PART NO. ENMDD5-NA1-1

HITACHI

Reliable solutions

Operator's Manual

ZAXIS

345USLC-6N

Hydraulic Excavator

ZX345USLC-6N HYDRAULIC EXCAVATOR OPERATOR'S MANUAL

Hitachi Construction Machinery Co., Ltd.

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ENMDD5-NA1-1

Serial No. 010001 and up

INTRODUCTION

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

This standard specification machine can be operated under the following conditions without being modified.
Atmospheric Temperature: –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.

In this manual, urea water is indicated as DEF/ AdBlue®.
"DEF" stands for the Diesel Exhaust Fluid.
AdBlue® is a registered trademark of the Verband der Automobilindustrie e.V. (VDA).

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.

WARNING

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.
- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel.

This product can expose you to chemicals including Lead and Lead Compounds, and Ethylene glycol, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Battery posts, terminals and related accessories contain lead and lead compounds.
WASH HANDS AFTER HANDLING !
Ethylene Glycol, which is used in some anti-freeze or coolants. No level is considered safe.
DO NOT ingest ethyleneglycol in any manner.

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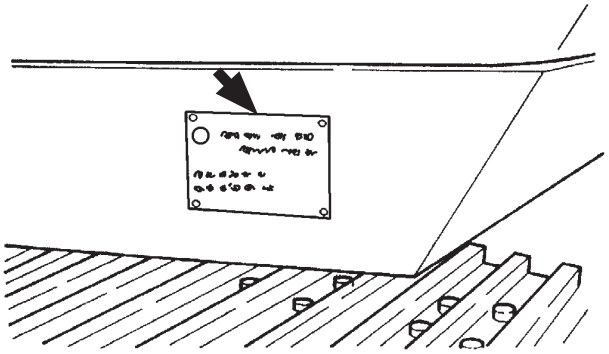
MACHINE NUMBERS

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

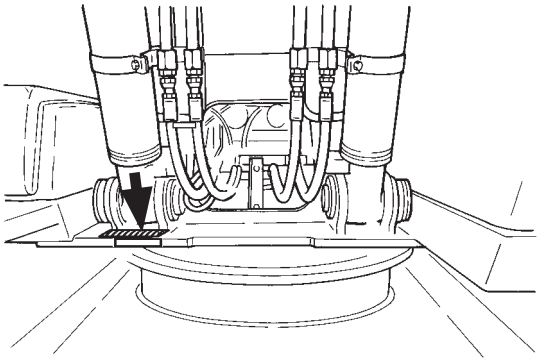


M157-00-001

Machine

TYPE : _____

PRODUCT IDENTIFICATION NUMBER : _____



MDD5-00-001

Product Identification Number

NOTE:

HCMDATA0000100001

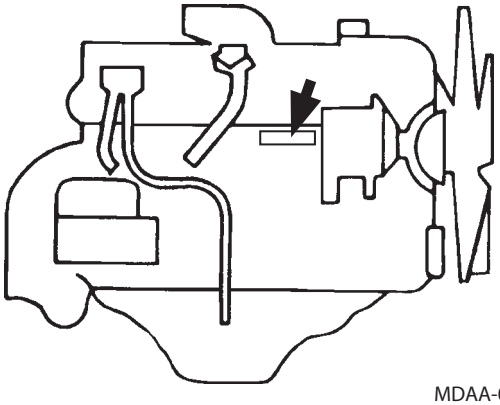
Marks to indicate the start and end of the PIN

PRODUCT IDENTIFICATION NUMBER (PIN)

Engine

TYPE : _____

MFG. NO. : _____

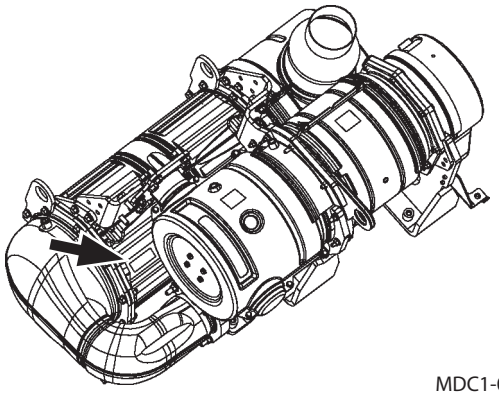


MDAA-00-001

SCR (Selective Catalytic Reduction) Catalyst

TYPE : _____

MFG. NO. : _____



MDC1-01-510

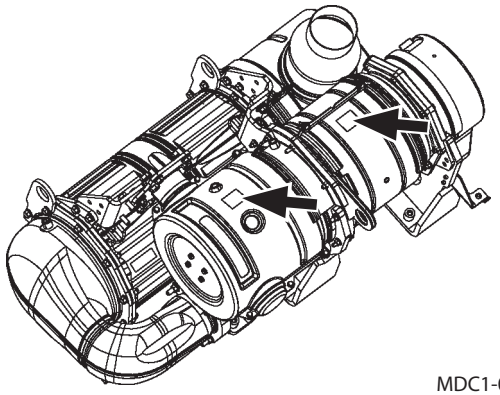
DOC (Diesel Oxidation Catalyst)

TYPE : _____

MFG. NO. : _____

TYPE : _____

MFG. NO. : _____



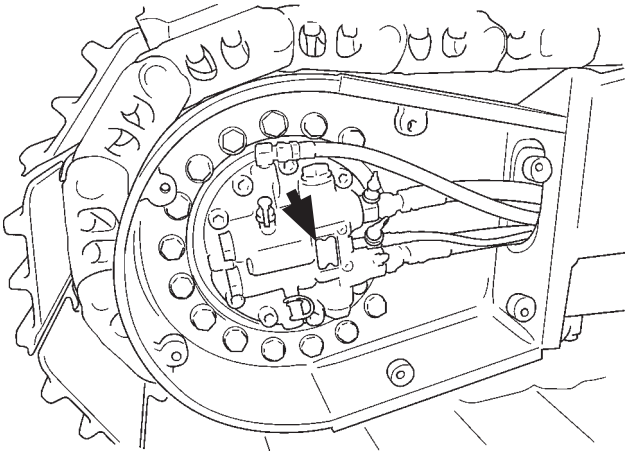
MDC1-01-510

MACHINE NUMBERS

Travel Motor

TYPE : _____

MFG. NO. : _____

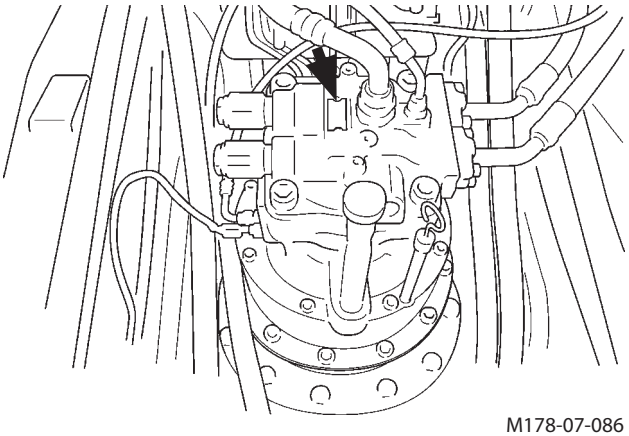


M178-07-047

Swing Motor

TYPE : _____

MFG. NO. : _____

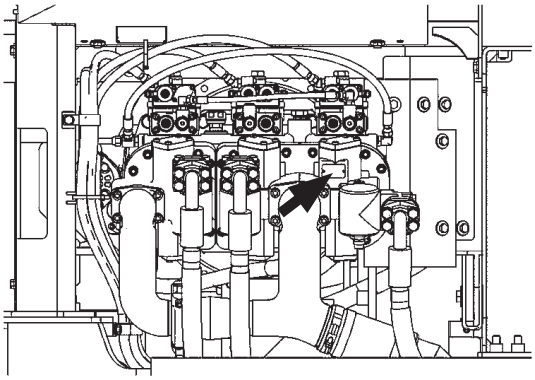


M178-07-086

Hydraulic Pump

TYPE : _____

MFG. NO. : _____



MDD5-00-002

MEMO

Recognize Safety Information

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

SA-2644

Understand Signal Words

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

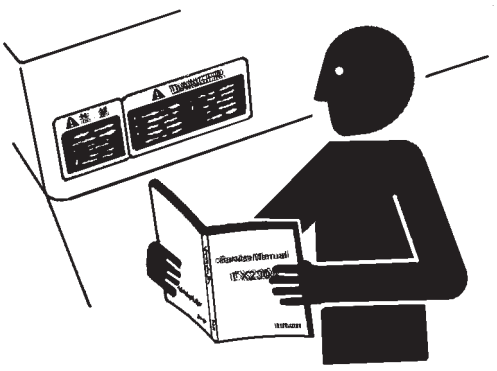
SA-1223

- To avoid confusing machine protection with personal safety messages, a signal word IMPORTANT indicates a situation which, if not avoided, could result in damage to the machine.

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

Follow Safety Instructions

- Carefully read and follow all safety signs on the machine and all safety messages in this manual.
- Safety signs should be installed, maintained and replaced when necessary.
  - If a safety sign or this manual is damaged or missing, order a replacement from your authorized dealer in the same way you order other replacement parts (be sure to state machine model and serial number when ordering).
- Learn how to operate the machine and its controls correctly and safely.
- Allow only trained, qualified, authorized personnel to operate the machine.
- Keep your machine in proper working condition.
  - Unauthorized modifications of the machine may impair its function and/or safety and affect machine life.
  - Do not modify any machine parts without authorization. Failure to do so may deteriorate the 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.



SA-003

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.

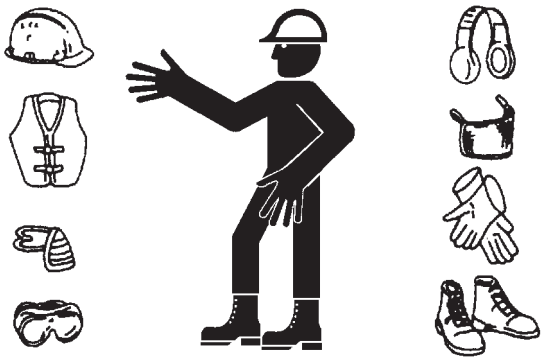
SA-437

Wear Protective Clothing

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

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

  Be sure to wear the correct equipment and clothing for the job. Do not take any chances.
  - Avoid wearing loose clothing, jewelry, or other items that can catch on control levers or other parts of the machine.
- Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating the machine.



SA-438

Protect Against Noise

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

SA-434

Inspect Machine

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

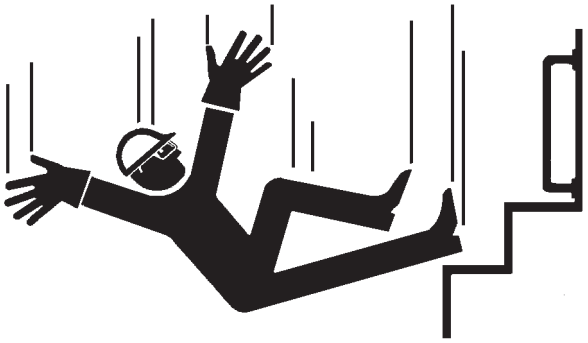
SA-435

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 face the machine and maintain a three-point contact with the steps and handrails.
  - Do not use any controls as hand-holds.
  - Never jump on or off the machine. Never mount or dismount a moving machine.
  - Before getting on or off the machine, check the condition of the steps and handrails for sticking of slippery material like grease or mud. Thoroughly remove such material if stack. In addition, repair the damage to the steps and/or handrails. Retighten loose bolts.
  - Never get on and off the machine with tools in your hands.



SA-439

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

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

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.
  - 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 Mirror section and Rear View Monitor section for information on cleaning the mirrors, camera lens and monitor display.

SA-426

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

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

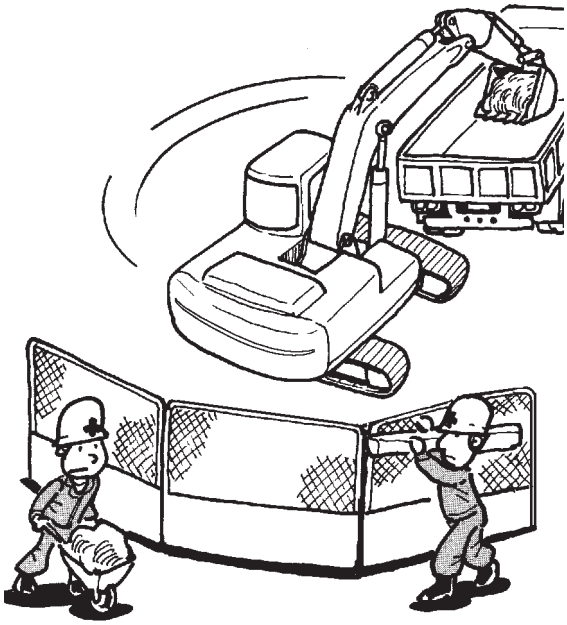
Keep Riders off Machine

- 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

Precautions for Operations

- Investigate the work site before starting operations.
  - Be sure to wear close fitting clothing and safety equipment appropriate for the job, such as a hard hat, etc. when operating the machine.
  - 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.



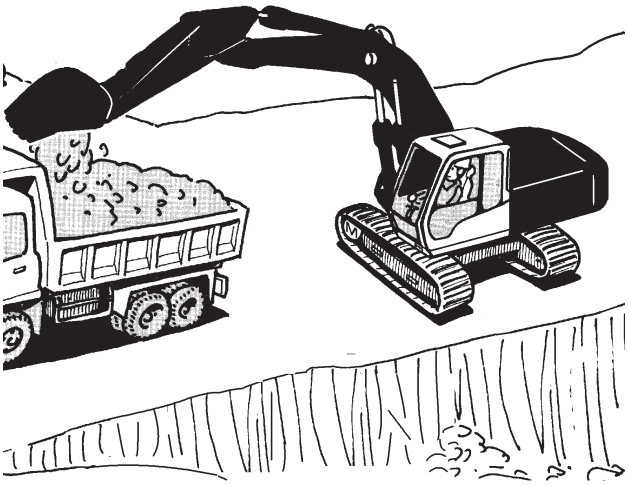
M178-05-007

Investigate Job Site Beforehand

- When working at the edge of an excavation or on a road shoulder, the machine could tip over, possibly resulting in serious injury or death.
  - Investigate the configuration and ground conditions of the job site beforehand to prevent the machine from falling and to prevent the ground, stockpiles or banks from collapsing.
  - Make a work plan. Use machines appropriate to the work and job site.
  - Reinforce ground, edges and road shoulders as necessary. Keep the machine well back from the edges of excavations and road shoulders.
  - When working on an incline or on a road shoulder, employ a signal person as required.
  - Confirm that your machine is equipped 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.

SA-380

- 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.
- 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.

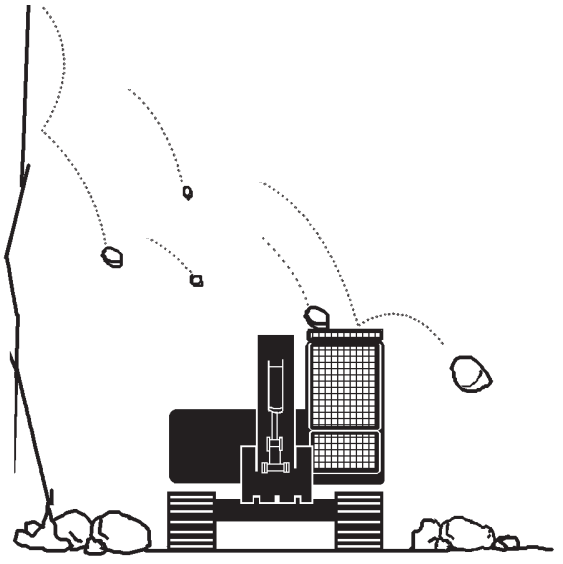


M104-05-016

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

Restriction of Attachment Installation

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

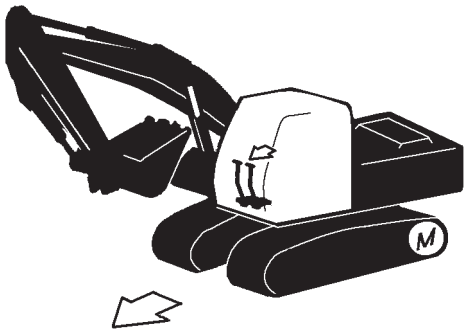
Provide Signals for Jobs Involving Multiple Machines

- 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

Confirm Direction of Machine to Be Driven

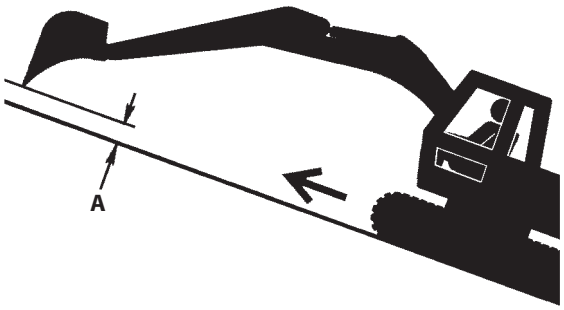
- Incorrect travel pedal/lever operation may result in serious injury or death.
  - Before driving the machine, confirm the position of the undercarriage in relation to the operator's position. If the travel motors are located in front of the cab, the machine will move in reverse when travel pedals/levers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



SA-491

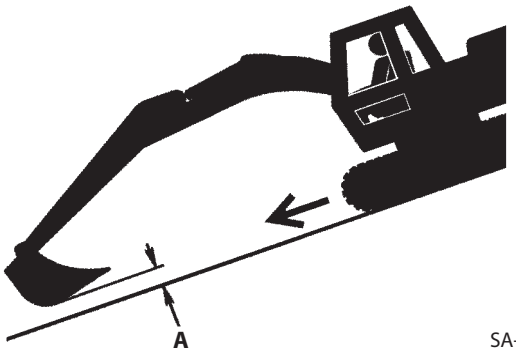
Drive Machine Safely

- Before driving the machine, always confirm that the travel levers/pedals direction corresponds to the direction you wish to drive.
  - Be sure to detour around any obstructions.
  - Avoid traveling over obstructions. Soil, fragments of rocks, and/or metal pieces may scatter around the machine. Do not allow personnel to stay around the machine while traveling.

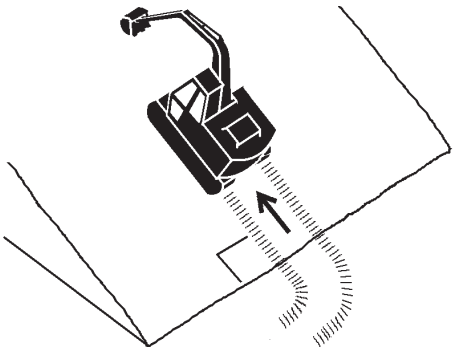


SA-657

- Driving on a slope may cause the machine to slip or overturn, possibly resulting in serious injury or death.
  - Never attempt to ascend or descend 35 degrees or steeper slopes.
  - Be sure to fasten the seat belt.
  - When driving up or down a slope, keep the bucket facing the direction of travel, approximately 0.2 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.

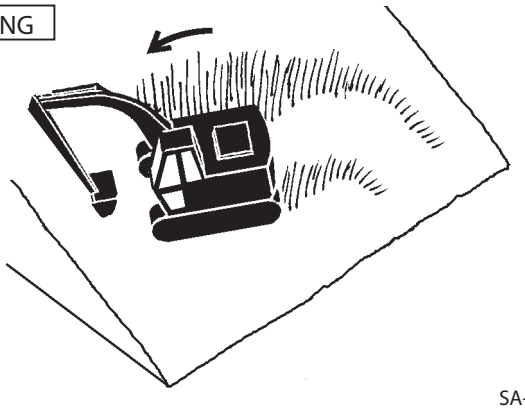


SA-658



SA-441

WRONG



SA-590

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

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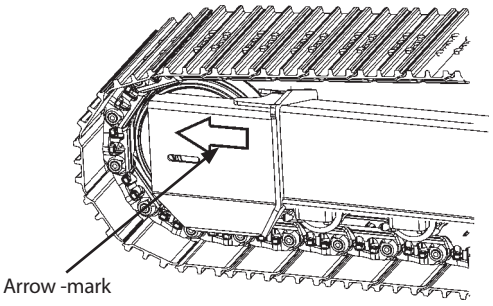

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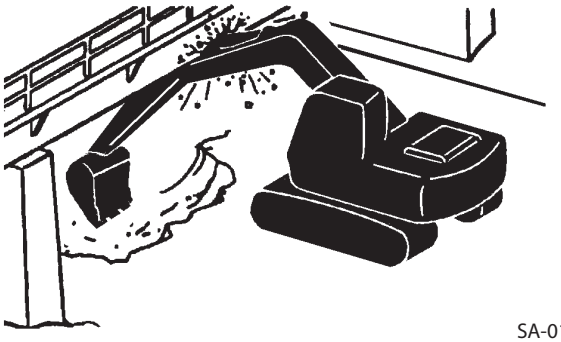


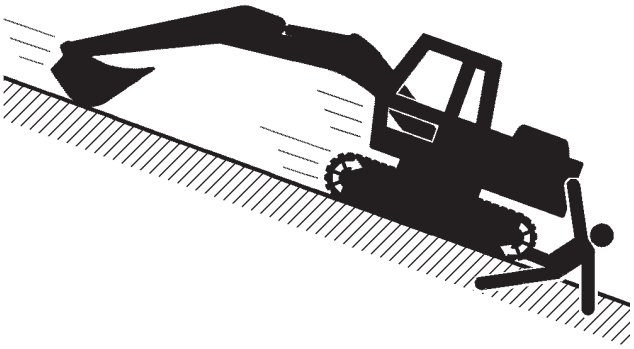
SA-011

Avoid Injury from Rollaway Accidents

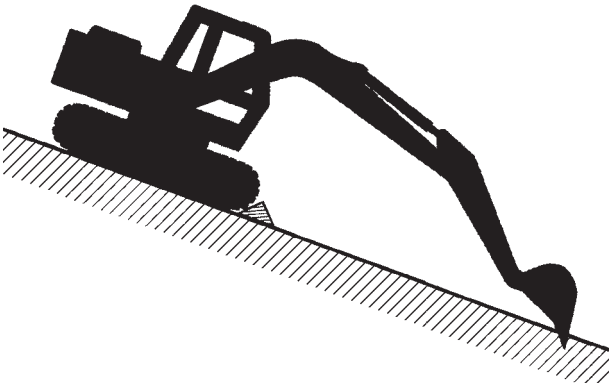
- Death or serious injury may result if you attempt to mount or stop a moving machine.

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.



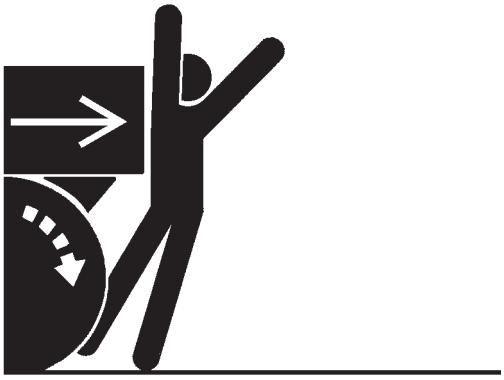
SA-391



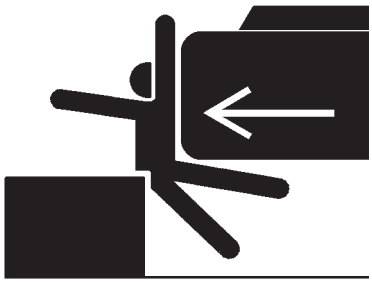
SA-2273

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.
  - Keep windows, mirrors, and lights clean and in good condition.
  - Dust, heavy rain, fog, etc., can reduce visibility. As visibility decreases, reduce speed and use proper lighting.
  - Read and understand all operating instructions in the operator's manual.



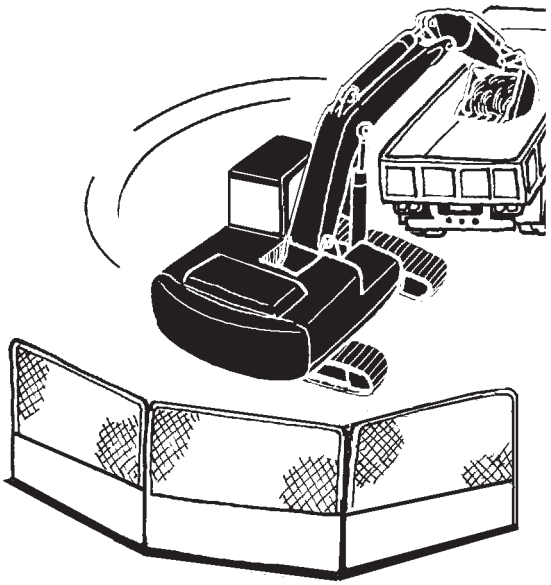
SA-383



SA-384

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

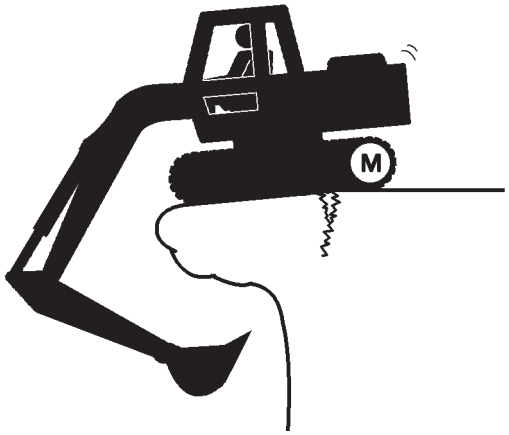
Never Position the Bucket Over Anyone

- 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.

SA-487

Avoid Undercutting

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



SA-488

Avoid Tipping

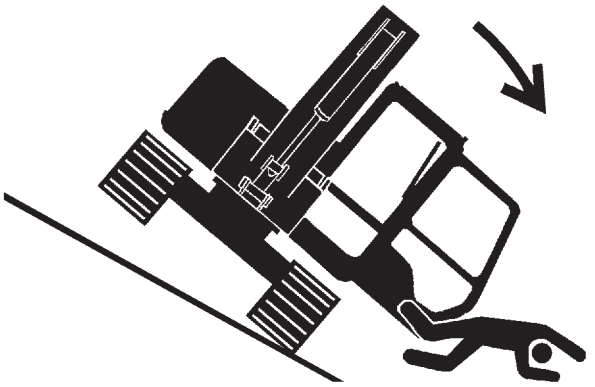
DO NOT ATTEMPT TO JUMP CLEAR OF TIPPING MACHINE --- SERIOUS OR FATAL CRUSHING INJURIES WILL RESULT

MACHINE WILL TIP OVER FASTER THAN YOU CAN JUMP FREE

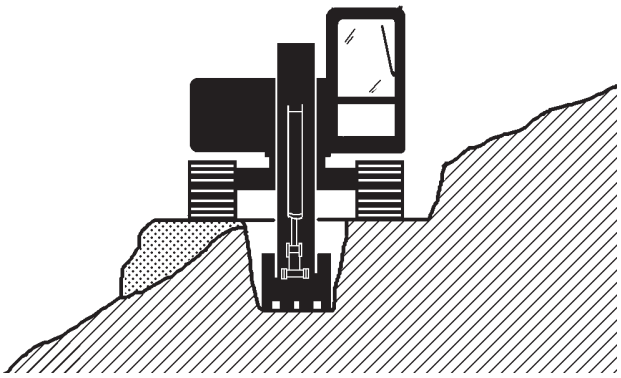
FASTEN YOUR SEAT BELT

- 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



SA-440

Never Undercut a High Bank

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

SA-489

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

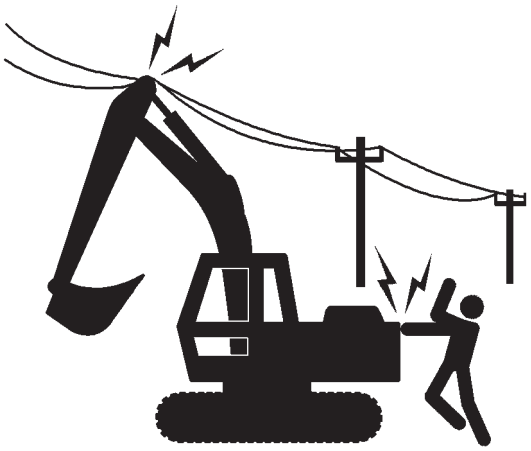
Operate with Caution

- 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

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

Precautions for Lightning

- Lightning may strike the machine.

  If lightning comes close, immediately stop the operation, and take the following action.

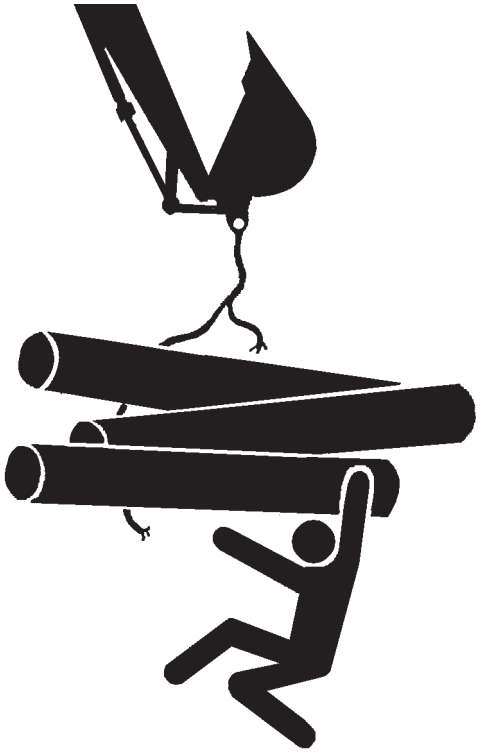
  - When you are around the machine or operating cab-less machine, evacuate to a safe place far away from the machine.
  - When you are in the cab, stay in the cab until lightning has passed and safety is assured. Close the cab doors and windows. Lower the bucket to the ground, and stop the engine. Put 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

Object Handling

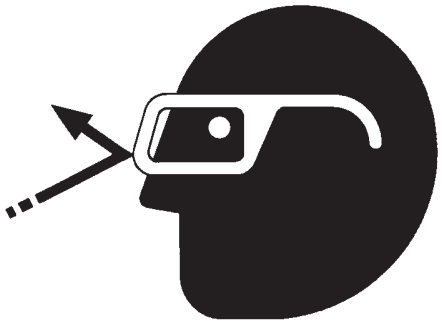
- If a lifted load should fall, any person nearby may be struck by the falling load or may be crushed underneath it, resulting in serious injury or death.
  - When using the machine for craning operations, be sure to comply with all local regulations.
  - Do not use damaged chains or frayed cables, slings,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

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

Park Machine Safely

To avoid accidents:
- Park machine on a firm, level surface.
- Lower the bucket and blade 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

Handle Fluids Safely–Avoid Fires

- Handle fuel with care; it is highly flammable. If fuel ignites, an explosion and/or a fire may occur, possibly resulting in serious injury or death.
  - Do not refuel the machine while smoking or when near open flame or sparks.
  - Always stop the engine before refueling the machine.
  - Fill the fuel tank outdoors.

- All fuels, most lubricants, and some coolants are flammable.
  - Store flammable fluids well away from fire hazards.
  - Do not incinerate or puncture pressurized containers.
  - Do not store oily rags; they can ignite and burn spontaneously.
  - Securely tighten the fuel and oil filler caps.

SA-018

SA-019

Transport Safely

- Take care the machine may turn over when loading or unloading the machine onto or off of a truck or trailer.
  - Observe the related regulations and rules for safe transportation.
  - Select an appropriate truck or trailer for the machine to be transported.
  - Be sure to use a signal person.
  - Always follow the following precautions for loading or unloading:

1. Select solid and level ground.
2. Always use a ramp or deck strong enough to support the machine weight.
3. Turn auto-idle switch OFF.
4. Always select the slow speed mode with the travel mode switch.
5. Never load or unload the machine onto or off a truck or trailer using the front attachment functions when driving up or down the ramp.
6. Never steer the machine while on the ramp. If the traveling direction must be changed while 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.

SA-395

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

Practice Safe Maintenance

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

SA-028

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

SA-527

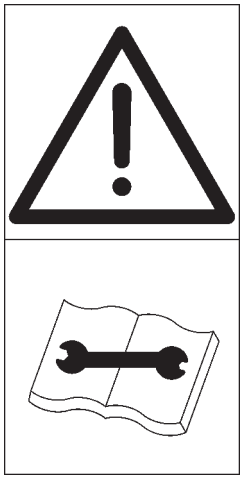
- If a maintenance procedure must be performed with the engine running, do not leave the machine unattended.
- If the machine must be raised, maintain a 90 to 110˚ angle between the boom and arm. Securely support any machine elements that must be raised for service work.
- Inspect certain parts periodically and repair or replace as necessary. Refer to the section discussing that part in the "MAINTENANCE" chapter of this manual.
- Keep all parts in good condition and properly installed.
- Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.
- When cleaning parts, always use nonflammable detergent oil. Never use highly flammable oil such as fuel oil and gasoline to clean parts or surfaces.
- Turn the battery disconnect switch to OFF before adjusting the electrical systems or performing welding on the machine.

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

SA-037

Warn Others of Service Work

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



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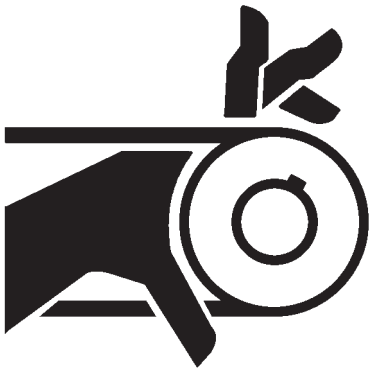
Support Machine Properly

- 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

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.



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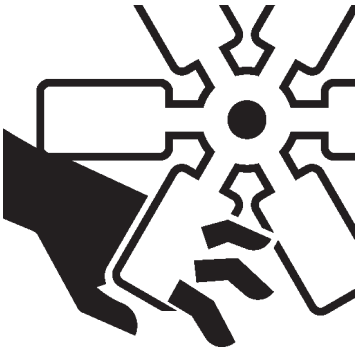
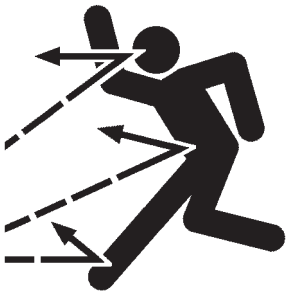


SA-2294

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.

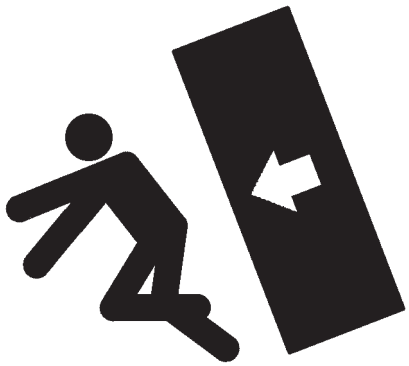


SA-344

- 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

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.
  - The hydraulic oil tank is pressurized. Again, be sure to release all pressure before removing the cap.

SA-039

Hot fluids and surfaces:

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

SA-225

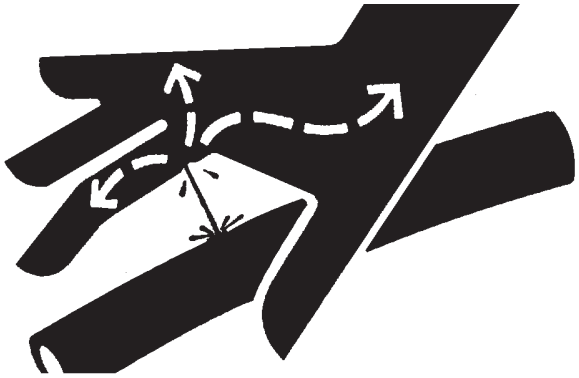
Replace Rubber Hoses Periodically

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

SA-019

Avoid High-Pressure Fluids

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



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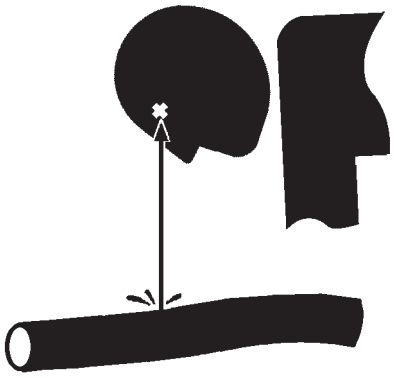
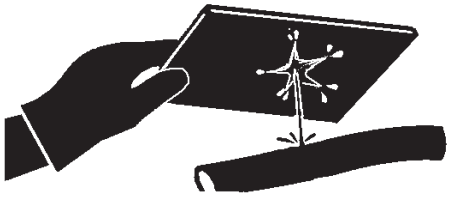


SA-292



SA-044

Prevent Fires

Check for Oil Leaks:

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

SA-019

Check for Shorts:

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

Clean up Flammable Materials:

- Spilled fuel 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.
  - 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

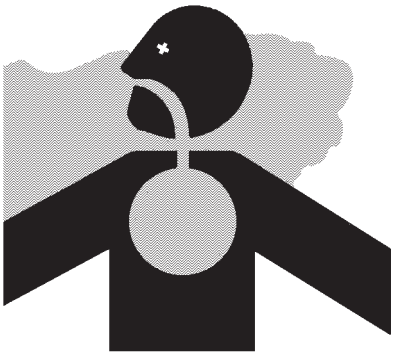
- If a fire breaks out, evacuate the machine in the following way:
  - Stop the engine by turning the key switch to the OFF position if there is time.
  - Use a fire extinguisher if there is time.
  - Exit the machine.
- In an emergency, if the cab door or front window can not be opened, break the front 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

SS-1510

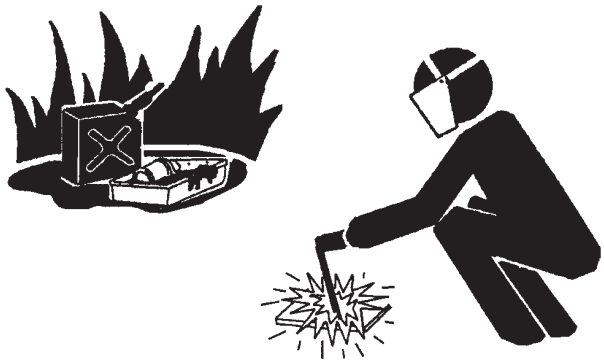
Beware of Exhaust Fumes

- 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.



SA-016

Precautions for Welding and Grinding



SA-818

- 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.
  - Turn the battery disconnect switch to the OFF position before performing welding on the machine.
- 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.

Avoid Heating Near Pressurized Fluid Lines

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

SA-030

Avoid Applying Heat to Lines Containing Flammable Fluids

- Do not weld or flame cut pipes or tubes that contain flammable fluids.
- Clean 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

SA-029

- 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.

Beware of Asbestos and Silica Dust and Other Contamination

SA-029

- 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.

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.
  - 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.

SA-032

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

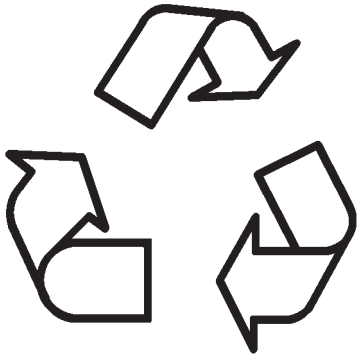
Handle Chemical Products Safely

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

SA-2579

Dispose of Waste Properly

- Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with Hitachi equipment includes such items as oil, fuel, coolant, 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.
  - Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your authorized dealer.



SA-226

Never Ride Attachment

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

Notes on Aftertreatment Device

About Aftertreatment Device

The aftertreatment device removes particulate matter (PM) and NOx (Nitrogen Oxide) from the exhaust gas. Follow the instructions below to prevent the aftertreatment device from being damaged.

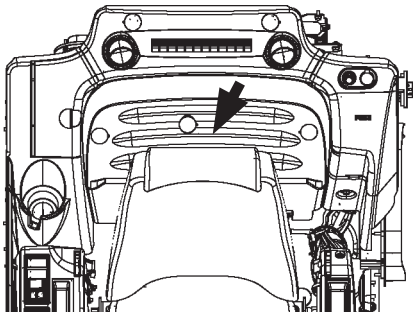
WARNING: Exhaust gas from the aftertreatment device, muffler, exhaust piping and tail piping becomes hot during and right after engine running and regeneration of aftertreatment device. Keep away from the exhaust system or hot gas from the exhaust piping during regeneration. Be careful to avoid skin contact with exhaust gas. It may cause severe burns.

- White smoke may be generated during aftertreatment device regeneration. Do not attempt to perform aftertreatment device manual regeneration in a badly ventilated area.
- Do not touch water coming directly out of the aftertreatment device. The water is mildly-acidic by oxidation catalyst mounted in the aftertreatment device. If filter water spills on your skin, immediately flush it out with clean water.

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.

Precautions for Communication Terminal Equipment



SA-2302

This machine has a communication terminal equipment emitting electrical waves installed inside the rear tray situated at the back of the operator's seat. There is a possibility that a medical device, including an implantable device such as a cardiac pacemaker, could be affected and malfunction due the electrical waves emitted from the communication terminal equipment.

Any person fitted with a medical device such as the above should not use this machine, unless the medical device and the rear tray are at least 22 centimeters apart at all times. If this condition cannot be met, please contact your authorized dealer and have the person in charge stop the communication terminal equipment from functioning completely, and confirm that it is not emitting electrical waves.
This machine is equipped with a communication terminal type A or type B.
Consult your nearest authorized dealer for the type of communication terminal.

Specific Absorption Rate ("SAR") (measured by 10 g per unit) of communication terminal equipments:

	Type A	Type B
E-GSM900	0.573 W/kg (914.8 MHz)	0.12 W/kg (897.6 MHz)
DCS-1800	0.130 W/kg (1710.2 MHz)	0.06 W/kg (1748.0 MHz)
WCDMA Band I	0.271 W/kg (1950.0 MHz)	0.05 W/kg (1950.0 MHz)
WCDMA Band VIII	-	0.10 W/kg (892.6 MHz)

*This data was measured by having each type of communication terminal equipment, such as the communication terminal equipment used with this machine, and a human body set apart by 3 centimeters.
* SAR is a measure of the amount of radio frequency energy absorbed by the body when using a wireless application such as a mobile phone.

In Japan: *Under the Japanese Radio Act and other relevant Japanese regulations, the maximum SAR value is 2 W/kg (as of March 2010).

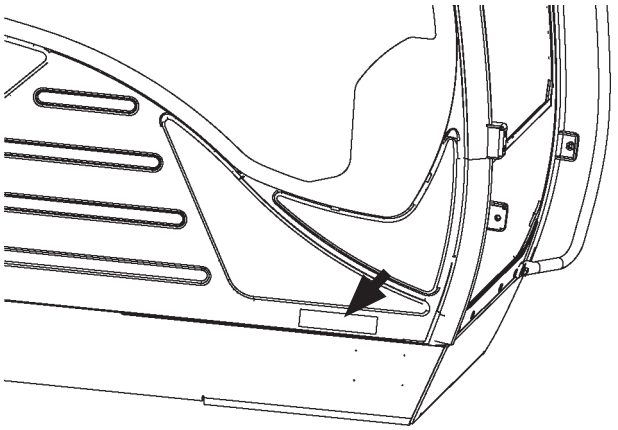
In EU Member nation: *Under the "Council Recommendation 1999/519/EC 12 July 1999'; the maximum SAR value is 2 W/kg (as of March 2010).

- Do not attempt to disassemble, repair, modification and displacement of the communication terminal, antenna and cables. Failure to do so may cause damage or fire on the machine and the communication terminal. (Before removing or installing the communication terminal, consult your authorized dealer.)

- Do not pinch or forcibly pull cables, cords and connectors. Failure to do so may cause damage or fire on the machine and the communication terminal due to short/broken circuit.

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.



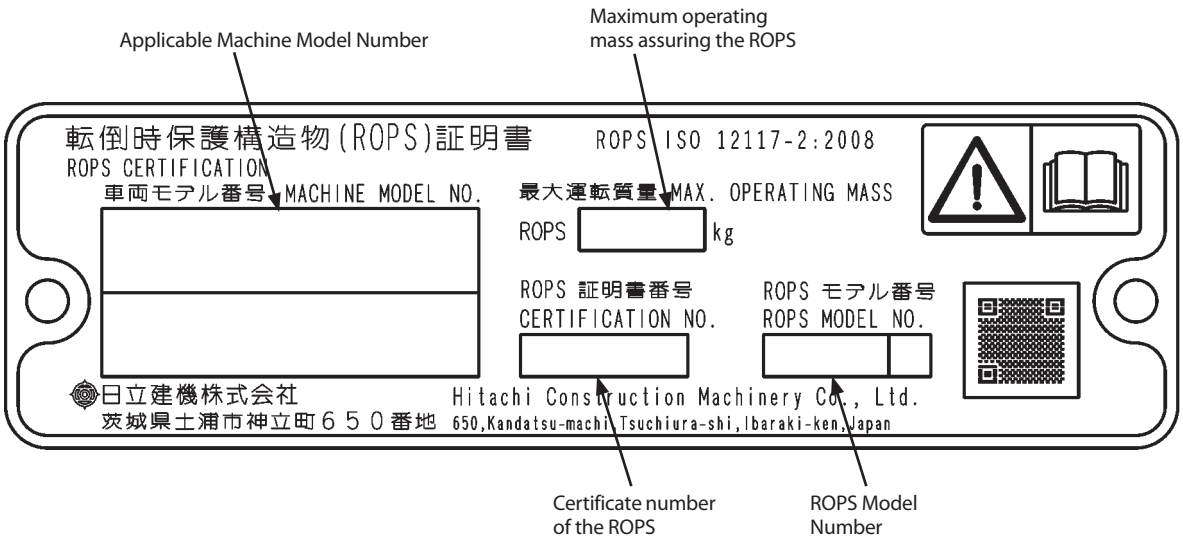
SS-3636

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 operator fastening the seat belt, the operator may become injured, may be thrown out from 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 mass is lower than the maximum operating mass described in the ROPS certification.
- The ROPS is properly installed.
- No modification is made to the ROPS.
- The ROPS is free from damage.



SS-3944

Visibility Map

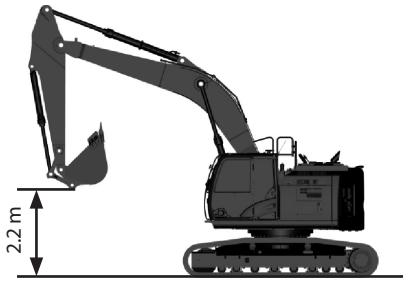
Personal Hazard

This machine complies with the essential health and safety requirements for visibility set out by Machinery Directive 2006/42/EC. The map shows the residual maskings (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 shown 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):	1.2m to 1.5m
(1mRB to VTC/on VTC):	Ground Level
Operator eye Height:	1.2m from the cab floor
Machine Configuration:	Monoblock Boom
Machine Position:	Travel Position (For the detail position, see the image below)
Applicable visual aids:	1. standard mirror(s) 2. standard rear view camera

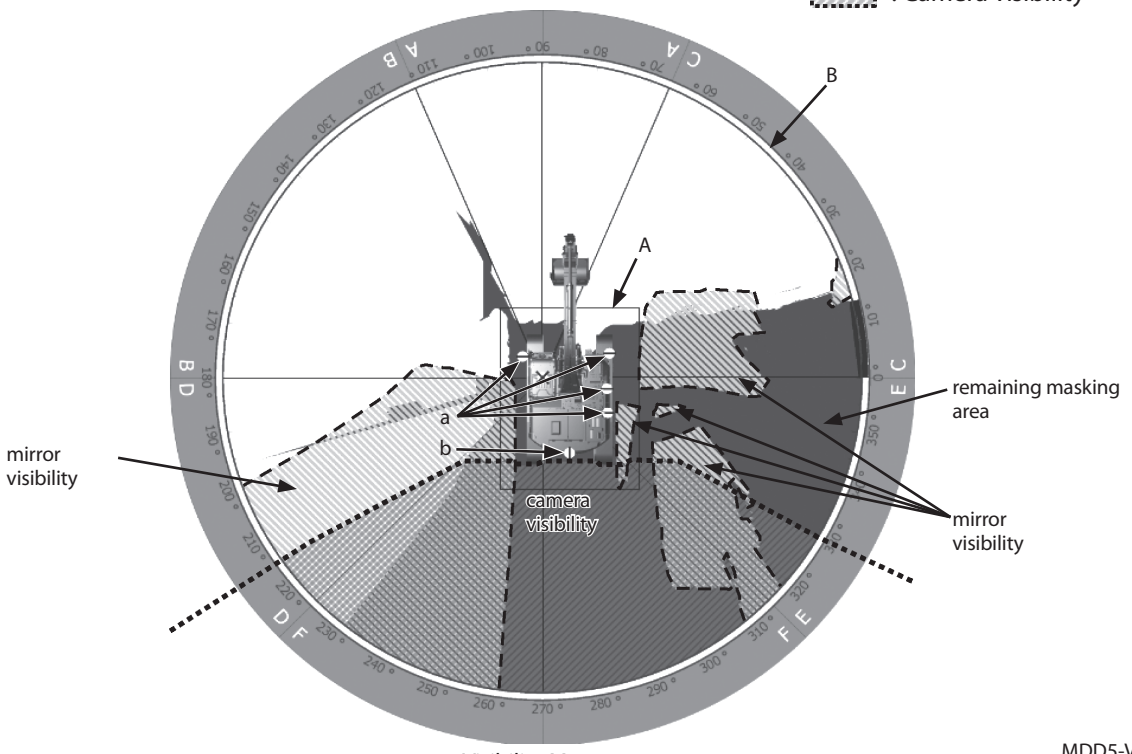


Machine Position Image

MDD5-VM-001

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

: Masking area
: Mirror visibility
: Camera visibility

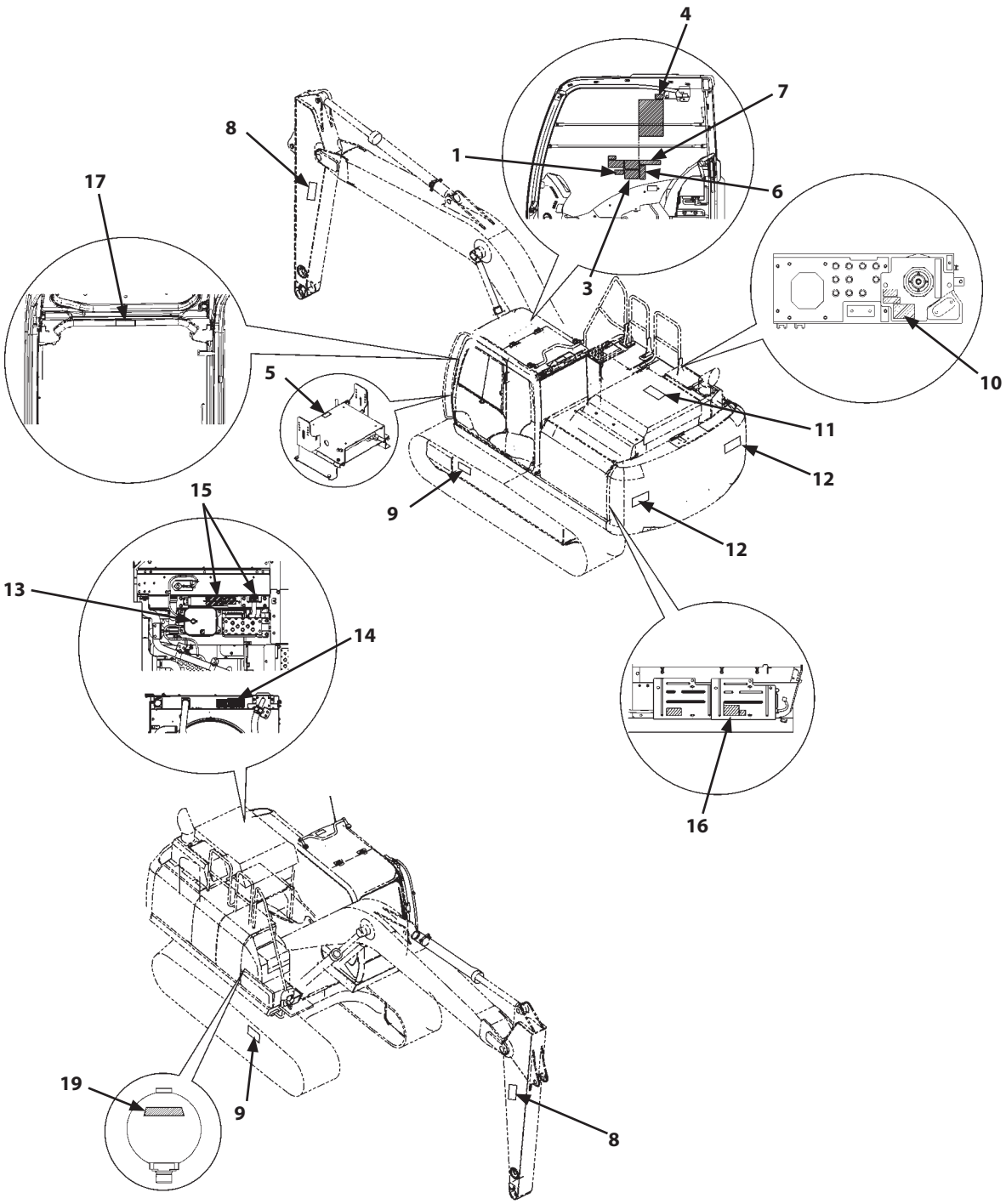


Visibility Map

MDD5-VM-002

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.

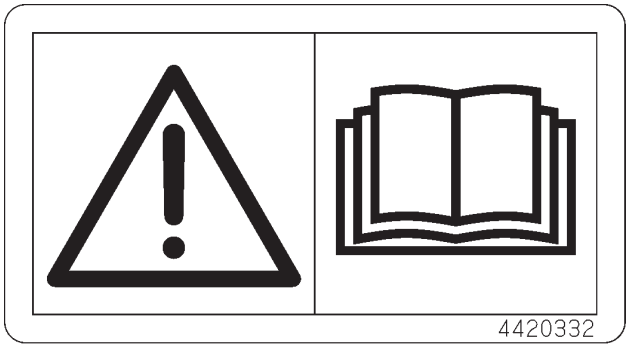


SS-4029

1.

WARNING!

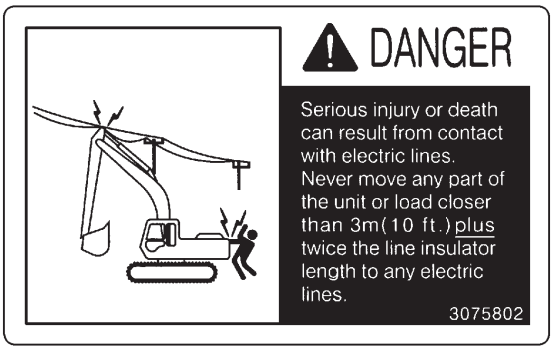
Prior to operation, maintenance, disassembling, and transportation of the machine, be sure to read and understand the Operator's Manual.



SS4420332-2

3.

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



SS-862

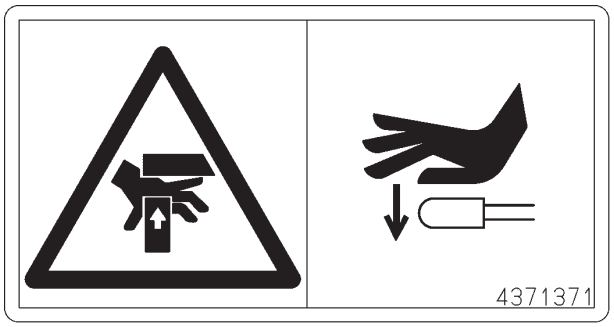
4.

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

SS-863

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

6.

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

SS3088058

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.

SS-859

8.

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

SS3092349

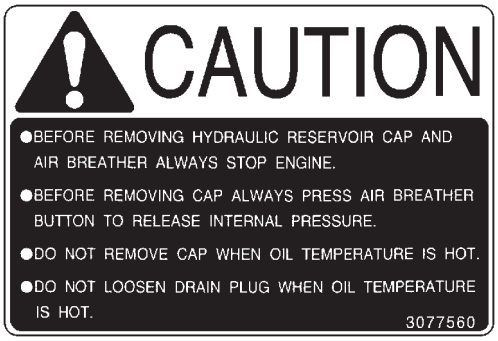
9.

Sign indicates a hazard of a flying plug from track adjuster that could cause injury.
Read manual before adjusting track for safe and proper handling.

SS-408

10.

Sign indicates a burn hazard from 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.



SS3077560

11.

Sign indicates a hazard of falling.
Do not stand on this place.

SS3092351

12.

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

SS-024

13.

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.

SSYA00036802-1

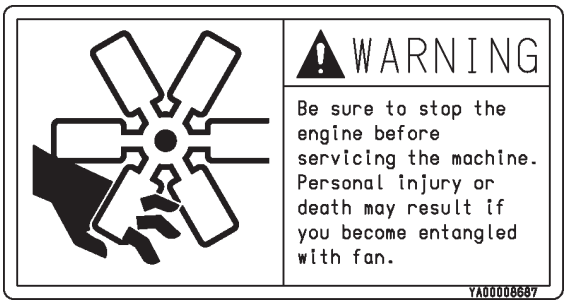
14.

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

SS3092352

15.

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



SSYA00008687

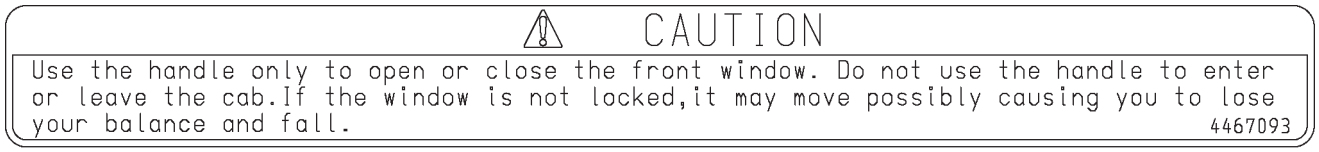
16.

Sign indicates an explosion hazard.
Keep fire and open flames away from this area.
Skin contact with electrolyte will cause burns. Splashed electrolyte into eyes will cause blindness. Take care not to touch electrolyte.

SS-411

17.

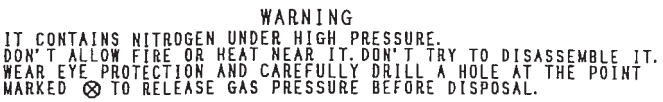
Use the handle only to open or close the front window. Do not use the handle to enter or leave the cab. If the window is not locked, it may move possibly causing you to lose your balance and fall.



SS4467093-2

19.

WARNING
IT CONTAINS NITROGEN UNDER HIGH PRESSURE.
DON'T ALLOW FIRE OR HEAT NEAR IT. DON'T TRY TO DISASSEMBLE IT.
WEAR EYE PROTECTION AND CAREFULLY DRILL A HOLE AT THE POINT MARKED × TO RELEASE GAS PRESSURE BEFORE DISPOSAL.

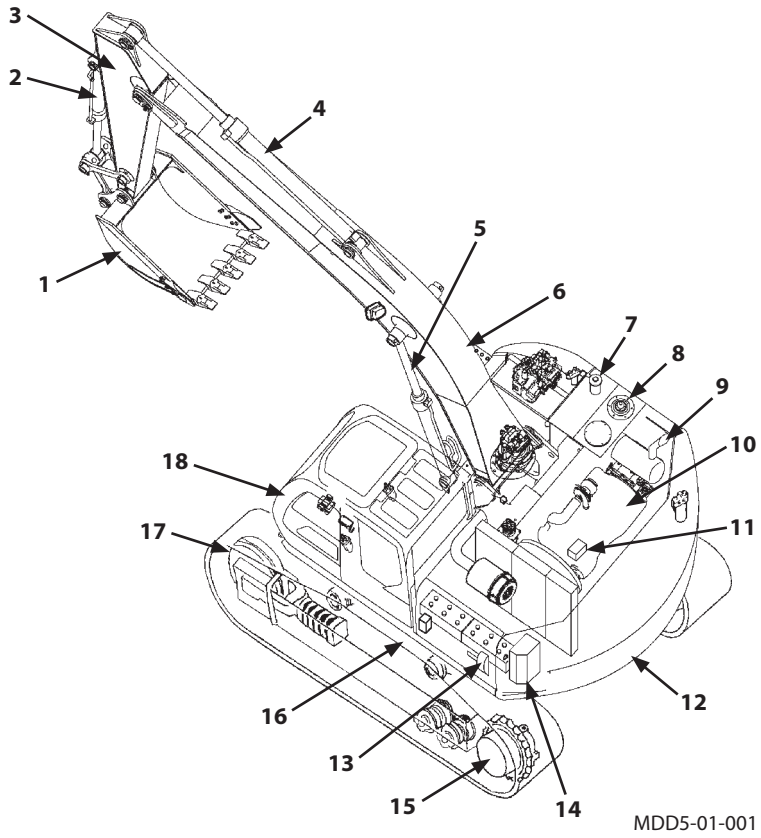


SS-3212

MEMO

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- Aftertreatment Device
10- Engine
11- Expansion Tank
12- Counterweight
13- Battery Disconnect Switch
14- DEF/AdBlue® Tank
15- Travel Device
16- Track
17- Front Idler
18- Cab



MDD5-01-001

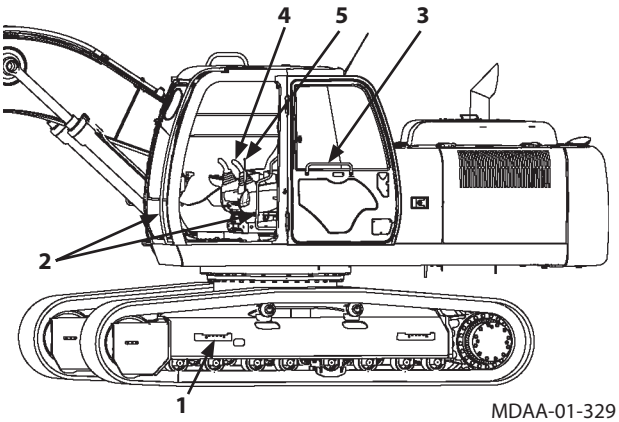
NOTE: A typical model is shown in the right. Some parts may differ depending on the model of the machine.

Getting ON and OFF the Machine

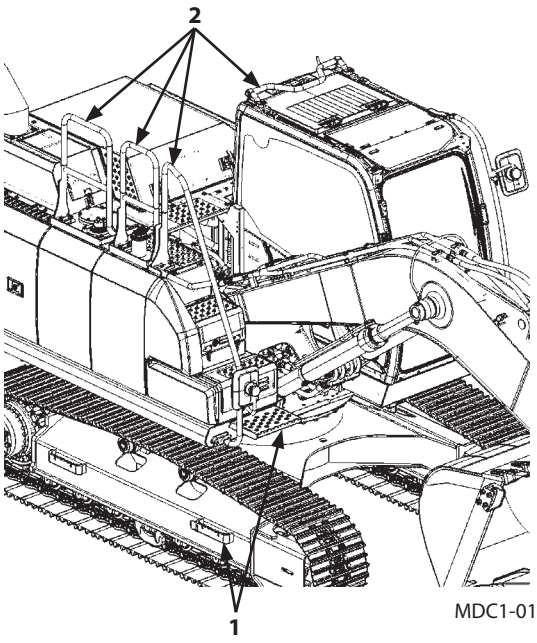
Footholds (1) and handrails (2) are provided around the machine for safe entry and exit to the cab.
They also allow for safe inspection and maintenance.
Never jump on or off the machine, it is very dangerous.

⚠ WARNING:

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



MDAA-01-329



MDC1-01-540

About Aftertreatment Device

The aftertreatment device removes particulate matter (PM) and nitrogen oxide (NOx) from the exhaust gas. Follow the instructions below to prevent the aftertreatment from being damaged.

⚠ WARNING:

- **Exhaust gas from the aftertreatment device, muffler, exhaust piping and tail piping becomes hot during and just after engine running and regeneration of aftertreatment device. Pay attention not to let your skin contact any part of exhaust system or hot gas from the exhaust piping, as it may cause severe burns.**
- **If flammable materials such as dead leaves or paper scraps are around the aftertreatment device, they may cause a fire.**
- **To avoid burns, stop the engine and make sure the engine has sufficiently cooled down before performing maintenance.**

IMPORTANT:

- **Be sure to use fuel that complies with JIS K-2204, EN-590 or ASTM D-975 that contains 15 ppm or lower sulfur. If the fuel described above is not used, exhaust gas that exceeds regulation values may be discharged and serious engine problems may occur.**
- **Refill DEF/AdBlue® which meets Japanese Industrial Standards (JIS) or International Organization for Standardization (ISO). If improper liquid (diesel oil, kerosene or gasoline) is refilled in the DEF/AdBlue® tank, fire or system failure may result.**
- **Use only genuine Hitachi engine oil. Using engine oil other than Hitachi genuine oil may result in malfunction of the aftertreatment device.**
- **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 aftertreatment device, leading to malfunction.**

- **Do not modify the machine without authorization. Never attempt to modify the air inlet and exhaust parts such as the air duct, aftertreatment device and the exhaust piping. Also never attempt to disassemble the aftertreatment device. Avoid giving shocks on the aftertreatment device by striking elements with other objects or dropping the device. Failure to do so may affect the aftertreatment device, possibly damaging it or lowering its performance.**
- **White smoke may be generated during the aftertreatment device regeneration. Do not attempt to perform a manual regeneration in a poorly ventilated area.**
- **Consult your authorized dealer for checking or repairing the aftertreatment device.**

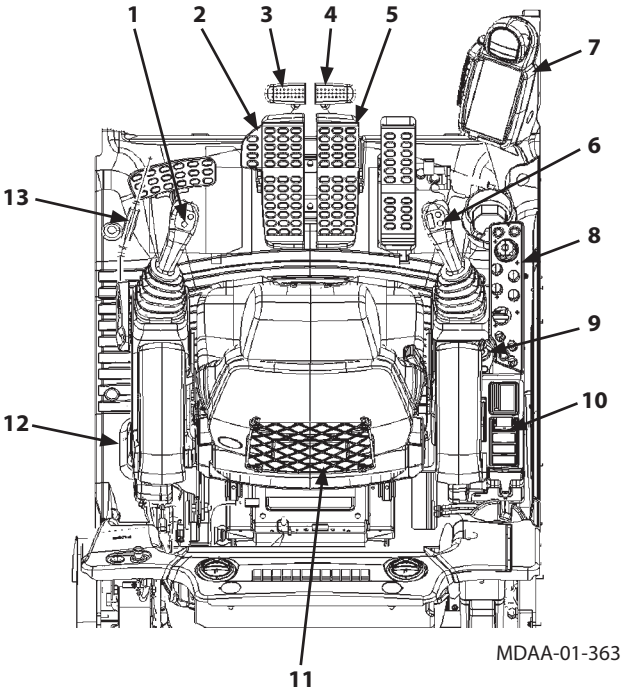
NOTE:

- *White deposits may accumulate inside the aftertreatment device. The aftertreatment device is automatically regenerated to remove accumulated white deposits at regular intervals. It is called auto-regeneration. The auto-regeneration may start during operation of the machine; you can continue to operate the machine. (Refer to the page 1-25)*
- *Do not stop the engine during regeneration unless absolutely necessary.*
- *The auto-regeneration may be terminated depending on the machine operating condition.*
- *Usually, auto-regeneration starts 30 hours after the previous regeneration (either auto or manual).*

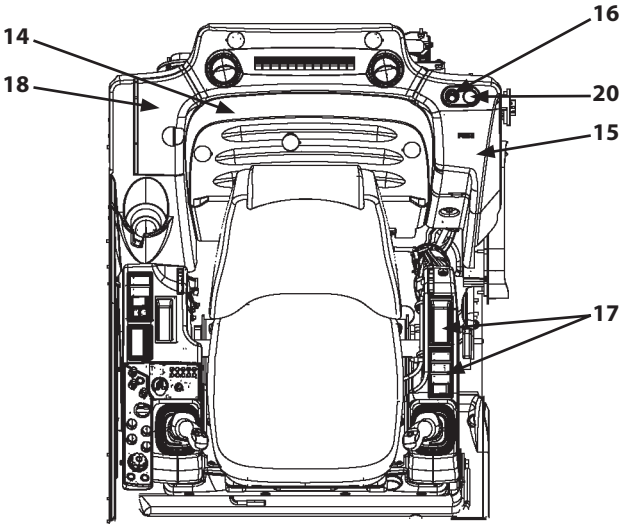
- *If auto regeneration did not complete, and 38 hours have passed since the previous regeneration, an aftertreatment device regeneration request will blink on the monitor. (Refer to the page 1-26) Perform manual regeneration following the specified procedure. (Refer to the page 1-27)*
- *When the machine is operated without performing manual regeneration, the aftertreatment device may be damaged. Immediately move the machine to a safe area and perform manual regeneration.*
- *If approximately 48 hours have passed without regeneration being carried out, the engine trouble alarm will be displayed on the monitor (Refer to the page 1-26). Consult your authorized Hitachi dealer.*
- *Both auto and manual regenerations restore aftertreatment device function. It is not a malfunction.*
- *White smoke may be emitted for several minutes after the engine starts, this is not a malfunction.*

Cab Features

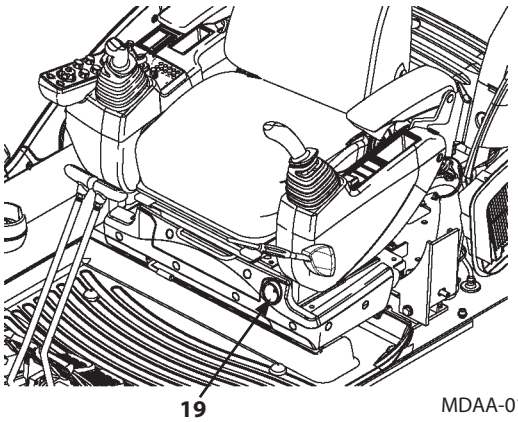
1- Left Control Lever/Horn Switch
2- Left Travel Pedal
3- Left Travel Lever
4- Right Travel Lever
5- Right Travel Pedal
6- Right Control Lever/Power Boost Switch
7- Multi Function Monitor Panel
8- Switch Panel
9- Key Switch
10- Regeneration Switch
11- Operator's Seat
12- Cab Door Release Lever
13- Pilot Control Shut-Off Lever
14- Glove Compartment
15- Fuse Box
16- Cigar Lighter
17- Switch Panel (for Optional Equipments)
Glove Compartment (without Optional Equipment)
18- Glove Compartment (Hot and Cool Box)
19- Engine Stop Switch
20- 12 V Power Supply



MDAA-01-363



MDAA-01-289



MDAA-01-290

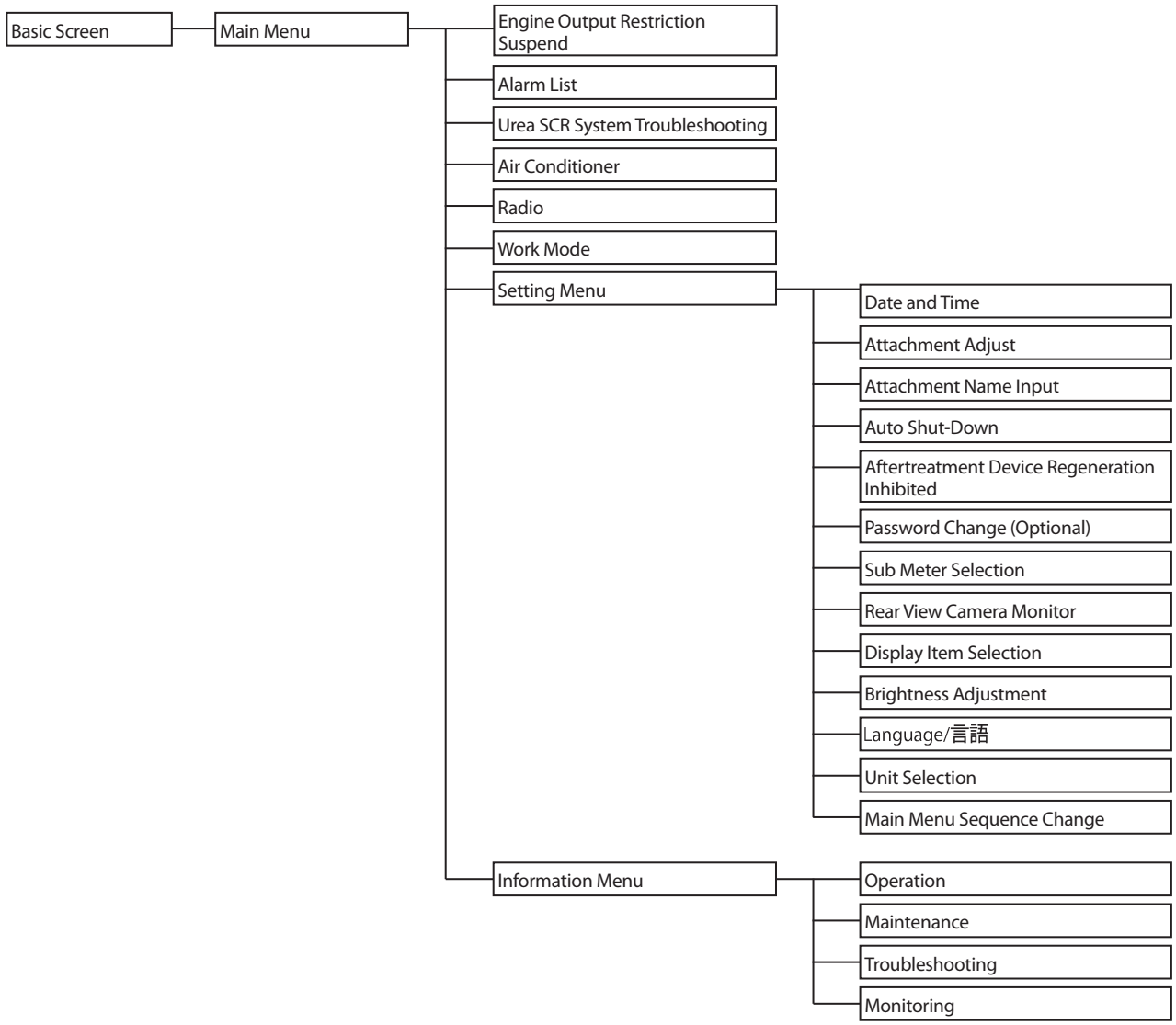
Multi Function Monitor

Feature

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.
There are 8 menus, and a further 17 sub menus.



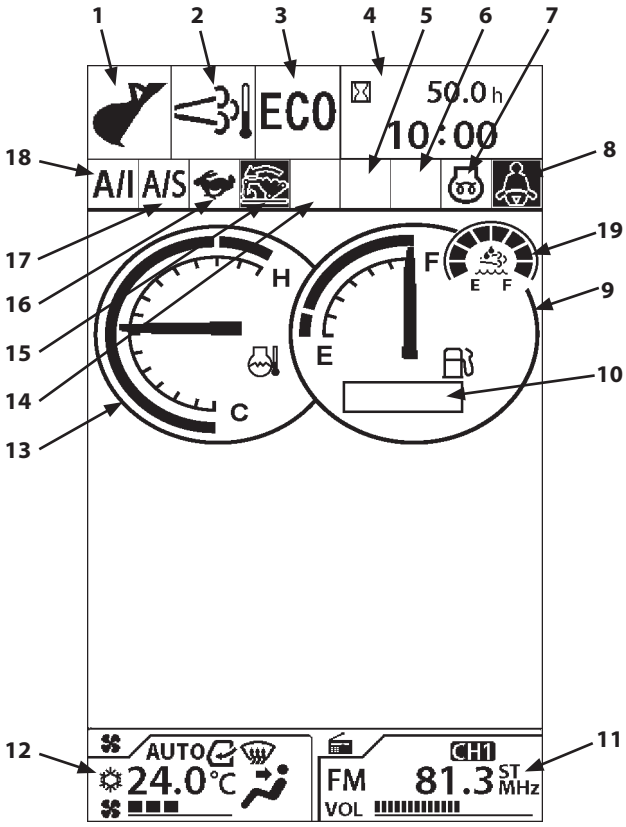
Default Setting

Function	Item	Default
Auto Shut-Down	ON/OFF of Auto Shut-down	OFF
	Setting Time	1 min
Aftertreatment Device 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- Aftertreatment Device Display
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 Display
11- Radio Display
12- Air Conditioner Display
13- Coolant Temperature Gauge
14- Auxiliary
15- Overload Alarm Display
16- Travel Mode Display
17- Auto Shut-Down Display
18- Auto-Idle Display
19- DEF/AdBlue® Gauge



MDC1-01-020EN

How to Use Screens

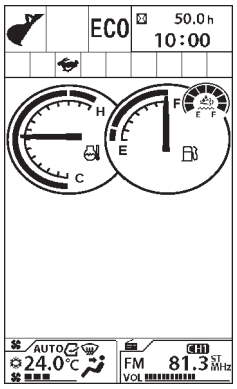
Displaying Basic Screen

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 will be displayed. When the key switch is turned from ACC to ON position, the basic screen will be displayed.

Starting Screen

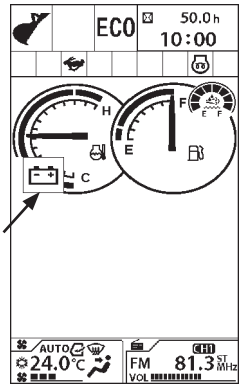
MDAA-01-003EN



Basic Screen

MDC1-01-001

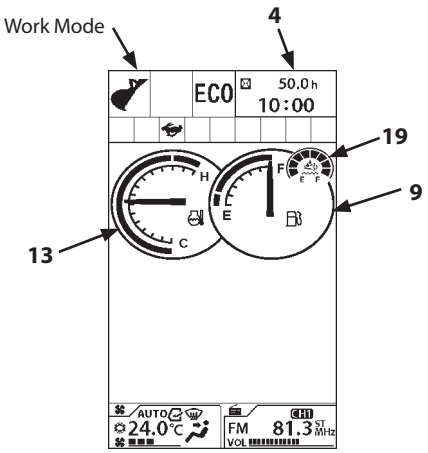
IMPORTANT: When the key switch is turned to ON position, the alternator alarm will be displayed on the basic screen. Until the alternator starts generating power after the engine starts, the alternator alarm is displayed on the basic screen.



Alternator Alarm

MDC1-01-042

- Display of Meters
  Items to be displayed
  4- Hour Meter, Clock
  9- Fuel Gauge
  13- Coolant Temperature Gauge
  19- DEF/AdBlue® Gauge
- Work Mode Display
  The attachments being used are displayed.



MDC1-01-001

Digging Mode

Attachment Mode

Breaker

Pulverizer

Crusher

Vibrating Hammer

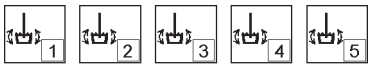
Grapple

Clamshell

Thumb

Tilting Rotator

Tilting Bucket



Others

- Aftertreatment Device Display (2)
  Displays condition of the aftertreatment device.

- 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 (7) 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)
  Fuel consumption or breaker hour meter is displayed.

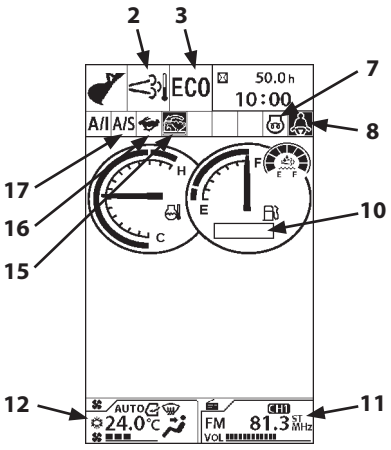
- Radio Display (11)
  Displays the radio panel.

- Air Conditioner Display (12)
  Displays the air conditioner panel.

- Overload Alarm Display (15)
  The system measures the suspended load from the pressure in the bottom of boom cylinder. When an overload is detected, an alarm is displayed.

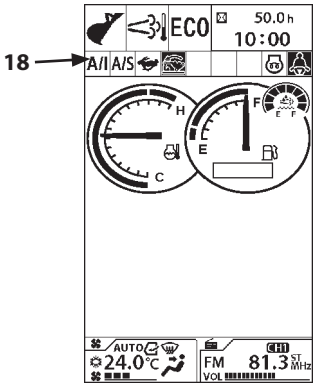
- Travel Mode Display (16)
  Displays the travel mode selected from the switch panel.

- Auto Shut-Down Display (17)
  Display auto shut-down display (17) when auto shut-down is turned ON from the menu screen.
  When the key switch is turned ON while auto shut-down is enabled, auto shut-down display (17) blinks for 10 seconds.



MDC1-01-286EN

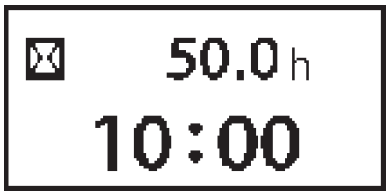
- Auto-Idle Display (18)
  When the auto-idle is selected from the switch panel, auto-idle display (18) displays.
  When the key switch is turned ON while the auto-idle switch is also ON, auto-idle display (18) blinks for 10 seconds.



MDC1-01-286EN

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).



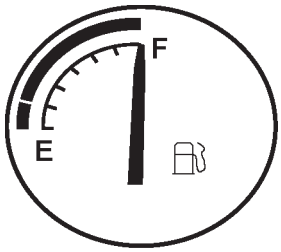
MDAA-01-021EN

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

DEF/AdBlue® Gauge

The remaining DEF/AdBlue® amount is indicated on the segment display.
When DEF/AdBlue® level becomes low, the last segment turns yellow. If the segment display turns yellow, immediately refill DEF/AdBlue®.

MDC1-01-509

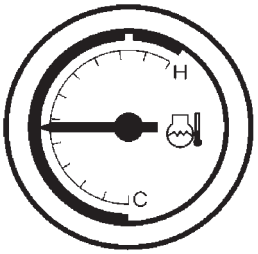
IMPORTANT: Display of the DEF/AdBlue® gauge changes depending on the DEF/AdBlue® level. If the engine runs with a low level of DEF/AdBlue®, the engine power will gradually be reduced. If the gauge turns yellow, immediately refill DEF/AdBlue®.

DEF/AdBlue® Level Alarm

Screen Display	Display of Segments	Buzzer	Content of Alarm
	The last segment turns yellow.	Once	DEF/AdBlue® level is low. Refill DEF/AdBlue® as soon as possible.
	The last segment turns red.	Intermittent sound	DEF/AdBlue® level is low. The engine output power derates gradually. Refill DEF/AdBlue® as soon as possible.
	All segments turn OFF.	Continuous sound	No DEF/AdBlue®. The engine can start, but the machine can not be operated. The machine can not be operated until refilling DEF/AdBlue®.

Coolant Temperature Gauge

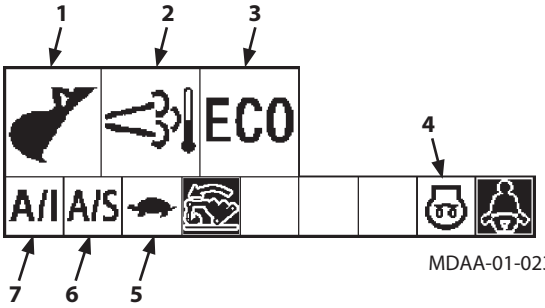
The engine coolant temperature is indicated with a needle. Normally the needle is around the center of the scale during operation.



