PART NO. ENMDEQ-EN1-1

HITACHI

Reliable solutions

Operator's Manual

ZAXIS
85US-6
85USB-6

Hydraulic Excavator

ZX85US-6 • 85USB-6 HYDRAULIC EXCAVATOR OPERATOR'S MANUAL

Hitachi Construction Machinery Co., Ltd.
URL:http://www.hitachi-c-m.com

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ENMDEQ-EN1-1

Serial No.

ZX85US-6	090001 and up
ZX85USB-6	110001 and up

CALIFORNIA

Proposition 65 Warning

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

INTRODUCTION

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

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

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

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

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

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

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

Be sure to use fuel that complies with JIS K-2204, EN-590 or ASTM D-975 which contains 15 ppm or lower sulfur. Also use fuel that complies with solid contamination level of class 18/16/13 of ISO4406-1999 (solid contamination includes dust). If the fuel specified above is not used, exhaust gas that exceeds the regulation values may be discharged, causing serious problem on the engine. Consult your authorized dealer.

Warranty is provided as a part of Hitachi's support program for customers who operate and maintain their equipment as described in this manual. The warranty is explained on the warranty certificate which you should have received from your dealer.

This warranty provides you the assurance that Hitachi will back its products where defects appear within the warranty period. In some circumstances, Hitachi also provides field improvements, often without charge to the customer, even if the product is out of warranty. **Should the equipment be abused, or modified to change its performance beyond the original factory specifications, the warranty will become void and field improvements may be denied.** Setting fuel delivery above specifications or otherwise overpowering machines will result in such action.

Only qualified, experienced operators officially licensed (according to local law) should be allowed to operate the machine. Moreover, only officially licensed personnel should be allowed to inspect and service the machine.

PRIOR TO OPERATING THIS MACHINE, INCLUDING COMMUNICATION SYSTEM, IN A COUNTRY OTHER THAN A COUNTRY OF ITS INTENDED USE, IT MAY BE NECESSARY TO MAKE MODIFICATIONS TO IT SO THAT IT COMPLIES WITH THE LOCAL REGULATORY STANDARDS (INCLUDING SAFETY STANDARDS) AND LEGAL REQUIREMENTS OF THAT PARTICULAR COUNTRY. PLEASE DO NOT EXPORT OR OPERATE THIS MACHINE OUTSIDE OF THE COUNTRY OF ITS INTENDED USE UNTIL SUCH COMPLIANCE HAS BEEN CONFIRMED. PLEASE CONTACT HITACHI CONSTRUCTION MACHINERY CO., LTD. OR ANY OF OUR AUTHORIZED DISTRIBUTOR OR DEALER IF YOU HAVE ANY QUESTIONS CONCERNING COMPLIANCE.

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

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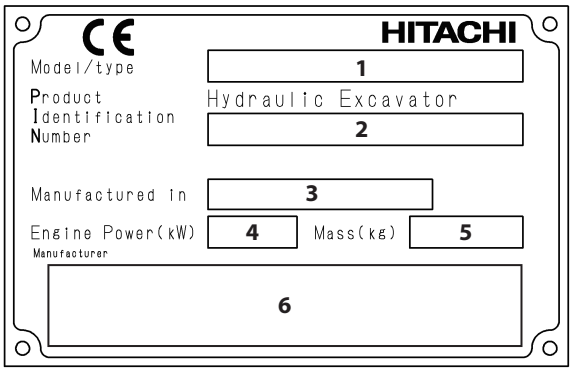
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MACHINE NUMBERS

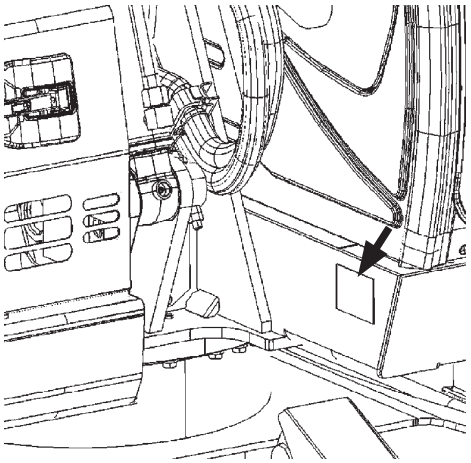
The product identification number discussed in this chapter is a number unique to each machine. It is necessary to have it when making inquiries about the machine. Please enter the ID number of your machine in the blank in this chapter.

Base Machine

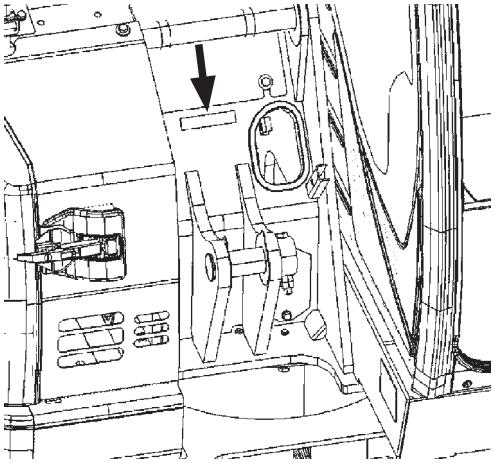


MADR-00-002-1 ja

1. MODEL/TYPE
2. Product Identification Number
3. Manufactured in
4. Engine power in kW according to ISO14396;2002
5. Operating mass (standard version)
6. Manufacturer (Authorized Representative, if applicable)



MDEQ-00-003-1 ja



MDEQ-00-004-1 ja

Product Identification Number

NOTE

HCMDEQ50000030001

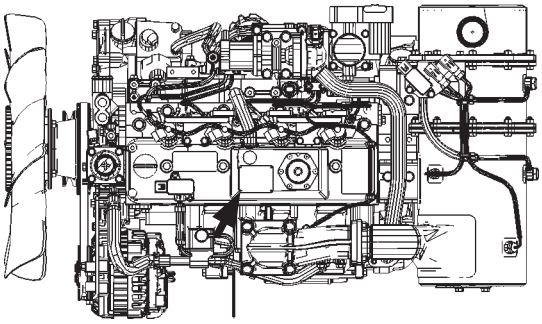
Marks to indicate the start and end of the PIN

PRODUCT IDENTIFICATION NUMBER (PIN)

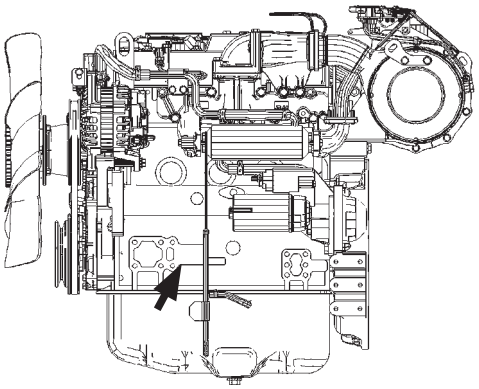
MACHINE NUMBERS

Engine

TYPE :
MFG. NO. :



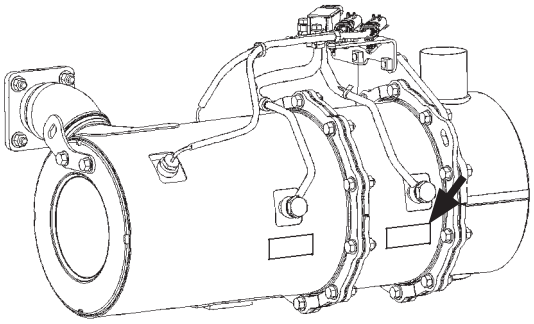
MDEQ-00-005-1 ja



MDEQ-00-006-1 ja

Muffler Filter

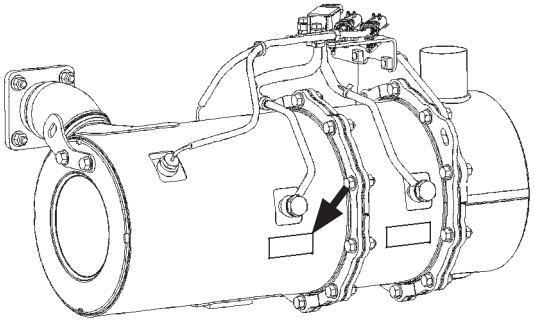
Model :
Product identification number :



MDEQ-00-007-1 ja

DOC (Oxidation Catalyst)

Model :
Product identification number :

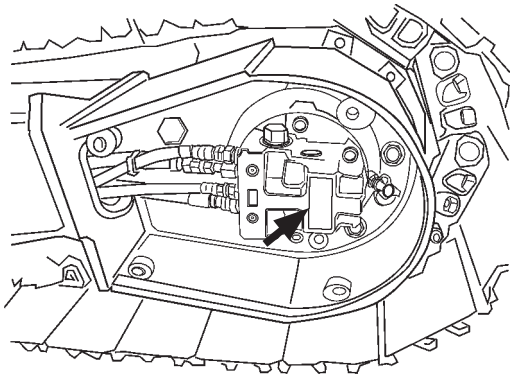


MDEQ-00-008-1 ja

Travel Motor

Model :

Product identification number :

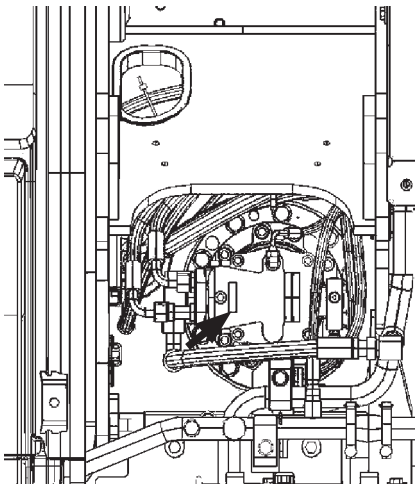


MDEQ-00-009-1 ja

Swing Motor

Model :

Product identification number :

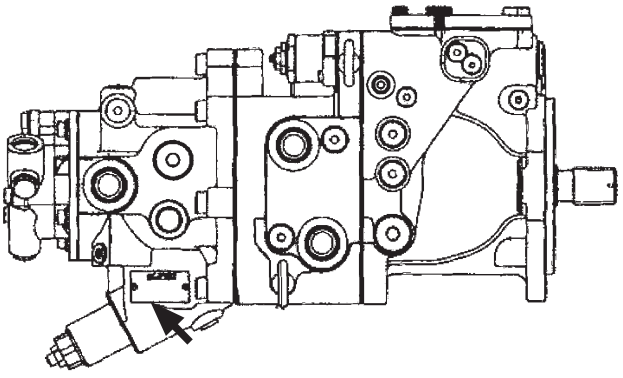


MDEQ-00-010-1 ja

Hydraulic Pump

Model :

Product identification number :



MDEQ-00-011-1 ja

MEMO

Recognize Safety Information

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



SA-2644 ja

Understand Signal Words

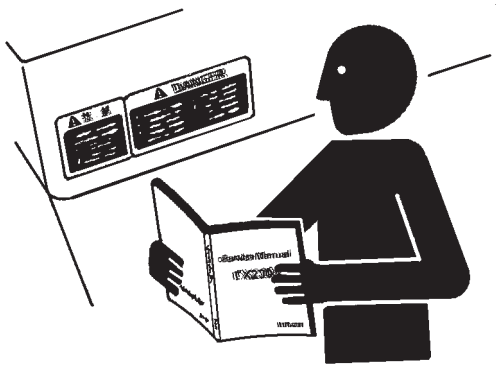
- On machine safety signs, signal words designating the degree or level of hazard - DANGER, WARNING, or CAUTION are used with the safety alert symbol.
  - **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
  - **WARNING** indicates a 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 are occasionally used on this machine that do not use any of the designated signal words mentioned above after the safety alert symbol.
- 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.



SA-632 en_GB

- NOTE: Indicates an additional explanation for a piece of information.

Follow Safety Instructions



SA-003 ja

- 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 safety, function, and/or service life of the part. In addition, personal accident, machine trouble, and/or damage to material caused by unauthorized modifications will void Hitachi Warranty Policy.
  - Never attempt to modify or disassemble the inlet/exhaust parts and the aftertreatment device. Avoid shocks to the element of the aftertreatment device, such as striking or dropping objects onto the element. Failure to do so may affect the exhaust gas purifying device, possibly damaging it or lowering its performance.
  - Do not use attachments and/or optional parts or equipment not authorized by Hitachi. Failure to do so may deteriorate the safety, function, and/or service life of the machine. In addition, personal accident, machine trouble, and/or damage to material caused by using unauthorized attachments and/or optional parts or equipment will void Hitachi Warranty Policy.
- The safety messages in this SAFETY chapter are intended to illustrate basic safety procedures of machines. However it is impossible for these safety messages to cover every hazardous situation you may encounter. If you have any questions, you should first consult your supervisor and/ or your authorized dealer before operating or performing maintenance work on the machine.

Prepare for Emergencies

- Be prepared for a fire or an accident.
  - 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.



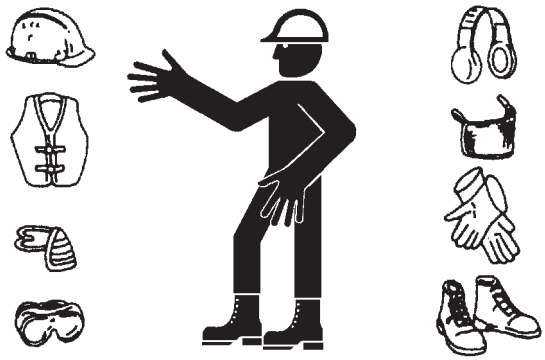
SA-437 ja

Wear Protective Clothing

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

  You may need:
  - A hard hat
  - Safety belt
  - 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 ja

Protect Against Noise

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



SA-434 ja

Inspect Machine

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



SA-435 ja

General Precautions for the Cab

- Before entering the cab, thoroughly remove all dirt and/or oil such as mud, grease, soil or stones from the soles of your work boots. If any controls such as a pedal is operated while with dirt and/or oil on the soles of the operator's work boots, the operator's foot may slip off the pedal, possibly resulting in a personal accident.
- Do not mess up around the operator's seat with parts, tools, soil, stones, obstacles that may fold up or turn over, cans or lunch box. The levers or pedals become inoperable if obstacle jams in operation stroke of the travel levers/pedals, pilot control shut-off lever or control levers, which may result in serious injury or death.
- Avoid storing transparent bottles in the cab. Do not attach any transparent type window decorations on the windowpanes as they may focus sunlight, possibly starting a fire.
- Refrain from listening to the radio, or using music headphones or mobile telephones in the cab while operating the machine.
- Keep all flammable materials 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.
- Correctly lay the floor mat specific to the machine. If another floor mat is used, it may be displaced and contact with the travel pedals during operation, resulting in serious injury or death.

Use Handholds and Steps

- Falling is one of the major causes of personal injury.
  - When you get on and off the machine, always use the crawler instead of the step for safety. Also get on and off from a position on the crawler that provides enough room for your feet.
  - When you get on and off the machine, always face the machine.
  - Maintain a three-point contact with the steps and handrails.
  - Do not use any controls as handholds.
  - Never jump on or off the machine. Never mount or dismount a moving machine.



SA-439 ja

  - In case a slippery material such as oil, grease, or mud is present on steps, handrails, or platforms, thoroughly remove such material.
  - Do not get on or off the machine while holding something, such as a tool, in your hands.

Adjust the Operator's Seat

- A seat which is poorly adjusted for the individual operator, or the work to be undertaken, may quickly fatigue the operator leading to misoperation.
  - The seat should be adjusted whenever the operator of the machine changes.
  - 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 ja

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 and/or pedal, 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.

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 is replaced every three years regardless of its apparent condition.



SA-237 ja

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 ja

  - Ensure the cab door, windows, doors and covers are securely locked.
  - Check the mirrors and the monitor in the cab for problems.
    If there is, replace the problem part (s) or clean the mirror, camera lens and the monitor display.
    Refer to Rear View Monitor section for information on cleaning the camera lens and the monitor display.

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



SA-444 ja

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.



SA-032 ja

- **Checking Battery Level and Supplementary Charging**
  - Never short across the battery terminals, including to check the remaining battery power. Doing so will result in sparks and may cause an explosion or fire. Use a hydrometer to check remaining battery power.

Keep Riders off Machine

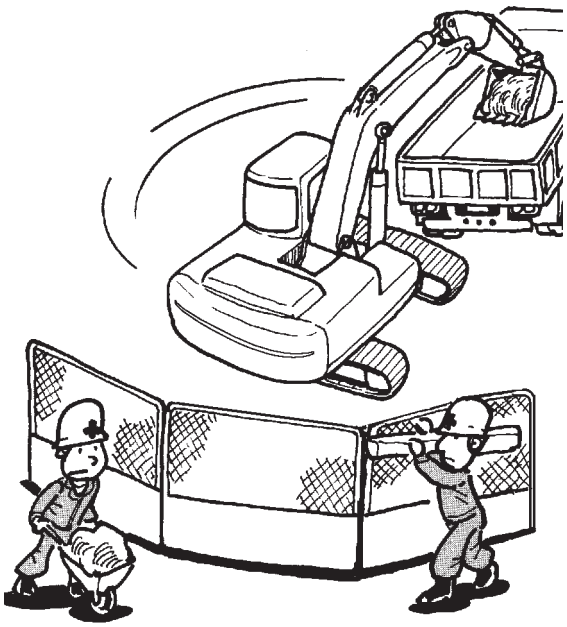
- Riders on machine are subject to injury such as being struck by foreign objects and being thrown off the machine.
  - Only the operator should be on the machine. Keep riders off.
  - Riders also obstruct the operator's view, resulting in the machine being operated in an unsafe manner.



SA-379 ja

Precautions for Operations

- Investigate the work site before starting operations.
  - Confirm that your machine is epuipped with a FOPS cab before working in areas where the possibility of falling stones or debris exist.
  - When the ground footing is weak, reinforce the ground before starting work.
  - Be sure to wear close fitting clothing and safety equipment appropriate for the job, such as a hard hat, etc. when operating the machine.
  - Keep bystanders and obstacles clear of the area of machine operation.
    Keep persons other than the operator away from areas where there is danger, such as from flying objects.
    Always be aware 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.



M178-05-007 ja

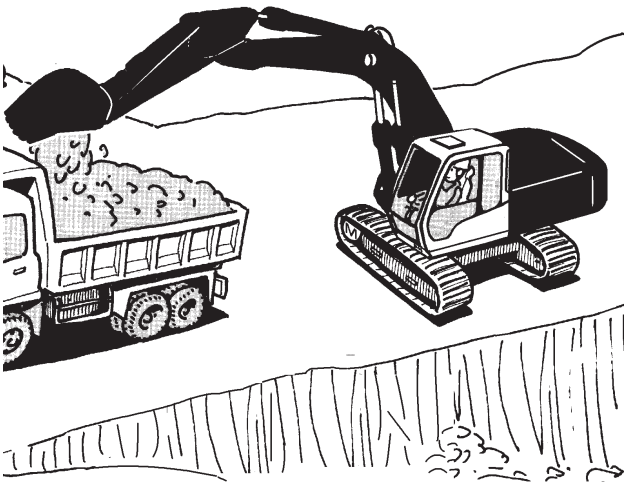
Investigate Job Site Beforehand

- 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.



SA-380 ja

- Confirm that your machine is equipped with a FOPS cab before working in areas where the possibility of falling stones or debris exist.
- When the ground 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 materials 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 the machine is operated on it, possibly causing the machine to tip over. When working on soft ground is required, be sure to reinforce the ground first using steel plates strong and firm enough to easily support the machine.



M104-05-016 ja

- 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.

Install OPG Guard

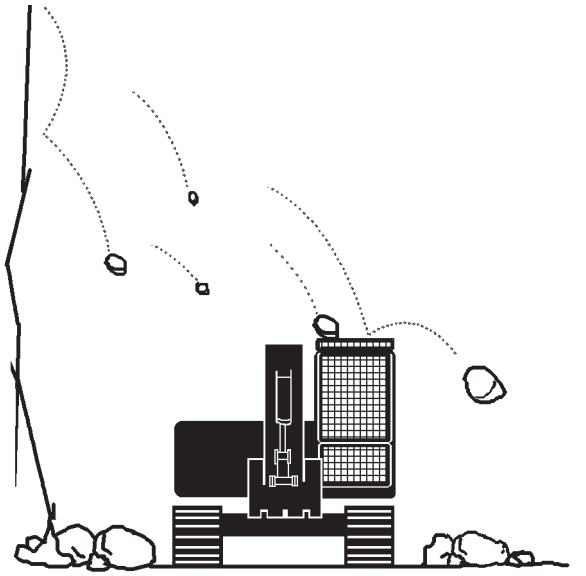
In case the machine is operated in areas where the possibilities of falling stones or debris exist, equip Hitachi OPG guard.

Consult your authorized dealer for installing the OPG guard.

In order not to impair operator protective structure:

Replace damaged OPG guard. Never attempt to repair or modify the guard.

OPG : Operator Protective Guard



SA-490 ja

Restriction of Attachment Installation

Do not install an attachment which exceeds the specified weight for the machine structure.

Provide Signals for Jobs Involving Multiple Machines

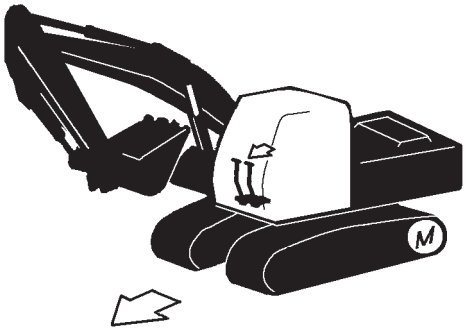
- For jobs involving multiple machines, provide signals commonly known by all personnel involved. Also, appoint a signal person to coordinate the job site. Make sure that all personnel obey the signal person's directions.



SA-481 ja

Confirm Direction of Machine to Be Driven

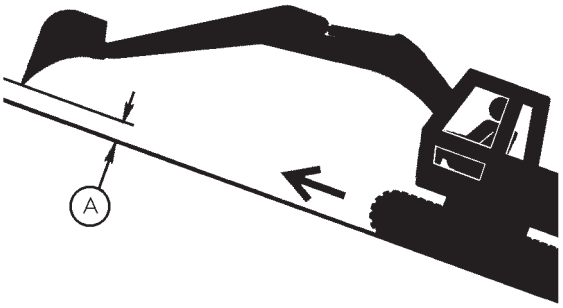
- Incorrect travel pedal/lever operation may result in serious injury or death.
  - Before driving the machine, confirm the position of the undercarriage in relation to the operator's position. If the travel motors are located in front of the cab, the machine will move in reverse when travel pedals/levers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



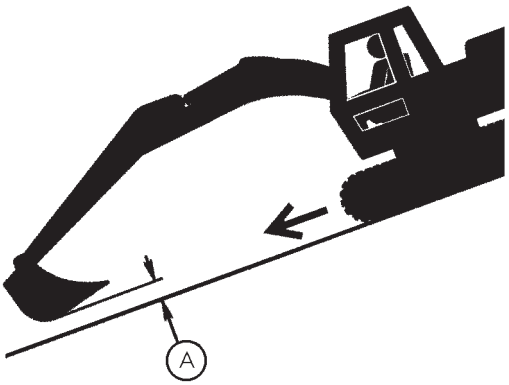
SA-491 ja

Drive the Machine Safely

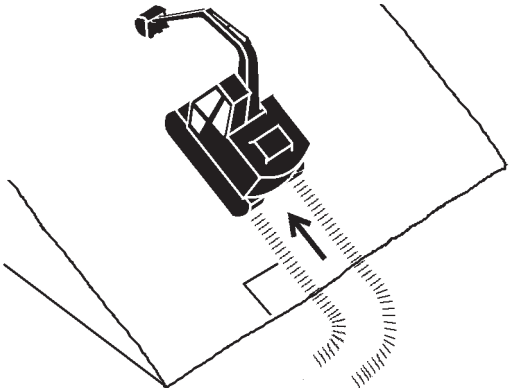
- Before driving the machine, always confirm that the travel levers/pedals direction corresponds to the direction you wish to drive.
  - Be sure to detour around any obstructions.
  - Avoid traveling over obstructions. Soil, fragments of rocks, and/or metal pieces may scatter around the machine. Do not 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 slopes 35 degrees or steeper.
  - Be sure to fasten the seat belt.
  - When driving up or down a slope, keep the bucket facing the direction of travel, approximately 0.2 to 0.3 m (see A on the right) above the ground.
  - If the machine starts to skid or becomes unstable, immediately lower the bucket to the ground and stop.
  - Driving across the face of a slope or steering on a slope may cause the machine to skid or 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.



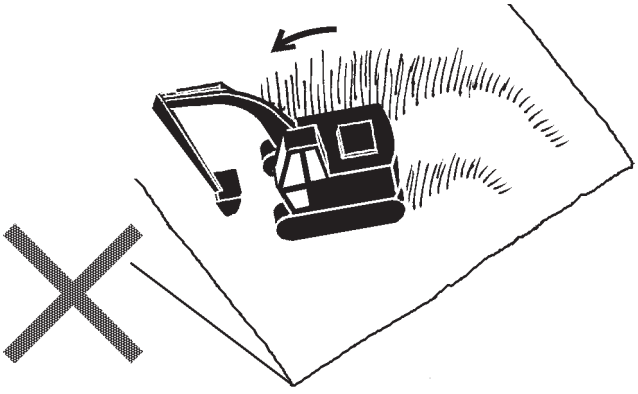
SA-387 ja



SA-388 ja



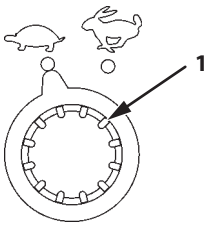
SA-441 ja



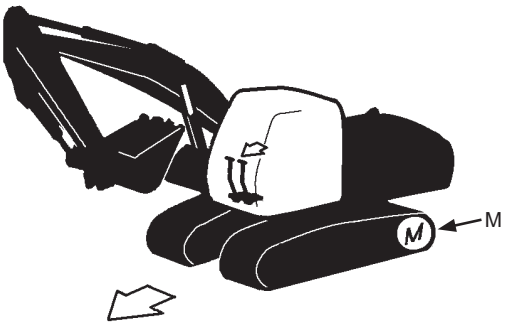
SA-442 ja

Because descending a slope in the high speed mode can result in speeding up excessively due to the machine's weight, it creates the risks of having a collision due to misjudging the stopping distance, or tipping over due to running over an obstacle unexpectedly. After checking that travel mode switch (1) is on , descend the slope with the engine at a reduced speed.

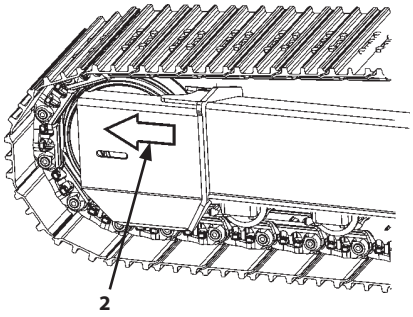
- Before moving machine, determine which way to move travel pedals/levers for the direction you want to go. When the travel motors are in the rear, pushing down on the front of the travel pedals or pushing the levers forward moves the machine forward, towards the idlers. An arrow-mark sticker is stuck on the inside surface of the side frame to indicate the machine front direction. An arrow-mark seal(2) 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 the slow travel speed. A slower speed will reduce potential damage to the machine.
- Avoid operations that may damage the tracks and undercarriage components.
- During freezing weather, always clean snow and ice from track shoes before loading and unloading the machine, to prevent the machine from slipping.



MDCD-01-028-1 ja



M104-05-008-2 ja



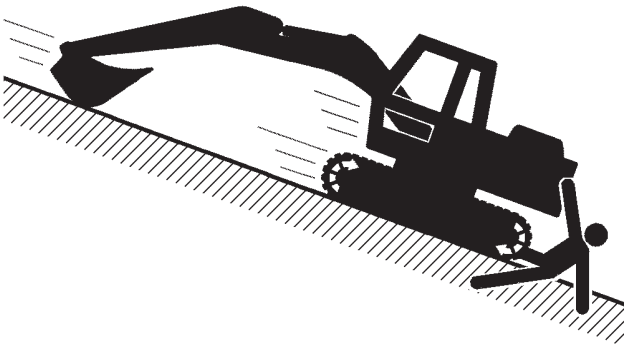
M178-03-001-3 ja



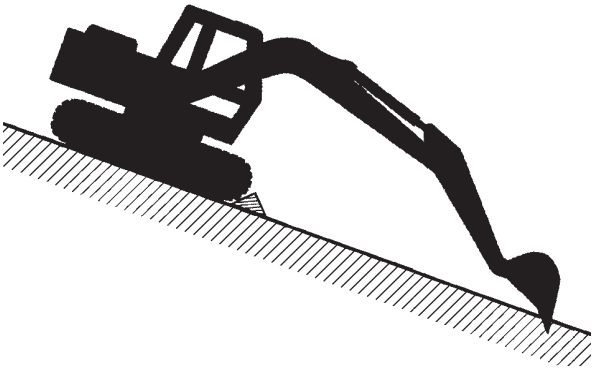
SA-011 ja

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 the machine.
  - Do not park the machine on a gradient.
  - Lower the bucket and/or other work tools to the ground.
  - Turn the auto-idle 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 gradient.
  - Position the machine to prevent rolling.
  - Park at a reasonable distance from other machines.



SA-391 ja



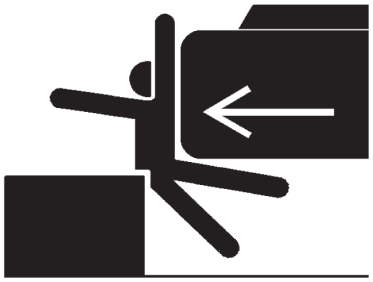
SA-2273 ja

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 signal person and operator.
  - Learn the meanings of all flags, signs, and markings used on the job and confirm who has the responsibility for signaling.



SA-383 ja

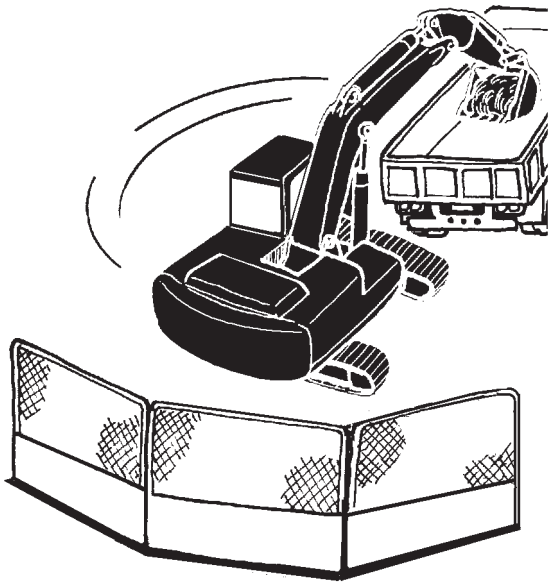


SA-384 ja

- 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.

Keep People Clear from Working Area

- People around the operating machine may be hit severely by the swinging front attachment or counterweight, be caught in other objects, and/or be struck by flying objects, resulting in serious injury or death.
  - Set up barriers and/or put a "NO ADMISSION" sign at the machine operating site and areas exposed by flying objects to prevent anyone from entering the work area.
  - 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.



SA-386 ja

Never Position the Bucket Over Anyone

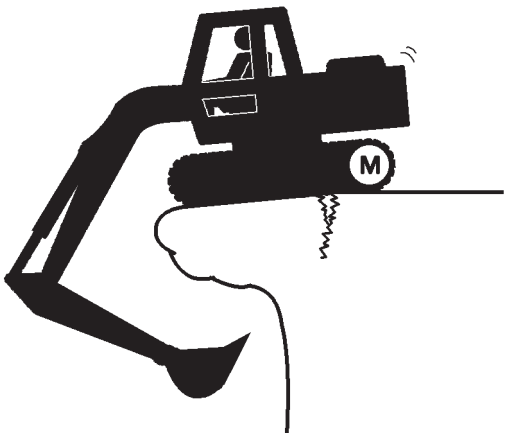
- Never lift, move, or swing the bucket above anyone or above the truck cab.
  Serious injury or machine damage may result due to bucket load spill or due to collision with the bucket.
- In the interest of safety, never pass the bucket over someone's head.



SA-487 ja

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.



SA-488 ja

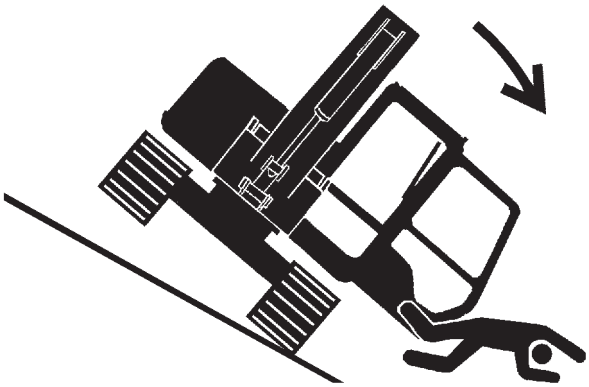
Avoid Tipping

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

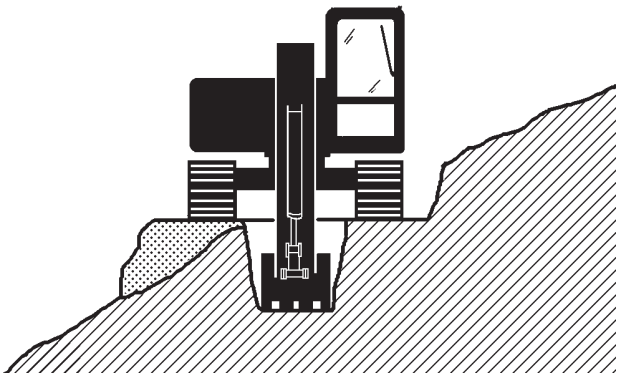
MACHINE WILL TIP OVER FASTER THAN YOU CAN JUMP FREE

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 gradient.
  - 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.



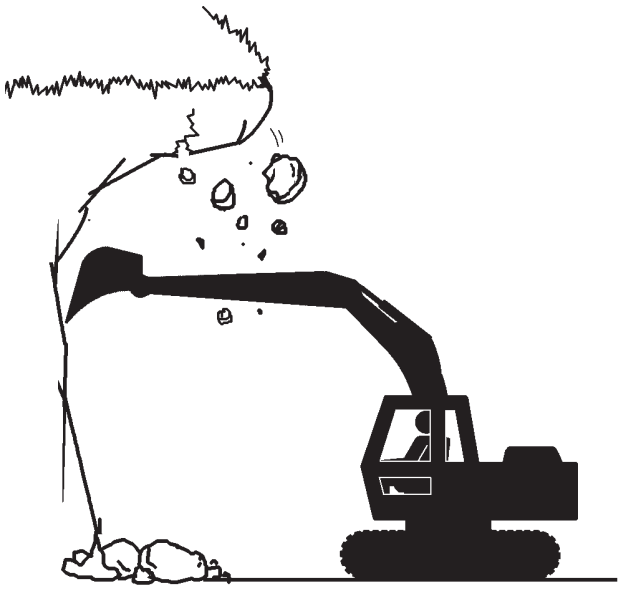
SA-012 ja



SA-440 ja

Never Undercut a High Bank

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



SA-489 ja

Dig with Caution

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



SA-382 ja

Operate with Caution

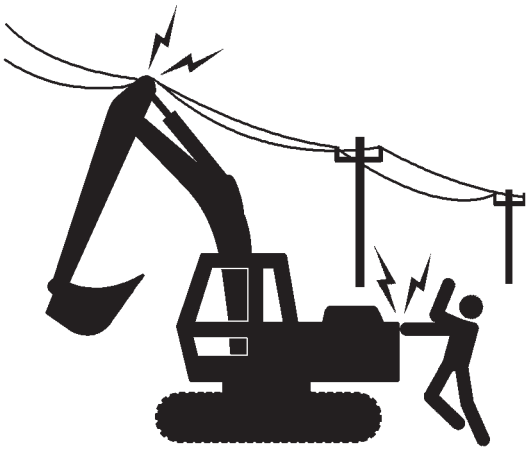
- If the front attachment or any other part of the machine hits against an overhead obstacle, such as a bridge, both the machine and the overhead obstacle will be damaged, and personal injury may result as well.
  - Take care to avoid hitting overhead obstacles with the boom or arm.



SA-389 ja

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 to within 3 m plus twice the line insulator length of overhead wires.
  - Check and comply with any local regulations that may apply.
  - Wet ground will expand the area that could cause any person on it to be affected by electric shock. Keep all bystanders or co-workers away from the site.

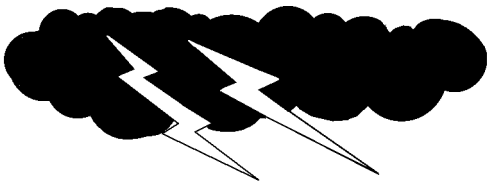


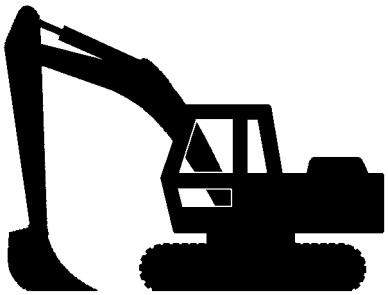
SA-381 ja

Precautions for Lightning

- Lightning may strike the machine.
  If lightning comes close, immediately stop the operation, and take the following action.
  - When you are around the machine or operating cabless machine, evacuate to a safe place far away from the machine.
  - When you are in the cab, stay in the cab until lightning has passed and safety is assured. Close the cab doors and windows. Lower the bucket to the ground, and stop the engine. Put your hands on your lap to avoid contact with any metal surfaces. Never go out of the cab.

If lightning strikes the machine or near the machine, check all of the machine safety devices for any failure after lightning has passed and safety is assured. If any trouble is found, operate the machine only after repairing it.

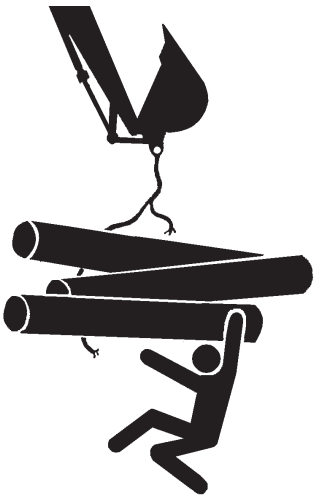




SA-2715 ja

Object Handling

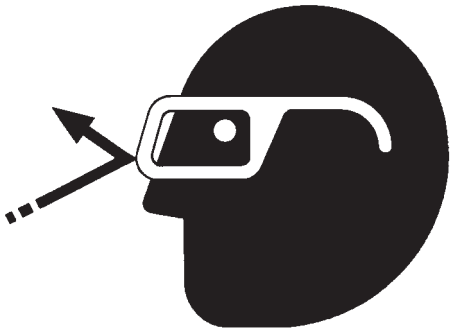
- If a lifted load should fall, any person nearby may be struck by the falling load or may be crushed underneath it, resulting in serious injury or death.
  - When using the machine for craning operations, be sure to comply with all local regulations.
  - Do not use damaged chains or frayed cables, slings, 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.



SA-014 ja

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.
  - Always close the front windows, doors, door windows and the overhead window when operating the machine.



SA-432 ja

Park Machine Safely

- To avoid accidents:
  - Park machine on a firm, level surface.
  - Lower bucket to the ground.
  - Turn auto-idle 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 ja

Handle Fluids Safely–Avoid Fires

- Handle fuel with care; it is highly flammable. If fuel ignites, an explosion and/or a fire may occur, possibly resulting in serious injury or death.
  - Do not refuel the machine while smoking or when near open flame or sparks.
  - Always stop the engine before refueling the machine.
  - Fill the fuel tank outdoors.
- All fuels, most lubricants, and some coolants are flammable.
  - Store flammable fluids well away from fire hazards.
  - Do not incinerate or puncture pressurized containers.
  - Do not store oily rags; they can ignite and burn spontaneously.
  - Securely tighten the fuel and oil filler caps.
  - When removing, inspecting and servicing parts of the fuel system (such as replacing the fuel filter), place a special container under the opening and take care not to spill fuel on the ground.
  - Do not use a piece of cloth instead of a container. Fuel evaporating from the cloth may catch on fire. Immediately wipe up any fuel spills.



SA-018 ja



SA-019 ja

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:



SA-395 ja

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 on the ramp, unload the machine from the ramp, reposition the machine on the ground, then try loading again.
7. At the top end of the ramp where it meets the flatbed, there is a sudden bump. Take care when traveling over it.
8. Place blocks in front of and behind the tires. Securely fasten the machine to the truck or trailer deck with wire ropes.

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

Practice Safe Maintenance

- Inspections and maintenance entail many hazards from being close to or touching working parts of the machine, or places that are hot and/or under high pressure. Follow the precautions below to prevent serious injury or death.
  - Prior to doing any inspections and maintenance or work, such as replacing an attachment, decide on the work procedure and make sure anyone working with you understands it completely.
  - Stop the machine in a safe place, as per the precautions in the section “Do Not operate”.
  - Make sure the surroundings are clean, organized and tidy.
  - Put a sign saying "Being Serviced" on the door or in a place that is easy-to-notice from the control levers.
  - If water gets inside the electrical system, it may cause misoperation and/or malfunction. Do not wash or steam clean any sensors, connectors or inside the operator’s seat area.
  - Do not use a high pressure washer on electrical parts of the engine or the ECU (engine control unit). Doing so may damage the electrical parts if water gets inside, and prevent the machine from operating properly.
  - Do not perform any work until parts such as the engine and hydraulic oil have cooled to a safe temperature.



SA-028 ja



SA-527 ja

  - If inspection or maintenance must be done with the engine running, have someone watch during the procedure. It must be possible to stop the engine immediately at all times.
  - Do not lubricate, inspect or perform maintenance while the machine is moving.
  - Put the angle between the boom and arm at 90 to 110° (A) when lifting the machine for inspections and maintenance. Never get under the machine when it is lifted with the boom and arm.
  - When it is absolutely necessary for the machine to be lifted up for inspections and maintenance, support it securely with a strong support, block or the like, that can withstand the weight of the machine.
  - Never work under a bucket that is lifted up.

- Maintain and manage the machine so all parts are always in a normal state of repair.
- Use the correct tool for the job and use it properly.
- Always keep tools in a clean state.
- Promptly repair any problems with the machine. Repair or replace worn or damaged parts.
- Remove any unneeded grease, oil, paint or debris clinging to the machine.
- When using a cleaning solvent to clean parts, use one that is not flammable. Do not use combustible ones, such as diesel or gasoline.

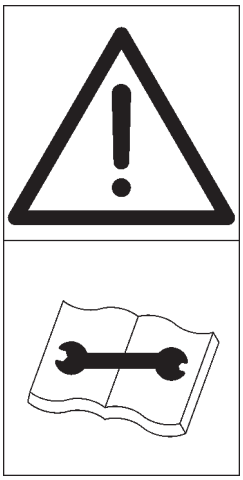
- When making adjustments to the electrical system or welding on the machine, disconnect the negative cable from the battery.
- Maintain appropriate lighting in the workplace. Use work lights when working under or inside the machine.
- Use a work light that has a guard. If the light bulb cracks, it may start a fire with any spilled fuel, oil, antifreeze or window washer fluid.



SA-037 ja

Warn Others of Service Work

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



SS2045102-4 ja

Support Machine Properly

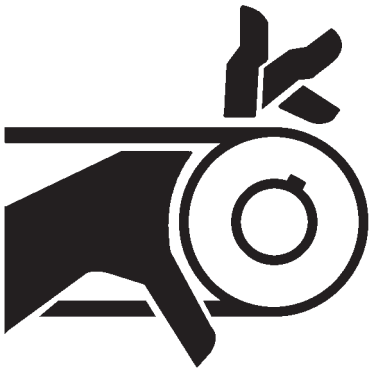
- Never attempt to work on the machine without securing the machine first.
  - Always lower the attachment to the ground before you work on the machine.
  - If you must work on a lifted machine or attachment, securely support the machine or attachment. Do not support the machine on cinder blocks, hollow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



SA-527 ja

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.
  - Stop the engine before performing any engine inspections.
  - Do not inspect the engine with the key in the key switch.
    Someone may fail to notice the machine is being inspected and accidentally start the engine.



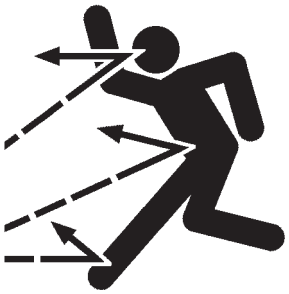
SA-026 ja



SA-2294 ja

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.
  - Do not attempt to remove the valve stop plate.
  - 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.

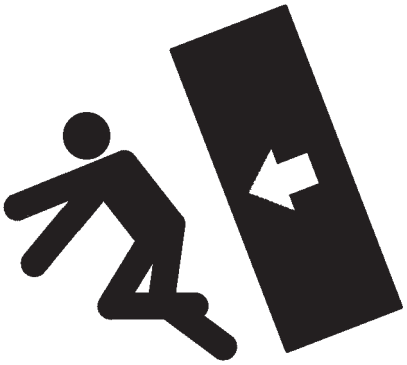


SA-344 ja

- 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.

Avoid Injury from Attachment Falling Accident

- Stored attachments such as buckets, hydraulic hammers, and blades can fall and cause serious injury or death.
  - To avoid possible personal injury from attachment falling accident, use a platform when replacing an attachment.
  - Securely store attachments such as a bucket, blade, breaker and other parts to prevent falling.
  - Keep children and bystanders away from attachment storage areas.



SA-034 ja

Prevent Burns

Hot spraying fluids:

- After operation, engine coolant is hot and under pressure. Hot water or steam is contained in the engine, expansion tank and heater lines.
  Skin contact with escaping hot water or steam can cause severe burns.
  - Avoid possible injury from hot spraying water. DO NOT remove the expansion tank 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.
  - Close the radiator cap securely after the inspection. If not fully closed, coolant may spurt out while operating the machine.



SA-039 ja

  - The hydraulic oil tank is pressurized. Again, be sure to release all pressure before removing the cap.
  - If engine oil needs to be drained while the engine is still hot, keep away from the engine while doing so to avoid getting burned by the hot engine oil. Be sure to wear eye protection.

Hot fluids and surfaces:

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



SA-225 ja

Replace Rubber Hoses Periodically

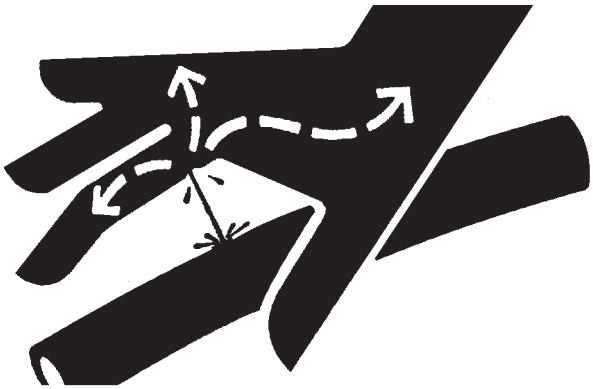
- Rubber hoses that contain flammable fluids under pressure may break due to aging, fatigue, and abrasion. It is very difficult to gauge the extent of deterioration due to aging, fatigue, and abrasion of rubber hoses by inspection alone.
  - Periodically replace the rubber hoses. (See the page of "Periodic 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.



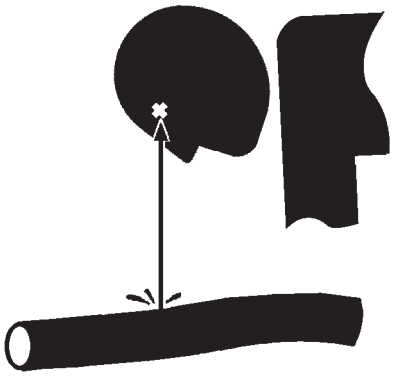
SA-019 ja

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.
  - The engine uses a high pressure common rail system.
  - The fuel is injected at very high pressure. Never disassemble parts of the fuel system.
  - Never loosen high pressure fuel lines while the engine is running.
    Doing so is dangerous as high pressure fuel will spray out.
  - Have your authorized dealer handle inspection, disassembly and repairs of parts in the engine's fuel system.



SA-031 ja



SA-292 ja



SA-044 ja

Prevent Fires

Check for Oil Leaks:

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



SA-019 ja

Check for Shorts:

- Short circuits can cause fires.
  - Clean and tighten all electrical connections.
  - Check before each shift or after eight (8) to ten (10) hours operation for loose, kinked, hardened or frayed electrical cables and wires.
  - Check before each shift or after eight (8) to ten (10) hours operation for missing or damaged terminal caps.
  - DO NOT OPERATE MACHINE if cable or wires are loose, kinked, etc.
  - Never attempt to modify electric wirings.
  - Never start the engine in any way except using the key switch.
  - Do not start the engine by shorting the starter circuit.
    Doing so will result in sparks and may cause an explosion or fire.

Clean up Flammable Materials:

- Spilled fuel and oil, trash, grease, debris, accumulated coal dust, and other flammable materials may cause fires.
  - Prevent fires by inspecting and cleaning the machine daily, and by removing adhered oil or accumulated flammable materials immediately. Check and clean high temperature parts such as the exhaust outlet and muffler earlier than the normal interval.
  - Do not wrap high temperature parts such as a muffler or exhaust pipe with oil absorbents.
  - Do not store oily cloths as they are vulnerable to catching fire.
  - Keep flammable materials away from open flames.
  - Do not ignite or crush a pressurized or sealed container.
  - Do not use fuel as a cleaner.
  - Wire screens may be provided on openings on the engine compartment covers to prevent flammable materials such as dead leaves from entering. However, flammable materials which have passed through the wire screen may cause fires. Check and clean the machine every day and immediately remove accumulated flammable materials.

Check Key Switch:

- If a fire breaks out, failure to stop the engine will escalate the fire, hampering fire fighting.
  - Always check key switch function before operating the machine every day:
    1. Start the engine and run it at slow idle.
    2. Turn the key switch to the OFF position to confirm that the engine stops.
  - If any abnormalities are found, be sure to repair them before operating the machine.

Check Heat Shields:

- Damaged or missing heat shields may lead to fires.
  - Damaged or missing heat shields must be repaired or replaced before operating the machine.
  - If hydraulic hoses are broken while the engine cover is open, splattered oil on the high temperature parts such as muffler may cause fire. Always close the engine cover while operating the machine.

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 pane with the emergency evacuation hammer to escape from the cab. Refer to the explanation pages on the Emergency Evacuation Method.



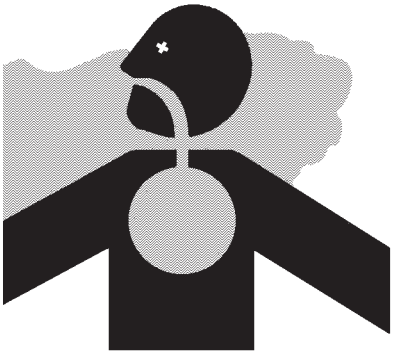
SA-393 ja



SS-1510 ja

Beware of Exhaust Fumes

- Prevent asphyxiation. Engine exhaust fumes can cause sickness or death.
  - If you must operate in a building, be sure there is adequate ventilation. Either use an exhaust pipe extension to remove the exhaust fumes or open doors and windows to bring enough outside air into the area.
  - White smoke may be generated during the aftertreatment device regeneration. Do not attempt to do aftertreatment device manual regeneration in a badly ventilated indoors.
  - After servicing the exhaust system, make sure all connections are tightened as specified.



SA-016 ja

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 materials in a safe place before starting welding.
  - Only qualified personnel should perform welding. Never allow an unqualified person to perform welding.
  - Before starting operation, disconnect the negative cable from the battery.
- Grinding on the machine may create fire hazards. Store flammable materials 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 ja

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 ja

Avoid Applying Heat to Lines Containing Flammable Fluids

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

Precautions for Handling Accumulator and Gas Damper

High-pressure nitrogen gas is sealed in the accumulator and the gas damper. Inappropriate handling may cause explosion, possibly resulting in serious injury or death.

Strictly comply with the following items:

- Do not disassemble the unit.
- Keep the units away from open flames and fire.
- Do not bore a hole, do not cut by torch.
- Avoid giving shocks by hitting or rolling the unit.
- Before disposing of the unit, sealed gas must be released. Consult your authorized dealer.

Remove Paint Before Welding or Heating

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



SA-029 ja

Beware of Asbestos and Silica Dust and Other Contamination

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



SA-029 ja

Prevent Battery Explosions

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



SA-032 ja

  - Connect terminals to the correct electrical poles. Failure to do so may cause damage to the electrical parts or fire.
- Battery electrolyte is poisonous. If the battery should explode, battery electrolyte may be splashed into eyes, possibly resulting in blindness.
  - Be sure to wear eye protection when checking electrolyte specific gravity.

Service Air Conditioning System Safely

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



SA-405 ja

Handle Chemical Products Safely

- Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with your machine include such items as lubricants, coolants, paints, and adhesives.
  - Safety Data Sheet (SDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques.
  - Check the SDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and use recommended equipment.

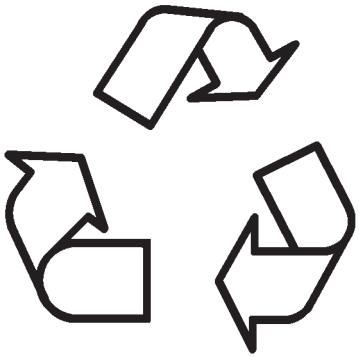


SA-2579 ja

  - See your authorized dealer for SDS's (available only in English) on chemical products used with your machine.

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, DEF/AdBlue®, 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.



SA-226 ja

  - Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your authorized dealer.

Never Ride Attachment

Never allow anyone to ride on attachments or the load. This is an extremely dangerous practice.

Notes for Muffler Filter

Muffler Filter

The muffler filter removes particulate matter (PM) in the exhaust gas. PM accumulates in the muffler filter and when a certain amount has been deposited the muffler filter regenerates (burns the PM) automatically. Follow the instructions below to prevent the muffler filter from being damaged.

Post injection is used in auto-regeneration, so fuel is burned directly inside the muffler filter (burns in a chemical reaction with the oxidation catalyst). This heat regenerates the filter (burns the PM), but this combustion raises the temperature of the exhaust gas to almost 600 ℃.
Take care not to touch it accidentally. Be careful to avoid burns and stay safe.
Pay attention to whether anyone or anything flammable is near the exhaust.
Fuel consumption may suffer slightly due to post injection.
Although dilution of engine oil with fuel from post injection is kept to a minimum, when operated under low load (low exhaust temperature), there is a possibility of it being diluted slightly.
Be sure to perform the regular check of engine oil level daily.
Even if regeneration of the muffler filter is performed, the PM may not be regenerated if operating conditions such as idling or operating under low loads occur frequently.
At such times, if the ECU (engine control unit) determines manual regeneration needs to be performed, it lights the muffler filter regeneration request lamp. If the muffler filter regeneration request lamp lights, perform a manual regeneration right away. Continuing to operate the machine with the muffler filter regeneration request lamp lit, results in the accumulation of excessive PM, which may cause the PM to burn abnormally, and potentially damage the muffler filter and/or start a fire.

- White smoke may be generated from burning PM (particulate matter) during muffler filter regeneration. Do not attempt to perform a manual regeneration in a poorly ventilated area.
- Due to the risk of carbon monoxide poisoning, never perform regeneration in a poorly ventilated location.
- The exhaust gas gets very hot, so to avoid fire, make sure nothing that can burn easily is anywhere near the exhaust outlet.
- The exhaust gas gets very hot, so to avoid injury, take care not to touch the exhaust pipe, even accidentally. In addition, keep everyone away from the exhaust outlet.
- Do not touch the water that comes out of the muffler filter. The water is slightly acidic due to the effect of the oxidation catalyst built into the muffler filter. Wash it off thoroughly with lots of water if it comes in contact with skin.

Precautions for Communication Terminal

Electrical wave transmitted from the communication terminal may cause malfunction of other electronic devices.

Inquire to the device manufacturer for information on electrical wave disturbance when using an electronic device near the communication terminal.

Notes on Protection of Operator's Station when the Machine Rolls Over

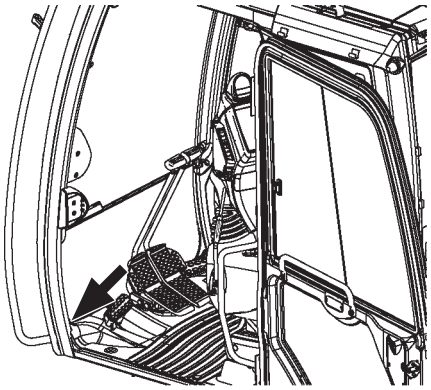
The cab corresponds to the structure to protect the operator by absorbing impact energy when the machine rolls over (Roll- Over Protective Structure (ROPS)). However, when modifying the machine or installing a special attachment causing the machine mass to exceed the maximum operating mass described in the ROPS certification, the cab cannot fulfill its protective function, possibly causing serious injury or death.

In order to safeguard the protective structure, follow the instructions below.

- Consult your authorized dealer before welding parts or drilling a hole on the cab, which possibly reduces the cab strength.
- Be sure to always fasten the seat belt when operating the machine. If the machine rolls over without the seat belt fastened, the operator may become injured, may be thrown out of the cab and/or may become crushed under the machine even though the cab has the protective structure.

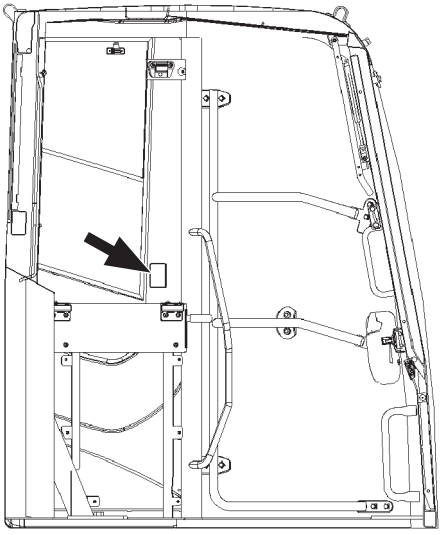
The ROPS certification is valid under the following conditions.

- The machine weighs less than the maximum operating weight described in the ROPS certification.
- The ROPS is properly installed.
- No modification is made to the ROPS.
- The ROPS is free from damage.



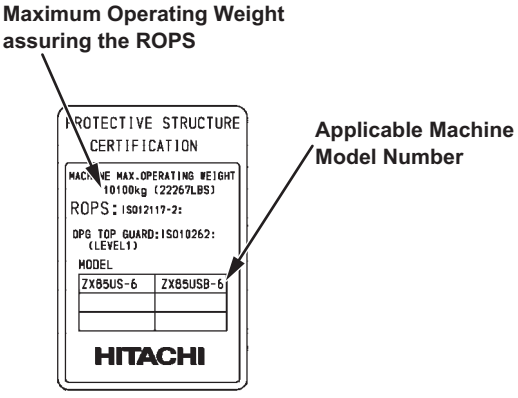
ZX85US-6

MDAA-01-298-1 ja



ZX85USB-6

MDEQ-00-001-1 ja



MDEQ-00-002-1 en_GB

MEMO

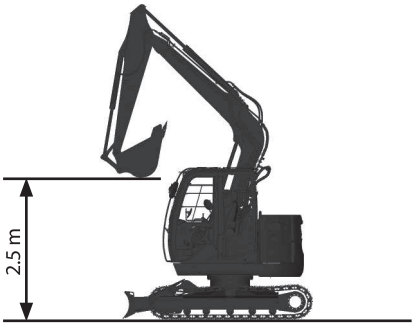
Visibility Map for Machine Model ZX85US-6 Series

This machine complies with the essential health and safety requirements for visibility set out by Machinery Directive 2006/42/EC. The map shows remaining impediments to visibility (blind spots) observed by a seated operator (wearing the recommended seat restraint) in the cab using direct vision and the standard visual aids supplied with the machine. Additionally, operators are encouraged to adjust the mirrors provided to the machine to show the area as indicated below.

This map shows an approximation of the residual masking. This can be used as a guide when conducting a site risk assessment, utilized for site management and to consider additional visual aids.

Conditions: Driver's visibility on 1mRB and VTC are evaluated under ISO 5006.

Test Height (on 1mRB):	1.2 m
(1mRB to VTC/on VTC):	Ground Level
Operator eye Height:	1.2 m from the cab floor
Machine Configuration:	Monoblock Boom
Machine Position:	Travel Position (For the detail postion, see the image below)
Applicable visual aids:	1. standard mirror (s)
	2. standard rear view camera

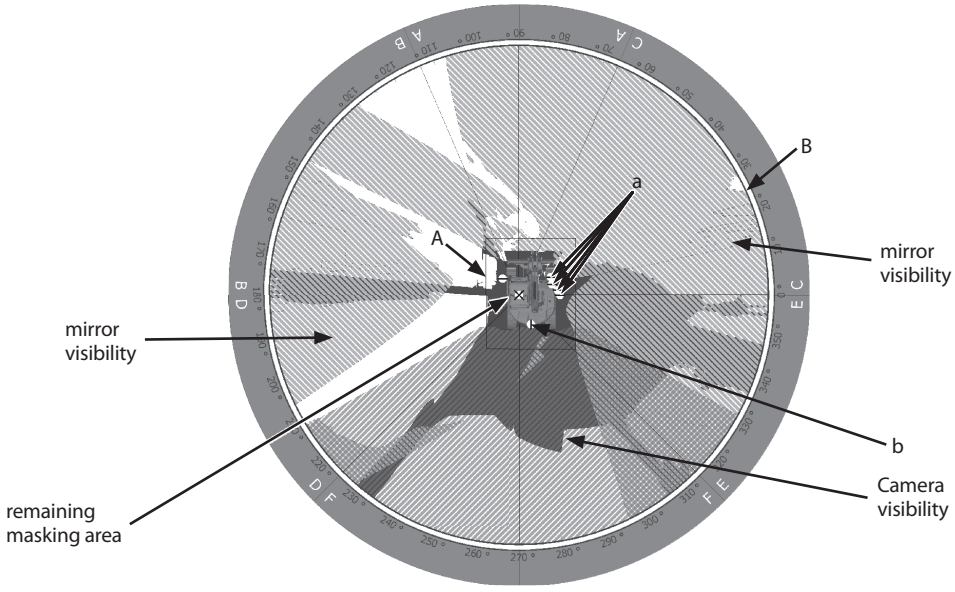


Machine Position Image

MDEQ-VM-001-1 ja

○ : Operator's eye point
A : 1 m Rectangular Boundary (1mRB)
B : 12 m Visibility Test Circle (VTC)
a : Standard Mirror (s)
b : Standard rear view camera

: Masking area
: Mirror visibility
: Camera visibility



Visibility Map

MDEQ-VM-005-1 en_GB

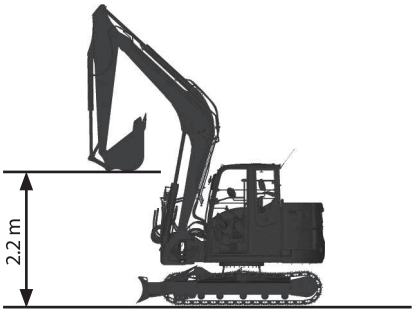
Visibility Map for Machine Model ZX85USB-6 Series Personal Hazard

This machine complies with the essential health and safety requirements for visibility set out by Machinery Directive 2006/42/EC. The map shows remaining impediments to visibility (blind spots) observed by a seated operator (wearing the recommended seat restraint) in the cab using direct vision and the standard visual aids supplied with the machine. Additionally, operators are encouraged to adjust the mirrors provided to the machine to show the area as indicated below.

This map shows an approximation of the residual masking. This can be used as a guide when conducting a site risk assessment, utilized for site management and to consider additional visual aids.

Conditions: Driver's visibility on 1mRB and VTC are evaluated under ISO 5006.

Test Height (on 1mRB):	1.2 m
(1mRB to VTC/on VTC):	Ground Level
Operator eye Height:	1.2 m from the cab floor
Machine Configuration:	Monoblock Boom
Machine Position:	Travel Position (For the detail postion, see the image below)
Applicable visual aids:	1. standard mirror (s) 2. standard rear view camera

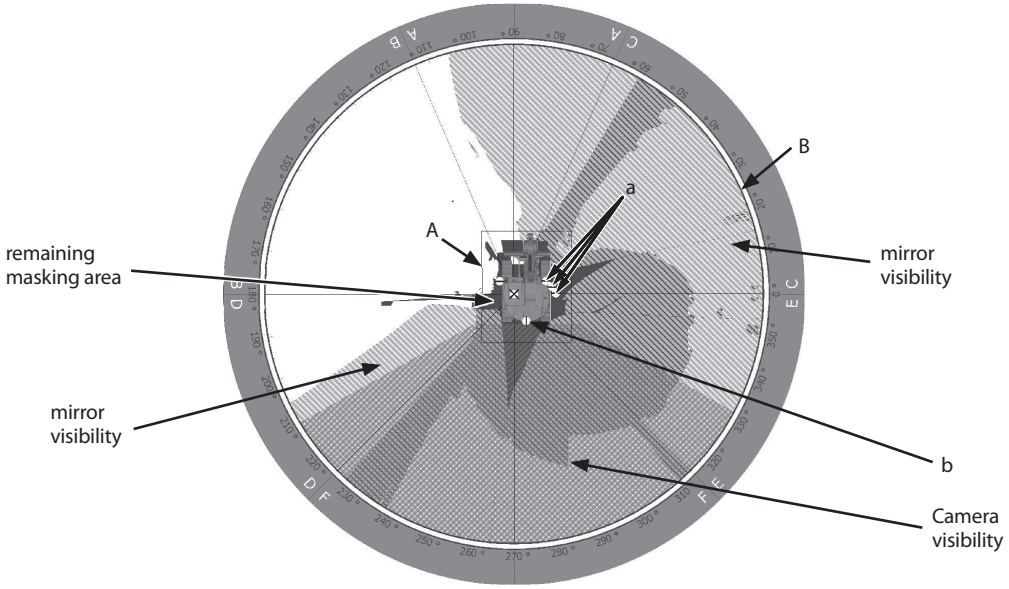


Machine Position Image

MDEQ-VM-006-1 ja

○ : Operator's eye point
A : 1 m Rectangular Boundary (1mRB)
B : 12 m Visibility Test Circle (VTC)
a : Standard Mirror (s)
b : Standard rear view camera

: Masking area
: Mirror visibility
: Camera visibility

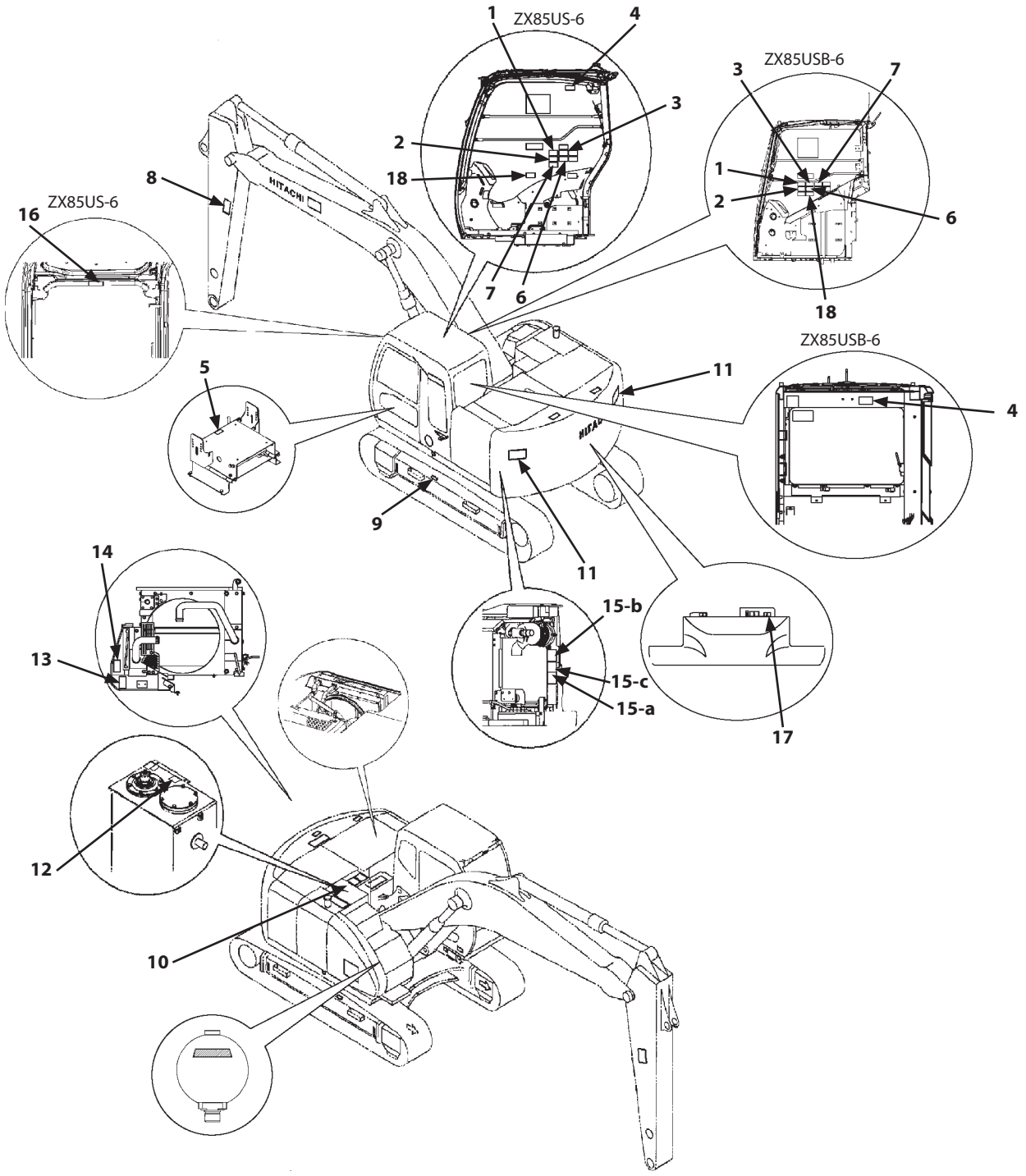


Visibility Map

MDEQ-VM-007-1 en_GB

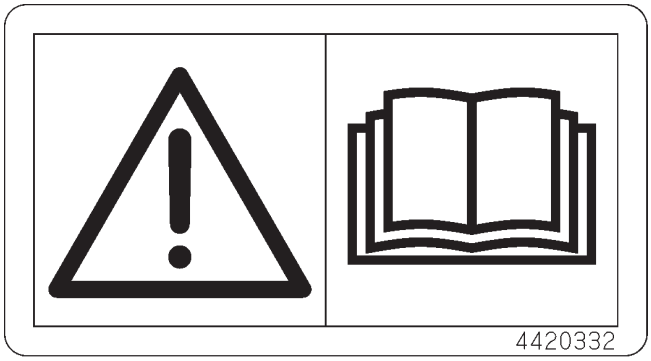
SAFETY SIGNS

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



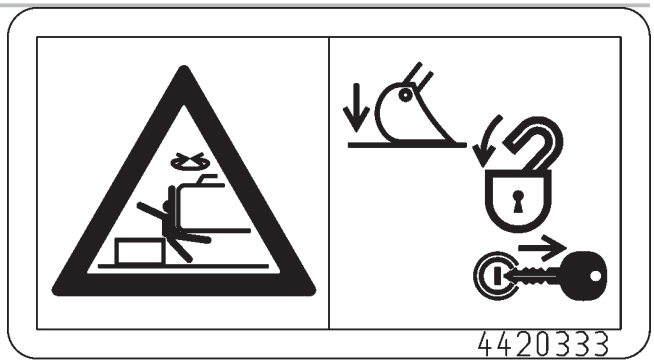
SS-3670-3 ja

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



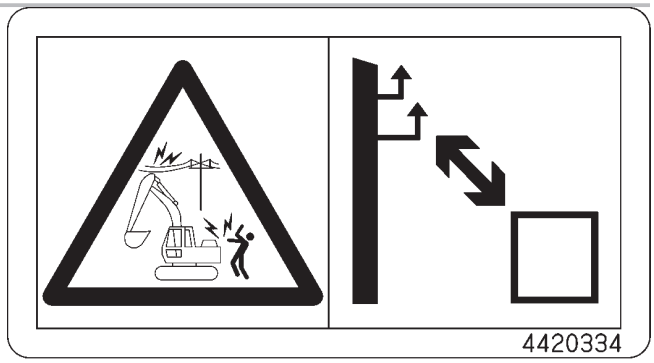
SS4420332-2 ja

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.



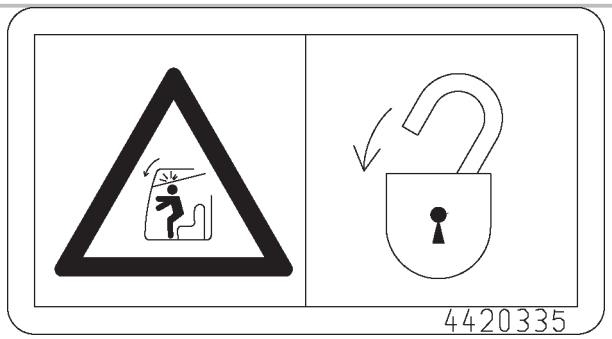
SS4420333-2 ja

3. Sign indicates an electrocution hazard if machine is brought too near electric power lines.
   Keep a safe distance from electric power lines.



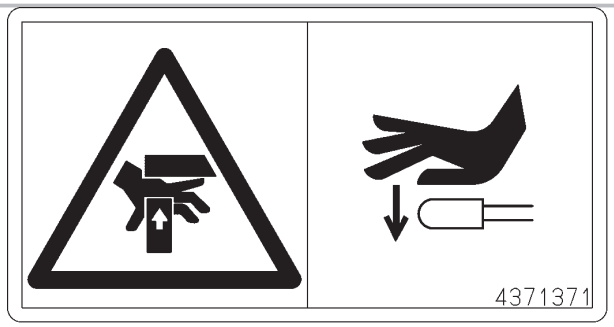
SS4420334-2 ja

4. Sign indicates a hazard from falling window.
   After raising window, be sure to lock it in place with lock pins.



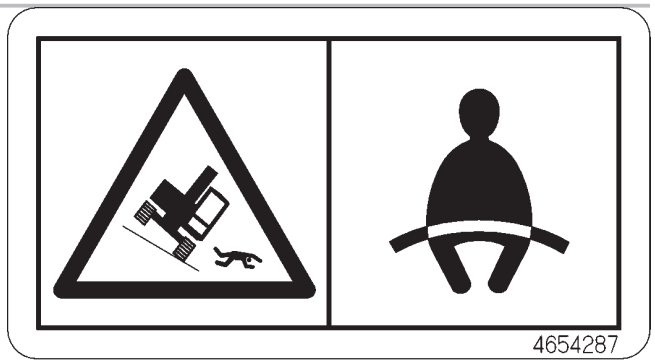
SS4420335-2 ja

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.



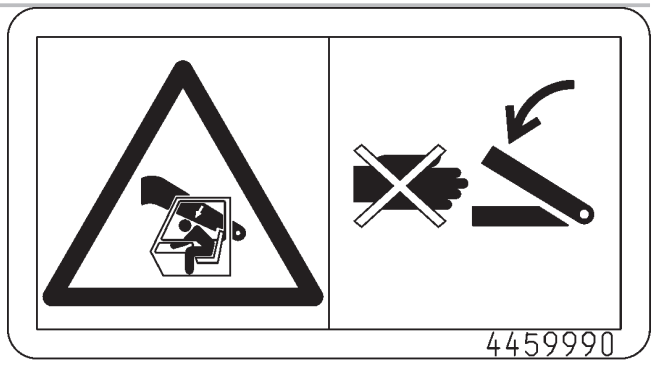
SS4371371-3 ja

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



SS4654287-1 ja

7. Do not extend your hands or head from the window. Your hands or head may come in contact with the boom.
   Keep away from machine during operation.



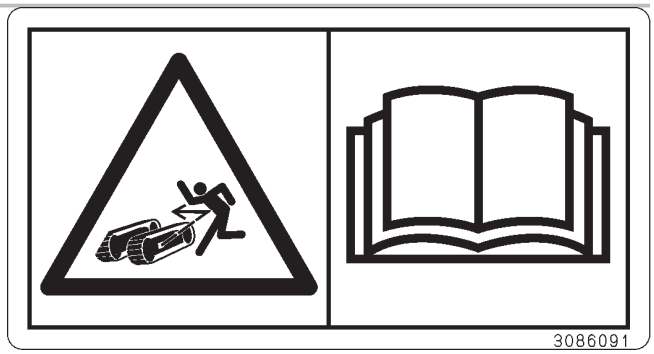
SS4459990-2 ja

8. Sign indicates a hazard of being hit by the working device of the machine.
   Keep away from machine during operation.



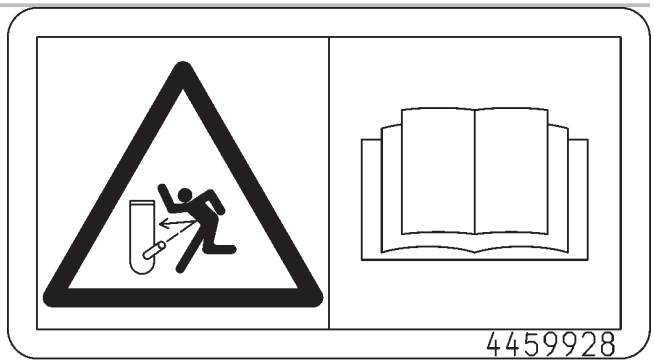
SS3085503-1 ja

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.



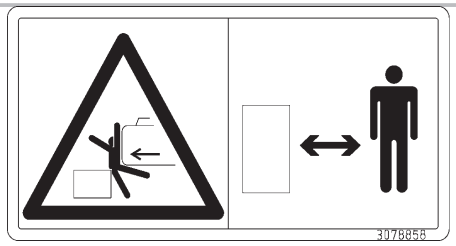
SS3086091-4 ja

10. 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.



SS4459928-1 ja

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



SS3078858-2 ja

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



SS4420336-2 ja

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



SS4623852 ja

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



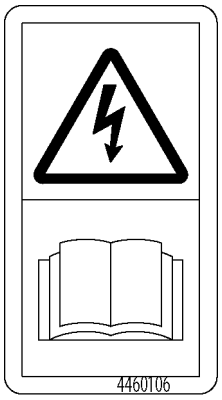
SS4408870-2 ja

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

    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.

a:



SS4460106-1 ja

b:



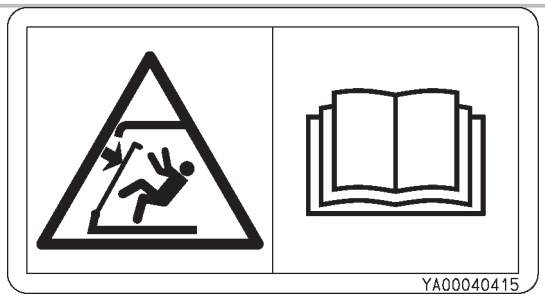
SSYD00007314 ja

c:



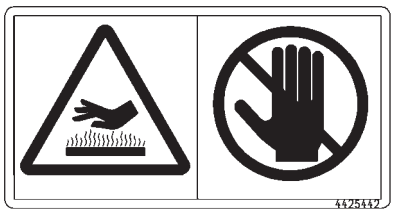
SS4460056-1 ja

16. Use the handle only to open or close the front window. Do not use the handle to enter or leave the cab. If the window is not locked, it may move possibly causing you to lose your balance and fall.



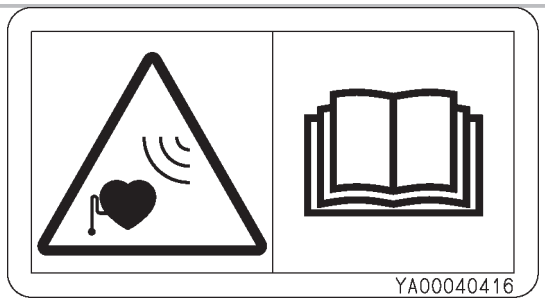
SSYA00040415 ja

17. Be careful to avoid skin contact with bight temperature part during operation or immediately after stopping the machine. Otherwise burns may result.



SS4425443-1 ja

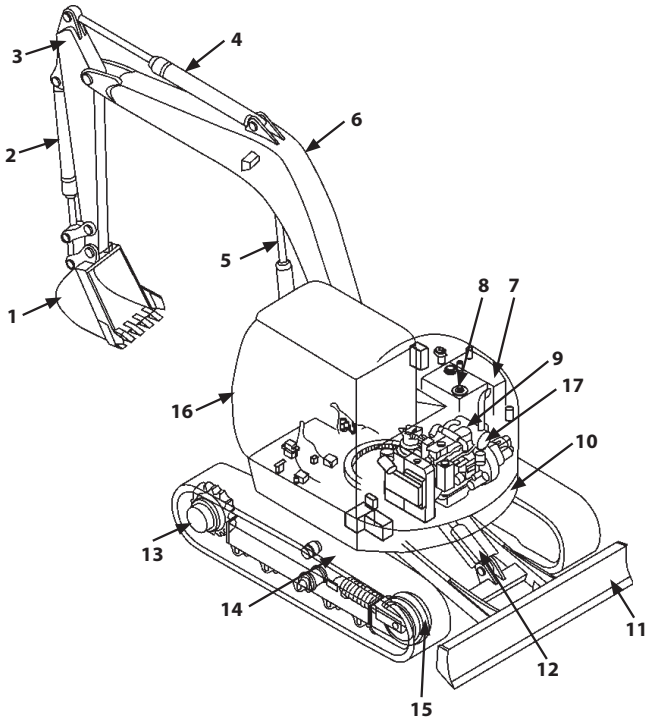
18. To those persons fixed with any medical device. Including implantable device such as a cardiac pacemaker. Please read the instruction manual carefully and follow the instructions before using this machine.



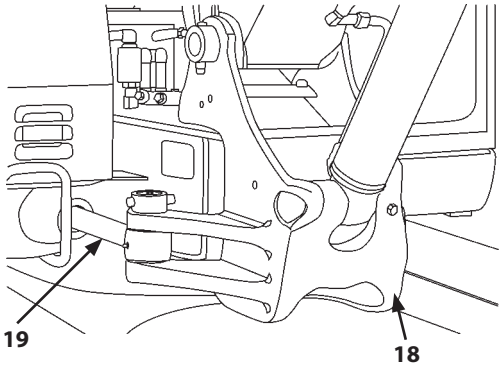
SSYA00040416 ja

Name of Components

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- Blade
12- Blade Cylinder
13- Travel Device
14- Track Shoe
15- Front Idler
16- Cab
17- Muffler Filter
18- Boom Swing Post
19- Boom Swing Cylinder



MDEQ-01-001-1 ja



ZX85USB-6

MDEQ-01-002-1 ja

MEMO

Getting ON and OFF the Machine

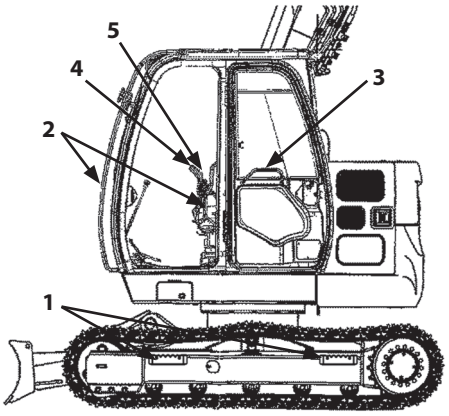
Footholds (1) and handrails (2) are provided around the machine for safe entry and exit to the cab.

These are used to get on and off the cab safely, and also allow for safe inspection and maintenance.

Never jump on or off the machine, as it is very dangerous.

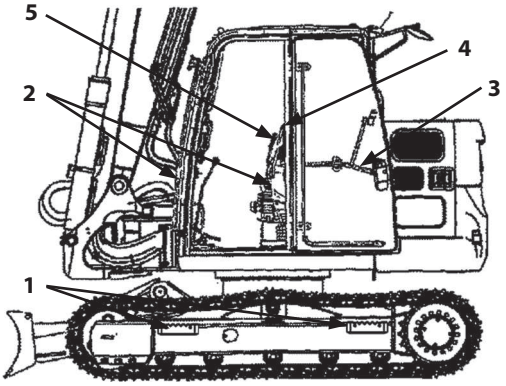
WARNING

- **When lifting the cab/main body or transporting the machine, never attach wire to footholds (1) or handrails (2).**
- **Door handle (3) is not a handrail. Do not use as a handrail when getting on and off the machine.**
- **Do not hold onto control levers (4) or pilot control shut-off lever (5) when getting on and off the machine.**



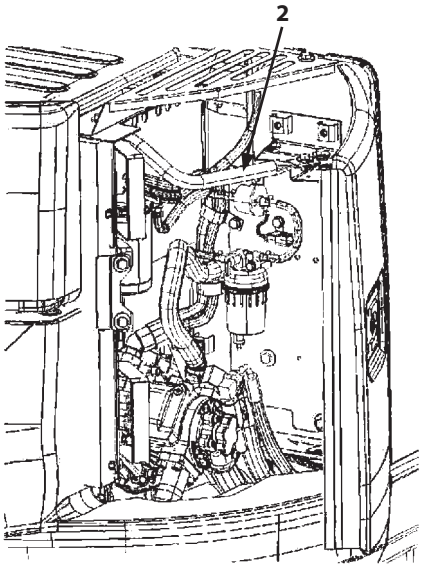
ZX85US-6

MDEQ-01-072-1 ja



ZX85USB-6

MDEQ-01-073-1 ja



Inside the Pump Compartment

MDEQ-01-005-2 ja

MEMO

Muffler Filter

The muffler filter removes particulate matter (PM) in the exhaust gas. PM accumulates in the muffler filter and when a certain amount has been deposited the muffler filter regenerates (burns the PM) automatically. Follow the instructions below to prevent the muffler filter from being damaged.

⚠ WARNING

- **Exhaust gas from the muffler filter, exhaust pipe and tail pipe becomes hot while the engine is running and immediately after, and during regeneration of the muffler filter. Be careful not to touch or get too close to any part of the exhaust system. Doing so may result in a burn.**
- **If flammable materials such as dead leaves or paper scraps are around the muffler filter, they may cause a fire.**
- **To avoid burns, stop the engine and make sure the engine has sufficiently cooled down before performing maintenance.**

IMPORTANT

- **Poor quality fuel has an adverse effect on engine performance and may damage it. To ensure the best engine performance, use fuel that complies with JIS K-2204, EN-590 or ASTM D-975 that contains 15 ppm of sulfur or less.**
  Fuels with a high sulfur content in particular degrade the performance of the catalyst in the oxidation catalyst, decreasing the performance in regenerating the muffler filter and causing PM to be deposited readily.
  A common rail system is mounted on the engine as a fuel injection device and it injects fuel into the cylinders as a mist under very high pressure. As a consequence, if there are impurities or water mixed into the fuel, it causes wear on the sliding parts of the fuel system and deteriorates the durability of the performance of the exhaust gas system of the engine. Always use high-quality, clean diesel.
  Always keeps the fuel tank and equipment for handling fuel clean. In addition, take care to prevent dust or dirt from getting in the filler port during fueling.
  If foreign matter such as dirt gets into the fuel system, it may cause a blockage in the system.
  When replacing the fuel filter or oil/water separator element, always use a genuine Hitachi filter or element.
- **Use the recommended engine oil.**
  If an oil other the recommended oil is used, it may shorten the time between cleaning of the muffler filter and/or reduce the fuel economy.
- **Keep foreign matter, such as dirt, out of the engine oil. Carefully remove any dirt around the cover of the oil fill port, around the port and the oil level gauge before removing the oil fill port cover.**
  Do not use with a mixture of different types of engine lubricating oil. Doing so may compromise the lubricating efficiency of the engine lubricating oil.
  Always keep the level of the engine lubricating oil between the upper and lower limits of the scale of the oil level gauge.
  Do not fill the engine lubricating oil above the designated level. Filling with too much engine lubricating oil may result in white smoke coming from the exhaust, surging in the engine RPM and/or internal damage to the engine.
  Always use a genuine Hitachi product when changing the engine lubricating oil filter.
- **Do not mix poor quality diesel fuel, drainage agents, fuel additives, gasoline, kerosene, alcohol, or any other type of lubricating oil with specified diesel fuel. Improper fuel usage may deteriorate performance of fuel filters, can cause problems in the lubricated parts of the injector. It can also affect the engine parts and muffler filter, leading to malfunction.**
- **If resistance in the intake and/or exhaust systems increases, the engine may produce soot due to poor combustion. Inspect and clean the air cleaner and EGR regularly.**
- **Do not modify the machine without authorization. Never attempt to modify the air intake and exhaust parts, such as the air duct, muffler filter and the exhaust outlet. Also never attempt to disassemble the muffler filter. Avoid shocking the muffler filter by striking it or dropping it. Failure to do so may affect the exhaust gas purifying equipment, possibly damaging it or lowering its performance.**
- **White smoke may be generated from burning PM (particulate matter) during muffler filter regeneration. Do not attempt to perform a manual regeneration in a poorly ventilated area.**

NOTE

- *PM accumulates in the muffler filter and when a certain amount has been deposited the muffler filter regenerates (burns the PM) automatically. This is called auto-regeneration. Auto-regeneration is not performed at set intervals, but as needed, depending on the machine operating conditions. Auto-regeneration may start while the machine is operating; you can continue to operate the machine (For details, refer to the section Muffler Filter).*
- *If the pilot control shut-off lever is put in the LOCK position during auto-regeneration, the sound of the engine changes, but this is not a malfunction.*
- *The sound of the engine during auto-regeneration differs from its normal sound, but this is not a malfunction.*
- *Do not stop the engine during regeneration unless absolutely necessary.*
- *Auto-regeneration may be terminated depending on the machine operating condition. If this happens, the muffler filter regeneration request lamp lights and the buzzer sounds; the engine RPM and output drop (For details, see Manual Muffler Filter Regeneration Request). This indicates that the operator needs to perform a manual regeneration. This is called manual regeneration. Perform manual regeneration following the specified procedure. (For details, see Manual Regeneration Procedure.)*
- *Usually, auto-regeneration starts 100 hours after the previous regeneration (either auto or manual). It is not performed at set intervals, but as needed, depending on the machine operating conditions.*
- *Approximately 3 hours after the auto-regeneration fails to complete, the muffler filter regeneration request lamp lights and the buzzer sounds; the engine RPM and output drop (For details, see Manual Muffler Filter Regeneration Request). In this situation as well, perform manual regeneration following the specified procedure. (For details, see Manual Regeneration Procedure)*
- *When the machine is operated without performing manual regeneration, the muffler filter may be damaged. Immediately move the machine to a safe area and perform manual regeneration.*
- *If the machine continues to be operated without manual regeneration being carried out, the muffler filter alarm and engine trouble alarm are displayed on the monitor (For details, see Manual Muffler Filter Regeneration Request) and the buzzer will sound. If this happens, consult your authorized dealer as the muffler filter needs repairs.*
- *Both auto and manual regenerations restore muffler filter function. They are not malfunctions.*
- *If the interval between auto-regeneration becomes shorter, consult your authorized dealer.*
- *White smoke may be emitted for several minutes after the engine starts, this is not a malfunction.*

ECU (Engine Control Unit)

⚠ WARNING

- **The engine uses a high pressure common rail system. As the fuel is injected under extremely high pressure, never disassemble parts of the fuel system. Failure to follow these instructions may result in serious injury or death.**
  Have your authorized dealer handle inspection, disassembly and repairs of parts in the fuel system.
- **Never do things like using an ECU other than the specified one, writing data other than designated to the ECU, leaving it in an out of order condition, or using it with sensors or actuators removed, as doing so may be considered a violation of laws on exhaust gas regulations.**
  The Hitachi Warranty is invalidated if used improperly.
- **The ECU must only be used in combination with an engine of the specified model and engine serial number.**
- **When injectors are replaced, it is necessary to rewrite the ECU with injection quantity correction data for the new injectors.**
  Your authorized dealer must rewrite the data.
- **If the ECU is replaced, your authorized dealer must write the data from the old ECU to the new ECU.**
  Failure to follow these instructions may result in serious injury or death, due to surging of the engine.

IMPORTANT

- **Do not disconnect the ECU while the key switch is ON, or within 60 seconds of turning the key switch OFF.**
- **Do not touch the connector pins of the ECU with bare hands.**
  Doing so may corrode the connector pins and/or destroy electronic circuits inside the ECU due to static electricity.
  It may also cause malfunction due to poor contact of the connector pins.
- **Take care to keep water out of the coupler when connecting and disconnecting it. It may cause malfunction due to corrosion of the connector pins.**
- **Do not connect/disconnect the connector frequently. Doing so may cause malfunction due to poor contact of the connector pins.**
- **If dropped, do not try to use the ECU.**
  Do not disassemble the terminals of the ECU.

Regulation(EU)2016/1628 Emission Diagnosis Functions

IMPORTANT

- **In order to maintain engine emissions performance, operate, use and maintain the engine, including the emissions control equipment, according to this user's manual.**
- **Do not intentionally tamper with or accidentally misuse the emissions control equipment of the engine.**
- **If the emissions control equipment fails to function properly, its warning lamp lights.**
  If the warning lamp continues to be ignored, it activates the inducement system.

Warning codes are displayed when a problem is detected with the emissions control equipment; they are for correcting any mistake in operating, using or maintaining the emissions control equipment.
In such case, immediately consult your authorized dealer.
Refer to the section Alarm List Display to check the warning code(s).

NCD System (NOx Control Diagnosis)

If a problem occurs with the EGR system, a warning is displayed on the monitor and the buzzer sounds.
If the machine is operated in this situation, the engine output control system gradually reduces the torque and RPM of the engine, as indicated in the table below.

Description of Error	Alarm Indication*	36 hr After Alarm Displayed	64 hr After Low-Level Inducement
EGR valve errors		Low-level inducement ・Limits Torque to 75% (Max torque to Rated torque)	Severe inducement ・Limits Torque to 50% ・Limits Engine RPM to 60% (vs. rated RPM)
EGR control sensor electrical fault (Disconnect/short circuit)			
EGR control sensor tampering			

*: Alarm is displayed and buzzer sounds.

PCD System (Particulate Control Diagnosis)

If a problem occurs with the muffler filter system, a warning is displayed on the monitor and the buzzer sounds.
If the machine is operated for longer than a certain period of time or left under this condition, the muffler filter error monitoring system calls for an incident counter/timer.

The incident counter/timer records the number of times and the duration the machine is operated with the error detected beyond the specified time.

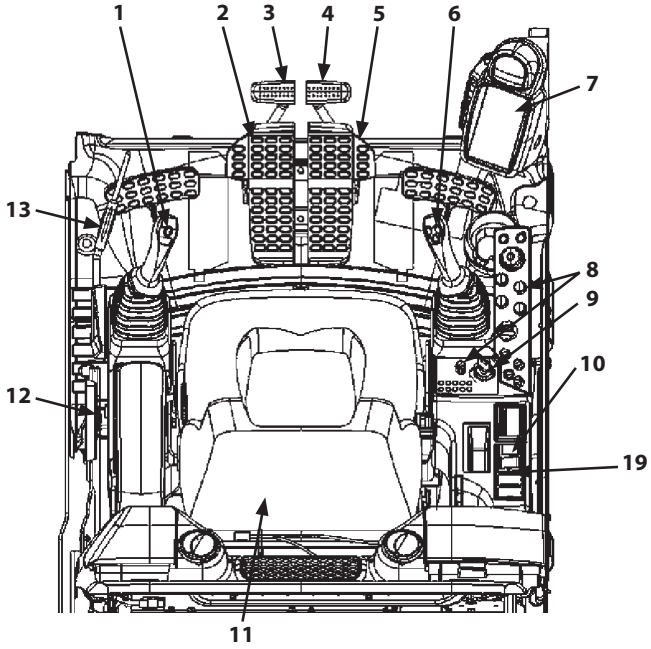
Description of Error	Alarm Indication*	Incident counter/timer
Muffler filter case or sensor removal		When an error is detected by PCD diagnostics, it records to the ECU the number and duration of incidents the engine is operated over 20 hours or it is left.
Removal of all muffler filter substrate		
Electrical fault or tampering with the PCD		

*: Alarm is displayed and buzzer sounds.

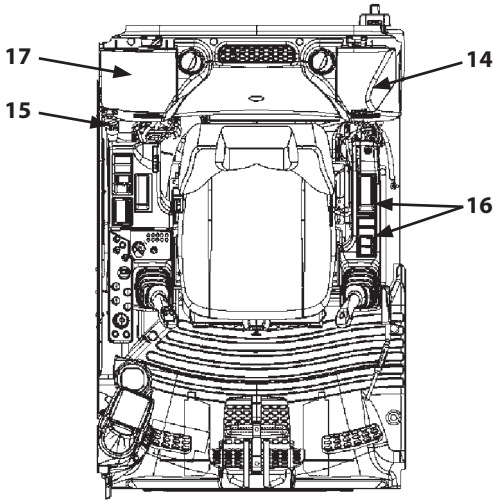
Name of Components

ZX85US-6

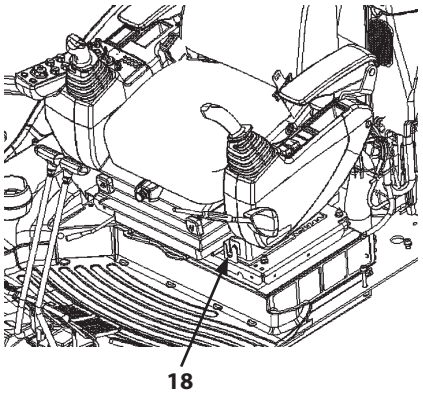
1- Left Control Lever/Horn Switch
2- Left Travel Pedal
3- Left Travel Lever
4- Right Travel Lever
5- Right Travel Pedal
6- Right Control Lever
7- Multi-Function Monitor
8- Switch Panel
9- Key Switch
10- Regeneration Switch
11- Operator's Seat
12- Cab Door Release Lever
13- Pilot Control Shut-Off Lever
14- Fuse Box
15- Cigar Lighter
16- Switch Panel (for Options)
Glove Compartment (without Optional Equipment)
17- Glove Compartment (Hot and Cool Box)
18- Engine Stop Switch
19- USB Charger Port (2.1 A)



MDEQ-01-006-3 ja



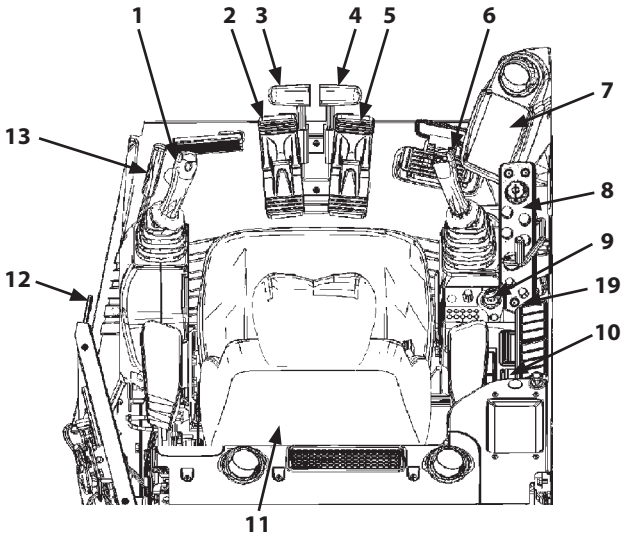
MDEQ-01-007-1 ja



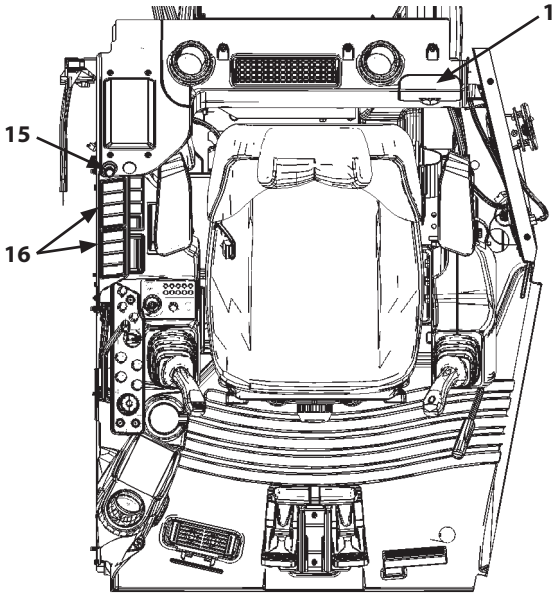
MDEQ-01-008-1 ja

ZX85USB-6

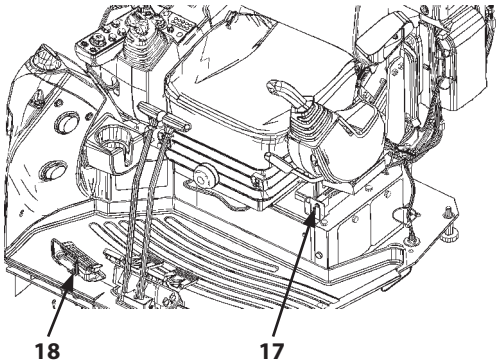
1- Left Control Lever/Horn Switch
2- Left Travel Pedal
3- Left Travel Lever
4- Right Travel Lever
5- Right Travel Pedal
6- Right Control Lever
7- Multi-Function Monitor
8- Switch Panel
9- Key Switch
10- Regeneration Switch
11- Operator's Seat
12- Cab Door Release Lever
13- Pilot Control Shut-Off Lever
14- Fuse Box
15- Cigar Lighter
16- Switch Panel (for Options)
17- Engine Stop Switch
18- Boom Swing Pedal
19- USB Charger Port (2.1 A)



MDEQ-01-010-3 ja



MDEQ-01-011-1 ja



MDEQ-01-012-1 ja

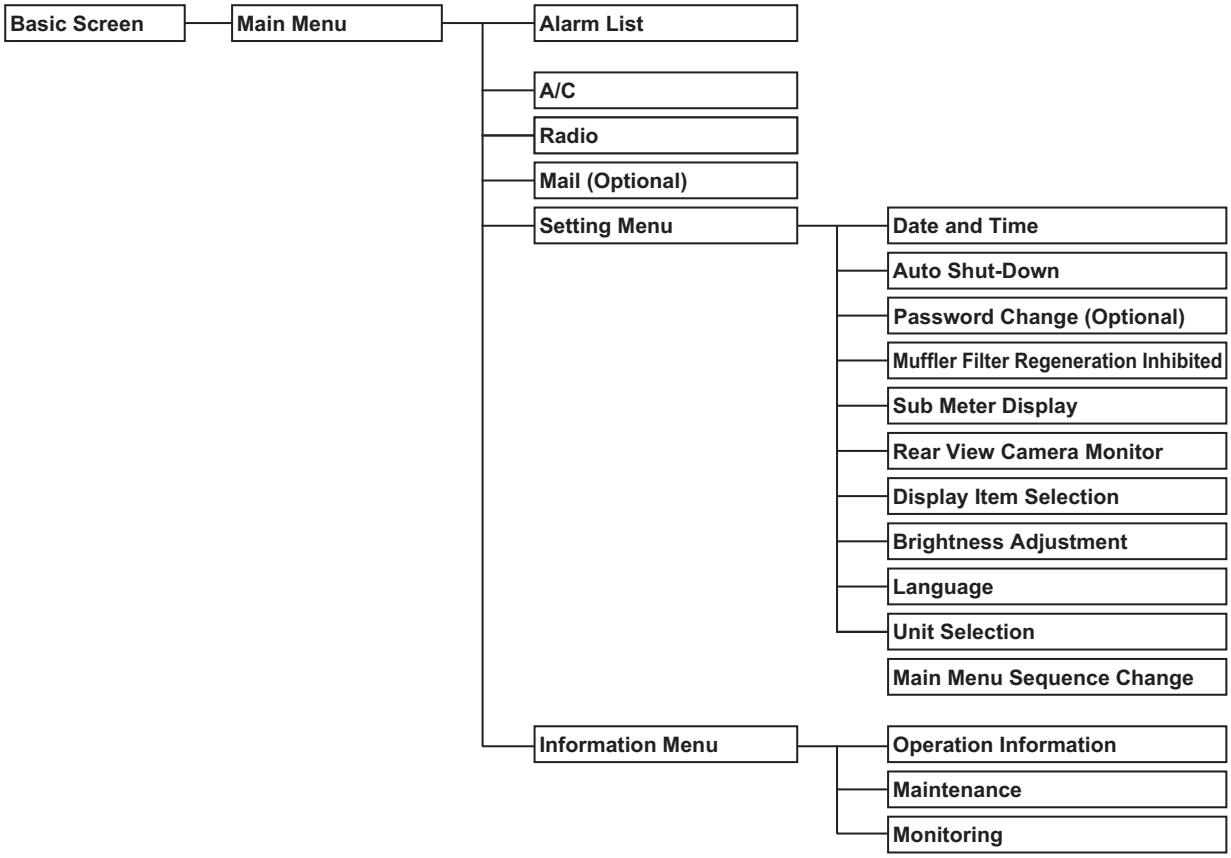
Multi Function Monitor

Function

The multi function monitor displays various meters, indicators, radio and air conditioner, numeric keypad lock function, rearview camera image, work mode selection and maintenance screen.

