

Operator's Manual

ZAXIS

120-3 class

110-3 • 110M-3 • 120-3 • 130K-3 • 130L-3

180-3 class

160LC-3 • 180LC-3 • 180LCN-3

200-3 class

200-3 • 200LC-3 • 210H-3 • 210LCH-3 • 210K-3 • 210LCK-3

270-3 class

240-3 • 240LC-3 • 250H-3 • 250LCH-3 • 250K-3 • 250LCK-3 • 270-3 • 270LC-3

330-3 class

330-3 • 330LC-3 • 350H-3 • 350LCH-3 • 350K-3 • 350LCK-3

Hydraulic Excavator

Serial No.

ZX120-3 class	080001 and up
ZX180-3 class	010372 and up
ZX200-3 class	202803 and up
ZX270-3 class	021321 and up
ZX330-3 class	052046 and up

ZX120-3 • 180-3 • 200-3 • 270-3 • 330-3 class HYDRAULIC EXCAVATOR OPERATOR'S MANUAL

EM1U1-3-6

 Hitachi Construction Machinery Co., Ltd.

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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 nearest Hitachi dealer.

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

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

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

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

Use only diesel fuel with quality specified in JIS K-2204, EN-590, ASTM D-975, GOST R52368 or GB252.
Failure to use diesel fuel with quality as specified above may allow the engine to emit exhaust gas which cleanliness can not conform to the requests in various relevant regulations. In addition, serious damage to the engine may result. Consult with your nearest Hitachi dealer for detailed information.

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.

Hitachi machine models are classified into 5 classes, 3 models and 1 type as shown in the table below. When referring to the texts and/or illustrations indicated with the applicable machine class names in this manual, check that the machine models concerned are included using this table. Unless specially described, all models explained in this manual include "F Type".

Class

ZX120-3 Class	ZX110-3, 110M-3, 120-3, 130K-3, 130L-3
ZX180-3 Class	ZX160LC-3, 180LC-3, 180LCN-3
ZX200-3 Class	ZX200-3, 200LC-3, 210H-3, 210LCH-3, 210K-3, 210LCK-3
ZX270-3 Class	ZX240-3, 240LC-3, 250H-3, 250LCH-3, 250K-3, 250LCK-3, 270-3, 270LC-3
ZX330-3 Class	ZX330-3, 330LC-3, 350H-3, 350LCH-3, 350K-3, 350LCK-3

Model

Std. Model	ZX110-3, 110M-3, 120-3, 160LC-3, 180LC-3, 180LCN-3, 200-3, 200LC-3, 210H-3, 210LCH-3, 240-3, 240LC-3, 250H-3, 250LCH-3, 270-3, 270LC-3, 330-3, 330LC-3, 350H-3, 350LCH-3
K Model	ZX130K-3, 210K-3, 210LCK-3, 250K-3, 250LCK-3, 350K-3, 350LCK-3
L Model	ZX130L-3

Type

F Type	ZX110-3F, 110M-3F, 120-3F, 130K-3F, 130L-3F, 160LC-3F, 200-3F, 200LC-3F, 210H-3F, 210LCH-3F, 210K-3F, 210LCK-3F, 240-3F, 240LC-3F, 250H-3F, 250LCH-3F, 250K-3F, 250LCK-3F, 270-3F, 270LC-3F, 330-3F, 330LC-3F, 350H-3F, 350LCH-3F, 350K-3F, 350LCK-3F
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All information, illustrations and specifications in this manual are based on the latest product information available at the time of publication. The right is reserved to make changes at any time without notice.

CALIFORNIA

Proposition 65 Warning

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

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MACHINE NUMBERS

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

MACHINE

TYPE: _____
PRODUCT
IDENTIFICATION
NUMBER: _____

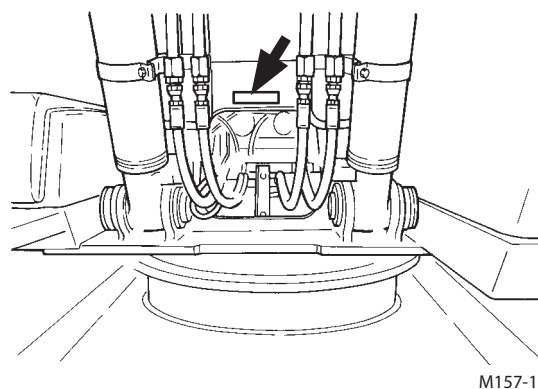
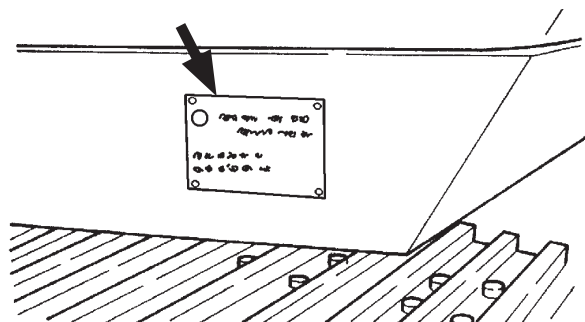
PRODUCT IDENTIFICATION NUMBER

PRODUCT
IDENTIFICATION
NUMBER: _____

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

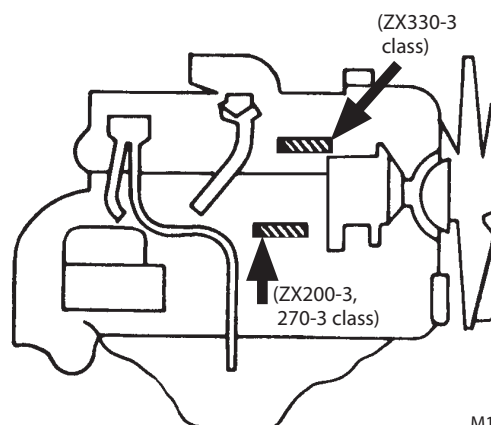
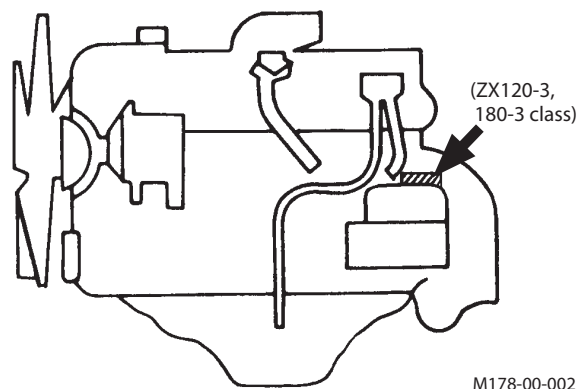
HCM1U100L00100001

PRODUCT IDENTIFICATION
NUMBER (PIN)



ENGINE

TYPE: _____
MFG. NO.: _____

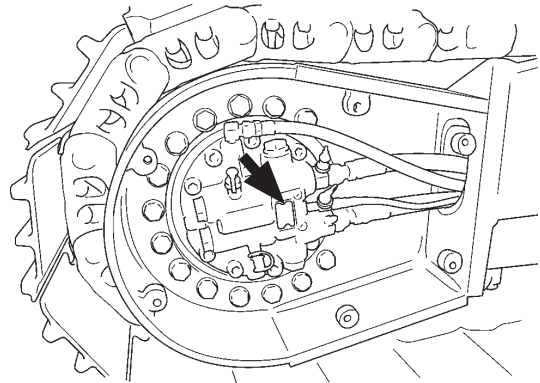


MACHINE NUMBERS

TRAVEL MOTOR

TYPE: _____

MFG. NO.: _____

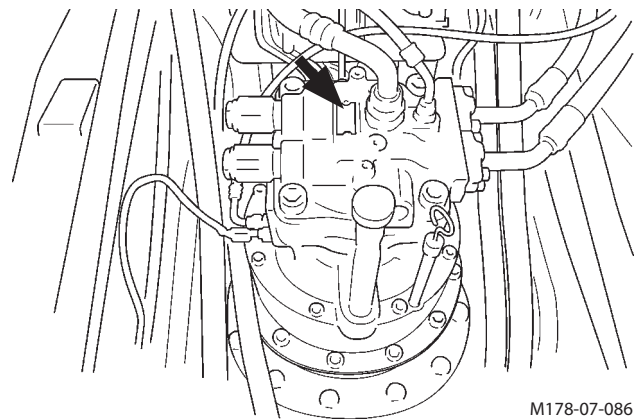


M178-07-047

SWING MOTOR

TYPE: _____

MFG. NO.: _____

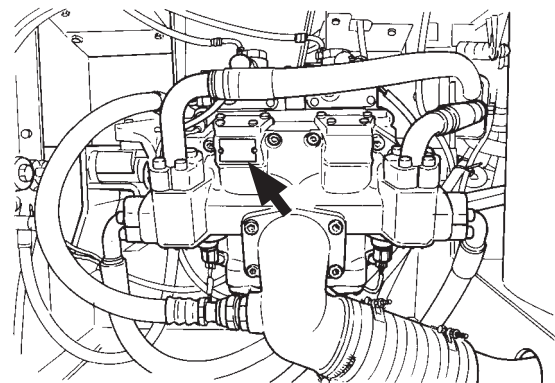


M178-07-086

HYDRAULIC PUMP

TYPE: _____

MFG. NO.: _____



M157-00-004

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SAFETY

RECOGNIZE SAFETY INFORMATION

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



001-E01A-0001

SA-688

UNDERSTAND SIGNAL WORDS

- On machine safety signs, signal words designating the degree or level of hazard - **DANGER**, **WARNING**, or **CAUTION** - are used with the safety alert symbol.
 - **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 - **WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 - **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
 - **DANGER or WARNING safety signs** are located near specific hazards. General precautions are listed on **CAUTION safety signs**.
 - Some safety signs do not use any of the designated signal words above after the safety alert symbol are occasionally used on this machine.
- To avoid confusing machine protection with personal safety messages, a signal word **IMPORTANT** indicates a situation which, if not avoided, could result in damage to the machine.
-  **NOTE** indicates an additional explanation for an element of information.



IMPORTANT



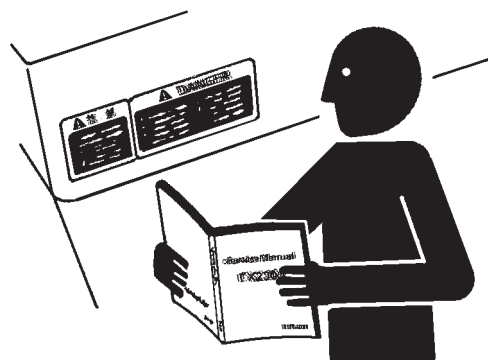
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002-E01A-1223

SAFETY

FOLLOW SAFETY INSTRUCTIONS

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



SA-003

003-E01B-0003

SAFETY

PREPARE FOR EMERGENCIES

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



SA-437

004-E01A-0437

WEAR PROTECTIVE CLOTHING

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

You may need:

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

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

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



SA-438

005-E01A-0438

PROTECT AGAINST NOISE

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



006-E01A-0434

SA-434

SAFETY

INSPECT MACHINE

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



007-E01A-0435

SA-435

GENERAL PRECAUTIONS FOR CAB

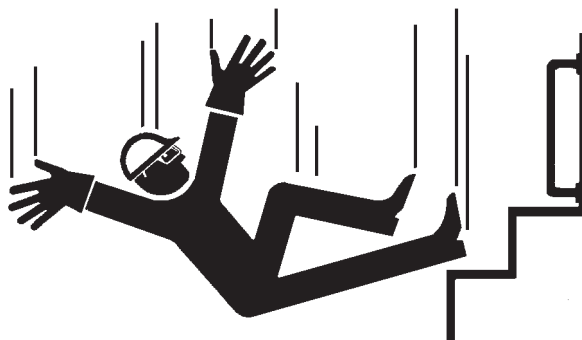
- Before entering the cab, thoroughly remove all dirt and/or oil such as mud, grease, soil or stones that may mess up the cab from the soles of your work boots. If any controls such as a pedal is operated while with dirt and/or oil on the soles of the operator's work boots the operator's foot may slip off the pedal, possibly resulting in a personal accident.
- Do not mess up around the operator's seat with parts, tools, soil, stones, obstacles that may fold up or turn over, cans or lunch box. The 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 objects and/or explosives away from the machine.
- After using the ashtray, always cover it to extinguish the match and/or tobacco.
- Do not leave cigarette lighters in the cab. When the temperature in the cab increases, the lighter may explode.
- Use proper floor mat dedicated to the machine. If another floor mat is used, it may be displaced and contact with the travel pedals during operation, resulting in serious injury or death.

524-E01A-0000

SAFETY

USE HANDHOLDS AND STEPS

- Falling is one of the major causes of personal injury.
 - When you get on and off the machine, always face the machine and maintain a three-point contact with the steps and handrails.
 - Do not use any controls as hand-holds.
 - Never jump on or off the machine. Never mount or dismount a moving machine.
 - Be careful of slippery conditions on platforms, steps, and handrails when leaving the machine.



008-E01A-0439

SA-439

ADJUST THE OPERATOR'S SEAT

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



009-E01A-0462

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, possibly resulting in serious personal injury or death.
- Before leaving the machine, be sure to first lower the front attachment to the ground and then move the pilot control shut-off lever to the LOCK position. Turn the key switch OFF to stop the engine.
- Before leaving the machine, close all windows, doors, and access covers and lock them up.

SAFETY

FASTEN YOUR SEAT BELT

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

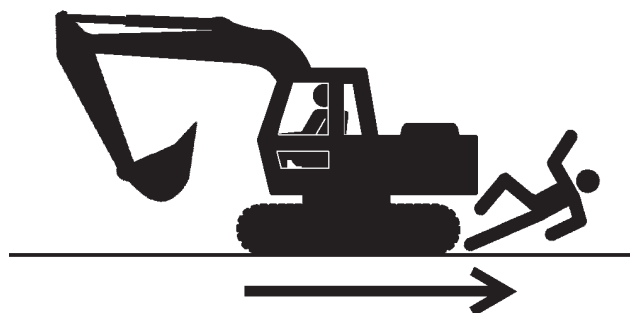


SA-237

010-E01A-0237

MOVE AND OPERATE MACHINE SAFELY

- Bystanders can be run over.
- Take extra care not to run over bystanders. Confirm the location of bystanders before moving, swinging, or operating the machine.
- Always keep the travel alarm and horn in working condition (if equipped). It warns people when the machine starts to move.
- Use a signal person when moving, swinging, or operating the machine in congested areas. Coordinate hand signals before starting the machine.
- Use appropriate illumination. Check that all lights are operable before operating the machine. If any faulty illumination is present, immediately repair it.



SA-426

011-E01A-0398

HANDLE STARTING AIDS SAFELY

Starting fluid:

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



SA-293

036-E01A-0293-3

SAFETY

OPERATE ONLY FROM OPERATOR'S SEAT

- Inappropriate engine starting procedures may cause the machine to runaway, possibly resulting in serious injury or death.
- Start the engine only when seated in the operator's seat.
- NEVER start the engine while standing on the track or on ground.
- Do not start engine by shorting across starter terminals.
- Before starting the engine, confirm that all control levers are in neutral.
- Before starting the engine, confirm the safety around the machine and sound the horn to alert bystanders.



SA-444

012-E01B-0431

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

S013-E01A-0032

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.



014-E01B-0427

SA-379

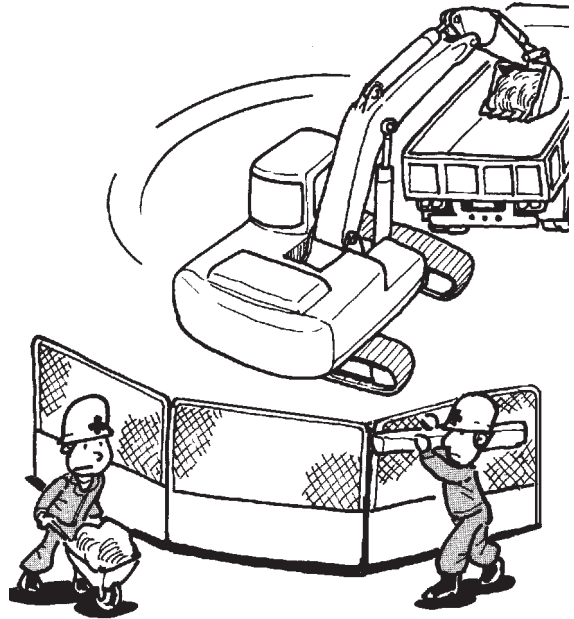
SAFETY

PRECAUTIONS FOR OPERATIONS

- Investigate the work site before starting operations.
- Be sure to wear close fitting clothing and safety equipment appropriate for the job, such as a hard hat, etc. when operating the machine.
- Clear all persons and obstacles from area of operation and machine movement.

Always beware of the surroundings while operating. When working in a small area surrounded by obstacles, take care not to hit the upperstructure against obstacles.

- When loading onto trucks, bring the bucket over the truck beds from the rear side. Take care not to swing the bucket over the cab or over any person.



M178-05-007

SAFETY

INVESTIGATE JOB SITE BEFOREHAND

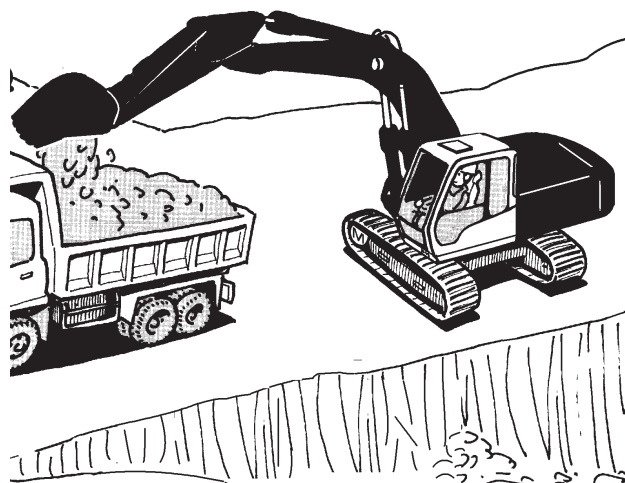
- When working at the edge of an excavation or on a road shoulder, the machine could tip over, possibly resulting in serious injury or death.
- Investigate the configuration and ground conditions of the job site beforehand to prevent the machine from falling and to prevent the ground, stockpiles, or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

When working close to an excavation or at road shoulders, operate the machine with the tracks positioned perpendicular to the cliff face with travel motors at the rear, so that the machine can more easily evacuate if the cliff face collapses.

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



SA-380



M104-05-016

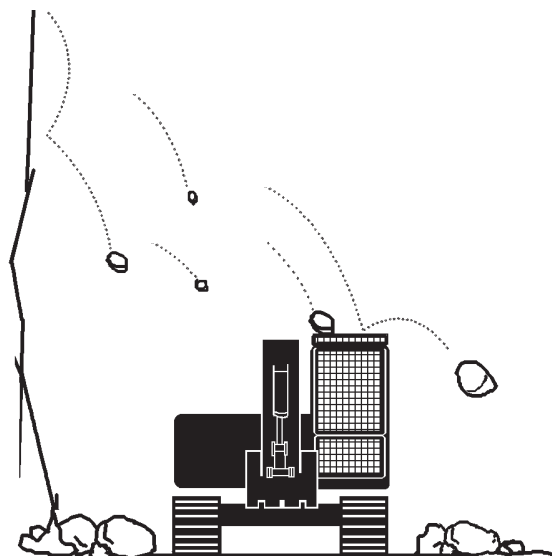
SAFETY

EQUIPMENT OF HEAD GUARD, ROPS, FOPS

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

ROPS: Roll-Over Protective Structure

FOPS: Falling Object Protective Structure



SA-490

PROVIDE SIGNALS FOR JOBS INVOLVING MULTIPLE 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.

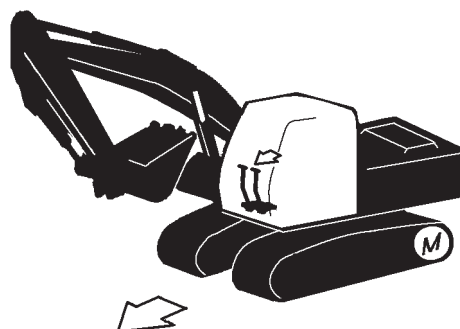


018-E01A-0481

SA-481

CONFIRM DIRECTION OF MACHINE TO BE DRIVEN

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



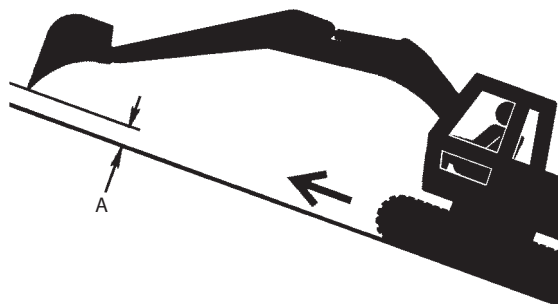
017-E01A-0491

SA-491

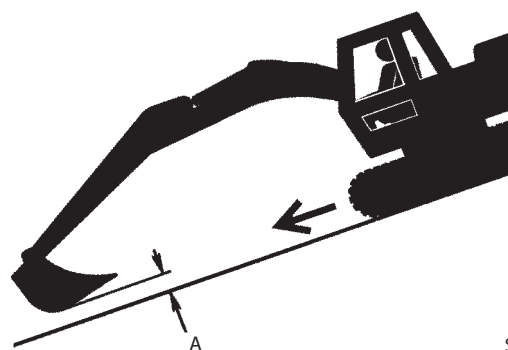
SAFETY

DRIVE MACHINE SAFELY

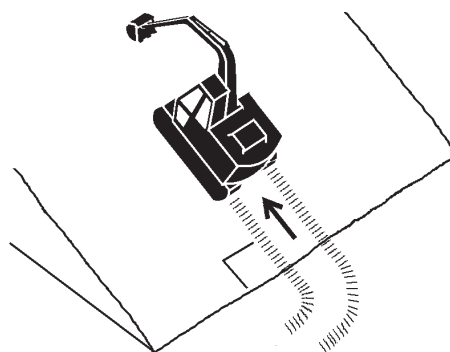
- Before driving the machine, always confirm that the travel levers/pedals direction corresponds to the direction you wish to drive.
 - Be sure to detour around any obstructions.
 - Avoid traveling over obstructions. Soil, fragments of rocks, and/or metal pieces may scatter around the machine. Do not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



SA-657

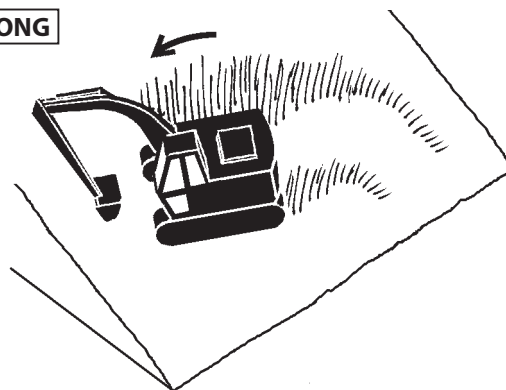


SA-658



SA-441

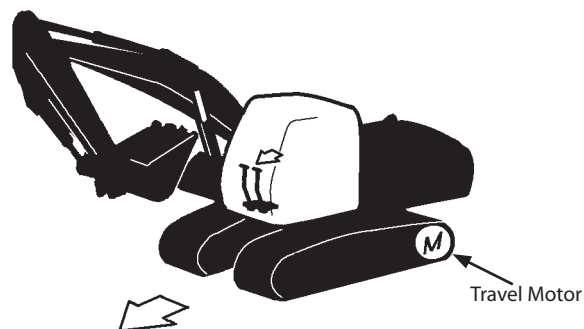
WRONG



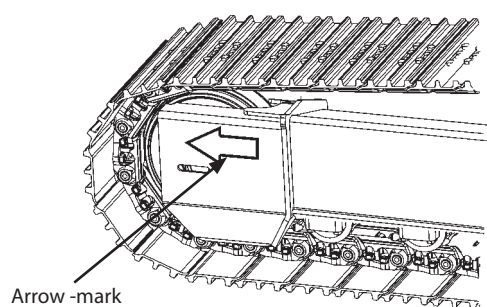
SA-590

SAFETY

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



M104-05-008



M178-03-001



SA-011

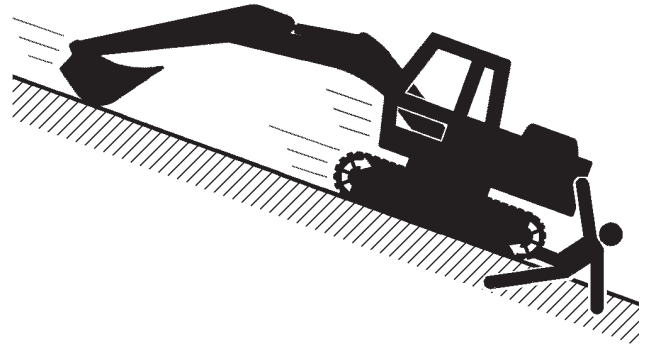
SAFETY

AVOID INJURY FROM ROLLAWAY ACCIDENTS

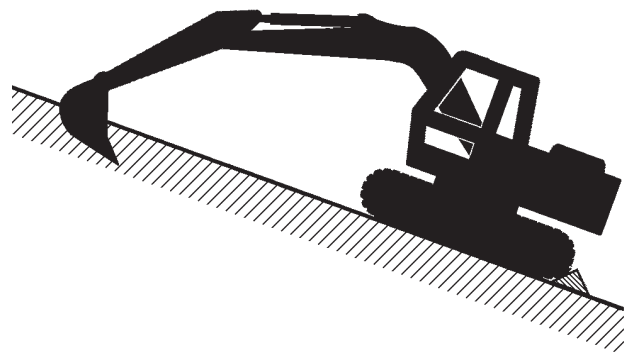
- Death or serious injury may result if you attempt to mount or stop a moving machine.

To avoid rollaways:

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



SA-391



SA-392

020-E02A-0493

SAFETY

AVOID INJURY FROM BACK-OVER AND SWING ACCIDENTS

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

To avoid back-over and swing accidents:

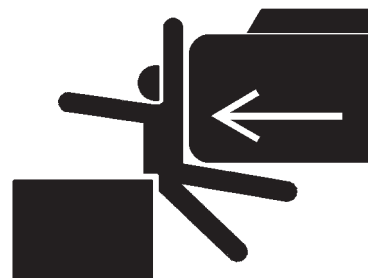
- Always look around **BEFORE YOU BACK UP AND SWING THE MACHINE**. BE SURE THAT ALL BYSTANDERS ARE CLEAR.
- Keep the travel alarm in working condition (if equipped). ALWAYS BE ALERT FOR BYSTANDERS MOVING INTO THE WORK AREA. USE THE HORN OR OTHER SIGNAL TO WARN BYSTANDERS BEFORE MOVING MACHINE.
- USE A SIGNAL PERSON WHEN BACKING UP IF YOUR VIEW IS OBSTRUCTED. ALWAYS KEEP THE SIGNAL PERSON IN VIEW.

Use hand signals, which conform to your local regulations, when work conditions require a signal person.

- No machine motions shall be made unless signals are clearly understood by both signalman and operator.
- Learn the meanings of all flags, signs, and markings used on the job and confirm who has the responsibility for signaling.
- Keep windows, mirrors, and lights clean and in good condition.
- Dust, heavy rain, fog, etc., can reduce visibility. As visibility decreases, reduce speed and use proper lighting.
- Read and understand all operating instructions in the operator's manual.



SA-383



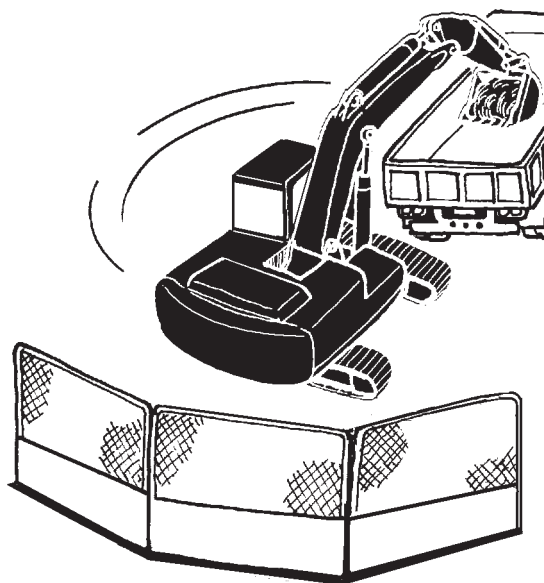
SA-384

021-E01A-0494

SAFETY

KEEP PERSON CLEAR FROM WORKING AREA

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



022-E01A-0386

SA-386

NEVER POSITION BUCKET OVER ANYONE

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

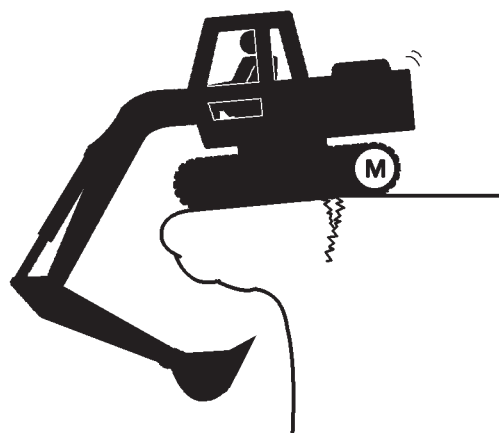


023-E01A-0487

SA-487

AVOID UNDERCUTTING

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



024-E01A-0488

SA-488

SAFETY

AVOID TIPPING

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

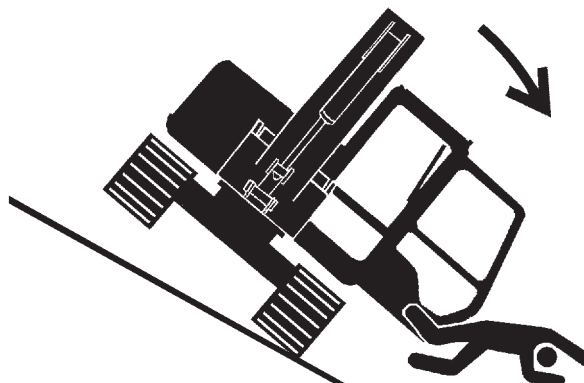
MACHINE WILL TIP OVER FASTER THAN YOU CAN JUMP FREE

FASTEN YOUR SEAT BELT

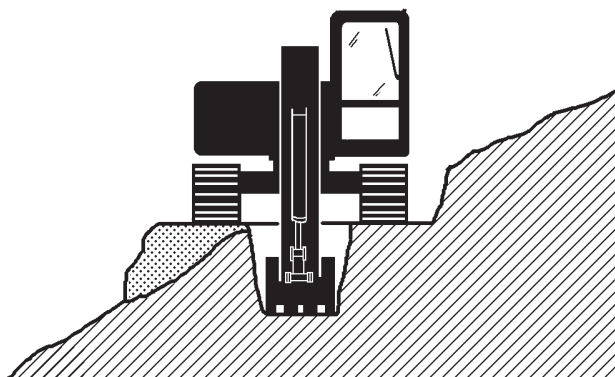
- The danger of tipping is always present when operating on a grade, possibly resulting in serious injury or death.

To avoid tipping:

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



SA-012



SA-440

025-E03B-0463

NEVER UNDERCUT A HIGH BANK

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



026-E01A-0519

SA-489

SAFETY

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

027-E01A-0382

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

028-E01A-0389

SAFETY

AVOID POWER LINES

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

029-E01A-0381



SA-381

PRECAUTIONS FOR LIGHTNING

- The machine is vulnerable to lightning strikes.
- In the event of an electrical storm, immediately stop operation, and lower the bucket to the ground. Evacuate to a safe place far away from the machine.
- After the electrical storm has passed, check all of the machine safety devices for any failure. If any failed safety devices are found, operate the machine only after repairing them.

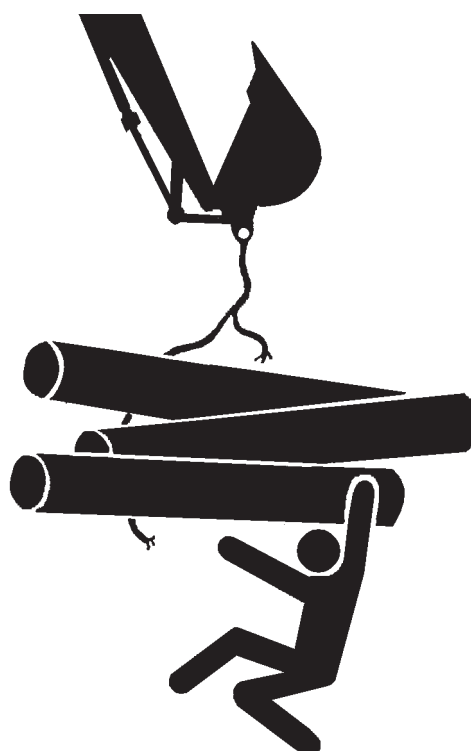


SA-1088

OBJECT HANDLING

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

032-E01A-0132

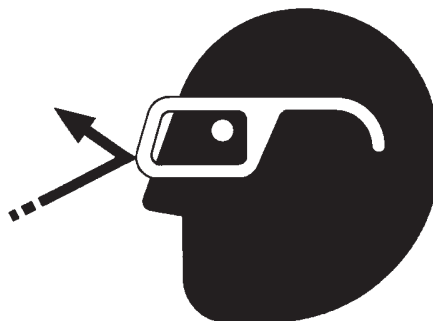


SA-014

SAFETY

PROTECT AGAINST FLYING DEBRIS

- If flying debris hit eyes or any other part of the body, serious injury may result.
- Guard against injury from flying pieces of metal or debris; wear goggles or safety glasses.
- Keep bystanders away from the working area before striking any object.



031-E01A-0432

SA-432

PARK MACHINE SAFELY

To avoid accidents:

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



SA-390

HANDLE FLUIDS SAFELY—AVOID FIRES

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



SA-018



034-E01A-0496

SA-019

SAFETY

TRANSPORT SAFELY

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



SA-395

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

035-E07A-0454

SAFETY

PRACTICE SAFE MAINTENANCE

To avoid accidents:

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

Before servicing the machine:

1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.
4. Run the engine at slow idle speed without load for 5 minutes.
5. Turn the key switch to OFF to stop engine.
6. Relieve the pressure in the hydraulic system by moving the control levers several times.
7. Remove the key from the 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.

- 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.
- Disconnect battery ground cable (–) before making adjustments to electrical systems or before performing welding on the machine.



SA-028



SA-527

500-E02C-0520

SAFETY

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



SA-037

WARN OTHERS OF SERVICE WORK

- Unexpected machine movement can cause serious injury.
- Before performing any work on the machine, attach a “Do Not Operate” tag on the control lever.

This tag is available from your authorized dealer.



501-E01A-0287



SS3076175

SS2045102

SUPPORT MACHINE PROPERLY

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

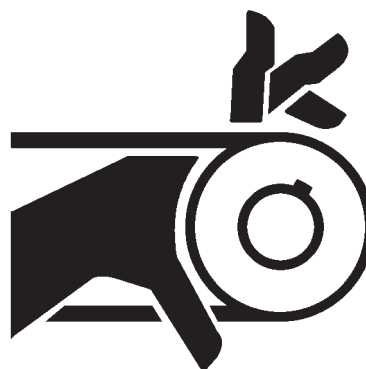


SA-527

519-E01A-0527

STAY CLEAR OF MOVING PARTS

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



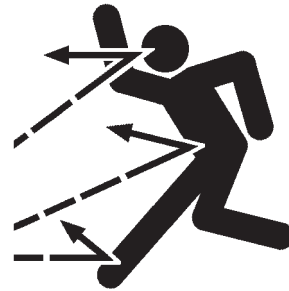
502-E01A-0026

SA-026

SAFETY

PREVENT PARTS FROM FLYING

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

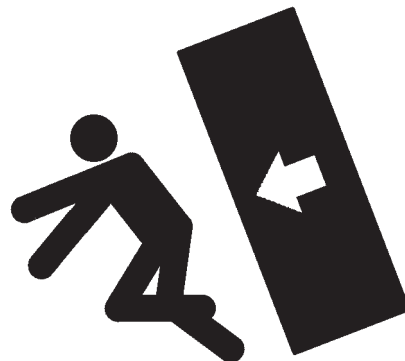


SA-344

503-E01B-0344

STORE ATTACHMENTS SAFELY

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



504-E01A-0034

SA-034

SAFETY

PREVENT BURNS

Hot spraying fluids:

- After operation, engine coolant is hot and under pressure. Hot water or steam is contained in the engine, radiator and heater lines.

Skin contact with escaping hot water or steam can cause severe burns.

- To avoid possible injury from hot spraying water. DO NOT remove the radiator cap until the engine is cool. When opening, turn the cap slowly to the stop. Allow all pressure to be released before removing the cap.
- The hydraulic oil tank is pressurized. Again, be sure to release all pressure before removing the cap.



SA-039

Hot fluids and surfaces:

- Engine oil, gear oil and hydraulic oil also become hot during operation.

The engine, hoses, lines and other parts become hot as well.

- Wait for the oil and components to cool before starting any maintenance or inspection work.



SA-225

505-E01B-0498

REPLACE RUBBER HOSES PERIODICALLY

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



SA-019

S506-E01A-0019

SAFETY

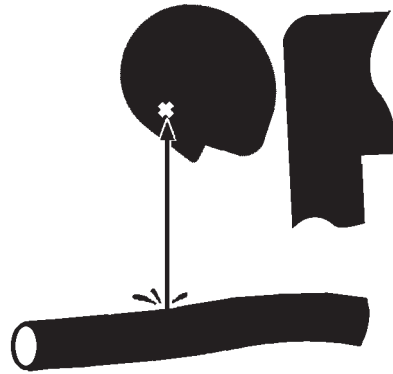
AVOID HIGH-PRESSURE FLUIDS

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

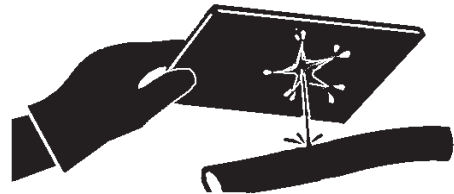
507-E03A-0499



SA-031



SA-292



SA-044

SAFETY

PREVENT FIRES

Check for Oil Leaks:

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



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..

SAFETY

Clean up Flammable Materials:

- Spilled fuel and oil, and trash, grease, debris, accumulated coal dust, and other flammable materials may cause fires.
 - Prevent fires by inspecting and cleaning the machine daily, and by removing adhered oil or accumulated flammable materials immediately. Check and clean high temperature parts such as the exhaust outlet and mufflers 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.

508-E02B-0019

Check Heat Shields:

- Damaged or missing heat shields may lead to fires.
 - Damaged or missing heat shields must be repaired or replaced before operating the machine.

508-E02A-0393

SAFETY

EVACUATING IN CASE OF FIRE

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



SA-393

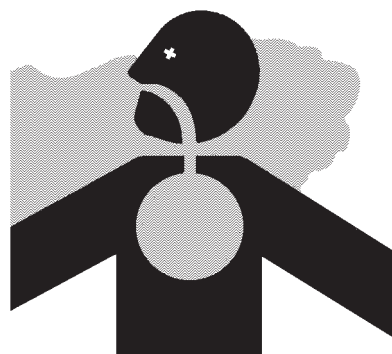


18-E02B-0393

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.



509-E01A-0016

SA-016

PRECAUTIONS FOR WELDING AND GRINDING

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



SA-818

523-E01A-0818

SAFETY

AVOID HEATING NEAR PRESSURIZED FLUID LINES

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



SA-030

AVOID APPLYING HEAT TO LINES CONTAINING FLAMMABLE FLUIDS

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

510-E01B-0030

REMOVE PAINT BEFORE WELDING OR HEATING

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



SA-029

511-E01A-0029

SAFETY

BEWARE OF ASBESTOS DUST

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



SA-029

PREVENT BATTERY EXPLOSIONS

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



SA-032

512-E01B-0032

SERVICE AIR CONDITIONING SYSTEM SAFELY

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



513-E01A-0405

SA-405

SAFETY

HANDLE CHEMICAL PRODUCTS SAFELY

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

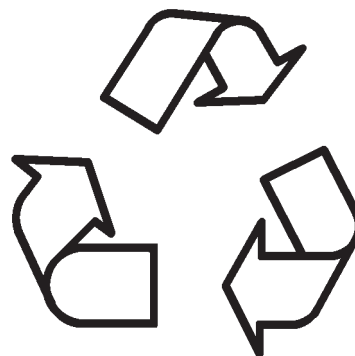


SA-309

515-E01A-0309

DISPOSE OF WASTE PROPERLY

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



SA-226

516-E01A-0226

SAFETY

PRECAUTION FOR COMMUNICATION TERMINAL EQUIPMENT

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

Any person affixed 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 (8.662 inches) apart at all times. If such condition cannot be met, please contact our company's nearest dealer and have the person in charge stop the communication terminal equipment from functioning completely and confirm that it is not emitting electrical waves.

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

E-GSM900 0.573 W/Kg (914.80 MHz)

DCS-1800 0.130 W/Kg (1710.20 MHz)

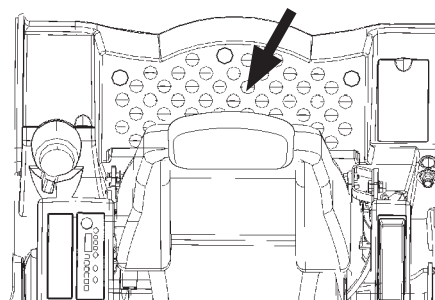
WCDMA B and I 0.271 W/Kg (1950.00 MHz)

* 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 cm (1.18 inches).

* 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).



SA-2201

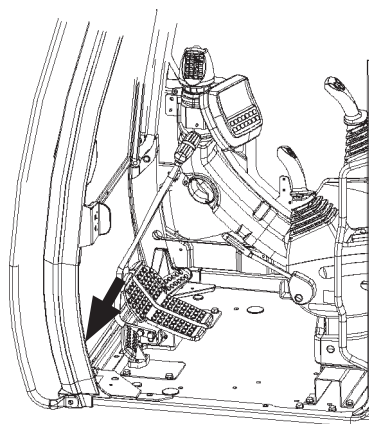
SAFETY

NOTES ON PROTECTION OF OPERATOR'S STATION WHEN THE MACHINE ROLLS OVER (OPTIONAL)

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 the machine mass exceeds the maximum operating mass described in the ROPS certification by modifying the machine or installing a special attachment, the cab can not fulfill its protective function, possibly causing serious injury or death.

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

- Consult your authorized Hitachi dealer before welding parts or drilling a hole on the cab, which possibly reducing 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.



M1U1-07-052

The ROPS certification is valid under the following conditions.

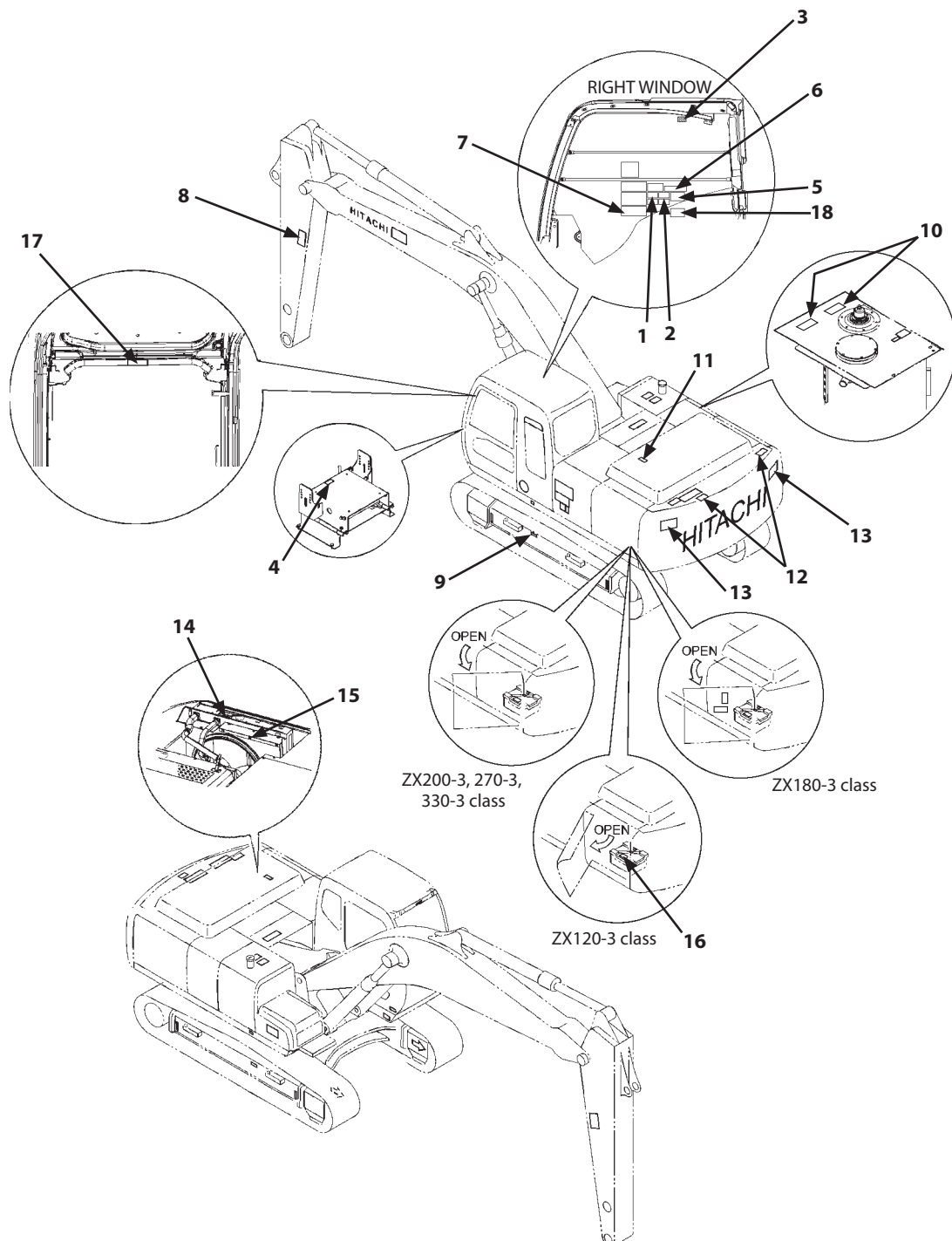
- The machine mass is lower than the maximum operating mass described in the ROPS certification.
- The ROPS is properly installed.
- No modification is made to the ROPS.
- The ROPS is free from damages.

Applicable Machine Model Number	ROPS Certification Number	ROPS Model Number	Maximum operating mass assuring the ROPS
ROPS CERTIFICATION			
CERTIFICATION No.		ROPS ISO 12117-2 : 2008	
MACHINE MODEL No.	ROPS MODEL No.	MAXIMUM OPERATING MASS kg	
THIS PROTECTIVE STRUCTURE COMPLIES WITH THE STANDARD PROVIDED THAT IT IS PROPERLY EQUIPPED ON THE MACHINE AND THE MASS IS LESS THAN THE SPECIFIED MAXIMUM OPERATING MASS.		WARNING • ANY ALTERATION OR MODIFICATION TO THIS STRUCTURE VOIDS THE CERTIFICATION. • ALWAYS WEAR SEAT BELT WHEN MOVING.	
Hitachi Construction Machinery Co., Ltd. 650, Kandatsu, Tsuchiura, Ibaraki, Japan			

SS-3474

SAFETY SIGNS/Oceania Model Only

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

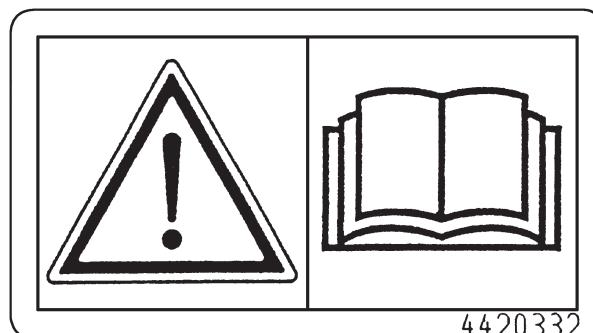


SAFETY SIGNS/Oceania Model Only

1.

WARNING!

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

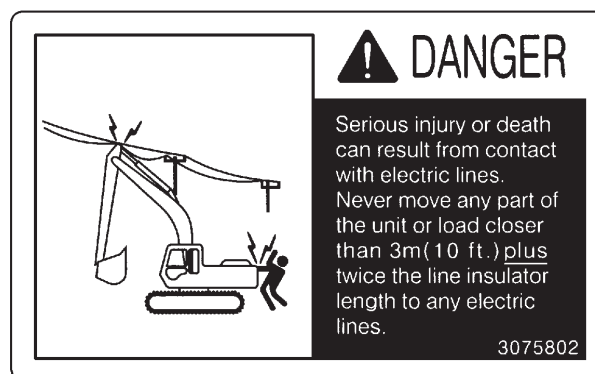


SS-1616

2.

