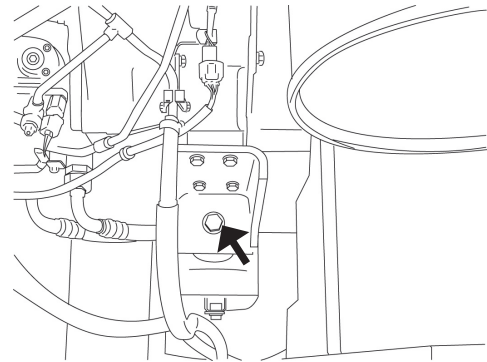
$$120\text{ N}\cdot\text{m} \div 0.25\text{ m} = 480\text{ N}$$

## MAINTENANCE

1. Retighten the engine cushion rubber mounting bolts and nuts.

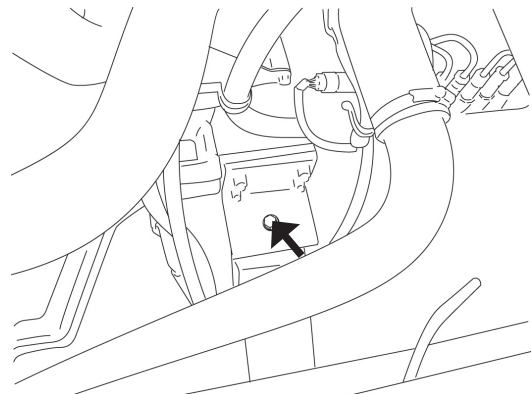
Tool : 27 mm

Torque: 400 N·m (40 kgf·m, 295 lbf·ft)



Pump Side

M1U1-07-040



Fan Side

M1U1-07-034

2. Retighten the engine bracket mounting bolts.

Pump side

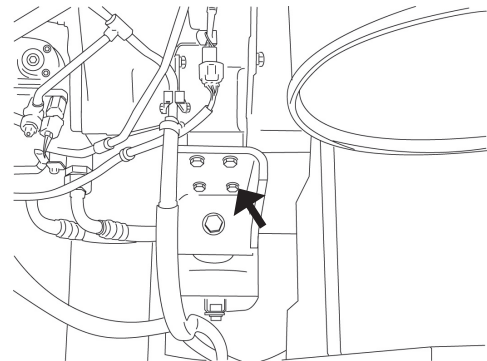
Tool : 19 mm

Torque: 110 N·m (11 kgf·m, 81 lbf·ft)

Fan side

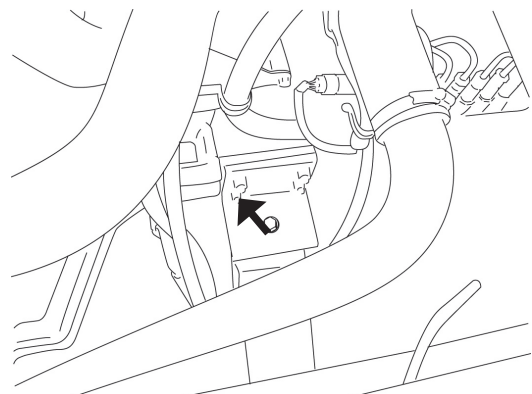
Tool : 17 mm

Torque: 65 N·m (6.5 kgf·m, 48 lbf·ft)



Pump Side

M1U1-07-040



Fan Side

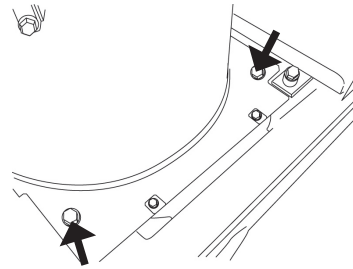
M1U1-07-034

## MAINTENANCE

### 3. Retighten the hydraulic oil tank mounting bolts.

Tool : 27 mm

Torque: 400 N·m (40 kgf·m, 295 lbf·ft)

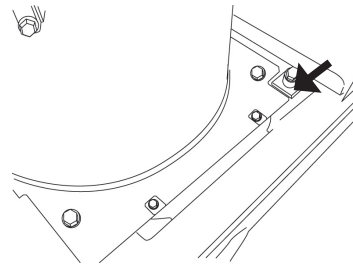


M1U1-07-038

### 4. Retighten the fuel tank mounting bolts.

Tool : 30 mm

Torque: 550 N·m (55 kgf·m, 406 lbf·ft)



M1U1-07-038

### 5. Radiator mounting bolt

(Upper Side)

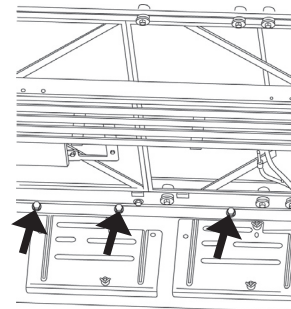
Tool : 17 mm

Torque: 65 N·m (6.5 kgf·m, 48 lbf·ft)

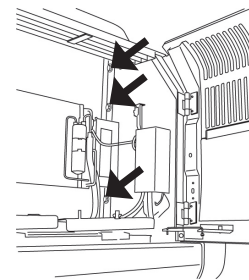
(Lower Side)

Tool : 24 mm

Torque: 270 N·m (27 kgf·m, 199 lbf·ft)



M1U1-07-057



M1U1-07-055

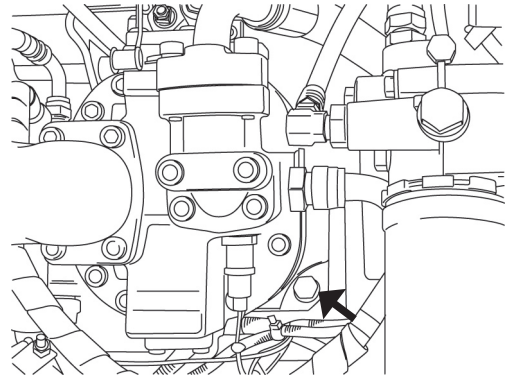


## MAINTENANCE

### 6. Retighten the pump transmission mounting bolts.

Tool : 17 mm

Torque: 65 N•m (6.5 kgf•m, 48 lbf•ft)

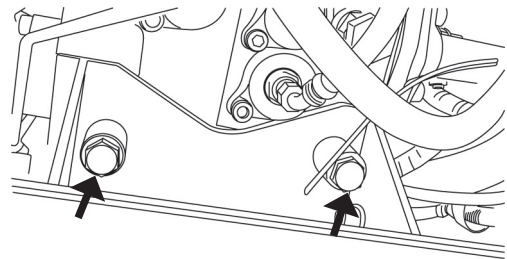


M1U1-07-021

### 7. Retighten the control valve mounting bolts.

Tool : 24 mm

Torque: 210 N•m (21 kgf•m, 155 lbf•ft)

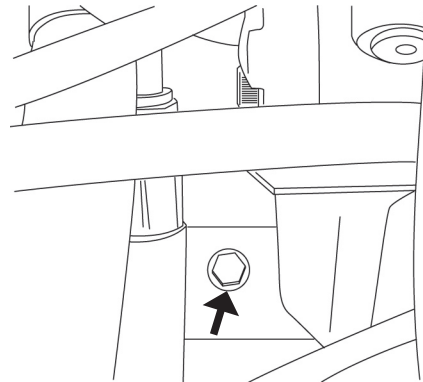


M1U1-07-025

### Retighten the control valve bracket mounting bolts.

Tool : 24 mm

Torque: 270 N•m (27 kgf•m, 199 lbf•ft)



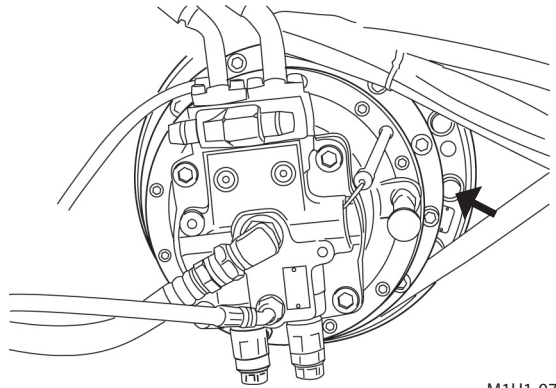
M1U1-07-041

## MAINTENANCE

8. Retighten the swing device mounting bolts.

Tool : 32 mm

Torque: 650 N•m (65 kgf•m, 472 lbf•ft)