M1U1-01-047

Operating Status Icon Display

Displays icons indicating the current status of each of following items: Attachment (1) and aftertreatment device 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-01-023EN

Security Functions (Optional)

Input Password

IMPORTANT:

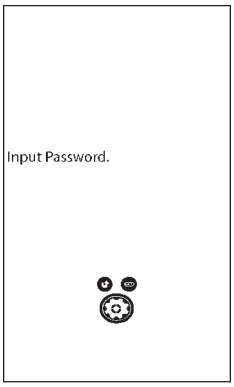
- **When required to activate the numeric keypad function, consult your authorized dealer.**
- **If the password is forgotten, the machine must be modified. Be extremely careful not to forget the password.**

Starting Screen

MDAA-01-003EN

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

2. Input a password by using the numeric keypad.



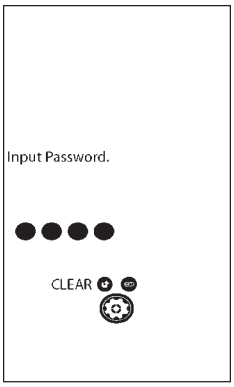
Password Input Screen

MDAA-01-085EN

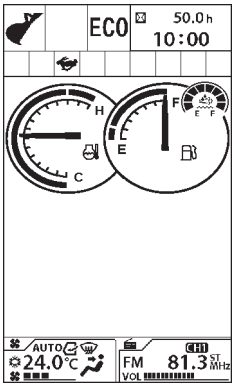
3. The monitor unit matches the input password to the registered one. If they match, the basic screen displays. The engine is ready to run. If an incorrect password is input 3 times, a buzzer sounds for 30 seconds. During that time, the buzzer does not stop even if the key switch is turned ON/OFF.

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

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.



MDAA-01-086EN



Basic Screen

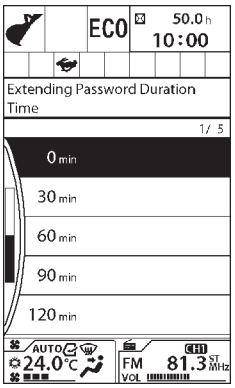
MDC1-01-001

Extending Password Duration Time

IMPORTANT: This operation is applicable only to machines that require a password.

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

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

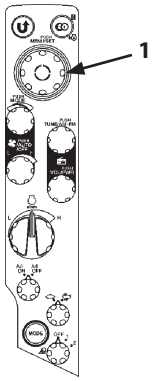


MDAA-01-087EN

Password Duration Screen (Key Switch: OFF)

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.

Duration time	0 minute
Duration time	30 minute
Duration time	60 minute
Duration time	90 minute
Duration time	120 minute



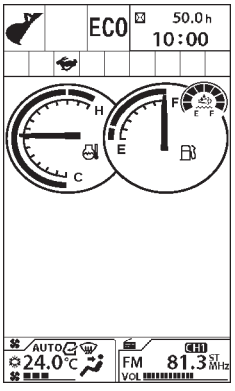
MDCD-01-026

NOTE: If the password duration time is not set explicitly, a duration of 0 is assumed.

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

MDAA-01-003EN

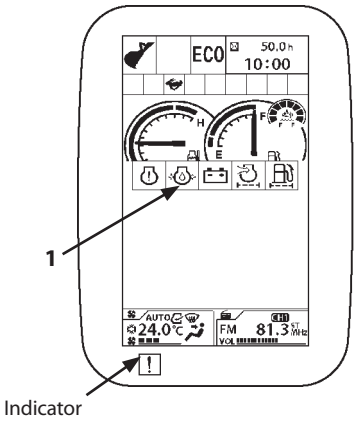
Starting Screen



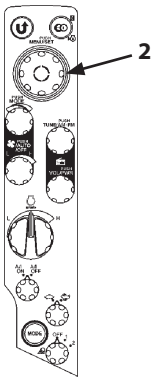
MDC1-01-001

Alarm Occurrence Screen

In case any abnormality occurs, alarm marks (1) are displayed on the basic screen.
If six or more alarms are generated, alarm marks (1) can be scrolled by rotating switch (2).



MDC1-01-316



MDCD-01-026

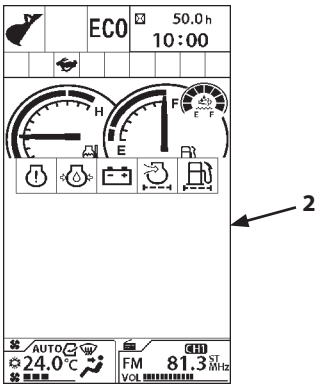
Follow the procedure below to display detailed information for an alarm.

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

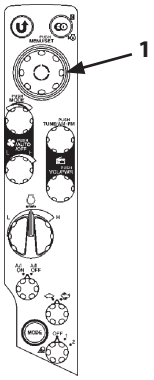
Rotate selector knob (1) to select alarm list (4), and push selector knob (1).

Rotate selector knob (1) to select a required alarm from alarm list (5), and push selector knob (1).

Detailed information of the selected alarm will be displayed.



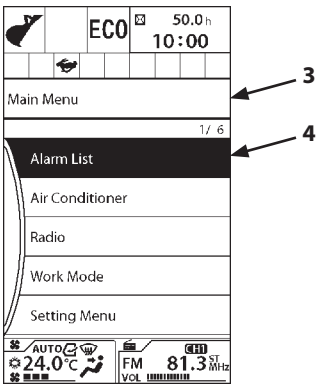
MDC1-01-004



MDCD-01-026

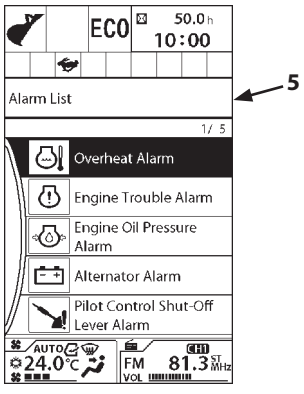
NOTE:

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

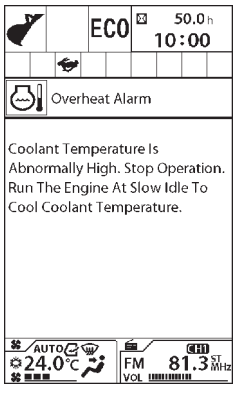


MDAA-01-077EN

- *Alarm list (5) contains only currently generated alarms.*

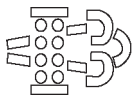
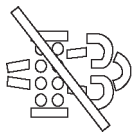
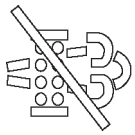


MDCD-01-006EN



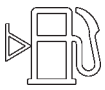
MDCD-01-007EN

Remedy

Display	Alarm Name	Content of Alarm
	Urea SCR System Alarm*	DEF/AdBlue® Level Is Low Or Urea SCR System Is Abnormal. Refill DEF/AdBlue® If Level Is Low. Consult Your Authorized Hitachi Dealer For System Malfunction.
	Engine Output Restriction	Engine Output Is Restricted.
	Aftertreatment Device Regeneration Request (Blinking) (Yellow)	Aftertreatment Device Regeneration Is Needed. Set Pilot Control Shut-off Lever To The LOCK Position. Run The Engine At Slow Idle Speed. Turn The Manual Regeneration Switch To The Regeneration Position.
	Aftertreatment Device Regeneration Inhibited Alarm (Lighting) (Yellow)	As The Regeneration Inhibition Has Been Set, Manual Regeneration Cannot Be Performed. Move The Machine To A Safe Area, Release The Regeneration Inhibition, And Perform Manual Regeneration.
	Aftertreatment Device Auto-Regeneration Inhibited Alarm (Lighting) (Yellow)	As The Regeneration Inhibition Has Been Set, Auto Regeneration Cannot Be Performed. Move The Machine To A Safe Area And Release The Regeneration Inhibition.
	Engine Oil Level Alarm	Check Engine Oil Level And Add Oil If Required.
	Coolant Level Alarm	Check Coolant Level And Add Coolant If Required.
	Overheat Alarm**	Coolant Temperature Is Abnormally High. Stop Operation. Run The Engine At Slow Idle To Cool Coolant Temperature.

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

**Alarm mark is displayed and buzzer will sound.*

Display	Alarm Name	Content of Alarm
	Engine Trouble Alarm	Engine Or Accessory Are Abnormal. Contact Your Nearest Authorized Dealer.
	Engine Oil Pressure Alarm*	Engine Oil Pressure Is Low. Immediately Stop Engine. Check Engine Oil System And Oil Level.
	Engine Start Disabled	Engine Cannot Start If Pilot Shut-Off Lever Is In The UNLOCK Position.
	Engine Start Disabled	Engine Cannot Start If Engine Shut-Off Switch Is In The OFF Position.
	Boost Temperature Alarm	Engine Intake Air Temperature Is Abnormally High. Stop Operation And Check For Clogged Intercooler And/Or Disconnected Intake Airline.
	Exhaust Temperature Alarm	Exhaust Temperature Is Abnormally High. Stop Operation. Check The Exhaust Piping.
	Aftertreatment Device Regeneration System Abnormal	Aftertreatment Device Regeneration System Is Abnormal. Consult Your Authorized Hitachi Dealer.
	Alternator Alarm	Electrical System Is Abnormal. Check Alternator And Battery Systems.
	Fuel Level Alarm	Fuel Level Is Low.

*NOTE: *Alarm mark is displayed and buzzer will sound.*

Display	Alarm Name	Content of Alarm
	Fuel Temperature Alarm	Fuel Temperature Is Abnormally High. Stop Operation And Check For Any Abnormality Such As Clogged Fuel Cooler.
	Hydraulic Oil Filter Restriction Alarm (Optional)	Hydraulic Oil Filter Is Clogged. Replace Hydraulic Oil Filter Element.
	Air Cleaner Restriction Alarm	Air Cleaner Is Clogged. Clean Or Replace Air Cleaner Element.
	Fuel Filter Restriction Alarm*	Fuel filter is clogged. Replace fuel filter element.
	Water Separator Alarm	Water Separator Is Full. Drain Water.
	System Failure Alarm	Machine Network System Is Abnormal. Contact Your Nearest Authorized Dealer.
	Electric Lever Alarm	Electric Lever System Is Abnormal. Contact Your Nearest Authorized Dealer.
	Pilot Control Shut-Off Lever Alarm	Pilot Control Shut-Off Lever System Is Abnormal. Contact Your Nearest Authorized Dealer.

NOTE:

- *The hydraulic oil filter alarm lights only when the high performance element (optional) is used.*
- **If the indicator comes ON immediately after replacing the fuel filter, air mixed in the system during replacement may be the cause. Be sure to bleed air from the fuel system when replacing the fuel filter. (When air is bled, the indicator will go OFF.)*

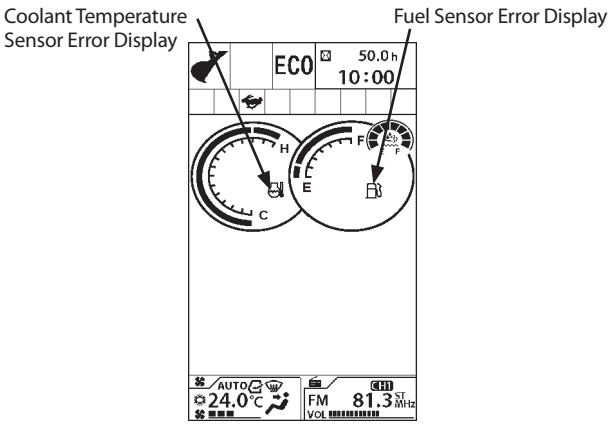
Urea SCR System Remedy

Display	Alarm Name	Content of Alarm
	DEF/AdBlue® Level Alarm*	DEF/AdBlue® Level Is Low. Refill DEF/AdBlue®.
	DEF/AdBlue® Level Alarm*	DEF/AdBlue® Is Insufficient. Refill DEF/AdBlue®. DEF Tank Empty. Engine Output Is Restricted.
	DEF/AdBlue® Level Alarm*	DEF/AdBlue®Tank Is Empty. Refill DEF/AdBlue®. Engine Output And Speed Are Restricted.
	Urea SCR System Malfunction*	Urea SCR System Is Broken.
	Urea SCR System Malfunction*	Urea SCR System Is Broken. Engine Output Is Restricted.
	Urea SCR System Malfunction*	Urea SCR System Is Broken. Engine Output And Speed Are Restricted.

*NOTE: *Alarm mark is displayed and buzzer will sound.*

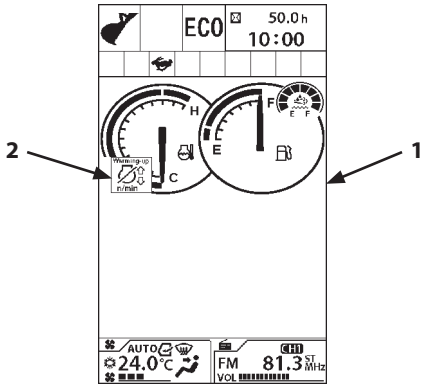
- Fuel Sensor Error Display
  If the fuel sensor is faulty, the color of the fuel mark changes and the needle disappears. If the harness between the fuel sensor and the controller unit is broken, the needle disappears.

- Coolant Temperature Sensor Error Display
  If the coolant temperature sensor is faulty, the color of the temperature mark changes and the needle disappears. If the harness between the temperature sensor and the controller unit is broken, the needle disappears.



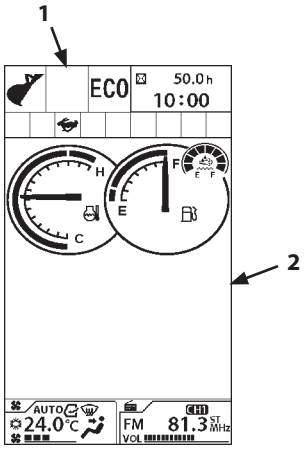
MDC1-01-024

- Engine Speed Control Display
  Engine warming-up operation due to low coolant temperature. The engine speed can not be changed during this operation. While the engine speed is controlled, mark (2) is displayed on monitor (1). When the control completes, mark (2) goes OFF and the engine speed becomes adjustable.



MDC1-01-355

Aftertreatment Device



MDC1-01-001

Aftertreatment Device Condition Display

Aftertreatment Device Display (1) displays the condition of the aftertreatment device.

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

NOTE:

- *The auto-regeneration is performed 30 hours after the previous regeneration. The auto-regeneration may start during operation of the machine; you can continue to operate the machine. The engine sound and/or the machine response to the operation of control levers may change when performing the auto-regenerration; 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." will be displayed on monitor (2).

Depending on the operating conditions of the machine, the regeneration may not be completed. In this case, an aftertreatment device regeneration request will be displayed on monitor (2). Immediately perform manual regeneration following the procedure.

This mark indicates that the aftertreatment device regeneration is inhibited. Regeneration will not be performed while this mark is lit.

IMPORTANT: Set aftertreatment device regeneration to the inhibited position while operating the machine in an environment with materials that could be flammable. (Refer to the page 1-53)

Aftertreatment Device Manual Regeneration Request

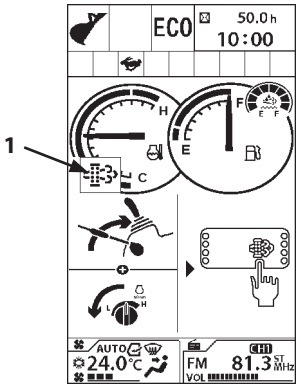
The aftertreatment device needs regeneration. Usually, regeneration is performed automatically. However, manual regeneration is required depending on the conditions. The marks described below may be indicated on monitor (1).

(Blinking, Yellow)

This mark indicates that the aftertreatment device manual regeneration is required. Perform manual regeneration by following the specified procedure.

(Lighting, Yellow)

This mark indicates that the aftertreatment device regeneration is inhibited. Displayed when the manual regeneration request arises while aftertreatment device regeneration is inhibited. Move the machine to a safe place. Perform manual regeneration following the specified procedure.



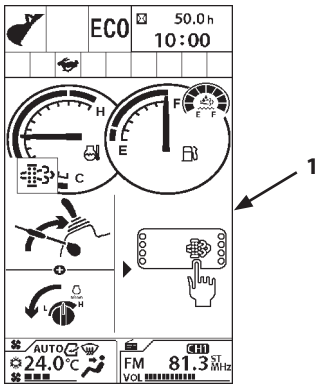
MDC1-01-005

IMPORTANT:

- **Manual regeneration performed when the aftertreatment device regeneration request is displayed restores aftertreatment device function. This is not a malfunction.**
- **If the machine is continuously operated despite the aftertreatment device regeneration request is displayed, an engine trouble alarm will be displayed. Consult your authorized dealer.**

Manual Regeneration Procedure

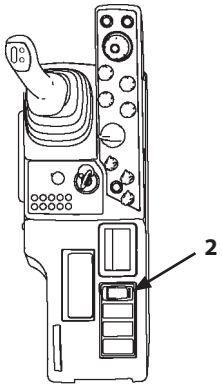
When manual regeneration is needed, screen (1) as shown in the right will be displayed. When this screen (1) is displayed, you need to perform manual regeneration. Before starting manual regeneration, be sure to check the following.
If the rear view camera is equipped on the machine and the camera is enabled, screen (1) is displayed only when the pilot control shut-off lever is in LOCK position.



MDC1-01-005

- No person is present around the machine.
- Keep flammable materials away from the muffler.
- Fuel level alarm is not lit.
- DEF/AdBlue® level alarm does not light.

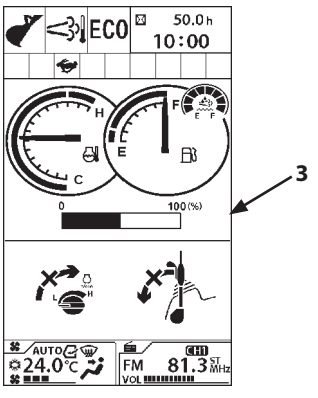
1. Park the machine in a safe place. Lower the front attachment onto the ground.
2. Pull the pilot control shut-off lever to the LOCK position.
3. Set the engine control dial to slow idle.
4. Push aftertreatment device regeneration switch (2).
5. When pushing aftertreatment device regeneration switch (2), screen (3) as shown in the right will be displayed and the manual regeneration starts. A bar graph on screen (3) shows the progress of the regeneration process.



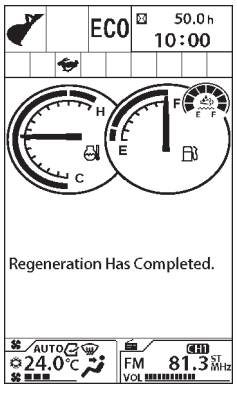
MDC1-01-543

IMPORTANT: The manual regeneration does not start unless the pilot control shut-off lever is in the LOCK position and the engine control dial is in slow idle. When touching the pilot control shut-off lever or the engine control dial during manual regeneration, the regeneration process is aborted. When the process is aborted, start over again.

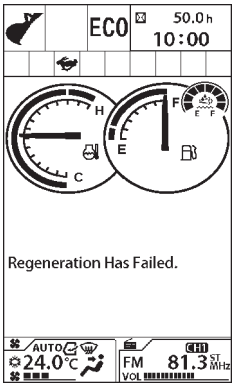
6. When the manual regeneration is complete, the message "Regeneration Has Completed." is displayed. If "Regeneration Has Failed." message is displayed, start over the manual regeneration process once again. Failure of the regeneration process may happen in conditions other than those mentioned above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



MDC1-01-006



MDC1-01-083EN

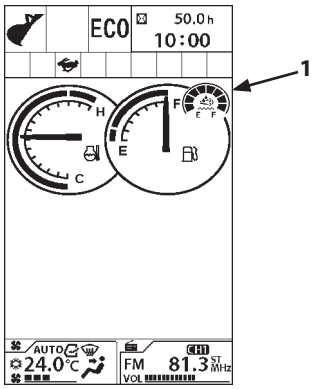


MDC1-01-084EN

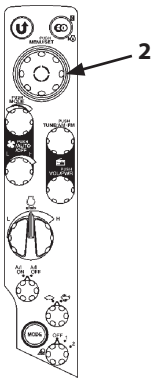
Main Menu

Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3). Main Menu screen (3) contains the items as shown in the figure right. Engine Output Restriction Is Temporary Released, Urea SCR System Troubleshooting and Alarm List will be displayed only when the engine output is limited, Urea SCR system is malfunctioning or an alarm is generated, respectively. The mail (optional) menu will not be displayed unless it is set beforehand.

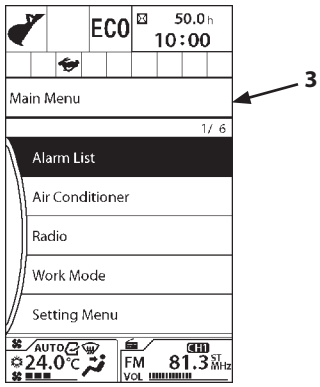
NOTE: The monitor automatically changes to Basic Screen (1) when it is not operated for 15 seconds or longer. If setting is terminated halfway, please restart the setting again.



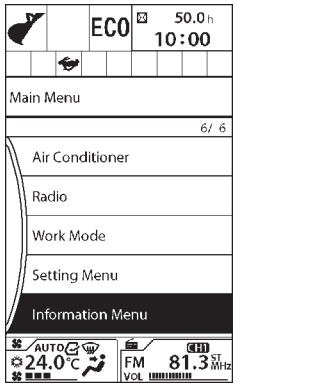
MDC1-01-001



MDCD-01-026



MDAA-01-077EN



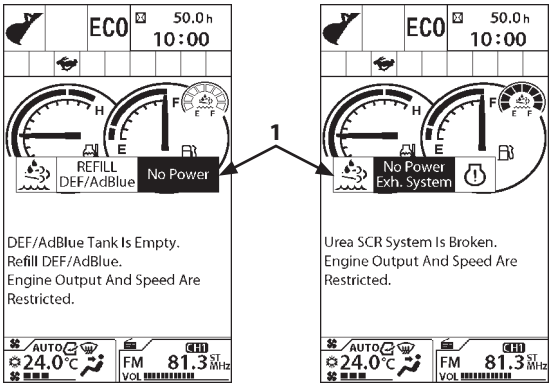
MDAA-01-190EN

Engine Output Restriction Suspend

When a lack of DEF/AdBlue® or Urea SCR system malfunction occurs, alarm mark (1) will be displayed on the basic screen and engine output / speed will be limited.

IMPORTANT:

- **This function can be performed only one time at one engine output limit.**
- **This is only a temporary release operation. Refill DEF/AdBlue® or repair Urea SCR system as soon as possible. Consult your authorized dealer to repair the system.**

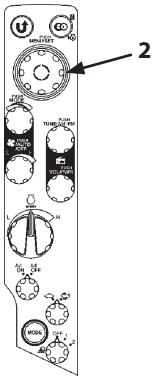


MDC1-01-519EN MDC1-01-520EN

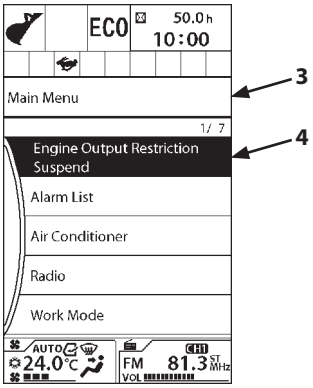
The engine output limit function can be temporarily released when evacuation is unavoidable during machine operation. Follow the below procedure.

1. Push selector knob (2) on the Basic Screen to display Main Menu (3).
2. Rotate selector knob (2) to highlight Engine Output Restriction Suspend (4).

NOTE: Engine output restriction suspend (4) is displayed on main menu (3) only when the engine output and speed is restricted.

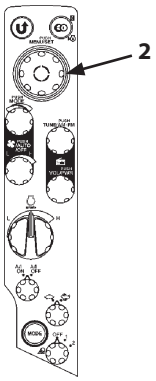


MDCD-01-026



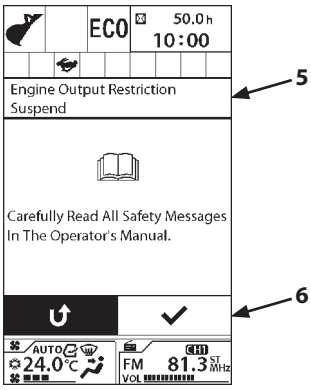
MDC1-01-521EN

3. Push selector knob (2) to display Engine Output Restriction Suspend screen (5).



MDCD-01-026

4. Rotate selector knob (2) to highlight ✔ (6), and push selector knob (2) to display Engine Output Restriction Suspend screen (8).

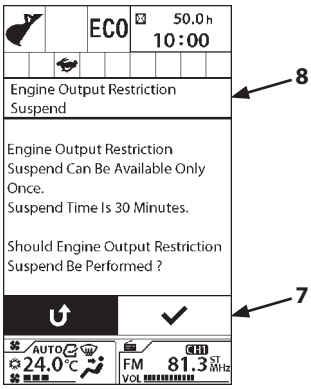


MDC1-01-522EN

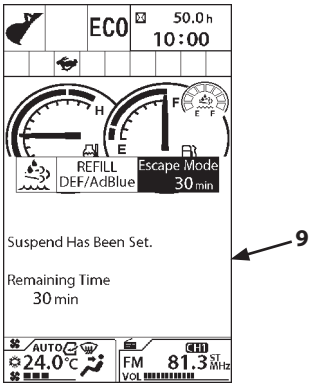
5. Rotate selector knob (2) to highlight ✔ (7), then screen (9) is displayed and the engine output is temporarily released.

NOTE:

- *The temporary release time is a maximum of 30 minutes.*
- *The engine output limit will be enabled after 30 minutes.*



MDC1-01-523EN

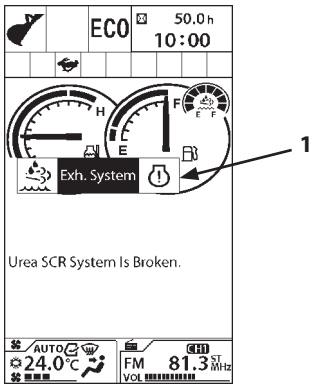


MDC1-01-524EN

Urea SCR System Troubleshooting

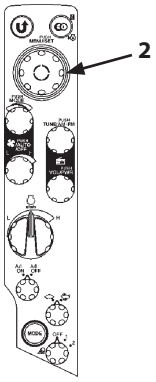
In case any abnormality occurs, alarm marks (1) are displayed on the Basic Screen. Follow the procedure below to display detailed information for an alarm.

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



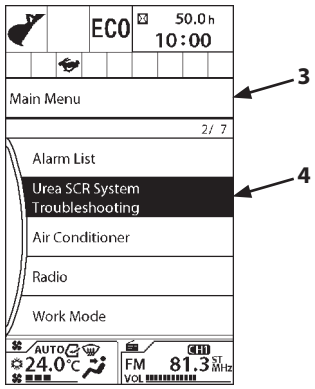
MDC1-01-514EN

2. Rotate selector knob (2) to highlight Urea SCR System Troubleshooting (4) and push selector knob (2).

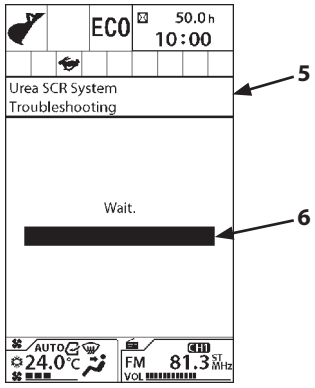


MDCD-01-026

3. Urea SCR System Troubleshooting screen (5) will be displayed and Urea SCR System Troubleshooting starts. Bar graph (6) on the screen indicates progress of the troubleshooting process.

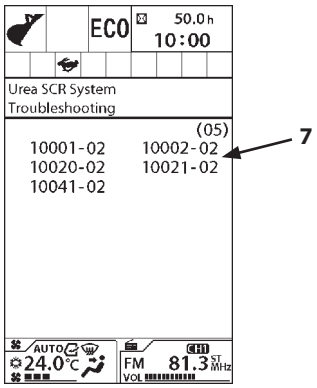


MDC1-01-515EN



MDC1-01-516EN

4. When the troubleshooting is finished, fault code (7) is displayed. Consult your authorized dealer to repair the system.



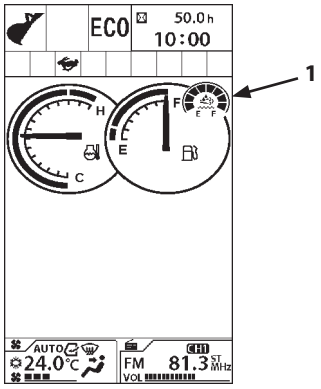
MDC1-01-517EN

NOTE:

- *The main menu displays information about the Urea SCR System Troubleshooting is only displayed when the Urea SCR system alarm is generated.*
- *Up to 20 fault codes are displayed in chronological order.*

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. (Refer to the page 1-111)

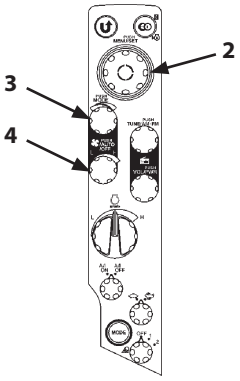


MDC1-01-001

Circulation Air Mode

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (5).
2. Rotate selector knob (2) to highlight Air Conditioner (6).
3. Push selector knob (2) to display Air Conditioner screen (7).

   Rotate selector knob (2) to highlight (8) mark.
4. Push selector knob (2) to set the circulation air mode.
5. Push selector knob (2) again to switch the fresh air mode.

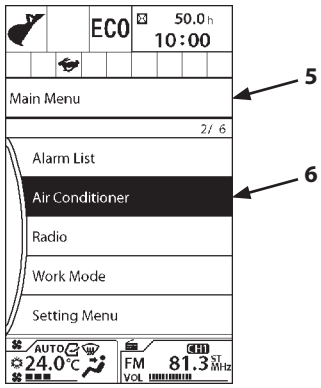


MDCD-01-026

Air Conditioner ON/OFF

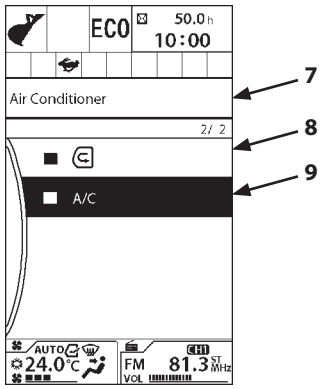
1. Rotate selector knob (2) to highlight A/C (9).
2. Push selector knob (2) to turn the air compressor ON.
3. Push selector knob (2) again to turn the air compressor OFF.

NOTE: When the function is ON, the mark "■" is displayed in green. When the function is OFF, the mark "■" is displayed in gray.



MDAA-01-089EN

IMPORTANT: If mark (10) is displayed on the air conditioner display, communication between the air conditioner and the monitor is abnormal. Consult your authorized dealer.



MDAA-01-091EN

MDAA-01-226

Radio

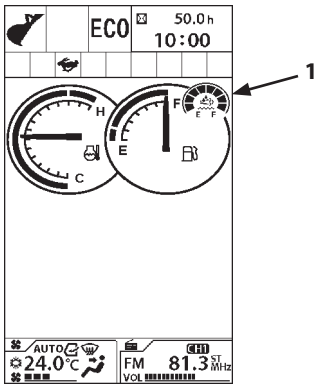
Most radio functions are operated by using switches (3) and (4), however memory channel setting, seek function, TONE adjustment, and AUTO PRESET are done at the radio screen in the main menu.

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (5).
2. Rotate selector knob (2) to highlight Radio (6).
3. Push selector knob (2) to display the radio screen.

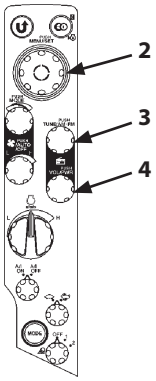
(Refer to the page 1-119)

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

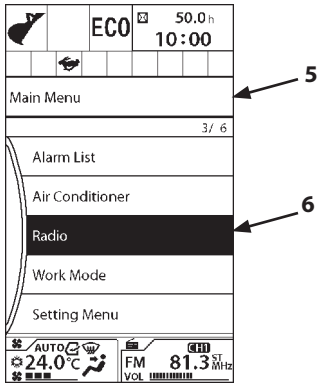
While the radio is ON, pressing the numeric keypad 1 to 8 will change the radio station to the respective memorized channel. (Refer to the page 1-97 and 1-116)



MDC1-01-001



MDCD-01-026



MDAA-01-092EN

MDAA-01-227

Work Mode

IMPORTANT: Before changing the work mode, stop the machine, lower the working device such as a bucket on the ground and pull the pilot control shut-off lever to the LOCK position.

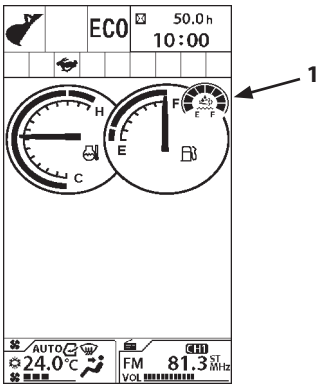
Front attachment is selected in Work Mode screen (5) under the Work Mode menu in the main menu.

Attachment Selection

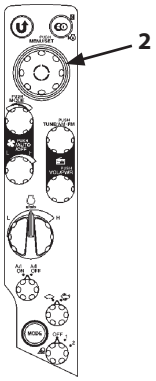
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Work Mode (4).
3. Push selector knob (2) to display Work Mode screen (5).
4. Rotate selector knob (2) to highlight the desired front attachment.

   (In the example on the right, Bucket (6) is highlighted.)
5. Push selector knob (2) to enable the changes.

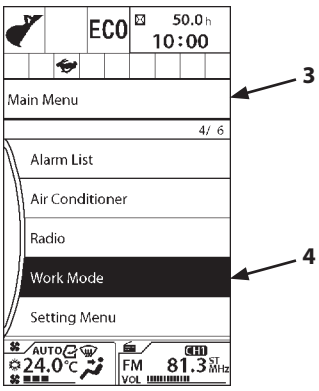
NOTE: When the attachment pedal is operated while the work mode is set to the digging mode, work mode display (7) on the monitor screen starts flashing.



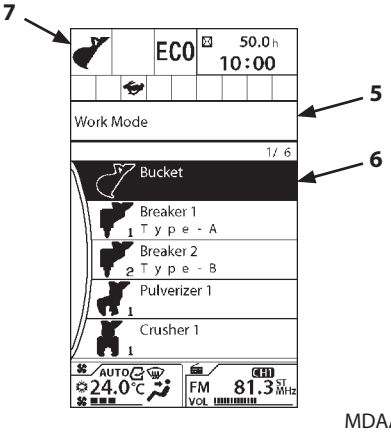
MDC1-01-001



MDCD-01-026



MDAA-01-100EN

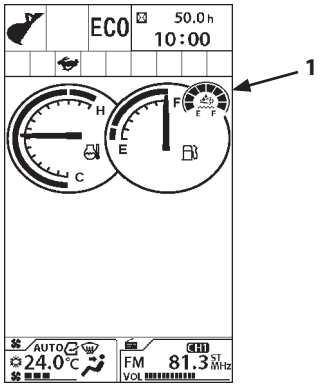


MDAA-01-101EN

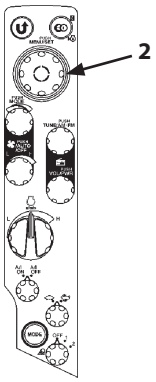
Setting Menu

Setting menu consists of date and time setting, attachment adjustment, attachment name, auto shut-down setting, change password, selecting sub meter, brightness adjustment of rear view camera monitor and screen.

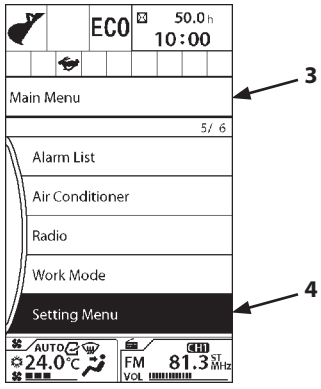
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).



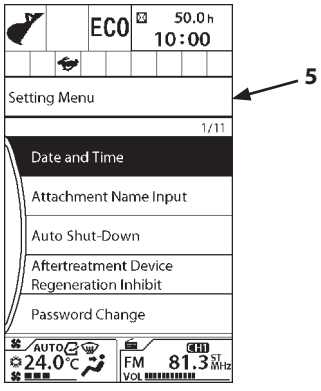
MDC1-01-001



MDCD-01-026



MDAA-01-114EN



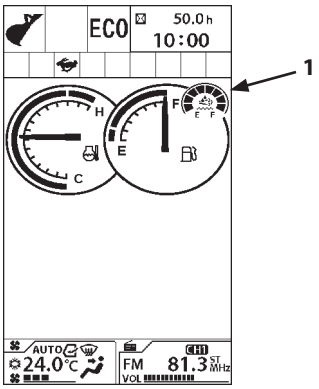
MDC1-01-115EN

Date and Time

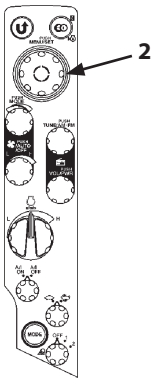
Time, date and display mode can be set on this screen. Year-month-day format and 24h/12h display mode are selected in the display setting.

Time Adjustment

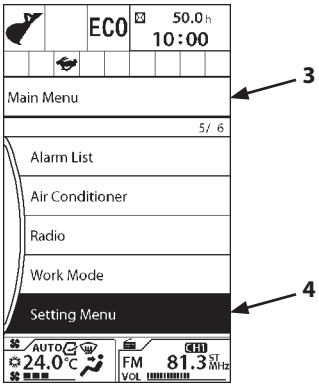
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).
4. Rotate selector knob (2) to highlight Date and Time (6).



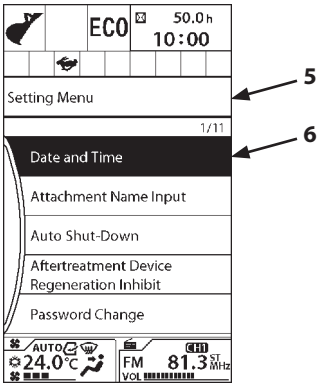
MDC1-01-001



MDCD-01-026

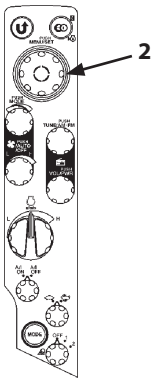


MDAA-01-114EN



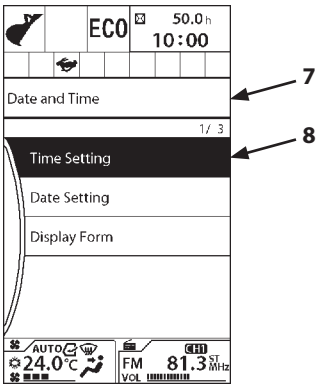
MDC1-01-115EN

5. Push selector knob (2) to display Date and Time screen (7).



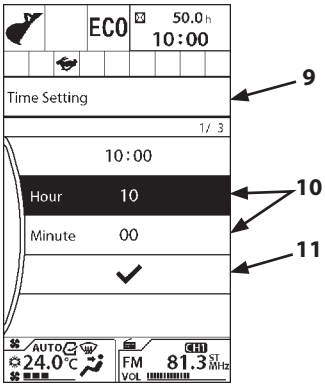
MDCD-01-026

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

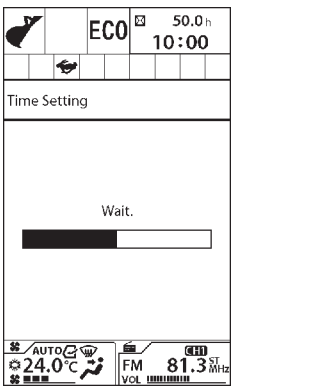


MDAA-01-117EN

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 Time setting procedure.
11. Rotate selector knob (2) to highlight ✔ (11). Push selector knob (2) to make the change.



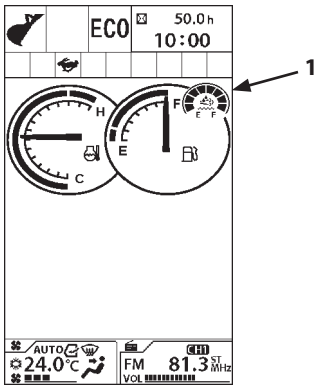
MDAA-01-118EN



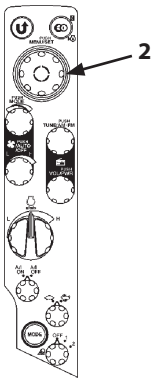
MDAA-01-121EN

Date Adjustment

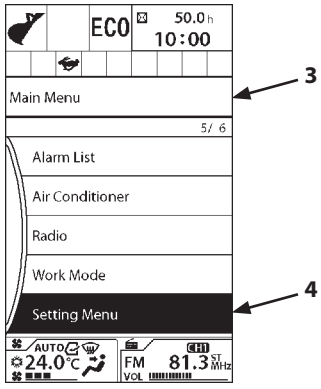
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).
4. Rotate selector knob (2) to highlight Date and Time (6).



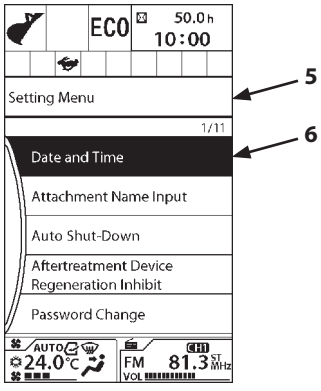
MDC1-01-001



MDCD-01-026

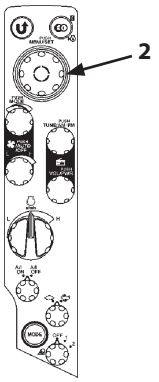


MDAA-01-114EN



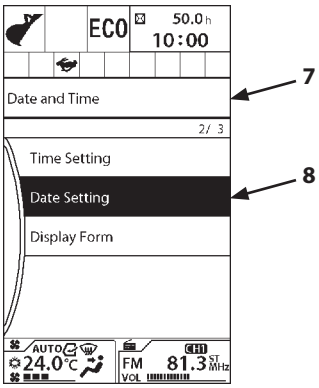
MDC1-01-115EN

5. Push selector knob (2) to display Date and Time screen (7).



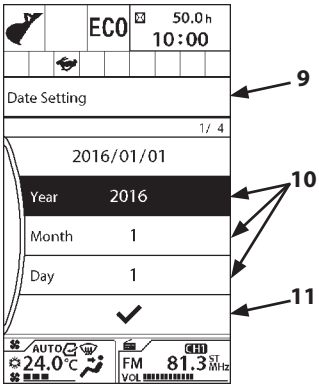
MDCD-01-026

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

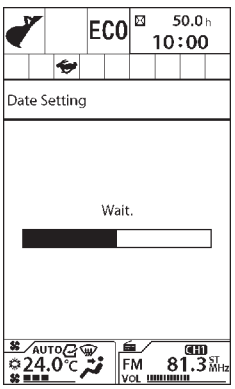


MDAA-01-122EN

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.



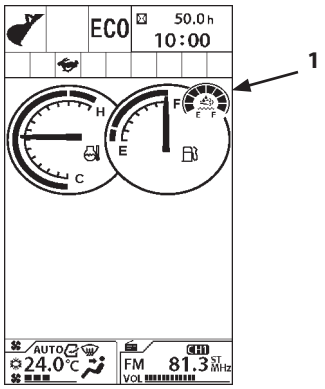
MDC1-01-123EN



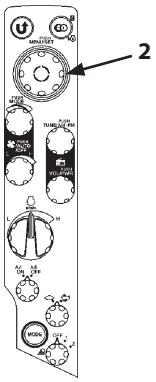
MDAA-01-127EN

Display Mode Setting

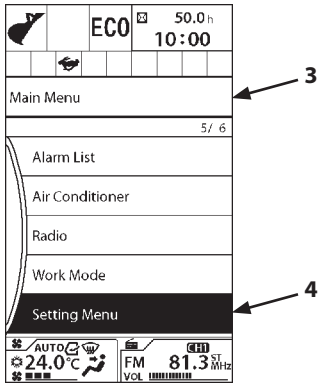
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).
4. Rotate selector knob (2) to highlight Date and Time (6).



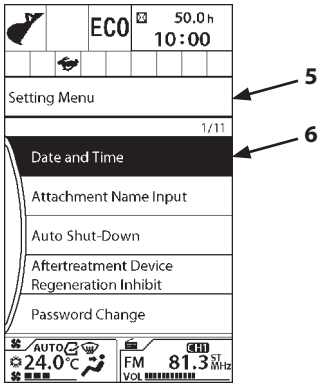
MDC1-01-001



MDCD-01-026

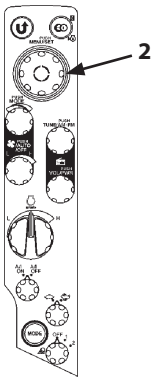


MDAA-01-114EN



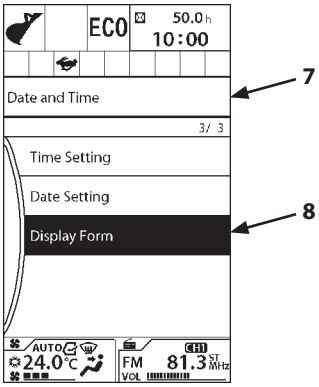
MDC1-01-115EN

5. Push selector knob (2) to display Date and Time screen (7).



MDCD-01-026

6. Rotate selector knob (2) to highlight Display Form (8).

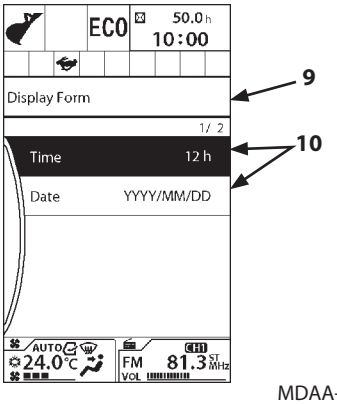


MDAA-01-228EN

7. Push selector knob (2) to display Display Form screen (9).
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-01-229EN

MDAA-01-230EN

MDAA-01-231EN

MDAA-01-232EN

MDAA-01-233EN

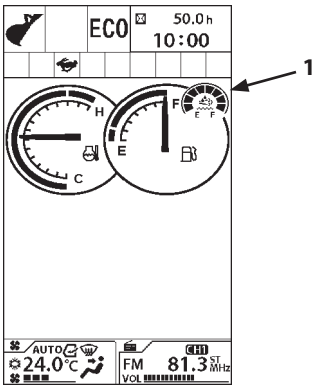
MDAA-01-234EN

Attachment Adjustment

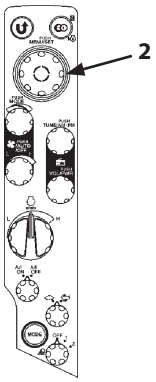
On the Attachment Adjustment screen, the supply flow rate to an attachment, the operational priority for combined operation of an attachment, and arm roll-in/arm roll-out can be adjusted.
Attachment adjustment can be done when the work mode is set to an attachment other than bucket. Select an attachment other than the bucket on the work mode screen. (Refer to "Work Mode".)

Flow Rate Adjustment

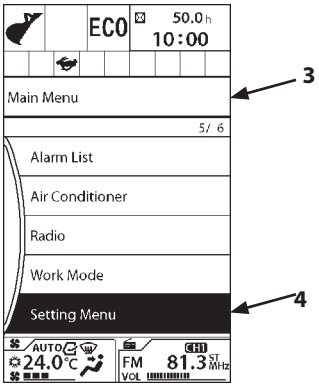
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).
4. Rotate selector knob (2) to highlight Attachment Adjustment (6).



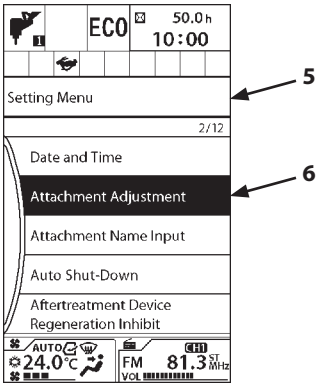
MDC1-01-001



MDCD-01-026

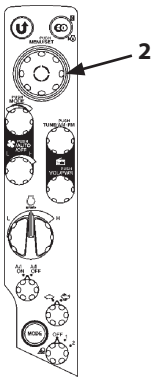


MDAA-01-114EN



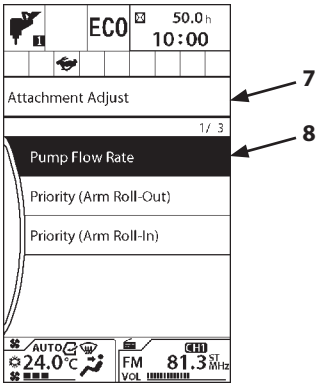
MDC1-01-128EN

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



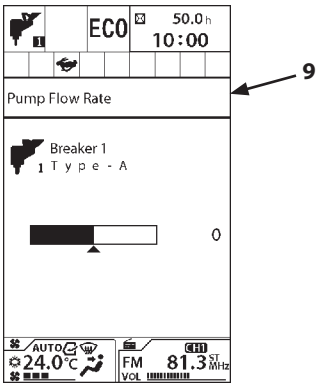
MDCD-01-026

6. Rotate selector knob (2) to highlight Pump Flow Rate (8).



MDAA-01-129EN

7. Push selector knob (2) to display Pump Flow Rate screen (9).
8. Rotate selector knob (2) clockwise or counterclockwise to adjust the pump flow rate.

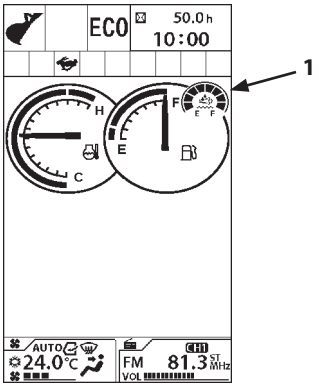


MDAA-01-130EN

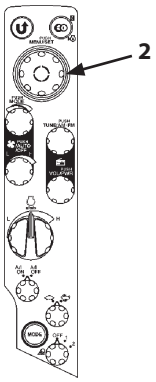
Priority (arm roll-out)

Select an attachment other than the bucket on the work mode screen. (Refer to the page 1-35)

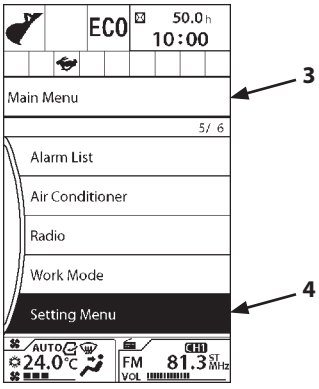
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).
4. Rotate selector knob (2) to highlight Attachment Adjustment (6).



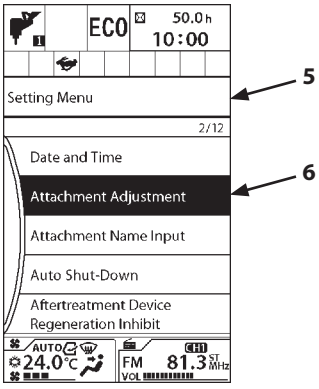
MDC1-01-001



MDCD-01-026

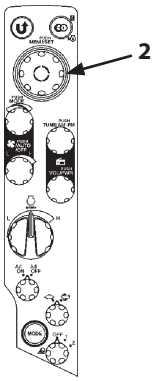


MDAA-01-114EN



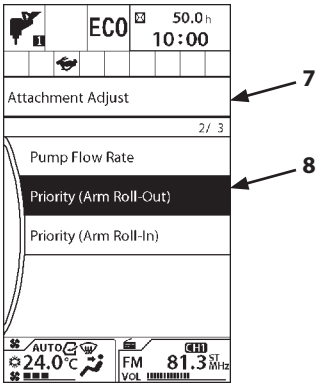
MDC1-01-128EN

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



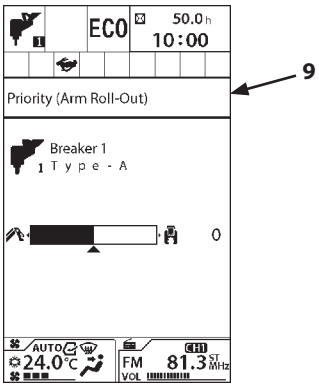
MDCD-01-026

6. Rotate selector knob (2) to highlight Priority (Arm Roll-Out) (8).



MDAA-01-235EN

7. Push selector knob (2) to display Priority (Arm Roll-Out) screen (9).
8. Rotate selector knob (2) clockwise to increase flow rate to the attachment. Rotate selector knob (2) counterclockwise to increase flow rate to the arm roll-out circuit.

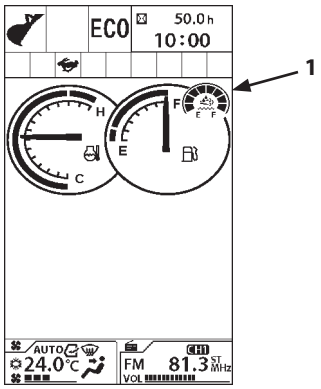


MDAA-01-132EN

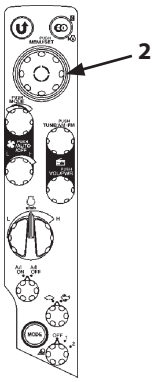
Priority (arm roll-in)

Select an attachment other than the bucket on the work mode screen. (Refer to the page 1-35)

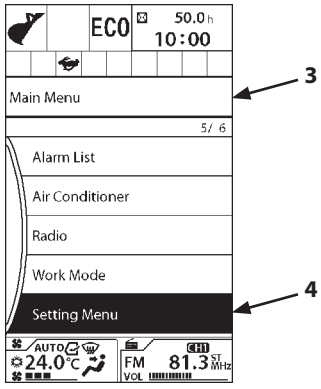
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).
4. Rotate selector knob (2) to highlight Attachment Adjustment (6).



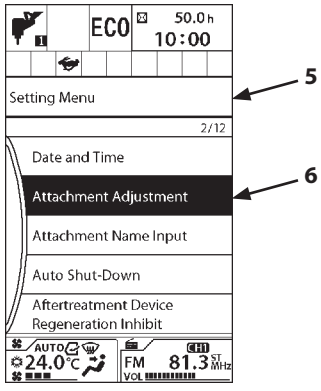
MDC1-01-001



MDCD-01-026

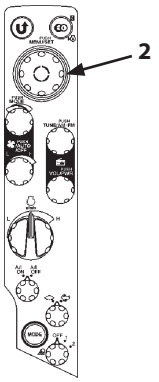


MDAA-01-114EN



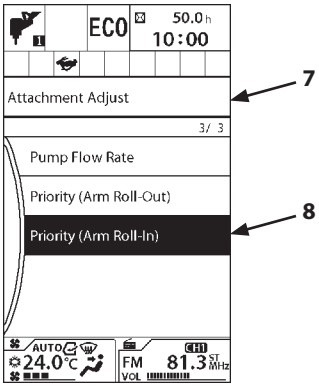
MDC1-01-128EN

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



MDCD-01-026

6. Rotate selector knob (2) to highlight Priority (Arm Roll-In) (8).

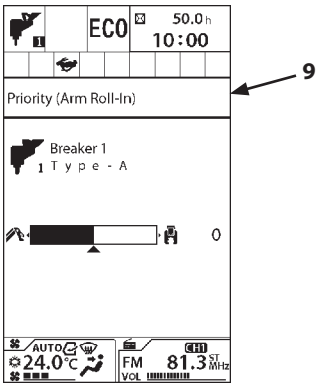


7. Push selector knob (2) to display Priority (Arm Roll-In) screen (9).

MDAA-01-236EN

8. Rotate selector knob (2) clockwise to increase flow rate to the attachment.

   Rotate selector knob (2) counterclockwise to increase flow rate to the arm roll-in circuit.

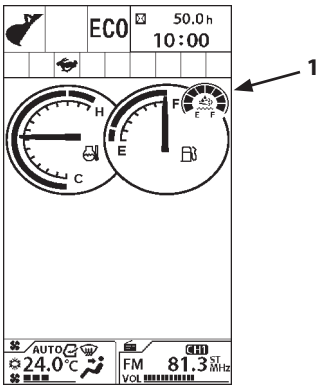


MDAA-01-131EN

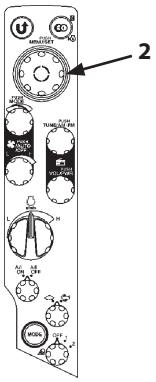
Attachment Name Input

Attachment name can be changed on this screen.

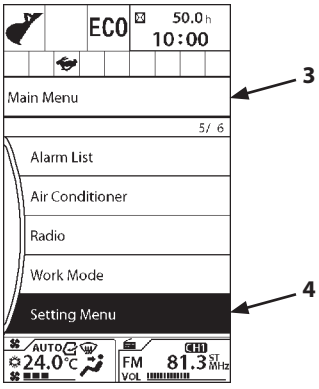
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).
4. Rotate selector knob (2) to highlight Attachment Name Input (6).



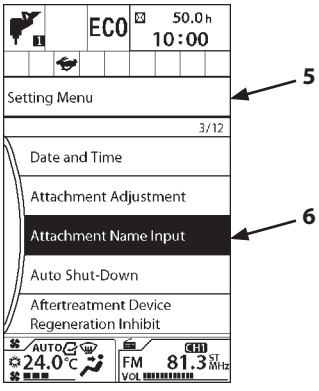
MDC1-01-001



MDCD-01-026

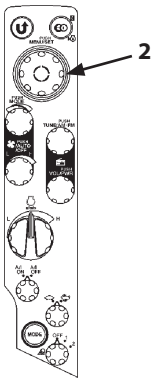


MDAA-01-114EN



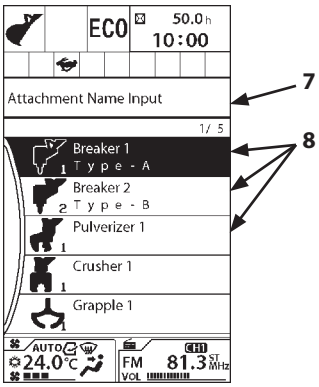
MDC1-01-133EN

5. Push selector knob (2) to display Attachment Name Input screen (7).



MDCD-01-026

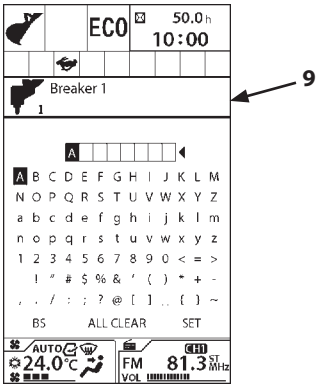
6. Rotate selector knob (2) to highlight Desired Attachment Name (8).



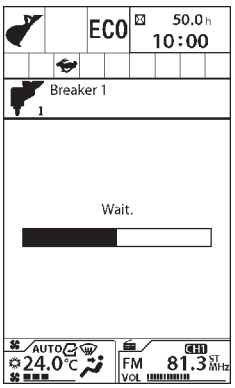
MDAA-01-134EN

7. Push selector knob (2) to display Name Change screen (9).
8. Rotate selector knob (2) right or left to highlight a character, and push selector knob (2).
9. After inputting the new name, rotate selector knob (2) to highlight "SET". Push selector knob (2) to finalize the setting.

NOTE: In order to delete the last entered character, rotate selector knob (2) to highlight "BS" (Back Space), and then push selector knob (2). In order to delete all entered characters, rotate selector knob (2) to highlight "ALL CLEAR". Push selector knob (2).



MDAA-01-137EN



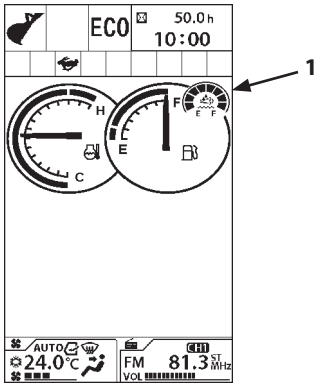
MDAA-01-145EN

Auto Shut-Down

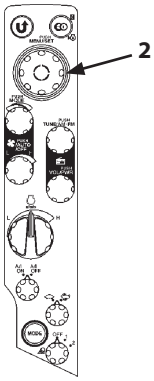
WARNING: This function automatically stops the engine. Pay extra attention to the work and work environment when using this function.

The auto shut-down function can be set in 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 stop, the monitor displays a message that engine will be stopped and the indicator starts flashing. The buzzer also sounds. The buzzer sounds once at 30 seconds before, and sounds continuously from 15 seconds before the stoppage. The engine speed decreases to the idling speed, and then stops after 15 seconds. When the pilot control shut-off lever is pushed before stopping the engine, the auto shut-down is disabled and the engine will 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 leave the machine after auto shut-down. Failure to do so may discharge the batteries.



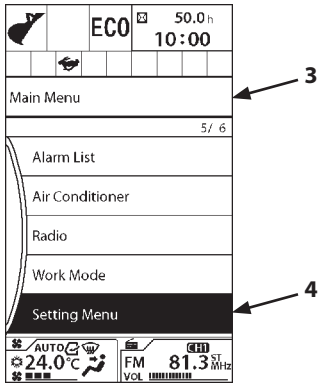
MDC1-01-001



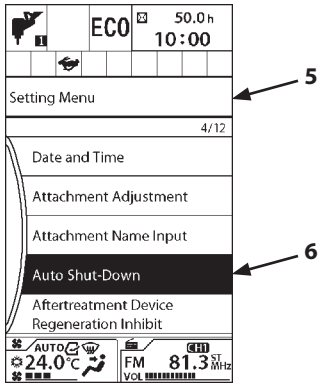
MDCD-01-026

Auto Shut-Down: ON/OFF

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).
4. Rotate selector knob (2) to highlight Auto Shut-Down (6).

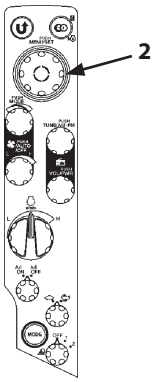


MDAA-01-114EN



MDC1-01-147EN

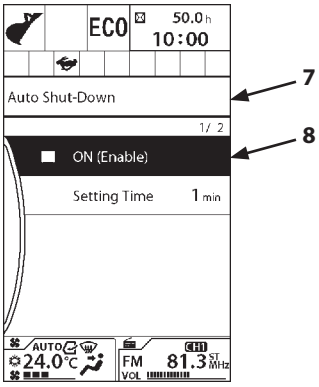
5. Push selector knob (2) to display Auto Shut-Down screen (7).



MDCD-01-026

6. Rotate selector knob (2) to highlight ON (Enable) (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 the function is ON, the mark "■" is displayed in green. When the function is OFF, the mark "■" is displayed in gray.

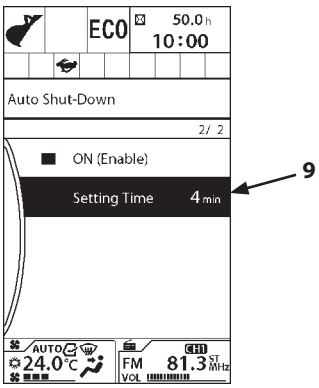


MDAA-01-148EN

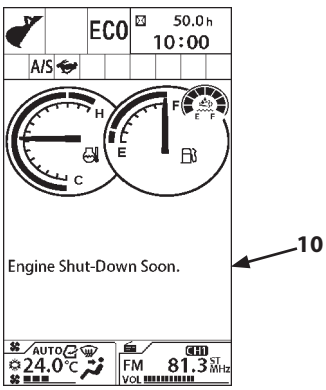
Auto Shut-Down: Setting Time

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.

NOTE: 30 seconds before the engine stops, the monitor will display "Engine Shut-Down Soon." message (10).



MDAA-01-150EN



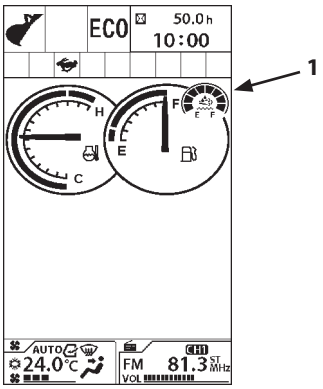
MDC1-01-146EN

Aftertreatment Device Regeneration Inhibited

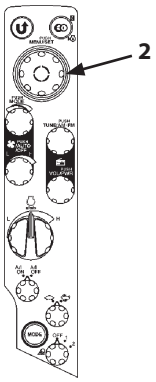
IMPORTANT: The aftertreatment device regeneration can be inhibited at this screen to prevent auto regeneration while operating the machine in a dusty area or indoors.

Setting Procedure

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

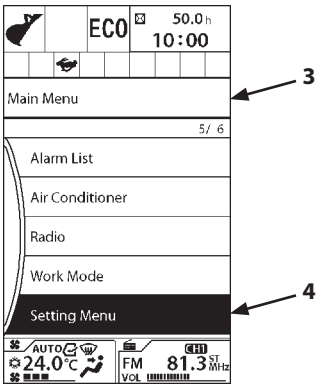


MDC1-01-001



MDCD-01-026

2. Rotate selector knob (2) to highlight Setting Menu (4).

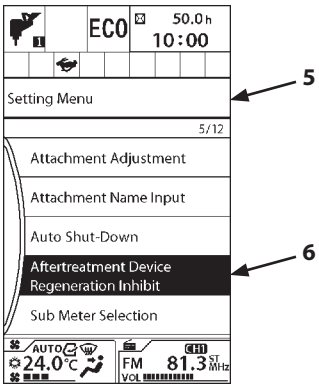


MDAA-01-114EN

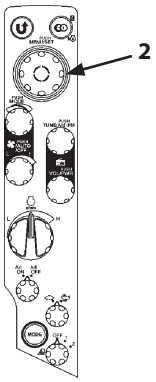
3. Push selector knob (2) to display Setting Menu screen (5).
4. Rotate switch (2) to highlight Aftertreatment Device Regeneration inhibited (6).
5. Push selector knob (2) to display aftertreatment device regeneration inhibited screen (7).
6. Rotate selector knob (2) to highlight ✔ (8), and push selector knob (2) to display Aftertreatment Device Regeneration Inhibited screen (9).
7. Rotate switch (2) to highlight ON (10). Confirmation screen is added.
8. Push selector knob (2) to turn aftertreatment device Regeneration Inhibited ON. Push selector knob (2) again to turn aftertreatment device Regeneration Inhibited OFF.
9. When ON is selected, the regeneration inhibited icon will be displayed on the monitor. (Refer to the page 1-25)

NOTE: When the auto shut-down function is ON, the mark "■" is displayed in orange. When the auto shut-down function is OFF, the mark "■" is displayed in gray.

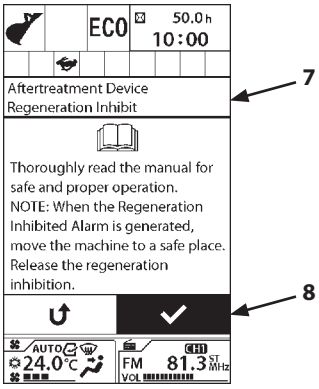
IMPORTANT: When the aftertreatment device regeneration request is displayed, move the machine to a safe place. Perform the manual regeneration by following the specified procedure. Failure to do so may damage the aftertreatment device. Refer to "Aftertreatment Device" section (1-27, 5-10) for the manual regeneration.



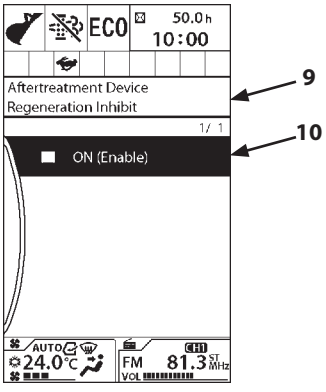
MDC1-01-283EN



MDCD-01-026



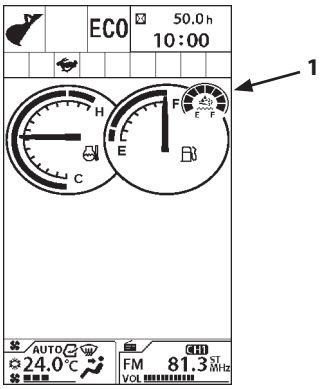
MDC1-01-325EN



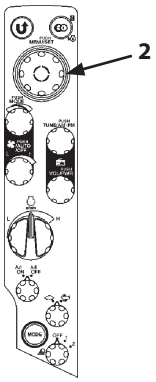
MDC1-01-284EN

Password Change (Optional)

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

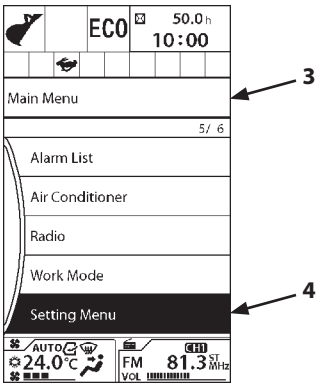


MDC1-01-001



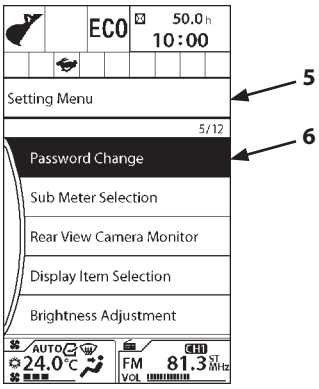
MDCD-01-026

2. Rotate selector knob (2) to highlight Setting Menu (4).



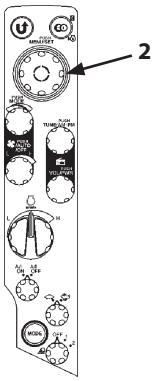
MDAA-01-114EN

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

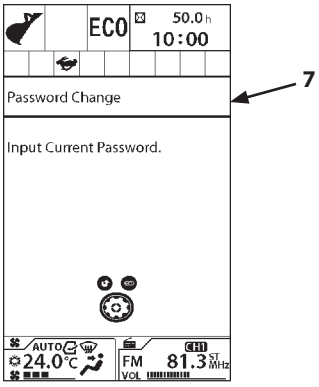


MDAA-01-156EN

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

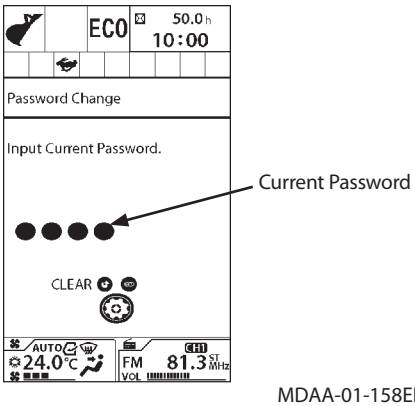


MDCD-01-026



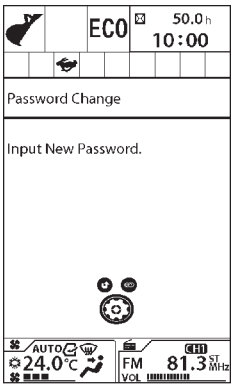
MDAA-01-157EN

6. Input current password from the numeric keypad.

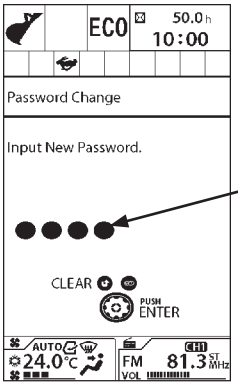


MDAA-01-158EN

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

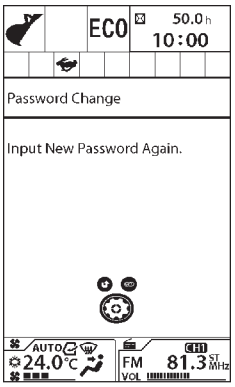


MDAA-01-159EN

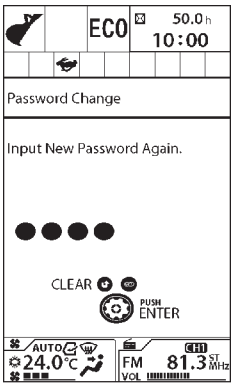


MDAA-01-160EN

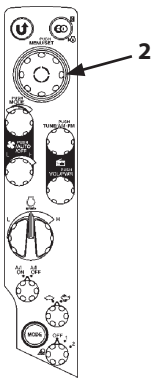
8. Input the new password again to confirm it and push selector knob (2).



MDAA-01-161EN

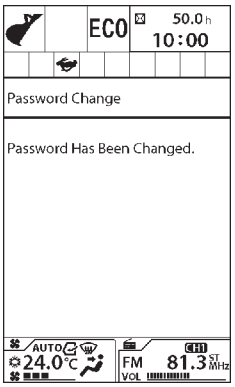


MDAA-01-162EN



MDCD-01-026

9. The password has been changed.

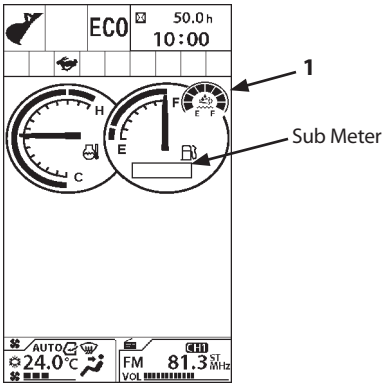


MDAA-01-163EN

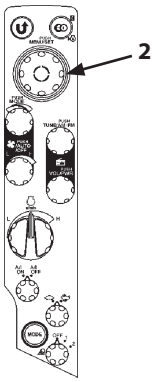
Sub Meter

A sub meter selection menu that can be added to the fuel meter is selected on this screen. OFF, Fuel Consumption Indicator and Breaker Hour Meter are provided. The breaker hour meter indicates the breaker operation time.

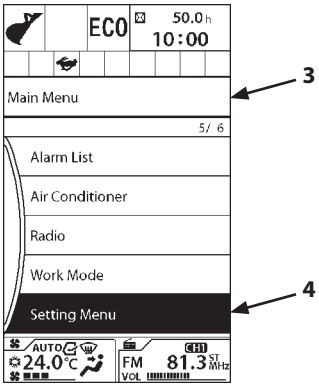
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).
4. Rotate selector knob (2) to highlight Sub Meter Selection (6).



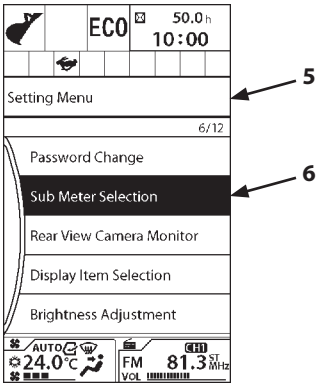
MDC1-01-315



MDCD-01-026

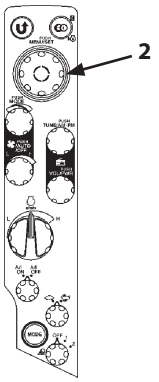


MDAA-01-114EN



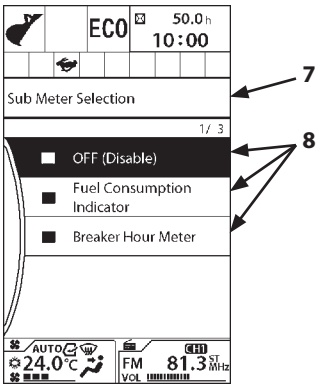
MDAA-01-164EN

5. Push selector knob (2) to display Sub Meter Selection screen (7).



MDCD-01-026

6. Rotate selector knob (2) to highlight Desired Sub Meter (8). (Selecting OFF will not display a sub meter.)
7. Push selector knob (2) to enable the changes.



MDAA-01-165EN

NOTE:

- *Only one sub meter can be selected at a time.*
- *When a display is selected, the mark "■" is displayed in green. When not selected, the mark "■" is displayed in gray.*

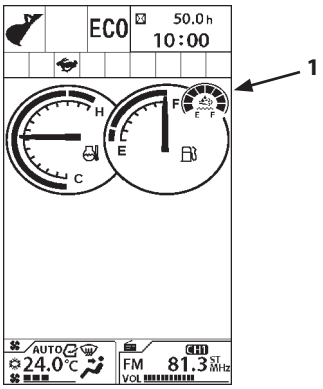
Rear View Camera Monitor

WARNING:

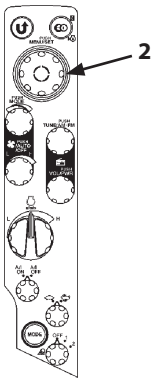
- **Switching the rear view camera monitor OFF may result in serious personal injury or damage to the machine, due to being unable to see the view from the rear of the machine. If the image from the rear view camera is not displayed on Basic Screen (1) of the monitor, follow the instructions on this page to display it.**
- **The image displayed on the rear view monitor is meant only as an aid. Actual position and distance of people and objects in the rear view monitor will be different. When operating the machine, pay thorough attention to the surrounding situation.**

Rear View Camera ON (Factory Setting: ON)

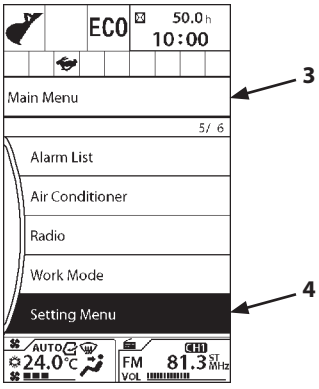
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).
4. Rotate selector knob (2) to highlight Rear View Camera Monitor (6).



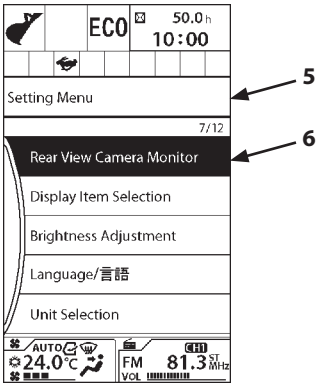
MDC1-01-001



MDCD-01-026

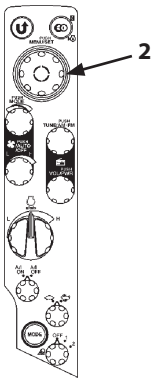


MDAA-01-114EN



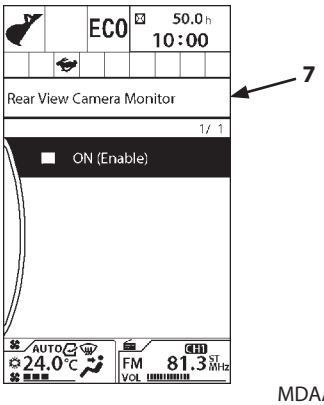
MDAA-01-168EN

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



MDCD-01-026

6. Push selector knob (2) to turn the rear view camera monitor ON.
7. Please confirm that the rear view image is displayed on the basic screen.



MDAA-01-169EN

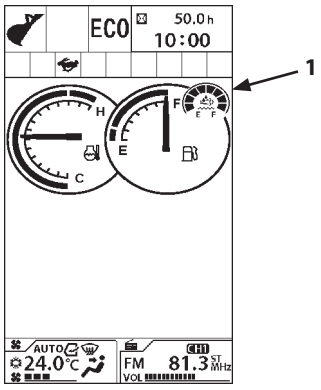
IMPORTANT:

- **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 on the rear view image.**

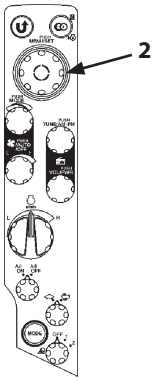
NOTE: The monitor display and camera lens surface are resin product. Lightly wipe the surface with a wet clean cloth. Never use an organic solvent.

Brightness Adjustment

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

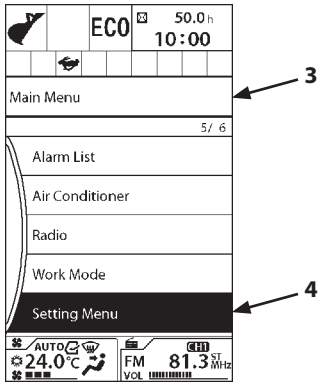


MDC1-01-001



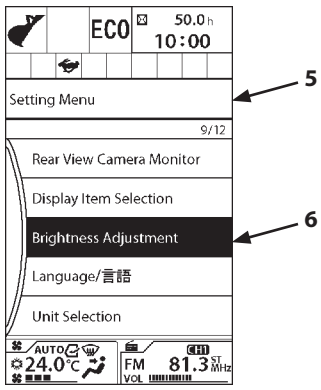
MDCD-01-026

2. Rotate selector knob (2) to highlight Setting Menu (4).



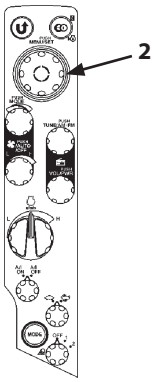
MDAA-01-114EN

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



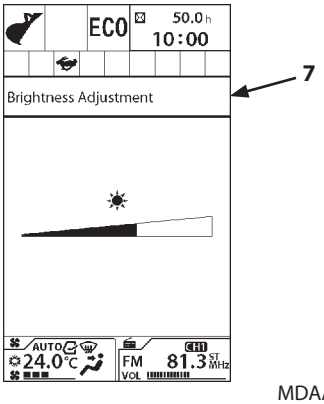
MDAA-01-171EN

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



MDCD-01-026

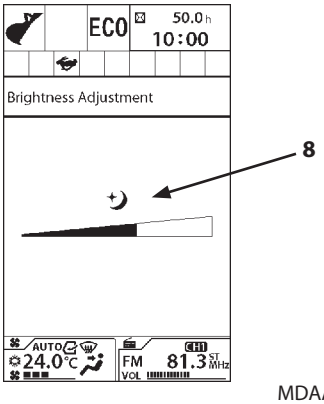
6. Rotate selector knob (2) clockwise to make the screen brighter, counterclockwise to make the screen darker.



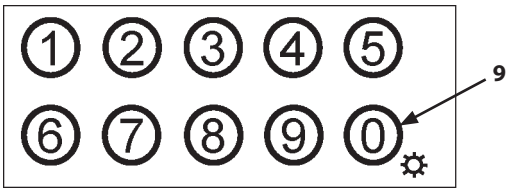
MDAA-01-172EN

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.*



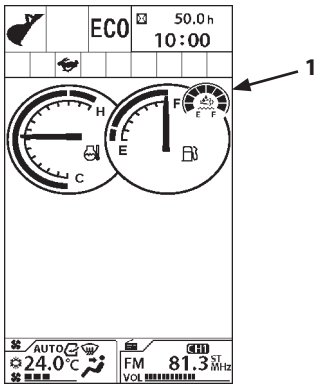
MDAA-01-173EN



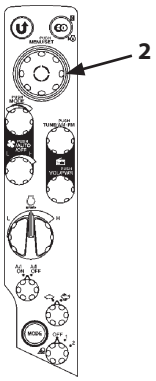
MDAA-01-018

Language Settings

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

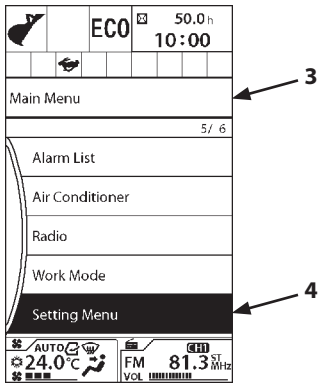


MDC1-01-001



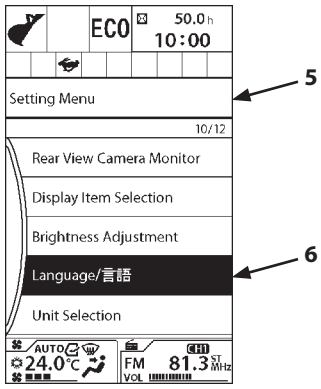
MDCD-01-026

2. Rotate selector knob (2) to highlight Setting Menu (4).



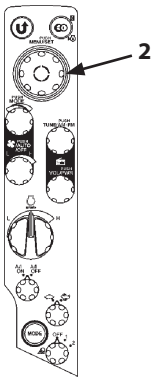
MDAA-01-114EN

3. Push selector knob (2) to display Setting Menu screen (5).
4. Rotate selector knob (2) to highlight Language/言語 (6).



MDAA-01-176EN

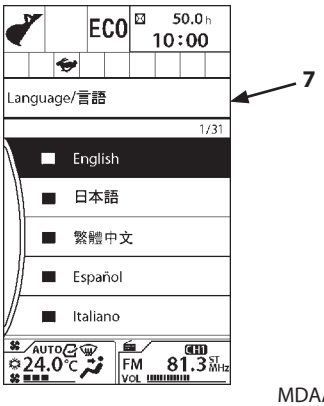
5. Push selector knob (2) to display Language/言語 screen (7).