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

Keep a safe distance from electric power lines.



SS-862

3.

Sign indicates a hazard from falling window.

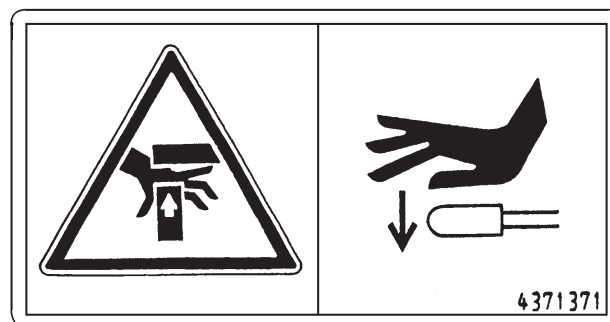
After raising window, be sure to lock it in place with lock pins.



SS-863

4.

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



SS-955

SAFETY SIGNS/Oceania Model Only

5.

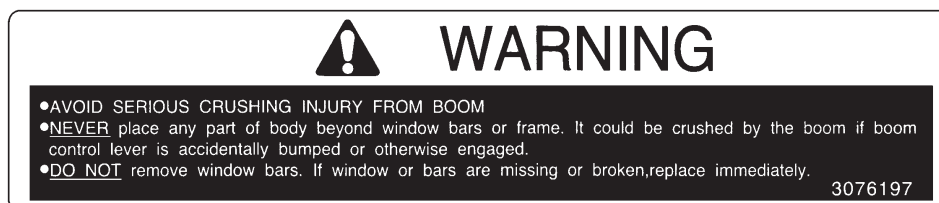
If the machine should overturn, the operator may become injured and/or throw from the cab and/or crushed by the overturning machine.



SS3088058

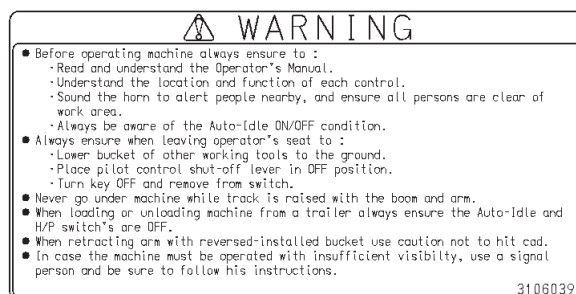
6.

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



SS-859

7.

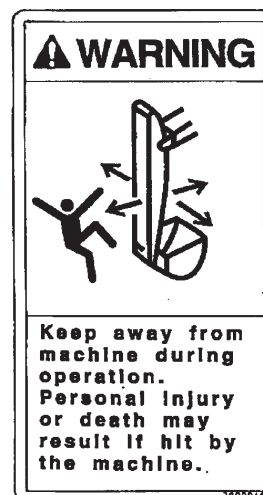


SS3106039

8.

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

Keep away from machine during operation.

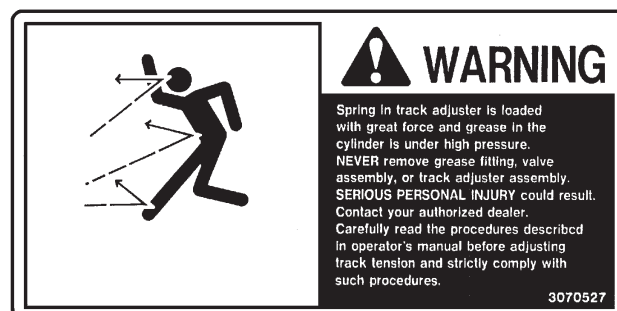


SS3092845

SAFETY SIGNS/Oceania Model Only

9.

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

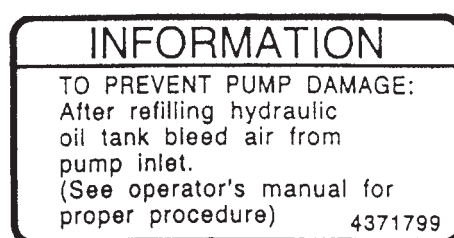


SS-408

10.

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

A



SS4371799

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

B



SS-864

11.

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



ZX200-3, 270-3, 330-3 Class

SS3092351

SAFETY SIGNS/Oceania Model Only

12.

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



SS3092350

13.

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



SS-024

14.

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



ZX120-3, 180-3, 200-3, 270-3

Class

SS-2827



ZX330-3 Class

SS-2828

15.

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

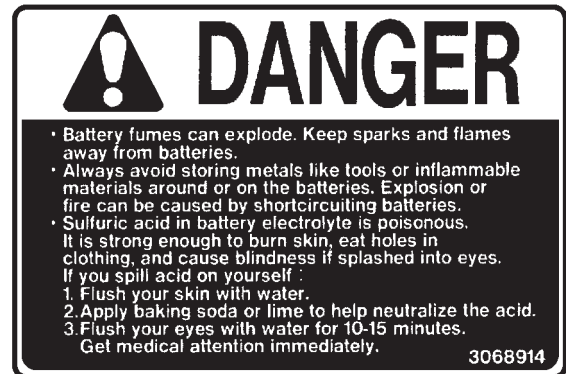


SS3092352

SAFETY SIGNS/Oceania Model Only

16.

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



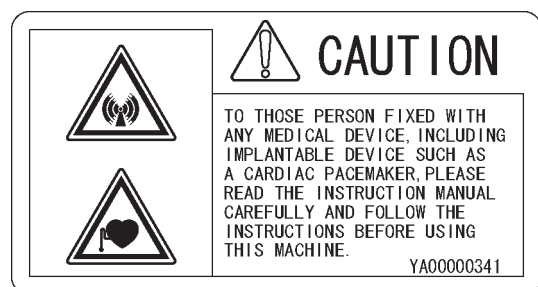
SS-411

17.



SS4467093

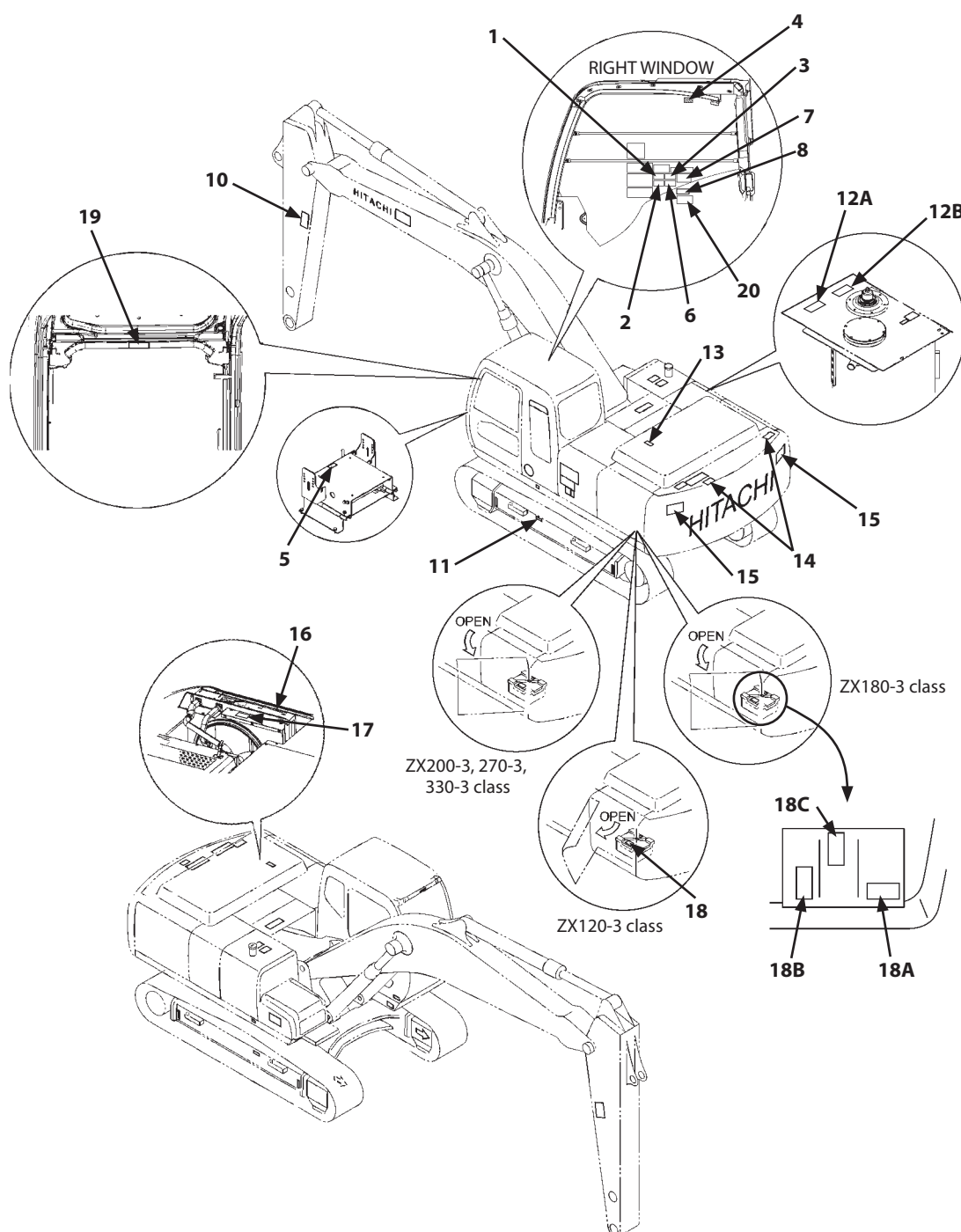
18.



SSYA00000341

SAFETY SIGNS/Asia/Middle and Near East Model Only

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

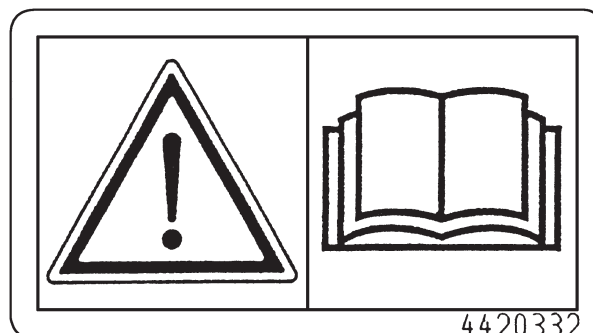


SAFETY SIGNS/Asia/Middle and Near East Model Only

1.

WARNING!

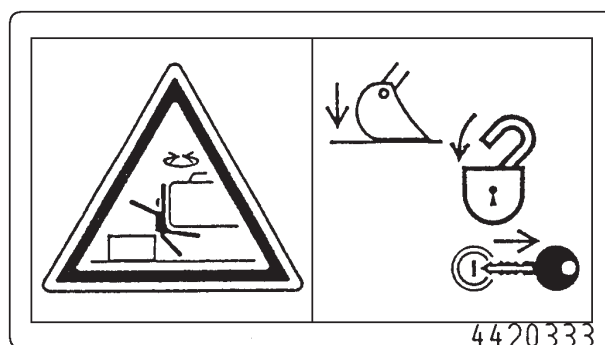
Prior to operation, maintenance, disassembling, and transportation of the machine, be sure to read and understand the Operator's Manual.



SS-1616

2.

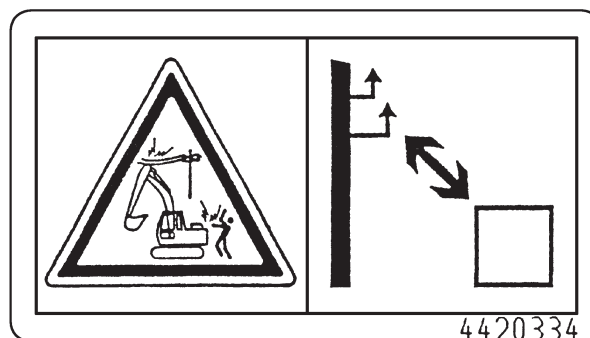
If the parked machine is unexpectedly moved, serious injury or death due to crushing may result. Be sure to lower the front attachment to the ground, lock the control levers, and remove the engine key before leaving the machine unattended.



SS4420333

3.

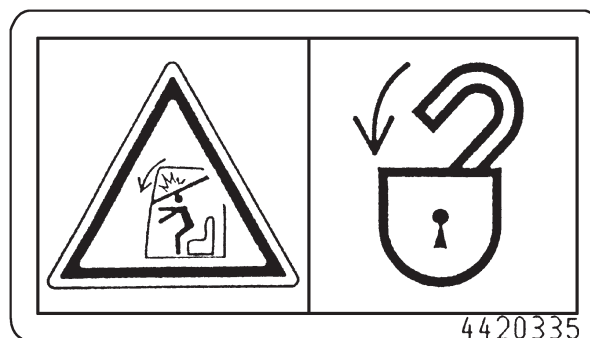
Sign indicates an electrocution hazard if machine is brought too near electric power lines. Keep a safe distance from electric power lines.



SS-1613

4.

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

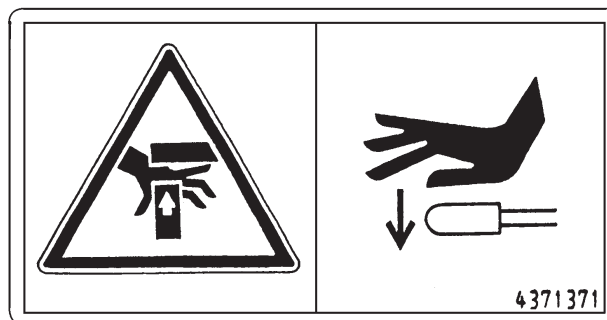


SS-1618

SAFETY SIGNS/Asia/Middle and Near East Model Only

5.

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



SS-955

6.

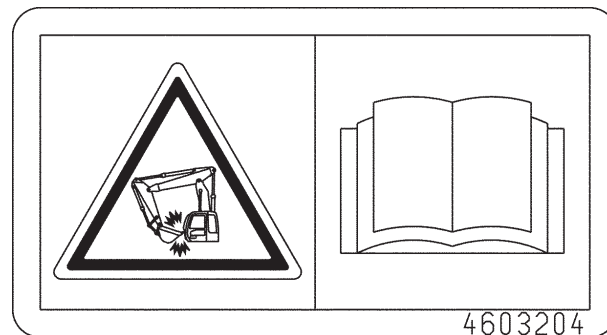
If the machine should overturn, the operator may become injured and/or throw from the cab and/or crushed by the overturning machine.



SS4654287

7.

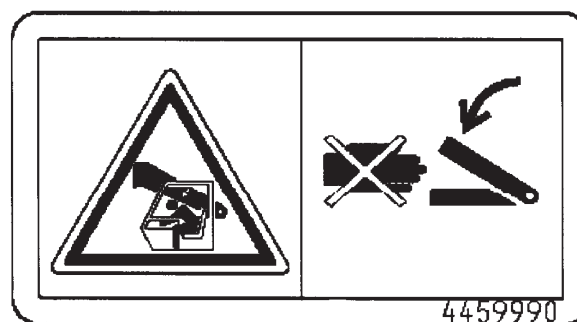
When operating, the bucket may come in contact with the cab. Operate the machine with care not to allow the tip of the bucket to hit the cab while rolling in the front attachment.



SS4603204

8.

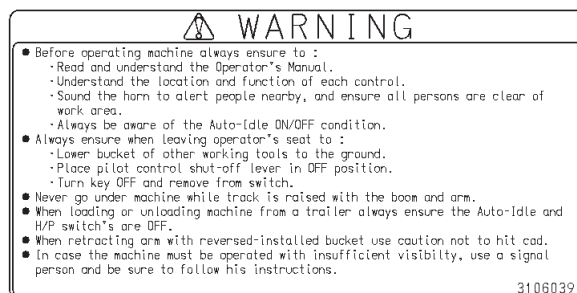
Do not extend your hands or head from the window. Your hands or head may come in contact with the boom.



SS4459990

SAFETY SIGNS/Asia/Middle and Near East Model Only

9.



SS3106039

10.

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

Keep away from machine during operation.

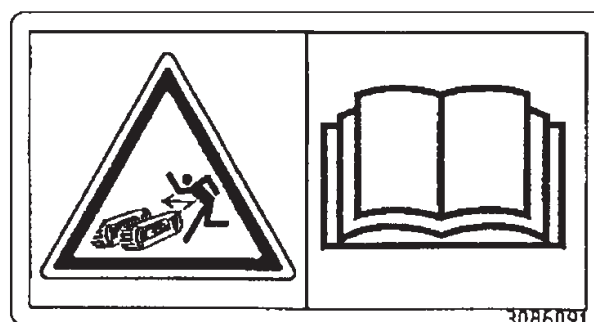


SS3109581

11.

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

Read manual before adjusting track for safe and proper handling.



SS3086091

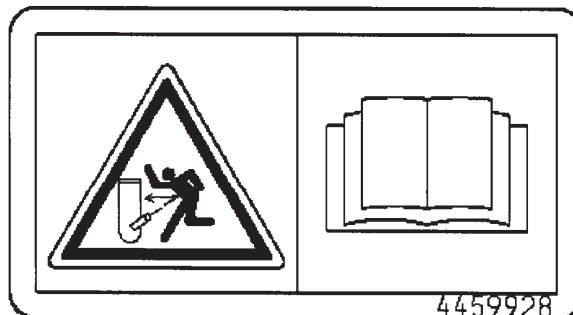
SAFETY SIGNS/Asia/Middle and Near East Model Only

12.

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

Read manual for safe and proper handling.

A

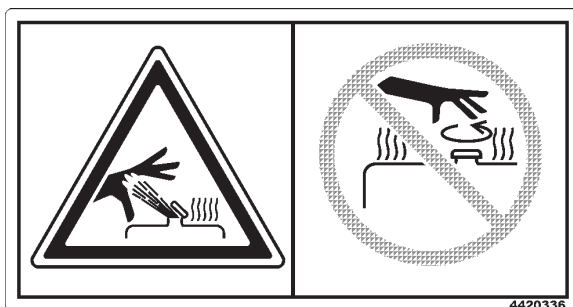


SS4459928

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.

B



4420336

SS4420336

13.

Sign indicates a hazard of falling.

Do not stand on this place.



3092126

SS3092126

14.

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

Never stand close to the edge.



3092125

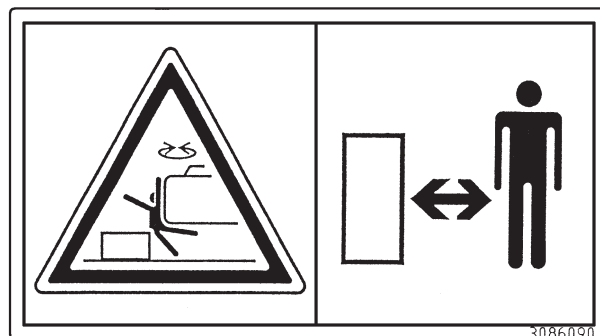
SS3092125

SAFETY SIGNS/Asia/Middle and Near East Model Only

15.

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

Keep away from swinging area of machine.



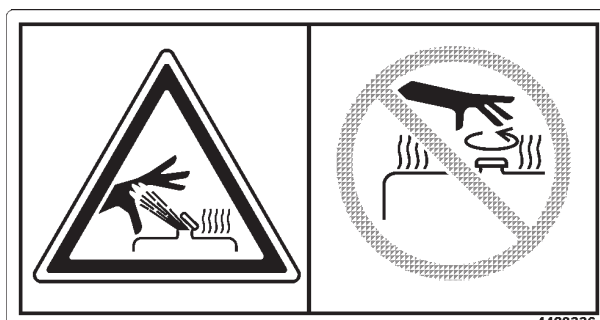
3086090

SS-1614

16.

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.



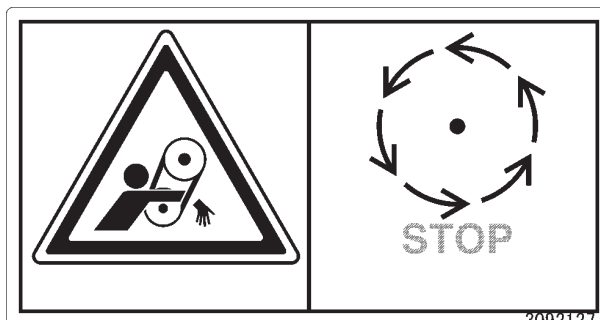
4420336

SS4420336

17.

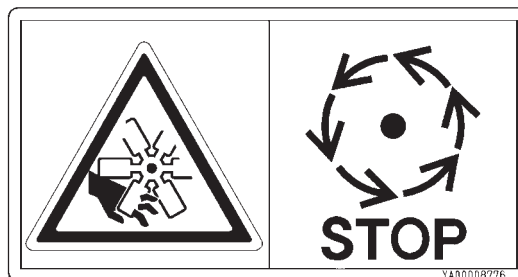
Sign indicates a hazard of rotating parts, such as belt.

Turn off before inspection and maintenance.



3092127

SS3092127



YAB0008776

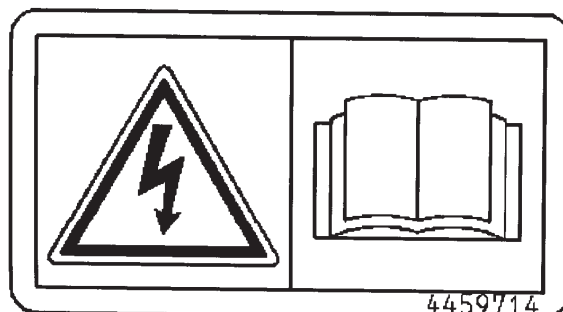
SSYA00008776

SAFETY SIGNS/Asia/Middle and Near East Model Only

18.

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

A



SS4459714

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

B



SS4460067

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

C



SS4460056

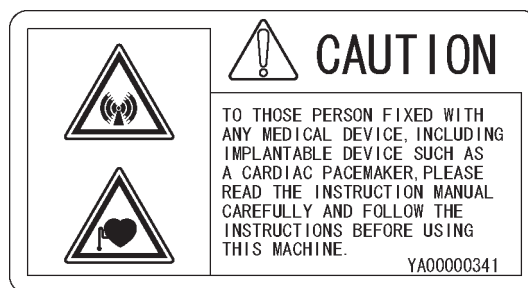
19.



SS4467093

SAFETY SIGNS/Asia/Middle and Near East Model Only

20.



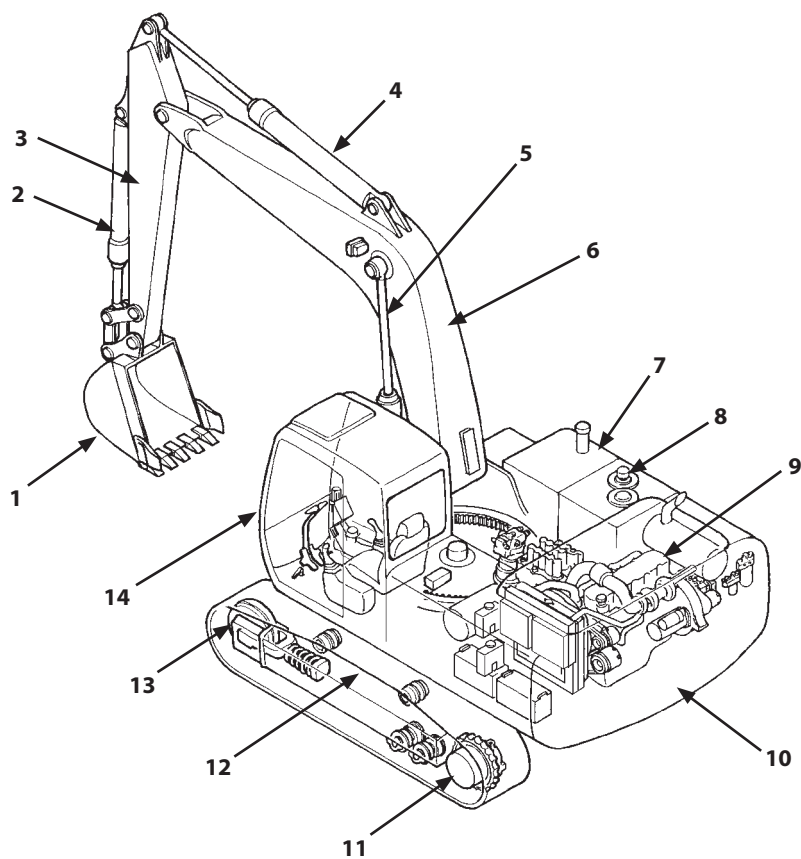
SSYA00000341

MEMO

COMPONENTS NAME

COMPONENTS NAME

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



M1U1-01-005

GETTING ON/OFF THE MACHINE

GETTING ON/OFF THE MACHINE

Foot holds (1) and handrails (2) are provided in and around the machine.

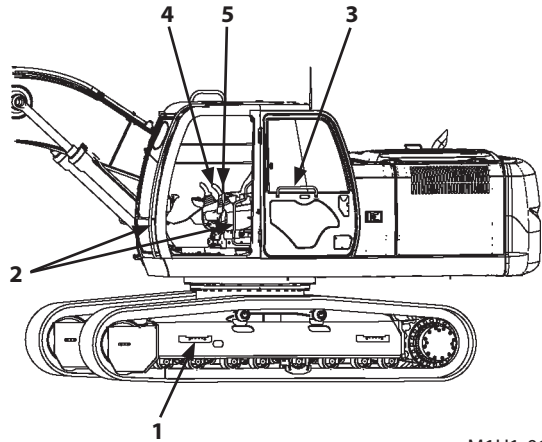
These are used to get on and off the cab safely as well as to do inspection and maintenance of the machine safely.

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

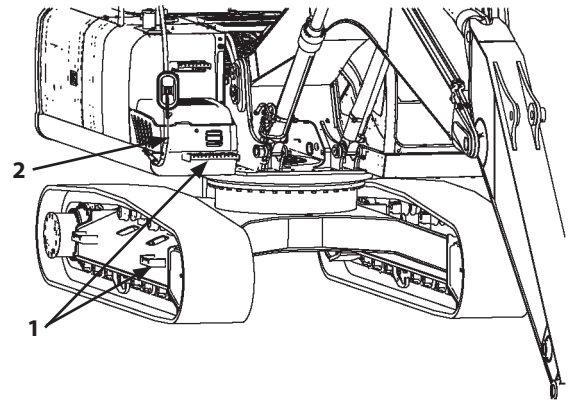


WARNING:

- **Never attach a wire on the foot holds (1) to lift the cab or main body or while transporting the machine on a truck or trailer as it is dangerous.**
- **The door handle (3) is not a handrail. Do not hold the door handle (3) as a handrail when getting on and off the machine.**
- **Do not hold the control levers (4), steering wheel or forward/reverse lever when getting on and off the machine.**



M1U1-01-120



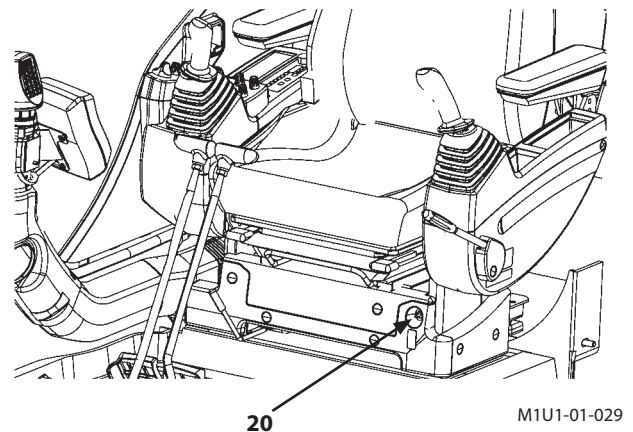
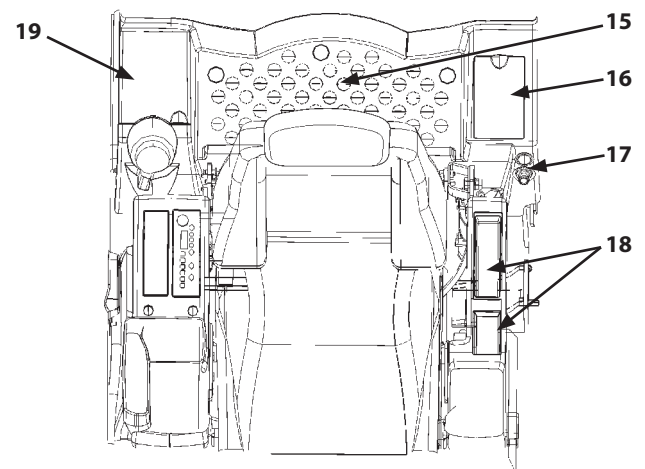
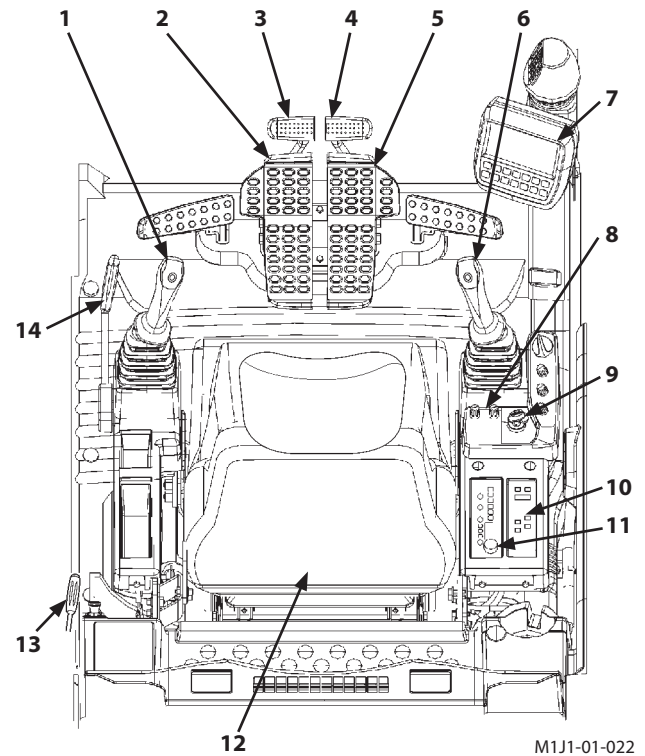
M1U1-01-121

OPERATOR'S STATION

CAB FEATURES

Std. Model, L Model

- 1- Left Control Lever/Horn Switch
(On Top of Lever)
- 2- Left Travel Pedal
- 3- Left Travel Lever
- 4- Right Travel Lever
- 5- Right Travel Pedal
- 6- Right Control Lever/Power Boost Switch
(Except ZX120-3 class)
- 7- Multi Function Monitor Panel
- 8- Switch Panel
- 9- Key Switch
- 10- Air Conditioner Panel
- 11- Radio
- 12- Operator's Seat
- 13- Cab Door Release Lever
- 14- Pilot Control Shut-Off Lever
- 15- Glove Compartment
- 16- Fuse Box
- 17- Cigar Lighter
- 18- Switch Panel
- 19- Hot & Cool Box
- 20- Engine Stop Switch

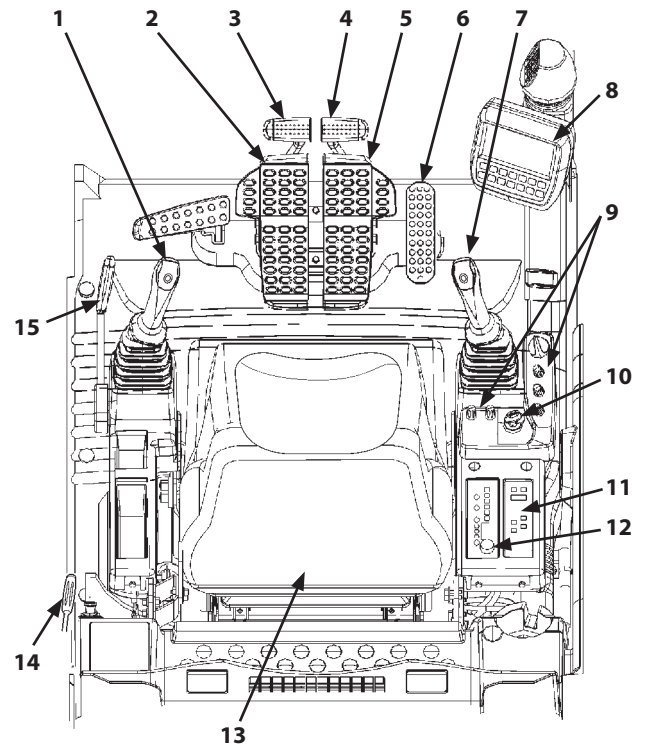


OPERATOR'S STATION

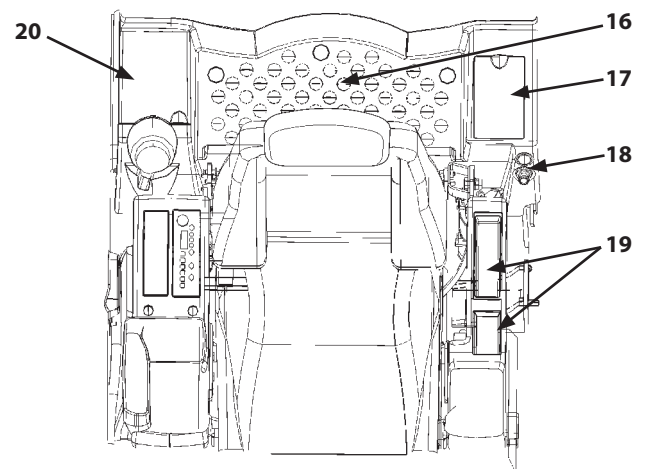
CAB FEATURES

K. Model (Except ZX180-3 class)

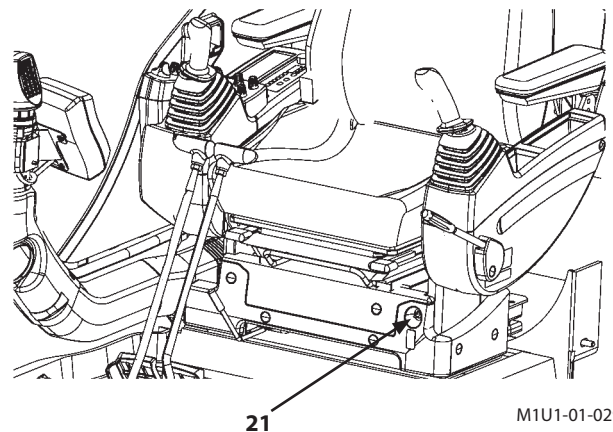
- 1- Left Control Lever/Horn Switch
(On Top of Lever)
- 2- Left Travel Pedal
- 3- Left Travel Lever
- 4- Right Travel Lever
- 5- Right Travel Pedal
- 6- Attachment Pedal (Optional)
- 7- Right Control Lever/Power Boost Switch
(Except ZX120-3 class)
- 8- Multi Function Monitor Panel
- 9- Switch Panel
- 10- Key Switch
- 11- Air Conditioner Panel
- 12- Radio
- 13- Operator's Seat
- 14- Cab Door Release Lever
- 15- Pilot Control Shut-Off Lever
- 16- Glove Compartment
- 17- Fuse Box
- 18- Cigar Lighter
- 19- Switch Panel
- 20- Hot & Cool Box
- 21- Engine Stop Switch



M1J1-01-026



M1U1-01-002



M1U1-01-029

OPERATOR'S STATION

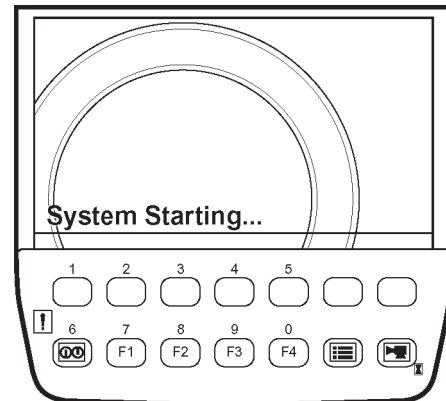
MULTI FUNCTION MONITOR

How To Use Screens

Displaying Basic Screen

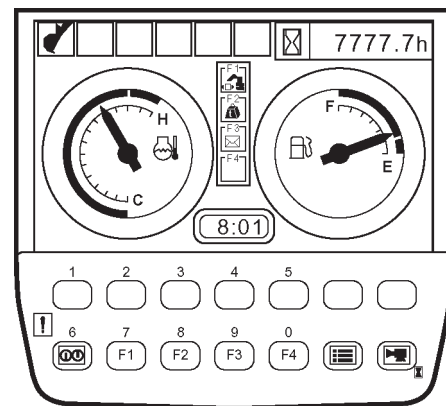
IMPORTANT: Start the engine after the basic screen is displayed.

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



Key Switch: ON

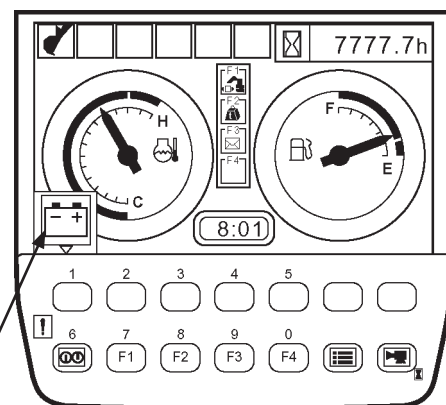
T1V1-05-01-115



Basic Screen

T1V1-05-01-123

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



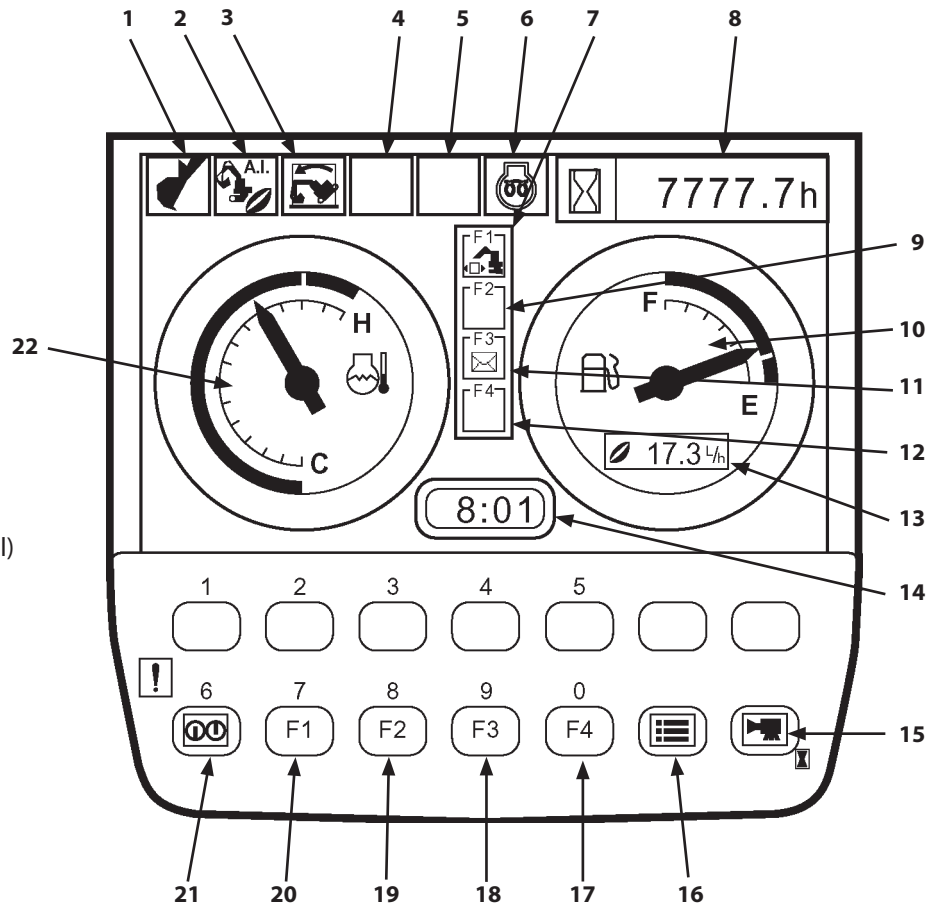
Alternator Alarm

T1V1-05-01-117

OPERATOR'S STATION

OUTLINE

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



M1U1-01-111

OPERATOR'S STATION

- Display of Meters
Items to be displayed

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

- Work Mode Display
The attachments being used are displayed.

Digging mode



T1V1-05-01-108

Attachment mode

Breaker



T1V1-05-01-104

Pulverizer



T1V1-05-01-105

Crusher



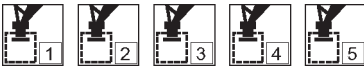
T1V1-05-01-106

Vibration hammer

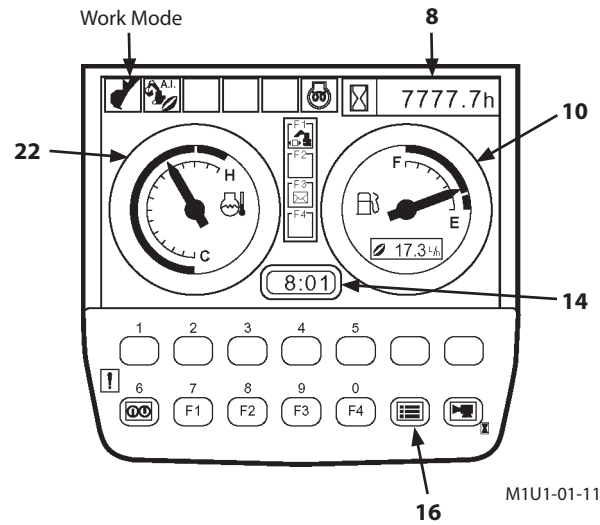


T1V1-05-01-107

Other



T1V1-05-02-003



OPERATOR'S STATION

- Auto-Idle Display (2)
When selecting auto-idle from the switch panel, auto-idle display (2) is displayed.
When the key is turned ON, the data blinks for 10 seconds.

Overload Alarm Display (3) (optional)

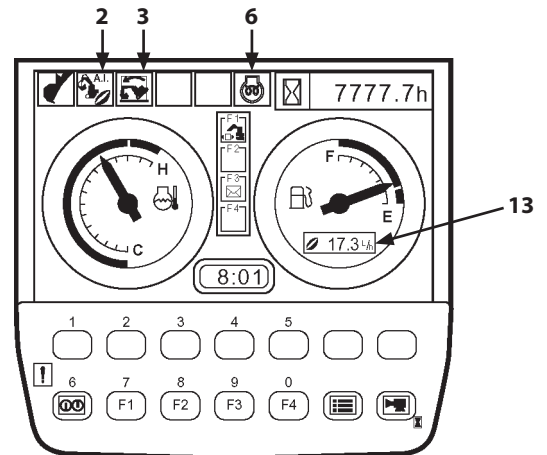


T1V1-05-02-002

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

- Preheat Display (6)
While the current is being supplied to the glow plug, the indicator is displayed.

- Fuel Rate Display (13)
Fuel consumption is displayed (Reference value).

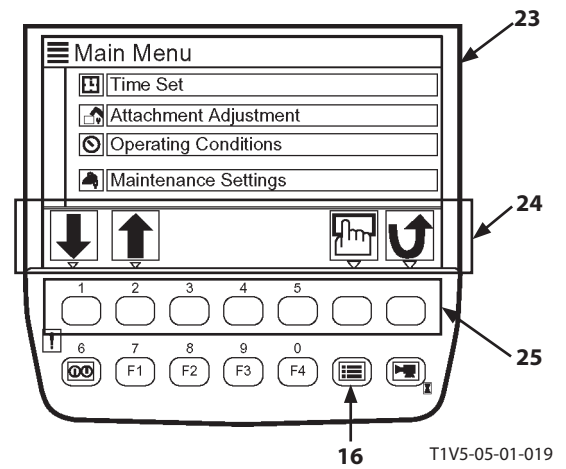


M1U1-01-113

OPERATOR'S STATION

Menu Screen (23)

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



OPERATOR'S STATION

Hour Meter

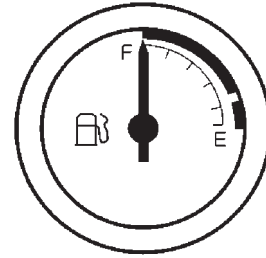
Total (accumulated) machine operation hours counted since the machine started working, are displayed in the unit of HOUR (h). One digit after the decimal point indicates the tenths of an hour (6 minutes).



M81U-01-058

Fuel Gauge

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



M1U1-01-039

Clock

Indicates the present time.



M1U1-01-040

Back Monitor Selector

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



M1U1-01-041

OPERATOR'S STATION

Menu Key

Shifts the basic screen to the menu screen.



M1U1-01-042

Optional Function Key

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

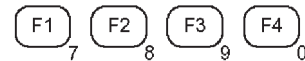
F1 : Work Mode Selection

F2 : Auxiliary

F3 : Mail (Optional)

F4 : Auxiliary

are the fixed function keys.



M1U1-01-043

Return to Basic Screen Key

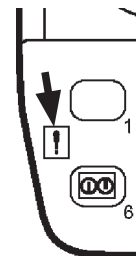
Allows any screen to return to the basic screen.



M1U1-01-044

Alarm Light

Comes ON when any abnormality occurs.



M1U1-01-045

Optional Function Display

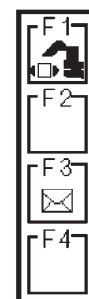
Displays the optional functions preset by the optional function key.

F1 : Work Mode Selection

F2 : Auxiliary

F3 : Mail (Optional)

F4 : Auxiliary

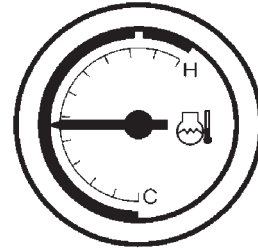


M1U1-01-114

OPERATOR'S STATION

Coolant Temperature Gauge

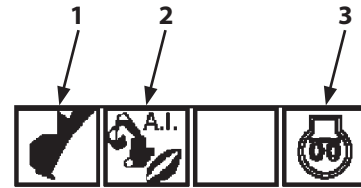
Indicates the engine coolant temperature. Normally the needle is around the center of the scale during operation.



M1U1-01-047

Operating Status Icon Display

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



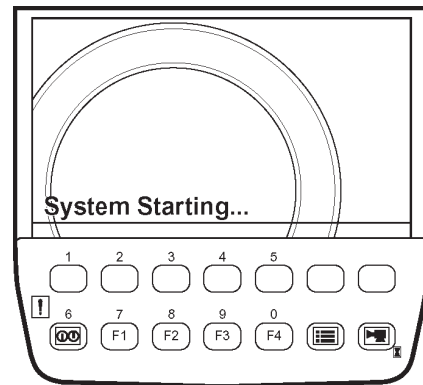
M1U1-01-065

OPERATOR'S STATION

Displaying Basic Screen by Password Input (Optional)

IMPORTANT: When required to activate the TEN-key function (ignition block system), consult your nearest Hitachi dealer.
If the password ever escapes the customer's memory, the machine must be modified. Be extra careful not to forget the password.

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

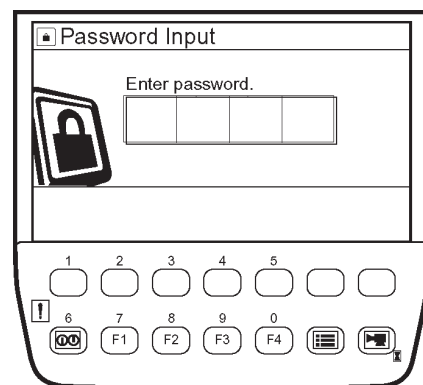


Starting Screen

T1V1-05-01-115

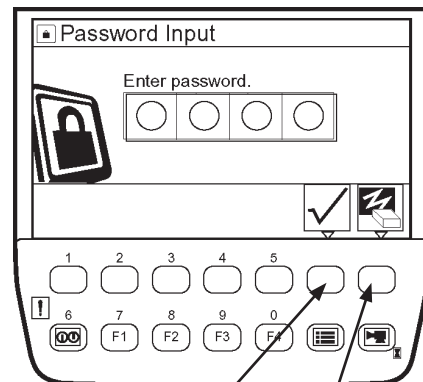
2. Input a password by using the keys located under the screen. If pushing the determination key, the monitor unit matches the input password to the registered one. If they match, the basic screen displays.