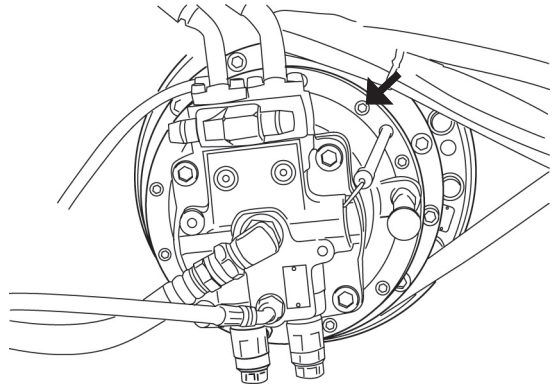


M1U1-07-053

9. Retighten the swing motor mounting bolts.

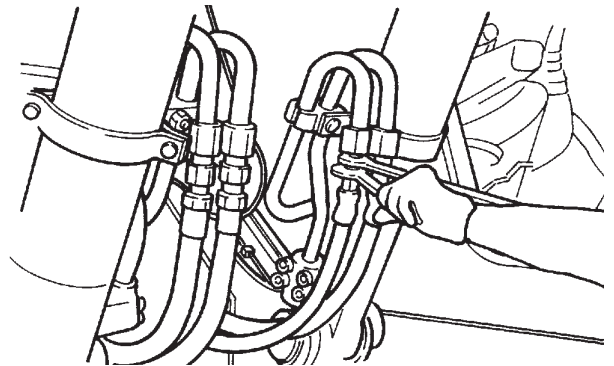
Tool : 12 mm

Torque: 90 N•m (9 kgf•m, 66 lbf•ft)



M1U1-07-053

10. Retighten the ORS fittings for hydraulic hoses and piping.

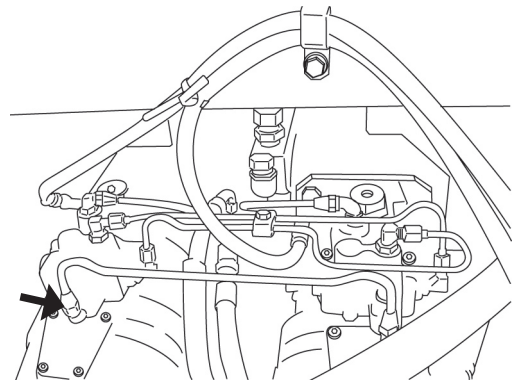


M104-07-079

11. Hycolin tube mounting nut

Tool : 17 mm

Torque: 35 N•m (3.5 kgf•m, 26 lbf•ft)



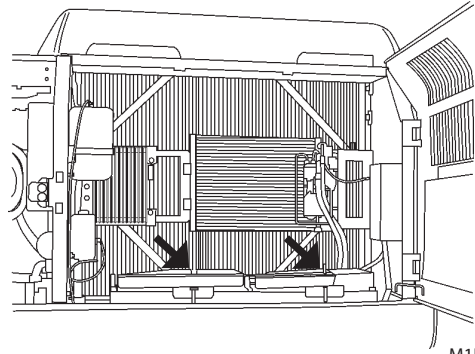
M1U1-07-035

## MAINTENANCE

### 12. Retighten the battery mounting nuts.

Tool : 17 mm

Torque: 25 N•m (2.5 kgf•m, 18 lbf•ft)



M1U1-07-016

### 13. Retighten the cab mounting nuts.

Tool : 24 mm

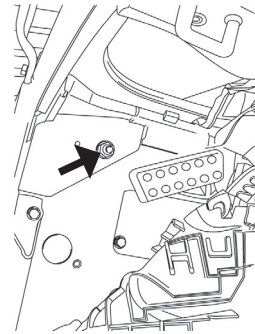
Torque: 210 N•m (21 kgf•m, 155 lbf•ft)

Tool : 32 mm

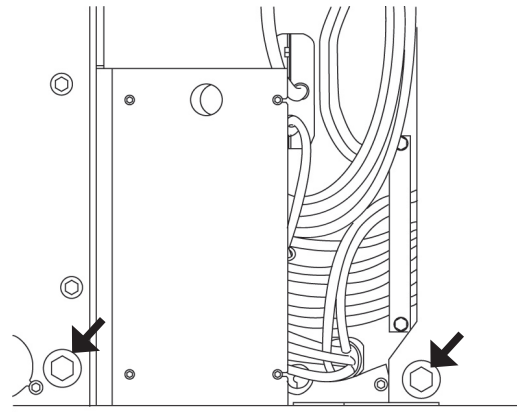
Torque: 550 N•m (55 kgf•m, 406 lbf•ft)

Tool : 19 mm

Torque: 110 N•m (11 kgf•m, 81 lbf•ft)



M1U1-07-026



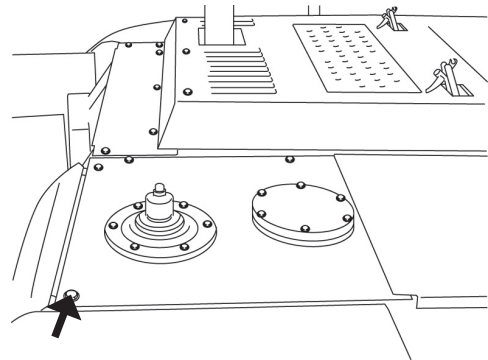
M1U1-07-054

Anchor Bolt Bottm View

## MAINTENANCE

### 14. Retighten the cover mounting bolts.

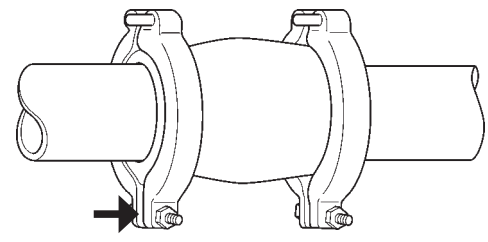
- Tool : 10 mm
- Torque: 10 N•m (1 kgf•m, 7 lbf•ft)
- Tool : 17 mm
- Torque: 50 N•m (5.1 kgf•m, 37 lbf•ft)
- Tool : 17 mm
- Torque: 90 N•m (9.2 kgf•m, 66 lbf•ft)



M1U1-07-042

### 15. Retighten flexible master coupling.

- Tool : 13 mm
- Torque: 10.3 to 12.4 N•m (1.05 to 1.26 kgf•m, 8 to 9 lbf•ft)
- Tool : 17 mm
- Torque: 20.5 to 22.6 N•m (2.07 to 2.30 kgf•m, 15 to 17 lbf•ft)

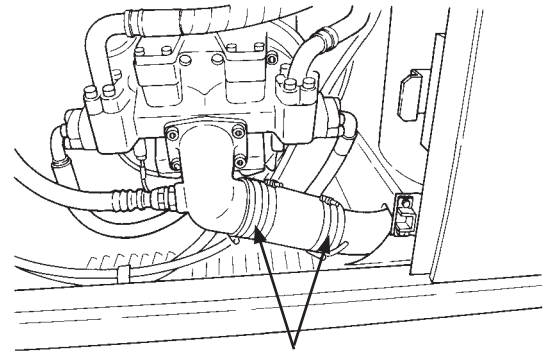


Flexible Master Coupling

M1G6-07-008

### Retighten, Jubilee and T-bolt clamp

- Tool : 10 mm
- Torque: 6 N•m (0.6 kgf•m, 4 lbf•ft)

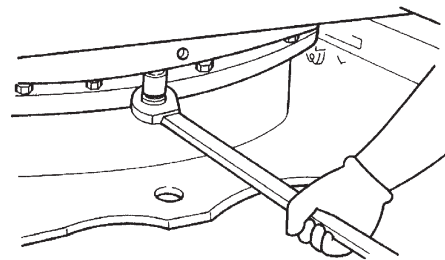


T-bolt Clamp

M157-07-215

### 16. Retighten the swing bearing mounting bolts to the upperstructure.

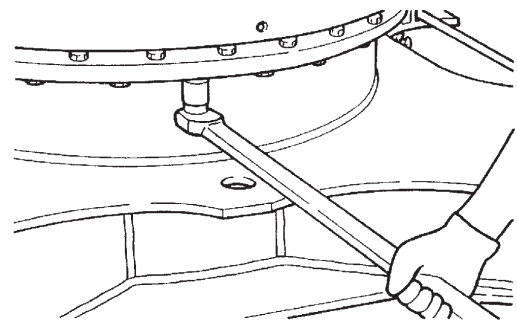
- Tool : 41 mm
- Torque: 1226 N•m (125 kgf•m, 904 lbf•ft)



M107-07-088

### Retighten the swing bearing mounting bolts to the undercarriage.

- Tool : 41 mm
- Torque: 1226 N•m (125 kgf•m, 904 lbf•ft)