Screen Configuration

The multi-function monitor consists of the following screens.



MDEQ-01-018 en_GB

Default Setting

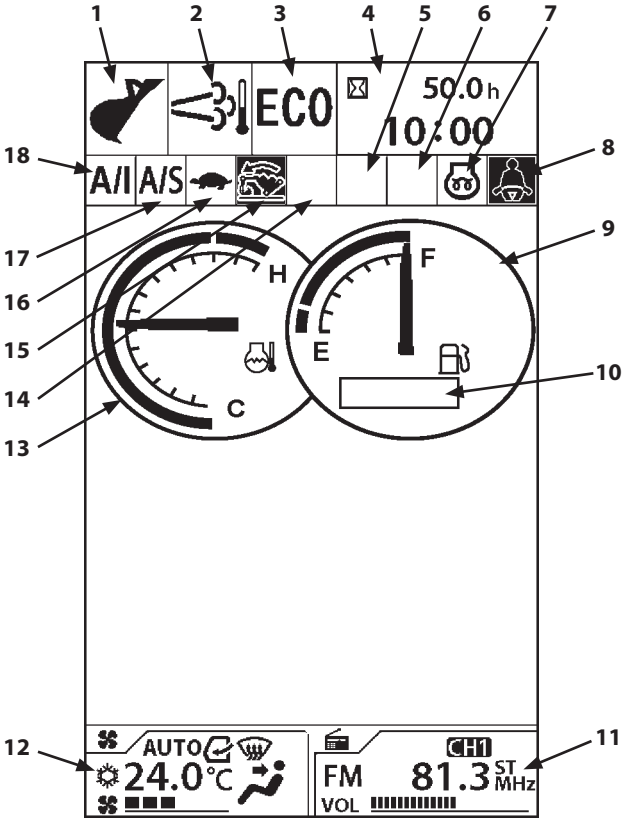
Function	Item	Default
Auto Shut-Down	ON/OFF of Auto Shut-down	OFF
	Setting Time	1 min
Muffler Filter Regeneration Inhibited	Regeneration Inhibited	OFF

NOTE

Typical functions are shown in the table. Check the initial values of other functions on each monitor screen.

Basic Screen

1- Work Mode Display
2- Muffler Filter Indicator
3- Power Mode Display
4- Hour Meter, Clock
5- Auxiliary
6- Auxiliary
7- Preheat Display
8- Seat Belt Display
9- Fuel Gauge
10- Sub Meter
11- Radio Display
12- Air Conditioner Display
13- Coolant Temperature Gauge
14- Auxiliary
15- Overload Alarm Indicator (Optional)
16- Travel Mode Indicator
17- Auto Shut-Down Display
18- Auto-Idle Display



MDAA-01-020-1 ja

How to Use Screens

Displaying Basic Screen

IMPORTANT

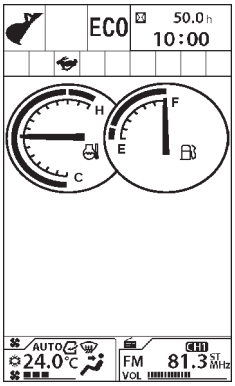
Start the engine after the basic screen is displayed.

When the key switch is turned to the ACC or ON position, the starting screen displays for about 2 seconds. When the key switch is kept in ACC position, only hour meter, clock and radio are displayed. When the key switch is turned from ACC to ON position, the basic screen is displayed.



Starting Screen

MDAA-01-003 ja

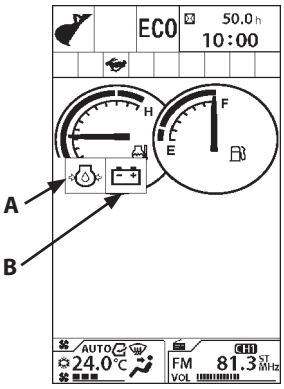


Basic Screen

MDAA-01-001 ja

IMPORTANT

When the key switch is turned to the ON position, the engine oil pressure indicator (A) and the alternator indicator (B) are displayed on the basic screen. Until the alternator starts generating power after the engine starts, the alternator indicator is displayed on the basic screen. Until the engine oil pressure exceeds the given pressure, the engine oil pressure indicator continues to be displayed.

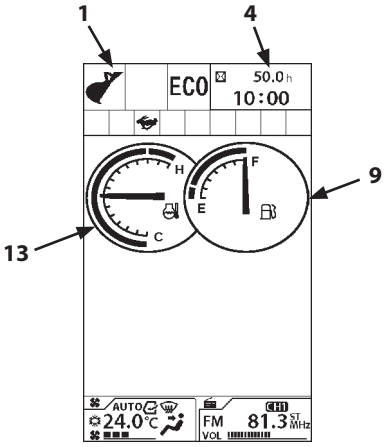


MDAA-01-041-1 ja

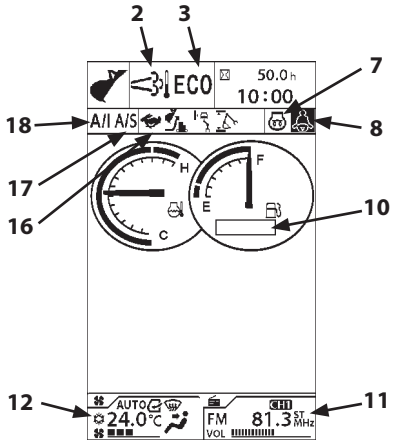
- Display of Meters
  Items to be displayed
  - 4- Hour Meter, Clock
  - 9- Fuel Gauge
  - 13- Coolant Temperature Gauge
- Work Mode Display (1)
  The attachments being used are displayed.
  Digging Mode



MDC1-00-006 ja



MDAA-01-001-1 ja



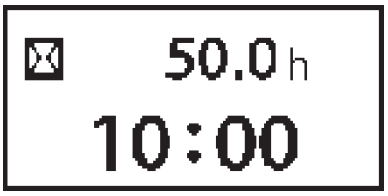
MDEP-01-020-2 ja

- Muffler Filter Indicator (2)
  Displays the status of the muffler filter.
- Power Mode Display (3)
  Displays the power mode selected from the switch panel.
- Preheat Display (7)
  While the current is being supplied to the glow plug, indicator is displayed.
- Seat Belt Display (8)
  Turns ON when the key switch is in the ON position, and turns OFF 5 seconds after the engine starts.
- Sub Meter Display (10)
  Indicates the fuel consumption gauge. The value displayed for the fuel consumption is only to be taken as a guide.
- Radio Display (11)
  Displays the radio panel.
- Air Conditioner Display (12)
  Displays the air conditioner panel.
- Travel Mode Display (16)
  Displays the travel mode selected from the switch panel.
- Auto Shut-Down Display (17)
  Display auto shut-down display when auto shut-down is turned ON from the menu screen.
  When the key switch is turned ON while auto shut-down is enabled, it blinks for 10 seconds.
- Auto-Idle Display (18)
  When the auto-idle is selected from the switch panel, auto-idle is displayed.
  When the key switch is turned ON while the auto-idle switch is also ON, it blinks for 10 seconds.

Hour Meter

The total accumulated operating hours since the machine started working are displayed in hours (h).

One digit after the decimal point indicates tenths of an hour (6 minutes).



MDAA-01-021 ja

Clock

Indicates the current time.

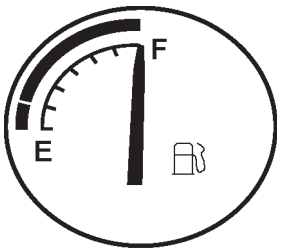
24-h/12-h display can be selected.

(Refer to "Date and Time" for switching the display mode.)

Fuel Gauge

The remaining fuel amount is indicated by the needle.

Refuel before the needle reaches "E".

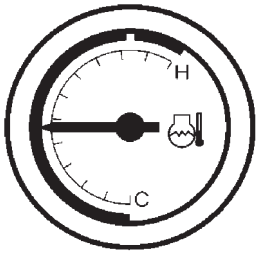


MDAA-01-276 ja

Coolant Temperature Gauge

The engine coolant temperature is indicated with a needle.

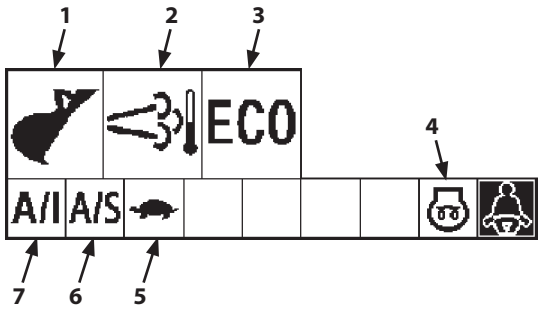
Normally the needle is around the center of the scale during operation.



M1U1-01-047 ja

Operating Status Icon Display

Displays icons indicating the current status of each of following items: Attachment (1) and muffler filter display (2) selected from the work mode selection screen; power mode (3), preheat indicator (4), travel mode (5), auto shut-down (6) ON, auto-idle (7) ON selected from the switch panel.



MDAA-01-023-1 ja

Security Functions (Optional)

Input Password

IMPORTANT

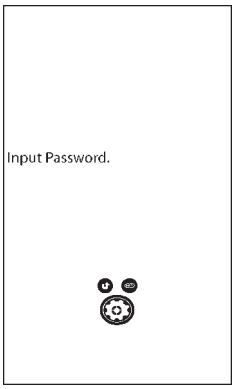
- **When required to activate the numeric keypad function, consult your authorized dealer.**
- **If the password is forgotten, the machine must be modified. Be extremely careful not to forget the password.**

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



Starting Screen

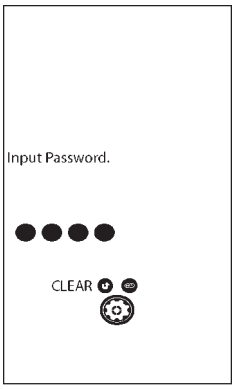
MDAA-01-003 ja



Password Input Screen

MDAA-01-085 en_GB

2. Input a password with the numeric keypad.

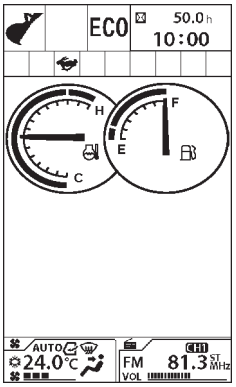


MDAA-01-086 en_GB

3. The monitor unit matches the input password to the registered one. If they match, the basic screen displays. The engine is ready to run. If an incorrect password is input 3 times, a buzzer sounds for 30 seconds. During that time, the buzzer does not stop even if the key switch is turned ON/OFF.

   NOTE

   If you make a mistake while entering the password, push the CLEAR key in order to erase the entered characters.



Basic Screen

MDAA-01-001 ja

4. After 30 seconds, if the key switch is turned to the ON position, the starting screen displays and the password input screen displays again. Then the password can be input again.
5. If an incorrect password is input again, the buzzer sounds for a further 30 seconds.

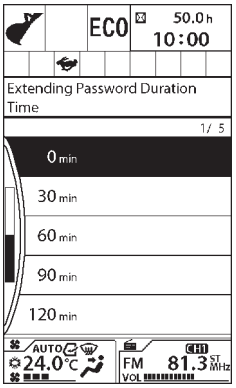
Extending the Password Duration Time

IMPORTANT

This operation only applies to machines that require a password.

The password duration screen can be used to set a password duration time. Once set, when the machine is restarted, the password does not need to be input within the extended time period.

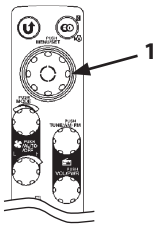
1. When turning the key switch from ON to ACC position, the monitor unit displays the password duration screen for 10 seconds.



Password Duration Screen (Key Switch: OFF)

MDAA-01-087 en_GB

2. While the password duration screen is still displayed, rotate selector knob (1) to highlight the relevant time. Pushing selector knob (1) sets the password duration time.



MDC1-01-026-1 ja

Duration time	0 minutes
Duration time	30 minutes
Duration time	60 minutes
Duration time	90 minutes
Duration time	120 minutes

NOTE

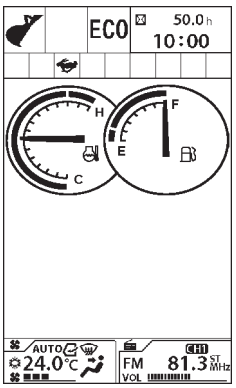
If a password duration time is not set, the duration is set to 0.

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



Starting Screen

MDAA-01-003 ja



Basic Screen

MDAA-01-001 ja

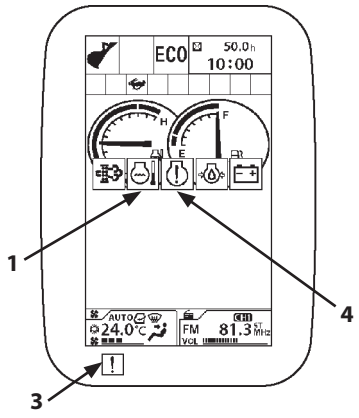
Alarm Screen

When something abnormal occurs, alarm marks (1) are displayed on the basic screen and alarm lamps (3) light simultaneously.

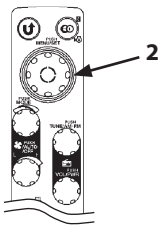
If 5 or more alarms are generated, alarms can be scrolled by turning switch (2).

IMPORTANT

- **The ECU performs various self-diagnostic functions on the engine, based on electronic control sensors and data presets of the various engine fault detection sensors. Engine problems are established according to the state of each of these sensors.**
- **When an engine alarm is detected, the ECU indicates the occurrence of a fault. When these errors are detected, it is indicated an engine error alarm (4) being displayed.**
  In such case, it means there is a problem with the engine, so consult your authorized dealer.
- **Do not continue operating the engine with an engine error alarm (4) displayed.**
  It is not just a question of not ensuring engine performance, but it may result in a more serious problem.



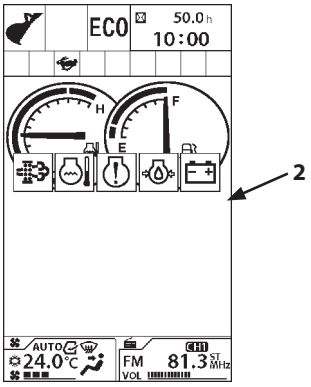
MDAA-01-316-1 ja



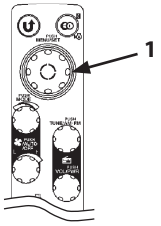
MDC1-01-026-2 ja

Follow the procedure below to display detailed information for an alarm.

1. Push selector knob (1) on basic screen (2) to display main menu (3).



MDAA-01-004-1 ja

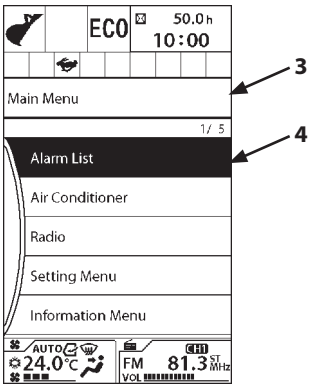


MDC1-01-026-1 ja

2. Rotate selector knob (1) to select alarm list (4), and push selector knob (1).

NOTE

Main menu (3) displays alarm list (4) only when an alarm occurs.

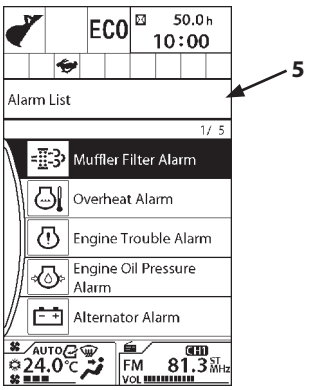


MDED-01-077-1 en_GB

3. Rotate selector knob (1) to select the desired alarm from alarm list (5), and push selector knob (1).

NOTE

Alarm list (5) contains only currently issued alarms.



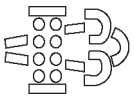
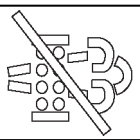
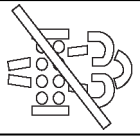
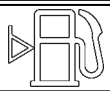
MDAA-01-078-1 en_GB

4. Detailed information of the selected alarm is displayed.



MDAA-01-079 en_GB

Description of Alarms

Display	Alarm Name	Description of Alarms
	Muffler Filter Alarm*1 (Flashing) (Red)	There is a problem with the muffler filter. Put the machine in a safe attitude and position immediately and stop the engine. Consult your authorized dealer.
	Muffler Filter Regeneration Request (Blinking) (Yellow)	The muffler filter needs regeneration immediately. The filter will be damaged if regeneration is not performed. Set pilot control shut-off lever to the LOCK position, run the engine at slow idle speed and put the muffler filter switch in the regeneration position.
	Muffler Filter Regeneration Inhibited Warning (Lighting) (Yellow)	Regeneration is inhibited. Move the machine to a safe area, release the regeneration inhibition, and perform manual regeneration.
	Muffler Filter Manual Regeneration Inhibited Warning (Lighting) (Yellow)	As regeneration is inhibited, auto regeneration cannot be performed.
	Overheating Alarm*2	Coolant temperature is abnormally high. Stop operations and run the engine at slow idle speed to lower the coolant temperature.
	Engine Trouble Alarm	There is a problem with the engine and/or engine-related parts. Consult your authorized dealer.
	EGR System Error Indicator (Lit)(Red)	There is a problem with the engine and/or engine-related parts. Consult your authorized dealer.
	Engine Oil Pressure Alarm*1	Engine oil pressure has dropped. Immediately stop the engine. Check the engine oil system and oil level.
	Engine Start Disabled	Engine cannot start if the pilot control shut-off lever is in the UNLOCK position.
	Engine Start Disabled	Engine cannot start if the engine shut-off switch is in the OFF position.
	Alternator Indicator	There is a problem in the electrical system. Check the alternator and the battery systems.
	Fuel Level Alarm	Fuel level is low. Refill as soon as possible.
	Hydraulic Oil Filter Clogged Alarm*3	The hydraulic oil filter is clogged. Clean or replace the hydraulic oil filter element.
	Air Cleaner Restriction Alarm	The air cleaner is clogged. Clean or replace the air cleaner element.
	System Failure Alarm	There is a problem with the communication system. Consult your authorized dealer.

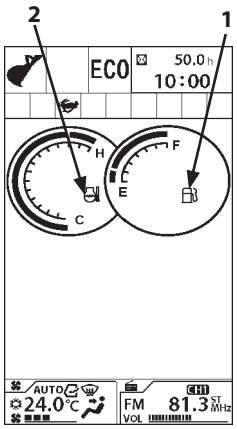
Display	Alarm Name	Description of Alarms
	Pilot Control Shut-Off Lever Alarm	There is a problem with the pilot control shut-off lever system. Consult your authorized dealer.
	Water Separator Alarm	The water separator is full. Drain the water.
	Electric Lever Alarm	Electric lever system is abnormal. Consult your nearest Hitachi dealer.

*1 Alarm mark is displayed and buzzer will sound.

*2 Alarm mark is displayed and buzzer will sound. Turn engine control dial to the slow idle position and the buzzer will stop.

*3 The hydraulic oil filter alarm lights only when the high performance element (optional) is used.

- Fuel Sensor Error Display
  If the fuel sensor is faulty, the color of icon (1) changes and the needle disappears. If the harness between the temperature sensor and the controller unit is broken, the needle disappears.
- Coolant Temperature Sensor Error Display
  If the coolant sensor is faulty, the color of icon (2) changes and the needle disappears. If the harness between the temperature sensor and the controller unit is broken, the needle disappears.



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DTC Code List

Code Displayed on Monitor	Engine DTC Code	Error Description	Engine Behavior when Error Occurs
51-3	P02E9	Intake throttle opening sensor output high	Engine output and RPM are limited by the default value of 100% for the intake throttle opening. The engine stops after 135 minutes.
51-4	P02E8	Intake throttle opening sensor output low	Engine output and RPM are limited by the default value of 100% for the intake throttle opening. The engine stops after 135 minutes.
91-3	P0123	Accelerator sensor 1 output high	Engine RPM is limited.
91-4	P0122	Accelerator sensor 1 output low	Engine RPM is limited.
100-4	P1192	Oil pressure switch disconnected	No engine output or RPM restriction.
100-1	P1198	Oil pressure drop error	Engine output and RPM are limited. The engine stops after 135 minutes.
110-0	P0217	Coolant temperature rise	Engine output and RPM are limited. The engine stops after 135 minutes.
157-0	P0088	Rail pressure error high pressure	Engine output and RPM are limited. The engine stops after 30 minutes.
157-3	P0193	Rail pressure sensor output high	Engine output and RPM are limited by the default pressure of 160 MPa for the rail pressure. The engine stops after 135 minutes.
157-4	P0192	Rail pressure sensor output low	Engine output and RPM are limited by the default pressure of 160 MPa for the rail pressure. The engine stops after 135 minutes.
157-15	P0093	Rail pressure deviation error (rail pressure high)	Engine output and RPM are limited. The engine stops after 30 minutes.
157-16	P000F	Rail pressure error PLV valve open	Engine output and RPM are limited. The engine stops after 30 minutes.
157-18	P0094	Rail pressure deviation error (rail pressure low)	Engine output and RPM are limited. The engine stops after 30 minutes.
172-3	P0113	New air temperature sensor output high	Engine output and RPM are limited by the default temperature of 25℃ for the new air temperature.
172-4	P0112	New air temperature sensor output low	Engine output and RPM are limited by the default temperature of 25℃ for the new air temperature.
174-0	P0168	Fuel temperature sensor fuel temperature rise	Engine output and RPM are limited. The engine stops after 135 minutes.
174-3	P0183	Fuel temperature sensor output high	Engine output and RPM are limited by the default temperature of 40℃ for the fuel temperature.
174-4	P0182	Fuel temperature sensor output low	Engine output and RPM are limited by the default temperature of 40℃ for the fuel temperature.
190-0	P0219	Overspeed RPM high 2	The engine stops.
630-12	P0601	EEPROM memory erase error	Engine output and RPM are limited. The engine stops after 135 minutes.

Code Displayed on Monitor	Engine DTC Code	Error Description	Engine Behavior when Error Occurs
633-3	P0629	High pressure pump drive circuit high side VB short	Engine output and RPM are limited. The engine stops after 30 minutes.
633-5	P0627	High pressure pump drive circuit disconnect	Engine output and RPM are limited. The engine stops after 30 minutes.
633-6	P1642	High pressure pump drive circuit high side GND short	Engine output and RPM are limited. The engine stops after 30 minutes.
651-3	P1271	Injector 4: Cylinder no. 4 short	Engine output and RPM are limited. The engine stops after 135 minutes.
651-5	P0204	Injector 4: Cylinder no. 4 disconnect (injector characteristic location)	Engine output and RPM are limited. The engine stops after 135 minutes.
651-6	P0271	Injector 4: Cylinder no. 4 coil short	Engine output and RPM are limited. The engine stops after 135 minutes.
652-3	P1268	Injector 3: Cylinder no. 3 short	Engine output and RPM are limited. The engine stops after 135 minutes.
652-5	P0203	Injector 3: Cylinder no. 3 disconnect (injector characteristic location)	Engine output and RPM are limited. The engine stops after 135 minutes.
652-6	P0268	Injector 3: Cylinder no. 3 coil short	Engine output and RPM are limited. The engine stops after 135 minutes.
653-3	P1265	Injector 2: Cylinder no. 2 short	Engine output and RPM are limited. The engine stops after 135 minutes.
653-5	P0202	Injector 2: Cylinder no. 2 disconnect (injector characteristic location)	Engine output and RPM are limited. The engine stops after 135 minutes.
653-6	P0265	Injector 2: Cylinder no. 2 coil short	Engine output and RPM are limited. The engine stops after 135 minutes.
654-3	P1262	Injector 1: Cylinder no. 1 short	Engine output and RPM are limited. The engine stops after 135 minutes.
654-5	P0201	Injector 1: Cylinder no. 1 disconnect (injector characteristic location)	Engine output and RPM are limited. The engine stops after 135 minutes.
654-6	P0262	Injector 1: Cylinder no. 1 coil short	Engine output and RPM are limited. The engine stops after 135 minutes.
1485-2	P068A	Main relay opened early	No engine output or RPM restriction.
1485-7	P068B	Main relay stuck	No engine output or RPM restriction.
2797-6	P1146	Injector drive circuit (bank 1) short	Engine output and RPM are limited. The engine stops after 135 minutes.
2798-6	P1149	Injector drive circuit (bank 2) short	Engine output and RPM are limited. The engine stops after 135 minutes.
2950-3	P1658	Intake throttle drive circuit throttle valve drive H bridge output 1 VB short	Engine output and RPM are limited. The engine stops after 135 minutes.
2950-4	P1659	Intake throttle drive circuit throttle valve drive H bridge output 1 GND short	Engine output and RPM are limited. The engine stops after 135 minutes.
2950-5	P0660	Intake throttle drive circuit throttle valve drive H bridge circuit--no load	Engine output and RPM are limited. The engine stops after 135 minutes.
2950-6	P1660	Intake throttle drive circuit throttle valve drive H bridge circuit--over load	Engine output and RPM are limited. The engine stops after 135 minutes.
2951-3	P1661	Intake throttle drive circuit throttle valve drive H bridge output 2 VB short	Engine output and RPM are limited. The engine stops after 135 minutes.

Code Displayed on Monitor	Engine DTC Code	Error Description	Engine Behavior when Error Occurs
2951-4	P1662	Intake throttle drive circuit throttle valve drive H bridge output 2 GND short	Engine output and RPM are limited. The engine stops after 135 minutes.
3242-0	P1436	DPF inlet temperature sensor temperature error (high)	Engine output and RPM are limited. The engine stops after 135 minutes.
3250-0	P1426	DPF midway temperature sensor temperature error (high)	The engine stops.
3250-1	P0420	DPF temperature (midway temperature) error low temperature	Engine output and RPM are limited. The engine stops after 135 minutes.
3251-0	P2452	DPF differential pressure sensor error (high)	Engine output and RPM are limited. The engine stops after 30 minutes.
3719-0	P1424	Backup mode	Engine output and RPM are limited. The engine stops after 30 minutes.
3719-7	P1446	Recovery regeneration inhibited	The engine stops.
3719-9	P1445	Recovery regeneration error	The engine stops.
3719-16	P1421	Stationary regeneration standby	Engine output and RPM are limited. The engine stops after 135 minutes.
3720-0	P1420	Ash cleaning request 2	Engine output and RPM are limited. The engine stops after 135 minutes.
3720-16	P242F	Ash cleaning request 1	Engine output is limited.
4257-12	P0611	Injector drive circuit, drive IC error	The engine stops.
522243-5	P0543	Start assist relay disconnect	No engine output or RPM restriction.
522243-6	P0541	Start assist relay GND short	No engine output or RPM restriction.
522323-0	P1101	Air cleaner clogged alarm	No engine output or RPM restriction.
522329-0	P1151	Oil/water separator alarm	No engine output or RPM restriction.
522400-2	P0336	Crank signal error	Engine output and RPM are limited. The engine stops after 135 minutes.
522400-5	P0337	No crank input	Engine output and RPM are limited. The engine stops after 135 minutes.
522401-2	P0341	Cam signal error	No engine output or RPM restriction.
522401-5	P0342	No cam input	No engine output or RPM restriction.
522401-7	P1341	Cam offset angle error	No engine output or RPM restriction.
522571-3	P1641	High pressure pump drive circuit low side VB short	Engine output and RPM are limited. The engine stops after 30 minutes.
522571-6	P1643	High pressure pump drive circuit low side GND short	Engine output and RPM are limited. The engine stops after 30 minutes.
522572-6	P062A	High pressure pump drive circuit/drive current (high level error)	Engine output and RPM are limited. The engine stops after 30 minutes.
522573-0	P2463	Excess accumulation (C method)	Engine output and RPM are limited. The engine stops after 30 minutes.
522574-0	P1463	Excess accumulation (P method)	Engine output and RPM are limited. The engine stops after 30 minutes.
522575-7	P2458	DPF regeneration fault (stationary regeneration error)	Engine output and RPM are limited. The engine stops after 30 minutes.

Code Displayed on Monitor	Engine DTC Code	Error Description	Engine Behavior when Error Occurs
522576-12	P160E	EEPROM memory read error	Engine output and RPM are limited. The engine stops after 135 minutes.
522577-11	P2459	DPF regeneration fault (stationary regeneration failed)	Engine output and RPM are limited. The engine stops after 30 minutes.
522578-12	P160F	EEPROM memory write error	Engine output and RPM are limited. The engine stops after 135 minutes.
522585-12	P1613	Internal ECU error CY146SP1 communication error	The engine stops.
522610-9	U010B	CAN communication timeout from EGR valve	Engine output and RPM are limited. The engine stops after 135 minutes.
522619-9	U1303	Y-DPFIF receive timeout error	No engine output or RPM restriction.
522744-4	P1626	Internal ECU error Actuator drive circuit 1 GND short	No engine output or RPM restriction.
523460-7	P1670	Rail pressure error Operating time error during RPS limp home	The engine stops.
523468-9	P1665	Rail pressure error Control rail pressure error after PLV valve open	The engine stops.
523469-0	P1666	Rail pressure error No. of times PLV valve opened error	Engine output and RPM are limited. The engine stops after 30 minutes.
523470-0	P1667	Rail pressure error Duration PLV valve opened error	Engine output and RPM are limited. The engine stops after 30 minutes.
523471-6	P1467	Internal ECU error Actuator drive circuit 3 GND short	No engine output or RPM restriction.
523462-13	P1648	QR data Error in IQA corrected injection amount for injector 1	The engine stops.
523463-13	P1649	QR data Error in IQA corrected injection amount for injector 2	The engine stops.
523464-13	P1650	QR data Error in IQA corrected injection amount for injector 3	The engine stops.
523465-13	P1651	QR data Error in IQA corrected injection amount for injector 4	The engine stops.
523473-12	P1469	Internal ECU error AD converter error 1	The engine stops.
523474-12	P1470	Internal ECU error AD converter error 2	The engine stops.
523475-12	P1471	Internal ECU error External monitoring IC and CPU error 1	The engine stops.
523476-12	P1472	Internal ECU error External monitoring IC and CPU error 2	The engine stops.
523477-12	P1473	Internal ECU error ROM error	The engine stops.
523478-12	P1474	Internal ECU error Shutoff path error 1	The engine stops.
523479-12	P1475	Internal ECU error Shutoff path error 2	Engine output and RPM are limited. The engine stops after 135 minutes.
523480-12	P1476	Internal ECU error Shutoff path error 3	The engine stops.
523481-12	P1477	Internal ECU error Shutoff path error 4	The engine stops.
523482-12	P1478	Internal ECU error Shutoff path error 5	The engine stops.
523483-12	P1479	Internal ECU error Shutoff path error 6	The engine stops.

Code Displayed on Monitor	Engine DTC Code	Error Description	Engine Behavior when Error Occurs
523484-12	P1480	Internal ECU error Shutoff path error 7	The engine stops.
523485-12	P1481	Internal ECU error Shutoff path error 8	The engine stops.
523486-12	P1482	Internal ECU error Shutoff path error 9	The engine stops.
523487-12	P1483	Internal ECU error Shutoff path error 10	The engine stops.
523488-12	P1484	Internal ECU error Engine RPM recognition error	The engine stops.
523489-0	P1668	Rail pressure error Excess rail pressure error during PRV limp home	The engine stops.
523491-0	P1669	Rail pressure error Injector B/F temperature error during PLV4 limp home	Engine output and RPM are limited. The engine stops after 30 minutes.
523249-5	P0008	Crank/cam No input from either sensor at same time	The engine stops.
522596-9	U0292	TCS1 (CAN message) TSC1 receive timeout (SA1)	No engine output or RPM restriction.
522597-9	U1301	TCS1 (CAN message) TSC1 receive timeout (SA2)	No engine output or RPM restriction.
522599-9	U1292	Y_ECR1 (CAN message) Y_ECR1 receive timeout	No engine output or RPM restriction.
522588-12	P1608	Internal ECU error Supply 1 overvoltage error	The engine stops.
522589-12	P1617	Internal ECU error Supply 1 undervoltage error	The engine stops.
522590-12	P1609	Internal ECU error Sensor supply 1 voltage error 1	No engine output or RPM restriction.
522591-12	P1618	Internal ECU error Sensor supply 1 voltage error 2	No engine output or RPM restriction.
522592-12	P1619	Internal ECU error Sensor supply 1 voltage error 3	No engine output or RPM restriction.
522994-4	P1633	Internal ECU error Actuator drive circuit 2 GND short	No engine output or RPM restriction.
522572-11	P1645	High pressure pump drive circuit pump overload error	Engine output and RPM are limited. The engine stops after 30 minutes.

DTC Code List (NCD System)

Code Displayed on Monitor	Engine DTC Code	Error Description	Engine Behavior when Error Occurs
102-3	P0238	EGR low pressure side sensor output high	Engine output and RPM are limited by the default pressure of 900 hPa for the EGR low-pressure side. The engine stops after 30 minutes.
102-4	P0237	EGR low pressure side sensor output low	Engine output and RPM are limited by the default pressure of 900 hPa for the EGR low-pressure side. The engine stops after 30 minutes.
102-13	P0236	EGR low pressure side sensor learning value error	Engine output and RPM are limited. The engine stops after 30 minutes.
105-3	P040D	Intake manifold temperature sensor output high	Engine output and RPM are limited by the default temperature of 100℃ for the intake temperature. The engine stops after 30 minutes.
105-4	P040C	Intake manifold temperature sensor output low	Engine output and RPM are limited by the default temperature of 100℃ for the intake temperature. The engine stops after 30 minutes.
108-3	P2229	Atmospheric pressure sensor output high	Engine output and RPM are limited by the default pressure of 900 hPa for the atmospheric pressure. The engine stops after 135 minutes.
108-4	P2228	Atmospheric pressure sensor output low	Engine output and RPM are limited by the default pressure of 900 hPa for the atmospheric pressure. The engine stops after 135 minutes.
108-10	P1231	Atmospheric pressure sensor validity error	Engine output and RPM are limited. The engine stops after 135 minutes.
110-3	P0118	Coolant sensor output high	Engine output and RPM are limited by the default temperature of 50℃ (at start, -15℃) for the coolant temperature. The engine stops after 135 minutes.
110-4	P0117	Coolant sensor output low	Engine output and RPM are limited by the default temperature of 50℃ (at start, -15℃) for the coolant temperature. The engine stops after 135 minutes.
173-3	P0546	Exhaust manifold temperature sensor output high	Engine output and RPM are limited by the default temperature of 550℃ for the exhaust temperature. The engine stops after 135 minutes.
173-4	P0545	Exhaust manifold temperature sensor output low	Engine output and RPM are limited by the default temperature of 550℃ for the exhaust temperature. The engine stops after 135 minutes.
412-3	P041D	EGR gas temperature sensor output high	Engine output and RPM are limited by the default temperature of 30℃ for the EGR gas temperature. The engine stops after 135 minutes.
412-4	P041C	EGR gas temperature sensor output low	Engine output and RPM are limited by the default temperature of 30℃ for the EGR gas temperature. The engine stops after 135 minutes.
1209-3	P0473	EGR high pressure side sensor output high	Engine output and RPM are limited by the default pressure of 900 hPa for the EGR high-pressure side. The engine stops after 30 minutes.

Code Displayed on Monitor	Engine DTC Code	Error Description	Engine Behavior when Error Occurs
1209-4	P0472	EGR high pressure side sensor output low	Engine output and RPM are limited by the default pressure of 900 hPa for the EGR high-pressure side. The engine stops after 30 minutes.
1209-13	P0471	EGR high pressure side sensor learning value error	Engine output and RPM are limited. The engine stops after 30 minutes.
2791-0	P0404	EGR overvoltage error	Engine output and RPM are limited. The engine stops after 135 minutes.
2791-1	P1404	EGR undervoltage error	Engine output and RPM are limited. The engine stops after 135 minutes.
2791-9	U0401	EGR ECM data error	Engine output and RPM are limited. The engine stops after 135 minutes.
2791-12	P0403	EGR motor coil disconnection	Engine output and RPM are limited. The engine stops after 135 minutes.
522579-12	P1405	EGR motor coil short	Engine output and RPM are limited. The engine stops after 135 minutes.
522580-12	P0488	EGR position sensor error	Engine output and RPM are limited. The engine stops after 135 minutes.
2791-7	P1409	EGR feedback error	Engine output and RPM are limited. The engine stops after 135 minutes.
522581-7	P148A	EGR stuck open error	Engine output and RPM are limited. The engine stops after 30 minutes.
522582-7	P049D	EGR initialize error	Engine output and RPM are limited. The engine stops after 30 minutes.
522617-12	U1401	Outside EGR target value range	Engine output and RPM are limited. The engine stops after 135 minutes.
522583-1	P1410	EGR high temperature thermistor error	Engine output and RPM are limited. The engine stops after 135 minutes.
522584-1	P1411	EGR low temperature thermistor error	Engine output and RPM are limited. The engine stops after 135 minutes.
102-10	P1673	EGR low voltage sensor Validity error	After 36 hours engine output is limited and after 100 hours engine RPM is also limited.
1209-10	P1679	EGR high voltage sensor Validity error	After 36 hours engine output is limited and after 100 hours engine RPM is also limited.
412-10	P1675	EGR gas temperature sensor Validity error	After 36 hours engine output is limited and after 100 hours engine RPM is also limited.
105-10	P1676	Intake manifold temperature sensor Validity error	After 36 hours engine output is limited and after 100 hours engine RPM is also limited.
173-10	P1677	Exhaust manifold temperature sensor Validity error	After 36 hours engine output is limited and after 100 hours engine RPM is also limited.
110-10	P1674	Water temperature sensor Validity error	After 36 hours engine output is limited and after 100 hours engine RPM is also limited.

DTC Code List (PCD System)

Code Displayed on Monitor	Engine DTC Code	Error Description	Engine Behavior when Error Occurs
3242-3	P1428	DPF inlet temperature sensor output high	Engine output and RPM are limited by the default temperature of 350℃ for the DPF inlet temperature. The engine stops after 30 minutes.
3242-4	P1427	DPF inlet temperature sensor output low	Engine output and RPM are limited by the default temperature of 350℃ for the DPF inlet temperature. The engine stops after 30 minutes.
3250-3	P1434	DPF midway temperature sensor output high	Engine output and RPM are limited by the default temperature of 350℃ for the DPF midway temperature. The engine stops after 30 minutes.
3250-4	P1435	DPF midway temperature sensor output low	Engine output and RPM are limited by the default temperature of 350℃ for the DPF midway temperature. The engine stops after 30 minutes.
3251-3	P2455	DPF differential pressure sensor output high	Engine output and RPM are limited by the default pressure of 0 hPa for the DPF differential pressure. The engine stops after 30 minutes.
3251-4	P2454	DPF differential pressure sensor output low	Engine output and RPM are limited by the default pressure of 0 hPa for the DPF differential pressure. The engine stops after 30 minutes.
3251-13	P2453	DPF differential pressure sensor learning value error	Engine output and RPM are limited. The engine stops after 30 minutes.
3609-3	P1455	DPF high pressure side sensor output high	Engine output and RPM are limited by the default pressure of 900 hPa for the DPF high-pressure side. The engine stops after 30 minutes.
3609-4	P1454	DPF high pressure side sensor output low	Engine output and RPM are limited by the default pressure of 900 hPa for the DPF high-pressure side. The engine stops after 30 minutes.
3609-10	P167C	DPF high pressure side sensor Validity error	No engine output or RPM restriction.
4795-31	P226D	DPF substrate removed/ DPF differential pressure sensor Validity error	No engine output or RPM restriction.
3242-10	P167E	DPF inlet temperature sensor Validity error	No engine output or RPM restriction.
3250-10	P167A	Midway DPF temperature sensor Validity error	No engine output or RPM restriction.

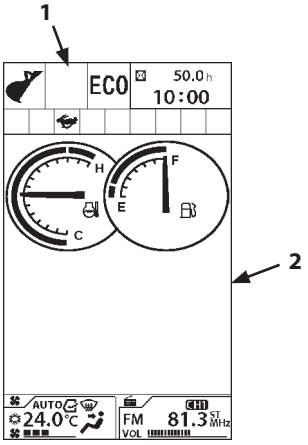
Muffler Filter

Muffler Filter Status Indicator

The muffler filter indicator (1) displays the status of the muffler filter.



This mark indicates that the exhaust temperature is high during muffler filter regeneration. It is lit while auto or manual regeneration is in process.



MDAA-01-001-2 ja

NOTE

- *Auto-regeneration is not performed at set intervals. The auto-regeneration may start during operation of the machine; you can continue to operate the machine. Note, if the pilot control shut-off lever is put in the LOCK position during auto-regeneration, the sound of the engine changes, but this is not a malfunction.*
- *Do not stop the engine during regeneration unless absolutely necessary.*

When the manual regeneration switch is pushed during the auto-regeneration process, the message "Minimal Exhaust Restriction. Exhaust Filter Cleaning Not Available." is displayed on monitor (2).

Depending on the operating conditions of the machine, the regeneration may not be completed. In this case, a muffler filter regeneration request will be displayed on the monitor. Immediately perform manual regeneration according to the procedure.



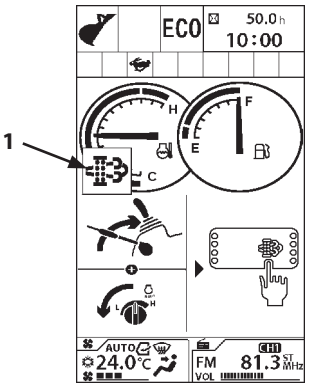
This mark indicates that muffler filter regeneration is inhibited. Regeneration is not performed while this mark is lit.

IMPORTANT

Set muffler filter regeneration to the inhibited position while operating the machine in an environment in which there are a lot of flammable materials around the machine. (For details on, see the section Muffler Filter Regeneration Inhibited.)

Manual Muffler Filter Regeneration Request

The muffler filter needs regeneration. Usually, regeneration is performed automatically. However, under some conditions manual regeneration is required. The marks described below may be indicated on monitor (1).



MDAA-01-005-1 ja



(Blinking, Yellow)

This mark indicates that manual muffler filter regeneration is required. Perform manual regeneration by following the specified procedure.



(Flashing, Red)

Indicates the muffler filter is excessively clogged. Stop working immediately and move the machine to a safe area. Then consult your authorized dealer.



(Lit, Yellow)

This mark indicates that muffler filter regeneration is inhibited. It is displayed when a manual regeneration request arises while muffler filter regeneration is inhibited. Move the machine to a safe place and perform a manual regeneration according to the procedure.

IMPORTANT

- **If a manual regeneration is performed when the muffler filter regeneration request is displayed, it restores muffler filter function. This is not a malfunction.**
- **If the machine continues to be operated without performing manual regeneration, despite the muffler filter regeneration request being displayed, the engine RPM and output drop and after approximately 2 hours, the engine stops automatically. If the muffler filter and engine trouble warnings are displayed, the buzzer sounds, and the engine stops automatically after approximately 30 minutes. If this happens, consult your authorized dealer as the muffler filter needs repairs.**

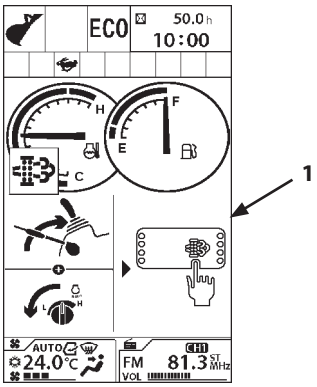
Manual Regeneration Procedure

When manual regeneration is needed, screen (1) as illustrated at right is displayed. When screen (1) is displayed, manual regeneration must be done. Before starting manual regeneration, be sure to check the following.

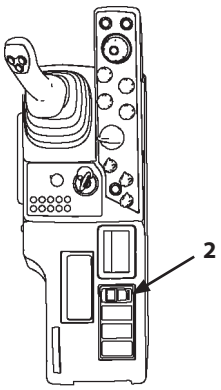
If the rear view camera is equipped on the machine and the camera is enabled, screen (1) is displayed only when the pilot control shut-off lever is in LOCK position.

- No one around the machine.
- No flammable materials near the muffler filter.
- Fuel level alarm does not light.

1. Park the machine in a safe place. Lower the front attachment to the ground.
2. Pull the pilot control shut-off lever to the LOCK position.
3. Set the engine control lever to slow idle.
4. Push the manual muffler filter regeneration switch (2).

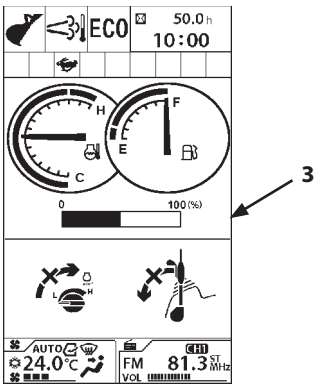


MDAA-01-005-2 ja



MDEQ-01-019-1 ja

5. When the manual muffler filter regeneration switch (2) is pressed, screen (3) as shown at right is displayed and manual regeneration starts. A bar graph on screen shows the progress of the regeneration process.



MDAA-01-006-1 ja

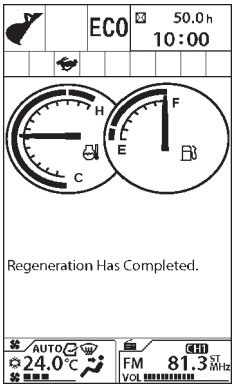
IMPORTANT

Manual regeneration does not start unless the pilot control shut-off lever is in the LOCK position and the engine control dial is on slow idle. If the pilot control shut-off lever or the engine control lever are touched during manual regeneration, the regeneration process is aborted. If the process is aborted, start over again.

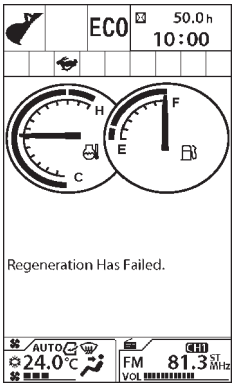
6. When the manual regeneration is complete, the message "Regeneration Has Completed." is displayed. If "Regeneration Has Failed." is displayed, start the manual regeneration process over again. Failure of the regeneration process may happen in conditions other than those mentioned above (such as a malfunction of a sensor that affects regeneration, or at low air temperature).

NOTE

When the engine is started, manual regeneration is not started, even if the manual regeneration switch is pressed, until the engine warms up for 15 to 20 minutes.



MDAA-01-083 en_GB

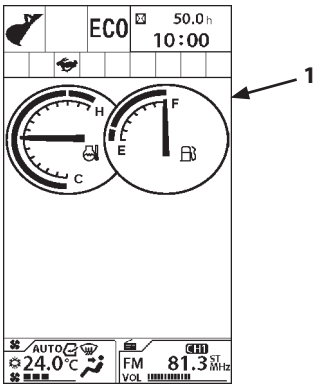


MDAA-01-084 en_GB

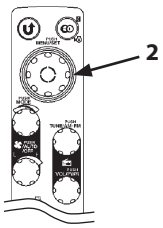
Main Menu

Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

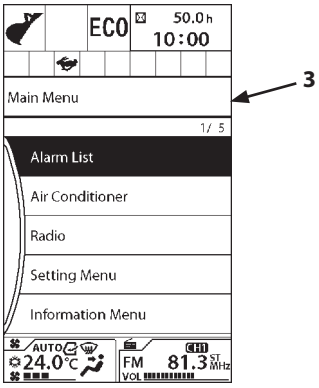
Main menu (3) displays the items shown at right. The alarm list is only displayed when an alarm occurs. The mail (optional) menu is not displayed unless it is set beforehand.



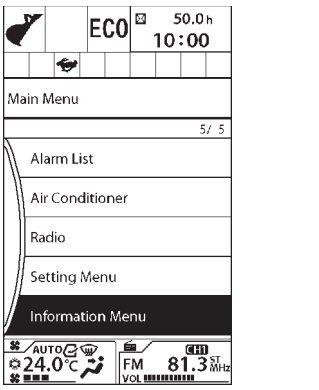
MDAA-01-001-3 ja



MDC1-01-026-2 ja



MDED-01-077-2 en_GB



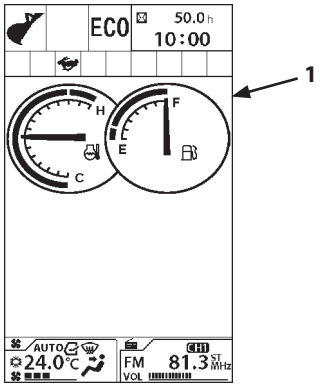
MDED-01-190 en_GB

Air Conditioner

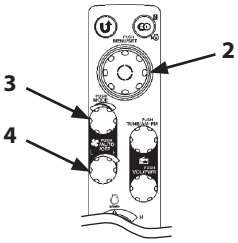
Most air conditioner functions are operated by using switches (3) and (4); however air vent selection and turning A/C ON and OFF are performed from the air conditioner setting screen in the menu. (For details, see Auto Air Conditioner.)

Circulating Air Mode

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (5).

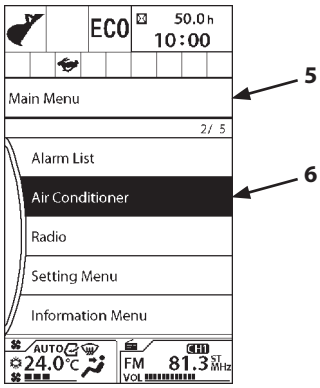


MDAA-01-001-3 ja



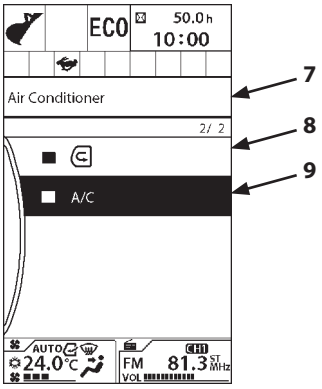
MDC1-01-026-3 ja

2. Rotate selector knob (2) to highlight Air Conditioner (6).



MDED-01-089-1 en_GB

3. Push selector knob (2) to display Air Conditioner screen (7).



MDAA-01-091-1 en_GB

- Air Vent Selection
  a. Rotate selector knob (2) to highlight (8).
  b. Push selector knob (2) to enable the changes.
  c. Push selector knob (2) again to switch to fresh air mode.
- A/C Compressor ON/OFF
  a. Rotate selector knob (2) to highlight A/C (9).
  b. Push selector knob (2) to turn the A/C compressor ON.
  c. Push selector knob (2) again to turn the A/C compressor OFF.

NOTE

When ON, the mark ■ is green; when OFF, it is gray.

IMPORTANT

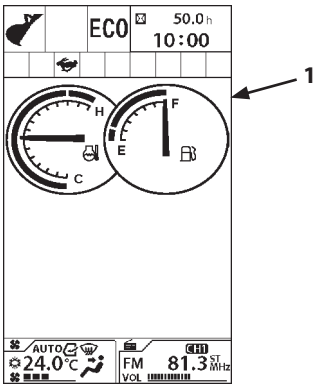
If mark (10) is displayed on the AC Display, there is a problem in communication between the air conditioner and the monitor. Consult your authorized dealer.



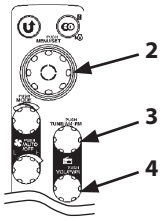
Radio

Normally the radio is operated with switches (3) and (4), but memory channel setting, the seek function, tone adjustments, and AUTO-presets are done on the radio screen in the Main Menu.

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (5).

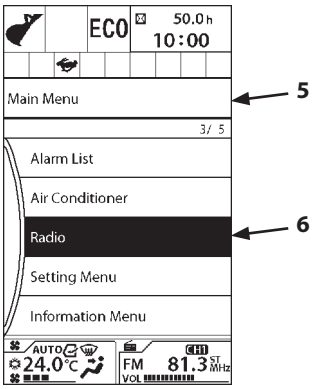


MDAA-01-001-3 ja



MDC1-01-026-4 ja

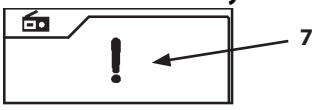
2. Rotate selector knob (2) to highlight Radio (6).
3. Push selector knob (2) to display the radio screen. (For details, see AM/FM Radio Operation.)



MDED-01-092-1 en_GB

IMPORTANT

If mark (7) is displayed on the radio display, communication between the radio and the monitor is abnormal. Consult your authorized dealer.



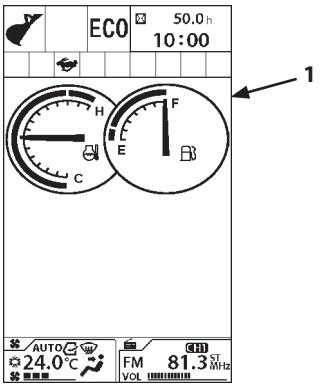
While the radio is ON, pressing the numeric keypad 1 to 8 changes the radio station to the respective memorized channel. (For details, see the sections Numeric Keypad and/or Setting Preset Stations.)

Mail (Optional)

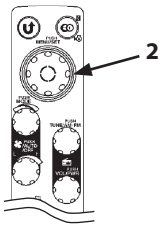
IMPORTANT

This function is available only on machines equipped with a communication terminal. If you wish to use the mail function, consult your nearest Hitachi dealer.

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

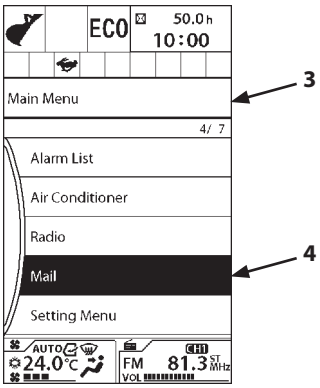


MDAA-01-001-3 ja



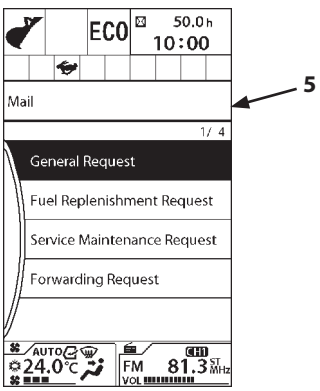
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Mail (4).
3. Push selector knob (2) to display Mail screen (5).



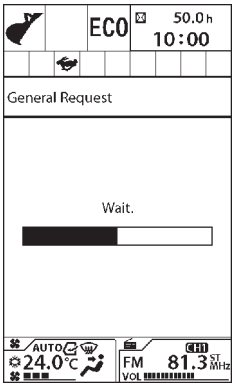
MDED-01-109-1 en_GB

4. Rotate selector knob (2) to highlight the desired request.
5. Push selector knob (2) to send mail information to the communication terminal.
   - General Request
   - Fuel Replenishment Request
   - Service Maintenance Request
   - Forwarding Request



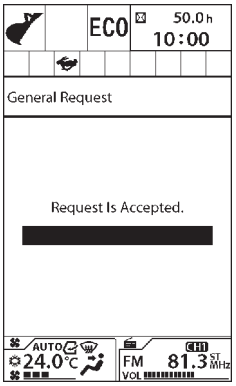
MDAA-01-110-1 en_GB

6. While mail information is being sent to the communication terminal, the message "Wait." is displayed on the screen.



MDAA-01-111 en_GB

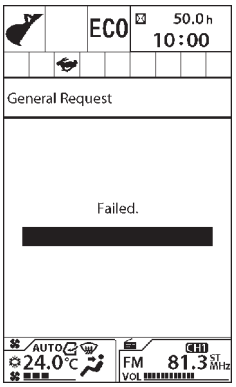
7. When the communication terminal completes receiving mail information, the message "Request Is Accepted." is displayed on the screen.
   Push the return to previous screen switch to return to the Mail screen.
8. Then, a mail is sent from the communication terminal to the central server.



MDAA-01-112 en_GB

NOTE

- *Depending on the machine's operating environment, the mail may not be sent.*
- *If the communication terminal failed to receive the mail, the message "Failed." is displayed on the screen.*

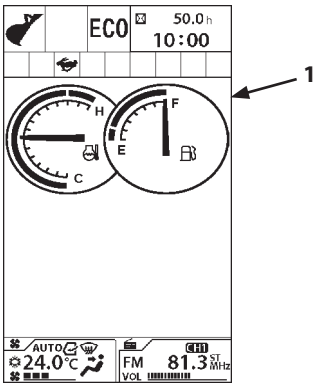


MDAA-01-113 en_GB

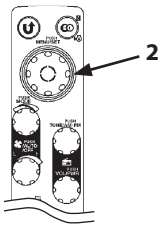
Setting Menu

The setting menu consists of settings for date and time, auto shut-down, changing the password, selecting sub meter, brightness adjustment of rear view camera monitor and screen.

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

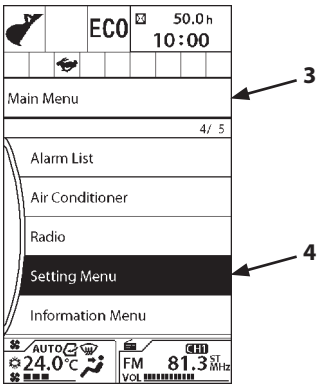


MDAA-01-001-3 ja

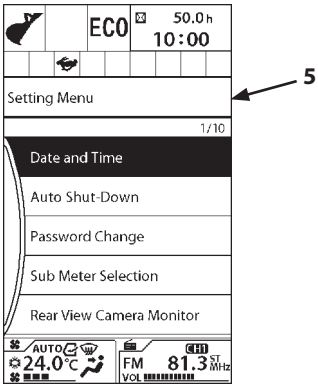


MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).



MDED-01-114-1 en_GB



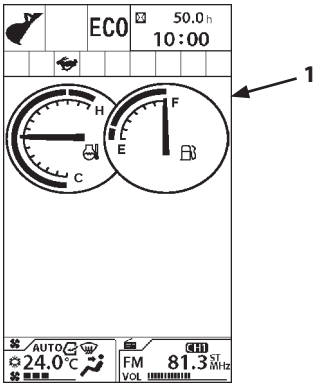
MDED-01-115-1 en_GB

Date and Time

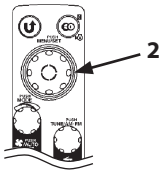
Time, date and display mode can be set on this screen. Year-month-day format and 24h/12h display mode can be selected in the display setting.

Clock Adjustment

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

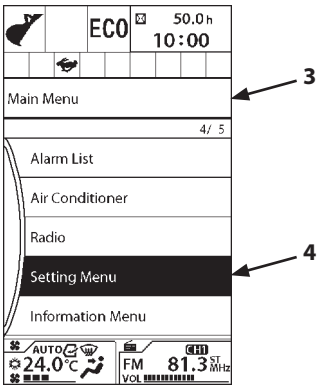


MDAA-01-001-3 ja



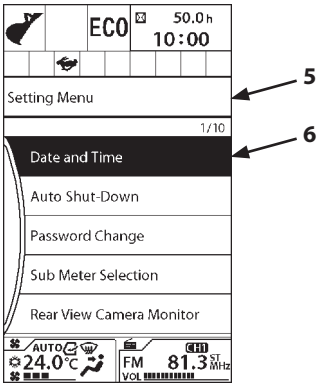
MDCD-01-026-2-1 ja

2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).



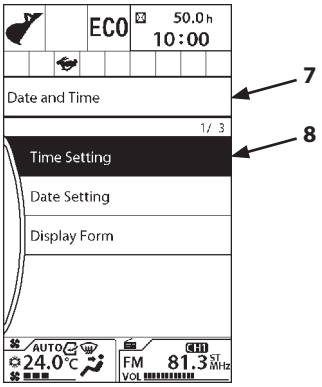
MDED-01-114-1 en_GB

4. Rotate selector knob (2) to highlight Date and Time (6).
5. Push selector knob (2) to display Date and Time screen (7).



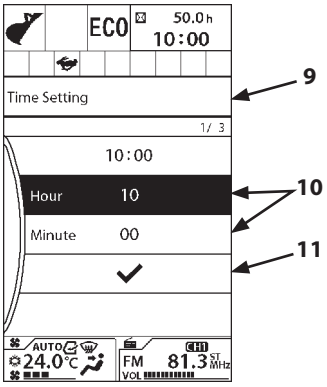
MDED-01-115-2 en_GB

6. Rotate selector knob (2) to highlight Time Setting (8).
7. Push selector knob (2) to display Time Setting screen (9).

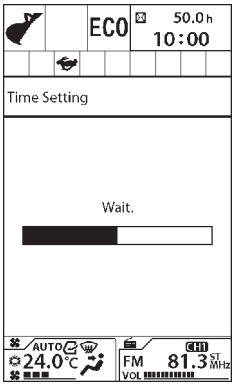


MDAA-01-117-1 en_GB

8. Rotate selector knob (2) to highlight Hour or Minute (10) and push selector knob (2).
9. Rotate selector knob (2) to adjust the clock. Rotate clockwise to adjust the number upwards, and counterclockwise to decrease it.
10. Push selector knob (2) to end the date setting procedure.
11. Rotate selector knob (2) to highlight ✔ (11). Push selector knob (2) to make the change.
"Wait" is displayed on the screen.



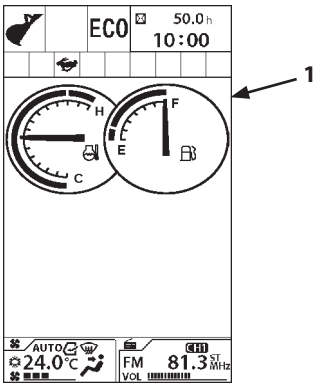
MDAA-01-118-1 en_GB



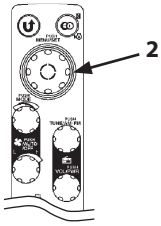
MDAA-01-121 en_GB

Date Adjustment

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

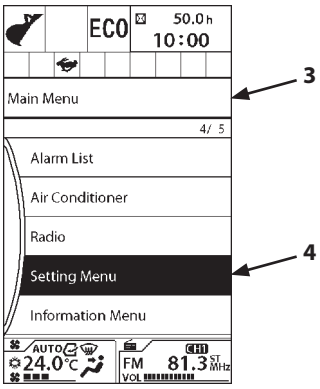


MDAA-01-001-3 ja



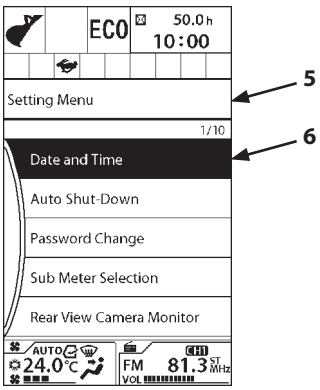
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).



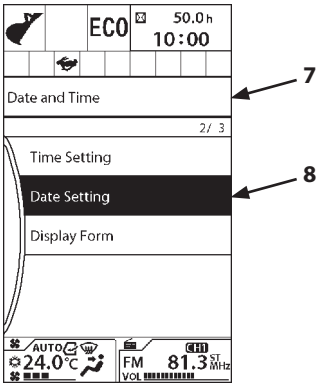
MDED-01-114-1 en_GB

4. Rotate selector knob (2) to highlight Date and Time (6).
5. Push selector knob (2) to display Date and Time screen (7).



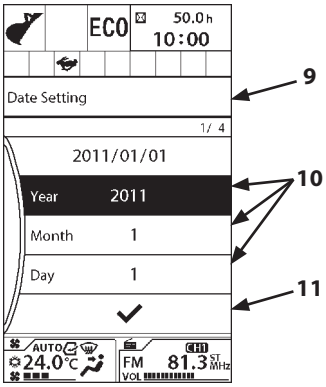
MDED-01-115-2 en_GB

6. Rotate selector knob (2) to highlight Date Setting (8).
7. Push selector knob (2) to display Date Setting screen (9).

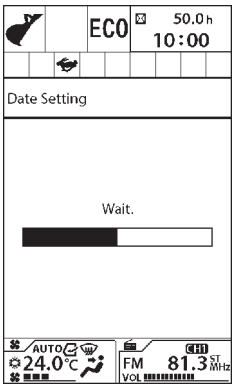


MDAA-01-122-1 en_GB

8. Rotate selector knob (2) to highlight Year, Month or Day (10) and push selector knob (2).
9. Rotate selector knob (2) to adjust the clock. Rotate clockwise to adjust the number upwards, and counterclockwise to decrease it.
10. Push selector knob (2) to end the date setting procedure.
11. Rotate selector knob (2) to highlight ✔ (11). Push selector knob (2) to make the change.
"Wait" is displayed on the screen.



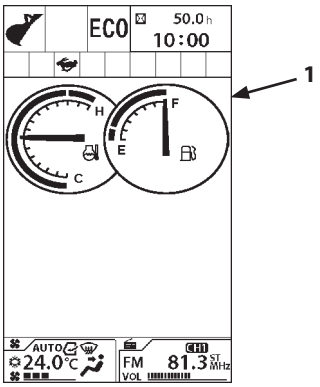
MDAA-01-123-1 en_GB



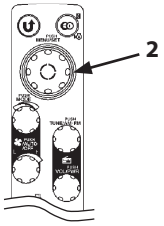
MDAA-01-127 en_GB

Display Mode Setting

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

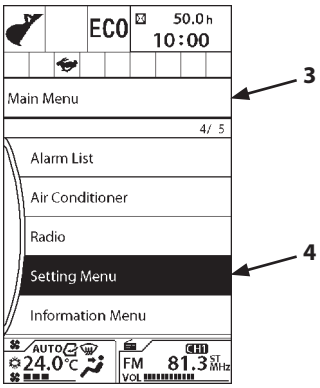


MDAA-01-001-3 ja



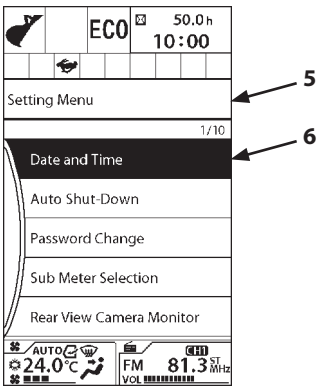
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).



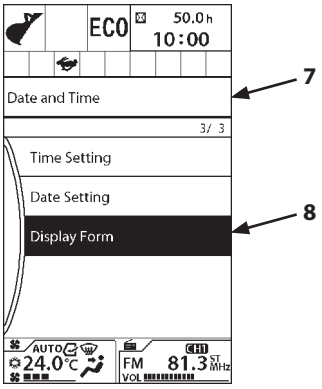
MDED-01-114-1 en_GB

4. Rotate selector knob (2) to highlight Date and Time (6).
5. Push selector knob (2) to display Date and Time screen (7).



MDED-01-115-2 en_GB

6. Rotate selector knob (2) to highlight Display Form (8).
7. Push selector knob (2) to display Display Form screen (9).

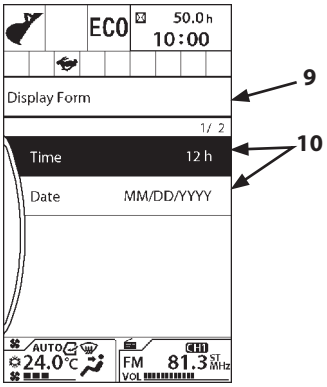


MDAA-01-228-1 en_GB

8. Rotate selector knob (2) to highlight Time or Date (10) and push selector knob (2).

   Time : Each time selector knob (2) is pushed, the time format is changed as follows: 12 h > 24 h > 12 h.

   Date : Each time selector knob (2) is pushed, the date format is changed as follows: YYYY/MM/DD -> MM/DD/YYYY -> DD/MM/YYYY -> YYYY/MM/DD.



MDAA-01-229-1 en_GB



MDAA-01-230 en_GB



MDAA-01-231 en_GB



MDAA-01-232 en_GB



MDAA-01-233 en_GB



MDAA-01-234 en_GB

Auto Shut-Down

WARNING

This function automatically stops the engine. Pay extra attention to the work and work environment when using this function.

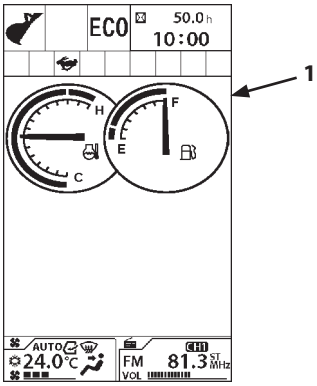
The auto shut-down function can be set on this screen. Set the auto shut-down time and enable (ON) the function beforehand. The engine automatically stops after the preset time at the state in which the pilot control shut-off lever is pulled. 30 seconds before the engine is to stop, the monitor displays a message that the engine will be stopped and the indicator starts flashing. The buzzer also sounds. The buzzer sounds once at 30 seconds before, and then continuously from 15 seconds before the engine stops. The engine speed drops to idle, and then stops after 15 seconds. If the pilot control shut-off lever is lowered before the engine stops, auto shut-down is disabled and the engine does not stop.

IMPORTANT

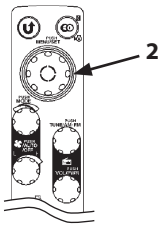
When the engine is stopped by the auto shut-down function, turn the key switch to ACC or OFF once, then turn it to START to restart the engine. Turn the key switch OFF after auto shut-down when leaving the machine for long period of time. Do not simply leave the machine after auto shut-down. Doing so may cause the batteries to discharge.

Auto Shut-Down: ON/OFF

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

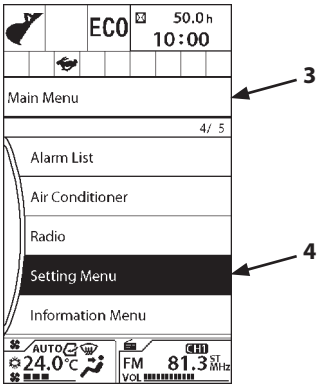


MDAA-01-001-3 ja



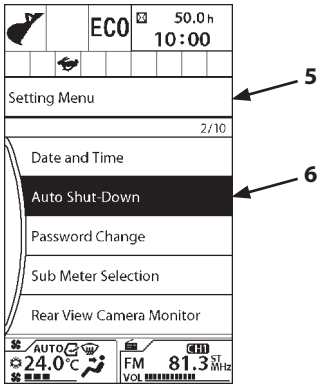
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).



MDED-01-114-1 en_GB

4. Rotate selector knob (2) to highlight Auto Shut-Down (6).
5. Push selector knob (2) to display Auto Shut-Down screen (7).

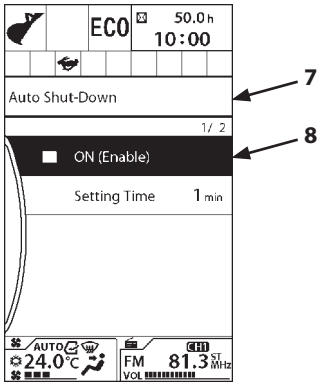


MDED-01-147-1 en_GB

6. Rotate selector knob (2) to highlight ON (8).
7. Push selector knob (2) to set the auto shut-down function ON. Push selector knob (2) again to turn the auto shut-down function OFF.

NOTE

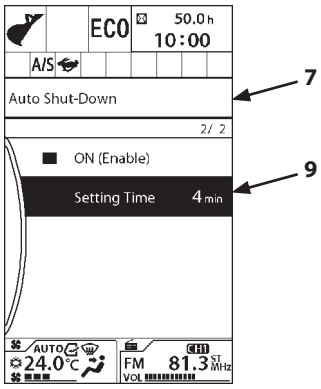
When ON, the mark ■ is green; when OFF, it is gray.



MDAA-01-148-1 en_GB

Auto Shut-Down: Setting Time

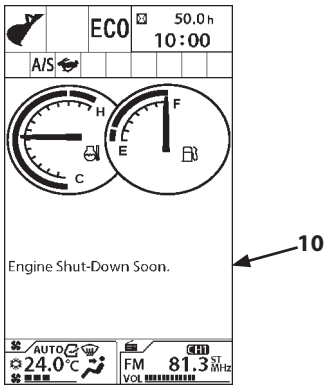
1. On Auto Shut-Down screen (7), rotate selector knob (2) to highlight Setting Time (9) and push selector knob (2).
2. Rotate selector knob (2) to adjust the Auto Shut-Down activation.
3. Push selector knob (2) to make the change.



MDAA-01-150-1 en_GB

NOTE

Once the function is ON, the message "Engine Shut-Down Soon" (10) is displayed on the monitor 30 seconds before the engine stops.



MDAA-01-146-1 en_GB

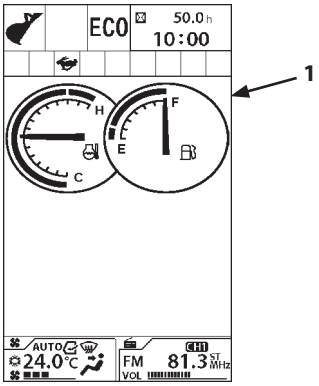
Muffler Filter Regeneration Inhibited

IMPORTANT

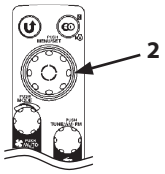
Muffler filter regeneration can be inhibited from this screen to prevent auto-regeneration while operating the machine in a dusty area or indoors.

Setting Procedure

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

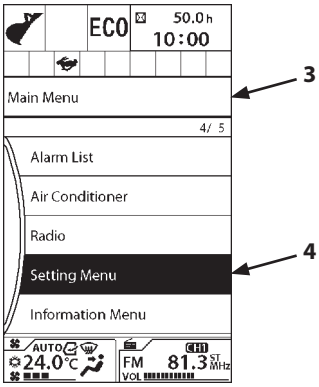


MDAA-01-001-3 ja



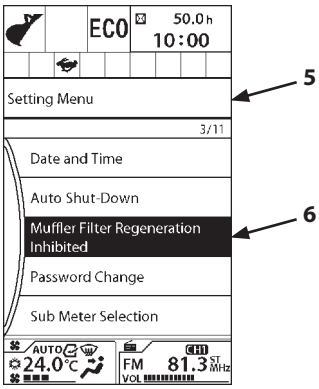
MDCD-01-026-2-1 ja

2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).



MDED-01-114-1 en_GB

4. Rotate selector knob (2) to highlight Muffler Filter Regeneration Inhibited (6).
5. Push selector knob (2) to display muffler filter regeneration inhibited screen (7).



MDEC-01-283-1 en_GB

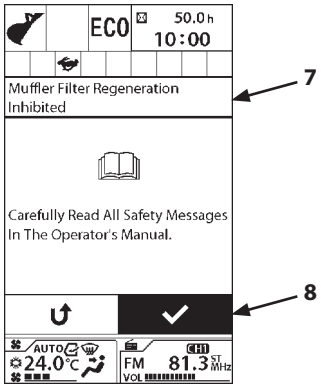
6. Rotate selector knob (2) to highlight ✔ (8), and push selector knob (2) to display muffler filter regeneration inhibited screen (9).
7. Rotate selector knob (2) to highlight ON (10). A confirmation screen is displayed.
8. Push selector knob (2) to turn muffler filter regeneration inhibited ON. Push selector knob (2) again to turn muffler filter regeneration inhibited OFF.
9. When ON is selected, the regeneration inhibited icon is displayed on the monitor. (For details on, see the section Muffler Filter.)

NOTE

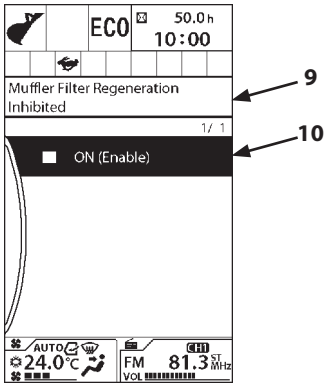
When ON, the mark ■ is green; when OFF, it is gray.

IMPORTANT

Continuing to operate the machine while muffler filter regeneration is inhibited will result in the muffler filter becoming clogged. When the muffler filter regeneration request is displayed, move the machine to a safe place and follow the set procedure for performing manual regeneration. Failure to perform a manual regeneration may damage the muffler filter. For details on manual regeneration, see the section Muffler Filter.



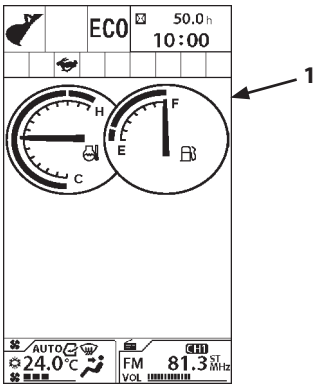
MDAA-01-325-1 en_GB



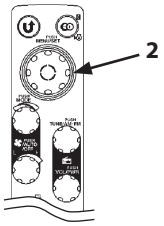
MDAA-01-284-1 en_GB

Password Change (Optional)

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

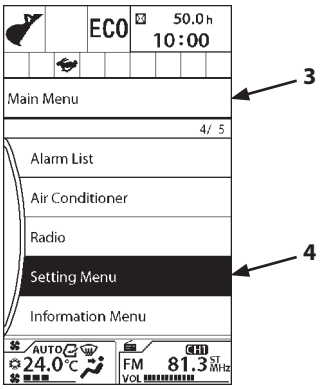


MDAA-01-001-3 ja



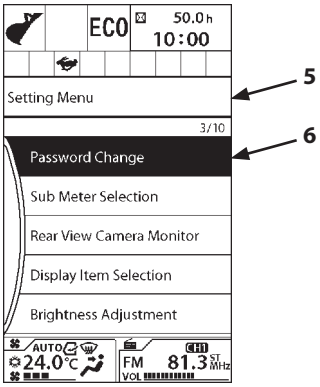
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).



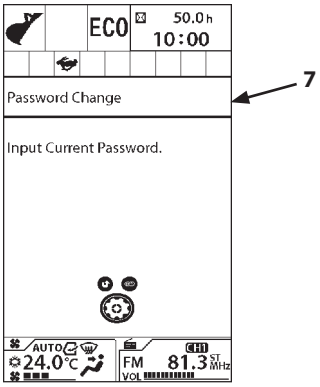
MDED-01-114-1 en_GB

4. Rotate selector knob (2) to highlight Password Change (6).
5. Push selector knob (2) to display Password Change screen (7).

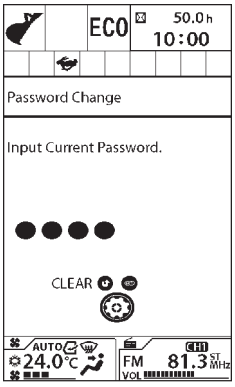


MDED-01-156-1 en_GB

6. Input current password from the numeric keypad.

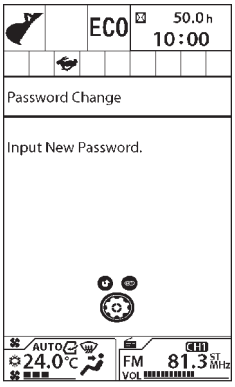


MDAA-01-157-1 en_GB

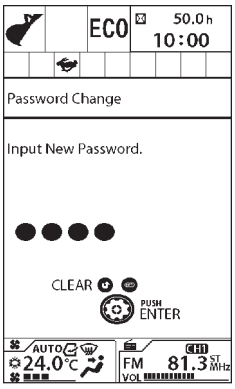


MDAA-01-158-2 en_GB

7. Input the new password and push selector knob (2). 3 to 8 digits can be input for the password.

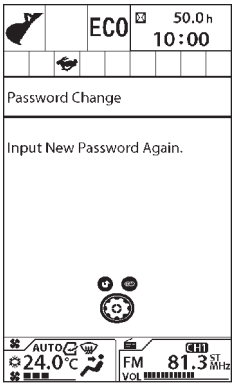


MDAA-01-159 en_GB

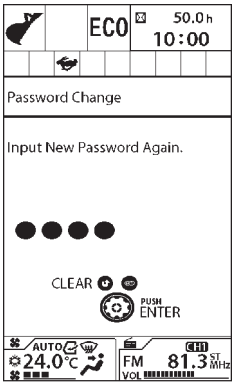


MDAA-01-160-2 en_GB

8. Input the new password again to confirm it and push selector knob (2).

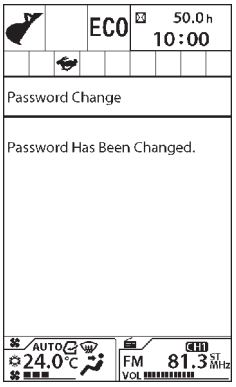


MDAA-01-161 en_GB



MDAA-01-162 en_GB

9. This completes the password change.

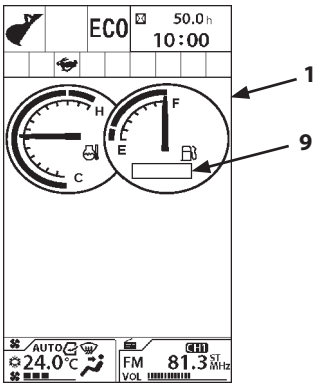


MDAA-01-163 en_GB

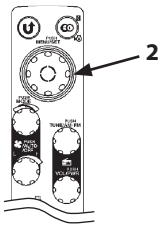
Sub Meter

A sub meter (9) can be added to the fuel meter by selecting it on this screen. The options are OFF and a fuel consumption gauge (only to be used as a guide).

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

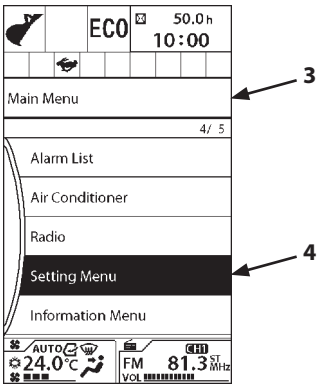


MDAA-01-315-1 ja



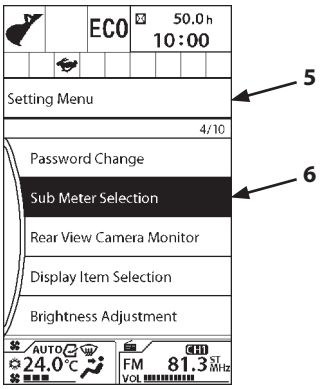
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).



MDED-01-114-1 en_GB

4. Rotate selector knob (2) to highlight Sub Meter Selection (6).
5. Push selector knob (2) to display Sub Meter Selection screen (7).

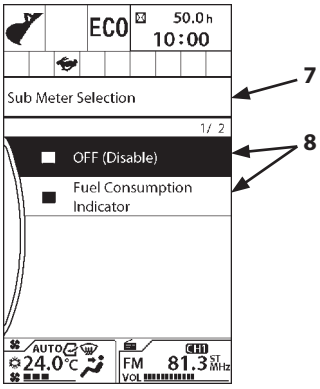


MDED-01-164-1 en_GB

6. Rotate selector knob (2) to highlight the desired sub meter option (8). (Selecting OFF hides the display.)
7. Push selector knob (2) to enable the changes.

NOTE

- *Only one sub meter can be selected at a time.*
- *When ■ is selected, it is green; when not selected, gray.*



MDEB-01-165-1 en_GB

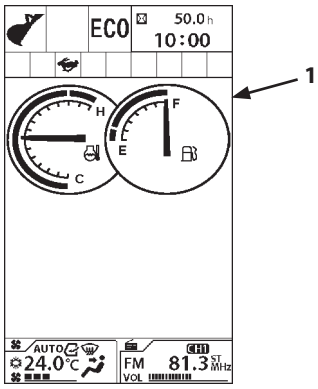
Rear View Camera Monitor

WARNING

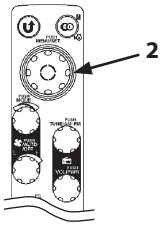
- **Switching the rear view camera monitor OFF may result in serious personal injury or damage to the machine, due to being unable to see the view from the rear of the machine. If the image from the rear view camera is not displayed on the Basic Screen of the monitor unit, follow the instructions on this page to display it.**
- **The image displayed on the rear view camera monitor is meant only as an aid. Actual position and distance of people and objects in the rear view camera monitor will be different. When operating the machine, pay thorough attention to the surrounding situation.**

Rear View Camera ON/OFF

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

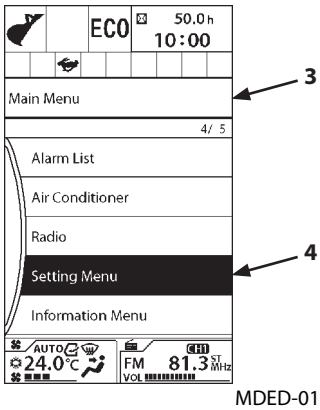


MDAA-01-001-3 ja



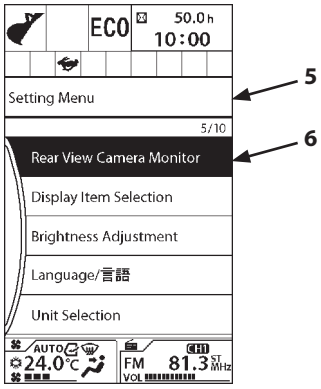
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).



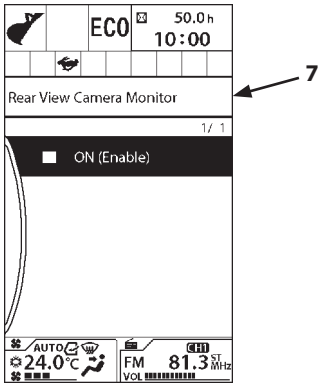
MDED-01-114-1 en_GB

4. Rotate selector knob (2) to highlight Rear View Camera Monitor (6).
5. Push selector knob (2) to display Rear View Camera Monitor screen (7).



MDED-01-168-1 en_GB

6. Push selector knob (2) to turn the rear view camera monitor ON/OFF.
7. When the rear view camera monitor is ON, the rear view image is continuously displayed on the basic screen.



MDAA-01-169-1 en_GB

IMPORTANT

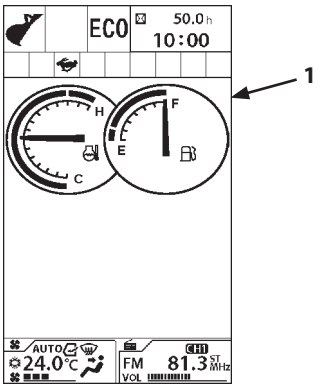
- **In order to obtain a clear image, clean the lens and the monitor display before operating the machine.**
- **Never attempt to change the mounting position of the rear view camera.**
- **Consult your authorized dealer if any abnormality is found with the rear view image.**

NOTE

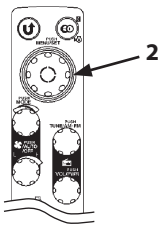
The monitor display and camera lens surface are made of plastic. Lightly wipe the surface with a wet clean cloth. Never use an organic solvent.

Brightness Adjustment

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

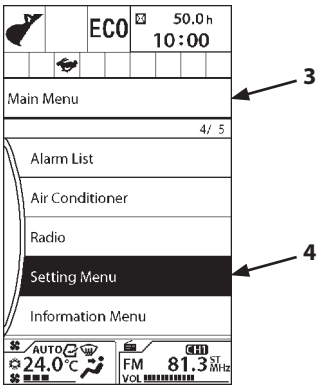


MDAA-01-001-3 ja



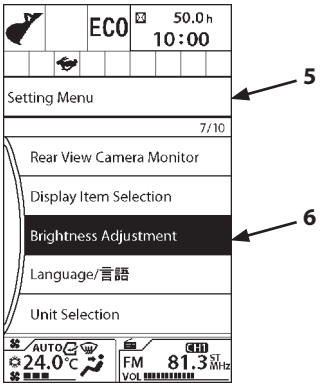
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).



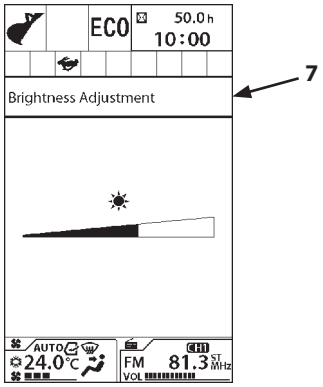
MDED-01-114-1 en_GB

4. Rotate selector knob (2) to highlight Brightness Adjustment (6).
5. Push selector knob (2) to display Brightness Adjustment screen (7).



MDED-01-171-1 en_GB

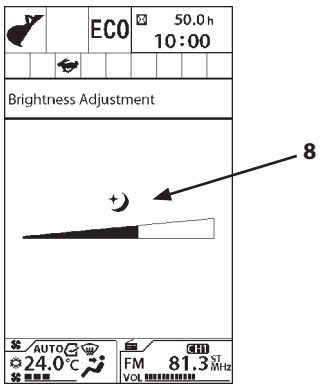
6. Rotate selector knob (2) clockwise to make the screen brighter, counterclockwise to make the screen darker.



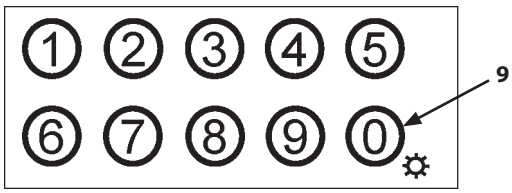
MDAA-01-172-1 en_GB

NOTE

- *When the light is turned ON, the monitor screen changes to night mode and mark (8) is displayed. Brightness can be adjusted for day mode and night mode respectively.*
- *Even if the light is turned ON during daytime, you can activate the daytime screen by pushing "0" (9) on the numeric keypad.*



MDAA-01-173-1 en_GB

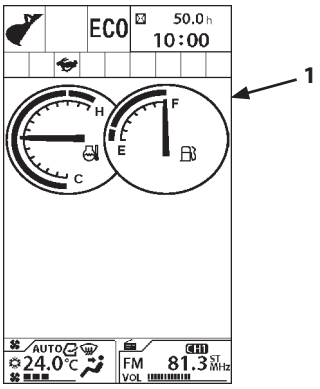


Numeric Keypad

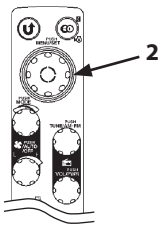
MDAA-01-018-1 ja

Language Settings

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

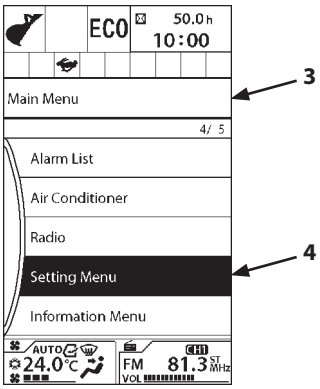


MDAA-01-001-3 ja



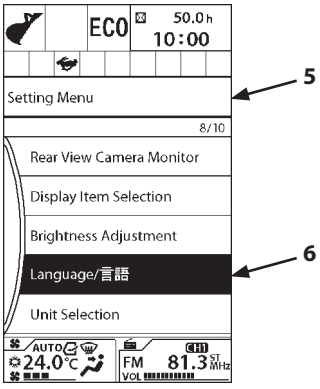
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).



MDED-01-114-1 en_GB

4. Rotate selector knob (2) to highlight (6).
5. Push selector knob (2) to display screen (7).

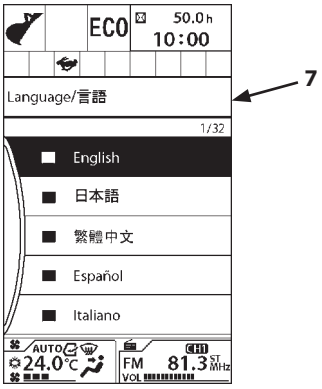


MDED-01-176-1 en_GB

6. Rotate selector knob (2) to highlight the desired language. Push selector knob (2) to set the image.

NOTE

When ■ is selected, it is green; when not selected, gray.



MDAA-01-177-1 en_GB

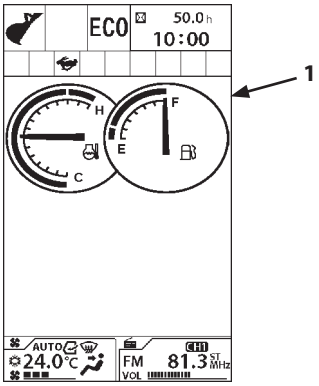
List of Display Languages

Language	Screen Display	Language	Screen Display
Japanese	日本語	Indonesian	Bahasa Indonesia
English	English	Thai	ภาษาไทย
Spanish	Español	Vietnamese	Tiếng Việt
Italian	Italiano	Myanmarese	မြန်မာဘာသာ
French	Français	Arabic	اللغة العربية
German	Deutsch	Persian	زبان فارسی
Dutch	Nederlands	Turkish	Türkçe
Russian	Русский	Danish	Dansk
Portuguese	Português	Estonian	Eesti
Finnish	Suomi	Polish	Polski
Greek	Ελληνικά	Icelandic	Íslenska
Swedish	Svenska	Croatian	Hrvatski
Norwegian	Norsk	Slovenian	Slovenščina
Chinese (Simplified)	简体中文	Romanian	limba română
Chinese (Traditional)	繁體中文	Bulgarian	Български език
Korean	한국어	Lithuanian	Lietuvių kalba

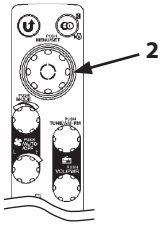
Unit Selection

The unit system displayed on the monitor can be selected on this screen.

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

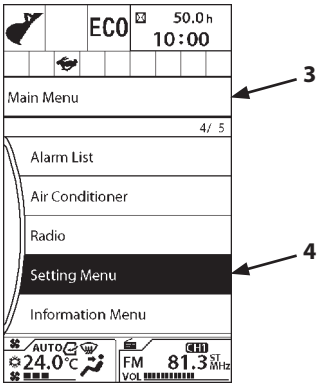


MDAA-01-001-3 ja



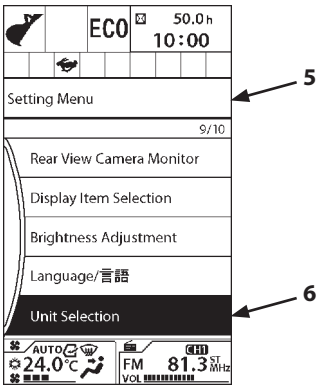
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).



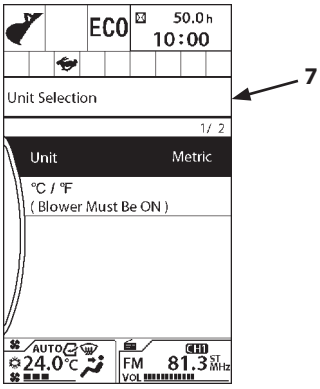
MDED-01-114-1 en_GB

4. Rotate selector knob (2) to highlight Unit Selection (6).
5. Push selector knob (2) to display Unit Selection screen (7).



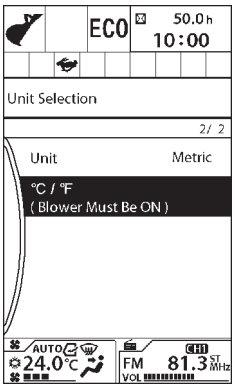
MDED-01-181-1 en_GB

6. Rotate selector knob (2) to highlight the desired unit system. Push selector knob (2) to set the unit (Metric or US system).

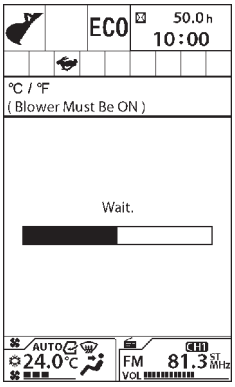


MDAA-01-182-1 en_GB

7. Before changing °C and °F, turn the blower of the air conditioner ON.
   Rotate selector knob (2) to highlight the desired unit system (°C or °F). Push selector knob (2) to set the unit. When pressing selector knob (2), "Wait." is displayed and then the change is completed.



MDAA-01-183 en_GB

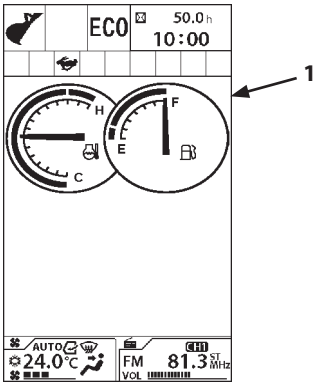


MDAA-01-184 en_GB

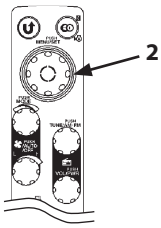
Display Item Selection (Rear View Camera OFF)

The display under the meters can be set to OFF (disable), Logo or Operational information.

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

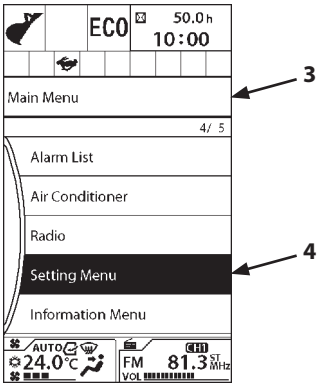


MDAA-01-001-3 ja



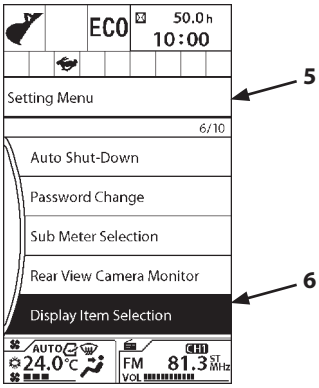
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).



MDED-01-114-1 en_GB

4. Rotate selector knob (2) to highlight Display Item Selection (6).
5. Push selector knob (2) to display Display Item Selection screen (7).

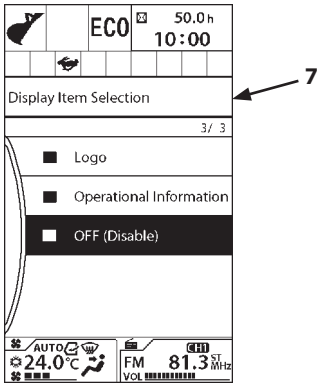


MDED-01-237-1 en_GB

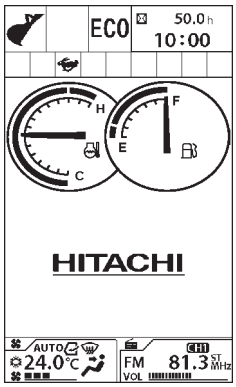
6. Rotate selector knob (2) to highlight the desired display. Push selector knob (2) to set the image. (Selecting OFF hides the display.)