MDCD-01-026

6. Rotate selector knob (2) to highlight the desired language. Push selector knob (2) to make the change.

NOTE: When a display is selected, the mark "■" is displayed in green. When not selected, the mark "■" is displayed in gray.



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Lists of Display Language

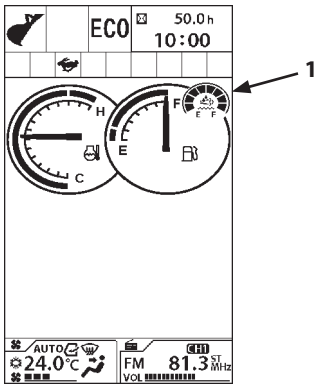
Language	Screen Display
Japanese	日本語
English	English
Spanish	Español
Italian	Italiano
French	Français
German	Deutsch
Dutch	Nederlands
Russian	Русский
Portuguese	Português
Finnish	Suomi
Greek	Ελληνικά
Swedish	Svenska
Norwegian	Norsk
Chinese (Simplified)	简体中文
Chinese (Traditional)	繁體中文
Korean	한국어

Language	Screen Display
Indonesian	Bahasa Indonesia
Thai	ภาษาไทย
Vietnamese	Tiếng Việt
Myanmarese	မြန်မာဘာသာ
Arabic	اللغة العربية
Persian	زبان فارسی
Turkish	Türkçe
Danish	Dansk
Estonian	Eesti
Polish	Polski
Icelandic	Íslenska
Croatian	Hrvatski
Slovenian	Slovenščina
Romanian	limba română
Bulgarian	Български език
Lithuanian	Lietuvių kalba

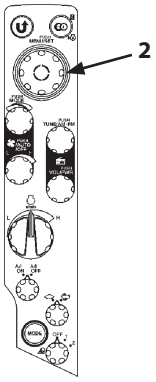
Unit Selection

Unit system displayed on the monitor can be selected in this screen.

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

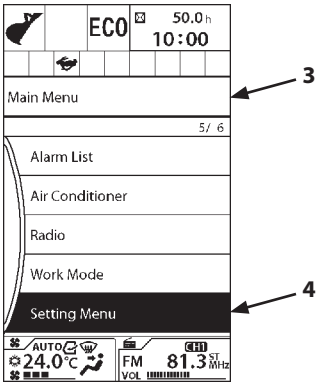


MDC1-01-001



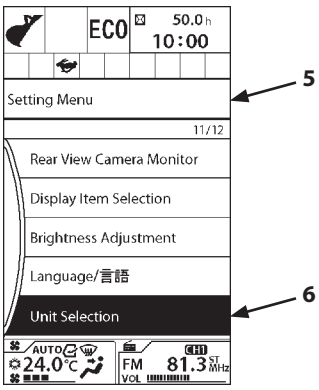
MDCD-01-026

2. Rotate selector knob (2) to highlight Setting Menu (4).



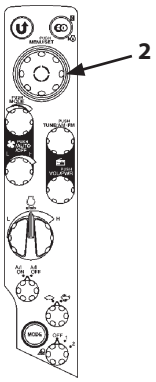
MDAA-01-114EN

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



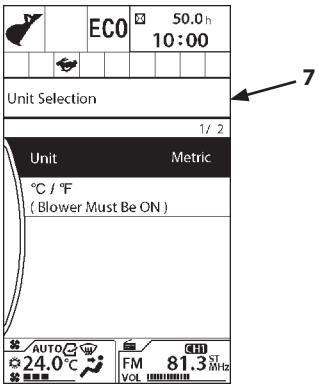
MDAA-01-181EN

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



MDCD-01-026

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

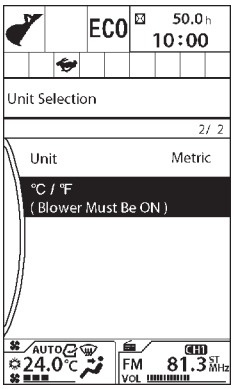


MDAA-01-182EN

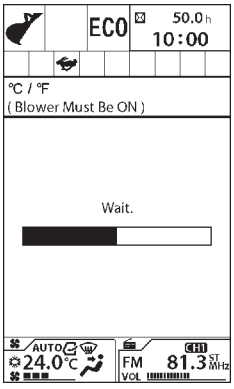
7. Before changing °C and °F, turn the blower of the air conditioner ON.

   Rotate selector knob (2) to highlight desired unit system (°C or °F). Push selector knob (2) to set the unit.

   When pressing selector knob (2), "Wait." will be displayed and then the change will be completed.



MDAA-01-183EN

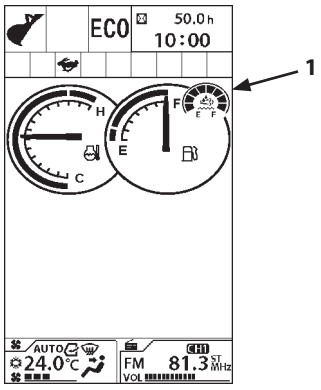


MDAA-01-184EN

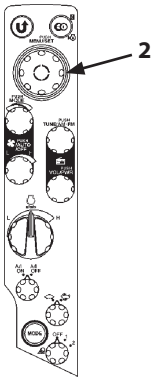
Display Item Selection (Rear View Camera OFF)

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).

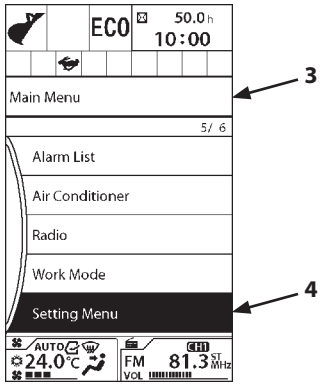


MDC1-01-001



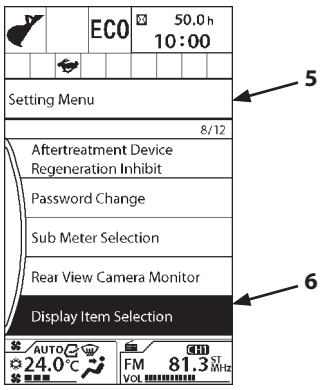
MDCD-01-026

2. Rotate selector knob (2) to highlight Setting Menu (4).



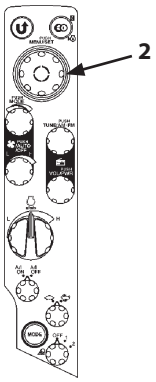
MDAA-01-114EN

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



MDC1-01-237EN

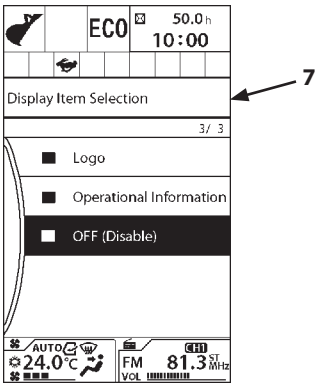
5. Push selector knob (2) to display Display Item Selection screen (7).



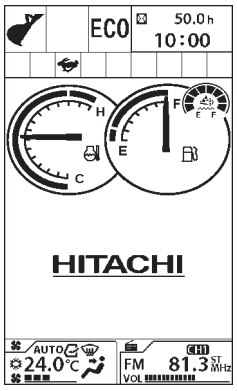
MDCD-01-026

6. Rotate selector knob (2) to highlight the Desired Display. Push selector knob (2) to set the image. (Selecting OFF sets non-display.)

NOTE: When a display is selected, the mark "■" is displayed in green. When not selected, the mark "■" is displayed in gray.

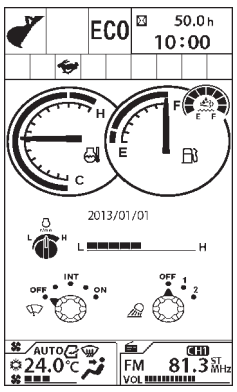


MDAA-01-238EN



Logo

MDC1-01-239



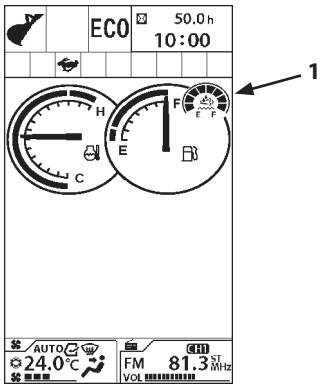
Operation Information

MDC1-01-222

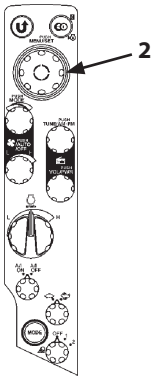
Main Menu Sequence Change

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

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

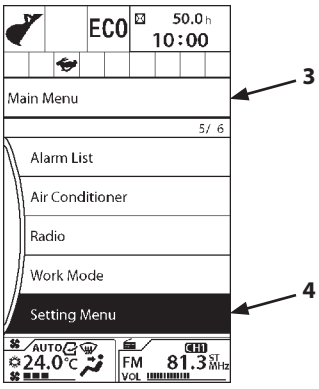


MDC1-01-001



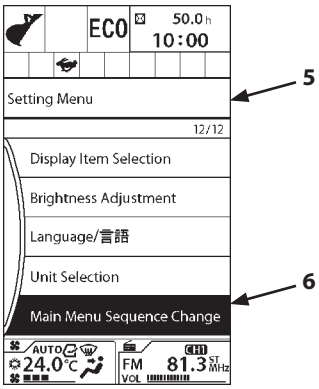
MDCD-01-026

2. Rotate selector knob (2) to highlight Setting Menu (4).



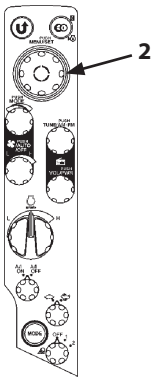
MDAA-01-114EN

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



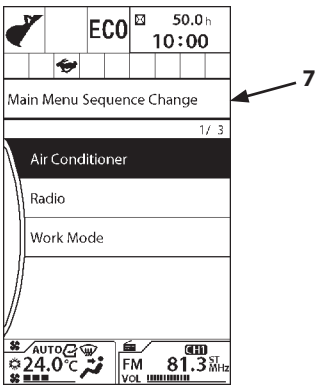
MDAA-01-186EN

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



MDCD-01-026

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.

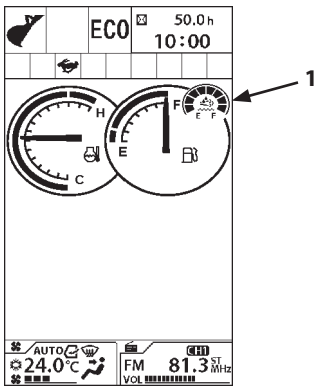


MDAA-01-187EN

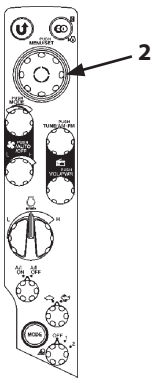
Information Menu

The information menu includes Operation, Maintenance and Monitoring.

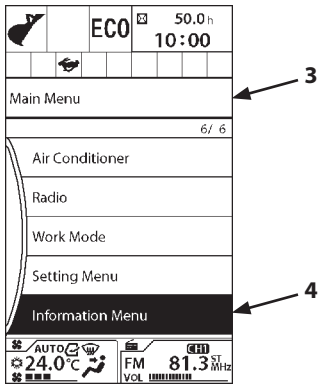
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Information Menu (4).
3. Push selector knob (2) to display Information Menu screen (5).



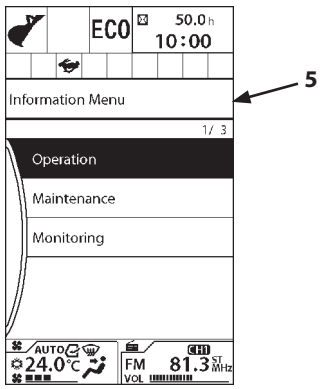
MDC1-01-001



MDCD-01-026



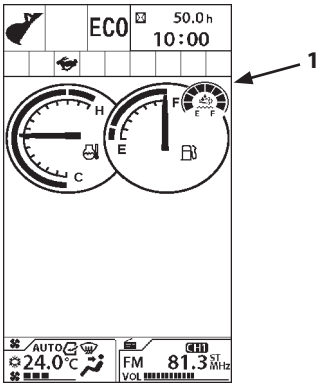
MDAA-01-190EN



MDAA-01-191EN

Operation

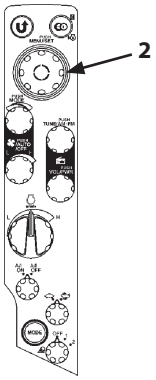
The Operation screen displays Fuel Consumption, Breaker Operation, Attachment Operation, Travel Operation, and Actual Operation menus. The Fuel Consumption screen displays fuel consumption, operating hours, and fuel consumption rate, for the period since the monitoring unit was last reset. The Breaker Operation screen displays breaker operating hours, machine operating hours and operating rate, for the period since the monitoring unit was last reset. The Attachment Operation screen displays total operating hours of front attachment, travel and all operation for the period since the monitoring unit was last reset.



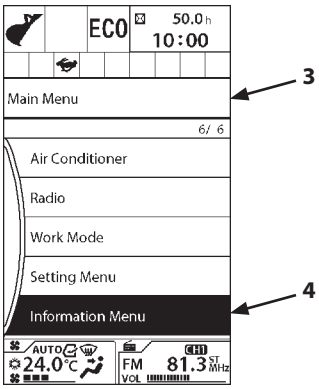
MDC1-01-001

Fuel Consumption

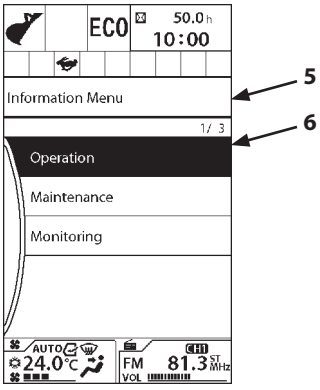
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Information Menu (4).
3. Push selector knob (2) to display Information Menu screen (5).
4. Rotate selector knob (2) to highlight Operation (6).



MDCD-01-026

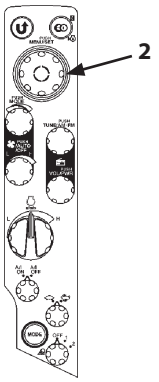


MDAA-01-190EN



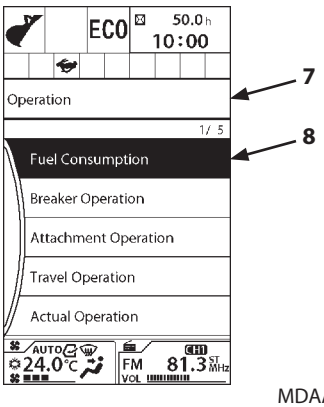
MDAA-01-191EN

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



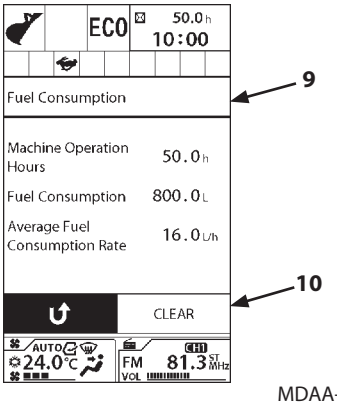
MDCD-01-026

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



MDAA-01-193EN

The Machine Operation Hours, Fuel consumption, and Average Fuel Consumption rate can be checked on this screen.
Pushing selector knob (2) returns to the previous screen. To clear the Fuel Consumption and Machine Operation Hours, rotate selector knob (2) to highlight CLEAR (10), and then push selector knob (2).



MDAA-01-194EN

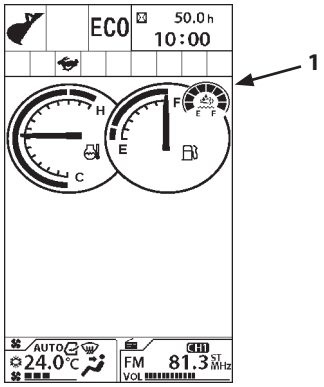
IMPORTANT: Total fuel consumption and fuel consumption rate depend on the operating environment and the operation method of the machine.

The values shown on the screen are just for reference.

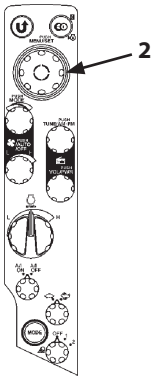
A difference could arise between actual fuel consumption and fuel consumption as displayed on the monitor unit.

Breaker Operation

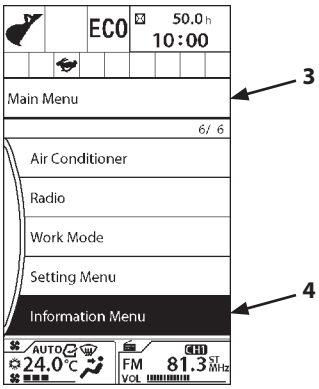
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Information Menu (4).
3. Push selector knob (2) to display Information Menu screen (5).
4. Rotate selector knob (2) to highlight Operation (6).



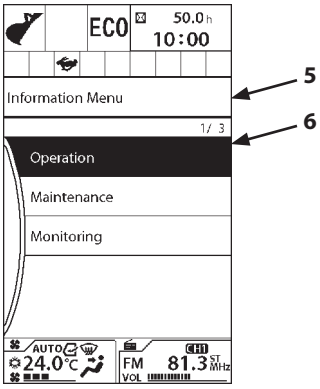
MDC1-01-001



MDCD-01-026

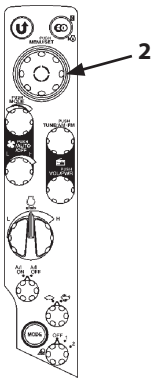


MDAA-01-190EN



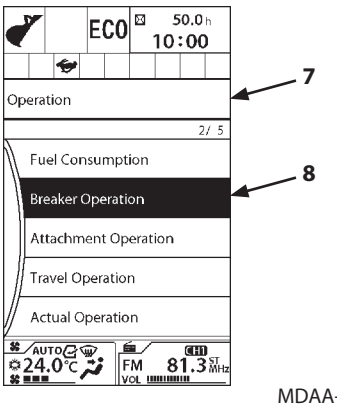
MDAA-01-191EN

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



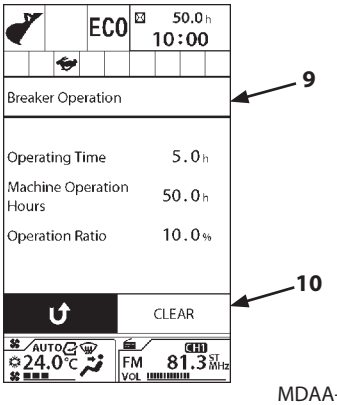
MDCD-01-026

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



MDAA-01-196EN

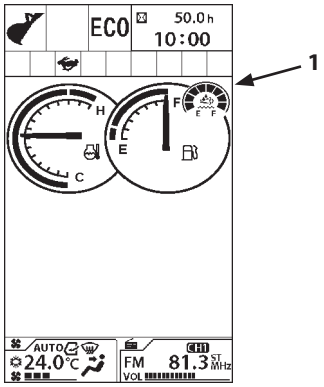
Operating Time, Machine Operation Hours and Operation Ratio can be checked in this screen.
Pushing selector knob (2) returns to the previous screen.
To clear the Operation Time and Machine Operation Hours data, rotate selector knob (2) to highlight CLEAR (10), and then push selector knob (2).



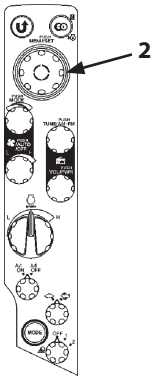
MDAA-01-197EN

Attachment Operation

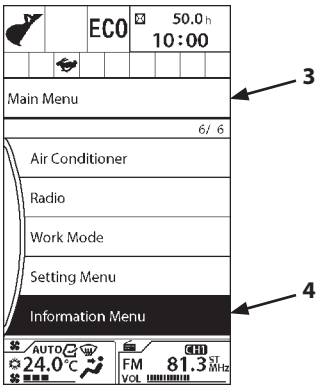
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Information Menu (4).
3. Push selector knob (2) to display Information Menu screen (5).
4. Rotate selector knob (2) to highlight Operation (6).



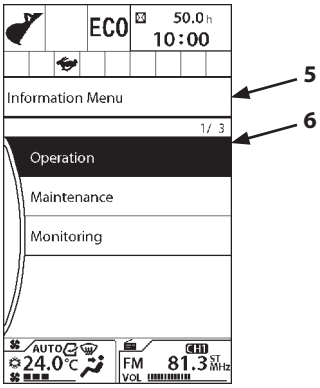
MDC1-01-001



MDCD-01-026

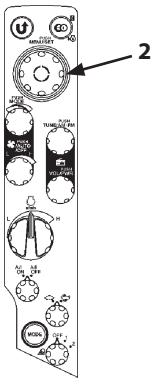


MDAA-01-190EN



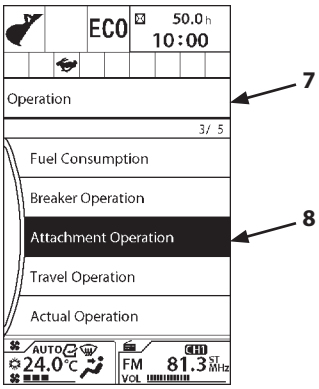
MDAA-01-191EN

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



MDCD-01-026

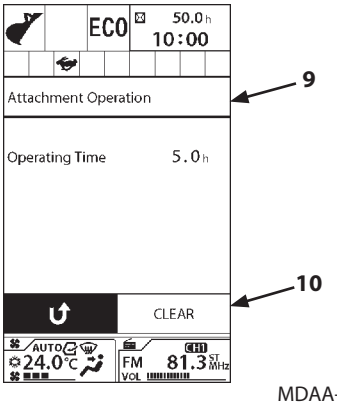
6. Rotate selector knob (2) to highlight Attachment Operation (8).



MDAA-01-199EN

7. Push selector knob (2) to display Attachment Operation screen (9).

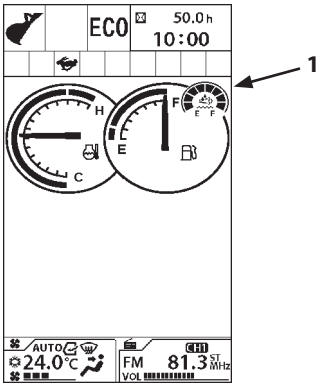
The attachment Operating Time can be checked in this screen.
Push selector knob (2) to return to the previous screen. To clear the Operating Time data, rotate selector knob (2) to highlight CLEAR (10), and then push selector knob (2).



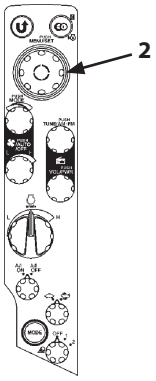
MDAA-01-200EN

Travel Operation

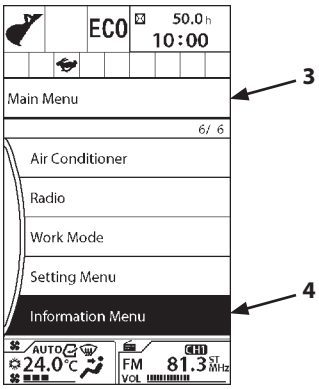
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Information Menu (4).
3. Push selector knob (2) to display Information Menu screen (5).
4. Rotate selector knob (2) to highlight Operation (6).



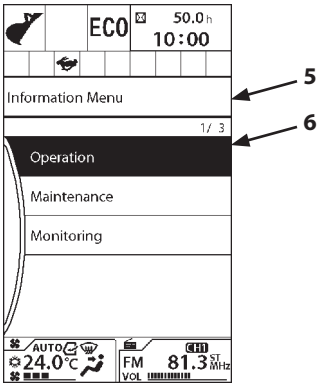
MDC1-01-001



MDCD-01-026

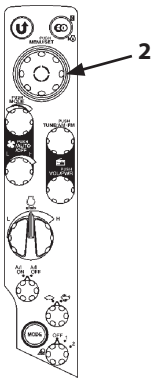


MDAA-01-190EN



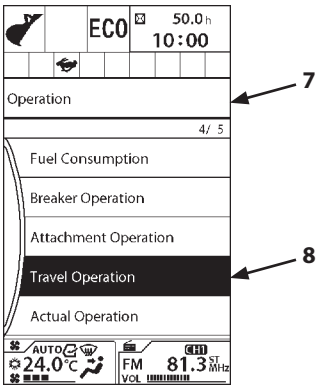
MDAA-01-191EN

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



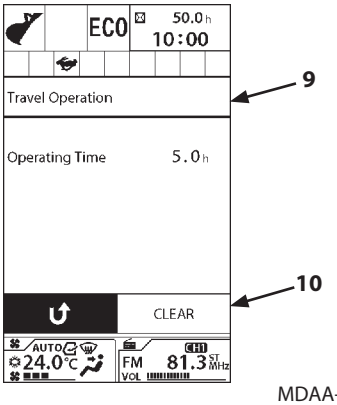
MDCD-01-026

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



MDAA-01-202EN

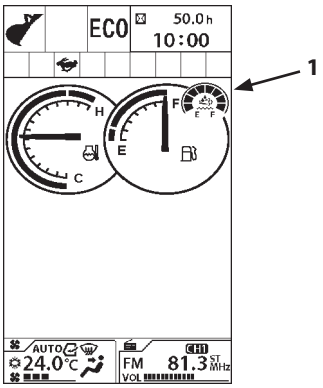
Total Travel Operating Time can be checked in this screen. Push selector knob (2) to return to the previous screen. To clear the Operating Time data, rotate selector knob (2) to highlight CLEAR (10), and then push selector knob (2).



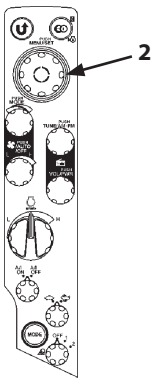
MDAA-01-203EN

Actual operation

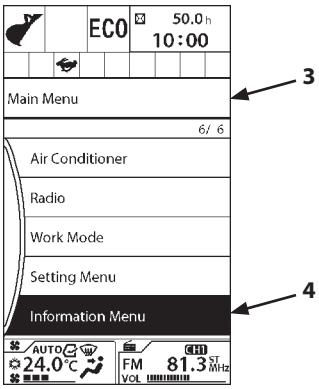
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Information Menu (4).
3. Push selector knob (2) to display Information Menu screen (5).
4. Rotate selector knob (2) to highlight Operation (6).



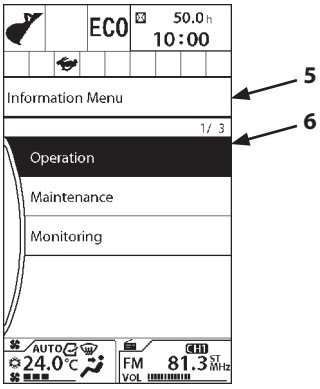
MDC1-01-001



MDCD-01-026

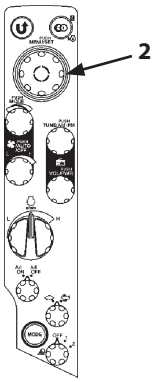


MDAA-01-190EN



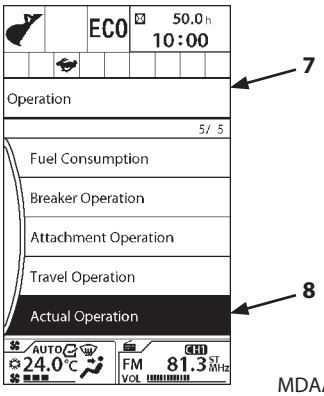
MDAA-01-191EN

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



MDCD-01-026

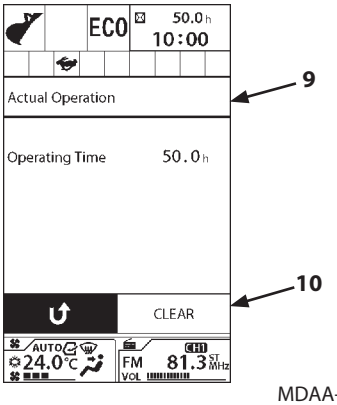
6. Rotate selector knob (2) to highlight Actual Operation (8).
7. Push selector knob (2) to display Actual Operation screen (9).



MDAA-01-205EN

The actual Operating Time can be checked in 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 Operating Time includes travel operation hours as well as all other operations.



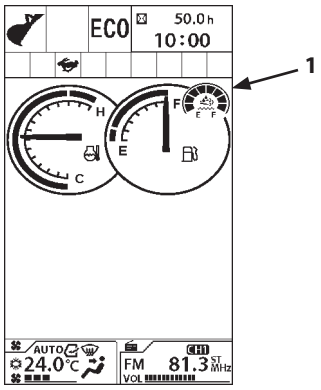
MDAA-01-206EN

Maintenance

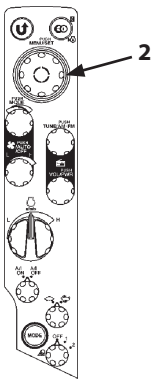
The maintenance screen includes maintenance notice, remaining hours until the next maintenance, and maintenance intervals.

Maintenance Items
- Engine Oil
- Engine Oil Filter
- Hydraulic Oil
- Hydraulic Oil Pilot Filter
- Hydraulic Oil Full-Flow Filter
- Pump Transmission Oil
- Travel Device Oil
- Swing Device Oil
- Swing Bearing Grease
- Air Cleaner Filter
- Fuel Filter
- Air Conditioner Filter
- DEF/AdBlue® Supply Module Main Filter
- Fuel Solenoid Pump Filter*
- User Setting 1
- User Setting 2

*NOTE: Item with *mark: Refer to "Maintenance" section.*



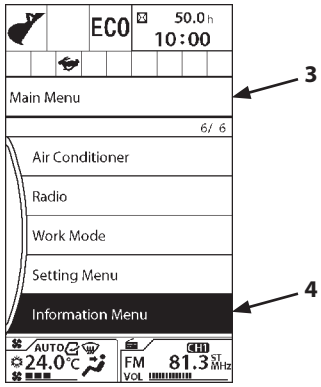
MDC1-01-001



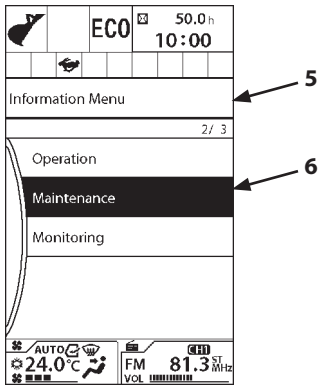
MDCD-01-026

Maintenance Notice

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Information Menu (4).
3. Push selector knob (2) to display Information Menu screen (5).
4. Rotate selector knob (2) to highlight Maintenance (6).

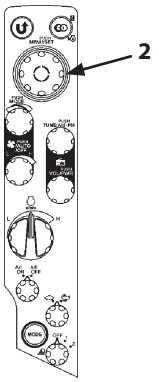


MDAA-01-190EN



MDAA-01-223EN

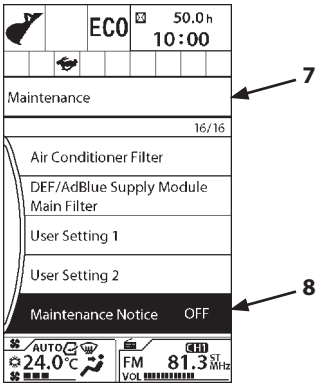
5. Push selector knob (2) to display Maintenance screen (7).



MDCD-01-026

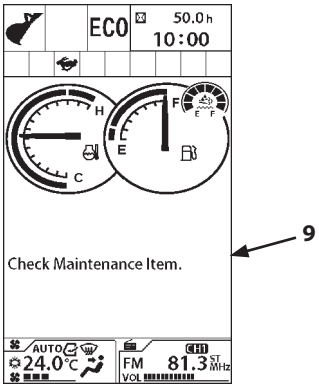
6. Rotate selector knob (2) to highlight Maintenance Notice (8).
7. Push selector knob (2) to turn the Maintenance Notice ON. Push selector knob (2) again to turn the Maintenance Notice OFF.

   ON : When the required interval is reached, an information message is displayed on the screen.
   OFF : No notification message is displayed.

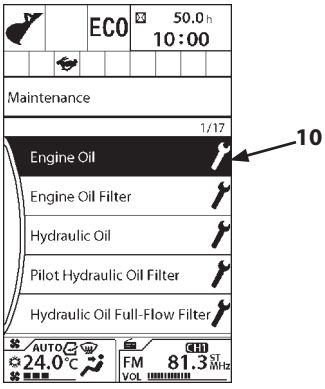


MDAT-01-208EN

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 spanner (10).



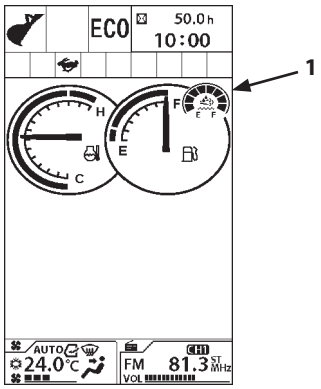
MDC1-01-213EN



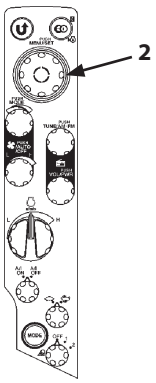
MDAA-01-214EN

Remaining Time and Maintenance Interval

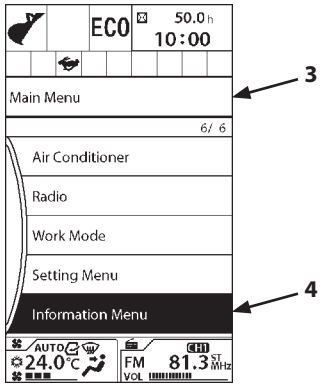
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Information Menu (4).
3. Push selector knob (2) to display Information Menu screen (5).
4. Rotate selector knob (2) to highlight Maintenance (6).



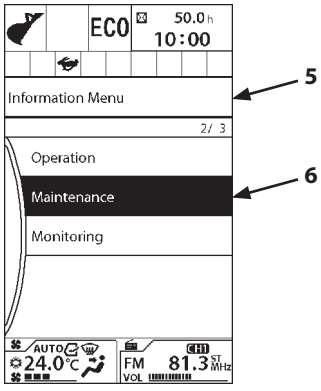
MDC1-01-001



MDCD-01-026

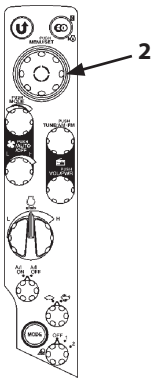


MDAA-01-190EN



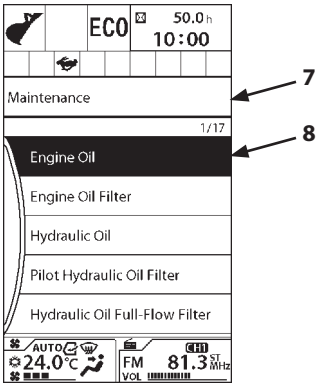
MDAA-01-223EN

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



MDCD-01-026

6. Rotate selector knob (2) to highlight a Maintenance Item to be checked (8). (In the example on the right, Engine Oil is selected.)
7. Push selector knob (2) to display the time remaining for the selected maintenance item.



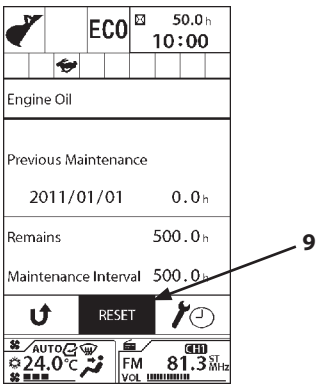
MDAA-01-336EN

Resetting Data

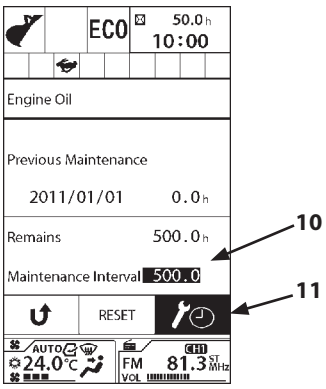
To reset the remaining time data, rotate selector knob (2) to highlight RESET (9), and then push selector knob (2). The value of the remaining hours is reset to that of the change interval. The previous change date/hour is updated with the current date and time.

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-01-210EN

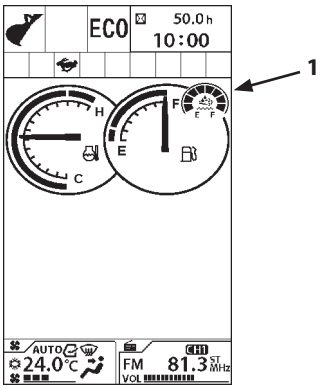


MDAA-01-212EN

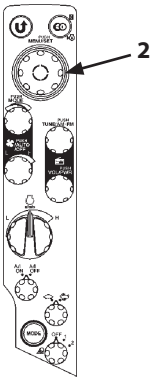
Monitoring

The engine speed can be checked.

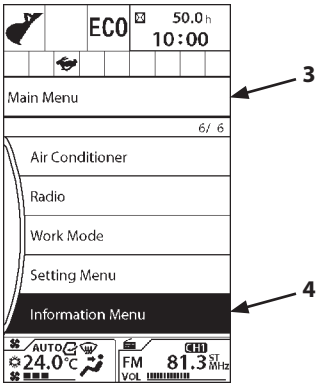
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Information Menu (4).
3. Push selector knob (2) to display Information Menu screen (5).
4. Rotate selector knob (2) to highlight Monitoring (6).



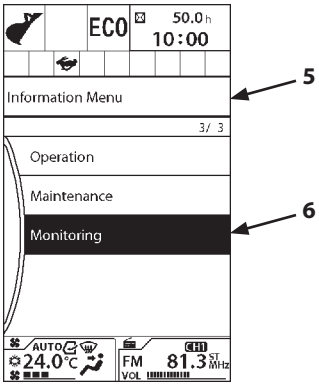
MDC1-01-001



MDCD-01-026

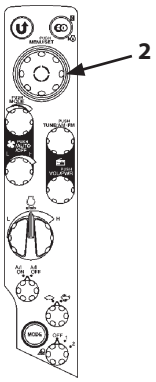


MDAA-01-190EN

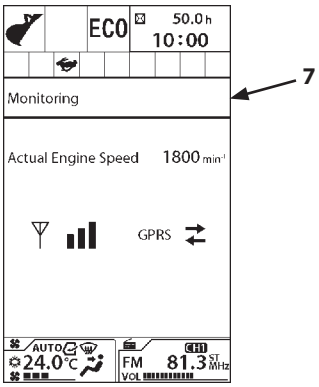


MDAA-01-220EN

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



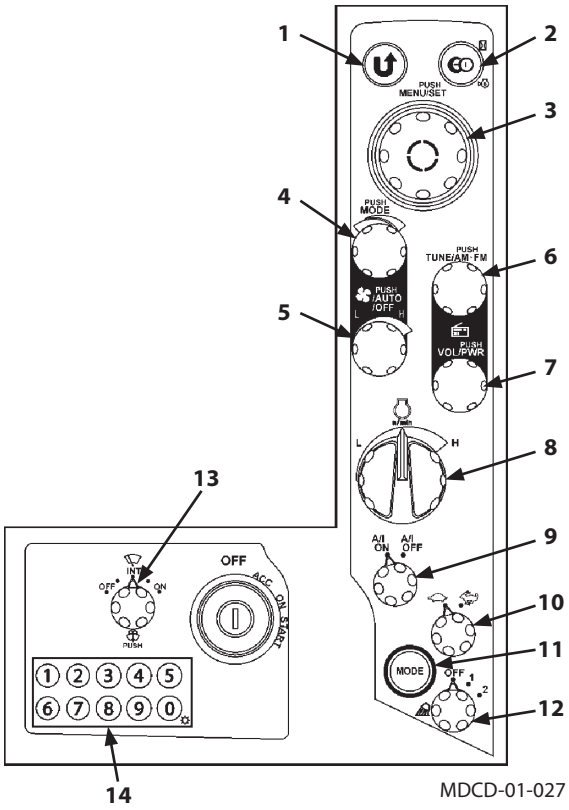
MDCD-01-026



MDC1-01-221EN

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



MDCD-01-027

Return to Previous Screen Switch (Monitor)

Push this switch to return to the previous screen.

MDAA-01-010

Return to Basic Screen Switch (Monitor)

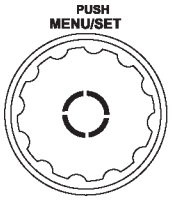
Allows any screen to return to the basic screen.

MDAA-01-011

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

Temperature Control Switch/Mode Switch (Air Conditioner)

Push : Air vent is selected.

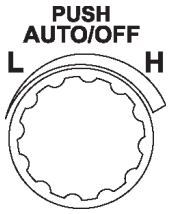
Rotate : Sets the temperature.

MDAA-01-013

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.

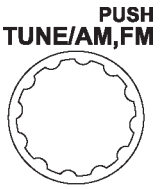
Rotate : Adjusts the blower speed.



MDAA-01-015

AM/FM Selector/Tuning Switch (Radio)

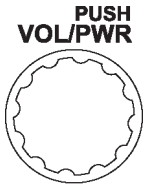
Push : AM/FM is selected.
Rotate : Adjusts radio frequency.



MDAA-01-014

Power Switch/Volume Control Knob (Radio)

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

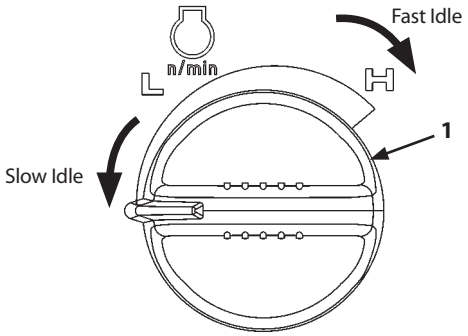


MDAA-01-016

Engine Control Dial

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

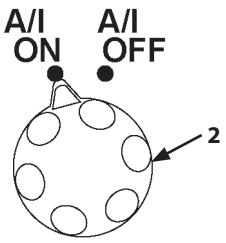
The fully clockwise position : Fast Idle
Counterclockwise : Slow Idle



M1P1-01-068

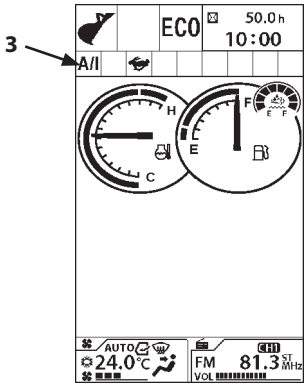
Auto-Idle Switch

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



MDAA-01-017

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



MDC1-01-314

NOTE:

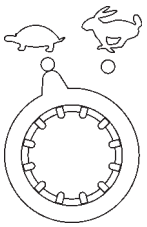
- *Auto-idle control may not work completely until the end of the warm-up.*
- *The auto-idle control function does not operate when the aftertreatment device is regenerating.*

Travel Mode Switch

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

Mark (Fast Speed Mode)

Mark (Slow Speed Mode)



MDCD-01-028

Power Mode Switch

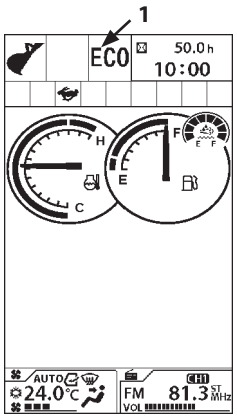
The two engine speed modes, ECO, PWR or H/P mode are selected by operating the power mode switch.

MDAA-01-274

- 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 (1).

- H/P (High Power) Mode
  Use the H/P mode when extra fast speed and/or heavy duty work is needed.



MDC1-01-001

NOTE: ECO mode is set automatically when starting the engine. Set PWR mode if necessary.

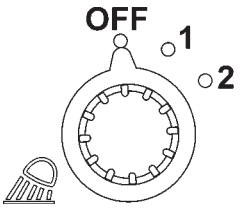
Work Light Switch

Work light switch has the following positions.

1 Position : Work light (3) on the base machine will light. Also, the switch panel illumination will light.

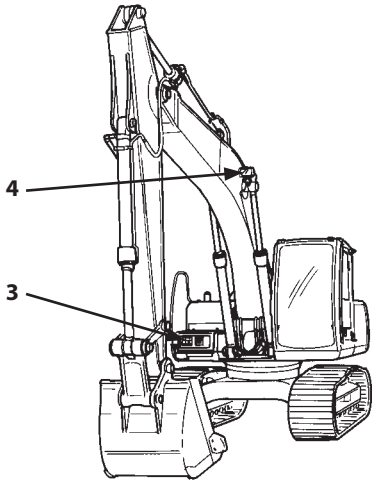
2 Position : Work light (4) mounted on the boom and work light (3) on the right side of the machine will light. At the same time, the switch panel illumination will light. The monitor changes to night mode.

OFF Position : Work lights (3), (4), and the switch panel illumination will turn off.



MDCD-01-029

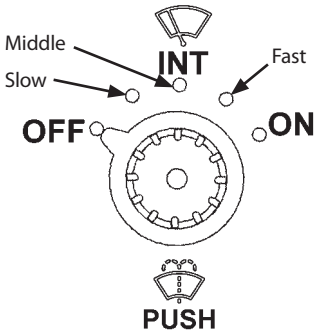
NOTE: When the key switch is turned OFF while the work light switch is in 2-position, work light (4) turns ON for 30 seconds.



M157-01-146

Wiper/Washer Switch

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

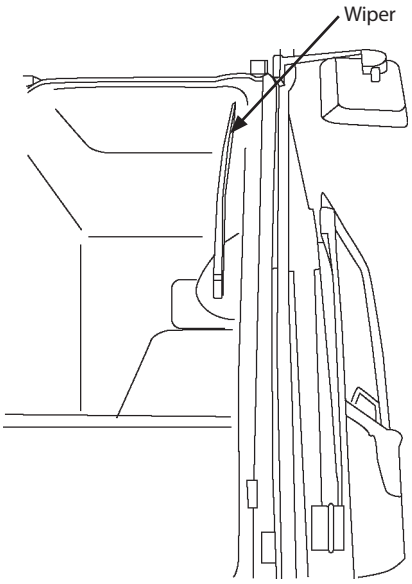


MBFM-01-005

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

OFF	The wiper stops and is retracted.
INT Position	The wiper operates intermittently at the interval selected by the switch position as described below. INT mode has three positions of operating speed as shown below.
INT (Slow):	The wiper operates at 8-second interval.
INT (Mid):	The wiper operates at 6-second interval.
INT (Fast):	The wiper operates at 3-second interval.
ON	The wiper operates continuously.

NOTE: When the front window (upper) is opened, the wiper and washer will not operate. If the front window is opened while operating the wiper, the wiper stops.



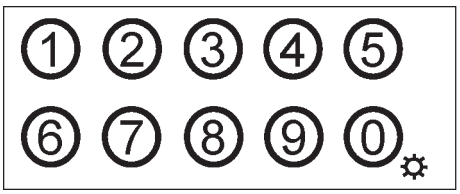
MDC1-01-513

- Washer
  Push and hold the wiper/washer switch to squirt washer fluid onto the front window. When the wiper/washer switch is pressed for more than 2 seconds, the wiper operates until the switch is released. When the wiper/washer switch is released, the wiper automatically retracts.
  When operating the wiper in INT mode, while push and hold the wiper/washer switch, the wiper operates continuously.

NOTE: The wiper motor protection control stops wiper operation, to prevent it from becoming stuck when operated for long period of time under high load. When the wiper stops, do not change the arm position and wait several minutes until the wiper starts operation 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.

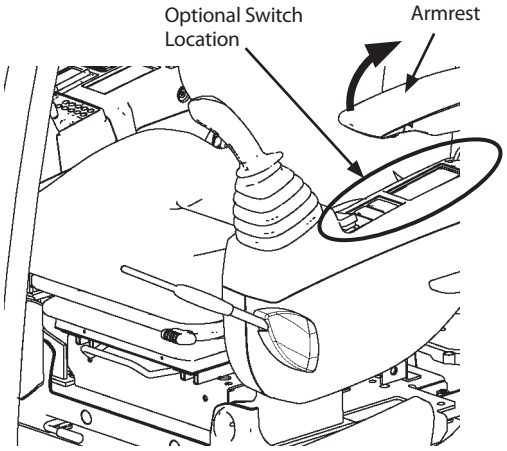


MDAA-01-018

Switch Panel (for Optional Equipments)

NOTE: The optional switch locations differ, depending on the kinds 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 the armrest when operating the optional switch. All available optional devices are shown below.

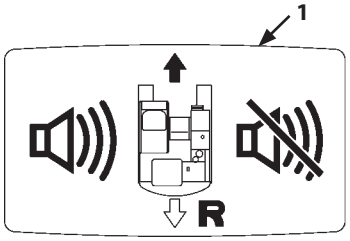
- Travel Alarm Deactivation
- Rear Light
- Seat Heater
- Electrical Control



MDAA-01-327

Travel Alarm Deactivation Switch (Optional)

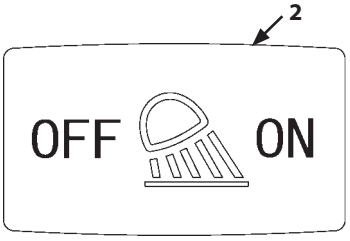
The travel alarm buzzer sounds during travel operation. When pushing the mark of travel alarm deactivation switch (1), the travel alarm buzzer function is deactivated.



M1U1-01-035

Rear Light Switch (Optional)

When rear light switch (2) is turned ON, the rear light at the rear of the cab roof comes ON.



MDC1-01-501

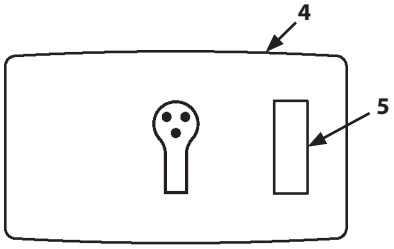
Seat Heater Switch (Optional)

When seat heater switch (3) 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

Electrical Control Main Switch (Optional)

By placing the pilot control shut-off lever in the lock release position, and pressing electrical control main switch (4), indicator (5) lights, allowing use of the electrical control (attachment switch). Pressing electrical control main switch (4) one more time, turns indicator (5) to the OFF position.
Also by turning the key switch to the OFF position changes the indicator OFF.



MDAA-01-311

CAUTION: When there is no need to use the electrical control (attachment switch) system, turn OFF electrical control main switch (4) to avoid incorrect operation.

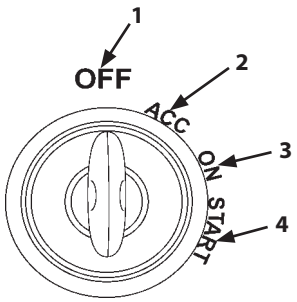
Key Switch

1- OFF (Engine Off)

2- ACC (Horn, Radio etc.)

3- ON (Engine ON)

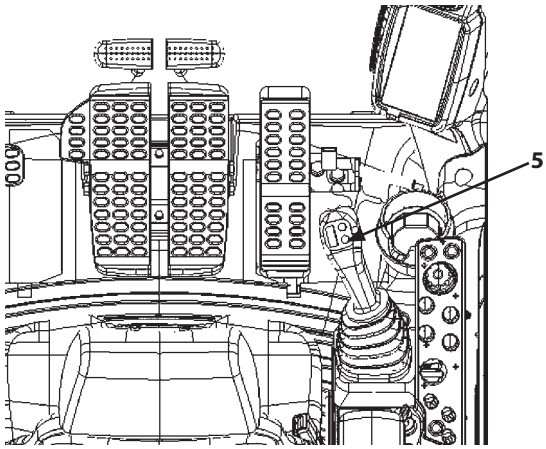
4- START (Engine Start)



MDC1-01-502

Power Boost Switch

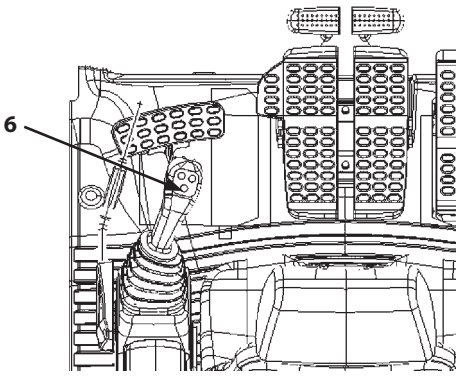
Power boost switch (5) is provided on the top of the right control lever.
While pressing power boost switch (5), the maximum digging power is boosted within approximately 8 seconds to increase work capacity.



MDAA-01-361

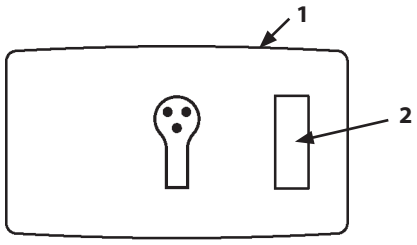
Horn Switch

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-01-362

Electrical Control Main Switch (Optional)



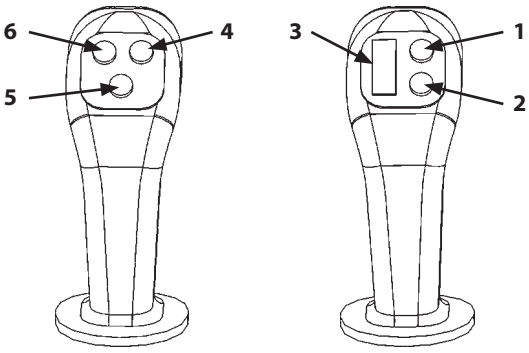
MDAA-01-311

- Attachment Switch (Assist Operation) (Main Operation)
  This switch (1) is mainly used for optional devices and attachments with a rotary or a tilt function. By placing the pilot control shut-off lever in the lock release position, and pressing electrical control main switch (1), indicator (2) will light. When indicator (2) is lit, operation of the attachment is possible.

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.

AUX Function Lever 1

1. Auxiliary
2. Power Boost Switch
3. Attachment Switch (Assist Operation) (Main Operation)
4. Auxiliary
5. Horn Switch
6. Auxiliary



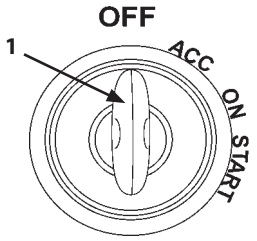
Left Control Lever

Right Control Lever

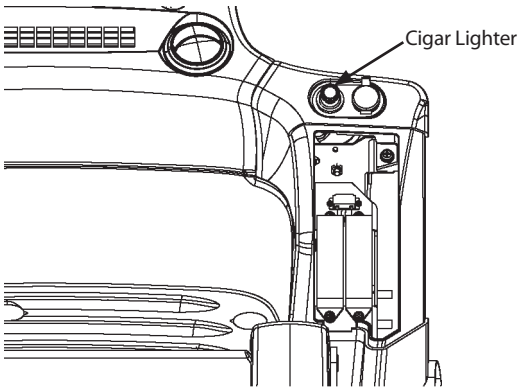
MDAA-01-337

MCGB-01-030

Cigar Lighter



MDC1-01-502



MDAA-01-297

Using Cigar Lighter

IMPORTANT: In case the cigar lighter does not pop out automatically 30 seconds after pushing the cigar lighter in, pull out the cigar lighter manually. Consult your authorized dealer.

1. Insert key switch (1). Turn it to "ACC" or "ON" position.
2. Push and release the cigar lighter knob.
3. The cigar lighter knob will return to the original position when the lighter becomes usable. Pull the cigar lighter out to use.
4. After use, reinsert the cigar lighter to its original position in the panel.

Using Cigar Lighter Port as External Power Source

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

IMPORTANT: Only 24 V electric power is available from the cigar lighter port on this machine.

Never connect accessories that use power other than 24 V. Damage to the batteries and accessories may result.

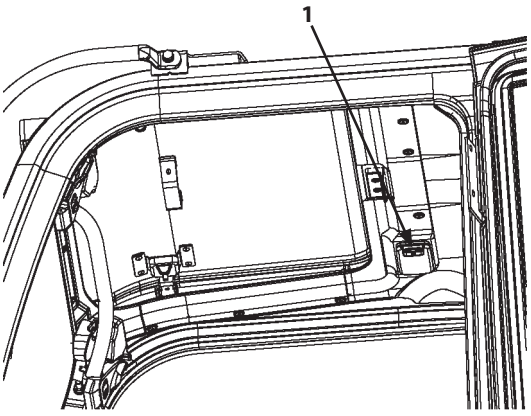
Do not supply power to accessories for a long time without running the engine. Failure to do so may discharge the batteries.

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

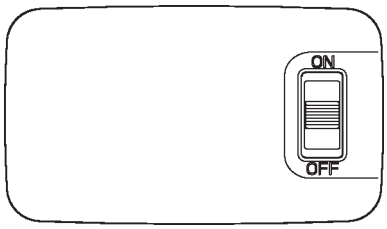
Cab Light Switch

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

ON	:	The cab light comes and stays ON. (The light does not turn ON while the key OFF.)
OFF	:	The cab light goes OFF.
Neutral	:	The cab light turns ON as the cab door is opened. The cab light automatically goes off after 30 seconds. (The cab light turns ON while the key switch is OFF.)



MDAA-01-305



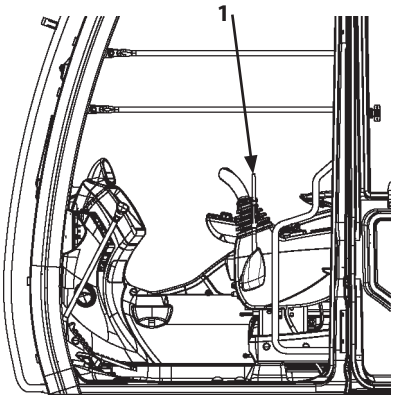
MDAA-01-318

Pilot Control Shut-Off Lever

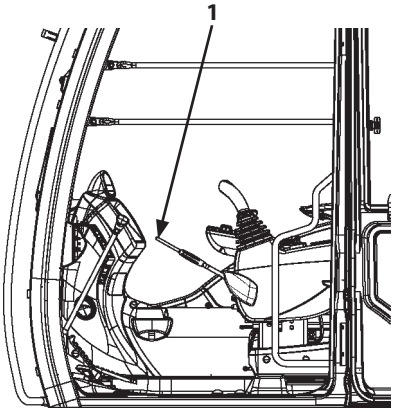
Pilot control shut-off lever (1) functions to prevent the machine from being mistakenly operated when the operator accidentally touches the control lever or pedals when getting on or off the machine.

⚠ WARNING:

- **Always pull pilot control shut-off lever (1) into the full LOCK position. Unless pilot control shut-off lever (1) is fully moved to the LOCK position, the control lever 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 pilot control shut-off lever (1) up to the LOCK position before transporting the machine and leaving the machine.**
- **Confirm that pilot control shut-off lever (1) is in the LOCK position before starting the engine. The engine will not start in any position other than the LOCK position.**



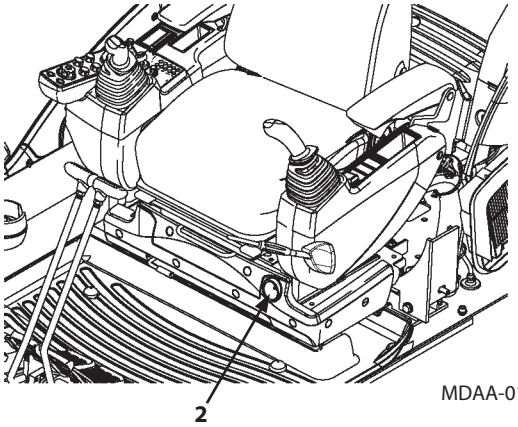
LOCK position MDAA-01-295



UNLOCK Position MDAA-01-296

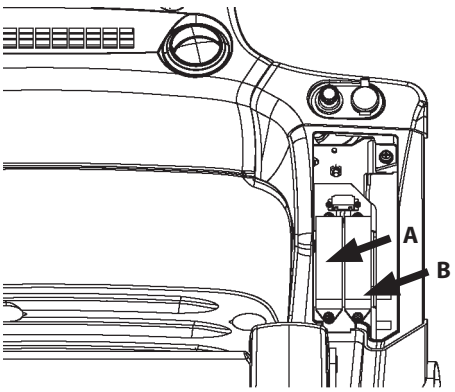
Engine Stop Switch

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



MDAA-01-290

Fuse Box

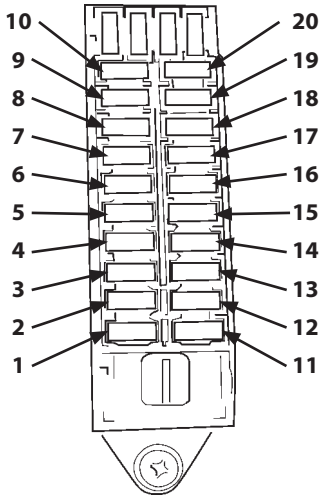


MDAA-01-297

A

10-	CONTROLLER 5 A	20-	OPT.3 (ALT) 5 A
9-	BACKUP 10 A	19-	HORN 10 A
8-	ECU 30 A	18-	IDLE STOP 5 A
7-	START 5 A	17-	POWER ON 5 A
6-	OPT.2 (ALT) 20 A	16-	GLOW RELAY 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-	FUEL PUMP 5 A

A

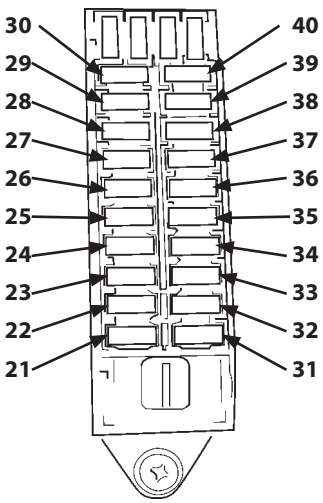


M1GR-01-003

B

30-	-	40-	-
29-	-	39-	-
28-	SENSOR_UNIT 10 A	38-	-
27-	AUX.3 5 A	37-	-
26-	QUICK HITCH 5 A	36-	-
25-	IMMOBI 5 A	35-	DCU 20 A
24-	12VUNIT 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

B



M1GR-01-003

Auto Air Conditioner

Features:

- Full Auto-Temperature 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. Cooling and Heating:
  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 Vent

2- Foot Vent

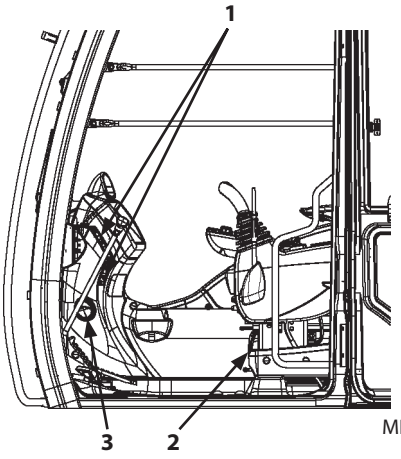
3- Defroster Vent

4- Rear Vent

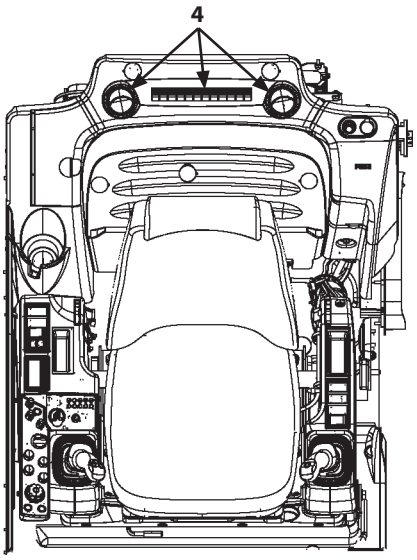
5- Temperature Control Switch/Mode Switch

6- AUTO/OFF Switch/Fan Switch

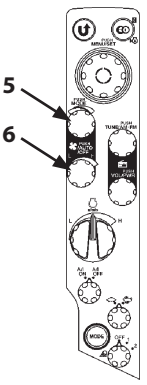
NOTE: Air flow direction can be adjusted by moving the louvers on all air vents except for foot vent (2). The louvers on front vents (1) and defroster vent (3) can be completely opened and closed by hand.



MDAA-01-295

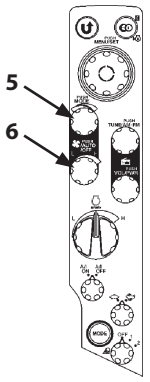


MDAA-01-289



MDCD-01-026

Controller Part Name and Function



MDCD-01-026

- Mode Switch (5)
  Selects the air vent. The selected air vent is indicated on monitor (7).

  Air flows out of the front and defroster vents. (Including defroster vent)

  Air flows out of the front, rear and defroster vents. (Including defroster vent)

  Air flows out of the front, rear, foot and defroster vents. (Including defroster vent)

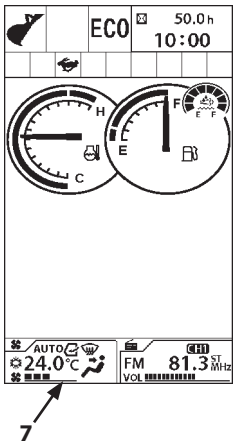
  Air flows out of the foot vents.

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

AUTO→ → → →

- When switch (6) is selected in AUTO:
  The air vent mode is automatically selected.

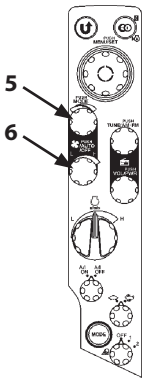
- Temperature Control Switch (5):
  Sets the air temperature in the cab.
  Temperature in the cab can be set between 18.0 and 32.0 °C by rotating temperature control switch (5). Temperature can be set in 0.5 °C increments.
  The set-temperature is displayed on monitor (7).



MDC1-01-001

- 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.

- 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.



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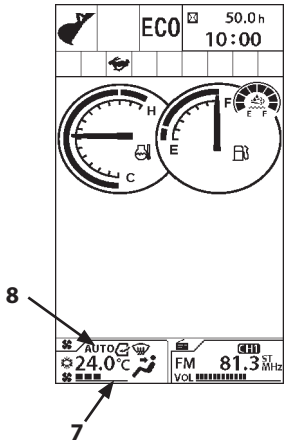


MDC1-01-001

Cab Heater Operation

1. AUTO/OFF switch (6):

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

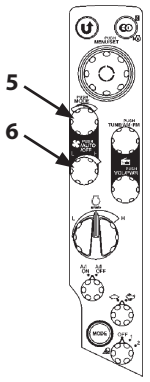
2. Temperature Control Switch (5):

   Adjust temperature control switch (5) so that "25.0" is indicated on the monitor. Control air temperature inside cab using switch (5) as necessary.

3. As Required:

- 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 at the air conditioner setting screen.



MDCD-01-026

Cooling Operation

1. AUTO/OFF switch (6):

   Push AUTO/OFF switch (6) to set the air conditioner AUTO mode. According to signals sent from various sensors, the air conditioner amplifier automatically selects the air flow-in vents, air suction ports, and air flow-in temperature at the vent, and controls the blower speed.

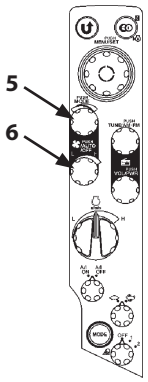
2. Temperature Control Switch (5):

   Adjust temperature control switch (5) so that "25.0" is indicated on the monitor. Control air temperature inside the cab using switch (5) as necessary.

3. As Required:

- 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.)



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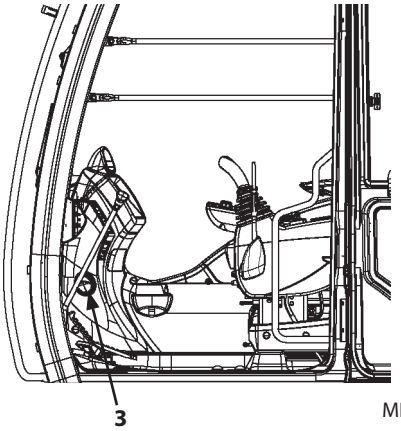
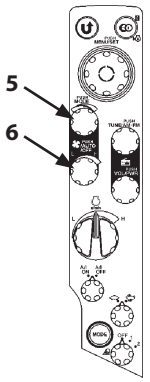


MDAA-01-295

Defroster Operation

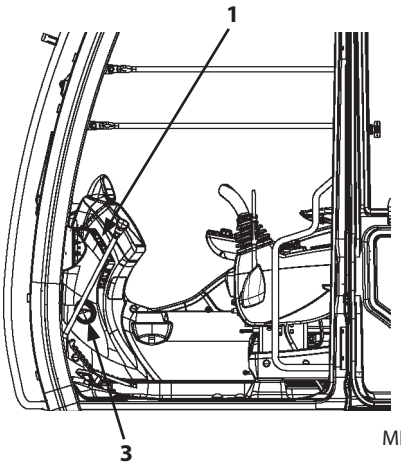
1. Push AUTO/OFF Switch (6) to blow out temperature-controlled air. When starting the engine during the cold season, the engine coolant temperature and air temperature in the cab are low. The Heater Start-Operation Control System controls the blow rate to the minimum (LO) in order to restrict cool air from flowing into the cab.
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 or the front and rear vents using mode switch (5).



MDCD-01-026

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 rainy season or in order to eliminate moisture, turn A/C ON at the air conditioner screen on the monitor.



MDAA-01-295

Cool Head/Warm Feet Operation

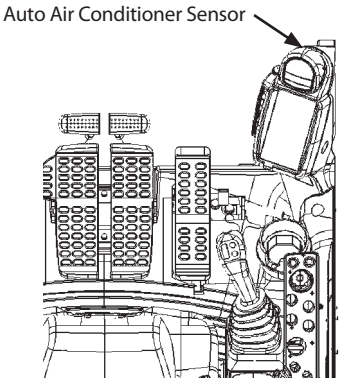
Cool and warm air is simultaneously supplied to the head vents and feet vents respectively.

1. Push Fan switch (6) to adjust the blower speed.
2. Push MODE switch (5) to display the front, rear and foot vent mark 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



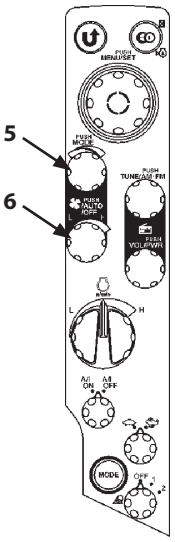
MDC1-01-541

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.
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.



MDCD-01-026

Off-Season Air Conditioner Maintenance

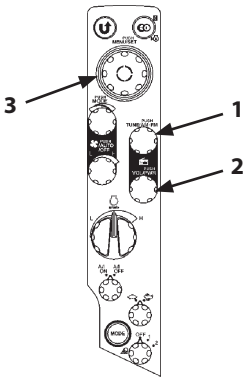
To protect each part of the compressor from a lack of lubricant, operate the air conditioner at least once a month for several minutes with the engine running at a slow speed during off-season.

IMPORTANT:

- **Do not suddenly increase the engine speed. Failure to do so may damage the compressor.**
- **Refer to the item "Check Air Conditioner Filter" in the Maintenance Chapter for maintenance of the air conditioner filters.**
- **Always clean the auto air conditioner sensor for effective air conditioner performance. Avoid placing any obstructions around the sensor.**

AM/FM Radio Operation

CAUTION: Refrain from listening to the radio in the cab while operating the machine.



MDCD-01-026

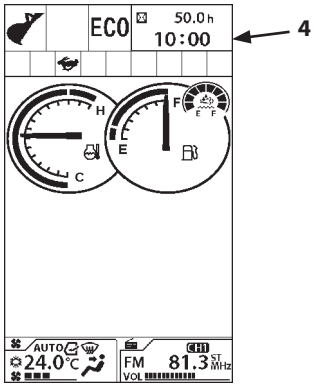
Controls on the Radio

1- AM/FM Selector/Tuning Switch

"FM" or "AM" is switched over alternately each time the switch is pressed. Rotate tuning switch (1) clockwise to increase frequency, counterclockwise to decrease frequency.

2- Power Switch/Volume Control Knob

Push: Turns power ON/OFF. Rotate the volume control knob (2) clockwise to increase the sound volume. Rotate it counterclockwise to decrease the sound volume.



MDC1-01-001

Tuning Procedure

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

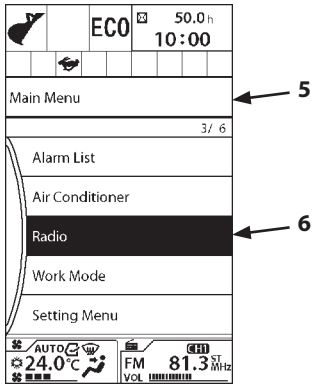
- Automatic Search Function

1. Push selector knob (3) while displaying Basic Screen (4) to display Main Menu screen (5).
2. Rotate selector knob (3) to highlight Radio (6).

   Push selector knob (3) to display the Radio screen.

   Rotate selector knob (3) to highlight Seek (8). Push selector knob (3) to go to the next higher frequency station. Push selector knob (3).

   Rotate selector knob (3) to highlight seek (7). Push selector knob (3) to go to the next lower frequency station. Push selector knob (3).



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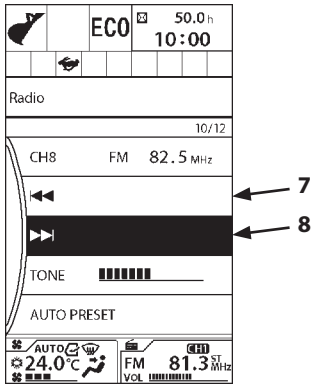


MDAA-01-095EN

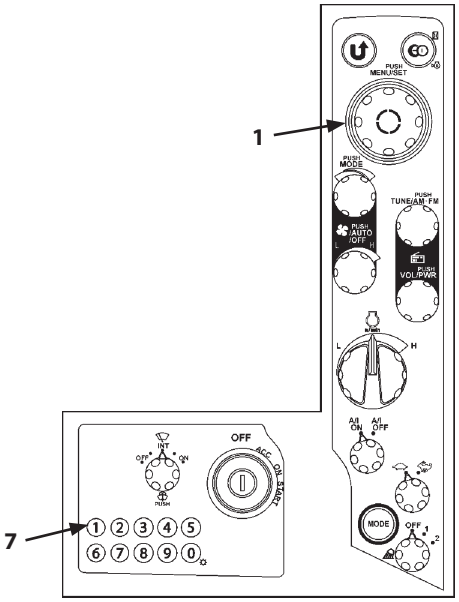
Station Presetting Procedure

Setting from Monitor

1. Select the desired station. Refer to the "Tuning Procedure" in the previous section.
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).
4. Rotate selector knob (1) to highlight a CH to preset a station. (CH1 to CH8)
5. Push and hold selector knob (1) for more than 1 second. The current station is preset to the selected CH.

Setting from numeric keypad

1. Select the desired station. Refer to the "Tuning Procedure" in the previous section.
2. Push and hold one keypad buttons (7) (1 to 8) for more than 1 second. The current station is preset to the selected number of CH.



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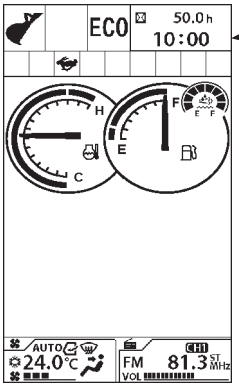

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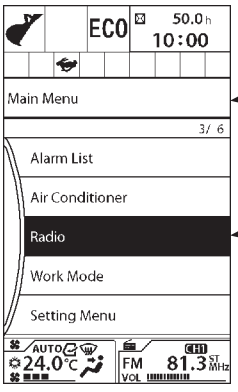

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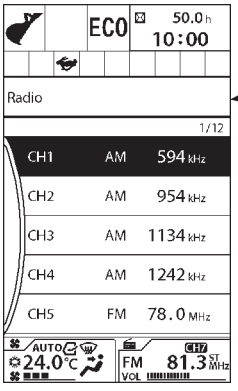


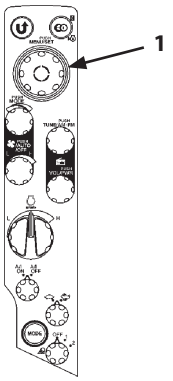
MDAA-01-093EN

Station Auto-Presetting Procedure

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).
2. Rotate selector knob (1) to highlight Radio (4).

   Push selector knob (1) to display Radio screen (5).
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 frequency stations will be preset from CH1 to CH4, FM frequency stations will be preset from CH5 to CH8. Operating the radio during scan stops the AUTO PRESET.



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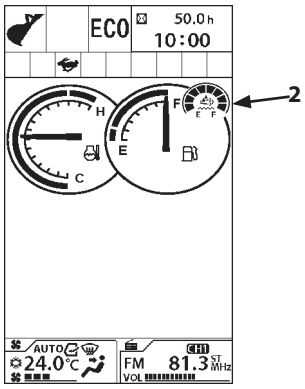

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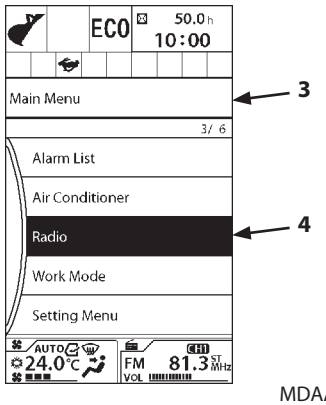

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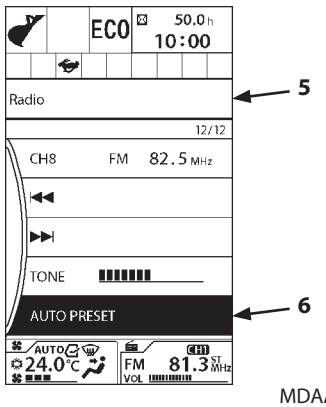
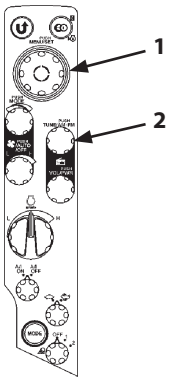


MDAA-01-099EN

TONE Control

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

   Push selector knob (1) to display Radio screen (6).
3. Rotate selector knob (1) to highlight TONE (7).
4. Push selector knob (1) to adjust TONE control. Rotate selector knob (1) clockwise to boost treble. Rotate selector knob (1) counterclockwise to boost bass. Push selector knob (1) to enable the changes.



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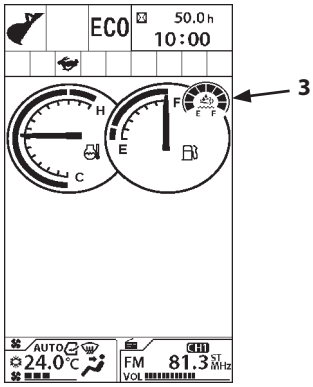

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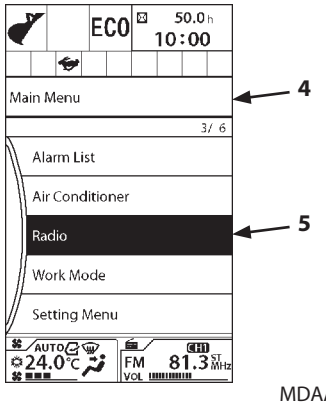

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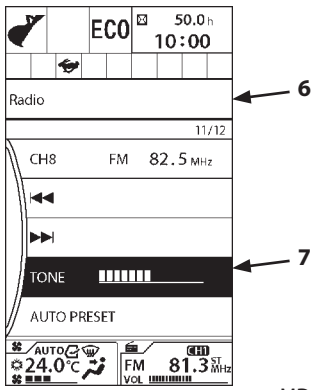


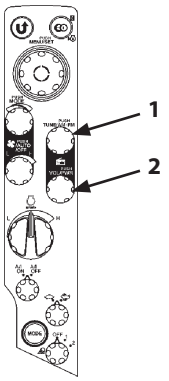
MDAA-01-096EN

Audio Input

IMPORTANT: This function is available only to a machine equipped with an audio input. Use this function with proper sound volume.

Audio Input Selection

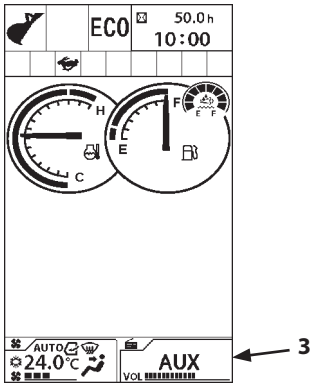
Attach the audio input device and push AM/FM Selector/ Tuning Switch (1) to display AM and FM screen as well as AUX input screen (3).



MDCD-01-026

Connecting audio device

By removing AUX IN Cap (4), the audio input terminal appears.
Connect your audio device to the audio input terminal of the machine with your audio cable.



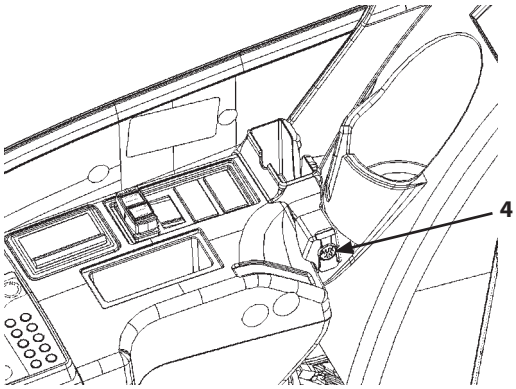
MDC1-01-340

IMPORTANT:

- **Use Φ3.5 mm stereo plug for the connection of audio input terminal.**
- **Put AUX IN cap (4) when the audio input is not in use.**

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.



MDAA-01-341

IMPORTANT:

- **If volume control knob (2) has been set to the maximum level the sound will be extremely loud. Set volume control knob (2) 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 (2) is set to the maximum level.**
- **Operate your audio device to play or stop the sound.**

Side View Camera System (Optional)

Images from side cameras (right side of machine) (4) and side cameras (left side) (5) can be displayed on the side camera monitor (1) inside the cab.

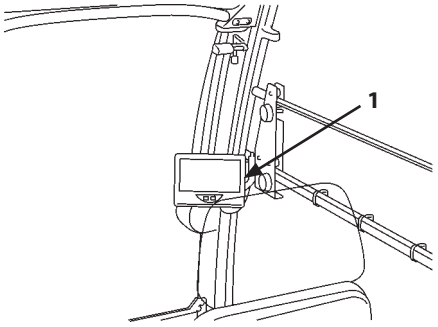
WARNING:

- **Check visibility before operating the machine. When visibility is poor, the field of vision cannot be ensured, which may lead to damage and/or serious injury.**
- **Do not make any alterations, such as changing the position of side cameras (right side of machine) (4) or side camera (left side) (5).**
- **If the quality of the image on side camera monitor (1) is poor, clean the camera(s) and/or monitor to make the image clearer. Always ensure good footing when cleaning the cameras.**
- **If it is difficult to see side camera monitor (1), adjust the angle of the monitor and/or the position of the seat so it is easy to see. (Refer to the sections on adjusting the side camera monitor position and adjusting the seat.)**

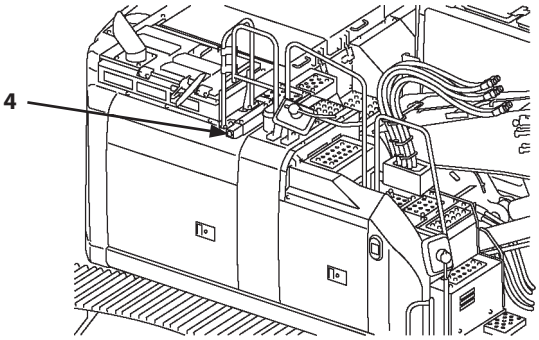
NOTE: The surface of side camera monitor (1) and camera lenses are made of plastic. When cleaning them, use a clean, water-dampened cloth and wipe lightly. Never use an organic solvent.