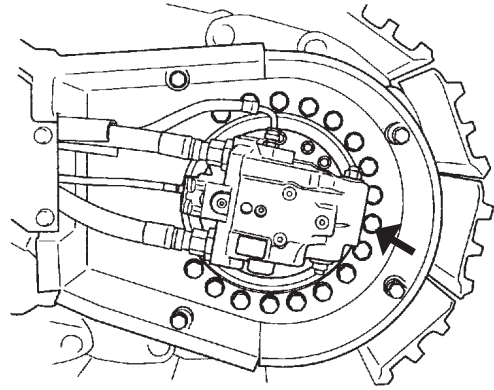


M107-07-089

## MAINTENANCE

### 17. Retighten the travel device mounting bolts.

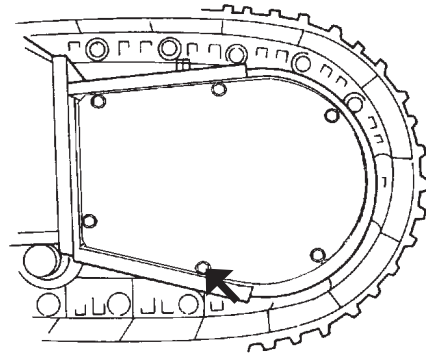
Tool : 32 mm  
Torque: 750 N·m (75 kgf·m, 553 lbf·ft)



M164-07-005

### Retighten the travel reduction device cover mounting bolts.

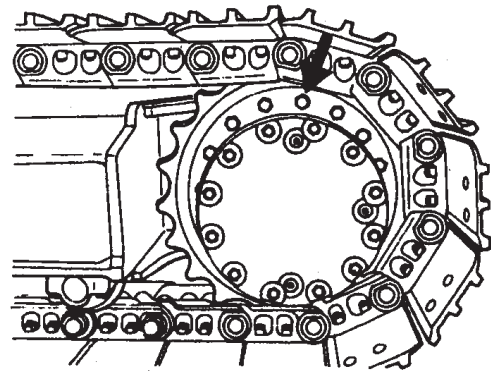
Tool : 24 mm  
Torque: 270 N·m (27 kgf·m, 199 lbf·ft)



M1G6-07-007

### Retighten the sprocket mounting bolts.

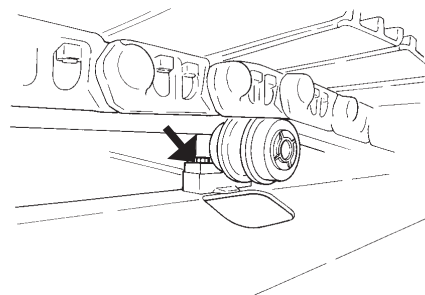
Tool : 32 mm  
Torque: 750 N·m (75 kgf·m, 553 lbf·ft)



M154-07-050

### 18. Retighten the upper roller mounting bolts.

Tool : 27 mm  
Torque: 400 N·m (40 kgf·m, 295 lbf·ft)

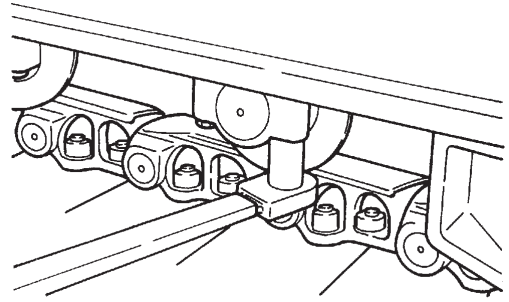


M157-07-224

## MAINTENANCE

19. Retighten the lower roller mounting bolts.

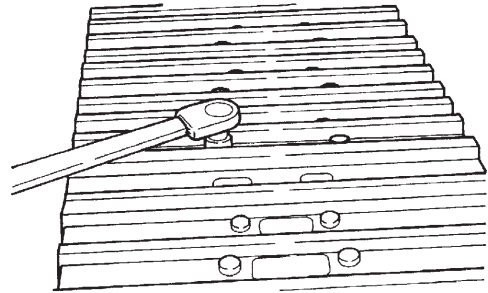
Tool : 32 mm  
Torque: 750 N·m (75 kgf·m, 553 lbf·ft)



M107-07-092

20. Retighten the shoe mounting bolts.

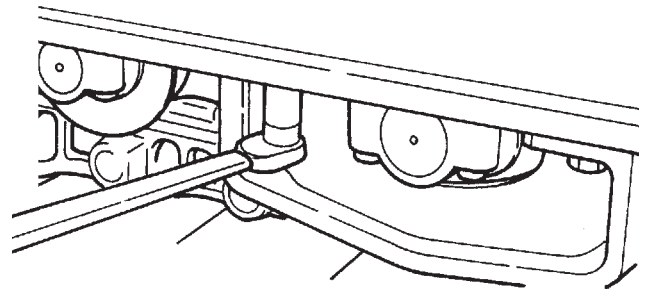
Tool : 32 mm  
Torque: 1400 N·m (140 kgf·m, 833 lbf·ft)



M107-07-093

21. Retighten the track guard mounting bolts.

Tool : 32 mm  
Torque: 750 N·m (75 kgf·m, 553 lbf·ft)



M107-07-094

22. Retighten front pin-retaining bolts and nuts.

Tool : 27 mm  
Torque: 400 N·m (41 kgf·m, 295 lbf·ft)

Tool : 30 mm  
Torque: 550 N·m (56 kgf·m, 406 lbf·ft)

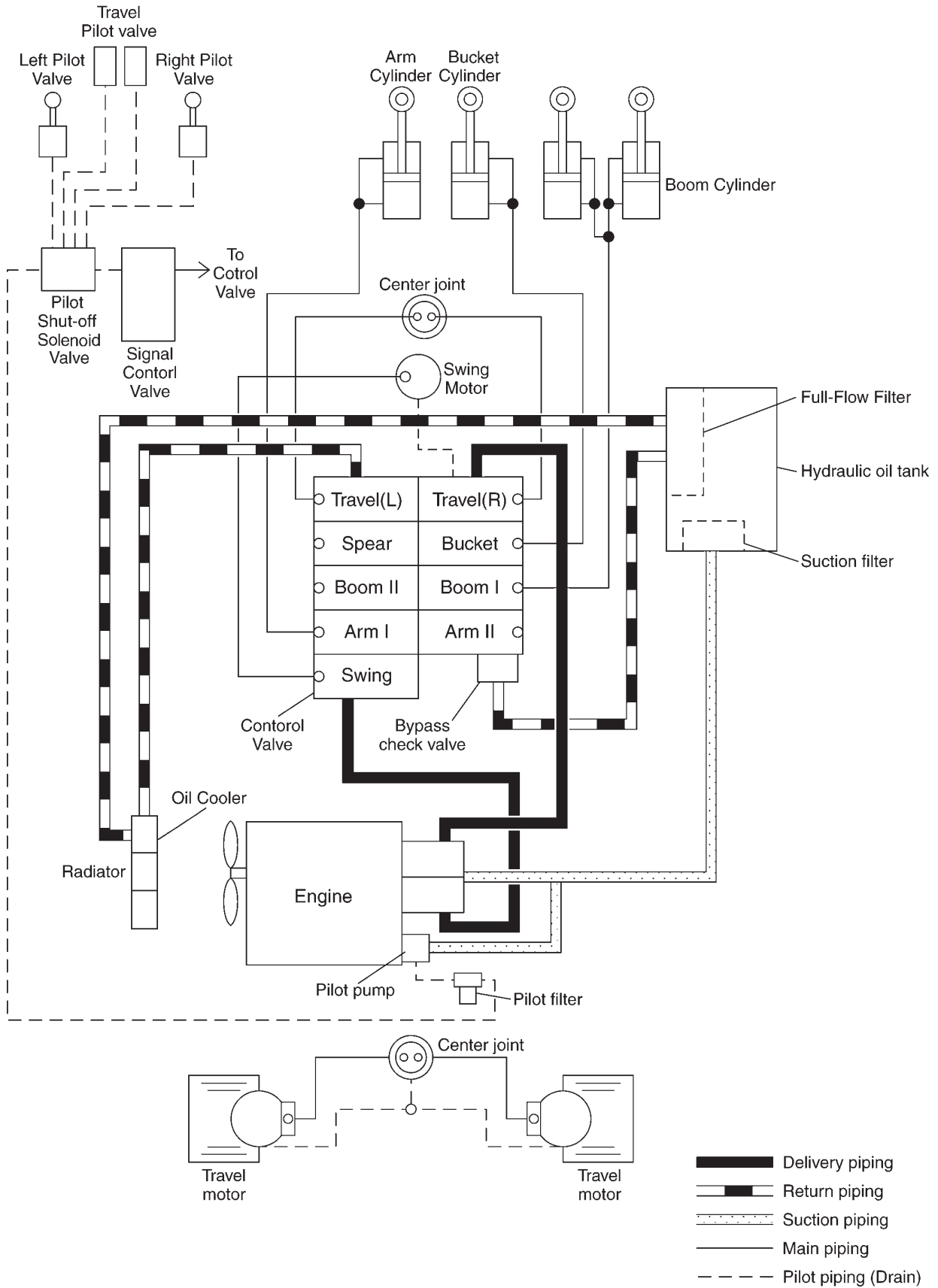
Tool : 32 mm  
Torque: 750 N·m (75 kgf·m, 553 lbf·ft)