NOTE

When ■ is selected, it is green; when not selected, gray.

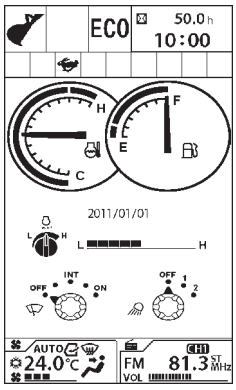


MDAA-01-238-1 en_GB



Logo Displayed

MDAA-01-239 ja



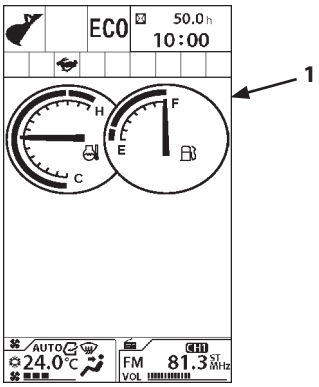
Operating Information Displayed

MDAA-01-222 ja

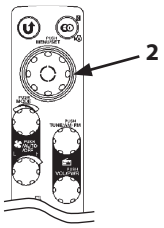
Main Menu Sequence Change

The menu sequence of Air Conditioner, Radio and Work Mode can be changed on this screen. Frequently used menus can be located at the top of the screen.

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

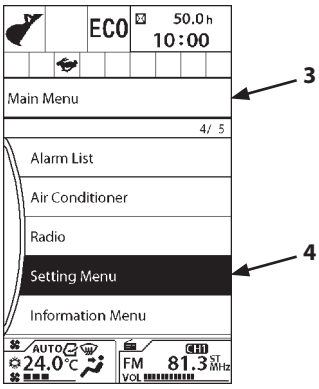


MDAA-01-001-3 ja



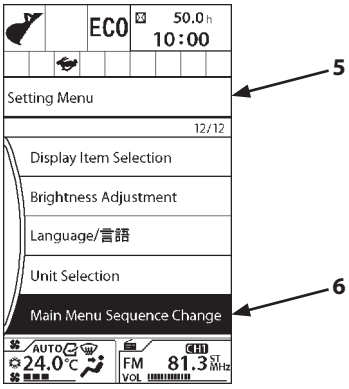
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).



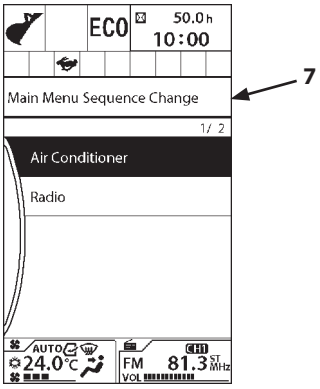
MDED-01-114-1 en_GB

4. Rotate selector knob (2) to highlight Main Menu Sequence Change (6).
5. Push selector knob (2) to display Main Menu Sequence Change screen (7).



MDAA-01-186-1 en_GB

6. Rotate selector knob (2) to highlight a menu to be on the top of the screen. Push selector knob (2) to set the menu to the top of the screen.

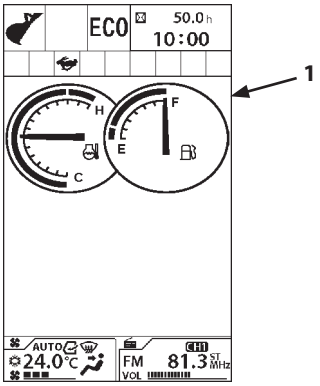


MDED-01-187-1 en_GB

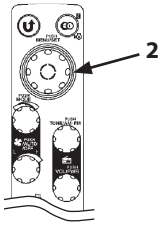
Information Menu

The information menu includes Operation, Maintenance and Monitoring.

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

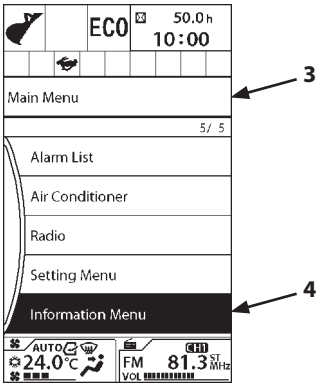


MDAA-01-001-3 ja

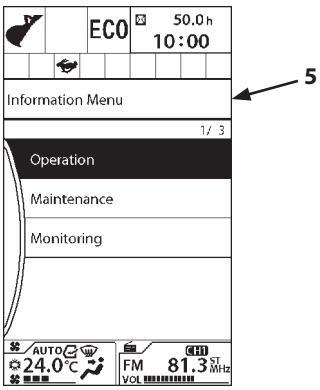


MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Information Menu (4).
3. Push selector knob (2) to display Information Menu screen (5).



MDED-01-190-1 en_GB



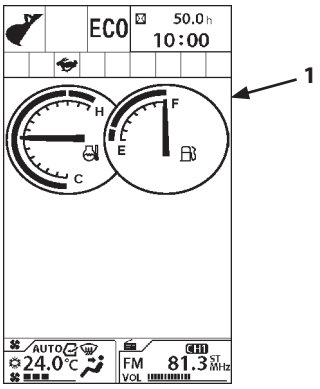
MDAA-01-191-1 en_GB

Operation Information

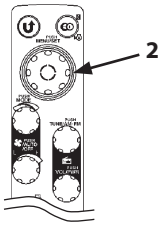
The Operation Information screen includes Operating Time, Attachment Operation, Travel Operation, and Actual Operating Time menus. It displays total operating hours of front attachment, travel and actual operation for the period since the monitoring unit was last reset.

Operating Time

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

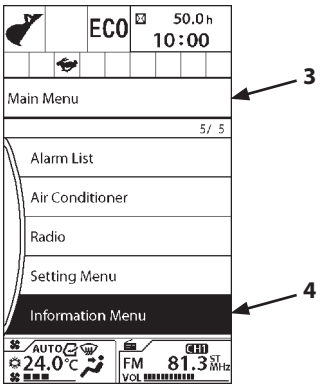


MDAA-01-001-3 ja



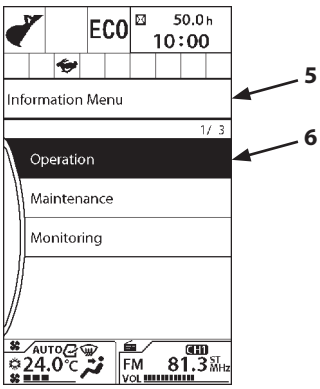
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Information Menu (4).
3. Push selector knob (2) to display Information Menu screen (5).



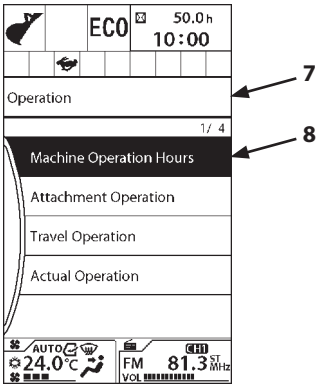
MDED-01-190-1 en_GB

4. Rotate selector knob (2) to highlight Operating Information (6).
5. Push selector knob (2) to display Operating Information screen (7).



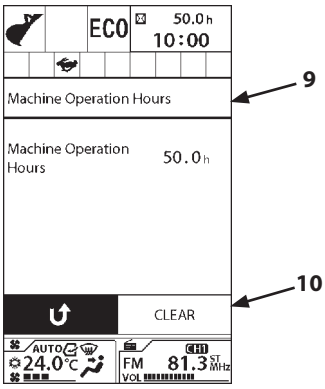
MDAA-01-191-2 en_GB

6. Rotate selector knob (2) to highlight Operating Time (8).
7. Push selector knob (2) to display Operating Time screen (9).



MDEB-01-193-1 en_GB

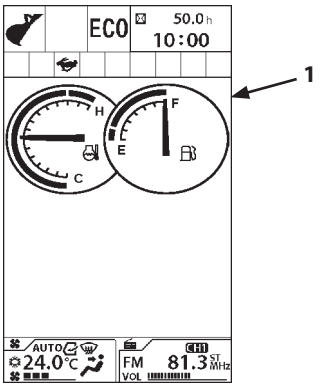
The Operating Time can be checked on this screen. Push selector knob (2) to return to the previous screen. To clear the Operating Time data, rotate selector knob (2) to highlight CLEAR (10), and then push selector knob (2).



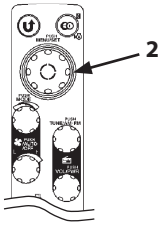
MDEB-01-194-1 en_GB

Travel Operation

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

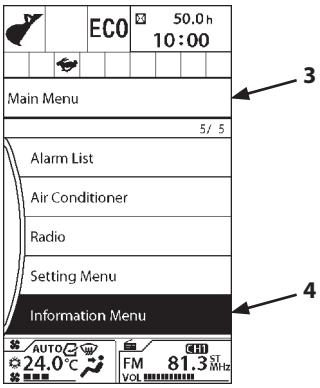


MDAA-01-001-3 ja



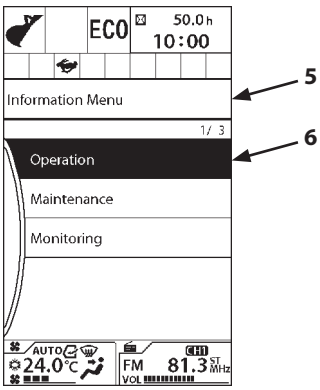
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Information Menu (4).
3. Push selector knob (2) to display Information Menu screen (5).



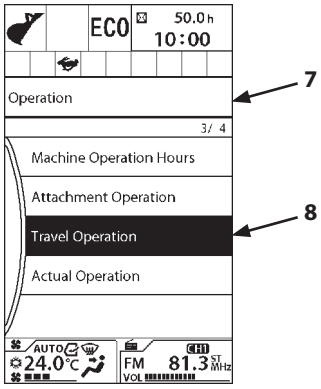
MDED-01-190-1 en_GB

4. Rotate selector knob (2) to highlight Operating Information (6).
5. Push selector knob (2) to display Operating Information screen (7).



MDAA-01-191-2 en_GB

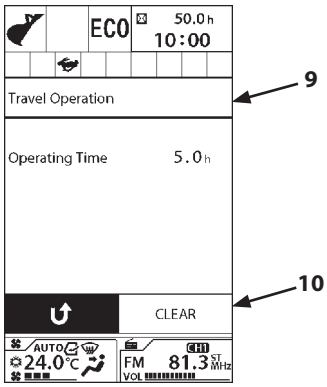
6. Rotate selector knob (2) to highlight Travel Operation (8).
7. Push selector knob (2) to display Travel Operation screen (9).



MDEB-01-202-1 en_GB

Travel operating time can be checked on this screen.

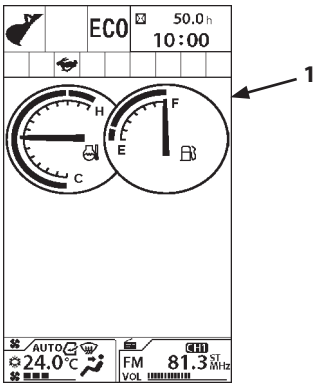
Push selector knob (2) to return to the previous screen. To clear the Operating Time data, rotate selector knob (2) to highlight CLEAR (10), and then push selector knob (2).



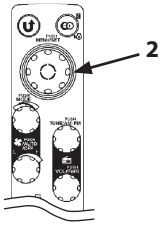
MDAA-01-203-1 en_GB

Actual Operation

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

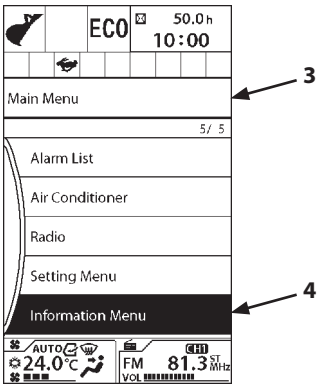


MDAA-01-001-3 ja



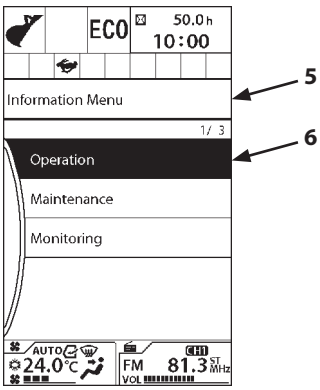
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Information Menu (4).
3. Push selector knob (2) to display Information Menu screen (5).



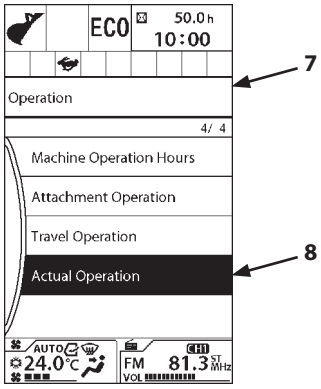
MDED-01-190-1 en_GB

4. Rotate selector knob (2) to highlight Operating Information (6).
5. Push selector knob (2) to display Operating Information screen (7).



MDAA-01-191-2 en_GB

6. Rotate selector knob (2) to highlight Actual Operation (8).
7. Push selector knob (2) to display Actual Operation screen (9).



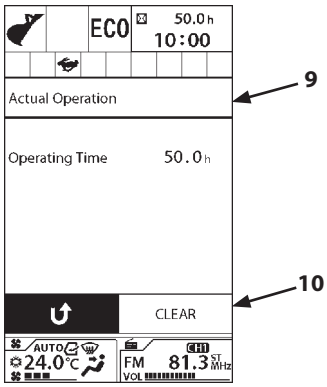
MDEB-01-205-1 en_GB

The actual Operating Time can be checked on this screen.

Push selector knob (2) to return to the previous screen. To clear the Operating Time data, rotate selector knob (2) to highlight CLEAR (10), and then push selector knob (2).

NOTE

The actual operating time includes travel operation hours as well as all other operations.



MDAA-01-206-1 en_GB

Maintenance

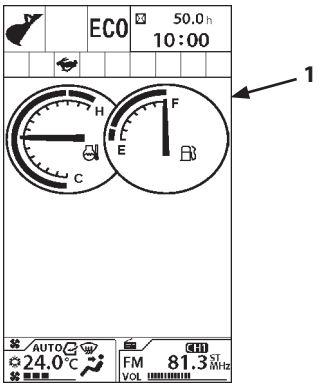
The maintenance screen includes maintenance notice, remaining hours until the next maintenance, and maintenance intervals.

Maintenance Items

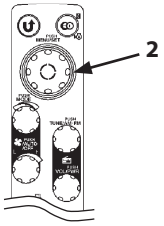
- Engine Oil
- Engine Oil Filter
- Hydraulic Oil
- Hydraulic Oil Pilot Filter
- Hydraulic Oil Full-Flow Filter
- Travel Device Oil
- Swing Drain Filter
- Swing Bearing Grease
- Air Cleaner Filter
- Fuel Filter
- Air Conditioner Filter
- Muffler Filter
- Water Separator
- User Setting 1
- User Setting 2

Maintenance Notice

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

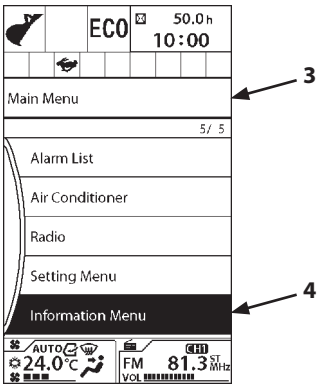


MDAA-01-001-3 ja



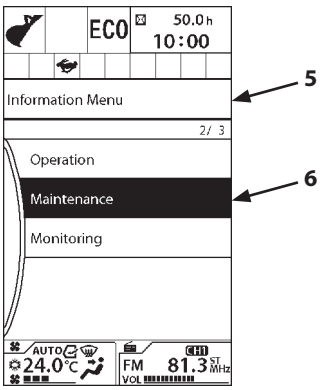
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Information Menu (4).
3. Push selector knob (2) to display Information Menu screen (5).



MDED-01-190-1 en_GB

4. Rotate selector knob (2) to highlight Maintenance (6).
5. Push selector knob (2) to display Maintenance screen (7).

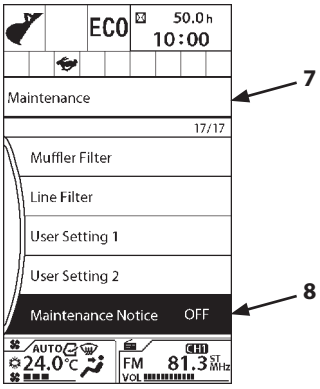


MDAA-01-223-1 en_GB

6. Rotate selector knob (2) to highlight Maintenance Notice (8).
7. Push selector knob (2) to turn the notice function ON. It is turned OFF by pressing it again.

   ON : When the required interval is reached, an information message is displayed on the screen.

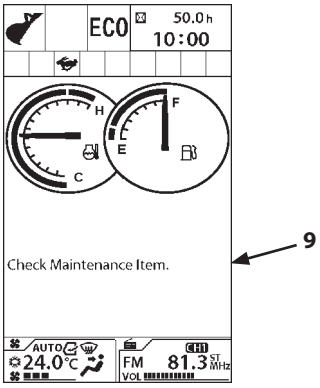
   OFF : No notification message is displayed.



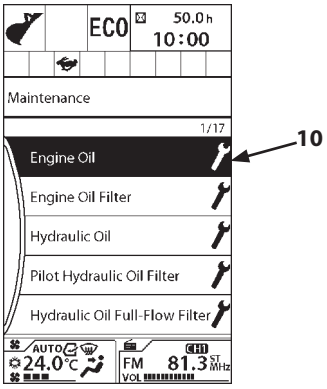
MDAA-01-208-1 en_GB

NOTE

When the required interval for an item is reached, screen (9) is displayed for 10 seconds when the key is switched ON. Push Return to Previous Screen switch to delete the notification. When checking the maintenance items from the menu, items where the set time has been reached are marked with a wrench (10).



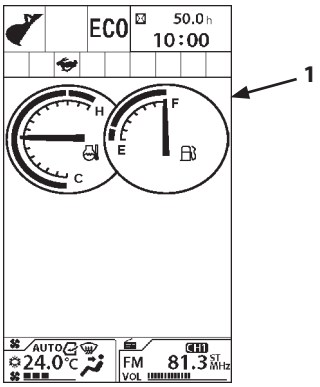
MDAA-01-213-1 en_GB



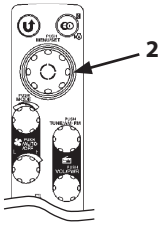
MDAA-01-214-1 en_GB

Remaining Time and Maintenance Interval

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

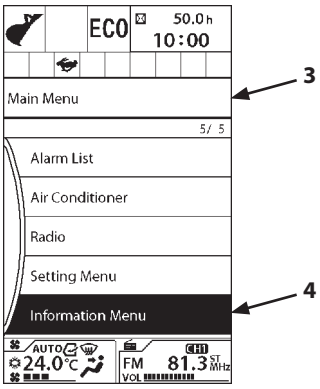


MDAA-01-001-3 ja



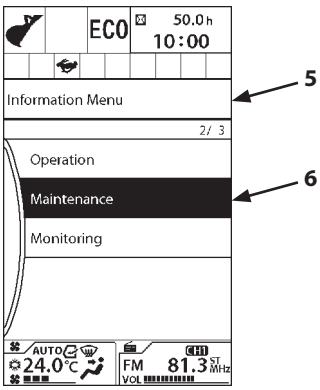
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Information Menu (4).
3. Push selector knob (2) to display Information Menu screen (5).



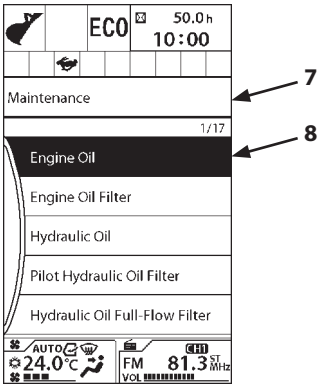
MDED-01-190-1 en_GB

4. Rotate selector knob (2) to highlight Maintenance (6).
5. Push selector knob (2) to display Maintenance screen (7).



MDAA-01-223-1 en_GB

6. Rotate selector knob (2) to highlight a Maintenance Item to be checked (8). (In the example on the right, Engine Oil is selected.)



MDAA-01-336-1 en_GB

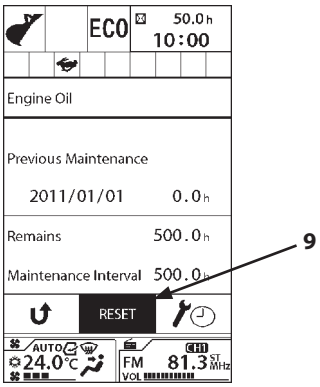
7. Push selector knob (2) to display the time remaining for the selected maintenance item.

   Resetting Data

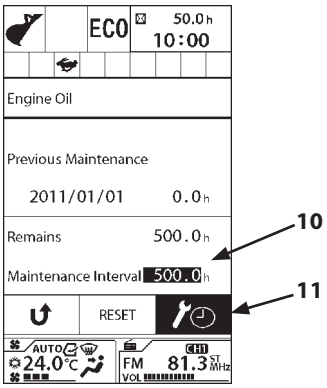
   To reset the remaining time data, rotate selector knob (2) to highlight RESET (9), and then push selector knob (2).
   The value of the remaining hours is reset to that of the change interval. The previous change date/hour is updated with the current date and time.

   Maintenance Interval Setting

   To change the maintenance interval, rotate selector knob (2) to highlight  (11), and then push selector knob (2).
   The background color of Maintenance Interval (10) changes, then rotate selector knob (2) to adjust the time, and then push selector knob (2) to enable the change.



MDAA-01-210-1 en_GB

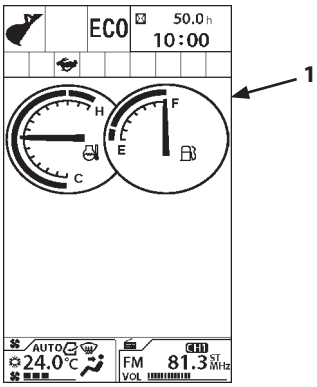


MDAA-01-212-1 en_GB

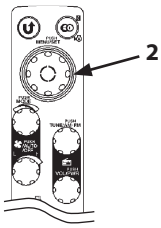
Monitoring

Items that can be monitored are the engine speed and how much PM (particulate matter) has accumulated in the muffler filter.

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

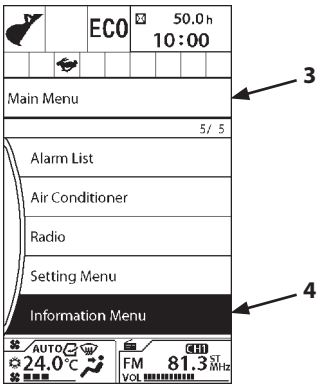


MDAA-01-001-3 ja



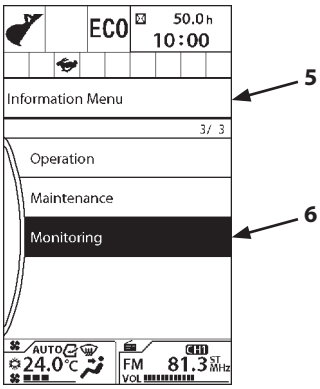
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Information Menu (4).
3. Push selector knob (2) to display Information Menu screen (5).



MDED-01-190-1 en_GB

4. Rotate selector knob (2) to highlight Monitoring (6).

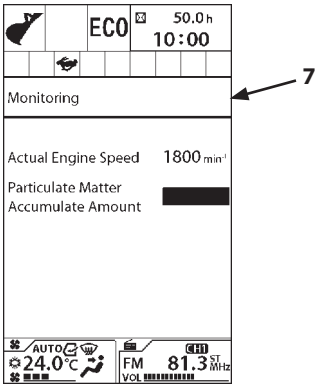


MDAA-01-220-1 en_GB

5. Push selector knob (2) to display Monitoring screen (7).

NOTE

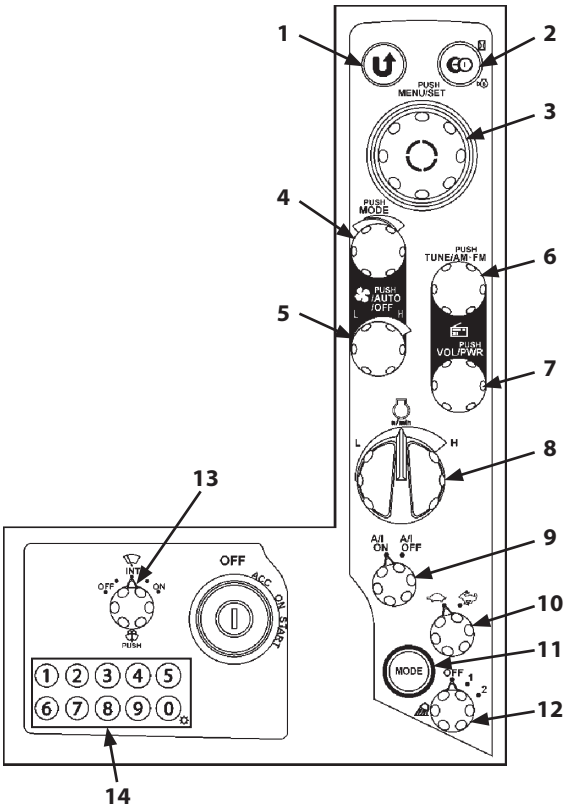
- *When the accumulated PM bar graph reaches the right side, auto-regeneration starts. However there are cases when auto-regeneration cannot be performed due to the condition of the machine.*
- *The accumulated PM is not indicated during regeneration.*



MDEP-01-221-1 en_GB

Switch Panel

1- Return to Previous Screen Switch
2- Return to Basic Screen Switch
3- Selector Knob
4- Temperature Control Switch/Mode Switch
5- AUTO/OFF Switch/Fan Switch
6- AM/FM Selector/Tuning Switch
7- Power Switch/Volume Control Knob
8- Engine Control Dial
9- Auto-Idle Switch
10- Travel Mode Switch
11- Power Mode Switch
12- Work Light Switch
13- Wiper/Washer Switch
14- Numeric Keypad



Switch Panel

MDCD-01-027-1 ja

Return to Previous Screen Switch (Monitor)

Push this switch to return to the previous screen.



MDAA-01-010 ja

Return to Basic Screen Switch (Monitor)

Allows any screen to return to the basic screen.

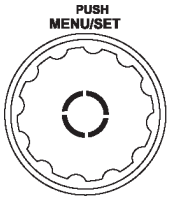


MDAA-01-011 ja

Selector Knob (Monitor)

Push : Push this switch while the basic screen is displayed, the menu screen opens.
Push this switch after the menu screen, the action is confirmed.

Rotate : Cursor moves.



MDAA-01-012 ja

Temperature Control Switch/Mode Switch (Air Conditioner)

Push : Selects the air vent.

Rotate : Sets the temperature.

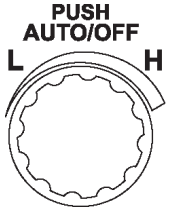


MDAA-01-013 ja

AUTO/OFF Switch/Fan Switch (Air Conditioner)

Push : Push this switch while the air conditioner is OFF, and it turns to AUTO. Push this switch while operating the air conditioner, and it turns OFF.

Rotate : Adjusts the blower speed.

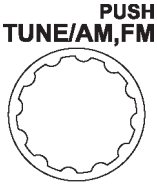


MDAA-01-015 ja

AM/FM Selector/Tuning Switch (Radio)

Push : AM/FM is selected.

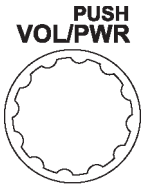
Rotate : Adjusts radio frequency.



MDAA-01-014 ja

Power Switch/Volume Control Knob (Radio)

Push : Turns power ON/OFF.
Rotate : Adjusts the volume.

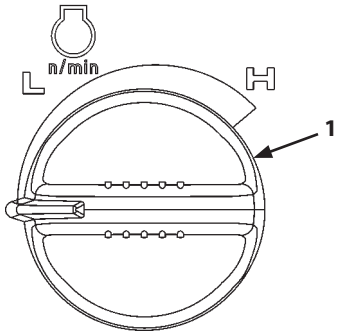


MDAA-01-016 ja

Engine Control Dial

Use engine control dial (1) to adjust engine speed.

H : Fast Idle
L : Slow Idle



M1P1-01-068-1-1 ja

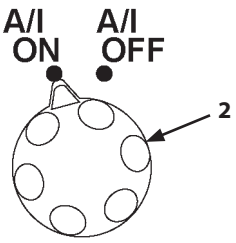
Auto-Idle Switch

Auto-idle switch (2) sets the engine speed control mode to either Auto-Idle ON or OFF.

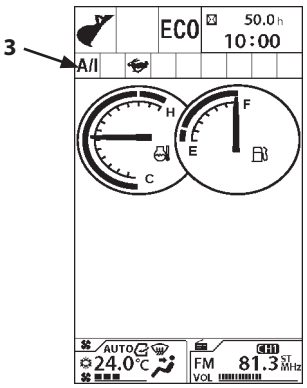
- Auto-Idle
  When auto-idle switch (2) is turned to ON position, the engine speed decreases to idle after approximately 4 seconds after the control lever is put in neutral.
  This function reduces fuel consumption.
  When the auto-idle mode is selected, auto-idle indicator (3) on the monitor panel lights.

NOTE

- *Auto-idle control may not work until the end of the warm-up.*



MDAA-01-017-1 ja



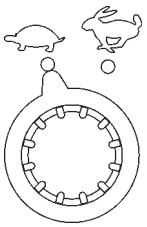
MDAA-01-314-1 ja

Travel Mode Switch

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

:Fast

:Slow



MDCD-01-028 ja

Power Mode Switch

Two engine speed modes are available, ECO or PWR, which are selected via the power mode switch.

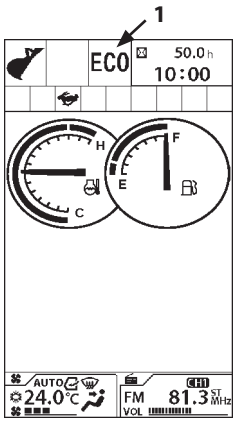
- ECO (Economy) Mode
  Operate the machine in this mode when performing normal work.
  ECO is displayed on Power Mode Display (1).
- PWR (Power) Mode
  Use PWR (Power) mode when extra horsepower is needed.
  PWR is displayed on Power Mode Display (2).

NOTE

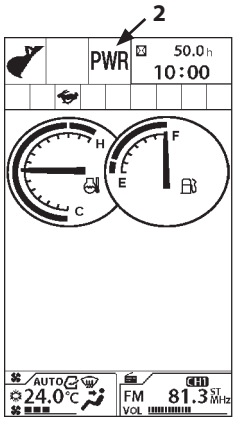
- *The system is set to ECO mode automatically when starting the engine. Set to PWR mode when necessary.*



MDAA-01-274 ja



MDAA-01-001-4 ja



MDAA-01-353-1 ja

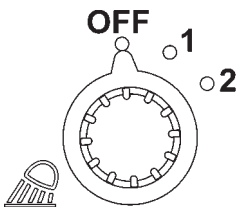
Work Light Switch

The work light switch has the following positions.

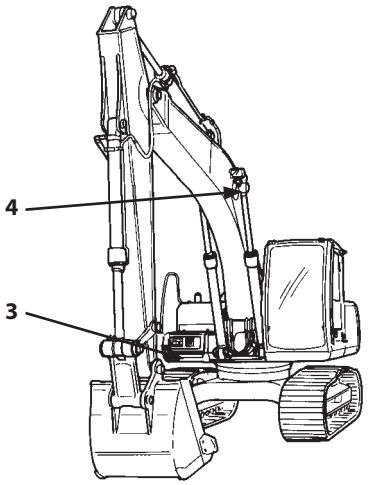
Position 1	:	Turns ON work light (3) on the right side of the machine.
Position 2	:	Turns on work light (4) mounted on the boom and work light (3) on the right side of the machine.
OFF	:	Work lights (3), (4), and the switch panel illumination are off.

NOTE

When the key switch is turned OFF while the work light switch is in position 2, work light (4) stays ON for 60 seconds.



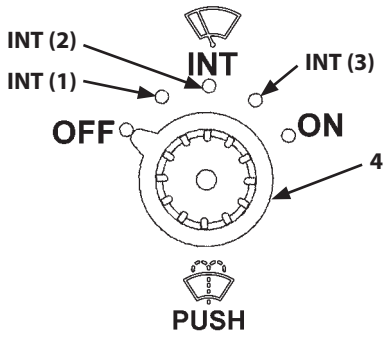
MDCD-01-029 ja



M157-01-146-1 ja

Wiper/Washer Switch

Wiper/washer switch (4) operates wiper (5) and the window washer.



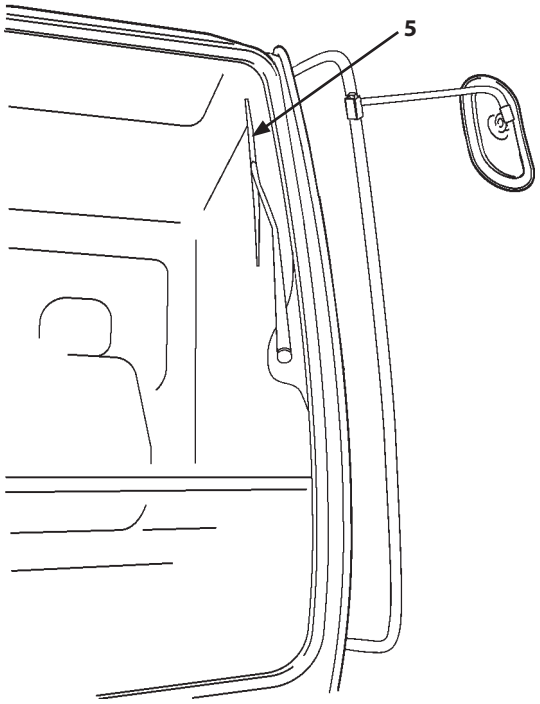
MBFM-01-005-2 en_GB

- Wiper
  Turn wiper/washer switch (4) to the desired position to operate wiper (5).

OFF	Wiper (5) stops and automatically returns to its at rest position.	
INT Position	Wiper (5) operates intermittently. The INT mode has three positions as shown below.	
	INT(1):	Wiper (5) operates at a 8-second interval.
	INT(2):	Wiper (5) operates at a 6-second interval.
	INT(3):	Wiper (5) operates at a 3-second interval.
ON	Wiper (5) operates continuously.	

NOTE

When the front window (upper) is opened, wiper (5) will not operate. If the front window is opened while operating the wiper, the wiper stops.



MDEQ-01-020-1 ja

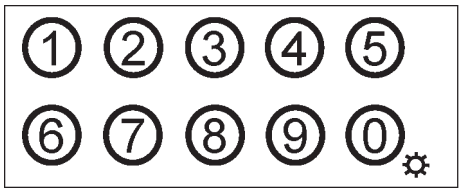
- Washer
  As long as wiper/washer switch (4) is pressed, it squirts washer fluid onto the window. When the wiper/washer switch is pressed for more than 2 seconds, wiper (5) operates continuously. When the wiper/washer switch (4) is released, the wiper automatically returns to its at rest position. When the wiper is in an INT mode and the wiper/washer switch (4) is pressed, the wiper operates continuously.

NOTE

The wiper motor protection control stops wiper operation, to prevent it from becoming stuck when operated for a long period under high load. If the wiper stops, do not change the arm position; wait several minutes until the wiper starts operating again.

Numeric Keypad

Used for inputting password.
Push the numeric keypad of 1 to 8 while the radio is ON, the radio station will switch to memorized channel of 1 to 8.
When the light is turned ON, the monitor changes to night mode screen.
Even if the light is turned ON, you can activate the daytime screen by pushing "0" on the numeric keypad.



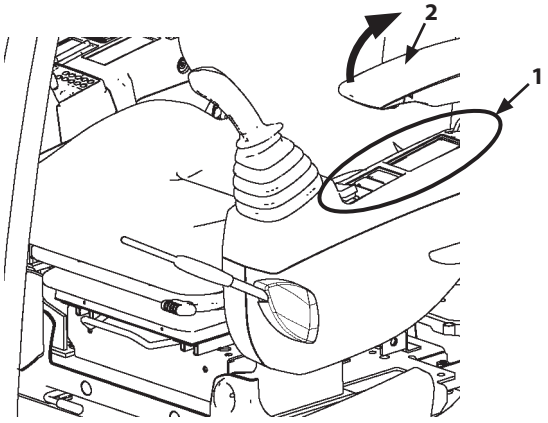
MDAA-01-018-2 ja

Switch Panel (for Options)

NOTE

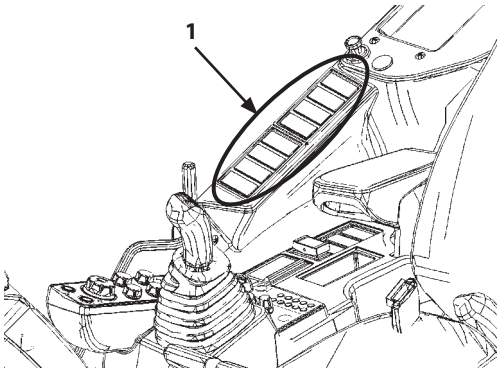
The position of optional switches (1) varies with the kind of optional devices that the machine is equipped with. Before using the switches, confirm which types of optional devices the machine is equipped with. Raise armrest (2) to operate the switches. All available optional devices are shown below.

- Overload Alarm
- Rotating Lamp
- Rear Light
- Overload Alarm Device Switch
- Seat Heat Switch
- Rotating Lamp
- USB Charger Port (2.1 A)
- Electrical Control



ZX85US-6

MDAA-01-327-2 ja



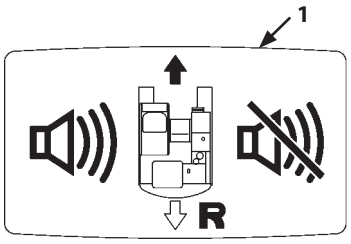
ZX85USB-6

MDEQ-01-021-1 ja

Travel Alarm Deactivation Switch (Optional)

The travel alarm buzzer sounds during travel operation.

Pressing the side of travel alarm deactivation switch (1), deactivates the travel alarm.

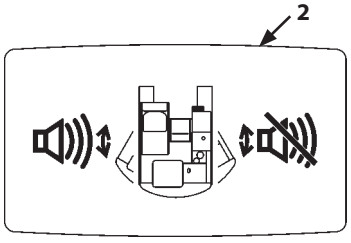


M1U1-01-035-1 ja

Swing Alarm Switch (Optional)

The swing alarm actuates a buzzer and a rotating lamp when the machine is swinging.

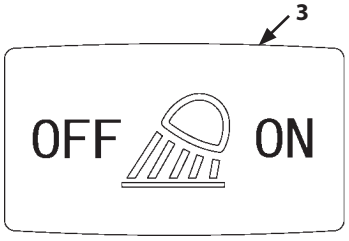
Pressing the side of swing alarm switch (2), mutes the sound of the swing alarm.



M1U1-01-036-1 ja

Rear Light Switch (Optional)

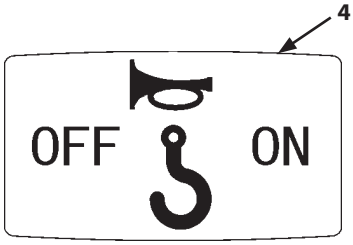
When rear light switch (3) is turned ON, the rear light at the rear of the cab roof comes ON.



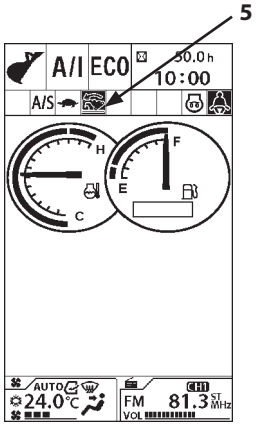
MDEQ-01-022-1 ja

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 (5) on the multi-monitor comes ON. Turn overload alarm switch (4) OFF to deactivate the overload alarm system function.



MDEQ-01-054-1 ja



MDEB-01-286-1 ja

Seat Heater Switch

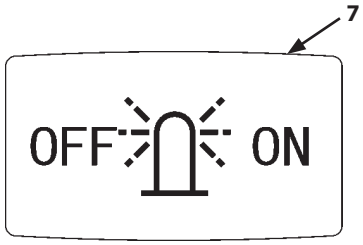
When seat heater switch (6) is turned ON, the seat surface is heated so that the seat section becomes warm. When the temperature of the seat section is raised to the specified temperature, heating is automatically stopped.



M1U1-01-011-2 ja

Revolving Light Switch (Optional)

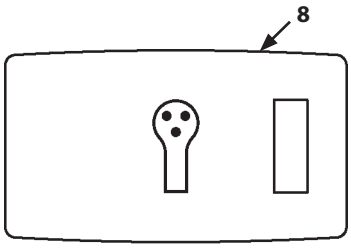
When revolving light switch (7) is turned ON, the revolving light provided at the rear on the cab roof comes ON.



MDEQ-01-055-1 ja

Electrical Control Main Switch (Optional)

Turn the pilot control shut-off lever to the UNLOCK position. The electrical control (grip switch) system becomes operable by pushing the ON side of the electrical control main switch (8). It is turned OFF by pressing the switch again. It is also turned OFF when the key switch is turned OFF or the pilot control shut-off lever is put in the LOCK position.



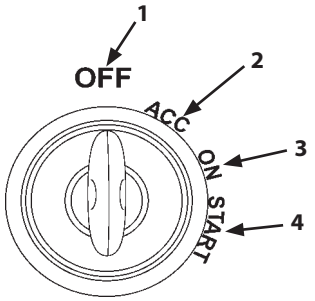
MDAA-01-311-3 ja

CAUTION

When there is no need to use the electrical control (grip switch) system, turn OFF the main switch to avoid accidental operation.

Key Switch

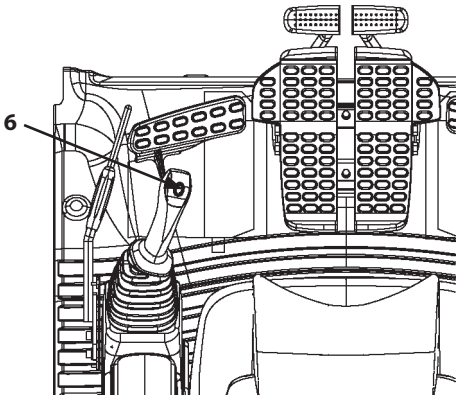
1- OFF (Engine Off)
2- ACC (Horn, Radio etc.)
3- ON (Engine ON)
4- START (Engine Start)



MDCD-01-030-1 ja

Horn Switch

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

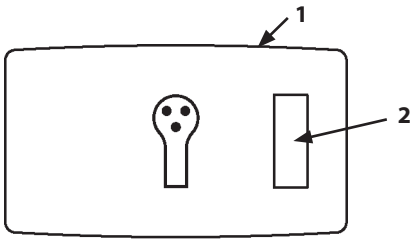


MDAA-01-293-1 ja

Electrical Control Main Switch (Optional)

Attachment Switch (Assist Operation) (Main Operation)

This switch is mainly used for optional devices and attachments with a rotary or a tilt function. The attachment becomes operable when ON of electrical control main switch (1) is pushed and main switch indicator (2) is lit.



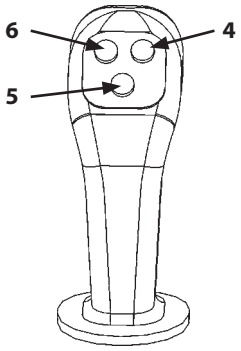
MDAA-01-311-2 ja

IMPORTANT

The attachment switch is operable only when indicator (2) of electrical control main switch (1) is lit.
Indicator (2) will not light unless the pilot control shut-off lever is in the UNLOCK position.
Indicator (2) turns OFF and the attachment switch becomes inoperable when the pilot control shut-off lever is placed in the LOCK position while indicator (2) is lit. To operate the attachment switch, place the pilot control shut-off lever in the UNLOCK position, and then push the ON side of electrical control main switch (1) to turn indicator (2) light ON.

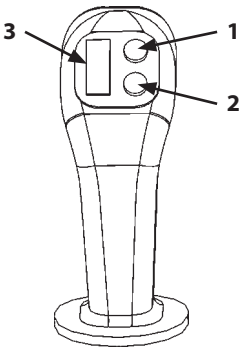
AUX Function Lever 1

1. Auxiliary
2. Auxiliary
3. Attachment Switch (Assist Operation)
4. Auxiliary
5. HORN
6. Auxiliary



Left Control Lever

MDAA-01-337-1 ja

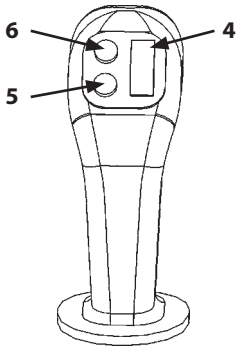


Right Control Lever

MCGB-01-030-1 ja

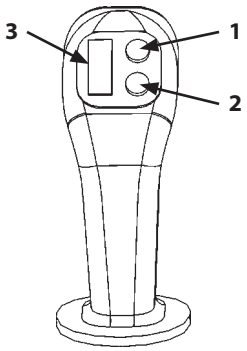
AUX Function Lever 2

1. Auxiliary
2. Auxiliary
3. Attachment Switch (Assist Operation)
4. Attachment Switch (Main Operation)
5. HORN
6. Auxiliary



Left Control Lever

MCGB-01-029-1 ja



Right Control Lever

MCGB-01-030-1 ja

CAUTION

- **These switches are provided for operating attachments on the end of the arm of this machine. Do not use this operating switch for any other purpose.**
- **Before using these switches, thoroughly read the operation manual of the corresponding attachment and check the operation of each function in a safe area.**
- **Before operating an attachment with this switch, confirm the requirements on safe and proper mounting and operation of the attachment with its manufacturer or distributor and observe them.**
- **Do not use this operating switch for mounting/ removing a quick hitch, or other coupler or attachment.**
- **Hitachi shall not be responsible for on any personal injury, malfunction and/or physical damage resulting from changes to the performance or form of this switch.**

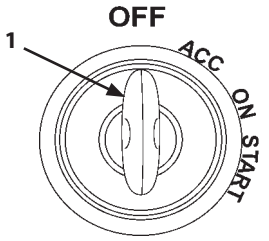
Cigar Lighter

Using the Cigar Lighter

IMPORTANT

If cigar lighter (2) fails to pop out automatically 30 seconds after pushing the cigar lighter in, pull out cigar lighter (2) and consult your authorized dealer.

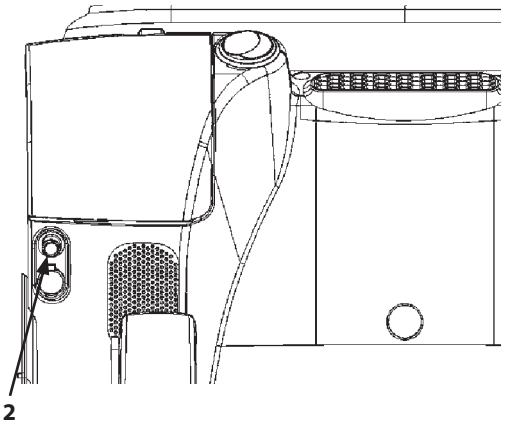
1. Insert key switch (1). Turn it to the ACC or ON position.
2. Push the cigar lighter (2) in firmly and let it go.
3. The cigar lighter (2) will return to the original position when it is ready to use. Pull cigar lighter (2) out to use it.
4. After use, reinsert cigar lighter (2) to its original position in the panel.



MDCD-01-030-2 ja

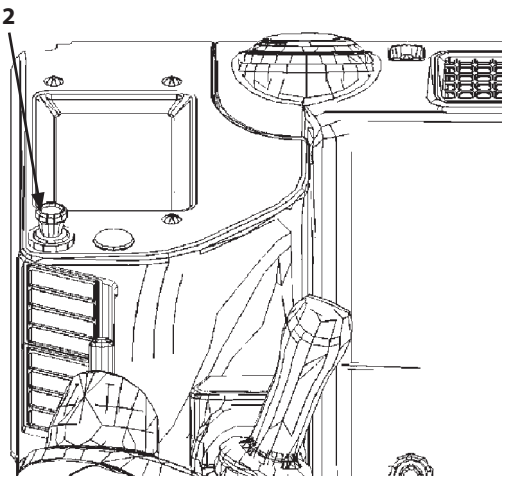
CAUTION

Do not power anything other than a genuine Hitachi Construction Machinery electronic device from the cigar lighter (2) port.



ZX85US-6

MDEQ-01-023-1 ja



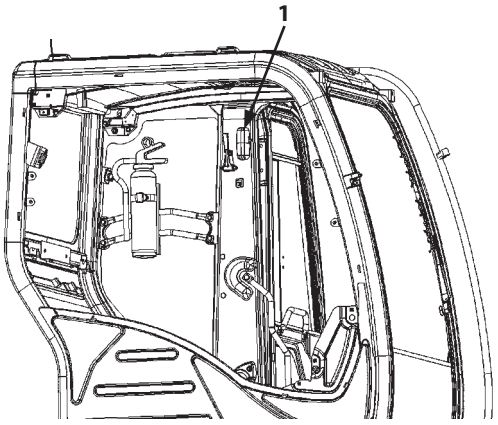
ZX85USB-6

MDEQ-01-024-1 ja

Cab Light Switch

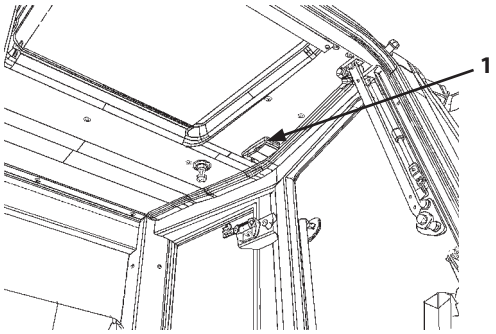
Push switch (1) on the cab light to turn the cab light ON.

ON position (A)	:	The cab light comes and stays ON. (The light does not turn ON while the key OFF.)
OFF position (B)	:	The cab light goes OFF.
DOOR position (C) (ZX85US-6)	:	The cab light turns ON as the cab door is opened. The cab light automatically goes off after 30 seconds. It also turns OFF automatically when the engine starts. (The cab light turns ON while the key switch is OFF.)



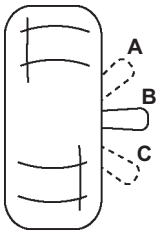
ZX85US-6

MDEQ-01-025-1 ja



ZX85USB-6

MDEQ-01-026-1 ja

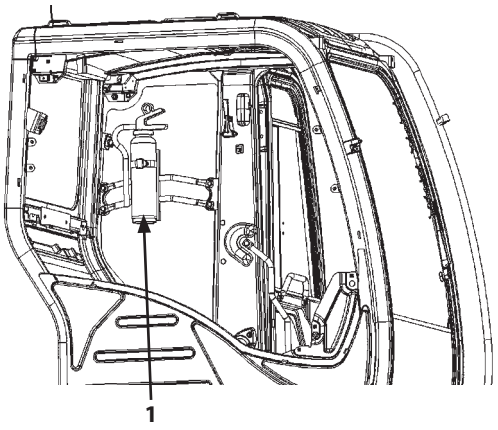


A: ON
B: OFF
C: DOOR (ZX85US-6)

MDEQ-01-027-1 ja

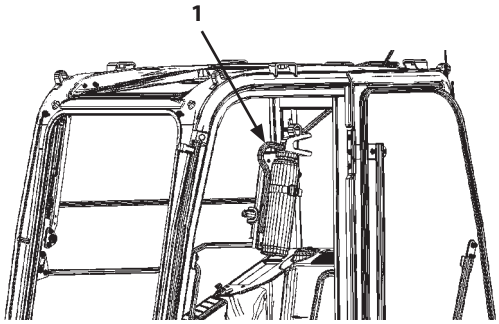
Installing a Fire Extinguisher (Optional)

A fire extinguisher (1) can be installed in the left rear corner of the cab. Consult your authorized dealer to install one.



ZX85US-6

MDEQ-01-025-2 ja



ZX85USB-6

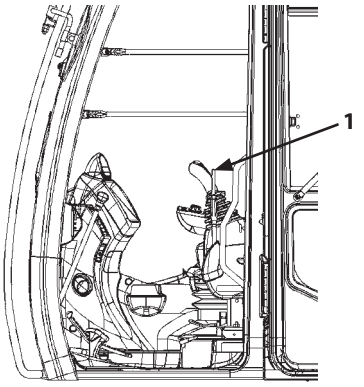
MDEQ-01-028-1 ja

Pilot Control Shut-Off Lever

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

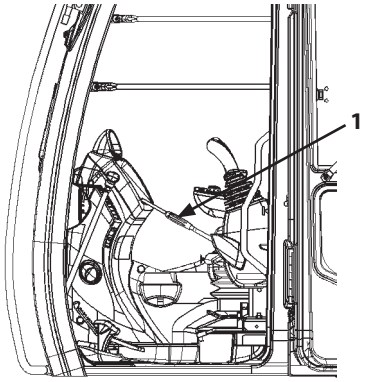
WARNING

- **When locking it, always pull pilot control shut-off lever (1) into the full LOCK position. If the lever is in any intermediate position, it is not locked, possibly creating a hazardous situation.**
- **When leaving the machine, always stop the engine. Then, pull pilot control shut-off lever (1) up to the LOCK position.**
- **Always pull the pilot control shut-off lever up to the LOCK position before transporting the machine and leaving the machine.**
- **Confirm that pilot control shut-off lever is in the LOCK position before starting the engine. The engine will not start in any position other than the LOCK position.**



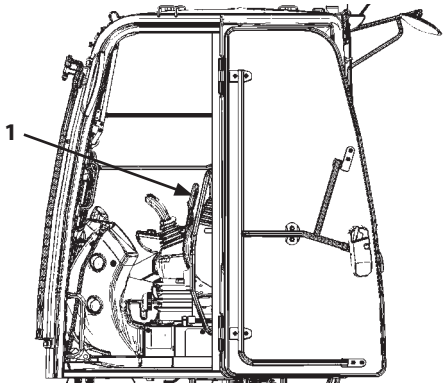
LOCK position
ZX85US-6

MDEQ-01-029-1 ja



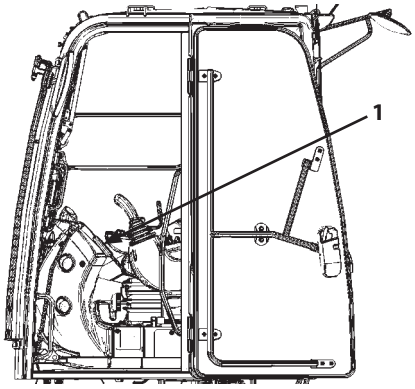
UNLOCK Position
ZX85US-6

MDEQ-01-030-1 ja



LOCK position
ZX85USB-6

MDEQ-01-031-1 ja



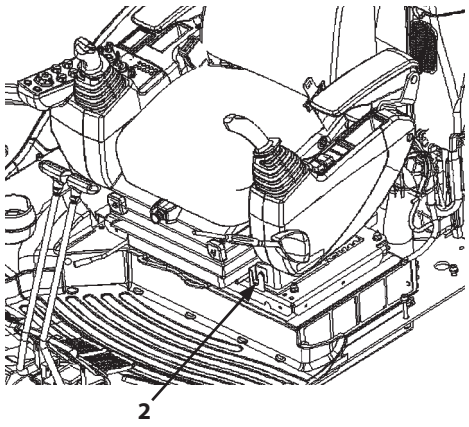
UNLOCK Position
ZX85USB-6

MDEQ-01-032-1 ja

Engine Stop Switch

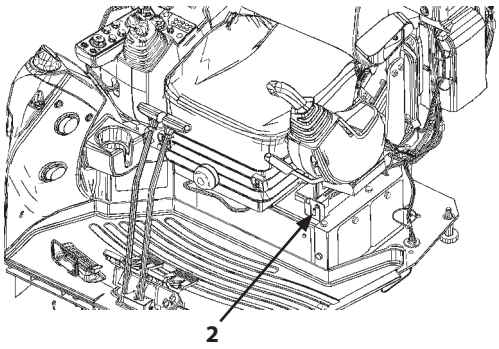
If the engine does not stop even though the key switch is turned OFF, due to failure of the machine, move switch (2) located at the front-left side of the seat stand downward to stop the engine.

After operating switch (2), return it to the up position.



ZX85US-6

MDEQ-01-008-2 ja



ZX85USB-6

MDEQ-01-012-2 ja

Fuse Box

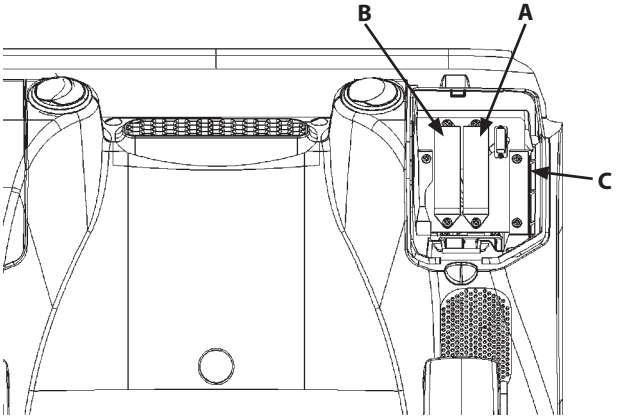
ZX85US-6

Fuse Box A

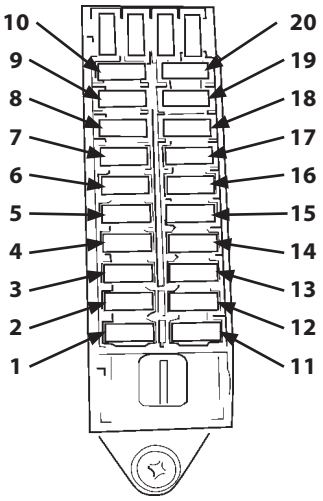
10-	CONTROLLER 5 A	20-	OPT.3 (BATT) 5 A
9-	BACKUP 10 A	19-	HORN 10 A
8-	SPARE	18-	IDLE STOP 5 A
7-	START 5 A	17-	FUEL PUMP 5 A
6-	OPT.2 (ALT) 20 A	16-	POWER ON 5 A
5-	OPT.1 (ALT) 5 A	15-	AUX. 10 A
4-	SOLENOID 20 A	14-	MONITOR 5 A
3-	HEATER 20 A	13-	LIGHTER 10 A
2-	WIPER 10 A	12-	RADIO 5 A
1-	LAMP 20 A	11-	DC-DC 20 A

Fuse Box B

30-	SPARE	40-	SPARE
29-	SPARE	39-	SPARE
28-	SPARE	38-	SPARE
27-	AUX.3 5 A	37-	SPARE
26-	QUICK HITCH 5 A	36-	SPARE
25-	IMMOBI. 5 A	35-	SPARE
24-	12V UNIT 10 A	34-	AUX.2 10 A
23-	CAB LAMP REAR 10 A	33-	WARNING LAMP 10 A
22-	CAB LAMP FRONT 10 A	32-	CAB LAMP FRONT +2 10 A
21-	SEAT HEATER 10 A	31-	SEAT COMPR. 10 A

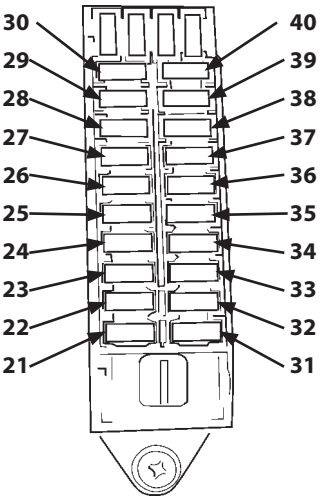


MDEQ-01-033-1 ja



Fuse Box A

M1GR-01-003-5 ja

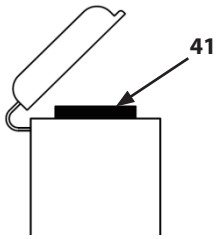


Fuse Box B

M1GR-01-003-6 ja

Fuse Box C

41- DC-DC (E-ECU)
25A



Fuse Box C

MDEQ-01-071-1 ja

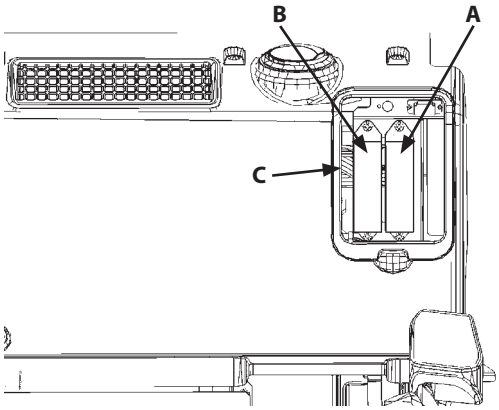
ZX85USB-6

Fuse Box A

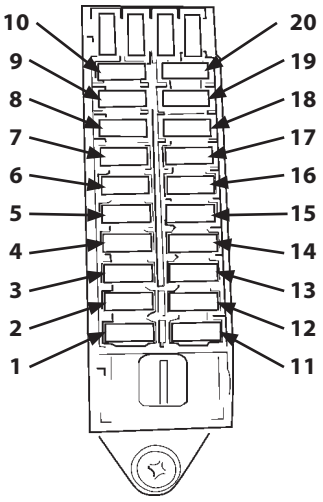
10-	CONTROLLER 5 A	20-	OPT.3 (BATT) 5 A
9-	BACKUP 10 A	19-	HORN 10 A
8-	SPARE	18-	IDLE STOP 5 A
7-	EM SW 10 A	17-	FUEL PUMP 5 A
6-	OPT.2 (ALT) 20 A	16-	POWER ON 5 A
5-	OPT.1 (ALT) 5 A	15-	AUX. 10 A
4-	SOLENOID 20 A	14-	MONITOR 5 A
3-	HEATER 20 A	13-	LIGHTER 10 A
2-	WIPER 10 A	12-	RADIO 5 A
1-	LAMP 20 A	11-	DC-DC 20 A

Fuse Box B

30-	SPARE	40-	SPARE
29-	SPARE	39-	SPARE
28-	SPARE	38-	SPARE
27-	AUX.3 5 A	37-	SPARE
26-	QUICK HITCH 5 A	36-	SPARE
25-	IMMOBI. 5 A	35-	SPARE
24-	12V UNIT 10 A	34-	AUX.2 10 A
23-	CAB LAMP REAR 10 A	33-	WARNING LAMP 10 A
22-	CAB LAMP FRONT 10 A	32-	CAB LAMP FRONT +2 10 A
21-	SEAT HEATER 10 A	31-	SEAT COMPR. 10 A

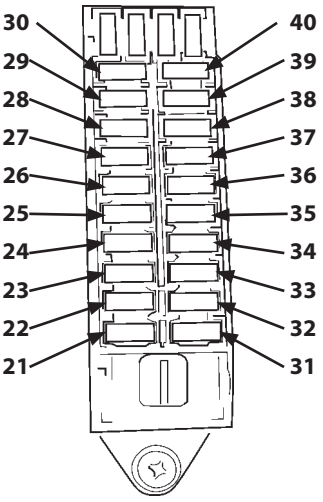


MDEQ-01-034-1 ja



Fuse Box A

M1GR-01-003-5 ja

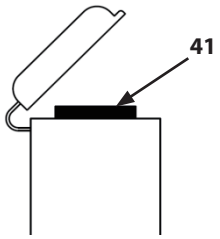


Fuse Box B

M1GR-01-003-6 ja

Fuse Box C

41- DC-DC (E-ECU)
25 A



Fuse Box C

MDEQ-01-071-1 ja

Auto Air Conditioner

Features

- Full Auto-Control
  Automatically controls the air temperature in the cab to maintain the temperature set by the temperature control switch regardless of outside air temperature and intensity of the sun.
- Max Cool/Heat
  Maximum cooling or heating can be obtained by rotating the temperature control switch clockwise (32 °C) or counterclockwise (18 °C) respectively.
- Heater Start-Operation Control System
  In winter or in cold weather, when starting the engine, the engine coolant is cool and air temperature inside the cab is low. Until the coolant is warmed, when the front foot vent and/or foot vent is selected, the air flow level is fixed to the minimum setting and cool air is restricted from entering the cab.

  NOTE

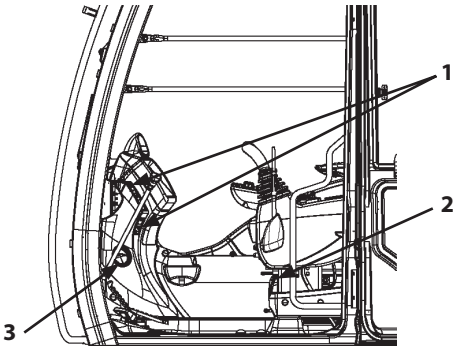
  Even in summer, the high idle speed may be higher than the normal speed due to the above control system.

Name of Components

1- Front Air Vents
2- Foot Vent
3- Defroster Vent
4- Rear Vent
5- Temperature Control Switch/Mode Switch
6- AUTO/OFF Switch/Fan Switch

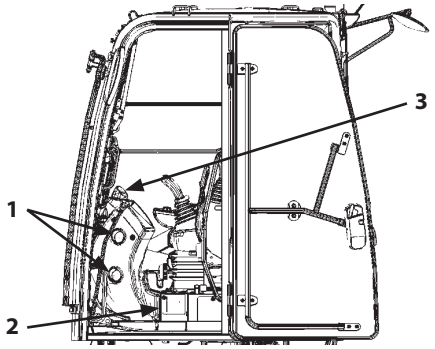
NOTE

Air flow direction can be adjusted by moving the louvers on all air vents except for foot vent (2). The louvers on front vents (1) and defroster vent (3) can be completely opened and closed by hand.



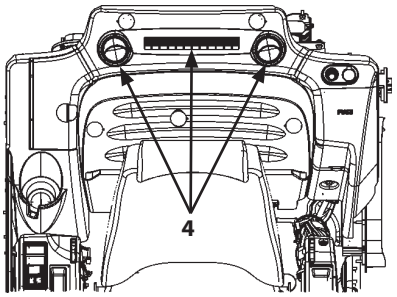
ZX85US-6

MDEQ-01-035-1 ja



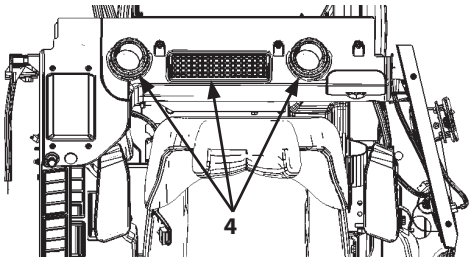
ZX85USB-6

MDEQ-01-031-2 ja



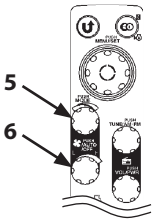
ZX85US-6

MDEQ-01-036-1 ja



ZX85USB-6

MDEQ-01-037-1 ja

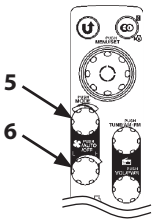


MDC1-01-026-5 ja

Controller Part Name and Function

Mode Switch (5)

Selects the air vent. The selected air vent is indicated on monitor (7).



MDC1-01-026-5 ja

Front vents
(Including defroster vent)

Front & rear vents
(Including defroster vent)

Front, rear & foot vents
(Including defroster vent)

Air flows out of the foot vents.

Each time mode switch (5) is pressed, the vent mode can be changed in 4 stages as illustrated below.

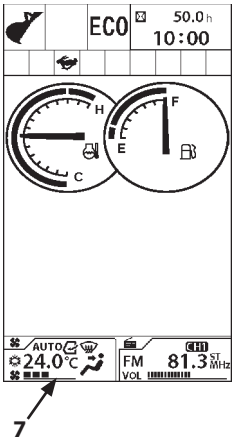


MDC1-00-143 ja

- When AUTO switch (6) is selected, the air vent mode switches automatically.

Temperature Control Switch (5):

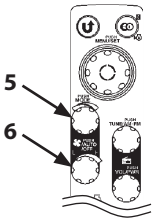
Sets the air temperature in the cab.
The temperature in the cab can be set between 18.0 and 32.0 °C by rotating temperature control switch (5).
The temperature can be set in 0.5 °C increments.
The set-temperature is displayed on monitor (7).



MDAA-01-001-5 ja

Fan Switch (6)

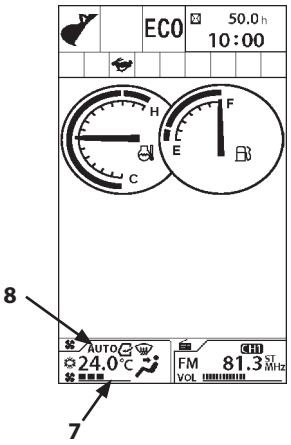
- When AUTO indicator (8) is ON, the blower speed is automatically controlled.
- When AUTO indicator (8) is OFF, the blower speed is controlled in 6 steps.
  Rotate blower switch (6) clockwise to increase blower speed. Rotate blower switch (6) counterclockwise to decrease blower speed. Monitor (7) indicates the corresponding blower speed.



MDC1-01-026-5 ja

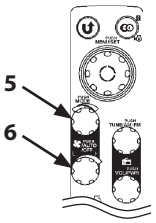
AUTO/OFF switch (6):

While the air conditioner is OFF, pressing AUTO/OFF Switch (6) switches the unit to AUTO mode. While operating the air conditioner, pressing AUTO/OFF switch (6) stops operation.



MDAA-01-001-6 ja

Cab Heater Operation



MDC1-01-026-5 ja

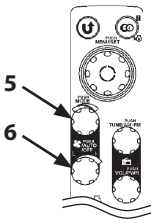
1. Operating AUTO/OFF Switch (6)
   The air conditioner controller uses the signals from various sensors to automatically select the air flow-in vents, air suction ports, and air flow-in temperature at the vent, and control the blower speed.
2. Temperature Control Switch (5):
   Adjust so that 25.0 is indicated on the monitor. Control air temperature inside the cab using switch (5) as necessary.
3. When necessary:
   - Operate Mode switch (5) to manually select the air vent.
   - Operate Fan switch (6) to manually control the blower speed.
   - Operate the air conditioner setting screen on the monitor to maintain the air vent in the fresh air mode or air circulation mode.

   Usually the cab heater turns the dehumidifier function OFF, however, it can be turned ON by switching the A/C to ON from the air conditioner setting screen.

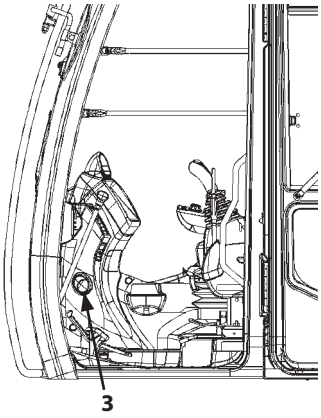
Cooling Operation

1. AUTO/OFF switch (6):
   Push AUTO/OFF switch (6) to set the air conditioner AUTO mode. The air conditioner controller uses signals from various sensors to automatically select the air flow-in vents, air suction ports, and air flow-in temperature at the vent, and control the blower speed.
2. Operating Temperature Control Switch (5)
   Adjust so that 25.0 is indicated on the monitor. Control air temperature inside the cab using switch (5) as necessary.
3. When necessary:
   - Operate Mode switch (5) to manually select the air vent.
   - Operate Fan switch (6) to manually control the blower speed.
   - Operate the air conditioner setting screen on the monitor to maintain the air vent in the fresh air mode or air circulation mode.

   If the front window (lower) becomes misty, manually close the defroster vent (3). (The vent can be closed manually.)

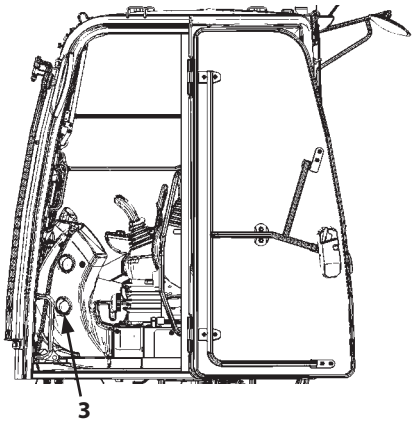


MDC1-01-026-5 ja



ZX85US-6

MDEQ-01-029-2 ja

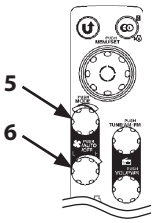


ZX85USB-6

MDEQ-01-031-3 ja

Defroster Operation

1. Push AUTO/OFF Switch (6) to blow out temperature-controlled air. When starting the engine during the cold season, the engine coolant temperature and air temperature in the cab are low. The Heater Start-Operation Control System controls the blow rate to the minimum (LO) in order to restrict cool air from flowing into the cab.



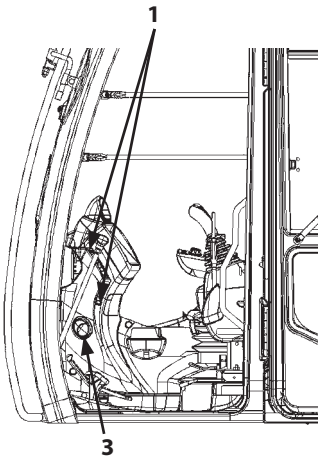
MDC1-01-026-5 ja

2. Adjust temperature control switch (5) so that "25.0" is indicated on the monitor. From the air conditioner setting screen on the monitor, set to fresh air mode.
3. Select the front vents (1) or the front and rear vents with mode switch (5).

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

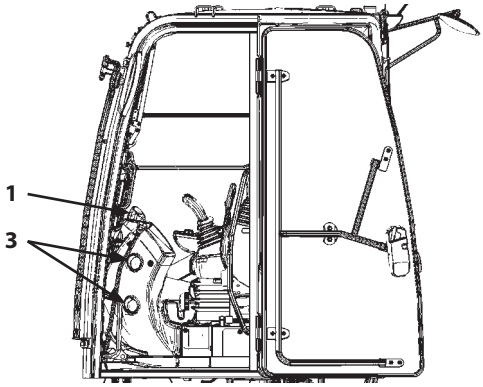
   Control air temperature in the cab by using temperature control switch (5).

   If the windowpanes become misty during a rainy season or in order to eliminate moisture, turn A/C ON from the air conditioner screen on the monitor.



ZX85US-6

MDEQ-01-029-3 ja



ZX85USB-6

MDEQ-01-031-4 ja

Cool Head/Warm Feet Operation

Cool and warm air are supplied at the same time to the head vents and feet vents, respectively.

1. Push Fan switch (6) to adjust the blower speed.
2. Push MODE switch (5) to display on the monitor.
   Turn A/C ON from the air conditioner setting screen on the monitor.

Control air temperature inside the cab by using temperature control switch (5).

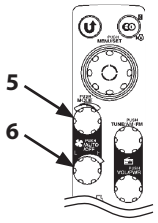
Tips for Optimal Air Conditioner Usage

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, push AUTO/OFF switch (6). Set temperature to "18.0" on the monitor by using temperature control switch (5). Turn air circulation mode ON from air conditioner setting screen on the monitor.



MDC1-01-026-5 ja

Close the windows when the cab cools down to the ambient temperature.

When Windows Become Misty

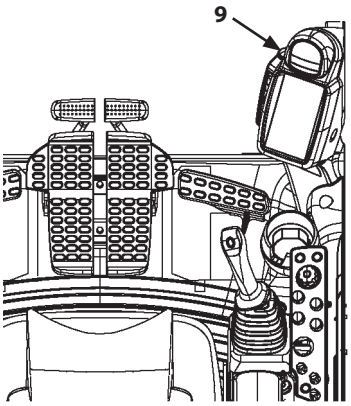
If the insides of the windows become misty during rainy weather or on humid days, operate the air conditioner to aid in keeping the windows clear. When the atmosphere is very damp, and if the air conditioner has run excessively, the outside of the windows may become misty. If this happens, turn off the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

IMPORTANT

- **Do not increase the engine speed suddenly. This may damage the compressor.**
- **Refer to the item "Cleaning and Replacing Air Conditioner and Heater Internal/External Filters" in the Maintenance Chapter for maintenance of the air conditioner filters.**
- **Keep auto air conditioner sensor (9) clean for effective air conditioner performance. Avoid placing any obstructions around the sensor.**



MDAA-01-292-4 ja

AM/FM Radio Operation

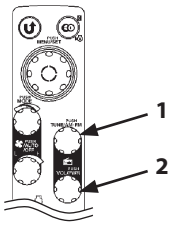
CAUTION

The radio distracts from operator attention. Refrain from listening to the radio in the cab while operating the machine; use only during breaks.

Controls on the Radio

1- AM/FM Selector/Tuning Switch
Toggles between AM & FM with every push. Rotate clockwise for higher frequencies, counterclockwise for lower.

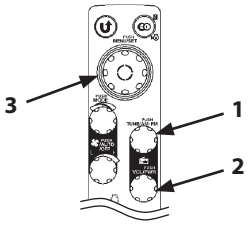
2- Power Switch/Volume Control
Turns ON & OFF with every push. Rotate clockwise to increase the volume, counterclockwise to lower it.



MDC1-01-026-6 ja

Tuning

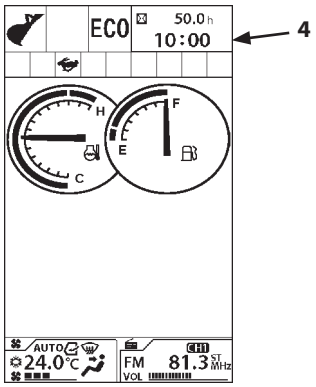
- Manual Tuning Procedure
  Rotate tuning switch (1) until the desired station is reached.



MDC1-01-026-7 ja

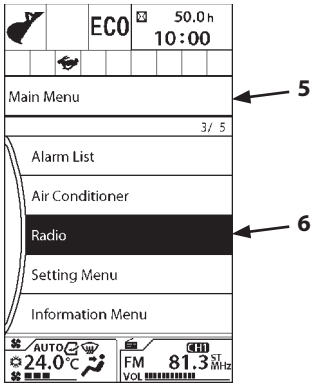
- Automatic Search Function

1. Push selector knob (3) from Basic Screen (4) to display Main Menu screen (5).

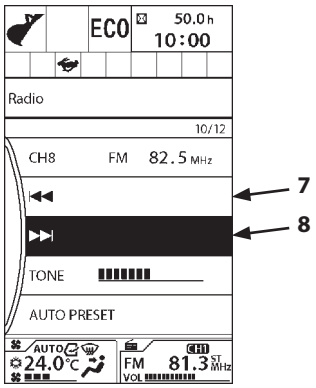


MDAA-01-001-7 ja

2. Rotate selector knob (3) to highlight Radio (6).
   Push selector knob (3) to display the radio screen.
   To go to the next higher station, rotate selector knob (3) to highlight Seek (8). Push selector knob (3).
   To go to the next lower station, rotate selector knob (3) to highlight Seek (7). Push selector knob (3).



MDED-01-092-1 en_GB

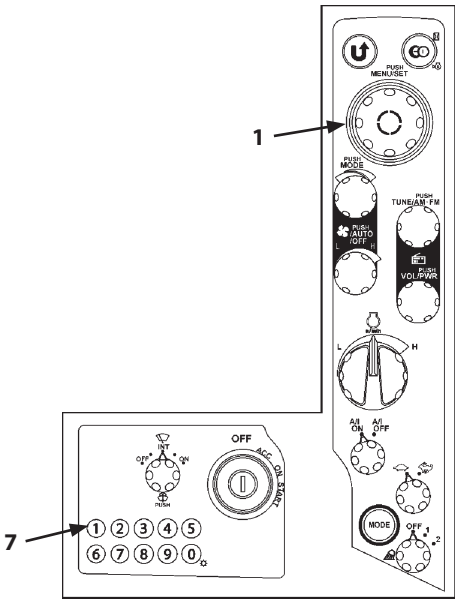


MDAA-01-095-1 en_GB

Station Presetting Procedure

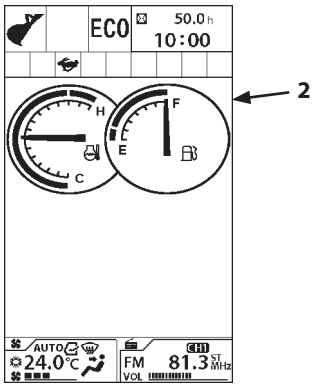
Setting from the Monitor

1. Select the station you wish to preset. (Refer to Tuning for how to tune a station.)

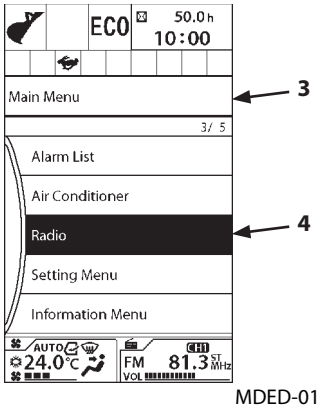


MDCD-01-027-2 ja

2. Push selector knob (1) while displaying Basic Screen (2) to display Main Menu screen (3). Rotate selector knob (1) to highlight Radio (4).
3. Push selector knob (1) to display radio screen (5).

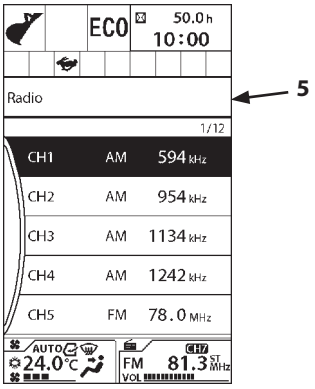


MDAA-01-001-8 ja



MDED-01-092-2 en_GB

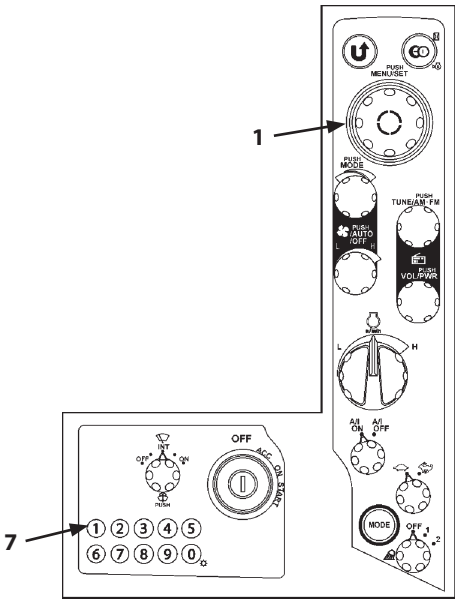
4. Rotate selector knob (1) to highlight a CH to preset a station. (CH1 to CH8)
5. Long pressing selector knob (1) records the current station as a preset for the selected CH.



MDAA-01-093-1 en_GB

Setting from the Numeric Keypad

1. Select the station you wish to preset. (Refer to Tuning for how to tune a station.)
2. Push and hold one of the keypad buttons (7) (1 to 8). The current station is preset to the selected number of CH.

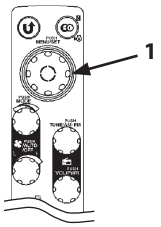


MDCD-01-027-2 ja

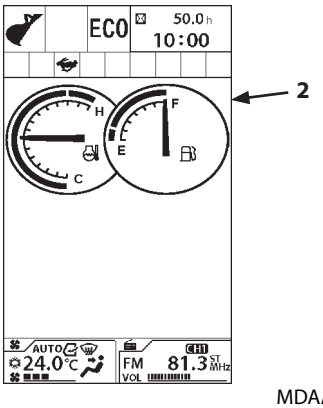
Auto-Presetting Stations

Receivable stations can be automatically detected and preset to the memory.

1. Push selector knob (1) while displaying Basic Screen (2) to display Main Menu screen (3).

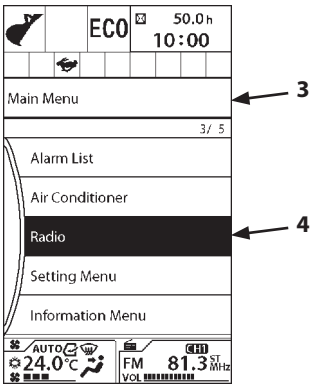


MDC1-01-026-1 ja



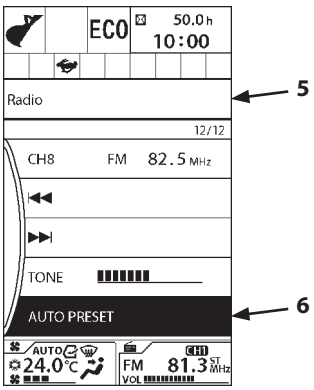
MDAA-01-001-8 ja

2. Rotate selector knob (1) to highlight Radio (4). Push selector knob (1) to display radio screen (5).



MDED-01-092-2 en_GB

3. Rotate selector knob (1) to highlight AUTO PRESET (6).
4. Push selector knob (1) to start AUTO PRESET process. AUTO PRESET scans reception frequency, and allocates the stations with the strongest signal to CH1 to CH8. AM stations are preset to CH1 to CH4, FM stations are preset to CH5 to CH8. Operating the radio during scanning stops the AUTO PRESET.

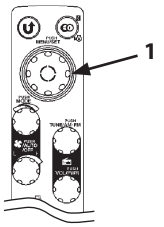


MDAA-01-099-1 en_GB

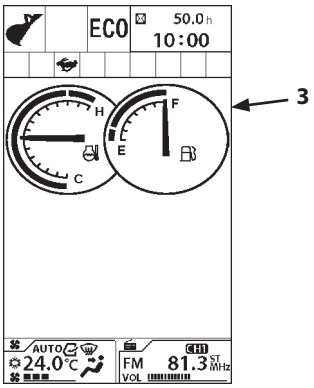
Adjusting the Tone

The tone can be adjusted.

1. Push selector knob (1) while displaying Basic Screen (3) to display Main Menu screen (4).

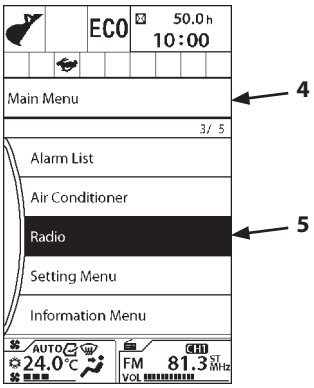


MDC1-01-026-1 ja



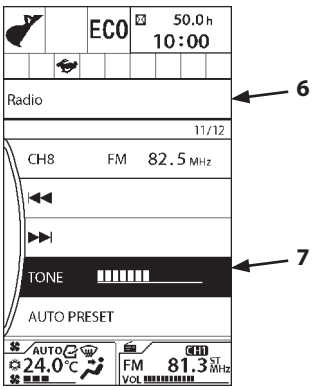
MDAA-01-001-9 ja

2. Rotate selector knob (1) to highlight Radio (5). Push selector knob (1) to display radio screen (6).



MDED-01-092-3 en_GB

3. Rotate selector knob (1) to highlight TONE (7).
4. Push selector knob (1) to adjust the tone. Rotate selector knob (1) clockwise to boost treble. Rotate it counterclockwise to boost bass. Push selector knob (1) to enable the changes.



MDAA-01-096-1 en_GB

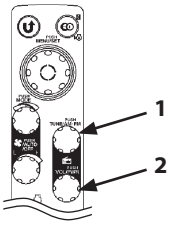
Audio Input

IMPORTANT

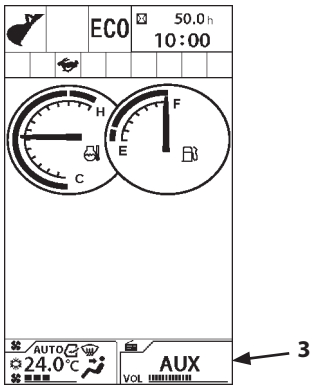
This function is available only to a machine equipped with an audio input. Use this function at an appropriate volume.

Audio Input Selection

Attach the audio input device and push AM/FM Selector/ Tuning Switch (1) to display AM and FM screen as well as AUX input screen (3).



MDC1-01-026-8 ja



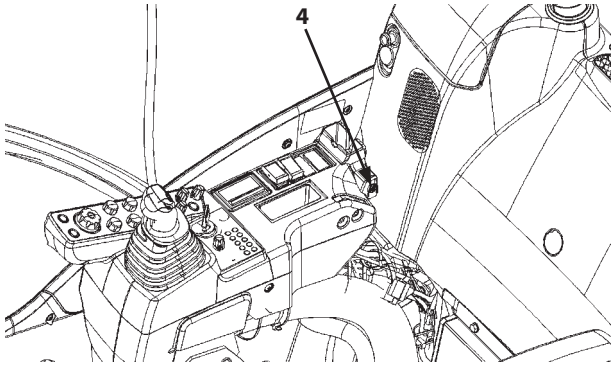
MDAA-01-340-1 ja

Connecting audio device

Removing AUX IN cap (4) reveals the audio input terminal. Connect your audio device to the audio input terminal of the machine with your audio cable.

IMPORTANT

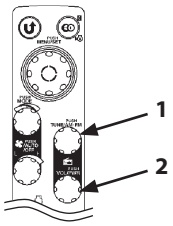
- **Use a 3.5 mm stereo plug Φ to connect to the audio input terminal.**
- **Put AUX IN cap (4) back in place when the audio input is not in use.**



MDEQ-01-038-1 ja

Volume Control of audio device

Turn the volume down to the minimum beforehand, and then turn volume control knob (2) clockwise to adjust the volume.



MDC1-01-026-8 ja

IMPORTANT

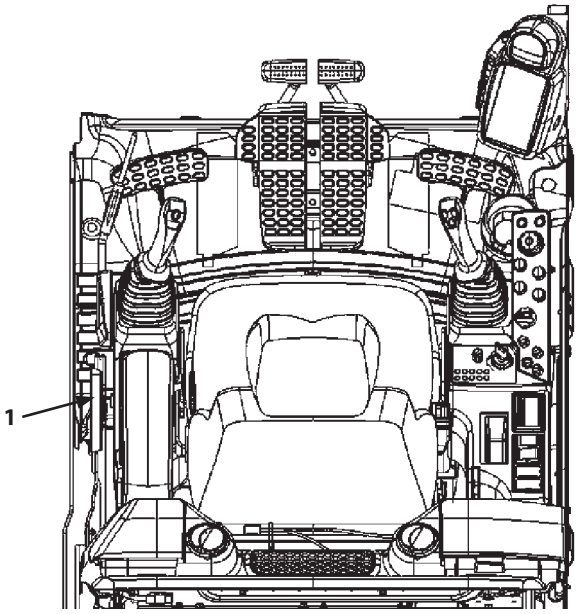
- **If volume control knob (2) has been set to the maximum level the sound will be extremely loud. Set volume control knob to the minimum first and then turn it clockwise to increase the volume. Adjust the volume control knob on the audio device if the sound is too low, even when the volume control knob is set to the maximum level.**
- **Operate your audio device to play or stop the sound.**

Cab Door Release Lever

CAUTION

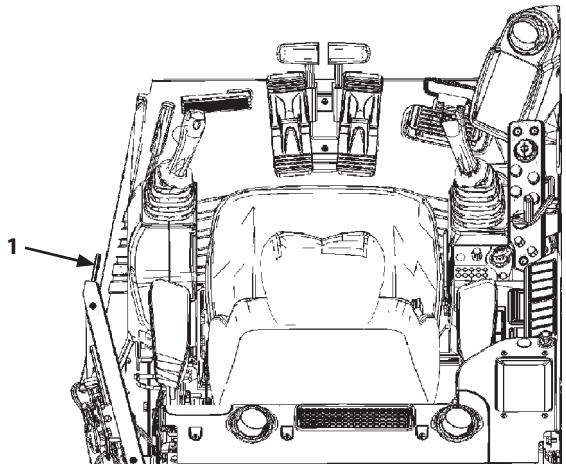
- **Open the cab door all the way until it securely locks in the latch on the side of the cab.**
- **Do not unlock the cab door when the machine is parked on a slope or while the wind is strong. The door may close suddenly.**
- **When opening or closing the cab door, take extra care not to catch fingers between the base machine and the cab door. The cab door may close accidentally, possibly resulting in personal injury.**

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



ZX85US-6

MDEQ-01-006-2 ja



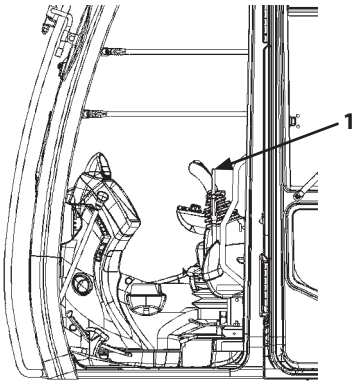
ZX85USB-6

MDEQ-01-010-2 ja

Opening/Closing and Removing Cab Inside Window

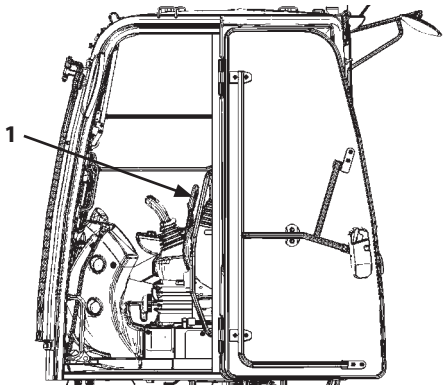
WARNING

- **Open, close or remove the upper front cab window, overhead window, cab door window or lower front window only after lowering the front attachment to the ground and pulling up pilot control shut-off lever (1) to the LOCK position. Failure to do so may allow the machine to move unexpectedly if a control lever or pedal is mistakenly touched with a part of the body, possibly resulting in personal injury or death.**
- **Park the machine on a level surface and stop the engine before opening and closing the upper front window.**
- **When opening the upper front window, hold the window with your hands and hold it until the upper front window is locked.**
- **When closing the upper front window, it may accidentally fall under its own weight. Hold the upper front window with both hands until it is completely closed. The window stops once before closing completely. Do not operate the machine when the window is in this position. The upper front window is not locked in this position, so there is a possibility that the window may drop suddenly.**



ZX85US-6

MDEQ-01-029-1 ja



ZX85USB-6

MDEQ-01-031-1 ja

Opening Upper Front Window

ZX85US-6

1. Press lock release lever (1) at the upper center to release the upper front window lock.
2. Holding lock release lever (1) at the upper center and the lower handle on the upper front window, pull the upper front window up and back until auto locks (3) at both sides of the upper front window securely catch into the strikers on the ceiling.
3. After confirming that the window has caught securely in auto locks (3), slide lock pin (2) 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.

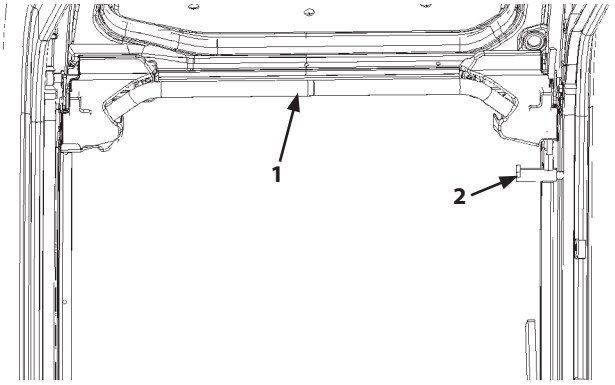
CAUTION

- **Close the upper front window slowly so you do not catch your fingers.**
- **Always secure lock pin (2) in the lock position after the upper front window is opened.**

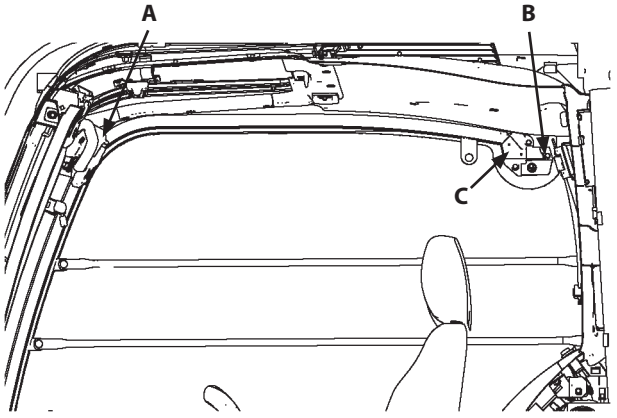
4. Close the front (upper) window by performing steps 1 to 3 in reverse order. The window stops before it completely closes, so close the front window by pushing lock release lever (1) upward.
   Push lock release lever (1) downward to release auto lock (3).

   NOTE

   The wiper and washer will not operate unless the upper front window is securely closed.

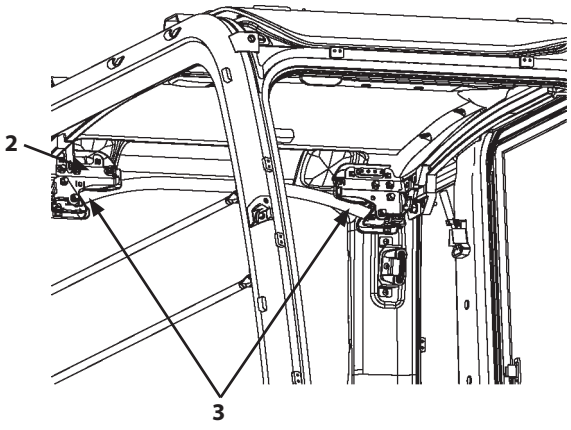


MDEQ-01-039-1 ja



A: Front window locked position
B: Front window unlocked position
C: Front window (upper) partially closed position

MDEQ-01-040-1 ja



MDEQ-01-041-1 ja

ZX85USB-6

1. To unlock the front (upper) window, hold the left and right handles (3) and push lock release lever (2).
2. Lift up on the left and right handles (3) of the front window (upper).
3. After making sure lock release levers (2) are securely locked, set lever (4) on the top-rear of the cab and securely lock the front window (upper).

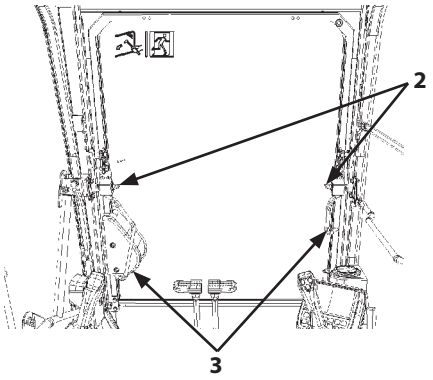
   NOTE

   When the upper front window is opened, the wiper does not work.

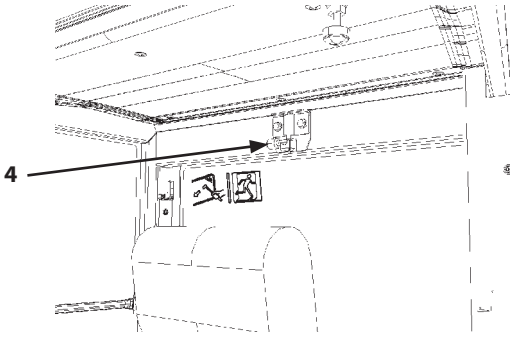
   CAUTION

   - **When opening the front (upper) window, always set lever (4) for locking the front window.**
   - **Close the upper front window slowly so you do not catch your fingers.**

4. Close the front (upper) window by performing steps 1 to 3 in reverse order.
   Push lock release lever (2) downward to release the left and right handles (3).

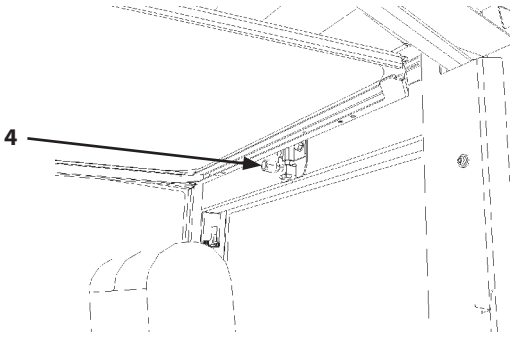


MDEQ-01-042-1 ja



UNLOCK Position

MDEQ-01-043-1 ja



LOCK position

MDEQ-01-044-1 ja

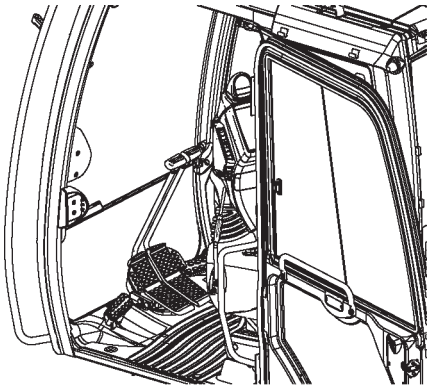
Removing and Storing Lower Front Window

CAUTION

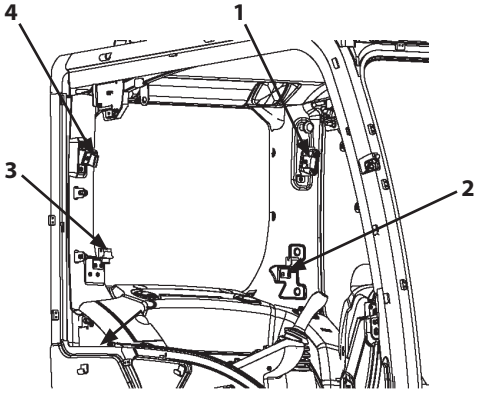
Take care not to get yours fingers caught when handling the lower front window.