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



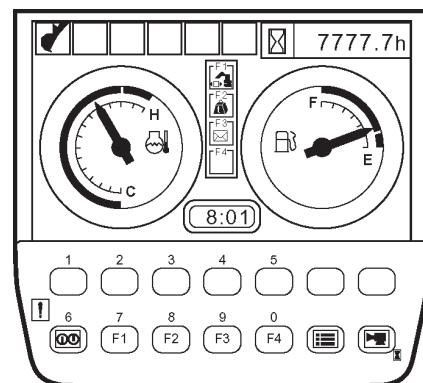
Password Input Screen

T1V5-05-01-093



Determination Key Delete Key

T1V5-05-01-002



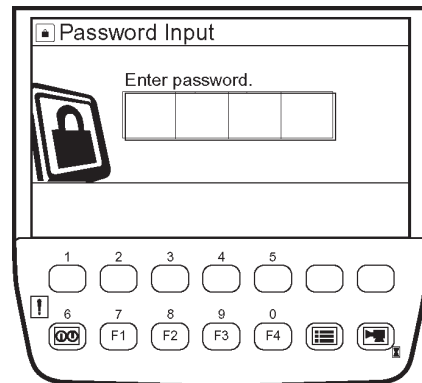
Basic Screen

T1V1-05-01-123

OPERATOR'S STATION

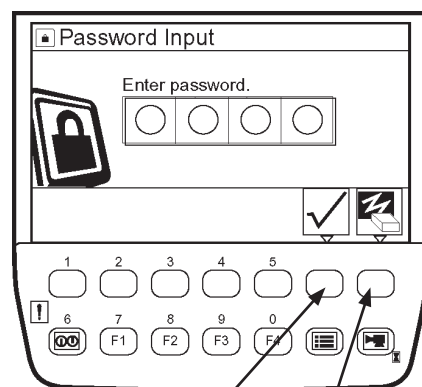
In Case of Inputting an Incorrect Password

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



Password Input Screen

T1V5-05-01-093

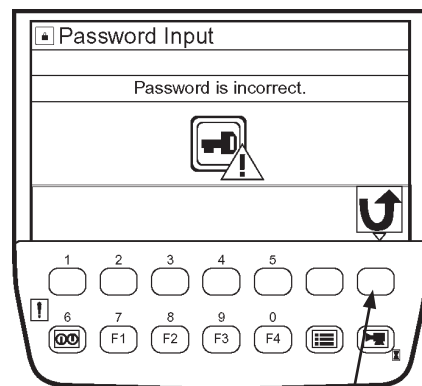


Determination Key Delete Key

T1V5-05-01-002

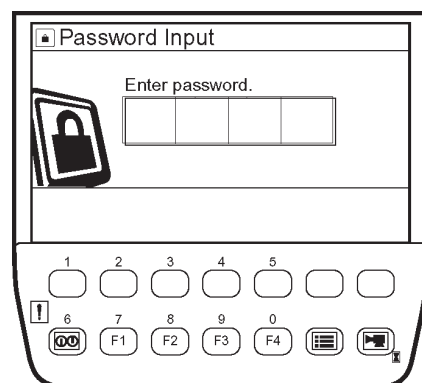
2. Return to the password input screen, by pushing the back key.

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



Back key

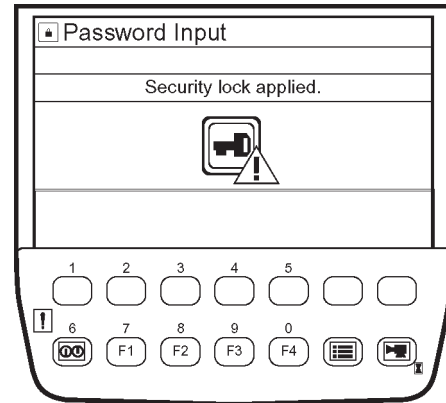
T1V5-05-01-004



T1V5-05-01-093

OPERATOR'S STATION

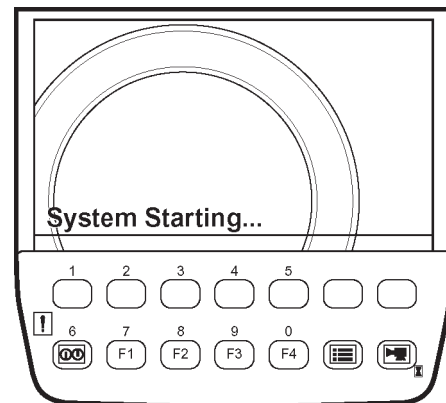
3. If inputting an incorrect password three times, a screen displays informing that the security lock has been applied, and a buzzer rings for thirty seconds. During that time, the buzzer does not stop ringing even if turning of the key switch ON/OFF.



Security Lock Screen

T1V5-05-01-005

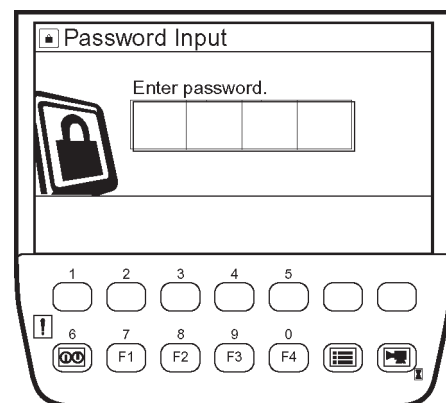
4. After thirty seconds, if the key switch is turned to the ON position, the starting screen displays and the password input screen displays again. Then a password can be input again. If inputting an incorrect password even once this time, the security lock screen displays again and a buzzer rings for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



Starting Screen

T1V1-05-01-115

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



Password Input Screen

T1V5-05-01-093

OPERATOR'S STATION

Extending Password Duration Time

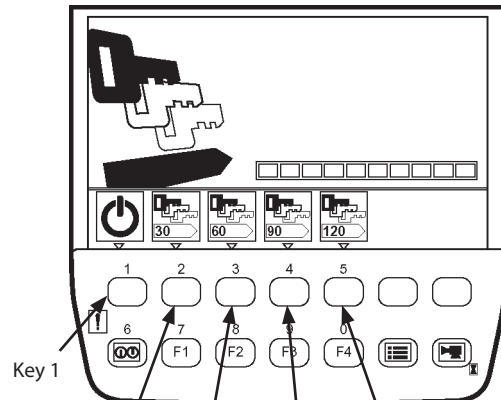
IMPORTANT: This operation is applicable only to those machines that display the basic screen based upon password input.

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

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

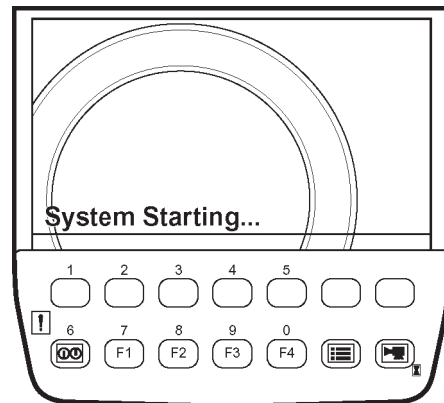
 **NOTE:** If password duration time is not set explicitly, 0 minute on duration time is assumed.

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



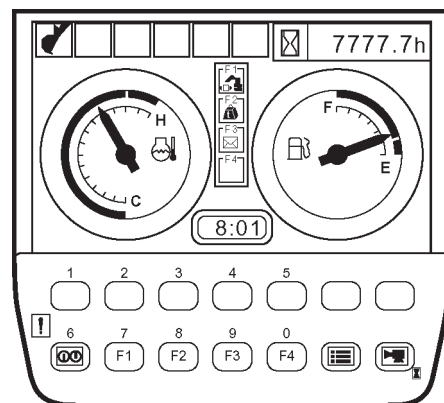
Password Duration Screen (Key Switch: OFF)

T1V1-05-01-012



Key Switch: ON

T1V1-05-01-115



Basic Screen

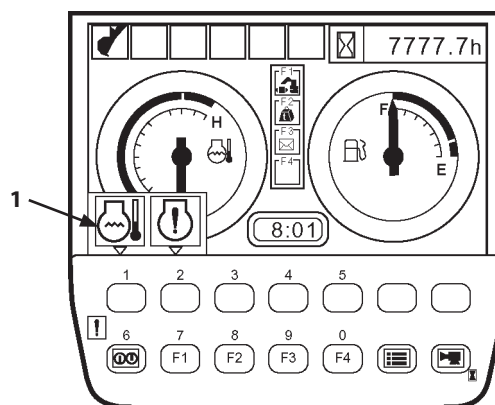
T1V1-05-01-123

OPERATOR'S STATION

ALARM OCCURRENCE SCREEN

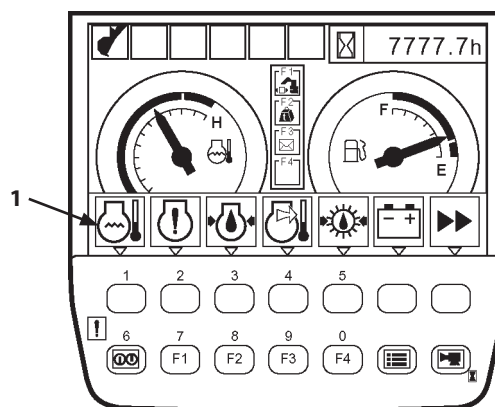
In case any abnormality occurs, alarm marks (1) are displayed on the basic screen.

- When the number of alarms is two or less



T1V1-05-01-095

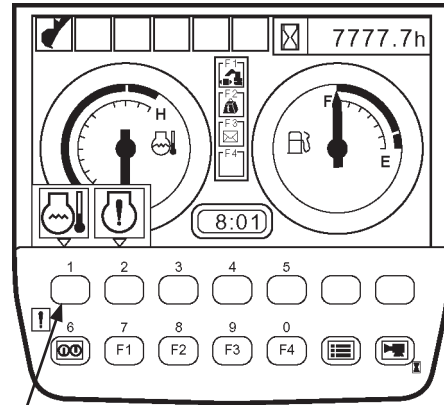
- When the number of alarms is three or more



T1V1-05-01-096

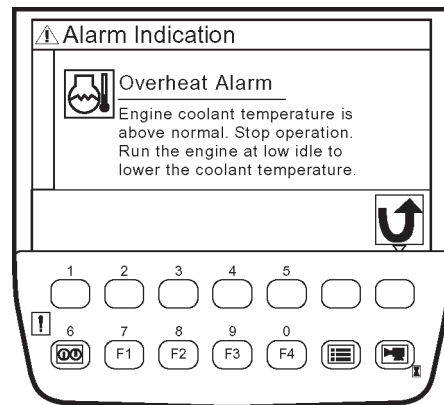
OPERATOR'S STATION

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



Push a Relevant Key

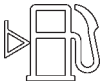
T1V1-05-01-095



T1V5-05-01-013

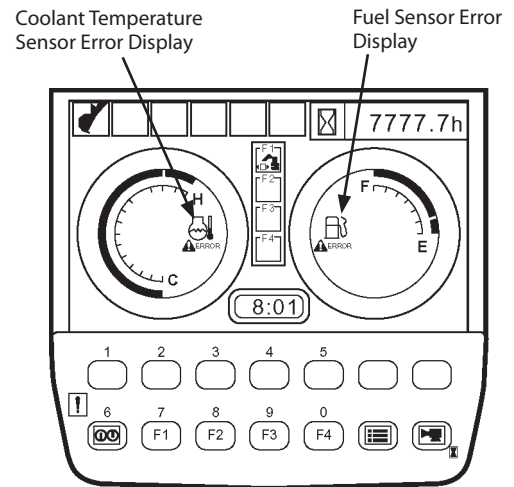
OPERATOR'S STATION

CONTENTS OF ALARMS

Display	Contents of Alarms	Remedy
 M178-01-036	Overheat Alarm	Engine coolant temperature has abnormally increased. Stop operation. Run the engine at slow idle speed and lower the coolant temperature.
 M183-01-080	Engine Warning Alarm	Engine or engine related parts are abnormal. Consult your nearest Hitachi dealer.
 M178-01-037	Engine Oil Pressure Alarm	Engine oil pressure has decreased. Immediately stop engine. Check engine oil system and oil level.
 M183-01-071	Alternator Alarm	Electrical system is abnormal. Consult your nearest Hitachi dealer.
 M178-01-034	Remaining Fuel Alarm	Fuel level is low. Refill fuel as soon as possible.
 M1CC-01-039	Hydraulic Oil Filter Alarm	Hydraulic oil filter is clogged. Replace filter.
 M183-01-067	Air Filter Clogged Alarm	Air filter elements are clogged. Clean or replace air filter elements.
 M1U1-01-125	Fuel Filter Clogged Alarm	Fuel filter elements (pre-filter, main filter) are clogged. Replace fuel filter elements.
 T1V1-05-01-102	Work Mode Alarm	Work Mode system is abnormal. Consult your nearest Hitachi dealer.
 T1V1-05-01-103	Pilot Control Shut-Off Lever Alarm	Pilot control shut-off lever system is abnormal. Consult your nearest Hitachi dealer.

OPERATOR'S STATION

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



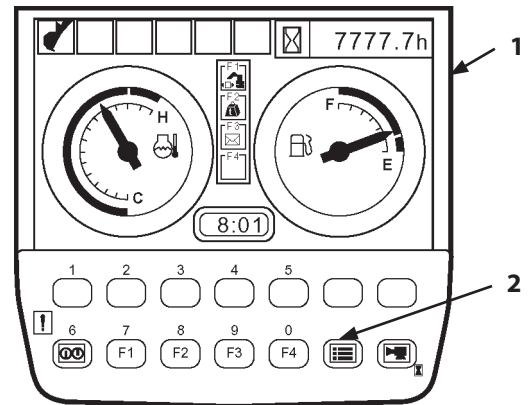
T1V1-05-02-005

OPERATOR'S STATION

CLOCK SETTING

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

Select time set menu (4) by pressing the key located under   keys on icon display area and adjust the clock set.

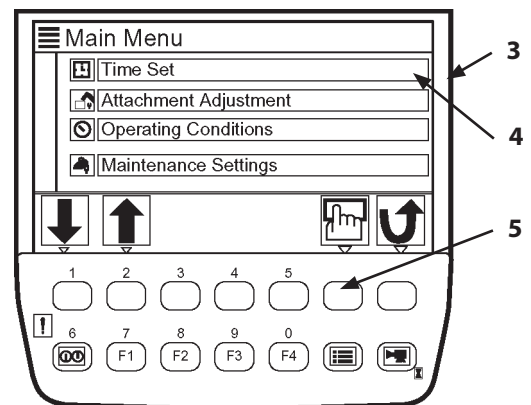


T1V1-05-01-123

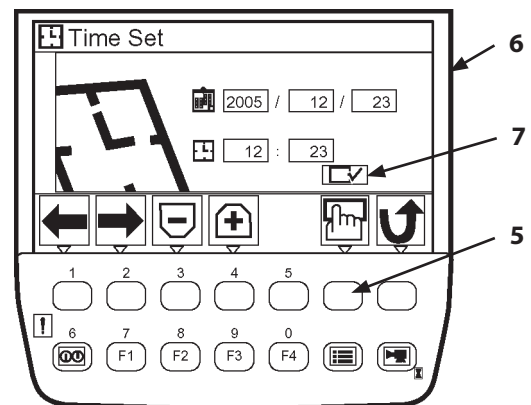
Time Adjustment

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

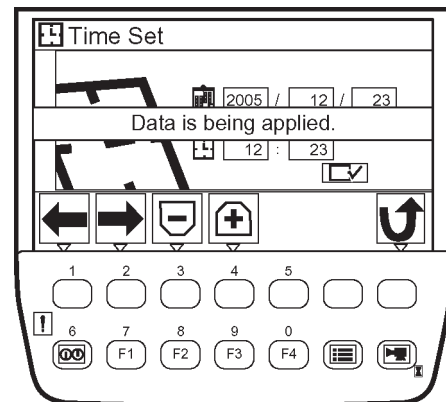
1. While pressing the key located under   and   keys on icon display area on time setting screen (6), select the figures for Year, Month, Day, and Time.
2. After moving the cursor to  position (7) by pressing the key located under  key, press determination key (5) to define the setting.



T1V5-05-01-019



T1V5-05-01-021



T1V5-05-01-022

OPERATOR'S STATION

ATTACHMENT SELECTION

(Only Machines Equipped with Optional Parts)

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

Selecting an Attachment by Using Work Mode Selection Key F1

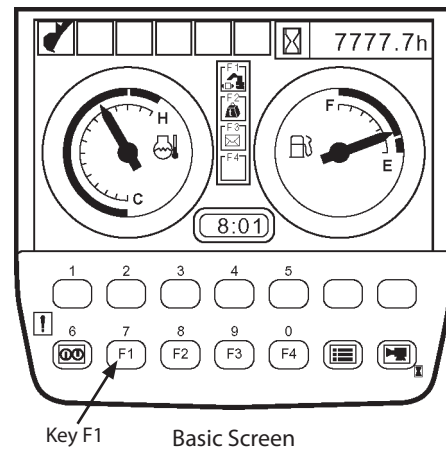
1. When the basic screen displays, push work mode selection key F1 and display the work mode screen.
2. Push a key located under an attachment mark to be used in order to select the attachment.
(In the right example, Crusher 1 is selected.)

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

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

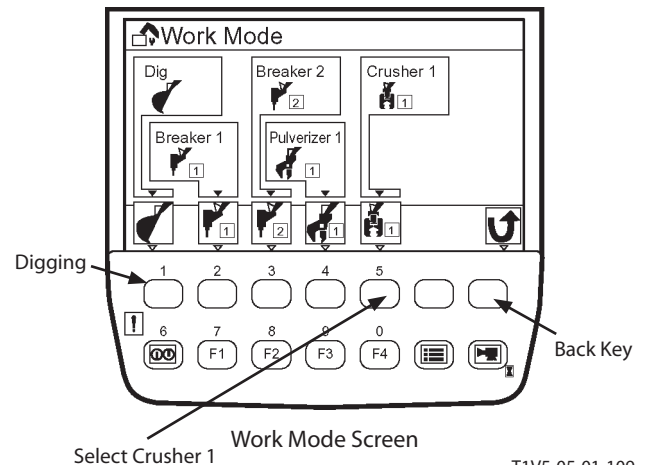
 **NOTE:** When pushing the back key, return to the previous screen.

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



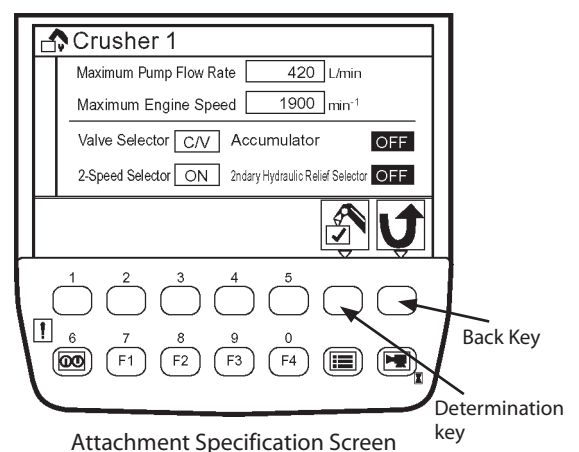
Basic Screen

T1V1-05-01-123



Work Mode Screen

T1V5-05-01-109



Attachment Specification Screen

T1V5-05-01-028

OPERATOR'S STATION

Selecting an Attachment from Main Menu

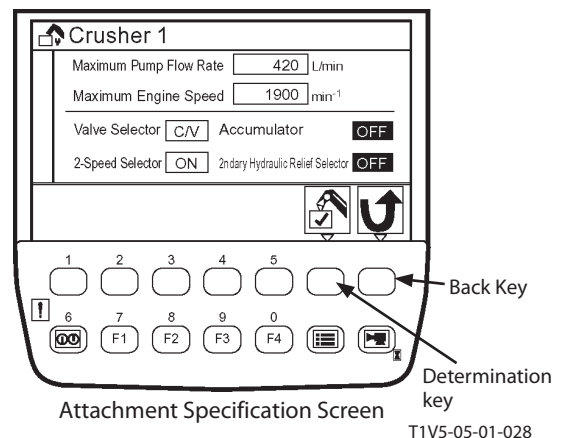
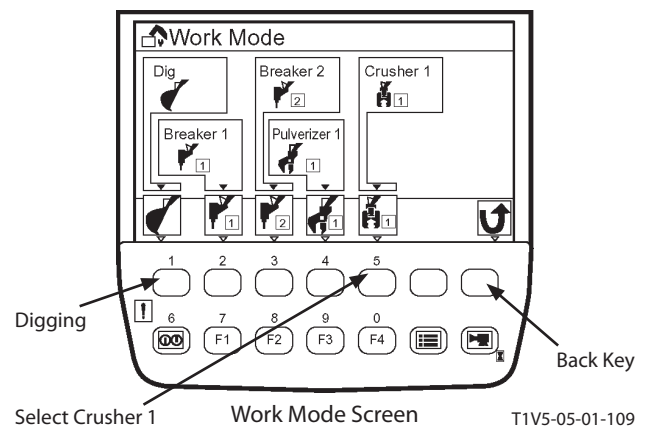
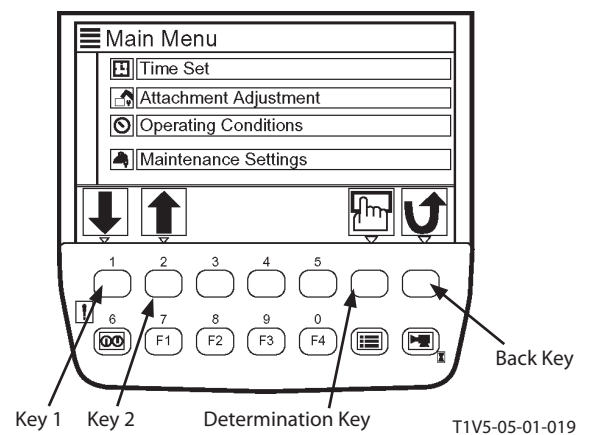
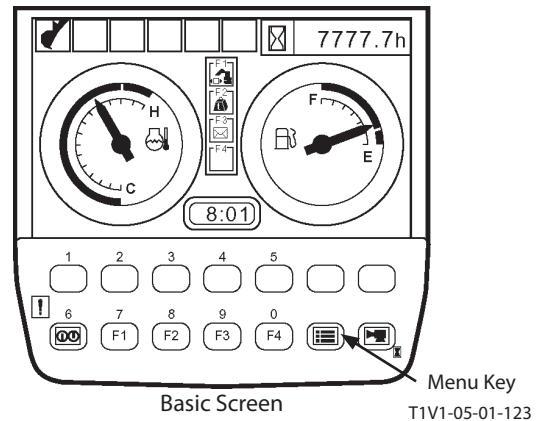
1. When the basic screen displays, push the menu key and display main menu.
2. Select work mode from main menu by using keys 1 (↓) and 2 (↑). Push determination key. Then, the work mode screen displays.
3. Push the key located under an attachment mark to be used in order to select the attachment.
(In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

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

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

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

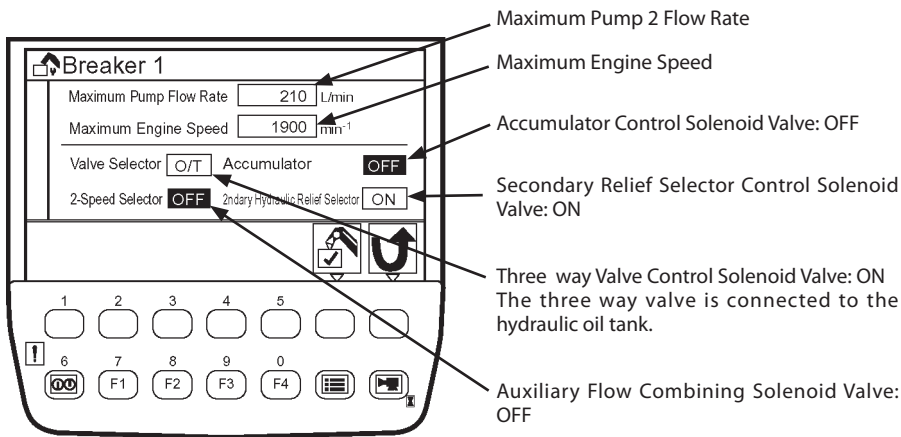
5. Push the determination key, and the basic screen displays.



OPERATOR'S STATION

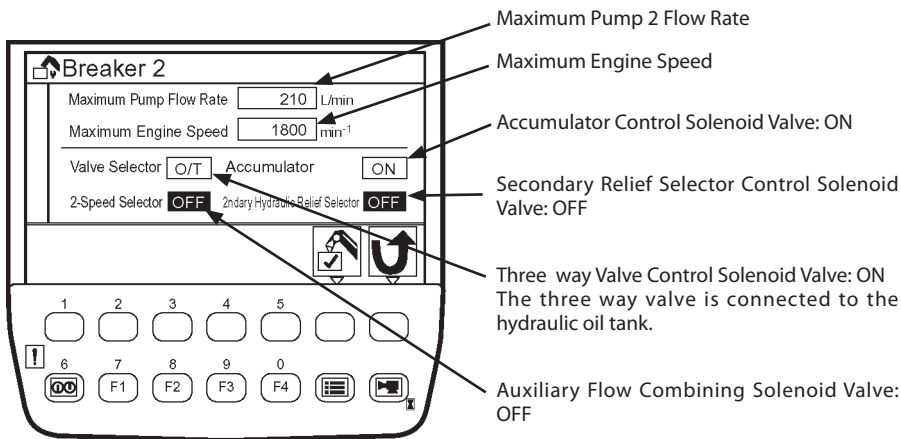
Attachment Specification Screen

Breaker 1



T1V5-05-01-001

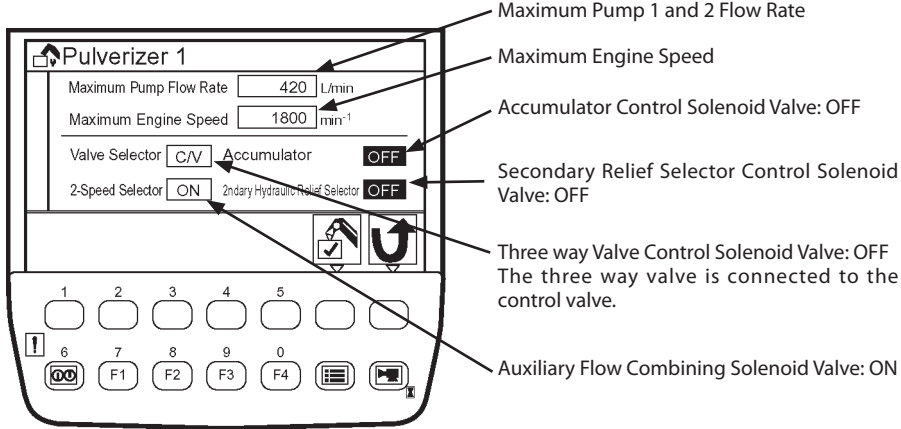
Breaker 2



T1V5-05-01-006

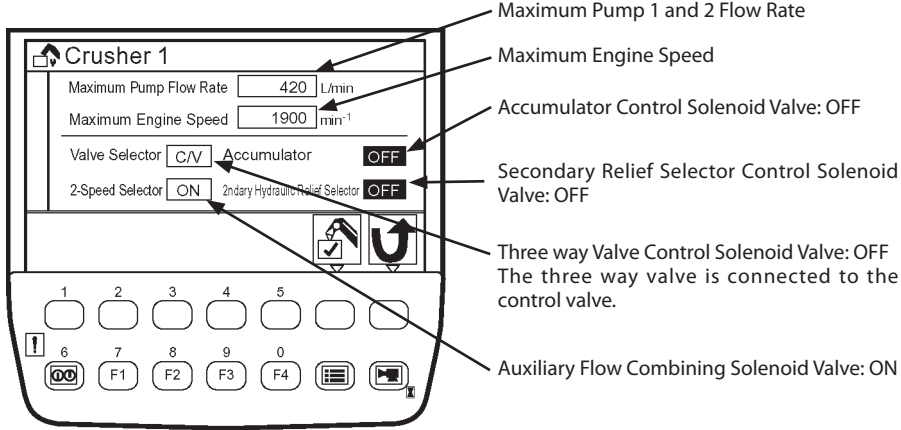
OPERATOR'S STATION

Pulverizer 1



T1V5-05-01-011

Crusher 1



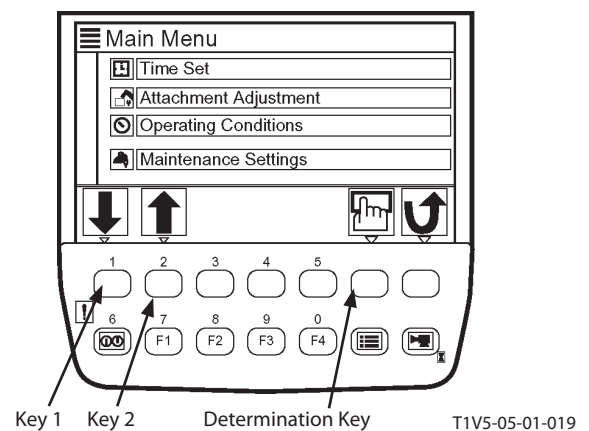
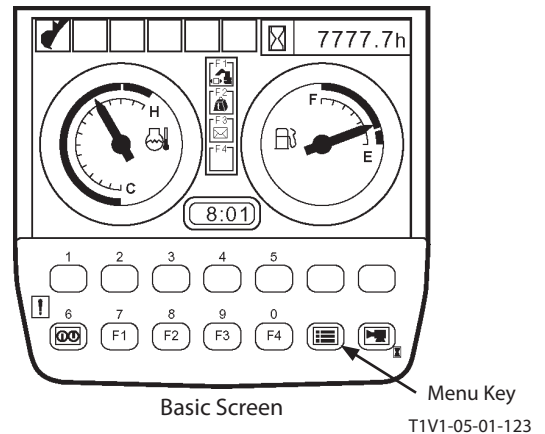
T1V5-05-01-028

OPERATOR'S STATION

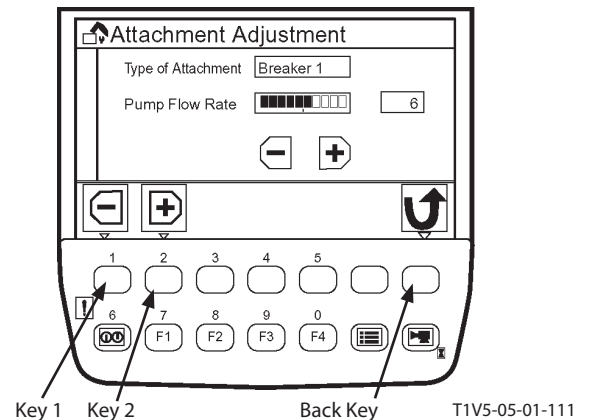
PUMP 2 FLOW RATE ADJUSTMENT (Only Machines Equipped with Optional Parts)

IMPORTANT: This operation is effective when attachments are used.

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



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

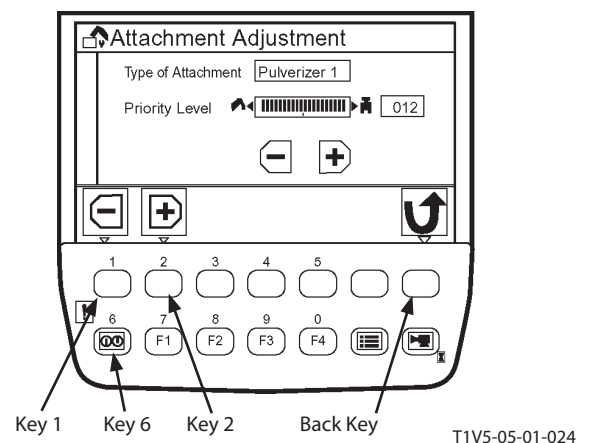


When using the pulverizer or crusher, pushing key 1 will increase flow rate of boom raise, arm roll-out, swing or travel circuit.

Pushing key 2 will increase flow rate of attachment side.

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

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



OPERATOR'S STATION

DISPLAYING OPERATING CONDITIONS

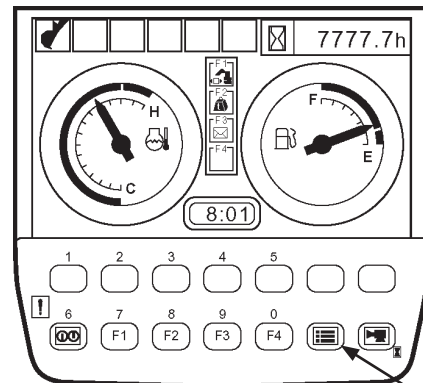
1. When the basic screen displayed, push the menu key and display main menu.
2. Select operating conditions from main menu by using keys 1 and 2. Push the determination key. Then, the operating conditions screen displays.
3. Push the reset key, and display the data reset confirm screen.

When reset the data, push the determination key.

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

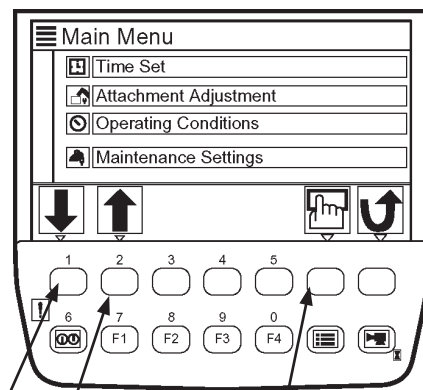
IMPORTANT: Total fuel consumption and fuel consumption rate depend on the operating environment and the operation method of machine. The values shown on the screen are just for reference.
There could arise $\pm 20\%$ of differences between actual fuel consumption and fuel consumption which is displayed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

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



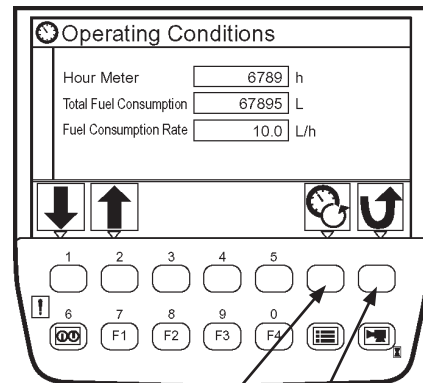
Basic Screen

Menu Key
T1V1-05-01-123



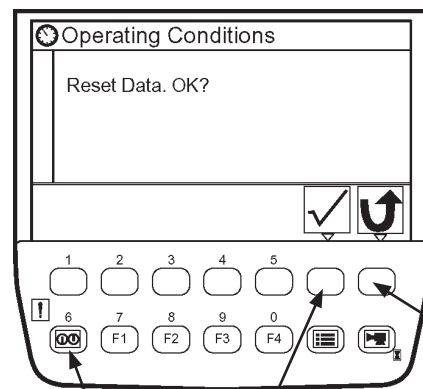
Key 1 Key 2 Determination Key

T1V5-05-01-019



Reset Key Back Key

T1V5-05-01-025



Key 6 Determination Key

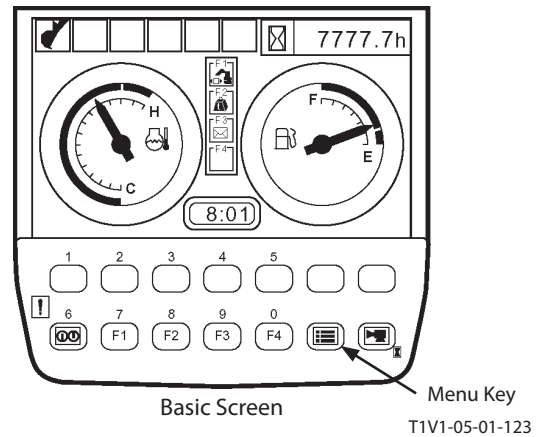
Back Key
T1V5-05-01-026

OPERATOR'S STATION

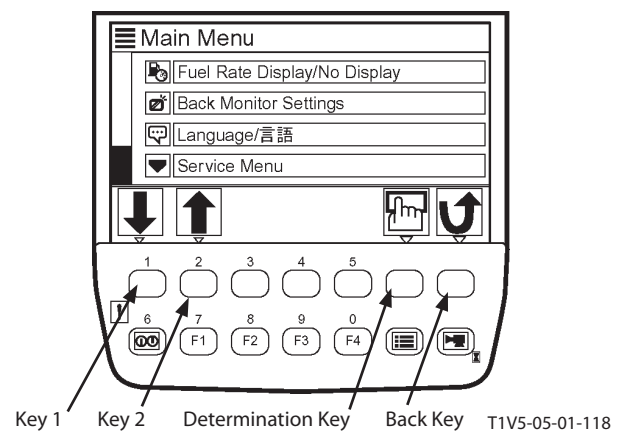
FUEL RATE DISPLAY/NO DISPLAY

Fuel Rate Display

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

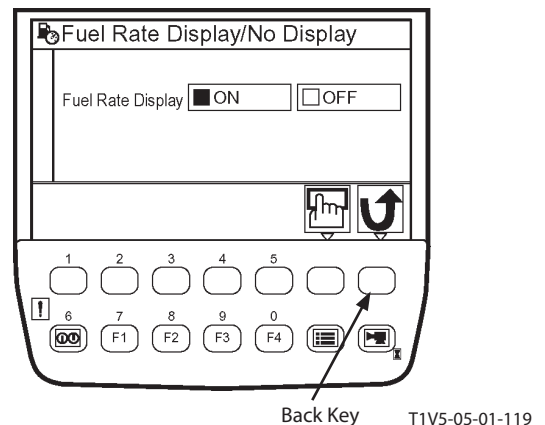
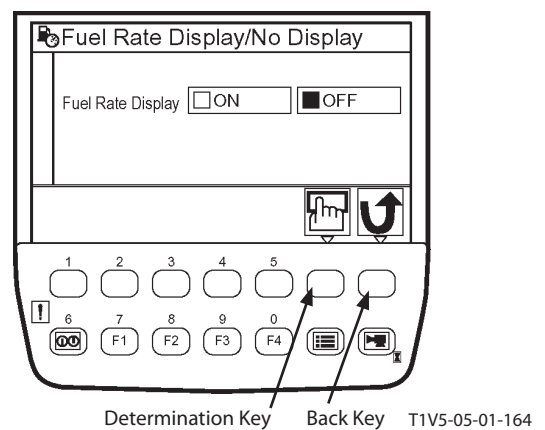


2. Select fuel rate display/No display from main menu by using keys 1 and 2. Push the determination key. Then, the fuel rate display/No display screen displays.



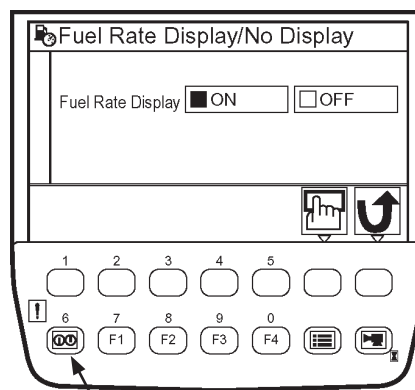
3. Push the determination key, and fuel rate display will be set to ON.

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



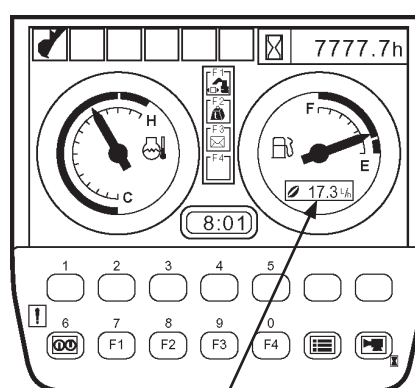
OPERATOR'S STATION

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



Key 6

T1V5-05-01-119



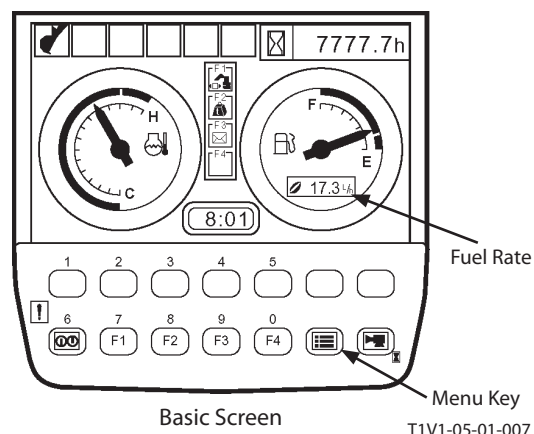
Fuel Rate

T1V1-05-01-007

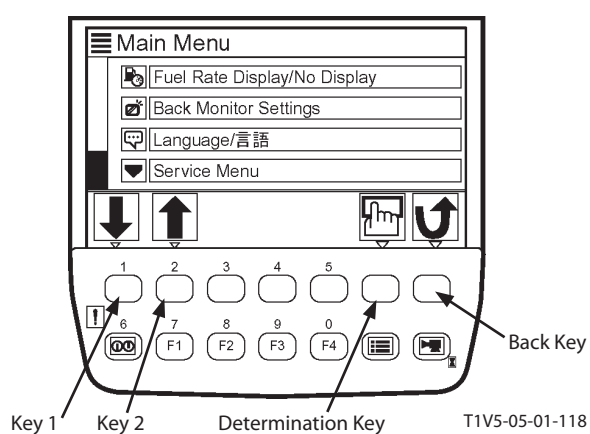
OPERATOR'S STATION

Fuel Rate No Display

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

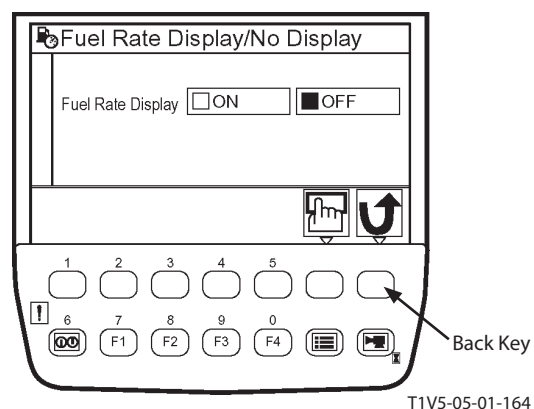
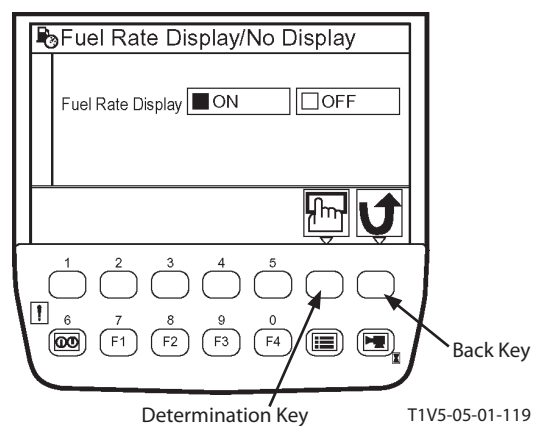


2. Select fuel rate display/No display from main menu by using keys 1 (↓) and 2 (↑). Push the determination key. Then, the fuel rate display/No display screen displays.



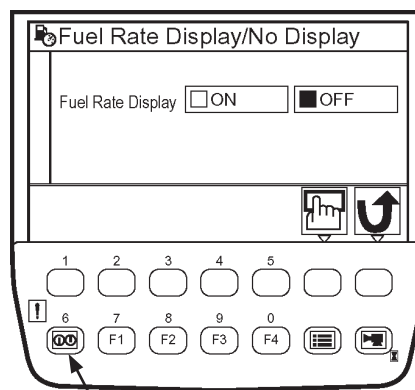
3. Push the determination key, and fuel rate display will be set to OFF.

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



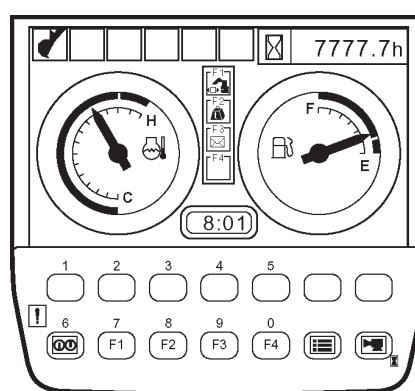
OPERATOR'S STATION

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



Key 6

T1V5-05-01-164



Basic Screen

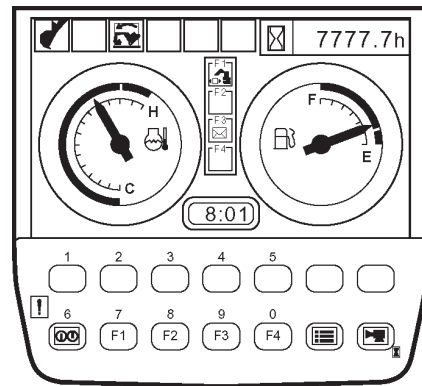
T1V1-05-01-123

OPERATOR'S STATION

- Overload Alarm
(Only machines equipped with optional parts)

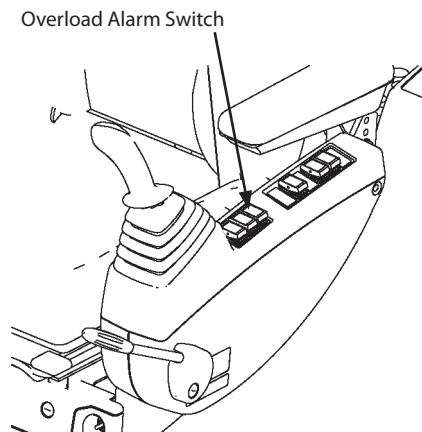
IMPORTANT: When using overload alarm, consult your nearest Hitachi dealer.

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



Basic Screen

T1V1-05-01-128

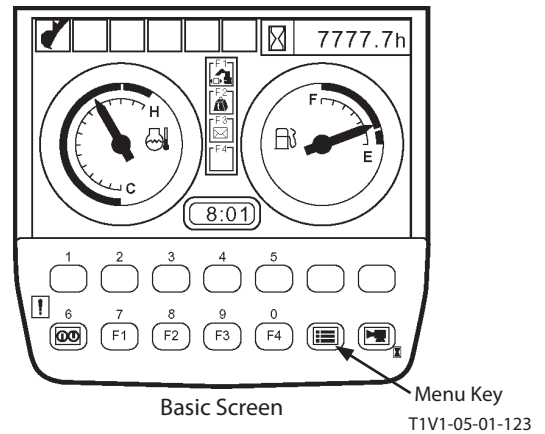


T1V1-05-02-004

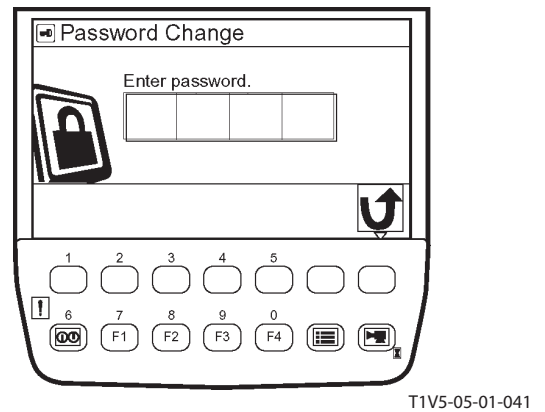
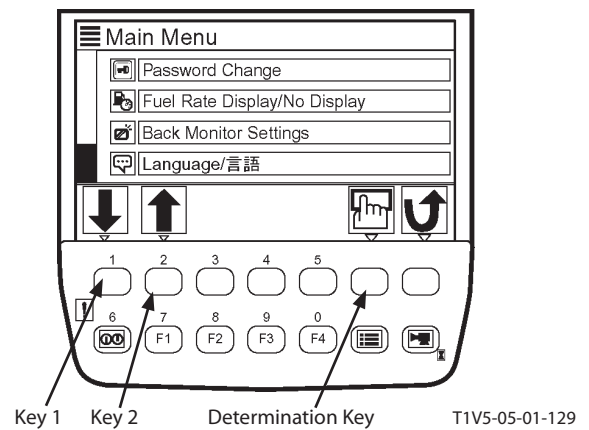
OPERATOR'S STATION

Password Change (Optional)

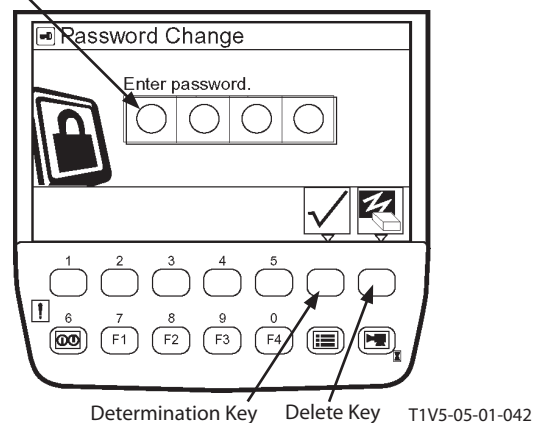
1. After the basic screen is displayed, push the menu key in order to display the main menu.



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

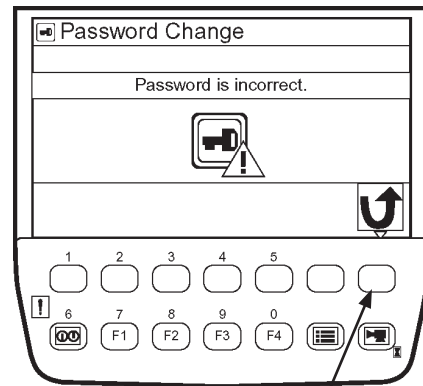


3. Input the registered password and push the determination key.
4. If inputting the password again, the entered characters can be erased by pushing the delete key.