23. Retighten counterweight mounting bolts.

Tool : 55 mm  
Torque: 2840 N·m (290 kgf·m, 2095 lbf·ft)

# HYDRAULIC CIRCUIT AND ELECTRICAL CIRCUIT

## HYDRAULIC CIRCUIT



M1V1-08-001

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## HYDRAULIC CIRCUIT AND ELECTRICAL CIRCUIT

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### ELECTRICAL CIRCUIT

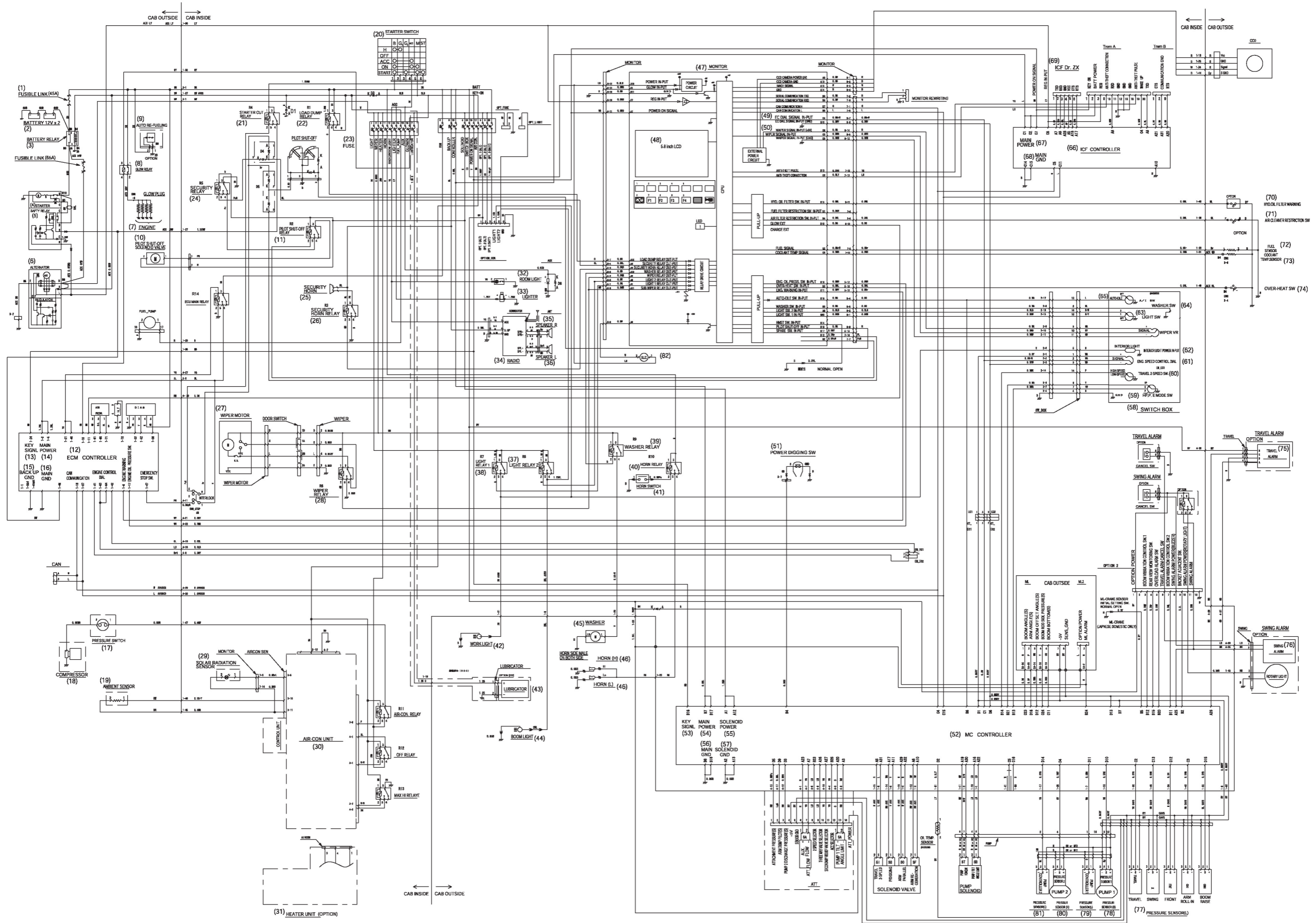
#### ZAXIS400R-3/400LCH-3 ELECTRICAL DIAGRAM

1. FUSIBLE LINK
2. BATTERY
3. BATTERY RELAY
4. STARTER
5. SAFETY RELAY
6. ALTERNATOR
7. ENGINE
8. GLOW RELAY
9. AUTO RE-FUELING SYSTEM
10. PILOT SHUT-OFF SOLENOID VALVE
11. PILOT SHUT-OFF RELAY
12. ECM CONTROLLER
13. KEY SIGNAL
14. MAIN POWER
15. BACK UP GND
16. MAIN GND
17. PRESSURE SWITCH
18. COMPRESSOR
19. AMBIENT SENSOR
20. STARTER SWITCH
21. STARYER CUT RELAY
22. LOAD DUMP RELAY
23. FUSE
24. SECURITY RELAY
25. SECURITY HORN
26. SECURITY HORN RELAY
27. WIPER MOTOR
28. WIPER RELAY
29. SOLAR RADIATION SENSOR
30. AIR-CON. UNIT
31. HEATER UNIT (OPTIONAL)
32. ROOM LIGHT
33. LIGHTER
34. RADIO
35. SPEAKER R
36. SPEAKER L
37. LIGHT RELAY2
38. LIGHT RELAY1
39. WASHER RELAY
40. HORN RELAY
41. HORN SWITCH
42. WORK LIGHT
43. LUBRICATOR
44. BOOM LIGHT
45. WASHER
46. HORN (H), HORN (L)
47. MONITOR
48. 5.8 INCH LCD
49. EC DIAL SIGNAL IN-PUT
50. WIPER SIGNAL IN-PUT
51. POWER DIGGING SWITCH
52. MC CONTROLLER
53. KEY SIGNAL
54. MAIN POWER
55. SOLENOID POWER
56. MAIN GND
57. SOLENOID GND
58. SWITCH BOX
59. HP, P, E MODE SW
60. TRAVEL 2-SPEED SW
61. ENGINE SPEED CONTROL DIAL
62. INTERIOR LIGHT
63. LIGHT SW
64. WASHER SW
65. AUTO-IDLE
66. ICF CONTROLLER
67. MAIN POWER
68. MAIN GND
69. ICF Dr. ZX
70. HYD. OIL FILTER WARNING
71. AIR CLEANER RESTRICTION SW.
72. FUEL SENSOR
73. COOLANT TEMP. SENSOR
74. OVER-HEAT SW
75. TRAVEL ALARM
76. SWING ALARM
77. PRESSURE SENSOR (L)
78. PRESSURE SENSOR (H)
79. PRESSURE SENSOR (L)
80. PRESSURE SENSOR (H)
81. PRESSURE SENSOR (L)
82. BUZZER



# ELECTRICAL DIAGRAM

CAUTION: Parts numbers on the drawing are provided only for reference purpose. To order parts on the drawing, be sure to consult the Parts Catalog.



# HYDRAULIC CIRCUIT AND ELECTRICAL CIRCUIT

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## MEMO

A series of horizontal dotted lines for writing a memo.

## MAINTENANCE UNDER SPECIAL ENVIRONMENTAL CONDITIONS

### MAINTENANCE UNDER SPECIAL ENVIRONMENTAL CONDITIONS

Operating Conditions	Precautions for Maintenance
Muddy Soil, Rainy or Snowy Weather	<p>Before Operation: Check the tightness of plug and all drain cocks.</p> <p>After Operation: Clean the machine and check for cracks, damaged, loose or missing bolts and nuts. Lubricate all necessary parts without delay.</p>
Near the Ocean	<p>Before Operation: Check tightness of plugs and all drain cocks.</p> <p>After Operation: Thoroughly clean the machine with fresh water to wash off salt. Service electrical equipment often to prevent corrosion.</p>
Dusty Atmosphere	<p>Air Cleaner: Clean the element regularly at shorter service intervals.</p> <p>Radiator: Clean the oil cooler screen to prevent clogging of the radiator core.</p> <p>Fuel System: Clean the filter element and strainer regularly at shorter service intervals.</p> <p>Electrical Equipment: Clean them regularly, in particular, the commutator surface of the alternator and starter.</p>
Rocky Ground	<p>Tracks: Carefully operate while checking for cracks, damage and loose bolts and nuts. Loosen the tracks a little more than usual.</p> <p>Front Attachment: Standard attachment may be damaged when digging rocky ground. Reinforce the bucket before using it, or use a heavy duty bucket.</p>
Freezing Weather	<p>Fuel: Use high quality fuel suitable for low temperature.</p> <p>Lubricant: Use high quality low viscosity hydraulic oil and engine oil.</p> <p>Engine Coolant: Be sure to use antifreeze.</p> <p>Battery: Fully charge the batteries regularly at shorter service intervals. If not fully charged, electrolyte may freeze.</p> <p>Tracks: Keep the track clean. Park the machine on a hard surface to prevent the tracks from freezing to the ground.</p>
Falling Stones	<p>Cab: Provide a cab guard to protect the machine from falling stones when necessary.</p>