ZX85US-6

1. Open the upper front window beforehand when removing the lower front window.
2. Lift up the lower front window to remove it.
3. Store the removed windowpane in the storage location to the rear. After inserting the windowpane into rubber clips (2 and 3), slide it sideways securely into rubber clip (4). Push fastener (1) to lock.



MDAA-01-298 ja

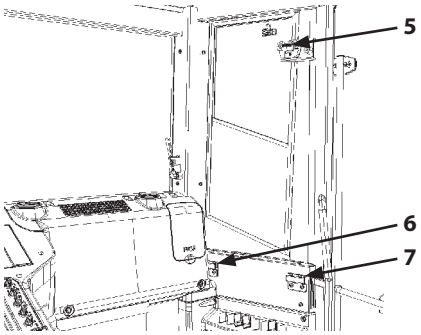


ZX85US-6

MDAA-01-299-1 ja

ZX85USB-6

1. Open the upper front window beforehand when removing the lower front window.
2. Lift up the lower front window to remove it.
3. Store the removed windowpane in the storage location to the rear. To install it, insert the window into brackets (6 and 7) and push in on lock (5) to secure it.



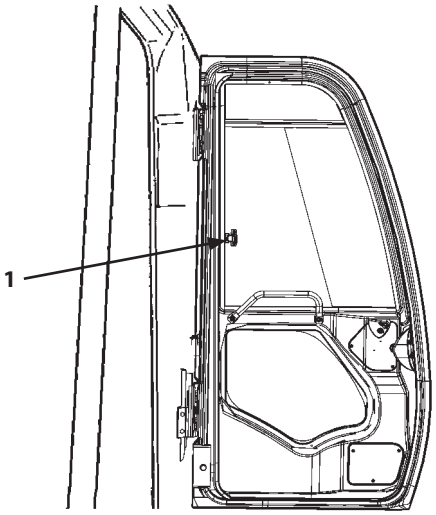
ZX85USB-6

MDEQ-01-045-1 ja

Using the Side Window

ZX85US-6

Hold handle (1) and slide the glass to open or close the side window.

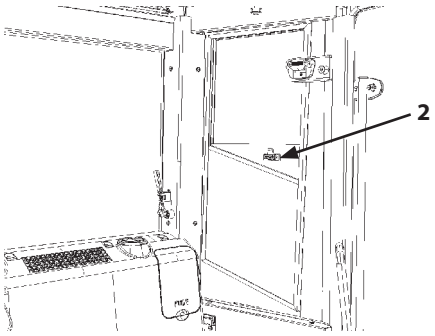


ZX85US-6

MDEQ-01-046-1 ja

ZX85USB-6

Hold handle (2) and slide the glass up/down to open or close the side window.



ZX85USB-6

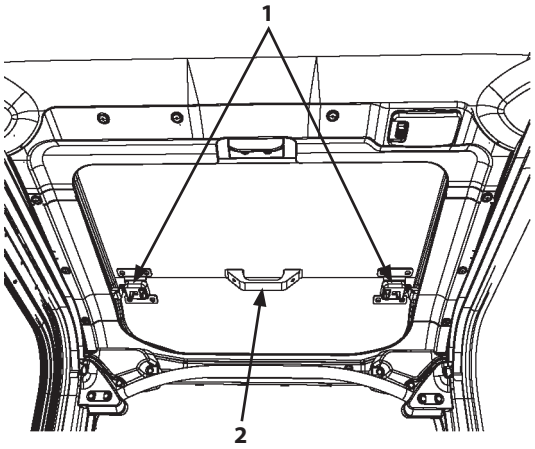
MDEQ-01-047-1 ja

Using the Overhead Window (Clear Hatch) (ZX85US-6) (Optional)

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

To close, hold handle (2) and pull window down until a "click" sound is heard from left and right locks (1).

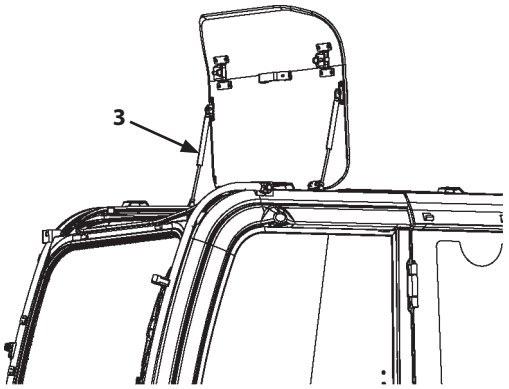
Note that the overhead window can be used as an emergency exit.



MDAA-01-302-1 ja

IMPORTANT

- **Replace the clear hatch with a new one every 5 years even if undamaged. Replace the roof in fewer than 5 years if there is any visible damage or it receives a major impact.**
- **When cleaning the clear hatch, use a neutral detergent.**
  If an 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.**

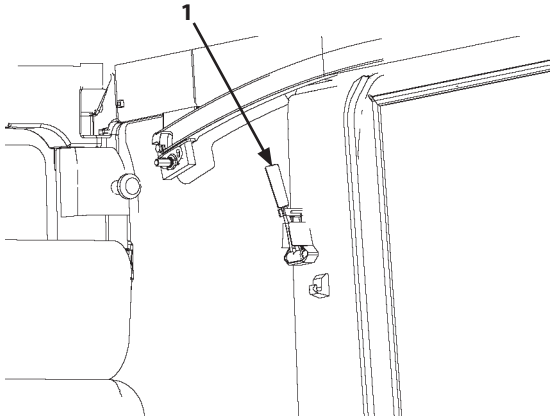


MDAA-01-303-1 ja

Emergency Exit

ZX85US-6

Escape from the cab in an emergency as follows:



MDAA-01-321-1 ja

CAUTION

The danger of falling is always present when escaping from the cab in an emergency, and may result in serious personal injury. Escape from the cab as safely as possible, depending on the position of the machine and the situation outside.

1. If it is possible to escape via the cab door, then do so.
2. If the cab door is difficult to open or use, open the upper front window. Escape through the window.

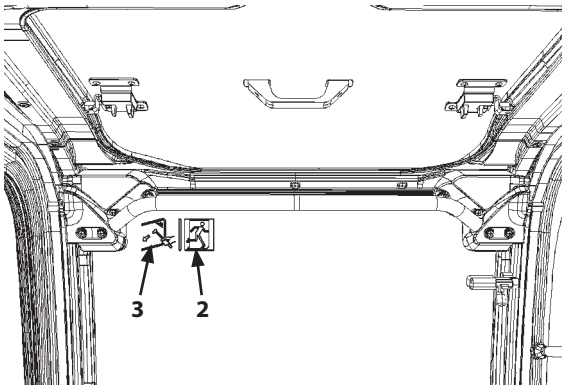
NOTE

Emergency exit decals (2) are affixed to the front and rear windows. See the section Opening the Upper Front Window for how to open the upper front window.

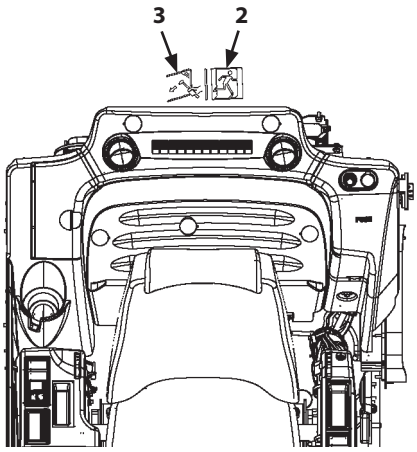
CAUTION

If decal (3) is affixed to the front windowpane, the windowpane can be broken. However if decal (3) is not affixed to the front windowpane, the glass cannot be broken with emergency evacuation hammer (1). If any windows are cracked or broken, take care not to be injured by pieces of broken glass.

3. If the upper front window is difficult to open, check if decal (3) is affixed to the windowpane.
   If decal (3) is affixed to the front windowpane, break the front windowpane using the emergency evacuation tool (1) mounted on the left side of the cab. Escape through the broken windowpane.
4. If no decal (3) is affixed to the front windowpane, or if it is not possible to escape through the front window, break the rear windowpane using emergency evacuation hammer (1). Escape through the broken windowpane.
5. If neither front nor rear windows are available for emergency exit, open the overhead window to escape from the cab.



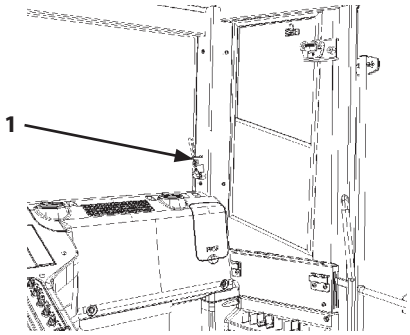
M1U4-01-012-1 ja



MDAA-01-322-1 ja

ZX85USB-6

Escape from the cab in an emergency as follows:



MDEQ-01-045-2 ja

CAUTION

The danger of falling is always present when escaping from the cab in an emergency, and may result in serious personal injury. Escape from the cab as safely as possible, depending on the position of the machine and the situation outside.

1. If it is possible to escape via the cab door, then do so.
2. If the cab door is difficult to open or use, open the upper front window. Escape through the window.

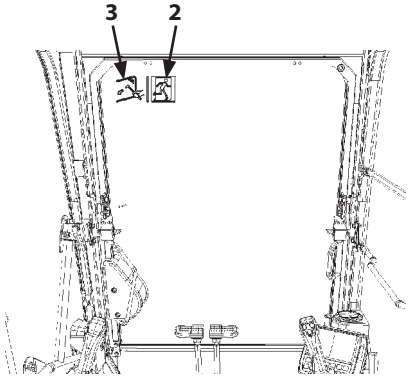
NOTE

Emergency exit decals (2) are affixed to the front and rear windows. See the section Opening the Upper Front Window for how to open the upper front window.

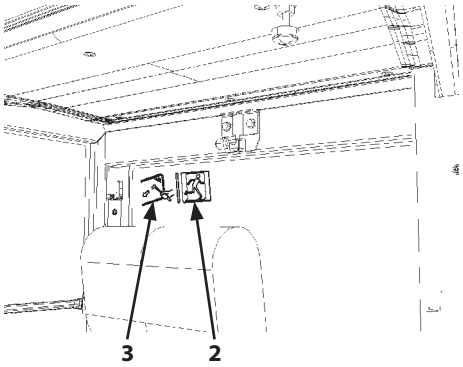
CAUTION

If decal (3) is affixed to the front windowpane, the windowpane can be broken. However if decal (3) is not affixed to the front windowpane, the glass cannot be broken with emergency evacuation hammer (1). If any windows are cracked or broken, take care not to be injured by pieces of broken glass.

3. If the upper front window is difficult to open, check if decal (3) is affixed to the windowpane.
   If decal (3) is affixed to the front windowpane, break the front windowpane using the emergency evacuation tool (1) mounted on the left side of the cab. Escape through the broken windowpane.
4. If no decal (3) is affixed to the front windowpane, or if it is not possible to escape through the front window, break the rear windowpane using emergency evacuation hammer (1). Escape through the broken windowpane.



MDEQ-01-042-2 ja



MDEQ-01-043-2 ja

Adjusting Operator's Seat

WARNING

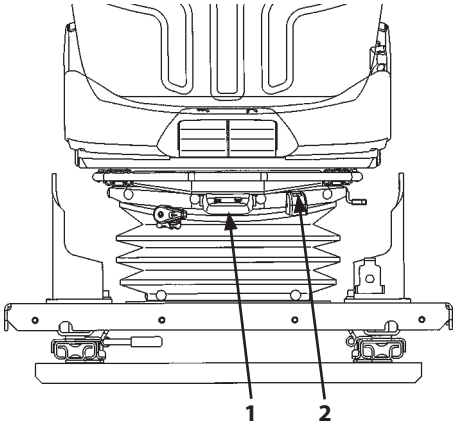
Adjust the seat only after lowering the front attachment on the ground and pulling up the pilot control shut-off lever to the LOCK position. Failure to do so may allow the machine to move unexpectedly if a control lever or pedal is touched with a part of the body by mistake, possibly resulting in personal injury or death.

Adjusting Seat Height

IMPORTANT

The seat is an air suspension type.

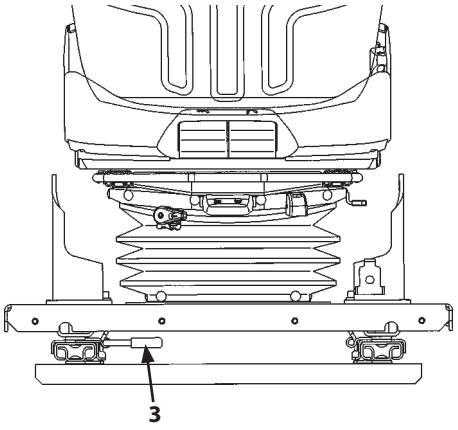
Pull lever (1) upward to fill air and raise the seat. Push lever (1) downward to release air and lower the seat. When the seat is properly adjusted for your weight, indicator (2) is in the green zone.



MDEQ-01-074-1 ja

Console and Seat Fore-aft Adjustment (ZX85US-6)

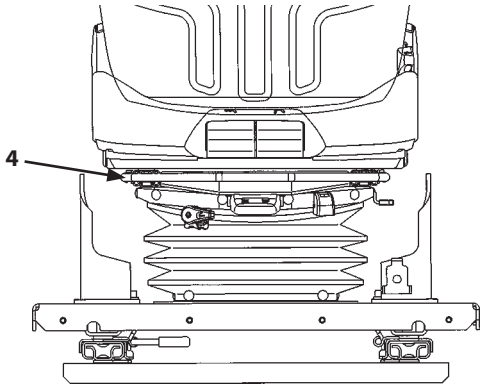
Operate console and seat slide lever (3) to adjust the seat and both right and left consoles to desired distance from the travel pedals and levers. Seat and console fore-aft adjustment range is 160 mm (6.3 in) with steps every 20 mm (0.8 in).



MDEQ-01-074-2 ja

Seat Fore-Aft Adjustment

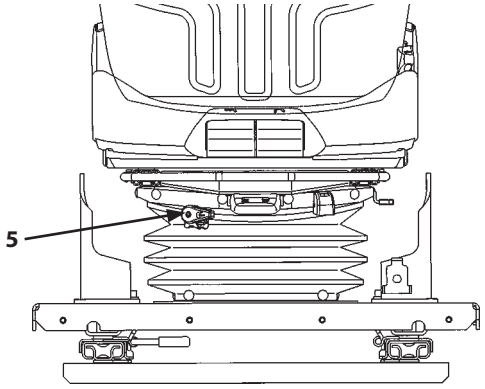
Operate seat slide lever (4) to adjust the seat to desired distance from the travel pedals and levers. Seat fore-aft adjustment range is 190 mm (7.5 in) with steps every 10 mm (0.4 in).



MDEQ-01-074-3 ja

Suspension Adjustment

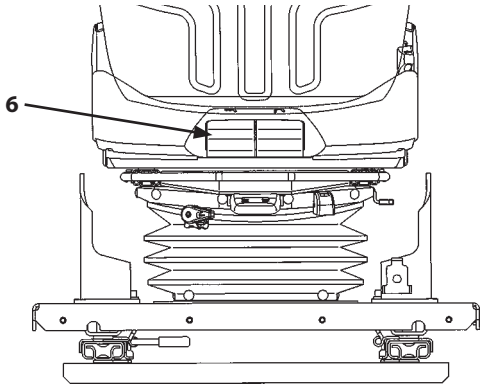
Rotate knob (5) to adjust the suspension.
Rotate knob (5) clockwise to decrease suspension stiffness.
Rotate knob (5) counterclockwise to increase suspension stiffness.



MDEQ-01-074-4 ja

Fore-Aft Position Adjustment of Seat Surface

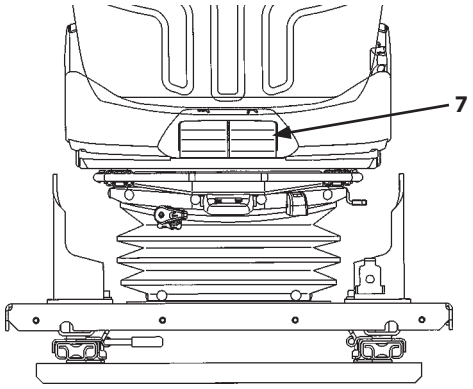
Pull lever (6) upward to adjust the seat angle. Seat and console fore-aft adjustment range is 60 mm (2.4 in) with steps every 15 mm (0.6 in).



MDEQ-01-074-5 ja

Angle Adjustment of Seat Surface

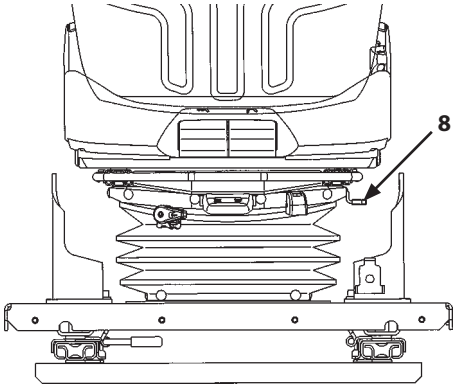
Pull lever (7) upward to adjust the seat angle. Height of the seat end is adjustable in 4 steps.



MDEQ-01-074-6 ja

Backrest Adjustment

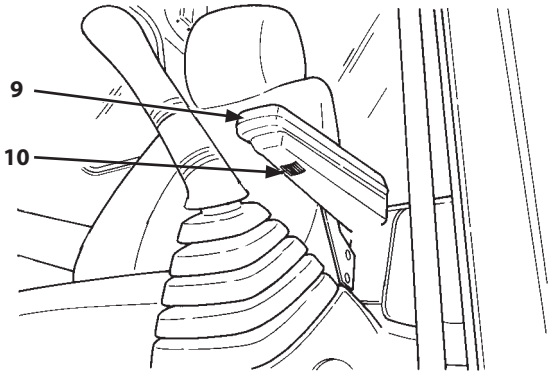
Pull up lever (8) to release backrest lock. Move backrest to the desired position. Move backrest to the desired position and release lever (8).



MDEQ-01-074-7 ja

Armrest Adjustment (ZX85US-6)

Armrest (9) can be pulled upright by hand 90°. Pull the armrest upright by hand to get on and off the machine easily. The angle of armrest (9) can be adjusted to the desired position by turning adjusting dial (10) located on the bottom of armrest (9).



M1G6-01-017-3 ja

Console Height Adjustment

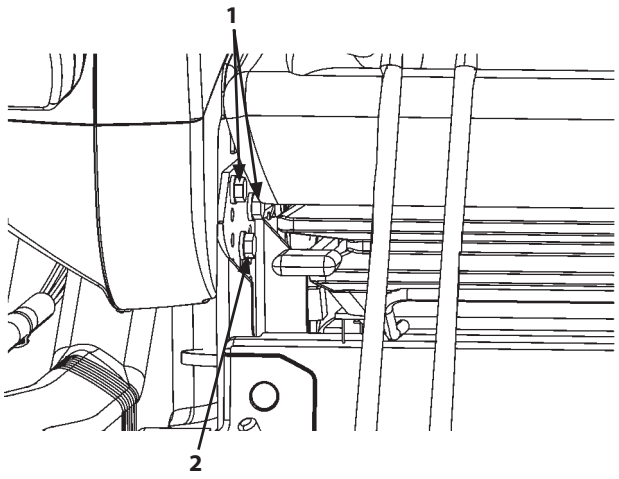
Adjust the console height for the operator's comfort and/or work conditions. Console height can be vertically adjusted to 3 positions at 20 mm intervals.

CAUTION

Before loosening its bolts, support the console. Failure to do so may result in the console dropping suddenly, possibly causing personal injury.

Console Height Adjustment Procedure

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 mounting bolts (1). Loosen bolt (2) and adjust the console height.
4. After adjusting, tighten bolts (1) and (2). Tightening Torque: 50 N·m (5 kgf·m)



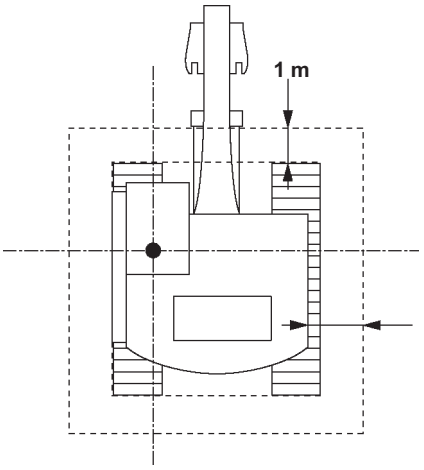
M1U1-01-030-1 ja

Installation and Adjustment of Mirrors

WARNING

Adjust the mirrors before starting work. Improper adjustment of the mirrors results in poor visibility, which may cause a serious injury or death.

Adjust the mirrors so that anyone on the ground within 1 meter of the machine (or an object 1.5 meters high and 30 cm in diameter) can be seen from the operator's seat.



MDEQ-01-050-1 ja

IMPORTANT

- **The image displayed on the rear view camera monitor is meant only as an aid. When operating the machine, pay thorough attention to the surrounding situation.**
- **If a modification is made that may restrict the operator's visibility, recheck the operator's visual field.**

Mirror Installation Diagram

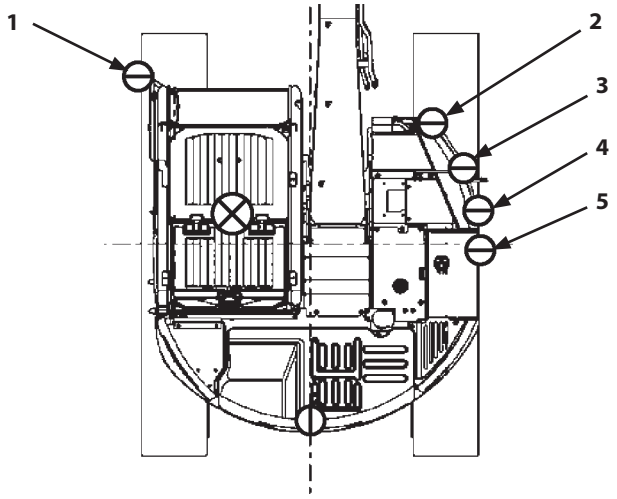
The mirror installation locations (1, 2, 3, 4, 5) on this machine are shown in the right.
Adjust the installation locations of each mirror by following the instructions below to ensure safety.
Installation angle and dimension varies depending on the model.

ZX85US-6

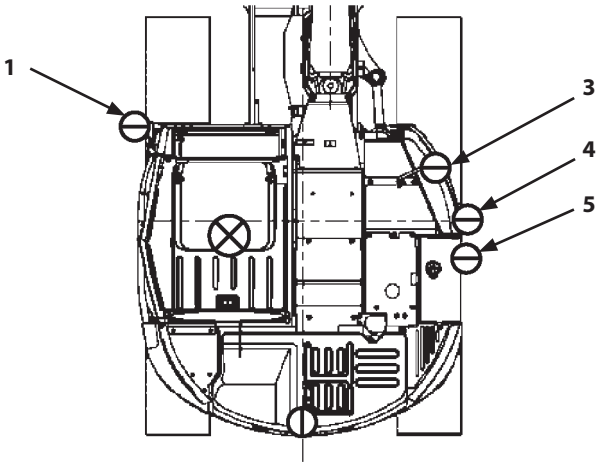
1- Operator's Seat Mirror
2- Right Front Cover Mirror (Front)
3- Right Front Cover Mirror (Rear)
4- Oil Tank Handrail Mirror (Front)
5- Oil Tank Handrail Mirror (Rear)

ZX85USB-6

1- Operator's Seat Mirror
3- Right Front Cover Mirror
4- Oil Tank Handrail Mirror (Front)
5- Oil Tank Handrail Mirror (Rear)



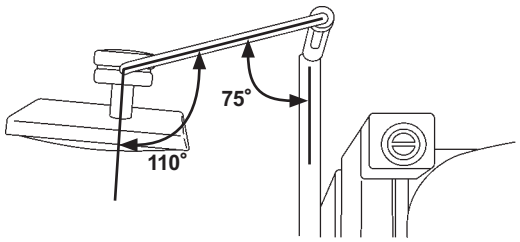
MDEQ-01-056-1 ja



MDEQ-01-057-1 ja

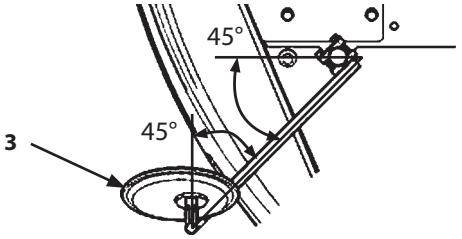
ZX85US-6

- Operator's Seat Mirror (1)
  Adjust the mirror to the specified position.

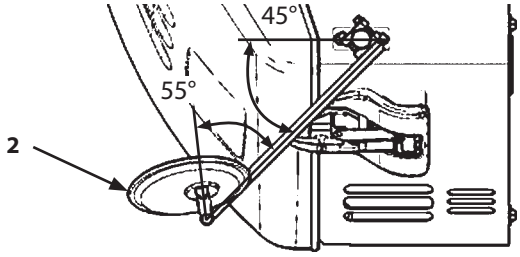


MDC1-01-549-1 ja

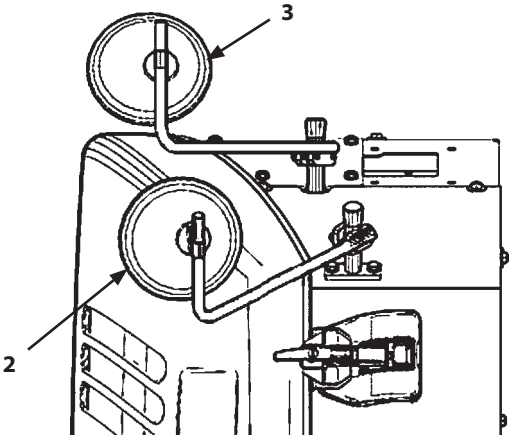
- Right Front Cover Mirror (Front) (2)
- Right Front Cover Mirror (Rear) (3)
  Adjust the mirror to the specified position.
  Adjust the mirror so that a range of at least 1 m from the right side of the machine can be seen from the operator's seat.



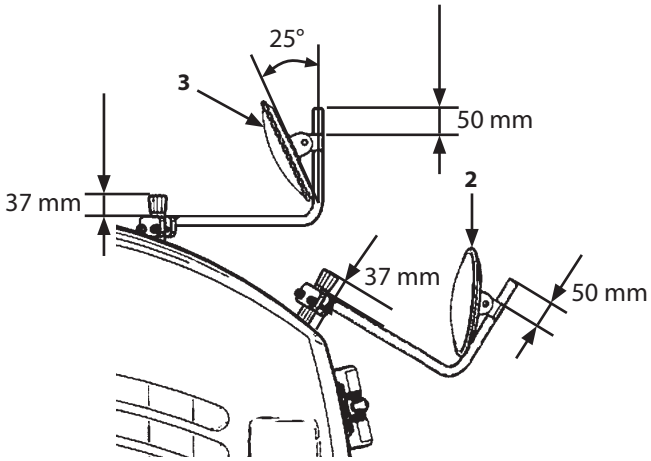
MDEQ-01-058-1 ja



MDEQ-01-059-1 ja

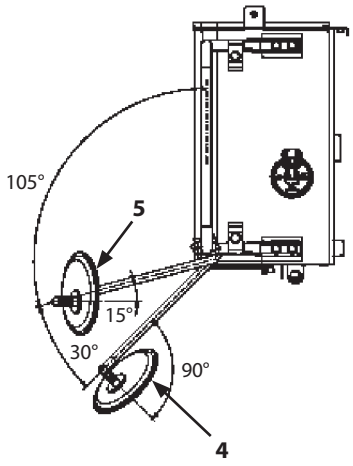


MDEQ-01-060-1 ja

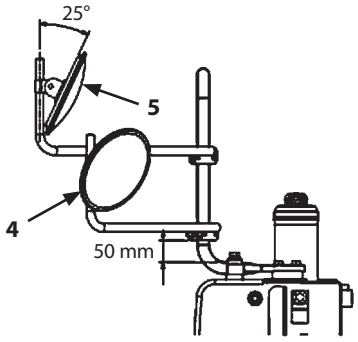


MDEQ-01-061-1 ja

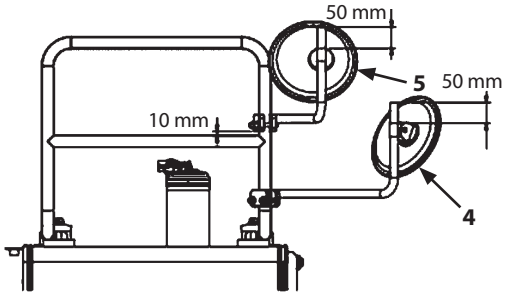
- Oil Tank Handrail Mirror (Front) (4)
- Oil Tank Handrail Mirror (Rear) (5)
  Adjust the mirror to the specified position.
  Adjust the mirror so that a range of at least 1 m from the right side of the machine can be seen from the operator's seat.



MDEQ-01-062-1 ja



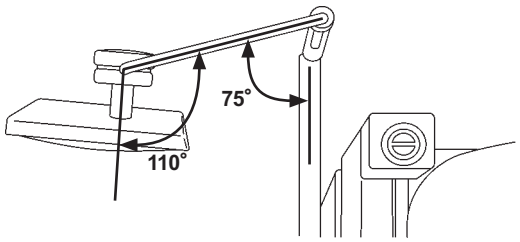
MDEQ-01-063-1 ja



MDEQ-01-064-1 ja

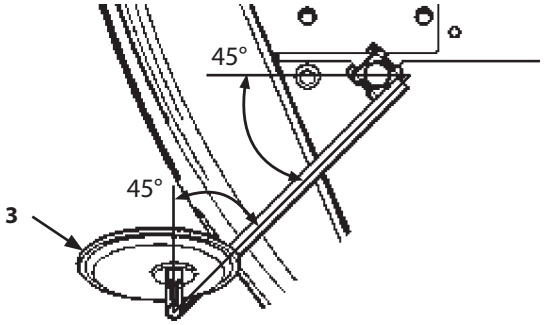
ZX85USB-6

- Operator's Seat Mirror (1)
  Adjust the mirror to the specified position.

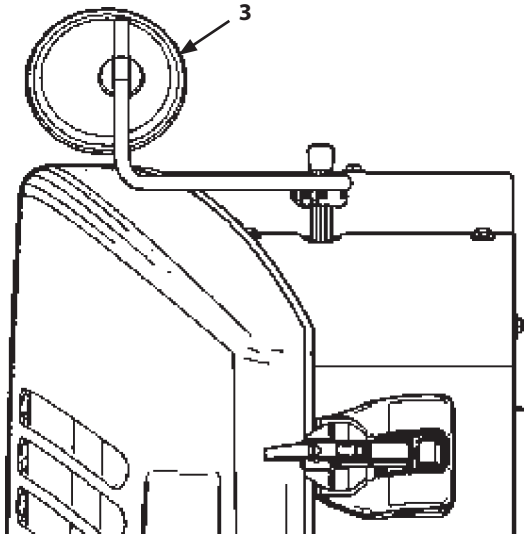


MDC1-01-549-1 ja

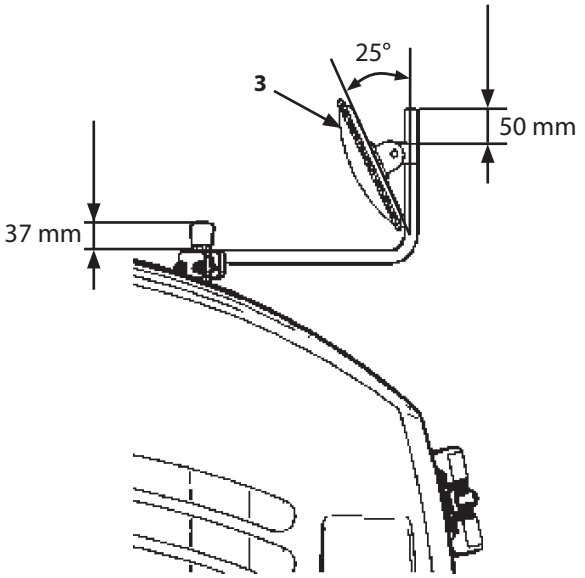
- Right Front Cover Mirror (3)
  Adjust the mirror to the specified position.
  Adjust the mirror so that a range of at least 1 m from the right side of the machine can be seen from the operator's seat.



MDEQ-01-065-1 ja

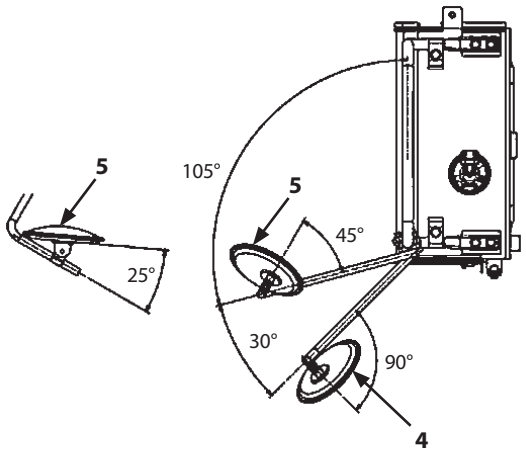


MDEQ-01-066-1 ja

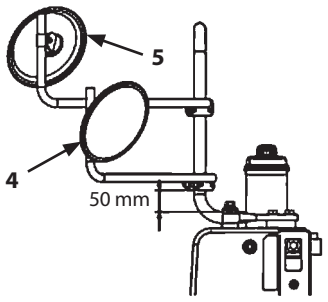


MDEQ-01-067-1 ja

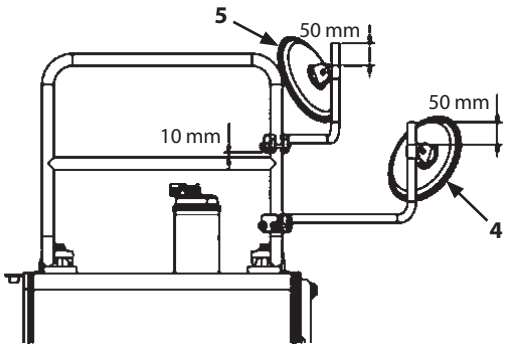
- Oil Tank Handrail Mirror (Front) (4)
- Oil Tank Handrail Mirror (Rear) (5)
  Adjust the mirror to the specified position.
  Adjust the mirror so that a range of at least 1 m from the right side of the machine can be seen from the operator's seat.



MDEQ-01-068-2 ja



MDEQ-01-069-1 ja

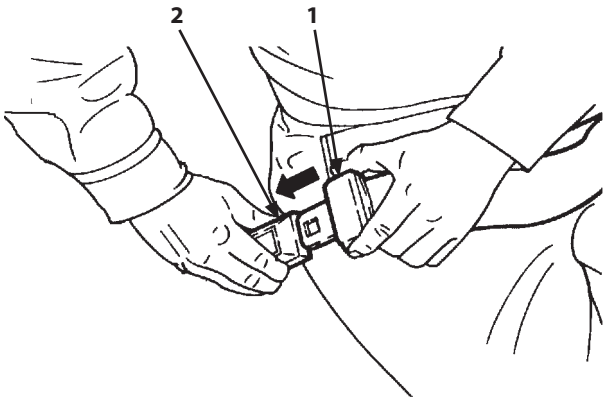


MDEQ-01-070-1 ja

Seat Belt

WARNING

- **Be sure to use seat belt (1) when operating the machine.**
- **Before operating the machine, always check the condition of seat belt (1) and its mounting hardware. If any damage and/or wear are found, replace the part concerned.**
- **Replace seat belt (1) every 3 years, regardless of appearance.**

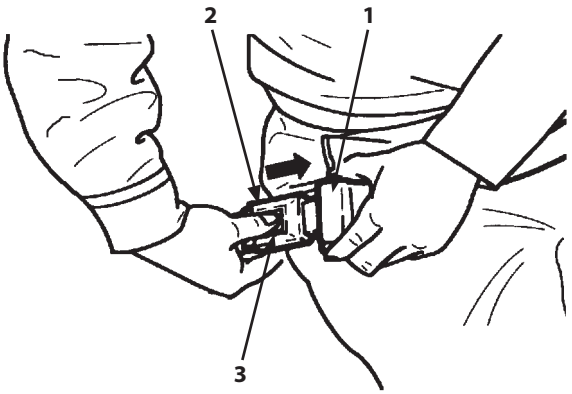


M1U1-01-031-1 ja

Using the Seat Belt

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

Replace seat belt (1) if it is damaged or worn, or if the machine is involved in an accident which puts severe stress on the seatbelt.



M1U1-01-032-1 ja

Battery Disconnect Switch (Optional)

IMPORTANT

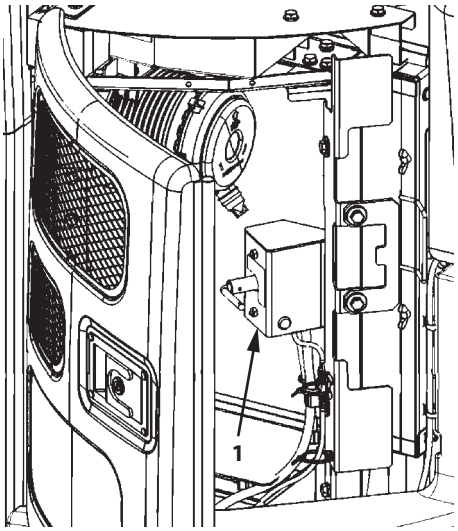
Do not turn battery disconnect switch (1) OFF while the engine is running or the key switch is in any position other than OFF. Doing so may damage the electrical system.

The battery disconnect switch (1) differs from the engine start key switch. When the battery disconnect switch is turned OFF, the electrical system is cut off, so no electric current flows in the entire circuit.

Before turning the battery disconnect switch OFF, be sure to turn the key switch OFF and wait 1 minute or more after the engine stops. If battery disconnect switch (1) is turned OFF within 1 minute of stopping the engine, it may cause a malfunction of the electrical system. Also, when battery disconnect switch (1) is turned from OFF to ON, the preset data of the radio or clock may be initialized, so reset them.

Use battery disconnect switch (1) for the following purposes only.

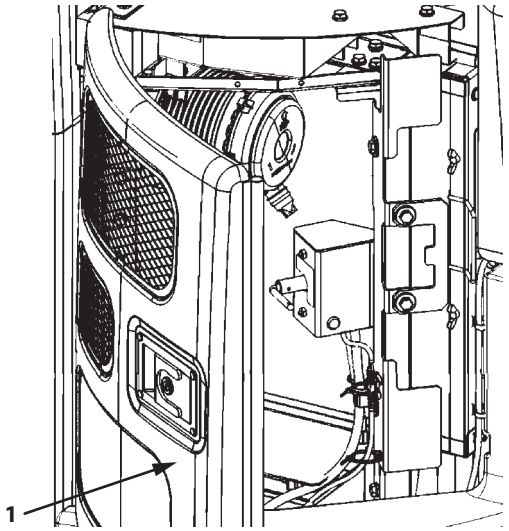
- Before maintaining or servicing the electrical system
- Before storing the machine for long period of time, to prevent battery discharge
- Before welding on the machine body
- Before replacing the battery



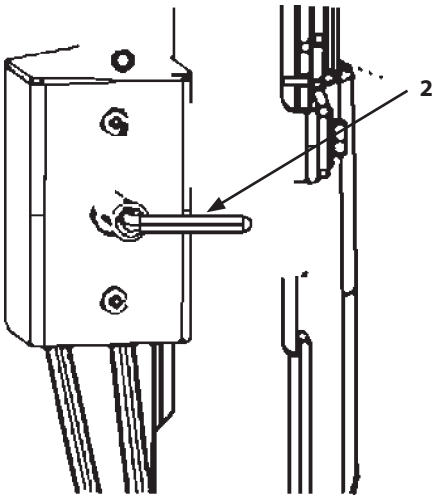
MDEQ-01-051-1 ja

Switch Operation

1. Open cover (1).
   When lever (2) is in the horizontal position, the battery disconnect switch is ON. When lever (2) is in the horizontal position, lever (2) can not be removed.
   To operate the machine with the battery disconnect switch in the ON position, close cover (1).
2. When lever (2) is turned counterclockwise to perpendicular, the battery disconnect switch turns OFF. Lever (2) can be removed from the battery disconnect switch when it is in the OFF position.
3. Store lever (2) in a safe place after removal to avoid losing it.

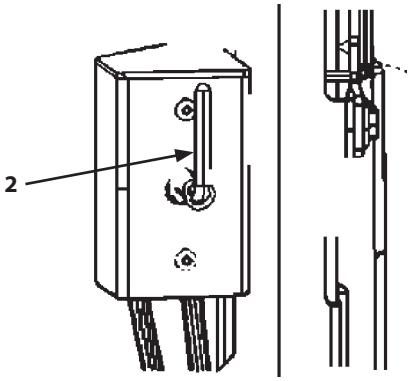


MDEQ-01-051-2 ja



ON

MDEQ-01-053-1 ja



OFF

MDEQ-01-052-1 ja

MEMO

BREAK-IN

New Machine Break-in

IMPORTANT

If a full load is applied to the engine without first breaking it in, it may result in seizure, galling, etc., and will greatly impact the service life of the machine. Break in the machine properly as instructed.

Machine life and performance are greatly affected by how it is treated as a new machine.

For the first 50 hours, only operate the machine in economy (ECO) mode and limit engine horsepower to around 80 % of its full load to break it in.

Also, grease bucket and link pivots every day.

NOTE

Pay close attention to the engine oil pressure and coolant temperature during the engine break-in period.
Also, check the engine oil and coolant levels frequently.

MEMO

Inspect Machine Daily Before Starting

Perform required daily checks before starting the engine.

Engine

- Levels and dirtiness of engine oil and coolant*1
- Oil and water leaks, damage to hoses and pipes
- Clogging and damage to radiator, oil cooler, intercooler and fuel cooler
- Loose and/or missing mounting bolts and nuts
- Clean around the muffler filter

Upperstructure

- Fuel level, leaks and contamination of fuel in tank*1
- Hydraulic oil level, contamination of hydraulic oil, leaks from hydraulic oil tank*1
- Movement, play and operating force of all control levers
- Operation of all hydraulic components, oil leaks and damage to pipings and hoses
- Deformity, breakage, and abnormal noise at each part
- Loose and/or missing mounting bolts and nuts
- Washer fluid*1

Undercarriage

- Sag, wear and damage to crawlers*1
- Oil leaks and wear on upper/lower rollers and front idlers
- Oil leaks from travel devices
- Loose and/or missing mounting bolts and nuts

Working Device

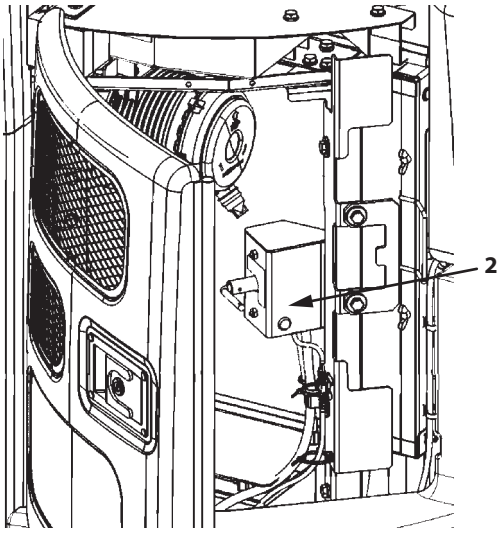
- Check cylinders, pipe lines and hoses for oil leaks and damage
- Wear and damage to the bucket
- Check for missing, loose and/or worn bucket teeth*1
- Condition of lubrication of working device
- Damage to pin anti-extraction pins, stoppers, rings and bolts
- Loose and/or missing mounting bolts and nuts

Other

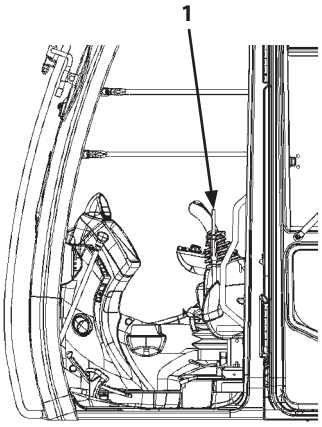
- Operation of instruments, switches, lights and buzzer/horn*1
- Function of parking brake
- Deformity and/or damage to the head guard
- Abnormal outside appearance of machine
- Wear or damage to seat belt*1

*1 For details on inspections, refer to “Inspections and Maintenance”.

Before Starting the Engine

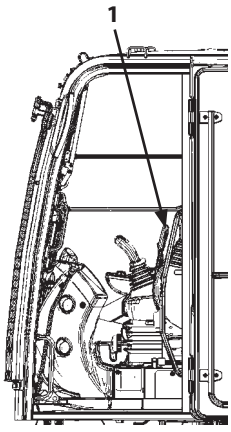


MDEQ-01-051-3 ja



LOCK position
ZX85US-6

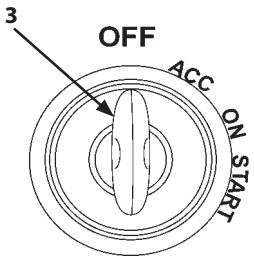
MDEQ-03-001-1 ja



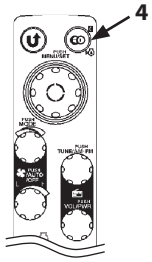
LOCK position
ZX85USB-6

MDEQ-03-003-1 ja

1. For machines equipped with a battery disconnect switch (2), make sure it is in the ON position.
   Battery disconnect switch (2) is inside the left cover.
2. Confirm that pilot control shut-off lever (1) is in the LOCK position.
3. Confirm that all control levers are placed in neutral.
4. Insert the key in key switch (3) and turn it to the ON position. Press and hold switch (4) with the engine stopped. After being lit for about 2 seconds, the basic screen is displayed. However, the alternator indicator (A) and engine oil pressure indicator (B) stay lit.



MDCD-01-030-4 ja



MDC1-01-026-11 ja

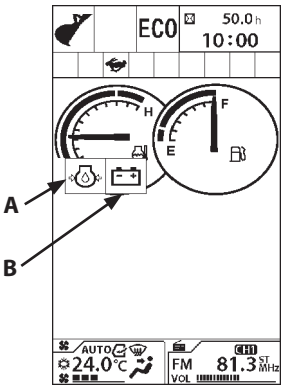
IMPORTANT

The monitor indicates the control status of the machine. If the machine is used when none of the warning lights light up, it cannot indicate warnings when something abnormal happens. Consult the nearest Hitachi representative immediately for repairs. If charge lamp (B) or engine oil pressure indicator (A) go off when the basic screen is displayed, there is a problem with the machine. Consult the nearest Hitachi representative immediately for repairs.

5. Adjust the seat to allow full control pedals and levers stroke with operator's back against the backrest. Fasten the seat belt.

NOTE

The monitor surface is made of plastic. When the surface becomes dusty, lightly wipe the surface with a wet cloth. Never use an organic solvent.

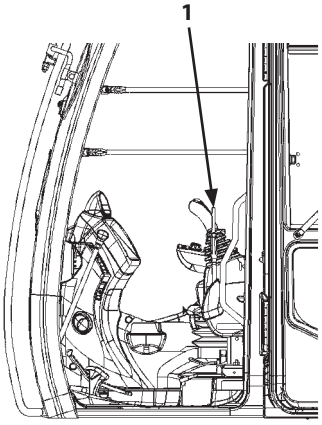


MDAA-01-041-1 ja

Starting the Engine

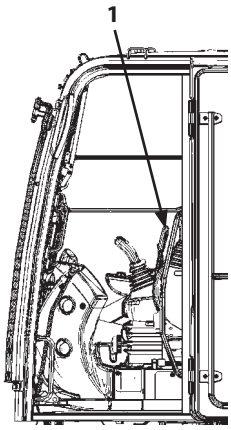
Starting the Engine at Ordinary Temperature

1. Confirm that pilot control shut-off lever (1) is in the LOCK position.
2. Turn engine control dial (3) to the slow idle position.
3. Sound horn to alert bystanders.



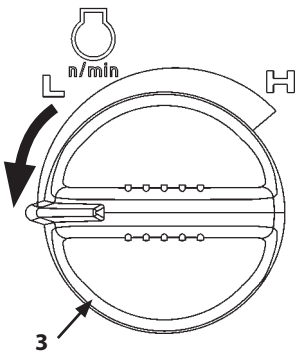
LOCK position
ZX85US-6

MDEQ-03-001-1 ja



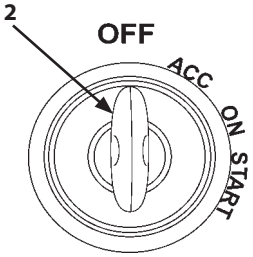
LOCK position
ZX85USB-6

MDEQ-03-003-1 ja



M1P1-01-068-2-1 ja

4. Insert key (2) to the key switch. Turn it to ON position.
5. Wait-screen (nothing is displayed) is displayed on the monitor for 2 seconds. Regardless of pilot control shut-off lever (1) position, the engine can not be cranked during this moment.



MDCD-01-030-3 ja

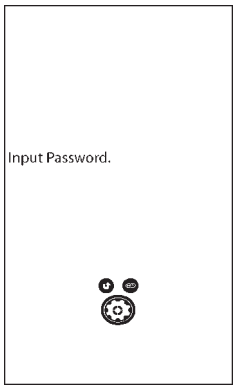
6. When the Password Input screen is displayed on the monitor, input the password. Unless the numeric keypad function (ignition block system) is activated, this screen is not displayed.

IMPORTANT

When required to activate the numeric keypad function, consult your authorized dealer.

NOTE

The monitor surface is made of plastic. When the surface becomes dusty, lightly wipe the surface with a wet cloth. Never use an organic solvent.

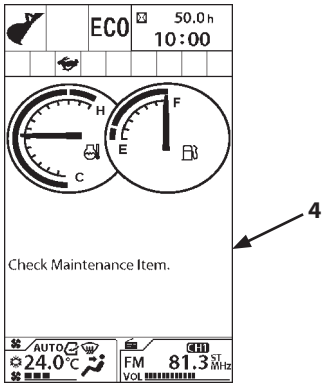


Password Input Screen

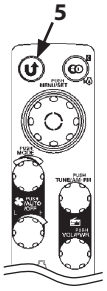
MDAA-01-085 en_GB

NOTE

When the key switch is turned ON, maintenance notification (4) for the item whose maintenance interval has expired displays for 10 seconds. Push Return to Previous Screen switch (5) or turn the pilot control shut-off lever to the UNLOCK position while the rear view camera is enabled to delete the notification.

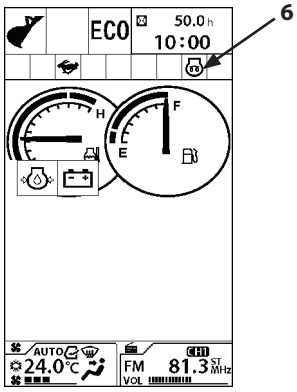


MDAA-01-213-2 en_GB



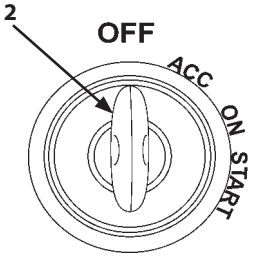
MDC1-01-026-10 ja

7. The Basic Screen will be displayed on the monitor. Check that the preheat indicator (6) is OFF at this time.



MDEC-01-042-1 ja

8. Turn key (2) to the START position to rotate the starter. The engine will start.

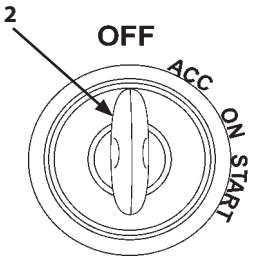


MDCD-01-030-3 ja

IMPORTANT

Never operate the starter for more than 10 seconds at a time. If the engine fails to start, return the key switch to the OFF position. Wait for at least 30 seconds, then try again. Failure to follow instructions may cause damage to the starter and/or discharge the batteries.

9. Release key switch (2) just after the engine has started. Key switch (2) returns automatically to the ON position.



MDCD-01-030-3 ja

NOTE

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

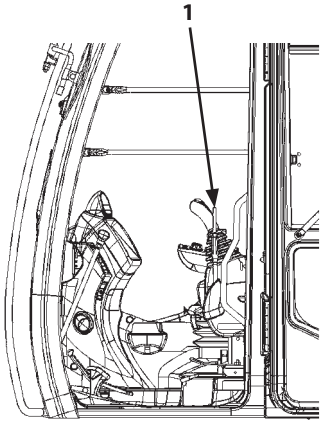
Starting in Cold Weather

CAUTION

Do not use additives for helping start the engine. Doing so may damage the engine.

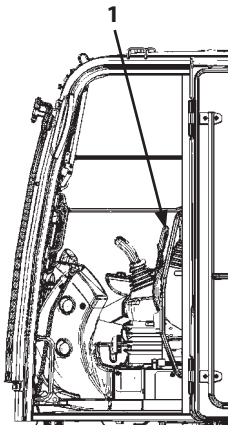
Preheating

1. Confirm that pilot control shut-off lever (1) is in the LOCK position.
2. Turn engine control dial (3) to the slow idle position.
3. Sound the horn to alert bystanders.



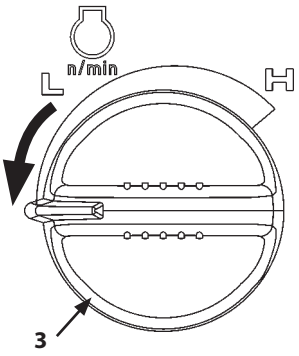
LOCK position
ZX85US-6

MDEQ-03-001-1 ja



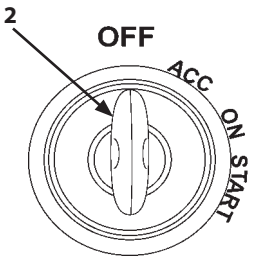
LOCK position
ZX85USB-6

MDEQ-03-003-1 ja



M1P1-01-068-2-1 ja

4. Insert key (2) to the key switch. Turn it to ON position.
5. Wait-screen (nothing is displayed) is displayed on the monitor for 2 seconds. Regardless of pilot control shut-off lever (1) position, the engine can not be cranked during this moment.

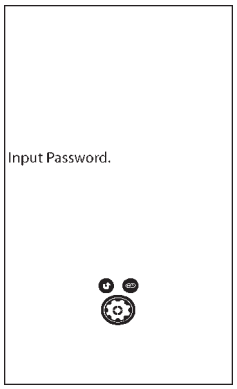


MDCD-01-030-3 ja

6. When the Password Input screen is displayed on the monitor, input the password. Unless the numeric keypad function (ignition block system) is activated, this screen is not displayed.

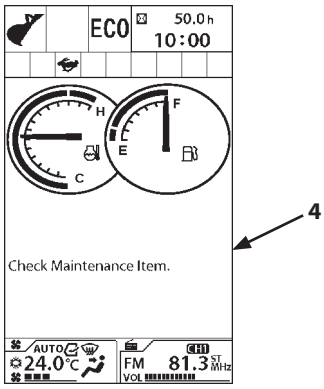
NOTE

When the key switch is turned ON, maintenance notification (4) for the item whose maintenance interval has expired displays for 10 seconds. Push Return to Previous Screen switch (5) or turn the pilot control shut-off lever to the UNLOCK position while the rear view camera is enabled to delete the notification.

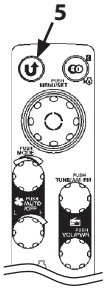


Password Input Screen

MDAA-01-085 en_GB



MDAA-01-213-2 en_GB



MDC1-01-026-10 ja

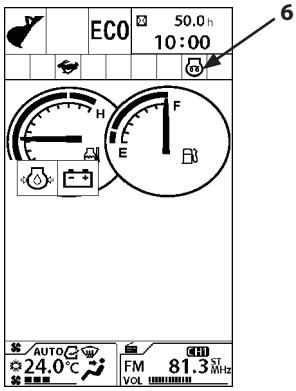
IMPORTANT

When required to activate the numeric keypad function, consult your authorized dealer.

7. 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 (6) is lit for automatically.

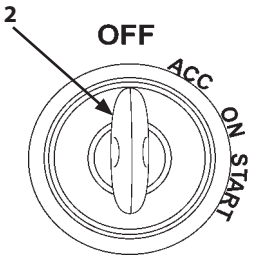
NOTE

If, preheat indicator (6) does not come ON, preheating is not required. Follow the "Starting the Engine in Ordinary Temperature" section.



MDEC-01-042-1 ja

8. As soon as preheat indicator (6) goes OFF, turn key switch (2) to the START position to turn the starter.



MDCD-01-030-3 ja

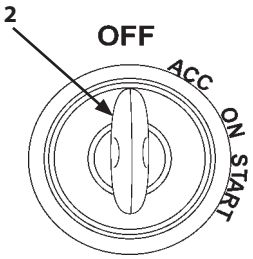
IMPORTANT

Never operate the starter for more than 10 seconds at a time. If the engine fails to start, return the key switch to the OFF position. Wait for at least 30 seconds, then try again. Failure to follow instructions may cause damage to the starter and/or discharge the batteries. Trying to actuate the starter while the engine is running may damage both the starter and the flywheel of the engine.

9. Release key switch (2) just after the engine has started. Key switch (2) returns automatically to the ON position.

NOTE

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



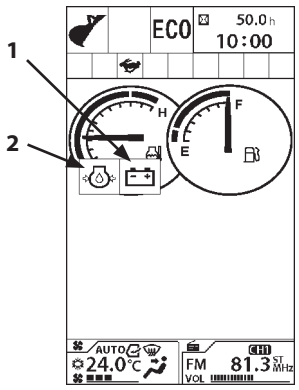
MDCD-01-030-3 ja

Check Instruments After Starting

Checking instruments through monitor functions

After starting the engine, check the following on the monitor.

1. Check that alternator indicator (1) is OFF. If alternator indicator (1) stays ON, immediately stop the engine. Inspect the alternator and battery system for any abnormality.
2. Check that engine oil pressure indicator (2) is OFF and the alarm buzzer does not sound.
   If engine oil pressure indicator (2) stays ON and the buzzer sounds, immediately stop the engine. Inspect the engine oil pressure system and the oil level.



MDAA-01-041-2 ja

IMPORTANT

If any abnormality is found on the monitor unit, immediately stop the engine. Inspect the cause of the problem.

CAUTION

- **Do not turn the key to the START position of the key switch while the engine is running. Doing so may damage the starter pinion gear and/or starter gear.**
- **Do not disconnect the battery cables or the battery while the engine is running. Doing so may damage electrical equipment.**

Check Engine Noise and Exhaust Gas Color

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

NOTE

- *Check the exhaust gas color as follows. (After warm-up operation, run the engine under no load.)*

  Clear : Normal (Perfect combustion)
  Black : Abnormal (incomplete combustion, fuel system or muffler filter problem)
  White : Abnormal (oil in the combustion chamber, fuel system or muffler filter problem)

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

Using the Booster Battery

⚠ WARNING

- **An explosive gas is produced while batteries are in use or being charged. Keep open flames and sparks away from the battery area. Do not continue to use or charge the battery when electrolyte level is lower than specified. Explosion of the battery may result.**
- **Park the machine and the machine providing the jump on a dry or concrete surface, not on steel plates. If machines are parked on steel plates, it may cause sparking unexpectedly.**
- **Never connect a positive terminal to a negative terminal. Doing so may cause a short.**



SA-032 ja

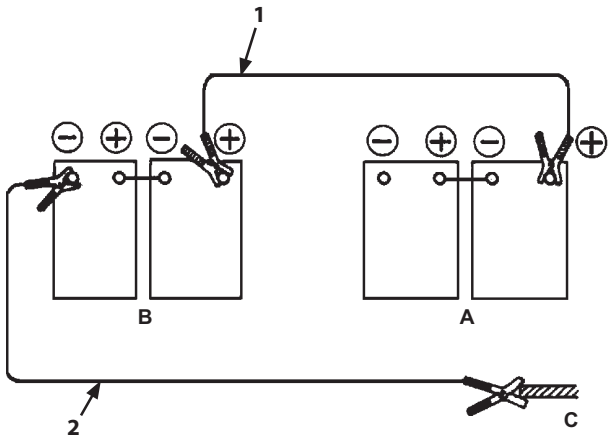
IMPORTANT

The machine electrical system is a 24 volt negative (-) ground. Only jump from a machine with a 24 volt system that has enough extra capacity.

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

Connecting the Booster Batteries

1. Stop the engine of the machine providing the jump.
2. Connect one end of red cable (1) to the positive (+) terminal (A) of one of the machine's batteries, and the other end to the positive (+) terminal (B) of the battery providing the jump.
3. Connect one end of black cable (2) to the negative (-) terminal (B) of a battery providing the jump, and then ground to the frame (C) of the machine to be started with the other end. As sparks may fly when the last connection is made, connect the cable as far away from batteries as possible.
4. After securely connecting the booster cables, start the engine of the machine providing the jump.
5. Start the engine of the machine with the dead batteries.
6. After the engine starts, disconnect cables (2) and (1), following the procedure below.



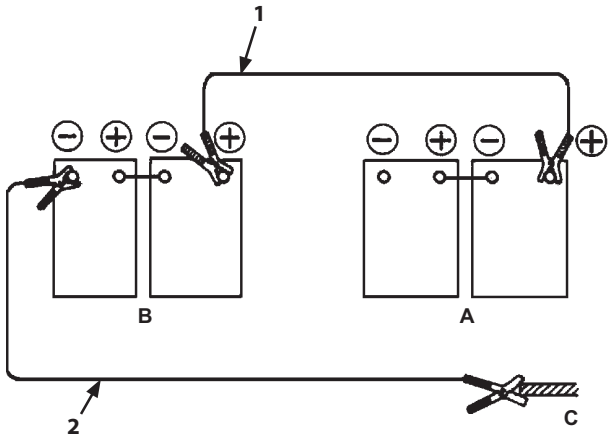
Connecting the Booster Batteries

MDEQ-03-002-1 ja

A	Batteries Being Jumped	C	To Upperstructure Frame of the Machine
B	Batteries Providing Jump		

Disconnecting the Booster Cables

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



Disconnecting the Booster Cables

MDEQ-03-002-1 ja

A	Batteries Being Jumped	C	To Upperstructure Frame of the Machine
B	Batteries Providing Jump		

Stopping the Engine

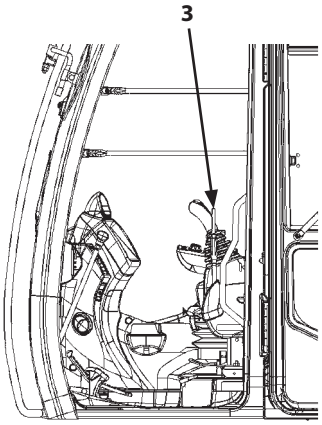
Engine Stop Procedure

1. Except for special cases, before stopping the engine, lower the bucket to the ground.



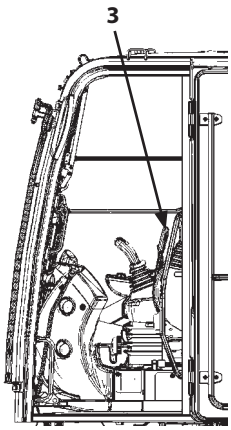
SA-390 ja

2. Pull pilot control shut-off lever (3) to the LOCK position.



LOCK position
ZX85US-6

MDEQ-03-001-2 ja



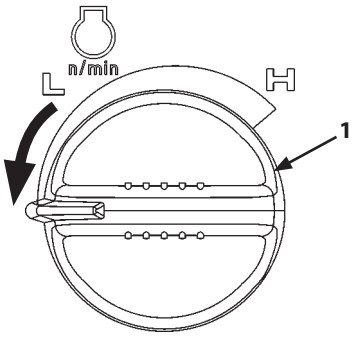
LOCK position
ZX85USB-6

MDEQ-03-003-2 ja

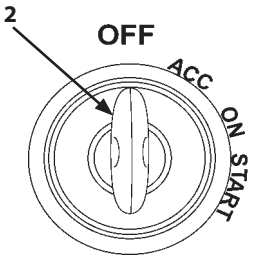
3. Turn key switch (2) OFF to stop the engine.

NOTE

To extend the life of the engine, we recommend a cool-down operation (run at low RPM under no load for 5 minutes) prior to stopping the engine. This cool-down operation can slightly lower the temperature of engine parts that operate at high temperatures, such as the exhaust system, before stopping the engine.



M1P1-01-068-4 ja



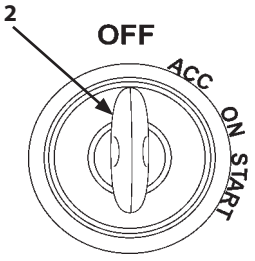
MDCD-01-030-3 ja

If the engine does not stop, even if the key switch is turned to the OFF position. (Emergency Stop)

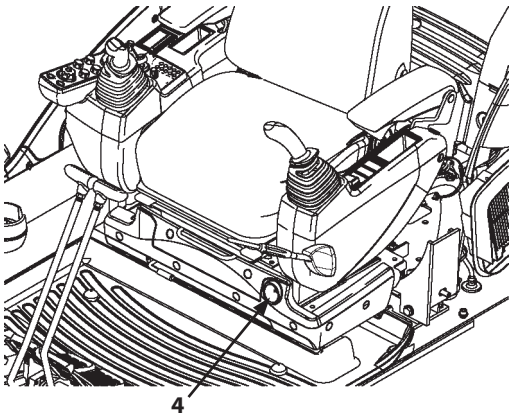
If the engine does not stop even if key switch (2) is turned OFF, due to a fault with the machine, move engine stop switch (4) downward to stop the engine. The engine will stop. Return engine stop switch (4) to its original position (upward).

CAUTION

Do not use engine stop switch (4) unless absolutely necessary. Alternatively, if the machine stops due to machine failure, do not start the machine until it has been repaired.



MDCD-01-030-3 ja

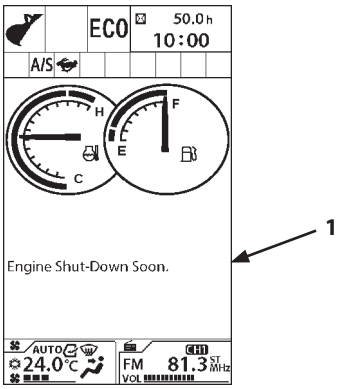


MDAA-01-290-5 ja

Engine Auto-Stop in Extremely Low Temperature

WARNING

This function automatically stops the engine. Take extra care on the work and work environment when using this function.



MDAA-01-146-3 en_GB

IMPORTANT

If the machine is left without being operated in an environment with temperatures under -20°C or lower for a long period of time, exhaust gas particles may accumulate in the muffler filter, which may result in damage to the device.

Under -20 °C or lower environment, the engine will automatically stop 60 minutes after the pilot control shut-off lever is pulled to the LOCK position. 30 seconds before the engine stop, the monitor displays a message that engine will be stopped (1) and the indicator starts flashing. Also the buzzer sounds. The buzzer sounds once at 30 seconds before, continuously sounds from 15 seconds. The engine speed decreases to the idling speed, and then stops after 15 seconds. When the control shut-off lever is pushed down before stopping the engine, the auto shut-down is disabled and the engine will not stop.

IMPORTANT

When the engine stops, turn the key switch to ACC or OFF once and then turn it to START to restart the engine. In the case the engine stops automatically, turn the key switch OFF before leaving the machine for long period of time. Do not leave the machine after auto shut-down. Failure to do so may discharge the batteries.

NOTE

The engine can stop automatically when related conditions are met regardless of the auto shut-down function ON or OFF.

Travel Levers and Pedals

Travel Operation

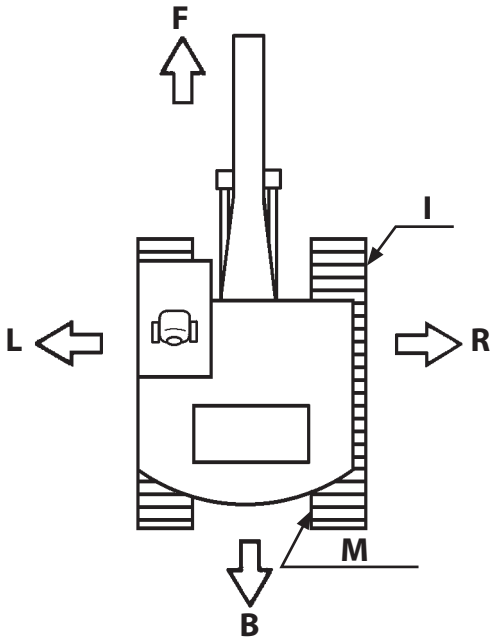
Control of the machine during travel is provided by using levers and pedals.

WARNING

Normal travel operation is when travel motor (M) is at the rear, and the front idler (I) is at the front of the machine.
If travel motor (M) is located at the front of the machine, the machine will move in the reverse direction to that shown on the operation instruction decal.
Check the position of travel motor (M) before starting to travel.

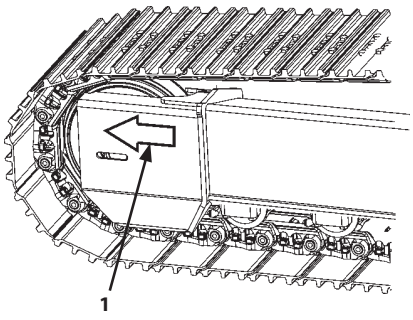
NOTE

- *An arrow mark (1) is stuck on the inside surface of the side frame to indicate the front of the machine.*
- *A travel lever damper is provided on this machine to ensure smooth travel operation. For that reason, the feel of the travel lever or pedal may be heavy in extreme cold (-20°C or below). This is caused by an increase in oil viscosity, not a malfunction.*



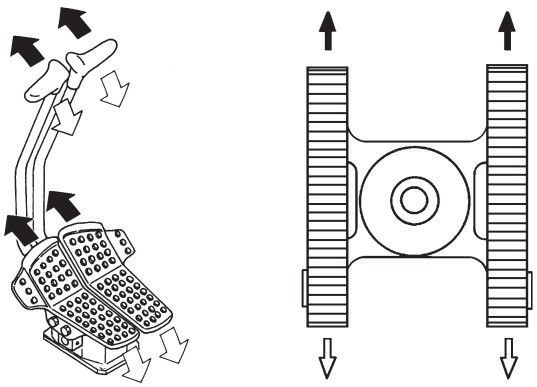
M104-01-038-3 ja

I	Front Idler	B	Rear
M	Travel Motor	R	Right
F	Front	L	Left



M178-03-001-2 ja

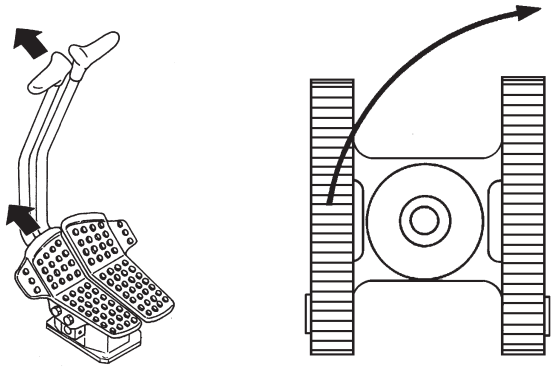
- Forward/Reverse Travel
  Push down both left and right levers (or both pedals) frontward to travel the machine forward. Pull down the two levers (or pedals) rearward to drive the machine in reverse. Travel speed can be controlled by the operation stroke of the travel levers and pedals.
- Ascend/Descending Slopes
  Never attempt to ascend or descend slopes steeper than 35 degrees (70 %).
  Slowly operate the travel levers (or pedals) when descending a slope. When the travel levers are placed in the neutral position, brakes are automatically applied and the machine stops.



Forward/Reverse Travel

M104-04-003 ja

- Pivot Turn
  The machine direction is changed by driving one of two crawlers with either left or right travel levers (or pedals).



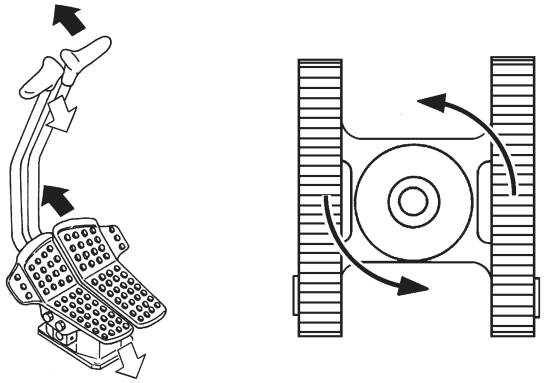
Pivot Turn

M104-04-005 ja

- Spin Turn
  The machine direction is changed by driving the two crawlers in opposite directions at the same time by operating one lever (or pedal) forward and the other lever (or pedal) in reverse.

⚠ CAUTION

The machine may shake during pivot or spin turns. Pay close attention to the surroundings and proceed slowly when turning in tight places.



Spin Turn

M104-04-007 ja

Travel Mode Switch

WARNING

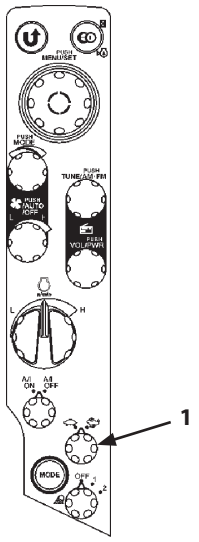
Do not change travel mode switch (1) while traveling. In particular, switching to fast mode while descending a slope is very dangerous. Always stop the machine before changing the travel mode switch (1).

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

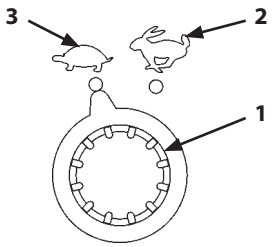
- To go faster: Turn travel mode switch (1) to (2).
- To go slower: Turn travel mode switch (1) to (3).

2- Mark (Fast Speed Mode)

3- Mark (Slow Speed Mode)



MDCD-01-026-12 ja



MDCD-01-028-2 ja

Travel Alarm (Optional)

The travel alarm buzzer sounds during travel operation to alert bystanders that the machine will move.

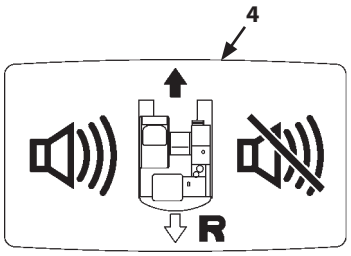
Canceling the Travel Alarm

Pressing the side of travel alarm deactivation switch (4), stops the buzzer after at least 12 seconds have elapsed since starting to travel. (It cannot be canceled before 12 seconds.)

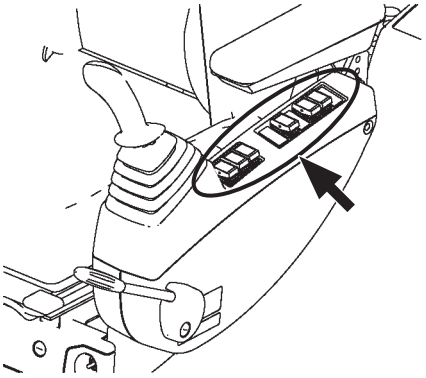
If the machine stops and then starts moving again, the buzzer will also sound again; to stop the buzzer, press deactivation switch (4) again.

NOTE

The position of optional switches varies with the kind of optional devices that the machine is equipped with. Before using the switches, confirm which types of optional devices the machine is equipped with.

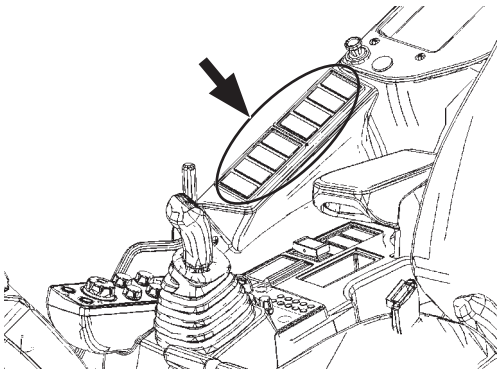


M1U1-01-035-2 ja



Position of Optional Switches
ZX85US-6

MDEQ-04-001-1 ja



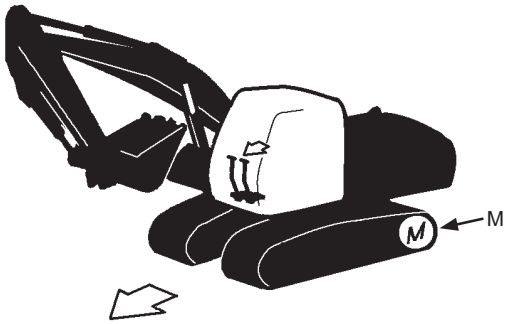
Position of Optional Switches
ZX85USB-6

MDEQ-01-021-2 ja

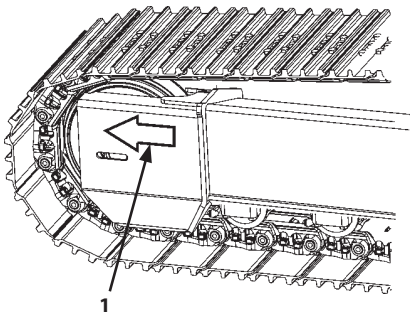
Precautions for Traveling

⚠ CAUTION

When traveling in narrow areas, such as on the shoulder of a road, use someone to provide guidance.



M104-05-008-2 ja



M178-03-001-2 ja



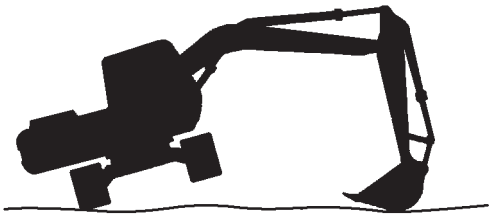
SA-011 ja

- Before moving the machine, check the direction of the undercarriage (position of the travel motor (M)) and then operate the travel lever or pedal.
  An arrow mark (1) is stuck on the inside surface of the side frame to indicate the front of the machine.
- Select as flat a path as possible when moving the machine. When changing direction, do so in a large arc; when small changes are required, make multiple small changes.
- Check the strength of bridges and road shoulders and reinforce them as necessary.
- Use planks to avoid damaging the surface of paved roads when using steel shoes. Pay particular attention in the summertime when traveling on or changing directions on asphalt roads.
- When crossing railroad tracks, take steps such as putting down wood boards to avoid putting all the weight on just the rails.
- Before driving under obstructions such as the girders of bridges and power lines, check their height so you do not touch them.
- When crossing streams or rivers, use the bucket to check the condition of the stream bed as you go and proceed cautiously. Never enter water that is deeper than the allowed depth.
- Traveling across rough terrain imposes severe shocks to the frame of the machine. Lower the engine speed and proceed slowly.
- Do not allow rolling stones to hit the travel motor. Avoid driving in such a way that puts excessive force on the treads, such as trying to drive over obstructions.
- When driving on snowpack or icy roads, or when loading/unloading the machine for transport, take steps to prevent slipping due to clogged shoes.

Traveling on Soft Ground

Avoid traveling on very soft ground that does not have sufficient strength to firmly support the machine. When traveling on soft ground is unavoidable, operate carefully and observe the following points.

- If the machine is operated on very soft ground or becomes stuck, it may be necessary to clean the track frame area. Do not go in so far that the machine cannot be towed out, in the worse case scenario.
- If the machine can no longer move, put the bucket on the ground and use the boom and arm functions to pull the machine toward firm ground. When doing so, operate the boom and arm at the same time as the travel lever to avoid applying excessive force.
- If the belly of the machine is high-centered, or if the undercarriage is blocked by mud and/or gravel, use the boom and arm to support the machine and lift up one side of the tracks at a time. Clear the mud and/or gravel so the machine can get out. Rotating the raised track back and forth can clear it of stones and mud.
- Tow the machine if it becomes stuck in soft ground and cannot escape on its own. For how to fasten wire ropes when doing so, refer to the section “Towing Machine”.



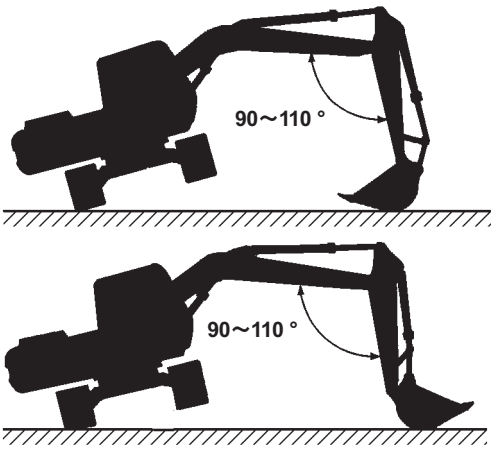
M104-05-012 ja

Raising One Track Using the Boom and Arm

WARNING

Be careful during this operation as the machine may slide to the side. Keep the angle between boom and arm 90 to 110°.

1. Swing the upperstructure 90 °.
2. Keep the angle between boom and arm 90 to 110 ° and position the bucket's round side on the ground.



M104-05-013-1 ja

3. Place supports, such as blocks, under the frame to support the machine.

IMPORTANT

When the machine is modified for use as a face shovel by installing the hoe bucket in reverse, avoid raising the machine above the ground using the front attachment with the bucket cylinder fully extended. Excessive loads will be applied to the pins around the bucket and the bucket cylinder, resulting in breakage of the pins.



MZX5-04-003 ja

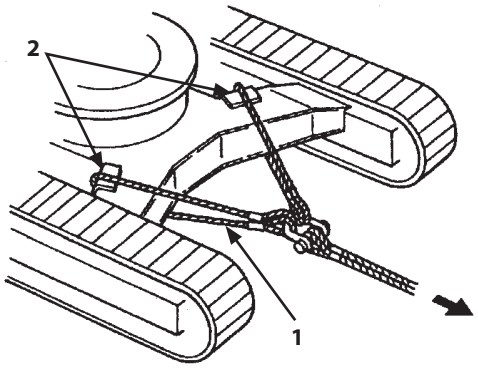
Towing the Machine

⚠ CAUTION

Damaged cables or ropes can cause serious accidents. Never tow the machine with damaged chains, fraying cables or ropes. Always wear gloves when handling cables and ropes.

If the machine becomes struck, attach wire ropes (1) to it as illustrated at right, and slowly tow the machine to firm ground with another machine. When attaching wire ropes (1), be sure to attach them to the frame.

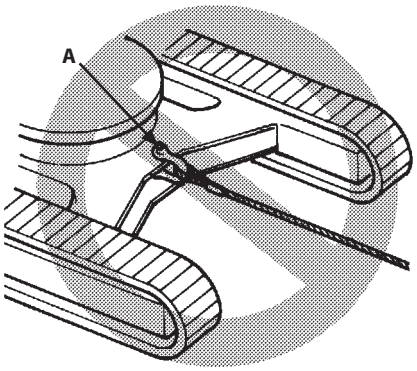
To prevent damage from the wire ropes (1), place protective material (2) between the track frame and the wire ropes.



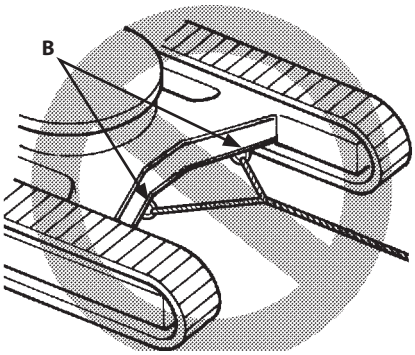
M104-05-010-4 ja

IMPORTANT

- **A shackle hole (A) is provided in the middle of the track frame for towing light objects; it also has tie-down loops (B) on the bottom side of the track frame for use during transport.**
- **Do not use the shackle hole (A) for towing light objects or the tie-down loops (B) for transport to tow the machine. Doing so may damage the hole (A) and loops (B).**
- **Refer to Using the Bracket for Towing Light Objects for instructions on using the center shackle hole (A) appropriately.**



MZX5-04-004-2 ja



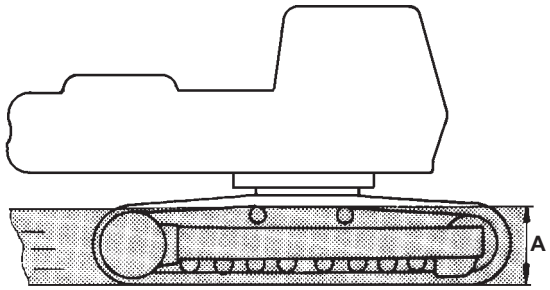
MZX5-04-005-2 ja

Operating in Water or Mud

The machine can be operated in water up to the upper edge of the upper rollers (A) only if water is flowing slowly, and the worksite ground is firm enough to prevent the machine from sinking past the upper edge of the upper roller.

Frequently check the position of the machine when working in such conditions. Reposition the machine if necessary.

The machine may sink little by little on soft ground. Pay attention constantly to the undercarriage of the machine.



M104-05-009-1 ja

Model	A (mm)
ZX85US-6, 85USB-6	560

IMPORTANT

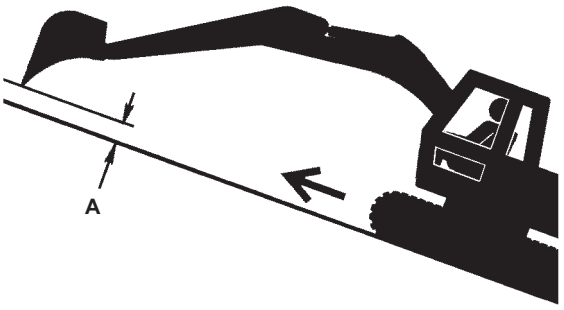
If the swing bearing, swing internal gear or center joint are submerged, remove the drain plug to drain mud and water. Clean the swing area. Install the plug. Lubricate the swing internal gear and swing bearing. The grease must be replaced immediately or the parts disassembled and serviced. In such case, stop using it and consult your authorized dealer.

Precautions for Traveling on Slopes

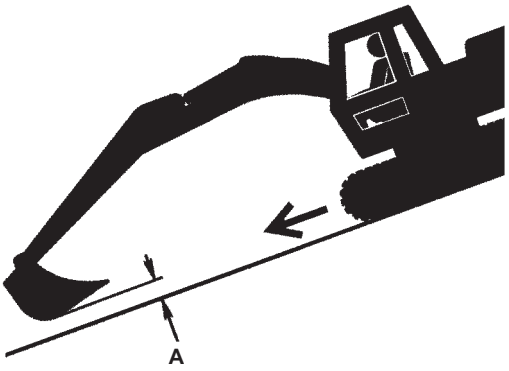
CAUTION

Take care not to cause any personal injury from traveling on slopes. This may be caused by the machine tipping over or sliding sideways. Fully read and understand the following precautions and keep the speed down while traveling on sloping ground. Do not travel with the bucket loaded or a load suspended from it.

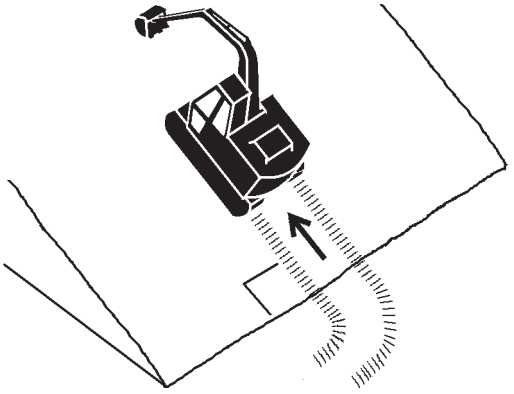
- Never attempt to travel on slopes steeper than 35 ° under any circumstances.
- Always fasten the seat belt when traveling on slopes.
- Keep the bucket 200 to 300 mm (A) above the ground when traveling on sloping ground. If the machine slips or becomes unstable, immediately lower the bucket to the ground and stop traveling.
- The machine is at risk of sliding sideways and/or overturning if the machine is turned or driven diagonally across a slope. Descend for a moment to level ground and turn or make other operations in a safe way.
- Do not swing while on sloping ground. In particular, never swing downhill while on sloping ground. Doing so may cause the machine to tip over. If swinging uphill, perform any swing or boom operations slowly and carefully.
- If the engine stalls while on sloping ground, put all levers in neutral before restarting the engine.
- If the hydraulic oil is not warmed up, the machine may not achieve its full climbing ability. Warm up the machine fully before climbing a steep slope.



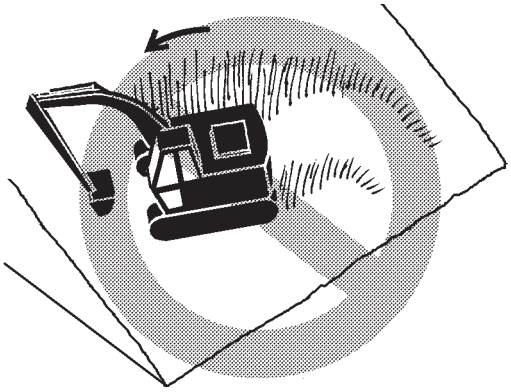
SA-657-1 ja



SA-658-1 ja



SA-441 ja



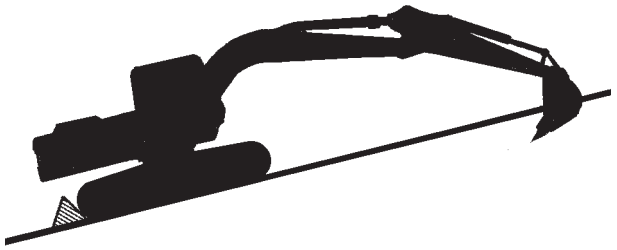
MZX5-04-002 ja

Parking the Machine on Slopes

WARNING

Avoid parking the 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 block both tracks.



MDEQ-04-002 ja

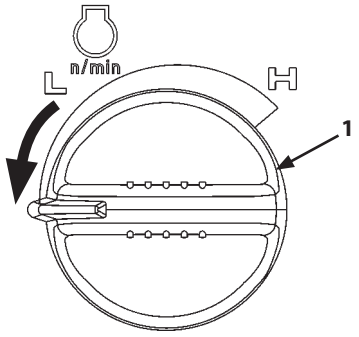
Parking

IMPORTANT

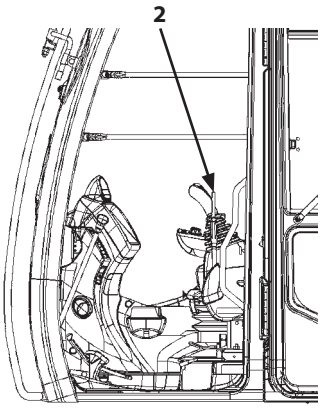
If the machine is parked with cab windows or the door open, electrical components may be damaged if rain is blown inside the cab. Close all windows and the door when parking the machine.

Parking the Machine

1. Park the machine on a firm, level surface. Lower the bucket to the ground.
2. Turn engine control lever (1) counterclockwise fully to the slow idle position. Run the engine for approximately 5 minutes to cool the engine.
3. Turn the key switch to OFF. Remove the key from the key switch.
4. Pull pilot control shut-off lever (2) to the LOCK position.
5. When leaving the machine, always close and lock windows, roof vent and cab door.

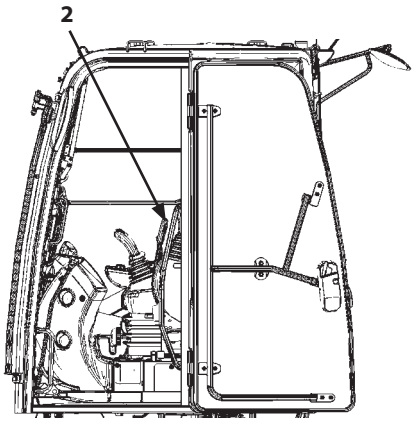


M1P1-01-068-4 ja



LOCK position
ZX85US-6

MDEQ-01-029-4 ja



LOCK position
ZX85USB-6

MDEQ-01-031-5 ja

Control Levers (ISO Pattern)

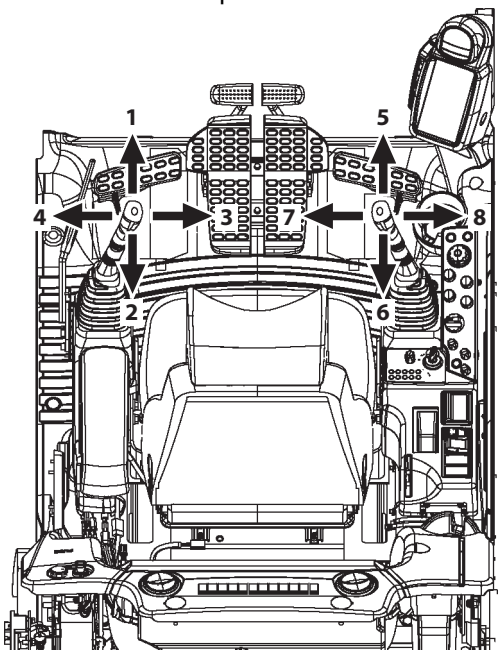
WARNING

- **Never extend any part of the body out of the window, as it could be crushed against the frame if the boom moves. Do not poke your head or hands out the window. Never remove the window sash bar.**
- **Make sure you know the location and function of each control before operating the machine.**
- **Do not change the operation pattern of the control levers. Doing so may result in mistakes in operating the machine.**

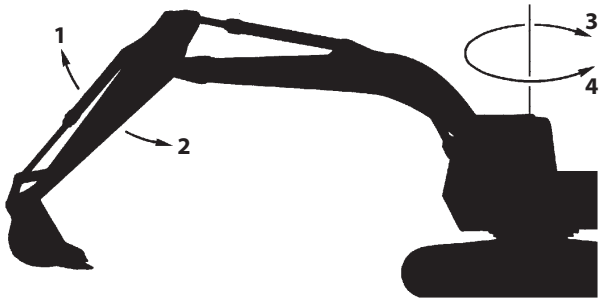
A label showing the control patterns of the levers and pedals is attached on the right side in the cab.

When a lever is released, it automatically returns to neutral, and that machine function stops.

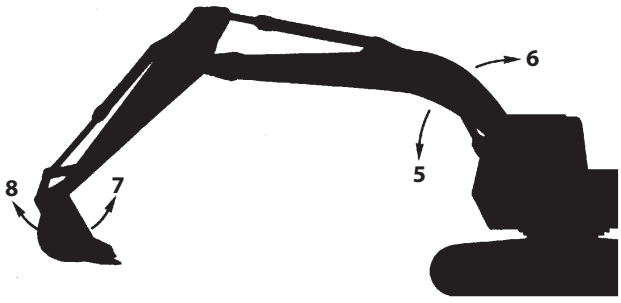
1- Arm Roll-Out
2- Arm Roll-In
3- Swing Right
4- Swing Left
5- Boom Lower
6- Boom Raise
7- Bucket Roll-In
8- Bucket Roll-Out



MDAA-01-343-1 ja



M104-05-001-1 ja



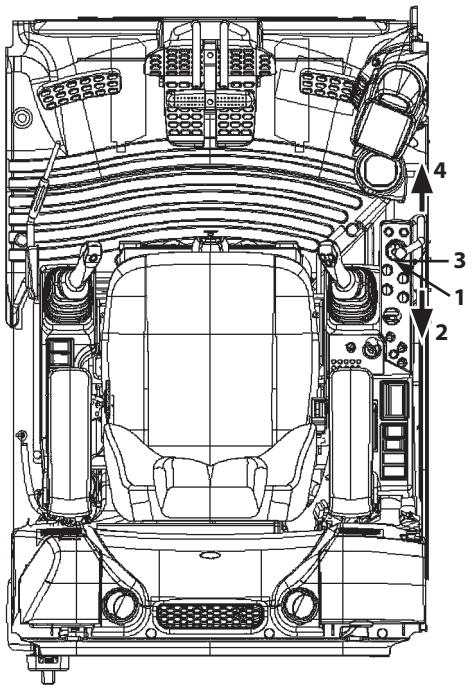
M104-05-002-1 ja

Blade

Blade Operation

The blade is operated with blade lever (1) on the right side of the operator's seat as illustrated at right.
Letting go of blade lever (1) returns the control lever to its neutral position, allowing the blade to maintain its position.

2- Blade up
3- Neutral
4- Blade down



MDEQ-05-001-1 ja

Precautions for Blade Operation

This blade is a simple blade designed exclusively for use with a hydraulic shovel. So, follow the precautions below and handle with all due care.

- This blade is exclusively for simple dozing. Do not do any extreme digging with the blade. Doing so may cause damage to the blade and/or undercarriage.
- Do not put concentrated or off-center loads on the blade. Also, crashing into anything while traveling is strictly prohibited. Doing so may damage the blade and/or undercarriage, so do not do so.
- To lift the machine using this blade, first make sure the ground is strong enough to support it. Be careful when the machine is lifted as the pressure on the ground will be extremely localized, making it prone to collapse. Make sure the bottom of the blade touches the ground evenly so no concentrated or off-center loads are applied to the blade.
- Using the blade as an outrigger is strictly prohibited.
- When excavating to the front with the blade, the bucket and/or boom may interfere with the blade. Take care to avoid this.



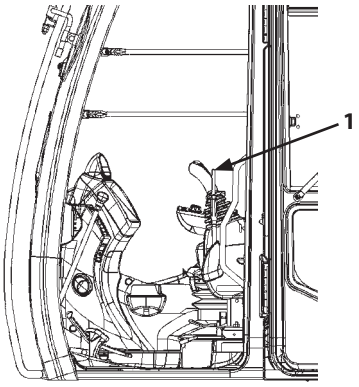
MDEQ-05-002-1 ja

Pilot Control Shut-Off Lever

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

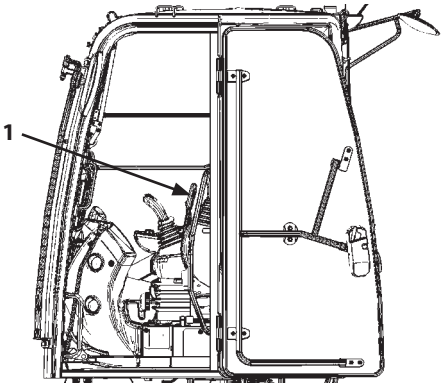
⚠ WARNING

- **Always pull pilot control shut-off lever (1) into the full LOCK position. If the lever is in any intermediate position, it is not locked, possibly creating a hazardous situation.**
- **When operating pilot control shut-off lever (1), be careful not to touch control levers. If the machine moves unexpectedly, it may cause a serious accident.**
- **When leaving the machine, always stop the engine. Then, pull pilot control shut-off lever (1) up to the LOCK position.**
- **Make sure it is in the LOCK position before transporting the machine or leaving the machine at the end of a shift.**



LOCK position
ZX85US-6

MDEQ-01-029-1 ja



LOCK position
ZX85USB-6

MDEQ-01-031-1 ja

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) to LOCK position.

Before Starting Work

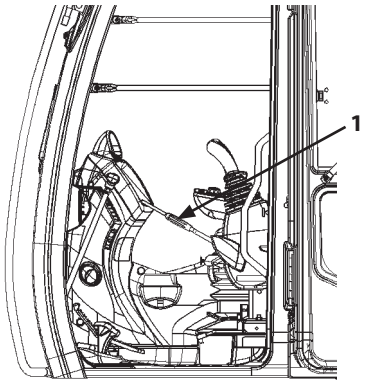
Confirm that pilot control shut-off lever (1) is pulled up to the LOCK position before starting the engine. The engine will not start in the UNLOCK position.

Slowly push down pilot shut-off lever (1) to the UNLOCK position before starting operation.

Confirm that all control levers and pedals are in neutral and that no part of the machine is in motion.

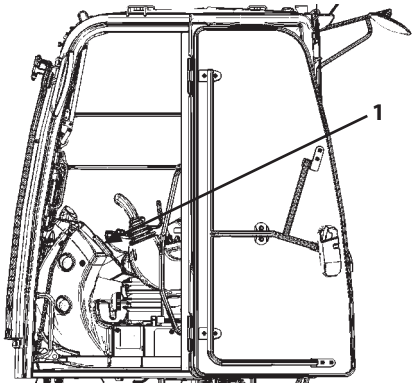
⚠ WARNING

If all the levers and pedals are in neutral and just putting pilot shut-off lever (1) in the UNLOCK position causes any part to move, the machine is malfunctioning. Immediately pull pilot shut-off lever (1) back to the LOCK position, and stop the engine. Consult the nearest Hitachi representative.



UNLOCK Position
ZX85US-6

MDEQ-01-030-1 ja



UNLOCK Position
ZX85USB-6

MDEQ-01-032-1 ja

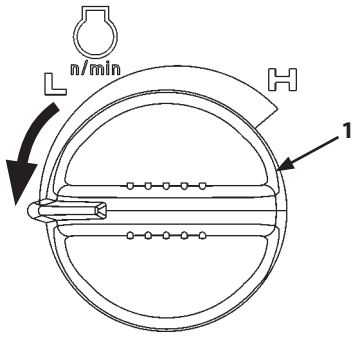
Warming Up Operation

In cold weather, perform warm up until the coolant and hydraulic oil reach the appropriate temperature.