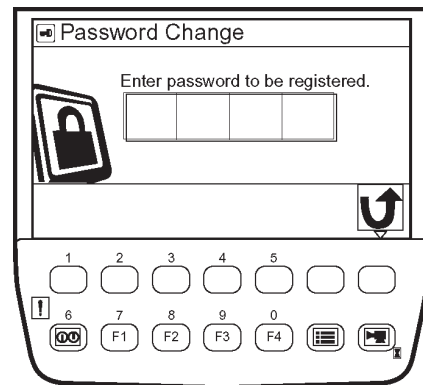
OPERATOR'S STATION

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



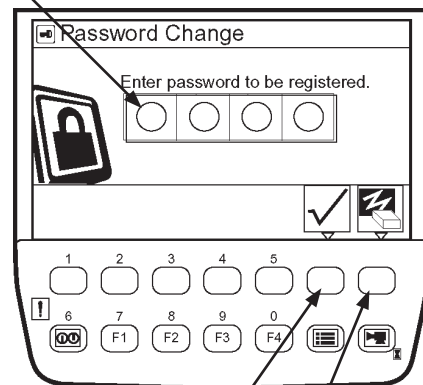
Back Key T1V5-05-01-044

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



T1V5-05-01-130

A New Password

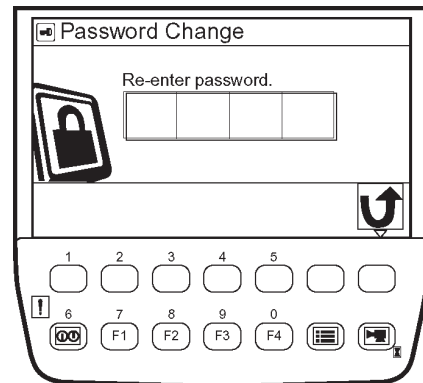


Determination Key Delete Key

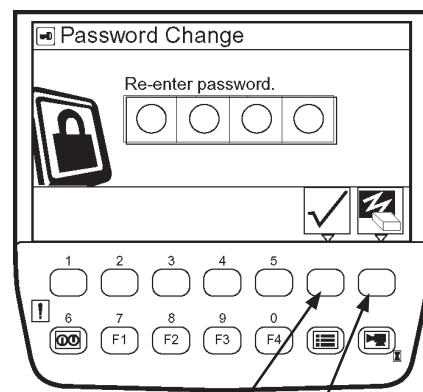
T1V5-05-01-131

OPERATOR'S STATION

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



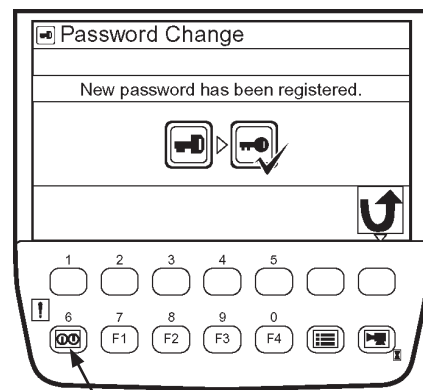
T1V5-05-01-132



Determination Key Delete Key

T1V5-05-01-133

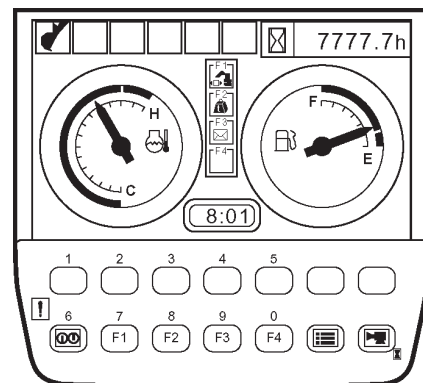
9. The message "New password has been registered." displays. This completes the password change process.



Key 6

T1V5-05-01-043

10. Push key 6 and the basic screen displays.



Basic Screen

T1V1-05-01-123

OPERATOR'S STATION

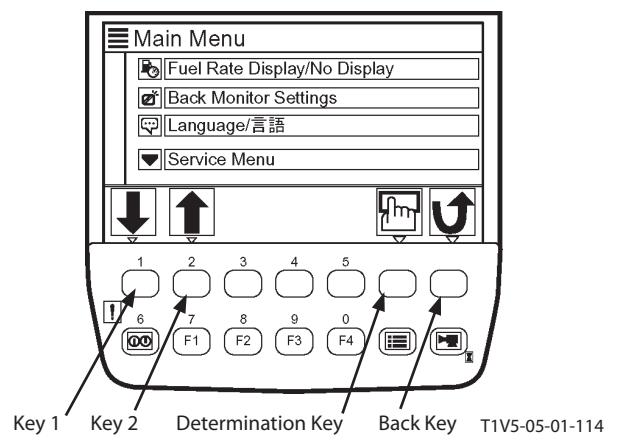
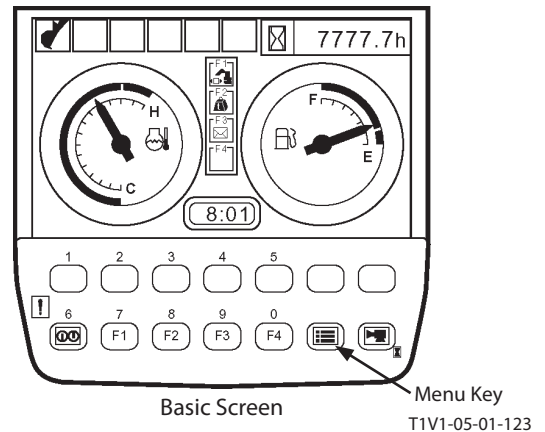
BACK MONITOR SETTINGS

IMPORTANT: The image displayed on the back monitor is to be used as an assist view. Drive the machine while paying thorough attention to the surroundings.

Auto-Control: ON

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

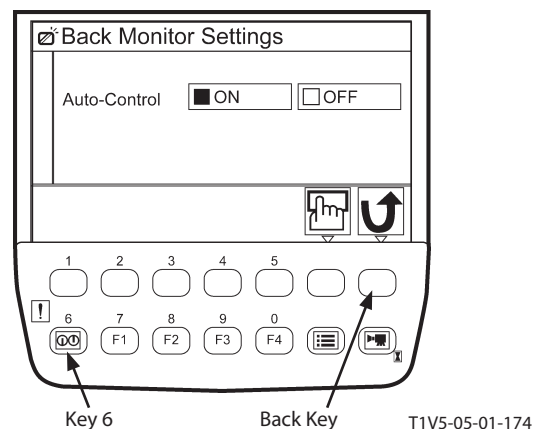
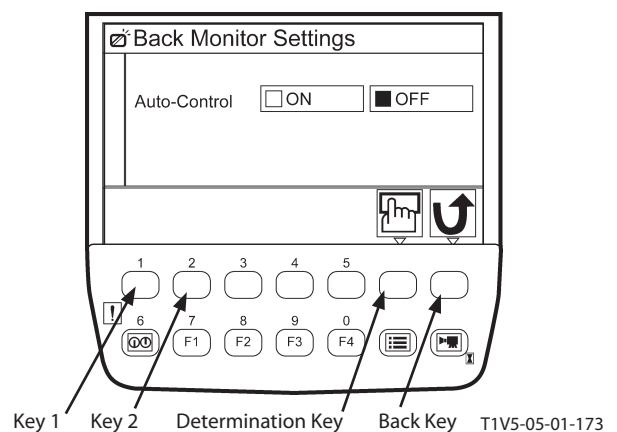
1. When the basic screen displays, push the menu key and display main menu.
2. Select back monitor settings from main menu by using keys 1 (↓) and 2 (↑). Push the determination key. Then, the back monitor settings screen displays.



3. Push the determination key. Then, auto-control is set to ON.

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

4. Push key 6 (00), and return to the basic screen.
5. If travel operation is done, backward image is displayed on the screen of monitor unit.

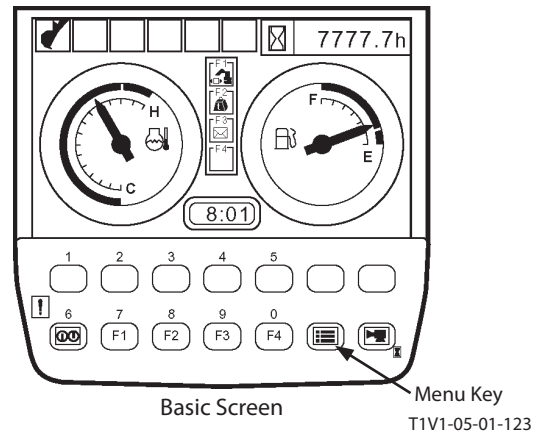


OPERATOR'S STATION

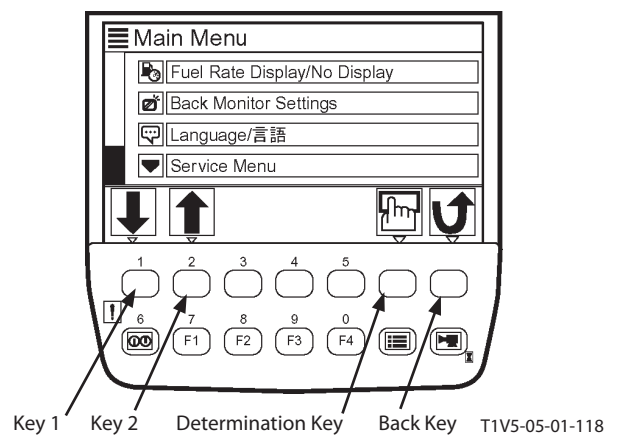
Auto-Control: OFF

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

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



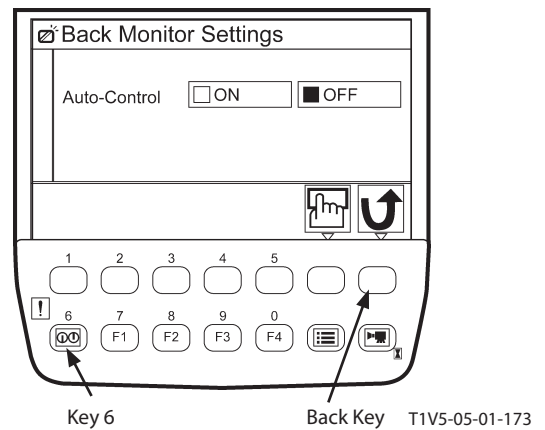
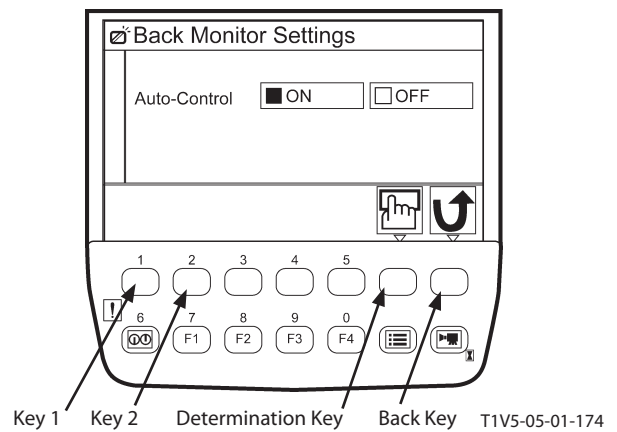
2. Select back monitor settings from main menu by using keys 1 and 2. Push the determination key. Then, the back monitor settings screen displays.



3. Push the determination key. Then, auto-control is set to OFF.

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

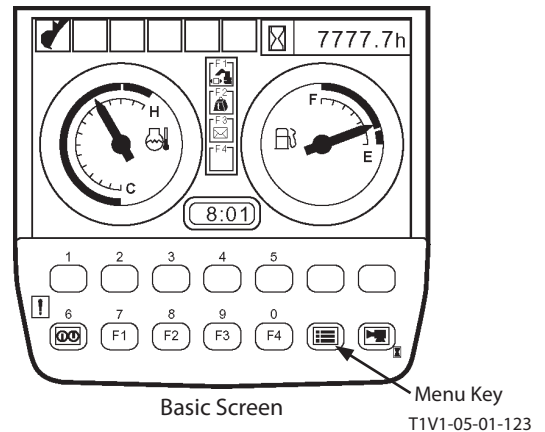
4. Push key 6 and return to the basic screen.



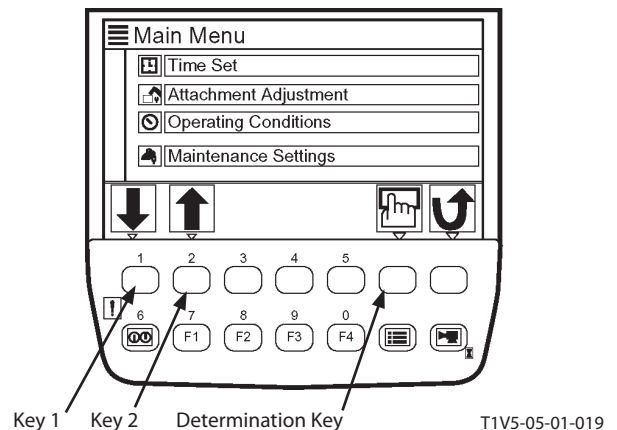
OPERATOR'S STATION

MAINTENANCE SETTINGS

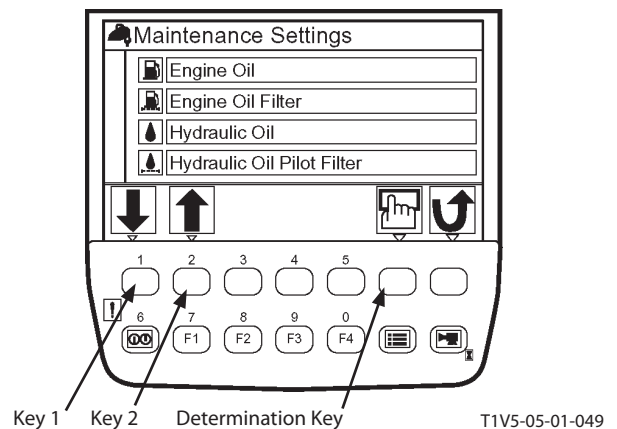
1. When the basic screen displays, push the menu key and display main menu.



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



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



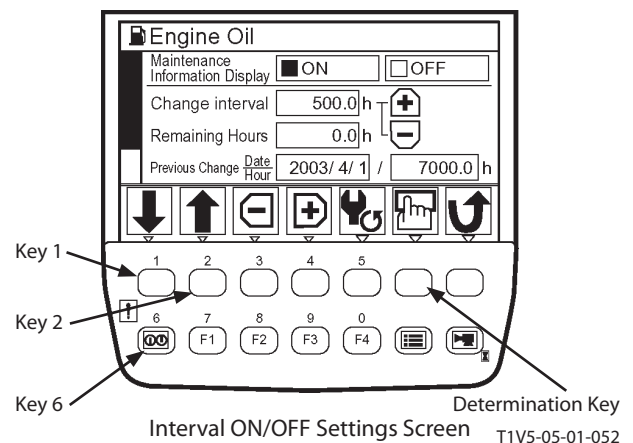
Maintenance Information Display ON/OFF

1. Select ON or OFF for maintenance information display by using keys 1 (↓) and 2 (↑). Push the determination key.

ON: When time comes to change, a information message is displayed on the screen.

OFF: No information message is displayed.

2. In order to complete setting, push key 6 (00). Then, the basic screen displays.

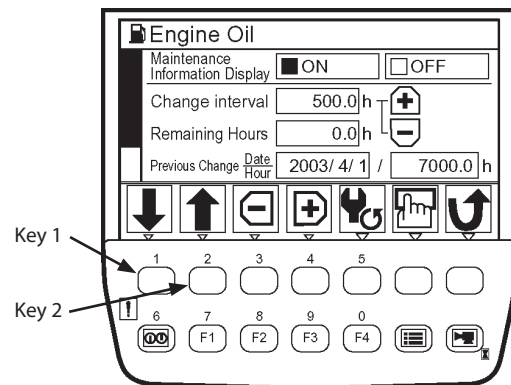


OPERATOR'S STATION

Change Interval Settings

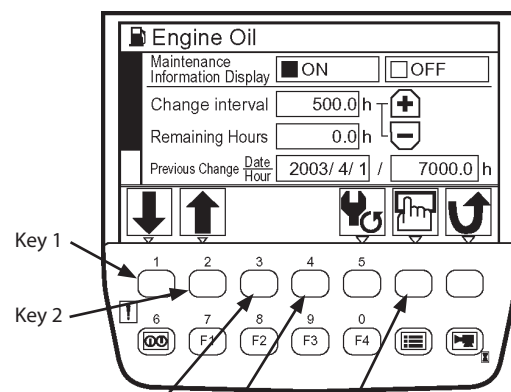
IMPORTANT: Change interval can only be set when maintenance information display is set to ON.

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



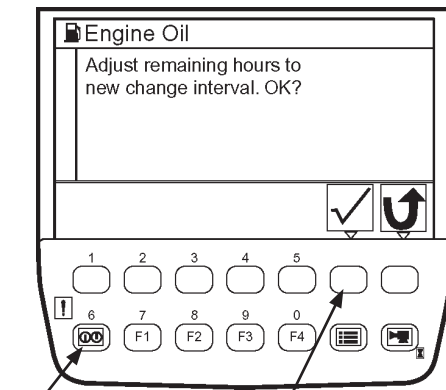
Interval ON/OFF Settings Screen

T1V5-05-01-052



Key 3 Key 4 Determination Key

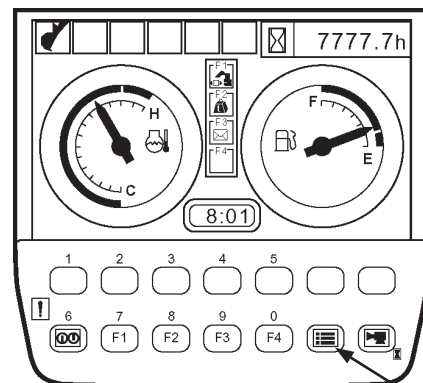
T1V5-05-01-138



Key 6

Determination Key

T1V5-05-01-139



Basic Screen

Menu Key

T1V1-05-01-123

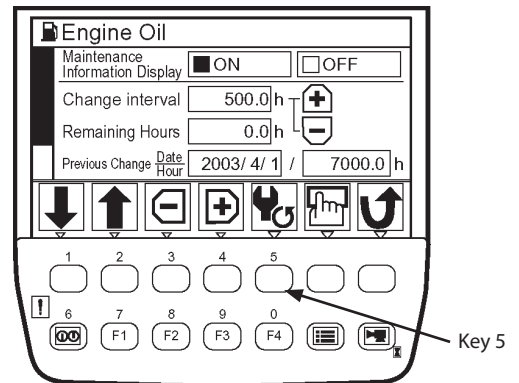
OPERATOR'S STATION

Resetting Data

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

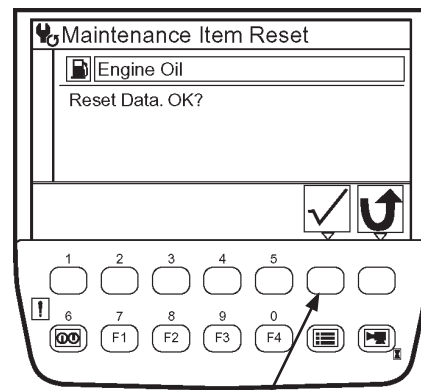
The message "Reset Data. OK?" displays. Then, push the determination key.

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



Interval ON/OFF Settings Screen

T1V5-05-01-052



Determination Key

T1V5-05-01-140

OPERATOR'S STATION

Screen Display when Maintenance Information Display is ON

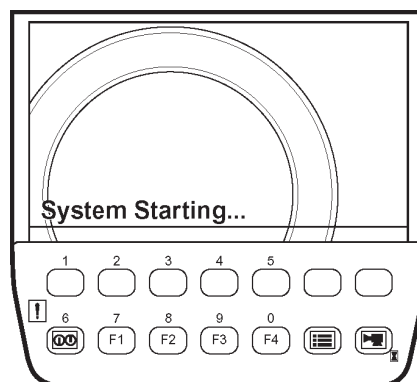
- When only one item displays
 - If turning the key switch to the ON position, the starting screen displays. Then, the scheduled maintenance screen for the item whose change interval has expired displays for three to ten seconds. Finally the basic screen displays. (In the right example, Hydraulic Oil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

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

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

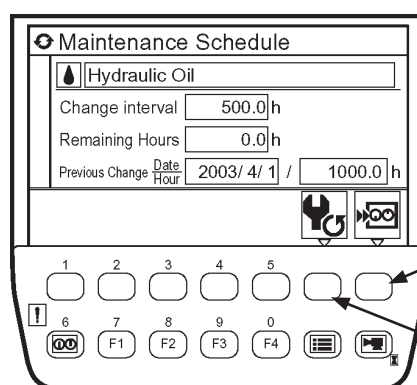
NOTE: When pushing the back key while the maintenance information display screen is displayed, return to the basic screen.

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



Starting Screen

T1V1-05-01-115

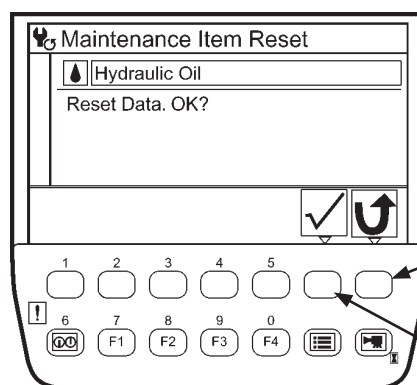


Back Key

Reset Key

Maintenance Information Display Screen

T1V5-05-01-170

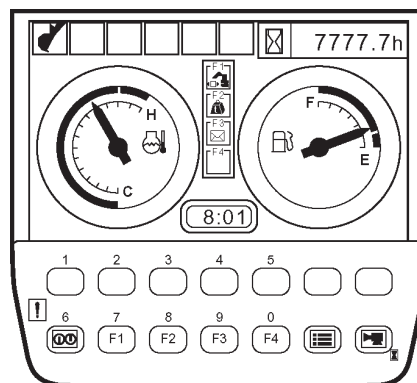


Back Key

Determination Key

Reset Screen

T1V5-05-01-171



Basic Screen

T1V1-05-01-123

OPERATOR'S STATION

- When more than two items apply

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

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

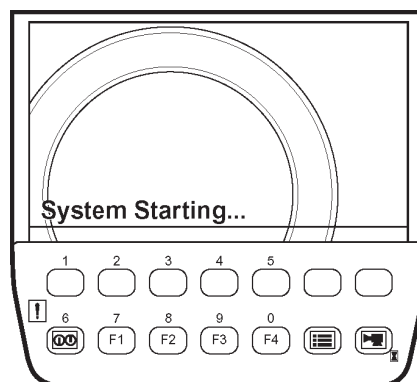
- If data is reset, while the scheduled maintenance screen is displayed, select desired item by using keys 1 (↓) and 2 (↑). Push the determination key. Then, the maintenance information display screen for the selected item displays. (In the right example, Hydraulic Oil is selected.)

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

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

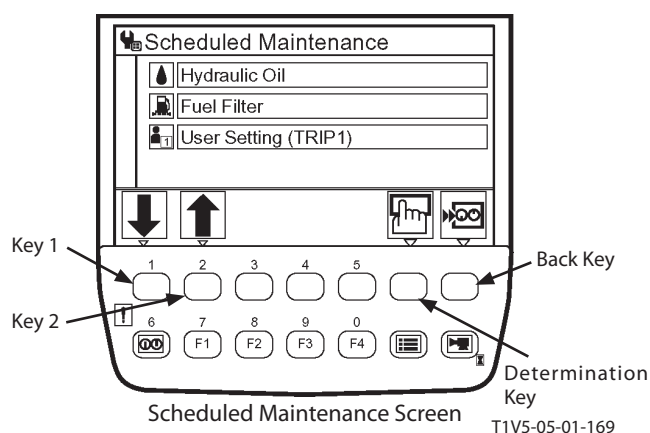
NOTE: When pushing the back key while the maintenance information display screen is displayed, return to the scheduled maintenance screen.

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



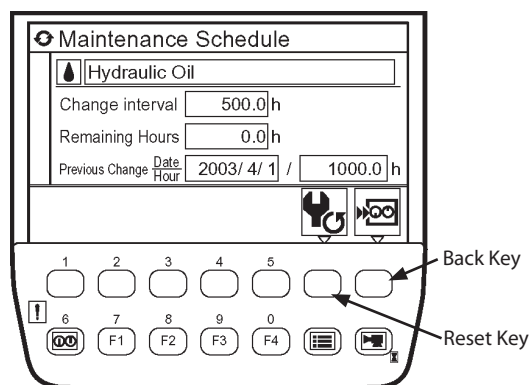
Starting Screen

T1V1-05-01-115



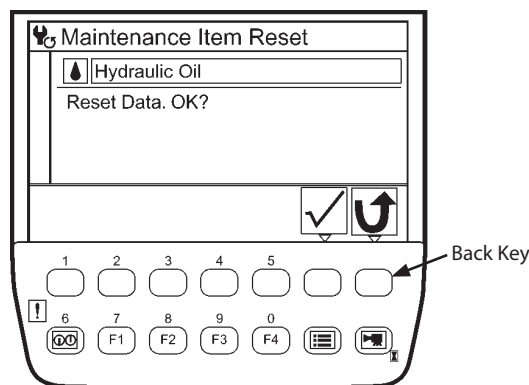
Scheduled Maintenance Screen

T1V5-05-01-169



Maintenance Information Display Screen

T1V5-05-01-170



Reset Screen

T1V5-05-01-171

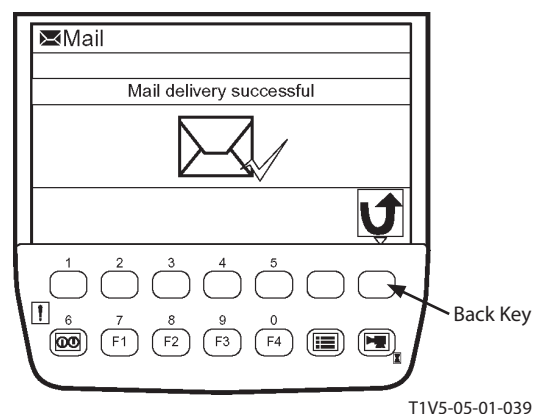
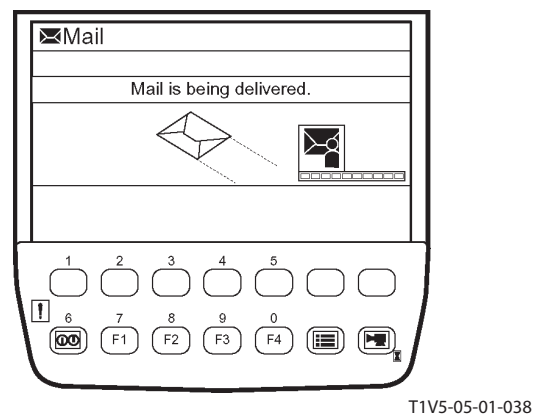
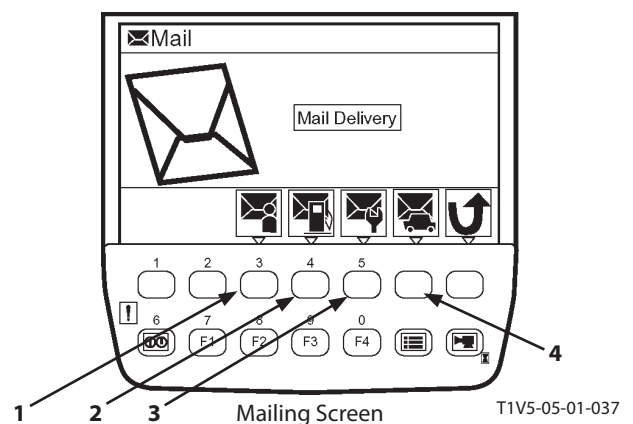
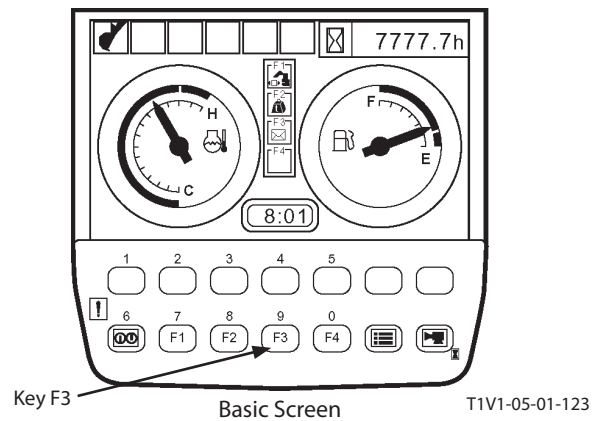
OPERATOR'S STATION

Mail (Optional)

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

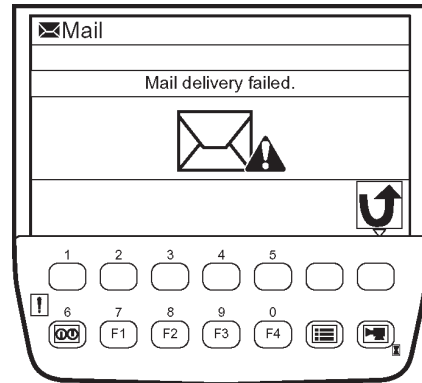
1. When the basic screen displays, push mail selection key F3 and display mail screen.
2. If pushing a relevant request key, mail information is sent to ICF.
 - 1 - General Request
 - 2 - Fuel Replenishment Request
 - 3 - Service Maintenance Request
 - 4 - Forwarding Request
3. While mail information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

 **NOTE:** Depending on machine's operating environment, the mail may not be sent.



OPERATOR'S STATION

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



T1V5-05-01-040

OPERATOR'S STATION

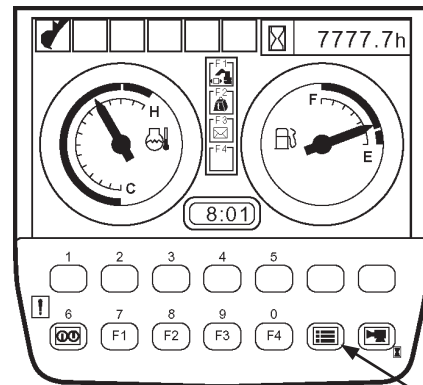
LANGUAGE SETTINGS

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

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

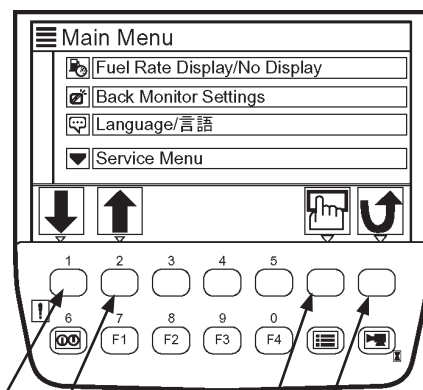
 **NOTE:** When pushing the back key, return to the previous screen.

4. Push key 6 (00), and the basic screen displays.



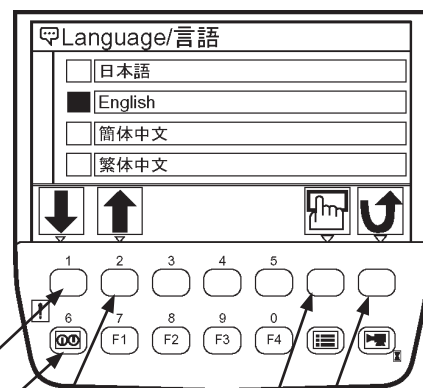
Basic Screen

Menu Key
T1V1-05-01-123



Key 1 Key 2 Determination Key Back Key

T1V5-05-01-114



Key 1 Key 2 Determination Key Back Key

T1V1-05-01-137

OPERATOR'S STATION

Lists of Display Language

Display Languages 1

Language	Screen Display	
Japanese	日本語	T1V1-05-01-141
English	English	T1V1-05-01-142
Chinese (Simplified)	簡体中文	T1V1-05-01-143
Chinese (Traditional)	繁体中文	T1V1-05-01-144
Korean	한국어	T1V1-05-01-145
Indonesian	Bahasa Indonesia	T1V1-05-01-146
Thai	ภาษาไทย	T1V1-05-01-147
Vietnamese	Tiếng Việt	T1V1-05-01-148
Myanmarese	မြန်မာဘာသာ	T1V1-05-01-149
Arabic	اللغة العربية	T1V1-05-01-150
Persian	اللغة الفارسية	T1V1-05-01-151
Turkish	Türkçe	T1V1-05-01-152

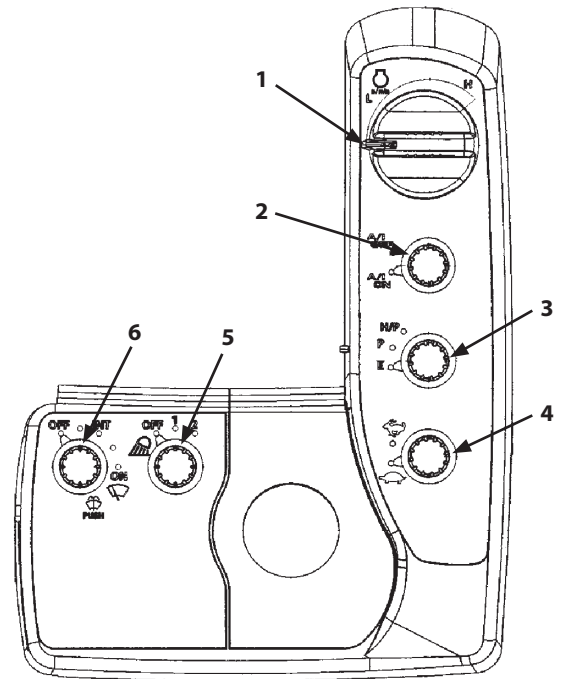
Display Languages 2

Language	Screen Display	
English	English	T1V1-05-01-142
Spanish	Español	T1V1-05-01-153
Italian	Italiano	T1V1-05-01-154
French	Français	T1V1-05-01-155
German	Deutsch	T1V1-05-01-156
Dutch	Nederlands	T1V1-05-01-157
Russian	Русский	T1V1-05-01-158
Portuguese	Português	T1V1-05-01-159
Finnish	Suomi	T1V1-05-01-160
Swedish	Svensk	T1V1-05-01-161
Norwegian	Norsk	T1V1-05-01-162
Danish	Dansk	T1V1-05-01-163

OPERATOR'S STATION

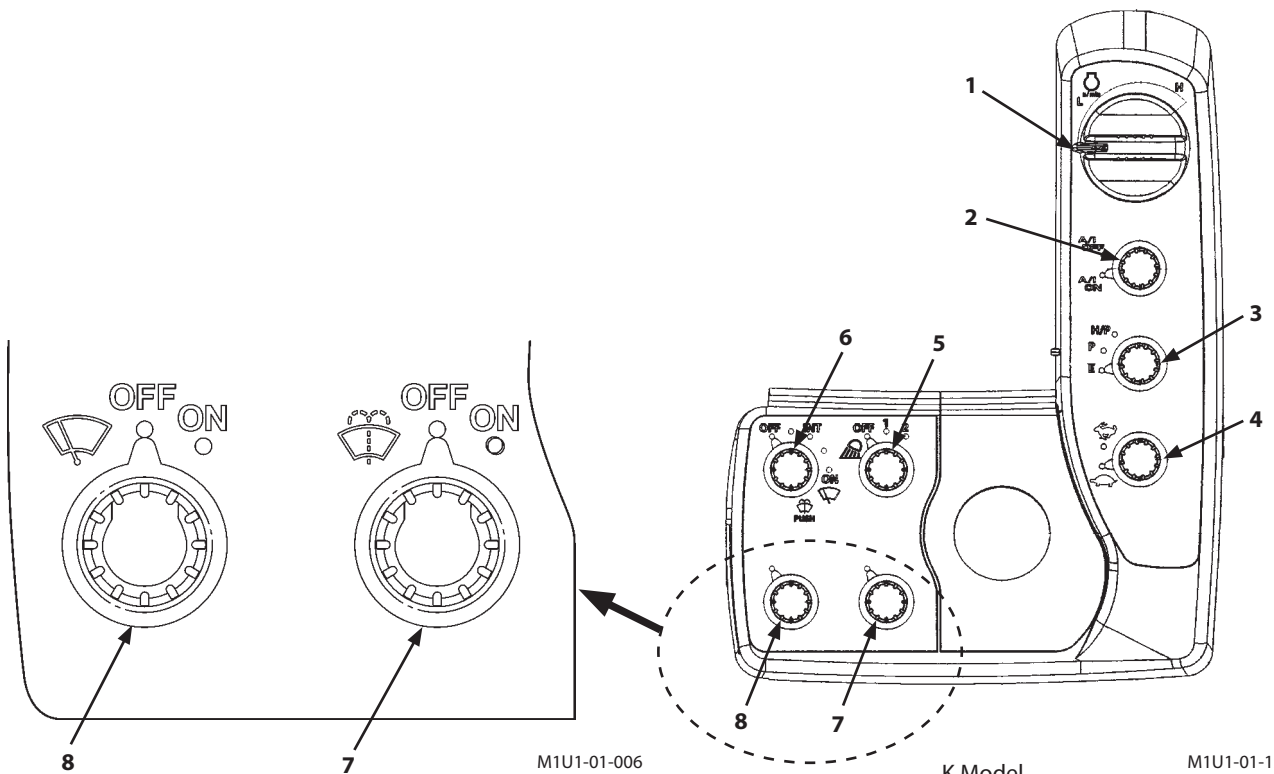
SWITCH PANEL

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



Std. Model

M1U1-01-123



K Model

M1U1-01-124

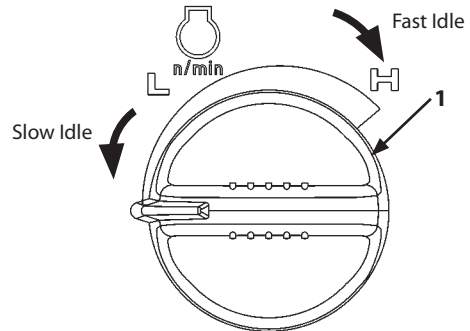
M1U1-01-006

OPERATOR'S STATION

ENGINE CONTROL DIAL

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

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



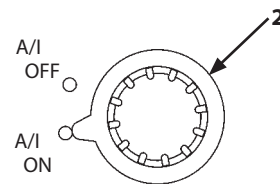
M1P1-01-068

AUTO-IDLE SWITCH

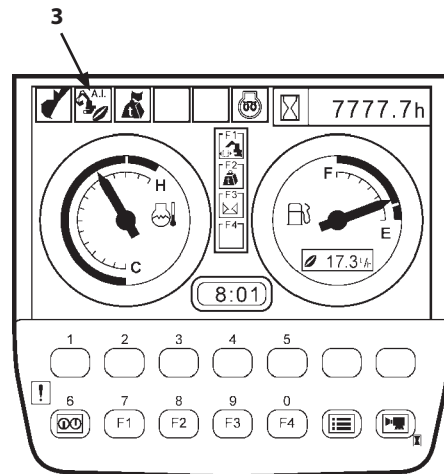
Auto-idle Switch (2) sets the engine speed control mode to Auto-Idle.

- Auto-Idle Mode

When auto-idle switch (2) is turned to the A/I ON position, the engine speed is reduced to slow idle speed 4 seconds after releasing all control levers (neutral), reducing the fuel consumption. When the auto-idle mode is selected, auto-idle indicator (3) on the monitor panel lights.



M1U1-01-017



M1U1-01-004

OPERATOR'S STATION

POWER MODE SWITCH

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

- E (Economy) Mode

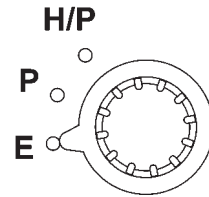
Although production is slightly reduced more than in the P mode, the fuel consumption and noise levels are reduced, allowing the machine to operate efficiently.

- P (Power) Mode

Use the P mode when general digging work is needed.

- H/P (High Power) Mode

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



M178-01-013

TRAVEL MODE SWITCH

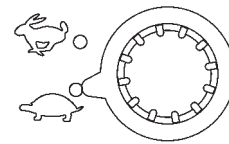
Two travel modes, FAST and SLOW, are selected by turning the travel mode switch to either position.



Mark (Fast Speed Mode)



Mark (Slow Speed Mode)



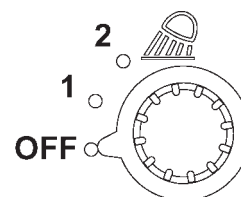
MBWA-01-009

OPERATOR'S STATION

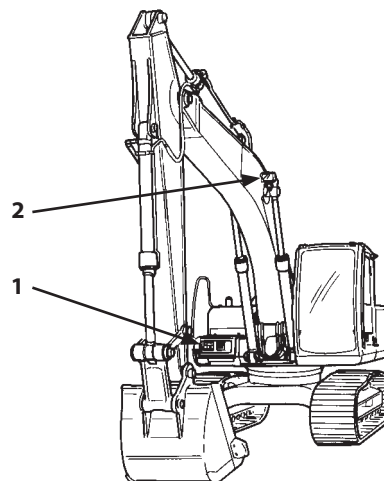
WORK LIGHT SWITCH

Work light switch has the following positions:

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



M1P1-01-069



M157-01-146

OPERATOR'S STATION

WIPER/WASHER SWITCH

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

- Wiper

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

OFF Position: The wiper stops and is retracted.

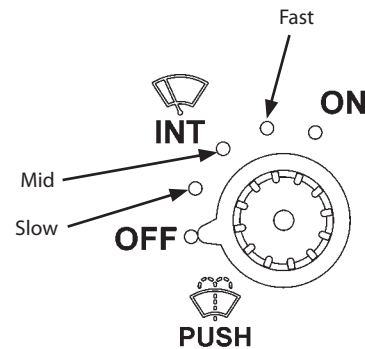
INT Position: The wiper operates intermittently at the interval selected by the switch position as described below.

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

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

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

ON Position: The wiper operates continuously.

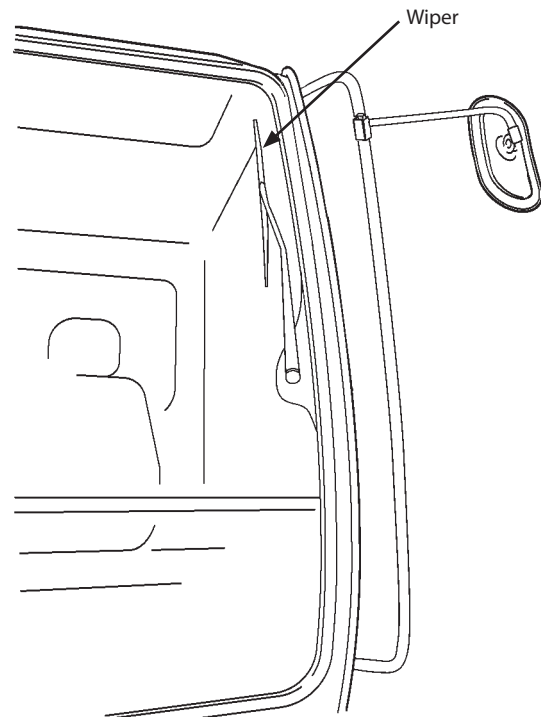


M178-01-016

- NOTE:** • When the front window (upper) is opened, the wiper and washer will not operate. Even if the front window (upper) is closed, the wiper and washer will not operate until the lock pin on the right side is placed in the lock position. If the front window is opened while during operating the wiper, the wiper will be retracted and the washer function is deactivated.
- In case either the wiper or washer is operated with the front window (upper) opened, or if front window (upper) is opened while operating either the wiper or washer, the front window opening alarm buzzer will sound intermittently at one-second intervals. Close the front window (upper).

- Washer (Std. Model, L Model, K Model)

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



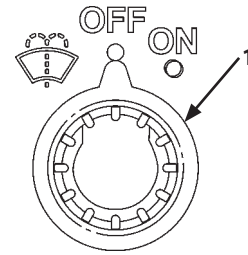
M1U1-01-018

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

OPERATOR'S STATION

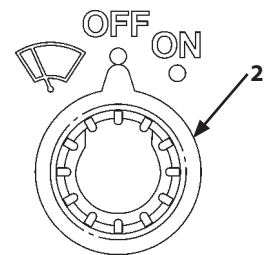
- Washer (K Model) (Overhead Window)

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



M1U1-01-007

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



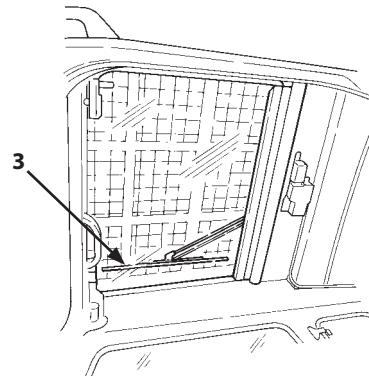
M1U1-01-008

Wiper Switch (2) (K Model) (Overhead Window)

Wiper switch (2) has two positions as follows:

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

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



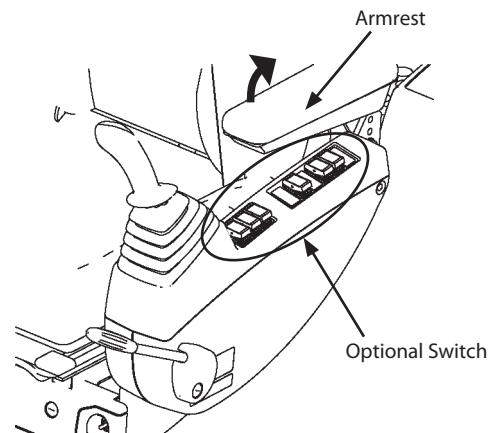
M157-01-081

OPERATOR'S STATION

SWITCH PANEL (Optional)

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

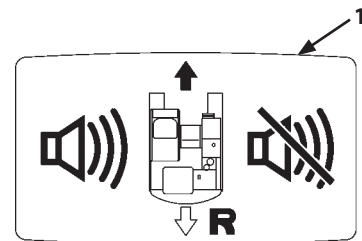
- Travel Alarm Deactivation
- Swing Alarm
- Rear Light
- Electric Type Control Lever
- Power Window (K Model Optional)



T1V1-05-02-004

Travel Alarm Deactivation Switch (Optional)

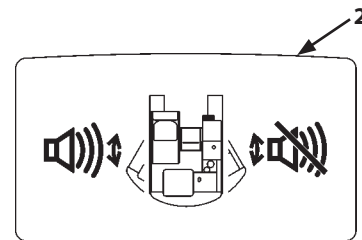
The travel alarm buzzer sounds during travel operation. When push travel alarm deactivation switch (1) to the off position () , the travel alarm buzzer function is deactivated.



M1U1-01-035

Swing Alarm Switch (Optional)

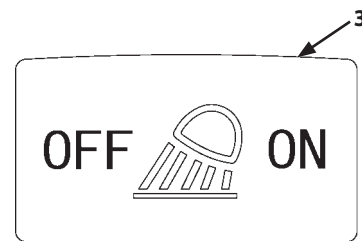
The swing alarm system sounds the buzzer and turns the beacon light ON during swing operation. When push swing alarm switch (2) to the off position () , the swing alarm buzzer function is deactivated.



M1U1-01-036

Rear Light Switch (Optional)

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

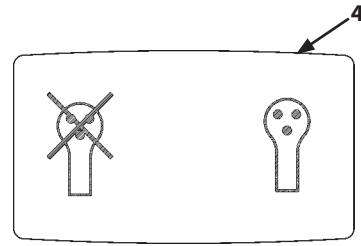


M1P1-01-070

OPERATOR'S STATION

Electrical Control Main Switch (Optional)

When the (⚡) mark side of electrical control main switch (4) is pressed, the electrical control (grip switch) system becomes operable. When there is no need to use the electrical control (grip switch) system, press the (ⓧ) mark side of main switch (4) to avoid misoperation.



M1U1-01-013

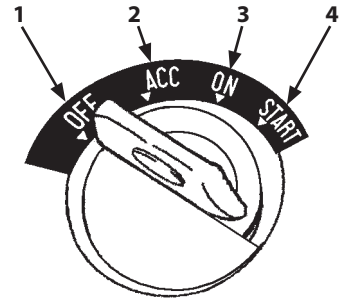
Power Window Switch (K Model Optional)

Open and close the cab upper-front window by the power window switch on the optional switch panel.