IMPORTANT:

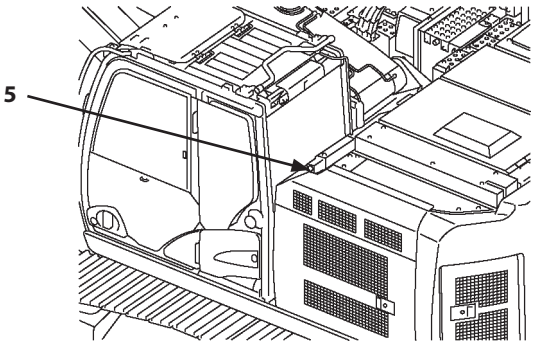
- **The images displayed on side camera monitor (1) are only meant as aids. People and objects displayed on the monitor may appear differently from their actual positions or distances. Before moving the machine, always check the area around the machine thoroughly before moving it.**
- **When the door of the cab is fully open, the door appears in the image from side camera (5) (left side). If the field of vision is insufficient, ensure visibility using the operator seat mirror.**
- **If there are any problems with the image in side camera monitor (1), contact your nearest authorized dealer.**



MDC1-01-561



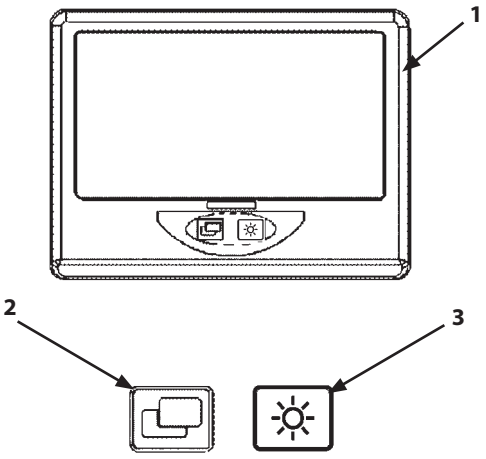
MDD5-01-002



MDD5-01-003

Component Layout

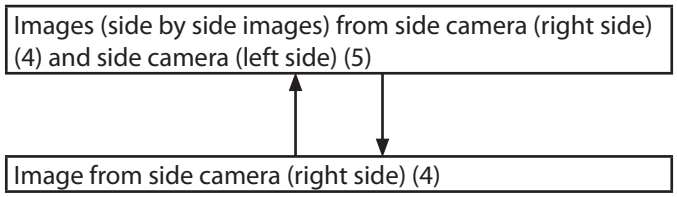
1. Side camera monitor
2. Image toggle switch
3. Brightness adjustment switch
4. Side camera (right side of machine)
5. Side camera (left side of machine)



MDC1-01-564

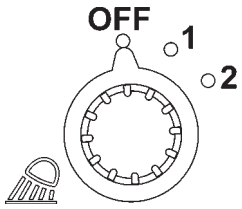
Operating the Camera

Once the key switch is turned to its ON position, side camera monitor (1) comes ON and an image is displayed on it.
Once the key switch is turned to its OFF position, side camera monitor (1) turns OFF and no image is displayed.
There are 2 patterns for displaying the images and the system switches between them each time image toggle switch (2) is pressed.



There are 4 levels of brightness, which can be adjusted with each push of brightness adjustment switch (3).

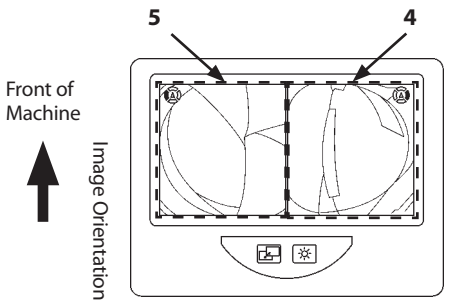
NOTE: If the work light switch is put in position 2, the monitor screen switches to Night Mode.



MDCD-01-029

Content of Monitor Display

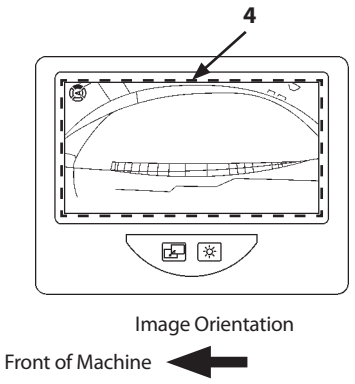
Images from side camera (right side) (4) and side camera (left side) (5)



MDC1-01-565

Image from side camera (right side) (4)

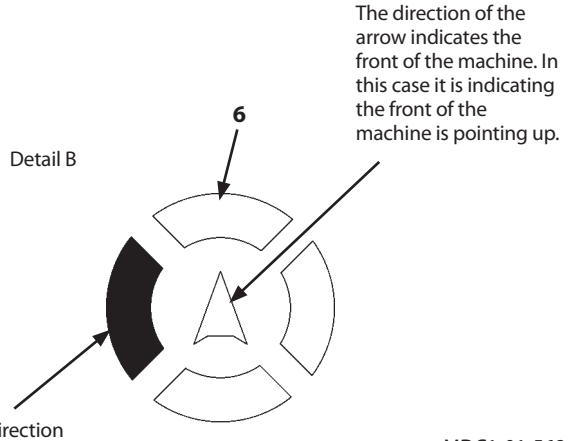
IMPORTANT: When the image is only from side camera (right side) (4), use the operator seat mirror to ensure the field of vision on the left side of the machine.



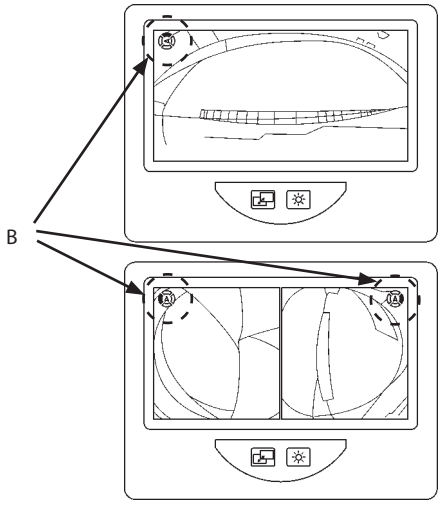
MDC1-01-566

Display of Camera Guide Icon

Camera guide icon (6) is normally displayed on the monitor and it indicates the orientations of the camera images and the machine.



MDC1-01-568

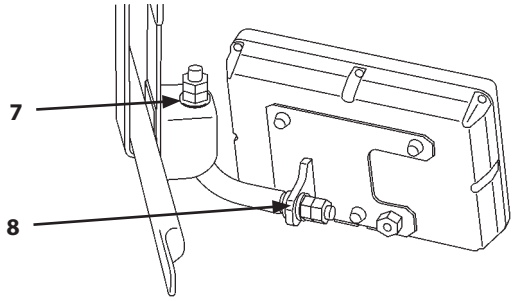


MDC1-01-567

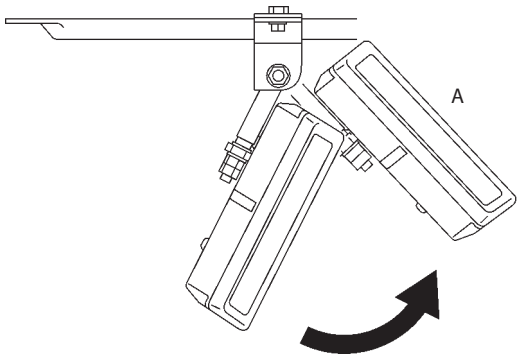
Adjusting the Position of the Side Camera Monitor

The position of the monitor can be adjusted using axes (7) and (8) of the monitor bracket.

IMPORTANT: When opening/closing the cab window, move the monitor to position A on the operator's side. If the position is not changed, the monitor will interfere with the cab's front window.



MDC1-01-569

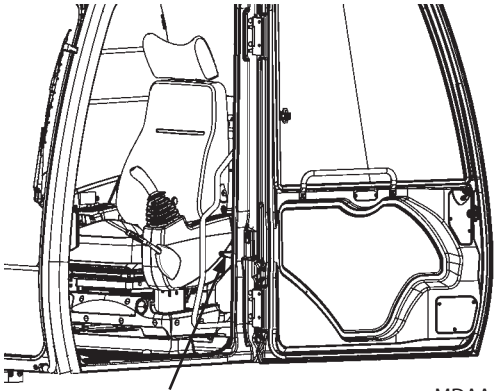


MDC1-01-570

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 cab door may close accidently, possibly resulting in personal injury.**
- **When opening or closing the cab door, take extra care not to catch fingers between the base machine and the cab door.**



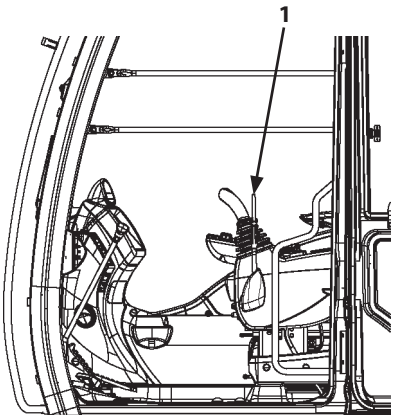
MDAA-01-320

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

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 by hands, 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, there is a possibility that the window may drop suddenly.**



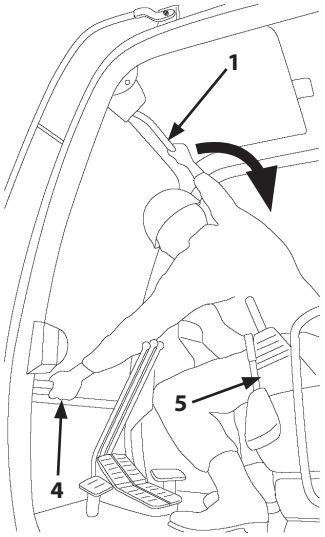
MDAA-01-295

Opening Upper Front Window

Opening Upper Front Window

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 lower handle (4) on the upper front window as illustrated, pull the upper front window up and back until auto locks (3) at both sides of the upper front window securely catches into the strikers on the ceiling.
3. After confirming that the window securely catches into auto locks (3), slide lock pin (2) into the left bracket boss hole to lock the window in position.

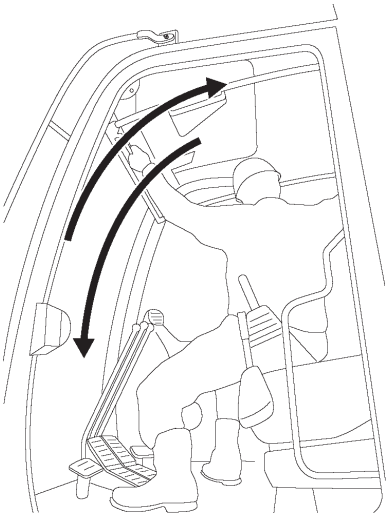
NOTE: When the upper front window is opened, the wiper and washer are inoperable.



MDAA-01-358

CAUTION:

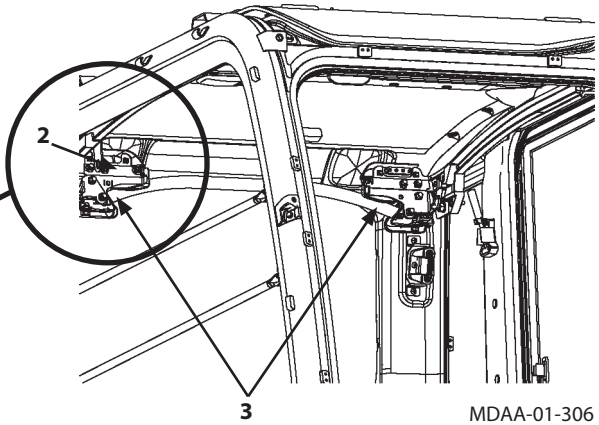
- **Slowly close the upper front window that you do not catch your fingers.**
- **Always secure lock pin (2) in the lock position after the upper front window is opened.**
- **Always pull pilot control shut-off lever (5) to the LOCK position before opening or closing the upper front window.**


MDAA-01-359

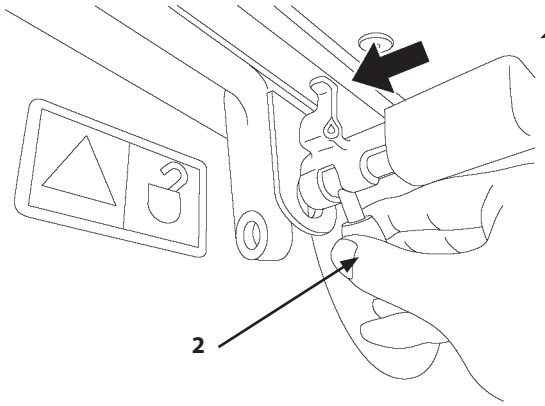
4. To close the upper front window, hold lock release lever (1) at the upper center and lower handle (4) on the upper front window as illustrated, and follow steps 1 to 3 in the reverse order. The window stops before it completely closes, so close the front window by pushing release lever (1) upward.

   Push lock release lever (1) downward to release auto lock (3).

NOTE: Unless the upper front window is securely closed, the wiper and washer will not operate.



MDAA-01-306



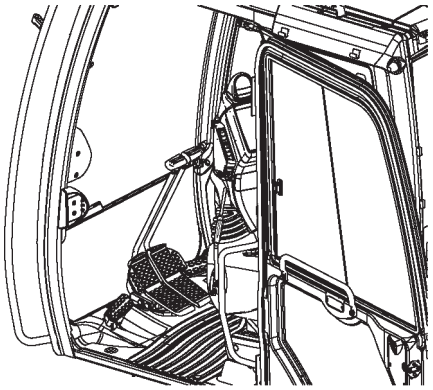
MDAA-01-360

Removing and Storing Lower Front Window

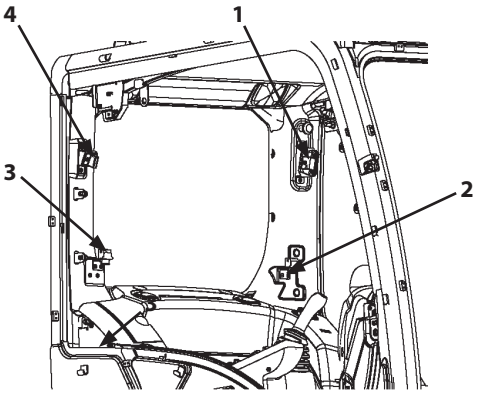
CAUTION: Take care not to get yours fingers caught when handling the lower front window.

Removing and Storing Lower Front Window

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



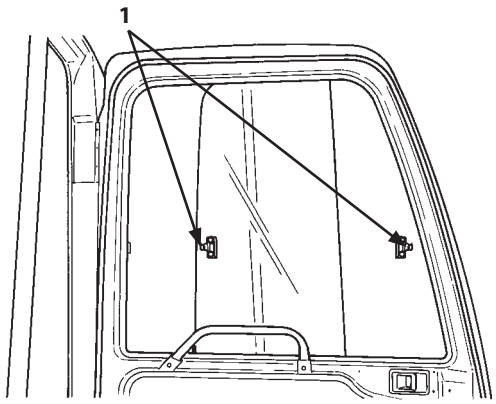
MDAA-01-298



MDAA-01-299

Opening Side Window

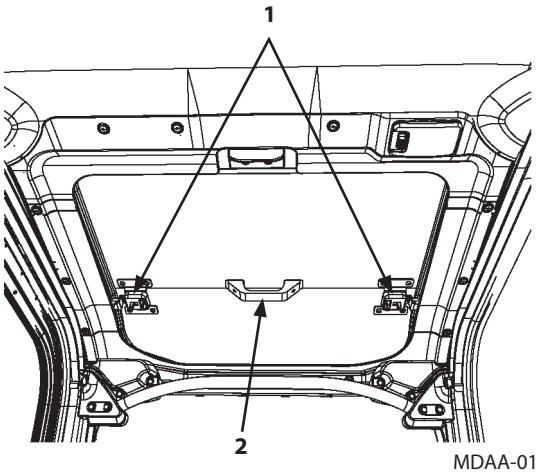
Hold handle (1) and slide windowpane to open the side window.



Side Window MDC1-01-547

Opening/Closing Overhead Window (Clear Hatch)

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).
Hold handle (2) and pull window down until "click" sound is heard from left and right locks (1).
Note that the overhead window can be used as an emergency exit.

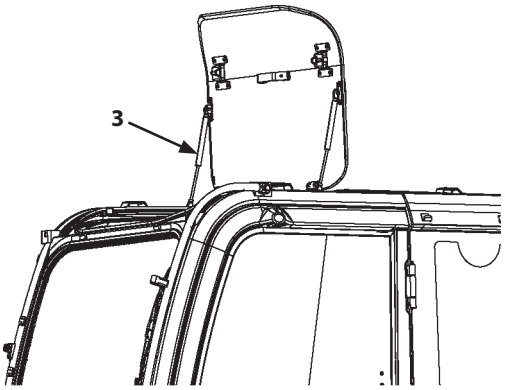


MDAA-01-302

IMPORTANT:

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

  If acidic or alkaline detergent is used, the clear hatch may become discolored or crack.
- **Keep organic solvent away from the clear hatch. Failure to do so may cause the clear hatch to become discolored or crack.**



MDAA-01-303

Emergency Exit

Escape from the cab in emergency in the following methods:

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

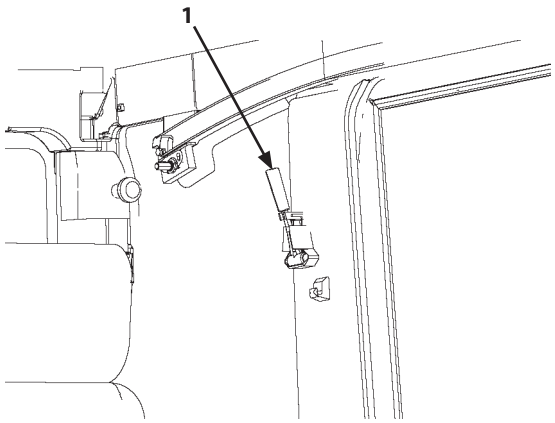
1. Open the cab door. Escape through the door.
2. If the cab door is difficult to open or use, open the upper front window. Escape through the window.

NOTE: Emergency exit decals (2) are affixed to the front and rear windows. See page "OPENING UPPER FRONT WINDOW" for the opening method of the upper front window.

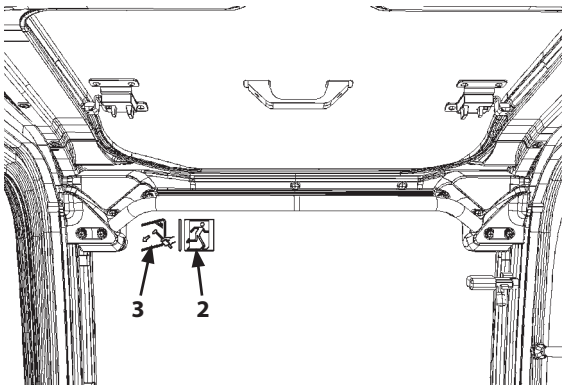
CAUTION: If decal (3) is affixed to the front windowpane, the windowpane can be broken. However if decal (3) is not affixed to the front windowpane, the glass cannot be broken with emergency evacuation hammer (1). Take care not to be injured by pieces of broken glass.

3. If the upper front window is difficult to open, check the decal (3) affixed to the windowpane.

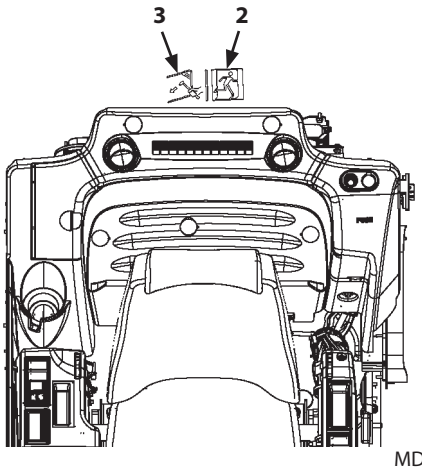
   If decal (3) is affixed to the front windowpane, break the front windowpane using the emergency evacuation tool (1) installed on the left side of the cab. Escape through the broken windowpane.
4. If decal (3) is not affixed to the front windowpane, or if it is not possible to escape through the front window, break the rear windowpane using emergency evacuation hammer (1). Escape through the broken windowpane.
5. If neither of front and rear windows are available for emergency exit, open the overhead window to escape from the cab.



MDAA-01-321



M1U4-01-012



MDAA-01-322

Console Height Adjustment

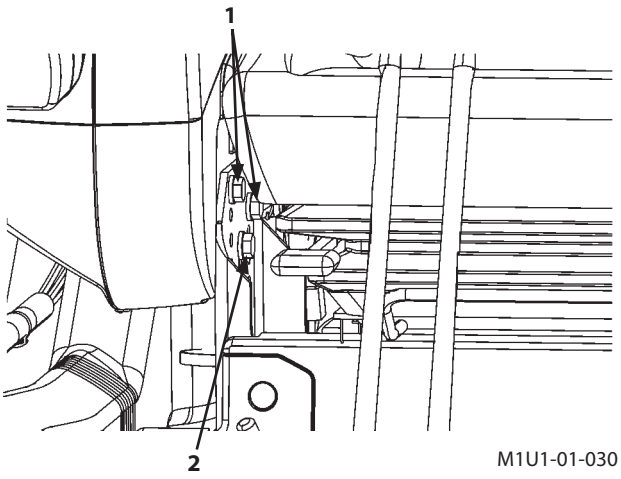
Adjust the console height to the operator's comfort and/or work conditions.
Console height can be vertically adjusted to 3 positions at 20 mm intervals.

CAUTION: Before adjusting the console, support the console. Failure to do so may result in the console dropping suddenly, possibly causing personal injury.

Adjusting Procedures

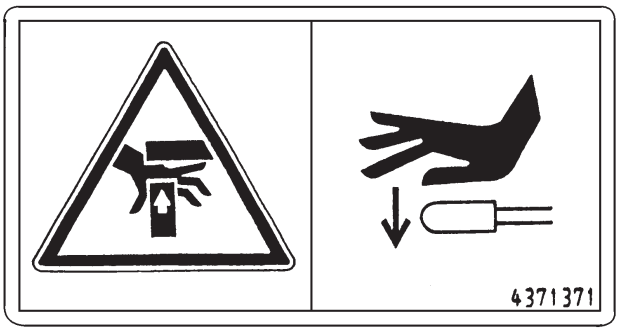
1. Lower the bucket to the ground. Stop the engine.
2. Move the pilot control shut-off lever to the LOCK position.
3. Remove left and right console holding bolts (1). Loosen bolts (2) to adjust the console height.
4. After adjusting, tighten bolts (1) and (2).

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



M1U1-01-030

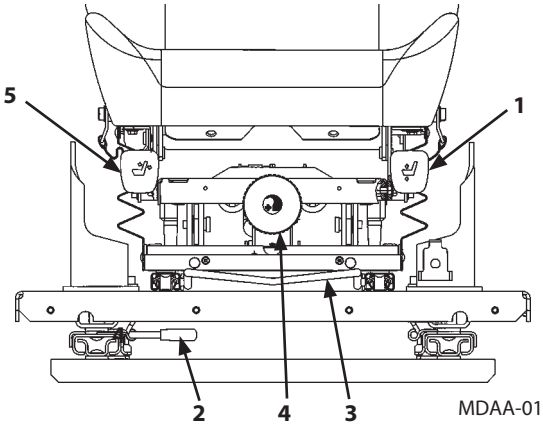
Adjusting Operator's Seat



SS-955

WARNING: Adjust the seat only after lowering the front attachment to 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 mistakenly touched with a part of the body, possibly resulting in personal injury or death.

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



MDAA-01-331

Seat Height and Angle Adjustment

Seat height adjustment range is 60 mm (2.4 in) with steps every 15 mm (0.6 in) (5 positions in total).
Push down lever (1): to adjust front part of the seat.
Pull up lever (1): to adjust rear part of the seat.

Console and Seat Fore-aft Adjustment

Operate console and seat slide lever (2) 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 80 mm (3.1 in) with steps every 20 mm (0.8 in).

Seat Fore-Aft Adjustment

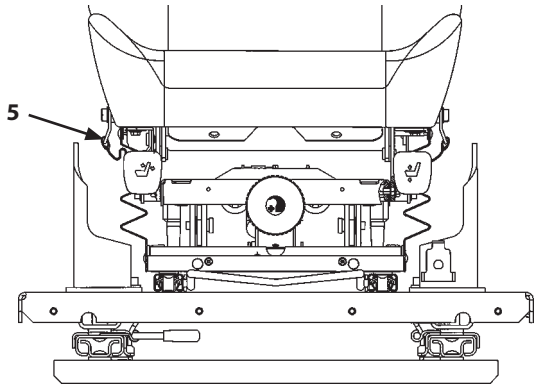
Operate seat slide lever (3) to adjust the seat to desired distance from the travel pedals and levers. Seat fore-aft adjustment range is 160 mm (6.3 in) with steps every 10 mm (0.4 in).

Suspension Adjustment

Rotate knob (4) to adjust the suspension.
Rotate knob (4) clockwise (+ direction) to increase suspension stiffness.
Rotate knob (4) counterclockwise (- direction) to decrease suspension stiffness.

Backrest Adjustment

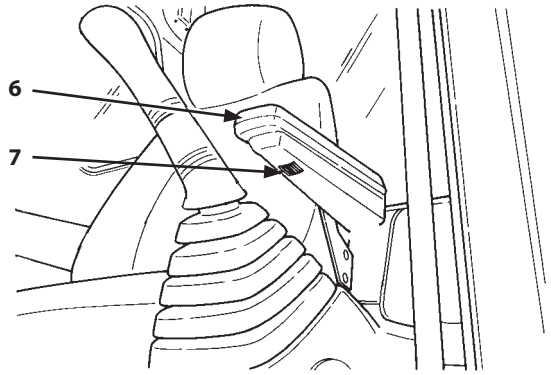
Pull up lever (5) to release backrest lock. Move backrest to the desired position and release lever (5).



MDAA-01-331

Armrest Adjustment

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



M1G6-01-017

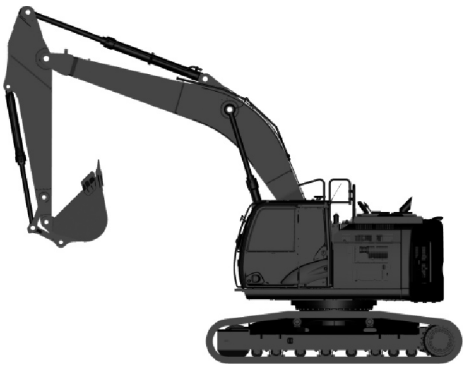
Installation and Adjustment of Mirrors

WARNING:

- **Adjust the mirrors, referring to the field of vision in the mirrors in the "VISIBILITY MAP" chapter. Perform adjustment with the machine position as shown.**
- **If the mirrors are adjusted improperly, the field of vision cannot be ensured and/or will be obstructed, which may result in serious personal injury.**
- **Check the field of vision in the mirrors every day before starting work.**
- **If any of the mirrors are dirty, clean them.**
- **Ensure appropriate footing when adjusting or cleaning mirrors.**

IMPORTANT: Mirrors and cameras only act as aids. Before operating the machine, always check the area around the machine thoroughly.

IMPORTANT: If a modification is made that could restrict the field of vision, it may result in an obstruction to the field of vision, so check the field of vision again.



MDD5-VM-001

Machine Position Image
(Monoblock Boom)

Mirror Installation Diagram

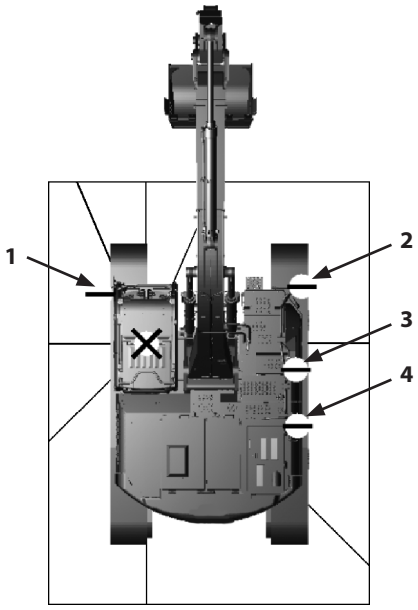
The mirror installation locations (1, 2, 3, 4) on this machine are shown in the right.
Adjust the installation locations of each mirror by following the instructions below to ensure safety.
Installation angle and dimension varies depending on the model.

1- Operator's Seat Mirror

2- Handrail Mirror for Getting ON/OFF the Machine

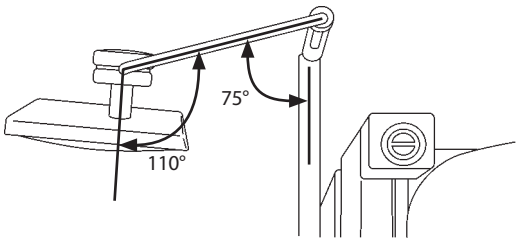
3- Fuel Tank Handrail Mirror

4- Aftertreatment Device Cover Mirror



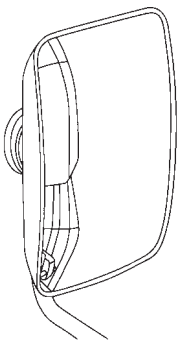
MDD5-01-012

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



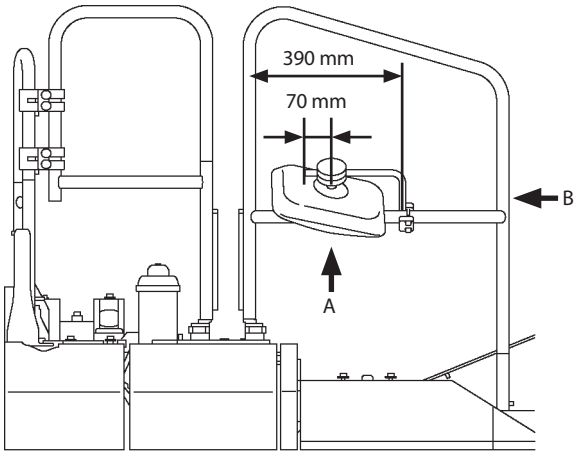
MDC1-01-549

- Handrail Mirror for Getting ON/OFF the Machine (2)
  Adjust the mirror so that the side of the machine appears on the mirror as shown in the right.
  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.



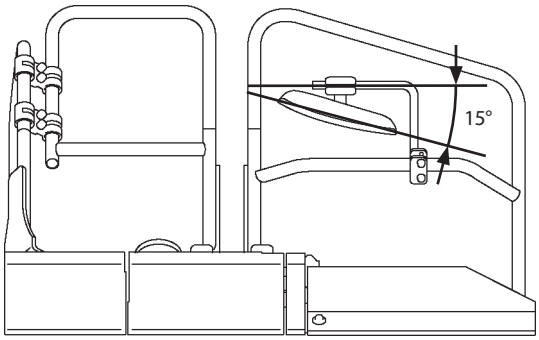
MDC1-01-550

- Fuel Tank Handrail 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.



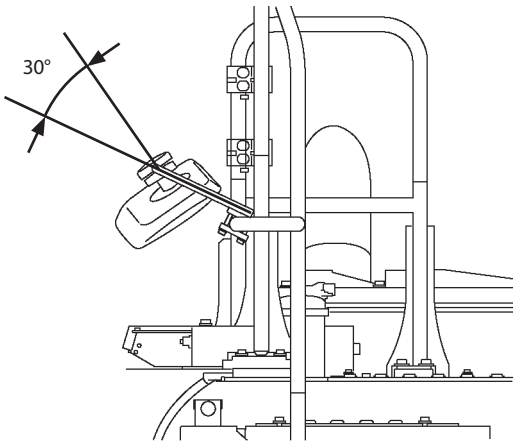
MDD5-01-005

View A



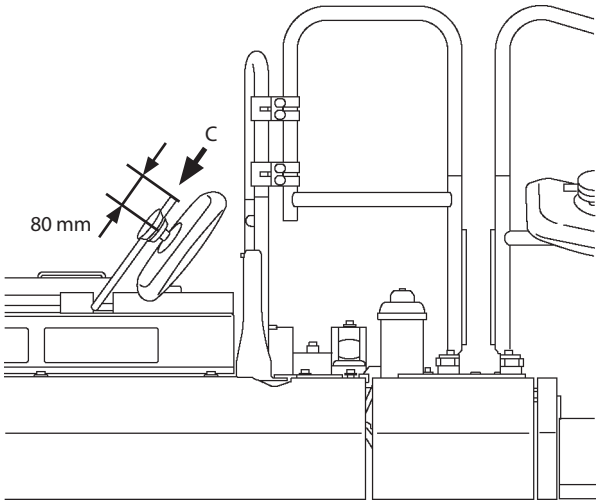
MDD5-01-006

View B



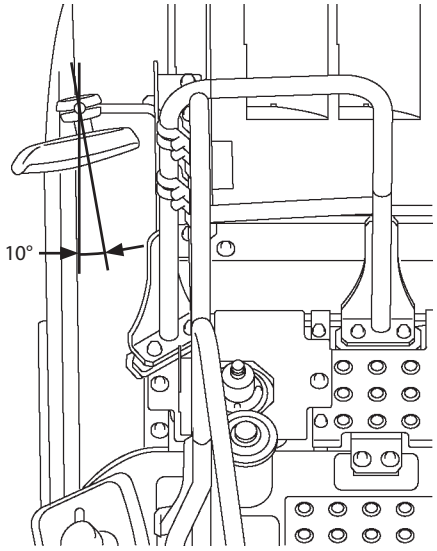
MDD5-01-007

- Aftertreatment Device Cover Mirror (4)
  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.



MDD5-01-008

View C

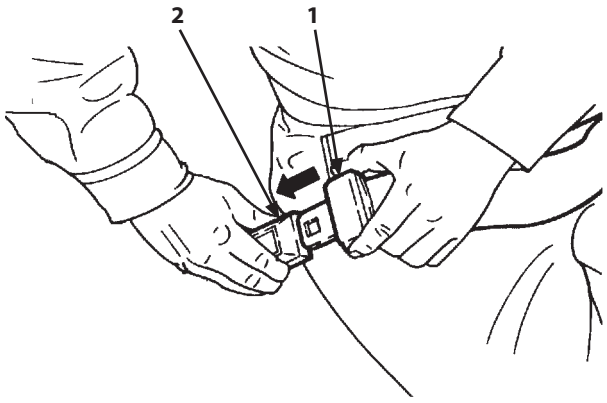


MDD5-01-009

Seat Belt

WARNING:

- **Be sure to use seat belt (1) when operating the machine.**
- **Before operating the machine, be sure to examine seat belt (1) and attaching hardware for any failure. If any damage and/or wear are found, replace the part concerned.**
- **Replace seat belt (1) every 3 years regardless of appearance.**

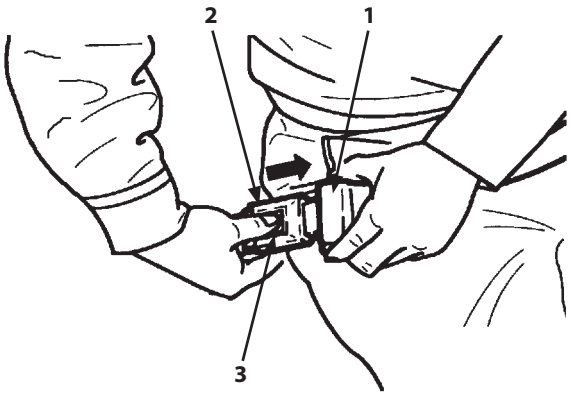


M1U1-01-031

Seat Belt

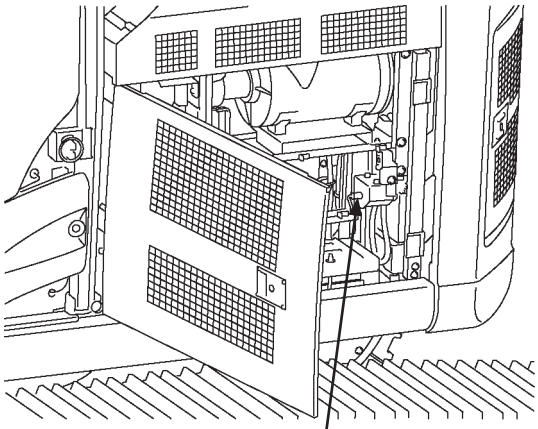
1. Confirm that seat belt (1) is not twisted. Securely insert the end of seat belt (1) into buckle (2). Lightly pull on the belt to confirm that the buckle latches securely.
2. Push button (3) on buckle (2) to unfasten seat belt (1).

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

Battery Disconnect Switch



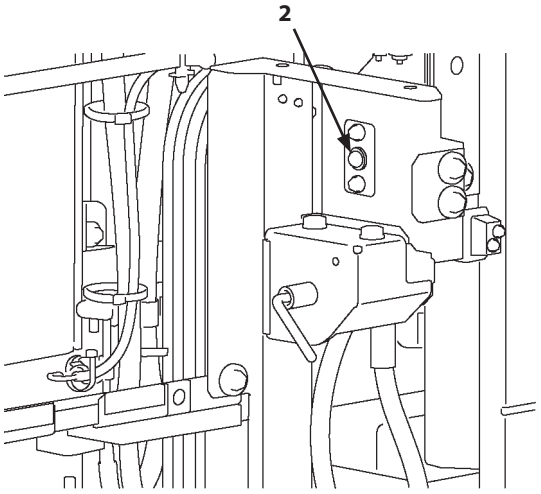
Battery Disconnect Switch

MDD5-01-010

IMPORTANT:

- **Do not turn the battery disconnect switch OFF while engine is running or the key switch is in another position than the OFF position. Failure to do so may damage the electrical system.**
- **The DEF/AdBlue® Pump runs for a while after the engine stops to return DEF/AdBlue® from piping to the DEF/AdBlue® tank. Do not turn the battery disconnect switch OFF when lamp (2) is lit. Doing so may cause damage to parts related to the Urea SCR system and/or system malfunction.**

The battery disconnect switch 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 into the entire circuit.



MDD5-01-011

Before turning the battery disconnect switch OFF, be sure to turn the key switch OFF and wait 5 minutes or more after the engine stops. If the battery disconnect switch is turned OFF within 5 minutes after the engine stops, it may result in malfunction of the electrical system. When the battery disconnect switch is turned from OFF to ON, the preset data of the radio, clock and air conditioner may be initialized. Set the radio, clock and air conditioner again.

- Refer to the page 1-115 "AM/FM Radio Operation" for the tuning of radio.
- Refer to the page 1-36 "Setting Menu" and 1-37 "Date and Time" for the setting of clock.
- Refer to the page 1-107 "Auto Air Conditioner" for the setting of air conditioner.

Use the battery disconnect switch for the following purposes only.

- Before maintaining or servicing the electrical system
- Before storing the machine for long period of time, preventing the battery discharge
- Before welding operation on the machine body
- Before replacement of the battery

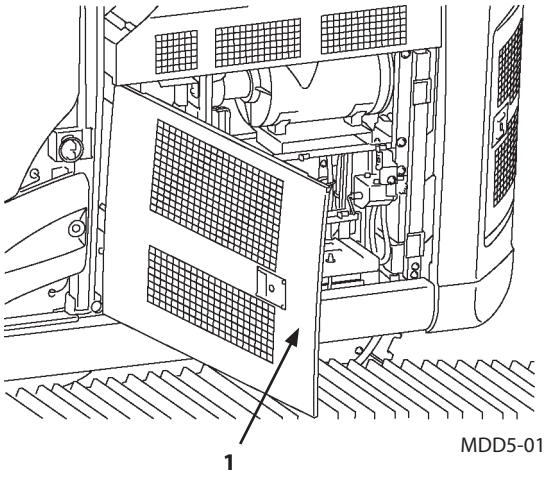
Switch Operation

1. Open cover (1).

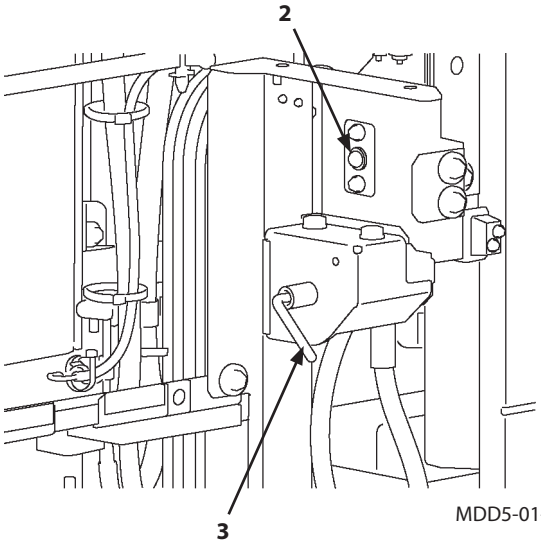
   When lever (3) is in the diagonal bottom position, the battery disconnect switch is ON. When lever (3) is in the diagonal bottom position, lever (3) can not be removed.

2. Check that lamp (2) is not lit. Lamp (2) goes off 5 minutes after the key switch is turned to OFF.

3. When lever (3) is turned counterclockwise to the vertical position, the battery disconnect switch turns OFF. Lever (3) can be removed from the battery disconnect switch when it is in the OFF position.



MDD5-01-010



MDD5-01-011

BREAK-IN

Observe Engine Operation Closely

IMPORTANT: Use extra caution during the first 50 hours of operation, until you become thoroughly familiar with the sound and feel of your new machine.

1. Only operate the machine in economy (ECO) mode and limit engine horsepower to around 80 % of its full load.
2. Avoid excess engine idling.
3. Check indicator lights and gauges frequently during operation.

Every 8 Hours or Daily

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

After the First 50 Hours

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

After the First 100 Hours

Perform 50-hour and 100-hour service.

MEMO

Inspect Machine Daily Before Starting

Perform the required daily check before starting the engine.

Engine
- Level of engine oil and coolant*
- Ease of starting, exhaust gas color, and noise
- Oil and water leaks, damage to hoses and pipe lines*
- Clogging and damage to radiator, oil cooler and intercooler*
- Loose and/or missing mounting bolts and nuts*

Upperstructure
- Fuel level, leaks and contamination of fuel in tank*
- Level, leaks and contamination in DEF/AdBlue® tank
- Hydraulic oil level, contamination of hydraulic oil, leaks from hydraulic oil tank*
- 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*
- Leaks from DEF/AdBlue® hoses
- Dirt around the aftertreatment device

Undercarriage
- Sag, wear and damage to crawler*
- 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*
- Condition of lubrication of the working device*
- Check for damage to pin anti-extraction pins, stoppers, rings and bolts
- Loose and/or missing mounting bolts and nuts*

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

*NOTE: Item with *mark: Refer to "Maintenance" section for detailed information.*

Before Starting Engine

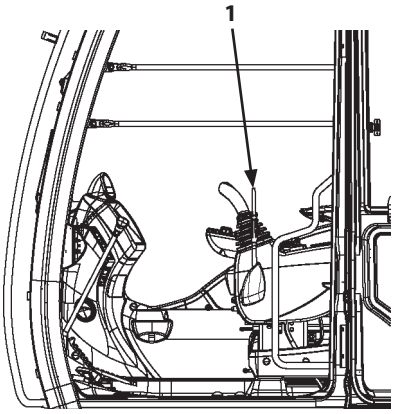
1. Ensure that the battery disconnect switch is in the ON position.
2. Confirm that pilot control shut-off lever (1) is in the LOCK position.
3. Confirm that all control levers are placed in neutral.
4. Insert key (2) to the key switch. Turn it to ON position. Push and hold switch (3) with the engine stopped.

IMPORTANT: Always check the machine on a firm, level surface. Never attempt to start the engine while checking the machine.

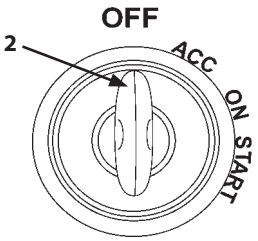
If engine oil level (4) (green) and coolant level (5) (green) is displayed, the status is normal.

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

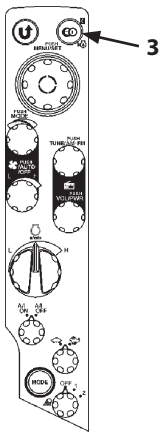
NOTE: The monitor surface is a resin product. When the surface becomes dusty, lightly wipe the surface with a wet cloth. Never use an organic solvent.



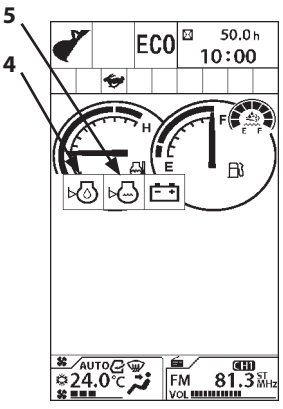
LOCK Position MDAA-01-295



MDC1-01-502



MDCD-01-026



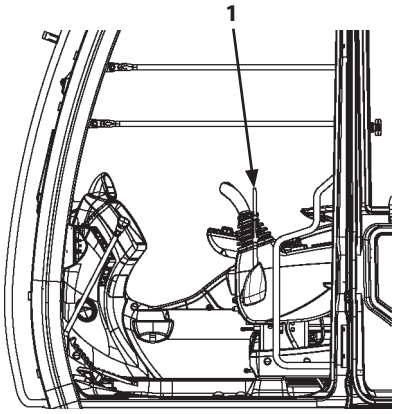
MDC1-01-041

Starting the Engine

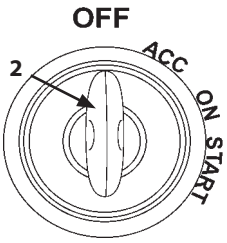
Starting the Engine in Ordinary Temperature

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
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.
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.

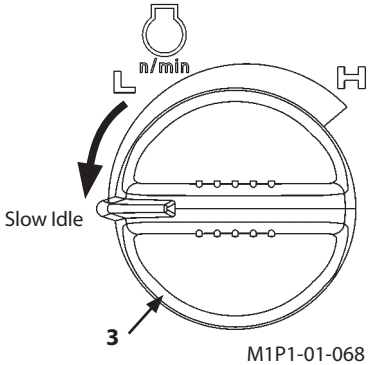
IMPORTANT: When required to activate the numeric keypad function (ignition block system), consult your authorized dealer.



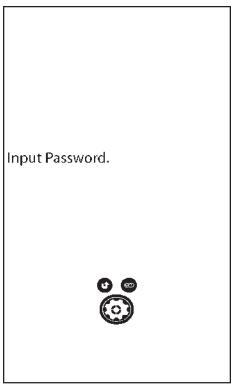
LOCK Position MDAA-01-295



MDC1-01-502



M1P1-01-068

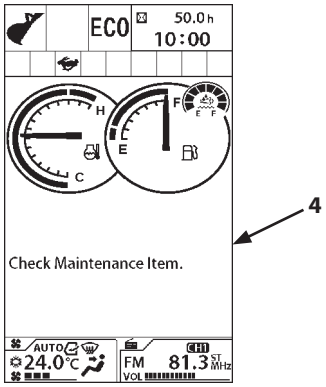


Password Input Screen MDAA-01-085EN

NOTE: When the key switch is turned ON, the 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.

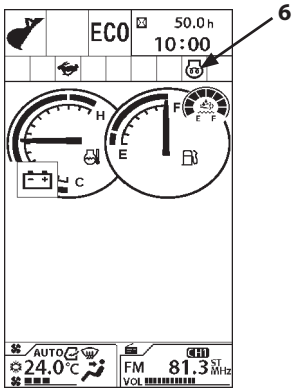
7. The Basic Screen will be displayed on the monitor. Check that the preheat indicator (6) is OFF at this time.
8. Turn key switch to the START position to rotate the starter. The engine will start.

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 more than 30 seconds, then try again. Failure to do so may cause damage to the starter and/or discharge the batteries.



MDC1-01-213EN

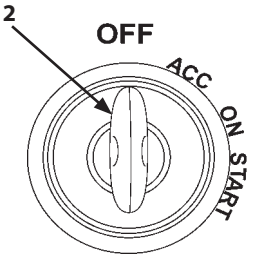
MDCD-01-026



MDC1-01-042

Basic Screen

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

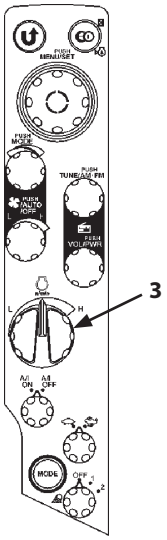


MDCD-01-030

NOTE:

- *The engine speed will be kept to slow idle speed just after the engine starts. When engine speed control indicator (7) is displayed, slow idle speed will be maintained. 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 dial (3) is not set in the slow idle position.*

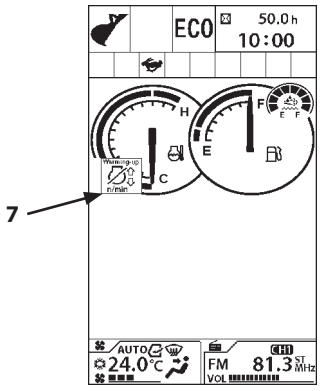
- *After the slow idle speed is maintained, the warm-up system automatically operates and the engine speed will temporarily increase even if engine control dial (3) is set to the slow idle position.*



MDCD-01-026

CAUTION: Do not attempt to operate the machine when engine speed control indicator (7) is lit. The engine speed may change after the slow idle period and operation speed of work device may suddenly increase, which may cause a serious accident.

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



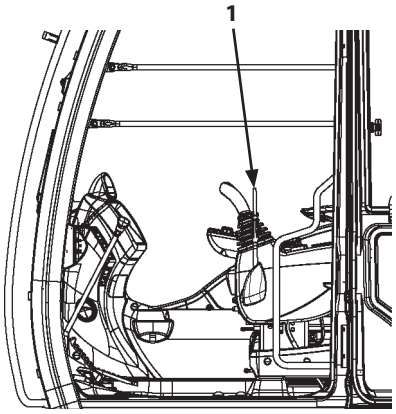
MDC1-01-355

Starting in Cold Weather

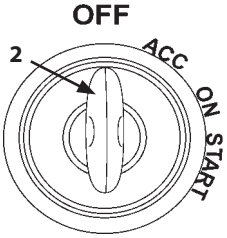
Preheating

1. Confirm that pilot control shut-off lever (1) is in the LOCK position.
2. Turn engine control dial (3) to around the middle between the L and H position.
3. Sound the horn to alert bystanders.
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.
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.

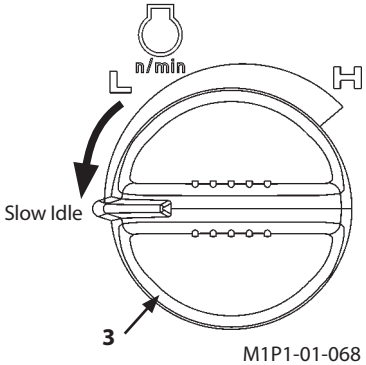
IMPORTANT: When required to activate the numeric keypad function (ignition block system), consult your authorized dealer.



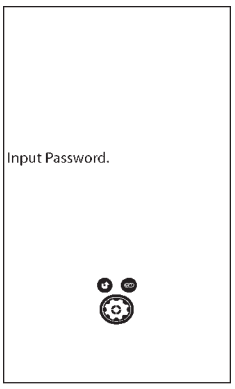
LOCK position MDAA-01-295



MDC1-01-502



M1P1-01-068



Password Input Screen MDAA-01-085EN

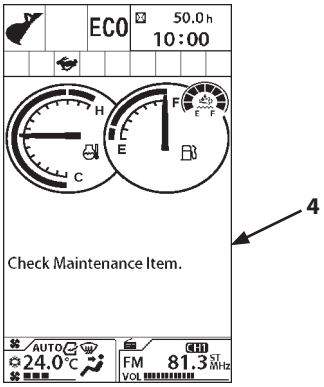
NOTE: When the key switch is turned ON, maintenance notification (4) for the item whose maintenance interval has expired displays for 10 seconds. Push Return to Previous Screen switch (5) or turn the pilot control shut-off lever to the UNLOCK position while the rear view camera is enabled to delete the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

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

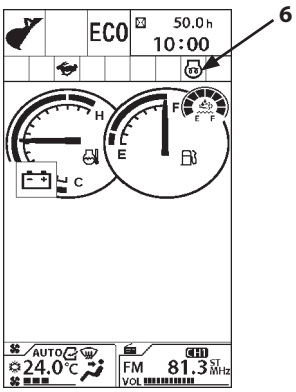
8. As soon as preheat indicator (6) goes OFF, turn key switch to START position to rotate the starter.

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 more than 30 seconds, then try again. Failure to do so may cause damage to the starter and/or discharge the batteries.



MDC1-01-213EN

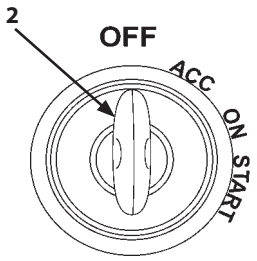
MDCD-01-026



MDC1-01-042

Basic Screen

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

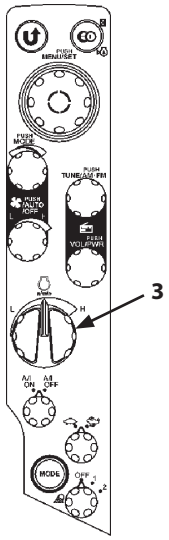


MDCD-01-030

NOTE:

- *The engine speed will be kept to slow idle speed just after the engine starts. When engine speed control indicator (7) is displayed, slow idle speed will be maintained. 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 dial (3) is not set in the slow idle position.*

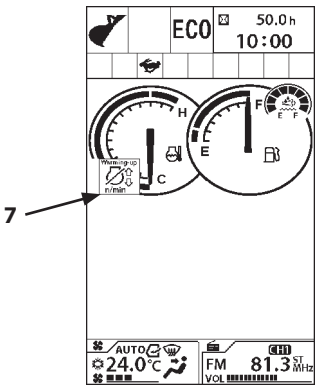
- *The warm-up system automatically operates after keeping slow idle speed, and the engine speed will temporarily increase even if the engine control dial is set in the slow idle position.*



MDCD-01-026

CAUTION: Do not attempt to operate the machine when engine speed control indicator (7) is lit. The engine speed may change after the slow idle period and operation speed of work device may suddenly increase, which may cause serious accident.

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



MDC1-01-355

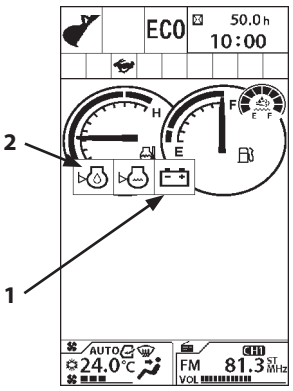
Check Instruments After Starting

Checking instruments through monitor functions

After starting the engine, check the following points through the monitor functions.

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

   In case engine oil pressure alarm indicator (2) stays ON and the buzzer sounds, immediately stop the engine. Inspect the engine oil pressure system and the oil level.



MDC1-01-041

IMPORTANT: In case any abnormality is found on the monitor unit, immediately stop the engine. Inspect the cause of the problem.

Check engine noise and exhaust gas color

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

NOTE:

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

Clear : Normal (Perfect combustion)
Black : Abnormal (Imperfect combustion, abnormal aftertreatment device, abnormal fuel system)
White : Abnormal (Oil is leaking into the combustion chamber, abnormal aftertreatment device, abnormal fuel system)

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

Using Booster Batteries

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

SA-032

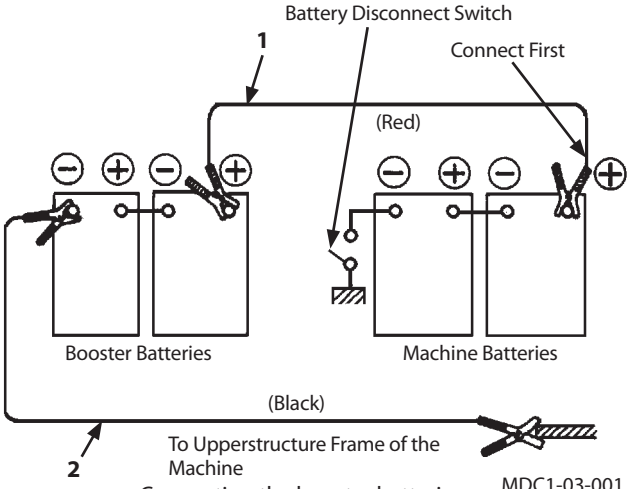
WARNING:

- **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 a machine with the booster batteries on a dry or concrete surface, not on steel plates. If the machine is parked on steel plates, dangerous sparks may be unexpectedly created on the machine.**
- **Never connect a positive terminal to a negative terminal, as a dangerous short circuit will occur.**

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

Connecting the booster batteries cables

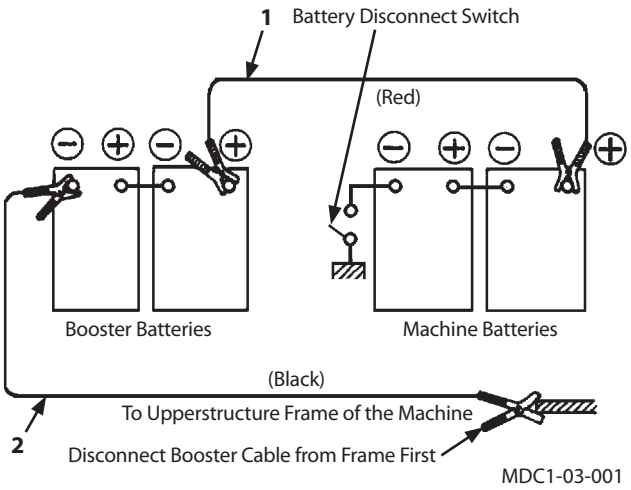
1. Stop the engine of the machine on which booster batteries are mounted.
2. Turn the battery disconnect switch to the OFF position.
3. Connect one end of red cable (1) to the positive (+) terminal of the machine batteries, and the other end to the positive (+) terminal of the booster batteries.
4. Turn the battery disconnect switch to the ON position.
5. Connect one end of black cable (2) to the negative (-) terminal of the booster batteries, and then make ground connection to the frame of the machine to be started with the other end of black (-) cable (2). In the last connection to frame, sparks may fly. Be sure to connect the cable end as far away from the machine batteries as possible.
6. After securely connecting the booster cables, start the engine of the machine on which booster batteries are mounted.
7. Start the engine of the machine with a problem.
8. After the engine starts, disconnect cables (2) and (1), following the procedure below.



Connecting the booster batteries

Disconnecting the booster cables

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



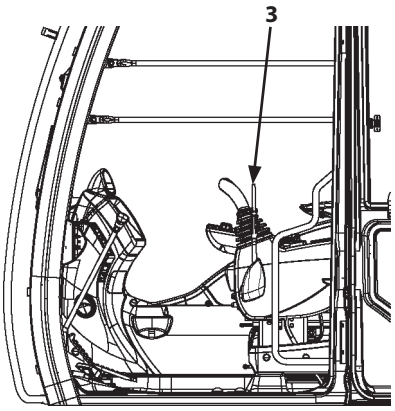
Disconnecting the booster cables

Stopping the Engine

SA-390

Engine Stop Procedure

1. Except for special cases, before stopping the engine, lower the bucket to the ground.
2. Pull pilot control shut-off lever (3) to LOCK position.
3. Turn engine control dial (1) to the slow idle position and run the engine for 5 minutes to cool the engine.



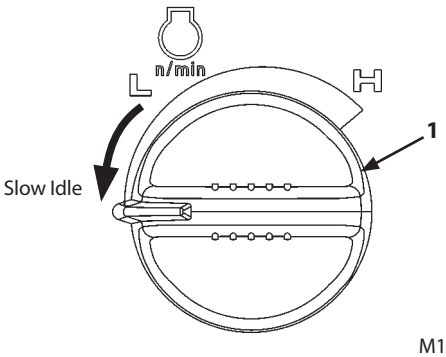
MDAA-01-295

IMPORTANT: If the engine equipped with a turbocharger is stopped without first performing the cool down operation, the lubricant on the turbocharger bearing surfaces may desiccate due to the intense heat present inside the turbocharger, possibly causing damage to the turbocharger.

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

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

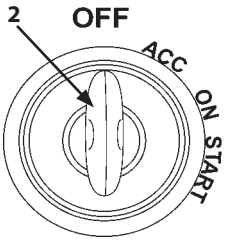
In case the engine does not stop even if key switch (2) is turned OFF due to failure of the machine, move engine stop switch (4) downward to stop the engine. The engine will stop. Return engine stop switch (4) to its original position (upward).



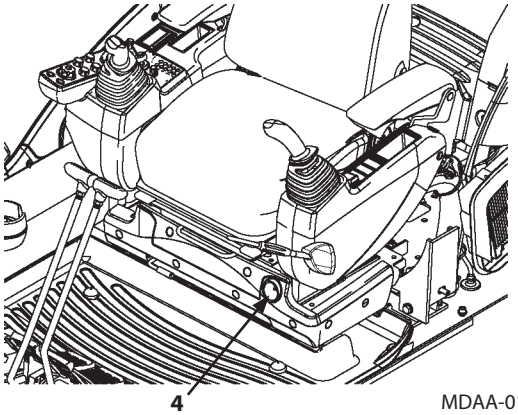
M1P1-01-068

CAUTION: Do not use engine stop switch (4) unless absolutely necessary. When the machine stops due to machine failure, do not start the machine until repair is completed

IMPORTANT: The DEF/AdBlue® pump runs for a while after the engine stops to return DEF/AdBlue® from piping to the DEF/AdBlue® tank. Do not turn battery disconnect switch to the OFF position during this time. Otherwise, the Urea SCR system may be damaged.



MDC1-01-502



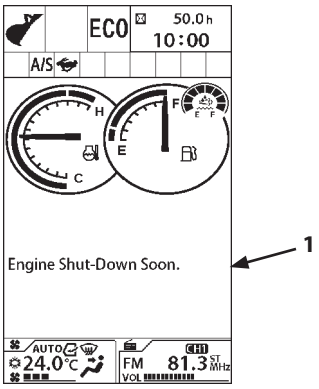
MDAA-01-290

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.

IMPORTANT: If the machine is left unoperated in an environment with temperatures under -20°C or lower for a long period of time, exhaust gas particles may accumulate in the aftertreatment device, and may result in damage to the device.

In an environment with temperature of -20 °C or lower, 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 "Engine Shut-down soon." message (1) and the indicator starts flashing. The buzzer sounds once 30 seconds before shut-down, and sounds continuously from 15 seconds. The engine speed decreases to idling speed, and then stops after 15 seconds. When the pilot control shut-off lever is pushed down before stopping the engine, the auto shut-down is disabled and the engine will not stop.



MDC1-01-146EN

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 a 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 being ON or OFF.

MEMO

Travel Levers and Pedals

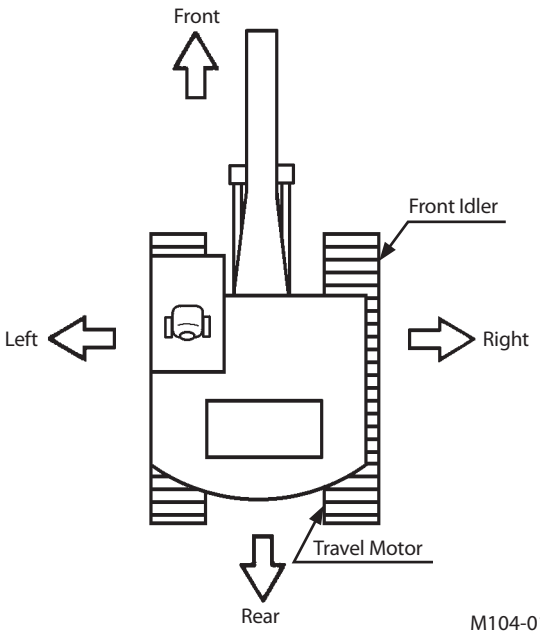
Travel Operation

Travel operation of this machine is controlled by using levers and pedals.

WARNING: If the travel motors are located at the front of the machine, the machine will move in the reverse direction to that shown on the operation instruction decal. Normal travel operation is when the travel motor is at the rear, and the front idler is at the front of the machine.

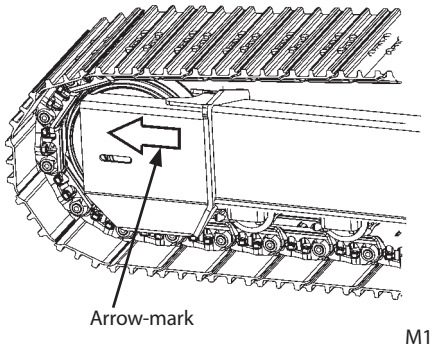
NOTE:

- *An arrow-mark seal is stuck on the inside surface of the side frame to indicate the machine front direction.*
- *A travel lever damper is provided on this machine to ensure smooth travel operation. Therefore, the travel lever or pedal may become heavier in extreme cold (-20 °C or below). This is caused by increase in oil viscosity, not a malfunction.*



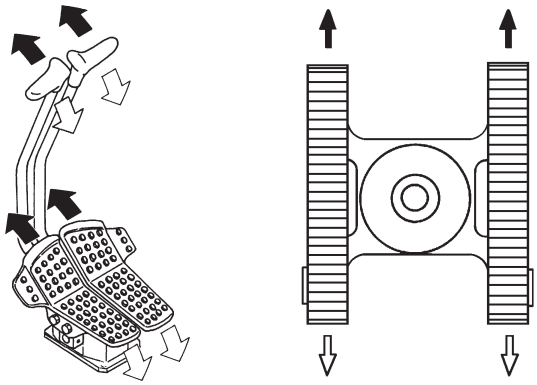
M104-01-038

- 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 travel the machine in reverse. Travel speed can be controlled by the operation stroke of the travel levers and pedals.



M178-03-001

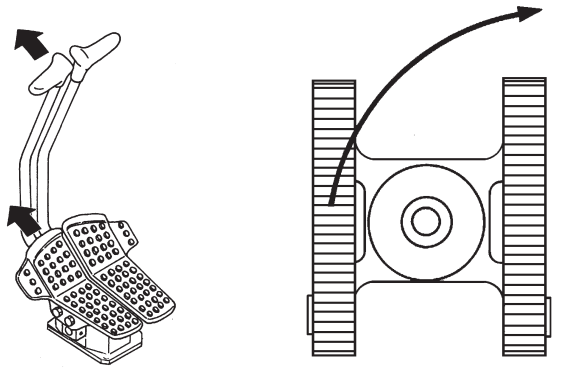
- Ascend/Descend Slopes
  Never attempt to ascend or descend slopes steeper than 35 degrees (70 %).
  Slowly operate the travel levers (or pedals) when descending a slope. When the travel levers are placed in the neutral position, brakes are automatically applied and the machine stops.



Forward/Reverse Travel

M104-04-009
M104-04-003

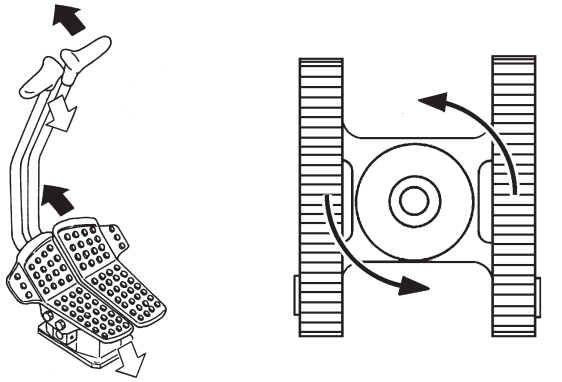
- Pivot Turn
  The machine direction is changed by driving one of two crawlers with either left or right travel levers (or pedals).



Pivot Turn

M104-04-010
M104-04-005

- Spin Turn
  The machine direction is changed by driving two crawlers in opposite direction at a time by operating one lever (or pedal) to forward and another lever (or pedal) to reverse.



Spin Turn

M104-04-011
M104-04-007

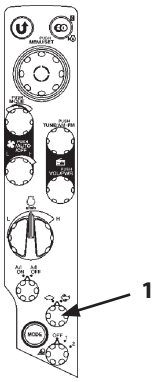
Travel Mode Switch

WARNING: Tipping-over accidents can cause serious personal injury. Do not change travel mode switch (1) while traveling. In particular, changing to fast mode (2) while descending a slope is very dangerous. Always stop the machine before changing the travel speed mode.

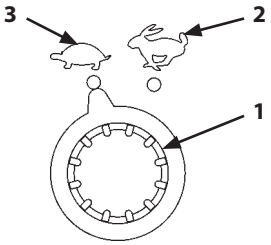
Turn travel mode switch (1) on the switch panel to the specified position to select the travel mode (Fast/Slow).

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

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



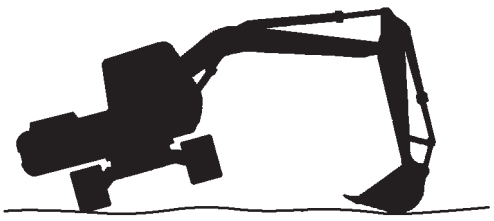
MDCD-01-026



MDCD-01-028

Operating on Soft Ground

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



M104-05-012

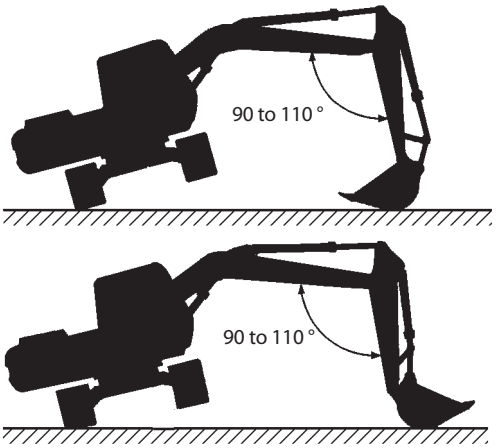
Raise One Track Using Boom and Arm

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

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

Place blocks under machine frame to support the machine.

IMPORTANT: When the machine is modified 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.



M104-05-013

MZX5-04-003

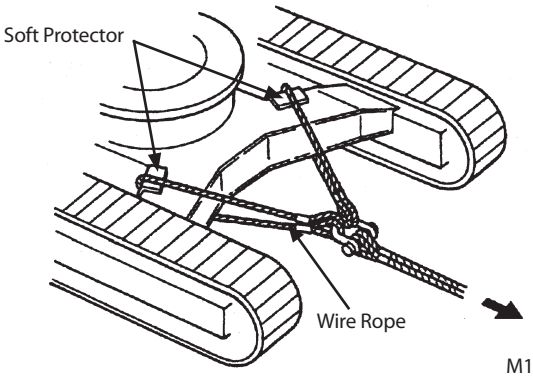
Towing Machine a Short Distance

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

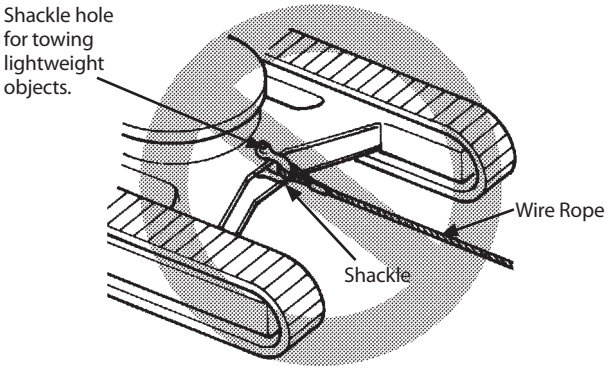
When your machine becomes struck but the engine is still operational, attach wire ropes to the machine as shown on the right, and slowly tow your machine to firm ground using another machine.
Be sure to attach the wire ropes around the track frames of both machines as shown.
To prevent the wire ropes from being damaged, place protective material between the track frame and the wire ropes.

IMPORTANT: Do not use the shackle holes on the track frame for towing the machine.

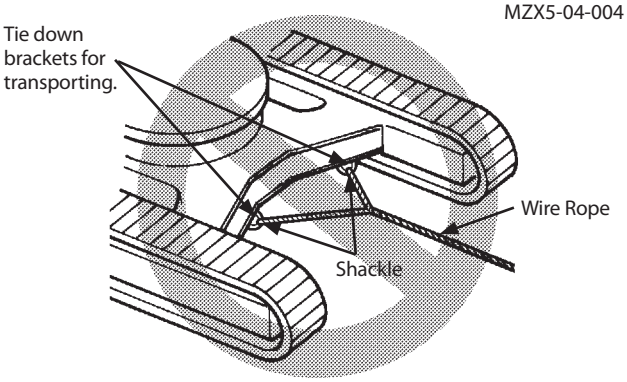
The center shackle hole on the track frame is provided to pull lightweight objects only. The shackle holes on the bottom of the track frame are used to secure the machine for transportation. Refer to the instructions on page 5-23 for using the center shackle hole appropriately.



M104-05-010



MZX5-04-004



MZX5-04-005

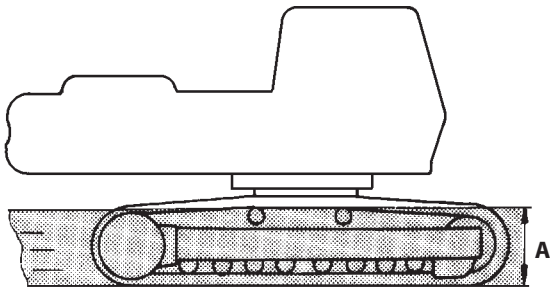
Operating in Water or Mud

The machine can be operated in water up to the upper edge of the upper rollers 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.

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

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

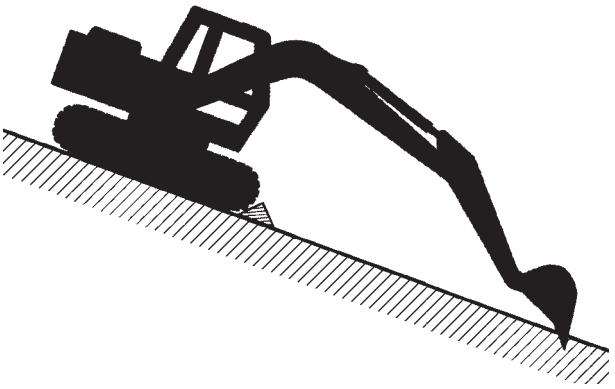


M104-05-009

Model	A
ZX345USLC-6N	860 mm

Parking the Machine on Slopes

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



SA-2273

If parking the machine on a slope is unavoidable:

- Thrust the bucket teeth into the ground.
- Return the control levers to neutral and pull pilot control shut-off lever (2) to the LOCK position.
- Block both tracks.

Parking the Machine

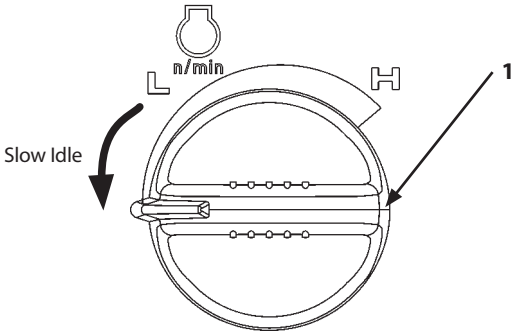
1. Park the machine on a firm, level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

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

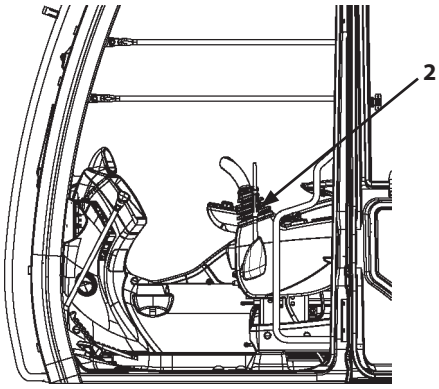
4. Turn engine control dial (1) counterclockwise fully to Slow Idle position. Run the engine for approximately 5 minutes to cool the engine.
5. Turn the key switch to OFF. Remove the key from the key switch.
6. Pull pilot control shut-off lever (2) to the LOCK position.

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

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



M1P1-01-068



Lock Position

MDAA-01-295

MEMO

Control Lever (ISO Pattern)

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.**

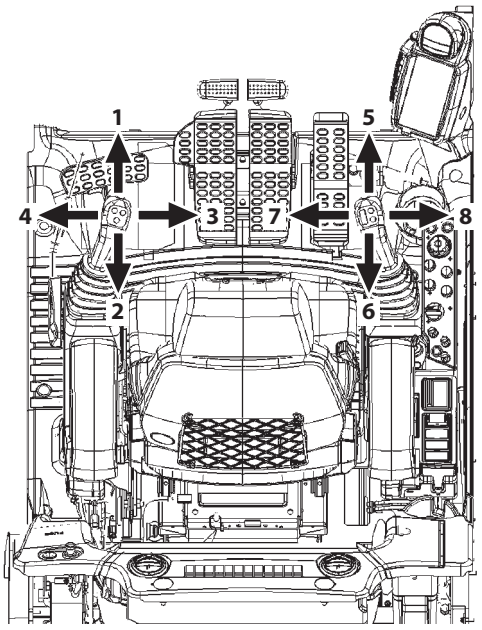
  Never remove the window sash bar.

- **Make sure you know the location and function of each control before operating.**
- **Do not change the operation pattern of the control lever. Failure to do so may result in mistaken operation of the machine.**

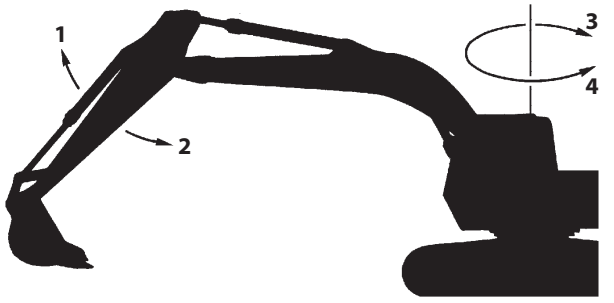
A label showing the control patterns of the levers and pedals is attached on the right side in the cab.

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

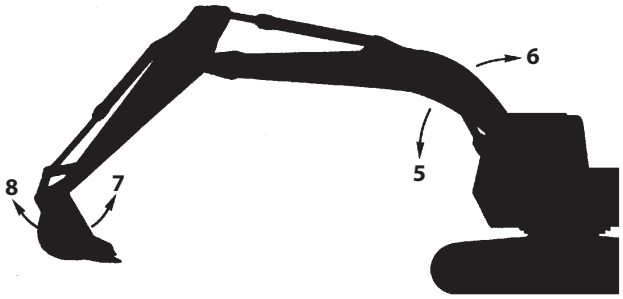
1- Arm Roll-Out
2- Arm Roll-In
3- Swing Right
4- Swing Left
5- Boom Lower
6- Boom Raise
7- Bucket Roll-In
8- Bucket Roll-Out



MDAA-01-363



M104-05-001

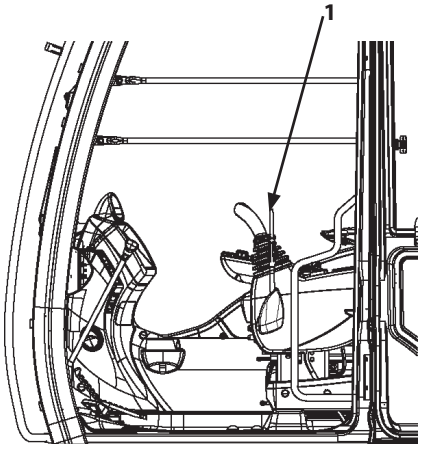


M104-05-002

Pilot Control Shut-Off Lever

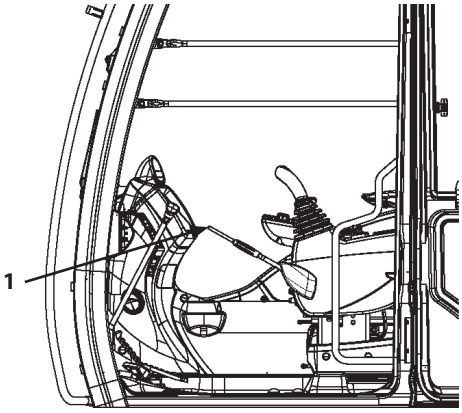
Pilot control shut-off lever (1) functions to prevent misoperation of the machine if control levers and pedals are accidentally moved when leaving the operator's seat or when entering the cab.

WARNING: Always pull pilot control shut-off lever (1) into the full LOCK position. Unless pilot control shut-off lever (1) is fully moved to the LOCK position, the control levers are not locked, possibly creating a hazardous situation. When leaving the machine, always stop the engine. Pull pilot control shut-off lever (1) up to the LOCK position. Always check to be sure that pilot control shut-off lever (1) is pulled up to the LOCK position before transporting the machine or leaving the machine at the end of a shift.



LOCK position

MDAA-01-295



UNLOCK Position

MDAA-01-296

Before Leaving the Machine

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

Before Starting Operation:

Confirm that pilot control shut-off lever (1) is pulled up to the LOCK position before starting the engine. The engine will not start if the pilot control shut-off lever (1) is in any other position than LOCK.
Slowly push down pilot control 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 any part of the machine (any actuator) moves when pilot control shut-off lever (1) is lowered to the UNLOCK position despite when all controls are in neutral, the machine is malfunctioning. Immediately pull pilot control shut-off lever (1) back to the LOCK position, and stop the engine. See your authorized dealer.

Warming-Up Operation

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

IMPORTANT:

- **The appropriate hydraulic oil operating temperature on this machine is 50 to 80 °C. Hydraulic components may be seriously damaged if the machine is operated with low temperature hydraulic oil. 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.**
- **When the hydraulic oil temperature is 5 °C or lower, the pump torque is restricted to protect the engine.**

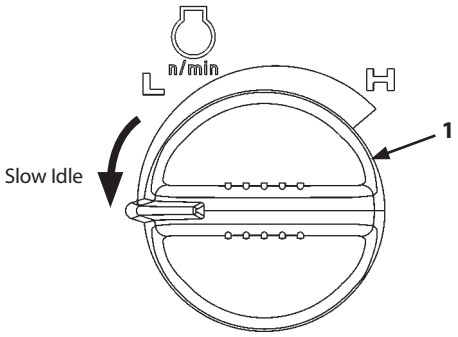
1. Even after engine starts, leave engine control dial (1) in the slow idle position.

   (Do not operate the machine until the needle of coolant temperature gauge (2) starts swinging.)
2. After the needle of coolant temperature gauge (2) starts swinging, turn engine control dial (1) to approx. Medium position.
3. Operate the boom, arm and bucket cylinders slowly to each stroke end several times. If the machine is equipped with various attachments, operate the attachment function slowly to allow hydraulic oil to circulate through the system.
4. Operate the travel and swing functions slowly to allow hydraulic oil to circulate through the systems.
5. Warming-up operation ends after the above operation is completed.