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## STORAGE

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### STORING THE MACHINE

1. Inspect the machine. Repair worn or damaged parts. Install new parts if necessary.
2. Clean the primary air cleaner element.
3. Retract all hydraulic cylinders, if possible. If not, coat exposed cylinder rods with grease.
4. Lubricate all grease points.
5. Park the tracks on long stable blocks.
6. Wash the machine.
7. Remove the batteries and store them in a dry protected place after charging fully. If not removed, disconnect the negative battery cable from the (-) terminal.
8. Add an antirust agent to the coolant. In cold weather, add an antifreeze, or drain the coolant completely. Be sure to attach a "No Water in Radiator" tag on a clearly visible location if the system is drained.
9. Loosen the alternator belt and fan belt.
10. Paint necessary areas to prevent rust.
11. Store the machine in a dry, protected place. If stored outside, cover with a waterproof cover.
12. If the machine is stored for a long time, operate hydraulic functions for travel, swing and digging two to three times for lubrication, at least once a month.  
Be sure to check the coolant level and lubrication conditions before operating.

#### **Precautions for Disconnecting or Connecting**

##### **Batteries**

In case the batteries are kept disconnected for more than one month or when the batteries are reconnected, contact your nearest Hitachi dealer. Resetting of the ICF (Information Controller) may be required.


## STORAGE

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### REMOVING THE MACHINE FROM STORAGE

 **CAUTION:** Start the engine **ONLY** in a well-ventilated place.

1. Remove grease from the cylinder rods if coated.
2. Adjust alternator and fan belt tension.
3. Fill the fuel tank. Bleed air from the fuel system. Check all fluid levels.
4. Start the engine.  
Run the engine at half speed for several minutes before full load operation.
5. Cycle all hydraulic functions several times.
6. Carefully check all systems before operating the machine at full load.

 **NOTE:** When the machine has been stored for a long time, be sure to perform the following steps as well:

- (a) Check condition of all hoses and connections.
- (b) Warm up the engine.
- (c) Stop the engine.
- (d) Install new fuel filters. Replace the engine oil filter and fill the engine with oil.

**IMPORTANT:** If the machine has not been used for a long time, oil films on sliding surfaces may have broken down. Cycling hydraulic functions for travel, swing and digging two to three times is necessary to lubricate the sliding surfaces.

## TROUBLESHOOTING

### IMPOSSIBLE TO START THE ENGINE

	Problem	Cause	Solution
<b>Engine will not start</b>	<b>Starter does not rotate or is not powerful</b>	Discharged battery Disconnected, loose, or corroded battery terminals Lowered pilot control shut-off lever. Disconnected, loose, or corroded starter ground line terminals. Faulty pilot control shut-off lever electrical system Too high engine oil viscosity Faulty starter and/or electrical system	Charge or replace battery. After repairing the corroded area, securely tighten the connectors. Pull pilot control shut-off lever up. After repairing the corroded area, securely tighten the connectors. See your authorized dealer. Change engine oil with appropriate viscosity. See your authorized dealer.
	<b>Starter rotates</b>	No fuel Air in the fuel system Clogged fuel filter Frozen fuel Faulty injection pump Faulty engine control system The emergency engine stop SW is ON. Faulty preheat system	After checking that no fuel is leaking, refill fuel. Bleed air. After draining water, replace the element. Warm the fuel pump with hot water or wait until the atmospheric temperature rises. See your authorized dealer. See your authorized dealer. See your authorized dealer. See your authorized dealer.
	<b>Even though the engine is started, the engine stalls soon</b>	Too low idle speed Clogged fuel filter Clogged pre-fuel filter Faulty engine control system Clogged air cleaner Faulty injection pump	See your authorized dealer. After draining water, replace the element. Clean or replace the element. See your authorized dealer. Clean or replace the element. See your authorized dealer.
	<b>Engine runs irregularly</b>	Faulty fuel system Water or air in the fuel system Faulty engine control system	See your authorized dealer. Drain water or bleed air. See your authorized dealer.

## TROUBLESHOOTING

### ENGINE

Problem	Cause	Solution
<b>Engine Not Developing Full Power</b>	Air filters plugged	Replace filter elements.
	Fuel line restricted	Repair or replace fuel line.
	Contaminated fuel	Drain fuel tank and clean outlet screen. Refill.
	Fuel filters plugged	Change filters.
	Plugged vent in fuel tank cap	Clean or install new cap.
	Injection nozzles dirty or malfunctioning	See your authorized dealer.
	Injection pump linkage adjustment	See your authorized dealer.
	Wrong fuel	Use correct fuel.
	Wrong oil	Use correct oil.
	Turbocharger failure	See your authorized dealer.
	Injection pump out of timing	See your authorized dealer.
	Exhaust restriction	Remove muffler and run engine.
	Engine is too hot or cold	See below.
	Engine failure	See your authorized dealer.
Valve clearance	Check and adjust valves.	
Intake or exhaust system leakage	See your authorized dealer.	
<b>Engine Overheats</b>	Low coolant level	Add coolant.
	Thermostat	See your authorized dealer.
	Engine overloaded	Check hydraulic relief valves.
	Radiator cap faulty	Install new cap.
	Radiator core or oil cooler core plugged	Clean radiator and oil cooler.
	Radiator screen plugged	Clean screen.
	Injection pump out of timing	See your authorized dealer.
	Fan damaged	Replace fan.
	Air cleaner plugged	Clean air cleaner.
	Alternator and fan belt loose	Tighten or install new belt.
	Pulley grooves worn	Replace pulleys.
	Cooling system passages dirty	Flush cooling system.
	Temperature gauge or sending unit	See your authorized dealer.



## TROUBLESHOOTING

### ENGINE

Problem	Cause	Solution
<b>Coolant Temperature Too Low</b>	Thermostat	See your authorized dealer.
	Temperature gauge or sending unit	See your authorized dealer.
<b>Low Engine Oil Pressure</b>	Engine oil pump or pump drive	See your authorized dealer.
	Low oil level	Add oil.
	Engine oil pressure regulation valve	See your authorized dealer.
	Plugged oil pump intake screen	See your authorized dealer.
	Plugged oil filter	Install a new oil filter.
	Oil leaks	Check for leaks.
	Oil diluted with fuel or coolant	See your authorized dealer.
	Engine temperature too high	Check cooling system.
<b>Engine Uses Too Much Oil</b>	Wrong oil	Drain oil. Use correct oil.
	Oil leaks	Check engine oil drain plug.
	Engine temperature too high	Check cooling system.
	Plugged air cleaner	Clean element or install new element.
	Internal engine component wear	See your authorized dealer.
<b>Engine Uses Too Much Fuel</b>	Plugged or dirty air intake system	Clean air intake system.
	Wrong fuel	Use correct fuel.
	Fuel injection nozzles	See your authorized dealer.
	Injection pump out of time	See your authorized dealer.
<b>Excessive Black or Gray Exhaust Smoke</b>	Wrong fuel	Drain tank. Use correct fuel.
	Plugged or dirty air intake or exhaust system	Clean air intake and exhaust system.
	Injection pump out of timing	See your authorized dealer.
	Injection nozzles dirty or faulty	See your authorized dealer.
	Basic engine failures	See your authorized dealer.

## TROUBLESHOOTING

### ENGINE

Problem	Cause	Solution
<b>Nothing Works</b>	Battery	Recharge or replace.
<b>Nothing Works (Except clock)</b>	Battery relay	Replace relay.
<b>Batteries Undercharged</b>	Loose or corroded connections Alternator belt loose Alternator not charging Fuse Key switch failure	Clean and tighten or replace batteries. Tighten or install new belt. See your authorized dealer. Replace fuse. Replace key switch.
<b>Starting Motor Will Not Turn</b>	Battery undercharged or dead Battery cables making poor connections Fusible link Key switch Start relay Starter solenoid Starter Starter pinion jammed in flywheel gear Major engine failure	Recharge or replace battery. Clean connections. Replace fusible link. See your authorized dealer. See your authorized dealer. See your authorized dealer. Repair or replace start motor. Repair or replace starter. See your authorized dealer.
<b>Starter Solenoid Chatters</b>	Poor connections at batteries or starter Low battery charge Starter solenoid "hold-in" windings open	Clean connections. Recharge or replace batteries. See your authorized dealer.
<b>Starter Motor Turns but Will Not Crank Engine</b>	Starter pinion gear not engaging flywheel ring gear Pinion shift mechanism jammed or malfunctioning Pinion gear teeth broken Flywheel gear teeth broken	See your authorized dealer. See your authorized dealer. See your authorized dealer. See your authorized dealer.
<b>Engine Cranks Slowly</b>	Battery cables damaged or broken internally Battery or starter cable connections loose or corroded	Inspect and replace cables. Clean and tighten connections.