IMPORTANT

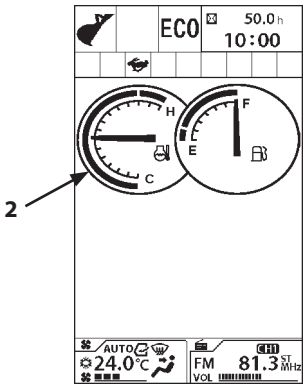
The appropriate hydraulic oil operating temperature on this machine is 50 to 80 °C. Hydraulic components may be seriously damaged if the machine is operated with low temperature hydraulic oil. If warming up the machine by relieving the hydraulic system, continuously relieve the relief valve for 10 to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

1. Even after engine starts, leave engine control lever (1) in the slow idle position.
   (Do not operate the machine until the needle of coolant temperature gauge (2) starts moving.)



M1P1-01-068-4 ja

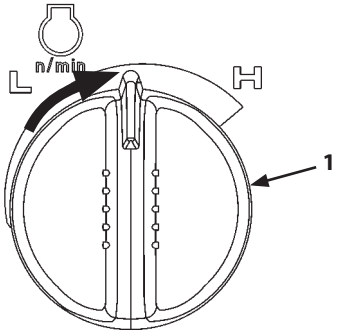
2. After the needle of coolant temperature gauge (2) starts moving, turn engine control lever (1) to around the middle.
3. Operate the boom, arm and bucket cylinders slowly to each stroke end several times.
   If the machine is equipped with various attachments, operate the attachments slowly to allow hydraulic oil to circulate through the system.
4. Operate the travel and swing functions slowly to allow hydraulic oil to circulate.
5. Warming-up operation ends after the above operations are complete.



MDAA-01-001-10 ja

NOTE

- *The engine speed is restricted right after the engine starts, so it is held to low idle for about 3 to 6 seconds. When the coolant temperature or hydraulic oil temperature is low, the time will be longer. The engine speed will be kept to slow idle speed even if engine control lever (1) is not set in the slow idle position.*
- *The warm-up system starts operating after the engine speed is kept to slow idle speed, and the engine speed will temporarily increase even if engine control lever (1) is in the slow idle position.*



M1P1-05-003-1 ja

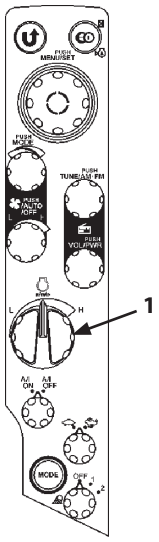
⚠ CAUTION

Do not attempt to operate the machine for at least 6 seconds after the engine starts. The engine speed may change after the slow idle period and operation speed of the work device may increase suddenly, which may cause a serious accident.

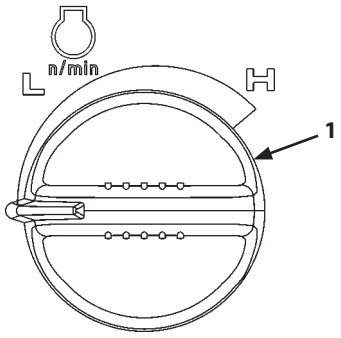
Engine Speed Control

Increase and decrease the engine speed using engine control dial (1) located on the switch panel.

- Turn engine control dial (1) clockwise to increase the engine speed or 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) all the way counterclockwise to the slow idle setting. Then, turn the key switch to the OFF position to stop the engine.



MDCD-01-026-13 ja



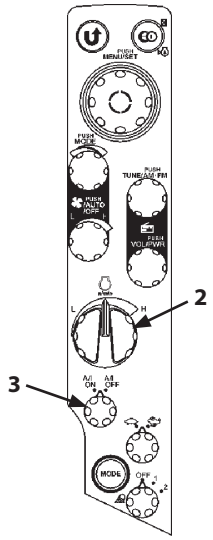
M1P1-01-068-1-1 ja

Auto-Idle

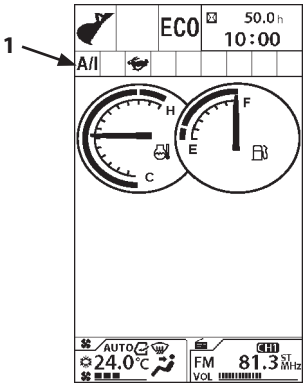
Auto-Idle Function

When auto-idle switch (3) is 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.

The engine speed immediately increases to the speed set by engine control lever (2) when any control lever is operated.



MDCD-01-026-14 ja



MDAA-01-314-2 ja

IMPORTANT

- **Always check if auto-idle indicator (1) is turned ON or OFF before starting operation. If indicator (1) is ON, the auto-idle function is enabled.**
- **Always be aware of the setting of engine control lever (2) when auto-idle switch (3) is turned to the A/I ON position. If the engine speed is set high with engine control lever (2), and the operator is not aware of the high engine speed setting, the engine speed will unexpectedly increase when any control lever is operated, causing the machine to move unexpectedly, possibly resulting in serious personal injury.**

WARNING

Be sure to turn auto-idle switch (3) to the A/I OFF position when doing work that would be dangerous if the machine moves unexpectedly, especially when loading/unloading the machine for transportation.

NOTE

- *Auto-idle control may not work completely until the end of the warm-up.*

Auto-Idle ON/OFF

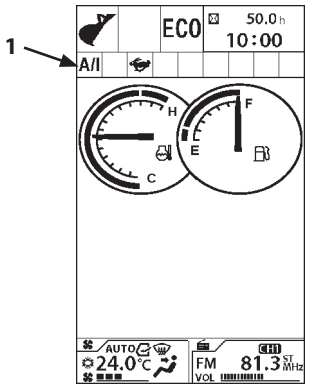
Note that the auto-idle function can be turned ON or OFF by using auto-idle switch (3) only when the key switch is in the ON position.

Always check if the auto-idle function is turned ON or OFF with auto-idle indicator (1).

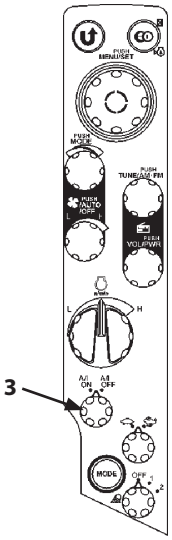
A/I Lit : Auto-Idle Function ON

A/I Off : Auto-Idle Function is OFF

- When auto-idle switch (3) is turned OFF with auto-idle indicator (1) ON, indicator (1) will go OFF and the auto-idle system is deactivated.
- The auto-idle system is not deactivated even if the engine is stopped by turning the key switch with auto-idle switch (3) in the A/I ON position [indicator (1) ON]. When the engine is restarted, the auto-idle system remains activated, allowing auto-idle indicator (1) to flash for 10 seconds and stay ON later.



MDAA-01-314-2 ja



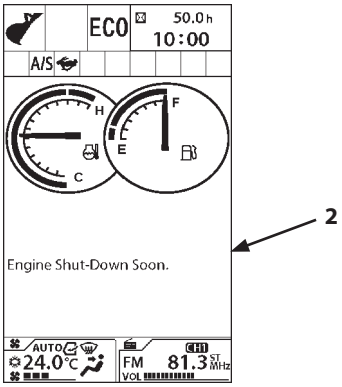
MDCD-01-026-15 ja

Auto Shut-Down

WARNING

This function automatically stops the engine. Pay extra attention to the work and work environment when using this function.

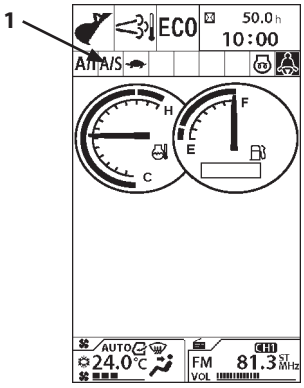
When the auto shut-down function is turned ON, the engine automatically stops after the preset time from when the pilot control shut-off lever is put in the lock position. The message "Engine Shut-Down Soon" is displayed on monitor (2) 30 seconds before the engine stops and indicator (1) flashes. The buzzer also sounds. The buzzer sounds once at 30 seconds before, and then continuously from 15 seconds before the engine stops. The engine speed drops to idle, and then stops after 15 seconds. If the pilot control shut-off lever is pushed down before the engine stops, the auto shut-down is disabled and the engine will not stop.
The auto shut-down function does not work when in the ML crane mode.



MDAA-01-146-2 en_GB

IMPORTANT

Check whether the status of auto shut-down indicator (1) is ON or OFF. If indicator (1) is ON, the auto shut-down function will be activated.



MDAA-01-286-1 ja

Operating Conditions

- The engine is running.
- The pilot control shut-off lever is in the LOCK position.
- Coolant temperature is not high.
- When the muffler filter is not regenerating

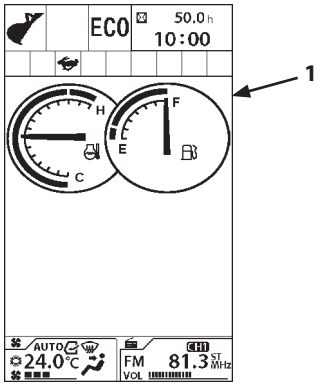
IMPORTANT

- **When the engine is stopped by the auto shut-down function, turn the key switch to ACC or OFF once, then turn it to START to restart the engine. Turn the key switch OFF after auto shut-down when leaving the machine for long period of time. Do not simply leave the machine after auto shut-down. Doing so may cause the batteries to discharge.**
- **When the key switch is turned to the OFF position while the auto shut-down function is ON, the setting will be reset. If you wish to maintain the setting, consult your authorized dealer.**
- **Even if the auto shut-down function is ON, the engine will not stop during regeneration of the muffler filter.**
- **When the auto shut-down activates, the air conditioner will also stop.**

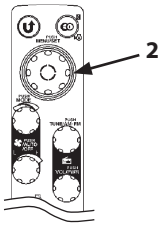
Setting the Auto Shut-Down Function

Auto Shut-Down: ON/OFF

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).

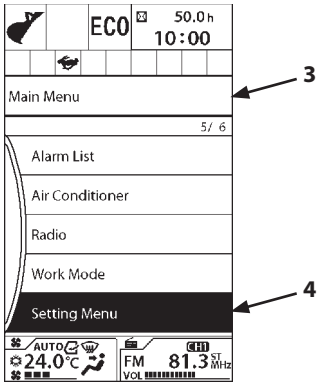


MDAA-01-001-3 ja



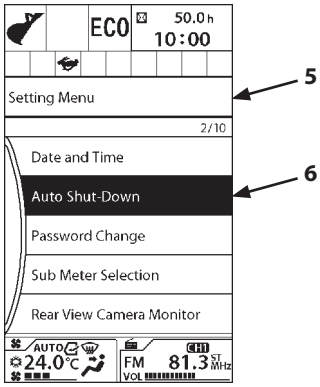
MDC1-01-026-2 ja

2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).



MDAA-01-114-1 en_GB

4. Rotate selector knob (2) to highlight Auto Shut-Down (6).
5. Push selector knob (2) to display Auto Shut-Down screen (7).

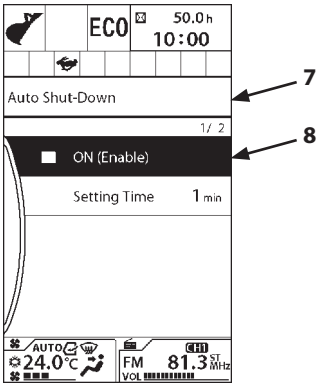


MDED-01-147-1 en_GB

6. Rotate switch (2) to highlight ON (8).
7. Push selector knob (2) to set the auto shut-down function ON. Push selector knob (2) again to turn the auto shut-down function OFF.

NOTE

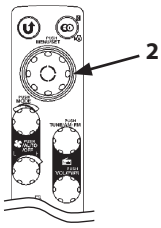
When ON, the mark ■ is green; when OFF, it is gray.



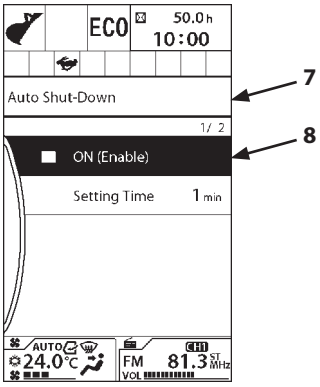
MDAA-01-148-1 en_GB

Setting the Shut-down Time

1. On the Auto Shut-Down screen (7), rotate selector knob (2) to highlight Setting Time (9).

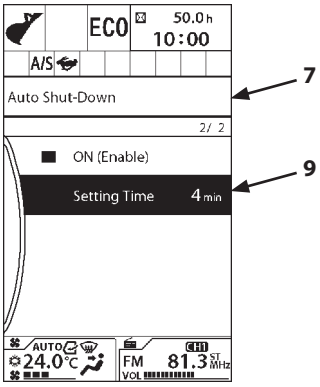


MDC1-01-026-2 ja



MDAA-01-148-1 en_GB

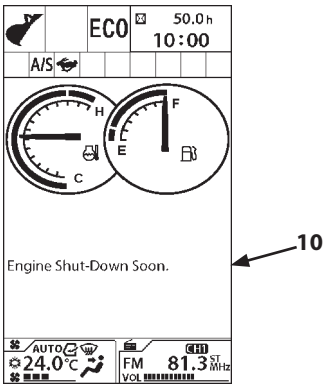
2. Push selector knob (2). Rotate selector knob (2) to adjust the auto shut-down setting time.
3. Push selector knob (2) to make the change.



MDAA-01-150-1 en_GB

NOTE

Once the function is ON, the message "Engine Shut-Down Soon" (10) is displayed on the monitor 30 seconds before the engine stops. という表示(10)が出ます。

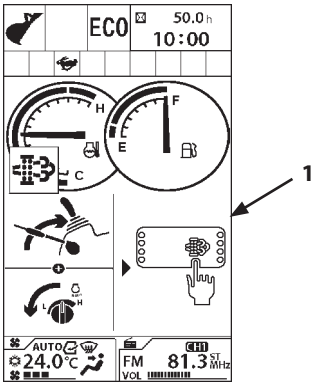


MDAA-01-146-1 en_GB

Manual Regeneration of the Muffler Filter

Manual Regeneration Procedure

When manual regeneration is needed, screen (1) as illustrated at right is displayed. When screen (1) is displayed, manual regeneration must be done. Before starting manual regeneration, be sure to check the following.
If the machine is equipped with a rear view camera, and the camera is enabled, screen (1) is displayed only when the pilot control shut-off lever is in LOCK position.



MDAA-01-005-2 ja

Check the Following First

- No one around the machine.
- No flammable materials near the muffler filter.
- Fuel level alarm is not lit.

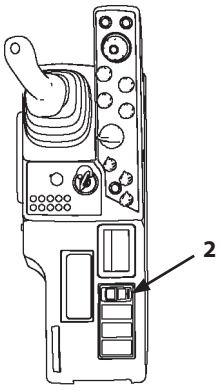
Procedure

1. Park the machine in a safe place. Lower the front attachment to the ground.
2. Pull the pilot control shut-off lever to the LOCK position.
3. Set the engine control lever to slow idle.

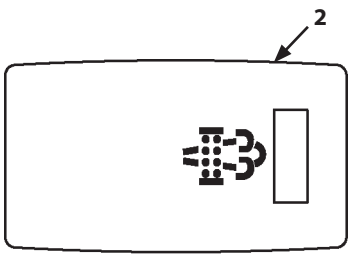


SA-390 ja

4. Push and hold muffler filter manual regeneration switch (2) (about 1 second).

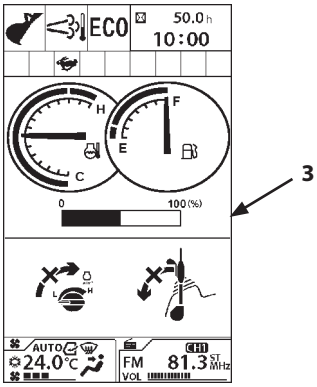


MDEQ-05-003-1 ja



MDAA-05-002-1 ja

5. When the manual muffler filter regeneration switch (2) is pressed, screen (3) as shown at right is displayed and manual regeneration starts. A bar graph on screen shows the progress of the regeneration process.

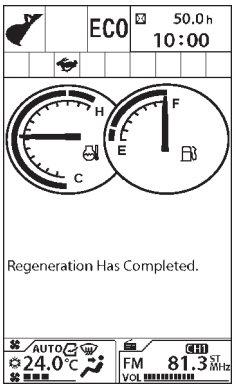


MDAA-01-006-1 ja

IMPORTANT

Manual regeneration does not start unless the pilot control shut-off lever is in the LOCK position and the engine control dial is on slow idle. If the pilot control shut-off lever or the engine control lever are touched during manual regeneration, the regeneration process is aborted. If the process is aborted, start over again.

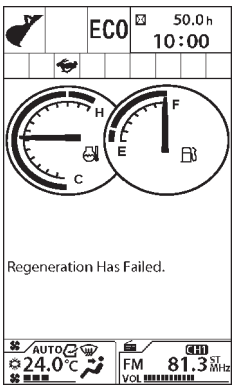
6. When manual regeneration is finished, the message "Regeneration is Complete." is displayed. If the message "Regeneration Failed" is displayed, start the manual regeneration process over again. The regeneration process may fail in conditions other than those mentioned above (such as sensor malfunction or low air temperature).



MDAA-01-083 en_GB

NOTE

- *The engine sound may change and the engine speed may increase when manual regeneration starts, this is not a malfunction.*
- *Regeneration time varies depending on the air temperature.*
- *White smoke may temporarily be generated from the tail pipe from burning PM (particulate matter) during the regeneration process; this is not a malfunction.*
- *The time required for manual regeneration is shorter right after operating the machine, and longer when the engine is cold.*
- *Coolant temperature may increase during the manual regeneration.*



MDAA-01-084 en_GB

IMPORTANT

- **If regeneration must be interrupted, push the manual muffler filter regeneration switch again. “Regeneration Failed" is displayed on the monitor, but the machine can be operated. In such case, manual regeneration should be performed again. Restart manual regeneration as soon as possible.**

NOTE

When the engine is started, manual regeneration will not start, even if the manual regeneration switch is pressed, until the engine warms up for 15 to 20 minutes.

Power Mode

Two engine speed modes are available, ECO or PWR, which are selected via power mode switch (1).

- **ECO (Economy) Mode**

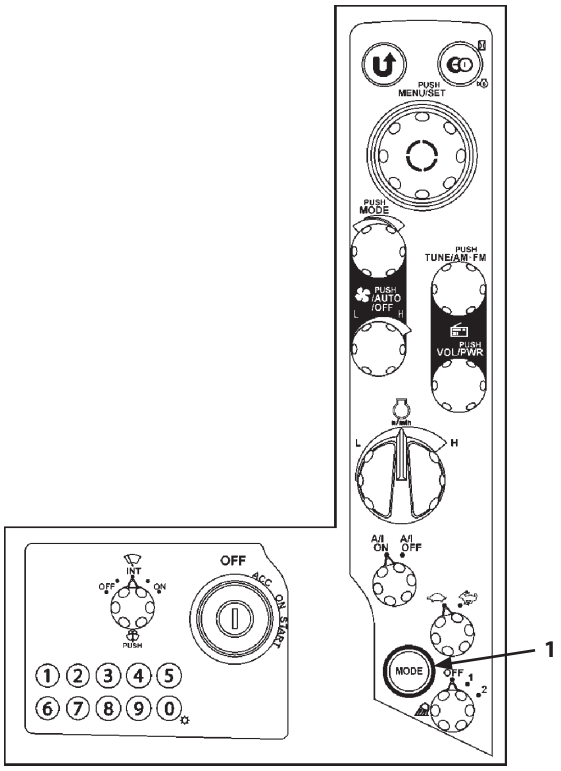
  Operate the machine in this mode when performing normal work. ECO is displayed on Power Mode Display (2).

- **PWR (Power) Mode**

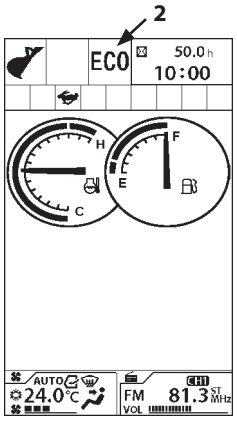
  Use PWR (Power) mode when extra horsepower is needed. PWR is displayed on Power Mode Display (3).

NOTE

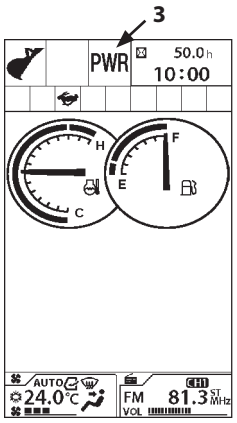
- *ECO mode is set automatically when starting the engine. Set to PWR mode if necessary.*



MDCD-01-027-3 ja

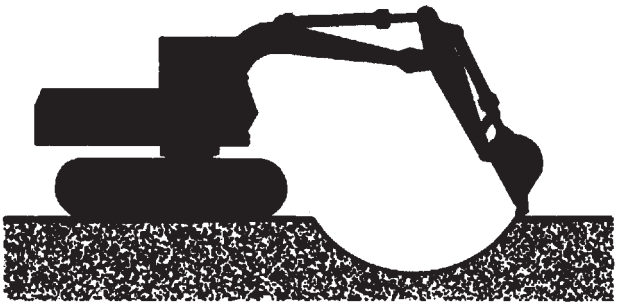


MDAA-01-001-11 ja



MDAA-01-353-2 ja

Operating the Backhoe



M107-05-037 ja

- Use the appropriate arm and bucket for the work. (Refer to the "Bucket Types and Applications" in the Specifications chapter.)
- Pull the bucket toward the machine using the arm as the main digging force.
- When soil sticks to the bucket, remove it by moving the arm and/or bucket back and forth 2 or 3 times.
- The teeth of the bucket should be at as shallow an angle as possible to the digging direction; maximize the use of arm stroke when digging.
- 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.
- When operating with hydraulic cylinders fully retracted or extended, all hydraulic cylinders and equipment may be damaged.

IMPORTANT

- **When digging at an angle, avoid striking the tracks with the bucket teeth.**
- **When lowering the boom, avoid stopping suddenly as this will shock the machine. Lower the boom smoothly to avoid shocking the machine.**
- **When digging deep, avoid striking the boom cylinder, boom bottom or bucket cylinder hoses against the ground.**
- **When operating the machine with the blade (if equipped) positioned towards the front, the bucket teeth may come in contact with the blade.**
- **When the bucket load is dumped with the boom raised, falling material may hit the base machine. Always be aware of loads in the bucket during operation.**

Shovel

Backhoe work involves digging the ground with the bucket in a roll-in motion. Shovel work involves digging with the arm cylinder in a scraping motion.

WARNING

Take care not to hit the cab by rolling in too far when the bucket is inverted. Be careful not to hit the cab with the teeth of the bucket when rolling the arm in.



Warning about Rolling Too Far with the Bucket

MZX5-05-003-2 ja

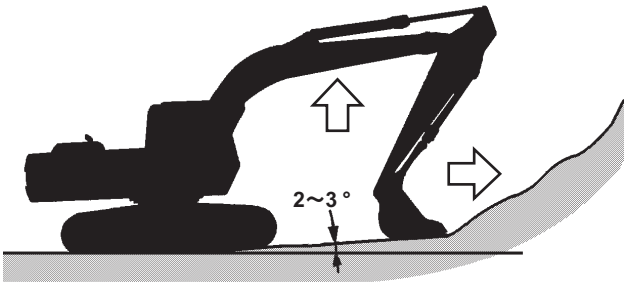
IMPORTANT

If a bucket hook is mounted, the hook may hit the arm if the bucket is rolled in to far. Take care not to hit it.

- For face shovel operation, dig the ground using the arm cylinder in a scraping motion.
- When underground water is expected, make a slope angle of 2 to 3° to drain the water as shown.

NOTE

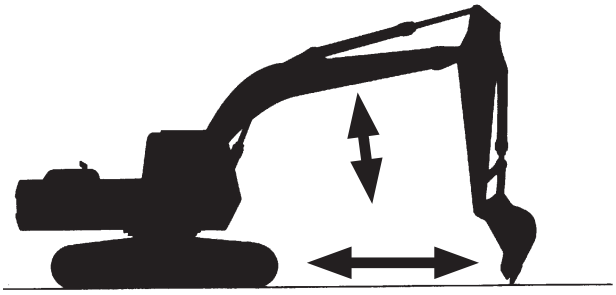
Because of the hydraulic cylinder structure, the digging force during face shovel operation is smaller than for backhoe operation.



M104-05-020-1 ja

Grading Operation

Operate the boom, arm, and the bucket in such a way that the bucket teeth move horizontally, constantly keeping them perpendicular to the ground during grading work.



M104-05-017-1 ja

IMPORTANT

Do not pull or push dirt with the bucket when traveling. Excess force will be applied on its parts, and the machine may be damaged.

1. When leveling ground toward the machine, while holding the boom up, gently roll in the arm. Once the arm moves past the vertical position, slowly lower the boom to allow the bucket to maintain a smooth surface.
2. Reverse the directions in step 1 to perform arm roll-out operation.
3. Perform slope finishing work using the same procedure described in steps 1 and 2.

Do Not Strike the Ground with Bucket Teeth

⚠ WARNING

Forcibly striking the bucket teeth on the ground may result in personal injury from flying debris. It will also shorten the service life of each part on the front attachment.

If the bucket teeth are forcibly struck on the ground, it shortens the service life of the front-end attachment parts (especially the bucket).
When digging a hard gravel layer, use the upwards digging force of the bucket. Operate the boom, arm and the bucket simultaneously so that the bucket teeth efficiently bite into the ground.
Flying debris may result in personal injury.

Avoid Hammer Work

⚠ WARNING

As the bucket body has a curved surface, hammer work or piling work is very dangerous. Doing so may damage the bucket and front attachment.

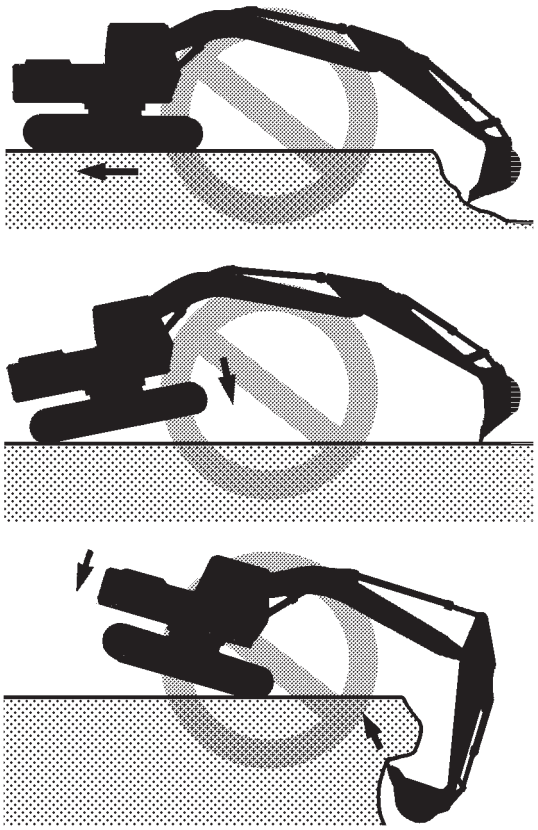
Do not attempt to use the bucket for hammering or piling work.
Doing so may damage the bucket and front attachment, causing personal injury. It is also dangerous, so do not do it.



MZX5-05-004 ja

Avoid Abusive Operation

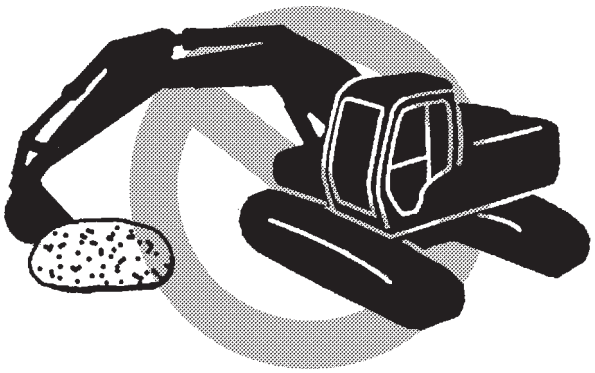
Do not attempt to add additional digging force by using travel, or raising the rear of the machine to use the machine's weight.



MZX5-05-005 ja

Never Move an Object Sideways with the Bucket

For example, do not swing the bucket to level material & do not strike objects sideways with the bucket.
Doing so may damage the front-end attachment and/or shorten the life of the swing system.



MZX5-05-006 ja

Precautions during Blade Operation

Boom Cylinder may Hit the Blade

When working with the blade in front, be careful not to hit the boom cylinder and/or the bucket on the blade.



MDEQ-05-004 ja



MDEQ-05-005 ja

Avoid Hitting the Blade with the Bucket

When the front end is rolled in for travel or transport, be careful not to hit the blade with the bucket.



MDEQ-05-005 ja

Avoid Collisions with the Blade

Avoid hitting rocks with the blade. Premature damage to the blade and/or cylinders will result.



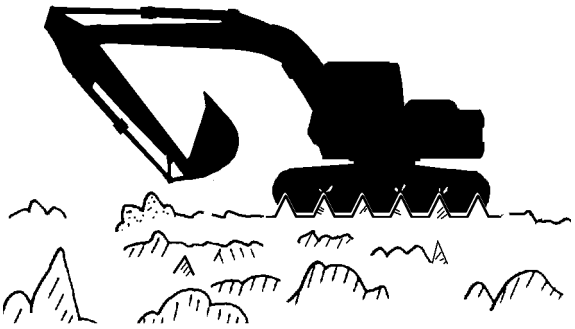
MDEQ-05-006 ja

Use the Right Shoes for the Site

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

It may result in bending of shoes and/or loosening of shoe bolts, and may damage other undercarriage components, such as track links and rollers.
(Refer to the "Shoe Types and Applications" in the Specifications chapter.)

Soil may easily become packed into the crawler during travel on sandy ground. If the machine is driven without removing the packed soil, excessive force is exerted on the crawlers, which may break them. Avoid the crawlers becoming packed with soil by removing soil as often as possible.



MDEQ-05-010 ja

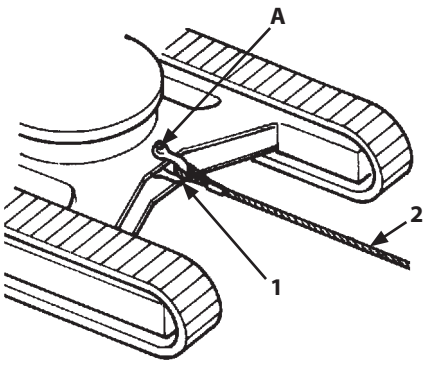
Using the Shackle Hole

A shackle (1) hole (A) is provided on the track frame for towing light weight objects as specified below.

IMPORTANT

Always follow the points below when towing a light object using the shackle hole (A) in the track frame. The track frame and/or the shackle hole (A) may be damaged if any instructions are ignored.

- The drawbar pulling capacity is indicated in the table below.



M104-05-011-2 ja

Model	Drawbar pulling capacity
ZX85US-6, 85USB-6	19610 N (2000 kgf) or less

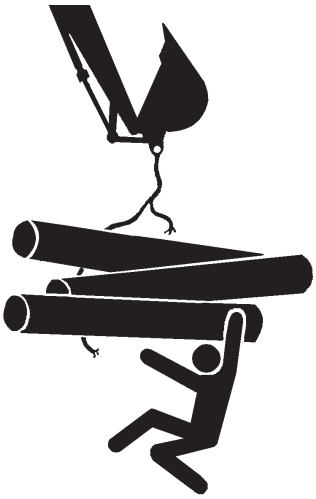
- Always use a shackle (1).
- Keep the wire rope (2) horizontal, straight, and parallel to the tracks.

Select the slow travel mode. Drive slowly when towing.

Lifting

⚠ WARNING

When you use machine for lifting, 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.



SA-014 ja

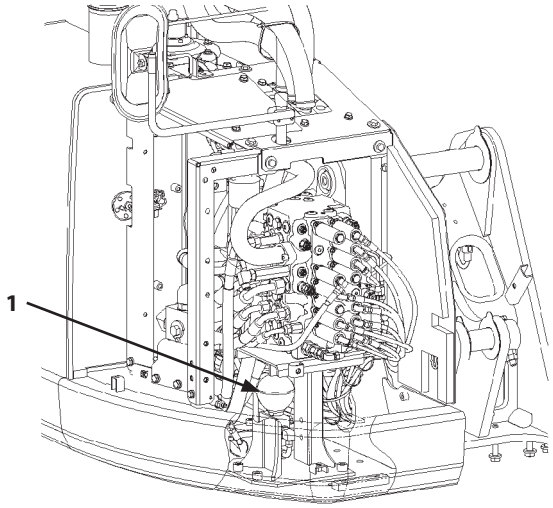
- Secure sling/chain tightly to the load being lifted. Wear gloves when securing sling/chain.
- Fasten sling/chain to bucket loop bucket hook or bucket pin, with the bucket roll-in and arm roll-in.
- Coordinate hand signals with your signal man before starting.
- Be aware of the location of all persons 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.

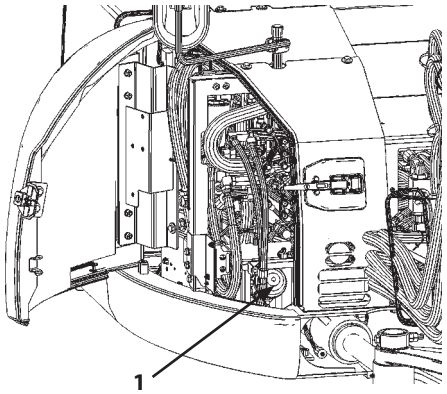
Pilot Accumulator Function

Pilot accumulator (1) is a pressure storage reservoir of the control circuit which supplies pressure and enables operation of the control circuit even after stopping the engine.
The front attachment can be lowered using the control lever and the weight of the attachment itself, and pressure in the hydraulic circuit can be released after stopping the engine.



ZX85US-6

MDEQ-05-007-1 ja



ZX85USB-6

MDEQ-05-011-1 ja

Guide to Releasing Pressure in the Hydraulic Circuit

1. Set the machine in the parking attitude.
2. Pull the pilot control shut-off lever to the LOCK position.

Perform items 3 to 5 within 15 seconds.
As the pressure in pilot accumulator gradually decreases after stopping the engine, pressure in the hydraulic circuit can be released for a few seconds after stopping the engine.

3. Stop the engine. Turn the key switch ON.
4. Push the pilot control shut-off lever to the UNLOCK position.
5. Move the control levers and attachment pedals forward and rearward or left and right to release pressure from the hydraulic circuit.
6. Pull the pilot control shut-off lever to the LOCK position and turn the key switch OFF.

Emergency Boom Lowering Procedure

⚠ WARNING

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

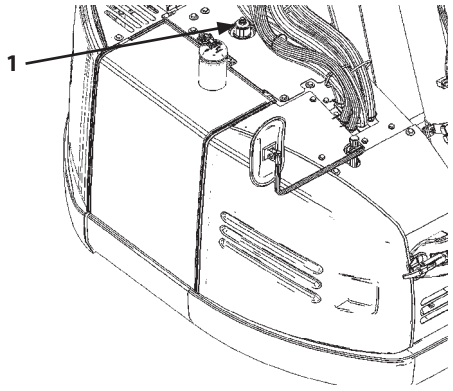
If the engine stalls and cannot be restarted, lower the boom to lower the bucket to the ground referring to the emergency boom lowering procedure stated below.

1. Be sure to bleed air pressure from the hydraulic oil tank by pressing air bleed valve (1) on the hydraulic oil tank.

⚠ WARNING

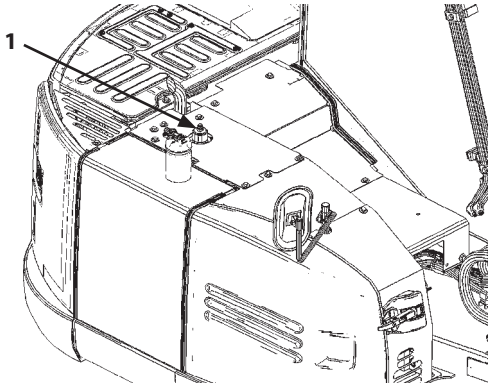
Be sure to work only after oil temperature is low or before operation. Failure to do so may allow high temperature oil to spray, possibly causing severe burns.

2. Lower the boom in the procedures on the next page.



ZX85US-6

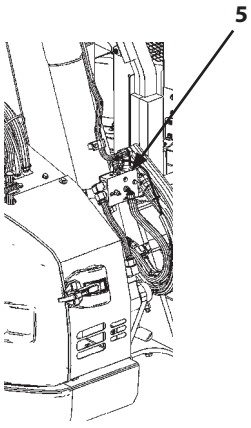
MDEQ-05-012-1 ja



ZX85USB-6

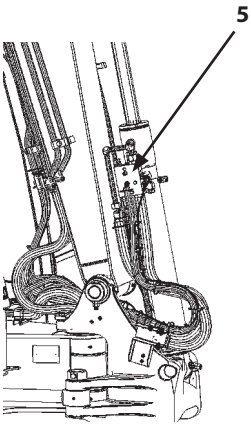
MDEQ-05-013-1 ja

Releasing Hose Rupture Valve (Machine Equipped with Hose Rupture Valve)



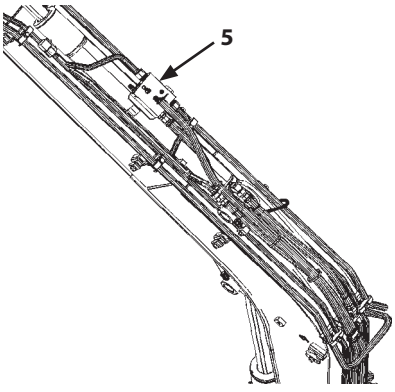
Boom Cylinder
ZX85US-6

MDEQ-05-014-1 ja



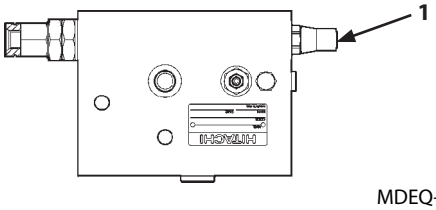
Boom Cylinder
ZX85USB-6

MDEQ-05-015-1 ja



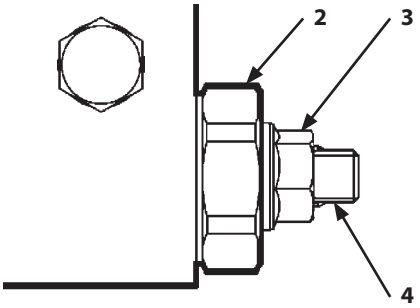
Arm Cylinder

MDEQ-05-016-1 ja



MDEQ-05-017-1 ja

Hose rupture valve (5) prevents sudden falling of the front attachment in the event of hose breaks during machine operation. It is located on the rod side of the arm cylinder and bottom side of the boom cylinder.



MADC-05-004-1 ja

WARNING

- **Never attempt to operate hose rupture valve (5) unless emergency. Failure to do so may result in serious accident.**
- **Loosen hose rupture valve (5) slowly. If adjustment screw (4) is loosened rapidly, the arm or boom may lower rapidly.**

To lower the front attachment in case of emergency such as a fault is generated while raising the front attachment, operate the valve by following the procedure given below.

1. Remove cap (1) from the valve.
2. Put the matching marks on plug (2), lock nut (3) and adjustment screw (4) for assembling.
3. Loosen lock nut (3). Securely tighten adjustment screw (4).

IMPORTANT

Note turn number of the adjustment screw. It is used for returning the adjustment screw to its original state.

4. Lower the front attachment by operating the emergency valve on the control valve.
   After checking that the front attachment is completely lowered, return the emergency valve to its original state. (Refer to "Releasing Emergency Valve" on the next page.)
5. Return adjustment screw (4), lock nut (3), plug (2) and cap (1) of hose rupture valve (5) to their original state.
   Tightening torque: 10 to 14 N (1 to 1.4 kgf·m)

Releasing Emergency Valve

WARNING

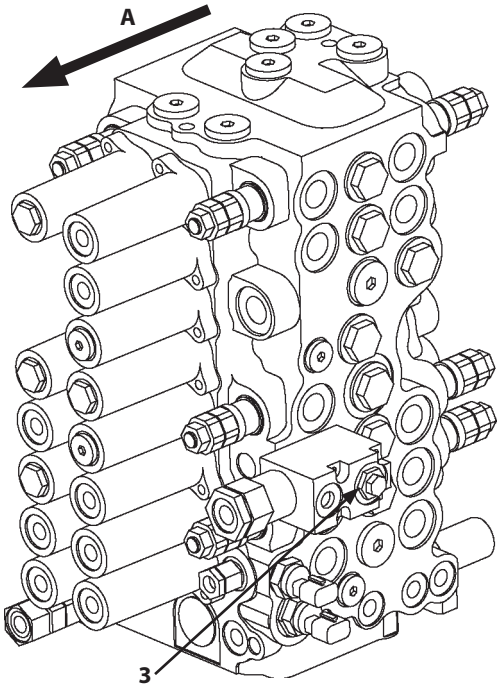
Never allow anyone under the boom during work.

1. Use a magnetized wrench to loosen lock nut (1) (13 mm hex) of emergency valve (3), which is built into the control valve, by turning it counterclockwise.

IMPORTANT

Never loosen screw (2) more than 2 turns as the screw may come off.

2. Insert a hex wrench into screw (2) (4 mm) and loosen it half a turn to the left. Monitor the lowering of the boom while adjusting the amount screw (2) is turned to control its speed.



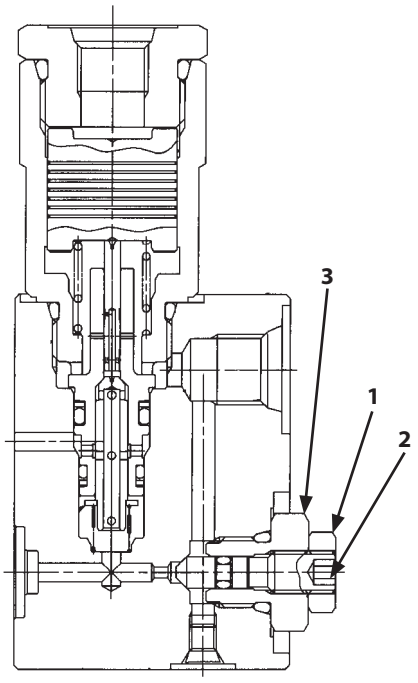
A: Rear of Machine

MDEQ-05-008-1 ja

IMPORTANT

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

3. After the boom is lowered, tighten screw (2) and tighten lock nut (1) to the specifications below.
   Locknut (1)
   Tightening Torque: 13 N·m (1.3 kgf·m)
   Screw (2)
   Tightening Torque: 7 N·m (0.7 kgf·m)



MDEQ-05-009-1 ja

Precautions for After Operations

- After finishing the day's work, drive the machine to firm, level ground where no possibility of falling stones, ground collapse, or floods are present. Park the machine according to the parking procedures.
  (Refer to the section "PARKING THE MACHINE" in the DRIVING THE MACHINE chapter.)
- Fully refill the fuel tank.
- Clean the machine.

Transporting by Road

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



M1V1-06-001 ja

- When transporting the machine using a trailer, check the width, height, length and weight of the trailer with the machine loaded. Note that transporting weight and dimensions may vary depending on the type of shoe or front attachments installed.

  Refer to the weights shown in the Specifications and take care not to overload it.
- Investigate conditions on the route to be traveled in advance, such as road width, and limits on height and weight, as well as traffic regulations.

In some cases it may be necessary to obtain permission from the local authority concerned, or to disassemble the machine to bring it within local regulations for dimensional or weight limits.

When transporting the machine, contact your authorized dealer.

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 use the front attachment functions when loading or unloading the machine.

Ramp/Loading Dock

1. Before loading, thoroughly clean the ramps, loading dock and flatbed. Dirty ramps, loading docks, and flatbeds with oil, mud, or ice on them are slippery and dangerous.
2. 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.
5. When loading a machine equipped with a pad crawler or rubber pad shoes, take sufficient care not to allow the machine to slip since the surface of the rubber pad shoe is flat.
   Only load the machine after removing soil or clay stuck to the machine.
6. When transporting a machine equipped with a blade, take care not to hit the blade.

Loading/Unloading

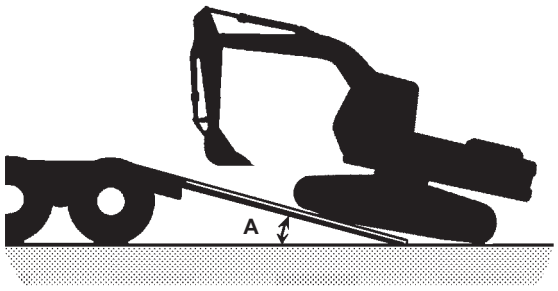
WARNING

- **Always turn the auto-idle switch OFF when loading or unloading the machine. In auto-idle mode, speed may automatically increase.**
- **Always select slow speed mode with the travel mode switch.**
- **Never steer while driving up or down a ramp, it is extremely dangerous and may cause the machine to turnover. NEVER attempt to change direction when positioned on the ramp. If repositioning is necessary, first move back to the ground or flatbed, change the direction of travel, and begin to drive again.**
- **At the point where the ramp meets the level surface there is a sudden change of angle. Take care when traveling over this point, as balance may be lost.**
- **Extreme care must be taken when swinging the upper structure when the machine is on the trailer flatbed. If the front attachment is fitted, swing slowly with the arm fully rolled-in underneath the boom, being careful not to lose the balance of the machine.**

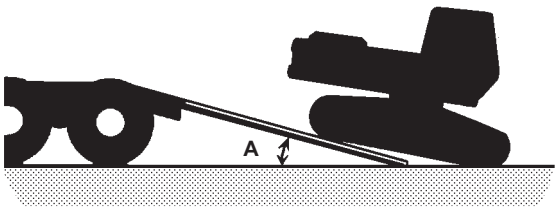
Loading

If the front attachment is fitted, load with the front attachment facing the front; if not, back it onto the trailer.

1. Load the machine so that the centerline of the machine aligns with the centerline of the trailer flatbed.
2. Drive the machine onto the ramp slowly.



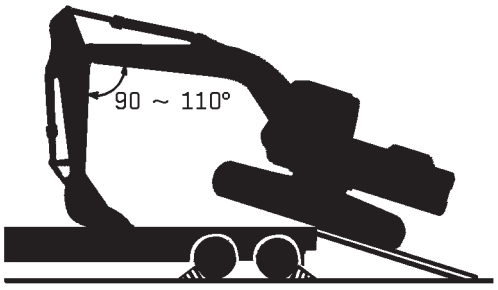
M1G6-06-002-2 ja



Ramp Angle (A) Less than 15°

M107-06-018-2 ja

3. If the front attachment is fitted:
   a. Determine a position for the bucket in line with the trailer. Adjust the angle of the boom and the arm at 90 to 110 °.
   b. Lower the bucket onto to the deck of the trailer before the machine passes over the end of the ramp for support.
   c. Lift the bucket slightly off the deck of the trailer after the machine has moved to the designated space. With the arm rolled in, slowly swing the upper structure around 180 °.
   d. Rest the front attachment on supports such as wooden blocks. When doing so, also lower the blade onto the deck (if fitted).



M107-06-012-1 ja

4. Stop the engine. Remove the key from the key switch.
5. Pull the pilot control shut-off lever to the LOCK position.
6. Close cab windows, roof vent and door, and cover the exhaust opening, to prevent entry of wind and water. Place a cover over the exhaust outlet. Lock all doors, covers and caps if they have a lock.
7. Store all mirrors and the radio antenna correctly.

⚠ CAUTION

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



MDEQ-06-001 ja



M107-06-013 ja

Fastening Machine for Transporting

WARNING

Securely fasten the machine to the flatbed with wire ropes. While transporting, loads may shake around, move forward or backward or to the sides.

1. Place cog stoppers or blocks in front of and behind the tracks to secure the machine.
2. Fasten the track frame of the machine to the flatbed with appropriate strength of wire ropes.
3. Fasten each corner of the machine and front attachment to the flatbed with appropriate strength of wire ropes.

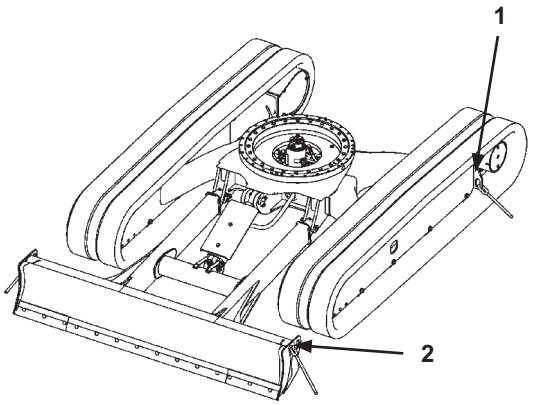


M1V1-06-001 ja

Transporting the machine equipped with rubber crawlers

When securing the machine to the trailer flatbed, do not directly tighten the rubber crawler with wire ropes. Tighten the machine firmly to the trailer flatbed with wire ropes at the travel motor side by using transportation bracket (1).

Tighten the machine firmly to the trailer flatbed with wire ropes at the front idler side by using transportation bracket (2) located on the left and right sides of the blade.



MADB-06-003-2 ja

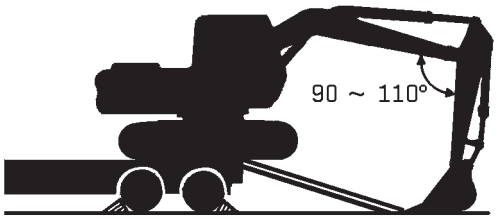
Unloading

⚠ WARNING

- **Turn the auto-idle switch OFF. When in the auto-idle mode, take care as the engine speed may increase suddenly.**
- **Always select slow speed mode with the travel mode switch.**
- **Never steer while driving up or down a ramp, as it is extremely dangerous and may cause the machine to turnover. Never attempt to change direction. If repositioning is necessary, first move back to the ground or flatbed, change the direction of travel, and begin to drive again.**
- **At the point where the ramp meets the level surface there is a sudden change of angle. Travel slowly over this point.**
- **Extreme care must be taken when swinging the upper structure when the machine is on the trailer flatbed. If the front attachment is fitted, swing slowly with the arm fully rolled-in underneath the boom, being careful not to unbalance the machine.**
- **If the front attachment is fitted, load with the front attachment facing the front; if not, back it onto the trailer.**

IMPORTANT

Make sure that the angle of the boom and the arm is kept between 90 to 110° when unloading the machine. Damage to the machine is possible if the arm is kept rolled in during unloading.



M107-06-014 ja

1. Travel extremely slowly with the bucket on the ground and the angle of the arm and the boom kept at between 90 to 110° when moving from the edge of the trailer onto the ramp.

IMPORTANT

When driving the machine over the ramp, do not allow the machine to hit the ground with the arm too hard. Possible damage to the hydraulic cylinders may result.

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.



M107-06-015 ja

Lifting the Machine

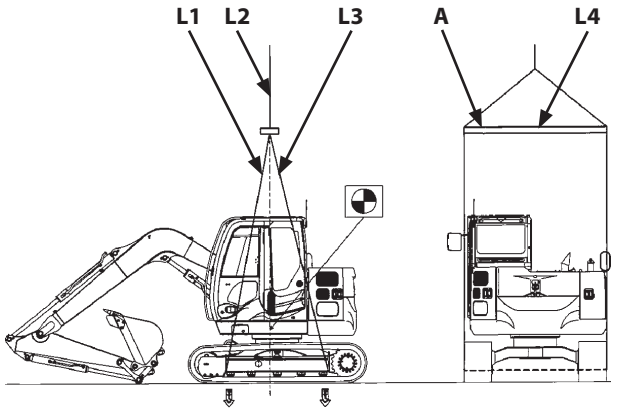
WARNING

- **Use lifting cables and other lifting equipment that are sufficiently strong and free from any damage and/or other defects.**
- **Consult your authorized dealer for correct lifting procedures, and the size and types of lifting cable and 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 close to, or underneath the lifted machine.**
- **The indicated center of gravity is for a machine with standard specifications. The center of gravity will vary depending on the kinds of attachments and/or optional equipment installed and their positioning. Take care not to unbalance the machine while lifting.**

Hoisting

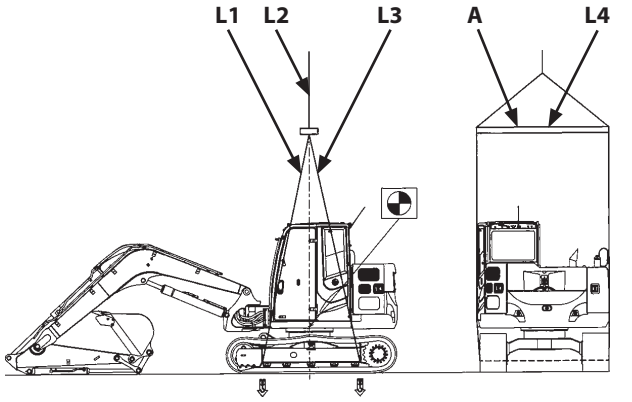
1. Fully extend the arm and bucket cylinders. Lower the boom until the bucket comes in contact with the ground.
2. Pull the pilot control shut-off lever to the LOCK position.
3. Stop the engine. Remove the key from the key switch.
4. Close and lock all doors and covers.
5. Use wire ropes and a support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

Model	Wire Rope and Support Bar (mm)			
	L1	L2	L3	L4
ZX85US-6	8420	5130	8500	3200
ZX85USB-6	8380	5130	8570	3200



ZX85US-6

MDEQ-06-002-1 ja



ZX85USB-6

MDEQ-06-003-1 ja

Center of Gravity

A Support Bar

Correct Maintenance and Inspection Procedures

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



SA-005 ja

Inspect the machine daily before starting.

- Check controls and instruments.
- Level, leakage and contamination of coolant, fuel, DEF/AdBlue® and hydraulic oil
- Check for leaks, kinked, frayed or damaged hoses and lines.
- Walk around machine checking its general appearance, for noise, heat, etc.
- Check for loose or missing parts.

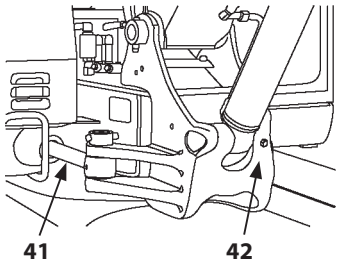
If there is any problem with your machine, repair it before operating or consult your authorized dealer.

IMPORTANT

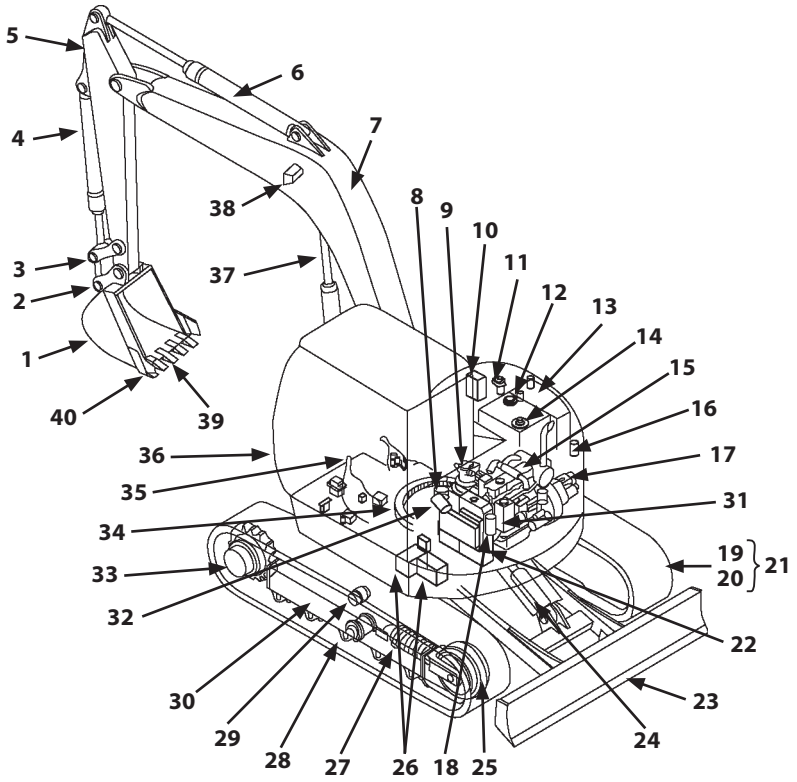
- **Use only specified fuel, lubricants and coolant.**
- **Be sure to use only genuine Hitachi parts. Failure to do so may result in serious injury or death and/or machine breakdown.**
- **Failure to use recommended fuel, lubricants, and genuine Hitachi parts will result in invalidation of Hitachi product warranty.**
- **Never adjust engine governor or hydraulic system relief valve.**
- **Protect electrical parts from water and steam.**
- **Never disassemble electrical components such as the main controller, sensors, etc.**
- **Never adjust parts of the engine fuel system or hydraulic equipment.**
- **Using poor quality fuel, drainage agent, fuel additives, gasoline, kerosene or alcohol refueled or mixed with the specified fuel may deteriorate the performance of fuel filters and cause sliding problems at lubricated contacts in the injector. It also affects the engine and muffler filter parts, leading to malfunction.**
- **Use Hitachi genuine high performance filter.**
- **Chemicals, such as those used in agriculture, and especially those containing a lot of sulfur, corrode the conductors if they get on the IC regulator of the alternator. This results in overcharging (boiling the battery) or the inability to charge.**
- **Conduct periodic maintenance and inspections of the engine and adhere strictly to the inspection intervals listed in this instruction manual.**
  Failure to perform regular maintenance and inspections will compromise the safety and performance of the engine, as well as shorten its service life.
  Furthermore, performing regular maintenance and inspections of the engine makes it possible to prevent interruptions to machine operations caused by a sudden failure. It can also prevent accidents due to deterioration of machine performance and extends the life of the engine.
- **Do not modify the engine.**
  Doing so may compromise the safety and performance of the engine, as well as shorten its service life.
  The Hitachi Warranty is also invalidated if the engine is modified.

- Body Information Controller
  This machine provides a body information controller that stores machine operation information for preventive maintenance.
  During the course of maintaining the machine, our authorized service personnel may download the stored information.
  Consult with your authorized dealer for details on the function of this device.
- Communication Terminal Operation
  It is not necessary to check or operate the communication terminal; however if you sense there is a problem with it, consult your authorized dealer.
  Before installing any attachment that covers the roof, such as a head guard, consult your authorized dealer.
  Never spray water on the communication terminal or the wiring.
- Inquire with your local environmental or recycling center or your authorized dealer, for the proper way to recycle or dispose of oil, fuel, coolant, filters, batteries, DEF/AdBlue® and other waste.

Layout



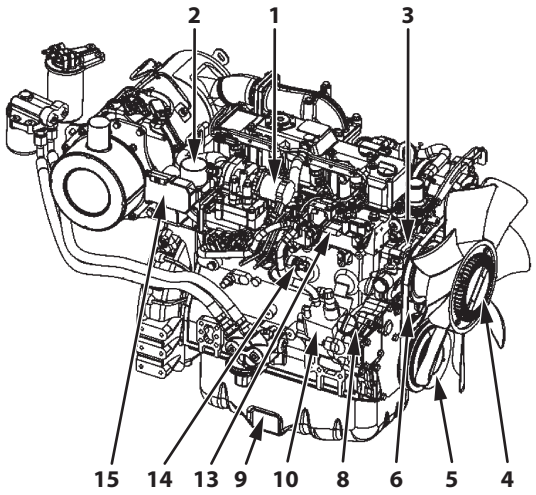
ZX85USB-6



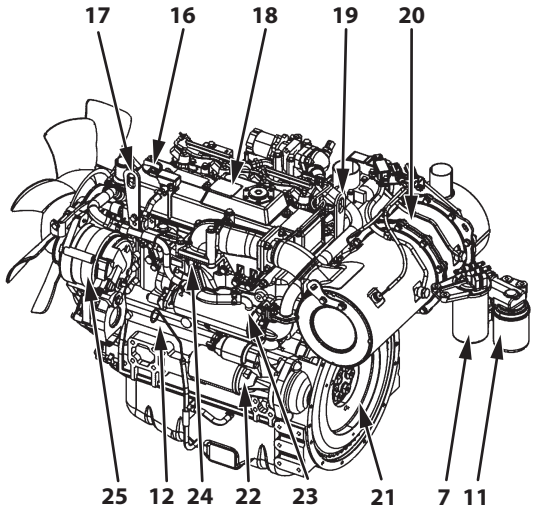
ZX85US-6, 85USB-6

MDEQ-07-001-1 ja

1- Bucket
2- Link A
3- Link B
4- Bucket Cylinder
5- Arm
6- Arm Cylinder
7- Boom
8- Center Joint
9- Swing Reduction Gear
10- Control Valve
11- Pilot Filter
12- Swing Drain Filter
13- Fuel Tank
14- Hydraulic Oil Tank
15- Engine
16- Fuel Filter
17- Pump
18- Reserve Tank
19- Track Link
20- Shoe
21- Track
22- Radiator, Oil Cooler
23- Blade
24- Blade Cylinder
25- Front Idler
26- Battery
27- Track Adjuster
28- Lower Roller
29- Upper Roller
30- Track Frame
31- Washer Tank
32- Air Cleaner
33- Travel Device
34- Swing Bearing
35- Control Lever
36- Cab
37- Boom Cylinder
38- Work Light
39- Tooth
40- Side Cutter
41- Boom Swing Cylinder
42- Boom Swing Post



MDEQ-07-105-1 ja



MDEQ-07-104-1 ja

1- EGR Valve
2- Intake Port (From Air Cleaner)
3- Coolant Pump
4- Cooling Fan
5- Crankshaft V-Pulley
6- V-Belt
7- Fuel Filter
8- Oil Fill Port (Engine Oil)
9- Drain Plug (Engine Oil)
10- Supply Pump
11- Oil Filter
12- Oil Level Gauge
13- Intake Manifold
14- Common Rail
15- Intake Throttle Valve
16- Oil Fill Port
17- Hoist Fitting (Fan Side)
18- Cylinder Head Cover
19- Hoist Fitting (Flywheel Side)
20- Muffler Filter
21- Flywheel
22- Starter
23- EGR Cooler
24- Exhaust Manifold
25- Alternator

Check the Hour Meter Regularly

Refer to the section (7-10) of the Maintenance Guide for information about lubricants, check and adjustment intervals. A maintenance guide table is affixed on the inside of the toolbox cover as well. For details, refer to (7-6) of the Maintenance Guide.

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

Regulation (EU) 2016/1628 Requirements
Following are the requirements on engine use conditions in terms of the exhaust gas regulations stipulated under Regulation (EU) 2016/1628. Insofar as these requirements are not met, the engine is not in compliance with the exhaust gas emission regulations of Regulation (EU) 2016/1628.
Consequently, perform regular maintenance and cleaning of the air cleaner and muffler.

Exhaust Back Pressure Limit (Maximum)

Initial Upper Limit	12.7 kPa
Clean Upper Limit	45 kPa

Intake Negative Pressure Limit (maximum):6.23 kPa

If the intake resistance value above is exceeded, clean or replace the air cleaner element.

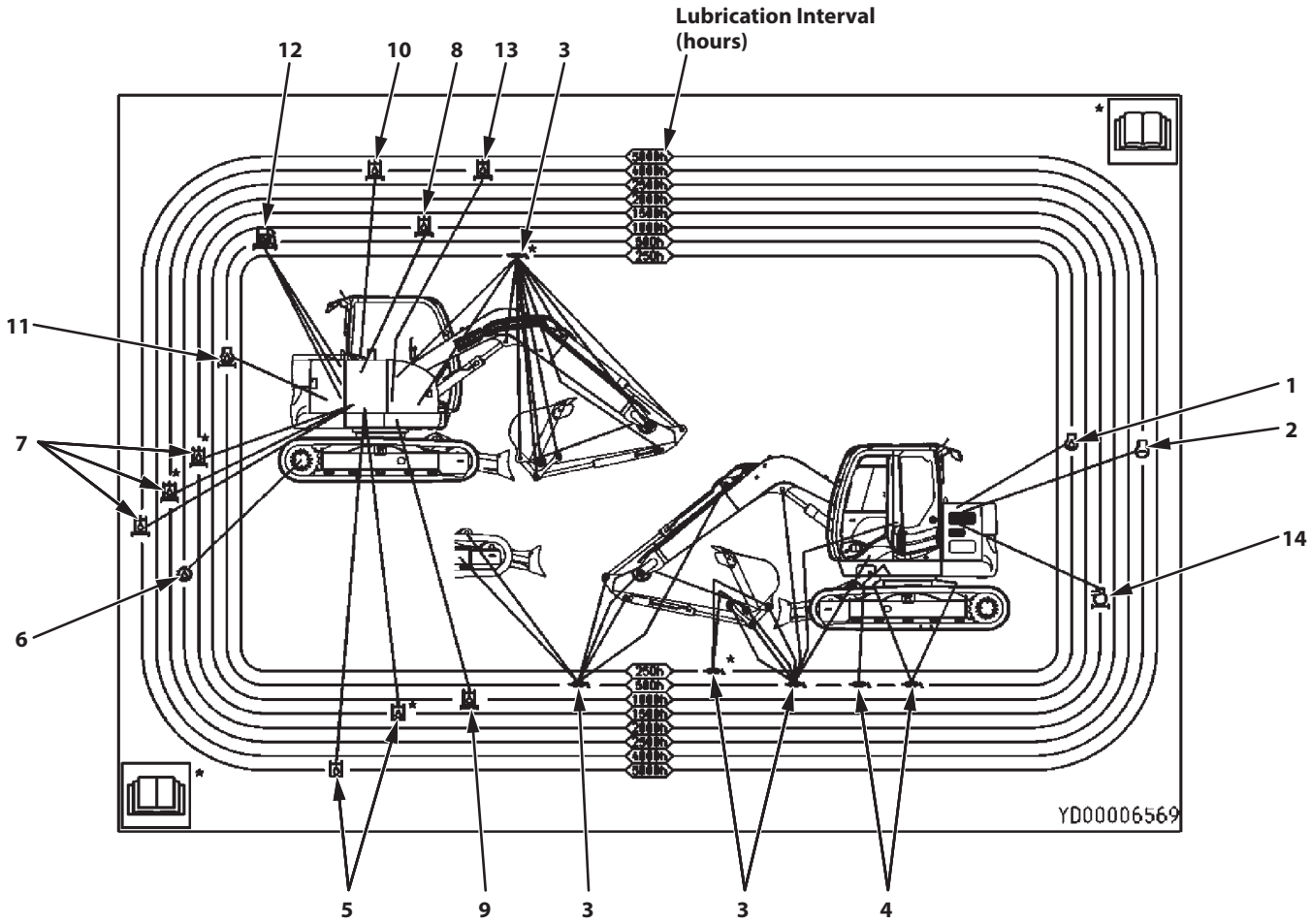
Maintenance Guide Table

A maintenance guide table is affixed on the boom foot side of the control valve compartment. 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 Internal Gear)		Hydraulic Oil Filters (Pilot Filter, Swing Drain Filter, Full-Flow Filter, Suction Filter)
	Gear Oil (Travel Device)		Air Cleaner Filter
	Engine Oil		Coolant (Long-Life Coolant)
	Engine Oil Filter		Fuel Filter (Fuel Main Filter, Pre-Filter)
	Hydraulic Oil		

- Maintenance Guide Table
  Ex: ZX85US-6



MDEQ-07-106-1 en_GB

	Item	Page		Item	Page
1	Engine Oil	7-30	8	Hydraulic Oil Filter (Full Flow)	7-44
2	Coolant (Long-Life Coolant)	7-68	9	Hydraulic Oil Filter (Pilot)	7-45
3	Grease	7-25	10	Hydraulic Oil Filter (Air Breather)	7-47
4	Grease	7-22	11	Engine Oil Filter	7-30
5	Hydraulic Oil	7-41	12	Fuel Filter (Main/Pre)	7-60
6	Gear Oil (Travel Device)	7-34	13	Swing Drain Filter	7-46
7	Hydraulic Oil Filter (Suction)	7-41	14	Air Cleaner Filter	7-63

*1 Indicates the lubrication or maintenance hours.

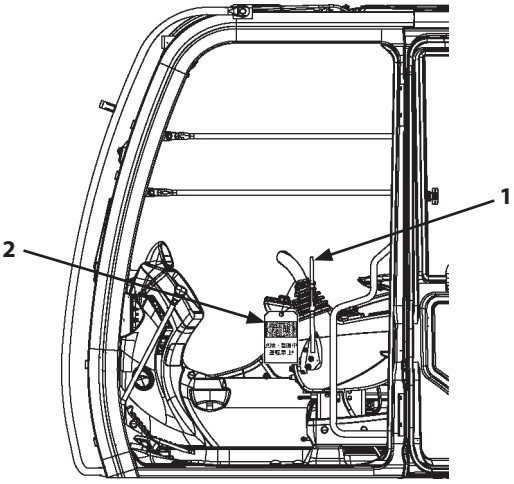
Preparation for Inspection and Maintenance

Except in special cases, park the machine as indicated below before servicing the machine.

1. Park the machine on a firm, level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch OFF.
4. Put the engine control lever in the slow idle position and run the engine for 5 minutes to cool it.
5. Turn the key switch OFF to stop the engine. Remove the key. Be sure to place pilot control shut-off lever (1) in the LOCK position.
6. Put a sign (2) saying "Being Serviced" on the door or in an easy-to-notice place before starting work.



M104-07-021 ja

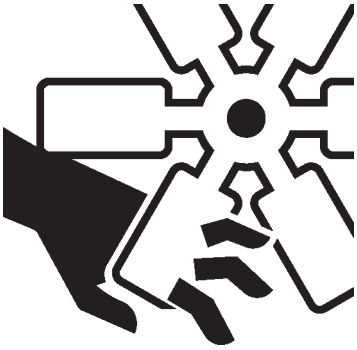


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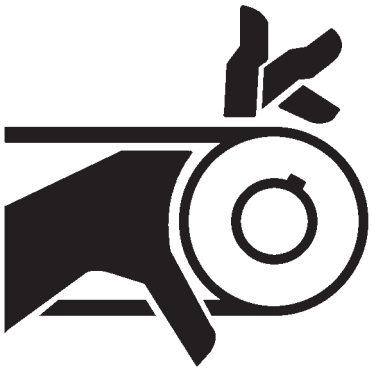
⚠ WARNING

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

- **One person should take the operator's seat and be ready to stop the engine at any time, while communicating with other workers.**
- **When working around moving parts is unavoidable, pay special attention to ensure that hands, feet, and clothing do not become entangled.**
- **If parts or tools are dropped or inserted into the fan or the belt, they may fly off or be cut off. Do not drop or insert parts or tools into moving parts.**
- **Move pilot control shut-off lever (1) to the LOCK position so the machine will not move.**
- **Take care not to touch the control levers and pedals. If operating the control levers or pedals is unavoidable, signal co-workers to evacuate to a safe place.**



SA-2294 ja



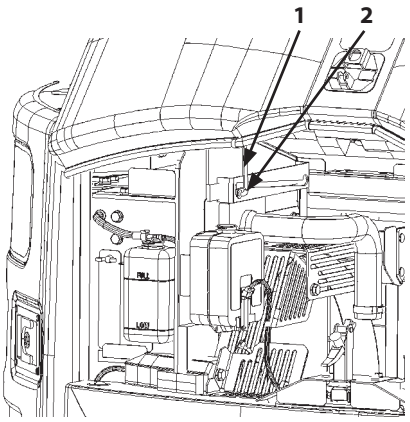
SA-026 ja

Hood and Access Covers

WARNING

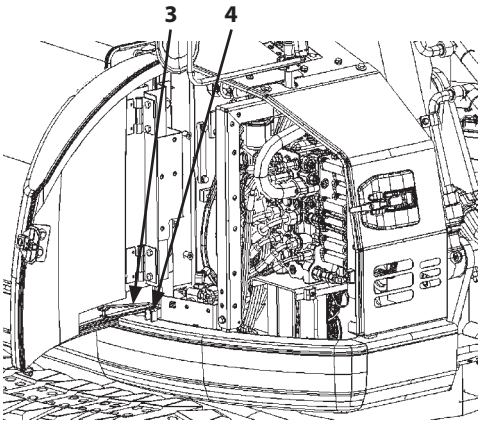
- **Do not keep the hood and access covers open when the machine is parked on a slope, or while the wind is blowing hard. The hood or access covers may close accidentally, possibly resulting in personal injury.**
- **When opening or closing the hood and access covers, take extra care not to catch fingers between the base machine and the hood or access covers.**

- When opening the engine cover, hold onto it until rod (1) is secured with catch (2).
- After opening the right and/or left access cover, be sure to insert rod (3) into cover lock hole (4) to hold the cover.



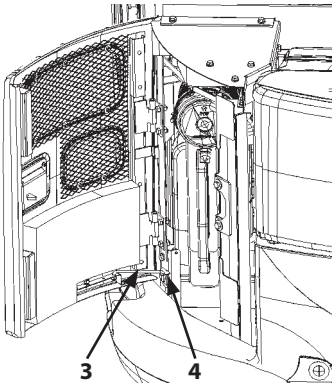
Engine Cover

MDEQ-07-003-1 ja



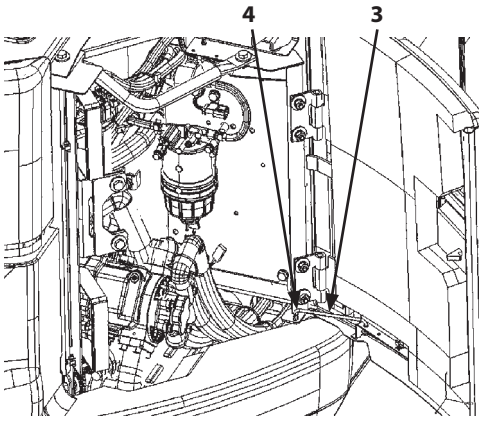
Right Front Cover

MDEQ-07-004-1 ja



Left Cover

MDEQ-07-006-1 ja



Right Rear Cover

MDEQ-07-005-1 ja

Maintenance Guide

A. Greasing

	Parts			Qty.	Interval (Hours) 8	50	100	250	500	1000	2000	Page
1.	Front Joint Pins	Bucket and Link Pins		9	★			★★				7-22
		Swing Post	ZX85USB-6	4				★★				7-24
		Miscellaneous		11	★			★★				7-22
2.	Swing Bearing			2								7-25
3.	Swing Internal Gear			1					★★ ★			7-26
4.	Blade Joint Pins			4								7-27

★ : Add grease daily during first 50 hours of operation.
If excavation is performed in water, grease the pin after operation is complete.
Shorten greasing intervals when the machine is operated under severe conditions or when the machine is continuously operated for a long period of time.

★★ : 250 hours for only first time.

★★★ : Check and add grease if necessary.

IMPORTANT

- **Grease bucket and link pivots every day until break-in operation (50 hours) is complete.**
- **When a bucket which does not have a clearance adjustment mechanism, such as slope-finishing bucket or V-type bucket, or a genuine Hitachi 0.13 m^3 hoe bucket before EX-5 model, or an attachment other than genuine Hitachi bucket is used, grease the two pins every 250 hours.**

B. Engine

	Parts		Qty.	Interval (Hours) 8	50	100	250	500	1000	2500	Page
1.	Engine Oil	Check Oil Level	1								7-28
2.	Engine Oil	Replace	12.3 L								7-30
	Engine Oil Filter	Replace	1								7-30

C. Transmission

	Parts		Qty.	Interval (Hours) 8	50	100	250	500	1000	2000	Page
1.	Travel Device	Check Oil Level	2								7-34
		Replace	1.2 L×2								7-35

D. Hydraulic System

	Parts		Qty.	Interval (Hours)										Page
				8	50	100	250	300	1000	1500	2500	4000	5000	
1.	Check Hydraulic Oil Level		1	■										7-39
2.	Drain Hydraulic Oil Tank Sump		1				■							7-40
3.	Change Hydraulic Oil		100 L							★	★		★	7-41
4.	Suction Filter Cleaning		1	Each time hydraulic oil is changed										7-41
5.	Replace Full-Flow Filter		1						★					7-44
6.	Replace Pilot Oil Filter Element		1						■					7-45
7.	Replace Swing Drain Filter Element		1									■		7-46
8.	Replace Air Breather Element		1									■		7-47
9.	Check Hoses and Lines	Leaks	–	■										7-48
		Cracks, bend, etc.	–				■							7-48

★ : The change interval varies with the brand of hydraulic oil used, kind of filter element and average attachment operating ratio.
Refer to sections Changing the Hydraulic Oil (7-41) and Replacing the Full Flow Filter Element (7-44) under Hydraulic System.

E. Fuel System

	Parts	Qty.	Interval (Hours)							Page
			8	50	100	250	500	1000	2000	
1.	Fuel System	1	■							7-57
2.	Drain Fuel Tank Sump	1	As required							7-57
3.	Drain Fuel Pre-Filter	1	■							7-57
4.	Replace Main Fuel Filter Element	1						■		7-60
5.	Replace Fuel Pre-Filter Element	1						■		7-61
6.	Check Fuel Hoses for leaks, cracks	–	■							7-62
	Check Fuel Hoses for cracks, bend, etc.	–				■				7-62

F. Air Cleaner

	Parts		Qty.	Interval (Hours)							Page
				8	50	100	250	500	1000	2000	
1.	Air Cleaner Outer Element	Clean	1	(or when indicator lit)			★				7-63
		Replace	1	After cleaning 6 times or 1 year							7-63
2.	Air Cleaner Element (Inner)	Replace	1	When outer element is replaced							7-63

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

G. Cooling System

	Parts		Qty.	Interval (Hours)							Page
				8	50	100	250	500	1000	2000	
1.	Check Coolant Level		1								7-66
2.	Check and Adjust Fan Belt Tension		1		★★						7-67
3.	Change Coolant		9.5 L	Twice a year*							7-68
4.	Clean Radiator/Oil Cooler Core	Out-side	1					★			7-69
		Inside	1	When changing the coolant							7-69
5.	Clean Oil Cooler, Radiator and Intercooler Front Screen		1					★			7-70
6.	Clean Air Conditioner Condenser		1					★			7-71
7.	Clean Fuel Cooler Front Screen		1					★			7-72

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

★★ : 1st time only

* : When genuine Hitachi Long-Life Coolant (LLC) is used, change every two years or 4000 operating hours, whichever comes first.

IMPORTANT

- **Use soft water as a coolant. Do not use strong acid or alkaline water. Use a coolant with genuine Hitachi Long-Life Coolant (LLC) at a mixture of 30 to 50 %. If a coolant mixed with less than 30 % of Hitachi Long-Life Coolant (LLC) is used, the service life of the cooling parts may be shortened due to damage by freezing or corrosion of cooling system parts.**
- **If mineral-rich water is used for coolant, water stains or scale may build up inside the engine or radiator, causing overheating due to deterioration of coolant performance.**
- **Do not use anything other than the specified coolant. The Hitachi Warranty may be invalidated if a coolant other than the specified one is used. Doing so may also cause corrosion and/or grime inside the engine, shortening its service life.**
- **Do not use with a mixture of different types of coolant. Doing so may compromise the cooling efficiency of the coolant.**

H. Electrical System

Parts			Qty.	Interval (Hours)							Page
				8	50	100	250	500	1000	2000	
1.	Battery	Check Electrolyte Level	2	Monthly							7-76
		Check Electrolyte Specific Gravity	2	Monthly							7-77
2.	Replacement Of Fuses	Replace	–	As required							7-80

I. Miscellaneous

	Parts			Qty.	Interval (Hours)								Page
					8	50	250	500	1000	1500	2000	3000	
1.	Check and Replace Bucket Teeth			–	■								7-84
2.	Change Bucket			–	As required								7-86
3.	Inverting the Bucket			–	As required								7-87
4.	Adjust Bucket Linkage			1	As required								7-89
5.	Remove Travel Levers (ZX85US-6)			2	As required								7-90
6.	Check and Replace Seat Belt			1	■	Every 3 years							7-91
7.	Check Windshield Washer Fluid Level			1	As required								7-92
8.	Adjust Track Sag (Steel Crawlers)			2		■							7-93
9.	Adjust Track Sag (Rubber Crawlers) (Optional)			2	■								7-96
10.	Check/Replace Air Conditioner Filter	Fresh Air Filter	Clean	1				■					7-100
			Re-place	1	After cleaning 6 times or so								7-99
		Circulating Air Filter	Clean	1				■					7-100
			Re-place	1	After cleaning 6 times or so								7-101
11.	Check Air Conditioner			–			■						7-105
12.	Clean Cab Floor			–	As required								7-107
13.	Inspect, Clean and Check Injector Function			–								■ ★	7-109
14.	Inspect and Adjust Valve Clearance			–					■ ★				7-109
15.	Measure Engine Compression Pressure			–					■ ★				7-109
16.	Check Starter and Alternator			–					■ ★				7-109
17.	Inspect, Clean and Check EGR Valve Function			–								■ ★	7-109
18.	Check Gas Damper			–	*As required								7-110
19.	Check Crankcase Breather			–						■ ★			7-110
20.	Clean EGR Cooler			–						■ ★			7-110
21.	Check the Function of the Intake Throttle Valve			–								■ ★	7-110
22.	Check the Radiator Cap										■ ★		7-110
23.	Tightening and Retightening Torque of Nuts and Bolts			–		■ ★ ★							7-111

★ : *Contact your authorized dealer for maintenance. Instruction plate for the recommended grease and lubricants is affixed inside the tool box cover.

★★ : Maintenance required only during first time check.

J. Muffler Filter

	Parts	Qty.	Interval (Hours)								Page
			8	50	100	250	500	1000	2000	3000	
1.	Inspect and Clean Filter of Muffler Filter	1								★	7-122
2.	Inspect and Clean Muffler Filter	–	As required*								7-122

★ : For information on inspecting and maintenance, consult your authorized dealer.

* : Perform a visual inspection of both the exhaust temperature sensor and the differential pressure sensor of the muffler filter.

IMPORTANT

Clean the filter if a warning that ash cleaning is required is generated.

Periodic Replacement of Parts

To ensure safe operation and long life, be sure to conduct periodic inspection and maintenance of the machine. In addition, the parts listed below, if defective, may pose serious safety/fire hazards.

These parts may cause serious safety/fire hazards due to deterioration, wear, or fatigue being attributed to material aging or repeated operation.

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.

Consult your authorized dealer for replacing the parts.

<table>
<tr><th colspan="3">Periodic Replacement of Parts</th><th>Replacement Interval</th></tr>
<tr><td colspan="2" rowspan="7">Engine</td><td>Fuel hose (tank to engine)</td><td rowspan="6">Every 2 years</td></tr>
<tr><td>Fuel hoses (Engine to fuel cooler to tank)</td></tr>
<tr><td>Oil filter hose (Engine to oil filter)</td></tr>
<tr><td>Heater hose (Heater to engine)</td></tr>
<tr><td>Breather hose</td></tr>
<tr><td>Engine rubber vibration insulator</td><td>Every 5 years or 4000 hours whichever comes first</td></tr>
<tr><td>Pump Coupling</td><td>Every 5 years or 4000 hours whichever comes first</td></tr>
<tr><td colspan="2">Differential pressure hose (differential pressure sensor to differential pressure pipe)</td><td>Every 3000 hours</td></tr>
<tr><td rowspan="7">Hydraulic System</td><td rowspan="4">Base Machine</td><td>Pump suction hose</td><td rowspan="7">Every 2 years or 4000 hours whichever comes first</td></tr>
<tr><td>Pump delivery hose</td></tr>
<tr><td>Swing hose</td></tr>
<tr><td>Travel high pressure hose</td></tr>
<tr><td rowspan="3">Working Devices</td><td>Boom cylinder line hose</td></tr>
<tr><td>Arm cylinder line hose</td></tr>
<tr><td>Bucket cylinder line hose</td></tr>
<tr><td colspan="3">Seat belt</td><td>Every 3 years</td></tr>
<tr><td colspan="3">Overhead window (clear hatch) (if equipped)</td><td>Every 5 years</td></tr>
</table>

IMPORTANT

- **Replace the clear hatch with a new one every 5 years even if undamaged. Replace the roof in less than 5 years if there is any visible damage or it receives a major impact.**
- **When cleaning the clear hatch, use a neutral detergent.**
  If an 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.

Kind of Oils

Recommended Grease

Kind of Grease		Lithium Grease
Application		Front Attachment Joint Pins, Swing Bearing, Swing Internal Gear
Air Temp.		-20 to 40 °C (-4 to 104 °F)
Recommended Products		Hitachi Genuine Grease NLGI EP-2
Alternative Products	Specification	NLGI 2 EP

IMPORTANT

- **Hitachi Genuine Greases are specially designed and tested to provide optimum performance for the machine, hence we recommend to use Hitachi Genuine Greases.**
- **If you do not use Hitachi Genuine Greases, use grease conforming to EP-2. Otherwise, the machine may suffer damage.**
- **Do not use greases which do not meet the above specification or requirements. Use of unsuitable grease may lead to damage which is excluded from Hitachi Warranty Policy.**
- **For details, contact your nearest authorized dealer.**

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)
Recommended Products		Hitachi Genuine Engine Oil 10W-30 DH-2	Hitachi Genuine Engine Oil 15W-40 DH-2
Alternative Products	Viscosity	10W-30	15W-40
	Specification	API Class CJ-4, ACEA Class E6, JASO Class DH-2 equivalents	

IMPORTANT

- **Hitachi Genuine Engine Oils are specially designed and tested to provide optimum performance for the machine, hence we recommend to use Hitachi Genuine Engine Oils.**
- **If you do not use Hitachi Genuine Engine Oil, use engine oil conforming to API Class CJ-4, ACEA Class E6, JASO Class DH-2 equivalents. Otherwise, engine and muffler filter may suffer damage, or performance of engine may deteriorate.**
- **Do not use oils which do not meet the above specification or requirements. Use of unsuitable oil may lead to engine damage which is excluded from Hitachi Warranty Policy.**
- **For details, contact your nearest authorized dealer.**
- **Do not use with a mixture of different types of engine oil. Doing so may compromise the lubricating efficiency of the engine oil.**
  Refrain from using additives in the engine oil.

Recommended Transmission Oil

Application		Travel Reduction Gear
Kind of Oil		Gear Oil
Air Temp.		-20 to 40 °C (-4 to 104 °F)
Recommended Products		Hitachi Gear Oil GL-4 90
Alternative Products	Specification	API GL-4

IMPORTANT

- **Hitachi Genuine Gear Oil are specially designed and tested to provide optimum performance for the machine, hence we recommend to use Hitachi Genuine Gear Oil.**
- **If you do not use Hitachi Genuine Gear Oil , use gear oil or engine oil conforming to specifications described above. Otherwise, the machine may suffer damage.**
- **Do not use oils which do not meet the above specification or requirements. Use of unsuitable oil may lead to engine damage which is excluded from Hitachi Warranty Policy.**
- **For details, contact your nearest authorized dealer.**

Recommended Hydraulic Oil

Kind of Lubricant	Hydraulic Oil	
Where to be applied	Hydraulic System	
Change Interval	5000 hours	1500 hours
Environmental Temp.	–20 to 40 °C (–4 to 104 °F)	
Recommended Products	Hitachi Genuine Hydraulic Oil 5000	Hitachi Genuine Hydraulic Oil Multi
Alternative Product		Product Conforming to JCMAS HK VG46W

NOTE

A different interval of oil change may be required for Alternative Products. For details, contact your nearest authorized dealer.

IMPORTANT

- **Hitachi Genuine Hydraulic Oils are specially designed and tested to provide optimum performance for the machine, hence we recommend to use Hitachi Genuine Hydraulic Oils.**
- **If you do not use Hitachi Genuine Hydraulic Oil, use hydraulic oil conforming to JCMAS HK VG46W. Otherwise, the machine may suffer damage.For the information of JCMAS HK VG46W, refer to JALOS website.**
- **Do not use oils which do not meet the above specification or requirements. Use of unsuitable grease may lead to damage which is excluded from Hitachi Warranty Policy.**

Recommended Oil Viscosity

Parts	Kind of Oil	Recommended Oil by Temperature (°C)									
		-30	-20	-10	0	10	20	30	40		
Engine Oil Pan	Engine Oil										Hitachi Genuine Engine Oil DH-2 10W30
											Hitachi Genuine Engine Oil DH-2 15W40
Travel Device	Gear Oil										Hitachi Gear Oil GL-4_90
Hydraulic Equipment (Hydraulic Oil Tank)	Hydraulic Oil										Hitachi Genuine Hydraulic Oil 5000 Hitachi Genuine Hydraulic Oil Multi
Fuel Tank	Diesel										EN590 ClassA
											EN590 ClassB
											EN590 ClassC
											EN590 ClassD
											EN590 ClassE
											EN590 ClassF
Grease Fitting	Lithium Grease										Hitachi Genuine Grease NLGI EP-2
Radiator	Coolant										Hitachi Genuine Long Life Coolant(LLC)

List of Consumable Parts

Filter Elements

	ZX85US-6 ZX85USB-6 Part No.	Qty.
Full-Flow Filter (with O-ring)	4448401	1
Hydraulic Oil Suction Filter	4670343	1
Pilot Filter	4630525	1
Swing Drain Filter	4463783	1
Engine Oil Filter	4665128	1
Fuel Main Filter Element	YD00005703	1
Fuel Pre-Filter Element	YD00002532	1
Air Cleaner Outer Element	YD00001541	1
Air Cleaner Element (Inner)	YD00001327*1	1
AC Circulating Air Filter (inner)	YA00011003	1
AC Circulating Air Filter (outer)	4445864	1
AC Fresh Air Filter	4350249	1

*1 is an optional part.

Drive Belts

	Part No.	Qty.
Engine Fan Belt	YD00005940	1
AC Compressor Belt	4439003	1

Bucket Parts

		ZX85US-6 ZX85USB-6 Part No.	Qty.
Tooth	Tooth	4135496	4
	Lock Pin	4135497	4
	Lock Rubber	4135498	4
Side Cutter	Side Cutter (right side)	3053595	1
	Side Cutter (left side)	3053596	1
	Bolts	4400608	6
	Nut	J953020	6
	Washers; springs	A590920	6
O-ring		4406388	4

NOTE

- *The quantity row in the table above represents the number of parts used for one standard (0.28 m^3) bucket.*
- *The quantity may vary with optional buckets.*
- *The quantity for O-rings includes connection parts of arms and links.*

A. Greasing

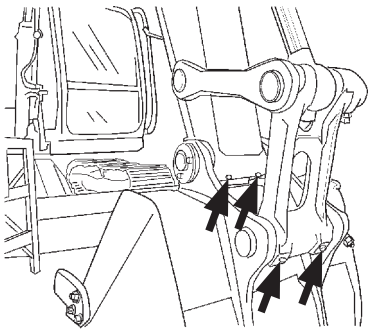
1 Front Joint Pins

Bucket and Link Pins--- every 500 hours

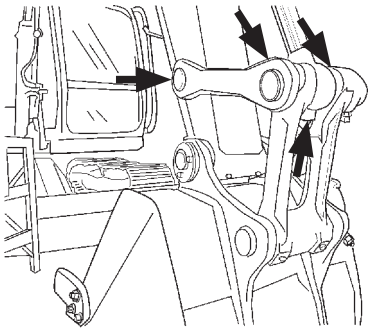
Lubricate all fittings shown in the figure.

Other parts--- every 500 hours

Lubricate all fittings shown in the figure.

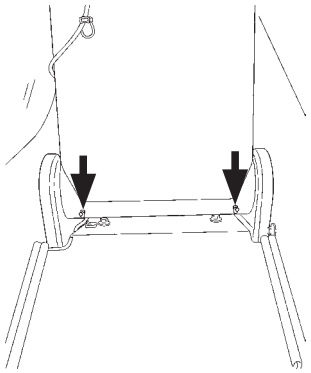


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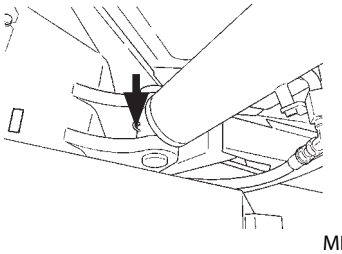
MDEQ-07-007-2 ja

- Boom Foot



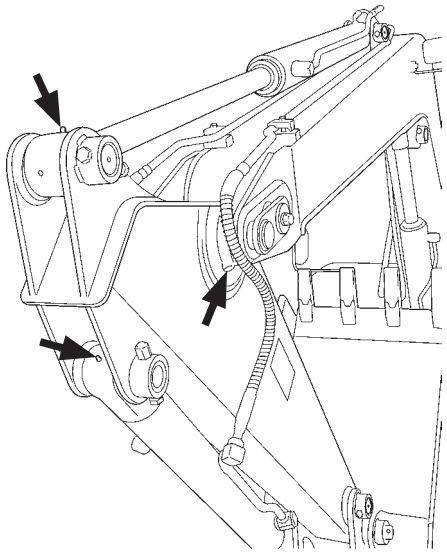
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- Boom Cylinder Bottom Side



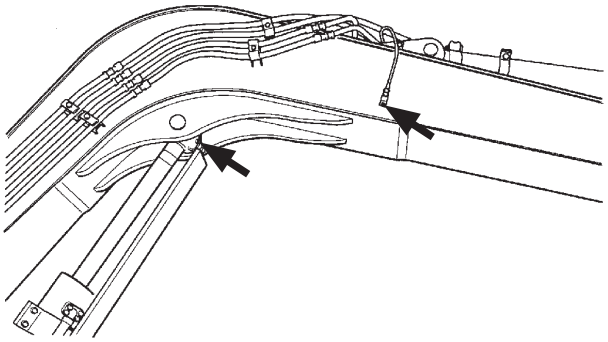
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- Boom and Arm Joint Pin (Both Sides), Arm Cylinder Rod Pin and Bucket Cylinder Bottom Pin



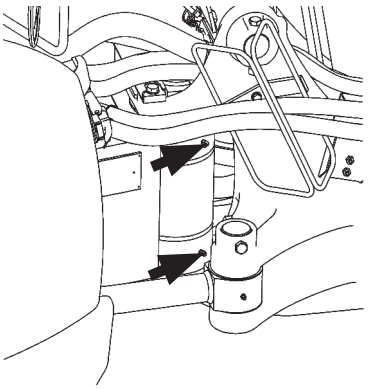
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- Boom Cylinder Rod Pins and Arm Cylinder Bottom Pin



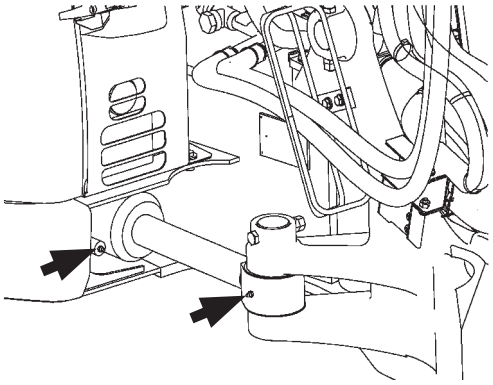
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- Swing Post (ZX85USB-6)



MDEQ-07-012-1 ja

- Swing Cylinder (ZX85USB-6)



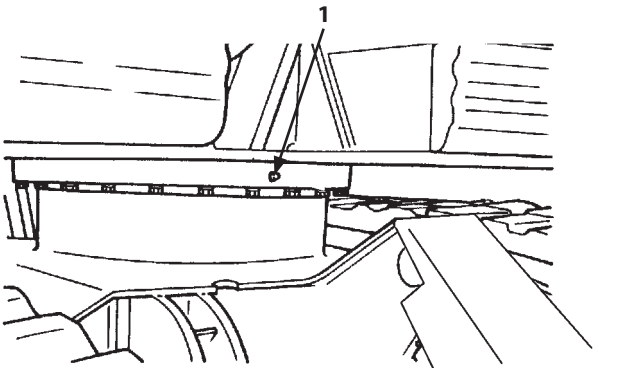
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2 Swing Bearing

--- every 500 hours

CAUTION

Lubricating both the swing bearing and gear, and rotating the upperstructure must be done by one person. Before starting this task, clear the area of all persons. Before lubricating the machine, lower the bucket to the ground, stop the engine and pull the pilot control shut-off lever to the LOCK position.



MDEQ-07-014-1 ja

1. Park the machine according to the instructions of (7-8) Preparations for Inspection and Maintenance.
2. Lubricate the parts via the fittings (1) shown in the figure. The appropriate amount of grease is expelled with two or three strokes of the grease gun.
3. Confirm that the pilot control shut-off lever is pulled to the UNLOCK position before starting the engine.
4. Raise the bucket approx. 200 mm above the ground and rotate the upperstructure 90°.
5. Lower the bucket to the ground.
6. Repeat the procedure (Steps 1 to 5) 3 times.
7. Apply grease (approx. 0.20 liters) to the swing bearing until grease can be seen escaping from the swing bearing seals. Take care not to supply excessive grease.

3 Swing Gear

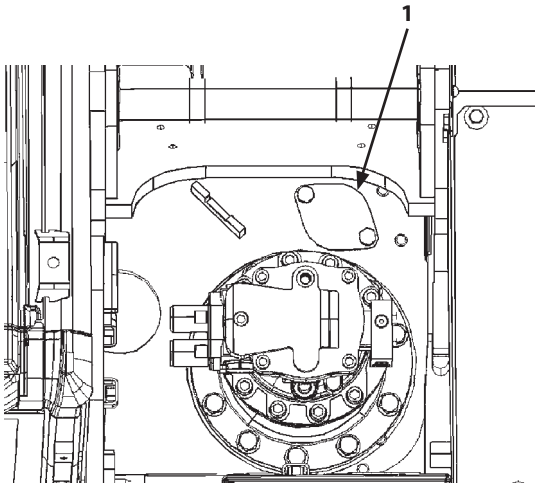
--- every 500 hours

CAUTION

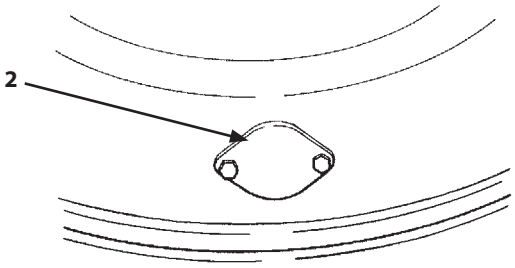
Lubricating both the swing bearing and gear, and rotating the upperstructure must be done by one person. Before starting this task, clear the area of all persons. Before lubricating the machine, lower the bucket to the ground, stop the engine and pull the pilot control shut-off lever to the LOCK position.

1. Park the machine according to the instructions of (7-8) Preparations for Inspection and Maintenance.
2. Remove cover (1) on top of the upperstructure and check whether the swing internal gear is greased properly or not. If there is not enough grease, add about 0.5 kg (0.5 liters), as a guide.

If the grease is cloudy due to contamination, remove cover (2) on the undercarriage and remove all the old grease and replace with new grease. It takes about 4.4 liters of grease.



MDEQ-07-015-1 ja

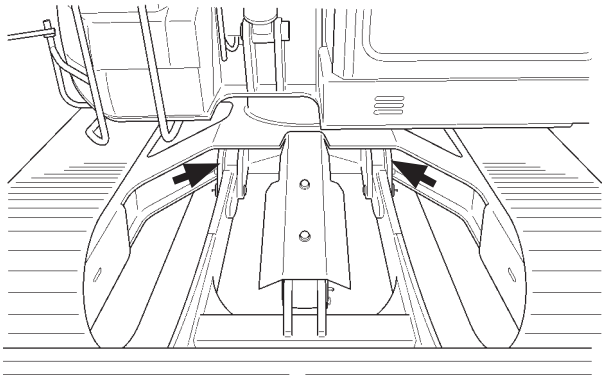


M157-07-161-2 ja

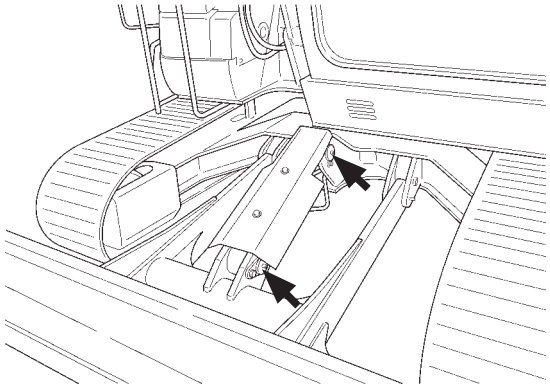
4 Blade Joint Pins

--- every 500 hours

- Blade Joint Pins
- Blade Cylinder Rod and Bottom Side



MDEQ-07-016-1 ja



MDEQ-07-017-1 ja

B. Engine

1 Check Engine Oil Level

...daily (before starting the engine)

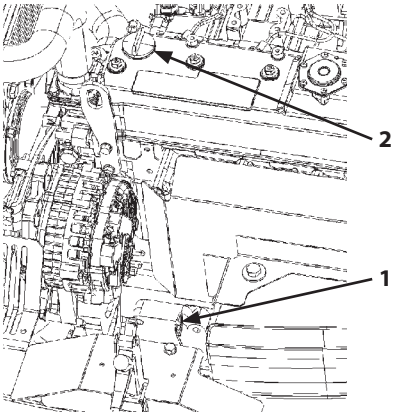
IMPORTANT

This machine employs a closed breather system. An incorrect engine oil level may cause problems with the engine. (The oil level should be between the upper and lower marks on oil level gauge (1).)
If the engine oil level exceeds the upper limit, the oil level must also be adjusted to the proper quantity before starting the engine.