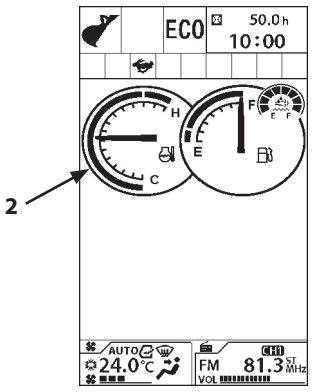
NOTE:

- *The engine speed will be kept to slow idle speed just after the engine starts. When engine speed control indicator (7) is displayed, slow idle speed will be maintained. 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 dial (1) is not set in the slow idle position.*
- *The warm-up system automatically operates after keeping slow idle speed, and the engine speed will temporarily increase even if engine control dial (1) is in the slow idle position.*

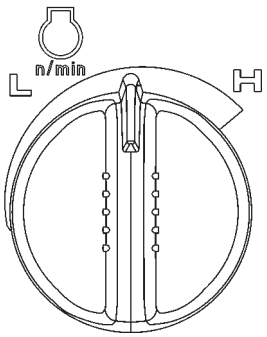
CAUTION: Do not attempt to operate the machine when engine speed control indicator (7) is lit. The engine speed may change after the slow idle period and operation speed of work device may suddenly increase, which may cause a serious accident.



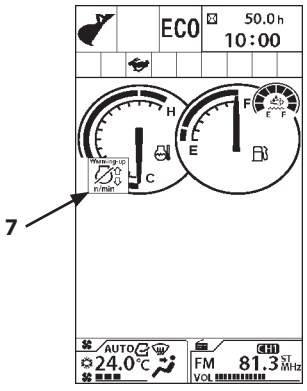
M1P1-01-068



MDC1-01-001



M1P1-05-003

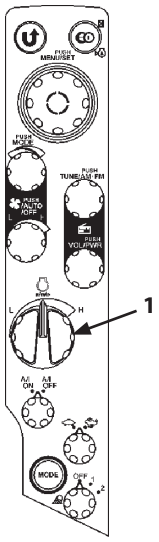


MDC1-01-355

Engine Speed Control

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

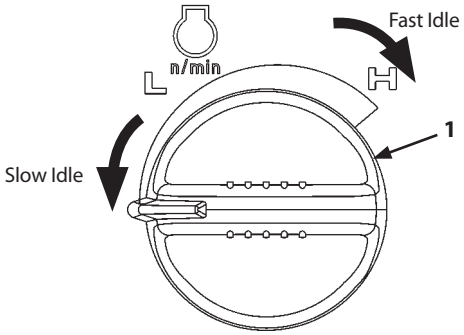
- Turn engine control dial (1) clockwise to increase the engine speed. Turn engine control dial (1) counterclockwise to decrease the engine speed.
- Note that the auto-idle function will be deactivated if engine control dial (1) is operated while the engine is running at the auto-idle setting.
- Before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



MDCD-01-026

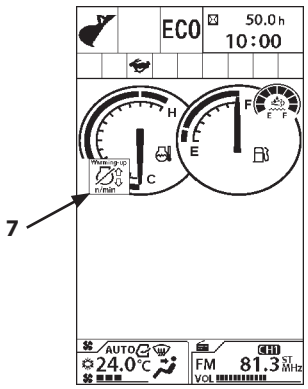
NOTE:

- *The engine speed will be kept to slow idle speed just after the engine starts. When engine speed control indicator (7) is displayed, slow idle speed will be maintained. 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 dial (1) is not set in the slow idle position.*
- *The warm-up system automatically operates after keeping slow idle speed, and the engine speed will temporarily increase even if engine control dial (1) is set in the slow idle position.*



M1P1-01-068

CAUTION: Do not attempt to operate the machine when engine speed control indicator (7) is lit. The engine speed may change after the slow idle period and operation speed of the work device may suddenly increase, which may cause a serious accident.

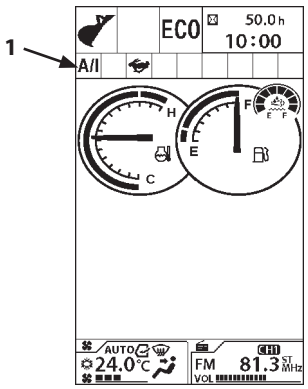


MDC1-01-355

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 consumption.
The engine speed will immediately increase to the speed set by engine control dial (2) when any control lever is operated.

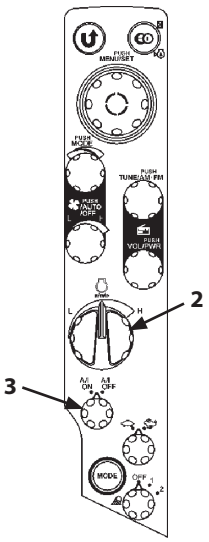


MDC1-01-314

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 will be activated.**
- **Always be aware of the setting of engine control dial (2) when auto-idle switch (3) is turned to the A/I ON position. If the engine speed is set high with engine control dial (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: Prevent the machine from moving unexpectedly. Be sure to turn auto-idle switch (3) to the A/I OFF position when unexpected machine movement is undesirable, especially when loading/ unloading the machine for transportation.



MDCD-01-026

NOTE:

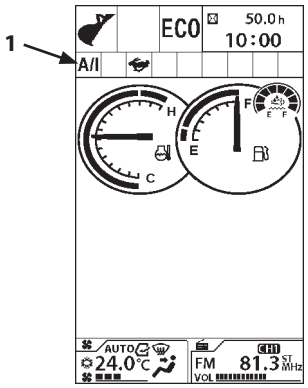
- *Auto-idle control may not work completely until the end of the warm-up.*
- *The auto-idle control function does not operate when the aftertreatment device is regenerating.*

Auto-Idle ON/OFF

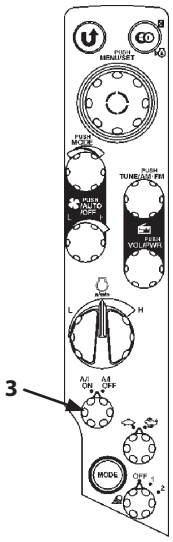
Note that the auto-idle function can be turned ON or OFF by using auto-idle switch (3) only when the key switch is in ON position.
Always check if the auto-idle function is turned ON or OFF with auto-idle indicator (1).

Auto-Idle Indicator (1) ON	:	Auto-Idle Function ON
Auto-Idle Indicator (1) OFF	:	Auto-Idle Function 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 5 seconds and stay ON later.



MDC1-01-314

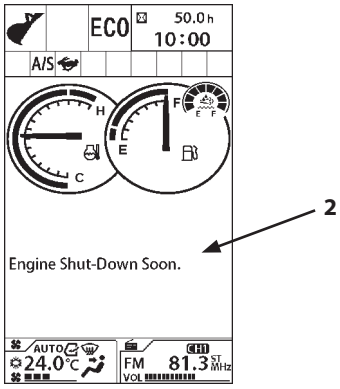


MDCD-01-026

Auto Shut-Down

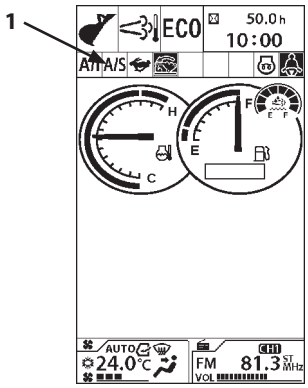
WARNING: This function automatically stops the engine. Take extra care on the work and work environment when using this function.

When the auto shut-down function is turned ON, the engine automatically stops after the preset time at the state in which the pilot control shut-off lever is pulled. 30 seconds before the engine stop, monitor screen (2) displays "Engine Shut-Down Soon." message and indicator (1) starts flashing. Also the buzzer sounds. The buzzer sounds once at 30 seconds before, and continuously sounds from 15 seconds. The engine speed decreases to the idling speed, and then stops after 15 seconds. When the pilot control shut-off lever is pushed down before stopping the engine, the auto shut-down is disabled and the engine will not stop.



MDC1-01-146EN

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.



MDC1-01-286EN

Operating Condition

- The engine is running.
- The pilot control shut-off lever is in the LOCK position.
- Coolant and hydraulic oil temperature are not high.
- The aftertreatment device is not in the process of manual regeneration.

IMPORTANT:

- **When the engine is stopped by the auto shut-down function, turn the key switch to ACC or OFF once and 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 leave the machine after auto shut-down. Failure to do so may discharge the batteries.**
- **When the key switch is turned to the OFF position while the auto shut-down function is ON, the setting will be reset. When required to keep the setting, consult your authorized dealer.**

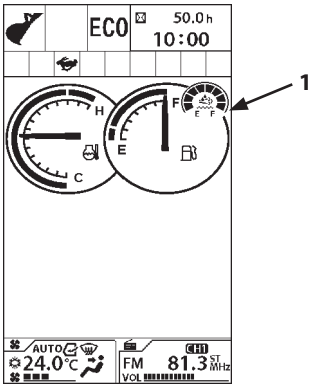
IMPORTANT:

- **Even if the auto shut-down function is ON, the engine will not stop during manual regeneration of the aftertreatment device.**
- **When the auto shut-down activates, the air conditioner will also stop.**

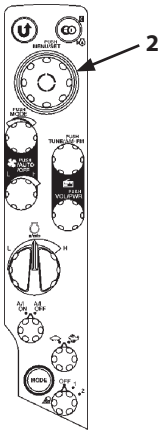
Setting the Auto Shut-Down Function

Auto Shut-Down: On/Off

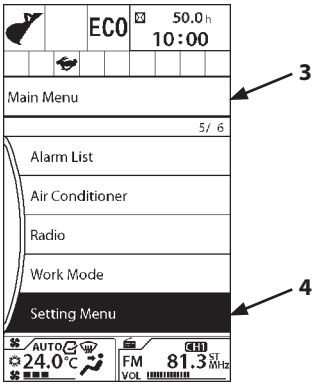
1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Setting Menu (4).
3. Push selector knob (2) to display Setting Menu screen (5).
4. Rotate selector knob (2) to highlight Auto Shut-Down (6).



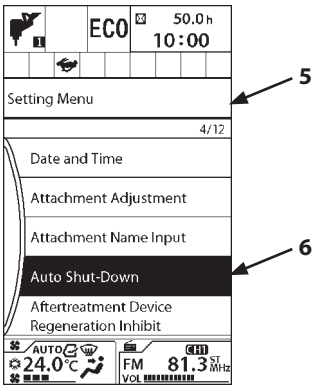
MDC1-01-001



MDCD-01-026

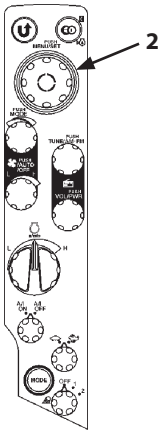


MDAA-01-114EN



MDC1-01-147EN

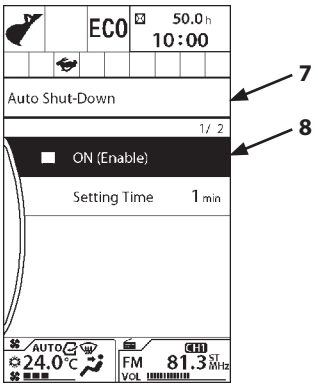
5. Push selector knob (2) to display Auto Shut-Down screen (7).



MDCD-01-026

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

NOTE: When the function is ON, the mark "■" is displayed in green. When the function is OFF, the mark "■" is displayed in gray.

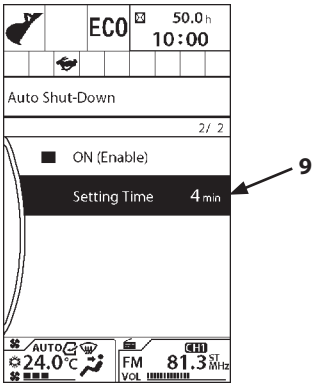


MDAA-01-148EN

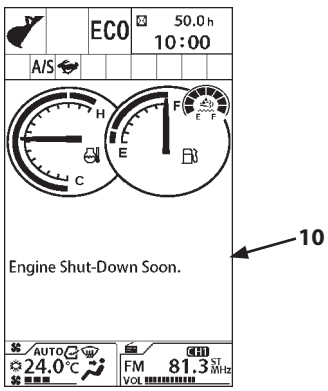
Setting Time of Auto Shut-Down

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

NOTE: 30 seconds before the engine stop, the monitor will display "Engine Shut-Down Soon." message (10).



MDAA-01-150EN



MDC1-01-146EN

Aftertreatment Device Manual Regeneration

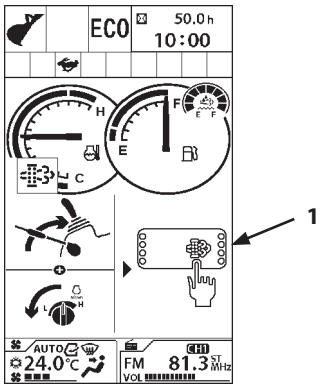
Manual Regeneration Procedure

When the manual regeneration is needed, screen (1) as shown on the right side will be displayed. When screen (1) is displayed, you need to perform the manual regeneration. Before starting the 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.

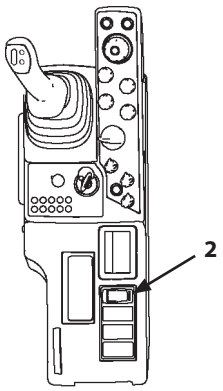
- No person is present around the machine
- Keep flammable materials away from the aftertreatment device.
- Fuel level alarm does not light.
- DEF/AdBlue® level alarm does not light.

1. Park the machine in a safe place. Lower the front attachment onto the ground.
2. Pull the pilot control shut-off lever to the LOCK position.
3. Set the engine control dial to slow idle.
4. Push aftertreatment device manual regeneration switch (2).
5. When pushing aftertreatment device manual regeneration switch (2), screen (3) as shown on the right side will be displayed and the manual regeneration starts. Bar graph on screen (3) indicates progress of the regeneration process.

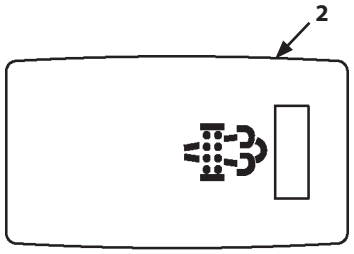
IMPORTANT: The manual regeneration does not start unless the pilot control shut-off lever is in the LOCK position and the engine control dial is in slow idle. When touching the pilot control shut-off lever or the engine control dial during manual regeneration, the regeneration process is aborted. When the process is aborted, start over again.



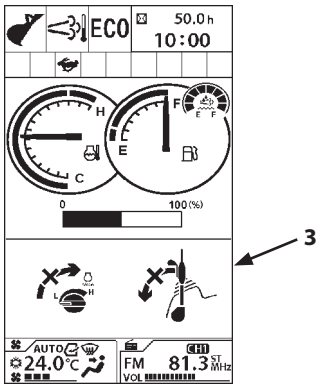
MDC1-01-005



MDC1-01-543



MDAA-05-002



MDC1-01-006

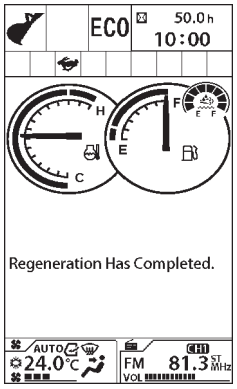
6. When the manual regeneration is finished, "Regeneration Has Completed." message will be displayed. If "Regeneration Has Failed." message is displayed, start the manual regeneration process again. Regeneration process may fall in conditions other than those mentioned above (such as sensor malfunction or low ambient temperature).

NOTE:

- *The engine sound may change and the engine speed may increase when the manual regeneration starts, this is not a malfunction.*
- *Regeneration time varies depending on the ambient temperature.*
- *White smoke may temporarily be generated from the tail pipe during the regeneration process, this is not a malfunction.*
- *Manual regeneration time is shorter directly after machine operation, and longer when engine temperature is low.*
- *Coolant temperature may increase during the manual regeneration.*

IMPORTANT:

- **If regeneration must be interrupted, push the manual regeneration switch again. The message "Regeneration Has Failed." will be displayed on the monitor, but the machine becomes operable. In this case, manual regeneration should be performed again. Restart manual regeneration as soon as possible.**
- **Depending on the working and environmental conditions, there may be occasions when the effectiveness of the catalyst within the aftertreatment device decreases and replacement becomes necessary. If warm up is finished, ordinarily a manual regeneration will take around 15 to 30 minutes to complete. If the regeneration takes over 40 minutes, contact your nearest authorized dealer to arrange an inspection.**



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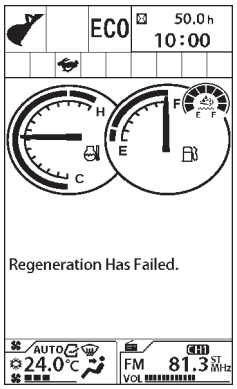


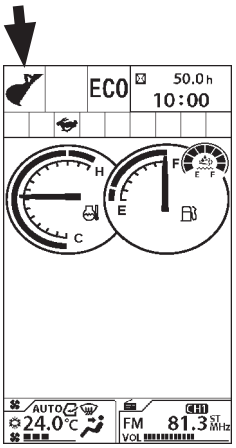
MDC1-01-084EN

Work Mode

Select Work Mode in the main menu, and select the appropriate hydraulic circuit and pump flow rate for the front attachment at Work Mode screen.

When the engine is started, the digging mode is automatically set. The following 7 work modes can be selected from the Work Mode screen.

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

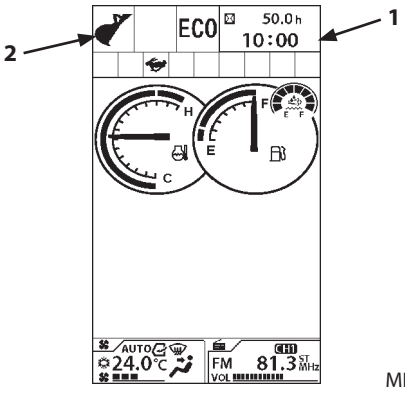


MDC1-01-001

The selected work mode is indicated by attachment mode indicator (2) on Basic Screen (1).
Select the work mode corresponding to the work in which the machine is engaged, referring to the table below.

	Work Mode	Description
	Digging Mode	Select this mode when using bucket.
	Thumb 1 to 5 Mode	Select this mode when using thumb.
	Breaker 1 to 5 Mode	Select this mode when using breaker.
	Pulverizer 1 to 5 Mode	Select this mode when using pulverizer.
	Crusher 1 to 5 Mode	Select this mode when using crusher.
	Vibrating Hammer 1 to 5 Mode	Select this mode when using vibrating hammer.
	Grapple 1 to 5 Mode	Select this mode when using grapple.
	Clamshell 1 to 5 Mode	Select this mode when using clamshell.
	Tilting Rotator 1 to 5 Mode	Select this mode when using tilting rotator.
	Tilting Bucket 1 to 5 Mode	Select this mode when using tilting bucket.
	Others 1 to 5 Mode	Select this mode when other than the above attachment is used.

NOTE: 51 work modes shown above are designated as standard specifications. Up to 11 attachment modes other than digging mode can be designated. Consult your authorized dealer for adding or changing the designation of the attachment modes.

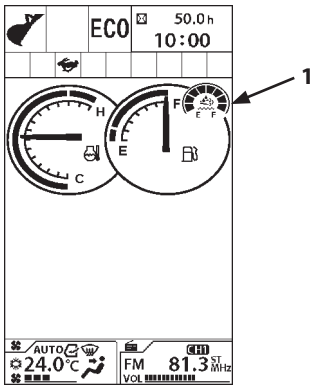


MDC1-01-001

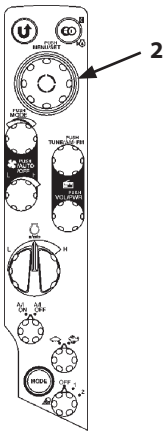
Attachment Selection

1. Push selector knob (2) while displaying Basic Screen (1) to display Main Menu screen (3).
2. Rotate selector knob (2) to highlight Work Mode (4).
3. Push selector knob (2) to display Work Mode screen (5).
4. Rotate selector knob (2) to highlight the Desired Front Attachment.

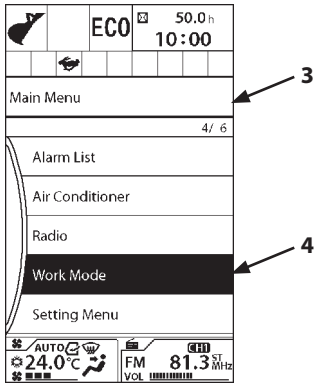
   (In the right example, "Bucket" (6) is highlighted.)
5. Push selector knob (2) to make the changes.



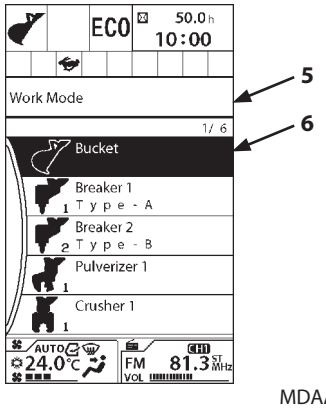
MDC1-01-001



MDCD-01-026



MDAA-01-100EN

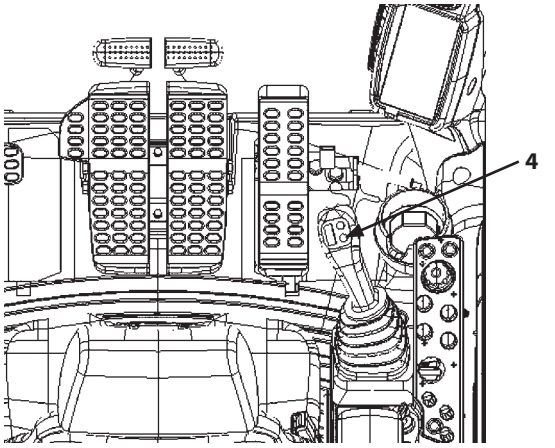


MDAA-01-101EN

Power Boost Switch

Power boost switch (4) is located on the top of the right control lever.

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



MDAA-01-361

Power Mode

Three engine speed modes, ECO, PWR and H/P mode is selected by operating 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

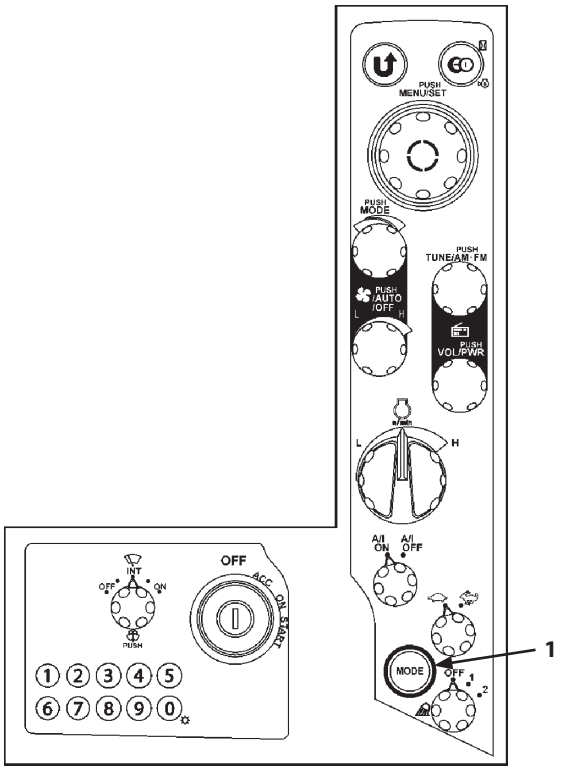
Use PWR (Power) mode when extra horsepower is needed.
PWR is displayed on Power Mode Display (3).

H/P (High Power) Mode

Use the H/P mode when extra horsepower is needed, i.e. when rolling in the arm in excavation work, etc. H/P is displayed on Power Mode Display (4).

NOTE:

- *ECO mode is set automatically when starting the engine. Set PWR or H/P mode if necessary.*



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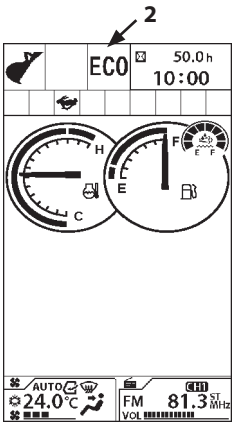

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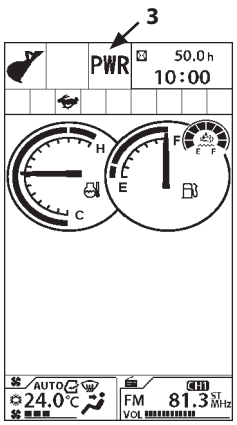

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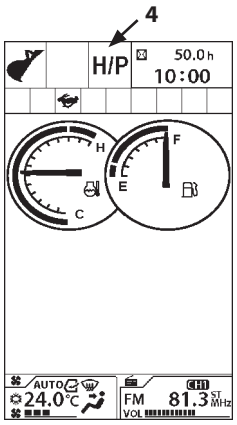
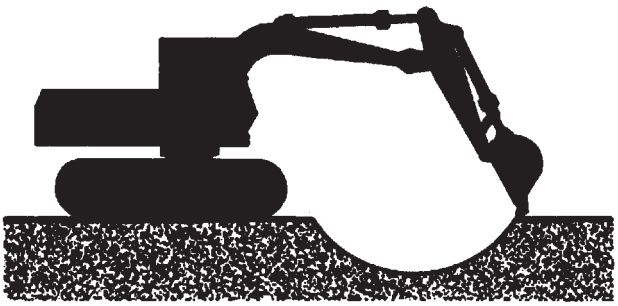


MDAA-01-357

Operating Backhoe

- 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 rapidly back and forth.
- Place the bucket teeth on the ground with the bottom of the bucket at a 45 degree angle to the ground.
- 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 the arm, avoid bottoming the cylinder to prevent cylinder damage.



M107-05-037

IMPORTANT:

- **When digging at an angle, avoid striking the tracks with the bucket teeth.**
- **Lower the boom smootly. Avoid stopping suddenly as this may impact the machine.**
- **When digging a deep excavation, avoid striking the boom or bucket cylinder hoses against the ground.**

Face Shovel

Backhoe operation digs the ground using the bucket in a roll-in motion. Face shovel operation digs the ground using the arm cylinder in a scraping motion.

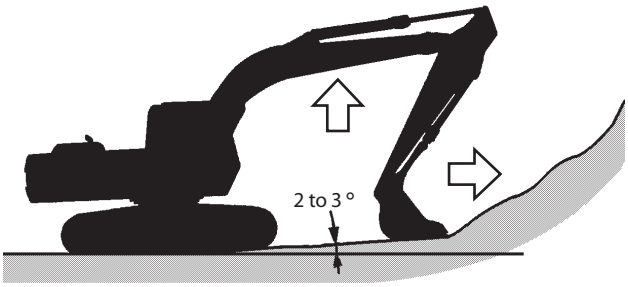
WARNING: Take care not to hit the cab when rolling in the arm with a reversed-installed bucket.

IMPORTANT: If a bucket hook is mounted, take care not to hit the arm with the hook when rolling in the bucket.

- 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 this water as shown.

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

MZX5-05-003



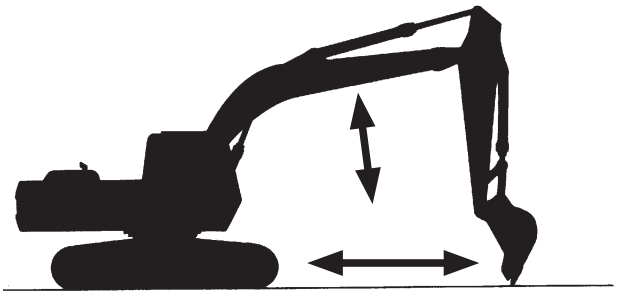
M104-05-020

Grading Operation

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

IMPORTANT: Do not pull or push dirt with the bucket when traveling. Excess force will be applied on each part, and the machine may be damaged.

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



M104-05-017

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 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

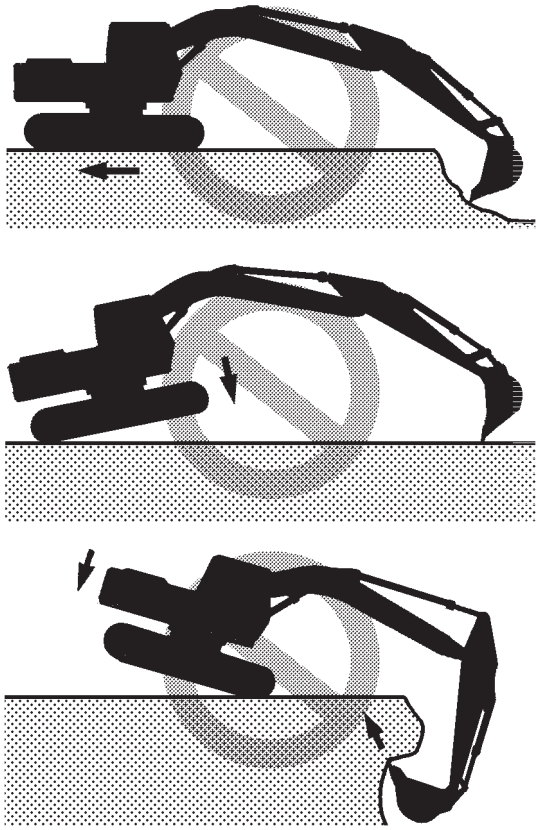
WARNING: As the bucket body has a curved surface, hammer work or piling work is very dangerous. Doing so may damage the bucket and front attachment.

Do not attempt to use the bucket for hammer work and piling work.
Doing so may damage the bucket and front attachment, causing personal injury.

MZX5-05-004

Avoid Abusive Operation

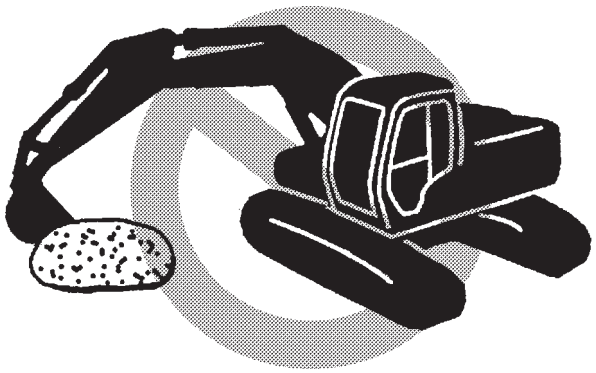
Do not attempt to add additional digging force by using travel, raising the rear of the machine to use the machine's weight.



MZX5-05-005

Never Move an Object Sideways with the Bucket

For example, do not swing the bucket to level material or do not strike objects sideways with the bucket.
Doing so may damage the front attachment and the swing system.



MZX5-05-006

Do Not Use Wide Track Shoes on Rough Ground

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

Failure to do so may result in shoe bending and/or shoe bolt loosening, and may damage other undercarriage components such as track link and rollers.
(Refer to the "Shoe Types and Applications" in the Specifications chapter.)

Shackle Hole Usage

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

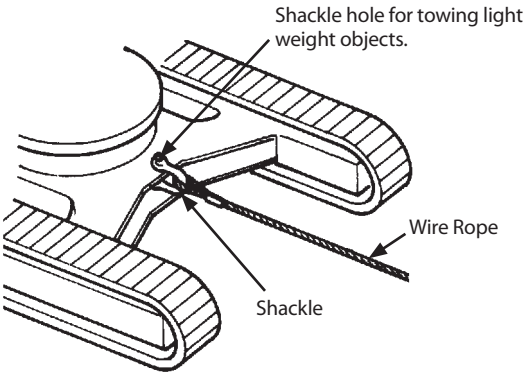
IMPORTANT: Be sure to conform to the restrictions and precautions stated below when towing a light weight object using the shackle hole provided on the track frame. The track frame and/or the shackle hole may be damaged otherwise.

- The maximum drawbar pull.

Model	Maximum Drawbar Pull
ZX345USLC-6N	73600 N (7500 kgf) or less

- Be sure to use a shackle.
- Keep the tow line horizontal, straight, and parallel to the tracks.

Select the slow travel mode. Slowly drive the machine when towing.



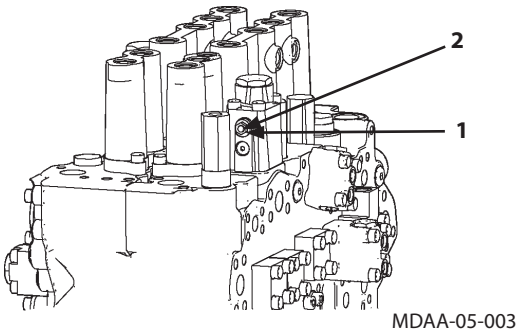
M104-05-011

How to Lower Boom in Case of Emergency and When Engine Stops

(Without hose-rupture safety valve)

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

In case the engine suddenly stops and the engine cannot be restarted, lower the boom by following the procedure below.



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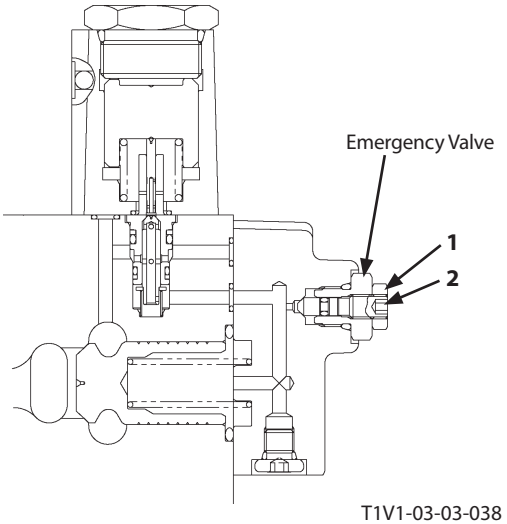
IMPORTANT: Never loosen screw (2) more than 2 turns. Screw (2) may come off.

1. Loosen lock nut (1) in the emergency valve on the right. Loosen screw (2) one half of a turn. The boom lowering speed can be partly adjusted by loosening screw (2) further.

IMPORTANT: Excessive leakage may result if screw (2) and lock nut (1) are tightened insufficiently. Be sure to retighten screw (2) and lock nut (1) to specifications.

2. 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)



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Precautions for After Operations

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

MEMO

Transporting by Road

M1V1-06-001

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

- 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.
- Investigate conditions on the route to be traveled in advance, such as dimensional limits, weight limits, and 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 regulation for dimensional or weight limits.
Notify your authorized dealer that you are transporting the machine.

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 adhered to the machine.
6. When transporting a machine equipped with a blade, take care not to hit the blade.

Loading/Unloading

WARNING:

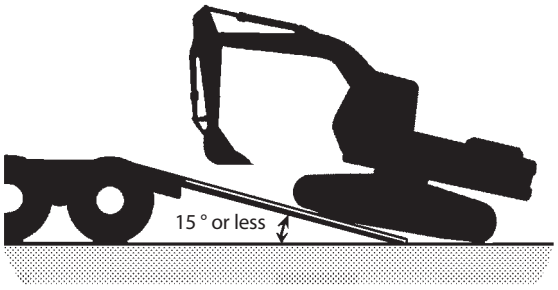
- **Always turn the auto-idle switch OFF when loading or unloading the machine. In auto-idle mode, speed may automatically increase.**
- **Always select slow speed mode with the travel mode switch.**
- **Never steer while driving up or down a ramp, it is extremely dangerous and may cause the machine 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

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

If the front attachment is fitted, load with the front attachment faced towards the front, if the front attachment is not fitted, reverse 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.



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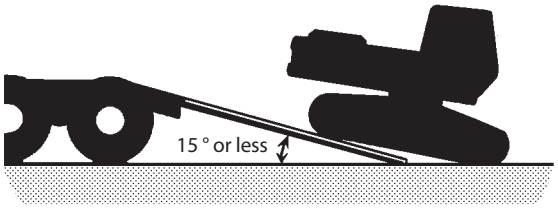


M107-06-018

3. When the front attachment is fitted

3.1 Determine a position for the bucket in line with the trailer. Adjust the angle of the boom and the arm at 90 to 110 °.

3.2 Lower the bucket onto to the deck of the trailer before the machine passes over the end of the ramp for support.

3.3 Lift the bucket slightly off the deck of the trailer after the machine has moved to the designated space. With the arm lifted inwards, slowly swing the upper structure place around 180 °.

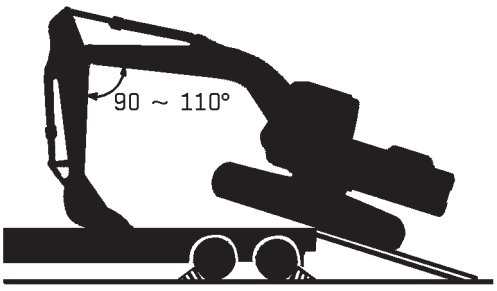
3.4 Rest the front attachment on supports such as wooden blocks placed on the trailer flatbed.

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.



M107-06-012

M107-06-013

Fastening Machine for Transporting

WARNING: Fasten the machine frame to the deck securely with chains and cables. While traveling, 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 help secure the machine.
2. Fasten each corner of the machine and front attachment to the trailer with appropriate strength of chains or cables.

M1V1-06-001

Unloading

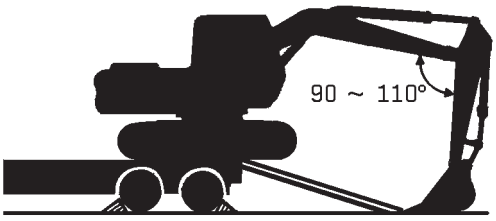
WARNING: At the point where the ramp meets the level surface there is a sudden change of angle. Take care when traveling over it.

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 in a suspended state during unloading.

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.



M107-06-014

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

Lifting Machine

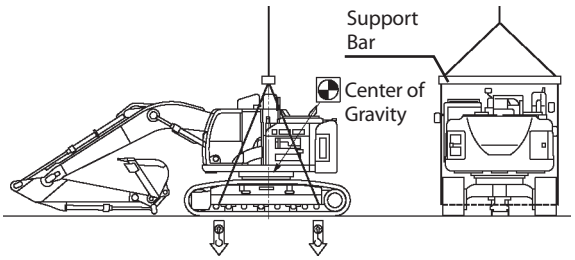
WARNING:

- **Use lifting cables and other lifting tools that are sufficient strong, and free from any damage and/or other detect.**
- **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 gravity center is for the standard specification machine. The center of gravity will vary depending on the kinds of attachments and/or optional equipment installed and their positioning. Take care not to lose the balance of the machine while lifting.**

Lifting

1. Fully extend the arm and bucket cylinders. Lower the boom until the bucket comes in contact with the ground.
2. Pull the pilot control shut-off lever to the LOCK position.
3. Stop the engine. Remove the key from the key switch.
4. Close and lock all doors and covers.
5. Use wire ropes and support bar of sufficient length so that they do not come in contact with the machine while lifting.

   Wrap some protectors around wire ropes and/or support bar as required to prevent the machine from being damaged.
6. Set a crane in an appropriate position.
7. Thread the wire rope through and under both sides of the track frames as illustrated. Attach the wire ropes to the crane.



MDD5-06-001

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

Inspect 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 general appearance, noise, heat, etc.
- Check for loose or missing parts.

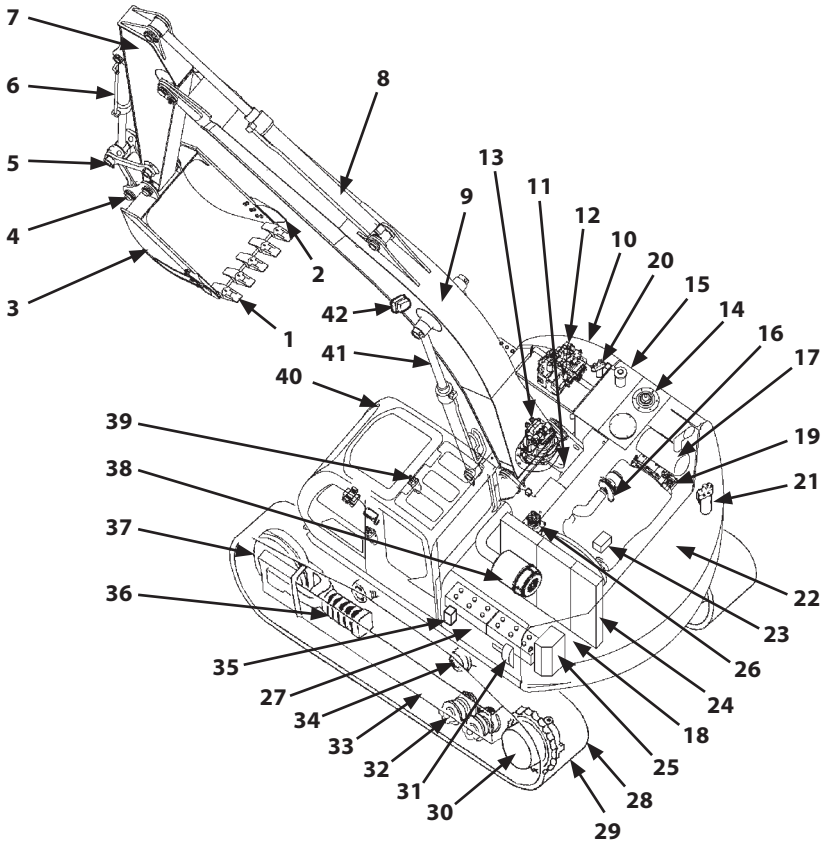
If there is any problem with your machine, repair it before operating or contact your authorized dealer.

IMPORTANT:

- **Use only specified fuel, DEF/AdBlue®, 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 loss of Hitachi product warranty.**
- **Never adjust engine governor or hydraulic system relief valve.**
- **Protect electrical parts from water and steam.**
- **Never disassemble electrical components such as main controller, sensors, etc.**
- **Never adjust parts of engine fuel system or hydraulic equipment.**
- **Using bad quality fuel, drainage agent, fuel additives, gasoline, kerosene or alcohol refueled or mixed with specified fuel may deteriorate performance of fuel filters and cause sliding problem at lubricated contacts in the injector. It also affects the engine and aftertreatment device parts, leading to malfunction.**
- **Using bad quality DEF/AdBlue® may deteriorate performance of the engine and affect the aftertreatment device, leading to malfunction. Using improper density DEF/AdBlue® may derate the engine power.**
- **Use Hitachi genuine high performance filter.**

- Body Information Controller
  This machine provides a body information controller that stores machine operation information for preventive maintenance.
  When maintaining the machine, our authorized service man may down load the stored information.
  Consult with your authorized dealer for detailed function of this device.
- Communication Terminal Operation
  It is not necessary to check or operate the communication terminal however if any abnormality is found, consult your authorized dealer.
  Before installing any covering attachment such as a head guard, consult your authorized dealer.
  Never spray water on the communication terminal and the wirings.
- Inquire to 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



MDD5-01-001

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

Check the Hour Meter Regularly

Refer to the List of Check and Maintenance for information about lubricants, check and adjustment intervals. The maintenance guide table is affixed to the reverse side of the front right cover. Refer to the next page.

This manual recommends grouping the intervals into three categories as follows:

Daily Check : To be conducted daily before operation
Monthly check : To be regularly conducted once per month
Annual check : To be regularly conducted once per year

Check and maintenance intervals shown in this manual are those for the machines to be operated under normal conditions. In case the machine is operated under more severe conditions, shorten the intervals.

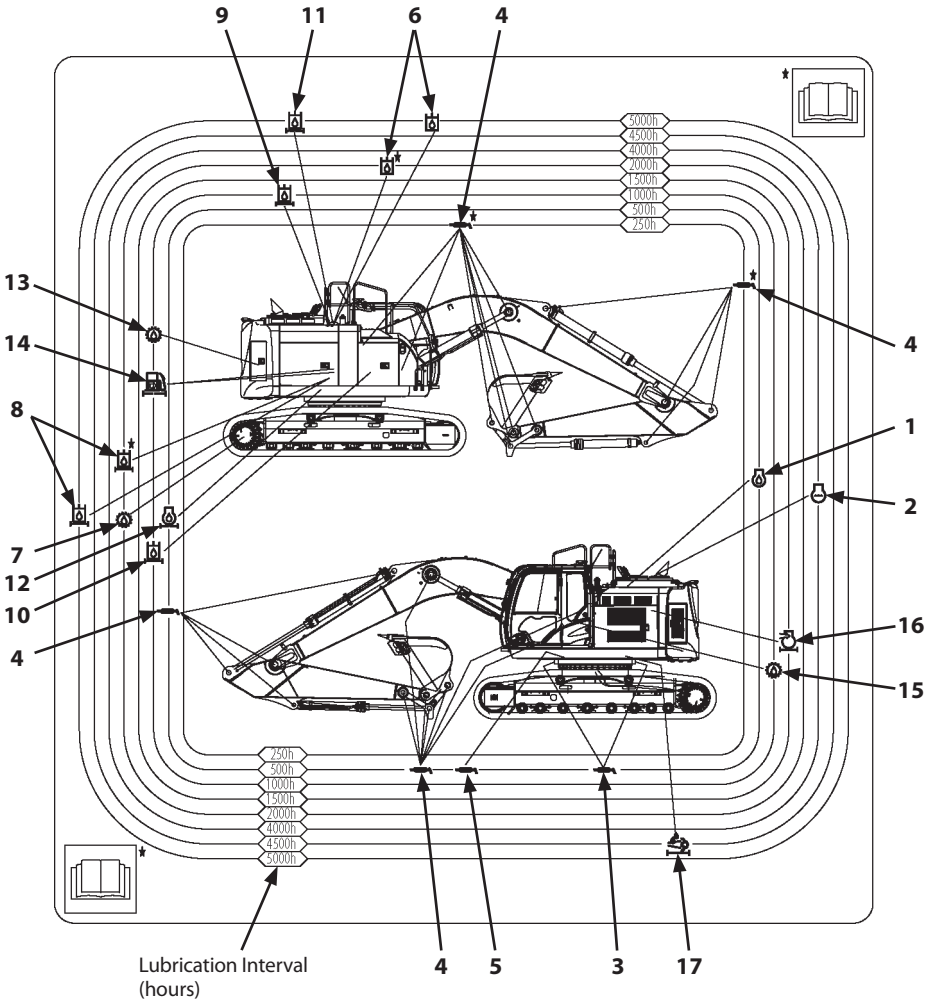
Maintenance Guide Table

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

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

	Grease (Front Joint Pin, Swing Bearing, Swing Internal Gear)		Hydraulic oil filters (Pilot Filter, Full-Flow Filter, Suction Filter)
	Gear Oil (Pump Transmission, Travel Reduction Gear, Swing Reduction Gear)		Air Cleaner Element
	Engine Oil		Coolant (Long-Life Coolant)
	Engine Oil Filter		Fuel Filter (Fuel Main Filter, Pre-Filter)
	Hydraulic Oil		DEF/AdBlue® Supply Module Main Filter

- Maintenance Guide Table



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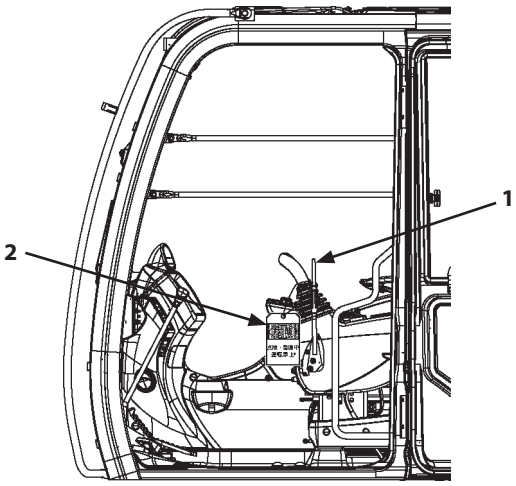
	Item	Page		Item	Page
1	Engine Oil	7-25	10	Hydraulic Oil Filter (Pilot)	7-27
2	Coolant (Long-Life Coolant)	7-68	11	Hydraulic Oil Filter (Air Breather)	7-45
3	Grease	7-23	12	Engine Oil Filter	7-26
4	Grease (Every 500 hours. Only first time at 250 hours)	7-21	13	Oil Separator Element	7-30
5	Grease	7-24	14	Fuel Filter (Main/Pre)	7-56
6	Hydraulic Oil	7-38	15	Gear Oil (Swing Reduction Gear)	7-31
7	Gear Oil (Travel Reduction Gear)	7-32	16	Air Cleaner Element	7-61
8	Hydraulic Oil Filter (Suction)	7-42	17	DEF/AdBlue® Supply Module Main Filter	7-124
9	Hydraulic Oil Filter (Full-Flow)	7-43			

Preparations for Inspection and Maintenance

Except in special cases, park the machine by following the procedure 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. Turn engine control dial to the slow idle position and run the engine for 5 minutes to cool the engine.
5. Turn the key switch OFF to stop the engine. Remove the key. Be sure to place pilot control shut-off lever (1) to the LOCK position.
6. After putting a tag (2) for "Under Serving" on the easy-to-see cab door or control lever, begin the work.

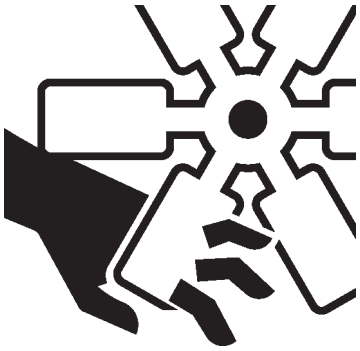
M104-07-021



MDAA-07-028

WARNING: Never attempt to maintain the machine when the engine is running in order to prevent the accident. If maintenance work while engine running is unavoidable, strictly comply with the following items.

- **One person should take the operator's seat to be ready to stop the engine 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 and tools into the moving parts.**
- **Move pilot control shut-off lever (1) to LOCK position so that the front attachment will not move.**
- **Never touch the control levers and pedals. If operating the control levers or pedals is unavoidable, signal co-workers to evacuate to safer place.**



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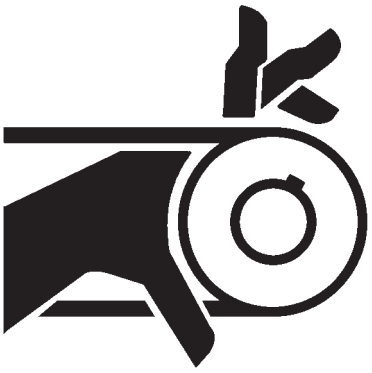


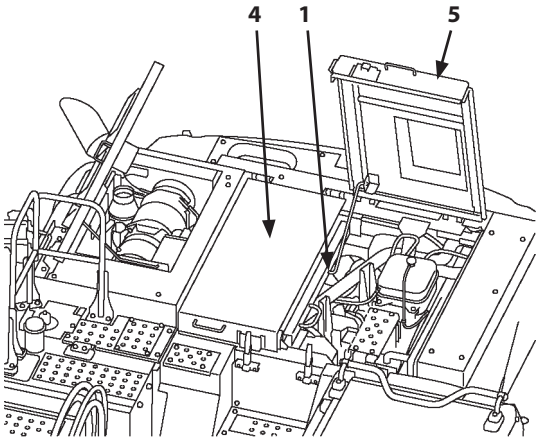
SA-026

Hood and Access Covers

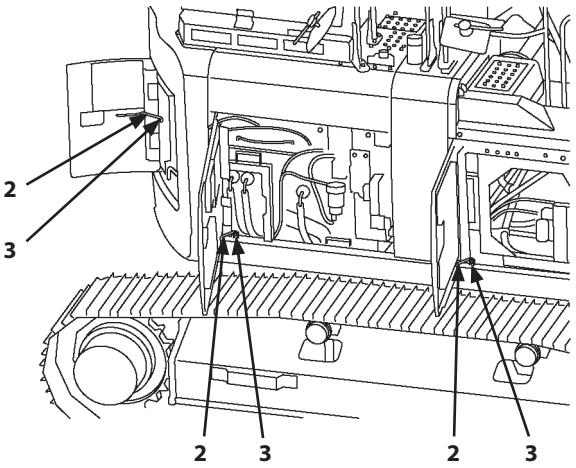
WARNING:

- **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.**

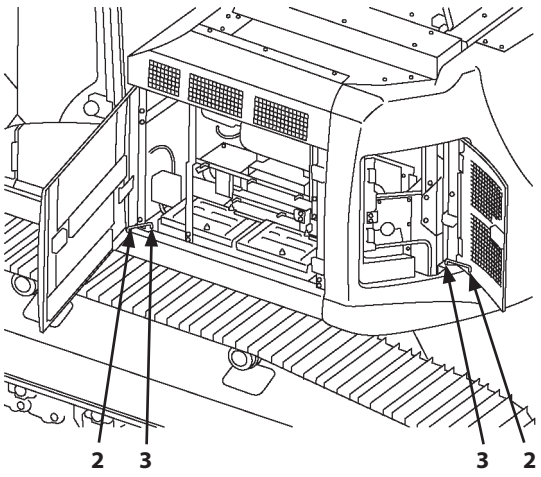
- Holding the handle on the access cover, raise the cover until the cover is secured with catch (1).
- When opening the engine cover, open the left engine cover (5). Then, pull to open the right engine cover (4) as illustrated.
- After opening the right and/or left access cover, be sure to insert rod (2) into cover lock hole (3) to hold the cover.



Engine Cover MDD5-07-001



Right Cover MDD5-07-002



Left Cover MDD5-07-003

Maintenance Guide

A. Greasing

	Parts		Quantity	Interval (hours)							Page
				8	50	100	250	500	1000	2000	
1.	Front Joint Pins	Bucket and Link Pins	9	★			★★				7-21
		Others	11	★			★★				7-21
2.	Swing Bearing		2								7-23
3.	Swing Internal Gear		1					★★★			7-24

★ : Add grease daily during first 50 hours of operation.
In case excavations are 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 clearance adjustment mechanism such as slope-finishing bucket or V-type bucket, or a genuine Hitachi hoe bucket before EX-5 model, or an attachment other than genuine Hitachi bucket is used, grease two pins every 250 hours.**

B. Engine

	Parts			Quantity	Interval (hours)							Page
					8	50	100	250	500	1000	2500	
1.	Engine Oil	Check Oil Level		1								7-25
2.	Engine Oil	Change	ZX345USLC-6N	48 L (12.7 US gal)								7-27
3.	Engine Oil Filter	Replace		1								7-27
4.	Check and Clean Around the Engine			–	As required							7-29

C. Transmission

	Parts			Quantity	Interval (hours)							Page
					8	50	100	250	500	1000	2000	
1.	Pump Transmission	Check Oil Level		1				■				7-30
		Change	ZX345USLC-6N	1.7 L (1.8 US qt)						■		7-30
		Air Breather Cleaning		1						■		7-30
2.	Swing Reduction Gear	Check Oil Level		1					■			7-31
		Change	ZX345USLC-6N	11.7 L (3.1 US gal)						■		7-31
3.	Travel Reduction Gear	Check Oil Level		2					■			7-32
		Change	ZX345USLC-6N	11 L×2 (2.9 US gal×2)							■	7-33

D. Hydraulic System

	Parts		Quantity	Interval (hours)										Page
				8	50	100	250	500	1000	1500	2000	2500	5000	
1.	Check Hydraulic Oil Level		1	■										7-38
2.	Change Hydraulic Oil	ZX345USLC-6N	251 L (66.3 US gal)								★		★	7-39
3.	Suction Filter Cleaning		1	Each time when hydraulic oil is changed										7-42
4.	Replace full-flow filter		1						★					7-43
5.	Replace Pilot Oil Filter		1						■					7-44
6.	Replace Air Breather Element		1										■	7-45
7.	Check Hoses and Lines	for leaks, loose		■										7-46
		for cracks, bend, etc.	–				■							7-47

★ : Changing interval differs according to the brand of hydraulic oil used, kind of filter element or average attachment operating availability.
Refer to the "changing intervals of hydraulic oil and full flow filter element". See recommended oil chart.

E. Fuel System

	Parts		Quantity	Interval (hours)							Page
				8	50	100	250	500	1000	2000	
1.	Drain Fuel Tank Sump		1	■							7-52
2.	Drain Fuel Pre-Filter		1	■							7-53
3.	Replace Fuel Main Filter Element		1	(or when indicator lit)					■		7-56
4.	Replace Fuel Pre-Filter Element		1	(or when indicator lit)					■		7-58
5.	Check Fuel Hoses	for leaks, cracks	–	■							7-60
		for cracks, bend, etc.	–				■				7-60

F. Air Cleaner

	Parts		Quantity	Interval (hours)							Page
				8	50	100	250	500	1000	2000	
1.	Air Cleaner Outer Element	Clean	1	(or when indicator lit)			■				7-61
		Replace	1	After cleaning 6 times or 1 year							7-61
2.	Air Cleaner Inner Element	Replace	1	When outer element is replaced							7-63

G. Cooling System

	Parts			Quantity	Interval (hours) 8	50	100	250	500	1000	2000	Page
1.	Check Coolant Level			1								7-65
2.	Check and Adjust Fan Belt Tension			1		★★						7-67
3.	Change Coolant	ZX345USLC-6N		41 L (10.1 US gal)	Twice a year*							7-68
4.	Clean Radiator, Oil Cooler and Inter Cooler Core		Outside	1					★			7-70
			Inside	1	Once a year							7-70
5.	Clean Oil Cooler, Radiator and Inter Cooler Front Screen			1					★			7-72
6.	Clean Air Conditioner Condenser			1					★			7-72
7.	Clean Fuel Oil Cooler			1					★			7-72

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

★★: Maintenance required only during first time check.

*: When genuine Hitachi Long-Life Coolant 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 the coolant with genuine Hitachi Long-Life Coolant (LLC) mixed by 30 to 50 %. If a coolant mixed with less than 30 % of Hitachi Long-Life Coolant is used, service life of the cooling parts may be shortened due to damage by freezing or corrosion of coolant system parts.**
- **If mineral-rich water is used for coolant, water stain or scale may build up inside the engine or radiator, causing overheating due to deterioration of coolant performance.**

H. Electrical System

	Parts		Quantity	Interval (hours) 8	50	100	250	500	1000	2000	Page
1.	Battery	Check Electrolyte Level	2	Every month							7-76
		Check electrolyte specific gravity	2	Every month							7-78
2.	Replacing Fuses	Replace	–	As required							7-79

I. Miscellaneous

	Parts			Quantity	Interval (hours)								Page
					8	50	100	250	500	1000	2000	4500	
1.	Check and Replace Bucket Teeth			–	■								7-82
2.	Change Bucket			–	As required								7-84
3.	Convert Bucket Connection Into Face Shovel			–	As required								7-85
4.	Adjust Bucket Linkage			1	As required								7-86
5.	Remove Travel Levers			2	As required								7-87
6.	Check and Replace Seat Belt			1	■	Every 3 years							7-87
7.	Check Windshield Washer Fluid Level			1	As required								7-88
8.	Check Track Sag			2		■							7-89
9.	Clean and Replace Air Conditioner Filter	Circulating Air Filter	Clean	1					■				7-92
			Replace	1	After cleaning 6 times or so								7-92
		Fresh Air Filter	Clean	1					■				7-92
			Replace	1	After cleaning 6 times or so								7-92
10.	Check Air Conditioner			–				■					7-94
11.	Clean Cab Floor			–	As required								7-96
12.	Retighten Cylinder Head Bolt			–	*As required								7-97
13.	Inspect and Adjust Valve Clearance			–						■ *			7-97
14.	Measure Engine Compression Pressure			–						■ *			7-97
15.	Check Starter and Alternator			–						■ *			7-97
16.	Check and Replace EGR Device			–	*As required								7-97
17.	EGR Cooler Cleaning			–								■ *	7-97
18.	Check Turbo Charger			–								■ *	7-97
19.	Check and Clean Injector			–								■ *	7-98
20.	Check Gas Damper			–	*As required								7-98
21.	Tightening and Retightening Torque of Nuts and Bolts			–		■ ★★		■					7-98

★★: Maintenance required only during first time check.

*NOTE: * Contact your authorized dealer for maintenance. Instruction plate for the recommended grease and lubricants is affixed to the reverse side of the front right cover.*

J. Aftertreatment Device

	Parts	Quantity	Interval (hours)								Page
			8	50	100	250	500	1000	2000	4500	
1.	Check and Clean Aftertreatment Device	–	As required								7-117

K. Urea SCR System

	Parts	Quantity	Interval (hours)								Page
			8	50	100	250	500	1000	2000	4500	
1.	Check DEF/AdBlue®	1									7-120
2.	Replace DEF/AdBlue® Supply Module Main Filter	1									7-124
3.	Replace DEF/AdBlue® Tank Water Supply Inlet Filter	1	*If DEF/AdBlue® overflows when supplying water							*	7-126

*NOTE: * Contact your authorized dealer for maintenance.*

Periodic Replacement of Parts

To ensure safe operation, be sure to conduct periodic inspection of the machine. In addition, the parts listed below, if defective, may pose serious safety/fire hazards.
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 correct replacement.

Periodic Replacement Parts			Replacement Intervals
Engine		Fuel hose (Fuel tank, Filter to Engine)	Every 2 years
		Fuel hose (Engine, Fuel cooler to Fuel tank)	Every 2 years
		DEF/AdBlue® hoses	Every 2 years
		Oil filter hose (Engine to oil filter)	Every 2 years
		Heater hose (Heater to engine)	Every 2 years
Hydraulic System	Base Machine	Pump suction hose	Every 2 years or 4000 hours whichever comes first
		Pump delivery hose	Every 2 years or 4000 hours whichever comes first
		Swing hose	Every 2 years or 4000 hours whichever comes first
		Travel high pressure hose	Every 2 years or 4000 hours whichever comes first
		Tail Hose	Every 2 years or 4000 hours whichever comes first
		Attachment Line Hose	Every 2 years or 4000 hours whichever comes first
		Hydraulic Fan Suction Hose	Every 2 years or 4000 hours whichever comes first
		Hydraulic Fan Delivery Hose	Every 2 years or 4000 hours whichever comes first
	Working Device	Boom cylinder line hose	Every 2 years or 4000 hours whichever comes first
		Arm cylinder line hose	Every 2 years or 4000 hours whichever comes first
		Bucket cylinder line hose	Every 2 years or 4000 hours whichever comes first
Seat Belt			Every 3 years

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

Kind of Oils

Brand Names of 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 40 ˚C (-4 to 104 ˚F)
Recommended Products		Hitachi Genuine Engine Oil 10W-40 DH-2
Alternative Products	Viscosity	10W-40
	Specification	JASO DH-2

IMPORTANT:

- **Hitachi Genuine Engine Oils are specially designed and tested to provide optimum performance for machine, hence we recommend to use Hitachi Genuine Engine Oils.**
- **If you do not use Hitachi Genuine Engine Oil, use engine oil conforming to JASO DH-2. Otherwise, engine and aftertreatment device may suffer damage or performance of engine and aftertreatment device 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.**

Brand Names of Recommended Oil

Application		Swing and Travel Reduction Gear	Pump Transmission
Kind of Oil		Gear Oil	Engine Oil
Air Temp.		–20 to 40 °C (–4 to 104 °F)	–20 to 40 °C (–4 to 104 °F)
Recommended Products		Hitachi Gear Oil GL-4 90	Hitachi Genuine Engine Oil DH-2 10W-40 Hitachi Genuine Engine Oil DH-1 15W-40
Alternative Products	Specification	API GL-4	API CD, JASO DH-1, JASO DH-2

IMPORTANT:

- **Hitachi Genuine Gear Oil and Hitachi Genuine Engine Oil are specially designed and tested to provide optimum performance for the machine, hence we recommend to use Hitachi Genuine Gear Oil and Hitachi Genuine Engine Oil .**
- **If you do not use Hitachi Genuine Gear Oil or Hitachi Genuine Engine 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.**

Brand Names of Recommended Hydraulic Oil

Kind of Lubricant		Hydraulic Oil		
Where to be applied		Hydraulic System		
Environmental Temp.		–20 to 40 °C (–4 to 104 °F)		
Recommended Products		Hitachi Super EX 46HN	Hitachi Genuine Hydraulic Multi	
Alternative Products	Specification			Product Conforming to JCMAS HK VG46W
Change Interval		5000 hours	1500 hours	

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 oil may lead to damage which is excluded from Hitachi Warranty Policy.**

Recommended Oil Viscosity

Where to be Applied	Kind of Oil	Air Temperature (degrees Celsius) -30 -20 -10 0 10 20 30 40	
Engine Oil Pan	Engine Oil		Hitachi Genuine Engine Oil DH-2 10W-40
Pump Transmission	Engine Oil		Hitachi Genuine Engine Oil DH-2 10W-40
			Hitachi Genuine Engine Oil DH-1 15W-40
Swing Reduction Gear Travel Reduction Gear	Gear Oil		Hitachi Gear Oil GL-4 90
Hydraulic System (Hydraulic Oil Tank)	Hydraulic Oil		Hitachi Genuine Hydraulic Oil 5000 Hitachi Genuine Hydraulic Oil Multi
Fuel Tank	Diesel Fuel		EN590 Class A
			EN590 Class B
			EN590 Class C
			EN590 Class D
			EN590 Class E
			EN590 Class F
Grease fitting	Lithium Grease		Hitachi Genuine Grease NLGI EP-2
Radiator	Coolant		Hitachi Genuine Long Life Coolant

List of Consumable Parts

Filter Elements

	Part No.	Quantity
Full-Flow Filter (with O-ring)	YA00033065	1
High Performance Full-Flow Filter	YA00033064	1
Hydraulic Air Breather Element	4437838	1
Pilot Oil Filter (with O-ring)	4630525	1
Engine Oil Filter	4658521	1
Fuel Main Filter Element	YA00033486	1
Fuel Pre-Filter Element	YA00005785	1
Air Cleaner Element (outer)	4459549	1
Air Cleaner Element (inner)	4459548	1
Air Conditioner Circulating Air Filter	YA00001490	1
Air Conditioner Fresh Air Filter	YA00032683	1
DEF/AdBlue® Supply Module Main Filter	YA00047054	1
DEF/AdBlue® Tank Water Supply Inlet Filter	YA60050027	1

Drive Belts

	Part No.	Quantity
Engine Fan Belt	4603925	1
Air Conditioner Compressor Belt	4612331	1

Bucket Parts

		Part No.	Quantity
Tooth	Tooth	4512365	5
	Lock Pin	4512366	5
	Lock Rubber	4501625	5
Side Cutter	Side Cutter (right side)	2021232	1
	Side Cutter (left side)	2021233	1
	Bolt	J932275	12
	Nut	J951022	12
	Spring Washer	A590922	12
O-ring		4089028	4

NOTE: Quantity row on the above table represents number of parts used for one bucket. The parts quantity of O-ring includes connection part of arm and link

Optional Parts

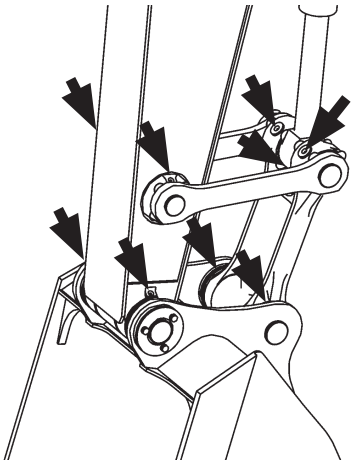
		Part No.	Quantity
One Point Ripper	Tooth	4507888	1
	Pin	4507890	1
	Bushing Rubber	4507891	1
Ripper Bucket	Tooth	4507888	1
	Pin	4507890	1
	Bushing Rubber	4507891	1
	Tooth	4383048	2
	Lock Pin	4383069	2
Rock Bucket	Tooth	4400253	5
	Lock Pin	4383465	5
	Shroud	4435856	1
	Shroud	4435857	1
	Bolt	J932780	6
	Nut	J951027	6
	Washer	4085857	6
Reinforced Hoe Bucket HD Type	Tooth	4512365	5
	Lock Pin	4512366	5
	Lock Rubber	4501625	5

A. Greasing

1 **Front Joint Pins**

--- every 500 hours (first time after 250 hours)

Lubricate all fittings shown in the figure.



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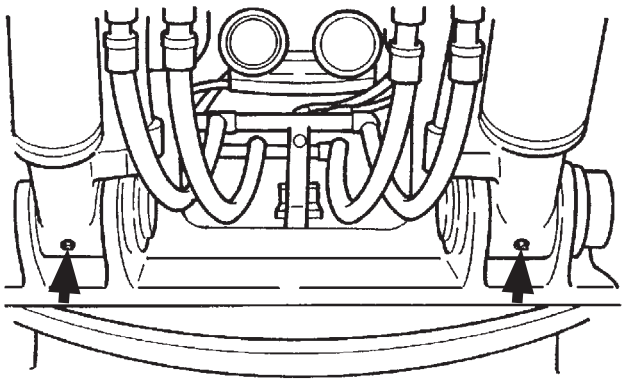
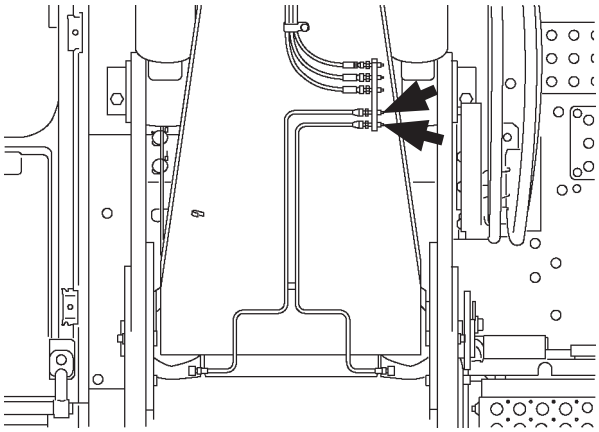
- Boom Cylinder Bottom Side



M157-07-156

- Boom Foot



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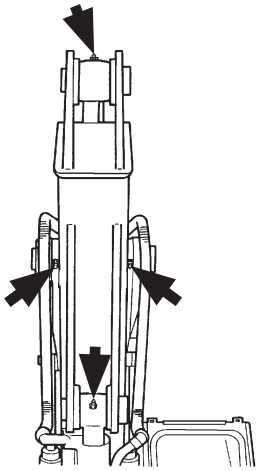
- Boom and Arm Joint Pin, Arm Cylinder Rod Pin and Bucket Cylinder Bottom Pin



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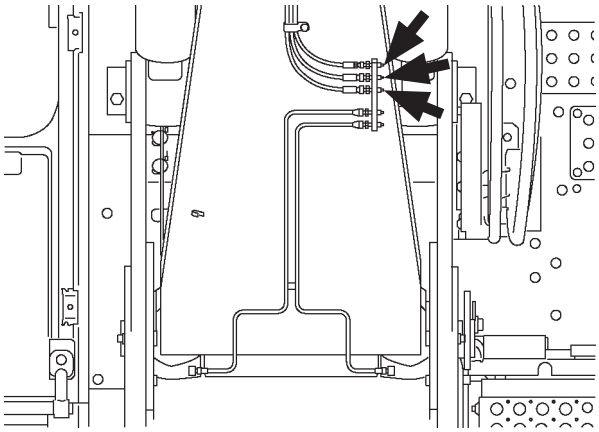
- Boom Cylinder Rod Pins and Arm Cylinder Bottom Pin



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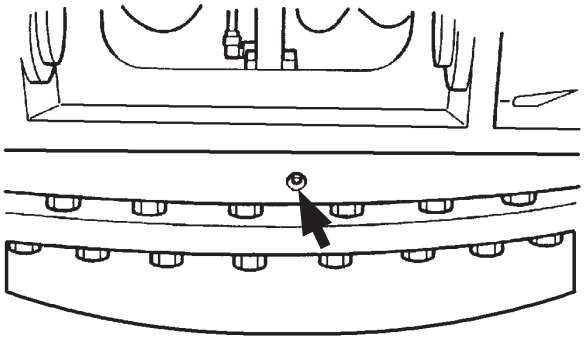
2 **Swing Bearing**

--- every 500 hours

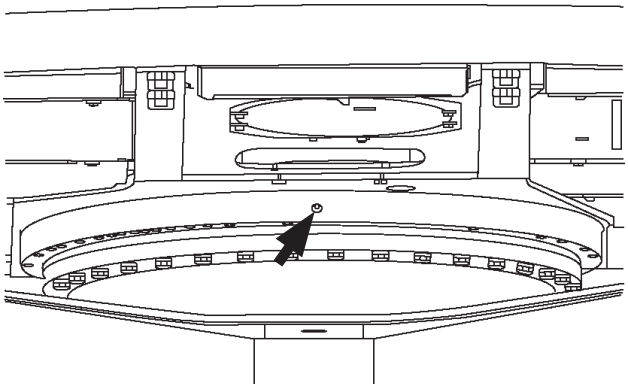


M157-07-159

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

Each time you leave the cab

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



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

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

4. Run the engine at slow idle speed without load for five minutes.
5. Turn the key switch OFF. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.
7. With the upperstructure stationary, apply grease via the 2 grease fittings.
8. Start the engine. Raise the bucket several inches off the ground and rotate the upperstructure 45 ° (1/8 turn).
9. Lower the bucket to the ground.
10. Repeat the procedure 3 times, beginning with step 3.
11. Apply grease to the swing bearing until grease can be seen escaping from the swing bearing seals.

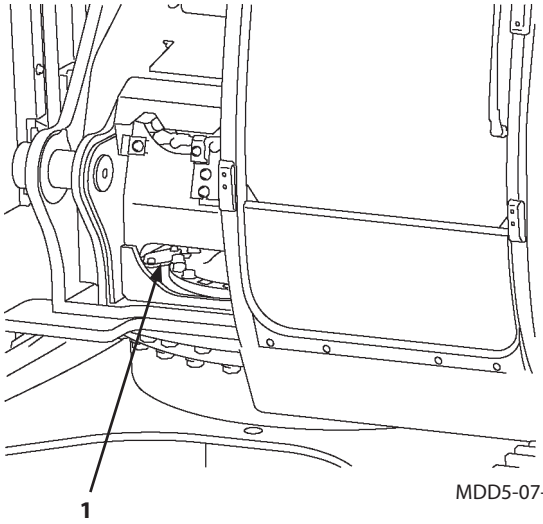
Model	Capacity
ZX345USLC-6N	0.40 L (0.42 US qt)

12. Take care not to supply excessive grease.

3 Swing Internal Gear
--- every 500 hours

CAUTION: Before lubricating the machine, lower the bucket on the ground, stop the engine and pull the pilot control shut-off lever to the LOCK position.

1. Remove cover (1) from upperstructure. Check if the swing internal gear is properly lubricated by grease.



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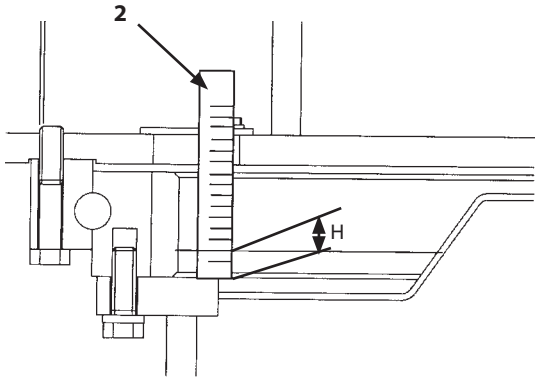
2. Please insert the scale (2) and check that the height (H) of the grease amount of the swing internal gear is higher than the reference value.
   Depending on the model, the height may be different depending on the inserted position. Please change the inserting position when the height is greatly different.

Model	Grease Height (H)
ZX345USLC-6N	10 mm

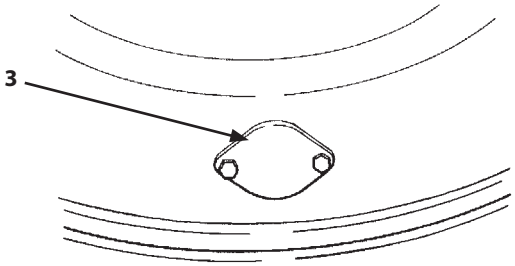


MDC1-07-102

3. If it is insufficient, replenish the grease, pay attention to the O-ring of the cover (1), install it downward, and then start the engine. Please check the height (H) of grease amount again after swinging a few times.

If the grease is contaminated, remove grease by opening cover (3) at the undercarriage side and change with clean grease.

Model	Grease Capacity
ZX345USLC-6N	19 L (5.0 US gal)



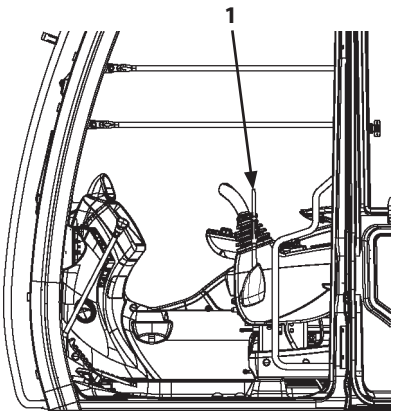
M157-07-161

B. Engine

1 **Check Engine Oil Level**
---daily

1. Confirm that pilot control shut-off lever (1) is in the LOCK position.
2. Confirm that all control levers are placed in neutral.
3. Insert key (2) into the key switch. Turn it to ON position. Press and hold switch (3) with the engine stopped.

   The engine oil level indicator (4) must be displayed in green.



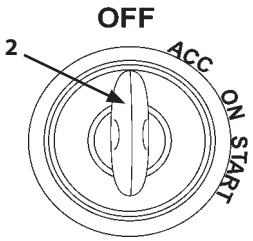
LOCK position

MDAA-01-295

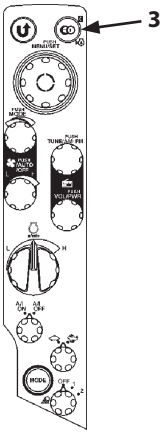
IMPORTANT: Do not rely only on the monitor display for checking the machine conditions; visually check them yourself as required such as oil level.

Always check the machine on a firm, level surface.

NOTE: If the security function is enabled, a password is required.



MDC1-01-502



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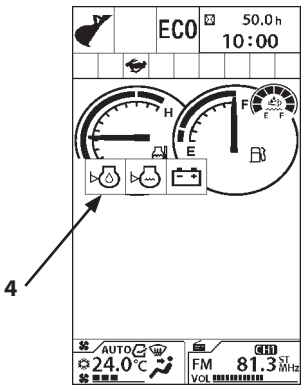


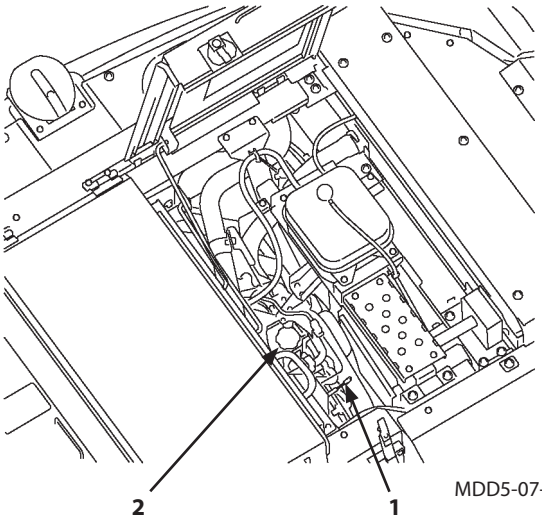
MDC1-01-041

--- Visual Inspection

IMPORTANT: Incorrect engine oil level may cause trouble in the engine (The oil level should be between the upper and lower marks on dipstick (1)).

Even if the engine oil level exceeds the upper limit, maintain oil to the proper level before starting the engine.

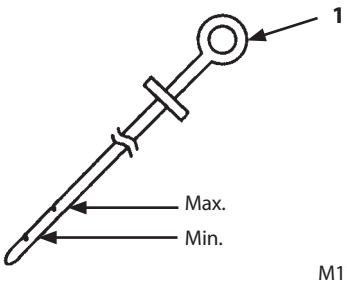
Check oil level before starting the engine.
Open the engine cover and pull out dipstick (1). Wipe dipstick (1) with cloth, re-insert it into the pipe to the end, and then pull it out again.
The oil level should be between the upper and lower marks on dipstick (1).
If oil level is below the lower limit mark, add the recommended engine oil via oil filler (2).
If oil level exceeds the upper limit mark, remove cap (4) of drain valve (3) at the bottom of the engine oil pan, and then open drain valve (3) by turning drainer (5) to drain oil.



MDD5-07-006

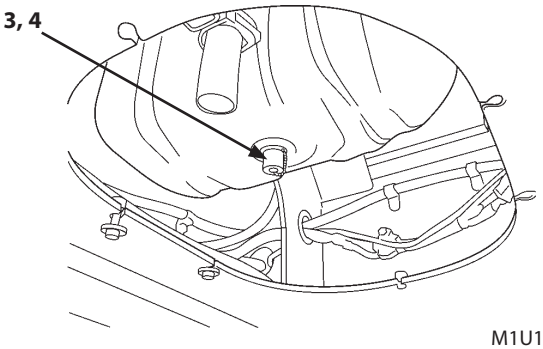
CAUTION: Avoid spillages while changing oil. Spilled fuel and oil, trash, grease, debris, accumulated coal dust, and other flammable materials may cause fires.

After refilling, make sure oil filler cap (2) is securely closed.

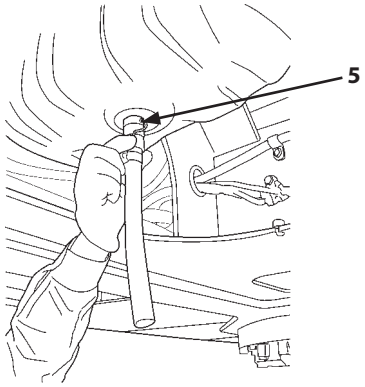


M178-07-011

IMPORTANT: Install drainer (5) to drain valve (3) slowly. Oil may exhaust in large quantity when tightened at once.



M1U1-07-045



M1U1-07-046

2 **Change Engine Oil**
--- every 500 hours

3 **Replace Engine Oil Filter**
--- every 500 hours

CAUTION: Engine oil may be hot just after operation. Take extra care to avoid burns.

After refilling, make sure oil filler cap (2) is securely closed.

1. Run the engine to warm oil.

   DO NOT run the engine until oil is hot.
2. Park the machine on a firm, level surface.
3. Lower the bucket to the ground.
4. Turn the auto-idle switch off.

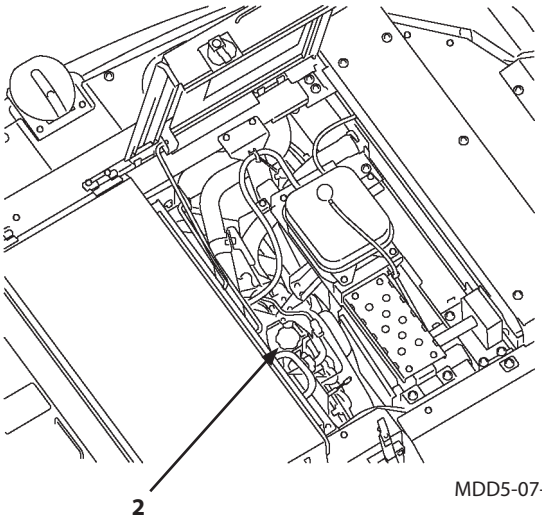
IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.

5. Run the engine at slow idle speed without load for 5 minutes.
6. Turn the key switch OFF. Remove the key from the key switch.
7. Pull the pilot control shut-off lever to the LOCK position.

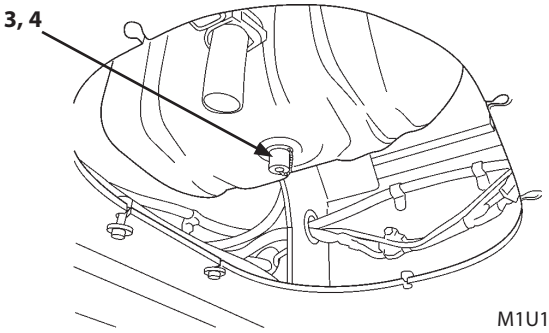
IMPORTANT: Install drainer (5) to drain valve (3) slowly. Oil may exhaust in large quantities when suddenly tightened.

8. Remove oil filler cap (2).
9. Remove cap (4) from oil pan drain valve (3). Install drainer (5) to drain valve (3).
10. Screw drainer (5) into drain valve (3). Drain valve (3) will be opened to drain oil.
11. Then, allow oil to drain through a clean cloth into a container.