## TROUBLESHOOTING

### ENGINE

Problem	Cause	Solution
<b>Exhaust Gas is White</b>	<p>Wrong fuel</p> <p>Cold engine</p> <p>Thermostat faulty or too "cool"</p> <p>Injection pump out of time</p> <p>Coolant leakage into engine cylinder</p>	<p>Drain tank. Use correct fuel.</p> <p>Run engine until warm.</p> <p>See your authorized dealer.</p> <p>See your authorized dealer.</p> <p>See your authorized dealer.</p>
<b>Turbocharger Excessively Noisy or Vibrates</b>	<p>Bearings not lubricated</p> <p>Worn bearings</p> <p>Air leak in engine, intake or exhaust manifold</p> <p>Improper clearance between turbine wheel and turbine housing</p> <p>Broken blades on turbine</p>	<p>Insufficient oil pressure. Check for restricted turbocharger oil line.</p> <p>See your authorized dealer.</p> <p>Inspect, repair.</p> <p>See your authorized dealer.</p> <p>Remove exhaust elbow and air inlet hose and inspect.</p>
<b>Oil Dripping from Turbocharger Adapter</b>	<p>Damaged or worn bearings and/or worn seals</p> <p>Excessive crankcase pressure</p> <p>Turbocharger oil return line carbon build up where line passes exhaust manifold</p>	<p>See your authorized dealer. Inspect and clean air cleaner. Check for proper engine service intervals or dirt enter into engine.</p> <p>Check vent tube to ensure tube is not plugged. Clean.</p> <p>Remove line. Inspect, clean.</p>
<b>Excessive Drag in Turbocharger Rotating Members</b>	<p>Carbon build-up behind turbine wheel caused by combustion deposits</p> <p>Dirt build-up behind compressor wheel caused by air intake leaks</p> <p>Bearing seizure or dirty or worn bearings, caused by excessive temperature, unbalanced wheel, dirty oil, oil starvation, or insufficient lubrication</p>	<p>Inspect, clean.</p> <p>Inspect, clean.</p> <p>See your authorized dealer.</p>

## TROUBLESHOOTING

### ELECTRICAL SYSTEM

Problem	Cause	Solution
<b>Engine Cranks Slowly</b>	Battery discharged or will not hold a charge	Replace battery.
	Starter "dragging"	See your authorized dealer.
	Low battery voltage	Recharge or replace battery.
<b>Starter Motor Continues to Run After Engine Starts</b>	Start relay stuck	See your authorized dealer.
	Starter solenoid stuck	See your authorized dealer.
	Starter not disengaging	See your authorized dealer.
	Key switch	See your authorized dealer.
<b>Charging Indicator Light On-Engine Running</b>	Loose or glazed alternator belt	Check belt. Replace if glazed, tighten if loose.
	Engine rpm low	Adjust rpm to specification.
	Excessive electrical load from added accessories	Remove accessories or install higher output alternator.
	Loose or corroded electrical connections on battery, ground strap, starter, or alternator	Inspect, clean, or tighten electrical connections.
	Battery voltage low	Change or replace battery.
	Alternator or regulator	See your authorized dealer.
	Indicator circuit	See your authorized dealer.
<b>Noisy Alternator</b>	Worn drive belt	Replace belt.
	Worn pulleys	Replace pulleys and belt.
	Pulley misaligned	Adjust alternator mount.
	Alternator bearing	Loosen alternator belts. Turn pulley by hand. If any roughness is felt, repair alternator.
<b>No Monitor Panel Indicators Work</b>	Fuse	Replace fuse.
	Wiring harness	See your authorized dealer.
<b>Individual Light in Monitor Panel is Not Working</b>	Bulb	Replace bulb.
	Fuse	Replace fuse.
	Wiring harness	See your authorized dealer.

## TROUBLESHOOTING

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### ELECTRICAL SYSTEM

Problem	Cause	Solution
<b>No Indicators in Gauge Panel Operate</b>	Circuit board	See your authorized dealer.
	Wiring harness	See your authorized dealer.
	Fuse	Replace fuse.
<b>Indicator Light in Gauge Panel is Inoperative</b>	Bulb	Replace bulb.
	Fuse	Replace fuse.
	Sender	Do sender check.
	Wiring harness failure	See your authorized dealer.
<b>Coolant Temperature Gauge Does Not Work</b>	Fuse	Replace fuse.
	Gauge	See your authorized dealer.
	Gauge sender	Do coolant temperature gauge sender check.
	Wiring harness	See your authorized dealer.
<b>Indicator Lights Do Not Operate Auto-idle</b>	Fuse	Replace fuse.
	Bulb	Replace bulb.
	Auto-idle switch	See your authorized dealer.
<b>Fuel Gauge Does Not Work</b>	Fuse	Replace fuse.
	Gauge	See your authorized dealer.
	Wiring harness	See your authorized dealer.

## TROUBLESHOOTING

### MODE SELECTION

Problem	Cause	Solution
<b>Work Mode Selector Does Not Work</b>	Mode switches	See your authorized dealer.
	Electrical connector	See your authorized dealer.
	Wire harness (between MC and Monitor)	See your authorized dealer.
	Main controller (MC)	See your authorized dealer.
	Solenoid valve unit	See your authorized dealer.
<b>Fast/Slow Travel Speed Does Not Function</b>	Travel mode switches	See your authorized dealer.
	Pilot pressure switch (Travel)	See your authorized dealer.
	Pump 1,2 pressure sensor	See your authorized dealer.
	Pump 1,2 control pressure sensor	See your authorized dealer.
	Pump delivery pressure sensor wire harness	See your authorized dealer.
	Main controller (MC)	See your authorized dealer.
	Solenoid valve unit	See your authorized dealer.
Damaged travel motor	See your authorized dealer.	
<b>Auto-Idle Does Not Work</b>	Fuse	Replace fuse.
	Switch panel	See your authorized dealer.
	Electrical connector	See your authorized dealer.
	Wire harness	See your authorized dealer.
	ECM	See your authorized dealer.
	Pressure switches (Travel, Front)	See your authorized dealer.
	Main controller	See your authorized dealer.

## TROUBLESHOOTING

### CONTROL LEVERS

Problem	Cause	Solution
<b>Moves Hard</b>	Corroded joint	See your authorized dealer.
	Worn out pusher	See your authorized dealer.
<b>Does Nothing</b>	Worn out pusher	See your authorized dealer.
	Pilot valve	See your authorized dealer.
<b>Does Not Return to Neutral</b>	Pilot valve	See your authorized dealer.
<b>Too Much Play</b>	Worn out pivot joint	See your authorized dealer.
<b>Lever is Not Vertical In Neutral</b>	Pilot valve	See your authorized dealer.

### HYDRAULIC SYSTEM

Problem	Cause	Solution
<b>Hydraulic Functions are Slow</b>	Low oil level	Fill reservoir to full mark.
	Cold oil	Push hydraulic warm up switch.
	Wrong oil	Drain tank. Use correct oil.
	Engine speed too low	Increase speed or see your authorized dealer.
	Pilot circuit	See your authorized dealer.
	Worn pump	See your authorized dealer.
	Restricted pump suction line	See your authorized dealer.
<b>Hydraulic Oil Overheats</b>	Wrong oil	Use correct oil.
	Air leak in pump suction line	See your authorized dealer.
	Oil lines restricted	See your authorized dealer.
	Low oil level	Fill reservoir to full mark.
	Plugged filters	Install new filters.
	Worn pump	See your authorized dealer.
	Plugged radiator or oil cooler	Clean and straighten fins.
Oil cooler bypass	See your authorized dealer.	