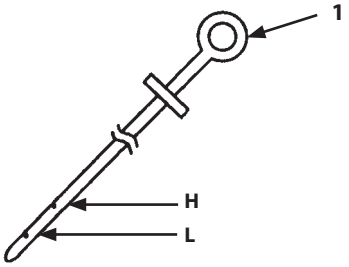
- **Keep foreign matter, such as dirt, out of the engine oil. Carefully remove any dirt around the oil fill port and the oil level gauge before removing the oil fill port.**
- **Take care not to get any sediment or water into the engine oil, containers for storing engine oil or in equipment for filling with engine oil.**
- **Never fill with engine oil beyond the specified level.**
  Filling with too much engine oil may result in white smoke coming from the exhaust, surging in the engine RPM and/or internal damage to the engine.

Check the oil level before starting the engine.

1. Check when the engine is level.
2. Open the engine cover and pull out oil level gauge (1).
3. Wipe off oil level gauge (1) with a cloth and insert it back in the pipe and pull it out again.
4. The oil level is correct if between the high (H) and low (L) marks on oil level gauge (1).
   If the oil level is below the low (L) mark, add the recommended engine oil via oil filler (2).
   If the oil level is above the upper mark (H), remove cap (4) of drain valve (3) on the bottom of the engine oil pan, and then open drain valve (3) by turning drainer (5) and drain off the excess oil.



MDEQ-07-018-1 ja



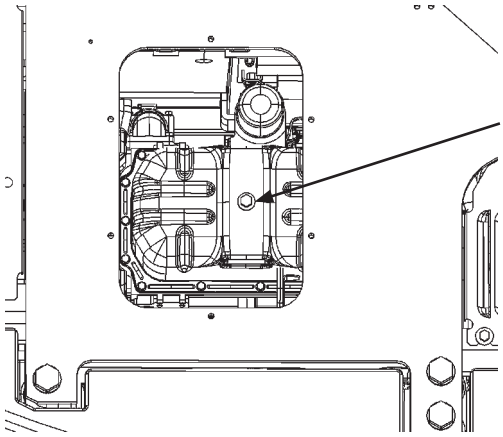
M178-07-011-2 ja

⚠ CAUTION

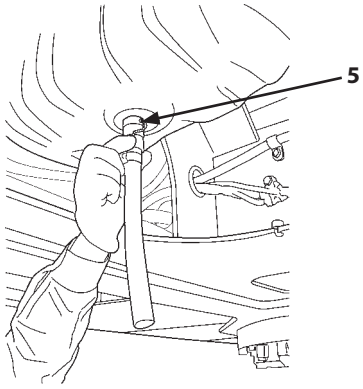
Avoid spillages when adding oil. Spilled oil may cause fires.

IMPORTANT

Turn in drainer (5) slowly. A lot of oil may come out if it is turned in all at once.



MDEQ-07-019-1 ja



M1U1-07-046-1 ja

2 Change Engine Oil and Replace Engine Oil Filter

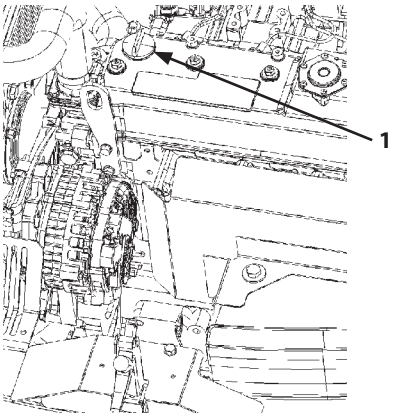
--- every 500 hours

1. Park the machine according to the instructions of (7-8) Preparations for Inspection and Maintenance.

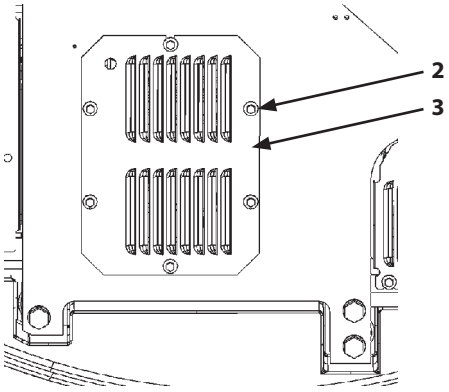
⚠ CAUTION

- **Engine oil may be hot just after operation. Wait for oil to cool before starting work.**
- **Avoid spillages when adding oil. If oil is spilled, wipe it up. If spilled oil is left as-is, it may lead to a fire.**

2. Remove oil filler cap (1).
3. Remove bolts (2) and cover (3).
4. Place a 20 liter container under the engine oil pan.

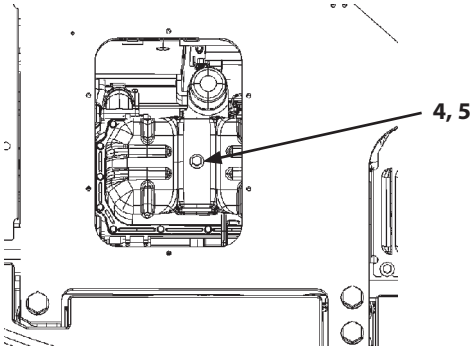


MDEQ-07-018-2 ja



MDEQ-07-020-1 ja

5. Remove cap (5) on drain valve (4) and screw in drainer (6) to open drain valve (4) and drain oil.

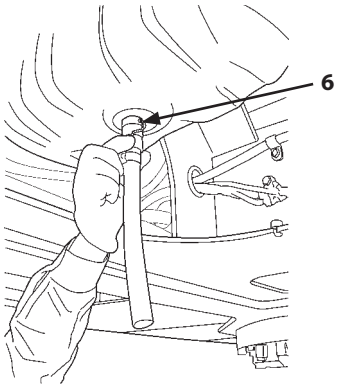


MDEQ-07-019-2 ja

IMPORTANT

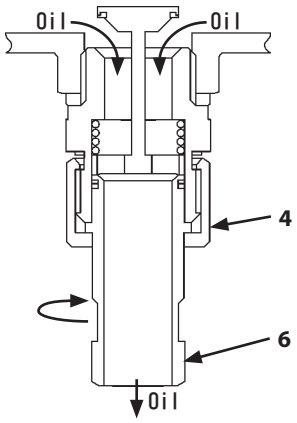
Turn in drainer (8) slowly. A lot of oil may come out if it is turned in all at once.

6. Filter the oil through a clean cloth (A) and into the container.
7. After all oil has drained, inspect the cloth for any debris, such as small pieces of metal.



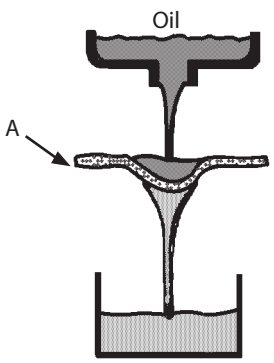
MDEQ-07-021-2 ja

8. Remove drainer (6) and install cap (5) on drain valve (4).



Structure of Drainer

M1U1-07-002-3 ja



Check for Contaminants in Drained Oil

M104-07-010-2 en_GB

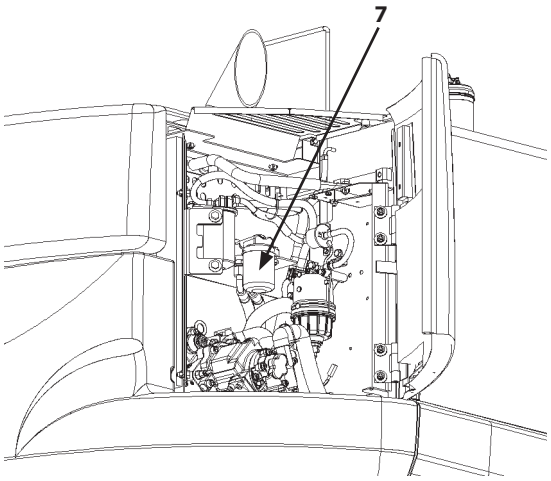
9. Remove oil filter cartridge (7) with a filter wrench by turning it counterclockwise.
10. Clean the filter cartridge contact area on the machine.

IMPORTANT

- **Put new oil into the cartridge. (Amount of oil:Approx. 0.4 L)**
- **When putting new oil in cartridge element, take care that no foreign objects gets inside.**
- **Do not reuse engine oil filter (7). Use a genuine engine oil filter (7). Failure to use non-genuine parts or failure to replace the oil filter may result in problems with the engine.**

11. Apply a thin layer of engine oil to the gasket (O - ring) of the new oil filter (7).
12. Install new oil filter (7). Turn the filler cartridge clockwise by hand until the gasket touches the contact area. Be sure not to damage the gasket when installing filter (7).
13. Tighten engine oil filter 3/4 of one turn using the filter wrench. Be careful not to overtighten as doing so may deform oil filter (7).

    Tightening Torque: 20 to 24 N·m
    (2.0 to 2.4 kgf·m)



MDEQ-07-022-1 ja

⚠ CAUTION

Avoid spillages when adding oil. If oil is spilled, wipe it up. If spilled oil is left as-is, it may lead to a fire.

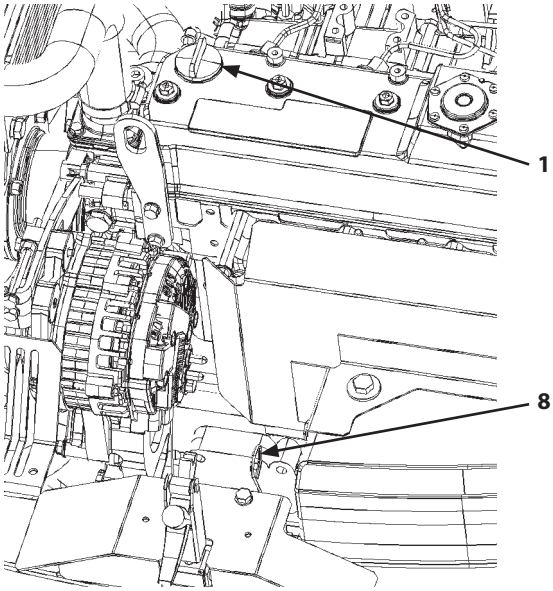
14. Fill the engine with the recommended oil via oil filler (1). Wait 15 minutes and then pull out dipstick (8) and check that the level is between the minimum and maximum levels.

    Engine Oil Amount: 11.6 L

    NOTE

    Refer to (7-17) Kinds of Oils for the type of oil to use.

15. Install new oil filter (1).
16. Start the engine. Run the engine at slow idle for 5 minutes.
17. Stop the engine. Remove the key from the key switch.
18. Check for any leakage.
19. Wait 15 minutes and then check the level; add or drain oil to ensure that the level is between the minimum and maximum levels. (The oil level should be between the upper and lower marks on the oil level gauge.) For further information, see (7-28) Engine Oil Capacity.



MDEQ-07-023-1 ja

C. Transmission

1 Gear Oil in Travel Device

Check Oil Level --- every 250 hours

1. Park the machine on a level surface.
2. Rotate the travel motor until the plugs are positioned as illustrated on the right.
3. Park the machine according to the instructions of (7-8) Preparations for Inspection and Maintenance.

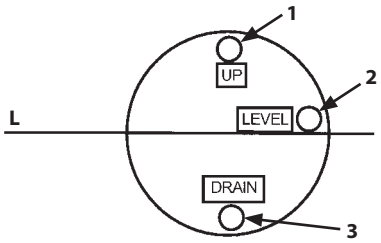
⚠ WARNING

Keep your body and face away from the air bleed plug. Gear oil may be hot just after operation. Wait for gear oil to cool and then gradually loosen the air bleed plug to bleed off air.

4. Once the oil is cool, slowly loosen plug (1) to release pressure.
5. Remove air bleed plug (1), and oil level check plug (2); oil must be up to the bottom of the hole.
6. Add oil until oil flows out of the oil level check plug (2) hole.
7. Clean and tighten plugs (1) and (2).

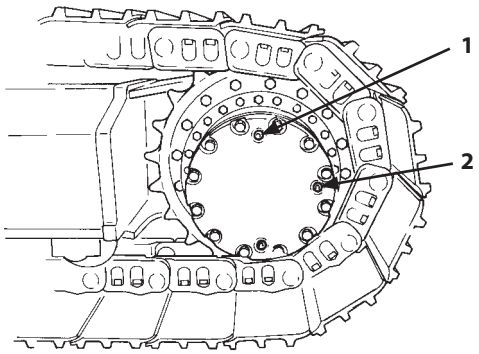
   Tightening Torque for Plugs (1) and (2): 50 N·m (5 kgf·m)

8. Repeat the steps for the other travel device.



MDAA-07-047-2 ja

L	Horizontal Oil Level	2	Oil Level Check Plug
1	Air Bleed Plug (Oil Supply Plug)	3	Drain Plug

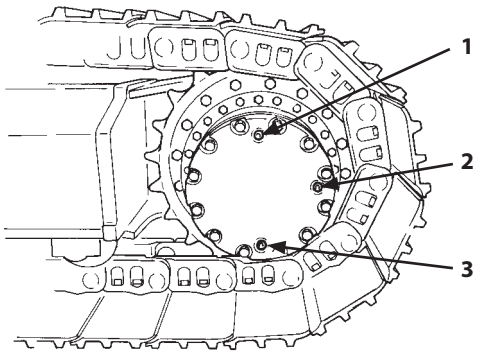


M157-07-170-1 ja

Change Gear Oil --- every 2000 hours

IMPORTANT

Do not use gear oils other than those listed in the "Brand Names of Recommended Oil".



M157-07-170-2 ja

1. Park the machine on a level surface.
2. Rotate the travel motor until the plugs are positioned as illustrated on the right.
3. Park the machine according to the instructions of (7-8) Preparations for Inspection and Maintenance.

⚠ WARNING

Keep your body and face away from the air bleed plug. Gear oil may be hot just after operation. Wait for gear oil to cool and then gradually loosen the air bleed plug to bleed off air.

4. After gear oil has cooled, slowly loosen air bleed plug (1) to bleed off air. Temporarily retighten plug (1).
5. Remove drain plug (3) and plug (1), in that order to drain gear oil.
6. Clean drain plug (3) and tighten it.

   Tightening Torque: 50 N·m (5 kgf·m)
7. Remove oil level check plug (2).
8. Add oil until oil flows out of oil level check plug (2) hole.

   NOTE

   Refer to (7-18) Recommended Transmission Oil for the type of oil to use.
9. Clean and tighten plugs (1) and (2).

   Tightening Torque for Plugs (1) and (2): 50 N·m (5 kgf·m)
10. Repeat steps 2. to 9. for the other travel device.

D. Hydraulic System

Inspection and Maintenance of Hydraulic Equipment

IMPORTANT

Never disassemble parts of the engine fuel system or try to adjust hydraulic equipment.

⚠ CAUTION

When checking and/or servicing the hydraulic components, pay special attention to the following points.

1. Park the machine according to the instructions of (7-8) Preparations for Inspection and Maintenance.
2. Prior to inspecting or servicing the hydraulic system, relieve the residual pressure and allow the parts to cool.
   a. Relieve the residual pressure in the various lines, such as the boom, arm and bucket cylinder circuits, swing lines, pilot system lines, etc. This machine may be equipped with an optional accumulator, which allows the front to be moved for a period of time (about 10 seconds) after the engine stops.
   b. Air bleed the hydraulic oil tank.
   c. Immediately after operation, all hydraulic components and hydraulic oil or lubricants are hot and under high pressure. Begin inspection and/or maintenance work only after the machine has cooled down.
   Servicing heated and pressurized hydraulic components may cause plugs, screws and/or oil to fly off or escape suddenly, possibly resulting in personal injury. Hydraulic components may be pressurized even when cooled. Keep body parts and face away from the front of plugs or screws when removing them.
   d. Even after air pressure in the hydraulic oil tank is released, when the machine is parked on a slope, the oil pressure in the travel motor and the swing motor circuits are maintained at high pressure in reaction to the machine's own weight, which is constantly applied to the travel motor. Never check and/or service the machine while parked on a slope.

IMPORTANT

- **When connecting hydraulic hoses and pipes, take special care to keep seal surfaces free from dirt and to avoid damaging them.**
- **Wash hoses, pipes, and the tank interior with a washing liquid and thoroughly wipe off before reconnecting.**
- **Only use O-rings that are free of damage or defects. Be careful not to damage them during reassembly. Do not allow high pressure hoses to twist when connecting them. The life of twisted hoses will be shortened considerably.**
- **Do not use hydraulic oils other than those listed in the table "Brand names of recommended hydraulic oil".**
- **When adding hydraulic oil, always use the same brand of oil; do not mix brands of oil. When using another manufacturer's hydraulic oil, be sure to change the full amount.**
- **Never run the engine without oil in the hydraulic oil tank.**

Change Hydraulic Oil and Replace Full-Flow Filter Element

Hydraulic breaker operation causes the hydraulic system to become contaminated faster and quickly deteriorates the hydraulic oil.

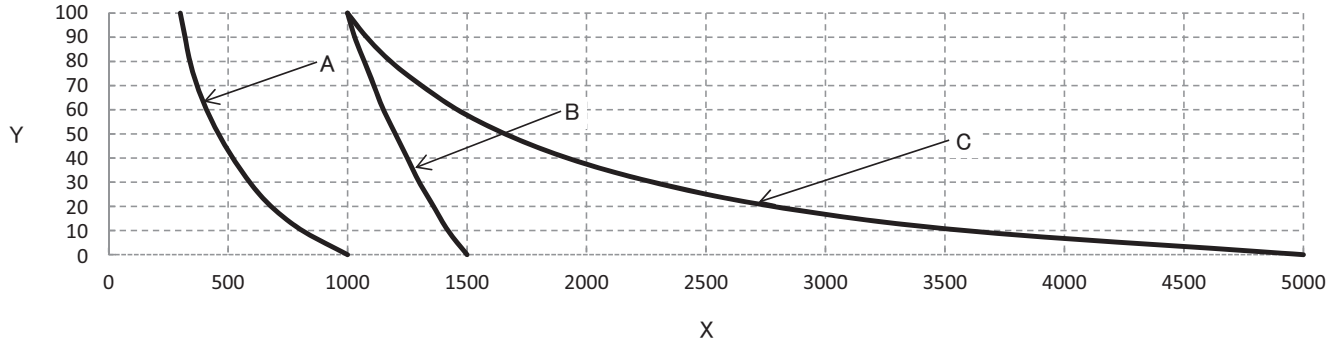
Failure to adhere to proper maintenance intervals may result in damage to the base machine and the breaker.

In order to extend service life, particularly that of the hydraulic pump, change the hydraulic oil and the full-flow filter element at the specified frequency given below.

Check machine service hours with the breaker hour meter. (Refer to the Operation Information in the Operator's Station chapter (1-76) to check the breaker operating ratio.)

Change Intervals for the High Performance Element (Micro-Glass)

Breaker Operating Ratio	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Full-Flow Filter	1000	810	680	590	520	460	410	370	340	320	300
1500 Hour Hydraulic Oil	1500	1420	1360	1300	1250	1200	1150	1110	1070	1030	1000
5000 Hour Hydraulic Oil	5000	3580	2780	2280	1920	1660	1460	1310	1180	1080	1000



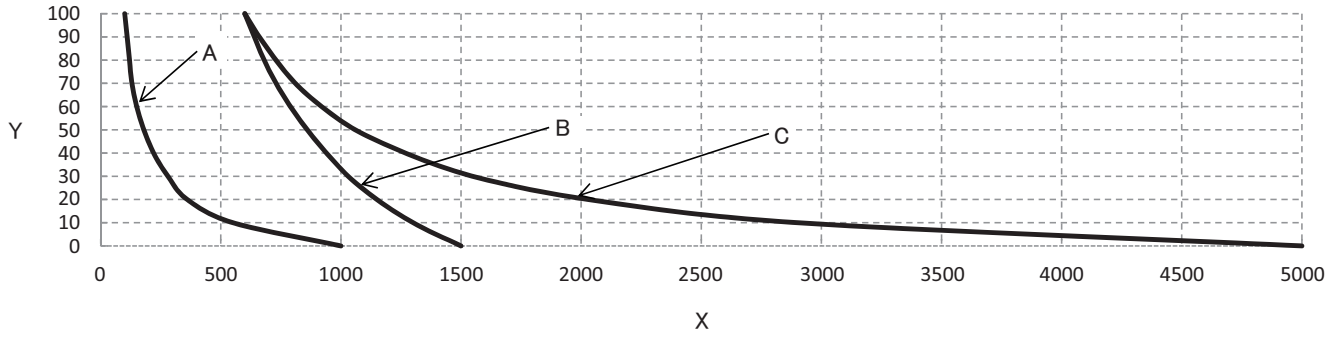
MDEQ-07-115-1 ja

A: Element Replacement Interval B: Every 1500 hours C: Every 5000 hours

X: Change Interval (Hours) Y: Average Breaker Operating Ratio(%)

Change Intervals for the Standard Full-Flow Filter (Paper Filter)

Breaker Operating Ratio	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Full-Flow Filter	1000	550	360	280	220	180	150	130	120	110	100
1500 Hour Hydraulic Oil	1500	1300	1150	1030	940	860	790	730	680	640	600
5000 Hour Hydraulic Oil	5000	2900	2030	1550	1270	1060	920	810	730	660	600

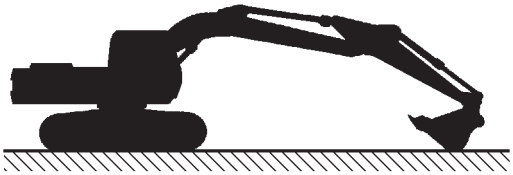


MDEQ-07-114-1 ja

A: Element Replacement Interval
B: Every 1500 hours
C: Every 5000 hours
X: Change Interval (Hours)
Y: Average Breaker Operating Ratio(%)

1 Check Hydraulic Oil Level

--- daily

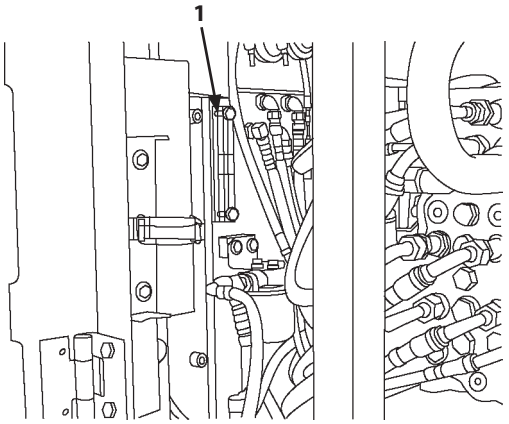


M104-07-021 ja

IMPORTANT

If the oil level cannot be seen in level gauge (1), immediately refill hydraulic oil up to the appropriate level. Failure to do so may result in a serious failure in the hydraulic system. If the oil level is higher than level gauge (1), remove oil down to the appropriate level using a pump.

1. Park the machine according to the instructions of (7-8) Preparations for Inspection and Maintenance.
2. Check the oil level with level gauge (1) on the hydraulic oil tank. Oil must be between the marks on gauge (1). If necessary, add oil.



MDEQ-07-025-1 ja

CAUTION

The hydraulic oil tank is under pressure. Press the bleed air button on the air breather to bleed off air. Be careful when removing the cap.

Refill

3. Press the bleed air button on the air breather to bleed off air. Remove the cover.
4. Fill with oil. Check the amount of oil with level gauge (1).
5. Put the cover back on. Make sure the filter and the rod assembly are installed in their correct positions.

2 Drain Hydraulic Oil Tank Sump

--- every 250 hours

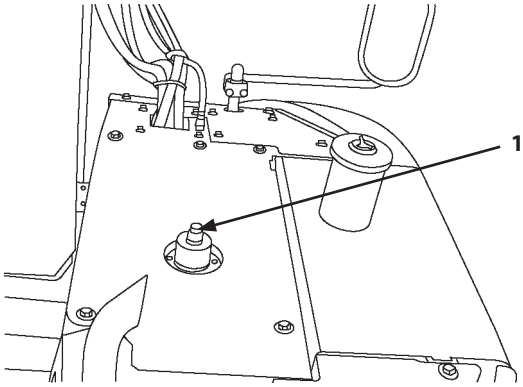
WARNING

Hydraulic oil becomes hot and is under pressure during operation. Severe burns may result if skin comes in contact with escaping hydraulic oil just after operation. Wait for the oil to cool or perform in the morning, before operating the machine.

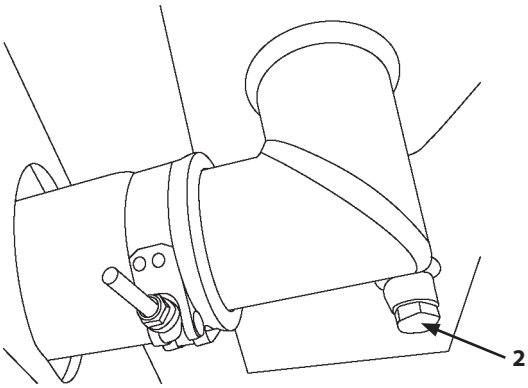
1. Park the machine on hard, level ground and swing the upperstructure 90 ° to the side.
2. Park the machine according to the instructions of (7-8) Preparations for Inspection and Maintenance.
3. Let the machine sit idle until the hydraulic oil is cool, then bleed air pressure from the hydraulic oil tank.
4. Press air bleed valve (1) to bleed off air inside the hydraulic oil tank.
5. Slowly loosen drain plug (2) on the bottom of the tank to drain water and sediment.



M104-07-117 ja



MDEQ-07-026-1 ja



MDEQ-07-027-1 ja

3 Change Hydraulic Oil

--- every 5000 or 1500 hours

4 Suction Filter Cleaning

---each time hydraulic oil is changed

CAUTION

Hydraulic oil becomes hot and is under pressure during operation. Severe burns may result if skin comes in contact with escaping hydraulic oil just after operation. Wait for the oil to cool before starting any maintenance work.

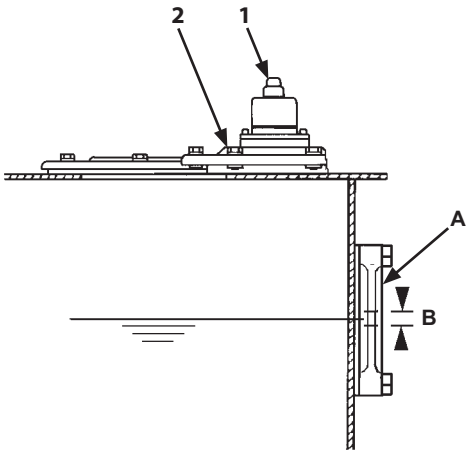


M104-07-117 ja

IMPORTANT

The change interval varies with the brand of hydraulic oil used, kind of filter element and average attachment operating ratio. Refer to section D. Hydraulic System (7-36).

1. Park the machine on hard, level ground and swing the upperstructure 90 ° to the side.
2. Park the machine as described on page 7-8 in Preparations for Inspection and Maintenance.
3. Clean the top of the hydraulic oil tank to prevent any debris from getting into the hydraulic system.



A: Level Gauge
B: Specified Range for Oil Level

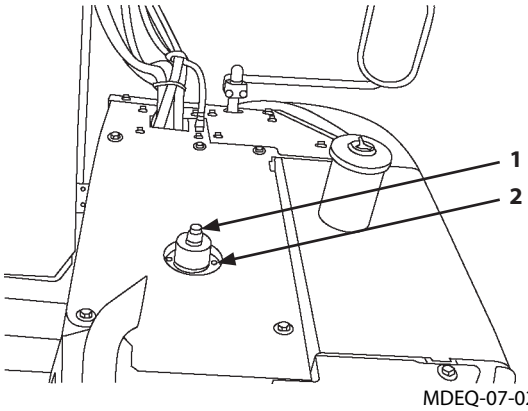
MDEQ-07-028-1 ja

CAUTION

The hydraulic oil tank is under pressure. Before removing cover (2), press the air bleed button (1) on top of the air breather.

4. Press air bleed valve (1) to bleed off air inside the hydraulic oil tank.
5. Remove cover (2) on the filler port.
6. Get a container large enough for the amount to be drained and use a hydraulic pump to drain the hydraulic oil.

   Amount of hydraulic oil to drain: 100 L



MDEQ-07-026-2 ja

7. Remove drain plug (3) and drain off the remaining oil.
8. Remove cover (2) and then rod assembly (4).

IMPORTANT

Take care when changing the hydraulic oil that nothing, such as water or sand, gets inside the tank.

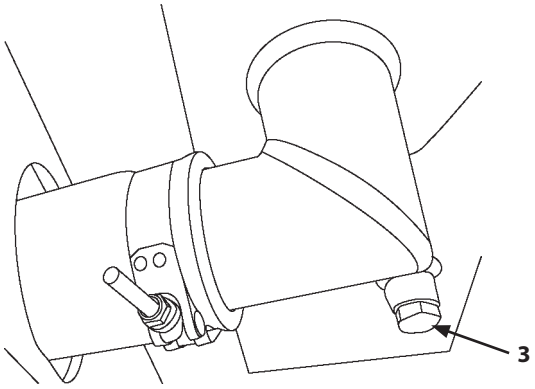
9. Clean the inside of the hydraulic oil tank and the suction filter.
   If the suction filter is to be replaced, install a new filter on rod (4) as illustrated.

   Tightening Torque: 15 to 20 N·m
   (1.5 to 2 kgf·m)
10. Before installing the suction filter, check the dimensions of the rod assembly as illustrated at right. Securely insert the rod assembly into pipe (6).
11. Replace the oil filter of the hydraulic oil tank. (Refer to the section Replacing the Full-Flow Filter Element)
12. Clean, install and tighten drain plug (3).
13. Add oil until it is between the marks on the oil level gauge.
14. Before securing cover (2) with bolts, ensure the top edge of the rod assembly (4) is completely inserted into the hole of support (5).

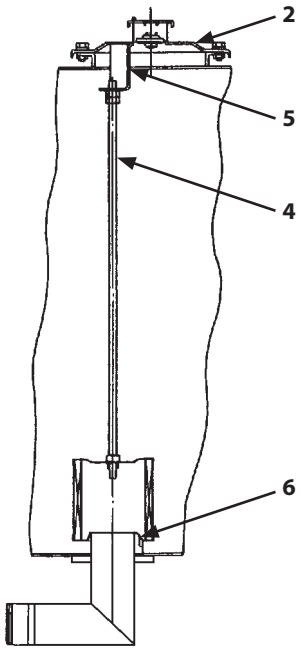
    Tightening Torque: 50 N·m (5.0 kgf·m)
15. Bleed air as per Bleeding Air from the Hydraulic System on the next page.

NOTE

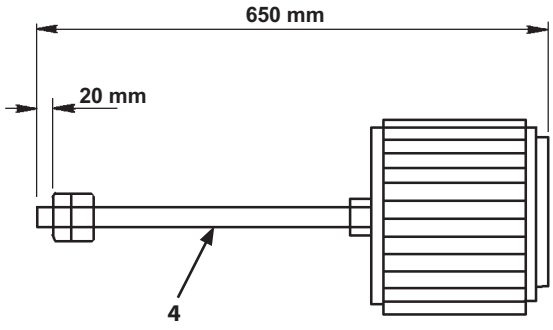
Replace the element at regular intervals to keep the hydraulic oil clean and to extend the service life of the hydraulic components.



MDEQ-07-027-2 ja



MDEQ-07-029-1 ja



MDEP-07-030-1 ja

Bleed Air from the Hydraulic System

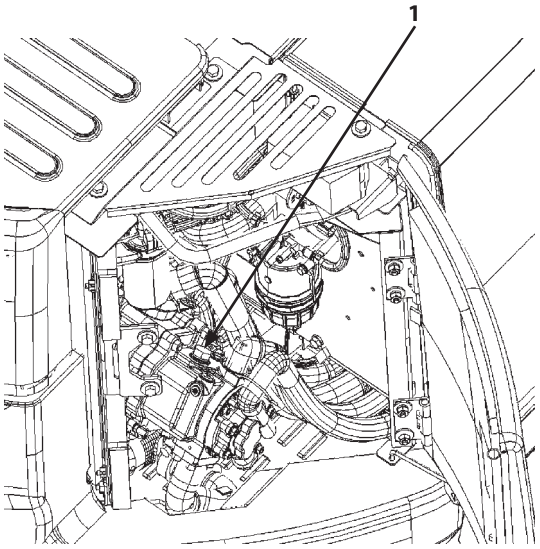
After changing hydraulic oil, bleed air from the hydraulic system by following the procedures below.

IMPORTANT

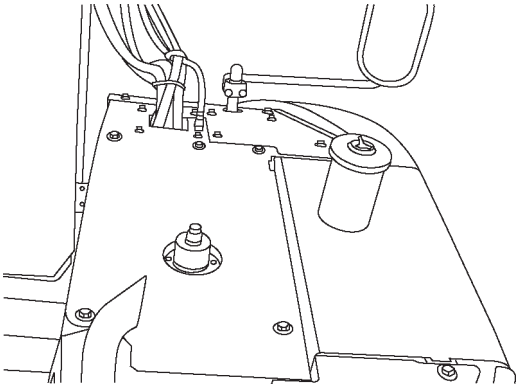
If the hydraulic pump is not filled with oil, it will be damaged when the engine is started. Bleed air from the pump.

- Bleeding Air from the Pump

1. Loosen air bleed plug (1).
2. To allow accumulated air to bleed from the pump, wait until hydraulic oil oozes out from the gap. After bleeding air, tighten plug (1) to specification.
3. Start the engine and run it at low idle. While moving all cylinders and the swing motor evenly, lightly operate the machine for 15 minutes.
4. Lower the bucket to the ground to return to the position to check hydraulic oil level.
5. Turn the auto-idle switch OFF.
6. Stop the engine and remove the key from the key switch.
7. Pull the pilot control shut-off lever to the LOCK position.
8. Stop the engine. Check the oil level and add if needed.



MDEQ-07-031-1 ja



MDEQ-07-026 ja

5 Replace Full-Flow Filter

--- every 1000 hours

IMPORTANT

The change interval varies with the brand of hydraulic oil used, kind of filter element and average attachment operating ratio.

⚠ CAUTION

Hydraulic oil becomes hot and is under pressure during operation. Severe burns may result if skin comes in contact with escaping hydraulic oil just after operation. Wait for the oil to cool before starting any maintenance work.

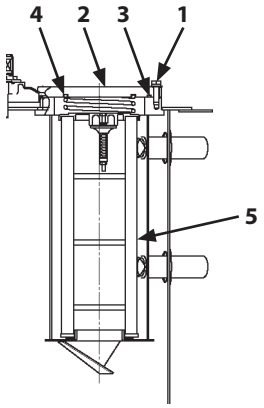
Replacement Guide

1. Park the machine according to the instructions of (7-8) Preparations for Inspection and Maintenance.



M1CC-07-002 ja

2. Before replacing element (5), be sure to bleed air from the hydraulic oil tank by pushing 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), do so slowly while pressing it downward so that spring (4) does not fly off.



MDEQ-07-032-1 ja

IMPORTANT

When removing the filter, be aware that oil still in the filter may spill. Take extra care.

4. Remove spring (4), and element (5).
5. Replace O-ring (3) and element (5) with new ones. Be careful not to damage element (5) and O-ring (3). If torn, element (5) cannot be used.
6. Install cover (2) with bolts (1) (6 used).

   Tightening Torque: 50 N·m (5 kgf·m)
7. Bleed air from the pump after replacing the element.
   (Refer to (7-43) Bleeding Air from the Hydraulic System.)
   If the machine is operated with air mixed in the hydraulic circuit, damage to the pump may result.

NOTE

Replace element (5) at regular intervals to keep hydraulic oil clean and to extend the service life of the hydraulic components.

6 Replace Pilot Oil Filter

--- every 1000 hours

WARNING

Hydraulic oil becomes hot and is under pressure during operation. Severe burns may result if skin comes in contact with escaping hydraulic oil just after operation. Wait for the oil to cool before starting any maintenance work.

1. Park the machine as described in the section Preparations for Inspection and Maintenance (7-8).

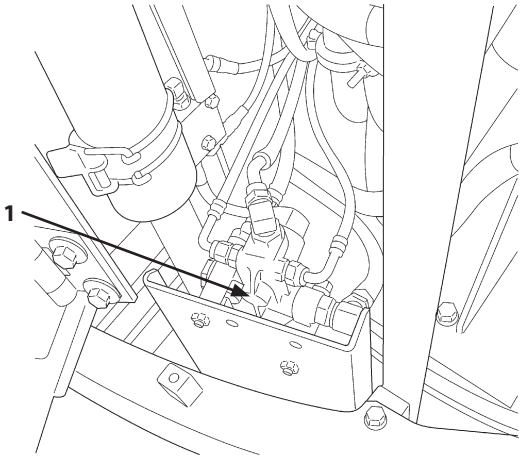


M1CC-07-002 ja

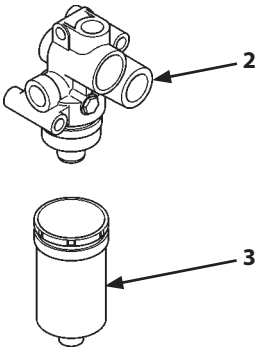
CAUTION

The hydraulic oil filter is under pressure. Before removing filter (2), press the air bleed button on top of the air breather.

2. Press the air bleed valve to bleed off air inside the hydraulic oil tank.
3. Rotate the case of pilot filter (1) counterclockwise with a filter wrench to remove it.
4. Clean the surface where the O-ring is installed on filter head (2).
5. Fit the O-ring securely into the O-ring groove of filter head (2).
6. Coat the seal on new filter element (3) with clean hydraulic oil. Completely install filter element (3) into head cover (2) while rotating and taking care not to damage the element.



MDEQ-07-033-1 ja



MDEQ-07-034-1 ja

IMPORTANT

Do not reuse the filter cartridge.

7. After replacing the filter element, air bleed the hydraulic circuit and check the level of oil in the hydraulic oil tank. (Refer to (7-43) Bleeding Air from the Hydraulic System.)
   If the machine is operated with air mixed in the hydraulic circuit, damage to the pump may result.

NOTE

Replace element (3) at regular intervals to keep the hydraulic oil clean and to extend the service life of the hydraulic components.

7 Replace Swing Drain Filter Element

--- every 4000 hours

WARNING

Hydraulic oil becomes hot and is under pressure during operation. Severe burns may result if skin comes in contact with escaping hydraulic oil just after operation. Wait for the oil to cool before starting any maintenance work.

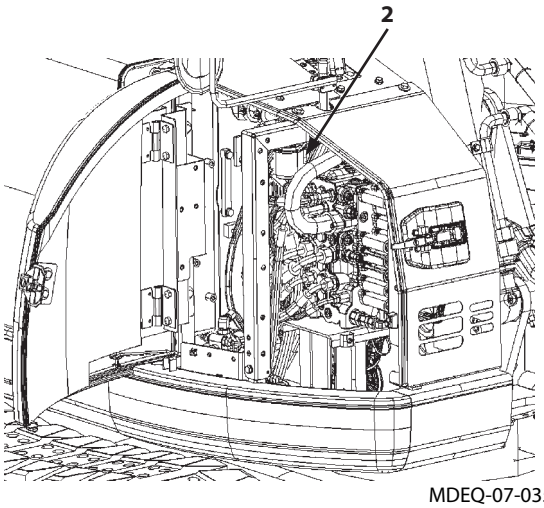


M1CC-07-002 ja

1. Park the machine as described in the section Preparations for Inspection and Maintenance (7-8).

CAUTION

The hydraulic oil filter is under pressure. Before removing filter (2), press the air bleed button on top of the air breather.



MDEQ-07-035-1 ja

2. Before replacing the element, be sure to bleed air from the hydraulic oil tank by pushing air bleed valve on the hydraulic oil tank.
3. Turn the cartridge element (swing drain filter) counterclockwise with a filter wrench to remove it.
4. Apply a thin film of hydraulic oil to the gasket of the new cartridge and then hand tighten the cartridge filter clockwise until its gasket touches the seal face.

IMPORTANT

Do not reuse the filter cartridge.

5. From this point, tighten it a further 1 & 1/4 turns with the filter wrench. Take care not to overtighten the cartridge as doing so will deform it.
6. Take care not to allow water or dust to enter the filter case.
7. Bleed air from the pump after replacing the element.
   (Refer to (7-43) Bleeding Air from the Hydraulic System.)
   If the machine is operated with air mixed in the hydraulic circuit, damage to the pump may result.

NOTE

Replace the element at regular intervals to keep the hydraulic oil clean and to extend the service life of the hydraulic components.

8 Replace Air Breather Element

--- every 5000 hours

CAUTION

Hydraulic oil becomes hot and is under pressure during operation. Severe burns may result if skin comes in contact with escaping hydraulic oil just after operation. Wait for the oil to cool before starting any maintenance work.

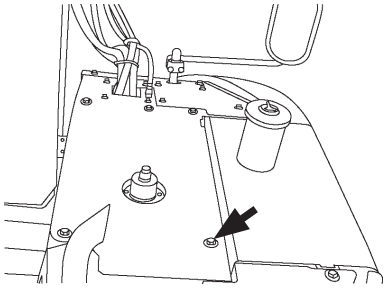
Replacement Guide

1. Park the machine according to the instructions of (7-8) Preparations for Inspection and Maintenance. Lower the bucket to the ground with the bucket cylinder extended and the arm cylinder crowded so the machine is in the position shown in the figure.



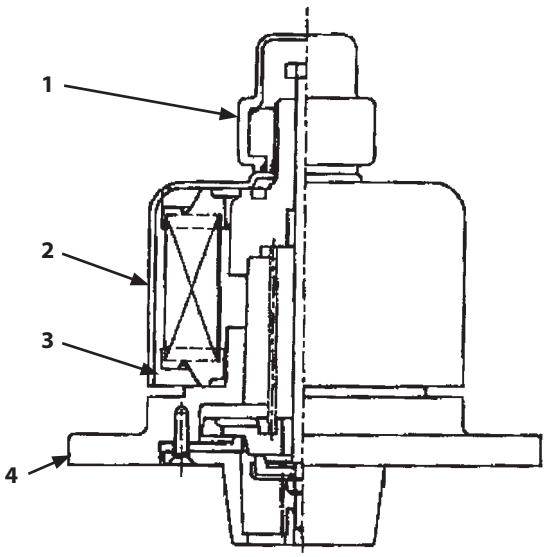
M1CC-07-002 ja

2. Before replacing element (3), be sure to bleed air pressure from the hydraulic oil tank by pushing air bleed valve on the hydraulic oil tank.



MDEQ-07-036-1 ja

3. Turn cover (2) clockwise approx. 1/4 turn. Remove cap (1) by turning it counterclockwise.
4. Turn cover (2) counterclockwise and remove it too. Remove element (3).
5. Install new element (3). Tighten to install cover (2) until it comes in contact with element (3). Then, tighten it a further 1/4 turn.
6. Securely tighten cap (1) clockwise by hand. While holding cap (1) by hand so it does not turn, securely tighten cover (2) by turning counterclockwise 5 to 10 ° by hand.
7. Take care never to allow water and/or contaminant to get in between cover (2) and body (4) (air breathing port).



M1G6-07-001-1 ja

NOTE

Replace element (3) at regular intervals to keep the hydraulic oil clean and to extend the service life of the hydraulic components.

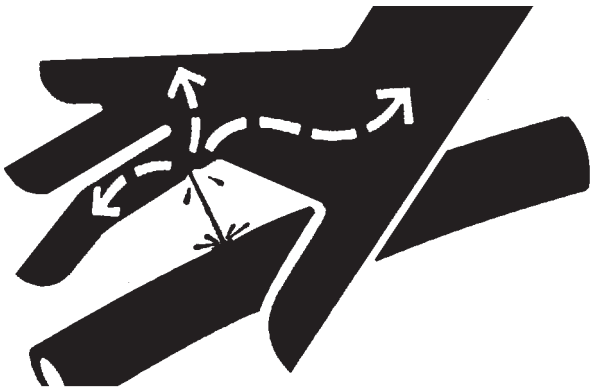
9 Check Hoses and Lines

...daily

--- every 250 hours

⚠ WARNING

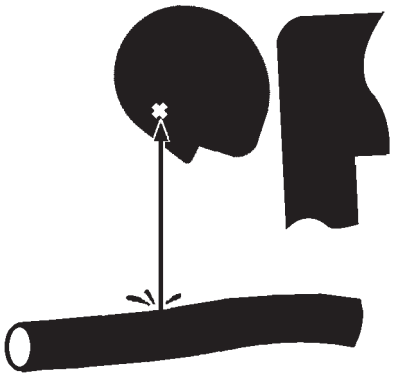
- **Hydraulic oil and lubricant leaks can lead to fire that may result in serious injury. Check for missing or loose clamps, kinked hoses, lines or hoses that rub against each other, damaged oil cooler, and loose oil cooler flange bolts, for leaks.**
- **Escaping oil under pressure can penetrate the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



SA-031 ja

Check hoses and lines for oil leaks and damage according to the check points shown below.

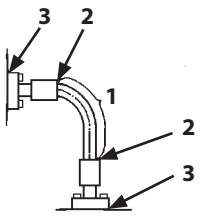
If any abnormality is found, replace or retighten as instructed in the table.



SA-292 ja



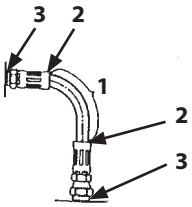
SA-044 ja



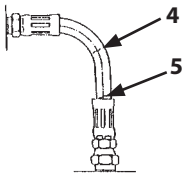
M137-07-008-1 ja

Hose

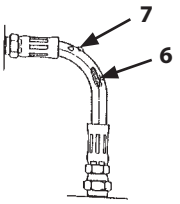
Interval (Hours)	Check Points	Check For	Remedies
Daily	Hose covers	Leak (1)	Replace
	Hose ends	Leak (2)	Replace
	Fittings	Leak (3)	Retighten or replace hose or O-ring
Every 250 hours	Hose covers	Damage or leak (4)	Replace
	Hose ends	Damage or leak (5)	Replace
	Hose covers	Exposed reinforcement (6)	Replace
	Hose covers	Crack or blister (7)	Replace
	Hose	Bend (8), Collapse (9)	Replace
	Hose ends and fittings	Deformation or corrosion (10)	Replace



M115-07-145-1 ja



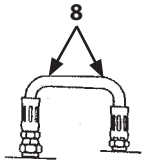
M115-07-146-1 ja



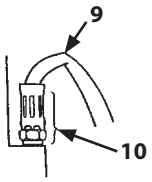
M115-07-147-1 ja

Lines

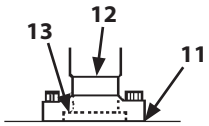
Interval (Hours)	Check Points	Check For	Remedies
Daily	Contact surfaces of flange joints	Leak (11)	Replace
	Bolts	Loose or leak (11)	Retighten or replace O-ring
	Welded surfaces on flange joints	Leak (12)	Replace
Every 250 hours	Flange joint neck	Crack (13)	Replace
	Welded surfaces on flange joints	Crack (12)	Replace
	Clamps	Missing, deformed or loose	Replace or retighten



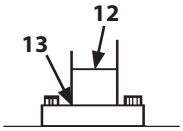
M115-07-148-1 ja



M115-07-149-1 ja



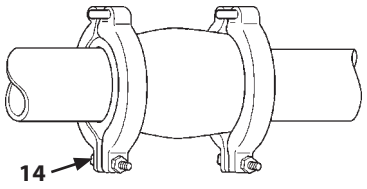
M137-07-001-1 ja



M137-07-007-1 ja

Hose and Lines

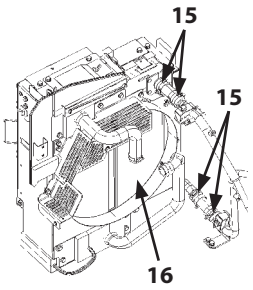
Interval (Hours)	Check Points	Check For	Remedies
Daily	Flexible master coupling	Leak (14)	Replace or retighten



MDCD-07-044-1 ja

Oil cooler

Interval (Hours)	Check Points	Check For	Remedies
Every 250 hours	Rubber hose	Leak (15)	Retighten or replace
	Oil cooler	Leak (16)	Replace

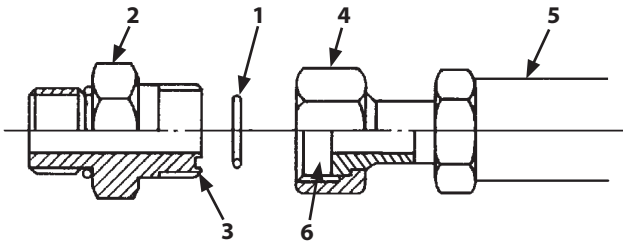


MDEQ-07-037-1 ja

Types of Hydraulic Fittings

Two hydraulic fitting designs are used on this machine.

- Flat Face O-ring Seal Fitting (ORS Fitting)
  O-ring (1) is used on the sealing surfaces of adapter (2) to prevent oil leakage.



M104-07-033-1 ja

Precautions for Use

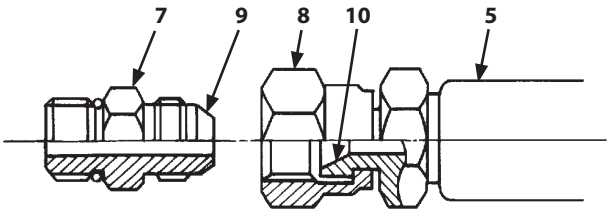
1. Replace O-ring (1) with a new one when assembling fittings.
2. Check that O-ring (1) is properly fitted in O-ring groove (3). Tighten union (4).
   If union nut (4) is tightened when O-ring (1) is not correctly seated in O-ring groove, damage to O-ring (1) and oil leak from fittings may result.
3. When assembling fittings, take care not to make a dent in O-ring groove (3) of adapter (2) and sealing surface (6) on hose (5) or the side of the valve. If these surfaces are scratched, it may result in damage to O-ring (1) and lead to an oil leak.
4. If oil leaks from a loose connection of union (4), do not tighten the fitting. Open the connection, replace O-ring (1) with a new one and check that the O-ring fits correctly in O-ring groove (3) before tightening the connection.

Tightening Torque

Tighten fittings to the torque values shown below.

Wrench size (mm)		27	32	36	41, 46
Tightening Torque (±10%)	N·m	95	140	180	210
	(kgf·m)	(9.5)	(14)	(18)	(21)

- Metal Face Seal Fittings
  Fittings are used on smaller diameter joints and consist of a metal flare (10) and a metal flare seat (9).



M202-07-051-1 ja

1. Inspect flare (10) and flare seat (9). They must be free of dirt or obvious defects.
2. After adjusting, 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 the adapter.

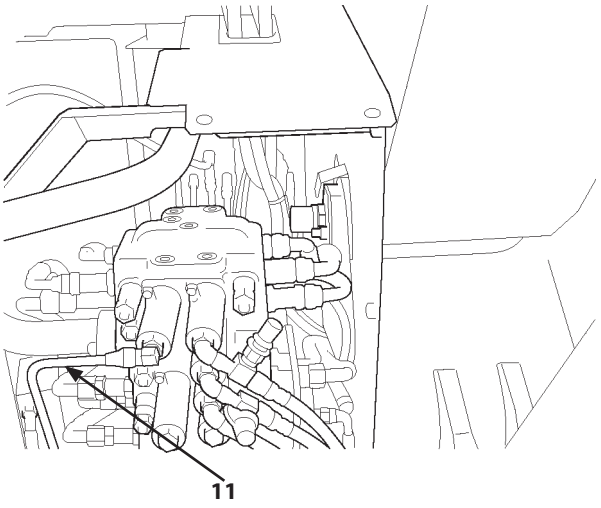
Tightening Torque

Tighten fittings to the torque values shown below.

Wrench size (mm)		17	19	22	27
Tightening Torque (±10%)	N·m	25	30	40	80
	(kgf·m)	(2.5)	(3)	(4)	(8)

- Bent Tube
  Tighten bent tube (11) mounted on the hydraulic pump to the torque values shown below.

Wrench size (mm)		17, 19
Tightening Torque	N·m	35
	(kgf·m)	(3.5)



Hydraulic Pump

MDEQ-07-038-1 ja

E. Fuel System

⚠ CAUTION

Danger of Fire
Fuel is dangerous as it can burn easily. Keep away from fire.

IMPORTANT

Always fill the fuel tank with the specified diesel fuel. Failure to do so may cause engine problems and also make it difficult for the engine to start.

Specified Fuel

Fuel must meet the following standards.
The table below indicates the diesel fuel standards of various countries.

Diesel Fuel Std.	Region
JIS K2204 Grade 2	Japan
ASTM D975 No. 1D S15 No. 2D S15	USA
EN590 (2009)	EU
ISO 8217 DMX	Intl. Std.
BS 2869-A1 (or A2)	UK
KSM-2610	Korea
GB252	China

- The cetane number of the fuel must be at least 45. A higher cetane number fuel is required when operating in cold or high-altitude environments.
- The sulfur content must be under 15 ppm. The use of fuel with a high level of sulfur generally causes corrosion inside the cylinder due to sulfuric acid.
  In the United States and Canada in particular, Ultra Low fuel must have a sulfur content of less than 10 ppm by volume (15 ppm at final sales point).
  Using fuel other than ultra low-sulfur or low-sulfur diesel fuel has adverse effects on the engine, which may result in malfunction.

- To avoid freezing of the fuel during the cold season, select a fuel that can be used at 12 ℃ colder than the coldest expected air temperature where the machine will be used.
- The ash content must be less than 0.01 % by weight.
- The residual carbon content must be less than 0.35% of the total volume.
  (Under 0.1 % is recommended)
- The total aromatics content must be less than 35 % of the total volume.
  (Under 30 % is recommended)
- PAH (polycyclic aromatic hydrocarbon) must be less than 10 % of the total volume.
- The metal content (magnesium, silicon, aluminum) must be less than 0.01 ppm by weight. (JPI-5S-44-95 test analysis method)
- FAME (fatty acid methyl esters) content must be less than 7% of the total volume.
- Must be zinc and sodium free.
- The lubricity must be a maximum of 460 μm with a scar diameter of WS 1.4 in an HFRR test.

Gasoline, kerosene and alcohol-based fuels must not be used.
Do not mix kerosene or used engine lubricating oil into the fuel.
Doing so will cause carbon deposits on the injectors, clog the fuel filter and in addition to poor sliding of fuel lubricated parts, it adversely affects various engine parts and leads to breakdowns.

Contact your authorized dealer if you wish to use bio-diesel as the BDF concentration necessitates measures with the machine.

Do not use leftover fuel or fuel that has been left in drums for a long time.
Do not store fuel in containers whose inside is zinc-plated.
Only use fuel purchased from reputable dealers.
Do not use fuel additives. Doing so may lead to deterioration in engine performance.

Refueling

1. Park the machine according to the instructions of (7-8) Preparations for Inspection and Maintenance.

CAUTION

Handle fuel carefully. Stop the engine before refueling. Keep flame away from the area when refueling or working on the fuel system.

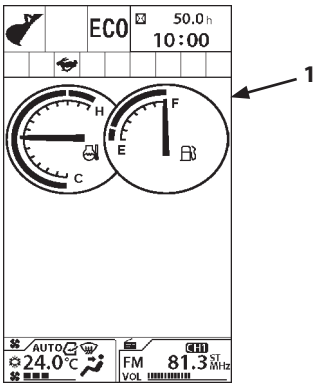
2. Check fuel level gauge (4) and fuel gauge (1) on the monitor panel. If the fuel level is low, stop the engine, remove cap (2) and refill the tank.

IMPORTANT

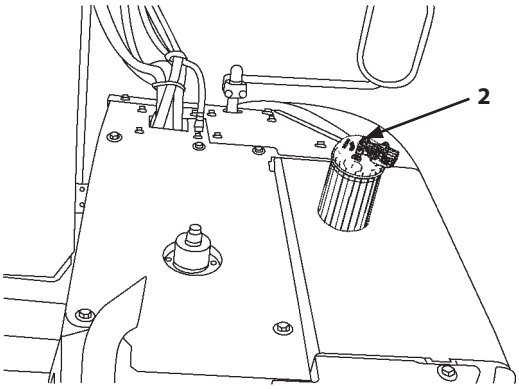
Keep all dirt, dust, water and other foreign materials out of the fuel system when refilling fuel.
Check the fuel level gauge of the fuel tank every day and take care not to run out of fuel. Doing so may burn out the engine fuel supply pump.

3. Remove cap (2) of filler port.
[Unlocking the Filler Port]
   - Release the lock.
   - Pull up handle (3) and turn it counterclockwise to release the cap lock.
   - Remove cap (2).
4. 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.

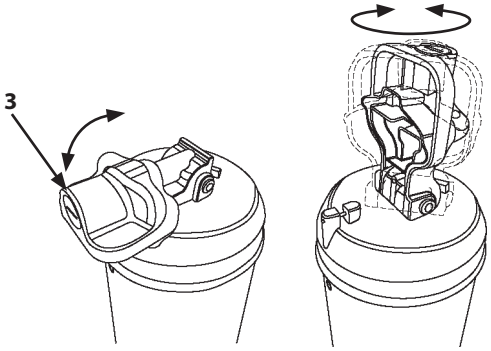
Model	Tank Capacity
ZX85US-6	135 L
ZX85USB-6	120 L



MDAA-01-001-3 ja

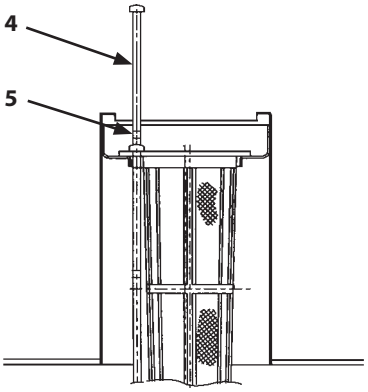


MDEQ-07-039-1 ja



MLBA-07-093-MLBA-07-095 ja

Do not fill the tank more than is needed. Use the float on level gauge (4) to check the level. Stop filling when yellow mark (5) on the float becomes visible.
Position the oil filler gun so that the gun will not obstruct the floating movement of level gauge (4).

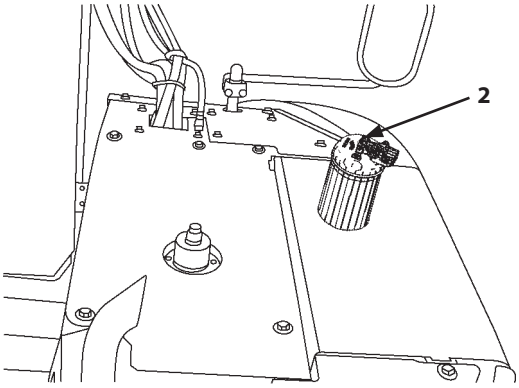


M157-07-060-2 ja

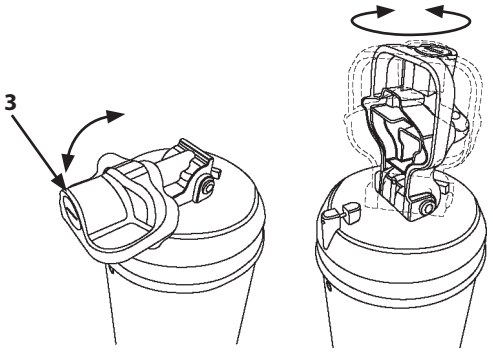
IMPORTANT

- **Take care not to allow dirt and/or water to enter the fuel tank.**
- **Wipe up any spilled fuel.**
- **Never forget 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 of level gauge (4) becomes visible.**

5. Install cap (2) of the filler port.
   [Locking the Filler Port]
   - Install cap (2).
   - Turn handle (3) clockwise until the cap is locked, and then push down the handle.
   - Lock with the key.



MDEQ-07-039-1 ja

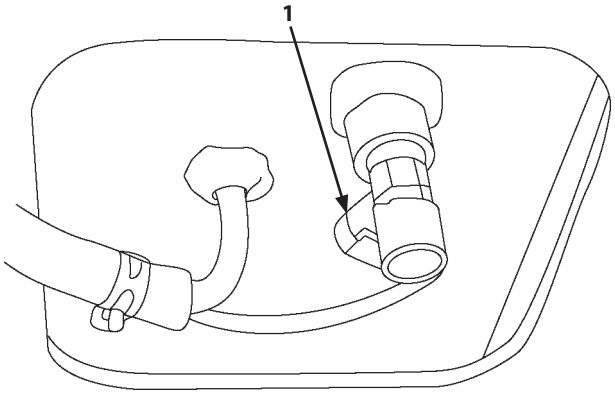


MLBA-07-093-MLBA-07-095 ja

1 Drain Fuel Tank Sump

--- As required

1. Park the machine according to the instructions of (7-8) Preparations for Inspection and Maintenance.
2. Place a 0.5 liter or larger container under drain valve (1).
3. Open drain valve (1) and drain water and sediment.
4. After draining, securely tighten drain valve (1).



MDEQ-07-040-1 ja

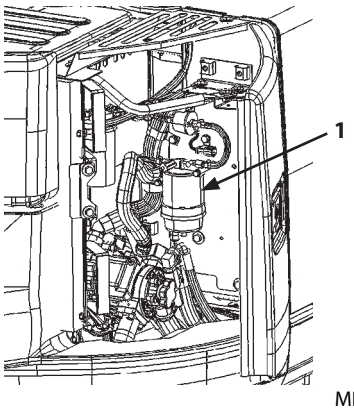
2 Drain Fuel Pre-Filter

--- Daily check (before starting operation)

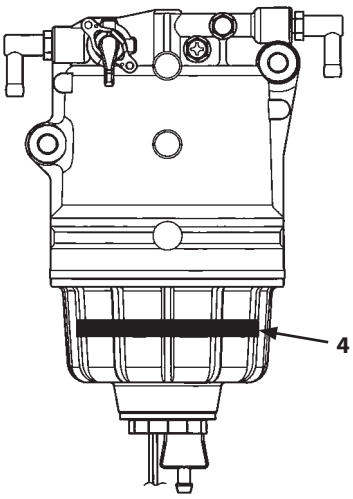
IMPORTANT

Drain fuel pre-filter (1) daily before starting operation. The engine may be damaged if you do not drain the fuel pre-filter daily.

Fuel pre-filter (1) has a water separator function. There is a float (4) inside the case which floats when water accumulates.
Check float (4) position daily. Be sure to drain the water accumulated in the pre-filter until float (4) goes to the bottom of the pre-filter case.



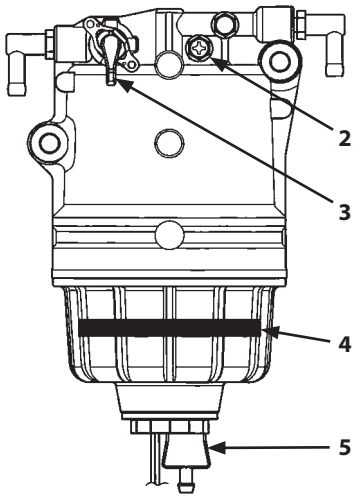
MDEQ-07-041-1 ja



MADG-07-002-2 ja

Drain Procedure

1. Park the machine according to the instructions of (7-8) Preparations for Inspection and Maintenance.
2. Place a 0.5 liter or larger container under drain plug (5).
3. Close fuel cock (3). Loosen drain plug (5) and drain the water accumulated in the pre-filter until float (4) goes to the bottom of the pre-filter case.
   If water fails to drain properly, loosen air bleed plug (2) on the top of the pre-filter.
4. After draining water, securely tighten drain plug (5) and air bleed plug (2).
5. Open fuel cock (3).



MADG-07-002-3 ja

IMPORTANT

After draining water mixed in the fuel filter, bleed air as per Bleeding Air from the Fuel System (7-58). Air in the fuel system may make the engine hard to start or run irregularly.

Bleeding Air

IMPORTANT

Air in the fuel system may make the engine hard to start or run irregularly.
Bleed air from the fuel system if the fuel tank is run dry, or when performing inspections and maintenance, such as replacing the fuel filter element, after draining the oil/water separator, or after replacing parts in the fuel system.

This machine is equipped with an electric fuel pump.

⚠ CAUTION

If there is a leak in the fuel system, it may lead to a fire.

1. Confirm that the fuel level is more than one-half of the tank capacity. If the fuel level is lower, add fuel.
2. Turn the key switch ON and hold it in that position for approx. 3 minutes. This operates the electric fuel pump and starts bleeding air.
3. After the main filter is filled with fuel, hold the key switch in the ON position for 30 seconds.
4. Start the engine. Check the fuel supply system for fuel leaks.

IMPORTANT

Even if air is not thoroughly bled, do not hold the key switch in the ON position for more than 5 minutes. If air is not thoroughly bled, first return the key switch to the OFF position. Wait at least 30 seconds and then turn the key switch ON again. Failure to do so may cause damage to the electric fuel pump and/or discharge the batteries.
Do not air bleed the fuel system by starting the engine with the starter motor. The starter motor will get hot and its coil, pinion gear and/or starter gear may be damaged.

If Air Mixed Downstream of Common Rail

If air becomes mixed into the fuel system due to lack of fuel and the engine is difficult to start, release air by following the procedure below.

1. Following the above mentioned procedures, bleed enough air up to the engine supply pump entrance.
2. Operate starter motor for long cranking within 20 seconds. If engine falls to start, return key switch to OFF. Wait more than about 60 seconds, and then try again.

3 Replace Fuel Main Filter Element

--- every 500 hours

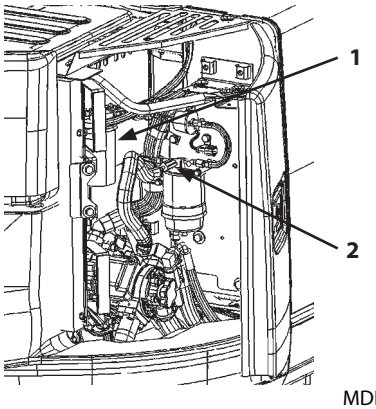
IMPORTANT

- **Be sure to use only genuine Hitachi elements for the fuel main filter element and the pre-filter element. Using a different element may adversely affect engine performance and/or shorten the engine service life. Note: any engine failure caused by using other manufacturers' elements is excluded from the Hitachi Warranty Policy.**
- **Take care not to allow dirt and/or water to enter the fuel tank.**

Replacement Guide

1. Park the machine according to the instructions of (7-8) Preparations for Inspection and Maintenance.
2. Close fuel cock (2).
3. Place a 1 liter or larger container under fuel filter (1).
4. Remove fuel filter (1) using a filter wrench.
5. Clean the fuel filter (1) contact area.
6. Apply a thin layer of clean fuel to the gasket of new fuel filter (1).
7. Turn fuel filter (1) clockwise by hand until it touches the contact area.
8. Tighten a further half turn with the filter wrench.

   Tightening Torque: 20 to 24 N·m
   (2.0 to 2.4 kgf·m)



MDEQ-07-041-2 ja

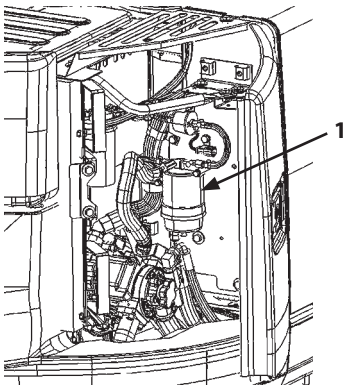
9. Open fuel cock (2).
10. Bleed air from the fuel system.
    After replacing the fuel filter element, bleed air from the fuel supply system.
    (Refer to Bleeding Air from the Fuel System (7-58).)

4 Replace Fuel Pre-Filter Element

--- every 500 hours or when fuel filter restriction alarm is lit

IMPORTANT

- **Be sure to use only a genuine Hitachi fuel pre-filter element (1). Using a different element may adversely affect engine performance and/or shorten the engine service life. Note: any engine failure caused by using other manufacturers' elements is excluded from the Hitachi Warranty Policy.**
- **Take care not to allow dirt and/or water to enter the fuel tank.**

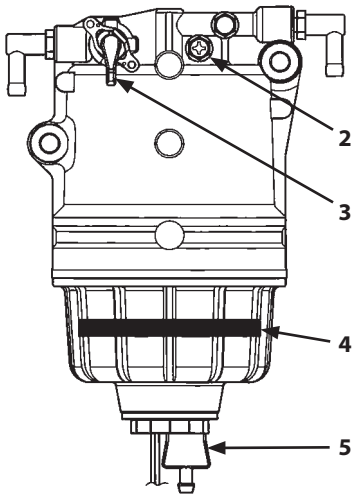


MDEQ-07-041-1 ja

Replacement Guide

1. Close fuel cock (3).
2. Place a 1 liter or larger container under drain plug (5).
3. Loosen air bleed plug (2) and drain plug (5). Drain fuel until no fuel flows out of the filter.
4. Remove transparent filter case (4) with the special tool.
5. When transparent filter case (4) is removed, the element and O-ring of transparent filter case (4) are exposed. Remove them by hand.
6. Replace the element and O-ring with new ones and tighten transparent filter case (4) with the special tool.

   Tightening Torque 30 ± 3 N·m
   (3.0 ± 0.3 kgf·m)



MADG-07-002-3 ja

7. Tighten air bleed plug (2) and drain plug (5).
8. Open fuel cock (3).
9. Bleed air from the fuel system.
   After replacing the fuel filter element, bleed air from the fuel supply system.
   (Refer to Bleeding Air from the Fuel System (7-58).)

5 Check Fuel Hoses

...daily

--- every 250 hours

⚠ CAUTION

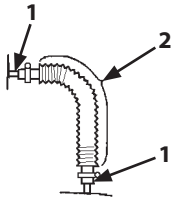
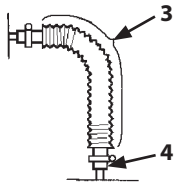
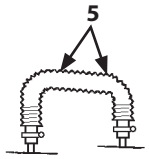
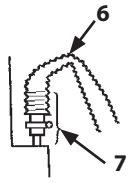
Fuel leaks can lead to fires that may result in serious injury.

- **Escaping combustible fluid can cause fires. Check for kinked hoses, hoses that rub against each other, and any fuel leaks.**
- **Repair or replace any loose or damaged hoses.**
- **Never reinstall bent or damaged hoses.**

According to the check points shown below, check hoses for oil leaks and damage.

If any abnormality is found, replace or retighten as instructed in the table.

Hose

Interval (hours)	Check Points	Check For	Remedies	
Daily	Hose ends	Leak (1)	Retighten or replace	
	Hose covers	Wear, crack (2)	Replace	
Every 250 hours	Hose covers	Crack (3)	Replace	
	Hose ends	Crack (4)	Replace	
	Hose	Bend (5), Collapse (6)	Replace	 
	Hose fittings	Corrosion (7)	Replace	

F. Air Cleaner

1 Clean and Replace Air Cleaner Element (Outer)

Clean --- every 250 hours or when the restriction indicator comes ON

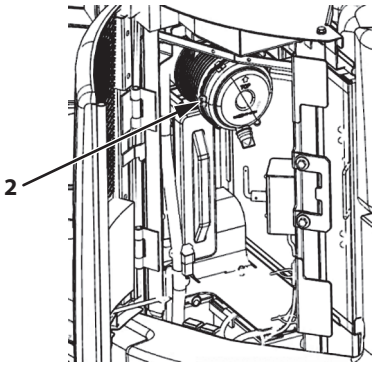
Replace --- after cleaning 6 times or after one year

2 Replace Air Cleaner Element (Inner)

Replace --- When outer element is replaced

Stop the engine before servicing outer element (1). If the engine is run with the air cleaner or its element removed, foreign matter will get in the engine and cause damage to it.

1. Park the machine according to the instruction on Preparations for Inspection and Maintenance (7-8).
2. Remove clamp (2) from the cover.

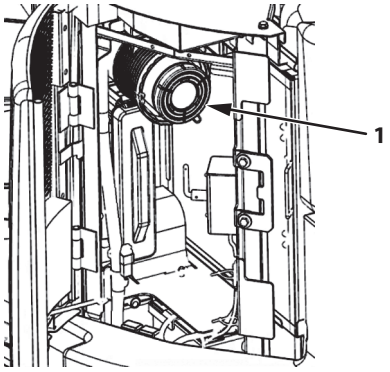


MDEQ-07-107-1 ja

3. Remove outer element (1).
4. Hit outer element (1) against the palm of your hand. Do not hit it on a hard surface.

⚠ WARNING

When using compressed air pressure (no higher than 0.69 MPa (7 kgf/cm^2), wear safety glasses or goggles.



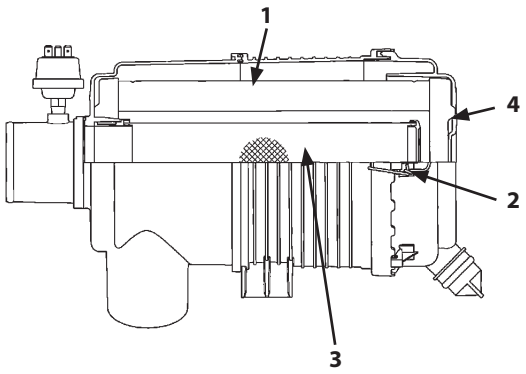
MDEQ-07-108-1 ja

IMPORTANT

When cleaning, do not hit or strike outer element (1) with another object.

5. Clean outer element (1) by blowing compressed air [less than 0.69 MPa (7 kgf/cm^2)] from the inside of the element. After cleaning, be sure to check outer element (1) for damage. If any damage is found, replace the element with a new one.
6. If the air filter restriction alarm lights soon after cleaning outer element (1), even if it has been cleaned fewer than 6 times, replace the outer element with a new one.

7. Clean the inside of the air cleaner before installing outer element (1).
8. Install outer element (1).



MADC-07-008-2 ja

IMPORTANT

Do not install outer element (1) and/or cover (4) forcibly when installing the clamps. Doing so may result in deformation of clamps (2), element, and/or cover (4).

9. Install cover (4) and tighten clamp (2).
10. Start the engine and run it at slow idle.
11. Check whether the air filter restriction indicator lights on the monitor panel. If the air filter restriction indicator comes ON, stop the engine and replace outer element (1) even if it has been cleaned fewer than 6 times.
12. When replacing the air cleaner filter element, replace both outer (1) and inner (3) elements together. Remove outer element (1). Clean the inside of the air cleaner before removing inner element (3). Remove inner element (3). First install inner element (3) and then install outer element (1).

IMPORTANT

Do not clean and reuse inner element (3).

G. Cooling System

Coolant

IMPORTANT

Use soft water as a coolant. Do not use strong acid or alkaline water. Use coolant with genuine Hitachi Long-Life Coolant (LLC) mixed at a ratio of 30 to 50 %.
If a coolant mixed with less than 30 % of Hitachi Long-Life Coolant (LLC) is used, the service life of the cooling parts may be shortened due to damage by freezing or corrosion of cooling system parts.
If over 60% is used, the machine becomes prone to overheating.

Antifreeze Mixing Ratio

Air Temperature [°C]	Mixing Ratio [%]	Antifreeze [L]	Soft water [L]
-15	30	2.9	6.6
-20	35	3.3	6.2
-25	40	3.8	5.7
-30	45	4.3	5.2
-35	50	4.8	4.7

Precautions for handling antifreeze

⚠ CAUTION

Antifreeze is poisonous.

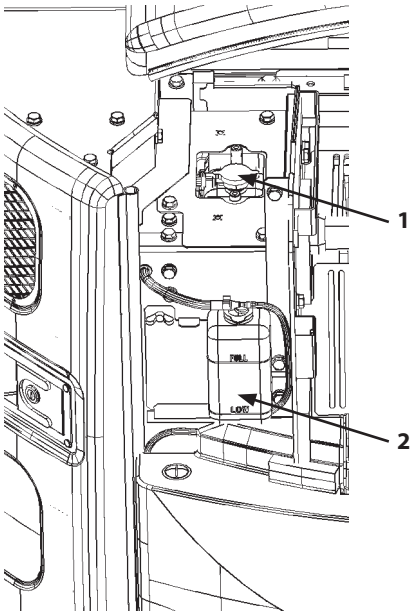
- **Antifreeze is poisonous; if ingested, it can cause serious injury or death. Induce vomiting and get emergency medical attention immediately.**
- **If antifreeze is accidentally splashed into eyes, flush with water for 10 to 15 minutes and get emergency medical attention.**
- **When storing antifreeze, be sure to keep it in a clearly marked container with a tight lid. Always keep ANTIFREEZE out of the reach of children.**
- **Use attention to fire hazards. LLC is specified as a dangerous substance in the fire protection law.**
- **When disposing of LLC, be sure to comply with all local regulations. When storing or disposing of antifreeze, be sure to comply with all local regulations.**

1 Check Coolant Level

--- daily

With the engine cold, the coolant level must be between the FULL and LOW marks on coolant reservoir (2). If the coolant level is below the low mark, remove the cap of coolant reservoir (2) and add to it.

Carefully remove any dirt around the radiator cap and the filler port before removing the radiator cap.



MDEQ-07-044-1 ja

WARNING

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

If coolant reservoir (2) is empty, add coolant through cap (1) of the radiator.

- When refilling a Long-Life Coolant (LLC), use the same brand product and the same mixture ratio as already used in the machine.
- If only water is added, it dilutes the mixture ratio of the Long-Life Coolant (LLC) and decreases the anti-rust and antifreeze effects of the coolant.

2 Check Fan Belt Tension

--- every 100 hours (first time only, after 50 hours)

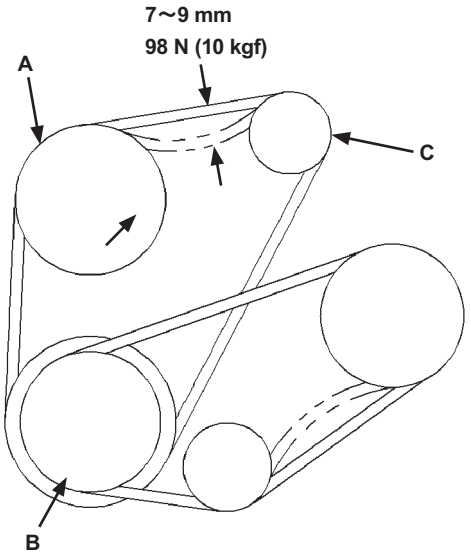
IMPORTANT

A loose fan belt may result in insufficient battery charging, engine overheating, as well as a rapid, abnormal belt wear. Belts that are too tight can damage both bearings and the belts.

Inspect

Check fan belt tension midpoint between the fan pulley (A) and the alternator pulley (C) by pressing down with your thumb at a force of approximately 98 N (10 kgf, 22 lbf). Correct adjustment of deflection is illustrated at right.

Visually check the belt for wear. Replace if necessary.



MDEQ-07-045-1 en_GB

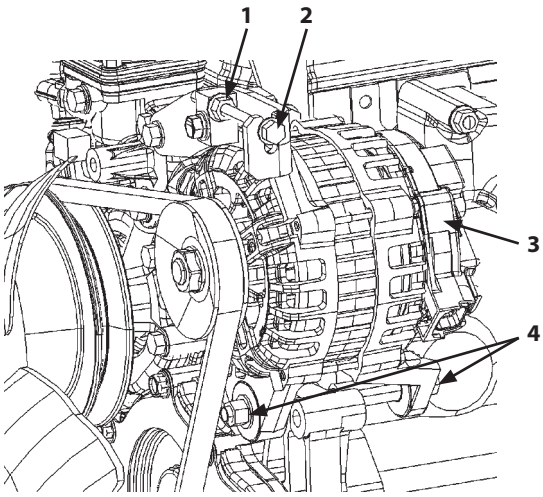
A Fan Pulley
B Crank Pulley
C Alternator Pulley

Adjust Belt Tension

1. Loosen lock nut (1) at the top of alternator (3), and lock nut (4) at the bottom of alternator.
2. Rotate tension adjust bolt (2) to adjust the belt tension and turn alternator (3) back and forth to make sure the tension is adjusted accurately.
3. Securely tighten lock nuts (1) and (4).

IMPORTANT

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.



MDEQ-07-046-1 ja

3 Change Coolant

---Replace twice a year

NOTE

When genuine Hitachi Long-Life Coolant is used, the change interval is once every two years (in autumn every other year) or every 4000 hours, whichever comes first.

WARNING

Keep foreign matter, such as dirt, out of the engine coolant.
Carefully remove any dirt around the radiator cap and the filler port before removing the radiator cap.

CAUTION

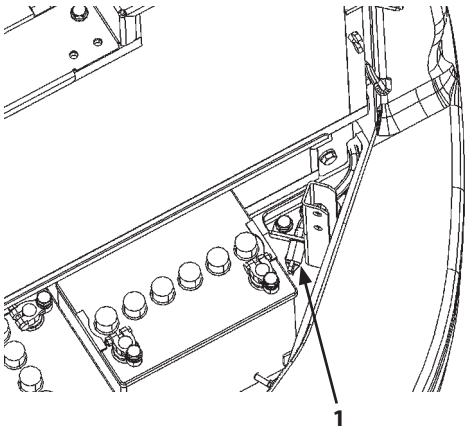
Do not remove the radiator cap when the coolant is hot. Hot steam may spout out, possibly causing severe burns. Loosen the cap slowly to the stop. Release all pressure before removing the cap.

IMPORTANT

Use soft water as a coolant. Do not use strong acid or alkaline water. Use coolant with genuine Hitachi Long-Life Coolant (LLC) mixed at a ratio of 30 to 50 %.

Coolant Changing Procedure

1. Park the machine according to the instructions of (7-8) Preparations for Inspection and Maintenance.
2. Remove the radiator cap and open drain cock (1) of the radiator to drain the coolant. Remove impurities such as scale at the same time.
3. Close drain cocks (1) and then fill with soft water with few impurities, or tap water along with detergent (radiator cleaner). Warm the engine so the needle of the temperature gauge is horizontal, and then run the engine at slightly higher than slow idle for about 10 minutes.
4. Stop the engine and open radiator drain cock (1). Flush out the cooling system with tap water until the water coming out is clear; this helps remove rust and sediment.



MDEQ-07-047-1 ja

5. Close drain cock (1) and fill with soft or tap water with few impurities and this time mix in LLC at the specified ratio. When adding coolant, do so slowly to avoid mixing air bubbles into the system. Run the engine to sufficiently bleed air from the cooling system.
6. After adding coolant, operate the engine for several minutes. Check the coolant level again, and add coolant if necessary.

4 Clean Radiator/Oil Cooler Core

Outside --- every 500 hours

Inside --- when coolant is changed

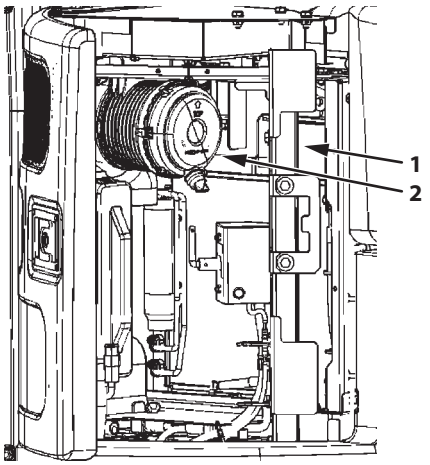
⚠ CAUTION

When using compressed air pressure (no higher than 0.2 MPa (2 kgf/cm^2)), wear safety glasses or goggles.

IMPORTANT

If compressed air (0.2 MPa (2 kgf/cm^2) or lower), or tap water at high pressure is used for cleaning, damage to the radiator (1) or oil cooler (2) fins may result.

The radiator (1) and the oil cooler (2) are arranged in parallel.
If dust or dirt are on them, clean the radiator (1) and oil cooler (2) with compressed air (0.2 MPa (2 kgf/cm^2) or lower) or tap water. This prevents a drop in performance of the cooling system.



MDEQ-07-109-1 ja

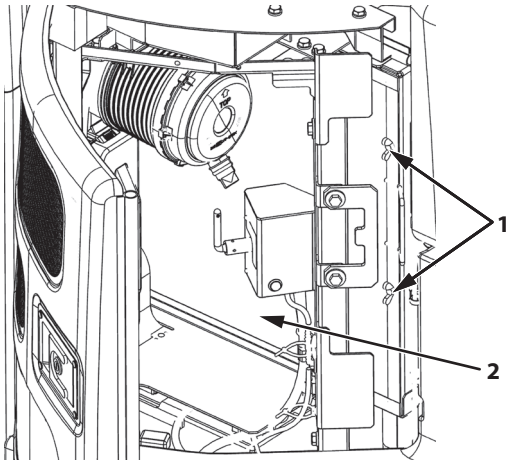
5 Clean Oil Cooler and Radiator Front Screen

--- every 500 hours

IMPORTANT

Check screen (2) daily for dirt when working at very dusty sites; if clogged, remove the screen and clean it.

Remove wing bolts (1) and then screen (2).



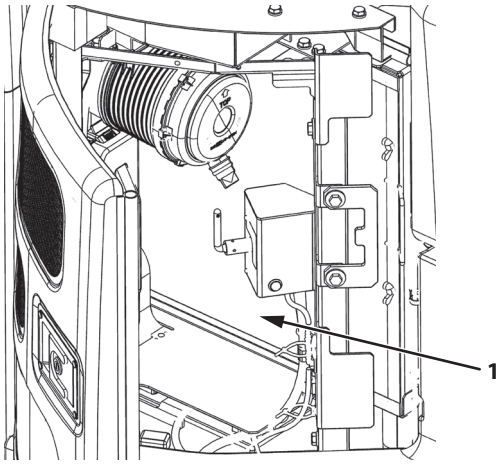
MDEQ-07-110-1 ja

6 Clean Air Conditioner Condenser

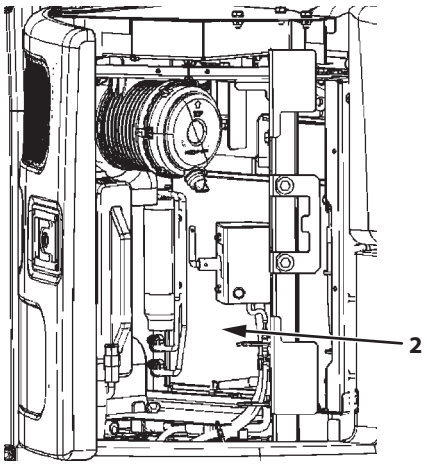
--- every 500 hours

IMPORTANT

Check condenser (2) daily for dirt when working at very dusty sites; if clogged, remove screen (1) and clean it.



MDEQ-07-110-2 ja



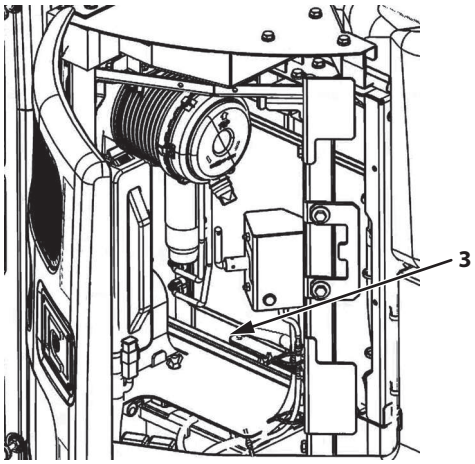
MDEQ-07-109-2 ja

7 Clean Fuel Oil Cooler

--- every 500 hours

IMPORTANT

Check fuel cooler (3) daily for dirt when working at very dusty sites; if clogged, remove screen (1) and clean it.



MDEQ-07-111-1 ja

H. Electrical System

WARNING

Improper radio communication equipment and associated parts, and/or improper installation of radio communication equipment affects the machine's electronic parts, causing unintended movement of the machine.

Improper installation of electrical equipment may cause machine failure and/or a fire on the machine.

Be sure to consult your authorized dealer when installing radio equipment or additional electrical parts, or when replacing electrical parts.

IMPORTANT

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

1 Battery

WARNING

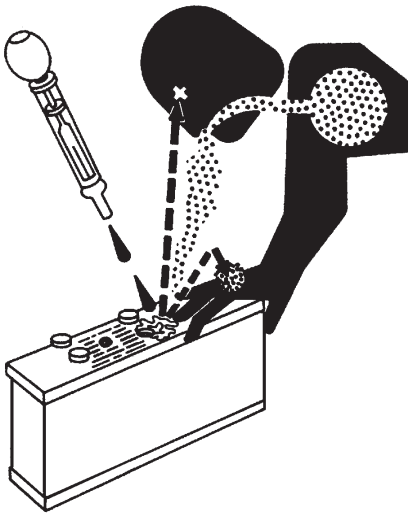
- **Battery gas can explode. Keep sparks and flames away from batteries.**
- **Do not leave cover (1) removed. Do not keep tools, metals or flammable materials around the battery or inside the battery compartment. If a metal tool is placed across the battery terminal and a vehicle component such as the engine block, sparks may be created, possibly resulting in fire and/or explosion.**
- **Do not continue to use or charge the battery when the electrolyte level is lower than specified. Explosion of the battery may result.**
- **Charge the batteries in a well ventilated location.**
- **Sulfuric acid is used in the battery electrolyte. It can eat through skin and clothing, and even metal. Wear eye protection and rubber gloves.**



SA-032 ja

IMPORTANT

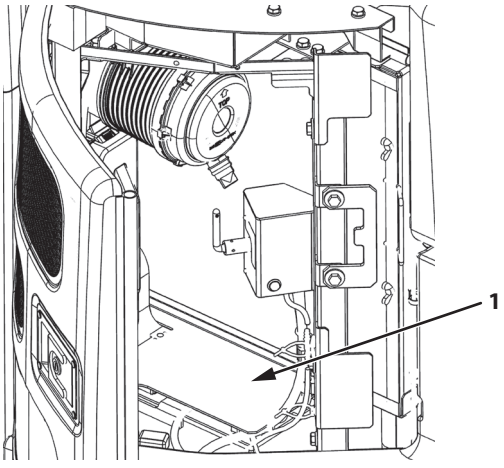
- **If the battery is used with the electrolyte level lower than the specified lower level, the battery may deteriorate quickly.**
- **Do not refill electrolyte above the specified upper level. Electrolyte may spill, damaging painted surfaces and/or corroding other machine parts.**
- **Take care to keep batteries in a good, charged condition. Failure to do so may prevent the engine from starting.**



SA-036 ja

NOTE

If electrolyte is refilled above the specified upper level line or beyond the bottom end of the sleeve, use a pipette to remove the excess electrolyte until the electrolyte level is down to the bottom end of the sleeve. After neutralizing the wiped up electrolyte with baking soda (sodium bicarbonate), flush it with plenty of water. Or, consult the battery manufacturer.



Battery Location

MDEQ-07-110-3 ja

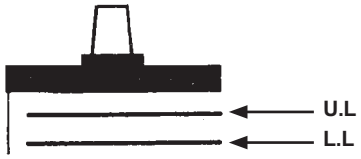
Precautions for Handling Batteries

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

Electrolyte Level Check --- monthly

Check the electrolyte level at least once a month.

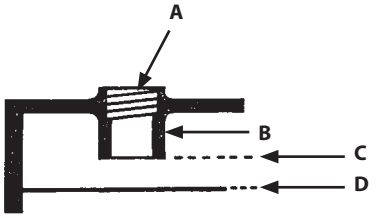
1. Park the machine on level ground and stop the engine.
2. How to Check the Electrolyte Level
   a. When checking the level from the battery side: Clean around the level marks with a water-dampened cloth and make sure the electrolyte level is between U.L (Upper Level) and L.L (Lower Level). Do not use a dry towel. Static electricity may develop, causing the battery gas to explode.
   If the electrolyte level is lower than the middle level between the U.L and L.L, immediately refill with distilled water or commercial battery fluid.
   After refilling, securely tighten the filler plug.
   Be sure to refill with distilled water before charging (operating the machine).



Side of Battery

M146-07-109-2 ja

U.L Upper Level L.L Lower Level



Inside of Battery

M146-07-110-2 ja

A Filler plug C Upper Level
B Sleeve D Lower Level (Separator Top)

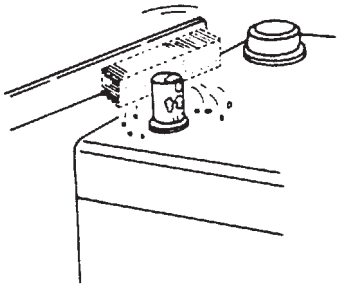
   b. If checking from the side is not possible, or if there are no level marks on the side:
   After removing the filler plug from the top of the battery, check the electrolyte level by viewing through the filler port. It is difficult to judge the electrolyte level accurately in this case, so judge its level as shown in the diagrams. When the electrolyte level is lower than the bottom end of the sleeve, refill with distilled water or commercial battery fluid up to the bottom end of the sleeve.
   After refilling, securely tighten the filler plug.
   Be sure to refill with distilled water before charging (operating the machine).
   c. If the level can be checked with an indicator, etc., follow its instructions.

Checking the Level via an Indicator

Good  When electrolyte reaches the bottom of the sleeve, surface tension makes the electrodes appear bent.

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

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



M409-07-072 ja

Check Electrolyte Specific Gravity every month

WARNING

- **Gas produced by the battery can be explosive.**
  Keep sparks and flames away from batteries.
  Use a flashlight to check the battery electrolyte level.
- **Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into the eyes.**
- **Never check the battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.**

Avoid hazard by:

1. **Charge the batteries in a well ventilated location.**
2. **Wearing eye protection and rubber gloves.**
3. **Avoiding breathing fumes when electrolyte is added.**
4. **Avoiding spilling or dripping electrolyte.**
5. **Using proper booster battery starting procedures.**

If you spill acid on yourself:

1. **Flush your skin with water.**
2. **Apply baking soda or lime to help neutralize the acid.**
3. **If it gets in your eyes, rinse them out for 15 to 30 minutes and get medical attention immediately.**

If acid is swallowed:

1. **Do not induce vomiting.**
2. **Drink large amounts of water or milk.**
3. **Get medical attention immediately.**

IMPORTANT

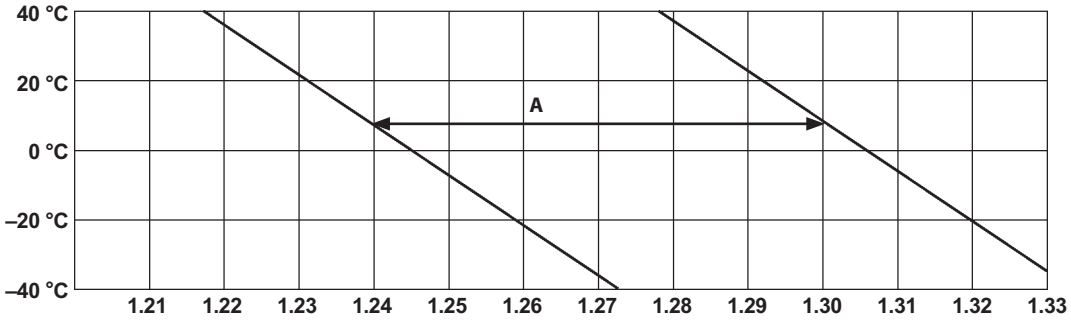
- **Add water to batteries in freezing weather before you begin operating your machine for the day, or before charging the batteries.**
- **If the battery is used with the electrolyte level lower than the specified lower level, the battery may deteriorate quickly.**
- **Do not refill electrolyte above the specified upper level. Electrolyte may spill, damaging painted surfaces and/or corroding other machine parts.**
- **Take care to keep batteries in a good, charged condition. Failure to do so may prevent the engine from starting.**

NOTE

Check the specific gravity of the electrolyte after it is cooled, not immediately after operation. Immediately after operation the electrolyte is still changing, so it cannot be measured accurately.

Check the electrolyte specific gravity in each battery cell.

The lowest limit of the specific gravity for the electrolyte varies depending on electrolyte temperature. The specific gravity should be kept within the range (A) shown below. Charge the battery if the specific gravity is below the limit.



Relationship between Electrolyte Specific Gravity and Temperature

M104-07-054-2 ja

Replace Battery

IMPORTANT

Before replacing a battery, turn the battery disconnect switch OFF.

This machine is equipped with two 12V batteries, which are negatively grounded.

If one battery is damaged on the 24V system, replace the damaged battery with the same type of new battery. If a maintenance free battery is damaged, replace it with new maintenance free battery. The type of battery charger differs depending on the type of battery. So, the batteries may be overloaded and damaged.

2 Replace Fuses

...as required

If any electrical equipment fails to operate, first check the fuses. The fuse box is located behind the operator's seat.

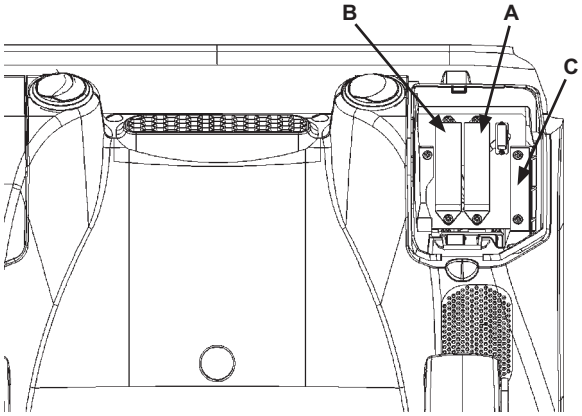
NOTE

- *One spare fuse for each fuse capacity is provided in the fuse box.*
- *A fuse removing tool is provided in the fuse box.*

Fuse Box

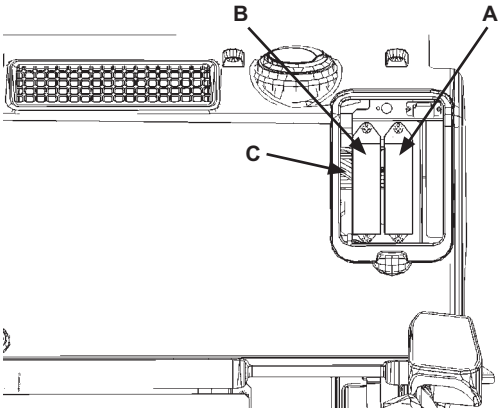
Fuse Box (A)

10-	CONTROLLER 5 A	20-	OPTION3 (BATT) 5 A
9-	BACKUP 10 A	19-	HORN 10 A
8-	SPARE	18-	IDLE STOP 5 A
7-	START 5 A	17-	FUEL PUMP 5 A
6-	OPTION2 (ALT) 20 A	16-	POWER ON 5 A
5-	OPTION1 (ALT) 5 A	15-	AUX. 10 A
4-	SOLENOID 20 A	14-	MONITOR 5 A
3-	HEATER 20 A	13-	LIGHTER 10 A
2-	WIPER 10 A	12-	RADIO 5 A
1-	LAMP 20 A	11-	DC-DC 20 A



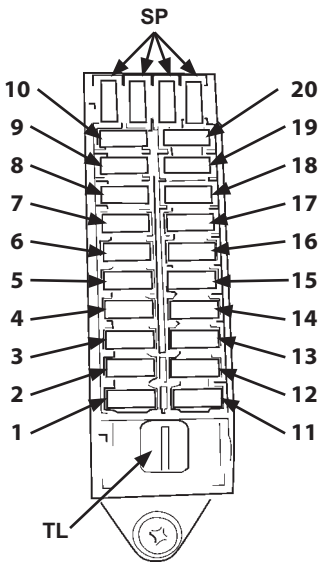
ZX85US-6

MDEQ-07-051-1 ja



ZX85USB-6

MDEQ-07-052-1 ja



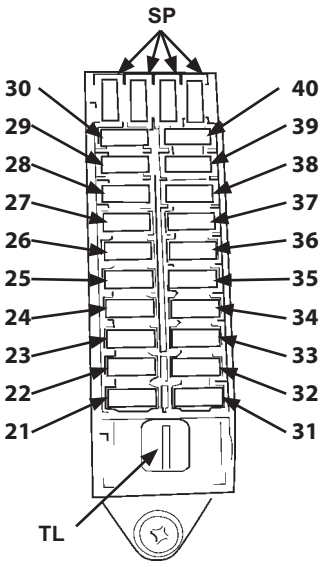
Fuse Box (A)

M1GR-01-003-3-1 ja

SP: Spare Fuses TL: Tool

Fuse Box (B)

30-	SPARE	40-	SPARE
29-	SPARE	39-	SPARE
28-	SPARE	38-	SPARE
27-	AUX.3 5 A	37-	SPARE
26-	QUICK HITCH 5 A	36-	SPARE
25-	IMOBI. 5 A	35-	SPARE
24-	12V UNIT 10 A	34-	AUX.2 10 A
23-	CAB LAMP REAR 10 A	33-	WARNING LAMP 10 A
22-	CAB LAMP FRONT 10 A	32-	CAB LAMP FRONT+2 10 A
21-	SEAT HEATER 10 A	31-	SEAT COMPR. 10 A



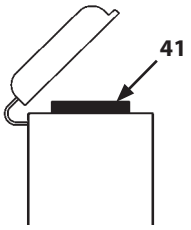
Fuse Box (B)

M1GR-01-003-4-1 ja

SP Spare Fuses TL Tool

Fuse Box (C)

41- DC-DC (E-ECU)
25 A



Fuse Box (C)

MDEQ-07-053-1 ja

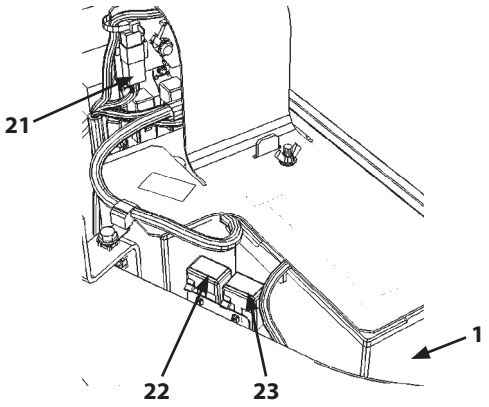
Fusible Link (Main Fuse)

If the starter fails to operate when the key is turned to the START position, the problem may be a blown fusible link. Remove the cover from the radiator compartment and check/replace the fusible link located near battery (1).