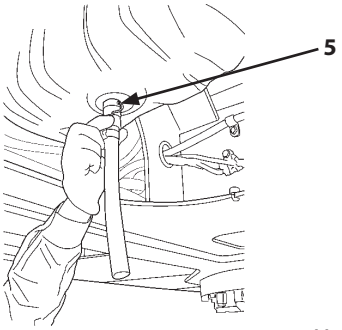
    Container: 50-liter (13 US gal)
12. After all oil has been drained, inspect the cloth for any debris such as small pieces of metal.
13. Remove drainer (5). Install cap (4) to drain valve (3).



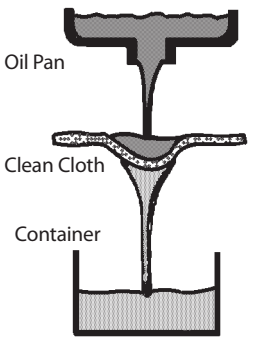
MDD5-07-006



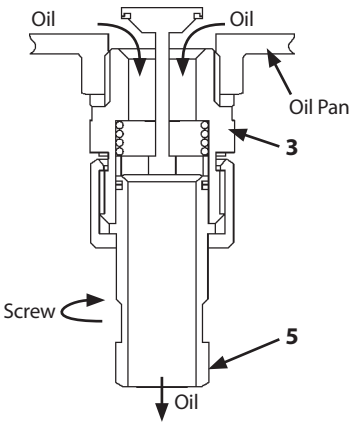
M1U1-07-045



M1U1-07-046

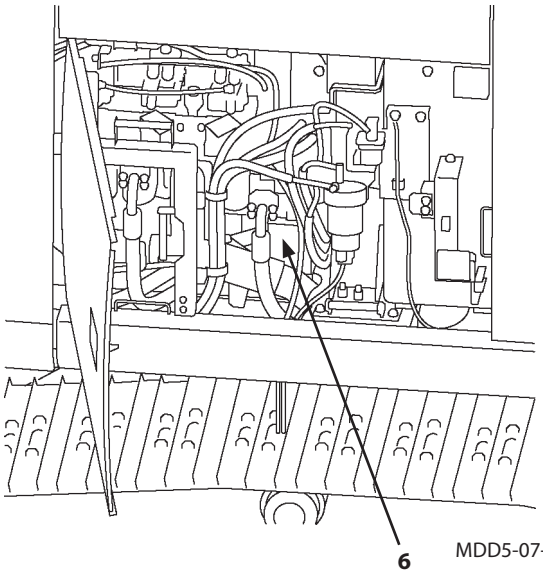


M104-07-010

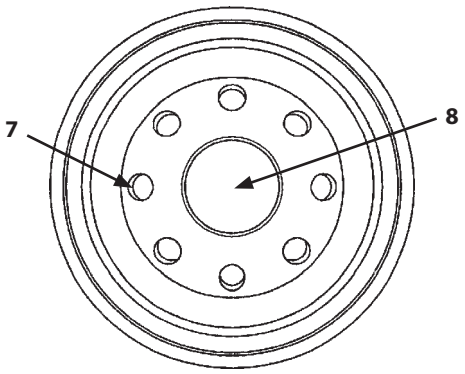


M1U1-07-002

14. Open the right access cover and secure the cover with rod.
15. Remove engine oil filter (6) by turning it counterclockwise with the filter wrench.
16. Clean filter (6) gasket contact area on the engine.
17. Put mew oil in from primary side (7) of new cartridge element (6) so it does not overflow. Take care not to insert it from secondary side (8).
18. Install new filter (6). Turn filter (6) clockwise by hand until the gasket touches the contact area. Be sure not to damage the gasket when installing filter (6).
19. Tighten engine oil filter (6) 3/4 to 1 turn further using the filter wrench. Be careful not to overtighten.
20. Fill the engine with recommended oil. Check that oil level is between the circle marks on the dipstick after 15 minutes.
21. Install the oil filler cap.
22. Start the engine. Run the engine at slow idle for 5 minutes.
23. Check that the engine oil pressure indicator on the monitor panel goes out immediately. If not, stop the engine immediately and find the cause.
24. Stop the engine. Remove the key from the key switch.
25. Check for any leakage at the drain plug.
26. Check oil level on the dipstick and add or drain oil to maintain proper oil level. (The oil level should be between the upper and lower limit marks on the oil level gauge.) (Refer to the page 7-30)



MDD5-07-007



MDCR-07-007

IMPORTANT:

- **When putting new oil in cartridge element (6), take care that no foreing objects get in from secondary side (8).**
- **Do not re-use filter (6).**
- **Incorrect engine oil level may cause trouble in the engine. Even if the engine oil level exceeds the upper limit, control the oil level to the proper quantity before starting the engine.**
- **Do not overtighten the engine oil pan mounting bolts of ZX135US-6N machine. Failure to do so may damage the packing seal.**

4 **Check and Clean Around the Engine**

----- as required

IMPORTANT: Check for flammable materials in the area around the engine and clean that area.

When the machine is operated in dusty areas, refer to the page 9-1 "Maintenance Under Special Environmental Conditions".

C. Transmission

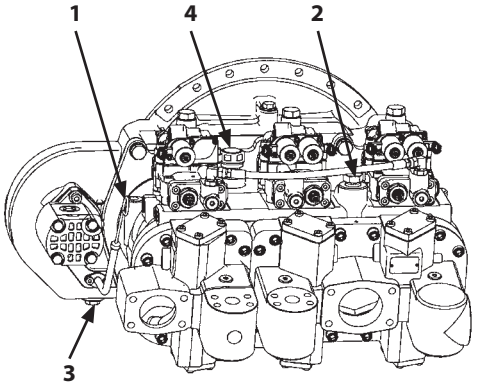
1 Pump Transmission

Check Oil Level --- every 250 hours

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

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

4. Run the engine at slow idle speed without load for 5 minutes.
5. Stop the engine. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.
7. Remove dipstick (1). Oil must be within the specified range.
8. If necessary, remove filler plug (2) and add oil. (See gear oil chart)
9. Recheck oil level.



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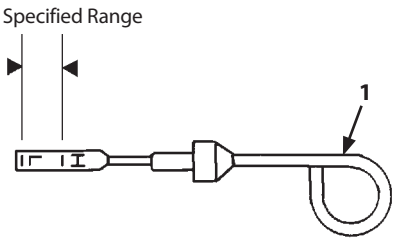


M1G6-07-004

Change Oil --- every 1000 hours

Air Breather Cleaning --- every 1000 hours

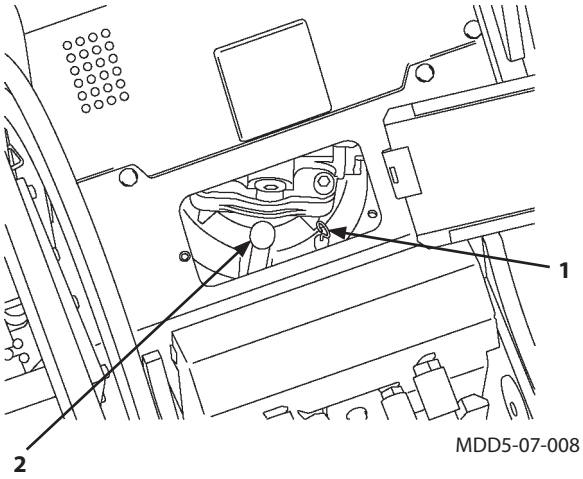
CAUTION: Oil may be hot just after operation. Wait for oil to cool before starting work.

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

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

4. Run the engine at slow idle speed without load for five minutes.
5. Stop the engine. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.
7. Remove filler plug (2).
8. Remove drain plug (3). Allow oil to drain through a clean cloth into a 2-liter (2.1 US qt) container.
9. After all oil has drained, inspect cloth for any debris such as small pieces of metal.
10. Reinstall drain plug (3).
11. Add oil via filler plug (2) until it is within the specified range on dipstick (1).
12. Reinstall filler plug (2).
13. Remove air breather (4) and perform cleaning. After cleaning, install air breather (4).

2 Swing Reduction Gear



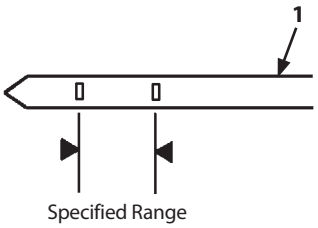
MDD5-07-008

Check Oil Level --- every 500 hours

1. Park the machine on a solid level surface. Lower the bucket to the ground. Stop the engine.
2. Open the swing reduction upper cover. Check level gauge (1).
3. When the oil level is correct, it can be seen between marks on level gauge (1). If necessary, open the swing device upper cover and add oil.

Change Gear Oil --- every 1000 hours

CAUTION: Gear oil may be hot just after operation. Wait for gear oil to cool before starting work.

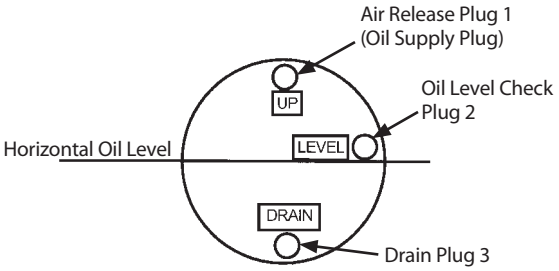


M104-07-017

1. Park the machine on a solid level surface. Lower the bucket to the ground. Stop the engine.
2. Remove the drain plug mounted on the end of drain pipe to drain oil.
3. Reinstall the drain plug. Open the swing device upper cover. Remove oil filler cap (2) and add oil.
4. Check oil level with level gauge (1). The oil level should be between the upper and lower marks on level gauge (1). Refill as necessary.

3 Travel Reduction Gear

CAUTION: Keep body and face away from air release plug (1). Gear oil may be hot just after operation. Wait for gear oil to cool and then gradually loosen air release plug (1) to release pressure.

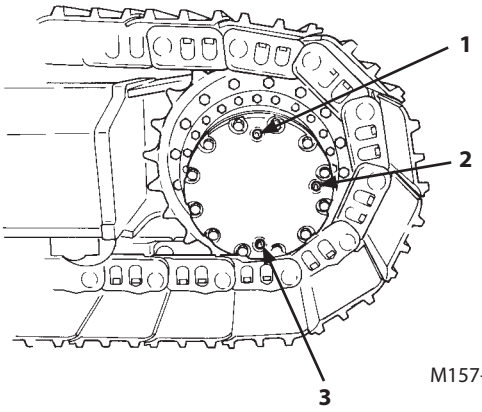


MDAA-07-047

Check Oil Level --- every 500 hours

1. Park the machine on a firm, level surface.
2. Rotate the travel motor until the imaginary line through plug (1) and plug (3) are vertical.
3. Lower the bucket to the ground.
4. Turn the auto-idle switch off.

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



M157-07-170

5. Run the engine at slow idle speed without load for 5 minutes.
6. Stop the engine. Remove the key from the key switch.
7. Pull the pilot control shut-off lever to the LOCK position.
8. After gear oil has cooled, slowly loosen air release plug (1) to release pressure.
9. Remove air release plug (1) and oil level check plug (2). Oil must be up to the bottom of hole.
10. If necessary, add oil until oil flows out of oil level check plug (2) hole. (See gear oil chart)
11. Wrap the plug threads with sealing-type tape. Install plugs (1) and (2).

    Tighten plugs (1) and (2) to 70 N·m (7 kgf·m, 52 lbf·ft).
12. Check the gear oil level in the other travel reduction gear.

Change Gear Oil --- every 2000 hours

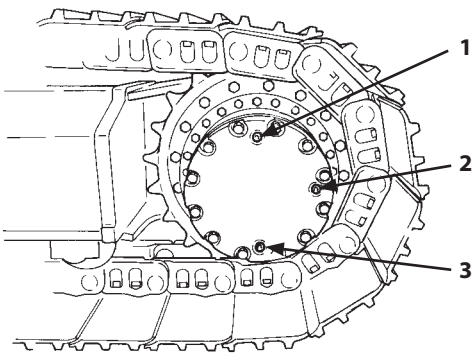
1. Park the machine on a firm, level surface.
2. Rotate the travel motor until the imaginary line through plug (1) and plug (3) are vertical.
3. Lower the bucket to the ground.
4. Turn the auto-idle switch off.

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

5. Run the engine at slow idle speed without load for 5 minutes.
6. Stop the engine. Remove the key from the key switch.
7. Pull the pilot control shut-off lever to the LOCK position.
8. After gear oil has cooled, slowly loosen air release plug (1) to release pressure, and temporarily retighten plug (1).
9. Remove drain plug (3) and plug (1), in that order, to drain oil.
10. Clean drain plug (3). Wrap the threads of drain plug (3) with sealing-type tape. Install plug (3). Tighten plug (3).

    Tightening Torque: 70 N·m (7 kgf·m, 52 lbf·ft)
11. Remove oil level check plug (2).
12. Add oil until oil flows out of oil level check plug (2) hole. (See gear oil chart)
13. Clean plugs (1) and (2). Wrap the threads of oil level check plug (2) and air release plug (1) with sealing-type tape. Reinstall the plugs (1) and (2). Tighten the plugs (1) and (2).

    Tightening Torque: 70 N·m (7 kgf·m, 52 lbf·ft)
14. Repeat steps 8. to 13. for the other travel reduction gear.



M157-07-170

D. Hydraulic System

Inspection and Maintenance of Hydraulic Equipment

IMPORTANT: Never adjust parts of engine fuel system or hydraulic equipment.

CAUTION: When checking and/or servicing the hydraulic components, pay special attention to the following points.

1. Be sure that the machine is parked on a level, firm surface before servicing hydraulic equipment.
2. Lower the bucket to the ground and stop the engine.
3. Begin servicing hydraulic components only after components, hydraulic oil and lubricants are completely cooled, and after releasing residual pressure.

3.1 Before checking and/or servicing the hydraulic system, be sure to release the residual pressure from the cylinder circuits of the boom, arm and the bucket, swing piping and pilot piping. An accumulator can be installed on some models of this machine as an option to be capable of moving the front attachment for specified time (around 10 seconds) after stopping the engine.

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

3.3 Immediately after operation, all hydraulic components and hydraulic oil or lubricants are hot and highly pressurized. 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.

3.4 Even after air pressure in the hydraulic oil tank is released, when the machine is parking on a slope, the oil pressure in the travel motor and the swing motor circuits are maintained at high pressure as the reaction force of the machine's own weight 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.**
- **The new machine is filled with Super EX 46HN hydraulic oil (change interval: every 5000 hours). When adding or changing the hydraulic oil, continue to use Super EX 46HN.**
- **Never run the engine without oil in the hydraulic oil tank.**

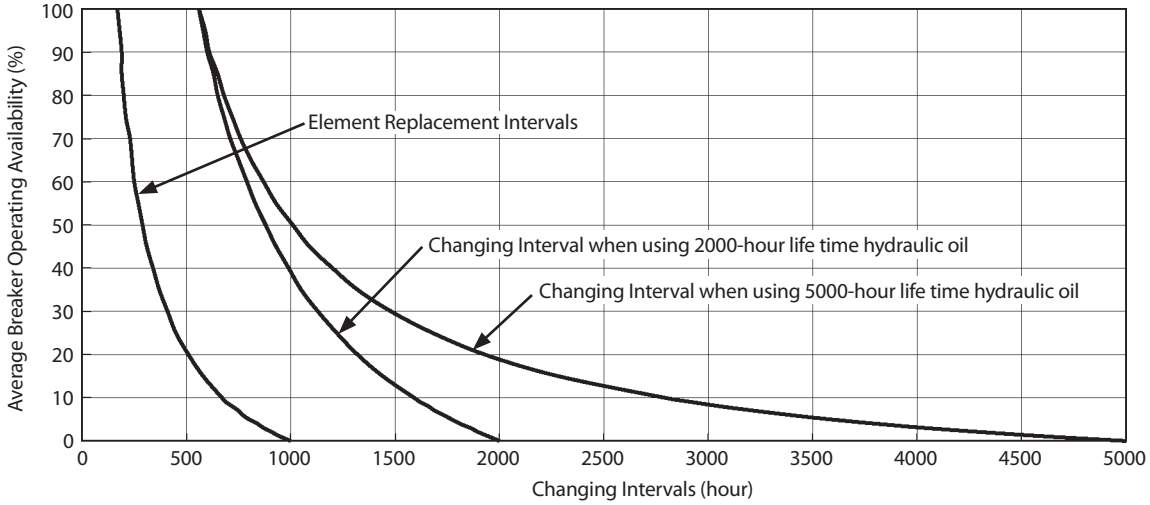
Change Hydraulic Oil and Replace Full-Flow Filter Element

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 by using the breaker hour meter. (Refer to the Breaker Operation in the OPERATOR'S STATION chapter.)

Changing intervals for the high performance element (micro-glass)

Breaker Operating Availability	0 %	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %	100 %
Full-Flow Filter	1000	670	510	410	340	290	250	230	200	190	170
Hydraulic oil: 2000 hours life time	2000	1590	1320	1130	990	880	790	710	650	600	560
Hydraulic oil: 5000 hours life time	5000	2790	1930	1480	1200	1010	870	760	680	610	560

When Using High Performance Full-Flow Filter Element

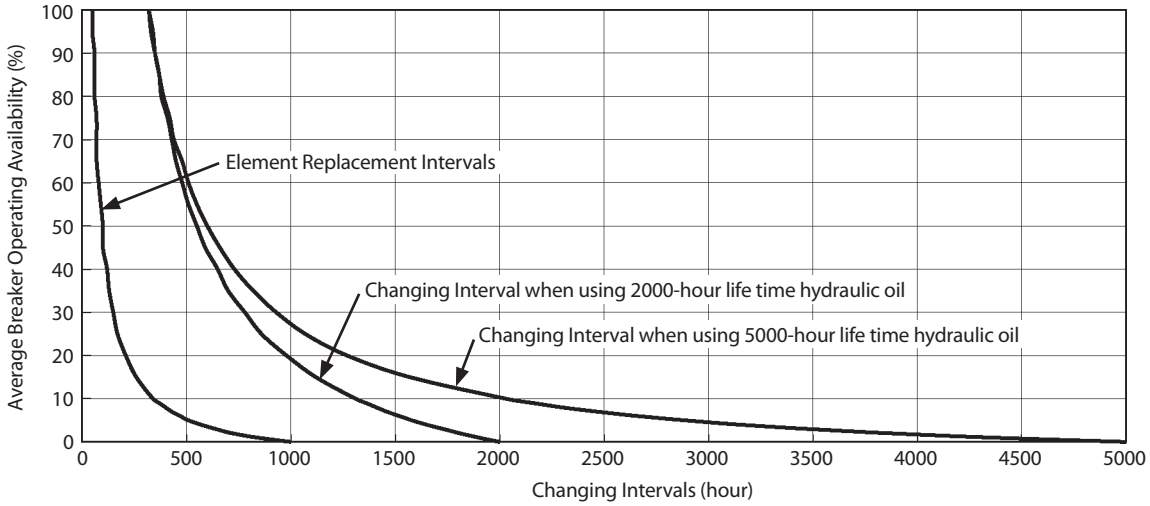


MDAA-07-050

Changing intervals for the standard full-flow filter (paper filter)

Breaker Operating Availability	0 %	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %	100 %
Full-Flow Filter	1000	340	210	150	120	100	80	70	60	60	50
Hydraulic oil: 2000 hours life time	2000	1310	980	780	650	550	480	430	380	350	320
Hydraulic oil: 5000 hours life time	5000	2030	1270	930	730	600	510	440	390	350	320

When Using Standard Filter Element



MDAA-07-051

NOTE: Hydraulic oil restriction indicator is optional.

If a filter-paper element is used, this indicator does not operate.

1 Check Hydraulic Oil Level --- daily

M104-07-021

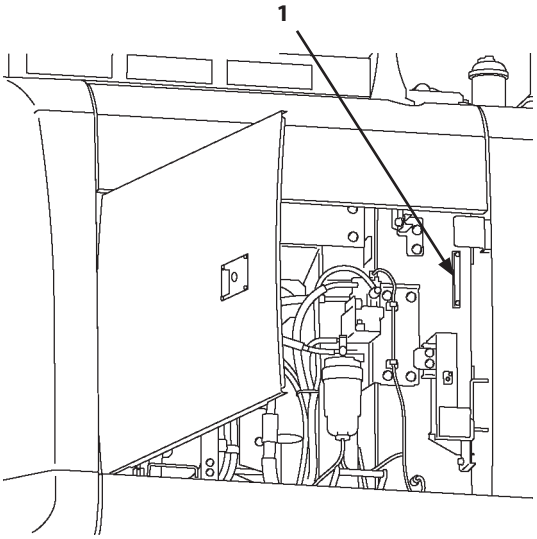
CAUTION: The hydraulic oil tank is pressurized. Push the pressure release button on the tank cap to release pressure, and carefully remove the cap.

IMPORTANT: Never run the engine without oil in hydraulic oil tank.

1. Park the machine on a firm, level surface.
2. Position the machine with the arm cylinder fully retracted and the bucket cylinder fully extended.
3. Lower the bucket to the ground.
4. Turn the auto-idle switch off.

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

5. Run the engine at slow idle speed without load for 5 minutes.
6. Turn the key switch OFF. Remove the key from the key switch.
7. Pull the pilot control shut-off lever to the LOCK position.
8. Open the access door in front of the main pump. Check oil level with level gauge (1) on hydraulic oil tank. Oil must be between marks on gauge (1). If necessary, add oil.



MDD5-07-009

To add oil:

9. Push the pressure release button on the air breather to release pressure. Remove the cover.
10. Add oil. Recheck oil level with level gauge (1).
11. Install the cover. Make sure the filter and rod assembly is in correct position.

2 Change Hydraulic Oil

--- every 2000 hours or 5000 hours

⚠ CAUTION:

- **Hydraulic oil may be hot just after operation. Wait for oil to cool before starting work.**
- **The hydraulic oil tank is pressurized. Push pressure release button (1) on the air breather before removing the air breather.**

IMPORTANT: Hydraulic oil changing intervals differ according to kind of hydraulic oils used. (See Recommended Oil Chart in this group)

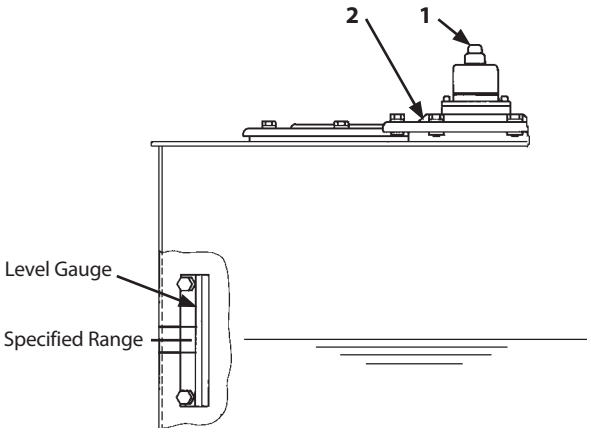
1. Park the machine on a firm, level surface with the upperstructure rotated 90 ° for easier access.
2. Position the machine with the arm cylinder fully retracted and the bucket cylinder fully extended.
3. Lower the bucket to the ground.
4. Turn the auto-idle switch off.

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

5. Run the engine at slow idle speed without load for 5 minutes.
6. Stop the engine. Remove the key from the key switch.
7. Pull the pilot control shut-off lever to the LOCK position.
8. Clean the top of the hydraulic oil tank to keep dirt out of the hydraulic system.
9. Push pressure release button (1) on the air breather.
10. Remove cover (2).
11. Remove oil using a suction pump. The hydraulic oil tank capacity, up to specified oil level, is approximately the value shown in column A below.

Model	A
ZX135US-6N	105 L (27.7 US gal)
ZX245USLC-6N	185 L (48.9 US gal)

M104-07-117



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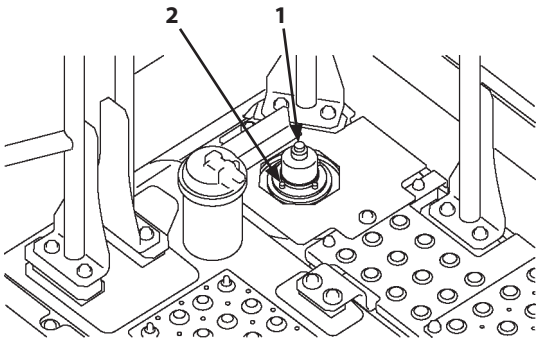

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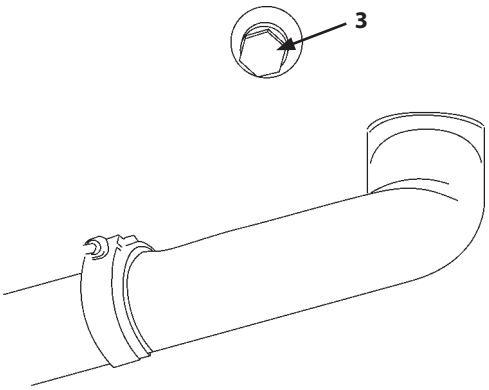
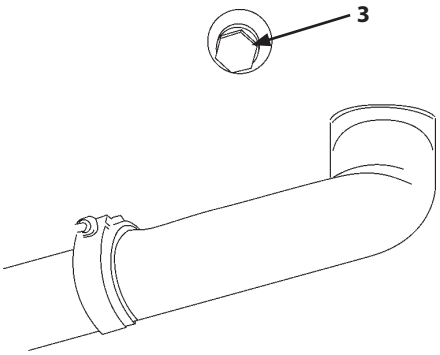


M1U1-07-047

12. Remove drain plug (3). Allow oil to drain.
13. Clean, install and tighten drain plug (3).
14. Add oil until it is between the marks on the oil level gauge.
15. Install cover (2). Tighten the bolts to 50 N·m (5 kgf·m, 36.9 lbf·ft).
16. Be sure to bleed air from the system following the procedures shown on the next page.



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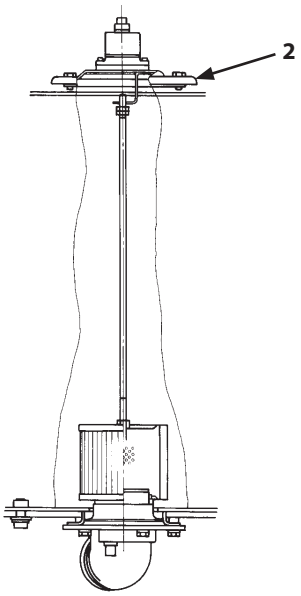
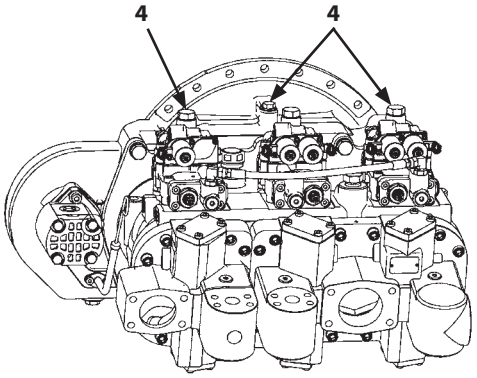


M157-07-062

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.



MDD5-07-051

- Bleeding Air from Hydraulic Pump
  1. Remove air bleed plug (4) on each pump. Fill the pump with oil through air bleed plug (4) hole.
  2. After hydraulic oil is filled in the pump, provisionally tighten plug (4). Start to run the engine at slow idle speed.
  3. Slightly loosen one of plugs (4). Allow air to bleed from the pump through the clearance until hydraulic oil permeates around plug (4).
  4. After bleeding air, tighten plug (4) to specification.

     Tightening Torque: 95 N·m (9.5 kgf·m, 70.1 lbf·ft)
  5. Repeat Steps 3 and 4 for the remainder of plugs (4).

- Bleeding Air from Hydraulic Circuit
  1. After filling hydraulic oil, start the engine. While moving all cylinders and the swing motor evenly, lightly operate the machine for 10 to 15 minutes.

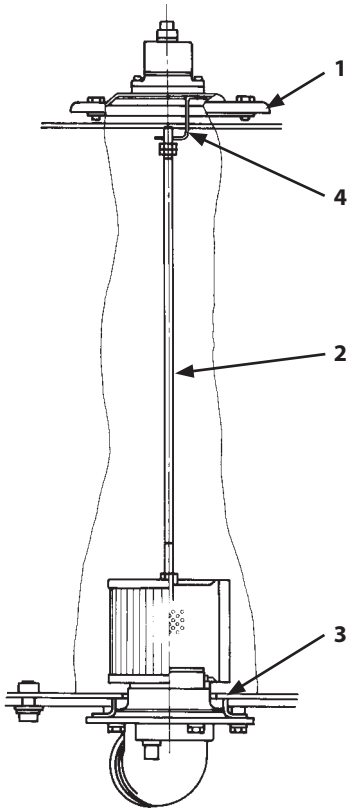
     As the air bleeding device is provided in the pilot circuit, air will be released by conducting the above operation for 5 minutes.
  2. Lower the bucket to the ground to return to the position to check hydraulic oil level.
  3. Stop the engine. Check the oil level. Add oil as needed.

3 Suction Filter Cleaning
---each time when hydraulic oil is changed

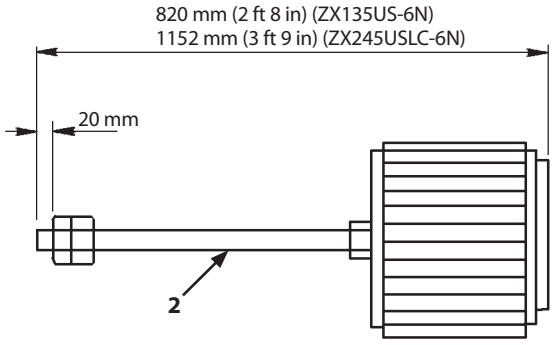
The suction filter is located on the bottom of the hydraulic oil tank.
Clean the suction filter when changing hydraulic oil.

1. After removing hydraulic oil from the hydraulic oil tank, remove cover (1) and rod assembly (2).
2. Clean the inside of the hydraulic oil tank and the suction filter.
3. Before installing the suction filter, check the dimension of rod assembly (2) shown in figure right. Securely insert rod assembly (2) into pipe (3).
4. Before securing cover (1) with bolts, ensure the top edge of the rod assembly (2) is completely inserted into the hole of support (4).
5. Bleed air from the hydraulic system.

   (Refer to the descriptions for " 2 Air bleeding procedures")



M157-07-062



Rod Assembly

M107-07-070

4 Replace Full-Flow Filter

--- every 1000 hours

M1CC-07-002

CAUTION: Hydraulic oil becomes hot and pressurized 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.

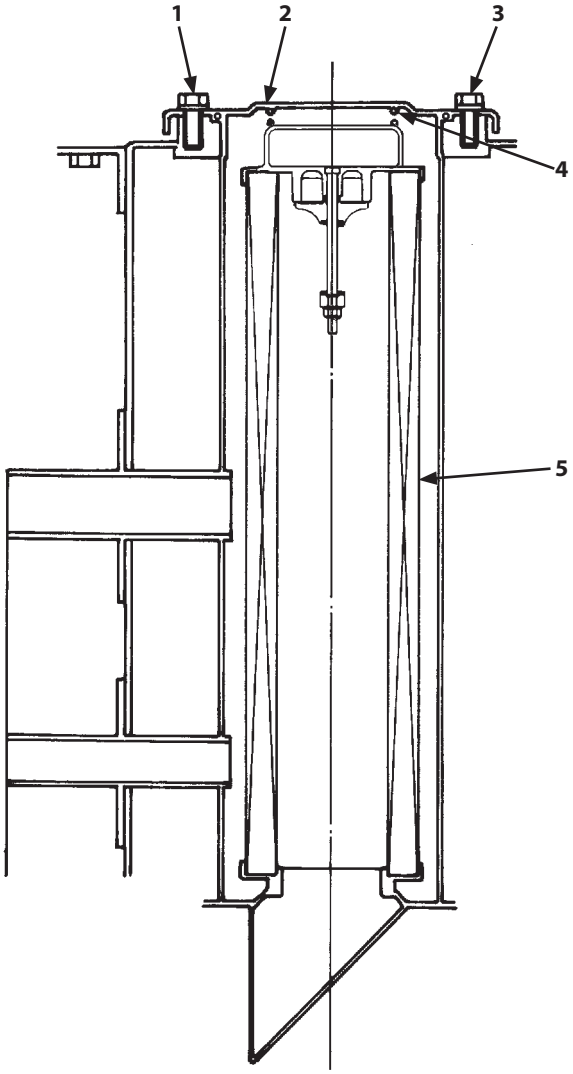
Replace

1. Park the machine on solid and level ground with the bucket cylinder fully extended and the arm cylinder fully retracted. Lower the bucket on the ground as shown to the right. Stop the engine.
2. Before replacing element (5), be sure to bleed air pressure from the hydraulic oil tank by pushing release button on the hydraulic oil tank.
3. Loosen bolts (1) (6 used) to remove cover (2) and O-ring (3). When removing cover (2), slowly remove cover (2) while pressing cover (2) downward so that spring (4) does not fly off.
4. Remove spring (4), and element (5).
5. Take extra care not to allow water or dust to enter the filter case.
6. Replace element (5) and O-ring (3) with new one, and install them to the hydraulic oil tank with spring (4). Be careful not to damage element (5) and O-ring (3).

   Broken element (5) is unusable.
7. Install cover (2) with bolts (1) (6 used).

   Tightening Torque: 50 N·m (5 kgf·m)
8. Bleed air from the pump after replacing element (5). (Refer to "Bleed Air from the Hydraulic System".)

   If the machine is operated with air mixed in the hydraulic circuit, damage to the pump may result.



M178-07-069

IMPORTANT: Replace element (5) at the regular interval to keep hydraulic oil clean and to extend the service life of the hydraulic components.

5 **Replace Pilot Oil Filter**
--- every 1000 hours

M104-07-021

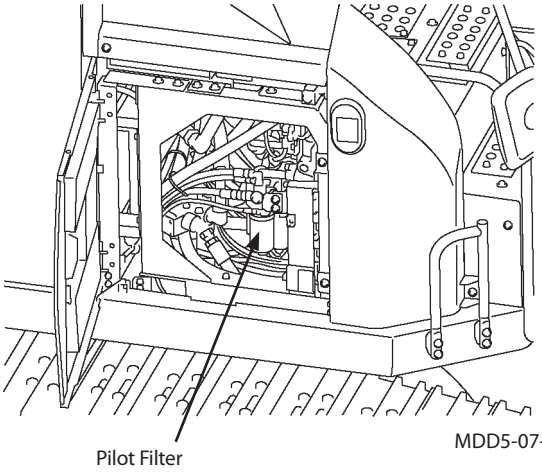
CAUTION: The hydraulic oil tank is pressurized. Push the pressure release button on the air breather before replacing pilot oil filter.

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

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

4. Run the engine at slow idle speed without load for 5 minutes.
5. Stop the engine. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.
7. Remove pilot oil filter (2) by turning it counterclockwise with the filter wrench.
8. Clean the filter O-ring contact area on filter head (1).
9. Apply a thin film of clean oil to the gasket of new filter (2).
10. Install new filter (2). Turn filter (2) clockwise by hand until the O-ring touches the contact area. Be sure not to damage the O-ring when installing filter (2).

IMPORTANT: Do not re-use pilot oil filter (2).



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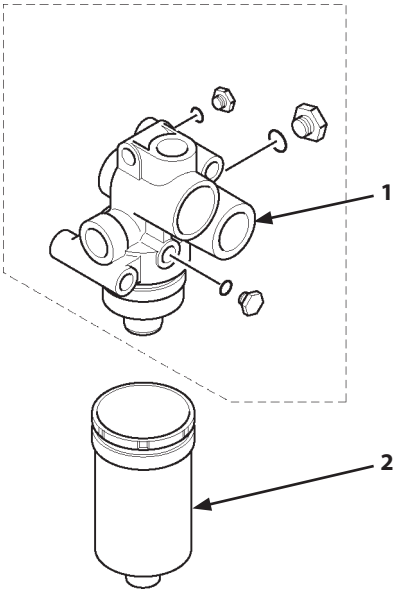


M1U1-07-050

6 Replace Air Breather Element

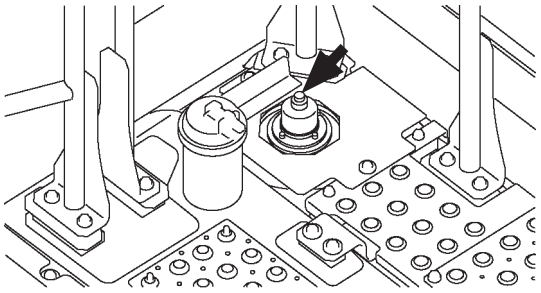
--- every 5000 hours

M104-07-021

CAUTION: Hydraulic oil becomes hot and pressurized 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.

Procedures:

1. Park the machine on solid and level ground with the bucket cylinder fully extended and the arm cylinder fully retracted. Lower the bucket on the ground as shown to the right. Stop the engine.
2. Before replacing element (3), be sure to bleed air pressure from the hydraulic oil tank by pushing release button on the hydraulic oil tank.
3. Turn cover (2) clockwise approx. 1/4 turn. Remove cap (1) by turning it counterclockwise.
4. Turn cover (2) counterclockwise and remove it. Remove element (3).
5. Install new element (3). Tighten to install cover (2) until cover (2) comes in contact with element (3). Then, further tighten cover (2) 1/4 turn.
6. Securely tighten cap (1) clockwise by hand. While holding cap (1) by hand so that cap (1) 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 stay between cover (2) and body (4) (air breathing port).
8. Replace element (3) at the regular interval to keep hydraulic oil clean and to extend the service life of the hydraulic components.



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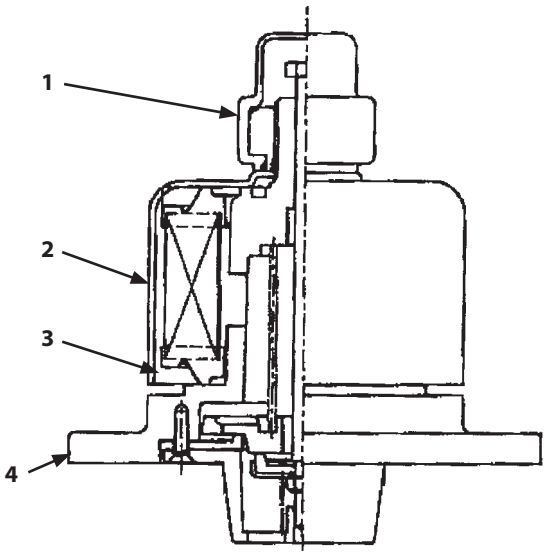


M1G6-07-001

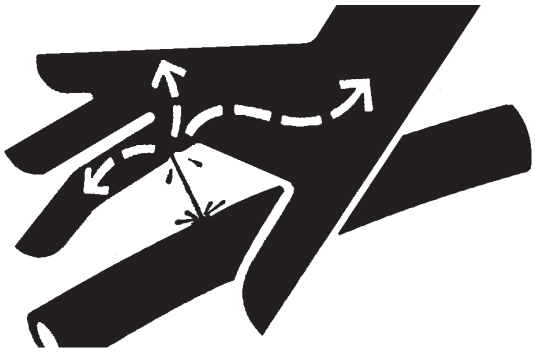
7 Check Hoses and Lines

---daily

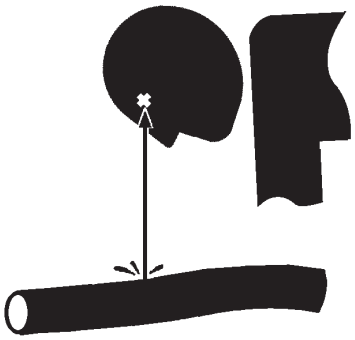
--- every 250 hours

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 an accident occurs, see a doctor familiar with this type of injury immediately.**
- **Tighten, repair or replace any missing, loose or damaged clamps, hoses and lines.**
- **Do not bend or strike high-pressure lines.**
- **Never install bent or damaged hoses or lines.**



SA-031



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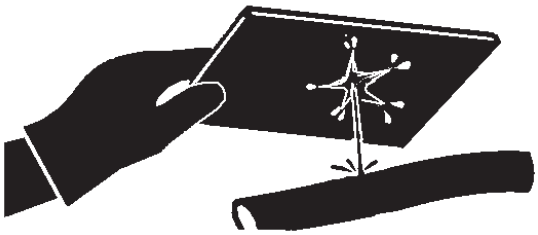
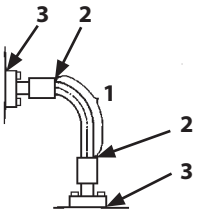


SA-044

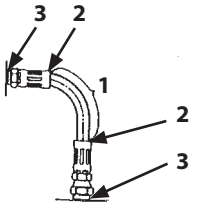
According to the check points shown below, check hoses and lines for oil leaks and damage.
If any abnormality is found, replace or retighten as instructed in the table.

Hose

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

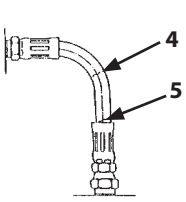


M137-07-008

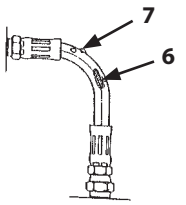


M115-07-145

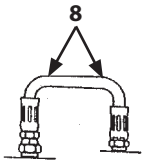
Interval (hours)	Check Points	Abnormalities	Remedies
Every 250 hours	Hose covers	Damage or leak (4)	Replace
	Hose ends	Damage or leak (5)	Replace
	Hose covers	Exposed reinforcement (6)	Replace
	Hose covers	Crack or blister (7)	Replace
	Hose	Bend (8), Collapse (9)	Replace
	Hose ends and Fittings	Deformation or corrosion (10)	Replace



M115-07-146



M115-07-147



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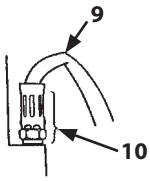
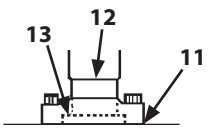


M115-07-149

Lines

Interval (hours)	Check Points	Abnormalities	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 or deformation Loose bolts	Replace or retighten



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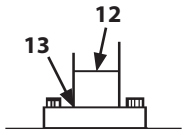

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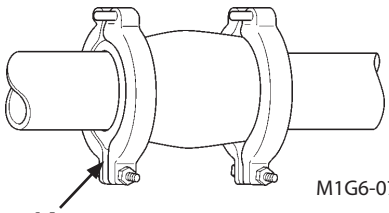
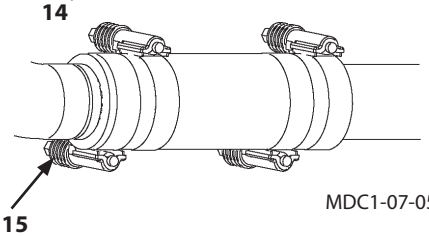


M1G6-07-008

Hose and Lines

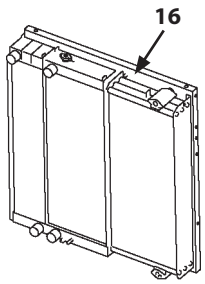
Interval (hours)	Check Points	Abnormalities	Remedies
Daily Check	Flexible master coupling	Leak (14)	Replace or retighten
Every 250 hours	Constant torque clamp	Leak (15)	Replace or retighten



MDC1-07-050

Oil Cooler

Interval (hours)	Check Points	Abnormalities	Remedies
Every 250 hours	Oil Cooler	Leak (16)	Replace

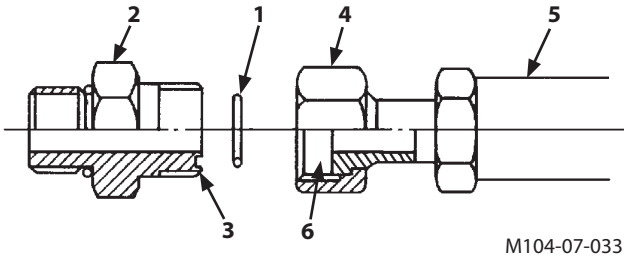


MDD5-07-012

Service Recommendations for 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

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).

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

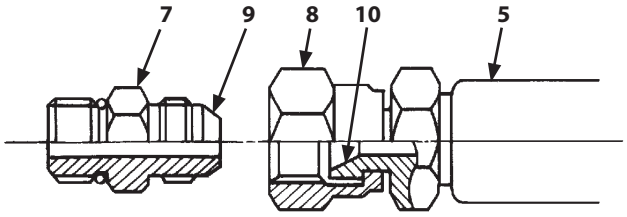
Tightening Torque:
Tighten fittings to the torque values shown below.

±10%

Wrench size (mm)		27	32	36	41, 46
Tightening Torque	N·m	95	140	180	210
	(kgf·m)	(9.5)	(14)	(18)	(21)
	(lbf·ft)	(70.1)	(103.3)	(132.8)	(154.9)

- Metal Face Seal Fittings
  Tight contact between metal flares on adaptor (7) and metal connector (8) of hose (5) prevents pressure oil leakage. This type of fitting is used on smaller diameter joints.

  Precautions for Use
  Connect or disconnect fittings with care not to damage seat surfaces (9 and 10).



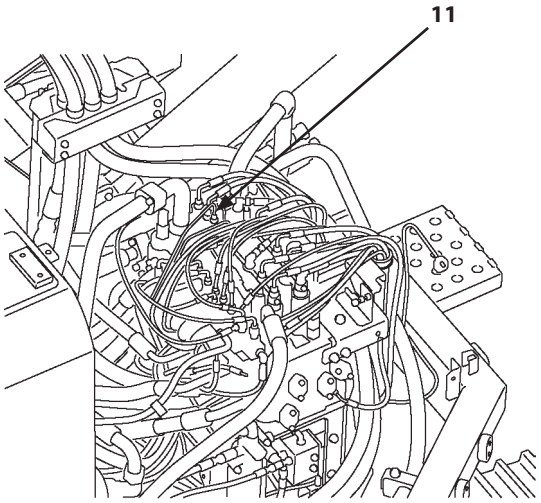
M202-07-051

  Tightening Torque:
  Tighten fittings to the torque values shown below.

Wrench size (mm)		17	19	22	27
Torque	N·m	25	30	40	80
	(kgf·m)	(2.5)	(3)	(4)	(8)
	(lbf·ft)	(18.4)	(22.1)	(29.5)	(59.0)

- Bent Tube
  Tighten bent tube (11) mounted on the control valve to the torque values shown below.

Wrench size (mm)		17, 19
Tightening torque	N·m	35
	(kgf·m)	(3.5)
	(lbf·ft)	(25.8)



MDD5-07-013

E. Fuel System

CAUTION: Beware of fire. Fuel is flammable. Keep fuel away from fire hazards.

Recommended Fuel

Use only super high quality or high quality DIESEL FUEL (JIS K-2204) (ASTM D-975) (EN-590). Kerosene must NOT be used.
Using bad quality fuel, drainage agent, fuel additives, gasoline, kerosene or alcohol refueled or mixed with specified fuel may deteriorate performance of fuel filters and cause sliding problem at lubricated contacts in the injector. It also affects the engine parts, leading to malfunction. Using fuel other than ultra low-sulfur or low-sulfur diesel fuel has adverse effects on the engine and the aftertreatment device, which may result in malfunction.

Refueling

1. Park the machine on a level surface. Lower the bucket to the ground. Check the fuel level with fuel gauge (1).

   If the fuel level is low, stop the engine. Refuel by removing cap (2) on the fuel tank.

2. Remove cap (2) of filler port.

   [Cap (2) unlock procedures]

   - Release the key lock.
   - Pull up handle (3) and turn handle (3) counterclockwise for releasing cap (2) lock.
   - Remove cap (2).

3. To avoid condensation, fill the tank at the end of each day's operation. Tank capacity is as follows.

Model	Tank Capacity
ZX345USLC-6N	380 L (100 US gal)

   Do not fill the tank more than specified. Stop filling when a yellow mark on fuel level gauge (4) becomes visible.

   Position the oil filler gun so that the gun will not obstruct the floating movement of level gauge (4).

4. Just after fueling, install and lock filler cap (2) to prevent vandalism and loss.

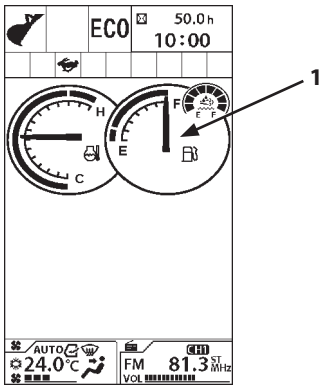
5. Install cap (2) of filler port.

   [Cap (2) lock procedures]

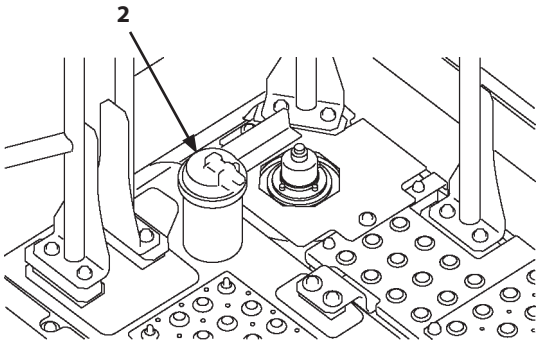
   - Install cap (2).
   - Turn handle (3) clockwise until cap (2) is locked, and push down handle (3).
   - Lock the key.

IMPORTANT:

- **Take care not to allow dirt and/or water to enter the fuel tank.**
- **Wipe off 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.**



MDC1-01-001



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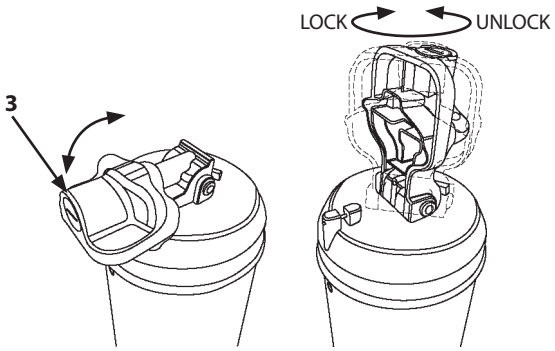
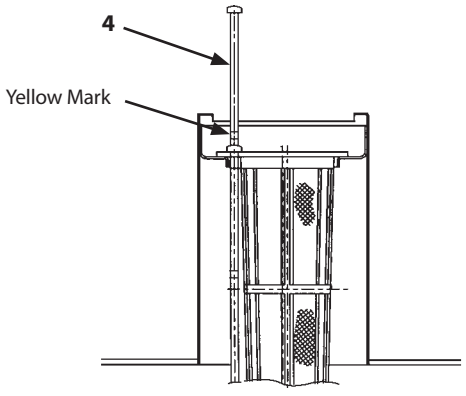


MLBA-07-094 MLBA-07-093



M157-07-060

1 **Drain Fuel Tank Sump**

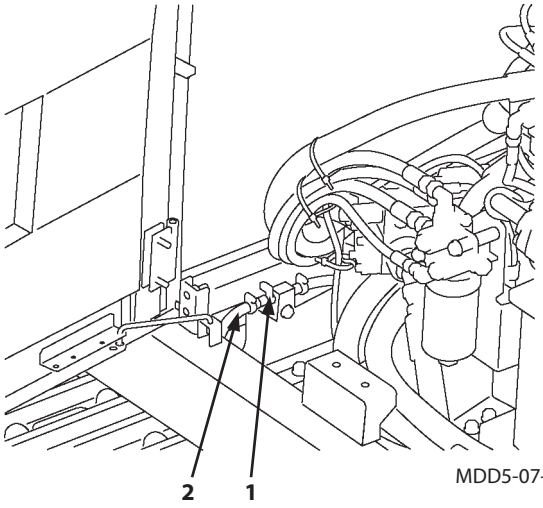
--- daily

1. Park the machine on a level surface with the upperstructure rotated 90 ° for easier access.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

M104-07-117

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

4. Run the engine at slow idle speed without load for 5 minutes.
5. Turn the key switch OFF. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.
7. Place 0.5 liters (0.5 US qt) or larger capacity container under drain hose (2) to collect the drained water.
8. Open drain valve (1) to drain water and/or sediment through drain hose (2).
9. After draining water, securely tighten drain valve (1).

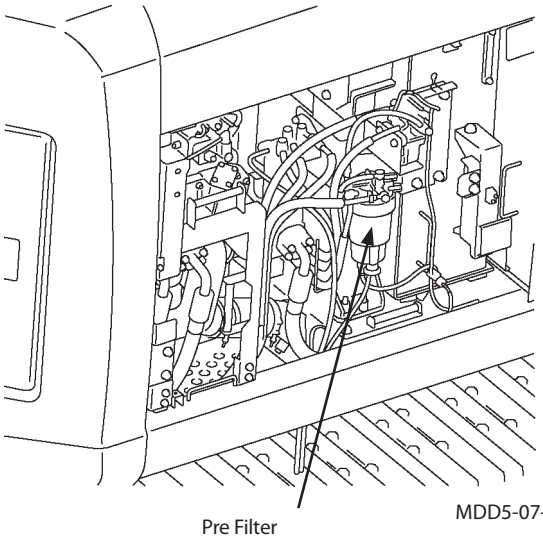


MDD5-07-014

2 Drain Fuel Pre-Filter --- daily

IMPORTANT: Drain fuel pre-filter daily before starting operation. The engine may be damaged if you do not drain fuel pre-filter daily.

The fuel pre-filter has a water separator function. There is a float (8) inside the case which buoys when water accumulates. Check float (8) position daily. Be sure to drain the water accumulated in the pre-filter until float (8) goes to the bottom of pre-filter case.



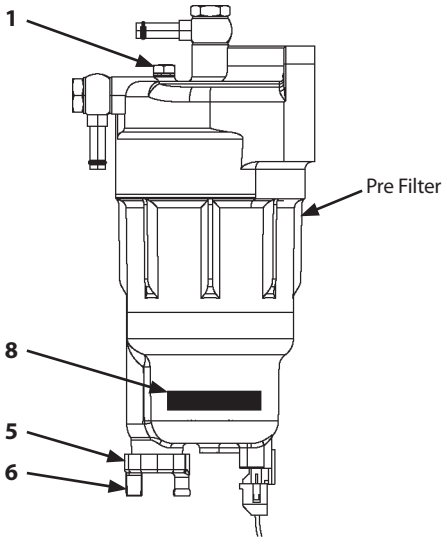
MDD5-07-015

Drain Procedures

1. Place 0.5 liters (0.5 US qt) or larger capacity container under drain hose (6).
2. Rotate drain plug (5) on the bottom of the pre-filter case counterclockwise. Drain the water accumulated in the pre-filter until float (8) goes to the bottom of pre-filter case. If it is difficult to drain, loosen plug (1) on the top of the pre-filter.
3. After draining water, securely tighten drain plug (5) and plug (1).
4. Start the engine. Check drain plug (5) and plug (1) for fuel leaks.

IMPORTANT: After draining water mixed in fuel, bleed air from the fuel supply system.

Wrench size: 14 mm



MDC1-07-092

Bleed Air from the Fuel System

Air in the fuel system may make the engine hard to start or make it run irregularly.
After draining water and sediment from the fuel filter, replacing the fuel filter, cleaning the fuel solenoid pump strainer or running the fuel tank dry, be sure to bleed the air from the fuel system.

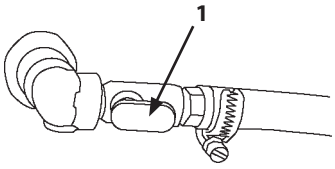
Main Points to Bleed Air

This machine is equipped with a fuel solenoid pump.

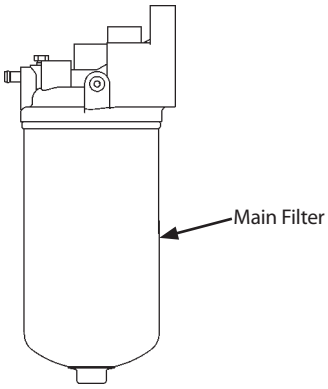
CAUTION: Fuel leaks may lead to fires.

1. Check that fuel cock (1) on the bottom of the fuel tank is opened.
2. Turn the key switch ON and hold it in that position for approx. 3 minutes. Thereby, the fuel solenoid pump operates, starting to bleed 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. In case air is not thoroughly bled, first return the key switch to the OFF position. After waiting for more than 30 seconds, turn the key switch ON again. Failure to do so may cause damage to the fuel solenoid pump and/or discharging the batteries.



MDAA-07-007



MDC1-07-047

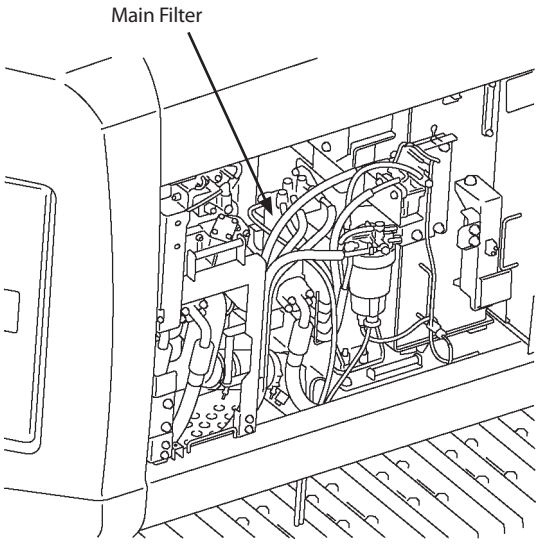
If Air Mixed Downstream of Common Rail

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 1000 hours or when fuel filter restriction alarm is lit



MDD5-07-015

IMPORTANT:

- **Be sure to use only genuine Hitachi elements for the fuel main filter element and the pre-filter element. Failure to do so may deteriorate the engine performance and/or shorten the engine service life. Please be noted that all engine failures caused by using other manufacturers' elements are excluded from Hitachi Warranty Policy.**
- **Take care not to allow dirt and/or water to enter the fuel tank.**

Procedures:

1. Close cock (1) on the bottom of the fuel tank.

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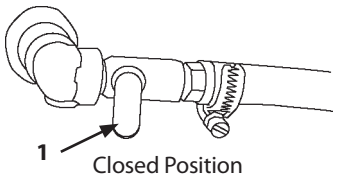


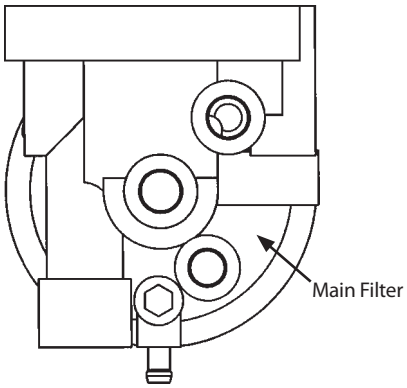
MDC1-07-020

2. Place 1 liter (1.1 US qt) or larger capacity container under the drain hose.
3. Rotate the bottom of filter element (2) counterclockwise by using a spanner to remove filter element (2) from head cover (3).
4. Apply a thin layer of fuel to the cartridge gasket (O-ring).
5. Install new filter element (2) on head cover (3) while rotating filter element (2) clockwise. Tightening torque: 25±2 N·m (2.5±0.2 kgf·m, 18.4±1.5 lbf·ft)
6. Open cock (1) on the bottom of the fuel tank.
7. Bleed Air from the Fuel System

   After replacing fuel filter element (2), bleed air from the fuel supply system.

   (Refer to " 2 Bleed Air from the Fuel System".)

   Wrench size: 24 mm



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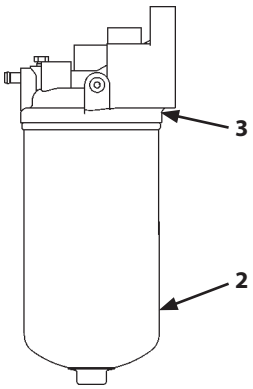

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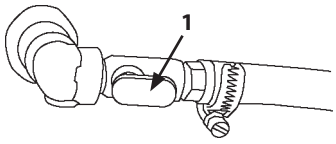

MDAA-07-007

Open Position

4 **Replace Fuel Pre-Filter Element**
--- every 1000 hours

IMPORTANT:

- **Be sure to use only genuine Hitachi elements. Failure to do so may deteriorate the engine performance and/or shorten the engine service life. Please be noted that all engine failures caused by using other manufacturers' elements are excluded from Hitachi Warranty Policy.**
- **Take care not to allow dirt and/or water to enter the fuel tank.**

Procedures:

1. Close cock (1) on the bottom of the fuel tank.

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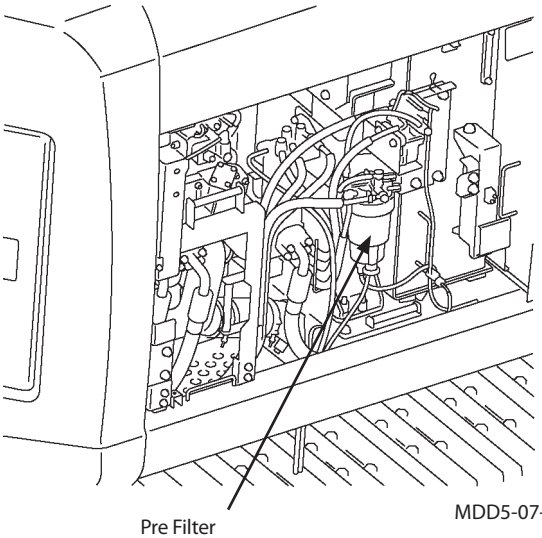

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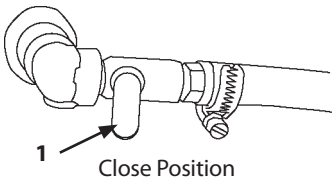


MDC1-07-020

2. Place 1 liter or larger capacity container under drain hose (3).
3. Loosen air bleed plug (1) and drain plug (2). Drain fuel until fuel does not flow out of the filter.

   After draining fuel, remove drain plug (2) and replace O-ring.
4. Remove the harness connected to sensor (7).

IMPORTANT: The harness connector has a lock (8). Press lock (8) and disconnect the connector. If an attempt is made to disconnect the connector without releasing lock (8), it may damage the connector.

5. Remove transparent filter case (4) using the exclusive tool.
6. When transparent filter case (4) is removed, the O-ring for transparent filter case (4) is exposed. Remove the element by hand.
7. Remove filter cartridge (6) by using a band wrench.
8. Install new cartridge (6). When the upper gasket of cartridge (6) contacts to the head, further tighten cartridge (6) for 3/4 turns by hand.
9. Replace O-ring with new one and tighten transparent filter case (4) to 10 ± 1 N·m using the special tool.
10. Tighten air bleed plug (1) and drain plug (2).
11. Reconnect the harness that was disconnected from sensor (7).

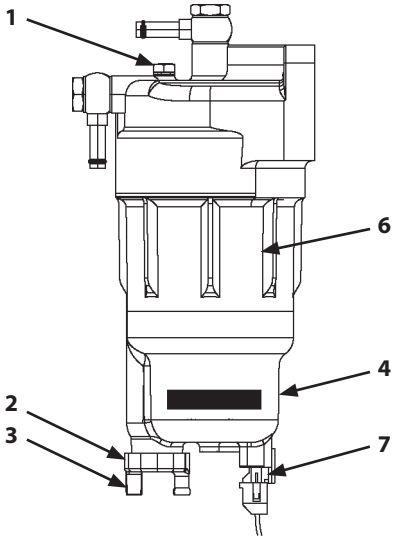
IMPORTANT: Fit the parts together until lock (8) of the harness connector is locked in place.

12. Open cock (5) on the bottom of the fuel tank.
13. Bleed Air from Fuel System

    After replacing the fuel filter element, bleed air from the fuel supply system.

    (Refer to " 2 Bleed Air from the Hydraulic System".)

    Wrench size: 14 mm



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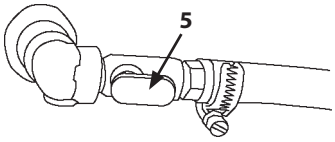
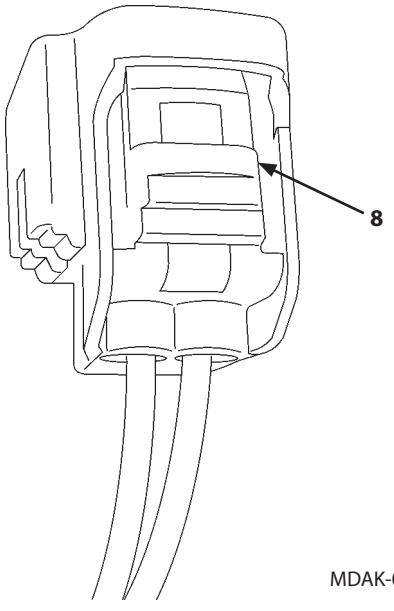


Open Position

MDAA-07-007



MDAK-07-057

6 Check Fuel Hoses

---daily

--- every 250 hours

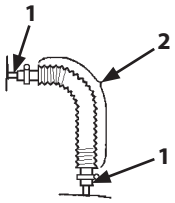
CAUTION: Fuel leaks can lead to fires that may result in serious injury.

- **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.**

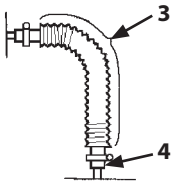
According to the check points shown below, check hoses for oil leaks and damage.
If any abnormality is found, replace or retighten as instructed in the table.

Hose

Interval (hours)	Check Points	Abnormalities	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



M137-07-003



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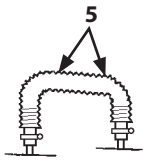

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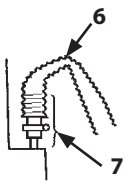


M137-07-006

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

⚠ CAUTION: When using compressed air pressure (less than 0.69 MPa (7 kgf/cm^2)), dust may scatter. Wear goggles or safety glasses, gloves and face shield.

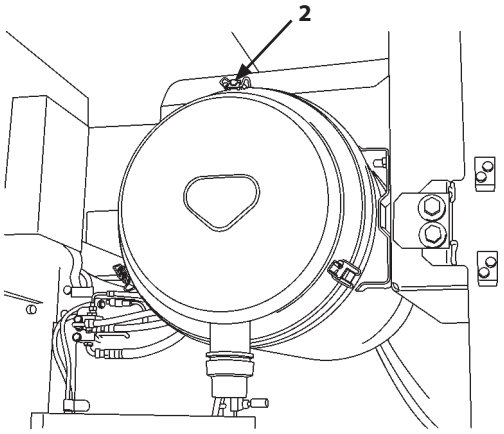
IMPORTANT: Clean and replace the air cleaner element by following the procedure below. If the following procedures are not followed, dirt may enter into the system and an engine malfunction may result.

- **Clean and replace the air cleaner element when the engine is stopped.**
- **Do not remove the inner element when cleaning the outer element.**
- **Replace the inner element when replacing the outer element. Do not reuse elements.**
- **Use clean and dried compressed air.**
- **When blowing compressed air, be sure to keep the air nozzle away from the element to avoid the filter paper being broken by the pressure of the air.**

Clean or replace the outer element.

Stop the engine before servicing outer element (1).

1. Remove clamp (2) of the cover. Remove the cover. Remove any dirt from the case.
2. Remove outer element (1) by holding its edge and slowly shaking it left to right, up and down while twisting it. Do not scatter dirt while removing outer element (1).



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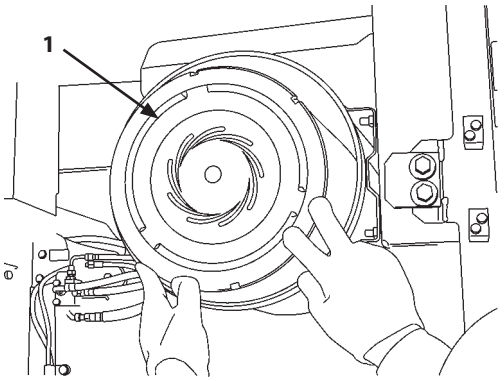


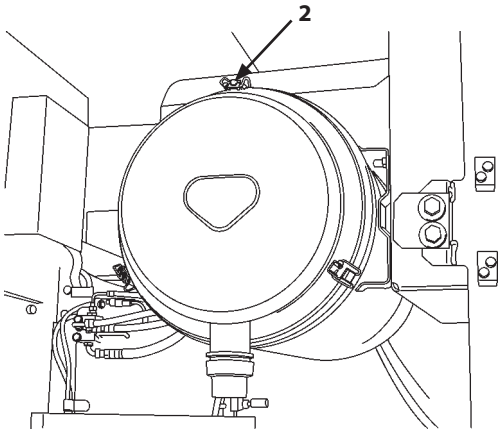
M1U1-07-028

3. At this time, do not remove the inner element.

IMPORTANT: Do not hit or strike outer element (1) against another object to clean the element.

4. Allow compressed air pressure [less than 0.69 MPa (7 kgf/cm^2)] to blow out of the inside of outer element (1) to clean the element. After that, blow compressed air along the pleats, and then blow out from the inside. When blowing compressed air, be sure to keep the air nozzle 50 mm or away from the element.
5. After cleaning is complete, be sure to check outer element (1) for any damage such as holes or wear of filter paper. If any damage is found, replace the element with a new one.
6. Press outer element (1) into the air cleaner body straightly by hand. Ensure that outer element (1) is properly installed by pushing its bottom edge.
7. Install cover and tighten clamps (2).
8. In case the air filter restriction indicator lights soon after cleaning outer element (1) even if it has been cleaned less than 6 times, replace both outer and inner elements with new ones.

IMPORTANT: Do not install outer element (1) and/or the cover forcibly when installing the clamps. Doing so may result in deformation of clamps (2), element, and/or cover.



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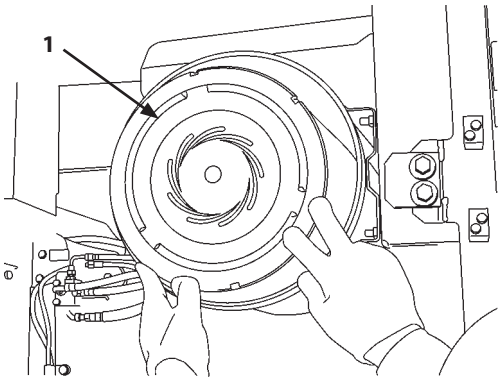

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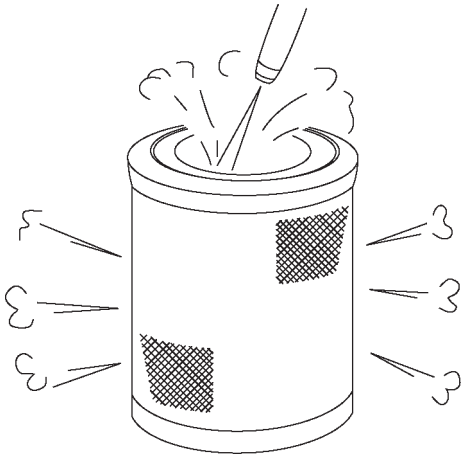


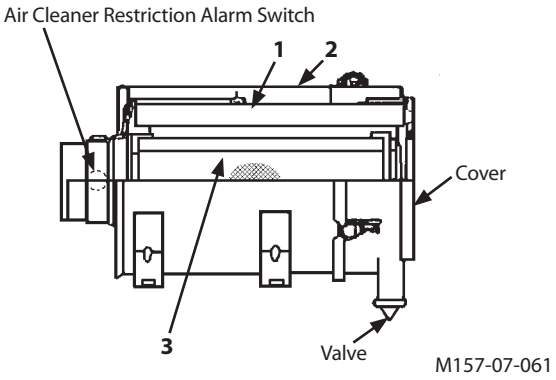
MJAE-07-059

2 **Replace Air Cleaner Element (Inner)**

Replace --- When outer element is replaced

IMPORTANT: Do not clean and reuse the inner element.

1. After removing outer element (1), clean inside the air cleaner body (2) with a clean cloth before removing inner element (3).
2. Remove inner element (3). Replace it with new one.



M157-07-061

G. Cooling System

Coolant

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

If a coolant mixed with less than 30 % of Hitachi Long-Life Coolant is used, service life of the cooling parts may be shortened due to damage by freezing or corrosion of coolant system parts.

Recommended Products	Alternative Products
Hitachi Genuine Long-Life Coolant	Organic type corrosion inhibitor long life coolant

Antifreeze Mixing Ratio

Air Temperature		Mixing Ratio	ZX345USLC-6N			
			Antifreeze		Soft water	
℃	℉	[%]	liters	US gal	liters	US gal
-1	30	30	12.3	3.3	28.7	7.6
-15	5	35	14.4	3.8	26.6	7.0
-20	-4	40	16.4	4.3	24.6	6.5
-25	-13	45	18.5	4.9	22.6	6.0
-30	-22	50	20.5	5.4	20.5	5.4

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.**
- **Pay attention to fire hazards. Antifreeze is specified as a dangerous substance in the fire protection law.**
- **When disposing of antifreeze, 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

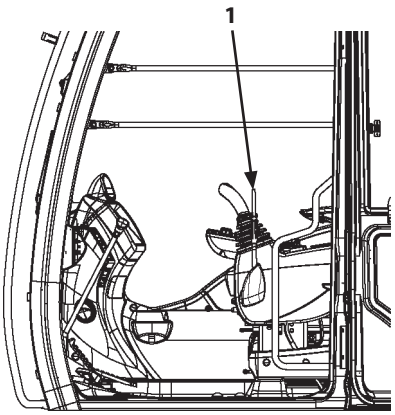
1. Confirm that pilot control shut-off lever (1) is in the LOCK position.
2. Confirm that all control levers are placed in neutral.
3. Insert key switch (2). Turn it to ON position. Press and hold switch (3) with the engine stopped.

   Coolant indicator (4) must be displayed in green.

IMPORTANT: Do not rely only on the monitor display for checking the machine conditions such as oil level; visually check them yourself as required.

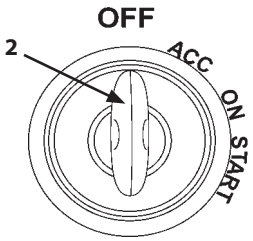
Always check the machine on a firm, level surface.

NOTE: If the security function is enabled, a password is required.



LOCK position

MDAA-01-295



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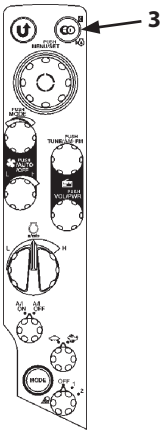

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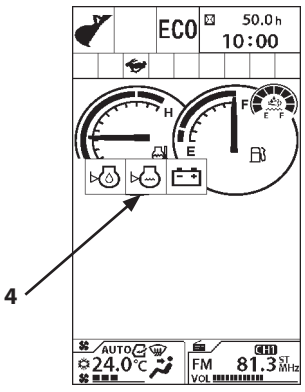


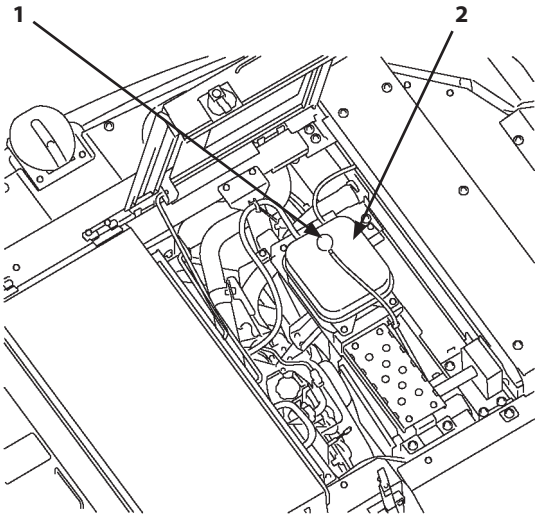
MDC1-01-041

--- Visual Inspection

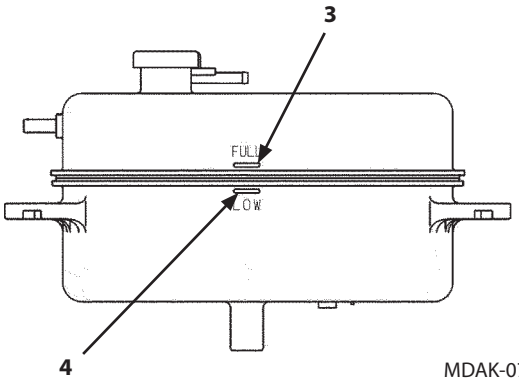
The coolant level must be between the FULL (3) and LOW (4) marks on expansion tank (2).
If the coolant level is below the LOW (4) mark, remove cap (1) from expansion tank (2) and refill coolant.

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

If expansion tank (2) is empty, add coolant to the radiator and then to expansion tank (2).



MDD5-07-006



MDAK-07-048

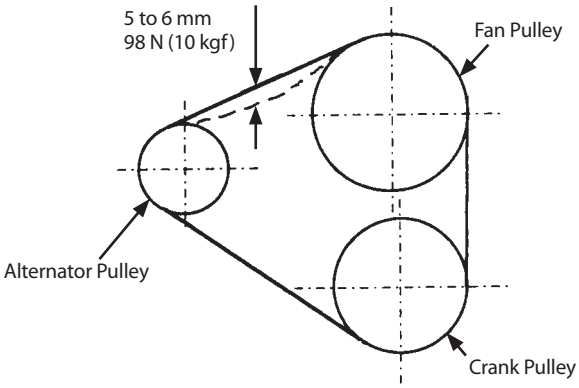
2 Check and Adjust Fan Belt Tension

--- every 250 hours (first time after 50 hours)

IMPORTANT: Loose fan belt may result in insufficient battery charging, engine overheating, as well as premature belt wear. A belt that is too tight can damage both water pump/alternator bearings as well as the belt.

Inspect

Check fan belt tension by depressing the midpoint between the fan pulley and the alternator pulley by your thumb with a depressing force of approximately 98 N (10 kgf, 22 lbf). Deflection must be within the value illustrated in the right. Visually check the belt for wear. Replace it if necessary.

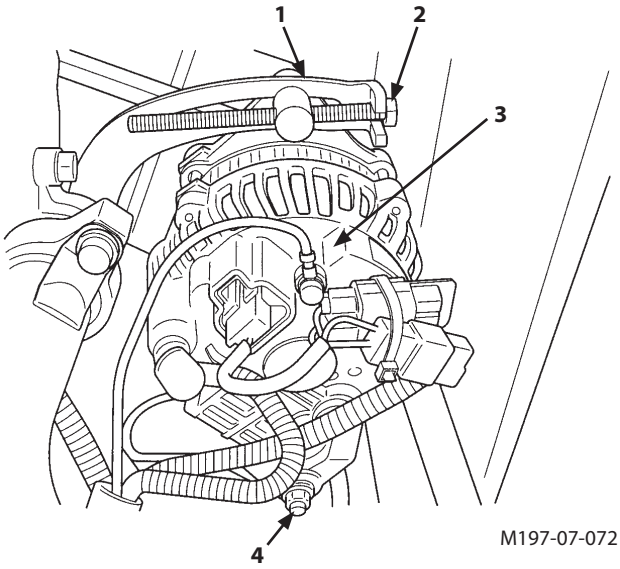


M1HM-07-001

Adjust Drive Belt Tension

1. Loosen lock nut (1) at the top of alternator (3), and lock nut (4) at the bottom of alternator (3).
2. Adjust belt tension by moving alternator (3) forward or backward by using adjustment bolt (2).
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.



M197-07-072

3 **Change Coolant**

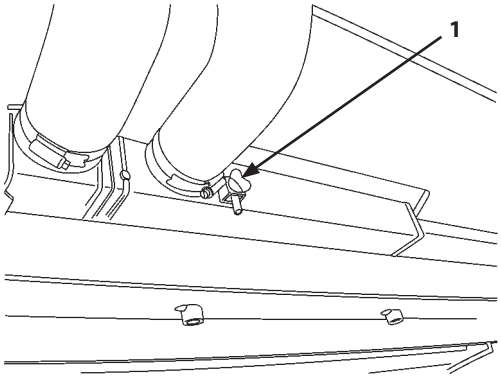
--- twice a year (in spring and autumn)

NOTE: When genuine Hitachi Long-Life Coolant is used, change interval is once every two years (in autumn every other year) or every 4000 hours whichever comes first.

CAUTION: Do not loosen the cap on the expansion tank when coolant temperature in the radiator is high. Hot steam may spout out, possibly causing severe burns. Loosen the cap slowly to the stop. Release all pressure before removing the cap.

Procedure:

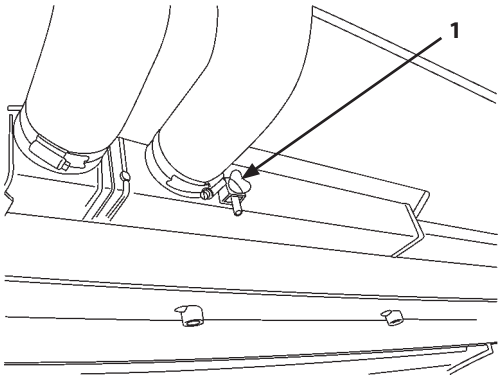
1. Park the machine on a solid level surface. Lower the bucket to the ground. Stop the engine.
2. Remove the under cover. Remove the cap from the expansion tank. Open drain cock (1) on the radiator to allow the coolant to drain completely. Remove impurities such as scale at the same time.
3. Close drain cock (1). Refill soft water containing fewer impurities or tap water and radiator cleaner agent. Close the cap on the expansion tank. Start the engine and run it at a speed slightly higher than slow idle; when the needle of the temperature gauge reaches the green zone, run the engine for about 10 or more minutes.
4. Stop the engine and open radiator drain cock (1). Flush out the cooling system with tap water, until draining water is clear. This helps remove rust and sediment.



M1U1-07-029

5. Close the radiator drain cock (1). Fill the radiator with tap water and LLC at the specified mixing ratio. When adding coolant, do so slowly to avoid mixing air bubbles in the system.

   Fill coolant in the expansion tank until its level reaches the upper limit line.



M1U1-07-029

IMPORTANT: If coolant is filled above the upper limit line, air in the cooling system may not be bled from the expansion tank. Do not fill coolant above the upper limit line.

6. Run the engine for several minutes to stabilize the coolant temperature, and then sufficiently bleed air from the cooling system.

   Stop the engine. Ensure that coolant level is in between the upper and lower limit line.

   Add coolant if necessary. Check the coolant level again (The coolant level should be between the upper and lower limit lines.)

4 **Clean Radiator/Oil Cooler/Inter Cooler Core**

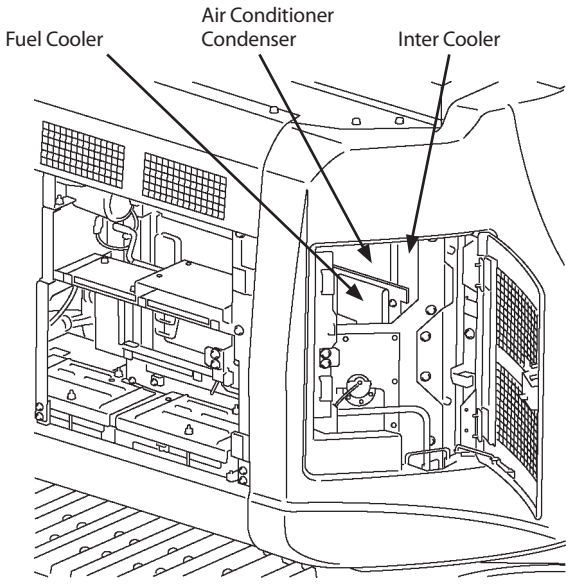
Outside --- every 500 hours

Inside --- once a year

CAUTION: Use reduced compressed air pressure (Less than 0.2 MPa, 2 kgf/cm^2) for cleaning purposes. Wear personal protection equipment including eye protection.

IMPORTANT: If air with pressure of higher than 0.2 MPa (2 kgf/cm^2) or tap water with high delivery pressure is used for cleaning, damage to the radiator/oil cooler/ inter cooler fins may result.