## TROUBLESHOOTING

### HYDRAULIC SYSTEM

Problem	Cause	Solution
<b>Hydraulic Oil Overheats</b>	Relief valve Contaminated oil Travel motors Improperly adjusted hydraulic components	See your authorized dealer. Drain oil and refill. See your authorized dealer. See your authorized dealer.
<b>Oil Foams</b>	Air leak in line from reservoir to pump Kinks or dents in oil lines Wrong oil Water in oil High or low oil level	Repair leak or see your authorized dealer. Check lines. Use correct oil. Change oil. Correct level.
<b>Low or No Oil Pressure</b>	Wrong oil Improperly adjusted hydraulic components No oil in system Worn cylinder packings Relief valve	Use correct oil. See your authorized dealer. Fill with correct oil. See your authorized dealer. See your authorized dealer.
<b>No Hydraulic Functions (Noise from pumps)</b>	Hydraulic pump Decreased set-pressure of main relief valve in control valve Lack of hydraulic oil Damaged suction line or hose Clogged suction filter Sucked air from oil suction port	See your authorized dealer.  Add oil. See your authorized dealer. Clean.
<b>Hydraulic Cylinders Operate but Cannot Lift Load</b>	Hydraulic pump worn Main relief valve pressure low Hydraulic oil level low Suction screen plugged Pump suction line leaking Pressure switches Solenoid valve	See your authorized dealer. See your authorized dealer. Add oil. Clean strainer and system. Inspect suction line. See your authorized dealer. See your authorized dealer.



## TROUBLESHOOTING

### HYDRAULIC SYSTEM

Problem	Cause	Solution
<b>One Control Lever Does Not Work</b>	Relief valve pressure low	See your authorized dealer.
	Tube or hose damaged	Repair or replace.
	Hydraulic fittings loose	Tighten.
	Damaged O-rings in fittings	Install new O-ring.
	Hydraulic Pump	See your authorized dealer.
	Pilot valve	See your authorized dealer.
	Pilot lines	Repair or replace.
<b>One Cylinder Does Not Work</b>	Control valve spool damaged or contaminated with dirt	See your authorized dealer.
	Hydraulic lines damaged	Repair or replace.
	Fittings loose	Tighten.
	O-ring in fitting damaged	Install new O-ring.
	Pilot valve	See your authorized dealer.
	Pilot lines	Repair or replace.
<b>One Cylinder Does Not Work or Has Little Power</b>	Piston seals leaking	See your authorized dealer.
	Cylinder rod damaged	See your authorized dealer.
	Pilot lines	Repair or replace.
	Pilot valve	See your authorized dealer.
	Failed wiring harness	See your authorized dealer.
<b>Both Travel Motors Do Not Work</b>	Center joint failure	See your authorized dealer.
<b>One Travel Motor Does Not Work</b>	Travel motor	See your authorized dealer.
	Parking brake not releasing	See your authorized dealer.
	Pilot valve	See your authorized dealer.
	Pilot lines	Repair or replace.
<b>Travel is Not Smooth</b>	Track adjustment	Adjust tension.
	Track idler or rollers damaged	See your authorized dealer.
	Track frame bent	See your authorized dealer.

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## TROUBLESHOOTING

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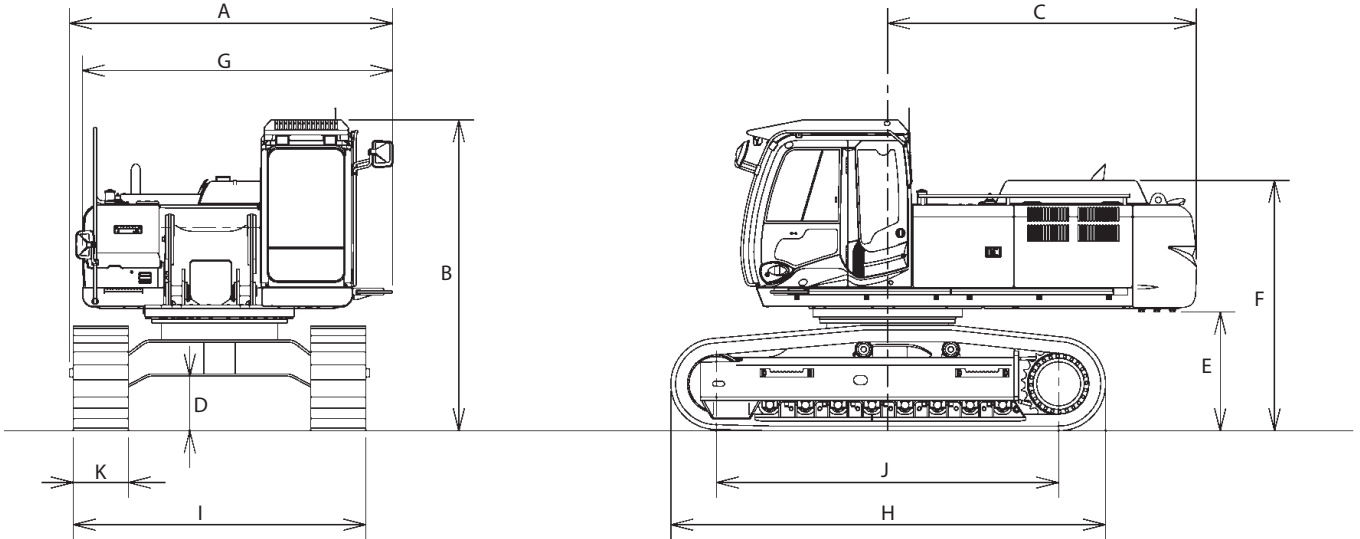
### HYDRAULIC SYSTEM

Problem	Cause	Solution
<b>Travel is Not Smooth</b>	Rocks or mud "jammed" in track frame	Remove and repair.
	Travel brake not releasing	See your authorized dealer.
<b>Swing Does Not Work</b>	Swing brake release valve	See your authorized dealer.
	Swing motor	See your authorized dealer.
	Pilot valve	See your authorized dealer.
<b>Swing is Not Smooth</b>	Swing gear	See your authorized dealer.
	Swing bearing	See your authorized dealer.
	Lack of grease	Apply grease.
	Combination valve	See your authorized dealer.
<b>Engine Stops When Travel or/ and Control Lever Moved</b>	Failure of connector contact	Repair or replace.
	Failed wiring harness	See your authorized dealer.
	Failed Main controller	See your authorized dealer.

## SPECIFICATIONS

### SPECIFICATIONS

#### ZAXIS400R-3, ZAXIS400LCH-3



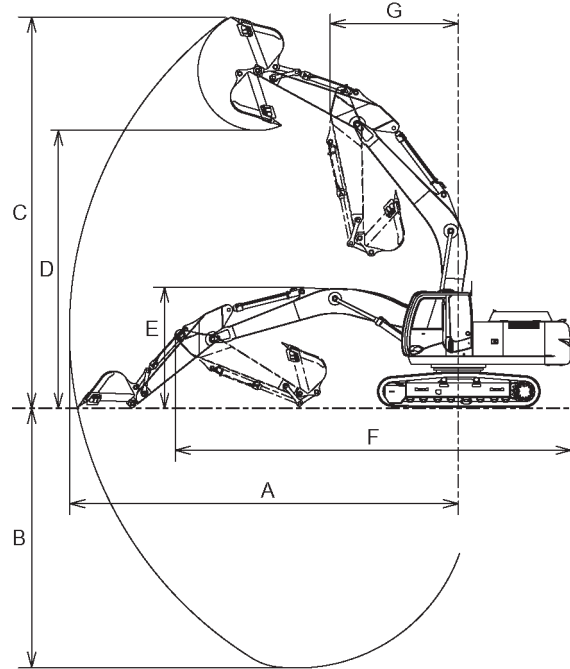
M1JK-12-001

Model	ZAXIS400R-3	ZAXIS400LCH-3
Type of Front-End Attachment	3.2 m (10 ft 6 in) R Arm	3.2 m (10 ft 6 in) H Arm
Bucket Capacity (Heaped)	PCSA 1.5 m <sup>3</sup> (1.96 yd <sup>3</sup> ), CECE 1.3 m <sup>3</sup>	PCSA 1.6 m <sup>3</sup> (2.09 yd <sup>3</sup> ), CECE 1.4 m <sup>3</sup>
Operating Weight	38700 kg (85300 lb)	39000 kg (86000 lb)
Base Machine Weight	29800 kg (65700 lb)	30300 kg (66800 lb)
Engine	Isuzu AH-6HK1XYSA-01 202 kW/1900 min <sup>-1</sup> (275 PS/1900 rpm)	
A: Overall Width (Excluding back mirrors)	3520 mm (11 ft 7 in)	
B: Cab Height	3390 mm (11 ft 2 in)	
C: Rear End Swing Radius	3390 mm (11 ft 2 in)	
D: Minimum Ground Clearance	* 560 mm (22 in)	
E: Counterweight Clearance	* 1260 mm (4 ft 16 in)	
F: Engine Cover Height	* 2690 mm (8 ft 10 in)	
G: Overall Width of Upperstructure	* 3380 mm (11 ft 1 in)	
H: Undercarriage Length	4740 mm (15 ft 7 in)	5060 mm (16 ft 7 in)
I: Undercarriage Width	3190 mm (10 ft 6 in)	
J: Sprocket Center to Idler Center	3730 mm (12 ft 3 in)	4050 mm (13 ft 3 in)
K: Track Shoe Width	600 mm (24 in) (Grouser shoe)	
Ground Pressure	78 kPa (0.79 kgf/cm <sup>2</sup> , 11 psi)	73 kPa (0.74 kgf/cm <sup>2</sup> , 10.6 psi)
Swing Speed	10.7 min <sup>-1</sup> (rpm)	
Travel Speed (fast/slow)	5.0/2.9 km/h (3.1/1.8 mph)	
Gradeability	35° (tan θ = 0.70)	

NOTE: \* The dimensions do not include the height of the shoe lug.