OPERATOR'S STATION

KEY SWITCH

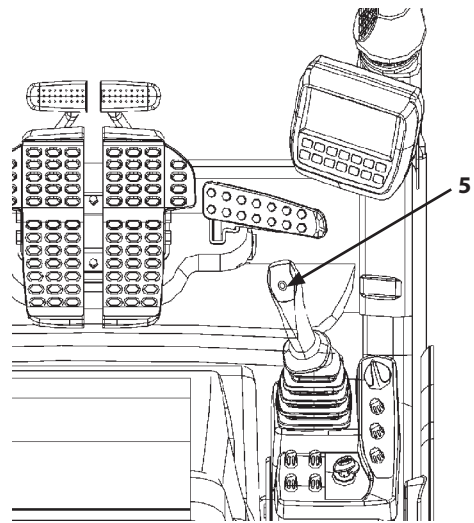
- 1- OFF (Engine Off)
- 2- ACC (Horn, Radio etc.)
- 3- ON (Engine On)
- 4- START (Engine Start)



MNDB-01-053

POWER BOOST SWITCH (ZX180-3, 200-3, 270-3, 330-3 Class)

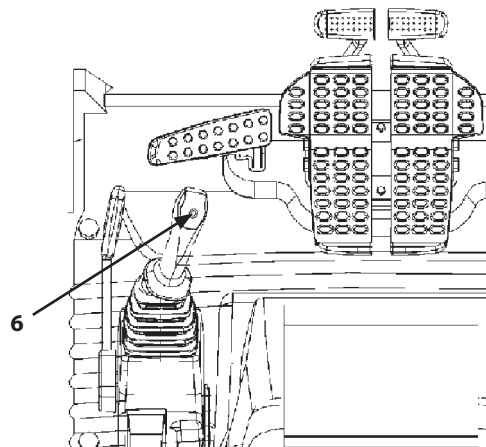
Power boost switch (5) is used to gain maximum digging power, and is located on the top of the right control lever.



M1J1-01-024

HORN SWITCH

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



M1J1-01-025

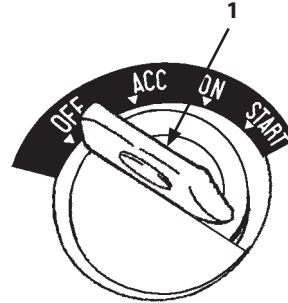
OPERATOR'S STATION

CIGAR LIGHTER

Operation

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

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

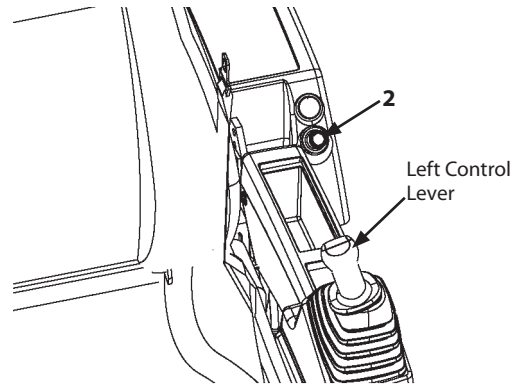


MNDB-01-053

Using Cigar Lighter (2) Port as External Power Source

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

IMPORTANT: Only 24 V electric power is available from cigar lighter (2) 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.



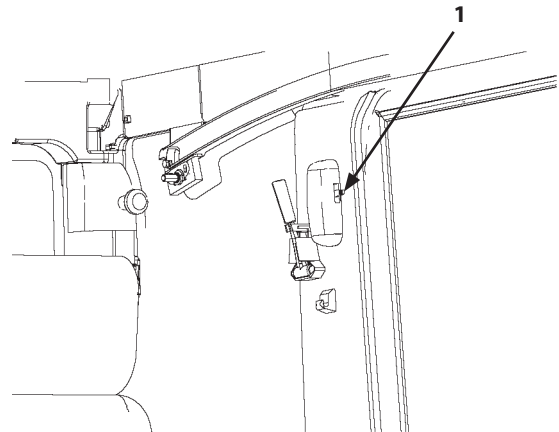
M1U1-01-021

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

OPERATOR'S STATION

CAB LIGHT

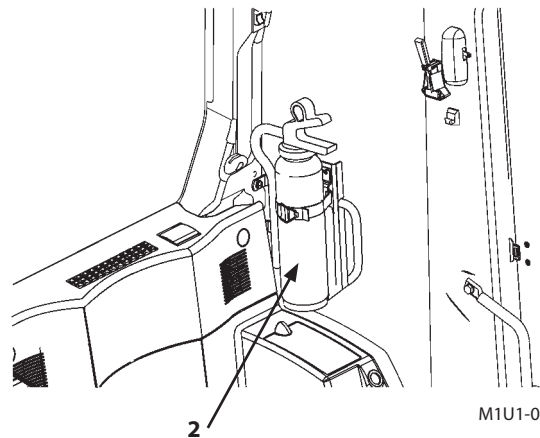
Turn the cab light ON or OFF by using switch (1).



M1U1-01-022

INSTALLING FIRE EXTINGUISHER (Optional)

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



M1U1-01-023

OPERATOR'S STATION

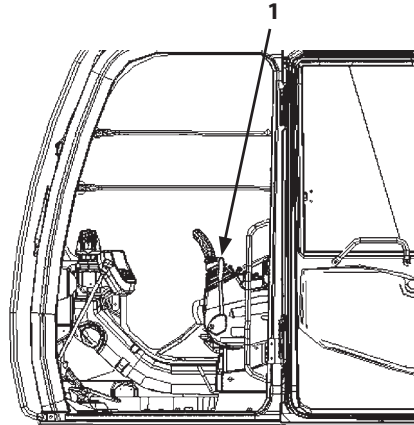
PILOT CONTROL SHUT-OFF LEVER

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



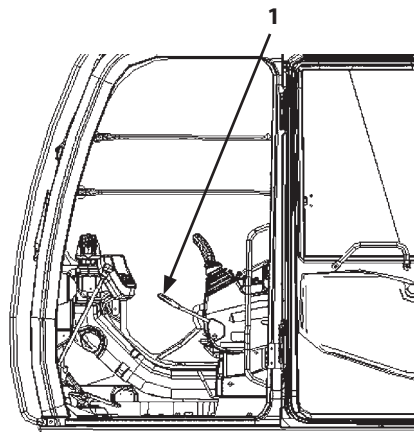
WARNING:

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



LOCK Position

M1U1-01-025

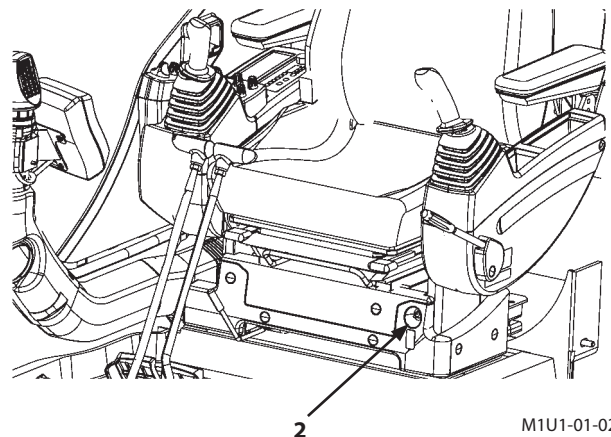


UNLOCK Position

M1U1-01-024

ENGINE STOP SWITCH

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

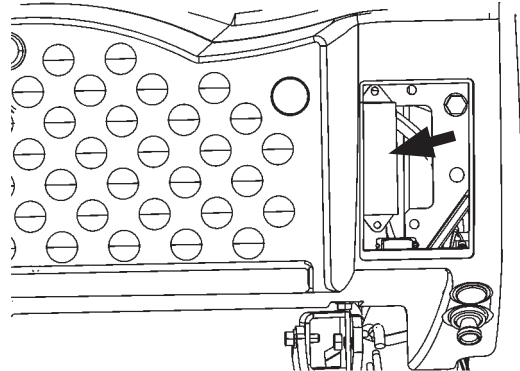


M1U1-01-029

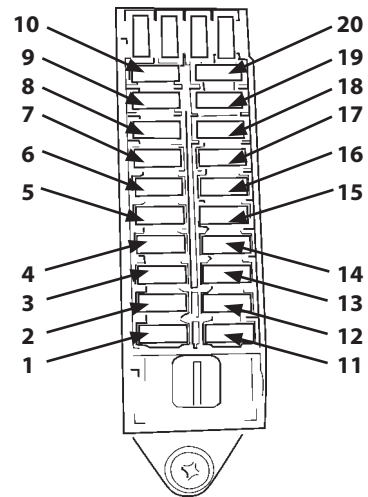
OPERATOR'S STATION

FUSE BOX

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



M1U1-01-026



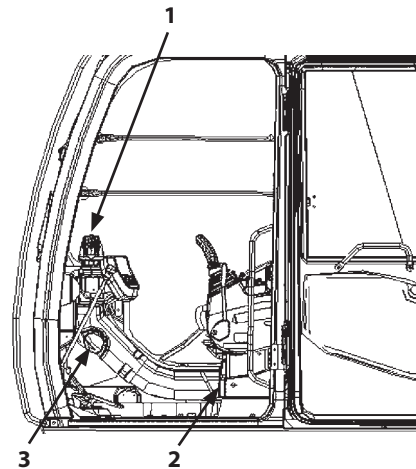
M1GR-01-003

OPERATOR'S STATION

AUTO AIR CONDITIONER

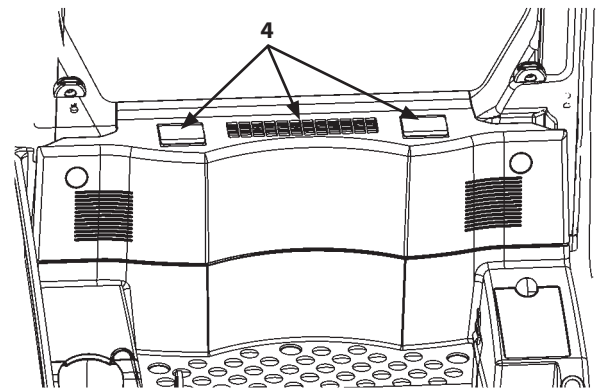
Distinctive Feature

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



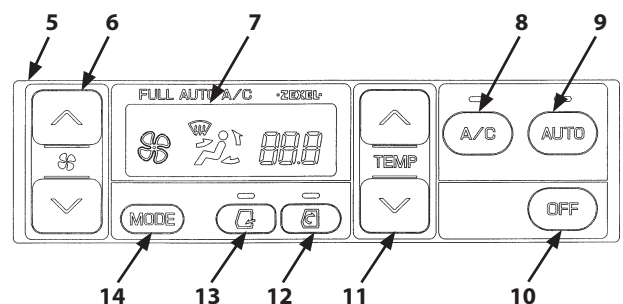
M1U1-01-025

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



M1U1-01-027

NOTE: Except for foot vent (2), all vents are provided with louvers to adjust the air flow direction. In addition, the louvers on front vent (1) and defroster vent (3) can be completely opened and closed by hand.



M178-01-073

OPERATOR'S STATION

Control Panel Designation and Function

- Mode Switch (14):

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

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

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



- When AUTO switch (9) is selected the AUTO, the air vent location is automatically selected.

- Temperature Control Switch (11):

Sets temperature in the cab from 18.0 to 32.0 °C or 63 to 91 °F by 0.5 °C or 1 °F step. The set-temperature is displayed on LCD (7).

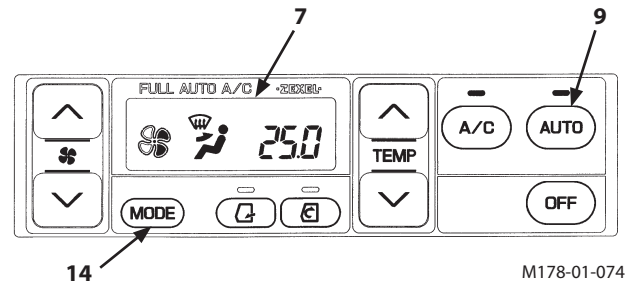
- FC (Full-Cool)

Push the  button after setting air temperature to 18 °C or 63 °F. Air flow temperature is set to the lowest and the "FC" symbol is displayed on LCD (7).

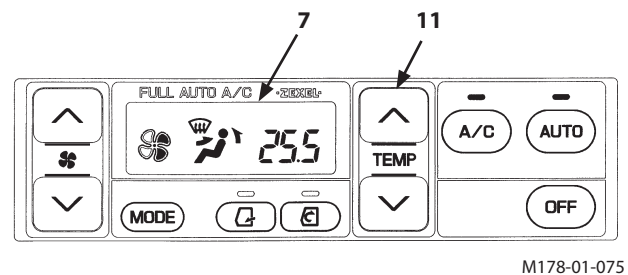
- FH (Full-Heat)

Push the  button after setting air temperature to 32 °C or 91 °F. Air flow temperature is set to the highest and the "FH" symbol is displayed on LCD (7).

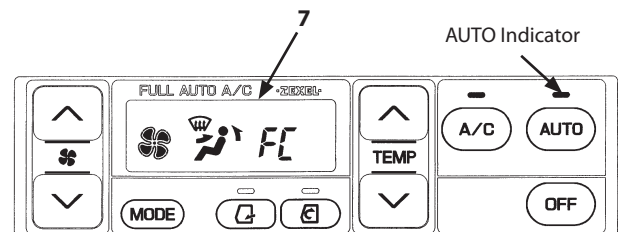
- When the AUTO indicator is ON, air temperature at the vents is automatically set together with the blower speed and vent locations.
- When the AUTO indicator is OFF, only air temperature at the vents is automatically set.
- When the "FC" symbol is displayed on LCD (7), air temperature at the vent, air vent (front and rear vents) locations, recirculation air suction port, and blower speed are maintained at the lowest cooling conditions. However, in case the circulation indicator is ON before the "FC" symbol is displayed, circulation operation is maintained.



Display when AUTO switch (9) is pressed:



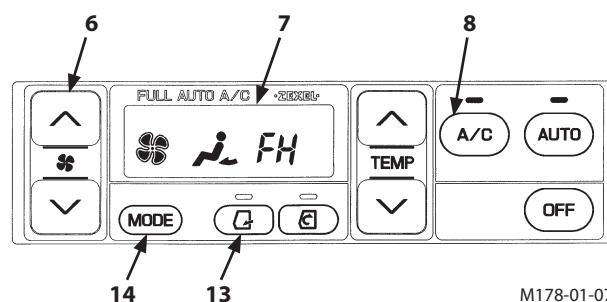
Display when the  button is pressed after displaying 25.0 °C (77 °F):



Display when the LCD displays "FC" symbol:

OPERATOR'S STATION

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



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Display when the LCD displays "FH" symbol:

Selecting Display Between Celsius And Fahrenheit

- While depressing both A/C (8) and mode (14) switches, turn the key switch "ON".
- LCD (7) will display "Sd" for approx. 5 seconds.
- After display "Sd" is deleted, all LED (7) will come ON.
- After all LED (7) come ON, repeat to press blower switch (6) four times.
- Sequentially, press A/C (8) and blower (6) switches at the same time.
- Then, the selection mode between celsius and fahrenheit starts.

Each time fresh air mode switch (13) is pressed, the display is shifted between celsius and fahrenheit.

When celsius is displayed, LED (7) displays "C."

When fahrenheit is displayed, LED (7) displays "F."

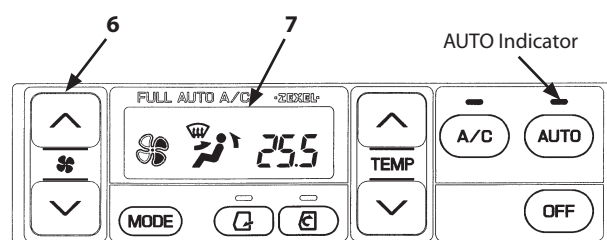
Select either one to be preferred.

- After selection is complete, end by turning the key switch "OFF".

LED (7) will display in the selected mode when the machine is operated next time.

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

- Blower Switch (6):
 - When the AUTO indicator is ON, the blower speed is automatically controlled.
 - When the AUTO indicator is OFF, the blower speed is controlled in 4 steps. When the button is pressed with the blower OFF, the blower starts running in the HI mode. Then, each time the button is pressed, the blower speed is reduced by one step. LCD (7) indicates the blower fan speed. When the button is pressed with the blower OFF, the blower starts running in the LO mode. Then, each time the button is pressed, the blower speed is increased by one step. LCD (7) indicates the corresponding blower fan speed.



M178-01-075

OPERATOR'S STATION

- Circulation Mode Switch (12):

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

NOTE: Operating the above switches controls the fresh air suction port manually or automatically. Therefore, even if AUTO switch (9) is turned ON, the fresh air suction port status will not be change

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

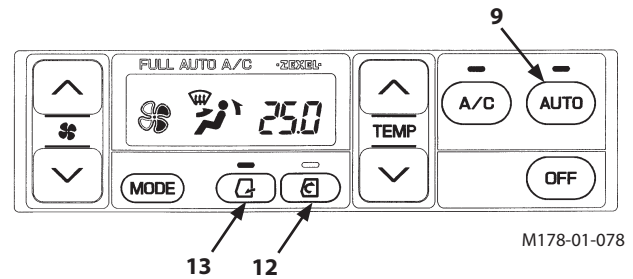
Press A/C switch (8) to turn the air conditioner and the A/C indicator ON. However, unless the blower is running (the fan display of blower switch (6) is lit), the air conditioner will not be turned ON.

- OFF Switch (10):

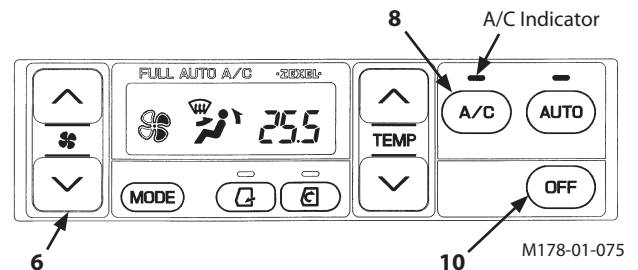
Press OFF switch (10) to turn the blower and the air conditioner OFF.

- AUTO Switch (9):

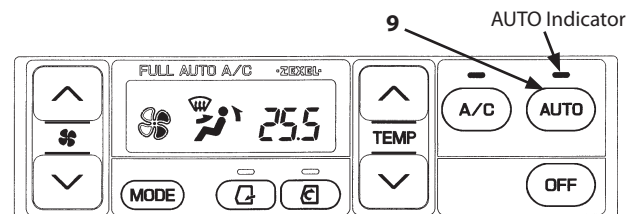
Press AUTO switch (9) to turn the AUTO and the A/C indicators ON so that the air flow-in temperature at the vent, blower speed, vent locations, and fresh air suction port are automatically controlled.



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



Display when Air Conditioner Switch (8) is pressed:



Display when AUTO Switch (9) is pressed:

OPERATOR'S STATION

CAB HEATER OPERATION

1. Operate AUTO switch (9).

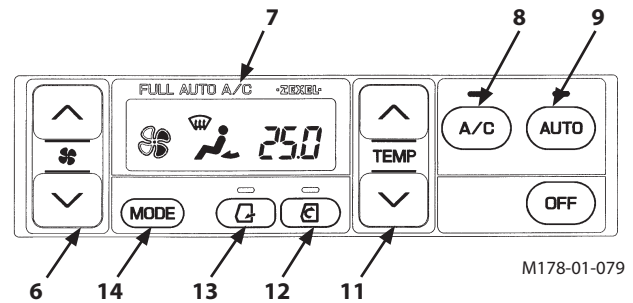
According to signals sent from various sensors, the air conditioner amplifier automatically selects the air flow-in vents, air suction ports, and air flow-in temperature at the vent, and controls the blower speed.

2. Operate Temperature Control Switch (11).

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

3. As Necessary:

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



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

COOLING OPERATION

1. Press AUTO Switch (9)

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

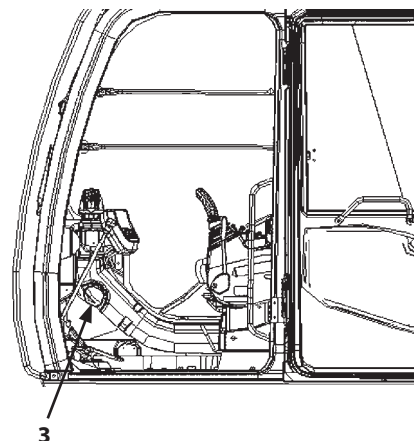
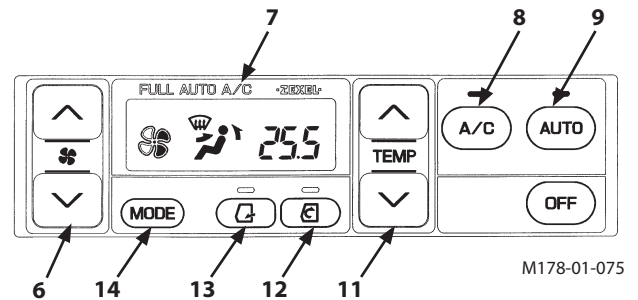
2. Operate Temperature Control Switch (11).

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

3. As Necessary:

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

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



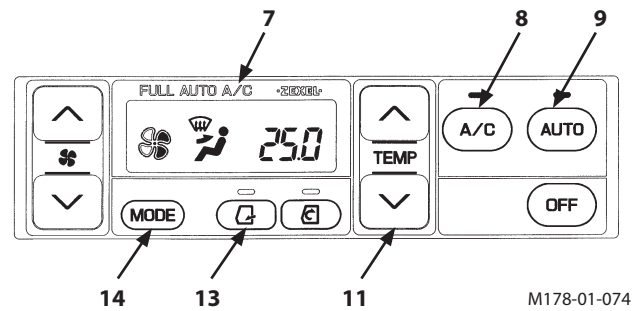
OPERATOR'S STATION

DEFROSTER OPERATION

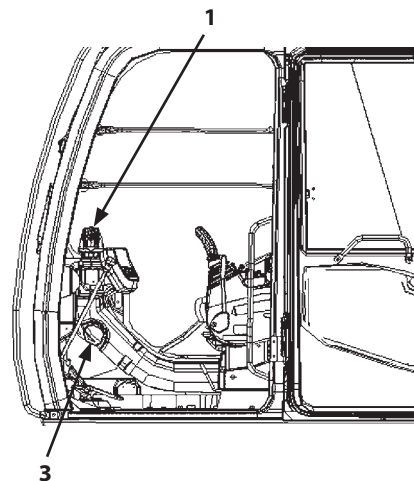
1. Press AUTO Switch (9). Temperature-controlled air blows out. During cold weather season when starting the engine, the engine coolant temperature and air temperature in the cab are low. Then, cool air is restricted not to flow in the cab to the minimum (LO) by the Heater Start-Operation Control System.
2. Set temperature control switch (11) so that "25.0" is indicated on LCD (7). Set fresh air vent switch (13) in the fresh air circulation mode.
3. Select the front vents  or the front and rear vents  using MODE switch (14).

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

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



M178-01-074



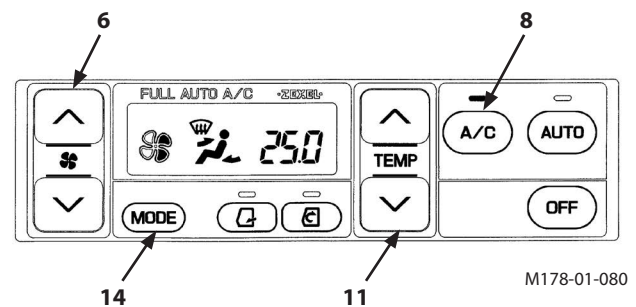
M1U1-01-025

Cool Head / Warm Feet Operation

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

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

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



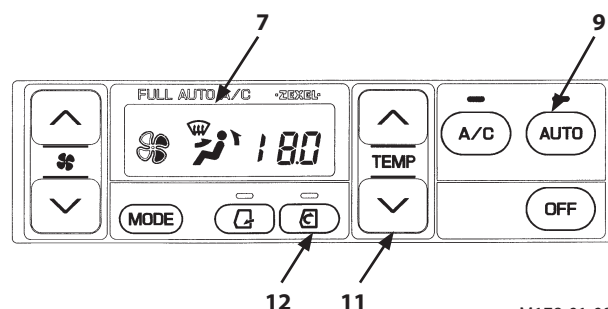
M178-01-080

OPERATOR'S STATION

TIPS FOR OPTIMAL AIR CONDITIONER USAGE

For Rapid Cooling

Temperature in the cab may rise over 80 °C (176 °F) when the machine is exposed to sun light in the summer. In this case, ventilate air in the cab first by opening the windows for rapid cooling. After starting the engine, press AUTO switch (9). Set temperature to "18.0" on LCD (7) using temperature control switch (11). Turn circulation mode switch (12) ON.



M178-01-081

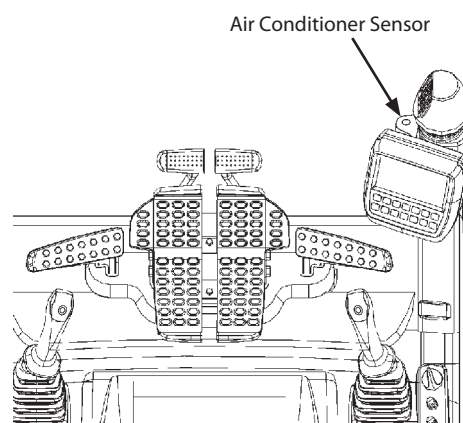
When Windows Become Clouded

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

Off-Season Air Conditioner Maintenance

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

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



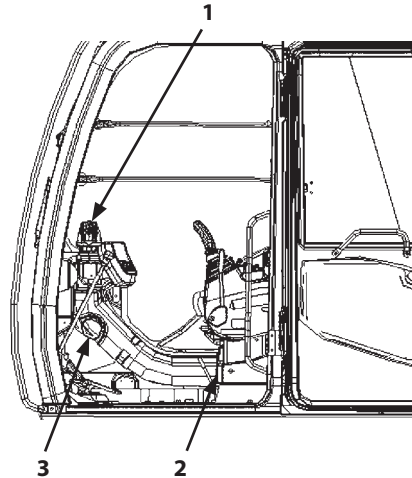
M1J1-01-028

OPERATOR'S STATION

CAB HEATER (Optional)

Part Name and Location

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



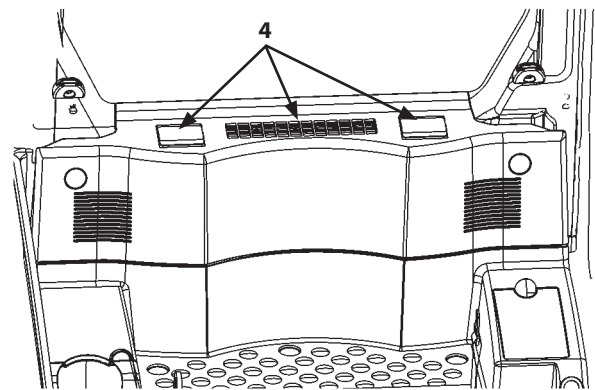
M1U1-01-025

NOTE: Air flow direction can be changed by controlling the louvers at all air vents except for foot vent (2). The louvers at front (1) and defroster (3) vents can be manually opened or closed.

Control Panel Designation and Function

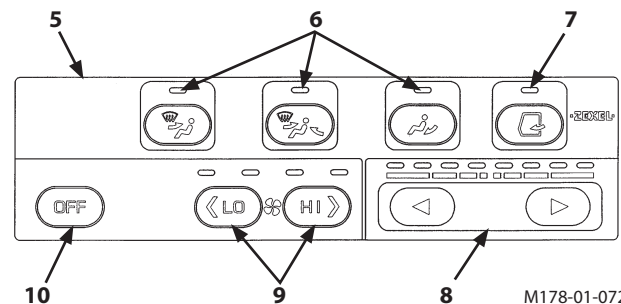
- Mode Switch (6)
Selects the air vent.

-  Air flows out of front vent (1) and defroster vent (3).
-  Air flows out of front (1), rear (4) vents and defroster vent (3).
-  Air flows out of foot vent (2).



M1U1-01-027

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

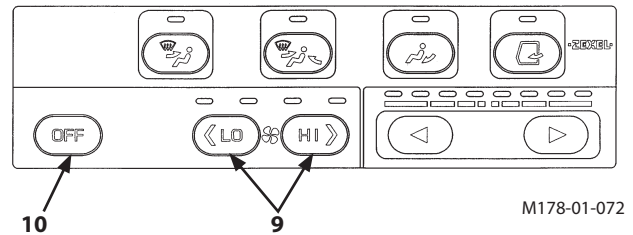


M178-01-072

OPERATOR'S STATION

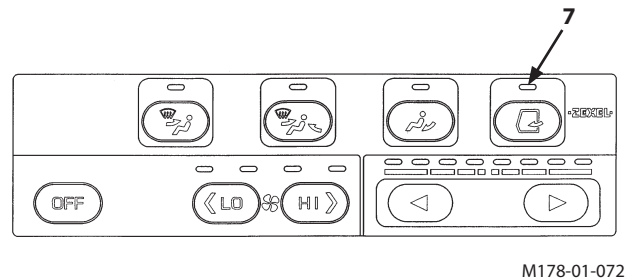
- Blower Switch (9)

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



- Fresh Air Vent Switch (7)

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

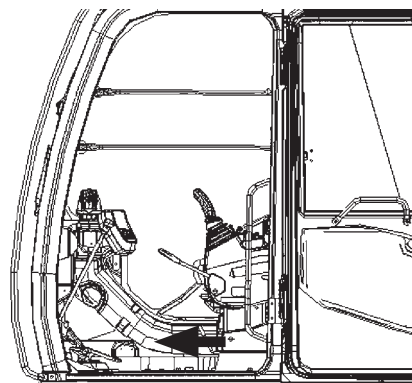
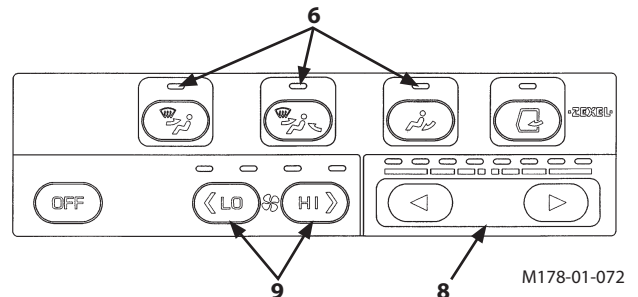


CAB HEATER OPERATION

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

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

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



OPERATOR'S STATION

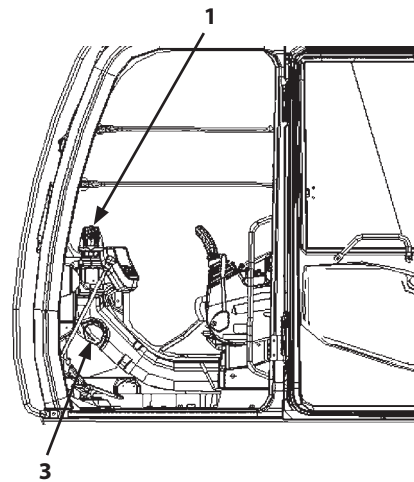
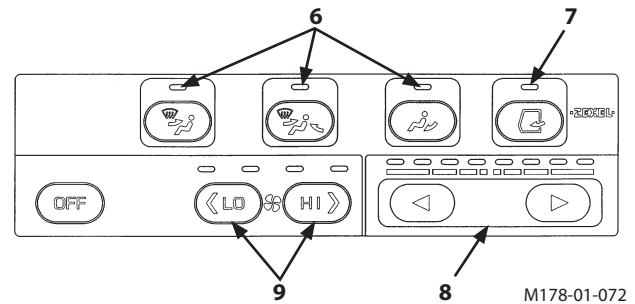
DEFROSTER OPERATION

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

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

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

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

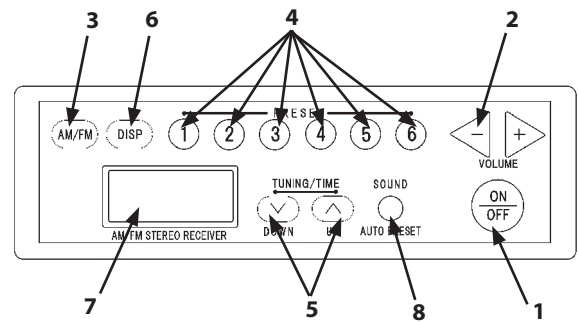


OPERATOR'S STATION

AM/FM RADIO OPERATION

Controls on the Radio

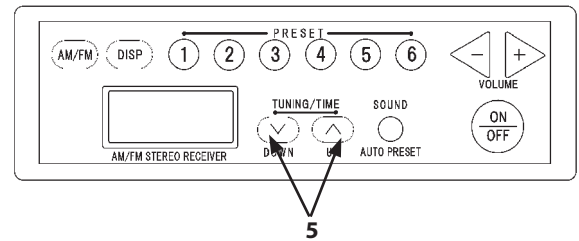
- 1- Power Switch
- 2- Volume Control Switch
- 3- AM/FM Switch
- 4- Station Presets
- 5- UP/DOWN Switch
- 6- Display Mode Change Switch
- 7- Digital Display
- 8- Tone Adjustment Switch



M1U1-01-119

Tuning Procedure

- Manual Tuning Procedure
Repeatedly tap one of UP/DOWN switch (5) until the desired station is reached.
Each time the tuning switch is pressed, the frequency changes at an interval.
Tap the tuning switch [UP] (⤴) to increase the frequency.
Tap the tuning switch [DOWN] (⤵) to decrease the frequency.
- Automatic Search Function
Press and hold one UP/DOWN switch (5) for more than half a second, then release. The frequency display will move up to the next higher frequency station.
To go up to the next higher frequency station, press and hold the tuning switch [UP] (⤴).
To go down to the next lower frequency station, press and hold the tuning switch [DOWN] (⤵).



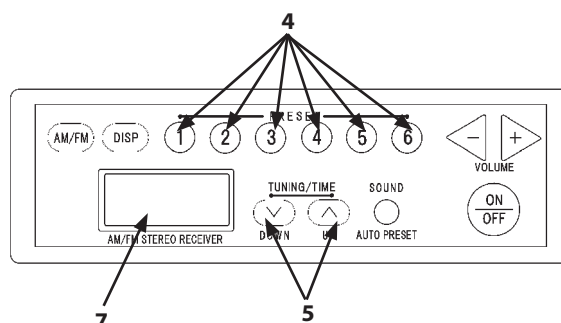
M1U1-01-119

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

OPERATOR'S STATION

Station Presetting Procedure

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



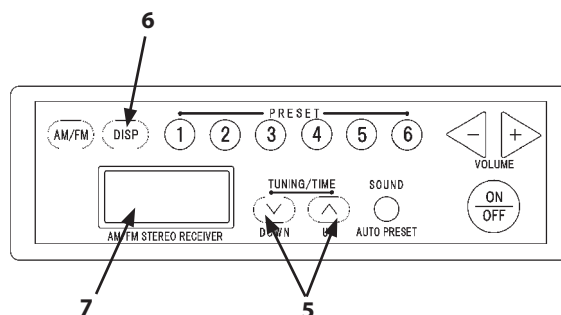
Once the presetting is complete for a station preset (4), the radio will be tuned to the preset station when station preset (4) is pressed (for less than 1 second).

M1U1-01-119

Digital Clock Setting Procedure

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

1. Press display mode button (6) to indicate the time display on digital display (7).
2. Press and hold display mode button (6) for longer than 1 second. The hour display will start flashing and the time set mode will be selected.
3. Press UP/DOWN switch (5) to set the clock. Each time UP/DOWN switch (5) is pressed, the time display will increase by one. If UP/DOWN switch (5) is pressed and held, the time display will change continuously.
- When the hour display is "12", if UP/DOWN switch (UP) (5) is pressed, the hour display will be reset to "1." The time is displayed in 12 hour standard. More press display mode button (6). The minute display will start flashing and time set mode will be selected. When the minute display is "59", if UP/DOWN switch (UP) (5) is pressed, the minute display will be reset to "00." However, the hour display remains unchanged in this case.
4. After the clock setting is complete, press display mode button (6) again to end the clock time setting procedure. Digital display (7) stops flashing and changes to stay ON.



M1U1-01-119

OPERATOR'S STATION

Sound Adjustment

When SOUND control switch (2) is pressed with the radio switch ON, It will be in the sound adjustment state. Each time SOUND control switch (2) is pressed, the adjustment item can be changed as below.
BAL → TRE → BAS → BAL → TRE → BAS
When SOUND control switch (2) is pressed with the BAS state, the sound adjustment is deactivated.

- Sound Adjustment (Balance Control)

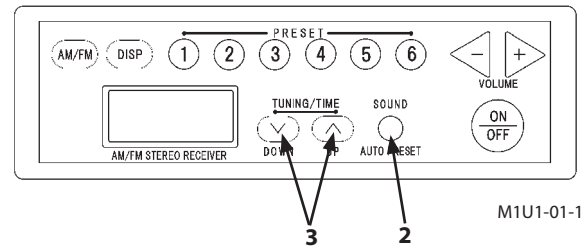
When UP button (3) is pressed with the BAL state, loudspeaker output is increased from R output by one step. When DOWN button (3) is pressed with the BAL state, loudspeaker output is decreased from L output by one step.

- Sound Adjustment (Treble Control)

When UP button (3) is pressed with the TRE state, treble level is increased by one step. When DOWN button (3) is pressed with the TRE state, treble level is decreased by one step.

- Sound Adjustment (Bass Control)

When UP button (3) is pressed with the Bas state, bass level is increased by one step. When DOWN button (3) is pressed with the Bas state, bass level is decreased by one step.



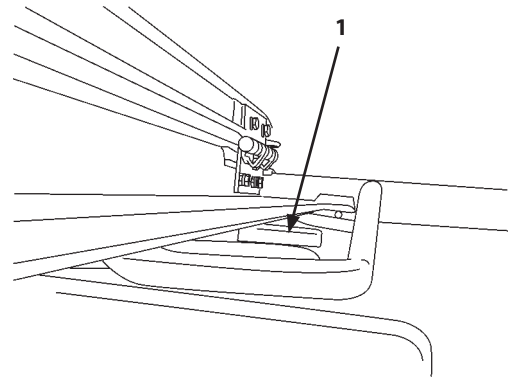
OPERATOR'S STATION

CAB DOOR RELEASE LEVER



CAUTION:

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



M1J1-07-051

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

OPENING UPPER FRONT WINDOW



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

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

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

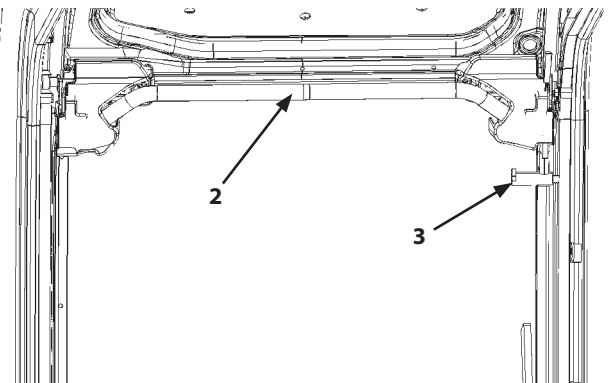
2. Holding the upper and lower handles (one each) on the upper front window, pull the upper front window up and back until it securely catches into auto locks (4).



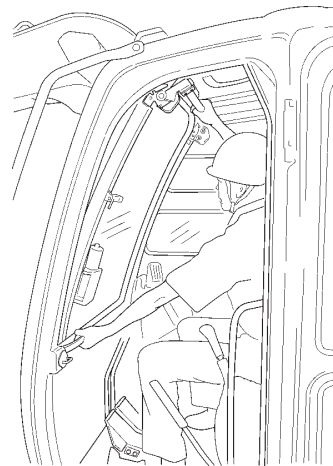
CAUTION: Always secure lock pin (3) in the lock position after the upper front window is opened.

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

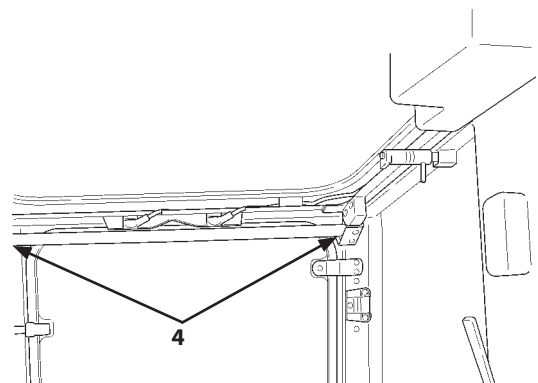
 **NOTE:** When the upper front window is opened, the wiper and washer are inoperable.



M1U1-01-028



M1CC-01-020



M1CC-01-031

OPERATOR'S STATION

CLOSING UPPER FRONT WINDOW

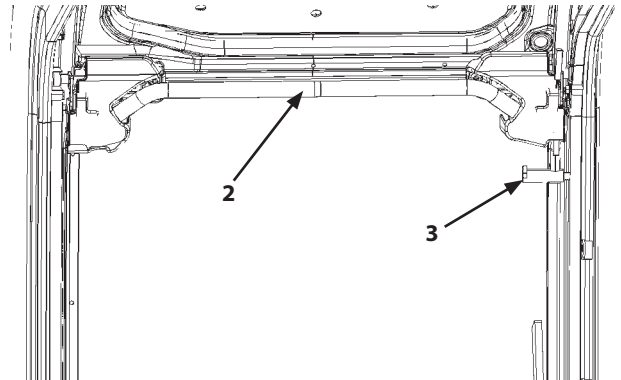


CAUTION: Avoid possible injury while closing window.
Upper front window comes down very forcefully.
Close window only when sitting in the operator's seat.
Guide window down slowly.

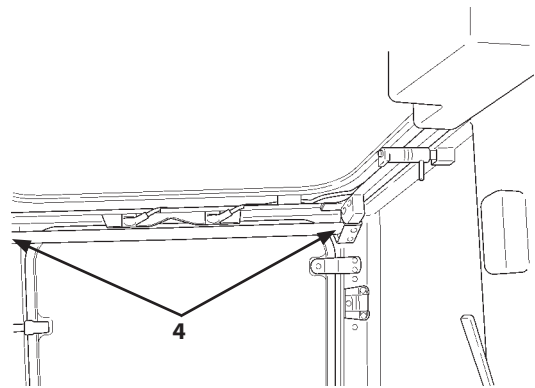
1. Pull out lock pin (3) to unlock window.
2. Slightly move the window forward while pushing lock release lever (2) to release auto locks (4).
3. Pull window down slowly until it securely catches into auto locks (4).



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



M1U1-01-028



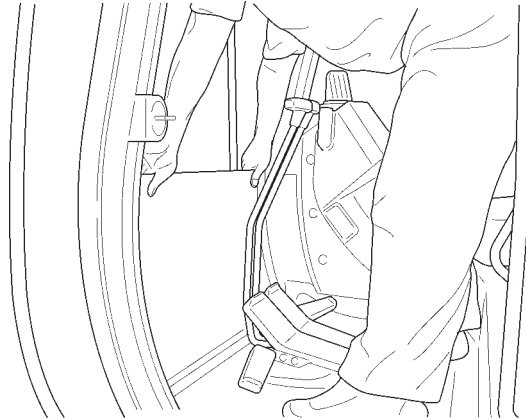
M1CC-01-031

OPERATOR'S STATION

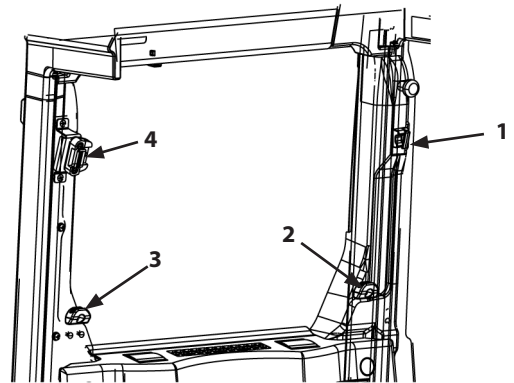
REMOVING AND STORING LOWER FRONT WINDOW

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

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



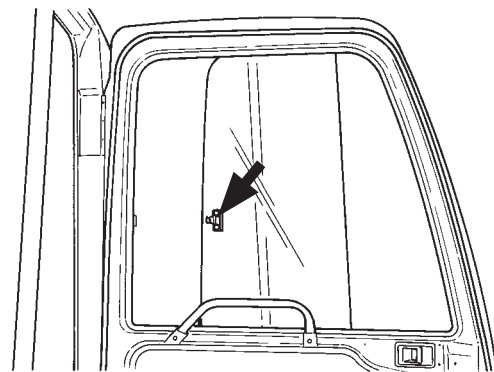
M1CC-01-022



M1U1-01-056

OPENING SIDE WINDOWS

Opening Cab Door Window
Slide rear pane to the front.



Cab Door Window

M178-01-061

OPERATOR'S STATION

OPENING/CLOSING OVERHEAD WINDOW

(Std. Model, L Model, K Model)

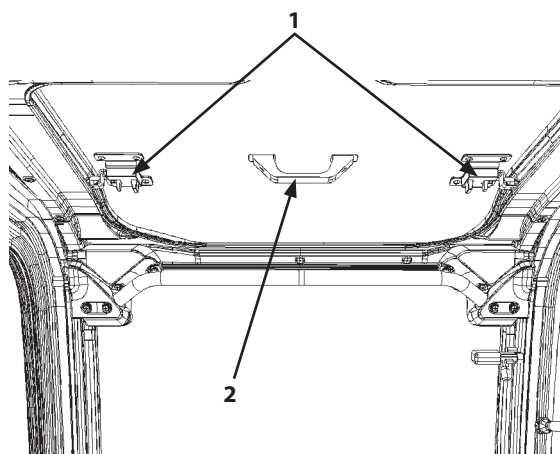
Opening

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

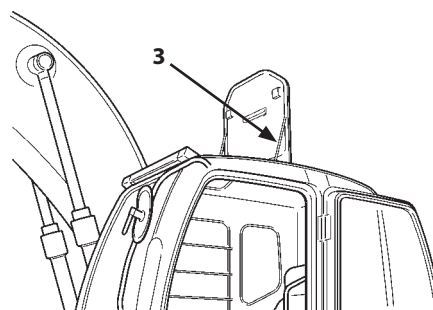
Closing

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

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



M1U4-01-011



M1U1-01-054

OPENING/CLOSING OVERHEAD WINDOW

(Clear Hatch: If Equipped)

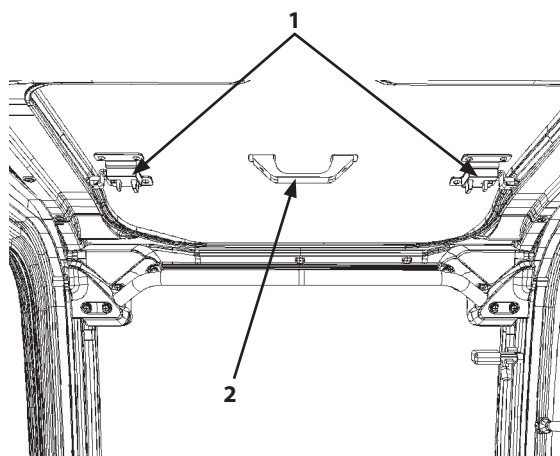
Opening

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

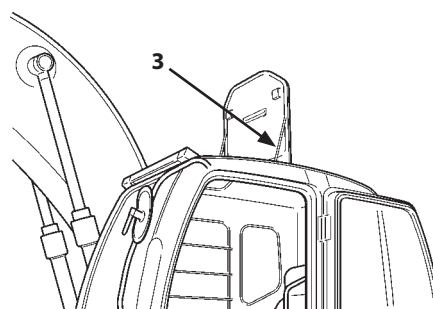
Closing

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

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



M1U4-01-011



M1U1-01-054

IMPORTANT:

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

OPERATOR'S STATION

EMERGENCY EXIT

Escape from the cab in emergency in the following methods:

⚠ CAUTION: The danger of downfall 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 posture of machine and the outside situation.

1. Open the cab door. Escape through the door.
2. If the cab door should be 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.

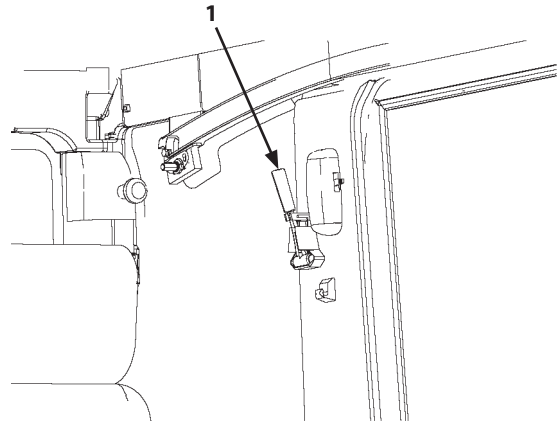
⚠ CAUTION:

- If decal (3) is affixed to the front window glass, the glass can be broken. However if decal (3) is not affixed to the front window glass, the glass cannot be broken.
- Take care not to be injured with pieces of broken glass.

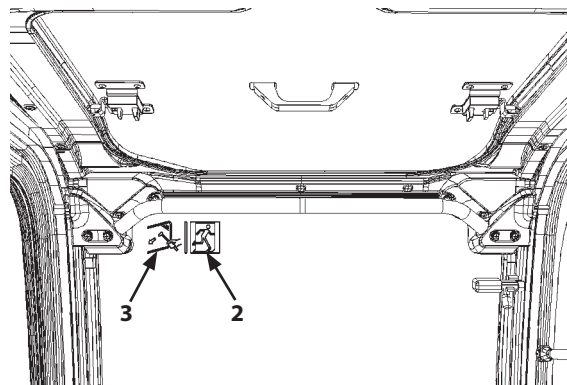
3. If upper front window should be difficult to open, check decal (3) affixed to the window glass.