The radiator, the oil cooler and the inter cooler are arranged in parallel.
If dirt or dust is accumulated on them, cooling system performance decreases. Clean the radiator/oil cooler/inter cooler cores with compressed air pressure (lower than 0.2 MPa (2 kgf/cm^2)) or tap water. It will prevent a reduction in cooling system performance.



MDD5-07-016

WARNING:

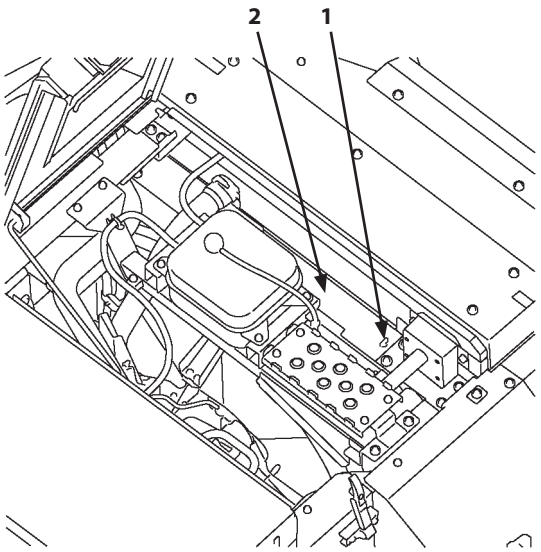
- **Entanglement in moving parts can cause serious injury.**
- **Before servicing, stop the engine and the fan to prevent any accident.**
- **Never attempt to start the engine when the cover is open.**
- **In case tools or parts are dropped into the radiator/ oil cooler/inter cooler core, remove them before starting the engine.**

Cleaning

1. Loosen bolt (1) to open cover (2) and perform cleaning.

   Take care not to break the fin during clean operation.

   Close cover (2) and tighten bolt (1) after cleaning.



MDD5-07-017

IMPORTANT: When the machine is operated in dusty areas, check the cores periodically and replace if necessary.

5 **Clean Oil Cooler, Radiator and Inter Cooler Front Screen**

--- every 500 hours

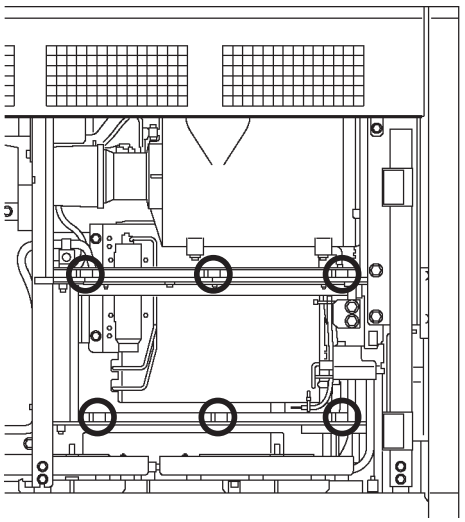
IMPORTANT: Check the screen daily and clean it if necessary when the machine is operated in dusty areas.

Pull the clip lever on the screen to remove the screen.

Insert the clip into the cover hole and turn over the clip lever to hold the screen.

The screen can not be held properly if the clip nut is too tight or loose. Adjust the tightening torque of the clip nut to hold the screen.

For rough indication of the tightening torque, refer to the below.
Tightening Torque: 0.5 N·m (0.05 kgf·m, 0.37 lbf·ft)
or
A: 2.5 to 3.5 mm

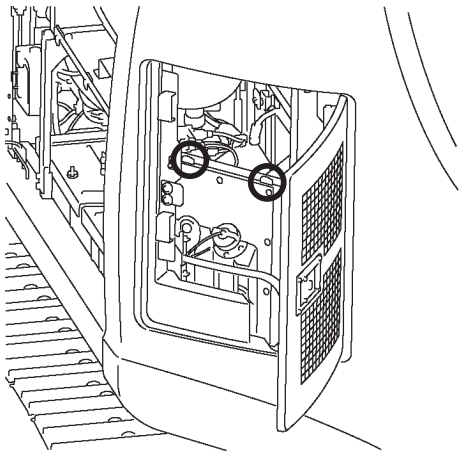


MDD5-07-018

6 **Clean Air Conditioner Condenser**

--- every 500 hours

IMPORTANT: Check the screen daily and clean it if necessary when the machine is operated in dusty areas.

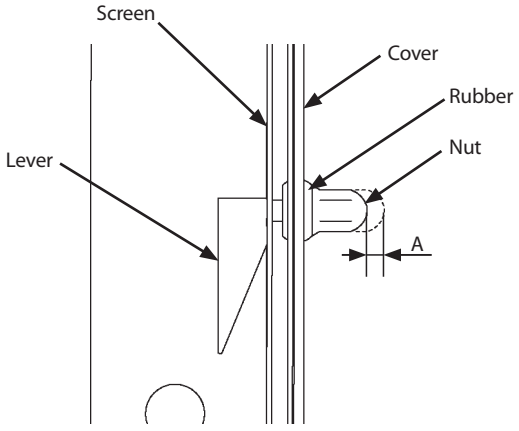


MDD5-07-019

7 **Clean Fuel Oil Cooler**

--- every 500 hours

IMPORTANT: Check the screen daily and clean it if necessary when the machine is operated in dusty areas.



MDAA-07-025

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 involuntary 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 communication equipment or additional electrical parts, or when replacing electrical parts.**

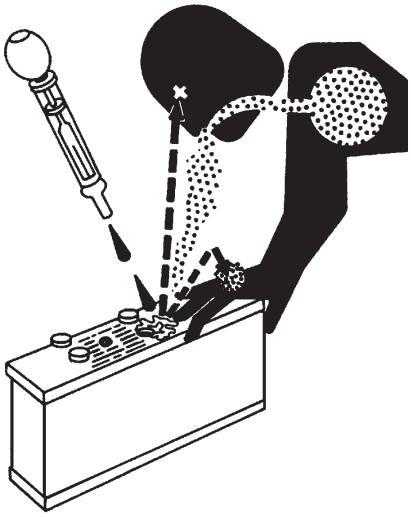
IMPORTANT: Never attempt to disassemble or modify the electrical/electronic components. If replacement or modification of such components is required, contact your authorized dealer.

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 room. 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 electrolyte level is lower than specified. Explosion of the battery may result.**
- **Charge the batteries in a well ventilated location.**
- **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. Wearing eye protection and rubber gloves.**

SA-032

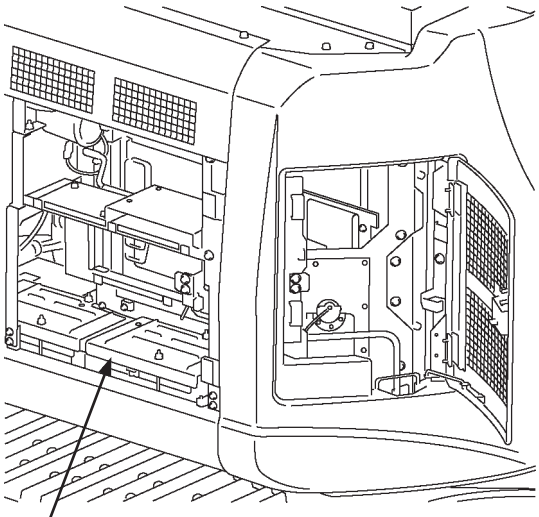


SA-036

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 more than the specified upper level. Electrolyte may spill, damaging the painted surfaces and/or corroding other machine parts.**

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



MDD5-07-016

1 Batteries Location

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 recharged, inflammable hydrogen gas is created. Remove the battery from the base machine. Recharge the battery after removing the caps in a well ventilated area.
- When disconnecting the battery terminals, first disconnect the ground line [minus (-)] side terminal. When connecting the battery terminals, connect the ground line [minus (-)] side terminal last. If a piece of metal, such as a tool comes in contact with the battery plus (+) side terminal and the machine frame when both terminals are connected, the electrical system may short-circuit, possibly creating a dangerous situation.
- If a new battery is used along with an old battery, the service life of the new battery may be shortened. Replace two batteries at the same time.
- Loose terminal may allow sparks to fly. Securely tighten the terminals.

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. Check the electrolyte level.

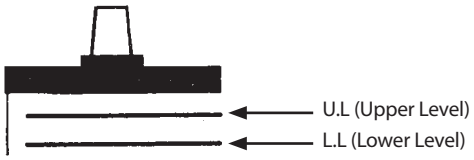
2.1 When checking the level from the battery side:

Clean around the level check lines with a wet towel. Do not use a dry towel. Static electricity may be developed, causing the battery gas to explode. Check if the electrolyte level is between U.L (Upper Level) and L.L (Lower Level).

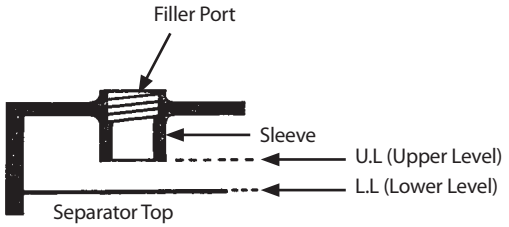
In case the electrolyte level is lower than the middle level between the U.L and L.L, immediately refill with distilled water or commercial battery fluid.

After refilling, securely tighten the filler plug.

Be sure to refill with distilled water before recharging (operating the machine).



M146-07-109



M146-07-110

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

After removing the filler plug from the top of the battery, check the electrolyte level by viewing through the filler port. It is difficult to judge the accurate electrolyte level in this case. Therefore, when the electrolyte level is flush with the U.L, the level is judged to be proper. Then, referring to the illustrations on the right side, check the level. When the electrolyte level is lower than the bottom end of the sleeve, refill with distilled water or commercial battery fluid up to the bottom end of the sleeve.

After refilling, securely tighten the filler plug.

Be sure to refill with distilled water before recharging (operating the machine).

Proper

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

M146-07-111

Lower

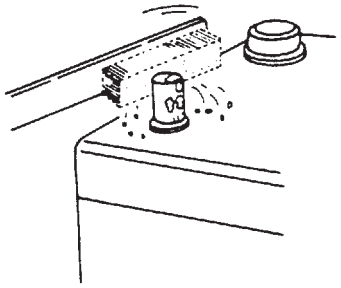
When the electrolyte surface is lower than the bottom end of the sleeve, the electrode ends are seen straight.

M146-07-112

2.3 When an indicator is available to check the level, follow the checking results.

3. Always keep the area around the battery terminals clean to prevent battery discharge. Check terminals for loose and/or rust.

   Check terminals for loose and/or rust. Coat terminals with grease or petroleum jelly to prevent corrosion build up.



M409-07-072

Replace Battery

IMPORTANT: Turn the battery disconnect switch to OFF before replacing the battery.

This machine is equipped with two 12V batteries. Negative terminal is connected to the ground.
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. Battery charger differs depending on the type of battery. If improper battery is connected, the battery becomes overloaded possibly resulting in malfunction.

Check Electrolyte Specific Gravity

--- every one month

WARNING: Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check the battery electrolyte level.

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into the eyes.

Never check the battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.

Always remove the grounded (-) battery clamp first and replace it last.

Avoid hazard by:

1. Filling batteries in a well-ventilated area.

2. Wearing eye protection and rubber gloves.

3. Avoiding breathing fumes when electrolyte is added.

4. Avoiding spilling or dripping electrolyte.

5. Using proper booster battery starting procedures.

If you spill acid on yourself:

1. Flush your skin with water.

2. Apply baking soda or lime to help neutralize the acid.

3. If splashed in eyes, flush with water for 10 to 15 minutes. Get medical attention immediately.

If acid is swallowed:

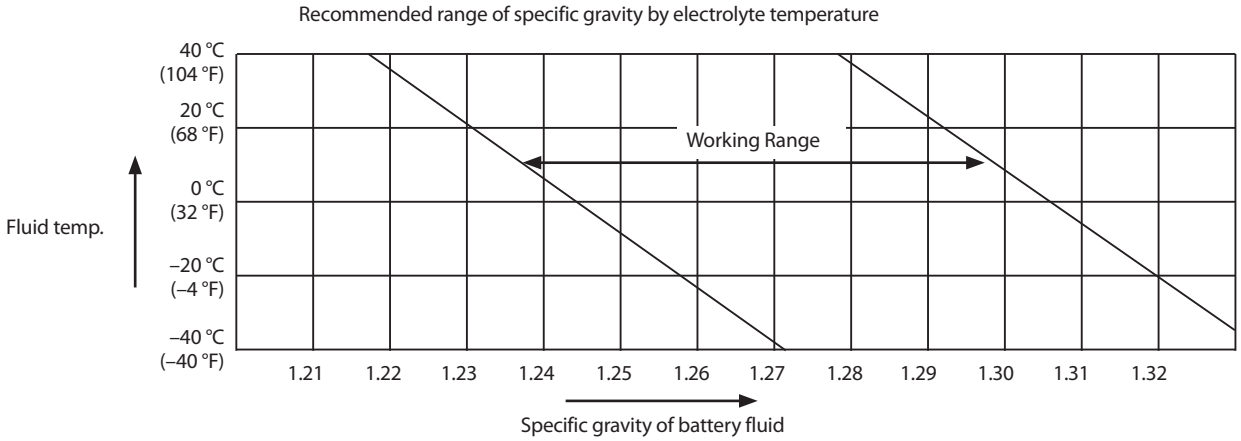
1. Do not induce vomiting.

2. Drink large amounts of water or milk.

3. Get medical attention immediately.

NOTE: Check the specific gravity of the electrolyte after it is cooled, not immediately after operation.

Check the electrolyte specific gravity in each battery cell.
The lowest limit of the specific gravity for the electrolyte varies depending on electrolyte temperature. The specific gravity should be kept within the range shown below. Charge the battery if the specific gravity is below the limit.



2 **Replacing Fuses**

--- as necessary

If any electrical equipment fails to operate, first check the fuses. Fuse box is located behind the operator's seat.

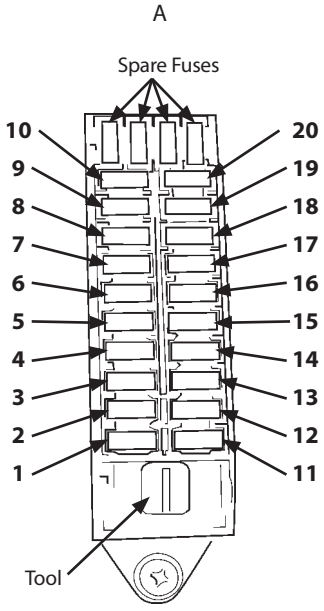
NOTE:

- *One spare fuse for each respective fuse capacity is provided in the fuse box.*
- *A fuse removing jig is provided in the fuse box.*

Fuse Box

A

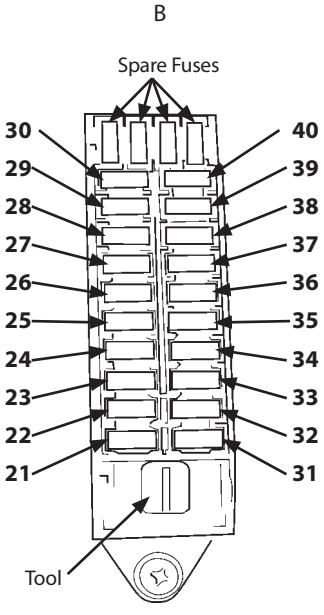
10- CONTROLLER 5 A	20- OPT.3 (ALT) 5 A
9- BACKUP 10 A	19- HORN 10 A
8- ECU 30 A	18- IDLE STOP 5 A
7- START 5 A	17- POWER ON 5 A
6- OPT.2 (ALT) 20 A	16- GLOW RELAY 5 A
5- OPT.1 (ALT) 5 A	15- AUX 10 A
4- SOLENOID 20 A	14- MONITOR 5 A
3- HEATER 20 A	13- LIGHTER 10 A
2- WIPER 10 A	12- RADIO 5 A
1- LAMP 20 A	11- FUEL PUMP 5 A



M1GR-01-003

B

30- -	40- -
29- -	39- -
28- SENSOR_UNIT 10 A	38- -
27- AUX.3 5 A	37- -
26- QUICK HITCH 5 A	36- -
25- IMMOBI 5 A	35- DCU 20 A
24- 12VUNIT 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

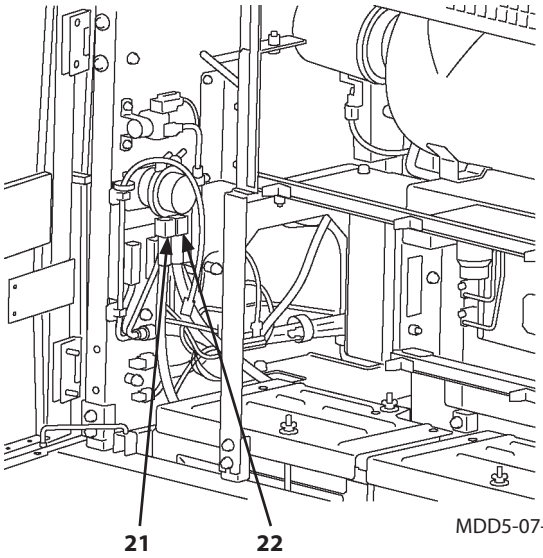


M1GR-01-003

- Fusible Link (Main Fuse)
  In case the starter will not rotate even if the key switch is turned to the START position, fusible link may be the cause of the trouble. Remove the cover next to the battery to check the fusible link. Replace it if blown.

21- + Side (Red)
45 A

22- – Side (Black)
65 A



MDD5-07-020

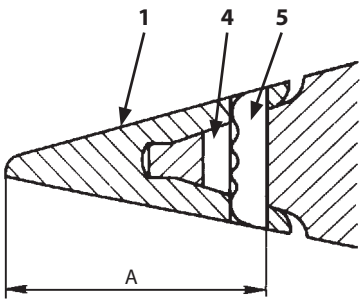
I. Miscellaneous

1 **Check and Replace Bucket Teeth**
--- daily

Check bucket teeth (1) for wear and looseness.
Replace teeth (1) if tooth wear exceeds the designated service limit shown below.

A mm (in)

Model	New	Limit of Use
ZX345USLC-6N	230 (9.1")	110 (4.3")



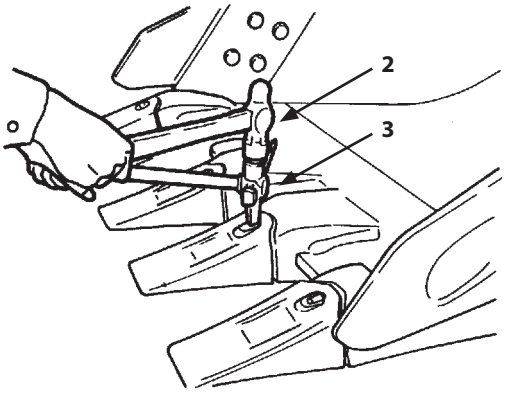
M104-07-056

Replace

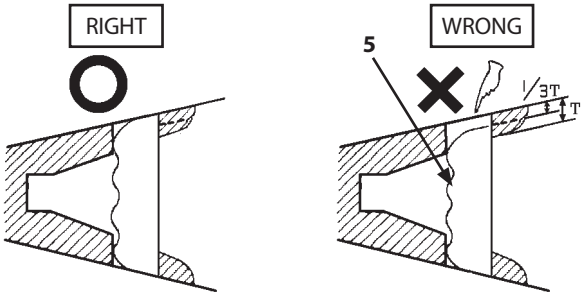
CAUTION:

- **Guard against injury from flying pieces of metal.**
- **Wear goggles or safety glasses, and safety equipment appropriate to the job.**

1. Use hammer (2) and drift (3) to drive out lock pin (5). Take care not to damage lock rubber (4).
2. Check lock pin (5) and lock rubber (4). Short lock pins (5) and damaged lock rubber (4) must be replaced with new ones.



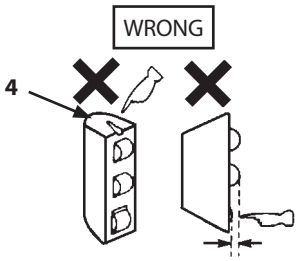
M104-07-116



Flush one end of the locking pin to evaluate. In this instance, the locking pin is too short.

M104-07-118

M104-07-058

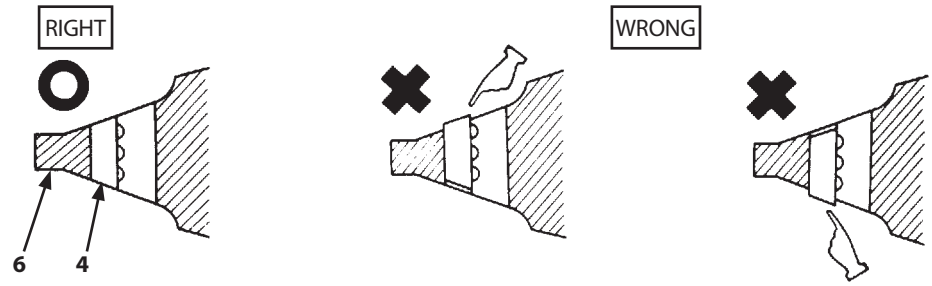


Crack on the rubber. The steel ball may come out.

The steel ball dents when pushing the ball.

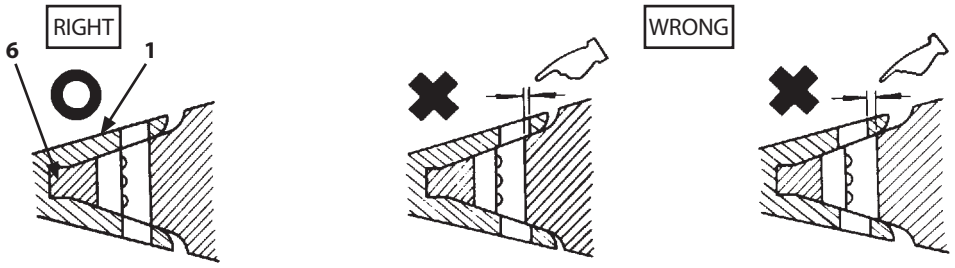
M104-07-059

3. Clean shank (6) surface.
4. Install lock rubber (4) into shank (6) hole as shown.



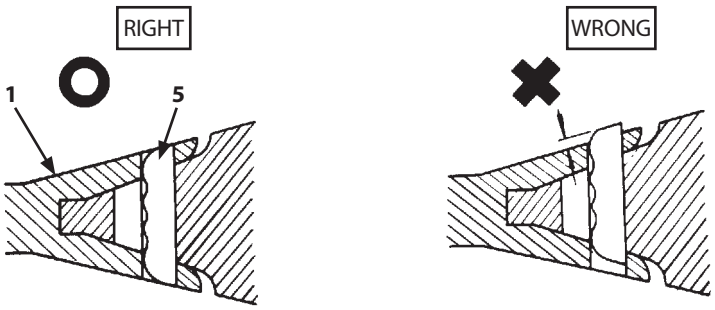
M104-07-060

5. Position new tooth (1) over shank (6).



M104-07-061

6. Drive lock pin (5) fully into the hole as shown.



M104-07-062

2 Change Bucket

CAUTION: When driving the connecting pins in or out, guard against injury from flying pieces of metal or debris. Wear goggles or safety glasses, hard hat and face shield.

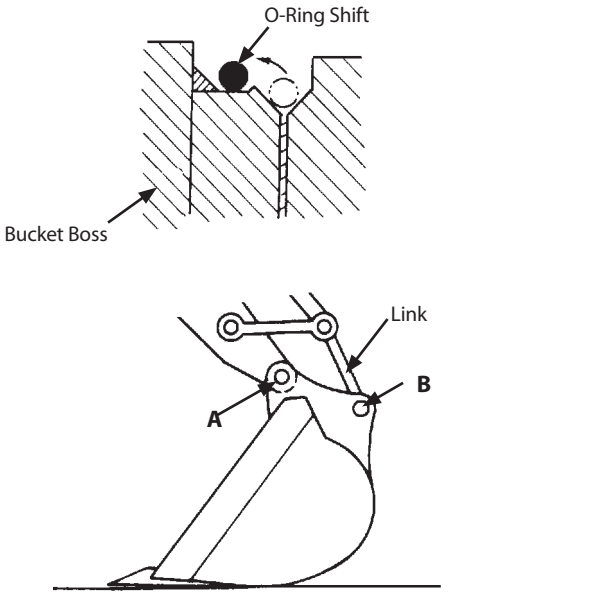
Before starting the conversion work, keep bystanders clear of the machine. Slowly move the front attachment. When using a signal person, coordinate hand signals before starting.

Removal

1. Place the bucket in a stable position.
2. Slide the O-rings out of the way, as shown.
3. Remove bucket pins A and B to separate the arm and bucket.

Installation

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 and alternate bucket. Be sure the bucket will not roll. Install bucket pins A and B.
4. Install the locking pins and snap rings on pins A and B.
5. Install O-rings 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 Convert Bucket Connection Into Face Shovel

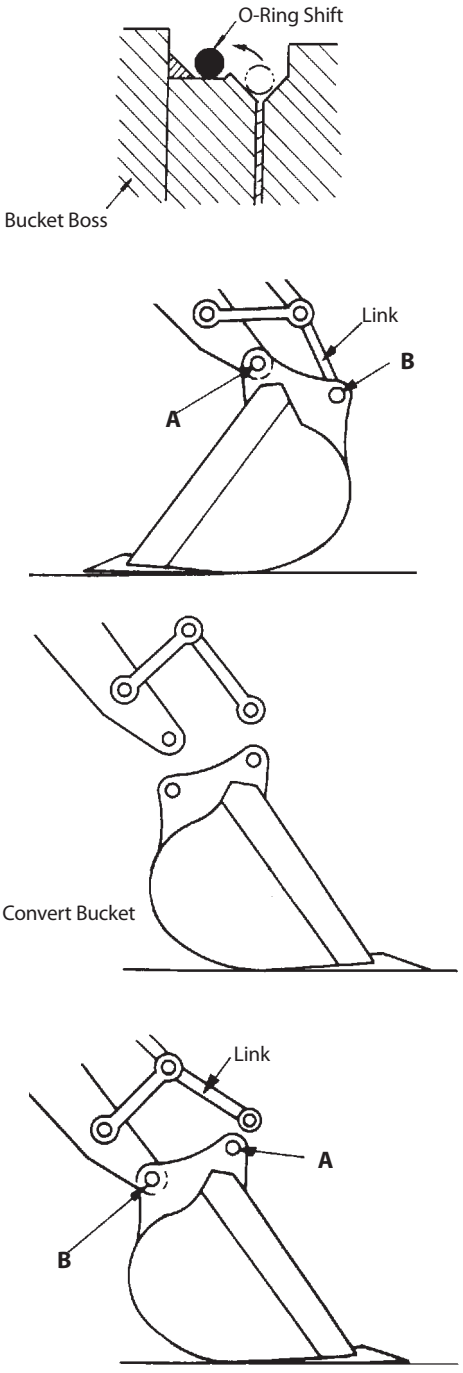
CAUTION: When driving the connecting pins in or out, guard against injury from flying pieces of metal or debris. Wear goggles or safety glasses, hard hat and face shield.

Converting the bucket connection allows you to use the machine as a face shovel. Before starting converting work, keep bystanders clear of the machine. Slowly move the front attachment. When using a signal person, coordinate hand signals before starting.

Procedure:

1. Place the bucket in a stable position.
2. Slide the O-rings out of the way, as shown.
3. Remove bucket pins A and B to separate the arm and bucket.

   Clean the pins and pin bores. Apply sufficient grease to the pins and pin bores.
4. Turn the bucket 180 °. Be sure the bucket will not roll.
5. Fit the arm and alternate bucket. Be sure the bucket will not roll. Install bucket pins A and B.
6. Install the locking pins and snap rings on pins A and B.
7. Install O-rings 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

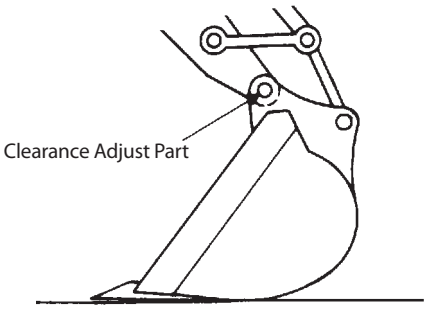
4 Adjust Bucket Linkage

--- as required

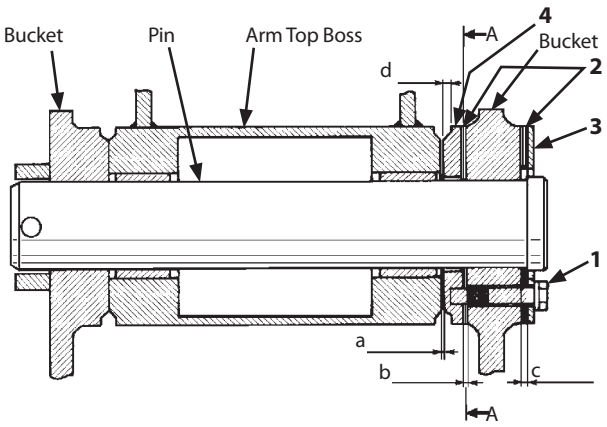
The machine is provided with a bucket adjustment system to take up play in the linkage. When play in the linkage increases, remove and install shims (2) as follows:

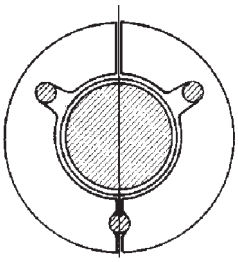
1. Place the bucket in a stable position.
2. Run the engine at slow idle. With the bucket on the ground, slowly swing counterclockwise slightly until the top of the left bucket boss contacts the arm.
3. Stop the engine. Pull the pilot control shut-off lever to the LOCK position.
4. Slightly loosen 3 bolts (1) using a 22 mm wrench. Remove all shims (2) from clearance (c) between plate (3) and bucket. As shim (2) is a dual partitioning type, it can be easily removed by slightly loosening bolt (1) and inserting tip of a screw driver into the contact surface of left and right shims (2).
5. Push and hold bolts (1) to remove all clearance (a) between arm and boss (4). Holding boss (4) against arm increases clearance (b). Install as many shims (2) into clearance (b) as possible.
6. Install remaining shims (2) into clearance (c) and tighten bolts (1) to 140 N·m (14 kgf·m, 103 lbf·ft).

NOTE: The total number of shims (2) used in clearance (b) and (c) are 6×2=12. Remaining shims (2) must be installed in clearance (c) to prevent arm end face or bolt damage. Replace boss (4) with new one if measurement (d) is 5 mm (0.2 in) or less.



M503-07-056





Section A

M1G6-07-010

5 **Remove Travel Levers**
--- as required

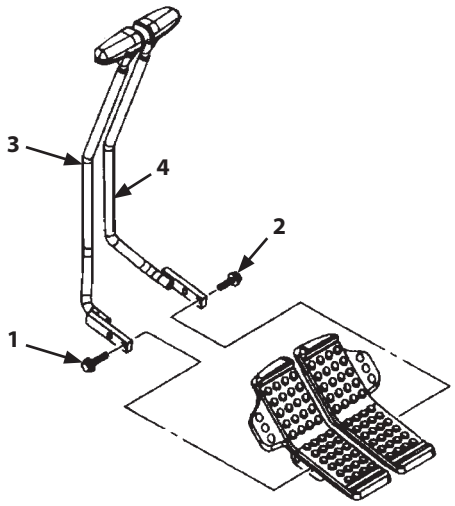
Travel levers (3) and (4) may be removed if desired.

Procedure:

Remove bolts (1) and (2) to remove travel levers (3) and (4) from brackets.

NOTE: Wrench size: 17 mm

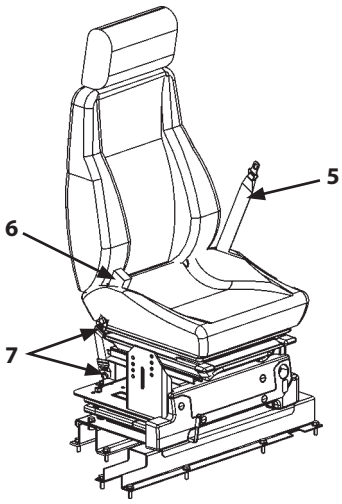
Tightening Torque: 50 N·m (5 kgf·m, 36.9 lbf·ft)



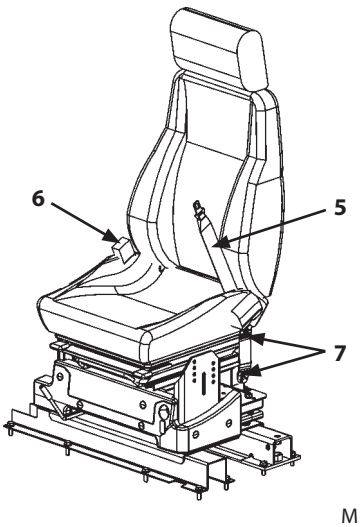
M178-07-077

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 materially worn, replace seat belt (5) or component before operating the machine.
We recommend that seat belt (5) should be replaced every 3 years regardless of its apparent condition.



M1U1-07-008

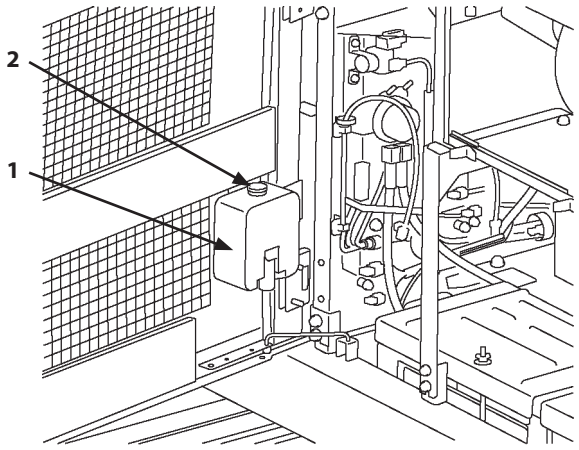


M1U1-07-009

7 Check Windshield Washer Fluid Level

--- as required

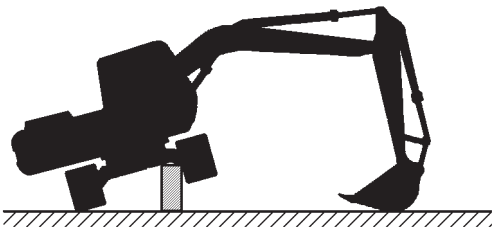
Check fluid in windshield washer tank (1). If the fluid level is low, remove cap (2) and add fluid via the opening.



MDD5-07-021

8 Check Track Sag
--- every 50 hours

Swing the upperstructure 90 ° and lower the bucket to raise the track off the ground as shown. Measure distance (A) at the middle of the track frame from the bottom of the track frame to the back face of the track shoe.
Each time, be sure to place blocks under the machine frame to support the machine.

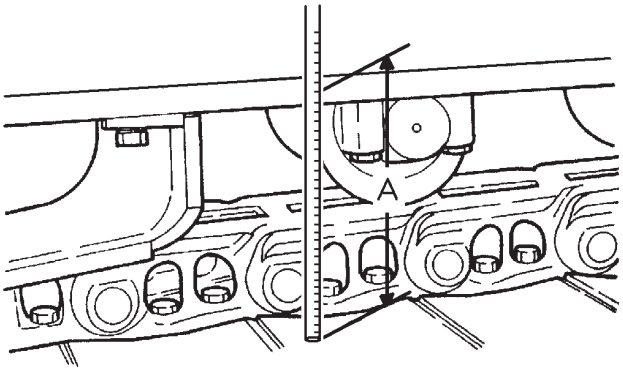


M104-07-067

CAUTION: To prevent accidents, care should be taken to ensure that hands, feet, and any body parts do not become entangled when working around the tracks.

Model	Appropriate sag A
ZX345USLC-6N	340 to 380 mm (13.4 to 15.0 in)

NOTE: Check track sag after thoroughly removing soil stuck on the track area by washing.



M107-07-068

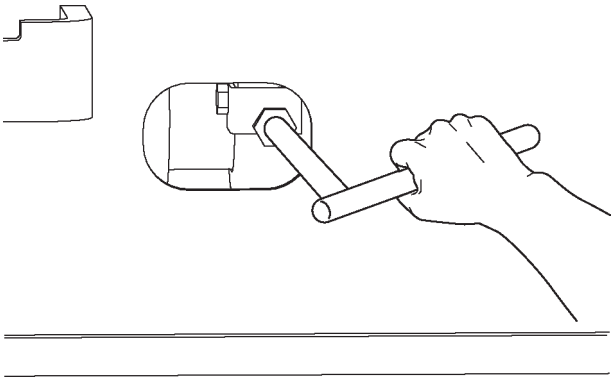
Adjust Track Sag

1. If track sag is not within specifications, loosen or tighten the track following the procedures shown on the next page.
2. When adjusting track sag, lower the bucket to the ground to raise one track off the ground. Repeat this procedure to raise the other track. Each time, be sure to place blocks under the machine frame to support the machine. To prevent accidents, care should be taken to ensure that hands, feet, and any body parts do not become entangled when working around the tracks.
3. After adjusting both side track sags, rotate the tracks backward and forward to equalize both side track sags.
4. Recheck the track sag once more. Readjust as necessary.

ZX245USLC-6N

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 valve (1). Never loosen grease fitting (2).**
- **To prevent accidents, care should be taken to ensure that hands, feet, and any body parts do not become entangled when working around the tracks.**

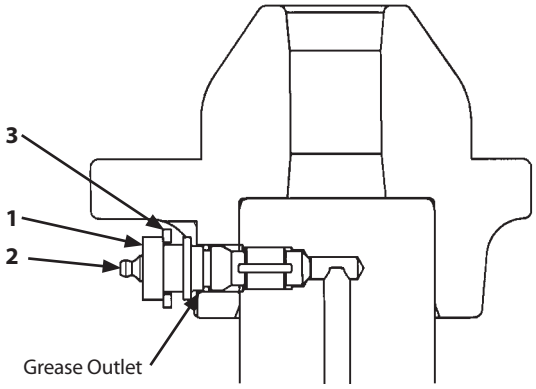


MDAA-07-013

IMPORTANT: When gravel or mud is packed between sprockets and track links, remove it before loosening.

1. To loosen the track, slowly turn valve (1) counterclockwise using long socket 24; grease will escape from the grease outlet.
2. Between 1 to 1.5 turns of valve (1) is sufficient to loosen the track. When valve (1) comes in contact with stop plate (3), do not loosen valve (1) further.
3. If grease does not drain smoothly, slowly rotate the raised track.
4. When proper track sag is obtained, turn valve (1) clockwise to the original condition.

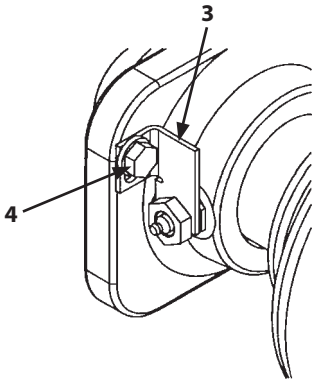
   Tightening Torque: 90 N·m (9 kgf·m, 66 lbf·ft)



MDAA-07-014

Do not remove valve stop plate (3). Do not loosen bolt (4) while adjusting the track sag.

CAUTION: Consult your authorized dealer if grease is not sufficiently drained.

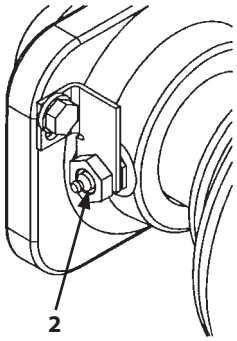


MDAA-07-057

Tighten the Track

CAUTION: It is abnormal if the track can not be adjusted. The strong force acts on the spring in track adjuster. Therefore, the grease in cylinder is highly pressurized. In such cases, NEVER ATTEMPT TO DISASSEMBLE the track or track adjuster, because of dangerous high-pressure grease inside the track adjuster. See your authorized dealer immediately.

To tighten the track, connect a grease gun to grease fitting (2) and add grease until the sag is within specifications.

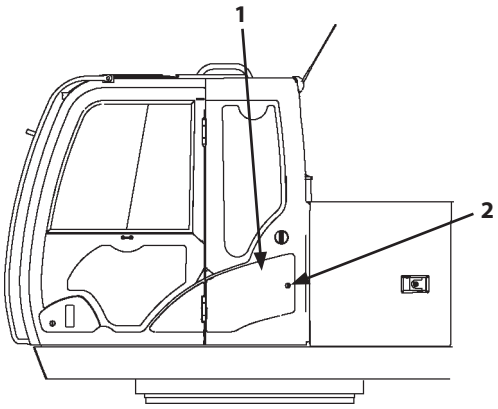


MDAA-07-057

9 Clean and Replace Air Conditioner Filter

Clean Circulating/Fresh Air Filters
Circulating Air Filter --- every 500 hours
Fresh Air Filter --- every 500 hours

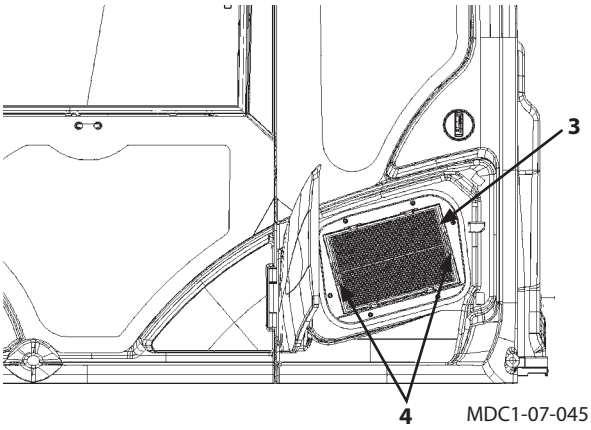
Replace Circulating/Fresh Air Filters
Circulating Air Filter --- After cleaning 6 times or so
Fresh Air Filter --- After cleaning 6 times or so



MDAA-07-040

Removing Fresh Air Filter

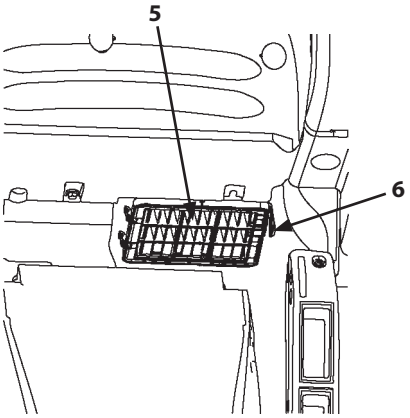
1. Insert the key into keyhole (2) on left cab side cover (1). Then, rotate the key counterclockwise to unlock the key. Open cover (1).
2. While pressing knobs (4) on both sides of fresh air filter (3) inward, horizontally remove fresh air filter (3).



MDC1-07-045

Removing Circulating Air Filter

1. Circulating air filter (5) is located under the rear tray.
2. Holding grips (6), pull them toward you to remove.



MDAA-07-039

WARNING: When using compressed air pressure, wear safety glasses or goggles.

Cleaning

Clean the circulating and fresh air filters.
Clean both the circulating and fresh air filters by blowing compressed air or washing with water.

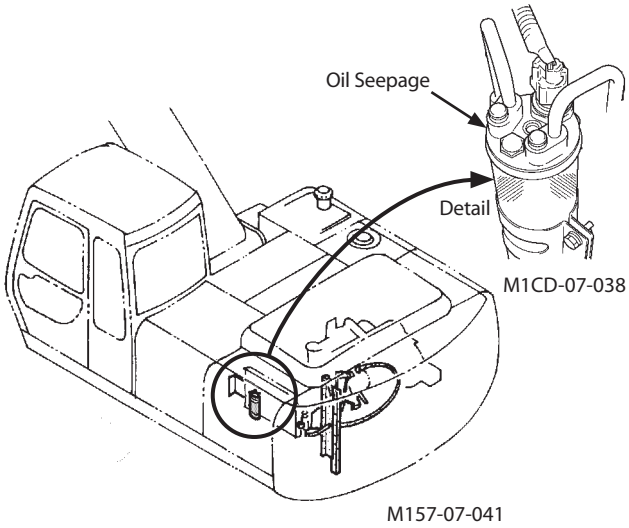
Washing procedure with water is as follows:

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 procedures described on the previous page.

10 Check Air Conditioner --- every 250 hours



Check pipe connections for refrigerant gas leakage

If oil seepage is found around pipe connections, it indicates possible gas leakage.

Check Refrigerant

Start the engine and run it at approximately 1500 min^{-1} (rpm). Turn the air conditioner switch to ON. Set the fan switch to HI and set the temperature control switch to the coolest position (18 °C on the monitor screen). Operate the air conditioner 2 to 3 minutes. Check if cool air comes out from the vent in the cab.

Type and amount of refrigerant when shipping the machine

Model	Type	Amount
ZX345USLC-6N	HFC134a	0.85±0.05 kg

Check the condenser

If the condenser fins become clogged with dirt or insects, the cooling effect will be decreased.
Be sure to keep it clean at all times. (Refer to "Clean Radiator/Oil Cooler/Inter Cooler Core" in Maintenance Chapter.)

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.

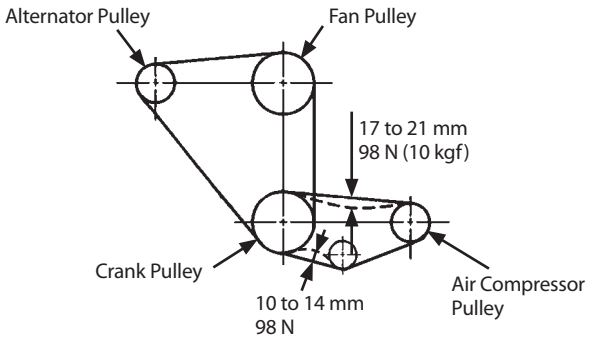
Check mounting bolts for looseness

Confirm that the compressor mounting bolts and other mounting/fastening bolts are securely tightened.

Inspect belt, check and adjust tension

--- every 250 hours

Visually check the compressor and fan belts for wear.
Check fan belt tension by depressing the midpoint of the belt with the thumb. Deflection must be shown in the right figure with a depressing force of approximately 98 N (10 kgf).
If cool air does not come out, or any other abnormalities are found in air conditioner system, see your authorized dealer for inspection.

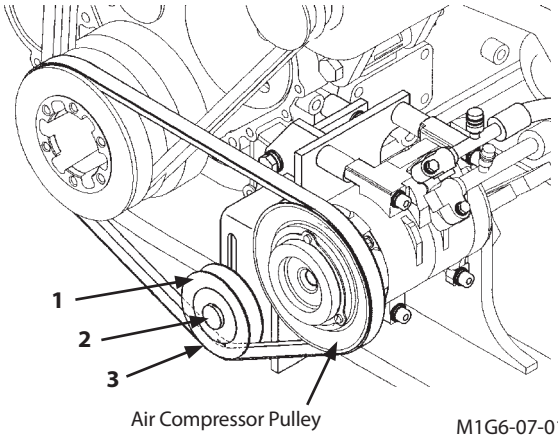


M1GR-07-007

Adjust Compressor Belt Tension

1. Loosen lock nut (2) of tension pulley (1).
2. Move tension pulley (1) by adjusting bolt (3) under tension pulley (1) until tension is correct.
3. Securely tighten bolt (2) of tension pulley (1).
4. After that tighten bolt (3).

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.



Air Compressor Pulley

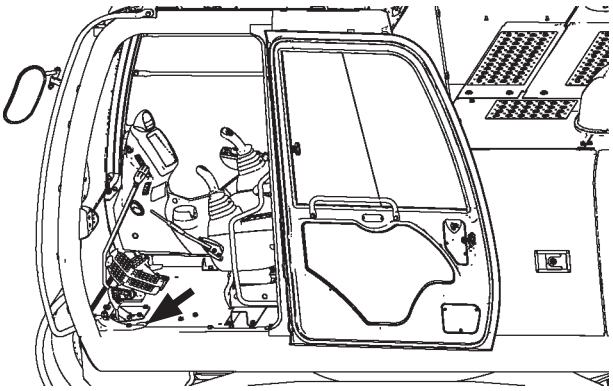
M1G6-07-013

11 **Clean Cab Floor**

--- as required

IMPORTANT: When cleaning the cab floor with tap water, spray the floor only. Take care not to splash the surrounding area. Do not increase water spray speed by restricting the hose end, and do not use high pressure steam for cleaning. Be sure to completely remove any moisture from the surrounding area.

1. Park the machine on solid and level surface. Lower the bucket to the ground. Before cleaning, stop the engine.
2. Sweep the cab floor clean using a brush, and brush dust from the cab floor while spraying water.
3. When cleaning the floor mat, sweep dust (water) along the grooves on the floor mat.
4. When cleaning after removing the floor mat, sweep dust (water) through one cleaning hole.



MDAA-07-041

12 **Retighten Cylinder Head Bolt**
--- as required

See your authorized dealer.

13 **Inspect and Adjust Valve Clearance**
--- every 1000 hours

See your authorized dealer.

14 **Measure Engine Compression Pressure**
--- every 1000 hours

See your authorized dealer.

15 **Check Starter and Alternator**
--- every 1000 hours

See your authorized dealer.

16 **Check and Replace EGR Device**
--- as required

See your authorized dealer.

17 **EGR Cooler Cleaning**
--- every 4500 hours

See your authorized dealer.

18 **Check Turbo Charger**
--- every 4500 hours

See your authorized dealer.

19 Check and Clean Injector

--- as required

See your authorized dealer.

20 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 dumpers are used in the overhead window of the cab. Contact your authorized dealer immediately in any of the following situations.

- The cover or window can not be opened with normal operating force.
- The cover or window can not maintain its open position.
- Oil or gas leak is found.

21 Tightening and Retightening Torque of Nuts and Bolts

--- every 250 hours (first time 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. For tightening nuts and bolts other than specified in the table below, refer to the Tightening Torque Chart at the end of this section.

No.	Descriptions		Bolt Dia	Quantity	Wrench size	Torque		
						N·m	(kgf·m)	(lbf·ft)
1.	Engine cushion rubber mounting bolt and nut		20	4	30	550	(55)	(410)
2.	Engine bracket mounting bolt (Pump side)		12	12	19	110	(11)	(81)
	Engine bracket mounting bolt (Fan side)		10	10	17	65	(6.5)	(48)
3.	Hydraulic oil tank mounting bolt		16	6	24	270	(27)	(200)
4.	Fuel tank mounting bolt		16	6	24	270	(27)	(200)
5.	Radiator mounting bolt (Left and right)		10	6	17	50	(5)	(37)
	Radiator mounting bolt (Lower side)		16	5	24	270	(27)	(200)
6.	Pump mounting bolt		12	13	19	110	(11)	(81)
7.	Control valve mounting bolt		18	4	27	300	(30)	(220)
	Control valve bracket mounting bolt		16	4	24	270	(27)	(200)
8.	Swing device mounting bolt		22	14	32	650	(65)	(480)
9.	Swing motor mounting bolt (Hexagon wrench)		12	8	10	90	(9)	(66)
10.	ORS fitting for hydraulic hose and piping		–	–	17	25	(2.5)	(18.5)
			–	–	19	30	(3)	(22)
			–	–	22	40	(4)	(29.5)
			–	–	27	95	(9.5)	(70)
			–	–	32	140	(14)	(103)
			–	–	36	180	(18)	(133)
			–	–	41	210	(21)	(155)
			–	–	50	260	(26)	(190)
11.	Hycolin tube mounting nut		–	–	17	35	(3.5)	(26)
12.	Battery mounting nut		10	8	17	25	(2.5)	(18.5)
13.	Cab mounting nut		16	4	24	210	(21)	(155)
	Cab mounting anchor bolt		22	2	32	550	(55)	(410)
	Cab cushion rubber mounting bolt		12	8	19	110	(11)	(81)
14.	Cover mounting bolt		8	–	13	20	(2)	(15)
			10	–	17	50	(5)	(37)
			12	–	19	90	(9)	(66)
15.	Constant torque clamp of low pressure piping		–	8	8	14	(1.4)	(10.5)
	Flexible master coupling of low pressure piping		–	1 pair	17	20.5 to 22.6	(2.1 to 2.3)	(15.0 to 16.5)
	Jubilee clamp of low pressure piping	Air cleaner I/C pipe	–	–	7	6	(0.6)	(4.4)
		For the radiator	–	–	8	6	(0.6)	(4.4)
		For the radiator (engine side)	–	–	8	6.9	(0.7)	(5.1)
	T-bolt clamp of low pressure piping		–	8	11	10	(1.0)	(7.4)
16.	Swing bearing mounting bolt	(Upperstructure)	27	36	41	1250	(125)	(920)
		(Undercarriage)	27	36	41	1230	(123)	(910)
17.	Travel device mounting bolt		20	40	30	630	(63)	(460)
	Travel reduction gear cover mounting bolt		14	12	22	180	(18)	(133)
	Sprocket mounting bolt		22	44	32	680	(68)	(500)
18.	Upper roller mounting bolt		18	16	27	460	(46)	(340)
19.	Lower roller mounting bolt		22	64	32	840	(84)	(620)
20.	Track shoe mounting bolt		22	384	32	1128	(113)	(830)
21.	Track guard mounting bolt		22	24	32	750	(75)	(550)
22.	Aftertreatment device mounting bolt		12	18	19	90	(9)	(66)
23.	DEF/AdBlue® tank bracket mounting bolt		10	4	17	50	(5)	(37)
24.	Platform handrail mounting bolt	Frame top	14	6	22	180	(18)	(133)
		Body top, Fuel tank top	12	7	19	110	(11)	(81)
25.	Body top handrail mounting bolt		12	6	19	110	(11)	(81)
26.	Cab top handrail mounting bolt		16	2	24	270	(27)	(200)
28	Front pin-retaining bolt		22	2	32	750	(75)	(550)
	Boom top, Arm cylinder bottom and rod pin-retaining bolt		18	5	27	400	(40)	(300)

Tightening Torque Chart

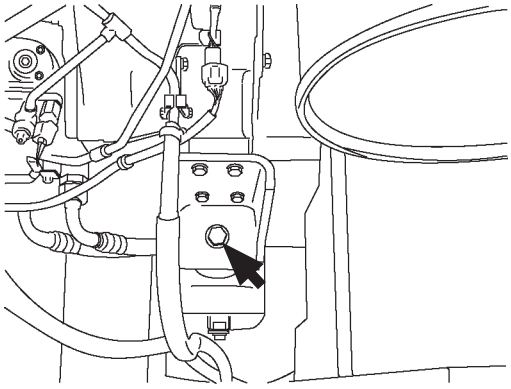
Bolt Dia. mm	Hexagon Wrench									Wrench size mm	Socket Bolt			
	10.9 Ⓣ T			8.8 Ⓗ H			7 M				Socket Bolt			Wrench size mm
	N·m	(kgf·m)	(lbf·ft)	N·m	(kgf·m)	(lbf·ft)	N·m	(kgf·m)	(lbf·ft)		N·m	(kgf·m)	(lbf·ft)	
6							3.3 to 4.2	(0.3 to 0.4)	(2.4 to 3.1)	10				5
8	30	(3.0)	(22)	20	(2.0)	(15)	10	(1.0)	(7.4)	13	20	(2.0)	(15)	6
10	65	(6.5)	(48)	50	(5.0)	(37)	20	(2.0)	(15)	17	50	(5.0)	(37)	8
12	110	(11)	(81)	90	(9)	(66)	35	(3.5)	(26)	19	90	(9)	(66)	10
14	180	(18)	(133)	140	(14)	(103)	55	(5.5)	(41)	22	140	(14)	(103)	12
16	270	(27)	(200)	210	(21)	(155)	80	(8.0)	(59)	24	210	(21)	(155)	14
18	400	(40)	(300)	300	(30)	(220)	120	(12)	(89)	27	300	(30)	(220)	14
20	550	(55)	(410)	400	(40)	(300)	170	(17)	(125)	30	400	(40)	(300)	17
22	750	(75)	(550)	550	(55)	(410)	220	(22)	(162)	32				
24	950	(95)	(700)	700	(70)	(520)	280	(28)	(205)	36				
27	1400	(140)	(1030)	1050	(105)	(770)	400	(40)	(300)	41				
30	1950	(195)	(1440)	1450	(145)	(1070)	550	(55)	(410)	46				
33	2600	(260)	(1920)	1950	(195)	(1440)	750	(75)	(550)	50				
36	3200	(320)	(2360)	2450	(245)	(1810)	950	(95)	(700)	55				

CAUTION: If fixing bolts for counterweight are loosened, consult your nearest authorized dealer.

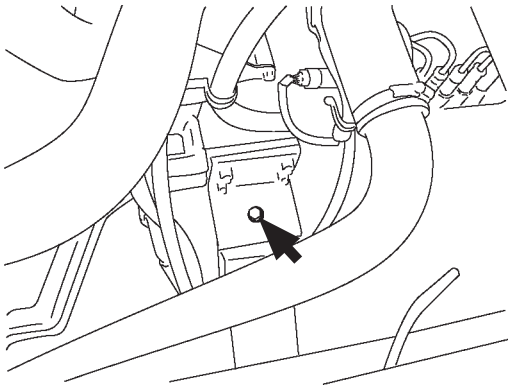
IMPORTANT:

- **Apply lubricant (e. g. white zinc B solved into spindle oil) to bolts and nuts to stabilize their friction coefficient.**
- **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 bolts and nuts

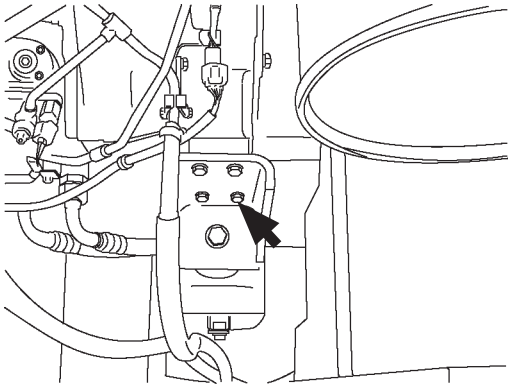


Pump Side M1U1-07-040

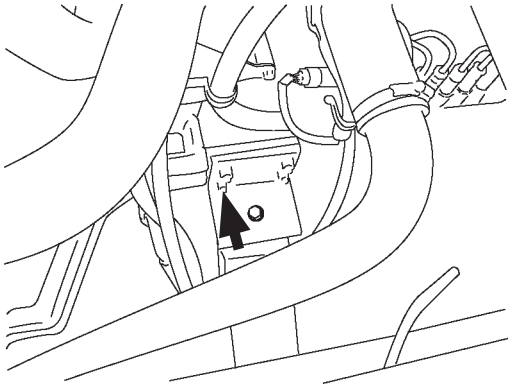


Fan Side M1U1-07-034

2. Engine bracket mounting bolts

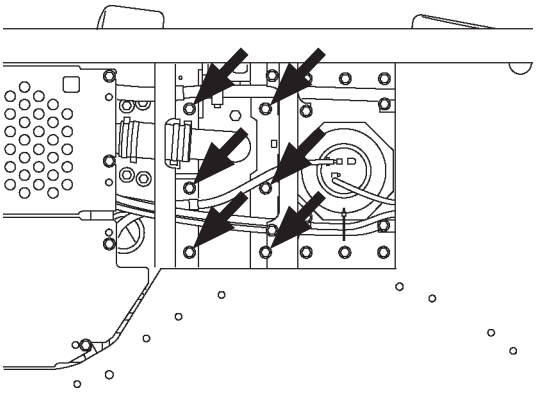


Pump Side M1U1-07-040



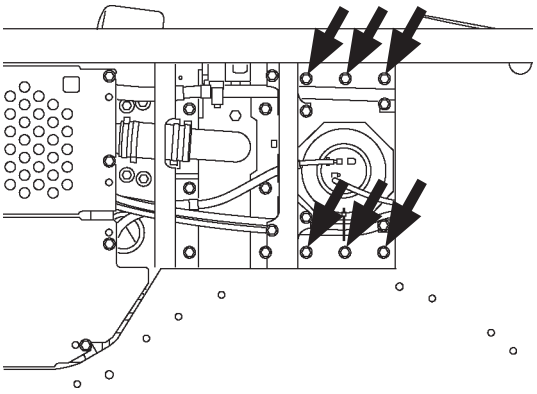
Fan Side M1U1-07-034

3. Hydraulic oil tank mounting bolts



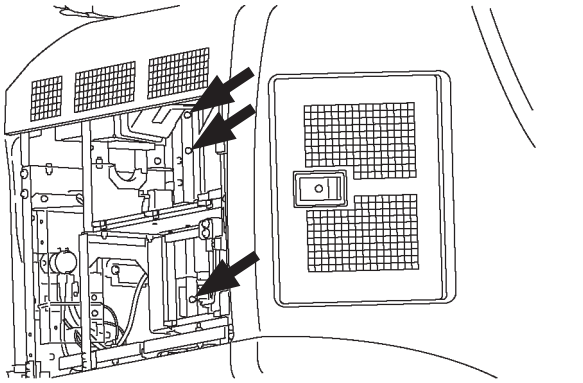
MDD5-07-022

4. Fuel tank mounting bolts

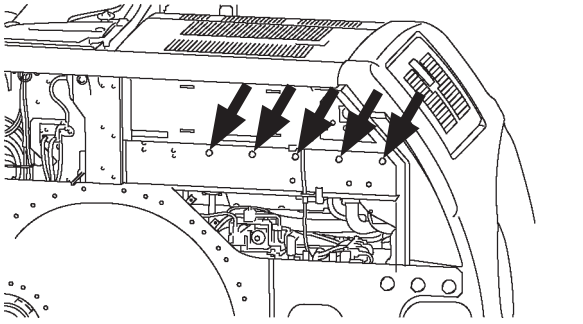


MDD5-07-022

5. Radiator mounting bolts

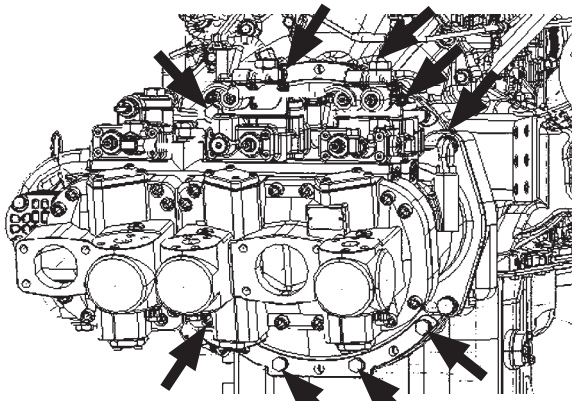


MDD5-07-023



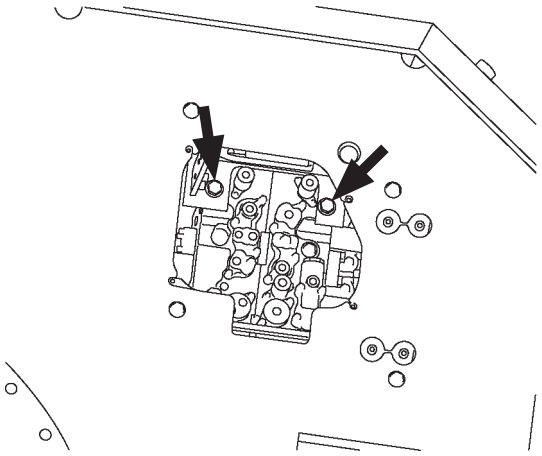
MDD5-07-024

6. Pump mounting bolts



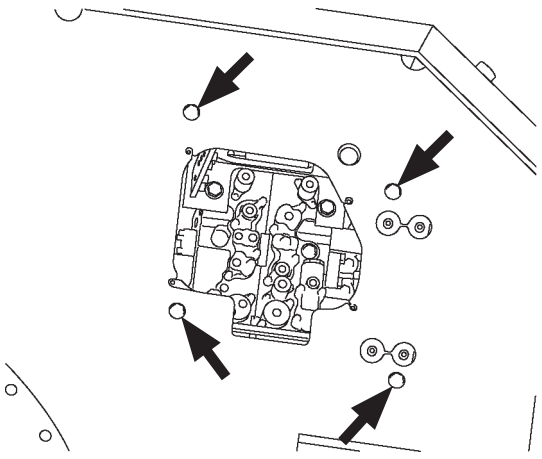
MDAA-07-110

7. Control valve mounting bolts



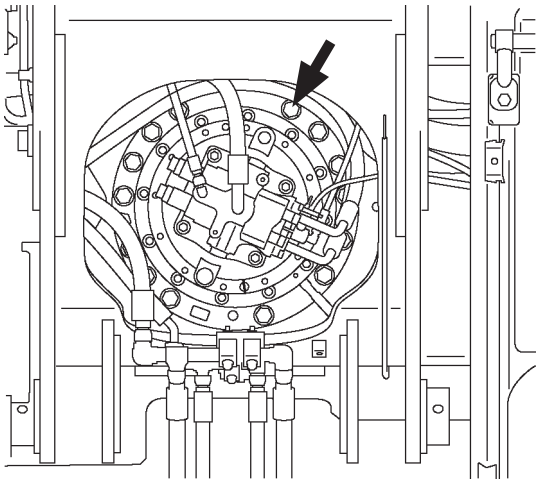
MDD5-07-025

Control valve bracket mounting bolts



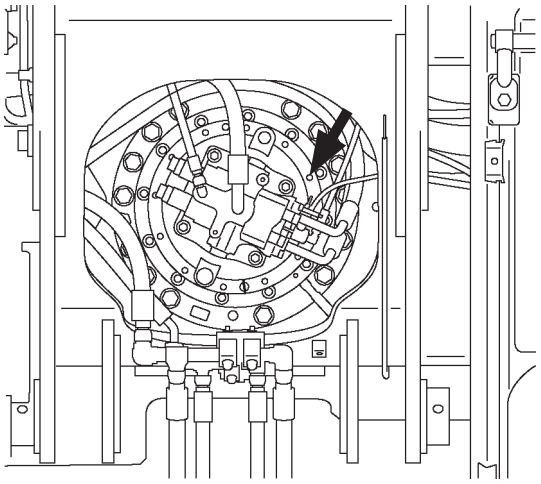
MDD5-07-025

8. Swing device mounting bolts



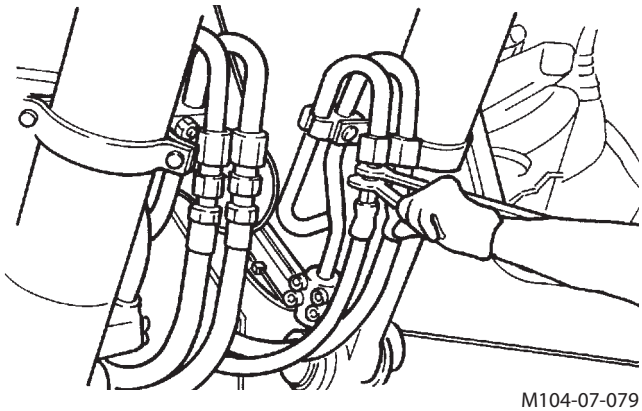
MDD5-07-026

9. Swing motor mounting bolts



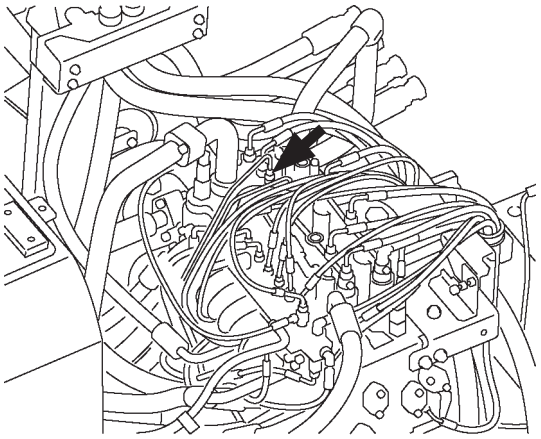
MDD5-07-026

10. ORS fittings for hydraulic hoses and piping



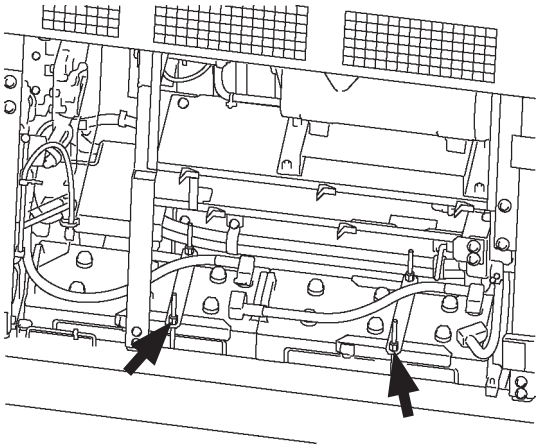
M104-07-079

11. Hycolin tube mounting nuts



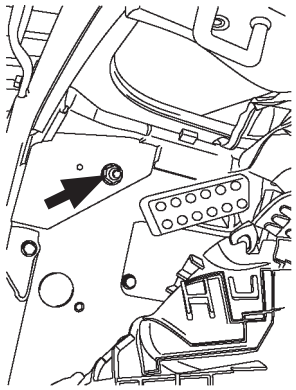
MDD5-07-027

12. Battery mounting nuts



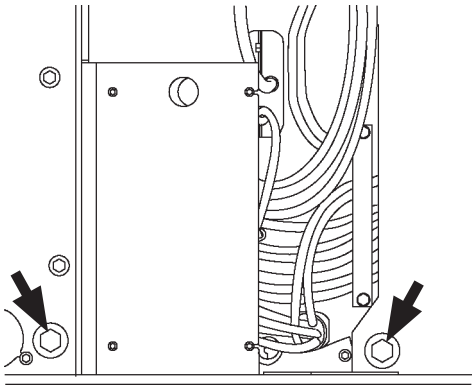
MDD5-07-028

13. Cab mounting nuts



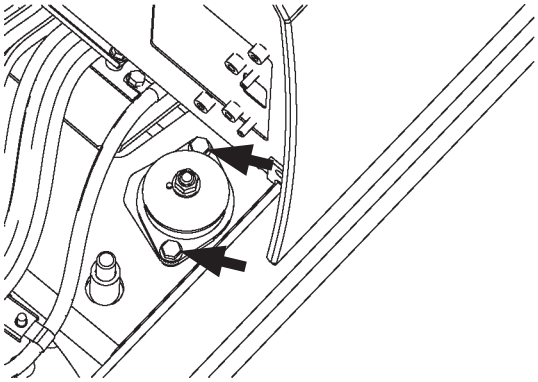
M1U1-07-026

Cab mounting anchor bolt



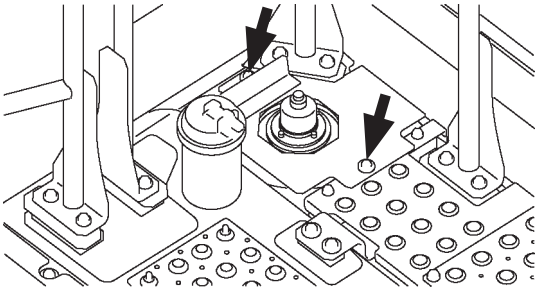
M1U1-07-054

Cab cushion rubber mounting bolt



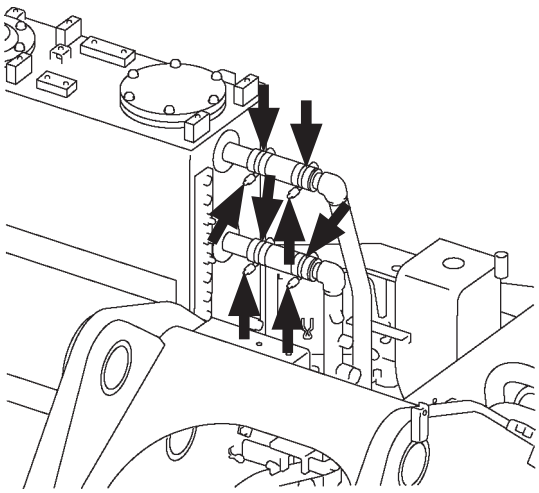
MDC1-07-052

14. Cover mounting bolts



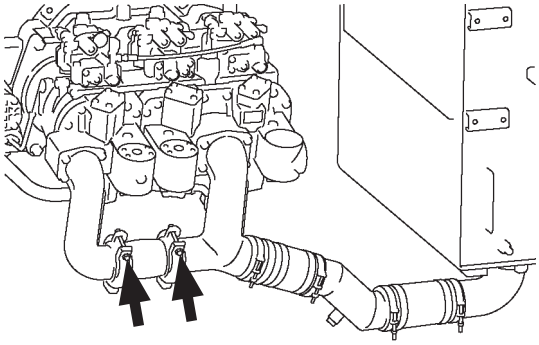
MDD5-07-011

15. Constant torque clamp of low pressure piping



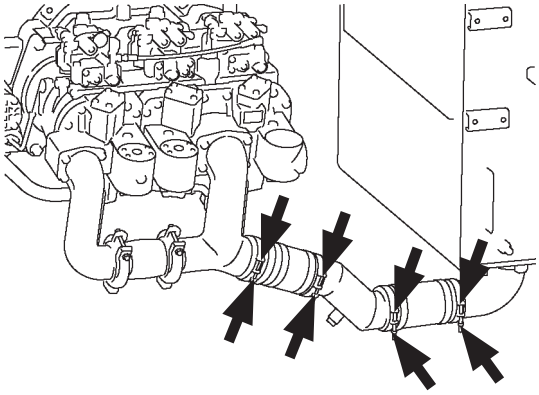
MDD5-07-029

Flexible master coupling of low pressure piping



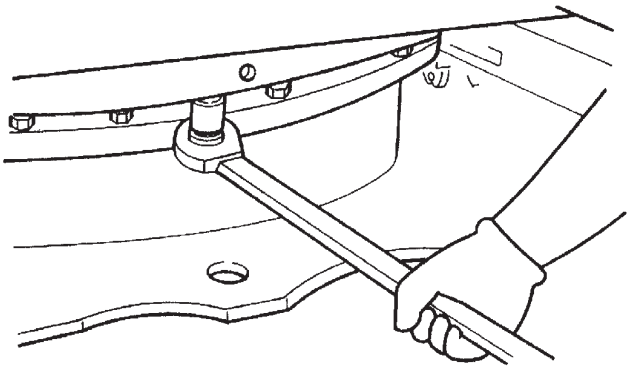
MDD5-07-030

T-bolt clamp of low pressure piping

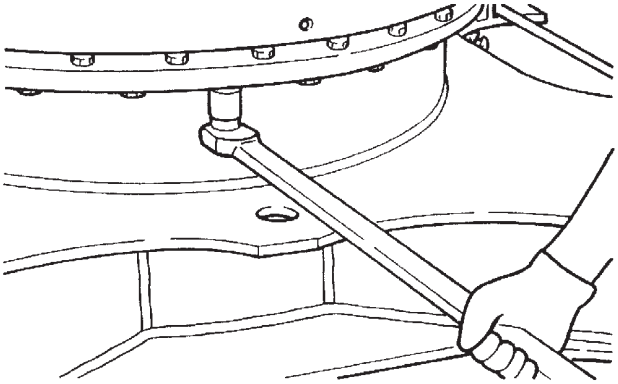


MDD5-07-030

16. Swing bearing mounting bolts

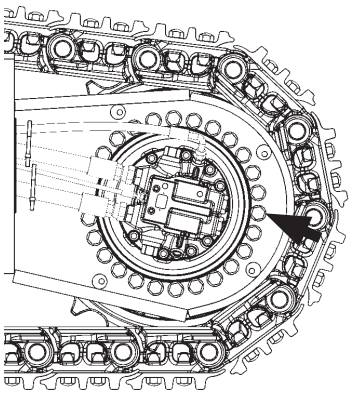


Upperstructure Side M107-07-088



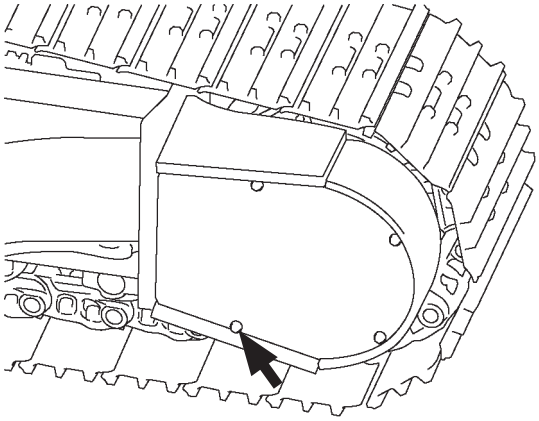
Undercarriage Side M107-07-089
ZX245USLC-6N

17. Travel device mounting bolts



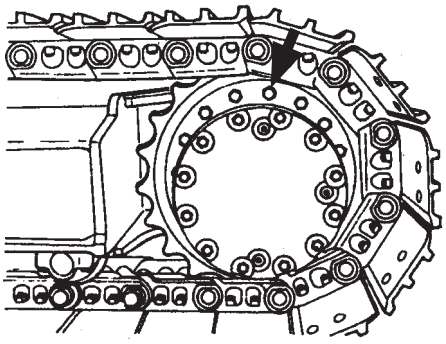
MDD5-07-052

Travel reduction gear cover mounting bolts



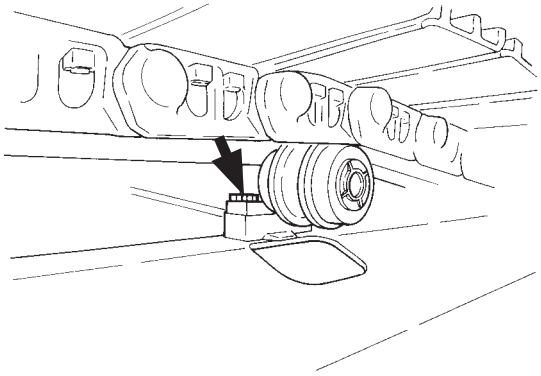
MDD5-07-031

Sprocket mounting bolts



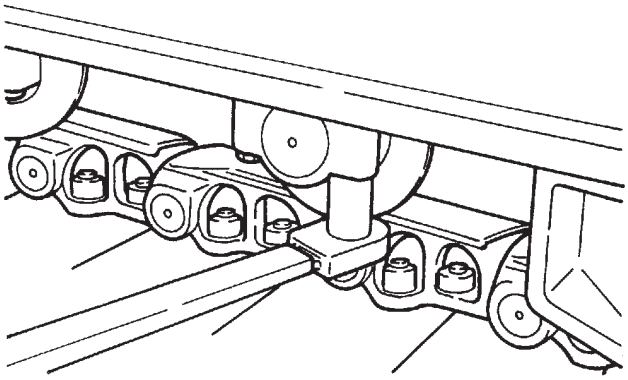
M154-07-050

18. Upper roller mounting bolts



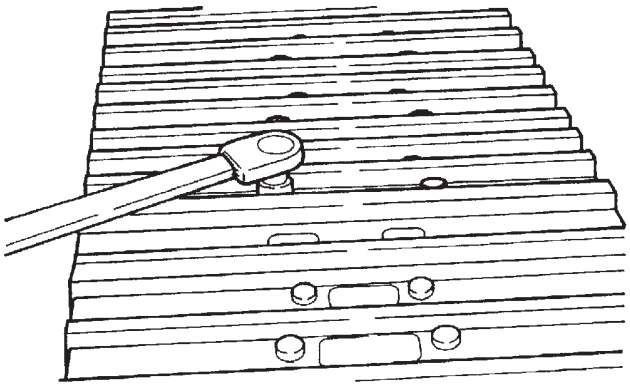
M157-07-224

19. Lower roller mounting bolts



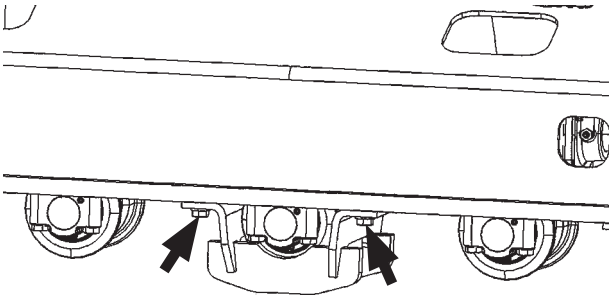
M107-07-092

20. Track shoe mounting bolts



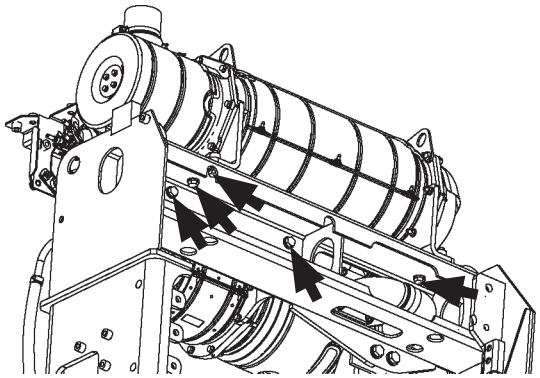
M107-07-093

21. Track guard mounting bolts



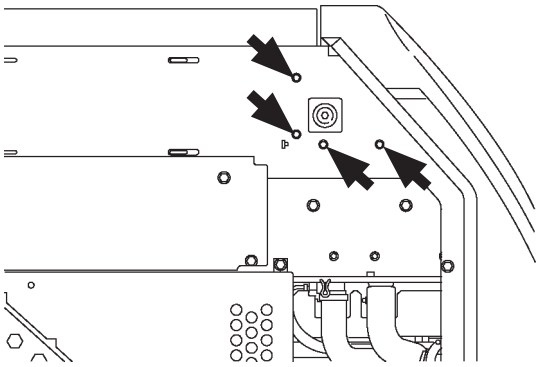
MDAA-07-058

22. Aftertreatment device mounting bolts



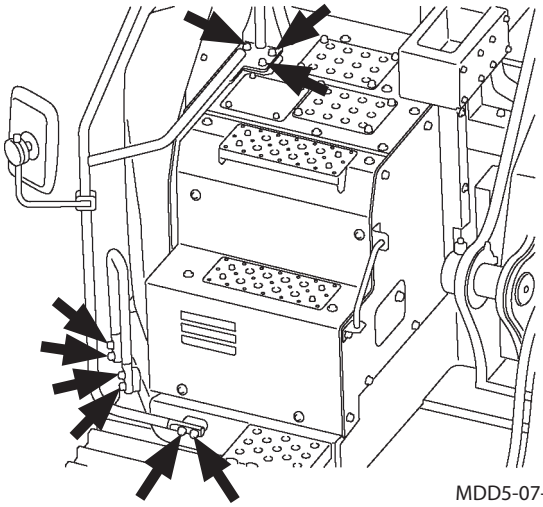
MDC1-07-049

23. DEF/AdBlue® tank bracket mounting bolts



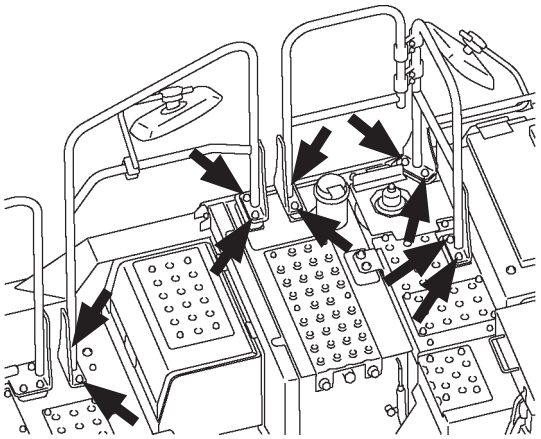
MDD5-07-032

24. Platform handrail mounting bolt



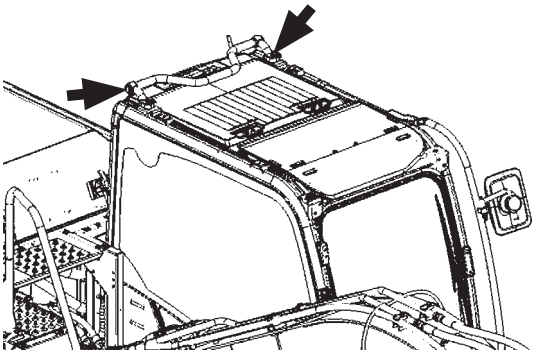
MDD5-07-033

25. Body top handrail mounting bolt



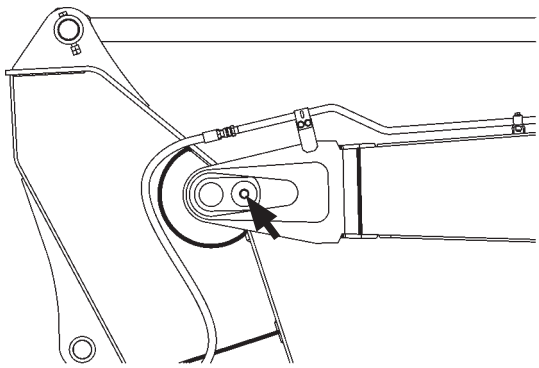
MDD5-07-034

26. Cab top handrail mounting bolt

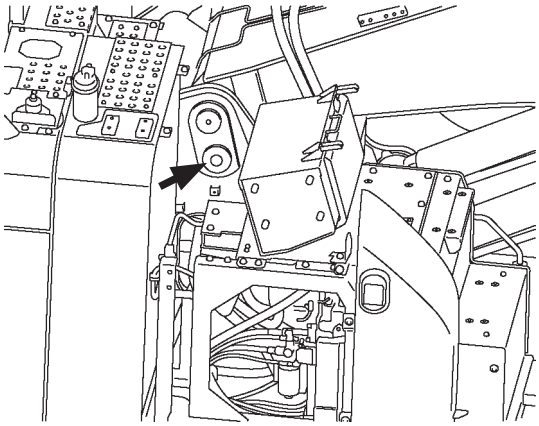


MDC1-07-077

28. Front pin-retaining bolt



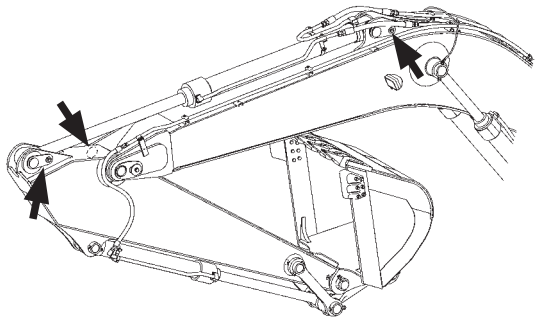
MDCS-07-004



MDD5-07-035

Boom top, Arm cylinder bottom and rod pin-retaining bolt

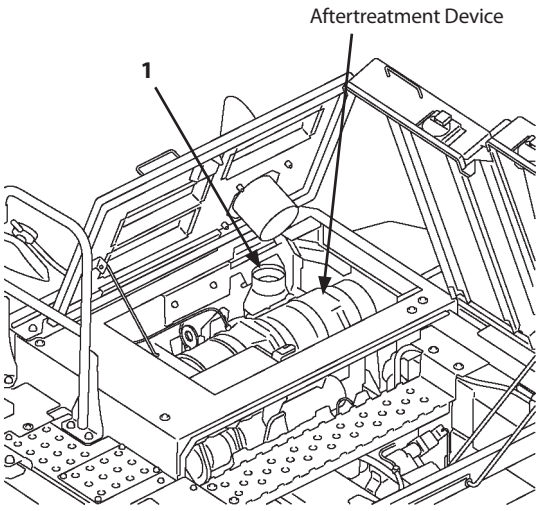
(There are three bolts on the boom top.)