21- Black 65 A

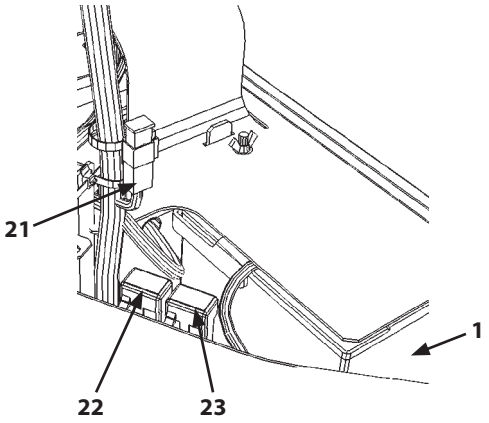
22- - Side (yellow) 60 A

23- +Side (red) 50 A



ZX85US-6

MDEQ-07-054-1 ja



ZX85USB-6

MDEQ-07-055-1 ja

I. Miscellaneous

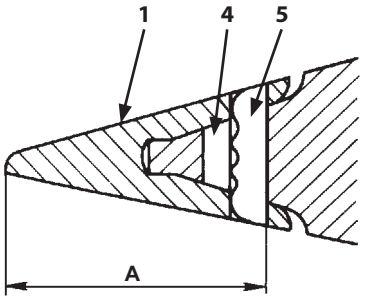
1 Check and Replace Bucket Teeth

--- daily

Check bucket teeth (1) for wear and looseness.

Replace if wear is beyond the service limit in the table.

	New	Service Limit
A (mm)	156	80



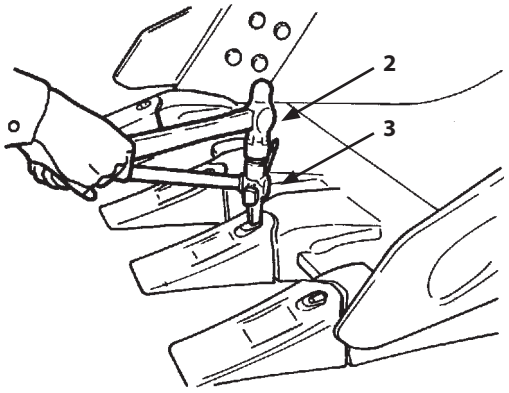
M104-07-056-1 ja

Replacement Guide

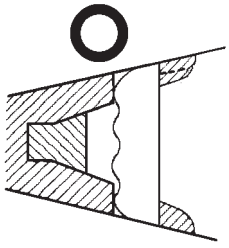
CAUTION

- **Guard against injury from flying pieces of metal.**
- **Wear goggles or safety glasses, and safety equipment appropriate for the job.**

1. Use hammer (2) and drift (3) to drive out lock pin (5). Take care not to damage lock rubber (4).
2. Inspect the lock pin (5) and lock rubber (4) after removing them. As shown in the diagram, short lock pins (5)and damaged lock rubber (4) must be replaced with new ones.

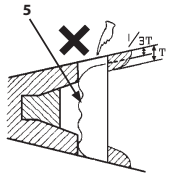
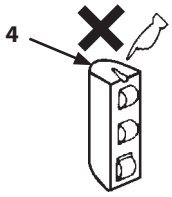
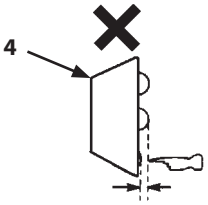


M104-07-116-1 ja

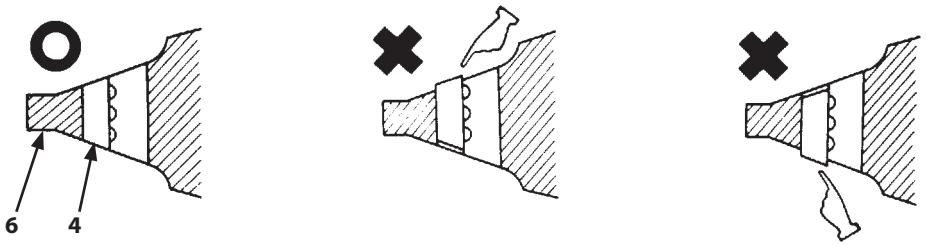


M104-07-118-2 ja

Examples of Defective Lock Pins (5) & Lock Rubbers (4)

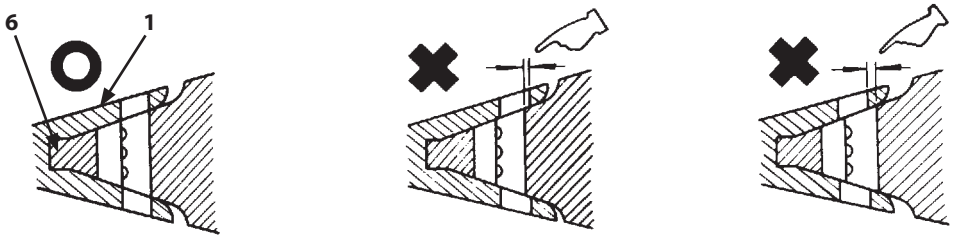
		
Lock pin (5) is too short	Steel ball may come out from cracked rubber	Pressing on the protruding steel ball makes it sink in.

3. Clean shank (6) surface.
4. Install lock rubber (4) into shank (6) hole as shown.



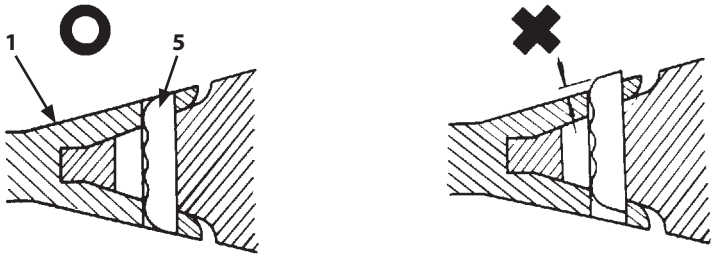
M104-07-060-2 ja

5. Position new tooth (1) over shank (6).



M104-07-061-2 ja

6. Drive lock pin (5) in so it is flush with the surface of tooth (1).



M104-07-062-2 ja

2 Change Bucket

--- As required

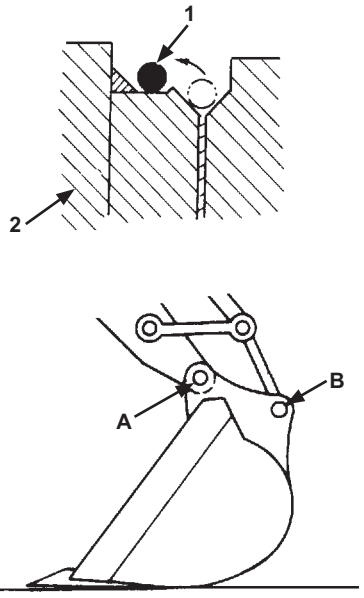
CAUTION

When removing/mounting pins, be careful of flying pieces of metal to avoid injury. Wear goggles or safety glasses, and safety equipment appropriate for the job.

Select a roomy area with good footing, and ensure the safety of anyone in the area while working. Move the front attachment slowly. When using a signal person, coordinate hand signals before starting.

Removal

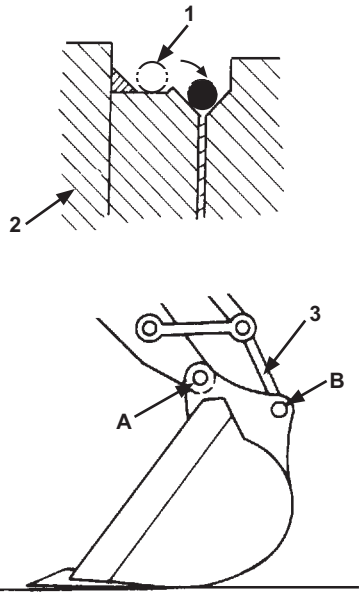
1. Place the bucket in a stable position.
2. Slide O-ring (1) out of its normal position toward the boss side of bucket (2).
3. Remove bucket pins A and B to separate the arm and bucket.



M104-07-063-2 ja

Mounting

1. Clean the pins and pin bores. Apply sufficient grease to the pins and pin bores.
2. Place the new bucket in stable position as shown in the figure.
3. Fit the arm to hole A and link (3) to hole B with the pins.
4. Install the locking pins and snap rings on each pin.
5. Install O-rings (1) to the specified positions.
6. Apply grease to each pin.
7. Start the engine and run it at slow idle. Slowly operate the bucket in both directions to check for any interference in bucket movement.



M104-07-063-3 ja

3 Inverting the Bucket

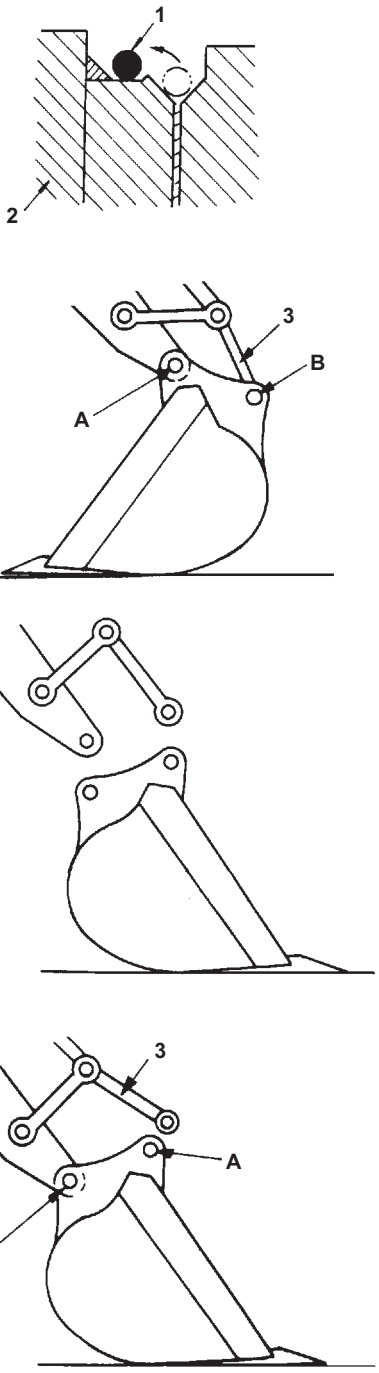
⚠ CAUTION

When removing/mounting pins, be careful of flying pieces of metal to avoid injury. Wear goggles or safety glasses, and safety equipment appropriate for the job.

Inverting the bucket connection allows you to use the machine as a face shovel. Select a roomy area with good footing, and ensure the safety of anyone in the area while working. Move the front attachment slowly. When using a signal person, coordinate hand signals before starting.

Guide to Inverting Bucket

1. Place the bucket in a stable position.
2. Slide O-ring (1) out of its normal position toward the boss side of bucket (2).
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. Invert the bucket so it is in a stable position as shown in the figure.
5. Fit the arm to hole B and link (3) to hole A with the pins.
6. Install the locking pins and snap rings on each pin.
7. Install O-rings (1) to the specified positions.
8. Apply grease to each pin.
9. Start the engine and run it at slow idle. Slowly operate the bucket in both directions to check for any interference in bucket movement.



M104-07-064-2 ja

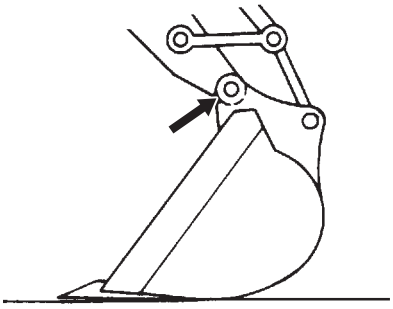
4 Adjusting the Bucket Linkage

The machine is provided with a bucket adjustment system to take up play in the linkage. When the gap between the bucket and the boss at the tip of the arm gets too big, adjust it as follows.

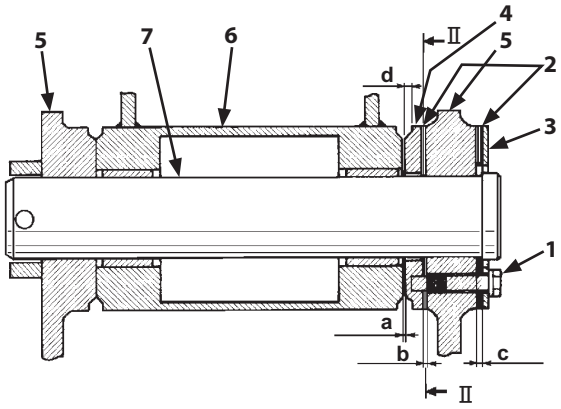
1. Place the bucket in a stable position as illustrated.
2. Turn it ever so slightly counter-clockwise and press gently on the arm tip boss to the left side of the bucket (side without the gap adjusting mechanism).
3. Stop the engine and put the pilot control shut-off lever in the LOCK position.
4. Slightly loosen the 3 bolts (1) using a 8 mm wrench. Remove all shims (2) from clearance (c) between plate (3) and the bucket. As shim (2) is a dual partitioning type, it can be easily removed by slightly loosening bolt (1) and inserting the tip of a screw driver in the gap between the left and right shims (2).
5. Pressing on the head of bolt (1) by hand eliminates gap (a) and gap (b) gets larger by that amount; put as many of the shims (2) just removed into gap (b) as possible, without forcing it.
6. Install remaining shims (2) into gap (c) and tighten bolts (1) to 50 N·m (5 kgf·m).

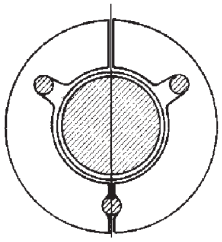
NOTE

The total number of shims (2) used in gap (b) and (c) are 6×2=12. Forgetting to return the remaining shims (2) into gap (c) in step 6 above will cause the end of bolt (1) to stick out and it may scratch the end of the arm tip boss (4) and/or damage the bolt.



M503-07-056-2 ja





Shim Shape (Cross-section II)

M1G6-07-010-2 ja

a	Gap	3	Plate
b	Gap	4	Boss
c	Gap	5	Bucket
d	Groove width	6	Arm Tip Boss
1	Bolts	7	Pin
2	Shim		

5 Remove Travel Levers (ZX85US-6)

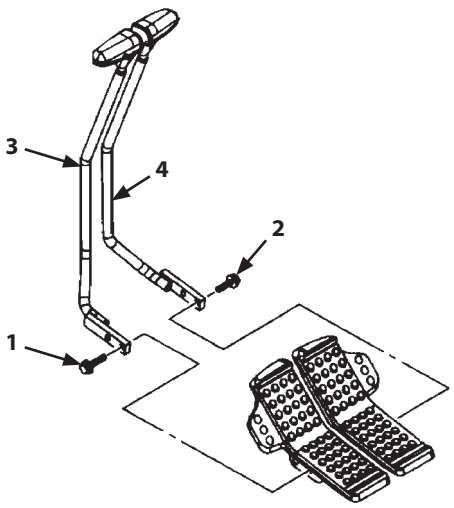
The machine can be operated with just the travel pedals. However, its operability suffers compared to using the levers.

How to Remove Travel Levers

Remove 2 each of bolts (1) and (2) to remove travel levers (3) and (4) from the brackets.

NOTE

Wrench size: 17 mm
Tightening Torque: 50 N·m (5 kgf·m)



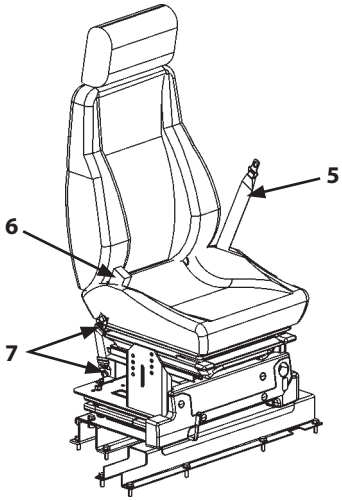
M178-07-077-1 ja

6 Check and Replace Seat Belt

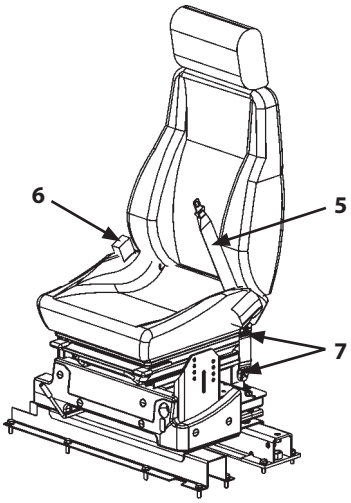
Check --- daily

Replace --- every 3 years

Prior to operating the machine, thoroughly examine belt (5), buckle (6) and attaching hardware (7). If any item is damaged or substantially worn, replace seat belt or components before operating the machine. We recommend that seat belt (5) be replaced every 3 years regardless of its apparent condition.



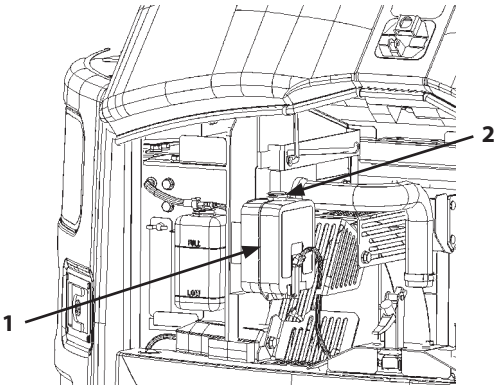
M1U1-07-008-1 ja



M1U1-07-009-1 ja

7 Check Windshield Washer Fluid Level

Check the level of washer in washer tank (1) and if the level is low, remove cap (2) and add fluid via the opening.



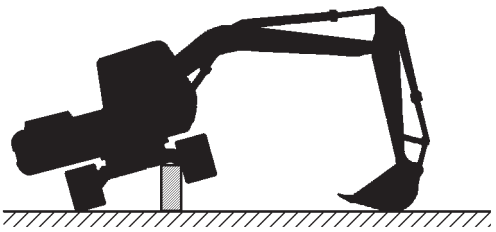
MDEQ-07-056-1 ja

8 Check Track Sag

--- every 50 hours

Raise the track to be measured as shown in the figure at right and measure the distance between the top of the shoe and the bottom of the side frame.

When doing so, be sure to place blocks under the machine frame to support the machine.



M104-07-067 ja

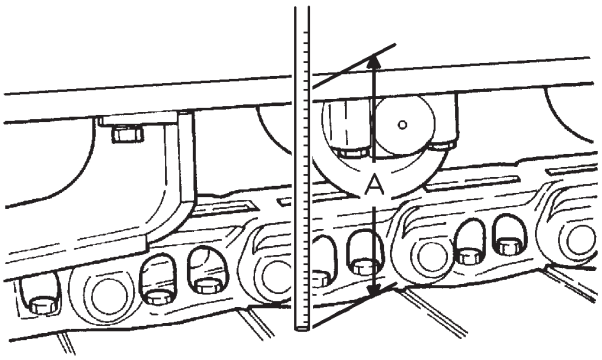
CAUTION

Take care that no hands, feet, or other body parts are put beneath the track.

	Measurement
Correct Amount of Sag A (mm)	210 to 245

NOTE

Check track sag after thoroughly removing soil stuck on the track area.



M107-07-068-1 ja

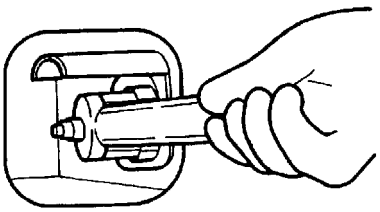
Adjusting Track Sag

1. If track sag is not within specifications, adjust the track following the procedures shown on the next page.
2. Adjust the tracks one at a time, with the tracks in the air. When doing so, be sure to place blocks under the machine frame to support the machine. During adjustment, take care that hands, feet, and no body parts are put beneath the track.
3. After adjusting the sag on both sides, rotate the tracks backward and forward to equalize the sag on both sides.
4. Recheck the track sag one more time. Readjust as necessary.

To Loosen the Track (Steel Crawler)

CAUTION

The pressure inside the cylinder of the track adjuster is high. Do not loosen valve (1) quickly or loosen it too much as valve (1) may fly out or high-pressure grease in the adjusting cylinder may spout out. Slowly loosen valve (1) while keeping body parts and face away from the valve. Never loosen grease fitting (2).

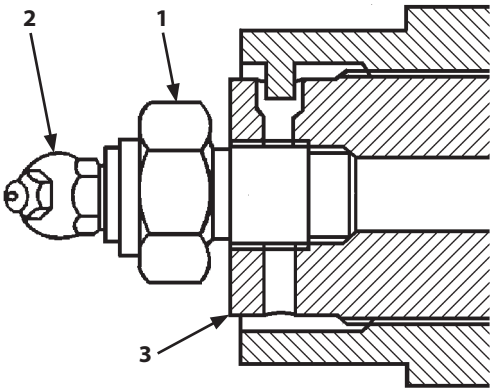


MDEQ-07-057 ja

IMPORTANT

When gravel or mud is packed between sprockets and track links, remove it before loosening.

1. Use a long 19 mm hex socket on the body of valve (1) and loosen the entire valve a little at a time; when grease is expelled from grease outlet (3), the track is loose.
2. Between 1 to 1.5 turns of valve (1) is sufficient to loosen the track. Do not loosen further than this.
3. If grease does not drain smoothly, slowly rotate the raised track.



MDEQ-07-058-1 ja

CAUTION

Take care that no hands, feet, or body parts are put beneath the track.

4. When proper track sag is obtained, turn valve (1) clockwise to the original condition.

   Tightening Torque: 150 N·m (15 kgf·m)

CAUTION

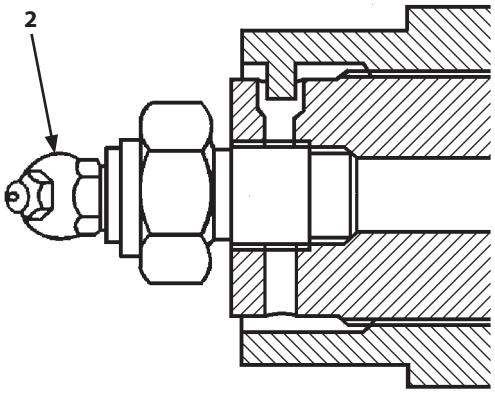
If grease is not expelled properly, consult your authorized dealer.

To Tighten the Tracks (Steel Crawlers)

CAUTION

It is abnormal if the track cannot be adjusted. A strong force acts on the spring in the track adjuster so the grease in the cylinder is under high pressure. Inappropriate handling during adjustment or disassembly is extremely dangerous, possibly resulting in serious injury or death. Consult your authorized dealer for repairs.

To tighten the tracks, connect a grease gun to grease fitting (2) and add grease until the sag is within specifications.

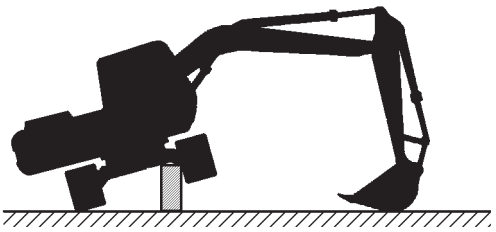


MDEQ-07-058-2 ja

9 Adjust Track Sag (Rubber Crawler) and Check for Damage

--- daily

Swing the upperstructure 90 ° and lower the bucket to raise the track off the ground as shown. Rotate the rubber track so that the seam (1) of the rubber crawler comes to the center. Measure the clearance between the tread surface of the lower roller (2) and the inner ridge of the rubber track (3).
When doing so, be sure to place blocks under the machine frame to support the machine.



M104-07-067 ja

CAUTION

Take care that no hands, feet, or other body parts are put beneath the track.

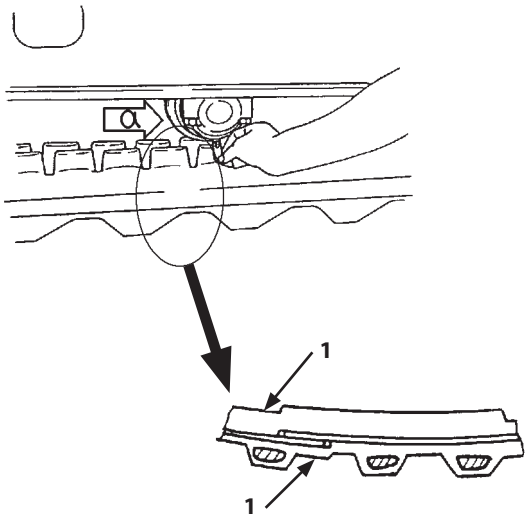
	Measurement
Correct Amount of Sag A (mm)	15 to 20

NOTE

Check track sag after thoroughly removing soil stuck on the track area.

Adjusting Track Sag

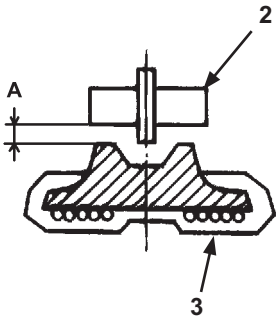
1. If track sag is not within specifications, loosen or tighten the track following the procedures shown on the next page.
2. Adjust the tracks one at a time, with the tracks in the air. When doing so, be sure to place blocks under the machine frame to support the machine. To prevent accidents, care should be taken to ensure that hands, feet, and other body parts do not become entangled when working around the tracks.
3. After adjusting the sag on both sides, rotate the tracks backward and forward to equalize the sag on both sides.
4. Recheck the track sag one more time. Readjust as necessary.



MDEQ-07-059-1 ja

Check Rubber Tracks for Damage

Check the rubber tracks for damage.
If there is any damage, consult the nearest Hitachi representative for repairs.

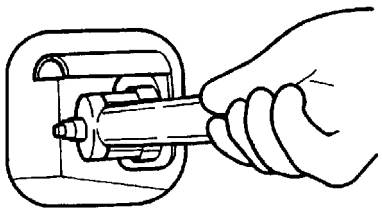


M503-05-050-3 ja

Loosening the Tracks (Rubber Crawlers)

WARNING

The pressure inside the cylinder of the track adjuster is high. Do not loosen valve (1) quickly or loosen it too much as valve (1) may fly out or high-pressure grease in the adjusting cylinder may spout out. Slowly loosen valve (1) while keeping body parts and face away from the valve. Never loosen grease fitting (2).

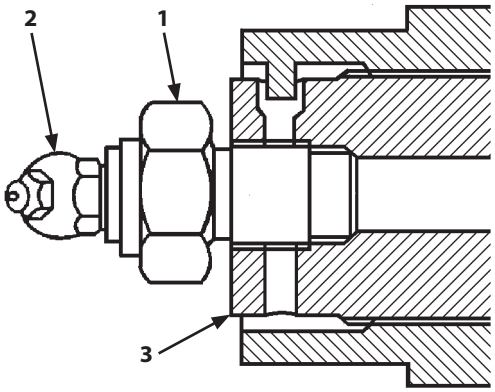


MDEQ-07-057 ja

IMPORTANT

When gravel or mud is packed between sprockets and track links, remove it before loosening.

1. Use a long 19 mm hex socket on the body of valve (1) and loosen the entire valve a little at a time; when grease is expelled from grease outlet (3), the track is loose.
2. Between 1 to 1.5 turns of valve (1) is sufficient to loosen the track. Do not loosen further than this.
3. If grease does not drain smoothly, slowly rotate the raised track.



MDEQ-07-058-1 ja

CAUTION

Take care that no hands, feet, or other body parts are put beneath the track.

4. When proper track sag is obtained, turn valve (1) clockwise to the original condition.

   Tightening Torque: 150 N·m (15 kgf·m)

CAUTION

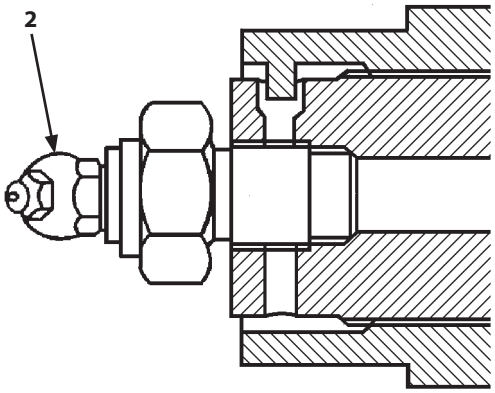
If grease is not expelled properly, consult your authorized dealer.

Tightening the Tracks (Rubber Crawlers)

CAUTION

It is abnormal if the track cannot be adjusted. A strong force acts on the spring in the track adjuster so the grease in the cylinder is under high pressure. Inappropriate handling during adjustment or disassembly is extremely dangerous, possibly resulting in serious injury or death. Consult your authorized dealer for repairs.

To tighten the tracks, connect a grease gun to grease fitting (2) and add grease until the sag is within specifications.



MDEQ-07-058-2 ja

Converting the Track

WARNING

- **Consult your authorized dealer for converting the track. The track adjuster is dangerous as it is under great pressure. When removing the rubber track, do not allow anyone to stand in front of the front idler.**
- **After the rubber track is removed, the front idler will become free to remove. If the front idler comes off unexpectedly, personal injury and/or death may result.**

Consult your authorized dealer for converting the track.
Change the track adjuster whenever converting the track.

10 Clean and Replace Air Conditioner Filter

Clean Circulating/Fresh Air Filters

Circulating Air Filter --- every 500 hours

Fresh Air Filter --- every 500 hours

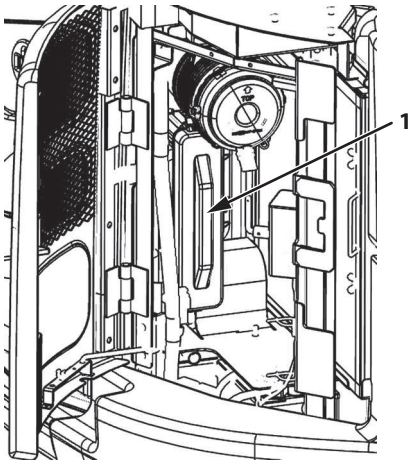
Replace Circulating/Fresh Air Filters

Circulating Air Filter --- After cleaning 6 times or so

Fresh Air Filter --- After cleaning 6 times or so

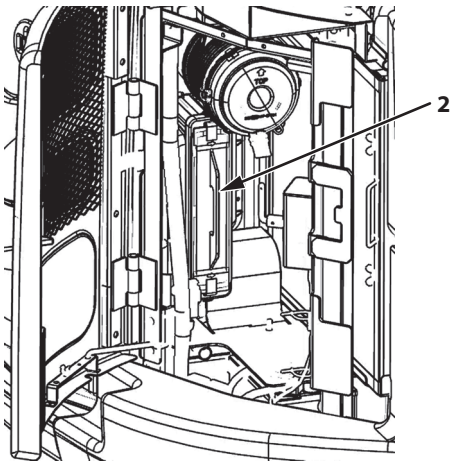
Removing the Fresh Air Filter

1. From outside the cab, grasp the top of filter cover (1) at the rear of the cab and pull it toward yourself to remove it.



MDEQ-07-112-1 ja

2. Grasp fresh air filter (2) from the opening where the filter cover (1) was removed and pull it out toward yourself.



MDEQ-07-113-1 ja

Cleaning

WARNING

When using compressed air pressure, wear safety glasses or goggles.

Clean the circulating and fresh air filters.

Clean both the circulating and fresh air filters by blowing compressed air or washing with water.

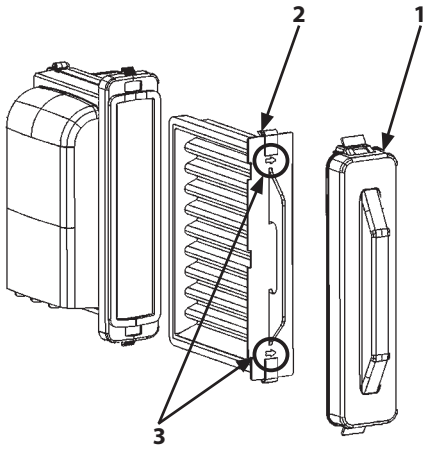
Washing procedure with water is as follows:

1. Use tap water.
2. Submerge the filters in water containing a neutral detergent for about 5 minutes.
3. Clean the filters with water again.
4. Dry the filters.

Installation

When installing the cleaned circulating/fresh air filters or new filters, follow the reverse order of the Removing Filter (7-99) procedure.

Fresh Air Filter (2)
Put fresh air filter (2) in the opening so the arrows (3) face the cab to the right.
After putting it into place, install filter cover (1) so it fits onto the duct.



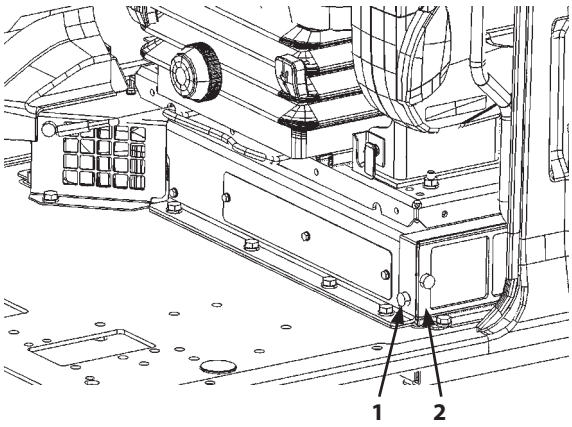
MDEQ-07-061-1 ja

Circulating Air Filter

ZX85US-6

Replacing the Circulating Air Filter (Outer) (4)

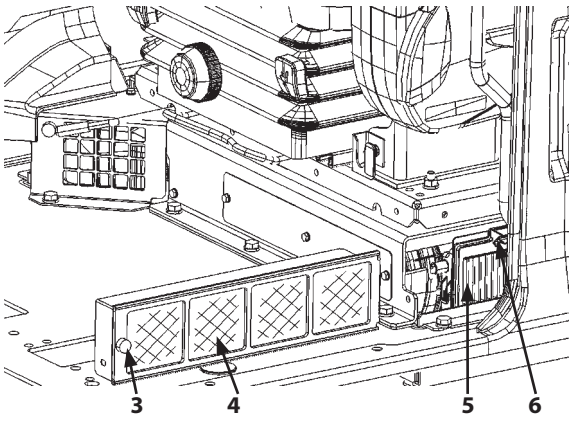
1. Circulating air filter (4) is located next to the seat stand.
2. Remove screw (1) and then pull cover (2) toward the front of the cab to remove it.
3. Remove screw (3).
4. Remove circulating filter (outer) (4).



MDEQ-07-062-1 ja

Circulating air filter (inner) (5)

1. Holding grip (6), pull toward yourself to remove.



MDEQ-07-063-1 ja

Cleaning

WARNING

When using compressed air pressure, wear safety glasses or goggles.

Clean the circulating and fresh air filters.

Clean both the circulating and fresh air filters by blowing compressed air or washing with water.

Washing procedure with water is as follows:

1. Use tap water.
2. Submerge the filters in water containing a neutral detergent for about 5 minutes.
3. Clean the filters with water again.
4. Dry the filters.

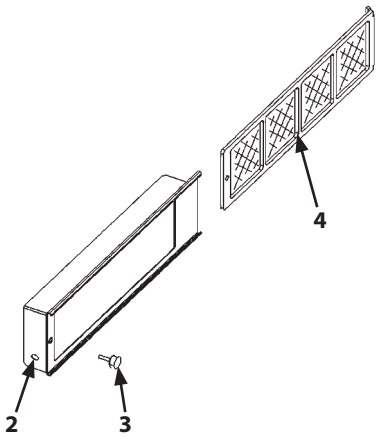
Installation

- Circulating air filter (outer) (4)

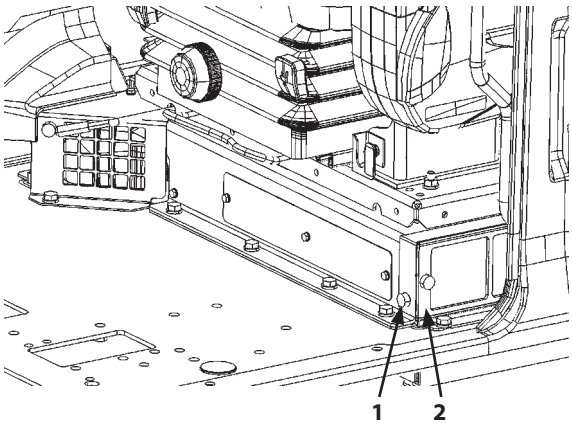
1. Secure circulating filter (outer) (4) and cover (2) with screw (3).
2. Secure cover (2) with screw (1).

- Circulating air filter (inner) (5)

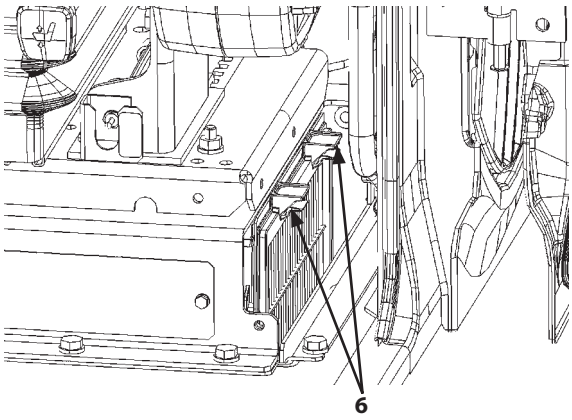
1. Fit the filter into groove (6).



MDEQ-07-064-1 ja



MDEQ-07-062-1 ja

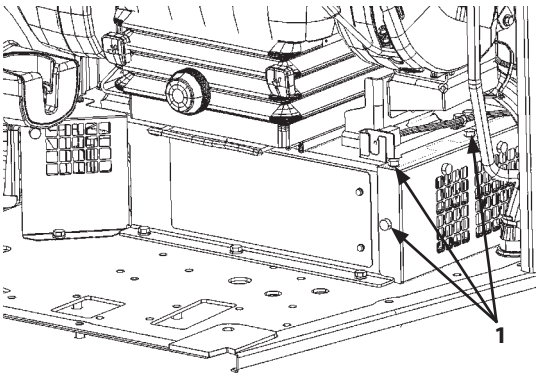


MDEQ-07-065-1 ja

ZX85USB-6

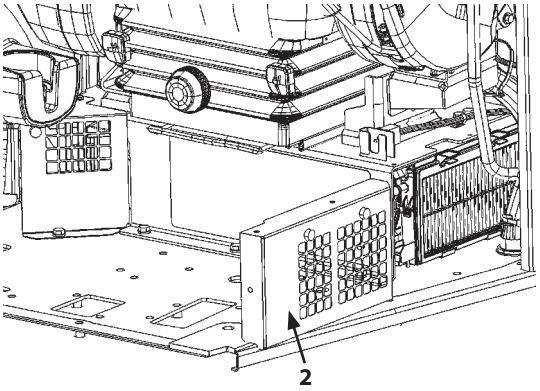
Replacing Circulating Air Filter

1. Circulating air filter (3) is located next to the seat stand.



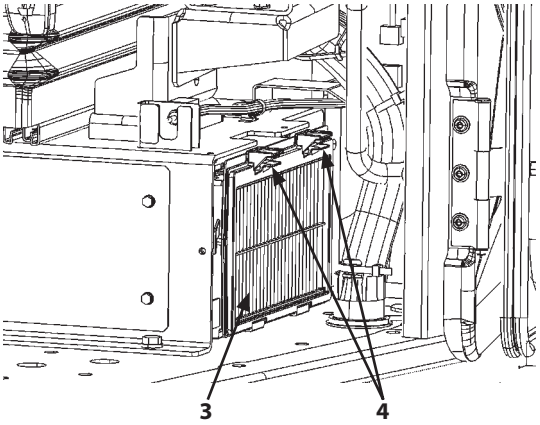
MDEQ-07-066-1 ja

2. Remove the 3 screws (1) and then pull cover (2) toward the front of the cab to remove it.



MDEQ-07-067-1 ja

3. Holding grips (4), pull the filter toward yourself to remove it.



MDEQ-07-068-1 ja

Cleaning

WARNING

When using compressed air pressure, wear safety glasses or goggles.

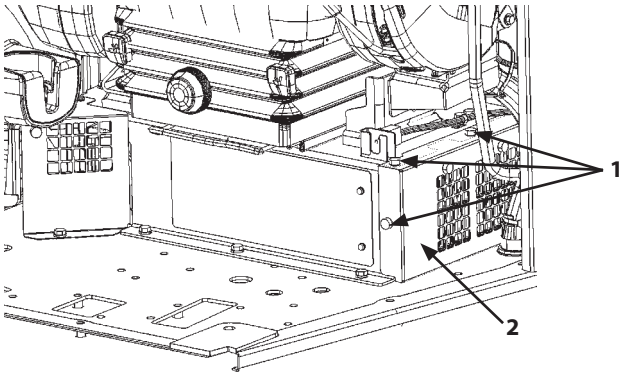
Clean the circulating and fresh air filters.
Clean both the circulating and fresh air filters by blowing compressed air or washing with water.
Washing procedure with water is as follows:

1. Use tap water.
2. Submerge the filters in water containing a neutral detergent for about 5 minutes.
3. Clean the filters with water again.
4. Dry the filters.

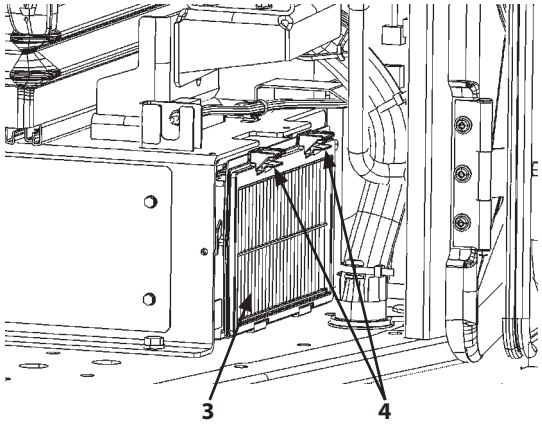
Installation

- Circulating air filter (3)

1. Fit filter (3) into the groove.
2. Secure cover (2) with the 3 screws (1).



MDEQ-07-066-2 ja



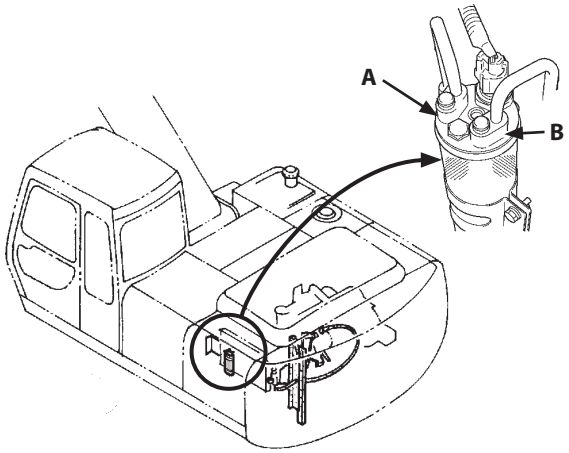
MDEQ-07-068-1 ja

11 Check Air Conditioner

--- every 250 hours

Check pipe connections for refrigerant gas leakage

If oil seepage is found around pipe joints (A,B), it indicates possible gas leakage.



M1CD-07-038-2 ja

Check Refrigerant Level

Start the engine and run it at 1500 min-1(rpm). Turn the air conditioner switch to ON. Set the blower switch to HI and set the temperature control switch to the coolest position (18 °C on the monitor screen). Operate the air conditioner for 2 to 3 minutes. Check if cool air comes out from the vent in the cab.

Type and Amount of Refrigerant when Shipped

Type	Amount
HFC134a	0.80±0.05 kg

IMPORTANT

For collection/refilling of refrigerant during checks and maintenance (including disposal), contact a company certified to handle refrigerant or your nearest Hitachi representative.

Checking the Condenser

If the condenser fins become clogged with dirt or insects, their cooling efficiency is compromised.
Be sure to keep them clean at all times. (Refer to the section Cleaning the Air Conditioner Condenser (7-71).)

Check compressor

After operating the air conditioner for 5 to 10 minutes, touch both the high pressure pipe and the low pressure pipe. If normal, the high pressure side pipe will be hot, and the low pressure side cold.

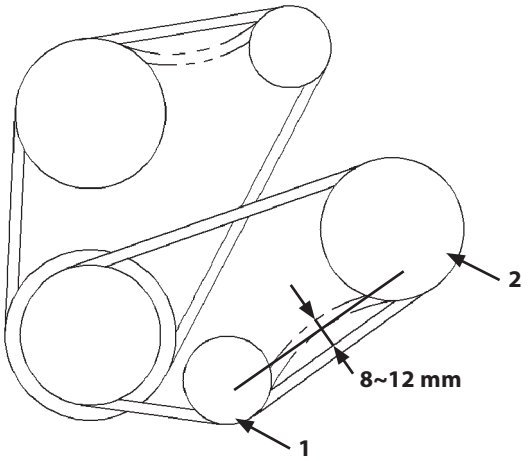
Check mounting bolts for looseness

Confirm that the compressor mounting bolts and other mounting/fastening bolts are securely tightened.

Inspect belt, check and adjust tension

--- every 250 hours

Check the compressor belt for wear and looseness.
Check fan belt tension midpoint between the tensioner pulley (1) and the compressor pulley (2) by pressing down with your thumb at a force of approximately 98 N (10 kgf). Correct adjustment of deflection is 8 to 12 mm.
If anything abnormal is found, contact your authorized dealer for a detailed inspection.



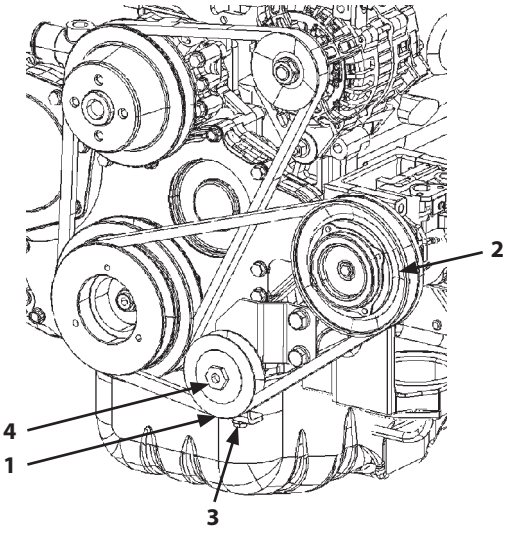
MDEQ-07-069-1 en_GB

Adjusting Compressor Belt Tension

1. Loosen lock nut (4) of tensioner pulley (1).
2. Move tensioner pulley (1) by adjusting bolt (3) under tensioner pulley (1) until tension is correct.
3. Securely tighten bolt (4) of tensioner pulley (1).

IMPORTANT

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.



MDEQ-07-070-1 ja

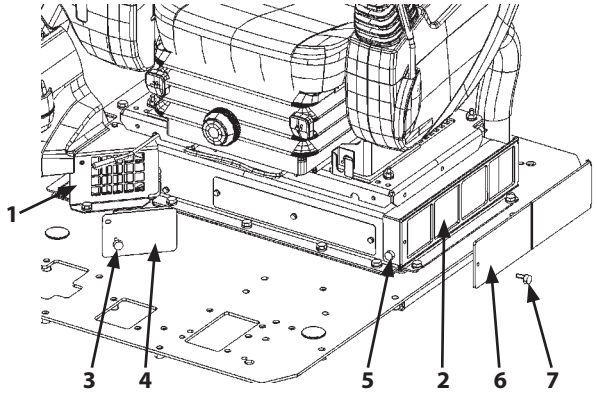
12 Clean Cab Floor

--- As required

IMPORTANT

Water can be used for cleaning inside the cab only for the floor. Take care not to splash the surrounding area. Do not increase water spray speed by restricting the hose end, and do not use high pressure steam for cleaning. Be sure to completely wipe up any water that splashed around.

1. With the machine on level ground, lower the bucket to the ground and stop the engine. Before cleaning, use covers (4), (6), (9) and (11) under the left console to cover AC circulating air intake (2) and floor vent (1).



ZX85US-6

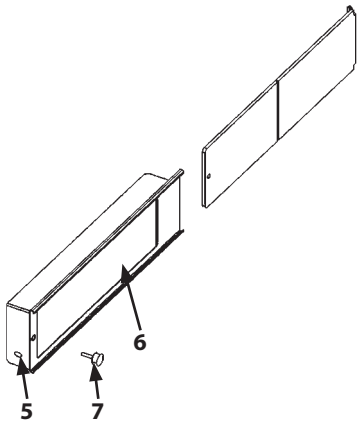
MDEQ-07-071-1 ja

ZX85US-6

2. Remove screw (7) and circulating filter (outer) cover (5) . Remove circulating filter (outer) from where the removed circulating filter (outer) cover (4) had been and mount cover (6) in the circulating filter position. After fastening screw (7), secure circulating filter (outer) cover (5) with screw (7). Remove screw (3) of floor vent (1) and then put cover (4) on floor vent (1) and secure it with screw (3).

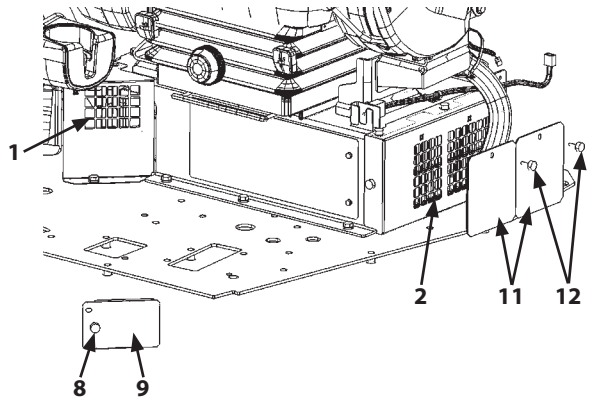
ZX85USB-6

2. Remove screw (12) and then secure cover (11) with screw (12). Remove screw (8) of floor vent (1) and then put cover (9) on floor vent (1) and secure it with screw (8).



ZX85US-6

MDEQ-07-072-1 ja



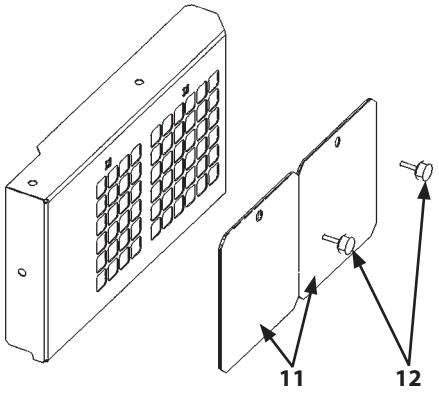
ZX85USB-6

MDEQ-07-073-1 ja

IMPORTANT

Failure to do this work will cause the AC to fail, so always follow the instructions.

3. Sweep the cab floor clean using a brush, and brush dust from the cab floor while spraying water.
4. When cleaning the floor mat, sweep dust (water) along the grooves on the floor mat.
5. When cleaning after removing the floor mat, sweep dust (water) through the 2 cleaning holes.
6. After cleaning the cab, in reverse order, remove covers (4), (6), (9) and (11) of AC circulating filter intake (2) and floor vent (1) and then install circulating filter (refer to Cleaning and Replacing Air Conditioner and Heater Internal/External Filters). Store covers (4), (6), (9) and (11) under the left console.



ZX85USB-6

MDEQ-07-074-1 ja

IMPORTANT

If the AC is used with the covers in place, the AC will not work properly and will result in poor cooling and/or malfunction.

13 Check and Clean Injector

--- every 3000 hours

Inspect the tips of injectors.

Consult your authorized dealer for repairs.

14 Inspect and Adjust Valve Clearance

--- every 1000 hours

If the clearances of the intake and exhaust valves are incorrect, it makes the engine noisy, decreases its performance and can damage the engine.
The correct procedures must be following in adjusting the intake and exhaust valves to maintain the correct timing for opening and closing them.

Consult your authorized dealer for repairs.

15 Measure Engine Compression Pressure

--- every 1000 hours

Consult your authorized dealer for repairs.

16 Check Starter and Alternator

--- every 1000 hours

Consult your authorized dealer for repairs.

17 Inspect, Replace and Check EGR Valve Function

--- every 3000 hours

The EGR is an important device in adjusting the amount of exhaust gases and it works to clean exhaust gases by recirculating them to the combustion chamber and lowering the combustion temperature.
Because the amount of exhaust gas this valve recirculates decreases over time due to carbon deposits from the exhaust, it must be inspected, cleaned and its function checked every 3000 hours.

Consult your authorized dealer for repairs.

18 Check Gas Damper

--- As required

⚠ CAUTION

The gas damper has been charged with high-pressure nitrogen gas. Inappropriate handling may cause explosion, possibly resulting in serious injury or death.

Gas dampers are used on the tool cover and the overhead window of the cab. Contact your authorized dealer immediately in any of the following situations.

- If the cover or window cannot be opened easily.
- If they cannot keep themselves open.
- If an oil or gas leak is found.

19 Check Crankcase Breather

--- every 1500 hours

The crankcase breather system must work properly for the engine to comply with exhaust gas regulations for its service life. Regulation (EU) 2016/1628 stipulates a crankcase breather system inspection every 1500 hours.

Consult your authorized dealer for repairs.

20 EGR Cooler Cleaning

--- every 1500 hours

Consult your authorized dealer for repairs.

21 Check the Function of the Intake Throttle Valve

--- every 3000 hours

Because the intake throttle is a part related to exhaust gas performance, its function must be checked every 3000 hours.

Consult your authorized dealer for repairs.

22 Check the Radiator Cap

--- every 2000 hours

Consult your authorized dealer for repairs.

23 Tightening and Retightening Torque of Nuts and Bolts

--- every 250 hours (first time only, after 50 hours)

Tighten or retighten nuts and bolts used on this machine in accordance with the torque values shown in the following table. Bolts and nuts should be replaced with those of the same or higher grade.

Check tightness after the first 50 hours, then every 250 hours.

Locations to be retightened other than those in the table should be tightened according to the Tightening Torque Chart (7-113).

No.	Descriptions		Bolt diameter	Qty.	Wrench size	Torque	
						N·m	(kgf·m)
1.	Engine cushion rubber mounting bolt		14	2	22	180	(18)
			16	2	24	270	(27)
2.	Engine bracket mounting bolts		10	8	17	50	(5)
			12	8	19	90	(9)
3.	Hydraulic oil tank mounting bolts		16	4	24	270	(27)
4.	Fuel tank mounting bolts		16	4	24	210	(21)
5.	Union joints 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)
6.	Pump mounting bolt		18	2	27	300	(30)
7.	Control valve mounting bolt		14	3	22	180	(18)
8.	Control valve bracket mounting bolts		14	4	22	140	(14)
9.	Swing device mounting bolts		16	10	24	210	(21)
10.	Swing motor mounting bolt (Hexagon wrench)		14	8	12	175	(17.5)
11.	Battery mounting nuts		10	4	17	20	(2.0)
12.	Cab mounting nuts		16	4	24	210	(21)
13.	Swing bearing mounting bolts	(Upperstructure)	16	24	24	210	(21)
		(Track)	16	24	24	270	(27)
14.	Travel device mounting bolts		16	20	24	300	(30)
	Travel reduction gear cover mounting bolts		14	8	22	140	(14)
15.	Sprocket mounting bolts		16	24	24	270	(27)
16.	Upper roller mounting bolts		14	2	22	140	(14)
17.	Lower roller mounting bolts		14	40	22	245	(24.5)
18.	Shoe mounting bolts		14	320	22	245	(24.5)
19.	Cover mounting bolt		6	–	10	10	(1)
			8	–	13	10	(1)
			10	–	17	50	(5)
20.	Flexible master coupling of low pressure piping		8	2 sets	13	10.3 to 12.4	(1.05 to 1.26)

No.	Descriptions		Bolt diam-eter	Qty.	Wrench size	Torque	
						N·m	(kgf·m)
21.	Jubilee clamp	Low pressure lines	–	4	7	4.5	(0.45)
		Intake duct	–	7	7	(6.0)	(0.6)
		Radiator hose (engine side)	–	1	7	(4.5)	(0.45)
		Radiator hose (radiator side)	–	2	7	(5.9)	(0.59)
	T-bolt clamp	Suction hose	–	2	11	(10.0)	(1.0)
		Low pressure lines	–	4	9.5	(7.4)	(0.74)
		Radiator hose	–	1	9.5	(7.4)	(0.74)
22.	Side-cutter mounting bolt		20	6	30	540	(54)

Tightening Torque Chart

Bolt Dia. mm	Hexagon Wrench						Wrench size mm	Socket Bolt		
	10.9 Ⓣ T		8.8 Ⓗ H		7 M			Socket Bolt		Wrench size mm
	N·m(kgf·m)		N·m(kgf·m)		N·m(kgf·m)			N·m	(kgf·m)	
6					3.3 to 4.2 (0.3 to 0.4)		10			5
8	30	(3.0)	20	(2.0)	10	(1.0)	13	20	(2.0)	6
10	65	(6.5)	50	(5.0)	20	(2.0)	17	50	(5.0)	8
12	110	(11)	90	(9)	35	(3.5)	19	90	(9)	10
14	180	(18)	140	(14)	55	(5.5)	22	140	(14)	12
16	270	(27)	210	(21)	80	(8.0)	24	210	(21)	14
18	400	(40)	300	(30)	120	(12)	27	300	(30)	14
20	550	(55)	400	(40)	170	(17)	30	400	(40)	17
22	750	(75)	550	(55)	220	(22)	32			
24	950	(95)	700	(70)	280	(28)	36			
27	1400	(140)	1050	(105)	400	(40)	41			
30	1950	(195)	1450	(145)	550	(55)	46			
33	2600	(260)	1950	(195)	750	(75)	50			
36	3200	(320)	2450	(245)	950	(95)	55			

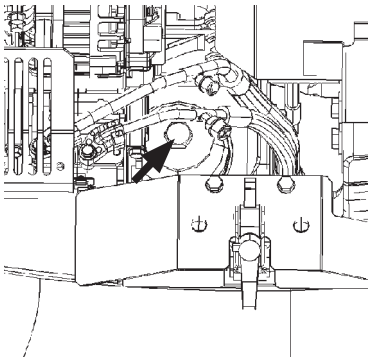
CAUTION

If mounting bolts for counterweights are loose, consult your authorized dealer.

IMPORTANT

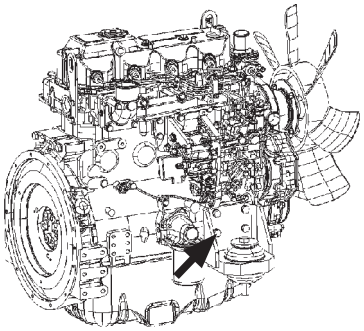
- **Apply lubricant (e.g. white zinc B dissolved into spindle oil) to new bolts and nuts before tightening them.**
- **Remove soil, dust, and/or dirt from the nut and bolt thread surfaces before tightening.**
- **Tighten nuts and bolts to specifications. If tightened with excessively low or high torque, missing or breakage of nuts and/or bolts may result.**

1. Engine cushion rubber mounting bolt

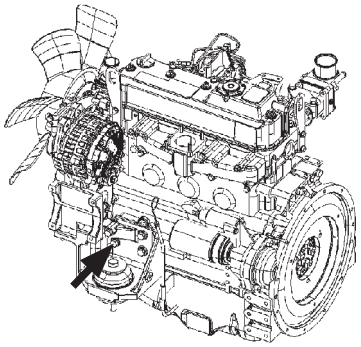


MDEQ-07-075-1 ja

2. Engine bracket mounting bolts

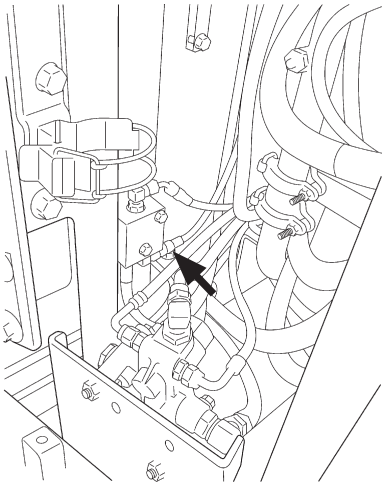


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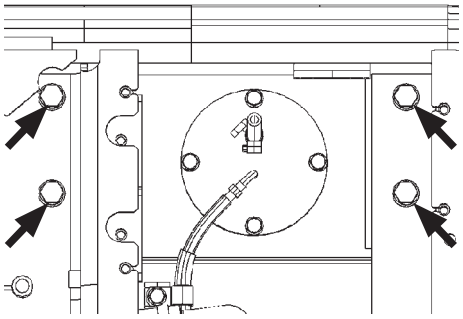
MDEQ-07-076-1 ja

3. Hydraulic oil tank mounting bolts



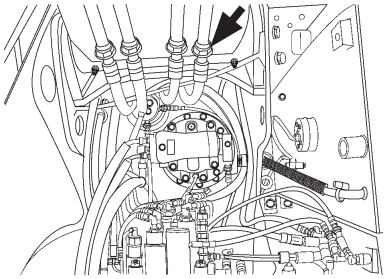
MDEQ-07-078-1 ja

4. Fuel tank mounting bolts



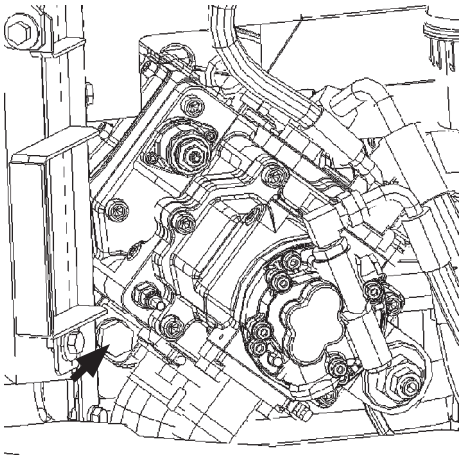
MDEQ-07-079-1 ja

5. ORS fittings for hydraulic hoses and piping



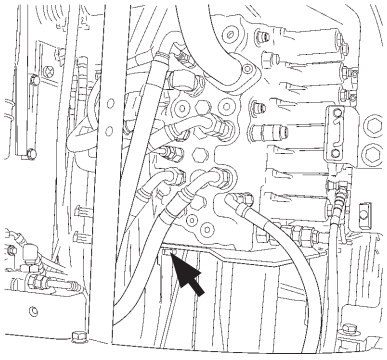
MDEQ-07-080-1 ja

6. Pump mounting bolt



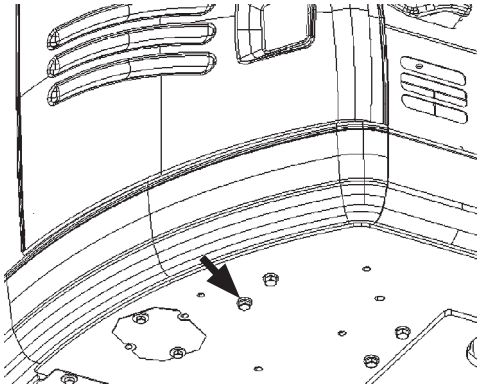
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7. Control valve mounting bolt



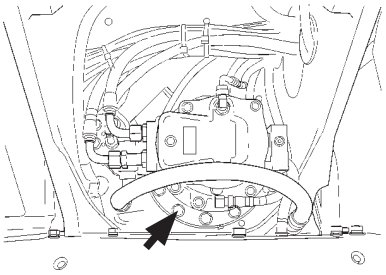
MDEQ-07-082-1 ja

8. Control valve bracket mounting bolts



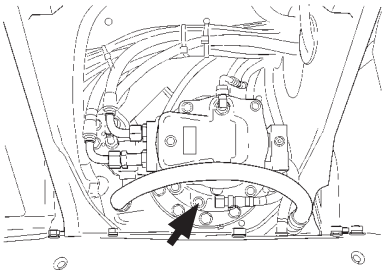
MDEQ-07-083-1 ja

9. Swing device mounting bolts



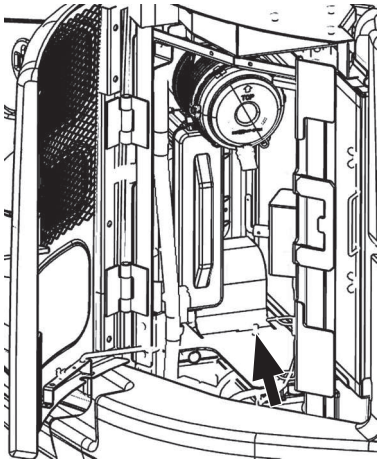
MDEQ-07-084-1 ja

10. Swing motor mounting bolts



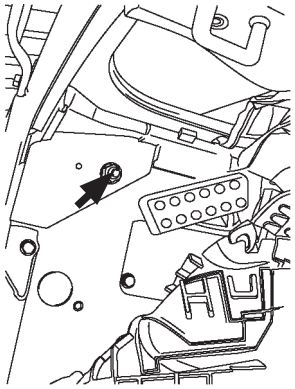
MDEQ-07-084-2 ja

11. Battery mounting nuts



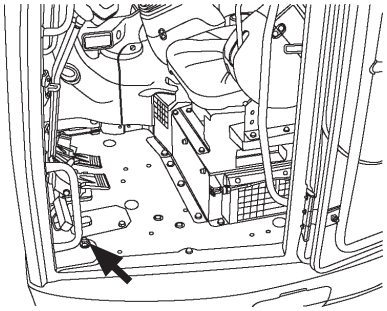
MDEQ-07-112-2 ja

12. Cab mounting nuts



ZX85US-6

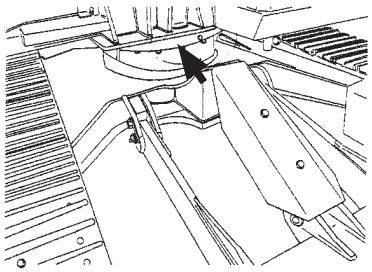
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ZX85USB-6

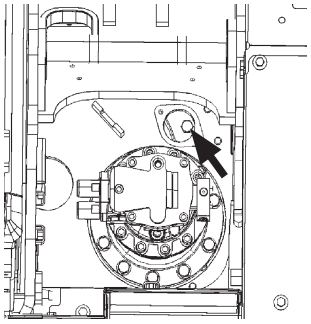
MDEQ-07-087-1 ja

13. Swing bearing mounting bolts
    Upperstructure Side



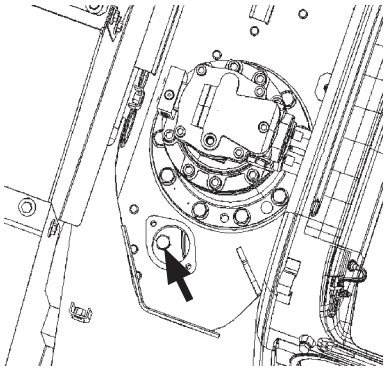
MDEQ-07-088-1 ja

    Undercarriage Side



ZX85US-6

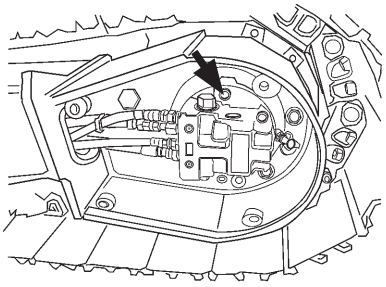
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ZX85USB-6

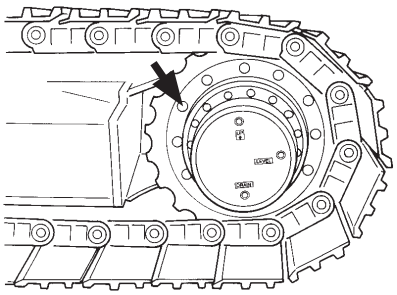
MDEQ-07-089-1 ja

14. Travel device mounting bolts



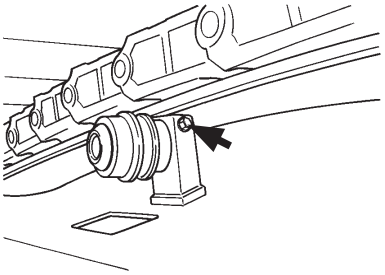
MDEQ-07-091-1 ja

15. Sprocket mounting bolts



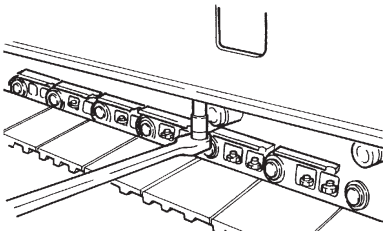
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16. Upper roller mounting bolts



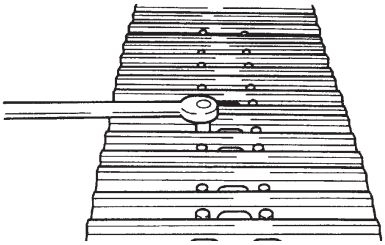
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17. Lower roller mounting bolts



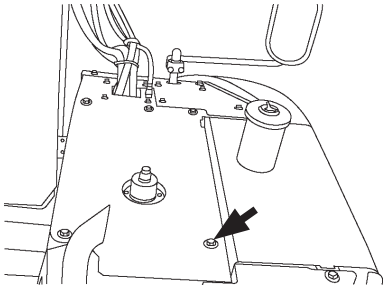
MDEQ-07-094 ja

18. Shoe mounting bolts



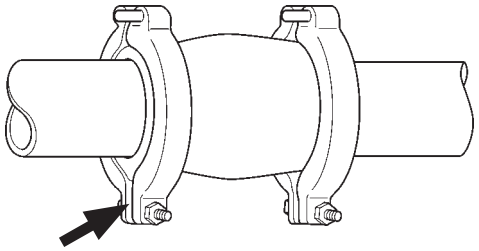
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19. Cover mounting bolt



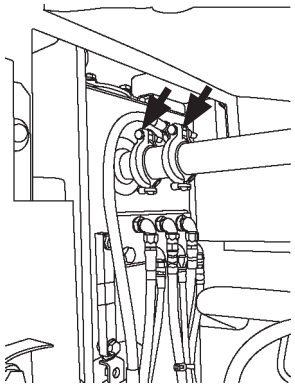
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20. Flexible master coupling of low pressure piping

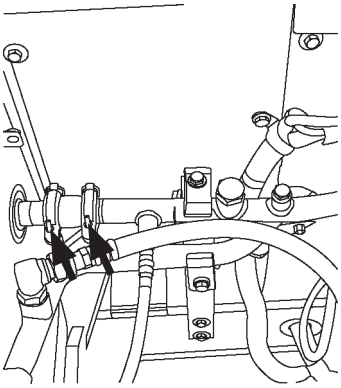


Flexible master coupling

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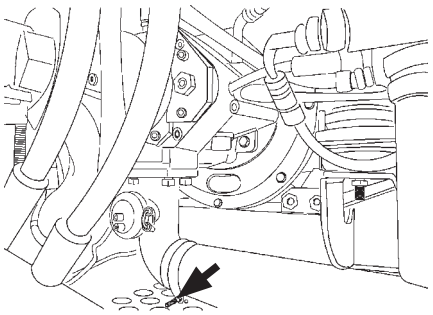


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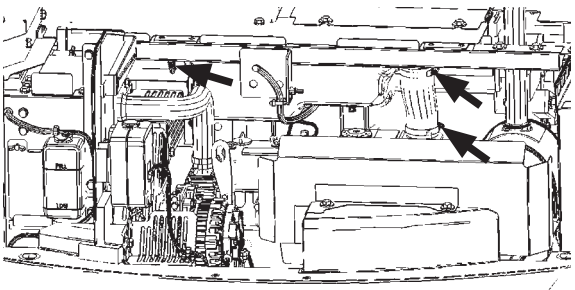


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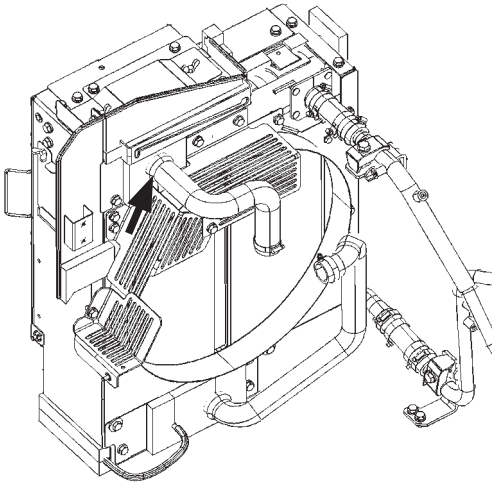
21. Flexible clamp and T-bolt clamp of low pressure piping



MDEQ-07-099-1 ja

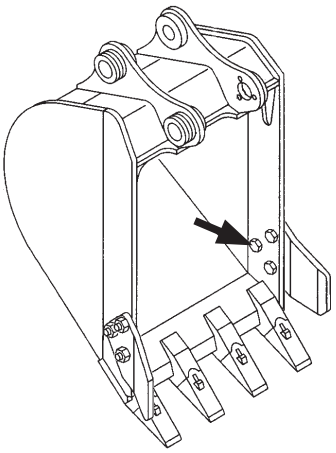


MDEQ-07-100-1 ja



MDEQ-07-101-1 ja

22. Side-cutter mounting bolt



MDEQ-07-102-1 ja

J. Muffler Filter

1 Inspect and Clean Filter of Muffler Filter

--- every 3000 hours

Consult your authorized dealer for inspecting and cleaning.

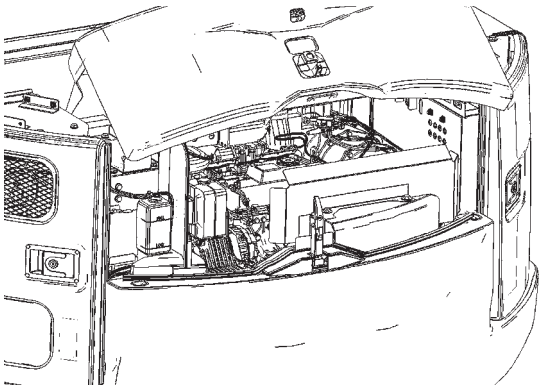
2 Inspect and Clean Muffler Filter

--- As required

IMPORTANT

Periodically check the area around the muffler filter and clean off any material that could catch fire.

Do not disassemble the base machine support parts and sensors, differential pressure hoses or pipes.
When the machine is operated in dusty areas, refer to chapter 9 "Maintenance Under Special Environmental Conditions".
Open the engine cover.
Check for anything missing or cracks in the differential pressure hoses and pipes.
Check the harnesses of differential pressure sensor and exhaust temperature sensors for anything abnormal.
Close the engine cover.



MDEQ-07-103 ja

Maintenance Under Special Environmental Conditions

Operating Conditions	Precautions for Maintenance		
Muddy Soil, Rainy or Snowy Weather	After Operation	:	Clean the machine and check for cracks, damage, loose or missing bolts and nuts. Lubricate all necessary parts without delay.
Near the Ocean	After Operation	:	The following measures to protect the machine from salt damage must be taken when the machine is operated at sea or near the coastline. (1) After completing the work, extend/retract the hydraulic cylinders several times to form an oil film on the rod surface. Store the machine with cylinders retracted as much as possible. (2) Thoroughly clean the machine with fresh water to wash off salt. (3) To prevent corrosion, perform touch up painting periodically on hose fittings, lubrication piping and inserting positions of covers, where sea water collects readily. (4) During storage of the machine, cover the machine with a tarp to prevent sea water from entering cab vents. Apply rust prevention oil (Example: ANTIRUST P-1300NP-3 JX Nippon Oil & Energy Corporation) onto plated parts of the cylinder rods.
Dusty Atmosphere	Air Cleaner	:	Clean the element regularly and more often than normal.
	Radiator	:	Clean the radiator to prevent clogging of the radiator core.
	Fuel System	:	Replace the filter element and strainer more often than normal.
	Electrical Equipment	:	In particular, clean surfaces of the commutators of the starter and alternator.
	Engine, Muffler Filter	:	Clean often to prevent dust from sticking and accumulating. Inhibit the muffler filter regeneration according to the machine operating condition.
Rocky Ground	Tracks	:	Carefully operate while checking for cracks, damage and loose bolts and nuts. Loosen the tracks a little more than usual. Do not use rubber crawlers.
	Front Attachment	:	A standard attachment may be damaged when digging in rocky ground. Reinforce the bucket before using it, or use a heavy duty bucket.
Falling Stones	Cab Head Guard	:	Always keep installed. Consult your authorized dealer for installation.
Freezing Weather	Fuel/Lubricant	:	Use high quality and low viscosity fuel and oil.
	Engine Coolant	:	Be sure to use antifreeze.
	Battery	:	Fully charge the batteries at shorter intervals. If not fully charged, electrolyte may freeze.
	Tracks	:	Keep the tracks clean. Park the machine on a hard surface to prevent the tracks from freezing to the ground.

MEMO

STORAGE

Storing the Machine

If the machine is to be stored for longer than one month, pay attention to the following points in preparation for using it the next time.

Storing the Machine

Item	Remedy
Machine Cleaning	Wash the machine. Remove soil or other debris on the machine.
Lubrication/Greasing	Check lubricants for level and contamination. Fill up or change if necessary. Lubricate all grease points. Coat exposed metal surfaces that are subject to rust with grease. (i.e. cylinder rods etc.)
Battery	Remove the batteries and store them in a dry, protected place after charging them fully. Turn the battery disconnect switch to the OFF position.
Coolant	Add anti-rusting agent. If storing in extremely cold areas, either add extra anti-freeze or drain coolant completely to avoid freezing. In this case, place a sign reading "NO COOLANT".
Dust and Moisture Protection	Store the machine in a dry storage area using a protective cover.
Tools	Inspect and repair, then store.
Lubrication Operation	If the oil film on the metal surfaces is lost, rust may form. This may cause abnormal wear of the machine when the machine operation is restarted. Perform the following hydraulic functions at least once a month, two to three times for lubrication: Travel, swing and digging. Be sure to check the coolant level and lubrication conditions before operating.

NOTE

- *Lubricating operation means a series of warm-up, travel, swing and digging operations carried out repeatedly 2-3 times at slow speed.*
- *Lubricants deteriorate during long term storage of the machine. Be sure to carefully check the lubricants before resuming operation of the machine.*

Precautions for Disconnecting or Connecting Batteries

If the battery has been removed for over one month, or if connecting a new battery, consult your authorized dealer. Resetting the Information Controller may be required.

MEMO

Troubleshooting

If any problems with the machine occur, repair them immediately. Confirm the cause and takes steps to prevent recurrence.

If it is difficult to determine the cause, or if measures marked with * must be taken, consult your authorized dealer.

IMPORTANT

Never attempt to disassemble, adjust or repair hydraulic or electrical/electronic components.

Engine

Consult your authorized dealer for engine troubleshooting.

Engine Auxiliaries

Problem	Cause	Solution
Batteries will not charge.	Broken battery separator	Replace
	Faulty regulator	Adjust or replace*1
	Faulty ground wire	Repair*1
	Faulty alternator	Repair or replace*1
	Insufficient fan belt tension	Adjust
Batteries discharge quickly after being charged.	Shorted cable	Repair or replace*1
	Plates inside the battery are shorting	Replace
	Excess sediment in battery	Replace
Coolant temperature is too high	Low coolant level	Refill
	Radiator fins dirty	Clean
	Insufficient fan belt tension	Adjust
	Damaged rubber hose	Replace*1
	Faulty thermostat	Replace*1
	Faulty coolant temperature gauge	Replace*1
	Inside of coolant passages dirty	Replace*1
	Faulty coolant pump	Replace*1

*1 Marked: Contact your authorized dealer.

Impossible to Start the Engine

Problem		Cause	Solution
Engine will not start	Starter does not rotate or is not powerful	Discharged battery	Charge or replace battery.
		Disconnected, loose, or corroded battery terminals	After repairing the corroded area, securely tighten the connectors.
		Lowered pilot control shut-off lever	Pull pilot control shut-off lever up.
		Disconnected, loose, or corroded starter ground line terminals.	After repairing the corroded area, securely tighten the connectors.
		Faulty pilot control shut-off lever electrical system	Repair*1
		Engine oil viscosity too high	Change to engine oil with appropriate viscosity.
		Faulty starter and/or electrical system	Repair or adjust*1
		Battery disconnect switch is in the OFF position	Turn the disconnect switch to the ON position
	Starter rotates	No fuel	After checking that no fuel is leaking, refill fuel.
		Air in the fuel system	Bleed air
		Clogged fuel main filter	Replace element
		Clogged fuel pre-filter	Replace element
		Frozen fuel	Warm the fuel pump with hot water or wait until the air temperature rises.
		Engine stop switch is ON	Turn Engine stop switch OFF
		Faulty preheat system	Repair or adjust*1
		Poor fuel injection	Repair or replace*1
		Leak in compression from intake/ exhaust valves	Repair or adjust*1
Even though the engine starts, it stalls shortly afterwards.		Too low idle speed	Repair or adjust*1
		Clogged fuel main filter	Replace element
		Clogged fuel pre-filter	Replace element
		Faulty engine control system	Repair or adjust*1
		Clogged air cleaner	Clean or replace the element.
		Faulty fuel system	Repair or adjust*1
Engine runs irregularly.		Faulty fuel system	Repair or adjust*1
		Water or air in the fuel system	Drain water or bleed air.
		Faulty engine control system	Repair or adjust*1
		Muffler filter is clogged.	Repair or adjust*1
Producing black smoke		Air cleaner clogged or dirty	Clean or replace the element.
		Poor quality fuel	Replace with the specified fuel
		Poor spray from fuel injector valve	Repair or replace*1

Problem	Cause	Solution
	Excessive clearance at intake/exhaust valve head	Repair or adjust*1
	Faulty EGR valve function	Repair or replace*1
Producing white smoke	Poor quality fuel	Replace with the specified fuel
	Poor spray from fuel injector valve	Repair or replace*1
	Fuel injection timing off	Repair or adjust*1
	Burning/abnormal consumption of engine oil	Repair*1
Drop in engine oil pressure	Not enough engine oil	Replace*1
	Too much engine oil	Replace*1
	Engine oil filter clogged	Replace*1

*1 Marked: Contact your authorized dealer.

Control Lever

Problem	Cause	Solution
Lever is heavy to operate.	Rusted joint	Grease, repair*1
	Worn pusher	Replace*1
Does not move smoothly.	Worn pusher	Repair or replace*1
	Faulty pilot valve	Replace*1
Does not return to neutral	Faulty pilot valve	Replace*1
The lever is tilted in the neutral position due to increase in play.	Worn joint	Repair or replace*1
	Faulty pilot valve	Replace*1

*1 Marked: Contact your authorized dealer.

Hydraulic System

When the machine is stored without running for a long period, air mixed in hydraulic oil will separate and accumulate in the upper part of cylinders, causing a delay in the response time of machine movements and/or weak power.

If these symptoms appear, operate all actuators repeatedly several times.

Problem	Cause	Solution
No hydraulic Functions (Noise from hydraulic pump)	Faulty hydraulic pump	Repair or replace*1
	Hydraulic oil low	Refill
	Broken suction pipe and/or hose	Repair or replace*1
No hydraulic Functions (Hydraulic pump noise remains unchanged.)	Faulty pilot pump	Replace*1
	Faulty pilot shut-off solenoid valve	Replace*1
	Faulty wire harness (pilot shut-off solenoid valve) pilot shut-off switch.	Repair or replace*1
	The pilot control shut-off lever is in the LOCK position.	Turn to the UNLOCK Position.
No actuators have any power.	Malfunction due to worn hydraulic pump	Replace*1
	Decreased main relief valve set pressure in the control valve	Adjust*1
	Hydraulic oil low	Refill
	Clogged suction strainer in the hydraulic oil tank	Clean
	Absorption of air from the oil suction side	Retighten
	Faulty pressure sensor.	Replace*1
	Faulty solenoid valve	Replace*1
Only one side lever is inoperable or has no power.	Faulty relief valve in the valve	Repair or replace*1
	Broken pipe and/or hose	Repair or replace*1
	Loose pipe line joint	Retighten
	Broken O-ring at pipe line joint	Replace*1
	Faulty hydraulic pump	Repair or replace*1
	Faulty pilot valve	Replace*1
	Faulty pilot circuit line	Repair or replace*1
	Faulty pilot solenoid valve	Repair or replace*1

Problem	Cause	Solution
Only one actuator is inoperable.	Broken control valve spool	Replace*1
	Embedded foreign matter in valve spool	Repair or replace*1
	Broken pipe and/or hose	Repair or replace*1
	Loose pipe line joint	Retighten
	Broken O-ring at pipe line joint	Replace*1
	Broken actuator	Repair or replace*1
	Faulty pilot valve	Replace*1
	Faulty pilot circuit line	Repair or replace*1
	Faulty pilot solenoid valve	Repair or replace*1
Only one cylinder is inoperable or has no power.	Broken oil seal in cylinder	Repair or replace*1
	Oil leak due to damage to cylinder rod	Repair or replace*1
	Faulty pilot valve	Replace*1
	Faulty pilot circuit line	Repair or replace*1
	Faulty pilot solenoid valve	Repair or replace*1
Hydraulic oil temperature increases.	Stained oil cooler	Clean
	Insufficient engine fan belt tension	Adjust
	Insufficient rotation speed of hydraulically driven fan	Repair or replace*1
Oil leak from low pressure hose.	Loose clamps	Retighten
	Faulty suction manifold	Repair or replace*1

*1 Marked: Contact your authorized dealer.

Drive Function

Problem	Cause	Solution
One or both side tracks are inoperable.	Damaged center joint	Repair or replace*1
	Incompletely released parking brake	Repair or replace*1
	Broken travel motor	Repair or replace*1
	Faulty pilot valve	Replace*1
	Faulty pilot circuit line	Repair or replace*1
Does not travel smoothly.	Overly tensioned or slackened crawler sag	Adjust
	Lack of lubricant in front idler and/or roller	Refill
	Deformed track frame	Repair or replace*1
	Embedded foreign matter such as rock fragments	Remove
	Dragging parking brake	Repair*1
Travel speed does not change.	Faulty travel mode switch.	Replace*1
	Faulty pressure sensor	Replace*1
	Pump 1 and 2 delivery pressure sensors	
	Pumps 1, 2 control pressure sensors	
	Poor contact in connector	Repair or replace*1
	Damaged wire harness	Repair*1
	Faulty controller (MC)	Replace*1
	Faulty solenoid valve	Repair or replace*1
	Faulty motor	Repair or replace*1

*1 Marked: Contact your authorized dealer.

Swing Function

Problem	Cause	Solution
Upperstructure does not swing	Faulty swing parking brake	Repair or replace*1
	Faulty swing parking brake release valve	Repair or replace*1
	Broken swing motor	Repair or replace*1
	Faulty pilot valve	Replace*1
	Faulty pilot circuit line	Repair or replace*1
Swing is not smooth.	Worn swing gear	Repair or replace*1
	Damaged swing bearing and bearing balls.	Repair or replace*1
	Lack of grease	Refill
	Faulty inversion protective valve	Repair or replace*1

*1 Marked: Contact your authorized dealer.

Just after the control valve, swing motor relief valve and/or the swing motor is replaced, noise may be produced when swinging and its operation may not be smooth. This is because air has accumulated in the hydraulic circuit for swinging.

Slowly continue to operate the machine for approx. 10 minutes to bleed air.

After repair work is complete, be sure to check the oil level in the hydraulic oil tank. Refill hydraulic oil as needed.

Engine Speed

Problem	Cause	Solution
Engine speed does not change even when the engine control dial is turned.	Blown fuse	Replace
	Faulty engine control dial	Replace*1
	Poor contact in connector	Repair or replace*1
	Damaged wire harness (between EC dial and MC, or MC and ECM)	Repair*1
	Faulty controller (MC, ECM)	Replace*1
	Performing manual regeneration	(Normal control)
Work mode does not change.	Poor contact in connector	Repair or replace*1
	Damaged wire harness (between MC and monitor)	Repair*1
	Faulty controller (MC)	Replace*1
	Faulty solenoid valve	Repair or replace*1
Auto-idle fails to activate/deactivate.	Faulty pressure sensor.	Replace*1
	Poor contact in connector	Repair or replace*1
	Damaged wire harness	Repair*1
	Faulty controller	Replace*1
	Performing manual regeneration	(Normal control)

*1 Marked: Contact your authorized dealer.

Pump control

Problem	Cause	Solution
Front attachment and/or travel speed is slow	Blown control fuse	Replace
	Poor contact in connector	Repair or replace*1
	Damaged wire harness	Repair*1
	Faulty controller	Replace*1
	Faulty pump solenoid valve.	Replace*1
	Faulty pressure sensor.	Replace*1

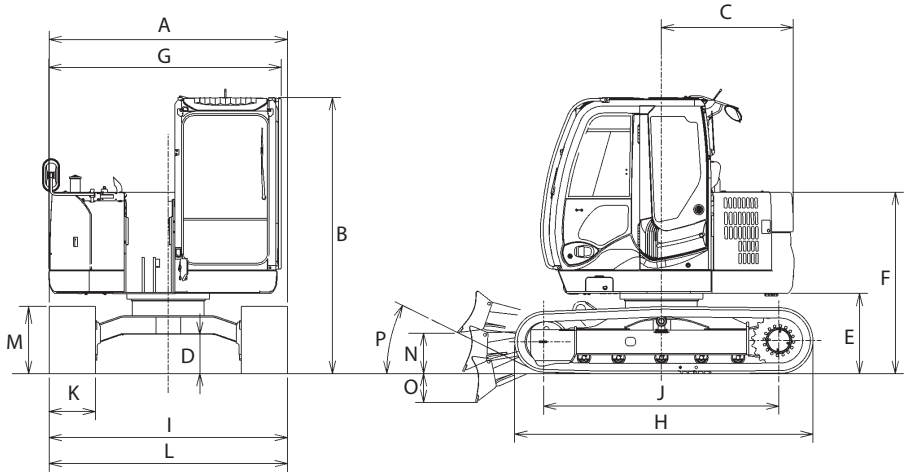
*1 Marked: Contact your authorized dealer.

Others

The machine may have a noise, excessive vibration, and abnormal smell when any trouble occurs.
Always beware of the machine conditions during operation.

MEMO

Specifications ZX85US-6

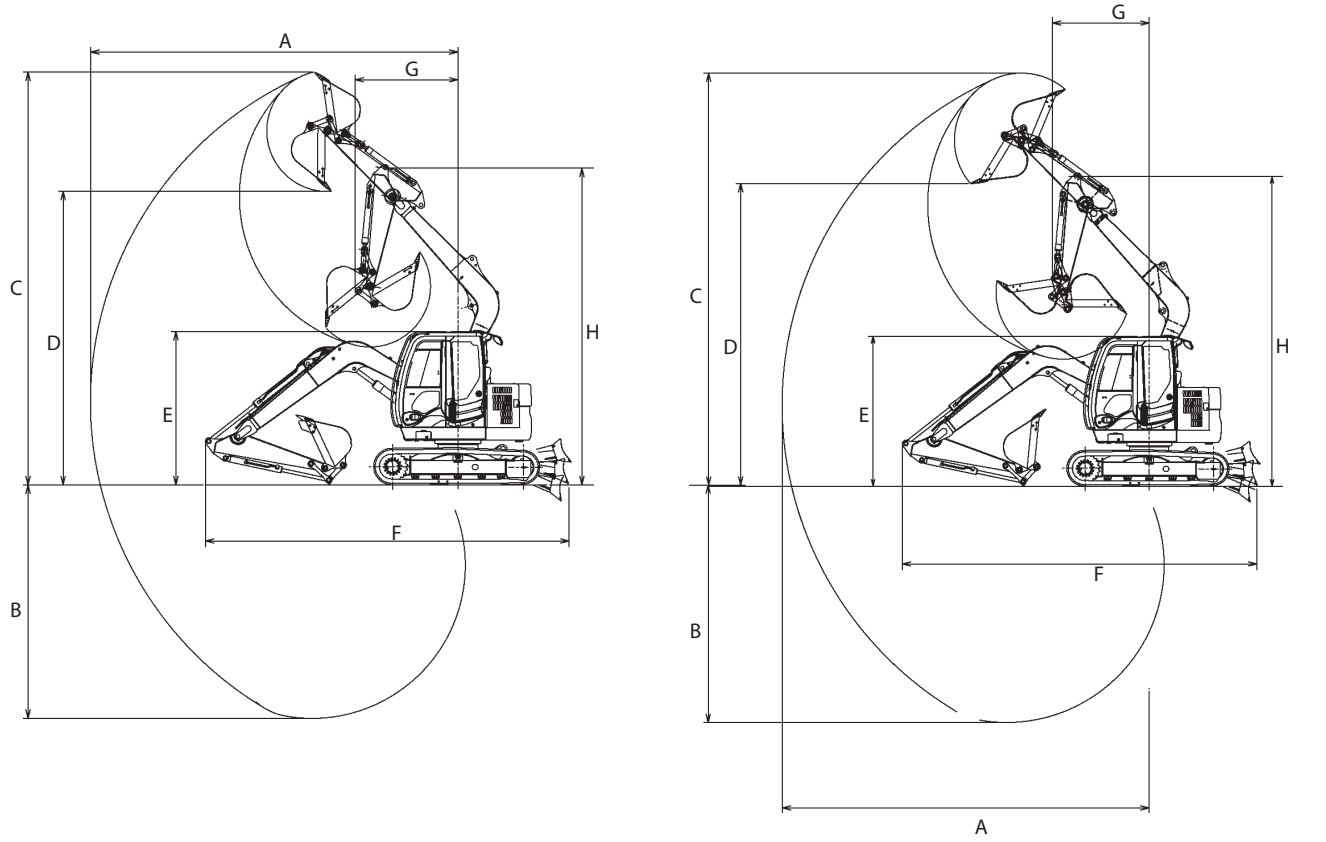


MDEQ-12-001-1 ja

Front-End Attachment	1.62 m Arm
Standard Bucket Capacity (Heaped)	PCSA 0.28 m^3 CECE 0.24 m^3
Operating Weight	7770 kg
Base Machine Weight	6640 kg
Engine Type	4TNV98C
Engine Power	ISO14396: 42.4 kW/2000 min^{-1} ISO9249: 41.8 kW/2000 min^{-1}
A: Overall Width	2320 mm
B: Cab Height	2690 mm
C: Rear End Swing Radius	1290 mm
D: Minimum Ground Clearance	360 mm*1
E: Counterweight Clearance	740 mm*1
F: Engine Cover Height	1830 mm*1
G: Overall Width of Upperstructure	2260 mm
H: Undercarriage Length	2920 mm
I: Undercarriage Width	2320 mm
J: Sprocket Center to Idle Center	2290 mm
K: Track Shoe Width	450 mm
L: Blade Width	2320 mm
M: Blade Height	460 mm
N: Blade Bottom Highest Position (above ground level)	360 mm*1
O: Blade Bottom Lowest Position (below ground level)	300 mm*1
P: Maximum Approach Angle	26.8 degree (tanθ = 0.51)
Ground Pressure	34 kPa (0.35 kgf/cm^2)
Swing Speed	10.5 min^{-1} (rpm)
Travel Speed	5.0/3.1 km/h (3.1/1.9 mph)
Gradeability	35° (tan θ = 0.70)

*1 : The dimensions do not include the height of the shoe lug.

Working Ranges ZX85US-6



MDEQ-12-006-1 ja

Backhoe

Face shovel (Reversed hoe bucket)

Front-End Attachment			1.62 m Arm		2.12 m Arm	
			Backhoe	Shovel	Backhoe	Shovel
A:	Maximum Digging Reach	(mm)	6430	6570	6920	7050
B:	Maximum Digging Depth	(mm)	4110	4250	4610	4750
C:	Maximum Cutting Height	(mm)	7210	7370	7610	7780
D:	Maximum Dumping Height	(mm)	5120	5390	5510	5830
E:	Overall Height	(mm)	2690	2690	2690 (without Bucket)	2690 (without Bucket)
					2830 (with Bucket)	2830 (with Bucket)
F:	Overall Length	(mm)	6300	6300	6370	6370
G:	Minimum Swing Radius	(mm)	1810	1810	2170	2170
H:	Minimum Swing Radius Height	(mm)	5590	5590	5610	5610

NOTE

"E : Overall Height" includes the height of shoe lug; Other dimensions do not include the height of the shoe lug.

Shoe Types and Applications ZX85US-6

Shoe Width		450 mm Grouser shoe	600 mm Grouser shoe	450 mm Pad Crawler Shoe	450 mm Rubber Crawler Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Paved Road (Option)	For Paved Road (Option)
Operating Weight	kg	7770	7950	7820	7790
Base Machine Weight	kg	6640	6810	6680	6650
Cab Height	mm	2690	2690	2720	2720
Minimum Ground Clearance	mm	360*1	360*1	410	410
Undercarriage Length	mm	2920	2920	2980	2980
Undercarriage Width	mm	2320	2470	2320	2320
Ground Pressure		34 kPa (0.35 kgf/cm^2)	26 kPa (0.27 kgf/cm^2)	4 kPa (0.35 kgf/cm^2)	34 kPa (0.35 kgf/cm^2)

*1: The dimensions do not include the height of the shoe lug.

NOTE

- *The specification for the front-end attachment is for a 1.62 m arm and 0.28 m^3 (0.24 m^3:old JIS indication) (heaped) bucket.*
- *Never use shoes other than 450 mm triple grouser shoes on rough ground such as rocks, sand or gravel. Traveling or digging on hard ground may result in bending of shoes and/or shoe bolt loosening, and may damage other undercarriage components such as track links and rollers.*

Bucket Types and Applications ZX85US-6

Use a combination in the table below when using a bucket. If a combination not in the table is used, such as a high-capacity or special bucket, the stability of the machine cannot be ensured and excessive forces are exerted on the body, front attachment and cylinders, which will damage the machine.

Do not use with a combination other than in the following table.

Name	Bucket Capacity (m^3)	Front-End Attachment	
	Heaping	1.62 m Arm	2.12 m Arm
Hoe Bucket	0.13	◉	◉
	0.17	◉	◉
	0.19	◉	◉
	0.23	◉	◉
	0.28	◉	◉
	0.33	○(*◉)	×
Reinforced Hoe Bucket	0.23	◉	◉
	0.28	◉	○
Slope finishing bucket	-	◇	◇

NOTE

◉ : *For general digging (digging and loading of sand, gravel, clay, ordinary earth and so on.)*

○ : *For light digging (digging and loading of dry, loosened earth, sand, mud and so on. Their bulk density shall be less than 1.60 t/m^3 as a standard.)*

△ : *For digging rocks (digging/loading of mountain gravels, blasted rock, hard clay, soft rock and so on.)*

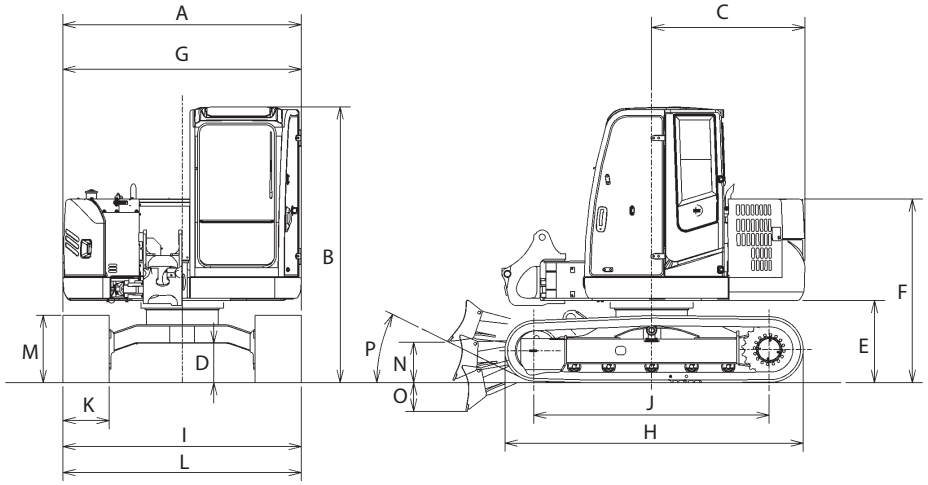
□ : *For loading (loading of dry, loosened earth and sand.) Their bulk density shall be less than 1.10 t/m^3 as a standard.*

◇ : *For slope work*

× : *Cannot be used (not covered by warranty)*

* : *Use 600 mm shoes.*

Specifications ZX85USB-6

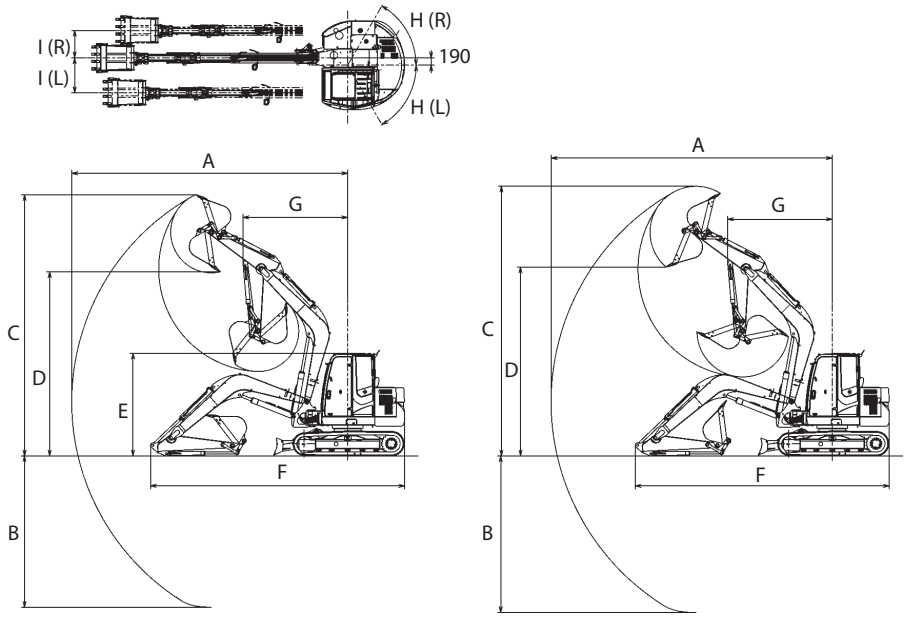


MDEQ-12-004-1 ja

Front-End Attachment	Boom-Swing Type 1.62 m Arm
Standard Bucket Capacity (Heaped)	PCSA 0.28 m^3, CECE 0.24 m^3
Operating Weight	8550 kg
Base Machine Weight	7130 kg
Engine Type	4TNV98C
Engine Power	ISO14396: 42.4 kW/2000 min^{-1} ISO9249: 41.8 kW/2000 min^{-1}
A: Overall Width	2260 mm
B: Cab Height	2550 mm
C: Rear End Swing Radius	1490 mm
D: Minimum Ground Clearance	380 mm*1
E: Counterweight Clearance	740 mm*1
F: Engine Cover Height	1850 mm*1
G: Overall Width of Upperstructure	2260 mm
H: Undercarriage Length	2920 mm
I: Undercarriage Width	2200 mm
J: Sprocket Center to Idle Center	2290 mm
K: Track Shoe Width	450 mm (Grouser shoe)
L: Blade Width	2200 mm
M: Blade Height	480 mm
N: Blade Bottom Highest Position (above ground level)	360 mm*1
O: Blade Bottom Lowest Position (below ground level)	300 mm*1
P: Maximum Approach Angle	25.8 degree
Ground Pressure	37 kPa (0.38 kgf/cm^2)
Swing Speed	10.5 min^{-1} (rpm)
Travel Speed	5.0/3.1 km/h (3.1/1.9 mph)
Gradeability	35 ° ($\tan\theta = 0.70$)

*1 : The dimensions do not include the height of the shoe lug.