If decal (3) is affixed to the front window glass, break the front window glass using emergency evacuation tool (1) installed the cab left side. Then escape through the broken window.

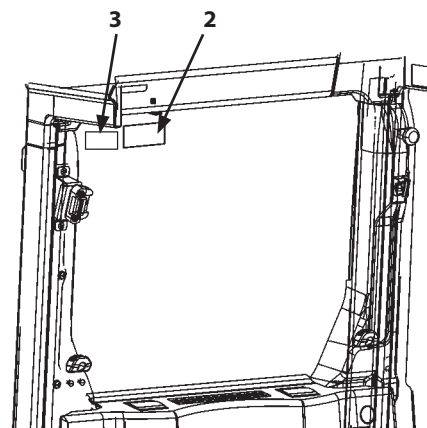
4. If decal (3) is not affixed to the front window glass, or if the front window is not available for escaping, break the rear window glass using emergency evacuation tool (1). Then escape through the broken window.
5. If neither of front and rear windows are available for emergency exit, open the overhead window to escape from the cab.



M1U1-01-022



M1U4-01-012



M1U1-01-115

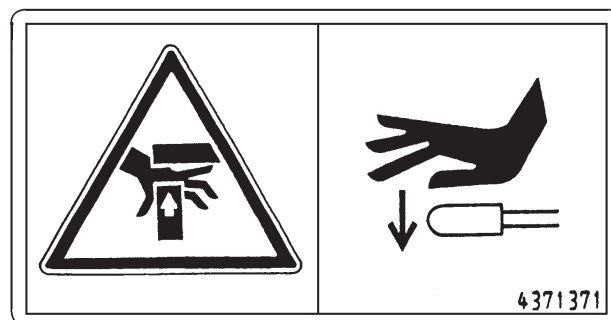
OPERATOR'S STATION

ADJUSTING THE SEAT

Seat Height and Angle Adjustment

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

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



Caution: Possibility of pinched fingers

Push down with the palm.

SS-955

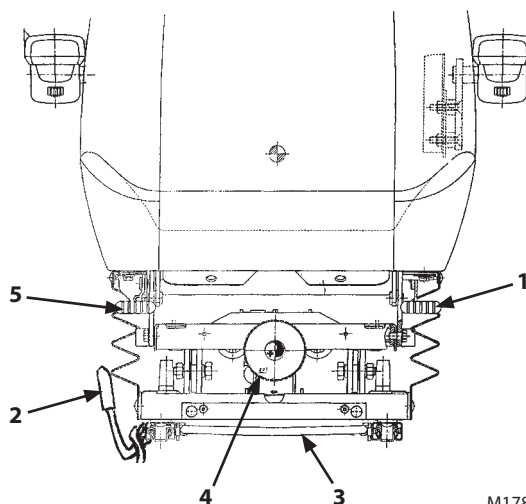
Use lever (1) to adjust the seat height and/or seat angle as follows:

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

Console and Seat Fore-aft Adjustment

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

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



M178-01-065

Seat Fore-Aft Adjustment

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

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

Suspension Adjustment

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

Backrest Adjustment

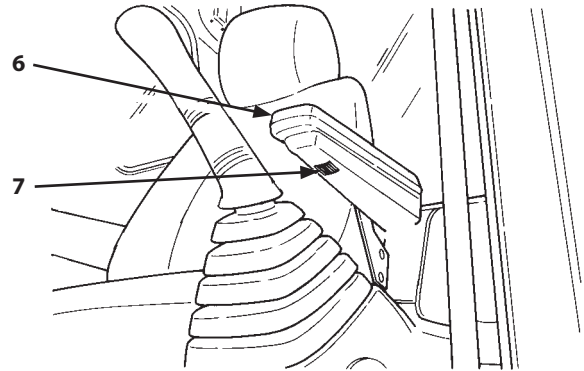
Pull up lever (5) to release backrest lock. Move backrest to the desired position and release lever (5).

OPERATOR'S STATION

Armrest Adjustment

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

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



M1G6-01-017

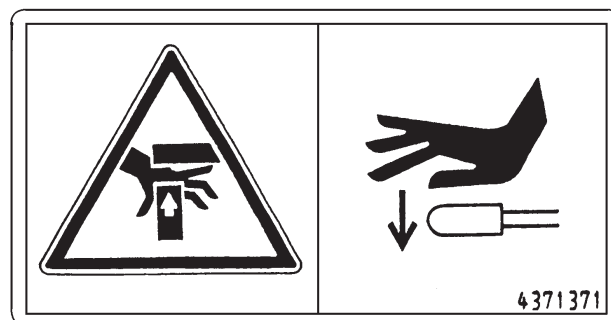
OPERATOR'S STATION

ADJUSTING THE AIR-SUSPENSION SEAT (Optional)

Seat Height and Angle Adjustment

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

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



Caution: Possibility of pinched fingers

Push down with the palm.

SS-955

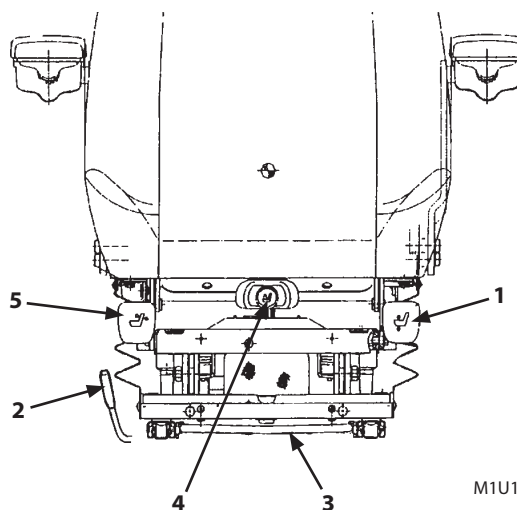
Use lever (1) to adjust the seat height and/or seat angle as follows:

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

Console and Seat Fore-aft Adjustment

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

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



M1U1-01-014

Seat Fore-Aft Adjustment

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

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

Suspension Adjustment

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

Backrest Adjustment

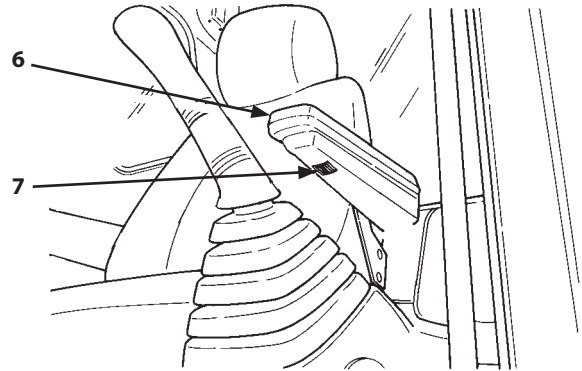
Pull up lever (5) to release backrest lock. Move backrest to the desired position and release lever (5).

OPERATOR'S STATION

Armrest Adjustment

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

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



M1G6-01-017

OPERATOR'S STATION

ADJUSTING CONSOLE HEIGHT

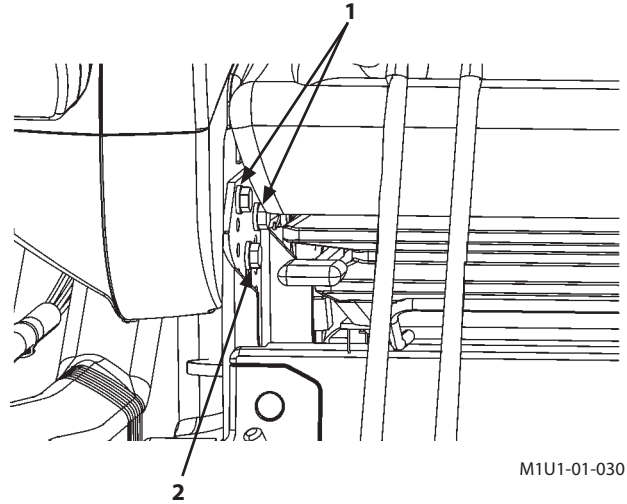
Adjust the console height to the operator's comfort and/or work conditions. Adjusting console height can be achieved using three positions provided vertically at 20 mm intervals.

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

Adjusting Procedures

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

Tightening Torque: 50 N·m (5 kgf·m)



M1U1-01-030

OPERATOR'S STATION

SEAT BELT



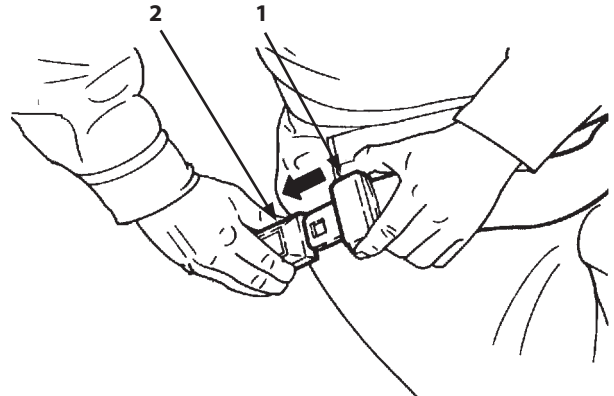
WARNING: Be sure to use seat belt (1) when operating the machine.

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

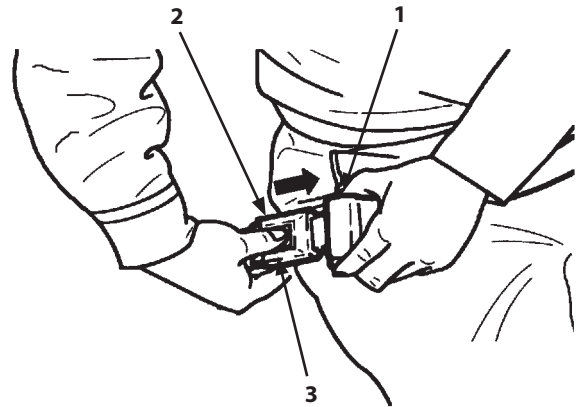
Replace seat belt (1) every three years, regardless of appearance.

Seat Belt

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



M1U1-01-031



M1U1-01-032

MEMO

BREAK-IN

OBSERVE ENGINE OPERATION CLOSELY

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

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

EVERY 8 HOURS OR DAILY

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

AFTER THE FIRST 50 HOURS

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

AFTER THE FIRST 100 HOURS

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

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins or other markings on the paper.

OPERATING THE ENGINE

INSPECT MACHINE DAILY BEFORE STARTING

ELECTRICAL SYSTEM

Check for worn or frayed wires and loose connections.

BOOM, BUCKET, SHEET METAL, TRACKS

Check for bent, broken or missing parts.

HARDWARE

Check for loose or missing parts.

FUEL SYSTEM

Drain water and sediments from fuel tank.

HYDRAULIC SYSTEM

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

LUBRICATION

Check lubrication points on the Periodic Service Chart.

PROTECTIVE DEVICES

Check guards, fenders.

SAFETY

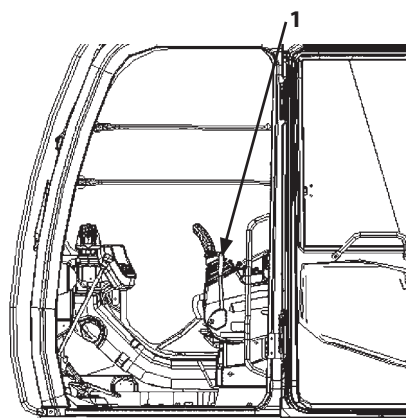
Walk around machine to clear all bystanders/obstacles from machine area.

OPERATING THE ENGINE

BEFORE STARTING ENGINE

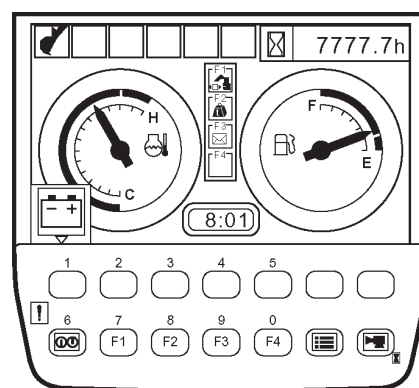
1. Confirm that pilot control shut-off lever (1) is in the LOCK position.
2. Confirm that all control levers are placed in neutral.
3. Adjust the seat to allow full pedal and control levers stroke with operator's back against the backrest. Fasten the seat belt.

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



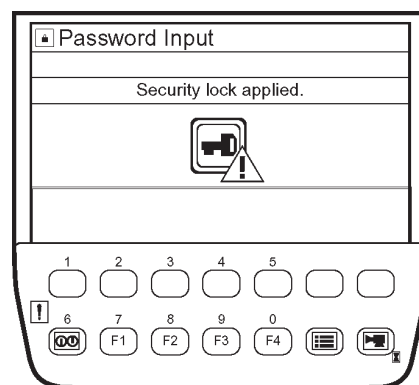
LOCK Position

M1U1-01-025



T1V1-05-01-117

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



Security Lock Screen

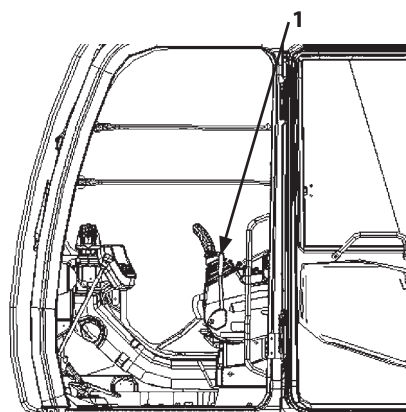
T1V5-05-01-005

OPERATING THE ENGINE

STARTING THE ENGINE IN ORDINARY TEMPERATURE

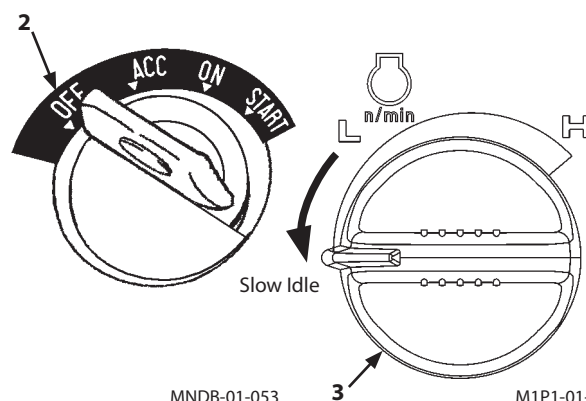
1. Pull pilot control shut-off lever (1) up to the LOCK position.
2. Turn engine control dial (3) to the slow idle position.
3. Sound horn to alert bystanders.
4. Insert key switch (2). Turn it ON position.
5. "Wait-screen (nothing is displayed)" is displayed on the monitor for 2 seconds. Regardless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

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



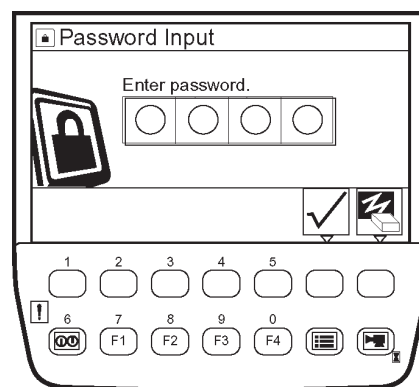
LOCK Position

M1U1-01-025



MNDB-01-053

M1P1-01-068



Password Input Screen

T1V5-05-01-002

OPERATING THE ENGINE

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

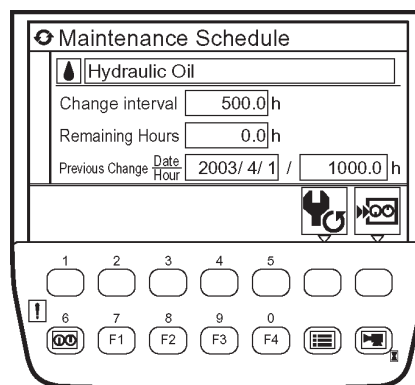
7. The basic screen will be displayed on the monitor. Check that preheat indicator (4) is OFF at this time.
8. Turn key switch (2) to start the engine.

IMPORTANT: Prevent the starter damage.

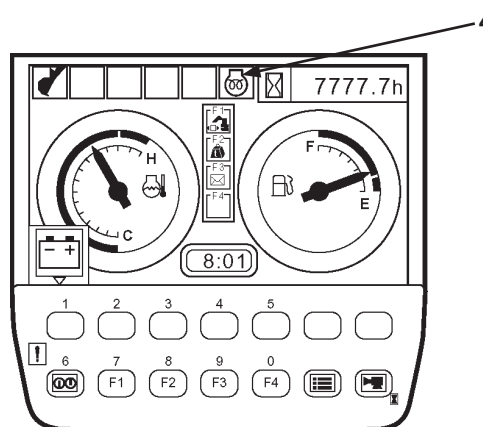
Never operate the starter motor for more than 10 seconds at a time. If the engine fails to start, return the key switch to OFF. Wait for more than 30 seconds, then try again. After a false start, do not turn the key switch until the engine stops or the starter may be damaged.

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

 **NOTE:** For a while after the engine starts, the automatic heating system operates so that even though the engine control dial is set in the slow idle position, the engine speed will temporarily increase.



T1V5-05-01-170



Basic Screen

M1U1-03-001

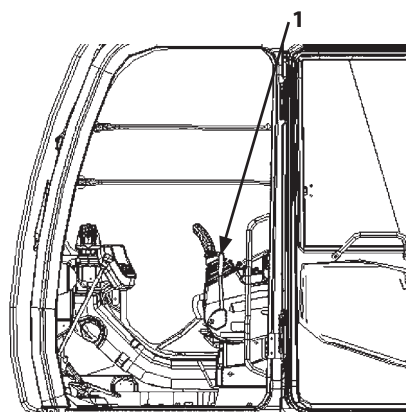
OPERATING THE ENGINE

STARTING IN COLD WEATHER

Preheating

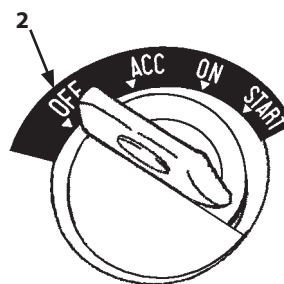
1. Pull pilot control shut-off lever (1) up to the LOCK position.
2. Turn engine control dial (3) to around the middle between the L and H positions.
3. Sound horn to alert bystanders.
4. Insert key switch (2). Turn it ON position.
5. "Wait-screen (nothing is displayed)" is displayed on the monitor for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

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

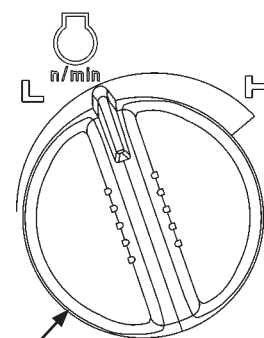


LOCK Position

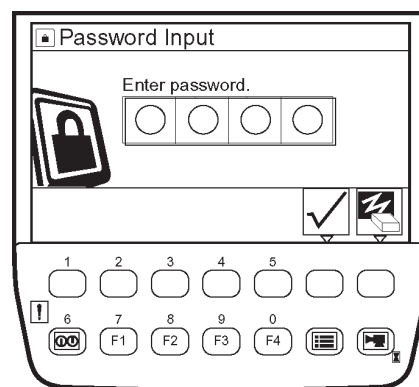
M1U1-01-025



MNDB-01-053



M1P1-03-007



Password Input Screen

T1V5-05-01-002

OPERATING THE ENGINE

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

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

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

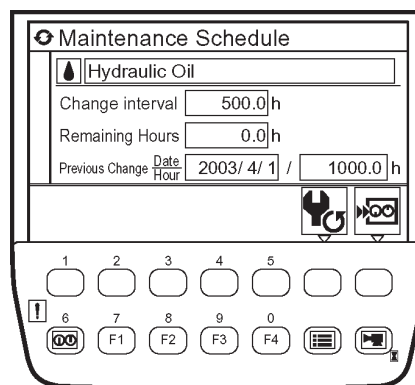
8. As soon as preheat indicator (4) goes OFF, turn the key switch to the START position to rotate the starter.

IMPORTANT: Prevent the starter damage.

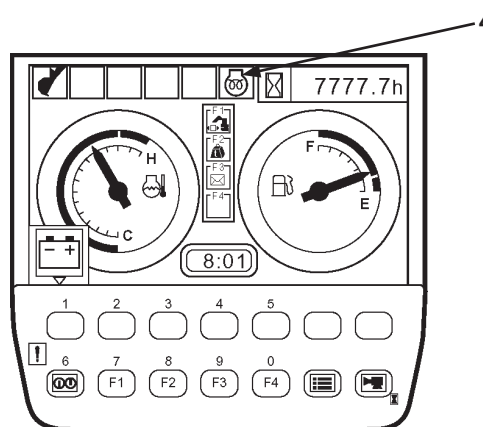
Never operate the starter motor for more than 10 seconds at a time. If the engine fails to start, return the key switch to OFF. Wait for more than 30 seconds, then try again. After a false start, do not turn the key switch until the engine stops or the starter may be damaged.

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

 **NOTE:** For a while after the engine starts, the automatic heating system operates so that the engine control dial is set in the slow idle position, the engine speed will not become slow idle immediately.



T1V5-05-01-170



Basic Screen

M1U1-03-001

OPERATING THE ENGINE

CHECK INSTRUMENTS AFTER STARTING

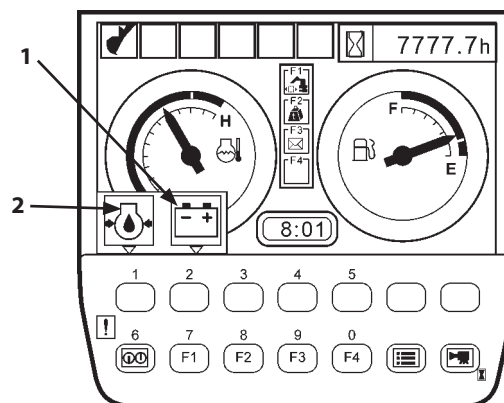
Checking instruments through monitor functions.
After starting the engine, check the following points through the monitor functions.

Check that

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

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

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



M1U1-03-002

OPERATING THE ENGINE

USING BOOSTER BATTERIES



WARNING:

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



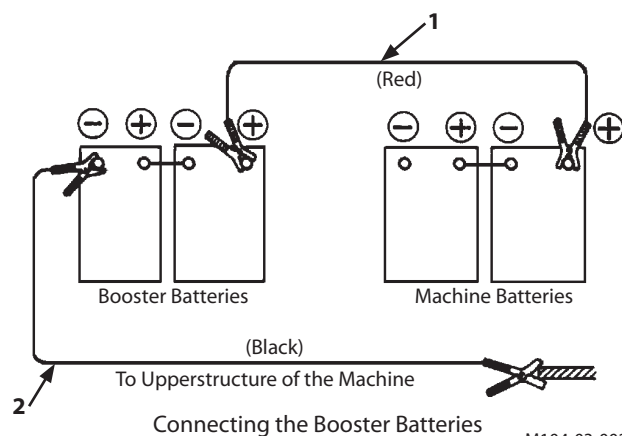
SA-032

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

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

Connecting the booster batteries

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

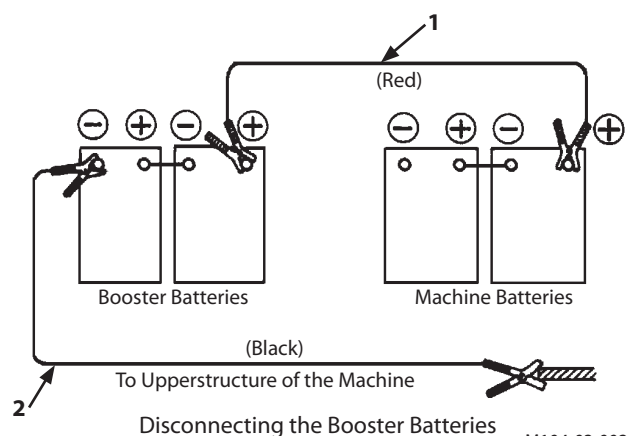


M104-03-002

OPERATING THE ENGINE

Disconnecting the booster batteries

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



OPERATING THE ENGINE

STOPPING THE ENGINE

Engine stop procedure

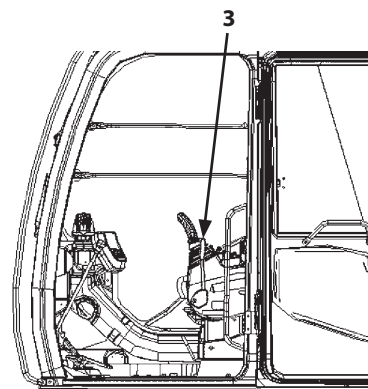
1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn engine control dial (1) to the slow idle position and run the engine for 5 minutes to cool the engine.



SA-390

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

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

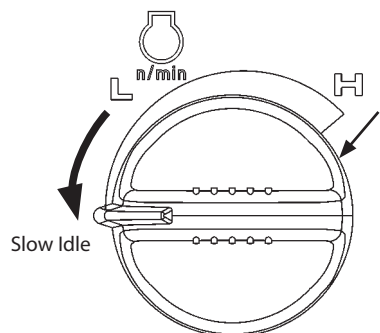


M1U1-01-025

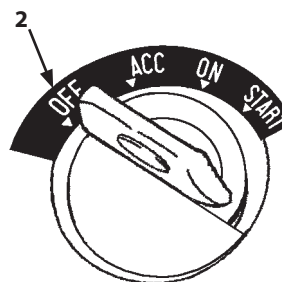
If the engine does not stop with key switch (2) turned in the OFF position

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.

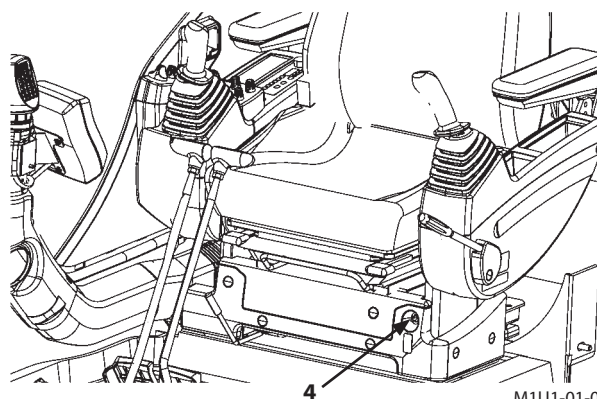
CAUTION: Do not use engine stop switch (4), except when unavoidable. Moreover, Do not operate the machine until repair is completed when stopping the engine with the failure of the machine.



M1P1-01-068



MNDB-01-053



M1U1-01-029

DRIVING THE MACHINE

DRIVE THE MACHINE CAREFULLY

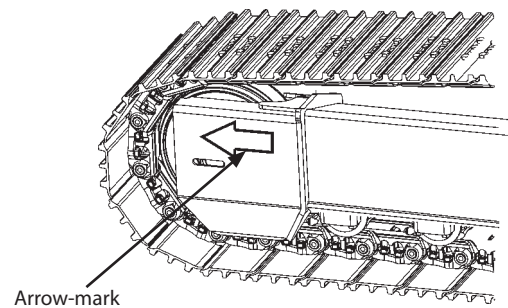
IMPORTANT: During freezing weather, park machine on a hard surface to prevent tracks from freezing to the ground. Clean debris from tracks and track frame.

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

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

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

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



M178-03-001

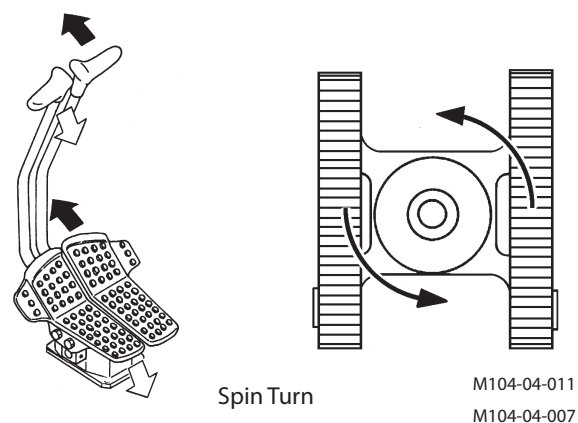
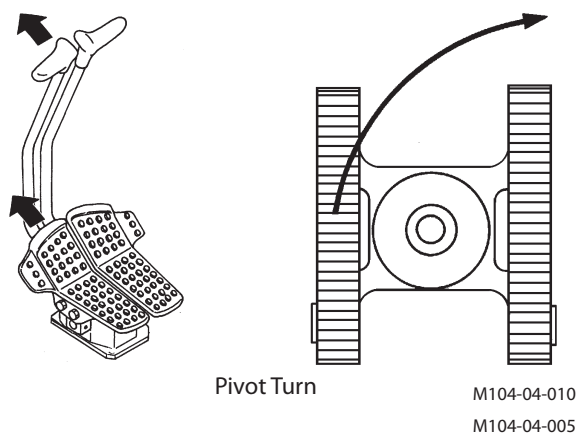
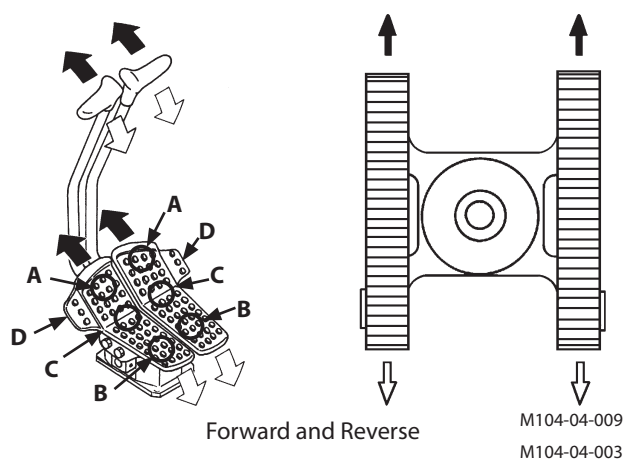
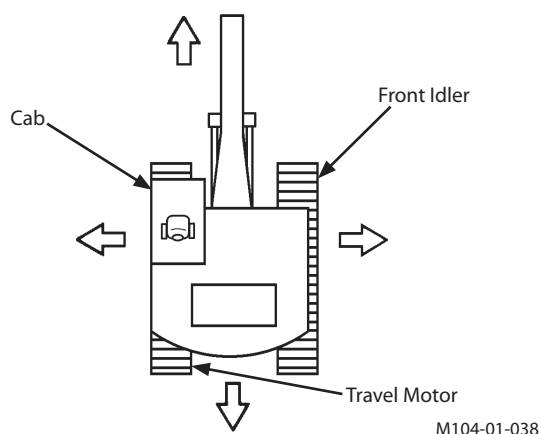
DRIVING THE MACHINE

STEERING THE MACHINE USING PEDALS

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

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

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



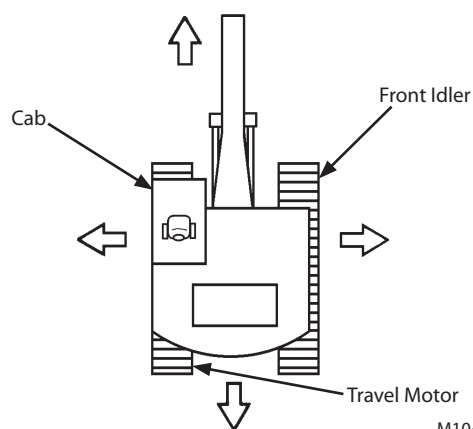
DRIVING THE MACHINE

STEERING THE MACHINE USING LEVERS

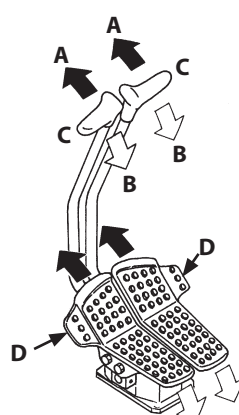
WARNING: In the standard travel position, the front idlers are positioned at the front of the machine and the travel motors at the rear. If the travel motors are positioned at the front of the machine, the control actions of the travel levers will be reversed. Be sure to confirm the position of the travel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

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

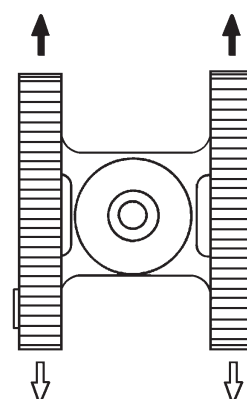
NOTE: For long-term traveling, push down on pedal tabs (D) and rest feet on the footrests.



M104-01-038

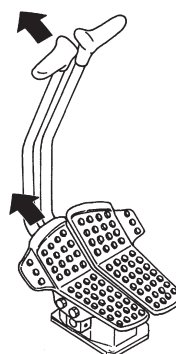


Forward and Reverse

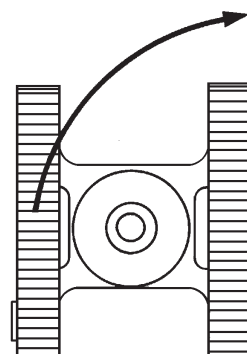


M104-04-009

M104-04-003

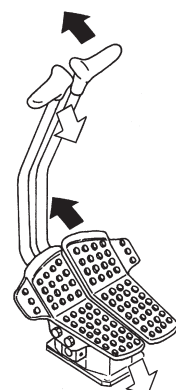


Pivot Turn

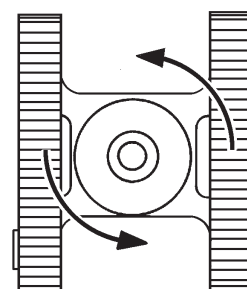


M104-04-010

M104-04-005



Spin Turn



M104-04-011

M104-04-007

DRIVING THE MACHINE

TRAVEL MODE SWITCH

⚠ WARNING: Tipping-over accidents can cause serious personal injury. Do not change travel mode switch (1) while traveling; especially, changing to fast mode (2) when descending slopes will create a very dangerous situation. Always stop the machine before changing the travel speed mode.

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

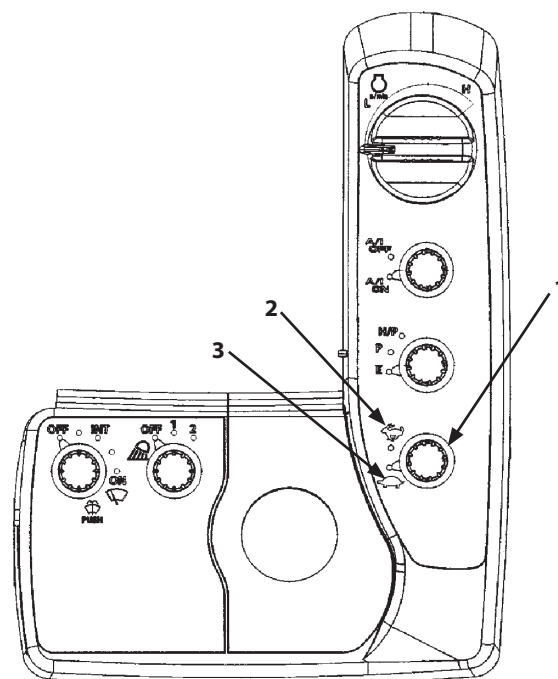
- Fast Mode: Turn travel mode switch (1) to  mark (2) position.
- Slow Mode: Turn travel mode switch (1) to  mark (3) position.



Mark (Fast Speed Mode)



Mark (Slow Speed Mode)



M1U1-01-123

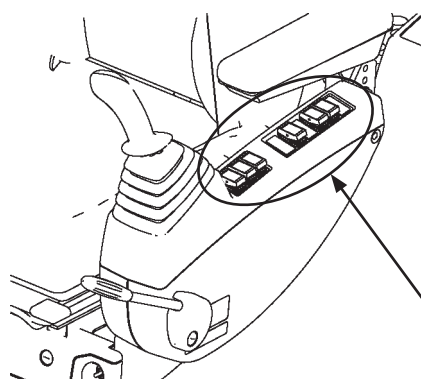
TRAVEL ALARM (Optional)

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

Deactivating Travel Alarm

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

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



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

DRIVING THE MACHINE

OPERATING ON SOFT GROUND

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



M104-05-012

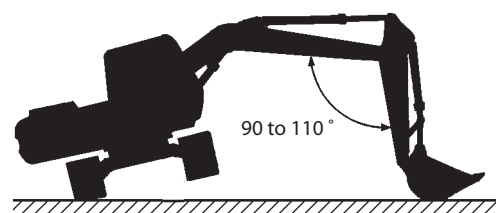
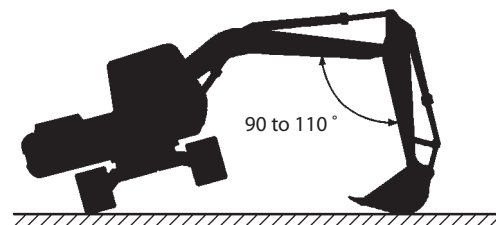
RAISE ONE TRACK USING BOOM AND ARM

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

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

Place blocks under machine frame to support the machine.

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



SA-817

DRIVING THE MACHINE

TOWING MACHINE A SHORT DISTANCE

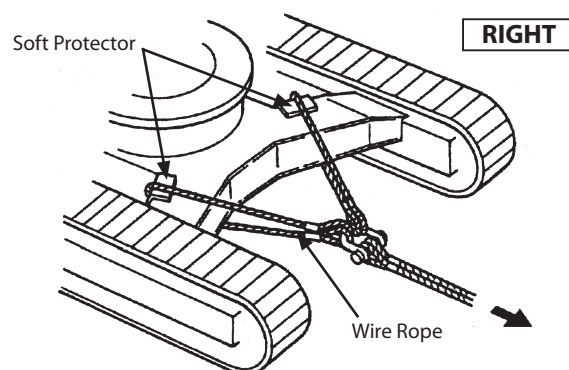
CAUTION: Cables, straps, or ropes can break causing serious injury. Do not tow machine with damaged chains, frayed cables, slings, straps, or wire ropes. Always wear gloves when handling cable, straps or wire ropes.

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

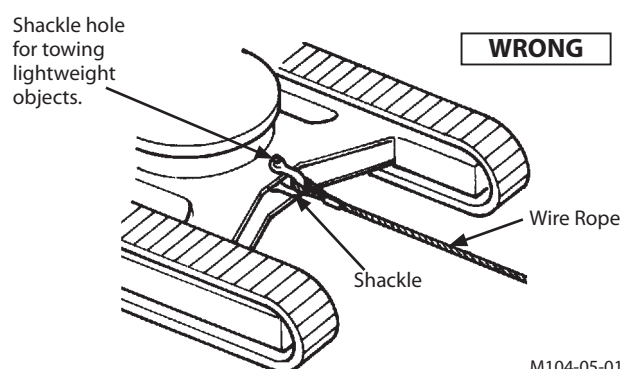
Be sure to attach the wire ropes around the track frames of both machines as illustrated.

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

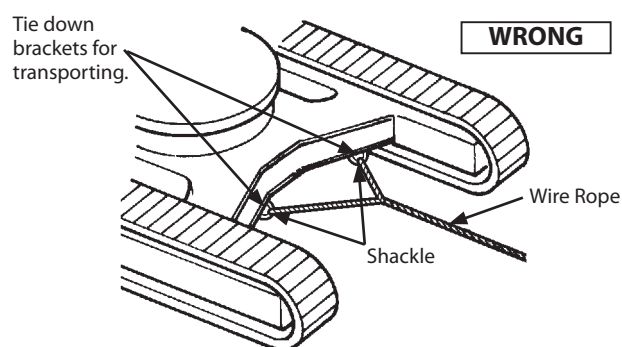
IMPORTANT: Do not use the shackle holes on the track frame for towing the machine. A center shackle hole on the track frame is provided to pull only lightweight objects. The shackle holes on the bottom of the track frame are used to secure the machine for transportation. Refer to the instructions on page 5-36 for using the center shackle hole appropriately.



M104-05-010



M104-05-011



M1U1-05-001

DRIVING THE MACHINE

OPERATING IN WATER OR MUD

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

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

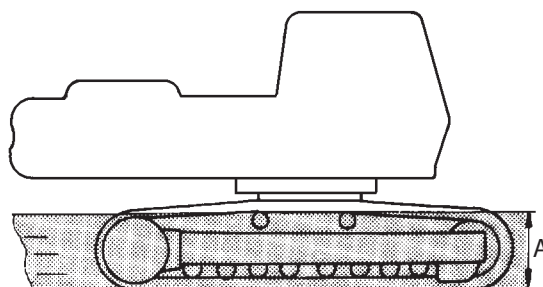
Avoid submerging the swing bearing, swing gears and center joint.

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

Swing Internal Gear Capacity

ZX120-3 Class:	9 L (2.4 US gal)
ZX180-3, 200-3, 270-3 Class:	17 L (4.5 US gal)
ZX330-3 Class:	19 L (5.0 US gal)

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



M104-05-009

Model	A
ZX120-3 Class (Except ZX110M-3, 130L-3)	660 mm (26 in)
ZX110M-3, 130L-3 ZX180-3 Class ZX200-3 Class ZX270-3 Class (Except ZX270-3, 270LC-3)	770 mm (30 in)
ZX270-3, 270LC-3 ZX330-3 Class	860 mm (34 in)

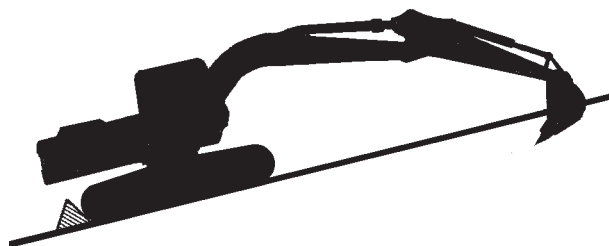
DRIVING THE MACHINE

PARKING THE MACHINE ON SLOPES

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

If parking the machine on a slope is unavoidable:

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



M104-05-014

PARKING THE MACHINE

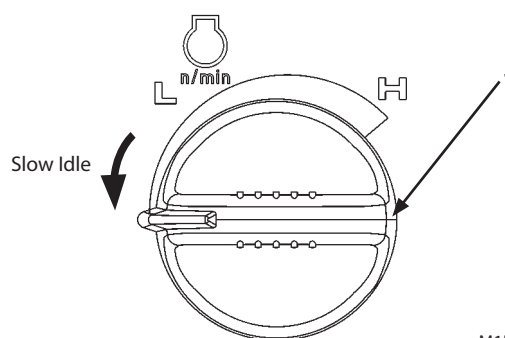
1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

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

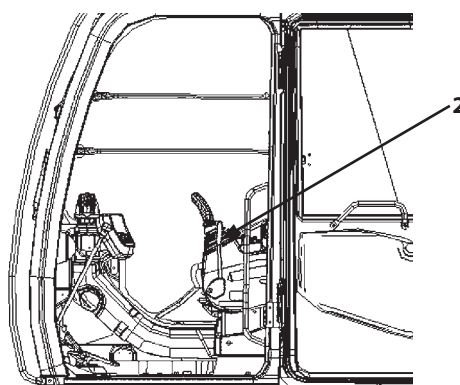
4. Turn engine control dial (1) counterclockwise to the stop (the slow idle position). Run the engine approximately 5 minutes to cool the engine.
5. Turn the key switch to OFF. Remove the key from the key switch.
6. Pull pilot control shut-off lever (2) to the LOCK position.

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

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



M1P1-01-068



M1Lock Position M1U1-01-025

OPERATING THE MACHINE

CONTROL LEVER (ISO PATTERN)

⚠ WARNING: Never place any part of body beyond window frame. It could be crushed by the boom if boom control lever is accidentally bumped or otherwise engaged. If window is missing or broken, replace immediately.

Prevent possible injury from unexpected machine movement.

Make sure you know the location and function of each control before operating.

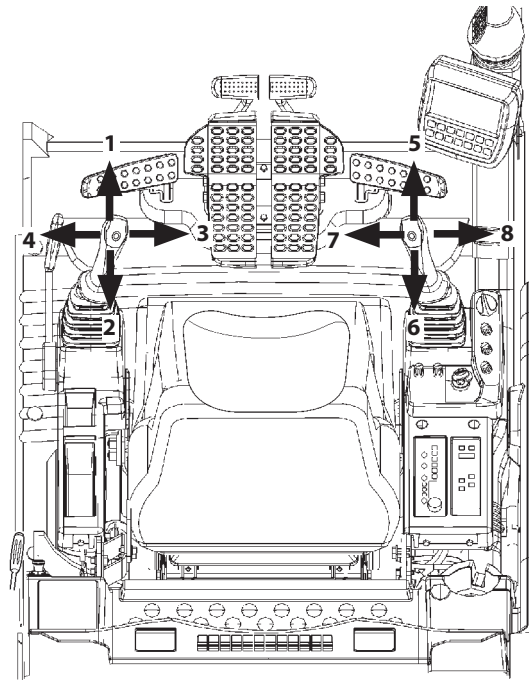
The machine is equipped with a label showing the control patterns of the levers and pedals.

IMPORTANT: When digging, avoid hitting tracks with boom cylinders.

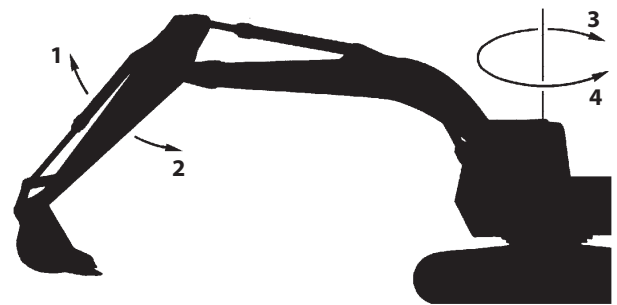
When digging over the end of the tracks, travel motors should be at the rear to maximize machine stability and lift capacity.

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

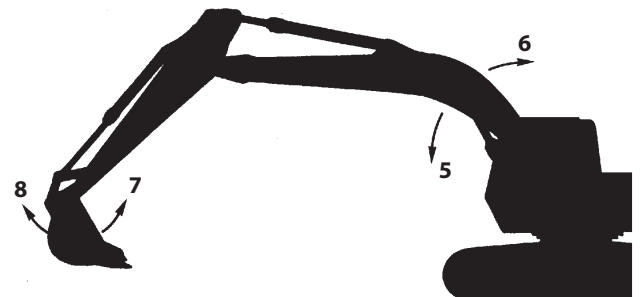
- 1- Arm Roll-Out
- 2- Arm Roll-In
- 3- Swing Right
- 4- Swing Left
- 5- Boom Lower
- 6- Boom Raise
- 7- Bucket Roll-In
- 8- Bucket Roll-Out



M1J1-01-022



M104-05-001



M104-05-002

OPERATING THE MACHINE

CONTROL LEVER (HITACHI PATTERN)

! WARNING: Never place any part of body beyond window frame. It could be crushed by the boom if boom control lever is accidentally bumped or otherwise engaged. If window is missing or broken, replace immediately.

Prevent possible injury from unexpected machine movement.

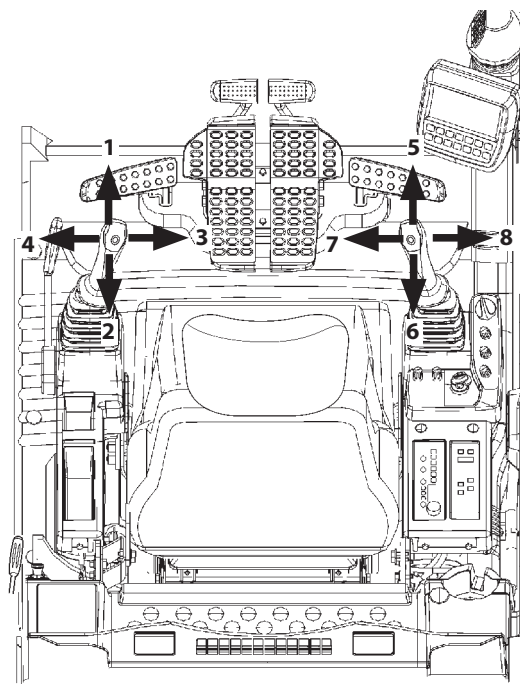
Make sure you know the location and function of each control before operating.

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

IMPORTANT: When digging, avoid hitting tracks with boom cylinders.

When digging over the end of the tracks, travel motors should be at the rear to maximize machine stability and lift capacity.