MDCA-07-001

J. Aftertreatment Device

1 **Check and Clean Aftertreatment Device**
--- as required



MDD5-07-036

IMPORTANT:

- **Check and clean flammable materials on the area around the Aftertreatment device.**
- **Condensation for dew may blow out from exhaust outlet (1) of the afterfreatment device and black deposition may be observed; it is not a malfunction.**

Do not disassemble the base machine support parts and sensors.
When the machine is operated in dusty areas, refer to the page 9-1 "Maintenance Under Special Environmental Conditions".
Open the engine cover.
Check the NOx sensor, harnesses of exhaust temperature sensors and dosing module for abnormality.
Securely close the engine cover.
Clean it if necessary.

K. Urea SCR System

WARNING: Fill specified DEF/AdBlue® into the DEF/AdBlue® tank.

If improper DEF/AdBlue® is refilled, fire or system failure may result. If improper liquid is refilled in the DEF/AdBlue® tank, consult your authorized dealer for check or repair.

Specified DEF/AdBlue®
Refill DEF/AdBlue® which meets Japanese Industrial Standards (JIS K2247), International Organization for Standardization (ISO 22241) or Deutsche Industrie Normen (DIN 70070). If improper liquid (diesel oil, kerosene or gasoline) is refilled in the DEF/AdBlue® tank, fire or system failure may result. The specified DEF/AdBlue® is colorless and odorless solution (urea 32.5%, water 67.5%) which begins to freeze at -11 °C. Store the DEF/AdBlue® in -10 to 40°C environment.

In some cases, specified area solution is referred to by one or more of these names:

- Aqueous Urea Solution 32
- AUS 32
- NO_X Reduction Agent
- Catalyst Solution

⚠ CAUTION:

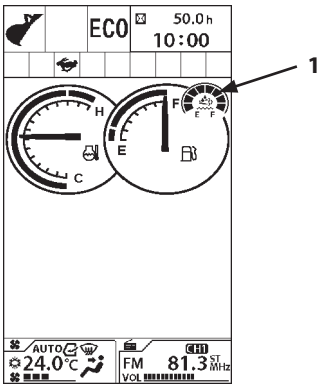
- **DEF/AdBlue® is colorless and harmless solution. It is harmless when contacting with the body, however, it may cause skin to become inflamed depending on the constitution of the individual. Flush DEF/AdBlue® with clean water when it contacts on the skin.**
- **If you swallow DEF/AdBlue® by mistake, drink 1 or 2 cups of water or milk and seek immediate medical attention.**
- **If DEF/AdBlue® is accidentally splashed into eyes, flush with water for 15 minutes or longer and get emergency medical attention.**

IMPORTANT:

- **Use dedicated container recommended by the business entity who is handling DEF/AdBlue® to store DEF/AdBlue®. Do not use general container, a container used for other purpose and contaminated container because the quality of DEF/AdBlue® deteriorates.**
- **The DEF/AdBlue® is non-combustible, however, move DEF/AdBlue® to a safe place when fire occurs.**
- **Wash out spilled DEF/AdBlue® with clean water.**
- **Seal the container and store it in a well ventilated place. If DEF/AdBlue® freezes, the quality does not change just after freezing.**
- **As long as sealed by an airtight stopper, unless water evaporates DEF/AdBlue® will not deteriorate within the guarantee period.**
- **Do not pour waste DEF/AdBlue® and its containers onto the ground, and do not allow waste to flow into rivers and/or lakes. When disposing DEF/AdBlue®, make sure to let authorized industrial waste disposal contractor dispose of it appropriately.**

1 Check DEF/AdBlue®
---daily

Park the machine on a level surface. Lower the bucket to the ground. Check the DEF/AdBlue® level with DEF/AdBlue® gauge (1).
If necessary, stop the engine and add DEF/AdBlue®.

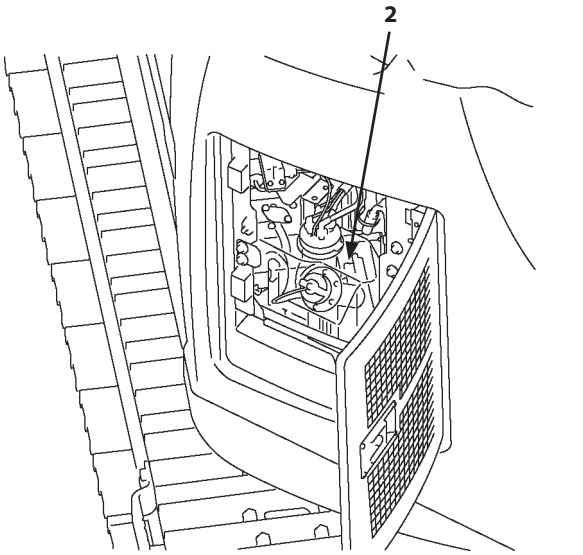


MDC1-01-001

Refill DEF/AdBlue®

⚠ CAUTION:

- **Refill DEF/AdBlue® which meets Japanese Industrial Standards (JIS K2247), International Organization for Standardization (ISO 22241) or Deutsche Industrie Normen (DIN 70070) in DEF/AdBlue® tank (2). If low density DEF/AdBlue® is refilled, alarm will be generated, restricting machine operation. Do not dilute DEF/AdBlue® with water.**
- **Do not add any additives to the specified DEF/AdBlue®. Similarly, do not use DEF/AdBlue® that already has additives in it. Doing so may cause damage to the machine.**
- **Wear safety equipment such as safety glasses or goggles, rubber globes appropriate to the job. Wash DEF/AdBlue® with clean water when it contacts on the skin. If DEF/AdBlue® is accidentally splashed into eyes, flush with water for 15 minutes or longer and get emergency medical attention.**
- **Prior to starting to refill, make sure no contaminants, such as sand or dust, are on the DEF/AdBlue® refill container or the port of the DEF/AdBlue® device.**

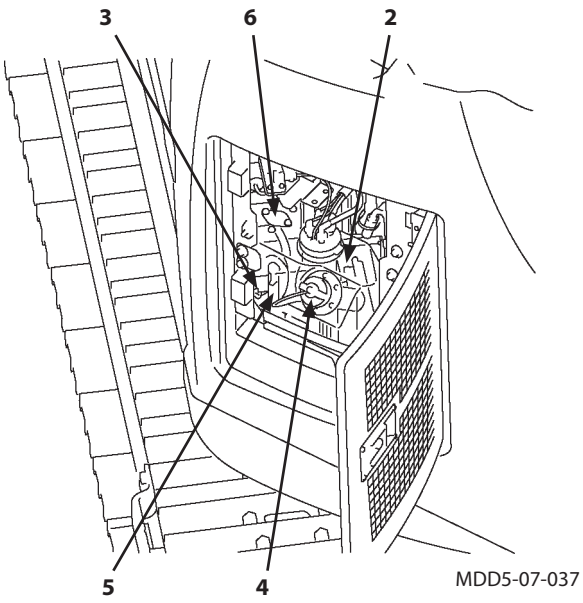


MDD5-07-037

1. Park the machine according to the instruction on "Preparations for Inspection and Maintenance" (7-8).
2. DEF/AdBlue® tank (2) is located in the cover at left rear of the machine. Open the cover with the key. Holding the handle on the access cover, raise the cover until the cover is secured with catch.
3. Clean dust and mud around the filler port of DEF/AdBlue® tank with clean cloth.

Model	DEF/AdBlue® Tank Capacity
ZX345USLC-6N	16 L (4.2 US gal)

4. Remove cap (4) from DEF/AdBlue® tank (2) and refill DEF/AdBlue®. Be sure to stop refilling before the "F" line by checking the level gauge (5) float.



MDD5-07-037

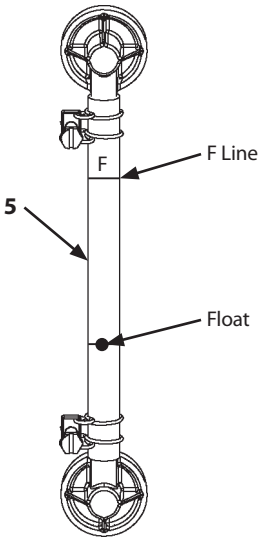
IMPORTANT:

- **Make sure the containers and equipment used for refilling and free of contaminants, such as sand, mud and dirt. If any contaminants are present, either rinse them off with soft water or wipe them off with a clean cloth before refilling.**
- **Take care not to allow dust and/or water to enter the DEF/AdBlue® tank when refilling.**
- **Put cap (4) of DEF/AdBlue® tank (2) on the cap holder (3) to prevent the cap from contamination.**
- **If DEF/AdBlue® is filled above the "F" line, the system may be damaged during operation or tank (2) may be broken when frozen.**

5. Install cap (4) after refilling DEF/AdBlue®. Close the tank cover and lock it with the key.

IMPORTANT:

- **Do not get on top of DEF/AdBlue® tank (2) or sensors and piping on the tank. Failure to do so may damage the machine.**
- **If it becomes necessary to refill DEF/AdBlue® when cap (4) can not be removed due to freezing, use emergency filler port (6).**
- **White deposits may be observed when DEF/AdBlue® is dried naturally; it is normal. Wash out DEF/AdBlue® deposits with soft water. Never use a high pressure washer.**



Level Gauge

MDC1-07-053

NOTE:

- *Wipe spilled DEF/AdBlue® and wash spilled area with plenty of water.*
- *The sound of flowing water may be heard from the tank after the engine stops. It is the sound of returning DEF/AdBlue® from piping to the tank, not a malfunction.*
- *DEF/AdBlue® will freeze at low temperature, and deteriorate (ammonification) at high temperature. Store DEF/AdBlue® at temperature between -10 and 40°C.*
- *Use dedicated container (purchased container) to store or carry DEF/AdBlue®. Alternatively use a polyethylene resin tank, or stainless steel tank.*

Clean Filler Port Strainer

Strainer (1) is provided on the filler port of the DEF/AdBlue® tank. Clean strainer (1) if dirt or dust is observed.

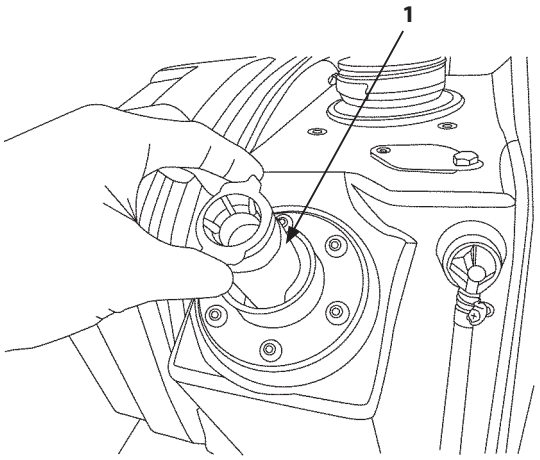
CAUTION: Wear safety equipment such as safety glasses or goggles, rubber gloves appropriate to the job. Wash DEF/AdBlue® with clean water when it contacts with the skin. If DEF/AdBlue® is accidentally splashed into eyes, flush with water for 15 minutes or longer and get emergency medical attention.

IMPORTANT: Take care not to allow dust to contaminate the area when carrying out the work.

1. Remove strainer (1) from the filler port of the DEF/AdBlue® tank.
2. Clean strainer (1) with compressed air pressure (lower than 0.2 MPa (2 kgf/cm^2)) or tap water.
3. Install strainer (1) on the filler port of the DEF/AdBlue® tank.

NOTE: If extendable filler neck (2) is used, clean strainer (3).

IMPORTANT: If DEF/AdBlue® overflows when supplying water, even if clean strainer (1), contact your authorized dealer.



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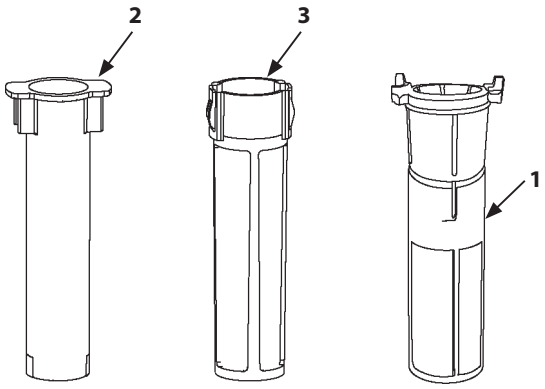


MJAG-07-070 MJAG-07-071 MJAG-07-072

Change DEF/AdBlue®

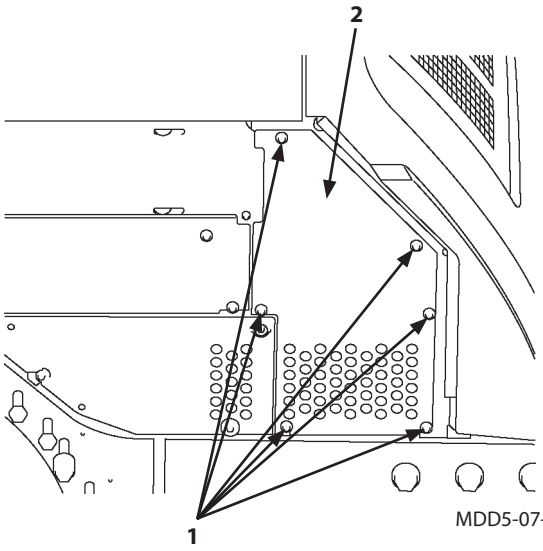
CAUTION: Wear safety equipment such as safety glasses or goggles, rubber gloves appropriate to the job. Wash DEF/AdBlue® with clean water when it contacts with the skin. If DEF/AdBlue® is accidentally splashed into eyes, flush with water for 15 minutes or longer and get emergency medical attention.

IMPORTANT: When contaminated or deteriorated DEF/AdBlue® is used, malfunction may result. Change DEF/AdBlue® periodically to keep cleanliness in the tank.

1. Remove bolts (1) and cover (2).
2. Place a 16 liter or larger capacity container under drain plug (3).
3. Slowly loosen drain plug (3) to drain DEF/AdBlue®.
4. Tighten drain plug (3) after draining DEF/AdBlue®.

   Wrench size: 13 mm

   Tightening torque: 19.5 N·m (1.95 kgf·m, 14.4 lbf·ft)
5. Fix cover (2) with bolts (1).



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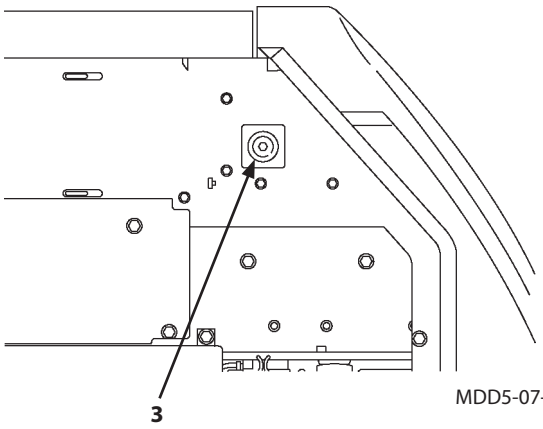

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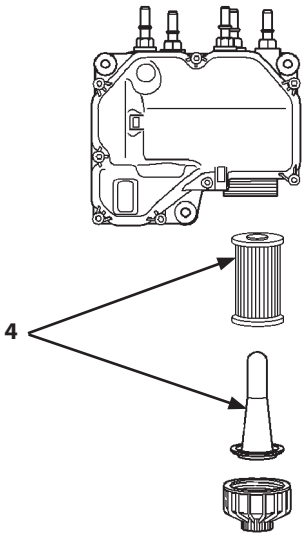
2 Replace DEF/AdBlue® Supply Module Main Filter --- every 4500 hours

A filter (4) is mounted in the DEF/AdBlue® pump. Periodically replace filter (4).



MDC1-07-105

CAUTION: Wear safety equipment such as safety glasses or goggles, rubber gloves appropriate to the job. Wash DEF/AdBlue® with clean water when it contacts with the skin. If DEF/AdBlue® is accidentally splashed into eyes, flush with water for 15 minutes or longer and get emergency medical attention.

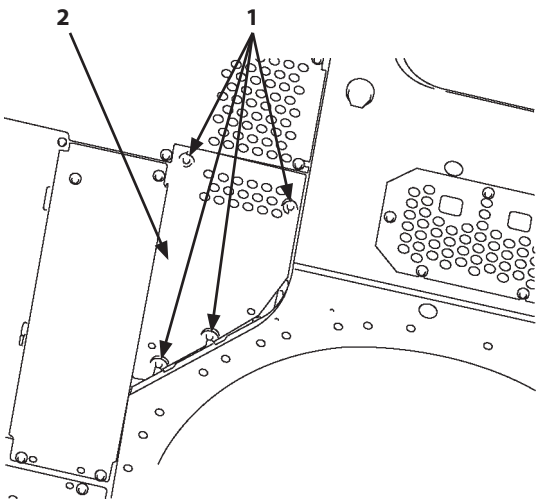
IMPORTANT:

- **Take care not to allow dirt and/or water to enter the DEF/AdBlue® tank while replacing filter (4).**
- **Check for leaks around the mounting position after replacement.**
- **White deposition may be observed when DEF/AdBlue® is dried naturally; it is normal. Wash out DEF/AdBlue® deposition with clean water. Never use a high pressure washer.**

1. Park the machine according to the instruction on Preparations for Inspection and Maintenance (7-7).

NOTE: The DEF/AdBlue® pump is located bottom of the machine, near the engine.

2. Remove bolts (1) and cover (2).
3. Remove cap (3) from the DEF/AdBlue® pump by using a 27 mm bihexagon wrench.
4. Pull out filter (4) inside the pump. As it is tightly mounted, it can not be pulled by hands. Use tools such as a pliers. Replace filter (4) assembly when replacing filter (4) of DEF/AdBlue® supply module.
5. Install new filter (4), and tighten cap (3) with 20±5 N·m (2.0±0.5 kgf·m, 15±3.7 lbf·ft) torque.
6. Fix cover (2) with bolts (1).



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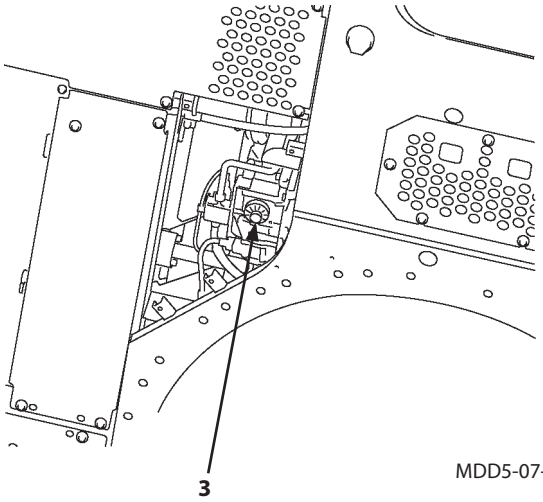

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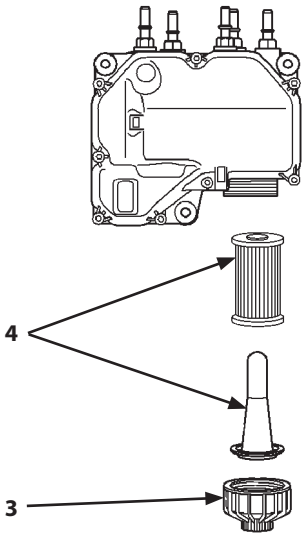

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3 **Replace DEF/AdBlue® Tank Water Supply Inlet Filter --- every 4500 hours or if DEF/AdBlue® overflows when supplying water**

IMPORTANT: Replace the filter without cleaning. Reusing after cleaning may cause a malfunction.

The filter inside the water supply inlet of the DEF/AdBlue® tank must be replaced periodically. Consult your authorized dealer for replacement.

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 salt pollution measures 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 position of cover, where sea water is easily collected. (4) During storage of the machine, cover the machine with tarpaulin to prevent sea water from entering into the cab vent. Apply rust prevention oil (example: ANTIRUST P-1300NP-3 JX Nippon Oil & Energy Corporation) onto plated part of the cylinder rods.
Dusty Atmosphere	Air Cleaner	: Clean the element regularly at shorter service intervals.
	Radiator	: Clean the radiator to prevent clogging of the radiator core.
	Fuel System, Urea SCR System	: Replace the filter element and strainer regularly at shorter service intervals.
	Engine, Aftertreatment Device	: Clean earlier than the normal interval to prevent dust from sticking and accumulating. Inhibit the aftertreatment device 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.
	Front Attachment	: Standard attachment may be damaged when digging rocky ground. Reinforce the bucket before using it, or use a heavy duty bucket.
Falling Stones	Cab Head Guard	: Provide a cab guard to protect the machine from falling stones. Consult your nearest Hitachi dealer.
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.
	Track	: Keep the tracks clean. Park the machine on a hard surface to prevent the tracks from freezing to the ground.
	DEF/AdBlue®	: May become frozen but the machine can be operated normally.

MEMO

STORAGE

Storing the Machine

In case the machine is to be stored for longer than one month, pay attention to the following points to in preparation for the next operation.

Precautions for Long-Term Storage

Item	Remedy
Machine Cleaning	Wash the machine. Remove soil or other debris adhered to the machine.
Lubrication/Greasing	Check level of lubricant 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 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".
Protection Against Dust and Moisture	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 occur. This may cause abnormal wear of the machine when the machine operation is restarted. If the machine is to be stored for a long time, at least once a month operate the following hydraulic functions two to three times for lubrication: Travel, swing and digging. Be sure to check the coolant level and lubrication conditions before operating.
DEF/AdBlue®	DEF/AdBlue® may become ammonia when storing it under 40°C for one month or longer. Change DEF/AdBlue® if ammonia odor is observed when opening the tank cap.

NOTE:

- *Lubricating operation is a series of warm-up, travel, swing and digging operation carried out repeatedly for a few cycles at slow speed.*
- *Lubricants will deteriorate during long term storage of the machine. Be sure to carefully check the lubricants before restarting operation of the machine.*

Precautions for Disconnecting or Connecting Batteries

In case the batteries are kept disconnected for more than one month or when the batteries are reconnected, contact your authorized dealer. Resetting of the Information Controller may be required.

MEMO

Troubleshooting

If any machine trouble has occurred, immediately repair it. Make certain the cause of the trouble and take necessary measures to prevent the reoccurrence of the same trouble.
In case troubleshooting is difficult, or measures marked with * must be taken, consult your authorized dealer. Never attempt to adjust, disassemble, or repair the hydraulic and/or electrical/electronic parts/components.
IMPORTANT: Never attempt to disassemble or modify the hydraulic and electrical/electronic components.

Engine

Consult your authorized dealer for the engine troubleshooting.

Engine Auxiliaries

Problem	Cause	Solution
Batteries will not be charged.	Broken battery separator	Replace
	Faulty regulator	* Adjust and replace
	Faulty ground line	* Repair
	Faulty alternator	* Repair or replace
Batteries discharge quickly after being charged.	Shorted cable	* Repair or replace
	Shorted battery separator	Replace
	Increased sediment in battery	Replace
Coolant temperature is too high.	Low coolant level	Refill
	Insufficient fan belt tension	Adjust
	Damaged rubber hose	* Replace
	Faulty thermostat	* Replace
	Faulty coolant temperature gauge	* Replace

Items with * mark: Consult 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
		Too high engine oil viscosity	Change engine oil with appropriate viscosity.
		Faulty starter and/or electrical system	* Repair and replace
		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 atmospheric temperature rises.
		Engine stop switch is ON	* Repair and replace
		Faulty preheat system	* Repair and replace
Even though the engine is started, the engine stalls soon.		Too low idle speed	* Repair and replace
		Clogged fuel main filter	Replace element.
		Clogged fuel pre-filter	Replace element.
		Faulty engine control system	* Repair and replace
		Clogged air cleaner	Clean or replace the element.
		Faulty fuel system	* Repair and replace
Engine runs irregularly.		Faulty fuel system	* Repair and replace
		Water or air in the fuel system	Drain water or bleed air.
		Faulty engine control system	* Repair and replace
		Clogged aftertreatment device	* Repair and replace

Items with * mark: Consult your authorized dealer.

Control Lever

Problem	Cause	Solution
Lever is heavy to operate.	Rusted joint	* Lubricate or repair
	Worn pusher	* Replace
Does not move smoothly.	Worn pusher	* Repair or replace
	Faulty pilot valve	* Replace
Does Not Return to Neutral.	Faulty pilot valve	* Replace
The lever is tilted in the neutral position due to increase in play.	Worn joint	* Repair or replace
	Faulty pilot valve	* Replace

Items with * mark: Consult your authorized dealer.

Hydraulic System

When the machine is stored without operation, air mixed in hydraulic oil will become separated and will accumulate in the cylinder upper sections, causing a delay in the response time of the machine movement or weak power development.
In case these symptoms appear, repeatedly operate all actuators several times.

Problem	Cause	Solution
No hydraulic Functions (Noise from pumps)	Faulty hydraulic pump	* Repair or replace
	Lack of hydraulic oil	Refill
	Broken suction pipe and/or hose	* Repair or replace
No hydraulic Functions (Hydraulic pump noise remains unchanged.)	Faulty pilot pump	* Replace
	Faulty pilot shut-off solenoid valve	* Replace
	Faulty wire harness (pilot shut-off solenoid valve) pilot shut-off switch.	* Repair or replace
	The pilot control shut-off lever is in the LOCK position.	Turn it to the UNLOCK Position.
All actuators have no power.	Malfunction due to worn hydraulic pump	* Replace
	Decreased main relief valve set pressure in the control valve	* Adjust
	Lack of hydraulic oil	Refill
	Clogged suction strainer in the hydraulic oil tank	Clean
	Absorption of air from the oil suction side	Retighten
	Faulty pressure sensor.	* Replace
	Faulty solenoid valve	* Replace
Only one side lever is inoperable or has no power.	Faulty relief valve in the valve	* Repair or replace
	Broken pipe and/or hose	* Repair or replace
	Loose pipe line joint	Retighten
	Broken O-ring at pipe line joint	* Replace
	Faulty hydraulic pump	* Repair or replace
	Faulty pilot valve	* Replace
	Faulty pilot circuit line	* Repair or replace
	Faulty pilot solenoid valve	* Repair or replace

Items with * mark: Consult your authorized dealer.

Problem	Cause	Solution
Only one actuator is inoperable.	Broken control valve spool	* Replace
	Embedded foreign matter in valve spool	* Repair or replace
	Broken pipe and/or hose	* Repair or replace
	Loose pipe line joint	Retighten
	Broken O-ring at pipe line joint	* Replace
	Broken actuator	* Repair or replace
	Faulty pilot valve	* Replace
	Faulty pilot circuit line	* Repair or replace
	Faulty pilot solenoid valve	* Repair or replace
Only one cylinder is inoperable or has no power.	Broken oil seal in cylinder	* Repair or replace
	Oil leak due to damage to cylinder rod	* Repair or replace
	Faulty pilot valve	* Replace
	Faulty pilot circuit line	* Repair or replace
	Faulty pilot solenoid valve	* Repair or replace
Hydraulic oil temperature increases.	Stained oil cooler	Clean
	Insufficient engine fan belt tension	Adjust
	Insufficient rotation speed of hydraulically driven fan	* Repair or replace
Oil leak from low pressure hose.	Loose clamps	Retighten
	Faulty suction manifold	* Repair or replace

Items with * mark: Consult your authorized dealer.

Drive Function

Problem	Cause	Solution
One or both side tracks are inoperable.	Damaged center joint	* Repair or replace
	Incompletely released parking brake	* Repair or replace
	Broken travel motor	* Repair or replace
	Faulty pilot valve	* Replace
	Faulty pilot circuit line	* Repair or replace
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
	Embedded foreign matter such as rock fragments	Remove
	Dragged parking brake	* Repair
Travel speed does not change.	Faulty travel mode switch.	* Replace
	Faulty pressure sensor.	* Replace
	Pump 1 and 2 delivery pressure sensors	
	Pumps 1, 2 control pressure sensors	
	Poor contact in connectors	* Repair or replace
	Damaged wire harness	* Repair
	Faulty controller (MC)	* Replace
	Faulty solenoid valve	* Repair or replace
	Faulty motor	* Repair or replace

Items with * mark: Consult your authorized dealer.

Swing Function

Problem	Cause	Solution
Upperstructure does not swing.	Faulty swing parking brake	* Repair or replace
	Faulty swing parking brake release valve	* Repair or replace
	Broken swing motor	* Repair or replace
	Faulty pilot valve	* Replace
	Faulty pilot circuit line	* Repair or replace
Swing is not smooth.	Worn swing gear	* Repair or replace
	Damaged swing bearing and bearing balls.	* Repair or replace
	Lack of grease	Refill
	Inversion protective valve	* Repair or replace

Items with * mark: Consult your authorized dealer.

Just after the control valve, swing motor relief valve and/or the swing motor is replaced, a noise may be emitted and/or operation may not be performed smoothly due to air trapped in the hydraulic line.
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
Even if operating the engine control dial, the engine speed does not change.	Blown fuse	Replace
	Faulty engine control dial	* Replace
	Poor contact in connector	* Repair or replace
	Damaged wire harness (between EC dial and MC, or MC and ECM)	* Repair
	Faulty controller (MC, ECM)	* Replace
	Performing manual regeneration	(Normal control)
Work mode does not change.	Faulty mode switch	* Replace
	Poor contact in connector	* Repair or replace
	Damaged wire harness (between MC and monitor)	* Repair
	Faulty controller (MC)	* Replace
	Faulty solenoid valve	* Repair or replace
Auto-idle is inoperable or not released.	Faulty pressure sensor.	* Replace
	Poor contact in connector	* Repair or replace
	Damaged wire harness	* Repair
	Faulty controller.	* Replace
	Performing manual regeneration	(Normal control)

Items with * mark: Consult 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
	Damaged wire harness	* Repair
	Faulty controller.	* Replace
	Faulty pump solenoid valve.	* Replace
	Faulty pressure sensor.	* Replace

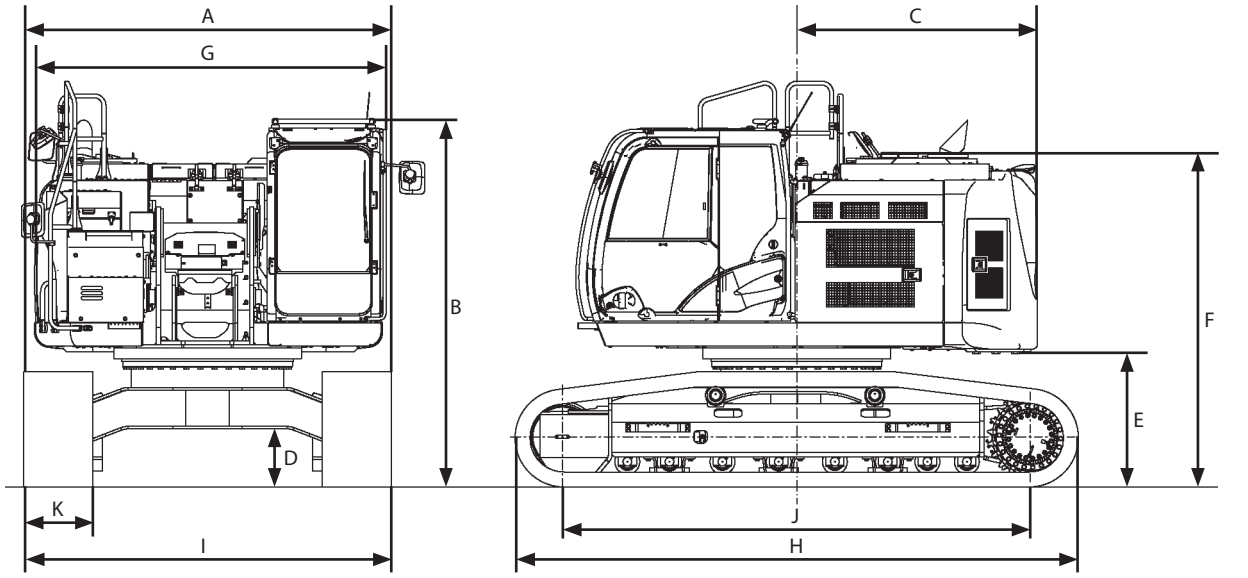
Items with * mark: Consult your authorized dealer.

Others

The machine may have a noise, excessive vibration, and abnormal smell when any trouble occurs.
Always beware of the machine conditions during operation.

Specifications

ZX345USLC-6N



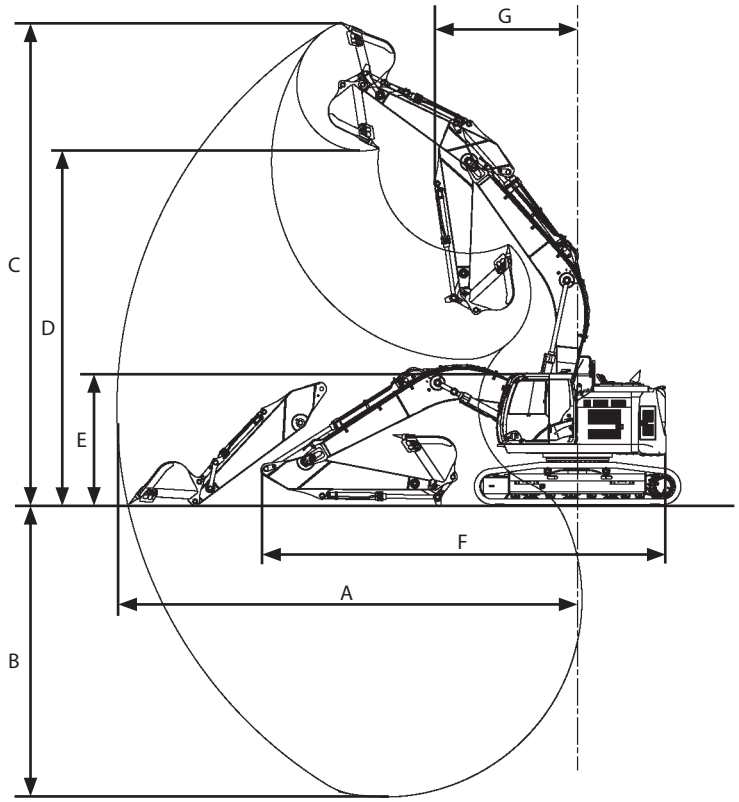
MDD5-12-001

Model	ZX345USLC-6N
Type of Front-End Attachment	3.11 m (10 ft 2 in) Arm
Bucket Capacity (Heaped)	PCSA 1.25 m^3 (1.64 yd^3), CECE 1.10 m^3
Operating Weight	34800 kg (76800 lb)
Base Machine Weight	28800 kg (63500 lb)
Engine	Isuzu AQ-6HK1XASA-02S 186kW/1900 min^{-1} (253 PS/1900 rpm)
A : Overall Width (Excluding back mirrors)	3190 mm (10 ft 6 in)
B : Cab Height	3230 mm (10 ft 7 in)
C : Rear End Swing Radius	2090 mm (6 ft 10 in)
D : Minimum Ground Clearance	*500 mm (8 ft 20 in)
E : Counterweight Clearance	*1160 mm (3 ft 10 in)
F : Engine Cover Height	*2900 mm (9 ft 6 in)
G : Overall Width of Upperstructure	3050 mm (10 ft)
H : Undercarriage Length	4940 mm (16 ft 3 in)
I : Undercarriage Width	3190 mm (10 ft 6 in)
J : Sprocket Center to Idler Center	4050 mm (13 ft 4 in)
K : Track Shoe Width	600 mm (24 in) (Grouser shoe)
Ground Pressure	66 kPa (0.67 kgf/cm^2, 9.6 psi)
Swing Speed	10.5 min^{-1} (rpm)
Travel Speed (fast/slow)	4.1/2.6 km/h (2.5/1.6 mph)
Gradeability	35 ° ($\tan\theta = 0.70$)

*NOTE: * The dimensions do not include the height of the shoe lug.*

Working Ranges

ZX345USLC-6N



Backhoe

MDD5-12-002

Category / Item	3.11 m (10 ft 2 in) Arm Backhoe		3.76 m (12 ft 4 in) Arm Backhoe	
	mm	ft·in	mm	ft·in
A : Maximum Digging Reach	10900	35′ 9″	11460	37′ 7″
B : Maximum Digging Depth	*6920	*22′ 8″	*7570	*24′ 10″
C : Maximum Cutting Height	*11410	*37′ 5″	*11690	*38′ 4″
D : Maximum Dumping Height	*8380	*27′ 6″	*8670	*28′ 5″
E : Overall Height	3380	11′ 1″	3420	11′ 3″
F : Overall Length	9960	32′ 8″	10020	32′ 11″
G : Minimum Swing Radius	3400	11′ 2″	3390	11′ 2″

*NOTE: * The dimensions do not include the height of the shoe lug.*

Shoe Types and Applications

ZX345USLC-6N

Shoe Width		600 mm (24″) Grouser Shoe	700 mm (28″) Grouser Shoe	800 mm (31″) Grouser Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	34800 (76800)	35200 (77700)	35600 (78500)
Base Machine Weight	kg (lb)	28800 (63500)	29200 (64400)	29600 (65300)
Cab Height	mm (ft·in)	3230 (10' 7″)	3230 (10' 7″)	3230 (10' 7″)
Minimum Ground Clearance	mm (ft·in)	* 500 (1'8″)	* 500 (1'8″)	* 500 (1'8″)
Undercarriage Length	mm (ft·in)	4940 (16' 3″)	4940 (16' 3″)	4940 (16' 3″)
Undercarriage Width	mm (ft·in)	3190 (10' 6″)	3290 (10' 10″)	3390 (11' 2″)
Ground Pressure		66 kPa (0.67 kgf/cm^2, 9.6 psi)	57 kPa (0.58 kgf/cm^2, 8.3 psi)	50 kPa (0.51 kgf/cm^2, 7.3 psi)

NOTE:

- *The Specifications for the front-end attachment is for 3.11 m (10 ft 2 in) arm with PCSA 1.25 m^3 (1.64 yd^3) bucket.*
- *700, 800 mm (28, 31 in) grouser shoe should not be used on gravel or rocky ground.*
- ** The dimensions do not include the height of the shoe lug.*

Bucket Types and Applications

ZX345USLC-6N

Bucket	Bucket Capacity m^3 (yd^3)		Bucket Width mm (in) (With side cutter)	Application	Front-End Attachment	
	PCSA (Heaped)	CECE (Heaped)			3.11 m (10' 2") Arm	3.76 m (12' 4") Arm
Hoe Bucket	1.00 (1.31)	0.90	1260 (49.6")		●	●
	1.25 (1.64)	1.10	1490 (59.0")		●	●
	1.40 (1.83)	1.20	1630 (64.2")		○	□
	1.62 (2.12)	1.40	1830 (72.0")		-	-
Bucket reinforcement can be welded in four places upon customer' s request	1.10 (1.44)	1.00	1350 (53.2")		●	●
	1.40 (1.83)	1.20	1630 (64.2")		○	□
Rock Bucket	0.92 (1.20)	0.80	1210 (47.6")		■	-
Ripper Bucket	0.80 (1.05)	0.70 (0.92)	1000 (39.4") (Without side cutter)		■	-
One Point Ripper	-		-		■	-
Clamshell Bucket		0.80 (1.05)	Bucket width 975 (38.4")	Side ditching	●	-

NOTE:

- *Symbols in the above table have the following meanings.*

● *: General excavating*

○ *: Light duty excavating*

■ *: Rock digging*

□ *: Loading work*

◊ *: Slope-finishing work*

\- *: Not applicable (not warrantable)*

- *Hoe bucket is applicable to the following types of work.*

  General excavating:

  For digging and loading operation of sand, gravel, clay, ordinary earth and so on.

  Light duty excavating:

  For digging and loading operation of dry, loosened earth, sand, mud and so on.

  Their bulk density shall be less than 1.60 t/m^3 (2700 lb/yd^3) as a standard.

  Loading:

  For loading operation of dry, loosened earth and sand.

  Their bulk density shall be less than 1.10 t/m^3 (1850 lb/yd^3) as a standard.

  Rock digging:

  For digging/loading operation of mountain gravels, blasted rock, hard clay, soft rock and so on.

IMPORTANT: Using inapplicable buckets may cause serious damage to the front structure such as boom, arm and hydraulic cylinders.

Control Lever (H Type) (Optional)

WARNING:

- **Never place any part of the body beyond the window frame. It could be crushed by the boom if the boom control lever is accidentally bumped or otherwise engaged.**

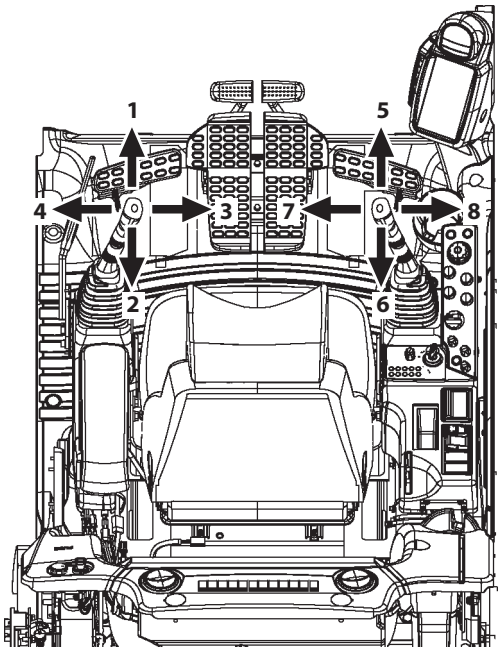
  Never remove the window sash bar.

- **Make sure you know the location and function of each control lever before operating.**

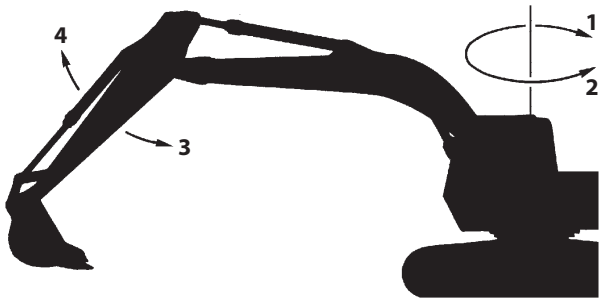
A label showing the control patterns of the levers and pedals is attached on the right side in the cab.

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

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



MDAA-01-343



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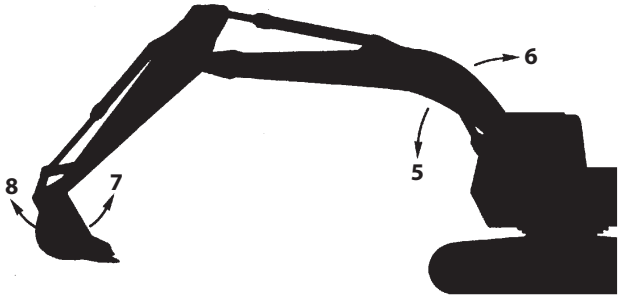
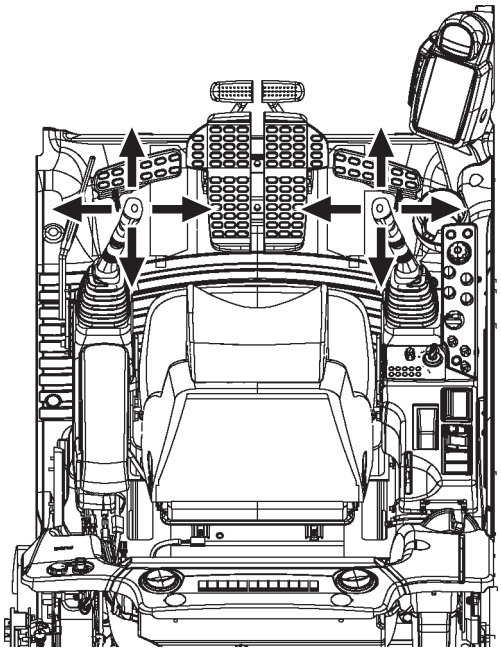


M104-05-002

CONTROL LEVER (2 Way Multi Valve) (Optional)

The control lever operation pattern is selected to either Backhoe pattern or Excavator pattern by shifting selector valve (1).

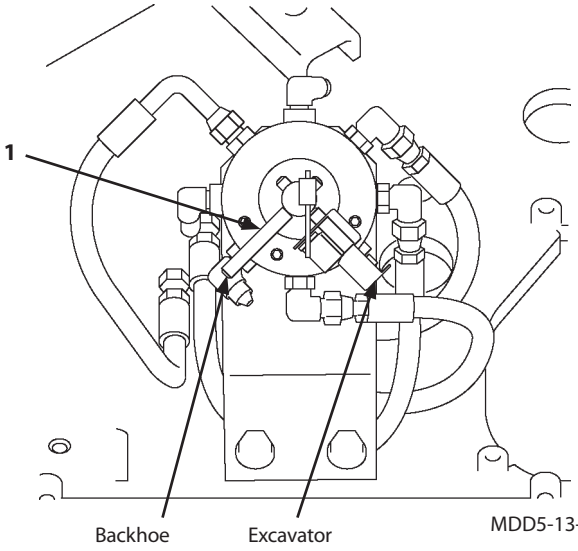


MDAA-01-343

WARNING: To prevent a serious accident or personal injury and/or death from occurring due to erratic machine movement, follow the instructions below.

- **Appoint a coordinator responsible to selection of the multi control lever operation pattern.**
- **Attach a lock (2) to selector valve (1). Prohibit that no personnel other than the coordinator change the control lever operation pattern.**
- **After changing the control lever operation pattern, check that the direction of the machine movement agrees with the control lever operation pattern described on the operation instruction decal. Be sure to change the operation instruction decal to that matching the new machine control lever operation pattern. The control lever operation pattern decal is affixed on the right side of the operator' seat as illustrated to the right.**
- **Never attempt to change the control lever operation pattern without stopping the engine. The machine may be unexpectedly moved, possibly resulting in personal injury or death. Whenever changing the control lever operation pattern, stop the engine first. Then, rotate selector valve (1) to the desired control lever operation pattern position and lock the valve up.**
- **After changing the control lever operation pattern, make it rule for the coordinator to instruct the operator the new control lever operation pattern.**
- **Rule that the coordinator is responsible to retain and stow the key for selector valve lock (2).**
- **Never place any part of body beyond window frame. It could be crushed by the boom if boom control lever is accidentally bumped or otherwise engaged. If window is missing or broken, replace immediately. Prevent possible injury from unexpected machine movement.**
  Make sure you know the location and function of each control before operating.

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



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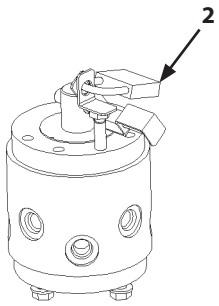
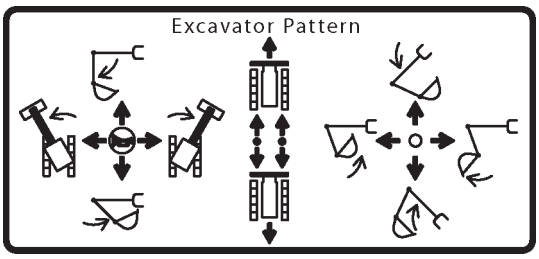
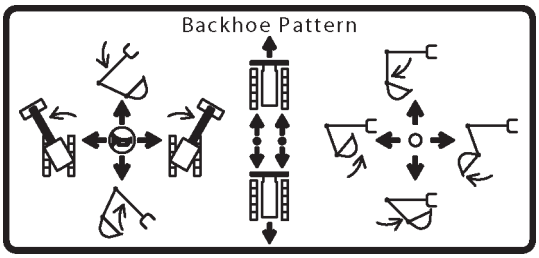


M1U1-01-118



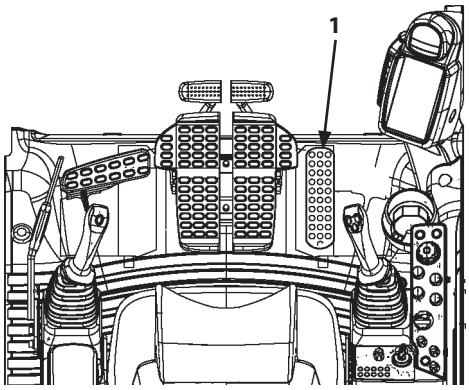
SS4664743



SS4664568

Attachment Pedal (Hydraulic Breaker) (Optional)

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

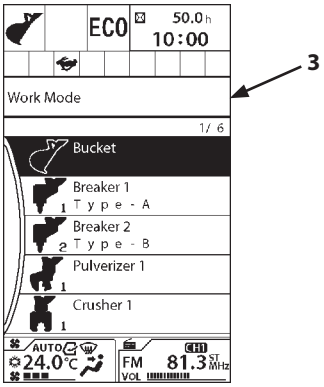


MDAA-05-001

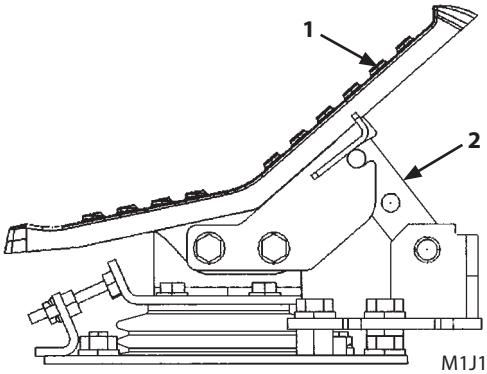
CAUTION: Be sure to lock attachment pedal (1) with pedal lock (2) when attachment pedal (1) is not in use. Do not allow your foot to rest on pedal (1) when attachment pedal (1) is not in use. When changing the position of pedal lock (2), pull the pilot control shut-off lever up to the LOCK position.

1. Select the hydraulic breaker icon on monitor work mode screen (3). Refer to the descriptions about the work mode on page 5-12 for work mode setting procedures.
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.
5. Always keep attachment pedal (1) locked with pedal lock (2) when attachment pedal (1) is not in use.

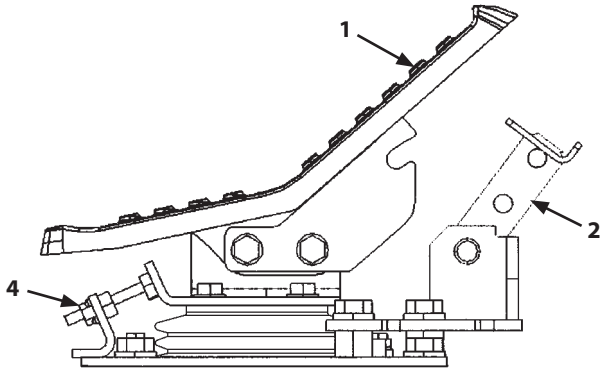


MDAA-01-101EN



M1J1-13-002

Locked Attachment Pedal

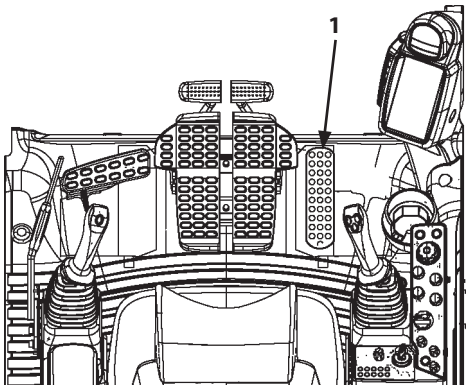


M1J1-13-003

Unlocked Attachment Pedal

Attachment Pedal (Hydraulic Crusher) (Optional)

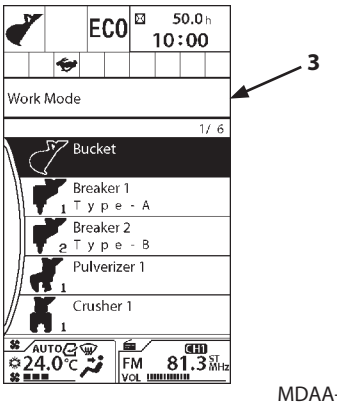
The crusher can be operated using attachment pedal (1) located on the right front of the seat, as illustrated.



MDAA-05-001

CAUTION: Be sure to lock attachment pedal (1) with pedal lock (2) when attachment pedal (1) is not in use. Do not allow your foot to rest on pedal (1) when attachment pedal (1) is not in use. When changing the position of pedal lock (2) pull the pilot control shut-off lever up to the LOCK position.

1. Select the proper hydraulic crusher icon on work mode screen (3). Refer to the descriptions about the work mode on page 5-12 for work mode setting procedures.
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.



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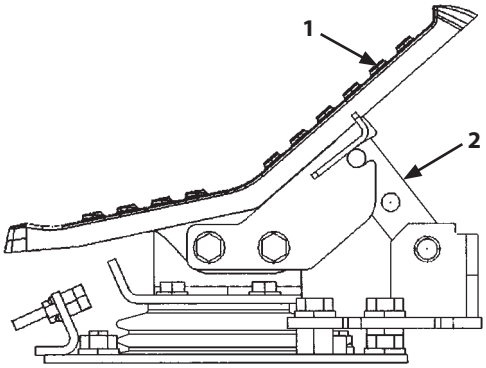
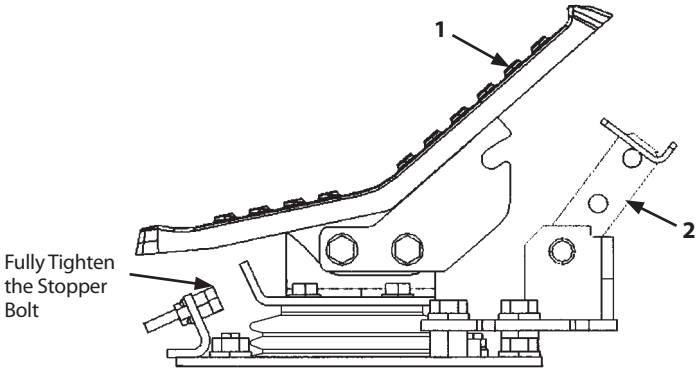


Locked Attachment pedal (Crusher)

M1J1-13-012



Unlocked Attachment pedal (Crusher)

M1J1-13-006

Hydraulic Breaker, Hydraulic Crusher and Quick Coupler

Selecting a Breaker, Crusher or Quick Coupler

Select a breaker, crusher or quick coupler with the correct size and weight for your machine, considering the stability of the machine, hydraulic oil pressure and flow rate of the breaker, crusher or quick coupler. See your authorized dealer for correct breaker information.

Precautions for Operation

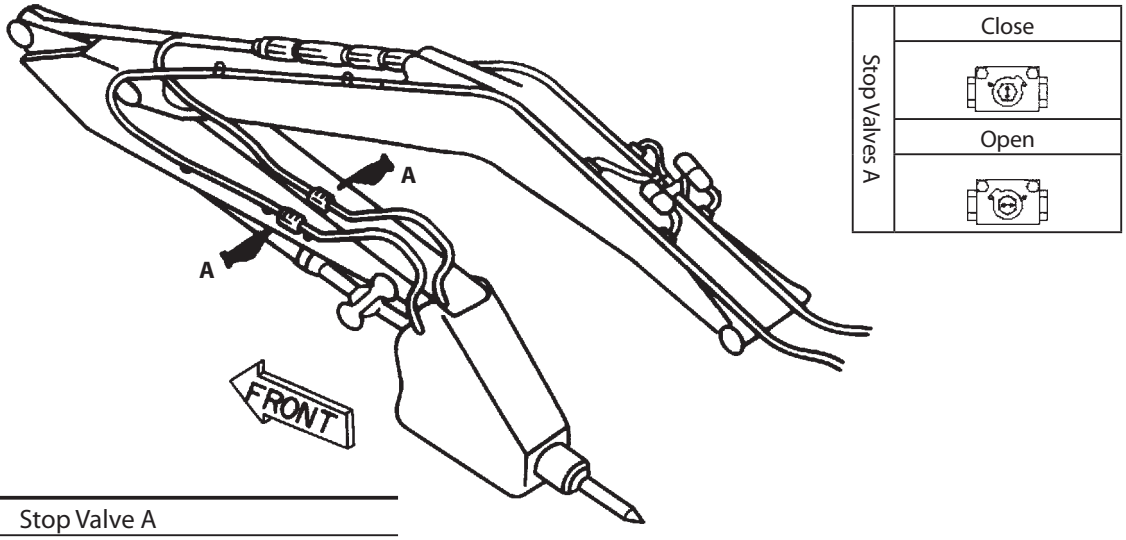
Thoroughly read and understand the operator's manuals of the breaker, crusher and quick coupler.
To avoid damaging the machine, hydraulic breaker, crusher or quick coupler, follow the precautions given below.

Precautions for Connecting Breaker, Crusher or Quick Coupler Piping.

Do not allow impurities to enter into the system when switching the breaker, crusher or the quick coupler with the bucket.
When the breaker, crusher or quick coupler is not used, apply the cover to the pipe opening on the arm top and install the plug or cap into the hose end of the breaker, crusher or the quick coupler to prevent impurities from entering the system.
Be sure to provide spare caps and plugs in the tool box so that they will be available when needed.
After connecting, check the connecting seal fitting for oil leakage, and pipe clamp bolts for looseness.

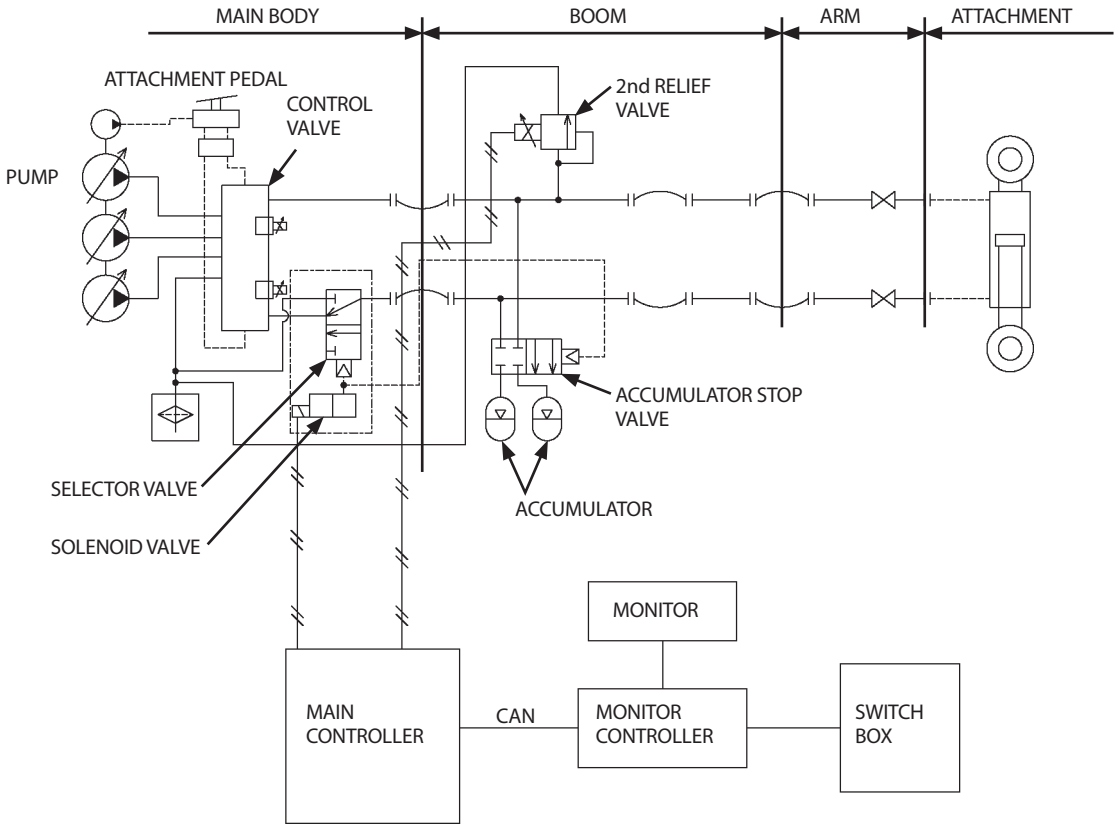
Piping for Breaker and Crusher

Operational Procedures for Stop Valves and Selector Valve.



Stop Valve A
Close: When attachment is detached or rot in use.
Open: When using attachment

M1U1-05-007



MDAA-05-006

Secondary Relief Pressure Adjustment

Depending on the breaker model, the secondary relief valve relief set pressure differs.
Consult your nearest Hitachi dealer for installing a breaker.

Precautions for Breaker Operation

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

Avoid Hitting Objects with Breaker

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

MZX5-13-019

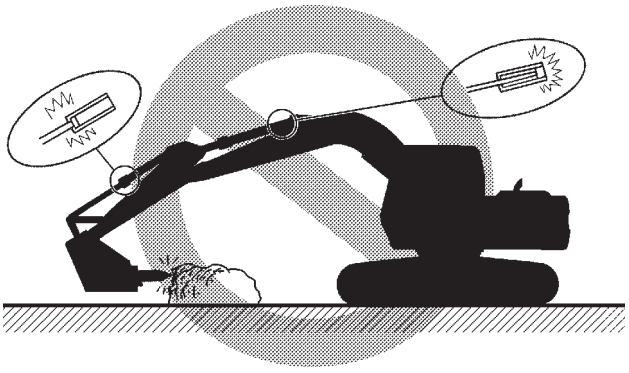
Avoid Moving Objects with Breaker

Do not use the breaker and/or the bracket to move objects. Damage to the boom, arm, and/or breaker may result.
Do not use the breaker and/or the swing function to move objects. Damage to the boom, arm, and/or breaker may result.

MZX5-13-020

Avoid Operating Breaker at Cylinder Stroke End

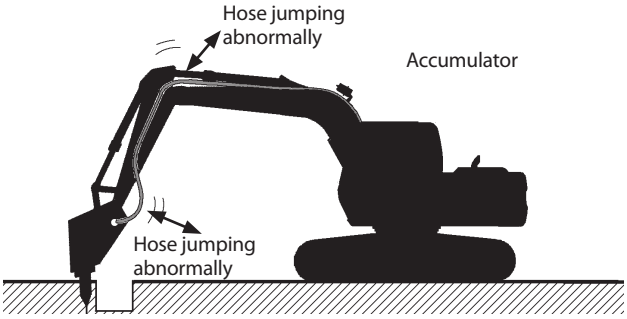
Always operate the breaker by positioning the cylinder rods 100 mm or longer before the stroke end position.
When operating the breaker with cylinders fully retracted or extended, hydraulic cylinders, arm or boom may be damaged.



MZX5-13-021

Stop Operation If Breaker Hydraulic Hoses Jump Abnormally

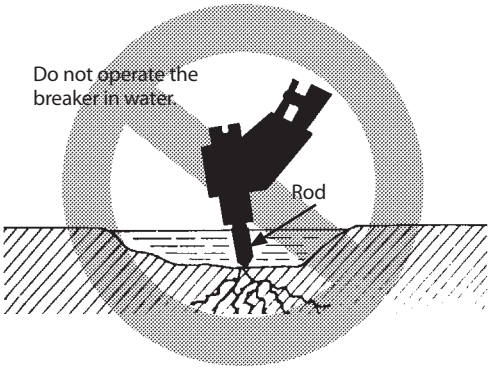
Change in breaker accumulator pressure or a damaged accumulator will cause abnormal hose jumping and may cause breaker and/or machine damage.
Immediately stop the machine operation. Failure to do so may result in serious failure in the hydraulic system including pumps.
Contact your nearest Hitachi dealer.



M104-05-058

Do Not Operate the Breaker in Water

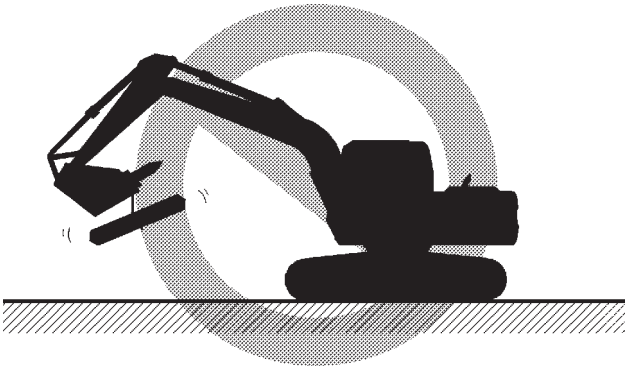
Doing so will cause rust and seal damage, resulting in damage to the hydraulic system components.
Rust, dust and water may enter into the hydraulic oil through the broken seal, damage to the hydraulic system may result.



MZX5-13-017

Do Not Use Breaker for Lifting Operation

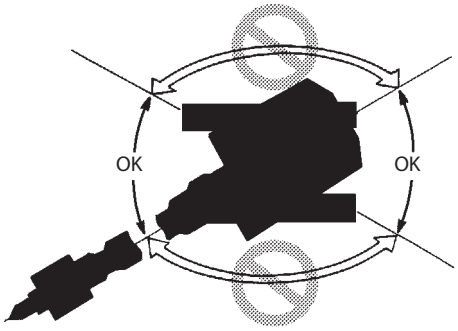
The machine tipping over and/or breaker damage may result.



MZX5-13-022

Do Not Operate the Breaker to the Side of the Machine

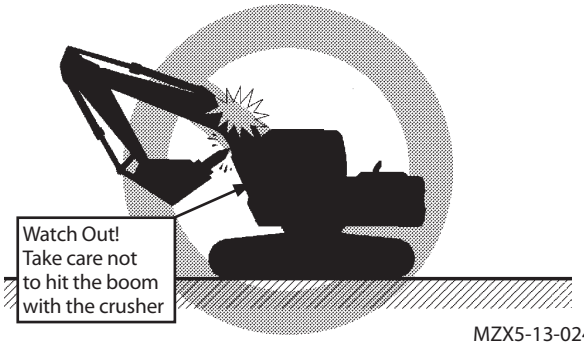
The machine may become unstable and undercarriage component life may shorten as a result from operating the breaker to the side of the machine.



MZX5-13-023

Operate the Hydraulic Excavator Carefully to Avoid Hitting the Boom

When the arm rolled in with the breaker equipped, the chisel may come in contact with the boom.



MZX5-13-024

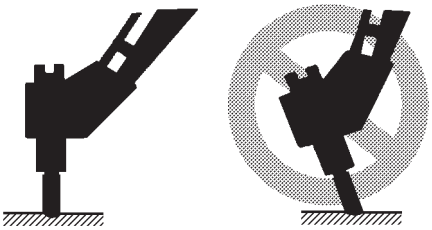
Do Not Operate Breaker with the Arm Positioned Vertically

Excessive vibration to the arm cylinder will occur, causing oil leakage.

MZX5-13-006

Press the Breaker so Chisel Axis Is Positioned Vertically Over the Object

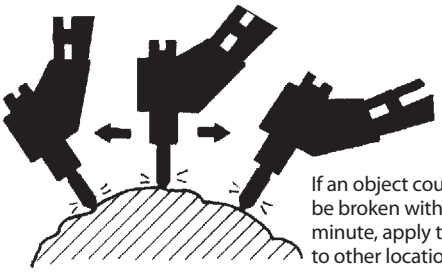
Failure to do so may damage the chisel or may cause a piston to seize.



MZX5-13-007

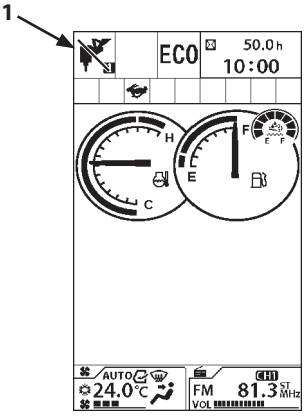
Do Not Continuously for Operate the Breaker Longer than One Minute

Failure to do so may result in premature wear of the chisel. If an object cannot be broken within one minute, apply the chisel to other locations for less than one minute in each location.



M147-05-015

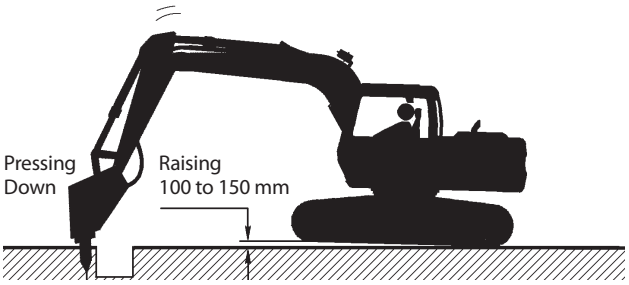
IMPORTANT: When the breaker is operated longer than one minute, a diagonal line will be displayed on work mode display (1) and the buzzer will sound. If so, immediately stop operation and wait a while to restart.



MDC1-13-001

Raising the Front Part of the Undercarriage by Pressing Down the Breaker May Cause Damage to the Front Attachment

Never raise the front edge of the undercarriage higher than 150 mm (6 in) by pressing the breaker down.



M147-05-016

Change Hydraulic Oil and Replace Full-Flow Filter Element

Hydraulic breaker operation results in faster contamination of the hydraulic system, and faster deterioration of hydraulic oil. Failure to comply with proper maintenance intervals may result in damage to the base machine and the breaker. Change the hydraulic oil and the full-flow filter element in order to extend the service life particularly of the hydraulic pump. (Refer to the section “Hydraulic System” in the “MAINTENANCE” chapter.)

Change intervals differ depending on the brand of hydraulic oil used. Refer to the "Hydraulic System" in the "MAINTENANCE" chapter.
Use the high performance element (micro-glass) on excavators engaged in demolition and logging work.

NOTE: Hydraulic oil filter restriction alam indicator is optional. If a filter-paper element is used, this indicator does not operate. (Refer to the section "Hydraulic System" in the "MAINTENANCE" chapter.)

Precautions for Crusher Operation

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

WARNING: Machine stability is reduced as the crusher is much heavier than bucket. When operating with a crusher, the machine is more likely to tip over. Falling or flying objects may hit the cab or other parts of the machine. Observe the following precautions and take any other precautions necessary to prevent accidents and machine damage from occurring.

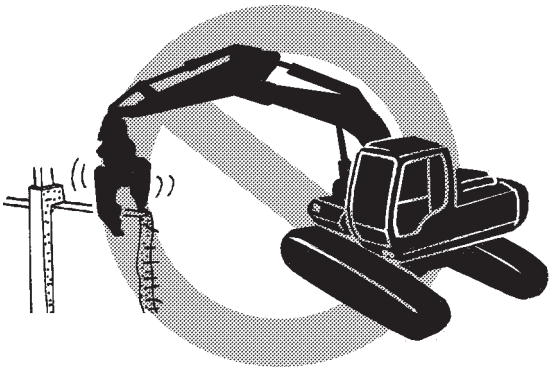
- Do not allow the machine's weight to be supported by the crusher or bucket cylinder with the bucket cylinder fully extended or retracted. Failure to do so may result in damage to the front attachment. In particular, avoid supporting the machine's weight with the bucket cylinder fully extended, as the front attachment will be easily damaged.
  Take care to prevent this happening when dismantling foundation structures using the crusher.

- Using the front attachment, do not raise the base machine off the ground with the arm cylinder fully extended. Failure to do so may result in damage to the arm cylinder.

- When a heavyweight attachment such as a crusher is installed, avoid quickly starting or stopping the front attachment. Failure to do so may result in damage to the front attachment.

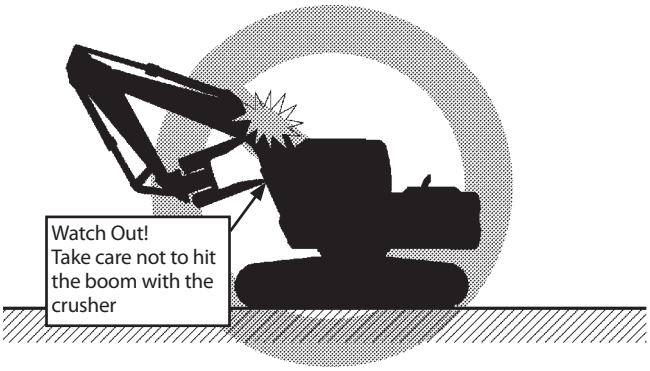
- Do not attempt to perform crushing on either side of the machine. Always perform crushing operations to the front or rear, parallel with the tracks. Failure to do so may result in the machine tipping over.

MZX5-13-008



MZX5-13-009

- When the arm is rolled in with the crusher equipped, the crusher may come into contact with the boom.

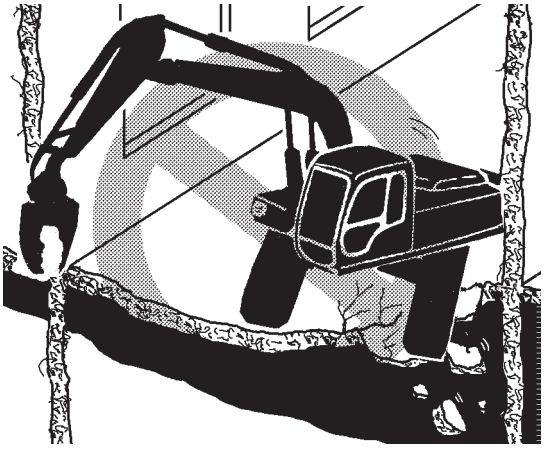


MZX5-13-010

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

MZX5-13-011

- When operating the crusher on the floor in a building, first confirm that the floor has sufficient strength to support the load caused by crushing, in addition to the machine weight.
  Depending on the operation method, a load higher than the machine weight may be applied to the floor.



MZX5-13-012

- Always operate the crusher on a stable, level surface, not on a slope or on crushed debris.
- Do not use the crusher to haul or load crushed debris.
- If a multiple number of attachments, such as crusher and bucket, or crusher and breaker, are used, replacing them with each other at intervals, impurities are more apt to enter the hydraulic system and the hydraulic oil deteriorates quickly. For this reason, replace the hydraulic oil tank filter and change the hydraulic oil at the intervals specified in the breaker time sharing diagram in the previous section.
- Always remove the crusher from the excavator before transporting the machine. Do not fully extend the bucket cylinder when transporting, as this may damage the front attachment, when vibrations arise during transportation.

Attachment

Allowable Weight Limits of Installed Attachment

WARNING:

- **Before installing attachments such as hydraulic breaker, crusher (concrete crusher), or pulverizer, take machine controllability into account when selecting the weight of the attachment by referring to the table below.**
- **When an attachment other than the standard bucket is installed on the machine, the machine stability will be different.**

  If a heavy attachment is used, not only will controllability be affected but also machine stability will be reduced, possibly causing safety hazard.
- **According to the specifications of installed attachment and the base machine, the machine weight may exceed the allowable maximum operating weight of the ROPS, making the ROPS unable to assure the protective function for operator. Refer to the ROPS certification for the allowable maximum operating weight.**

Unit: kg (lb)

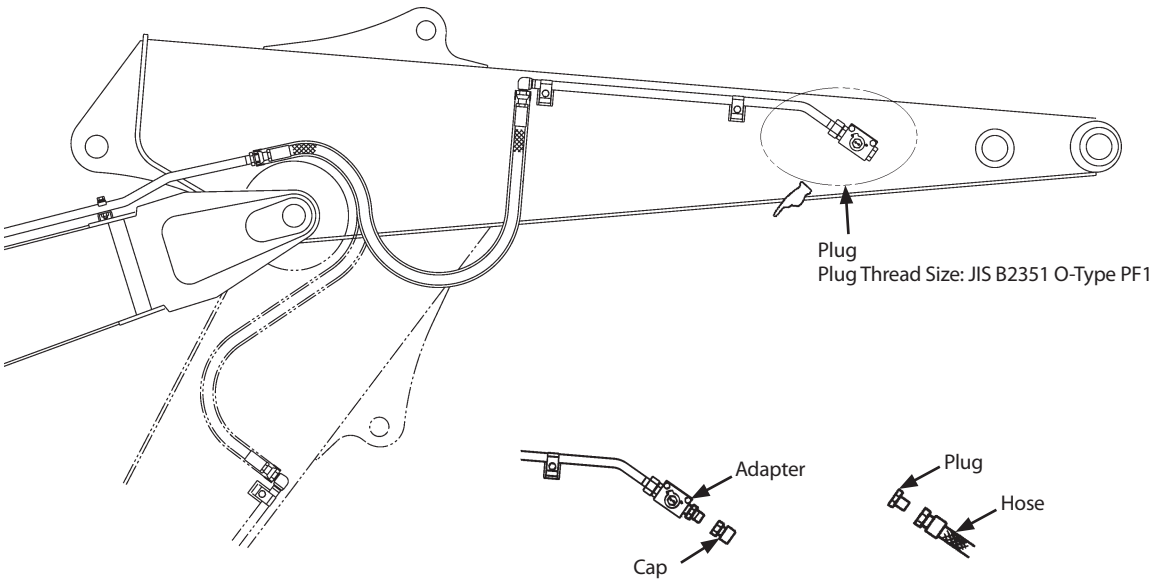
Specification	Base Machine		Breaker		Crusher/Pulverizer	
	Model	Arm	Std.Weight	Max.Weight	Std.Weight	Max.Weight
Std. Model	ZX345USLC-6N	Std.	2400 (5290)	2650 (5840)	2600 (5730)	3400 (7500)

- Breaker operation speed is faster than crusher operation, so that recommended maximum weight for breaker are lower than those for crushers.
- Weight is not the only factor to be considered when selecting a breaker. Select manufacturer's breaker models referring to the table on the next page.
- Avoid installing an attachment with a long overall length. Damage to the front attachment may result.
- When an attachment of the maximum weight is installed, always operate the attachment over the front or rear side of the machine. Avoid operating the attachment at maximum reach.
- Crushers are heavier than breakers. Slowly move the control lever when operating a crusher.
- Always contact your authorized dealer before installing attachments of other manufacturers.

Attachment Connection Parts

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

Adapter tightening torque:
PF1: 210 N·m (21 kgf·m)



When the attachment is disconnected

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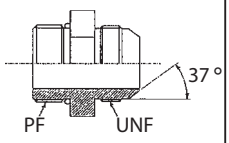
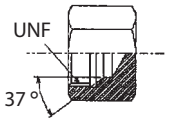
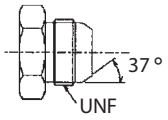
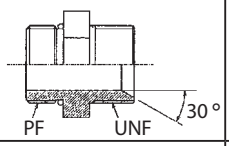
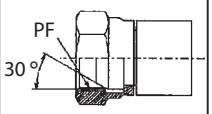
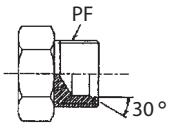
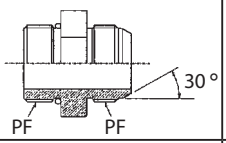
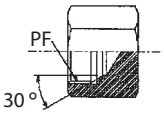
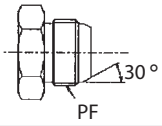
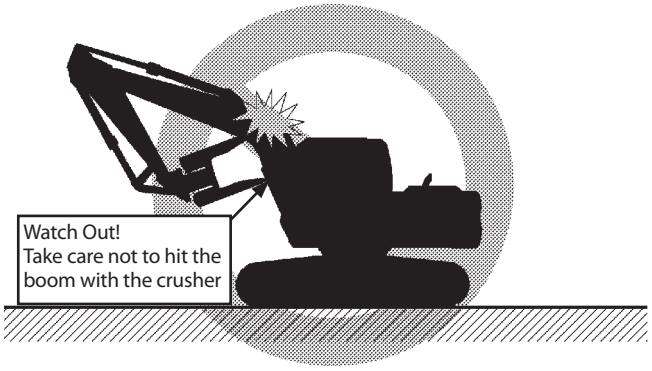
Part No. List (Fill attachment manufacturer's part Nos. in the blank spaces.)

	Adapter Size	Adapter	Cap	Plug	Hose
Form / Size	PF-UNF Male-Type				
ZX345USLC-6N left side piping	PF1X1-5/16UN	4214444	4222712	4222265	
Form / Size	PF-PF30° Female-Type				
ZX345USLC-6N left side piping	PF1XPF1	4042034	9718917	4168177	
Form / Size	PF-PF30° Male-Type				
ZX345USLC-6N left side piping	PF1XPF1	4456118	4222716	4222045	

Precautions for Arm Roll-In/Bucket Roll-In Combined Operation

When Installing an Attachment Longer Than Standard Bucket

WARNING: If an attachment (such as a hydraulic breaker, crusher or quick coupler) is installed that has a longer overall length than that of the bucket, the attachment may come into contact with the cab and/or the boom. Do not to allow the tip of the front attachment to hit the cab and/or the boom while rolling in the front attachment.



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