Work Ranges ZX85USB-6



MDEQ-12-005-1 ja

Backhoe Work

Shovel Work (How bucket reversed)

		1.62 m Arm		2.12 m Arm	
		Backhoe	Shovel	Backhoe	Shovel
A: Maximum Digging Reach	(mm)	7210	7350	7700	7840
B: Maximum Digging Depth	(mm)	4010	4150	4510	4650
C: Maximum Cutting Height	(mm)	6770	6980	7140	7340
D: Maximum Dumping Height	(mm)	4720	4870	5080	5260
E: Overall Height	(mm)	2550			
F: Overall Length	(mm)	6640	6640	6820	6820
G: Minimum Swing Radius	(mm)	2740	2740	2900	2900
H: Maximum Boom-Swing Angle		L: 60 °/R: 60 °			
I: Offset Distance	(mm)	L: 910/R: 720			

NOTE

The dimensions do not include the height of the shoe lug (except Item E). Other dimensions do not include the height of the shoe lug.

Shoe Types and Applications ZX85USB-6

Shoe Width		450 mm Grouser shoe	600 mm Grouser shoe	450 mm Pad Crawler Shoe	450 mm Rubber Crawler Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Paved Road (Option)	For Paved Road (Option)
Operating Weight	kg	8550	8730	8600	8570
Base Machine Weight	kg	7130	7310	7180	7150
Cab Height	mm	2530	2530	2560	2540
Minimum Ground Clearance	mm	360*1	360*1	410	390
Undercarriage Length	mm	2920	2920	2980	2940
Undercarriage Width	mm	2200	2350	2200	2200
Ground Pressure		37 kPa (0.38 kgf/cm^2)	28 kPa (0.29 kgf/cm^2)	37 kPa (0.38 kgf/cm^2)	37 kPa (0.38 kgf/cm^2)

*1: The dimensions do not include the height of the shoe lug.

NOTE

- *The specification for the front-end attachment is for a 1.62 m arm and 0.28 m^3 (0.24 m^3:old JIS indication) (heaped) bucket.*
- *Never use shoes other than 600 mm triple grouser shoes on rough ground such as rocks, sand or gravel. Traveling or digging on hard ground may result in bending of shoes and/or shoe bolt loosening, and may damage other undercarriage components such as track links and rollers.*

Bucket Types and Applications ZX85USB-6

Use a combination in the table below when using a bucket. If a combination not in the table is used, such as a high-capacity or special bucket, the stability of the machine cannot be ensured and excessive forces are exerted on the body, front attachment and cylinders, which will damage the machine.

Do not use with a combination other than in the following table.

Name	Bucket Capacity (m^3)	Front-End Attachment	
	Heaping	1.62 m arm	2.12 m arm
Hoe Bucket	0.13	◉	◉
	0.17	◉	◉
	0.19	◉	◉
	0.23	◉	◉
	0.28	◉	◉
	0.33	◉	×

NOTE

◉ : *For general digging (digging and loading of sand, gravel, clay, ordinary earth and so on.)*

× : *Cannot be used (not covered by warranty)*

Noise Level Results

(2000/14/EC)
(2006/42/EC)

LwA : guaranteed sound power level of airborne noise (ISO 6395:1988)
LpA : sound pressure level at operator's station (ISO 6396:2008)

Unit: dB(A)

	LwA	LpA
ZX85US-6	98	72
ZX85USB-6	98	72

Electric Fans

We consider our products exempt from EU regulation 327/2011, implementing EU directive 2009/125/EC, based on the fact that the fans are considered battery powered as the energy supply recharging the battery is not continuous nor at a constant level.

The Value of the Carbon Dioxide (CO_2) emissions

These CO_2 measurement results from testing over a fixed test cycle under laboratory conditions a(n) (parent) engine representative of the engine type (engine family) and shall not imply or express any guarantee of the performance of a particular engine.

Model	Power category	Family name	Parent engine model	Test cycle	CO2 Value[g/kWh]
ZX85US-6, ZX85USB-6	19-56 kW	YD332DNCDV4A	4TNV98C-DM	Hot NRTC	792

MEMO

Hydraulic Breaker, Crusher, Quick Coupler

Selecting a Breaker or Crusher

When mounting a hydraulic breaker, crusher or quick hitch (coupler) on the hydraulic shovel, it is necessary to consider the stability of the base machine, as well as requirements of the breaker, crusher or quick hitch, such as oil pressure and amount.

When selecting a hydraulic breaker or crusher, consult your authorized dealer.

Precautions for Operation

When using a hydraulic breaker, crusher or quick hitch (coupler), do so according to the instruction manual "Hydraulic Breakers, Crushers and Quick Hitches (Couplers)."

Follow the precautions to avoid damage to the body of the machine or to the breaker, crusher or quick hitch (coupler).

When the hydraulic breaker, crusher or quick coupler is changed, make sure there is no risk related to the field of vision.

Notes on the Piping of Hydraulic Breakers, Crushers, Quick Hitches (Quick Coupler)

Take care when connecting/disconnecting the hoses of hydraulic breaker, crusher or quick hitch (coupler) to the pipes at the end of the arm so no dirt or debris gets on or inside hoses or pipes.

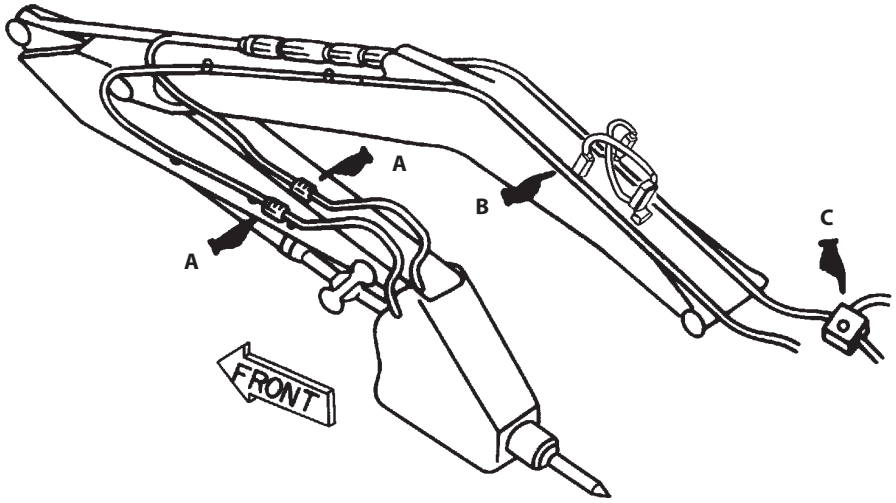
When a hydraulic breaker, crusher or quick hitch (coupler) is not attached to the machine, always put a cap or plug on the ends of the pipes at the end of arms and the ends of hoses of the breaker, crusher or quick hitch (coupler), to avoid dirt/debris from getting on or in them.

Always keep spare caps and plugs in the tool box, so they will not be lost.

Prior to starting work, check for looseness of bolts on the clamps holding pipes and for oil leaks from connections of pipes and hoses.

Piping for Breaker and Crusher (Demolition Machine) (Std Machine Option)

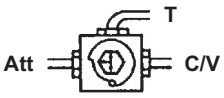
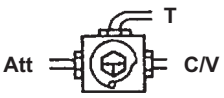
- Layout of Stop and Selection Valves



MDEQ-13-001-1 ja

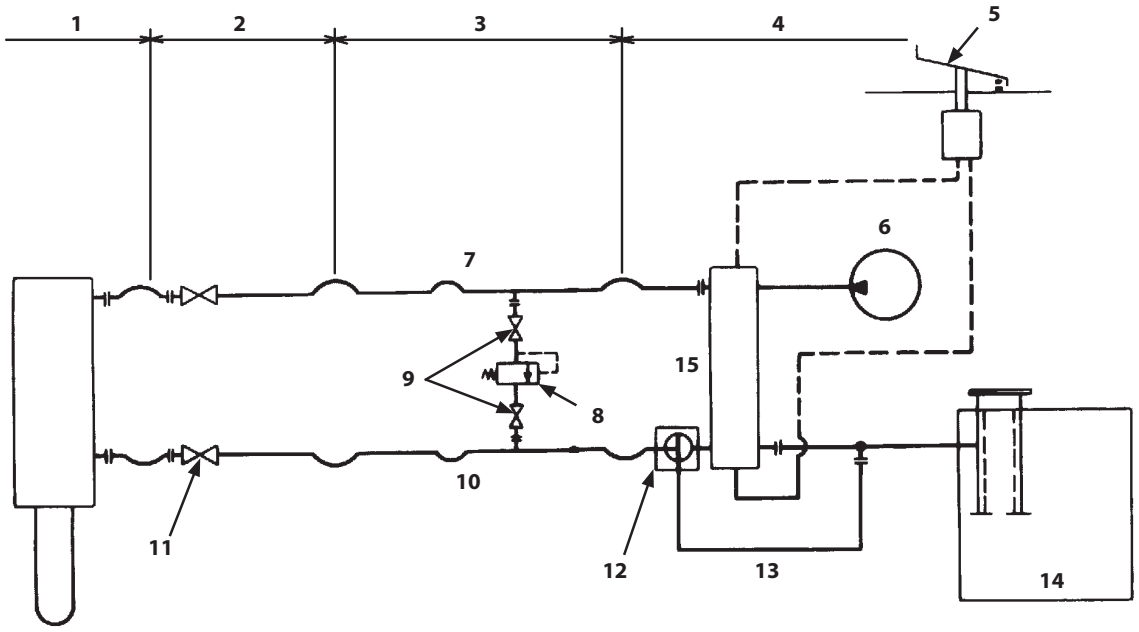
- Valve Operation Guide
  Wrench size: 24 mm

Stop Valves A and B		
Valve Operation	Closed	Open
		
Description	When mounting/removing attachments or when not in use	When using an attachment

Selection Valve C		
Valve Switching Position	When using a breaker	When using a crusher
		
Description	When using a breaker	When using a crusher

Att: To front attachment
C/V: To control valve
T: Drain line

- Image of Hydraulic Circuit



MDEQ-13-002-1 ja

1	Front Attachment	5	Control Pedal	9	Stop Valve B	13	Drain Line
2	Arm	6	Hydraulic Pump	10	Front Right Line	14	Hydraulic Oil Tank
3	Boom	7	Front Left Line	11	Stop Valve A	15	Control Valve
4	Shovel body	8	Relief Valve	12	Selection Valve C		

Adjusting Pressure of Secondary Relief Valve

The relief pressure settings of secondary relief valves vary with breakers.

When shipped the pressure setting is 9.8 MPa (100 kgf/cm^2).

To use a breaker with a different pressure setting, contact your authorized dealer to have the pressure adjusted.

Pressure Adjustment Method

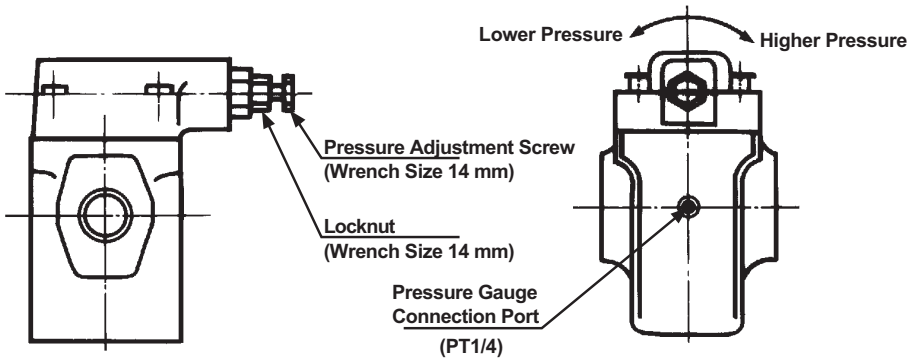
1. Loosen the locknut on the pressure adjustment screw of the relief valve, then gradually turn the adjustment screw clockwise to increase the pressure, or counterclockwise to lower the pressure.
2. One turn changes the pressure about 4.9 MPa (50 kgf/cm^2). After adjusting the pressure, tighten the lock nut. Lock Nut Tightening Torque: 20 N·m (2 kgf·m)

Measuring the Pressure

There are two ways to measure the pressure--at the relief valve or at the attachment hose on the tip of the arm.

Measuring at the relief valve:

1. Connect a pressure gauge to the pressure gauge connection port as illustrated below.
2. Close the arm tip stop valve and operate the attachment pedal to pressurize the line. Refer to the table in the section Attachments for the pressure setting. Set to a value 1 to 1.5 MPa (10～15 kgf/cm^2) higher than the listed pressure.



MDEQ-13-003-1 en_GB

Measuring at the arm tip:

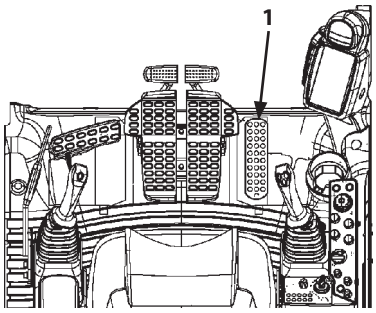
1. Remove the connection hose of the attachment and connect a pressure gauge.
2. Refer to the table in the section Attachments for the pressure setting. Set to the listed pressure.

Attachment Pedal (Hydraulic Breaker) (Optional)

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

CAUTION

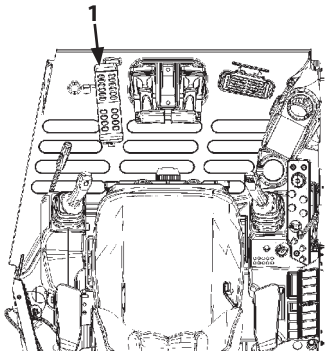
Be sure to lock attachment pedal (1) with pedal lock (2) when the attachment pedal is not in use. Do not allow your foot to rest on the pedal when the attachment pedal (1) is not in use. When changing pedal lock (2) position, pull the pilot control shut-off lever up to the LOCK position.



ZX85US-6

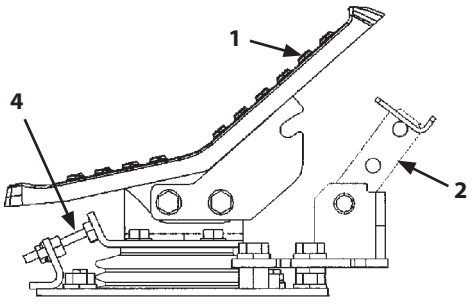
MDEQ-13-004-1 ja

1. Move pedal lock (2) forward to the UNLOCK position.
2. Push down on attachment pedal (1) to operate the breaker.
   Loosen stopper bolt (4) until stopper bolt (4) comes in contact with the bracket in attachment pedal (1) neutral to prevent attachment pedal (1) from being stepped backward.
3. Remove foot from attachment pedal (1) to stop the breaker.
4. Always keep attachment pedal (1) locked with pedal lock (2) when attachment pedal (1) is not in use.



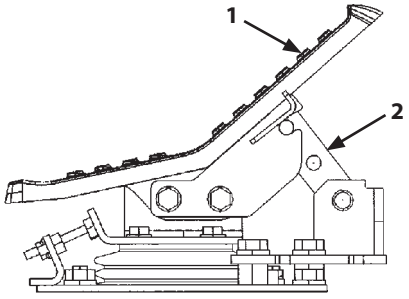
ZX85USB-6

MDEQ-13-005-1 ja



Unlocked Attachment Pedal

MDEQ-13-006-1 ja

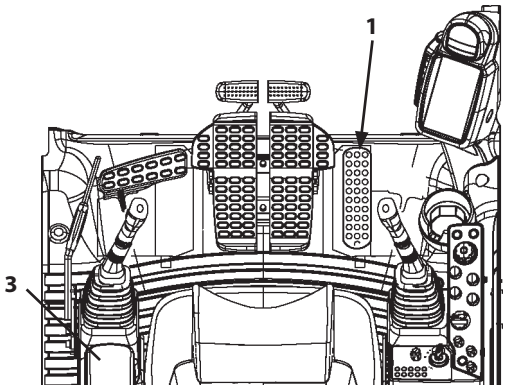


Locked Attachment Pedal

MDEQ-13-007-1 ja

Attachment Pedal (Hydraulic Breaker) Standard Machine (with Two-Speed Switching Optional)

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

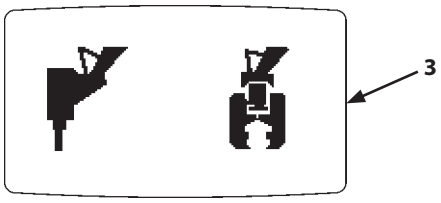


MDEQ-13-008-1 ja

CAUTION

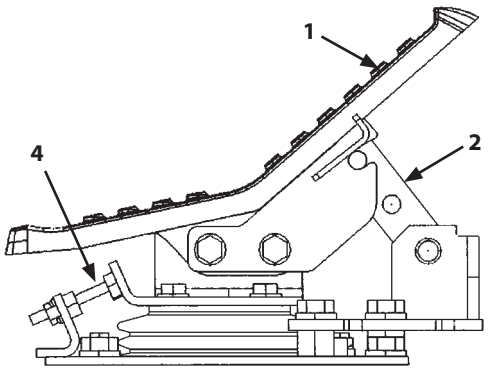
Be sure to lock attachment pedal (1) with pedal lock (2) when the attachment pedal is not in use. Do not allow your foot to rest on the pedal when the attachment pedal (1) is not in use. When changing pedal lock (2) position, pull the pilot control shut-off lever up to the LOCK position.

1. Push the breaker mark on attachment selection switch (3).
2. Move pedal lock (2) forward to the UNLOCK position.
3. Push down on attachment pedal (1) to operate the breaker. Loosen stopper bolt (4) until stopper bolt (4) comes in contact with the bracket in attachment pedal (1) neutral to prevent attachment pedal (1) from being stepped backward.
4. Remove foot from attachment pedal (1) to stop the breaker.



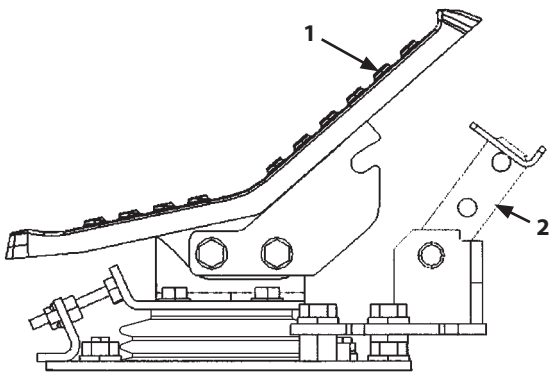
MDEQ-13-009-1 ja

5. Always keep attachment pedal (1) locked with pedal lock (2) when attachment pedal (1) is not in use.



Locked Attachment Pedal

MDEQ-13-010-1 ja



Unlocked Attachment Pedal

MDEQ-13-011-1 ja

Precautions for Breaker Operation

WARNING

When working with a hydraulic breaker mounted, the machine becomes less stable because the attachment is heavy; this is the opposite of when using a bucket. Note that it is also extremely dangerous because materials go flying, such as sand and fragments of rock and metal. In addition to safety measures to prevent turning over and to protect from flying debris, follow the precautions below and work safely.

Crashing into Crushed Materials Not Allowed

Hydraulic breakers are heavier than buckets, so they drop faster and require caution for this reason.

If a hydraulic breaker crashes into crushed material, it will damage the front and/or upperstructure of the machine.



MZX5-13-019 ja

Moving Crushed Materials Not Allowed

Do not move crushed materials or the like with the hydraulic breaker.

In particular, do not use swiveling force to move crushed materials. Doing so may cause damage to the boom and/or arm, as well as the hydraulic breaker.

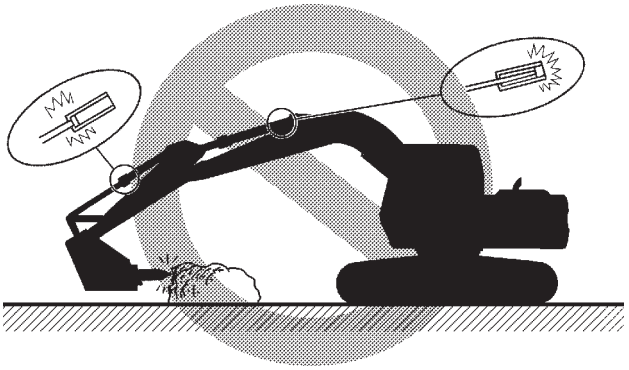


MZX5-13-020 ja

Never Strike with Cylinder at its Stroke End

Leave at least 100 mm of room at the end of the stroke of the machine's cylinders when striking with it.

Striking with cylinders at the end of their stroke will cause damage to the cylinders, arm and/or boom.



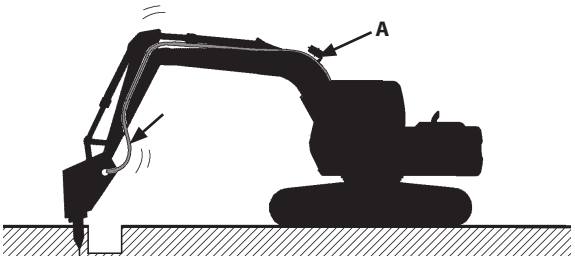
MZX5-13-021 ja

Stop operation if breaker hydraulic hoses jump abnormally.

It may be caused by a drop in gas pressure in the accumulator (A) or damage.

Continuing to use it as-is results in massive shock, damage to the pump and a negative impact on the machine.

Immediately consult the nearest Hitachi representative.



M104-05-058-2 ja

Never use in Water

Doing so causes rust on the hydraulic breaker and damage to the seals.

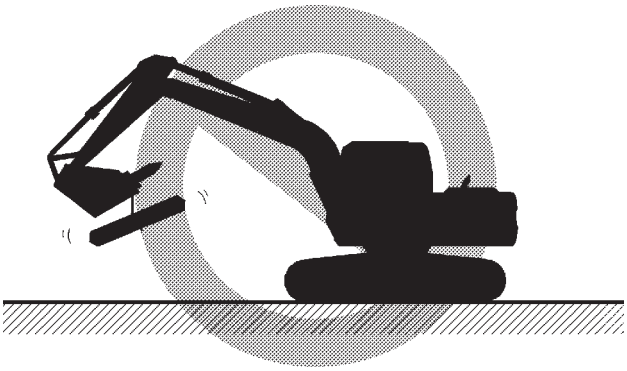
As such, rust, debris and water may get into the hydraulic oil, which will cause damage to the machine's hydraulic equipment.



MZX5-13-017-2 ja

Never use for Sling Loads

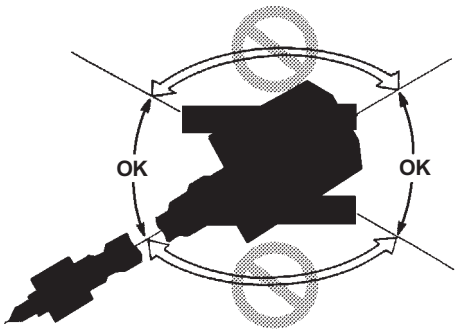
Using a hydraulic breaker for sling loading is prohibited.



MZX5-13-022 ja

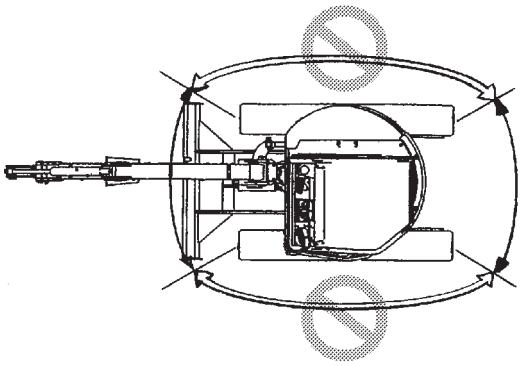
Do not operate the breaker to the side of the machine.

Do not do any work while facing the side of the machine. Doing so may cause the machine to tip over and decreases the life of the undercarriage.



ZX85US-6

MZX5-13-023-1 ja

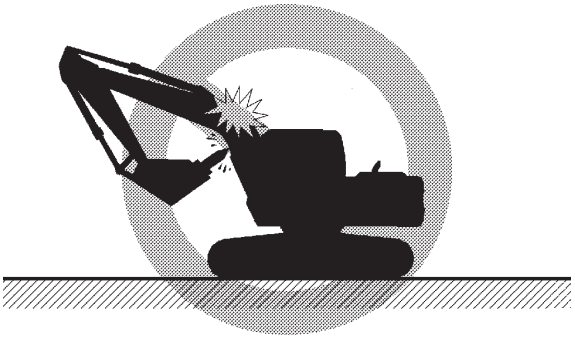


ZX85USB-6

MZX5-13-005 ja

Operate the chisel carefully to avoid hitting the machine.

Be careful when crowding the hydraulic breaker as its chisel may hit the boom.



Warning about Touching the Boom

MZX5-13-024-2 ja

Never Operate Breakers with Arm in Vertical Attitude

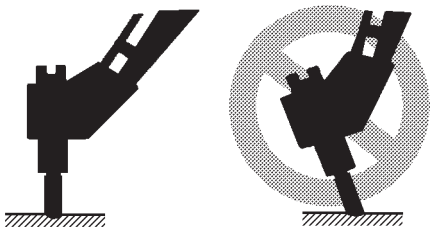
This causes vibration to the arm cylinder and causes oil leaks.



MZX5-13-006 ja

Align the Direction of Pressing the Hydraulic Breaker with the Direction of Penetration of the Chisel (Axially)

Failure to do so causes damage to the chisel and/or scoring of pistons.

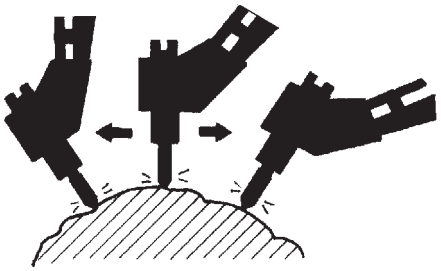


MZX5-13-007 ja

Do not operate the breaker continuously for longer than one minute.

Pounding too long causes abnormal wear to the chisel.

If a rock does not break, change the point the chisel is touching.



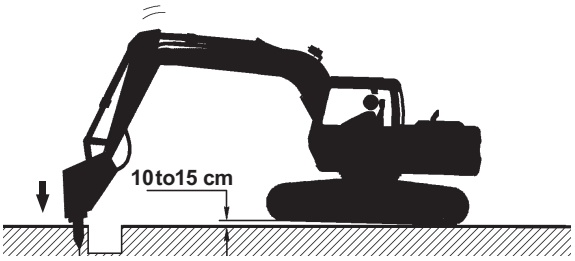
If a material fails to break after 1 minute, move the striking position.

M147-05-015-2 ja

Work Carefully when Body is Lifted

Do not press on anything with the breaker and lift the front of the undercarriage more than 150 mm.

Doing so may cause damage the attachment.

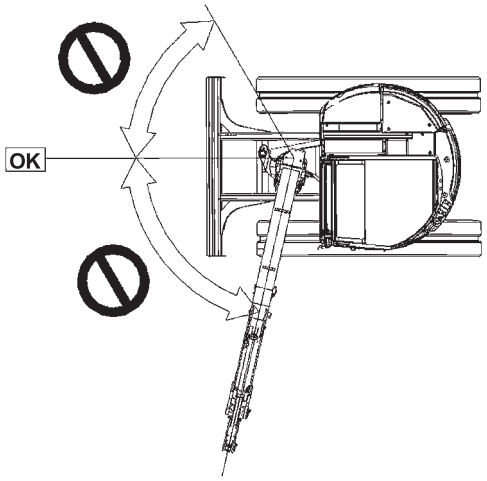


M147-05-016-2 en_GB

Do Not operate breaker with the boom swing operation. (ZX85USB-6)

Do not operate the breaker for long period of time while swinging the boom.

Failure to do so may shorten the service life of the main frame.



MADB-13-044-1 ja

Changing Hydraulic Oil and Replacing Full-Flow Filter Element

Hydraulic breaker operation causes the hydraulic system to become contaminated faster and quickly deteriorates the hydraulic oil.

Failure to adhere to proper maintenance intervals may result in damage to the base machine and the breaker.

In order to extend service life, particularly that of the hydraulic pump, change the hydraulic oil and the full-flow filter element. (Refer to section D. Hydraulic System in the Inspections and Maintenance chapter.)

Hydraulic oil changing intervals differ according to kind of hydraulic oils used. Refer to section D. Hydraulic System.

Use a high performance element (micro glass) for demolition machines.

NOTE

Demolition machines are equipped with a hydraulic oil restriction indicator, but if a filter-paper element is used, this indicator does not operate. (Refer to section D. Hydraulic System in the Inspections and Maintenance chapter.)

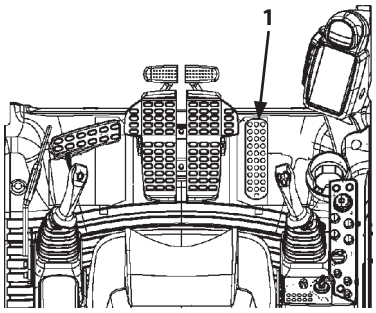
Attachment Pedal (Hydraulic Crusher) Std. Model (Optional)

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

CAUTION

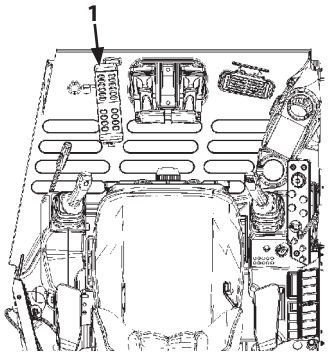
Be sure to lock attachment pedal (1) with pedal lock (2) when the attachment pedal is not in use. Do not allow your foot to rest on the pedal when the attachment pedal (1) is not in use. When changing pedal lock (2) position, pull the pilot control shut-off lever up to the LOCK position.

1. Tighten stopper bolt (4) to the position illustrated and secure with the lock nut. Put attachment pedal (1) in a position so that it can be depressed to the rear as well.
2. Move pedal lock (2) forward to the UNLOCK position.
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.



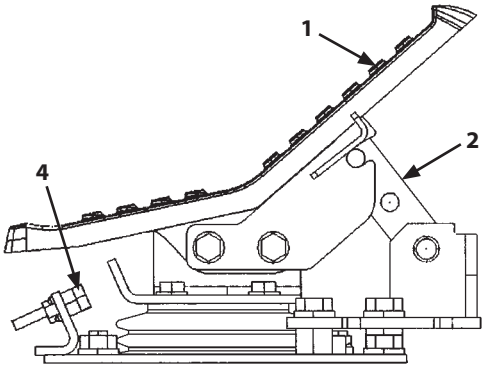
ZX85US-6

MDEQ-13-004-1 ja



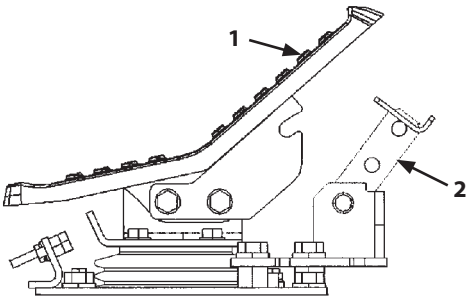
ZX85USB-6

MDEQ-13-005-1 ja



Locked Attachment pedal (Crusher)

M1J1-13-012-2 ja

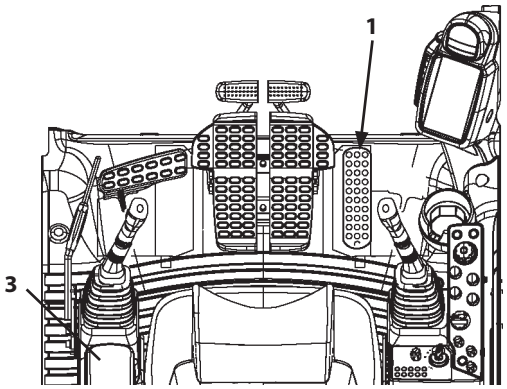


Unlocked Attachment pedal (Crusher)

MDEQ-13-018-1 ja

Attachment Pedal (Crusher) Standard Machine (with Two-Speed Switching Optional)

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

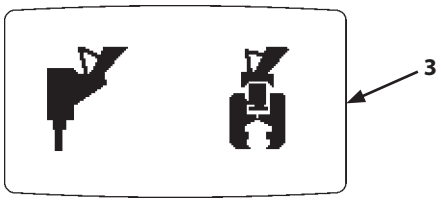


MDEQ-13-008-1 ja

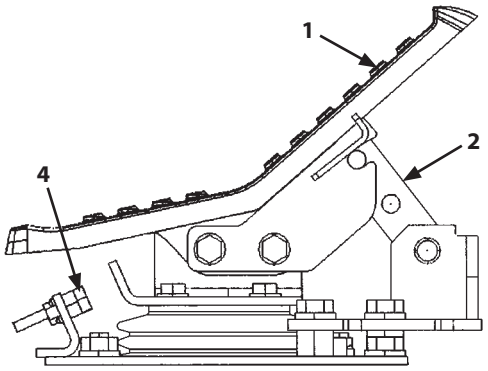
CAUTION

Be sure to lock attachment pedal (1) with pedal lock (2) when the attachment pedal is not in use. Do not allow your foot to rest on the pedal when the attachment pedal (1) is not in use. When changing pedal lock (2) position, pull the pilot control shut-off lever up to the LOCK position.

1. Tighten stopper bolt (4) to the position illustrated and secure with the lock nut. Put attachment pedal (1) in a position so that it can be depressed to the rear as well.
2. Push the crusher mark on attachment selection switch (3).
3. Move pedal lock (2) forward to the UNLOCK position.
4. Push down on attachment pedal (1) either forward or backward to open or close the crusher.
5. Remove foot from attachment pedal (1) to stop the crusher.
6. Always keep attachment pedal (1) locked with pedal lock (2) when attachment pedal (1) is not in use.

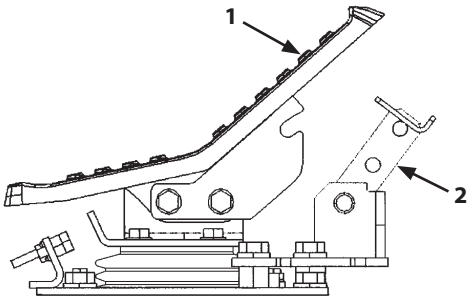


MDEQ-13-009-1 ja



Locked Attachment pedal (Crusher)

M1J1-13-012-2 ja



Unlocked Attachment pedal (Crusher)

MDEQ-13-020-1 ja

Precautions for Crusher Operation

Heed the following points to avoid damage to the front-end and to prevent the machine from tipping over.

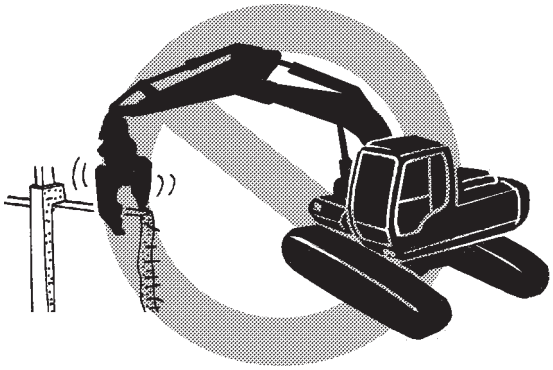
WARNING

When working with a crusher mounted, the machine becomes less stable because the attachment is heavy; this is the opposite of when using a bucket. It is extremely hazardous due to crushed material falling and scattering and the potential to tip over. In addition to normal safety measures, follow the precautions below and work safely.

- Do not lift the machine when the bucket cylinder is in its fully extended or retracted positions. Doing so may damage the parts of the front. The bucket cylinder is particularly susceptible to damage when fully extended.
  Be particularly careful during work like demolition of foundations with a crusher.
- Do not lift the machine when the arm cylinder is fully extended. Doing so will damage the arm cylinder.
- Do not make abrupt start or stop operations with the front-end when a heavy attachment like a crusher is mounted on it. Doing so may damage the parts of the front.
- Work in the forward/reverse direction of the tracks. Working lateral to the track makes the machine unstable and may cause it to tip over.

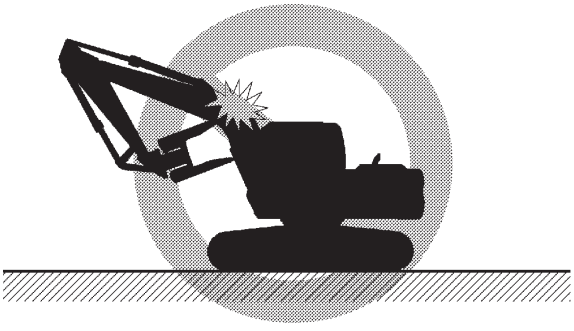


MZX5-13-008 ja



MZX5-13-009 ja

- Be careful when crowding the crusher as it may hit the boom.



Warning about Touching the Boom or Cab

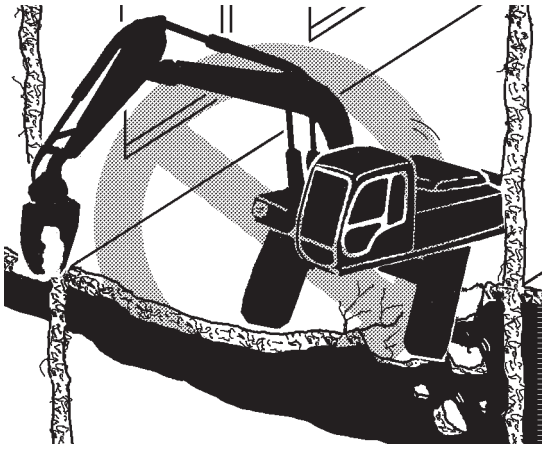
MZX5-13-010-2 ja

- When crushing high places, such as a ceiling, take care that crushed material does not fall on the machine.



MZX5-13-011 ja

- Before working on the floor of a building, check and make sure it is strong enough.
  Some working methods result in a greater load on the floor than the machine's own weight.
- Keep the body horizontal and stabilize its footing while working. Do not drive onto glass or work on a slope.
- Do not use the crusher to move or load crushed materials.
- Hydraulic oil tends to get contaminated when changing attachments, such as crusher and bucket, or hydraulic breaker and another attachment. Change the hydraulic oil and full-flow filter element at the same frequency (hours) as the hydraulic breaker.



MZX5-13-012 ja

- Remove the crusher from the machine during transport. Do not leave the bucket cylinder fully extended during transport. (Vibration during transport causes the same conditions as the posture when lifting the machine, which damages the front.)

Allowable Weight Limits of Installed Attachments

WARNING

- **Do not attach any attachments to the hydraulic shovel that exceed the specified weight in terms of stability and its structure. Weights that can be attached are calculated according to the Ordinance on Industrial Safety and Health and these are posted in the operator's seat. However, use the table of attachment weights below as a guide when selecting attachments in terms of their workability.**
- **The stability of the machine varies when an attachment other than the standard bucket is mounted on the hydraulic shovel.**
  If an attachment that is too heavy is attached, it results in not only poor workability, but also instability and danger.
- **The allowable load of the structure (ROPS) that protects the operator may be exceeded, depending on the specification of the base machine and the attachment being attached; this presents the risk that the structure cannot guarantee the protection of the operator. Refer to the ROPS certificate posted in the operator's seat for the maximum allowable operating weight.**

Body Conditions			Breaker		Crusher/Pulverizer	
Model	Arm	Blade	Std. Weight (kg)	Max Weight (kg)	Std. Weight (kg)	Max Weight (kg)
ZX85US-6	Standard	-	700	750	800	950
ZX85USB-6	Standard	Attached	550	600	650	750

- When working with a breaker mounted, the front operates more quickly than when working with a crusher, as it is lighter than the crusher.
- Since the selection of a breaker is not based solely on its weight, choose a model of the makers shown in the table on the next page.
- Avoid using attachments with an extremely long overall length as it may cause damage to parts of the front end of the hydraulic shovel.
- When an attachment at maximum weight is attached, work in the front/rear of the machine. Also, avoid full deflection of levers.
- The crusher is heavier than the breaker, so operate levers more slowly.

Attachments

Examples of attachments (breakers and crushers) available on the market are listed. There are some crushers that are very heavy. Discuss their use thoroughly with the maker of the attachment prior to mounting it.
If you wish to use products of makers marked with * below, first consult your nearest Hitachi dealer.

As the use of other attachments puts a greater load on the machine than working with a bucket, both the attachment and the machine itself can be damaged if not used properly. Prevent any problems by thoroughly reading both this user's manual and that of the attachment to be mounted.

Breakers

Maker		HITACHI		NPK	NPK	Okada	Furukawa	Mitsubishi
Model		HSB66	HSB66S	H-10XB	E-12X	OUB312	HB20G	MKB1400
Weight	kg (lb)	1510 (3330)	1520 (3350)	1450 (3200)	1550 (3420)	1400 (3090)	1480 (3260)	1480 (3260)
Flow Rate	(L/min)	110~160	110~160	160~200	165~210	140~180	125~150	110~160
Operating Pressure	MPa (kgf/cm2)	12.3~13.2 (125~135)	12.3~13.2 (125~135)	11.8~13.7 (120~140)	15.7~17.7 (160~180)	13.7~16.7 (140~170)	15.7~17.6 (160~180)	14.7~17.6 (150~180)
Secondary Relief Valve Set Pressure	MPa (kgf/cm2)	21.6 (220)	21.6 (220)	-	-	17.6 (180)	17.6 (180)	17.6 (180)

Maker		Toukuu	Matuda	MON- TAB-ERT	STK	Ranma	GERMANY KRUPP
Model		TNB14E	THBB1400	BRH501	SIB221	E-66	HM960CS
Weight	kg (lb)	1487 (3280)	1480 (3260)	1350 (2980)	1400 (3090)	1300 (2870)	1500 (3310)
Flow Rate	(L/min)	130~170	120~170	110~140	160~210	100~160	130~170
Operating Pressure	MPa (kgf/cm2)	12.7~16.7 (130~170)	9.8~12.7 (100~130)	7.8~10.8 (80~110)	15.7~17.6 (160~180)	13.2~14.2 (135~145)	11.8~13.7 (120~140)
Secondary Relief Valve Set Pressure	MPa (kgf/cm2)	17.6 (180)	12.7 (130)	10.8 (110)	19.6 (200)	15.9 (160)	16.7 (170)

NOTE

The size of the front return line may have to be increased (3/4 → 1) when using a MONTABERT breaker, so consult the nearest Hitachi representative.

Crushers

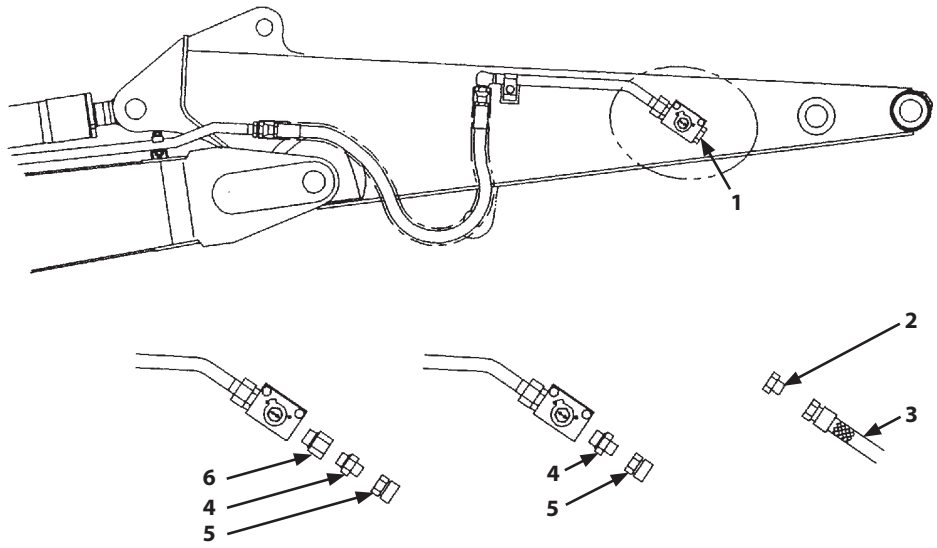
Maker		HITACHI		SANGO JYU-KI	NPK*	Sakado	Oosumi*	STK*
Model		HSC100	HSC160	TS850RCD	S-22XA	SPAC80R-3	MR1100-2	CX1100
Weight	kg (lb)	2430 (5360)	2300 (5070)	2000 (4410)	2000 (4410)	1640 (3620)	2100 (4630)	2350 (5180)
Overall Length	mm (ft·in)	2340 (7'8")	2600 (8'6")	2500 (8'2")	2500 (8'2")	1810 (5'11")	2100 (6'11")	2450 (8'0")
Rated Pressure	MPa (kgf/cm2)	27.9 (285)	27.9 (285)	27.4 (280)	24.5 (250)	27.4 (280)	27.4 (280)	27.4 (280)
Maximum Opening Width	mm (ft·in)	900 (2'11")	850 (2'9")	850 (2'9")	850 (2'9")	850 (2'9")	1000 (3'3")	1100 (3'7")
Swing Method		Hydraulic	Hydraulic	Free	Free	Free	Free	Free
Jaw Tip Crushing Force	kN (tf·f)	640 (65)	-	980 (100)	970 (99)	630 (64)	-	590 (60)
Jaw Center Crushing Force	kN (tf·f)	980 (100)	1570 (160)	1570 (160)	-	780 (80)	1540 (157)	880 (90)

Attachment Connections

This describes the connection parts between arm tip pipes and the pipes of each attachment.

When attachments are removed, always put a cap (1) or plug (2) on the ends of the arm tip pipe and attachment pipe, to prevent dirt from getting on or in them.

Adapter Tightening Torque: 210 N·m (21 kgf·m)

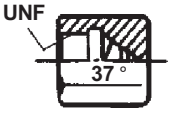
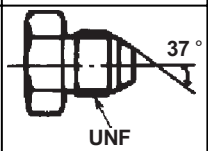
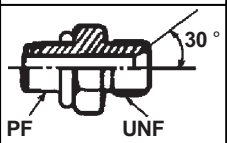
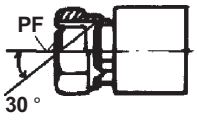
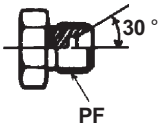
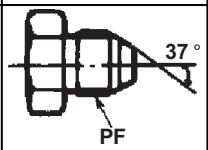
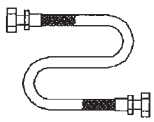


When the Attachment is Removed

MDEQ-13-012-1 ja

1	Plug (Screw size: JIS B2351 O-shape PF1)	2	Plug	4	Adapter	6	Reducer
		3	Hose	5	Cap		

Table of Parts Numbers (Put the parts number of the maker of the attachment being used in the empty spaces.)

Manufacturer	Adapter Code	Adapter	Cap	Plug	Hose
Part Shape	PF-UNF Male Seat				
Hitachi	PF1-1-1/16-12UN	4456399	4222711	4222264	
	PF3/4-3/4-16UN	*1 4279302	4223519	4225492	
Part Shape	PF-PF 30 ° Female Seat				
Hitachi	PF1-PF3/4	4129457	9718916	4222047	
	PF3, 4-PF1 2 L	*1 4129227	9719234	4095927	
Part Shape	PF-PF 30 ° Male Seat				
Hitachi	PF1-PF3/4	4456120	4222715	4222044	
	PF3/4-PF1/2		4222714	4222043	

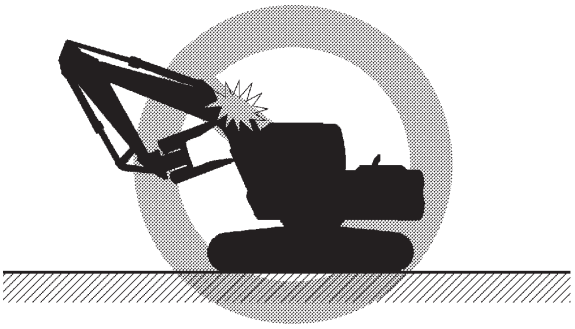
*1 A reducer (Part No.: 4263448) is required when using this adapter.

Precautions when Retracting the Arm and Bucket

When an attachment whose overall length is longer than a standard bucket is attached

WARNING

When an attachment (such as breaker, crusher, quick hitch, etc.) whose overall length is longer than a standard bucket is attached, the attachment may interfere with the cab or boom. Be careful not to hit the cab or boom with the tip of the attachment when retracting the arm.



MZX5-13-010-2 ja

With a Head Guard Integrated Cab

WARNING

If a long arm is used with a head guard integrated cab, the teeth of the bucket will hit the head guard if it is rolled in too far. Be careful not to hit the head guard with the teeth of the bucket when rolling the arm in.



MDEQ-13-013-1 ja

Control Lever

Control Levers (H Type) (Optional)

NOTE

H-type levers are the conventional Hitachi lever format.

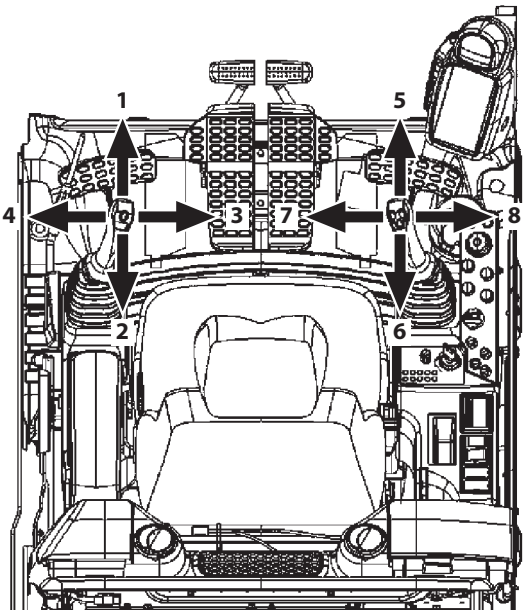
WARNING

- **Never extend any part of body beyond window bars or frame, as it could be crushed, if boom control lever is accidentally bumped or otherwise engaged.**
  Do not poke your head or hands out the window. Never remove the window sash bar.
- **Make sure you know the location and function of each control before operating the machine.**
- **Do not change the operation pattern of control levers. Doing so is dangerous as it will result in mistaken operation of the machine.**

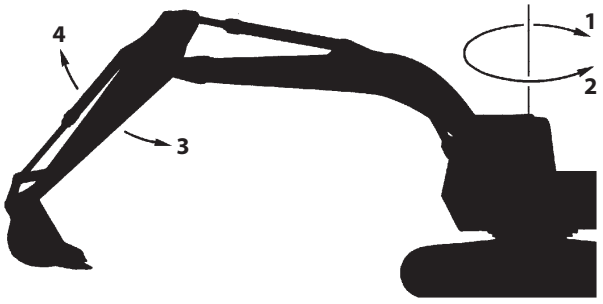
A label showing the control patterns of the levers and pedals is attached on the right side in the cab.

When a lever is released, it returns automatically to neutral, and that machine function stops.

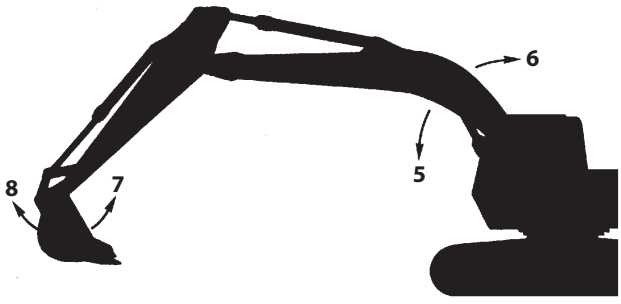
1- Swing Right
2- Swing Left
3- Arm Roll-In
4- Arm Roll-Out
5- Boom Lower
6- Boom Raise
7- Bucket Roll-In
8- Bucket Roll-Out



MDEQ-13-014-1 ja



M104-05-001-2 ja

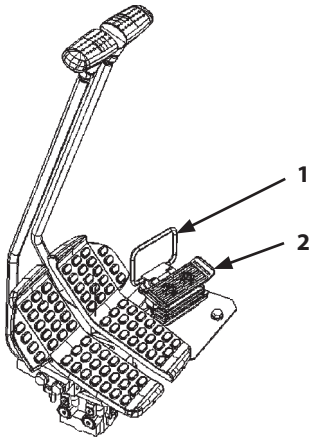


M104-05-002-1 ja

Offset Arm Front (ZX85US-6)

Offset Control Pedal

Pedal (2) is located at the operator's right foot.

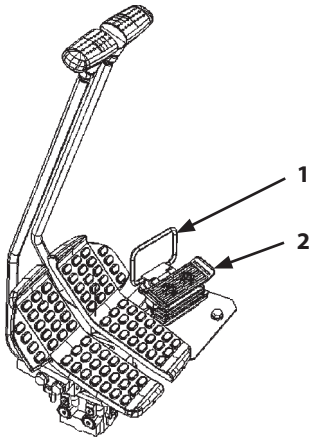


MDEQ-13-015-1 ja

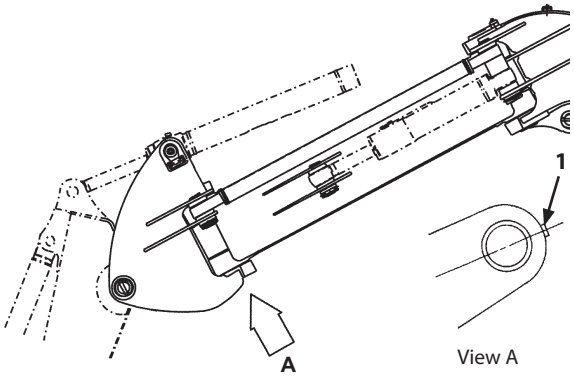
Offset Operation

1. Turn cover (1) forward to unlock pedal (2).
2. Push down on the left side of pedal (2) to move the arm to the left offset position.
3. Push down on the right side of pedal (2) to move the arm to the right offset position.
4. Turn cover (1) backward to lock pedal (2) when the arm offset operation is no longer required.

The center position of the arm (offset 0) can be confirmed by consulting the gauge (A) at the top end of the boom.



MDEQ-13-015-1 ja



MDEQ-13-016-1 en_GB

1 Offset O position

Offset Direction and Working Range

Right and left offset directions are taken from the point of view of the operator. Accordingly, “left” offset means that the front attachment is moved towards the cab.

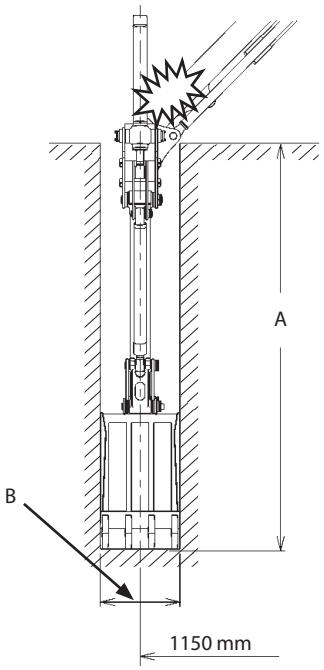
Maximum digging depth with maximum offset distance of 1150 mm is A due to interference of the boom with the ground surface, as illustrated.

A : 3160 mm

Working Range :

Offset distance can be selected up to a maximum distance of 1150 mm for both right and left directions.

1. Maximum digging depth with maximum offset distance using 0.28 m3 and 0.24 m^3 bucket is as shown in the illustration.
2. Distance L from the end surface of the crawler to the farthest end of the bucket will differ with the width of the bucket and track shoes as shown below.

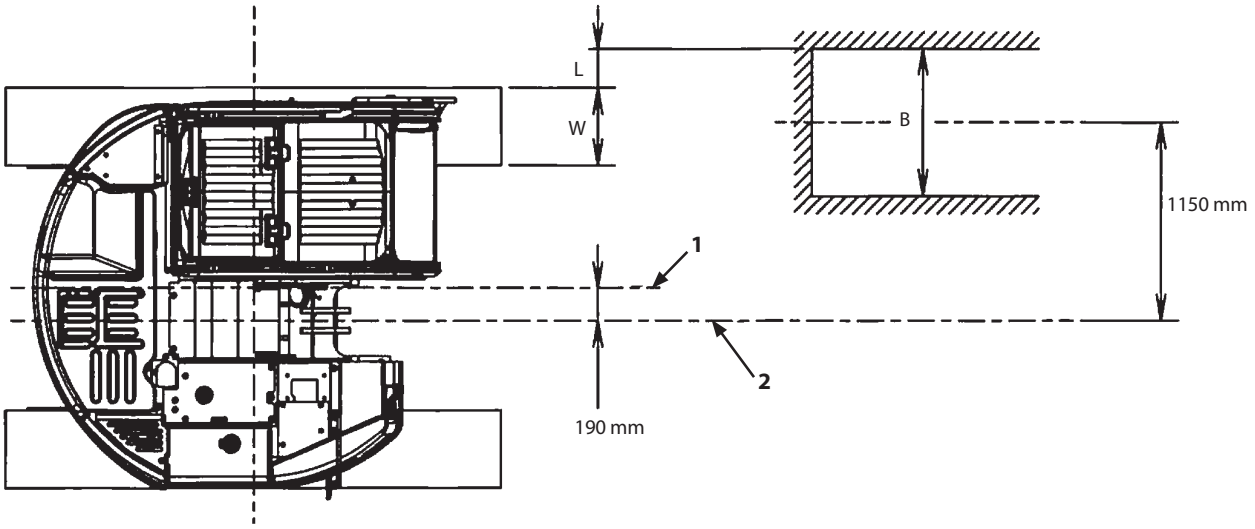


MDEQ-13-019-1 ja

Dimension L by width of Bucket and Shoe

Bucket		W: Shoe Width 450 mm	W: Shoe Width 600 mm
Capacity *1 m^3	B: Width mm	L: mm	L: mm
0.11	450	25	-50
0.24	650	125	50
0.28	750	175	100

*1 PCSA Heaped



MDEQ-13-021-1 ja

1	Swing Center	2	Front-End Attachment Center

Precautions for Operating With the Offset Function

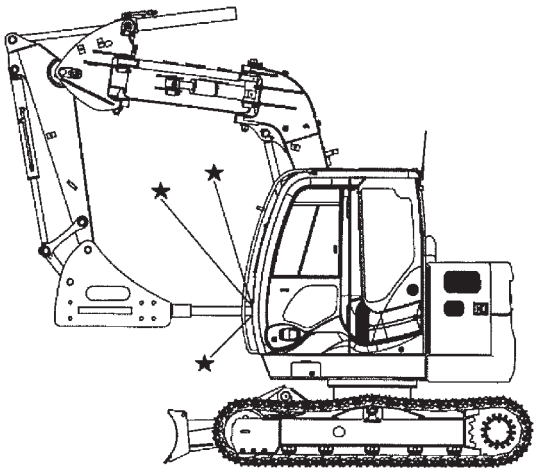
WARNING

- **In case this machine is equipped with an unspecified attachment such as an oversized bucket or hydraulic breaker, the attachment may come in contact with the cab if the machine is operated with the front attachment offset, possibly causing injury or death as well as damaging the machine**
- **Never jack up the machine with the front in the offset position. This is extremely dangerous, as the machine is unstable.**

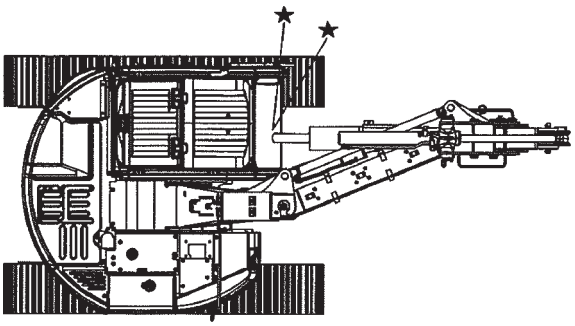
IMPORTANT

Do not perform heavy duty work, or dig gravel with the front in the offset position. Do not perform tamping work with a slope-finishing bucket attached. These operation will damage the lower and upper booms.

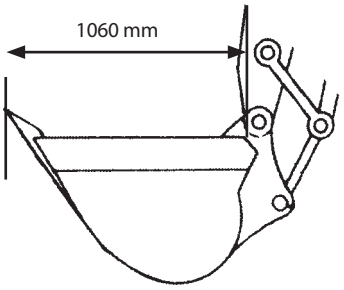
1. When using unspecified attachments such as oversized buckets or hydraulic breaker, be sure the front attachment dimension does not exceed the specified dimension shown rightward. Use an attachment with the dimension between the arm top pin center to the tip end of the attachment 1060 mm or less.
2. When digging with the front in the offset position, the bucket will come in contact with the track link if the arm is crowded. Even if bucket does not touch the track link, watch for the bucket digging under the track, as this will cause instability.
3. Be sure to follow the precautions shown below.
   a. Do not use the 2.12 m arm as it will interfere with the cab when in the offset position.
   b. Do not use the bucket as a pile driver with the boom in the offset position.
   c. When digging with the boom in offset position, be careful not to damage the cylinder stay. In order to prevent the offset pins from getting rusty, operate the offset function regularly. Check offset function operation every time before starting work.



MDEQ-13-022-1 ja



MDEQ-13-023-1 ja



MDEQ-13-024-1 ja

Maintenance

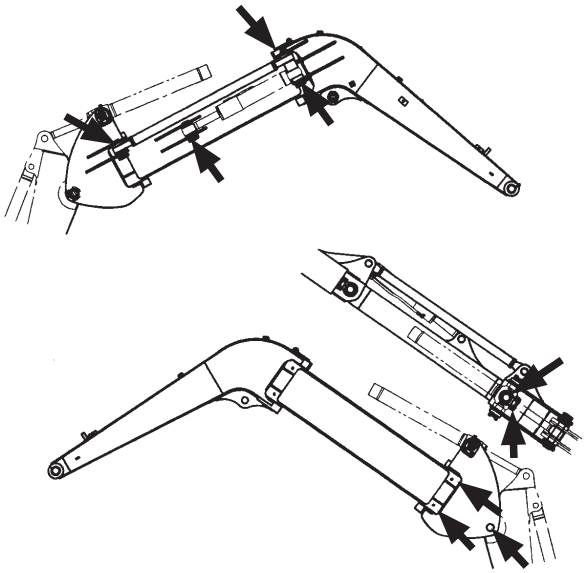
Refer to the Greasing Front Joint Pins pages in the MAINTENANCE section.

Boom Foot, Boom Cylinder Bottom Side, Arm Cylinder Rod Side, and Bucket Cylinder Bottom Side Pins:

Refer to the Greasing Front Joint Pins pages in the MAINTENANCE section.

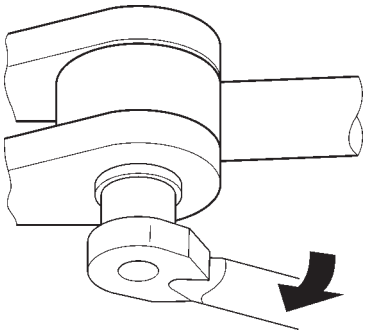
Offset Front Attachment Joint Pins
--- every 50 hours

Add greasing to all illustrated grease fittings.



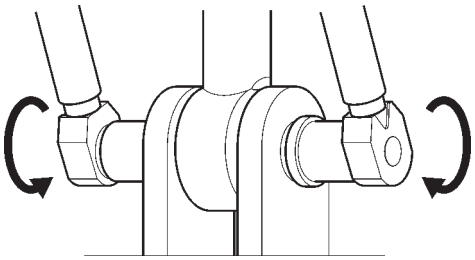
MDEQ-13-025-1 ja

Retightening EX Pin.



EX Pin for Front

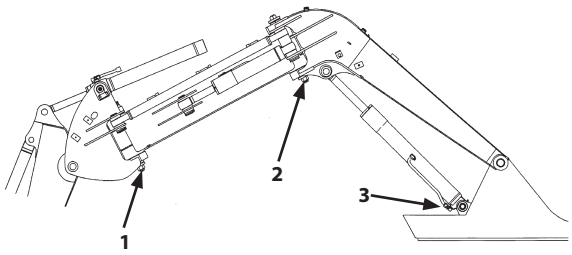
MDEQ-13-026-1 ja



EX Pin for Boom Cylinder

MDEQ-13-027-1 ja

The EX pin is tightened with a screw. The pin will unavoidably become loose due to permanent set of the parts fastened with the screw during initial operation. Be sure to retighten the pin once within the first 5 to 20 hours after starting operation to the same tightening torque as specified.



MDEQ-13-028-1 ja

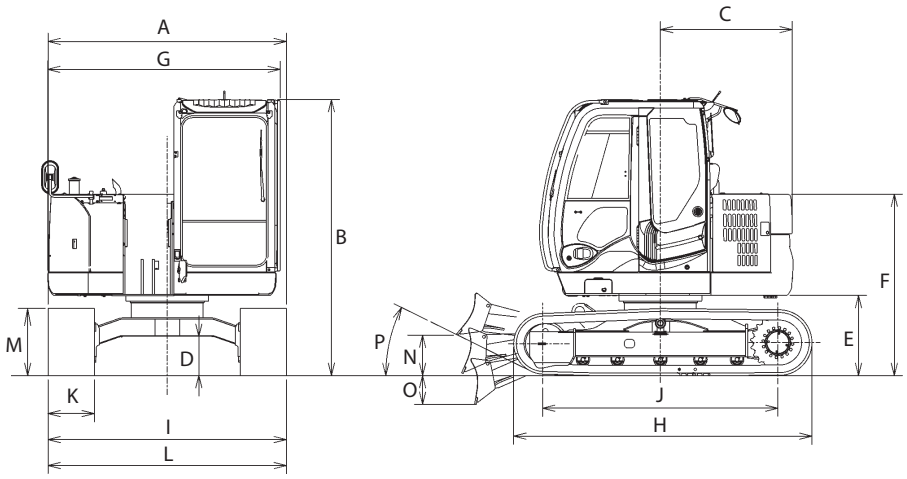
Cylinder Stay and Upper Boom Joint Pin (1)
Tool: 55 mm

Torque: 1050 N·m (105 kgf·m) Upper Boom and Lower Boom Joint Pin (2)
Tool: 55 mm

Torque: 1050 N·m (105 kgf·m) Boom Cylinder Bottom Side and Frame Joint Pin (3)
Tool: 36 mm

Torque: 450 N·m (45 kgf·m)

Specifications ZX85US-6 (Offset Front)

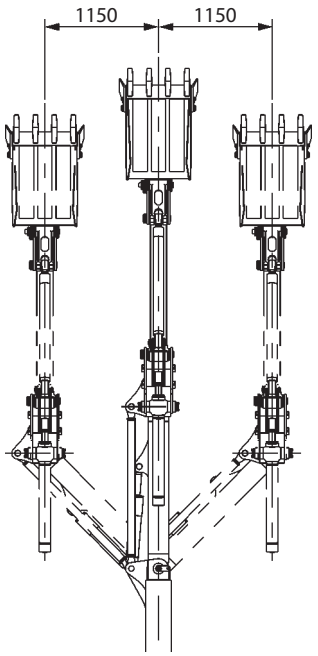


MDEQ-12-001-1 ja

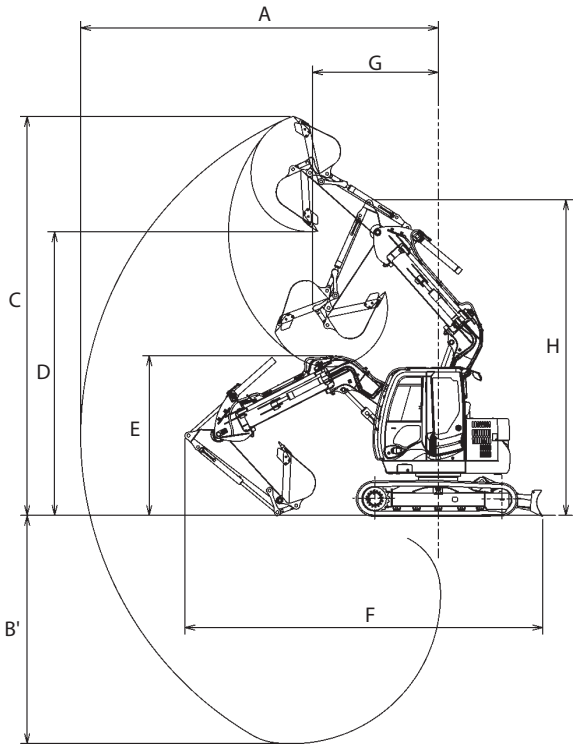
Type of Front-End Attachment	Offset Boom, 1.62 m Arm
Bucket Capacity (Heaped)	PCSA 0.28 m^3 CECE 0.24 m^3
Operating Weight	8270 kg
Base Machine Weight	6630 kg
Engine Type	4TNV98C
Engine Output	ISO14396: 42.4 kW/2000 m^{-1} ISO9249: 41.8 kW/2000 min^{-1}
A: Overall Width (Excluding back mirrors)	2320 mm
B: Cab Height	2690 mm
C: Rear End Swing Radius	1290 mm
D: Minimum Ground Clearance	360 mm*1
E: Counterweight Clearance	740 mm*1
F: Engine Cover Height	1830 mm*1
G: Overall Width of Upperstructure	2260 mm
H: Undercarriage Length	2920 mm
I: Undercarriage Width	2320 mm
J: Sprocket Center to Idler Center	2290 mm
K: Std. Shoe Width	450 mm
L: Blade Width	2320 mm
M: Blade Height	460 mm
N: Maximum Blade Lift	360 mm*1
O: Maximum Blade Lower	300 mm*1
P: Departure Angle	26.8 degree (tanθ = 0.51)
Ground Pressure	34 kPa (0.35 kgf/cm^2, 4.9 psi)
Offset	0 to 1150 mm
Swing Speed	10.5 min^{-1} (rpm)
Travel Speed (fast/slow)	5.0/3.1 km/h (3.1/1.9 mph)
Gradeability	35° (tan θ = 0.70)

*1: The dimensions do not include the height of the shoe lug.

Working Ranges ZX85US-6 (with Offset Arm Front)



MDEQ-13-040-1 ja



MDEQ-13-039-1 ja

Item \ Category	Off-set Distance (0 mm)	Max. Off-set Distance (1150 mm)
	mm	mm
A: Maximum Digging Reach	6430	5980
B: Maximum Digging Depth	4110	3650
C: Maximum Cutting Height	7190	6830
D: Maximum Dumping Height	5110	4750
E: Overall Height	2870	2820
F: Overall Length (with Blade)	6440	6020
G: Minimum Swing Radius	2260	Left: 2230 Right: 2430
H: Front-End Attachment Height at Min. Swing Radius.	5680	5330

NOTE

"E: Overall Height" includes the height of shoe lug; Other dimensions do not include the height of the shoe lug.

Shoe Types and Applications ZX85US-6 (with Offset Arm Front)

Shoe Width		450 mm Grouser Shoe	600 mm Grouser Shoe	450 mm Pad Crawler Shoe	450 mm Rubber Crawler Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Paved Road (Option)	For Paved Road (Option)
Operating Weight	kg	8270	8450	8320	8290
Base Machine Weight	kg	6630	6810	6680	6650
Cab Height	mm	2690	2690	2720	2700
Minimum Ground Clearance	mm	* 360	* 360	410	390
Undercarriage Length	mm	2920	2920	2980	2940
Undercarriage Width	mm	2320	2470	2320	2320
Ground Pressure		36 kPa (0.37 kgf/cm^2)	28 kPa (0.29 kgf/cm^2)	36 kPa (0.37 kgf/cm^2)	36 kPa (0.37 kgf/cm^2)

NOTE

- *The specifications for the front-end attachment is for arm with PCSA 0.28 m3 bucket.*
- *600 mm grouser shoe, 450 mm pad crawler shoe and 450 mm rubber crawler shoe should not be used on gravel or rocky ground.*
- ** The dimensions do not include the height of the shoe lug.*

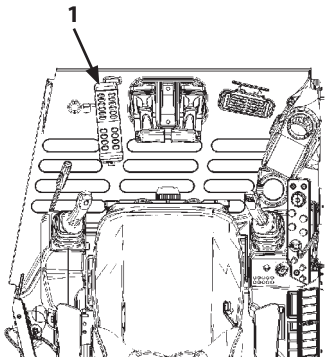
2-Piece Boom (ZX85USB-6)

2-piece boom operation

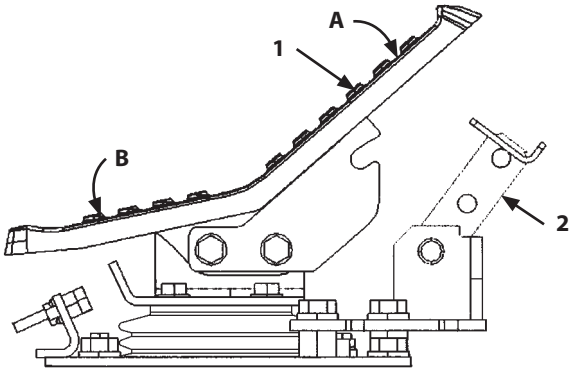
The 2-piece boom can be operated using attachment pedal (1) located on the left front of the seat, as illustrated.

CAUTION

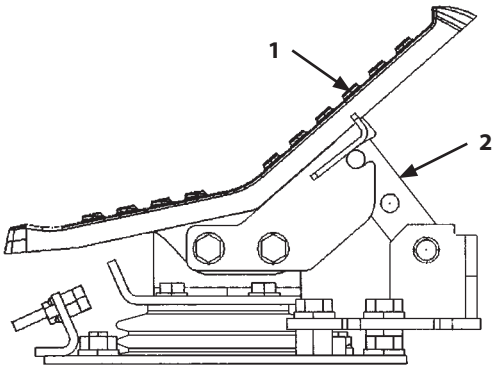
Be sure to lock attachment pedal (1) with pedal lock (2) when attachment pedal (1) is not use. Do not step on attachment pedal (1).



MDEQ-13-031-1 ja

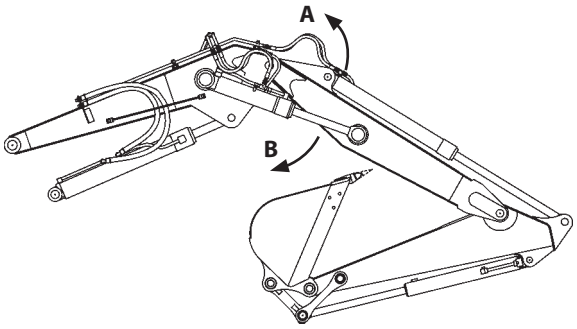


MDEQ-13-020-2 ja



MDEQ-13-032-1 ja

A: Raise
B: Lower

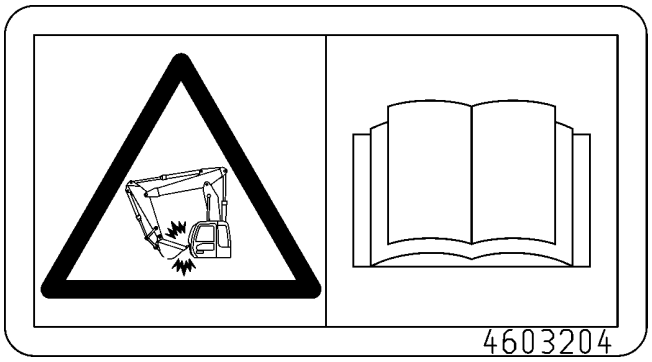


MDEQ-13-033-1 ja

Precautions for operating 2-piece boom

WARNING

When operating with 2-piece boom, the bucket may come in contact with boom cylinder. Operate the machine with care not to allow the tip of bucket to hit boom cylinder while rolling in the front attachment.

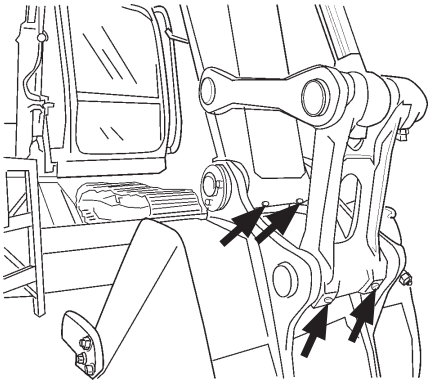


SS4603204-1 ja

Maintenance (2-Piece Boom)

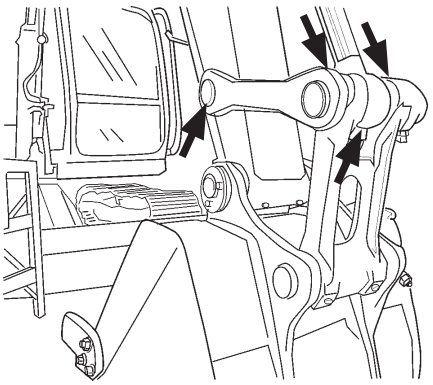
Front Joint Pins

- Bucket --- every 250 hours



MDEQ-13-034-1 ja

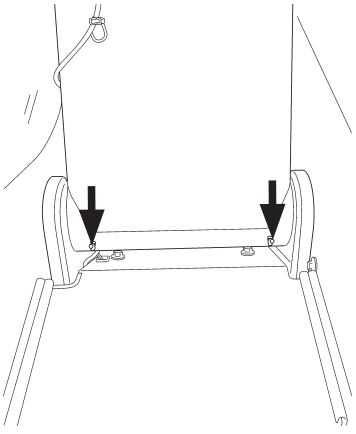
- Link Pins --- every 500 hours



MDEQ-13-034-2 ja

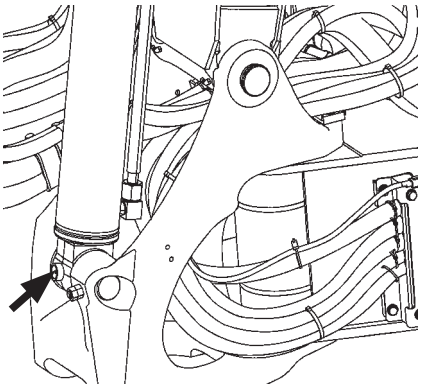
Others --- every 500 hours

- Boom Foot



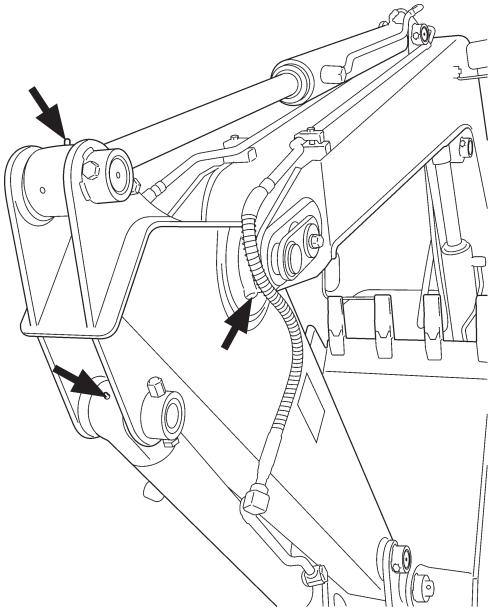
MDEQ-13-035-1 ja

- Boom Cylinder Bottom



MDEQ-13-036-1 ja

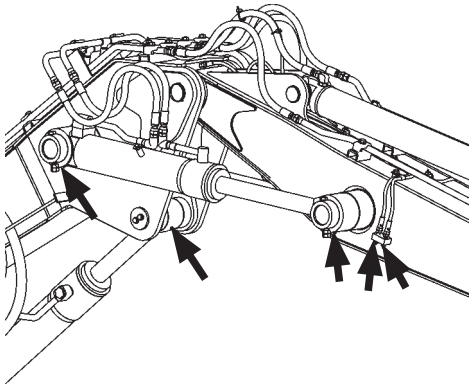
- Boom and Arm Joint Pin, Arm Cylinder Rod Pin and Bucket Cylinder Bottom Pin.



MDEQ-13-037-1 ja

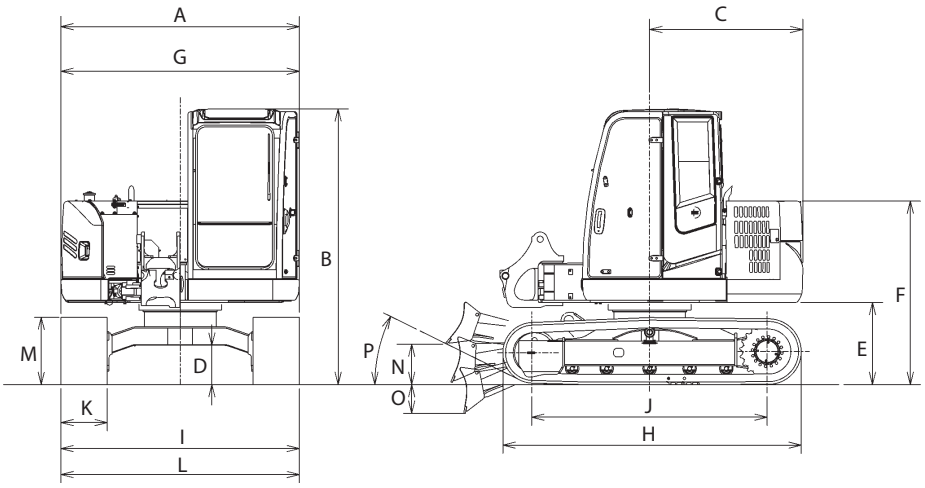
- Bottom Boom and Upper Boom Joint Pin and Arm Cylinder Bottom Pin.
  (Centralized greasing system)

  Positioning Cylinder Rod and Bottom Pins. Boom Cylinder Rod Pin.



MDEQ-13-038-1 ja

Specifications ZX85USB-6 (With 2-Piece Boom)

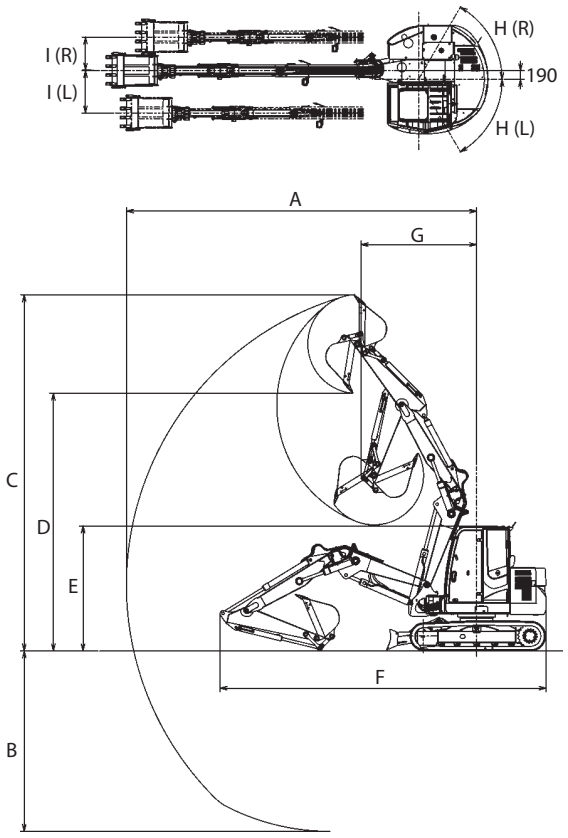


MDEQ-12-004-1 ja

Type of Front-End Attachment	2-Piece and Boom-Swing Type 1.62 m Arm
Bucket Capacity (Heaped)	PCSA 0.28 m^3, CECE 0.24 m^3
Operating Weight	9010 kg
Base Machine Weight	7160 kg
Engine Type	4TNV98C
Engine Output	ISO14396: 42.4 kW/2000 m^{-1} ISO9249: 41.8 kW/2000 min^{-1}
A: Overall Width (Excluding back mirrors)	2260 mm
B: Cab Height	2550 mm
C: Rear End Swing Radius	1490 mm
D: Minimum Ground Clearance	380 mm*1
E: Counterweight Clearance	740 mm*1
F: Engine Cover Height	1850 mm*1
G: Overall Width of Upperstructure	2260 mm
H: Undercarriage Length	2920 mm
I: Undercarriage Width	2200 mm
J: Sprocket Center to Idler Center	2290 mm
K: Std. Shoe Width	450 (Grouser shoe)
L: Blade Width	2200 mm
M: Blade Height	480 mm
N: Maximum Blade Lift	360 mm*1
O: Maximum Blade Lower	300 mm*1
P: Departure Angle	25.8 degree
Ground Pressure	37 kPa (0.38 kgf/cm^2, 5.4 psi)
Swing Speed	10.5 min^{-1} (rpm)
Travel Speed (fast/slow)	5.0/3.1 km/h (3.1/1.9 mph)
Gradeability	35 ° (tan θ = 0.70)

*1: The dimensions do not include the height of the shoe lug.

Working Ranges ZX85USB-6 (with 2-piece Boom)



MDEQ-13-030-1 ja

Category / Item	1.62 m Arm	2.12 m Arm
	mm	mm
A: Maximum Digging Reach	7510	8000
B: Maximum Digging Depth	3930	4430
C: Maximum Cutting Height	7580	8030
D: Maximum Dumping Height	5470	5920
E: Overall Height	2550	2550
F: Overall Length	7010	7040
G: Minimum Swing Radius	2480	2910
H: Maximum Boom-Swing Angle	L: 60° / R: 60°	
I: Offset Distance	L: 910 / R: 720	

NOTE

"E: Overall Height" includes the height of shoe lug; Other dimensions do not include the height of the shoe lug.

Shoe Types and Applications ZX85USB-6 (with 2-piece Boom)

Shoe Width		450 mm Grouser Shoe	600 mm Grouser Shoe	450 mm Pad Crawler Shoe	450 mm Rubber Crawler Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Paved Road (Option)	For Paved Road (Option)
Operating Weight	kg	9010	9190	9060	9030
Base Machine Weight	kg	7160	7340	7210	7180
Cab Height	mm	2530	2530	2560	2540
Minimum Ground Clearance	mm	* 360	* 360	410	390
Undercarriage Length	mm	2920	2920	2980	2940
Undercarriage Width	mm	2200	2350	2200	2200
Ground Pressure		39 kPa (0.40 kgf/cm^2)	30 kPa (0.31 kgf/cm^2)	39 kPa (0.39 kgf/cm^2)	39 kPa (0.40 kgf/cm^2)

NOTE

- *The specifications for the front-end attachment is for PCSA 0.28 m3 bucket.*
- *600 mm grouser shoe, 450 mm pad crawler shoe and 450 mm rubber crawler shoe should not be used on gravel or rocky ground.*
- ** The dimensions do not include the height of the shoe lug.*

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MEMO

CONFORMITY

EU Declaration of Conformity*

Manufacturer;

Hitachi Construction Machinery (Europe) N.V.

- Amsterdam
  Siciliëweg 5, 1045 AT, Amsterdam, The Netherlands
- Oosterhout
  Souvereinstraat 16, 4903 RH, Oosterhout, The Netherlands

Hitachi Construction Machinery Co.,Ltd.

- Tokyo
  16-1, Higashi ueno 2-chome, Taito-ku, Tokyo, Japan
- Tsuchiura
  650 Kandatsu-machi, Tsuchiura-shi, Ibaraki, Japan

Position and address of the person authorised to compile the technical file

General Manager, Engineering
Siciliëweg 5, 1045 AT, Amsterdam, The Netherlands

Legal Provisions;

Herewith we declare that the machine is in conformity with the relevant provisions of:
2014/53/EU Radio Equipment Directive
2006/42/EC Machine Directive
2000/14/EC Outdoor Noise Directive

Notified body for 2000/14/EC

SNCH
Société Nationale de Certification et d'Homologation
S.à.r.l. 11, route de Luxembourg L-5230 Sandweiler
Conformity assessment procedure followed; Annex VI

The EU Declaration of Conformity will lose its validity for any modification of the machine without approval.

*The EU Declaration of Conformity includes the machine without accessory, unless fitted with accessories approved by Hitachi Construction Machinery.

CONFORMITY

Vibration levels

The level of vibrations transmitted from the machine to the operator depends mainly upon the ground conditions on which the operations take place, the mode of operation of the machine and the equipment used. Exposure to vibrations can be considerably reduced when taking into account the following recommendations:

- Select the right type and size of machine. Use equipment and tools compatible with the machine and suitable for the type of work to be done;
- Adjust the seat to the weight and size of the operator and lock the seat in the correct position;
- Inspect regularly the suspension of the seat. Adjust and repair if necessary;
- Perform maintenance of the machine at the prescribed intervals;
- Operate the equipment in a smooth way, preventing, as far as possible, aggressive movements or excessive loads;
- Adapt travelling speed and –route if necessary and avoid, as far as possible, rough terrain or hitting obstacles to prevent bouncing.
- Keep the terrain in good condition. Remove large obstacles and fill any ditched and holes.

This machine is equipped with an operator's seat, limiting the exposure of the operator's body to vibrations in accordance with ISO 7096:2008 when the machine is used as intended. The operator's seat has been tested in accordance with EM6 input spectral class and a SEAT transmissibility factor <0.7.

The average acceleration value to which the operator's arms are subjected does not exceed 2.5 m/s^2.

The average acceleration value to which the operator's body is subjected does not exceed 0.5 m/s^2.

The results were obtained using an accelerometer during excavating operations.

Note:

The vibration exposure values have been determined under particular operating and terrain conditions and therefore may not be representative for all possible operating conditions within the intended use of the machine.
Consequently, this single Whole-Body vibration emission value is not intended to determine the Whole-Body vibration exposure as required by European Directive 2002/44/EC.
For this purpose it is recommended to conduct measurements under actual working conditions. If this is not feasible, information provided in the table below, taken from ISO/TR 25398:2006(*1), to estimate the daily vibration exposure is recommended.
For regular operating activities, use the typical vibration levels as the estimated level.
With an experienced operator and/or smooth terrain, subtract the standard deviation from the typical vibration level in order to obtain the estimated vibration level.
For aggressive operations and/or rough terrain, add the standard deviation to the typical vibration level in order to obtain the estimated vibration level.

Operating activity	Typical vibration level [m/s^2]			Standard deviation [m/s^2]		
	$1.4*a_{w,eqx}$	$1.4*a_{w,eqy}$	$a_{w,eqz}$	$1.4*s_x$	$1.4*s_y$	s_z
Excavating	0.44	0.27	0.30	0.24	0.16	0.17
Hydraulic breaker application	0.53	0.31	0.55	0.30	0.18	0.28
Mining	0.65	0.42	0.61	0.21	0.15	0.32
Travelling	0.48	0.32	0.79	0.19	0.20	0.23

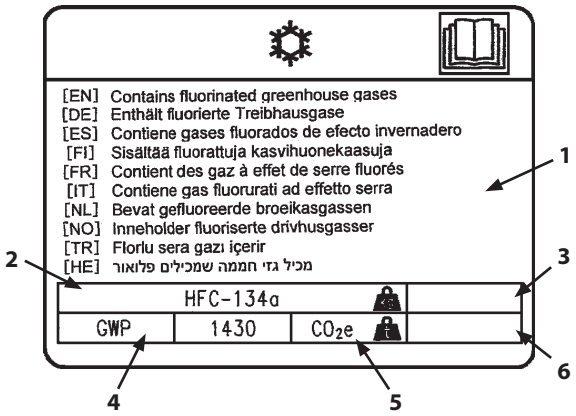
(*1) ISO/TR 25398:2006 Mechanical vibrations – Guidelines for assessment of exposure to whole-body vibration of ride-on machine – Use of harmonized data measured by international institutes, organizations and manufacturers.

CONFORMITY

Information on the fluorinated greenhouse gas contained in the machine

Label on the machine

1. Text showing this machine contains fluorinated greenhouse gases.
2. Type of Refrigerant: HFC-134a
3. Amount of refrigerant in kilogram
4. 'global warming potential (GWP)' means a climatic warming potential of a greenhouse gas relative to that of carbon dioxide.
5. 'tonne(s) of CO_2 equivalent (CO_2e)' means a quantity of greenhouse gases, expressed as the product of the weight of the greenhouse gases in metric tonnes and of their global warming potential.
6. CO_2e in tonnes



MPD8-00-001-1 ja

*Immediately resolve any leakage to limit the environmental impact.

*For the refrigerant and CO_2e amount, please refer to the maintenance page for the Air Conditioner.

*Filling and retrieval should be performed by qualified personnel and waste refrigerant should be disposed in accordance with local regulations.

Engine Importer information

The engine was placed on the EU market by:
Hitachi Construction Machinery (Europe) NV
Souvereinstraat 16, 4903RH Oosterhout, The Netherlands

This version is in effect as of October 1, 2014.

Hitachi Construction Machinery Europe N.V. (HCME) Limited Warranty

This limited warranty ("Warranty") applies only to the Product specified in this Operator's Manual.

This Warranty applies only to the Product manufactured and/or sold by Hitachi Construction Machinery (Europe) N.V. ("HCME") or through its authorized Distributor in the European Union, Switzerland, Iceland and Norway.

This Warranty does not apply to the Product operating in the countries outside the European Union with the exception of Switzerland, Iceland and Norway. (In other areas different warranties may apply. Copies of applicable warranties may be obtained by written request to Hitachi Construction Machinery Co., Ltd.)

HCME warrants the new Product will comply in all material respects with HCME's specifications thereof and will be free of defects proved to have been caused by defective materials and/or faulty workmanship, in the sole judgment of HCME during the following period:

Warranty Period

Twelve (12) months, unlimited hours of operation after the date of delivery to the first User.

This Warranty is subject to the following terms and conditions:

HCME's Obligations & Responsibilities

- Repair the Product in the sole judgment of HCME;
- Repair or provide replacement parts in the sole judgment of HCME (either new, remanufactured, repaired or by HCME approved parts) needed to correct the defects;
- The replaced parts become the property of HCME;
- The replaced parts provided under this Warranty are warranted for the remaining Warranty Period applicable to the Product in which they were installed;
- Provide reasonable and customary labour necessary for the Warranty works through its authorized Distributor at the place of business of HCME or its authorized Distributor during normal working hours.

User's Obligations & Responsibilities

- Operate the Product in accordance with the Operator's Manual and the designated specification of fuel and perform the required maintenance as indicated in the Operator's Manual;
- Provide proof of a delivery inspection to the first User, periodical maintenance compliance (receipts, copies of work orders, invoices and periodical inspection results);
- Pay for travel expenses of HCME or HCME's authorized Distributor (as the case may be) to a job site and transportation expenses;
- Labour costs in excess of those provided under "HCME Obligations & Responsibilities" including but not limited to premium or overtime labour costs;
- Pay for parts shipping charges in excess of those that are considered usual or customary;
- Pay for local taxes and duties if applicable;
- Pay for costs to investigate complaints, unless the problem is caused by a defect in HCME material or workmanship;
- Give a prompt notice (within five (5) working days) of a warrantable failure and/or potential problem;
- Promptly make the Product available for Warranty works;
- Permit HCME and/or its authorized Distributor to get access to all relevant information in order to investigate and/or repair the failure.

Limitations

This Warranty does not apply to service parts, wear parts, consumable parts such as lamps, fuses, V-belts, brake clutch lining, brake disc, clutch disc, ground engaging parts, track, tires, wire ropes, filter elements, oil, grease, grease nipples, etc., unless these parts fail as a result of a failure of a warranted part of the Product. Moreover, this Warranty shall not be applicable in the following cases:

- Failures resulting from unauthorized repair or adjustments in the Product;
- Failures resulting from the attachments, and/or parts, not manufactured and/or sold or approved by HCME;
- Failures resulting from using fuel and/or lubricant other than the type designated by HCME;
- Failures resulting from operation in disregard of the Operator's Manual and/or catalogues and/or such instructions as are issued by HCME for the Product;
- Failures resulting from any abuse, neglect, improper handling and/or insufficient or erroneous maintenance of the Product;
- Failures resulting from floods, lightning, storms, fires, and other Acts of God;
- Failures resulting from the User's delay in prompt repair of the initial problem;
- Failures resulting from any use and/or installation that HCME judges improper;
- Minor change of colour and/or rust on the Product ascribable to normal wear and tear;
- Such phenomena as normal noise, vibration, etc. which will not affect the function of the Product;
- Minor adjustments such as re-torque and tightening of nuts, bolts, hoses, hydraulic lines, fittings and troubleshooting.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES AND THERE IS NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THIS WARRANTY CONSTITUTES USER'S SOLE RIGHT AND REMEDY AND HCME'S SOLE OBLIGATIONS & RESPONSIBILITIES IN RESPECT OF ANY DEFECTIVE OR MALFUNCTIONING PRODUCTS AND IS SUBJECT TO ANY LIMITATIONS OF LIABILITY THAT ARE PART OF ANY SALES AGREEMENT WITH HCME.

FOR THE AVOIDANCE OF DOUBT AND WITHOUT PREJUDICE TO THE FOREGOING, HCME WILL NOT BE LIABLE FOR ANY DIRECT OR INDIRECT DAMAGES (INCLUDING BUT NOT LIMITED TO ANY CONSEQUENTIAL DAMAGES, LOSS OF REVENUES, LOSS OF PROFITS OR BUSINESS INTERRUPTION LOSSES) UNLESS THE DAMAGE IS THE RESULT OF HCME'S WILFULL MISCONDUCT OR GROSS NEGLIGENCE.

EXCEPT AS EXPRESSLY STATED HEREIN, THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, BY OPERATIONS OF LAW OR OTHERWISE, PERTAINING TO THE PRODUCTS.

This version is in effect as of October 1, 2014.

Hitachi Construction Machinery Europe N.V. (HCME) Limited Warranty

IF THIS WARRANTY IS ALSO TRANSLATED INTO ANOTHER LANGUAGE, DIFFERENT FROM ENGLISH, IN CASE OF DISCREPANCIES BETWEEN THE TEXTS, THE TEXT IN ENGLISH LANGUAGE SHALL PREVAIL.

THIS WARRANTY SHALL BE GOVERNED BY AND IS CONSTRUED IN ACCORDANCE WITH THE LAW OF THE NETHERLANDS WITH THE EXCLUSION OF THE UN CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS (CISG). ALL CLAIMS AND DISPUTES ARISING OUT OF OR IN CONNECTION WITH THIS WARRANTY SHALL BE SETTLED BY THE COMPETENT COURT IN AMSTERDAM, THE NETHERLANDS. HOWEVER, HCME SHALL HAVE THE RIGHT TO SUBMIT ANY CLAIM OR DISPUTE TO A COURT THAT WOULD HAVE JURISDICTION IN THE ABSENCE OF THE FOREGOING STIPULATION. AS AN EXCEPTION, IF THE USER IS DOMICILED OUTSIDE THE EUROPEAN UNION, SWITZERLAND, NORWAY OR ICELAND, UPON COMMENCEMENT OF PROCEEDINGS ALL CLAIMS AND DISPUTES ARISING OUT OF OR IN CONNECTION WITH THIS WARRANTY, SHALL BE FINALLY SETTLED IN ACCORDANCE WITH THE ARBITRATION RULES OF THE NETHERLANDS ARBITRATION INSTITUTE (NAI). THE ARBITRAL TRIBUNAL SHALL BE COMPOSED OF THREE ARBITRATORS WHO SHALL DECIDE IN ACCORDANCE WITH THE RULES OF DUTCH LAW. THE PLACE OF ARBITRATION SHALL BE AMSTERDAM, THE NETHERLANDS. THE ARBITRAL PROCEDURE SHALL BE CONDUCTED IN THE ENGLISH LANGUAGE.

Claims under this Warranty should be submitted to a place of business of an authorized HCME's Distributor or directly to HCME. For the information concerning either the address to submit the claims or HCME as the issuer of this Warranty, please write to: Hitachi Construction Machinery (Europe) N.V., Sicilieweg 5, 1045 AT, Amsterdam, The Netherlands.

Hydraulic Excavator ZX85US-6, ZX85USB-6

Operator's Manual (Original Instruction)

Manual part number : ENMDEQ-EN1-1

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