# SPECIFICATIONS

## WORKING RANGES



T1V1-01-01-002

Model		ZAXIS400R-3		ZAXIS400LCH-3	
Item	Category	mm	ft·in	mm	ft·in
		A: Maximum Digging Reach	11090	36'5"	11120
B: Maximum Digging Depth		7310	23'12"	7310	23'12"
C: Maximum Cutting Height		10320	33'10"	10440	34'3"
D: Maximum Dumping Height		7220	23'8"	7330	24'1"
E: Transport Height		3410	11'2"	3390	11'2"
F: Overall Transport Length		11030	36'2"	10960	35'12"
G: Minimum Swing Radius		4470	14'8"	4460	14'8"

NOTE: \* The dimensions do not include the height of the shoe lug.

## SPECIFICATIONS

### BUCKET TYPES AND APPLICATIONS

Bucket	Bucket Capacity m <sup>3</sup> (yd <sup>3</sup> )		Bucket Width (in)		NO. of Bucket Teeth	Weight kg (lb)	Front-End Attachment	
	PCSA (Heaped)	CECE (Heaped)	With Side Cutter	Without Side Cutter			ZAXIS400R-3	ZAXIS400LCH-3
							R Boom 6.4 m(20'12")	H Boom 6.4m (20'12")
							R Arm 3.2 m (10'6")	H Arm 3.2 m (10'6")
Rock Bucket	1.6 (2.09)	1.4 (1.83)	1490 (59")	1520 (60")	5	1650 (3640)	-	■
Reinforced Rock Bucket	1.5 (1.96)	1.3 (1.70)	1440 (57")	1470 (58")	5	1720 (3800)	■	-

 NOTE: • Symbols in the above table have the following meanings.

■ : Rock digging

- : Not applicable (not warrantable)

**IMPORTANT: Using inapplicable buckets may cause serious damage to the front structure such as boom, arm and hydraulic cylinders.**

## SPECIFICATIONS

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### SOUND LEVEL RESULTS (2000/14/EC)

LwA: sound-power level of airborne noise

LpA: sound level at operator's station


Unit: dB(A)

	LwA	LpA
ZAXIS400R-3, 400LCH-3	105	75

### VIBRATION LEVEL


Hands/Arms: The acceleration to which the operator's hands and arms will be exposed is lower than  $2.5\text{m/s}^2$ .

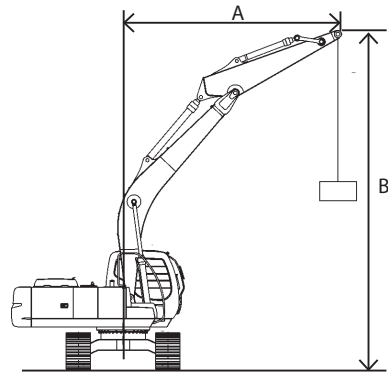
Entire body: The acceleration to which the operator's entire body will be exposed is lower than  $0.5\text{m/s}^2$ .

 *NOTE: The acceleration is measured in accordance with ISO 2631/1; ISO 5349 and SAE J1166.*

## OPTIONAL ATTACHMENTS AND DEVICES

### LIFTING CAPACITIES

-  **NOTE:** 1. Lifting capacity of the ZX series does not exceed 75% of tipping load with the machine on firm, level ground or 87% of full hydraulic capacity.  
 2. \* Indicates load limited by hydraulic capacity.















M1G6-13-013

A: Rating over-side or 360 degrees  
 B: Rating over-front

### METRIC MEASURE


ZAXIS400R-3 Mono block boom, Arm 3.2m, Without Bucket, G 600 mm

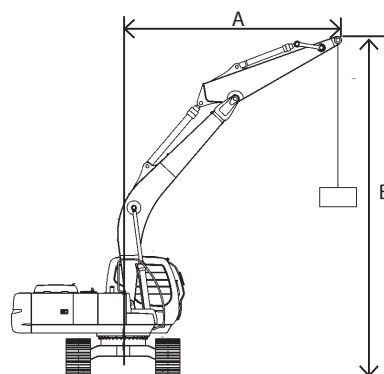
Unit; 1000 kg

B: Load point height m	A: Load radius												Max.		
	1.5 m		3.0 m		4.5 m		6 m		7.5 m		9 m		REACH m		
															
6									7.5	8.3*			5.9	6.6*	8.6
4.5					12.9*	12.9*	10.2	10.2*	7.3	8.9*	5.4	7.8*	5.3	6.7*	9.1
3					14.6	16.2*	9.6	11.8*	7.0	9.7*	5.3	7.6	4.9	7.0*	9.4
1.5					13.6	18.3*	9.1	13.1*	6.7	9.8	5.1	7.5	4.8	7.0	9.4
0(GROUND)					13.2	18.9*	8.8	13.3	6.5	9.6	5.0	7.4	4.9	7.2	9.1
-1.5			14.1*	14.1*	13.2	18.3*	8.7	13.1	6.4	9.5			5.3	7.8	8.6
-3	16.4*	16.4*	22.2*	22.2*	13.3	16.7*	8.7	12.7*	6.5	9.6			6.2	9.1*	7.8
-4.5			17.8*	17.8*	13.5*	13.5*	9.0	10.1*					8.2	8.9*	6.5

## OPTIONAL ATTACHMENTS AND DEVICES

### LIFTING CAPACITIES

-  **NOTE:** 1. Lifting capacity of the ZX series does not exceed 75% of tipping load with the machine on firm, level ground or 87 % of full hydraulic capacity.  
 2. \* Indicates load limited by hydraulic capacity.



M1G6-13-013  
 A: Rationg over-side or 360 degrees  
 B: Rationg over-front

### METRIC MEASURE

ZAXIS400LCH-3 Mono block boom, Arm 2.67 m, Without Bucket, G 600 mm

Unit; 1000 kg

B: Load point height m	A: Load radius										Max.				
	1.5 m		3.0 m		4.5 m		6.0 m		7.5 m				REACH m		
6													6.8	9.1*	8.1
4.5					14.5*	14.5*	10.4	11.3*	7.5	9.7*	6.1	9.1*	6.1	9.1*	8.6
3							9.9	12.7*	7.2	10.4*	5.7	9.0	5.7	9.0	8.9
1.5							9.5	13.9*	7.0	11.0*	5.6	8.9	5.6	8.9	8.9
0(GROUND)					13.8	19.3*	9.2	14.3*	6.9	11.1	5.7	9.2	5.7	9.2	8.6
-1.5			14.8*	14.8*	13.9	18.2*	9.2	13.9*	6.8	10.9*	6.2	9.8*	6.2	9.8*	8.1
-3			20.8*	20.8*	14.1	16.2*	9.3	12.5*			7.4	9.9*	7.4	9.9*	7.2
-4.5			15.4*	15.4*	12.2*	12.2*					9.3*	9.3*	9.3*	9.3*	5.7

ZAXIS400LCH-3 Mono block boom, Arm 3.2m, Without Bucket, G 600 mm

Unit; 1000 kg

B: Load point height m	A: Load radius												Max.				
	1.5 m		3 m		4.5 m		6 m		7.5 m		9 m				REACH m		
7.5															6.4*	6.4*	7.8
6									7.8	8.2*			6.0	6.2*	6.0	6.2*	8.6
4.5					13.0*	13.0*	10.4*	10.4*	7.4	9.0*	5.6	7.7*	5.4	6.2*	5.4	6.2*	9.2
3					14.9	16.4*	9.9	12.0*	7.1	9.8*	5.4	8.6*	5.1	6.5*	5.1	6.5*	9.4
1.5					14.0	18.6*	9.4	13.3*	6.9	10.6*	5.3	8.5	5.0	6.9*	5.0	6.9*	9.4
0(GROUND)					13.6	19.2*	9.0	14.0*	6.7	11.0	5.2	8.4	5.1	7.7*	5.1	7.7*	9.2
-1.5			13.8*	13.8*	13.5	18.6*	8.9	13.9*	6.6	10.9*			5.5	8.9	5.5	8.9	8.6
-3	16.1*	16.1*	21.8*	21.8*	13.7	16.9*	9.0	12.9*	6.7	9.8*			6.4	9.2*	6.4	9.2*	7.8
-4.5			18.1*	18.1*	13.8*	13.8*	9.3	10.3*					8.3	9.0*	8.3	9.0*	6.5



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