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

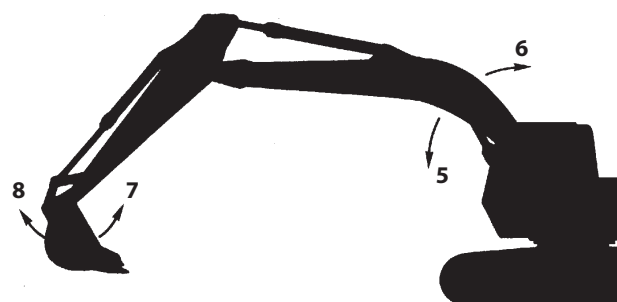


M1J1-01-022

- 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



M104-05-001



M104-05-002

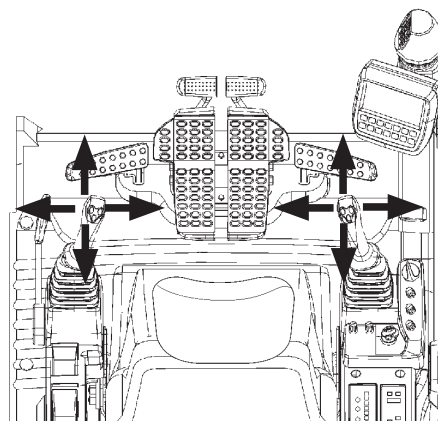
OPERATING THE MACHINE

CONTROL LEVER (4 Way Multi Valve) (Optional)

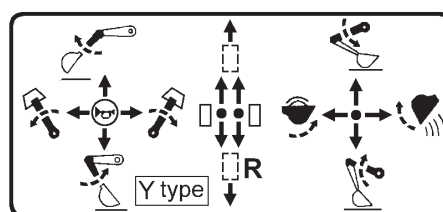
The control lever operation pattern is selected to one of four patterns, Y-type (ISO pattern), H-type (Hitachi pattern), M-type and K-type by shifting selector valve (1).

! WARNING: To prevent a serious accident or personal injury and/or death from occurring due to erratic machine movement, follow the instructions below.

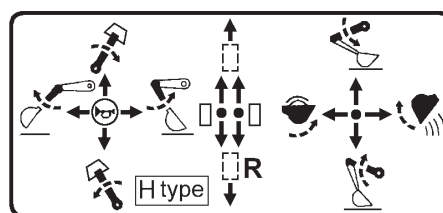
- Appoint a coordinator responsible to selection of the multi control lever operation pattern.
- Attach a lock (2) to selector valve (1). Prohibit that no personnel other than the coordinator change the control lever operation pattern.
- After changing the control lever operation pattern, check that 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's 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.



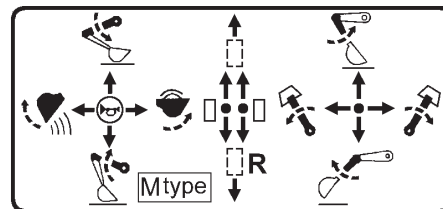
M1U1-01-001



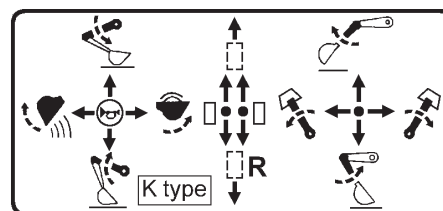
SS4288252



SS4288250

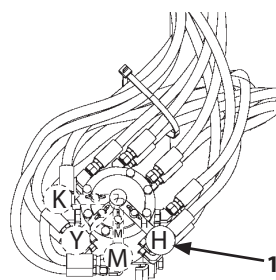


SS4288251

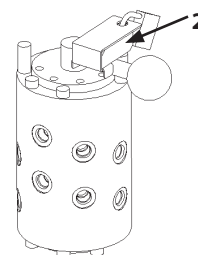


SS4288249

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



M178-05-013



M1U1-01-117

OPERATING THE MACHINE

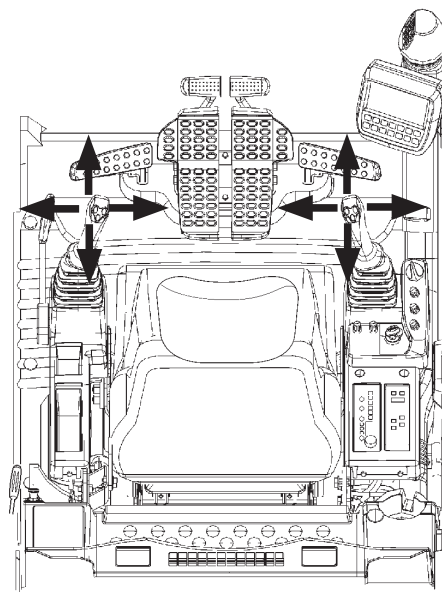
CONTROL LEVER (2 Way Multi Valve) (Optional)

The control lever operation pattern is selected to either A-type (ISO pattern) or B-type (Hitachi pattern) by shifting selector valve (1).

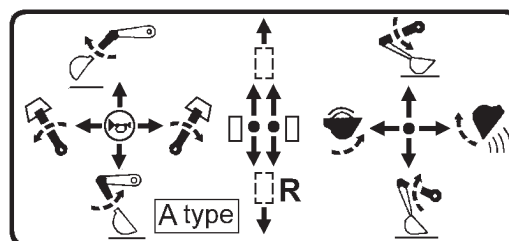
! WARNING: To prevent a serious accident or personal injury and/or death from occurring due to erratic machine movement, follow the instructions below.

- 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's 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.

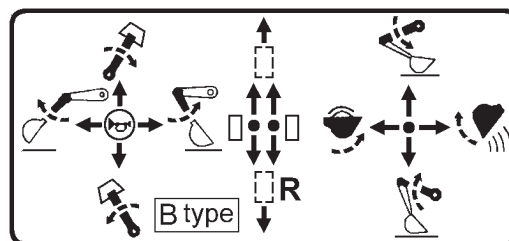
When a lever is released, it will automatically return to neutral, and that machine function will stop.



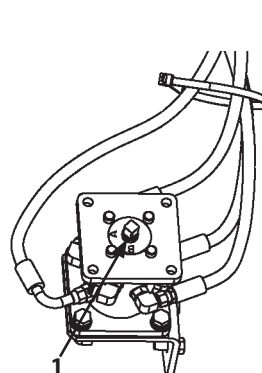
M1U1-01-001



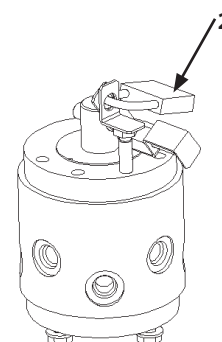
SS4419224



SS4419223



M178-05-012



M1U1-01-118

OPERATING THE MACHINE

ATTACHMENT PEDAL (HYDRAULIC BREAKER)

K Model

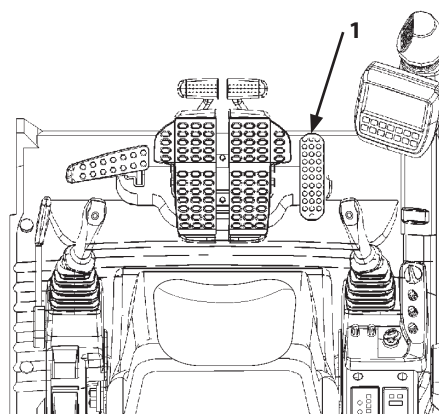
Std. Model, L Model (Optional)

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

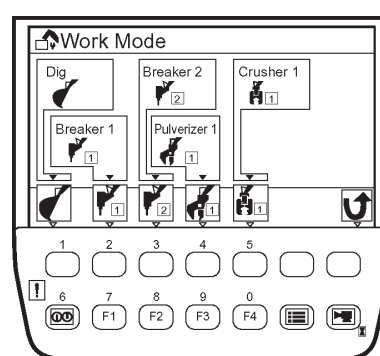
CAUTION: Be sure to lock attachment pedal (1) with pedal lock (2) when attachment pedal (1) is not in use.

1. Select the hydraulic breaker icon on monitor work mode selection screen (4). Refer to the descriptions about the work mode on page 5-12 for work mode selecting procedures.
2. Move pedal lock (2) forward to unlock attachment pedal (1).
3. Push down on attachment pedal (1) to operate the breaker.
Loosen stopper bolt (3) until stopper bolt (3) 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.

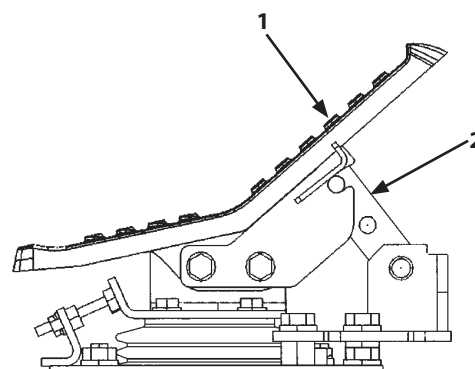
IMPORTANT: When operating a hydraulic breaker, do not step on attachment pedal (1) rearward. Damage to the hydraulic breaker may result.



M1U1-05-008

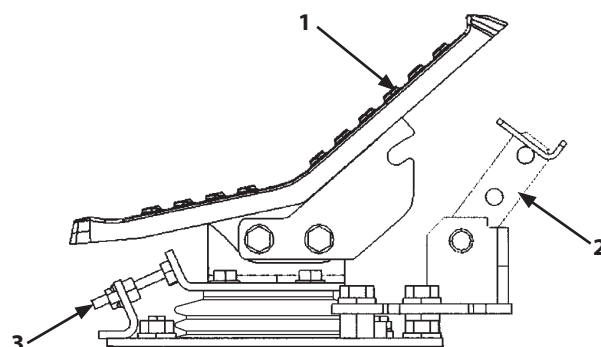


T1V5-05-01-109



Locked Attachment Pedal

M1J1-13-002



Unlocked Attachment Pedal

M1J1-13-003

OPERATING THE MACHINE

ATTACHMENT PEDAL (HYDRAULIC CRUSHER)

K Model

Std. Model, L Model (Optional)

Machine stability, applicable hydraulic oil pressure and oil quantity for crusher, etc. must be examined when selecting a crusher.

Be sure to consult your authorized dealer when selecting a crusher.

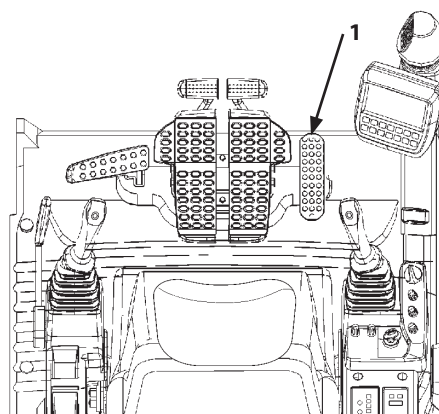
For operational instructions, refer to the crusher instruction manual.

Operation

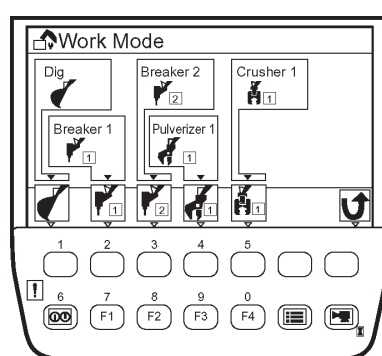
The crusher can be operated using attachment pedal (1) located on the right front of the seat, as illustrated.

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

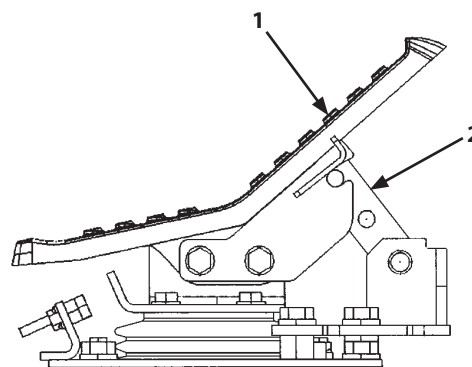
1. Select the hydraulic crusher icon on monitor work mode selection screen (3). Refer to the descriptions about the work mode on page 5-12 for work mode selecting procedures.
2. Move pedal lock (2) forward to unlock attachment pedal (1).
3. Push down on attachment pedal (1) either forward or backward to open or close the crusher.
4. Remove foot from attachment pedal (1) to stop the crusher.
5. Always keep attachment pedal (1) locked with pedal lock (2) when attachment pedal (1) is not in use.



M1U1-05-008

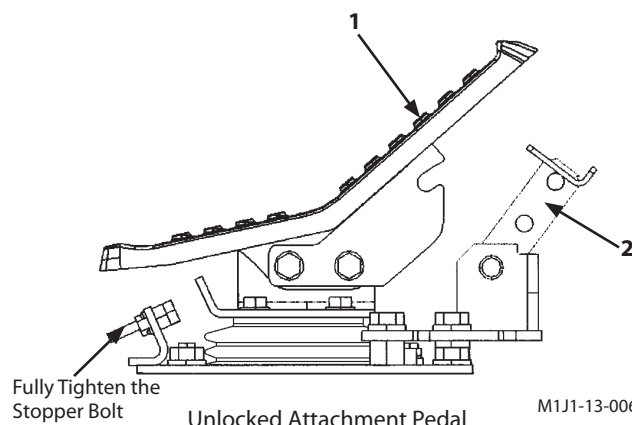


T1V5-05-01-109



Locked Attachment Pedal

M1J1-13-012



Unlocked Attachment Pedal

M1J1-13-006

OPERATING THE MACHINE

PILOT CONTROL SHUT-OFF LEVER

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



WARNING:

- **Always pull pilot control shut-off lever (1) into the full LOCK position. The pilot control shut-off function will not be activated otherwise.**
- **When leaving the machine:**
 - **Stop the engine.**
 - **Then, pull 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.**
 - **Leaving the machine at the end of the shift.**

Pilot Control Shut-Off Lever Operation

Before Leaving the Machine:

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

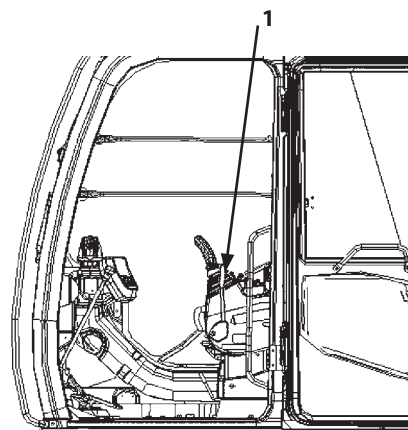
Before Starting Operation:

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

After starting the engine:

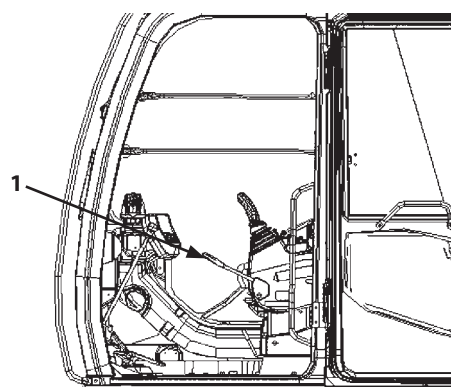
1. Confirm that all control levers and pedals are in neutral and that no part of the machine is in motion.
2. Lower pilot control shut-off lever (1) to the UNLOCK position.

If any part of the machine (any actuator) moves when pilot control shut-off lever (1) is lowered to the UNLOCK position despite the fact that all controls are placed in neutral, the machine is malfunctioning. Immediately pull pilot control shut-off lever (1) back to the LOCK position, and stop the engine. Then, see your authorized dealer.



LOCK Position

M1U1-01-025



UNLOCK Position

M1U1-01-024

OPERATING THE MACHINE

Warming-up Operation

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

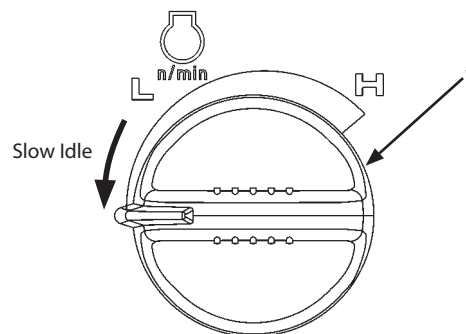
IMPORTANT: The appropriate hydraulic oil operating temperature on this machine is 50 to 80 °C. Hydraulic components may be seriously damaged if the machine is operated with low temperature hydraulic oil. In case warming up the machine by relieving the hydraulic system, continuously relieve the relief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

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

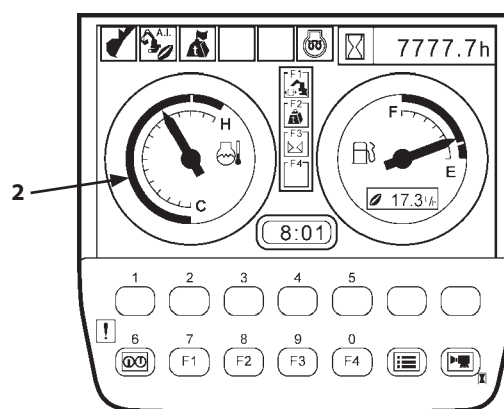
Do not operate the machine until the needle of coolant temperature gauge (2) starts swinging.

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

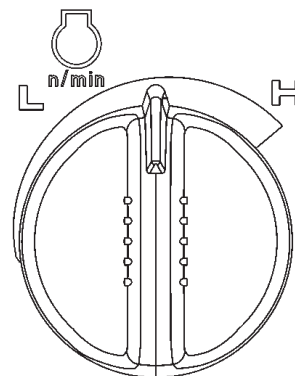
 **NOTE:** During cold weather season, the warm-up operation system automatically operates so that the engine speed increases for a moment even though engine control dial (1) is in the slow idle position.



M1P1-01-068



M1U1-01-004



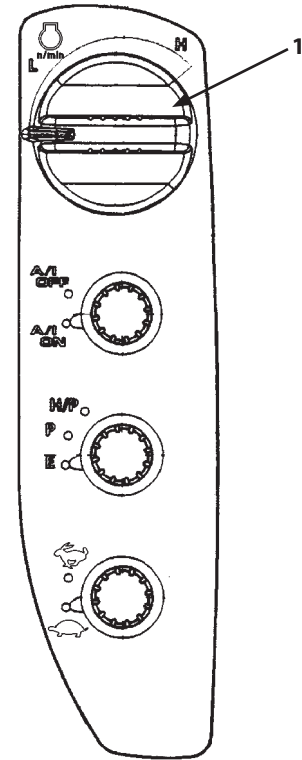
M1P1-05-003

OPERATING THE MACHINE

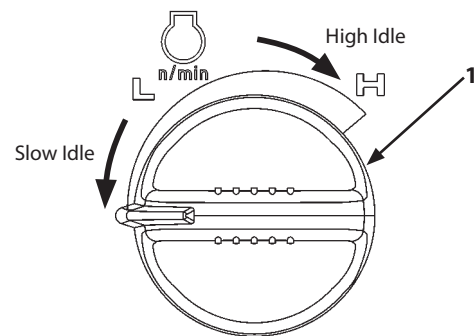
ENGINE SPEED CONTROL

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

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



M1U1-05-013



M1P1-01-068

OPERATING THE MACHINE

AUTO-IDLE

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

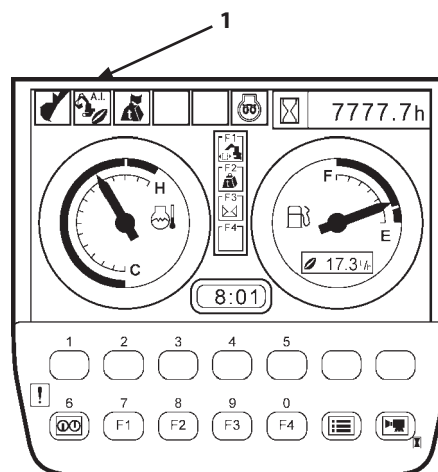
- IMPORTANT:**
- Always check if auto-idle indicator (1) is turned on or off before starting operation. If the indicator is on, the auto-idle function will be activated.
 - Always be aware of engine control dial (2) setting when auto-idle switch (3) turned to the A/I ON position. If the engine speed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

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

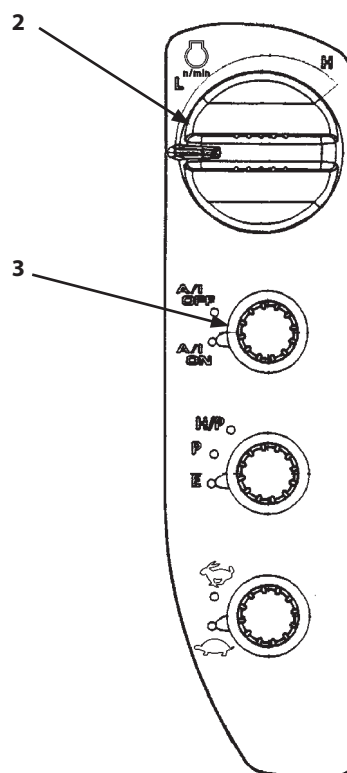
Note that auto-idle function can be turned on or off only when the key switch is in ON position. Always check if the auto-idle function is turned on or off with auto-idle indicator (1).

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

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



M1U1-01-004



M1U1-05-013

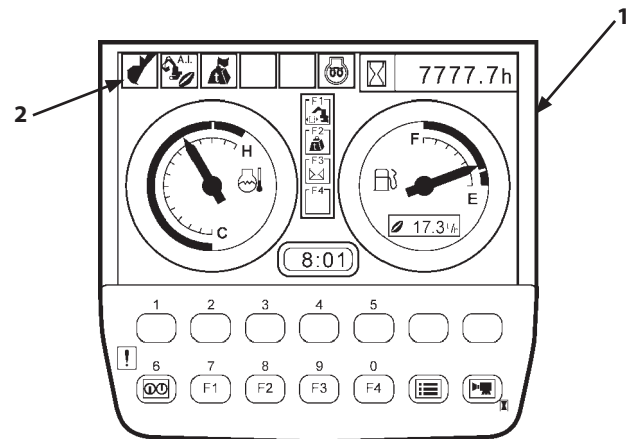
OPERATING THE MACHINE

WORK MODE

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

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

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



M1U1-01-004

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

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

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

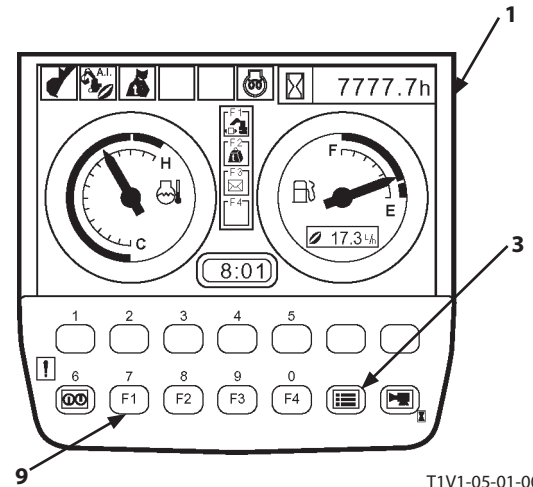
OPERATING THE MACHINE

WORK MODE SELECT

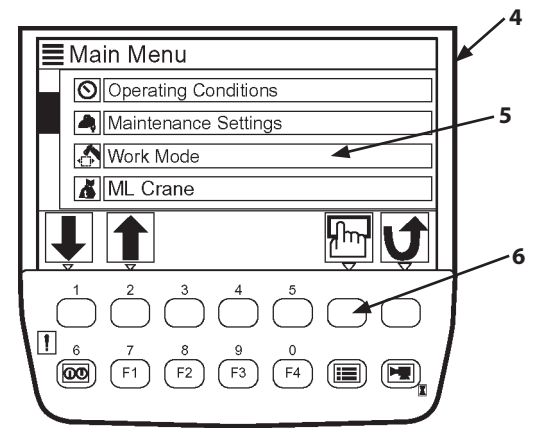
Press menu key (3) on basic screen (1) to display main menu screen (4). Select work mode (5) by operating $\downarrow \uparrow$ key on menu screen (4). Then, press determination key (6). Select the work mode matching the work to be done by pressing bottom key (8) on work mode selection screen (7). Then,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

Selecting Work Mode By Pressing Key F1

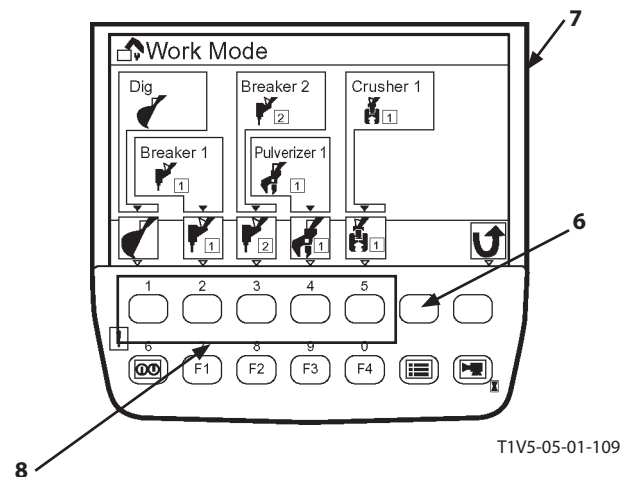
Press Key F1 (9) on basic screen (1). Then, work mode selection screen (7) is displayed. Set the work mode by following procedure mentioned above.



T1V1-05-01-008



T1V5-05-01-121



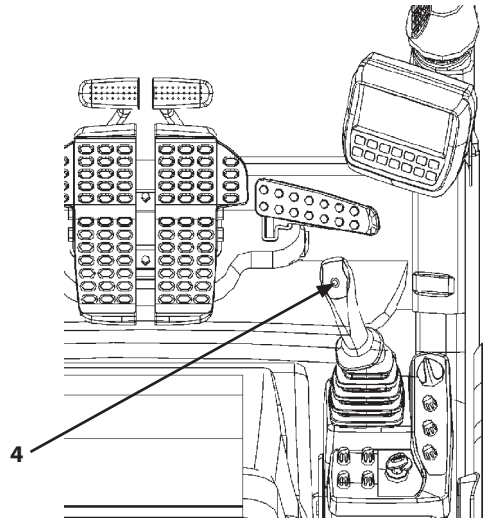
T1V5-05-01-109

OPERATING THE MACHINE

POWER BOOST (ZX180-3, 200-3, 270-3, 330-3 Class)

Power boost switch (4) is used to gain maximum digging power, and 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.



M1J1-01-024

OPERATING THE MACHINE

POWER MODE

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

- E (Economy) Mode

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

- P (Power) Mode

Operate the machine in this mode when performing normal work.

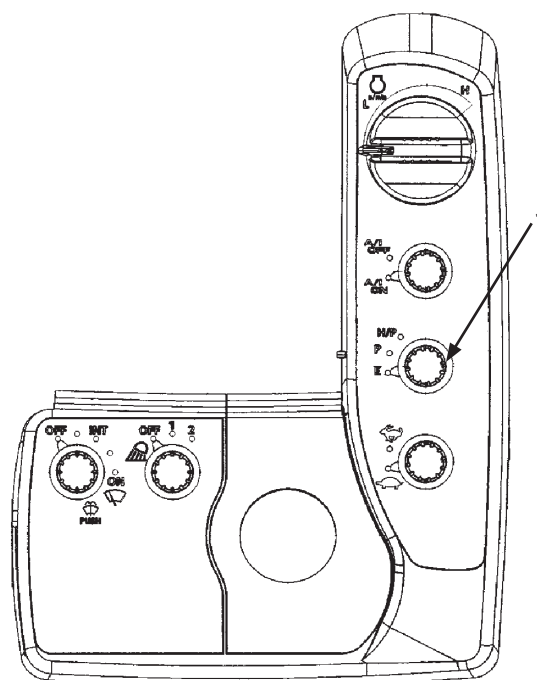
- H/P (High Power) Mode

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

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

The H/P mode is activated and the engine speed is increased when the boom raise or the arm rolled-in operation is made with the engine fast idle speed set at faster than approx. 1650 min^{-1} . In case of ZX180-3 class, it is faster than approx. 1850 min^{-1} .

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



M1U1-01-123

OPERATING THE MACHINE

PRECAUTIONS FOR EXCAVATION (K Model)

This model has been exclusively designed to applications for demolition works. Therefore, the points described below are remarkably different from those of the standard specifications. Do not allow the machine to engage in a bucket work severer than handling crushed material. Never apply the machine to heavy duty excavation works.

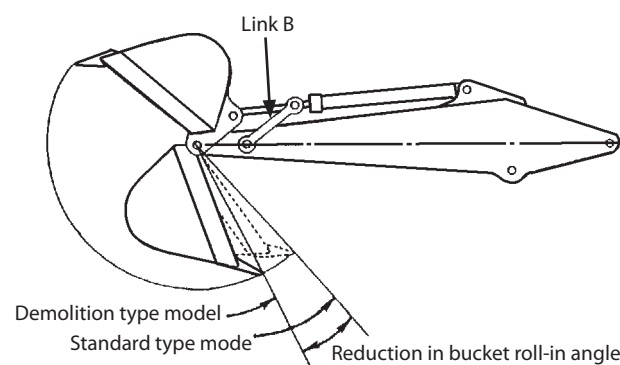
Increase in Counterweight

IMPORTANT: According to the provision that the machine is equipped with an attachment heavier than the standard bucket, the counterweight is increased as shown in the right table. Therefore, the machine stability in bucket works decreases. Avoid applying this machine to excavation works. In addition, avoid quick operation of the front attachment such as dropping the front attachment at fast speed, possibly resulting in damage to the frame.

Model	Increased weight (kg)
ZX130K-3	600
ZX210K-3, 210LCK-3	1000
ZX250K-3, 250LCK-3	1100
ZX350K-3 , 350LCK-3	1400

Change in Specifications of Bucket Cylinder and Link B

Overall length of a breaker and/or crusher to be attached to this machine is longer than the standard bucket. Accordingly, the roll-in operation angle of them is reduced than the standard machine to prevent the breaker/crusher from coming in contact with the front attachment structures, possibly causing damage to the front attachment structures. As mentioned above. When a bucket is operated on this machine, the roll-in operation angle of the bucket is reduced. Therefore, the soil volume loaded in the bucket decrease. Thereby, this machine is inadequate to use as an excavator.



M104-05-051

Precautions to be Taken When Using the Machine as an Excavator

Modify the machine in the following points when exclusively using this machine as an excavator. Consult with your nearest Hitachi dealer for the detailed information.

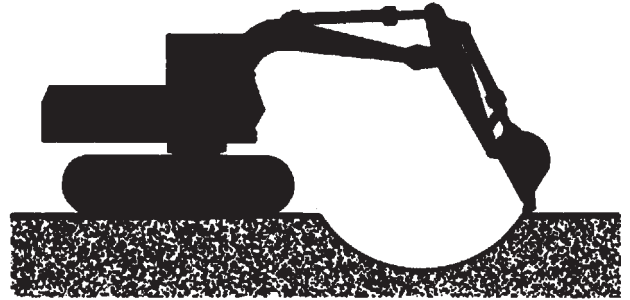
- Replace the counterweight with one for the standard specification machine.
- Replace link B with one for the standard specification machine.
- In case the bypass pipe lines are mounted on the arm, remove the bypass pipe lines.

Model	Reduction in bucket roll-in angle
ZX130K-3	7 °
ZX210K-3, 210LCK-3, 250K-3, 250LCK-3	13 °
ZX350K-3, 350LCK-3	15 °

OPERATING THE MACHINE

OPERATING BACKHOE

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



M107-05-037

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

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

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

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

GRADING OPERATION

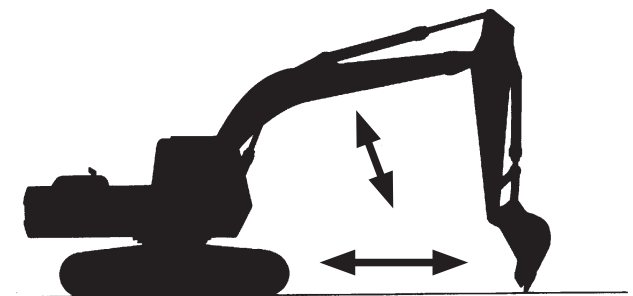
IMPORTANT: Do not pull or push dirt with the bucket when traveling.

Select grading mode when finishing work is required.

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

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

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



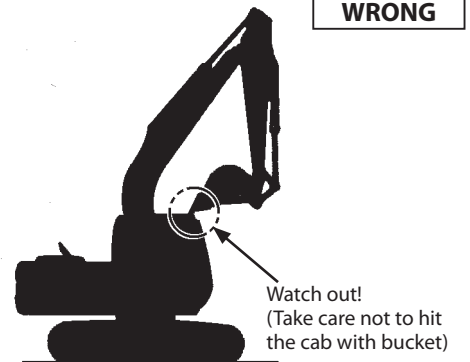
M104-05-017

OPERATING THE MACHINE

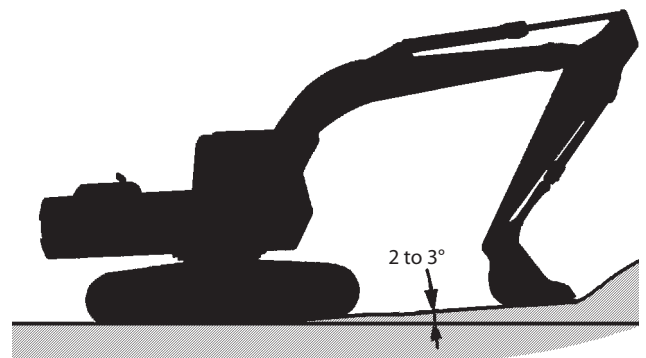
FACE SHOVEL OPERATION

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



M107-05-045

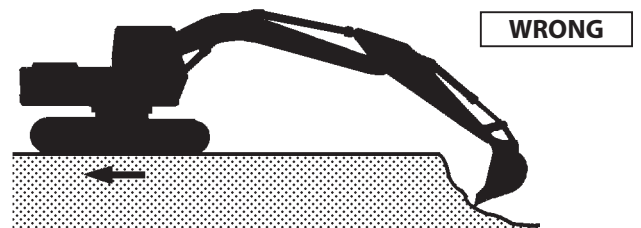


M104-05-020

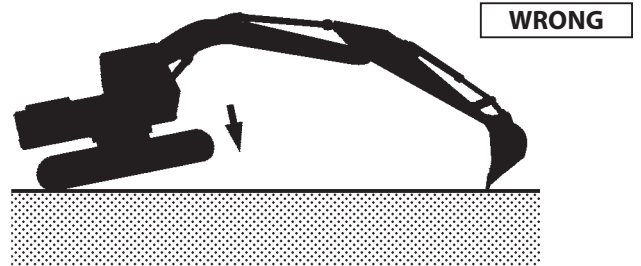
AVOID ABUSIVE OPERATION

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

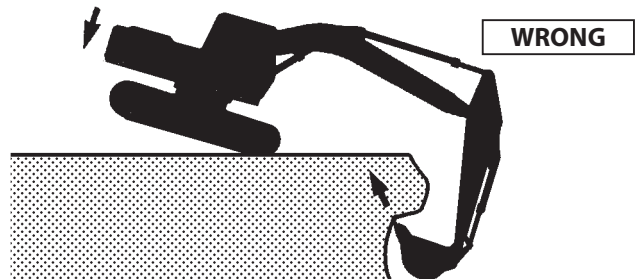
Do not raise rear of machine to use the machine's weight as additional digging force. Severe machine damage may result.



WRONG



WRONG



WRONG

M104-05-018

OPERATING THE MACHINE

OPERATING TIPS

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

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

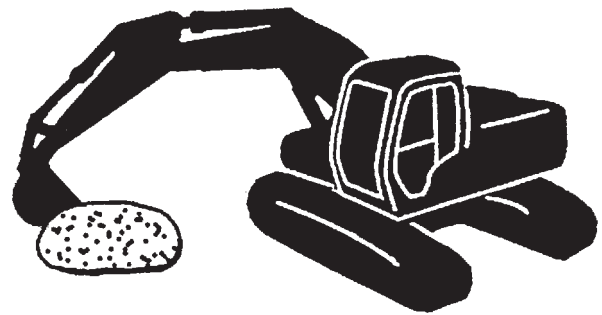
Adjust the length and depth of each cut to produce a full bucket with every pass. Full loads on every pass is more productive than a faster cycle with a partially filled bucket. Full load should be the first objective, followed by speed, to increase productivity.

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

Once the trench is open, ledge rock can be broken by pulling the bucket up under the layers. The top layers are pulled out first, with one or two layers being lifted at a time. Do not side load the bucket. For example, do not swing the bucket to level material or do not strike objects from the side with the bucket.



M104-05-019



M161-05-006

SELECT CORRECT TRACK SHOES

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

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

Track shoe bolts should be checked periodically for tightness.

OPERATING THE MACHINE

HYDRAULIC BREAKER AND HYDRAULIC CRUSHER

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

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

IMPORTANT: Precautions for connecting breaker or crusher piping.

- **Do not allow impurities to enter into the system when switching the breaker or the crusher with the bucket.**
- **When the breaker or crusher is not used, apply the cover to the pipe opening on the arm top and install the plug into the hose end of the breaker or the crusher to prevent impurities from entering the system.**
Be sure to provide spare covers and plugs in the tool box so that they will be available when needed.
- **After connecting, check the connecting seal fitting for oil leakage, and pipe clamp bolts for looseness.**

OPERATING THE MACHINE

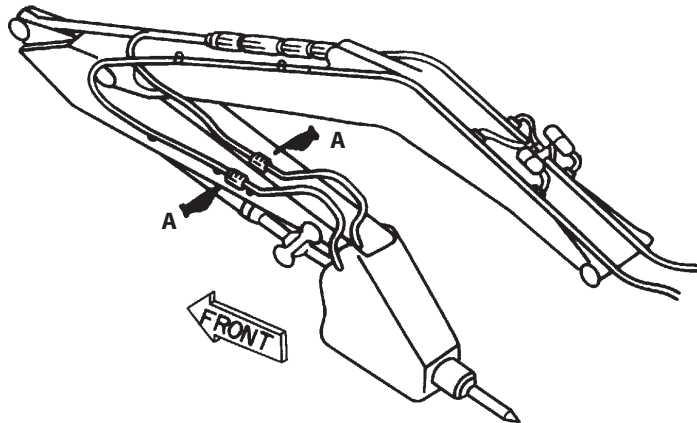
PIPING FOR BREAKER AND CRUSHER

K Model

Std. Model, L Model (Optional)

ZX120-3 Class

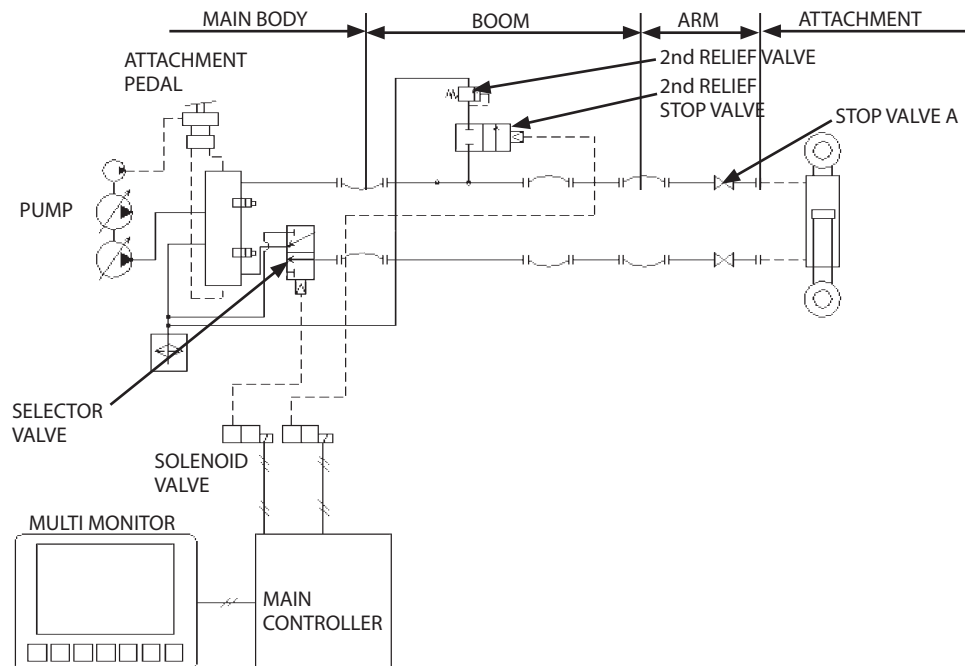
Operational procedures for stop valves and selector valve.



A Stop Valves	Close
A Stop Valves	Open

Stop Valves A
Close : When not using attachment or is detached.
Open : When using attachment

M1U1-05-007



M1U1-05-012

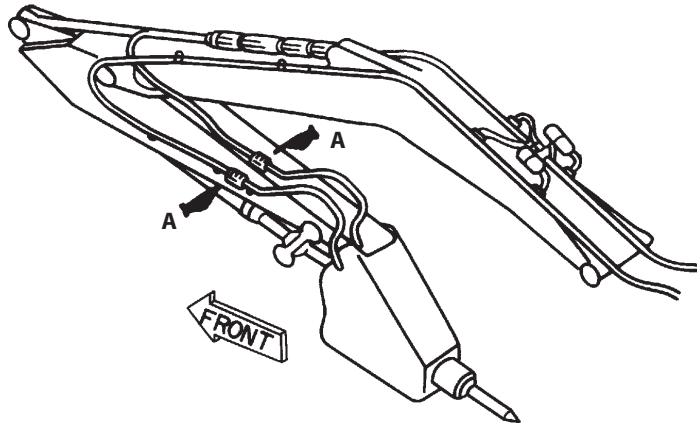
OPERATING THE MACHINE

K Model

Std. Model, L Model (Optional)

ZX180-3, 200-3, 270-3, 330-3 Class

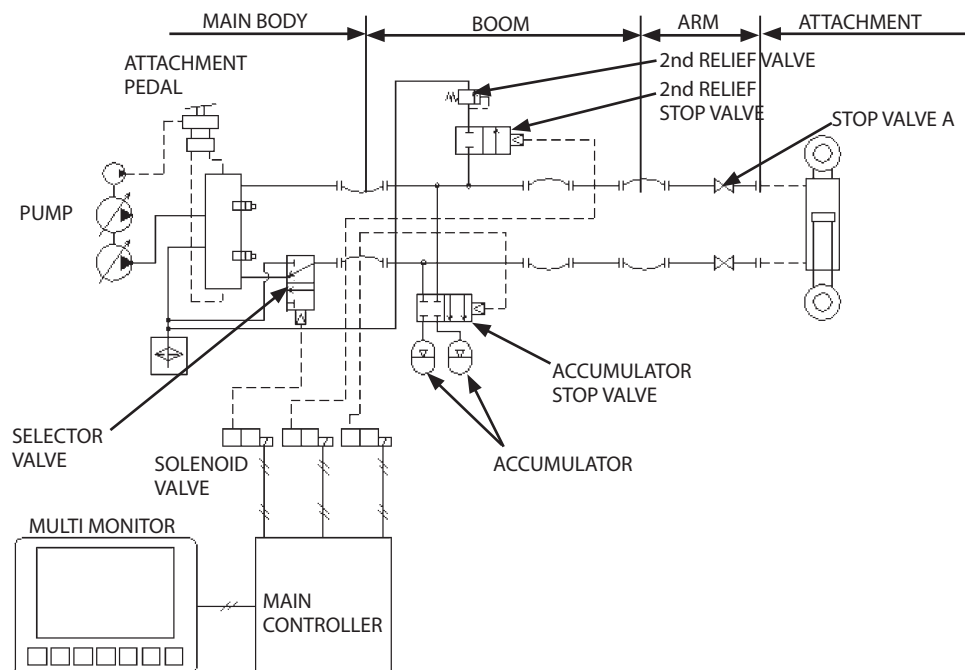
Operational procedures for stop valves and selector valve.



A Stop Valves	Close
A Stop Valves	Open

M1U1-05-007

Stop Valves A
Close : When not using attachment or is detached.
Open : When using attachment



M1U1-05-005

OPERATING THE MACHINE

SECONDARY RELIEF PRESSURE ADJUSTMENT

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

Pressure is set to A when shipped from HITACHI.

Model	Set Pressure A
ZX120-3, 180-3, 200-3 Class	17.6 MPa (180 kgf/cm ²)
ZX270-3, 330-3 Class	19.6 MPa (200 kgf/cm ²)

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

Adjust the pressure as follows :

1. Attach the pressure gauge to the pressure gauge port.
2. Loosen the lock nut, then gradually turn the pressure-adjust screw clockwise to increase the pressure, or counterclockwise to reduce the pressure.
One turn of the screw changes about 4.9 MPa (50 kgf/cm²) in pressure.
3. After adjusting the pressure, make sure to tighten the lock nut.

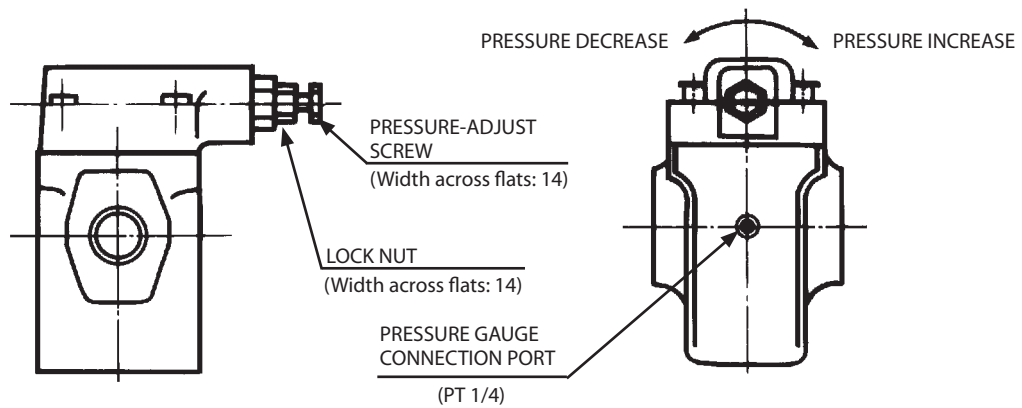
OPERATING THE MACHINE

Pressure Measurement

There are three points to measure the pressure; at the relief valve, at the arm tip attachment hose and by Dr.ZX.

Measurement at the relief valve:

1. Install a pressure gauge to the pressure gauge connection port shown below.
2. Close the stop valve located at the arm tip. Increase the hydraulic oil pressure in the hydraulic line by operating the attachment pedal. Refer to the separate table described in the "ATTACHMENT" group for the set-pressure value.



M107-05-005

Measurement at the arm tip attachment hose:

1. Disconnect the attachment connection hose and connect a pressure gauge.
2. Refer to the separate table described in the "ATTACHMENT" group for the set-pressure value.

Measurement by Dr.ZX:

(Consult with your nearest Hitachi dealer.)

Set the pressure value equivalent to the higher set-pressure value shown in the separate table described in the "ATTACHMENT" group by 1 to 1.5 MPa (10 to 15 kgf/cm²).

OPERATING THE MACHINE

PRECAUTIONS FOR BREAKER OPERATION

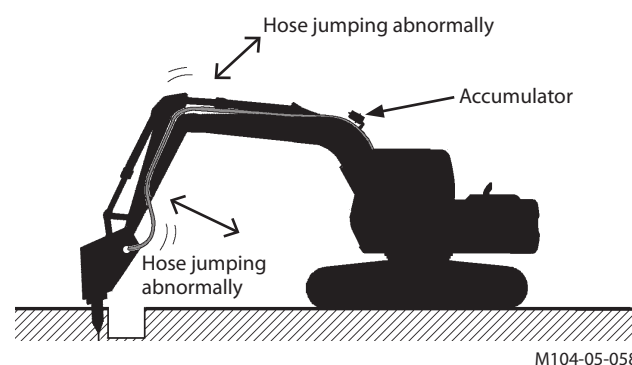
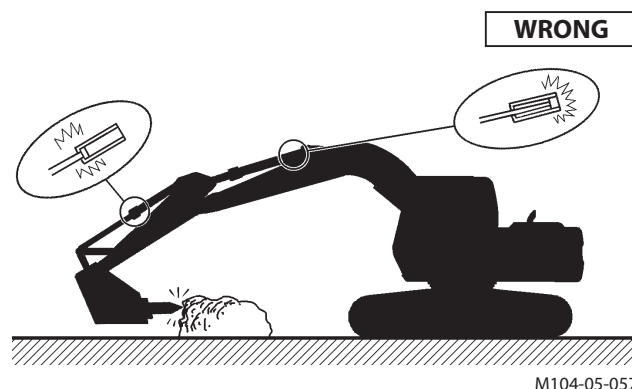
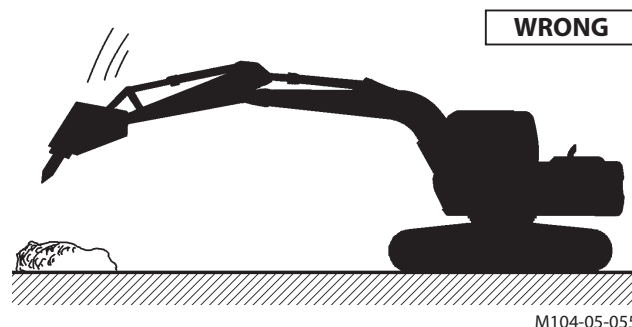
! WARNING: Machine stability is reduced as the breaker is much heavier than the bucket. When using a breaker, the machine is more apt to tip over. Also, flying objects may hit the cab or other part of the machine. Observe the following precautions and take any other precautions necessary to prevent accidents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

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

- Do not use the breaker and/or the swing function to move objects. Damage to the boom, arm, and/or breaker may result.

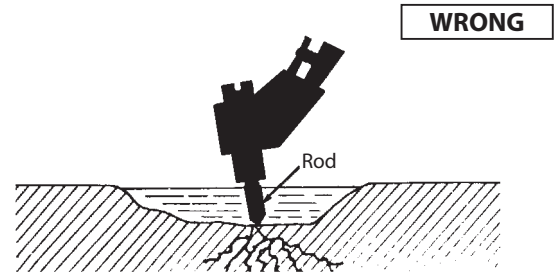
- To prevent cylinder/machine damage, do not operate the breaker with the hydraulic cylinder rod fully retracted or fully extended.

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



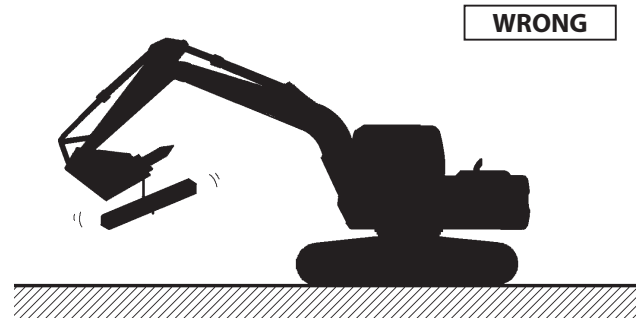
OPERATING THE MACHINE

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



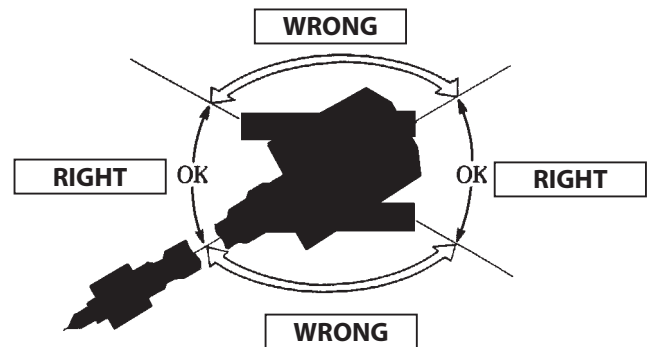
M104-05-059

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



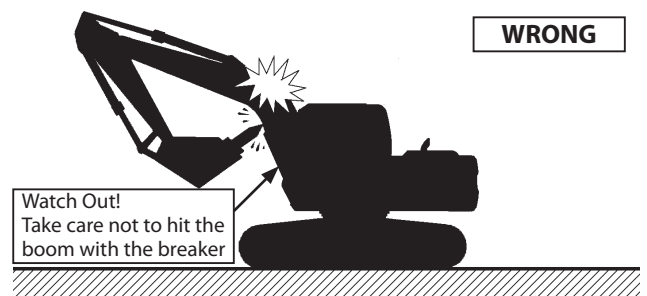
M104-05-060

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



M104-05-061

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



M104-05-062

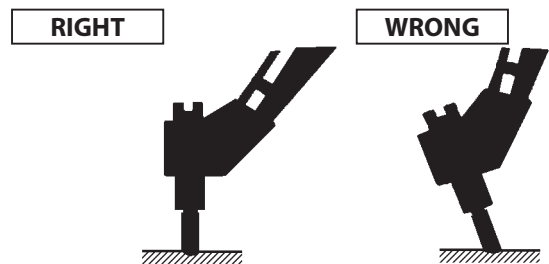
OPERATING THE MACHINE

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



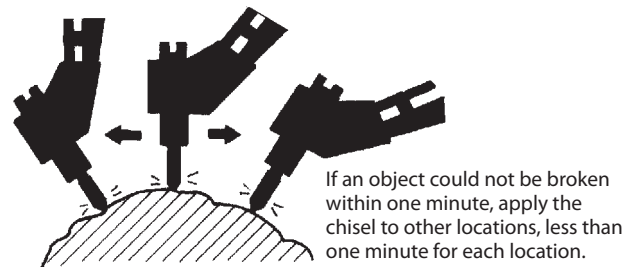
M147-05-013

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



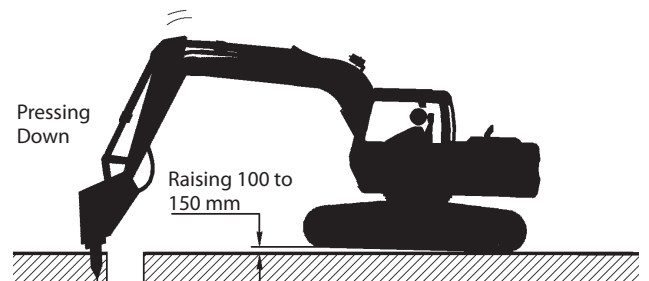
M147-05-014

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



M147-05-015

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



M147-05-016

OPERATING THE MACHINE

BREAKER MAINTENANCE

Change Hydraulic Oil and Replace Hydraulic Oil Tank Filter

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

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

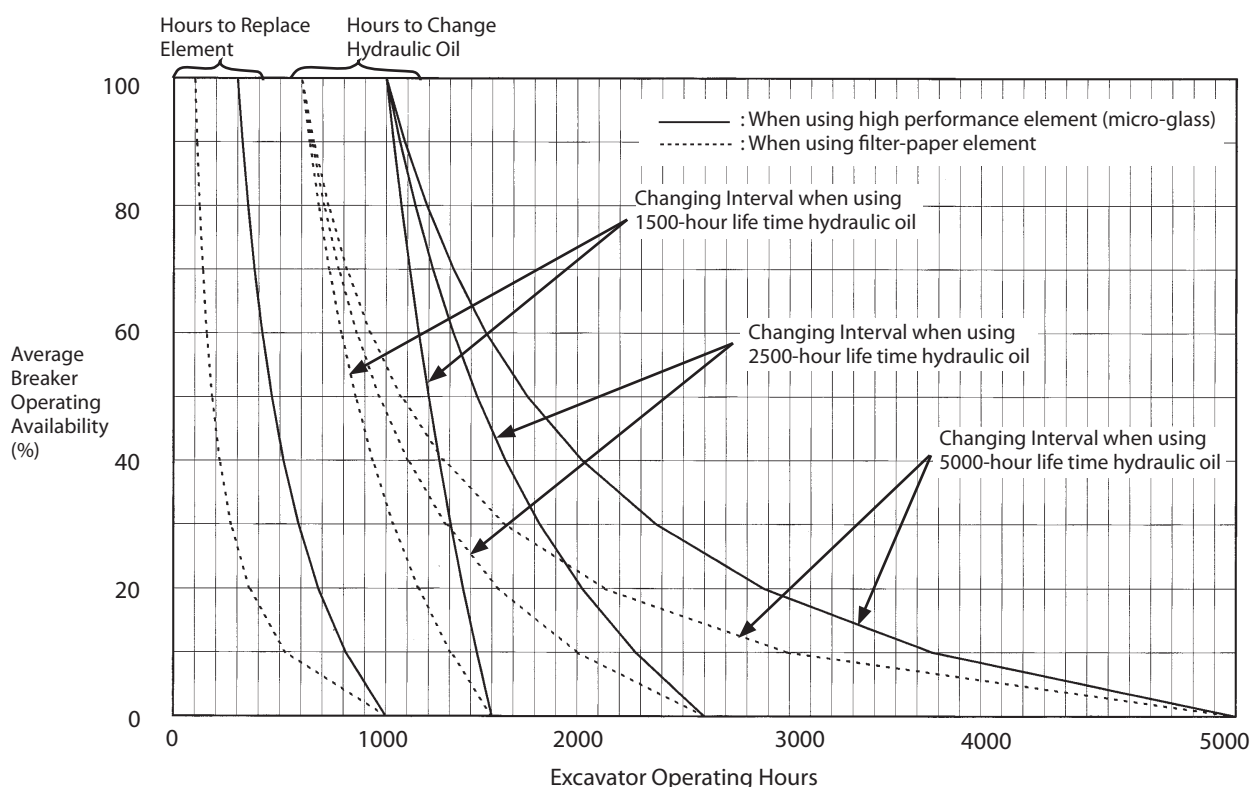
Changing intervals (Hours)

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

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

** : Use the high performance element (micro-glass) on excavators engaged in demolition and logging work (K Model, L Model).

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



M1U1-05-006

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

NOTE: K Model and L Model are equipped with a full-flow filter restriction indicator. If a filter-paper element is used, this indicator does not operate. (Refer to the Hydraulic System in the Maintenance section.)

OPERATING THE MACHINE

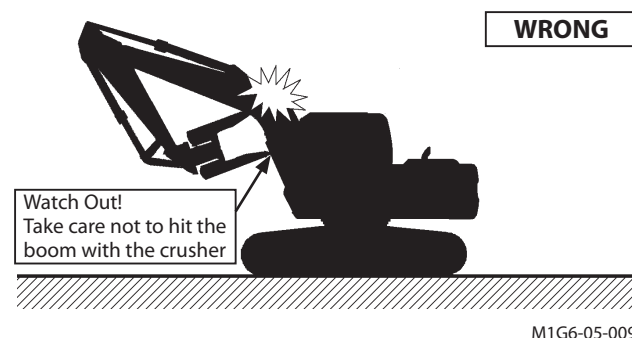
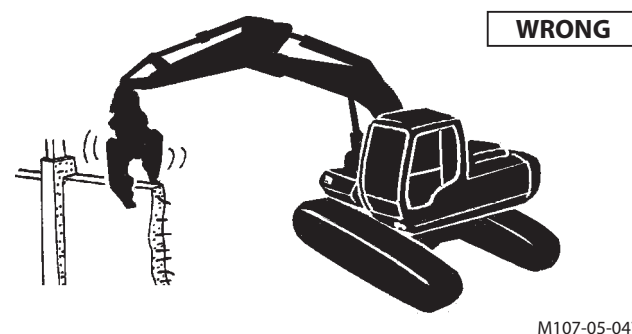
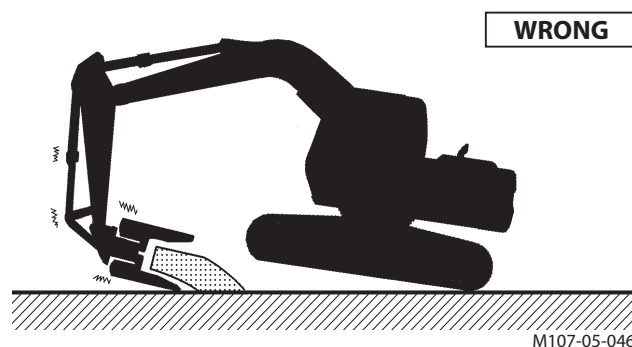
PRECAUTIONS FOR CRUSHER OPERATION

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

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

- Do not allow the machine's weight to be supported by the crusher or bucket cylinder with the bucket cylinder fully extended or retracted. Doing so may damage the front attachment. In particular, avoid doing so with the bucket cylinder fully extended, as the front attachment will be easily damaged.
Take care to prevent this from happening when dismantling foundation structures using the crusher.
- Using the front attachment, 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 fore or rear, parallel with the tracks. Otherwise, tipping over may occur.

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



OPERATING THE MACHINE

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

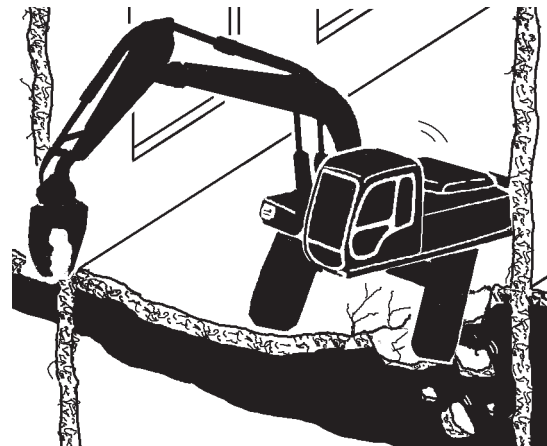
WRONG



M107-05-048

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

WRONG



M107-05-049

OPERATING THE MACHINE

ATTACHMENT

Allowable Weight Limits of Installed Attachment

WARNING:

- When an attachment other than the standard bucket is installed on the machine, the machine stability will be different. If a heavy attachment is used, not only will controllability be affected but also machine stability will be reduced, possibly causing safety hazard.
- Before installing attachments such as hydraulic breaker, crusher (concrete crusher), or pulverizer, take machine controllability into account when selecting the weight of the attachment by referring to the table below.
- 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 affixed in the cab 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
Demolition Type	ZX130K-3	Std.	1150 (2540)	1300 (2870)	1400 (3090)	1650 (3640)
	ZX210K-3	Std.	1800 (3690)	2000 (4400)	2150 (4730)	2500 (5500)
	ZX210LCK-3	Std.	2000 (4400)	2200 (4840)	2400 (5280)	2800 (6160)
	ZX250K-3	Std.	2200 (4840)	2450 (5390)	2650 (5830)	3100 (6820)
	ZX250LCK-3	Std.	2450 (5390)	2700 (5940)	2950 (6500)	3450 (7590)
	ZX350K-3	Std.	2950 (6490)	3250 (7150)	3500 (7720)	4100 (9020)
	ZX350LCK-3	Std.	3000 (6600)	3300 (7260)	3600 (7920)	4200 (9240)
Standard Type	ZX110-3	Std.	1000 (2200)	1100 (2430)	1200 (2650)	1400 (3090)
	ZX110M-3	Std.	1250 (2760)	1400 (3090)	1500 (3310)	1750 (3860)
	ZX120-3	Std.	1000 (2200)	1150 (2540)	1250 (2760)	1450 (3200)
	ZX160LC-3	Std.	1250 (2750)	1350 (2970)	1500 (3300)	1750 (3850)
	ZX180LC-3	Std.	1400 (3080)	1550 (3410)	1700 (3740)	2000 (4400)
	ZX180LCN-3	Std.	1300 (2860)	1450 (3190)	1600 (3520)	1850 (4070)
	ZX200-3	Std.	1550 (3410)	1750 (3850)	1900 (4180)	2200 (4840)
	ZX200LC-3	Std.	1750 (3850)	1950 (4290)	2100 (4620)	2450 (5390)
	ZX210H-3	Std.	1650 (3630)	1800 (3960)	2000 (4400)	2300 (5060)
	ZX210LCH-3	Std.	1850 (4070)	2000 (4400)	2200 (4840)	2600 (5720)
	ZX240-3	Std.	1950 (4290)	2150 (4730)	2350 (5170)	2700 (5940)
	ZX240LC-3	Std.	2150 (4730)	2400 (5280)	2600 (5720)	3050 (6710)
	ZX250H-3	Std.	2150 (4730)	2350 (5170)	2550 (5610)	3000 (6600)
	ZX250LCH-3	Std.	2350 (5170)	2600 (5720)	2850 (6270)	3300 (7260)
	ZX270-3	Std.	2350 (5170)	2600 (5720)	2850 (6270)	3300 (7260)
	ZX270LC-3	Std.	2400 (5280)	2650 (5830)	2900 (6380)	3400 (7480)
	ZX330-3	Std.	2600 (5720)	2850 (6270)	3100 (6820)	3600 (7920)
	ZX330LC-3	Std.	2650 (5830)	2900 (6380)	3150 (6930)	3700 (8140)
	ZX350H-3	Std.	2750 (6050)	3000 (6600)	3250 (7150)	3800 (8360)
	ZX350LCH-3	Std.	2800 (6160)	3050 (6710)	3350 (7370)	3900 (8580)
Logging Type	ZX130L-3	Std.	1000 (2200)	1150 (2540)	1250 (2760)	1450 (3090)

OPERATING THE MACHINE

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

OPERATING THE MACHINE

Attachments

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

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

Breaker (ZX120-3 Class)

Maker	HITACHI		NPK	Okada	Furukawa	Mitsubishi	Toukuu	Matsuda	MON-TABERT	STK	Ranma	GERMANY KRUPP
Model	HSB29	HSB29S	H-7X	OUB308	HB10G	MKB900	TNB7E	THBB801	BRH625	SIB215	E-64	HM560CS
Weight kg (lb)	820 (1810)	920 (2030)	940 (2070)	810 (1790)	790 (1740)	870 (1920)	910 (2010)	740 (1630)	1000 (2200)	900 (1980)	1000 (2200)	870 (1920)
Flow Rate (L/min)	60~120	60~120	90~140	90~120	70~90	65~110	70~140	60~110	80~130	80~130	70~130	50~110
Operating Pressure MPa (kgf/cm ²)	12.3~14.7 (125~150)	12.3~14.7 (125~150)	11.8~13.7 (120~140)	11.8~15.7 (120~160)	13.7~15.7 (140~160)	13.7~16.7 (140~170)	11.8~16.7 (120~170)	13.7~17.6 (140~180)	~113 (~115)	13.7~15.7 (140~160)	13.2~14.2 (135~145)	11.8~16.7 (120~170)
Secondary Relief Valve Set Pressure MPa (kgf/cm ²)	21.6 (220)	21.6 (220)	—	17.6 (180)	20.6 (210)	17.6 (180)	17.6 (180)	19.6 (200)	11.8 (120)	17.6 (180)	15.7 (160)	16.7 (170)

Breaker (ZX200-3 Class)

Maker	HITACHI		NPK	Okada	Furukawa	Mitsubishi	Toukuu	Matsuda	MON-TABERT	STK	Ranma	GERMANY KRUPP
Model	HSB66	HSB66S	H-10XB	OUB312B	F22	MKB1500V	TNB-14E	THBB-1401	BRH501	SIB312	E-66	HM960CS
Weight kg (lb)	1510 (3330)	1520 (3350)	1450 (3200)	1500 (3310)	1550 (3420)	1530 (3370)	1550 (3420)	1350 (3000)	1350 (2980)	1310	1300 (2870)	1500 (3310)
Flow Rate (L/min)	110~160	110~160	160~200	140~180	145~180	130~175	130~170	130~200	110~140	140~180	100~160	130~170
Operating Pressure MPa (kgf/cm ²)	13.2~14.2 (135~145)	13.2~14.2 (135~145)	11.7~13.7 (120~140)	13.7~16.7 (140~170)	15.7~17.7 (160~180)	14.7~17.7 (150~180)	12.7~16.7 (130~170)	15.7~17.7 (160~180)	7.8~10.8 (80~110)	14.7~16.7 (150~170)	13.2~14.2 (135~145)	11.8~13.7 (120~140)
Secondary Relief Valve Set Pressure MPa (kgf/cm ²)	21.6 (220)	21.6 (220)	—	17.6 (180)	17.6 (180)	17.6 (180)	17.6 (180)	17.6 (180)	10.8 (110)	17.6 (180)	14.2 (145)	13.7 (140)

Breaker (ZX270-3 Class)

Maker	HITACHI		NPK	Okada	Furukawa	Mitsubishi	Toukuu	Matsuda	MON-TABERT	STK	Ranma	GERMANY KRUPP
Model	HSB68	HSB68S	E-216	OUB316	F27	MKB1800V	TNB-160	THBB1650	BRH100	SIB316	E-68	HM960CS
Weight kg (lb)	1930 (4250)	1940 (4280)	1960 (4320)	1900 (4190)	1845 (4070)	1800 (3970)	1707 (3760)	1950 (4300)	1840 (4060)	1800 (3970)	1700 (3750)	—
Flow Rate (L/min)	120~200	120~200	170~220	145~185	155~190	135~180	150~200	120~170	110~180	145~185	120~200	130~170
Operating Pressure MPa (kgf/cm ²)	13.2~14.2 (135~145)	13.2~14.2 (135~145)	14.7~16.7 (150~170)	13.7~16.7 (140~170)	15.7~17.7 (160~180)	14.7~17.7 (150~180)	12.7~16.7 (130~170)	9.8~12.7 (100~130)	~13.7 (~140)	13.7~16.7 (140~170)	13.2~14.2 (135~145)	11.7~13.7 (120~140)
Secondary Relief Valve Set Pressure MPa (kgf/cm ²)	21.6 (220)	21.6 (220)	—	17.6 (180)	17.6 (180)	17.6 (180)	17.6 (180)	12.7 (130)	13.7 (140)	17.6 (180)	14.2 (145)	13.7 (170)

Breaker (ZX330-3 Class)

Maker	HITACHI	NPK	Okada	Furukawa	Mitsubishi	Toukuu	Matsuda	MON-TABERT	STK	Ranma	GERMANY KRUPP
Model	HSB80S	E-220	OUB318	F35	MKB2500V	TNB-220	THBB-2000	BRV43	SIB318	S-83	HM150CS
Weight kg (lb)	2430 (5360)	2500 (5510)	2400 (5290)	2345 (5170)	2400 (5290)	2403 (5300)	2330 (5140)	2480 (5470)	2100 (4630)	2200 (4850)	2100 (4630)
Flow Rate (L/min)	160~230	200~250	160~210	175~220	140~210	180~220	150~180	180~250	160~210	160~230	120~180
Operating Pressure MPa (kgf/cm ²)	13.7~14.7 (140~150)	14.7~16.7 (150~170)	13.7~16.7 (140~170)	15.7~17.7 (160~180)	14.7~17.7 (150~180)	12.7~16.7 (130~170)	14.7~17.7 (150~180)	15.2 (155)	13.7~16.7 (140~170)	13.7~ (140~)	15.7~17.6 (160~180)
Secondary Relief Valve Set Pressure MPa (kgf/cm ²)	21.6 (220)	—	17.6 (180)	17.6 (180)	17.6 (180)	17.6 (180)	17.6 (180)	15.2 (155)	17.6 (180)	14.2 (145)	17.6 (180)

OPERATING THE MACHINE

Crusher (ZX120-3 Class)

Maker	SANGO JYUKI	NPK*	Sakato*	Oosumi*	STK*
Model	TS700RCD	S-15X	SPAC70R-3	MR800	CX750
Weight kg (lb)	1200 (2650)	1410 (3110)	1300 (2870)	1400 (3090)	1250 (2760)
Overall Length mm (ft-in)	1980 (6'6")	2230 (7'4")	1620 (5'4")	1900 (6'3")	2000 (6'7")
Rated Pressure MPa (kgf/cm ²)	24.5 (250)	20.6 (210)	27.4 (280)	~31.4 (~320)	27.4 (280)
Maximum Opening Width mm (ft-in)	700 (2'4")	750 (2'6")	750 (2'6")	800 (2'8")	750 (2'6")
Swing Method	Free	Free		Free	Free

Crusher (ZX200-3 Class)

Maker	HITACHI		SANGO JYUKI	NPK*	Sakato*	Oosumi*		STK*
Model	HSC100	HSC160	TS850RCD	S-22XA	SDS250 RC	MR1000L	MR1100	DX-900
Weight kg (lb)	2430 (5360)	2300 (5070)	2000 (4410)	2010 (4430)	2390 (5270)	1900 (4190)	2350 (5180)	2100 (4630)
Overall Length mm (ft-in)	2340 (7'8")	2600 (8'6")	2400 (7'11")	2326 (7'8")	2425 (7'11")	2200 (7'3")	2250 (7'5")	2380 (7'10")
Rated Pressure MPa (kgf/cm ²)	27.9 (285)	27.9 (285)	27.5 (280)	24.5 (250)	31.4 (320)		27.5 (280)	
Maximum Opening Width mm (ft-in)	900 (2'11")	850 (2'9")	850 (2'9")	850 (2'9")	1050 (3'5")	1060 (3'6")	1060 (3'6")	900 (2'11")
Swing Method	Hydraulic	Hydraulic	Free	Free	Free	Free	Free	Free
Jaw Tip Crushing Force	kN (tf-f) 640 (65)		980 (100)	970 (99)	834 (85)			
Jaw Center Crushing Force	kN (tf-f) 980 (100)	1570 (160)	1570 (160)	1470 (150)		1240 (126)	1540 (157)	

Crusher (ZX270-3 Class)

Maker	HITACHI		NPK*	Oosumi*	STK
Model	HSC100	HSC160	S-26X	MR1300	CX-1100
Weight kg (lb)	2430 (5360)	2300 (5070)	2520 (5560)	3070 (6770)	2650 (5840)
Overall Length mm (ft-in)	2340 (7'8")	2600 (8'6")	2602 (8'6")	2800 (9'3")	2450 (8'0")
Rated Pressure MPa (kgf/cm ²)	27.9 (285)	27.9 (285)	24.5 (250)	27.5 (280)	27.5 (280)
Maximum Opening Width mm (ft-in)	900 (2'11")	850 (2'9")	1000 (3'3")	1300 (4'4")	1100 (3'7")
Swing Method	Hydraulic	Hydraulic	Free	Free	Free
Jaw Tip Crushing Force	kN (tf-f) 640 (65)		1080 (110)		
Jaw Center Crushing Force	kN (tf-f) 980 (100)	1570 (160)	1660 (169)	1540 (157)	

Crusher (ZX330-3 Class)

Maker	SANGO JYUKI	NPK*	Sakato*	Oosumi*	STK*
Model	1100RCD	S-35X	SDS350 RC	MR1500	DX-1500
Weight kg (lb)	2940 (6480)	3500 (7720)	3550 (7830)	4200 (9260)	3400 (7500)
Overall Length mm (ft-in)	2700 (8'8")	2824 (9'3")	3285 (10'9")	2950 (9'7")	2550 (8'4")
Rated Pressure MPa (kgf/cm ²)	27.5 (280)	27.5 (280)	31.4 (320)	31.4 (320)	
Maximum Opening Width mm (ft-in)	1500 (4'11")	1100 (3'7")	1300 (4'3")	1500 (5'0")	1300 (4'3")
Swing Method	Free	Free	Free	Free	Free
Jaw Tip Crushing Force	kN (tf-f) 1180 (120)	1230 (125)	981 (100)		
Jaw Center Crushing Force	kN (tf-f) 1780 (180)	1770 (180)		2080 (211)	

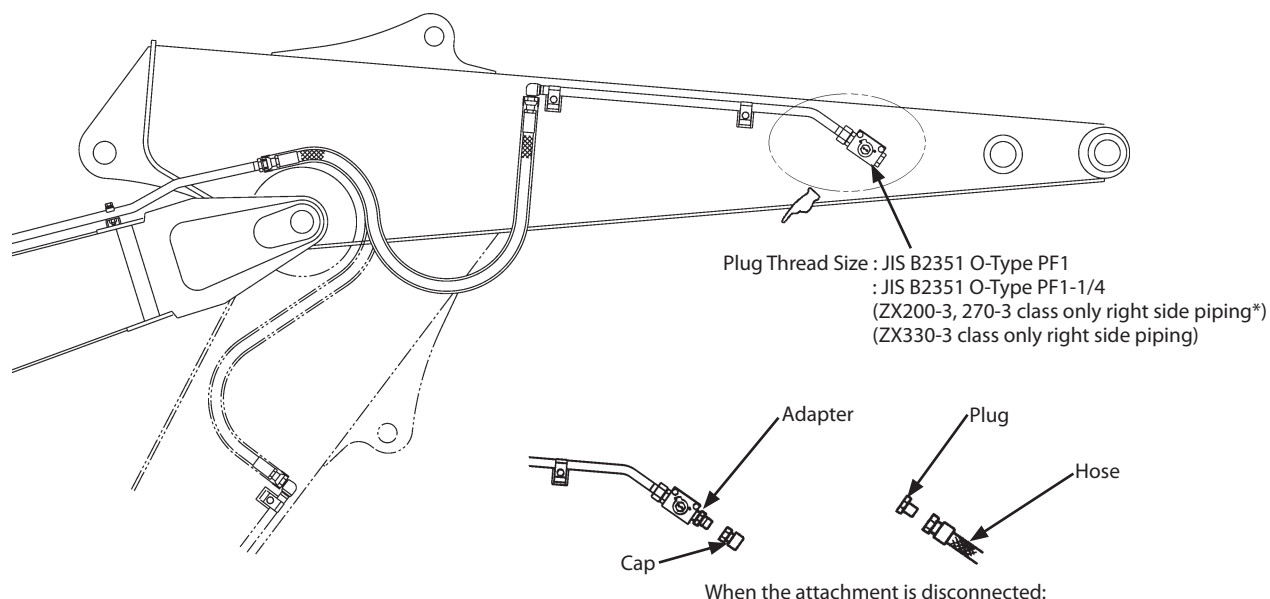
OPERATING THE MACHINE

ATTACHMENT CONNECTION PARTS

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

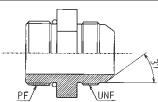
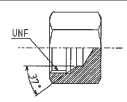
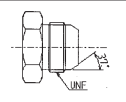
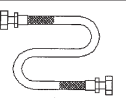
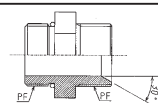
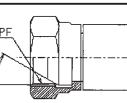
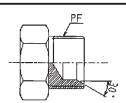
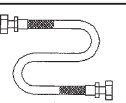
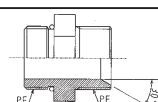
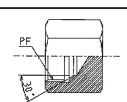
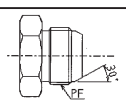
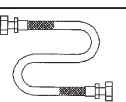
Adapter tightening torque:

PF1	210 N·m (21 kgf·m)
PF1-1/4	340 N·m (34 kgf·m)
(ZX200-3, 270-3 class only right side piping*)	
(ZX330-3 class only right side piping)	



M175-05-005

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

Maker	Adapter Size	Adapter	Cap	Plug	Hose
Form / Size	Male-Type PF-UNF				
ZX120-3 Class	PF1-1-1/16UN	4456399	4222711	4222264	
ZX180-3, 200-3, 270-3 Class ZX330-3 Class left side piping	PF1X1-5/16UN	4214444	4222712	4222265	
ZX200-3, 270-3 Class only right side piping* ZX330-3 Class only right side piping	PF1-1/4X1-5/16UN	4314094			
Form / Size	Female-Type PF-PF30°				
ZX120-3 Class	PF1-PF3/4	4129457	9718916	4222047	
ZX180-3, 200-3, 270-3 Class ZX330-3 Class left side piping	PF1XPF1	4042034	9718917	4168177	
ZX200-3, 270-3 Class only right side piping* ZX330-3 Class only right side piping	PF1-1/4XPF1	4317614			
Form / Size	Male-Type PF-PF30°				
ZX120-3 Class	PF1-PF3/4	4456120	4222715	4222044	
ZX180-3, 200-3, 270-3 Class ZX330-3 Class left side piping	PF1XPF1	4456118	4222716	4222045	
ZX200-3, 270-3 Class only right side piping* ZX330-3 Class only right side piping	PF1-1/4XPF1	4653961			

* If equipped

OPERATING THE MACHINE

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

--- If Headguard-Integrated Cab or Rainguard is Equipped

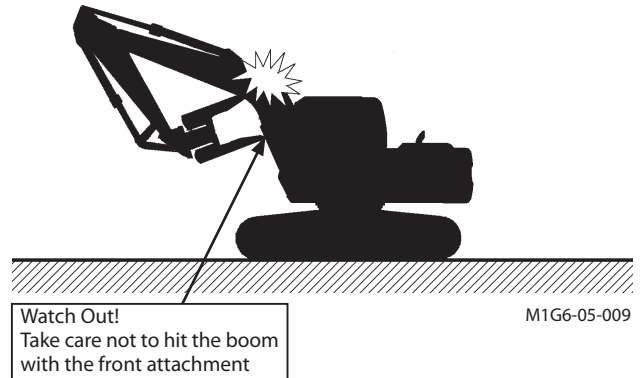
! **WARNING:** The bucket teeth will hit the headguard or rainguard if the bucket is rolled in with the arm fully rolled in, as illustrated. When performing combined operation of long arm roll-in/bucket roll-in or when rolling in the bucket with the arm fully retracted, be careful not to hit the headguard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



M107-05-072

WHEN INSTALLING AN ATTACHMENT LONGER THAN STANDARD BUCKET

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



M1G6-05-009

OPERATING THE MACHINE

SHACKLE HOLE USAGE

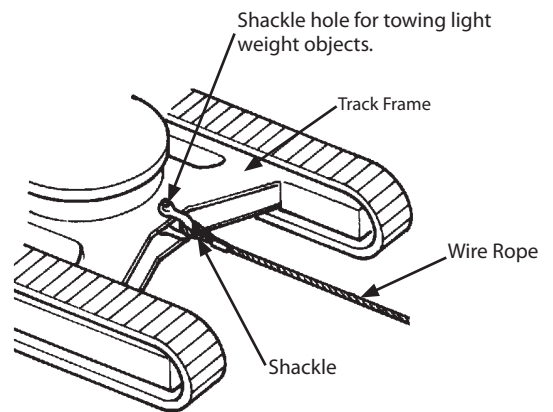
A shackle hole is provided on the track frame to tow light weight objects as specified below.

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

- The maximum drawbar pull.

Model	Maximum Drawbar Pull
ZX110-3	39200 N (4.0 tf)
ZX110M-3, 130L-3	53900 N (5.5 tf)
ZX120-3, 130K-3	44100 N (4.5 tf)
ZX180-3 Class	53900 N (5.5 tf)
ZX200-3 Class	73600 N (7.5 tf)
ZX270-3 Class (Except ZX270-3, 270LC-3)	83400 N (8.5 tf)
ZX270-3, 270-LC-3	98000 N (10.0 tf)
ZX330-3 Class	108000 N (11.0 tf)

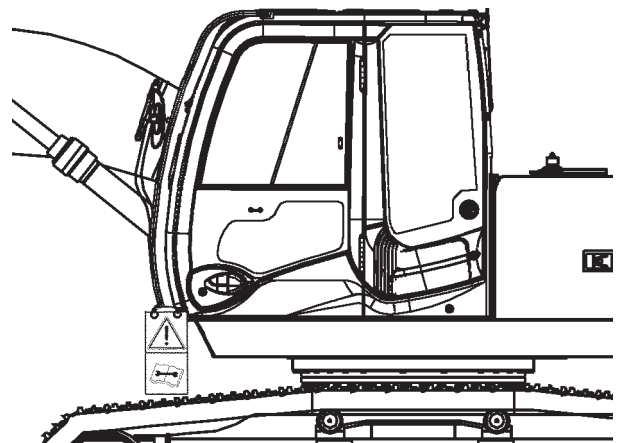
- Be sure to use a shackle.
- Keep the tow line horizontal, straight, and parallel to the tracks.
- Select the slow travel mode. Slowly drive the machine when towing.



M104-05-011

OVERNIGHT STORAGE INSTRUCTIONS

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



M1U1-05-003

OPERATING THE MACHINE

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

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

ZX120-3 class

If the engine abnormally stalls and cannot be restarted, lower the boom to the ground by following the emergency procedures described below.

1. Remove rubber caps (1) and (2) from the boom 1 section on the 4 spool control valve.
2. Turn lock nut (8) (with hexagonal width across flats: 17 mm) counterclockwise to remove with an offset box wrench or a spanner.
3. Turn screw (7) (with hexagonal hole width across flats: 4 mm) clockwise with a hexagon wrench until it comes to stop.
4. Turn lock nut (5) (with hexagonal width across flats: 17 mm) counterclockwise to slightly loosen with an offset wrench or a spanner.
5. While turning screw (6) (with hexagonal hole width across flats: 4 mm) clockwise with a hexagon wrench to adjust the boom lowering speed, lower the boom. Do not remove snap ring (3) and washer (4) at this time. In addition, do not turn screw (6) to such extent as washer (4) is deformed.

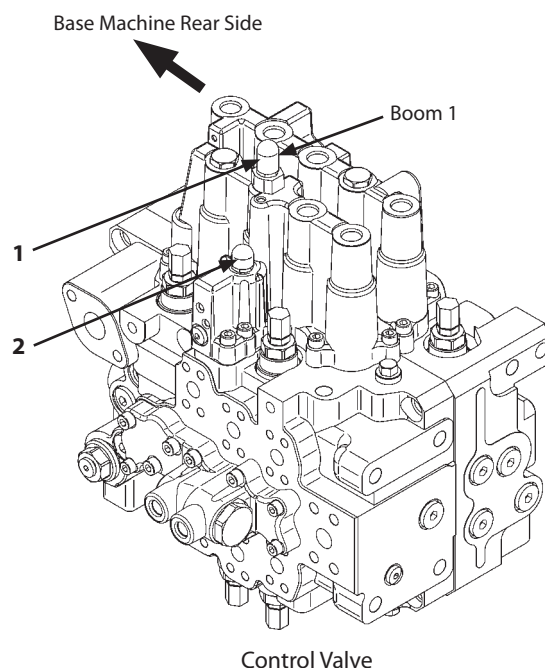
IMPORTANT: Unless lock nuts (5) and (8) are sufficiently tightened, oil leakage may increase. Be sure to completely tighten lock nuts (5) and (8) to the torque specified below.

6. After the boom is lowered to the ground, allow screws (6) and (7) to be fully loosened by turning them counterclockwise. Then, turn screw (7) one eighth of a turn clockwise and tighten lock nuts (5) and (8).

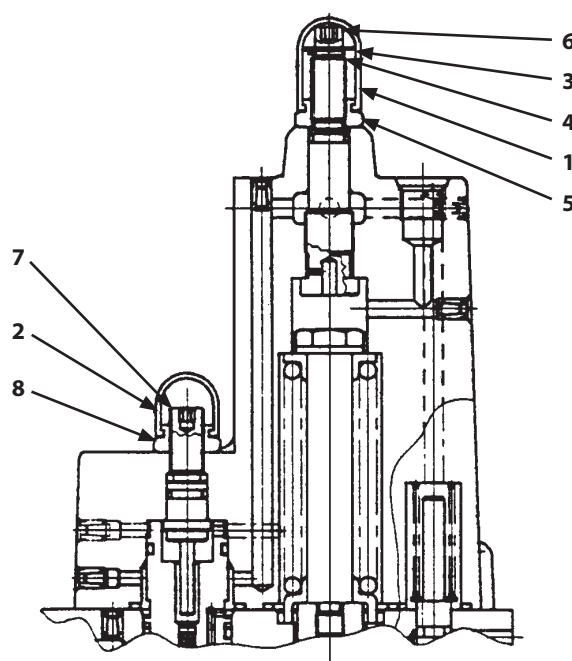
Tightening torque: 20 N·m (2 kgf·m)

7. Take care to correctly install rubber caps (1) and (2) in their respective original position.

NOTE: Conduct the work of screw (7) and screw (6) in order.



M175-05-001



M154-05-001

OPERATING THE MACHINE

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

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

ZX180-3, 200-3, 270-3, 330-3 class

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

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

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

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

Lock Nut (1)

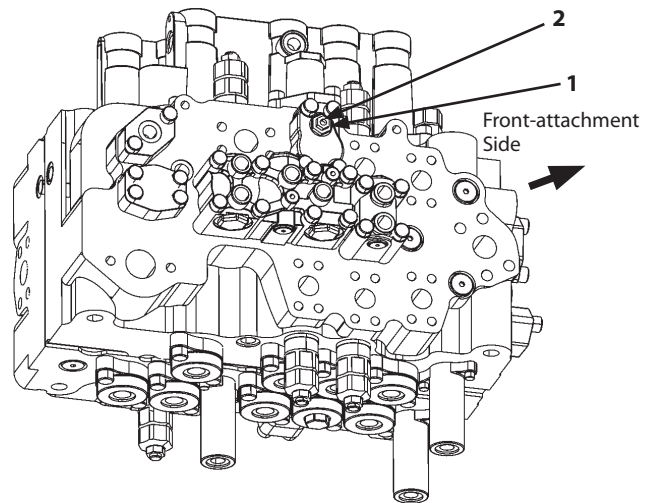
Tool : 13 mm

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

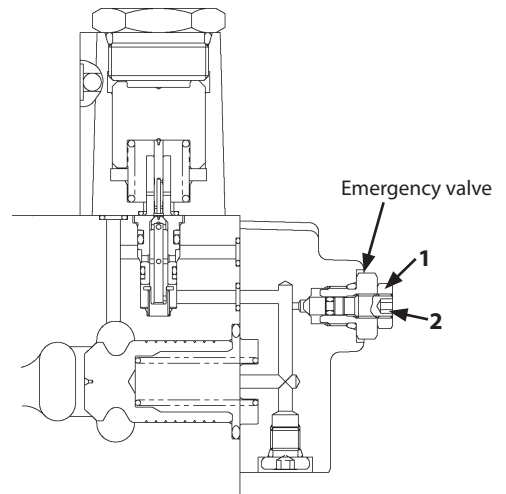
Screw (2)

Tool : 4 mm (Hexagonal wrench)

Torque : 7 N·m (0.7 kgf·m, 5.0 lbf·ft)



T1V1-03-03-073



T1V1-03-03-038

OPERATING THE MACHINE

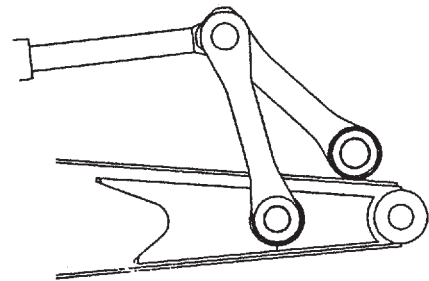
BUCKET LINK SECURING METHOD (L Model)

When installing a suspend type attachment such as a logging type attachment, secure the bucket links with the link securing parts.

CAUTION: If the bucket cylinder is mistakenly operated when the bucket links are secured, the securing bolts will be broken. Be careful that the broken bolts may fly off.

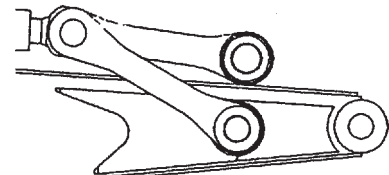
IMPORTANT: Do not tighten the securing bolts to the torque exceeding specification. The bolts may be broken.

1. Remove the bucket while referring to the descriptions on "Bucket Replacement" in the Inspection and Maintenance section.



M1SA-05-001

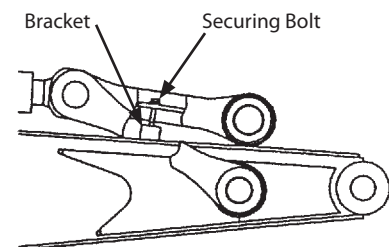
2. Fully retract the bucket cylinder.



M1SA-05-002

3. Install a bolt through the hole on the bucket link and tighten the bolt to the bracket on the top of the arm.

	Bolt diameter	Wrench size	Torque	
	mm	mm	N·m	kgf·m
Securing bolt	12	19	35	3.5



M1SA-05-003

OPERATING THE MACHINE

OBJECT HANDLING --- IF EQUIPPED



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

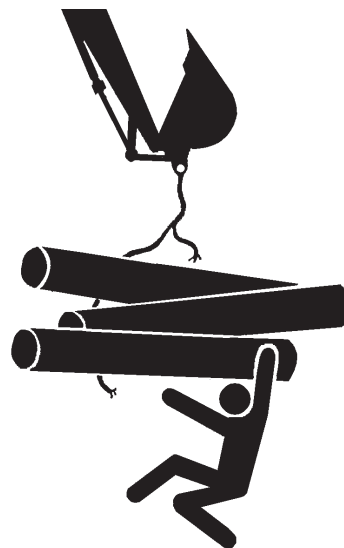
Never move the load suddenly. Never move load over a person's head. Do not allow any persons near load.

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

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

Do not attach sling/chain to the bucket teeth.

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



SA-014

TRANSPORTING

TRANSPORTING BY ROAD

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

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

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



M1V1-06-001

LOADING/UNLOADING ON A TRAILER

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



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

Ramp/Loading Dock:

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

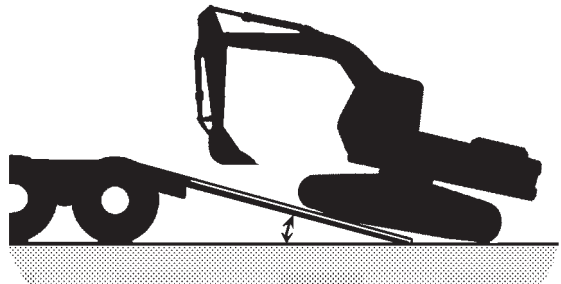
TRANSPORTING

Loading/Unloading



WARNING:

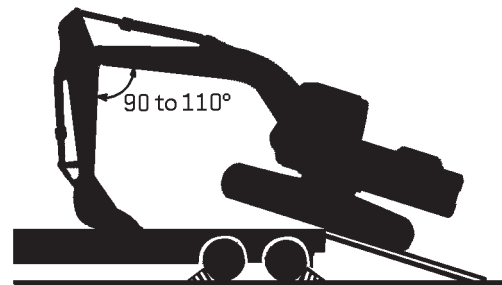
- Always turn the auto-idle switch OFF and the power mode switch E or P when loading or unloading the machine, to avoid unexpected speed increase due to unintentional operation of a control lever.
- Always select the slow speed mode with the travel mode switch. In the fast speed mode, travel speed may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



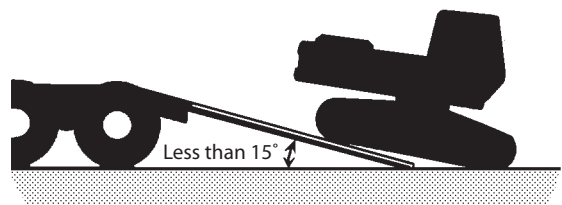
M1G6-06-002

Loading

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



M107-06-021



M107-06-018



M107-06-013

TRANSPORTING

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



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

TRANSPORTING

Transporting



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

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



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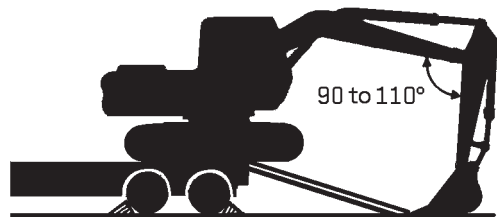
Unloading



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

IMPORTANT: Prevent possible damage to the front attachment. Always position the arm at 90 to 110° to the boom when unloading the machine. Unloading the machine with the arm tucked in may cause machine damage.

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



M107-06-023

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

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



M107-06-015

TRANSPORTING

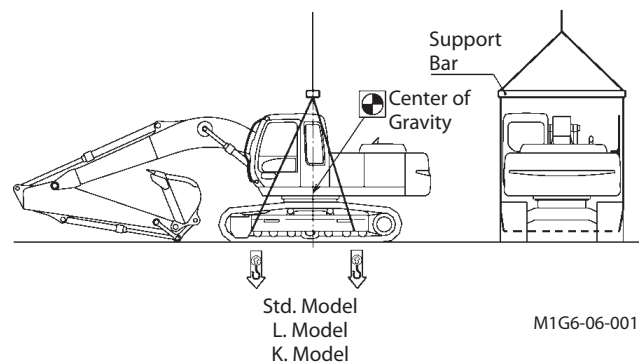
MACHINE LIFTING PROCEDURE



WARNING:

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

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



TRANSPORTING

MEMO

Dotted lines for memo content.

MAINTENANCE

CORRECT MAINTENANCE AND INSPECTION PROCEDURES

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

Inspect machine daily before starting.

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

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

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



SA-005

MAINTENANCE

Hitachi machine models are classified into 5 classes, 3 models and 1 type as shown in the table below. When referring to the texts and/or illustrations indicated with the applicable machine class names in this manual, check that the machine models concerned are included using this table. Unless specially described, all models explained in this manual include "F Type".

Class

ZX120-3 Class	ZX110-3, 110M-3, 120-3, 130K-3, 130L-3
ZX180-3 Class	ZX160LC-3, 180LC-3, 180LCN-3
ZX200-3 Class	ZX200-3, 200LC-3, 210H-3, 210LCH-3, 210K-3, 210LCK-3
ZX270-3 Class	ZX240-3, 240LC-3, 250H-3, 250LCH-3, 250K-3, 250LCK-3, 270-3, 270LC-3
ZX330-3 Class	ZX330-3, 330LC-3, 350H-3, 350LCH-3, 350K-3, 350LCK-3

Model

Std. Model	ZX110-3, 110M-3, 120-3, 160LC-3, 180LC-3, 180LCN-3, 200-3, 200LC-3, 210H-3, 210LCH-3, 240-3, 240LC-3, 250H-3, 250LCH-3, 270-3, 270LC-3, 330-3, 330LC-3, 350H-3, 350LCH-3
K Model	ZX130K-3, 210K-3, 210LCK-3, 250K-3, 250LCK-3, 350K-3, 350LCK-3
L Model	ZX130L-3

Type

F Type	ZX110-3F, 110M-3F, 120-3F, 130K-3F, 130L-3F, 160LC-3F, 200-3F, 200LC-3F, 210H-3F, 210LCH-3F, 210K-3F, 210LCK-3F, 240-3F, 240LC-3F, 250H-3F, 250LCH-3F, 250K-3F, 250LCK-3F, 270-3F, 270LC-3F, 330-3F, 330LC-3F, 350H-3F, 350LCH-3F, 350K-3F, 350LCK-3F
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All information, illustrations and specifications in this manual are based on the latest product information available at the time of publication. The right is reserved to make changes at any time without notice.

CHECK THE HOUR METER REGULARLY

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

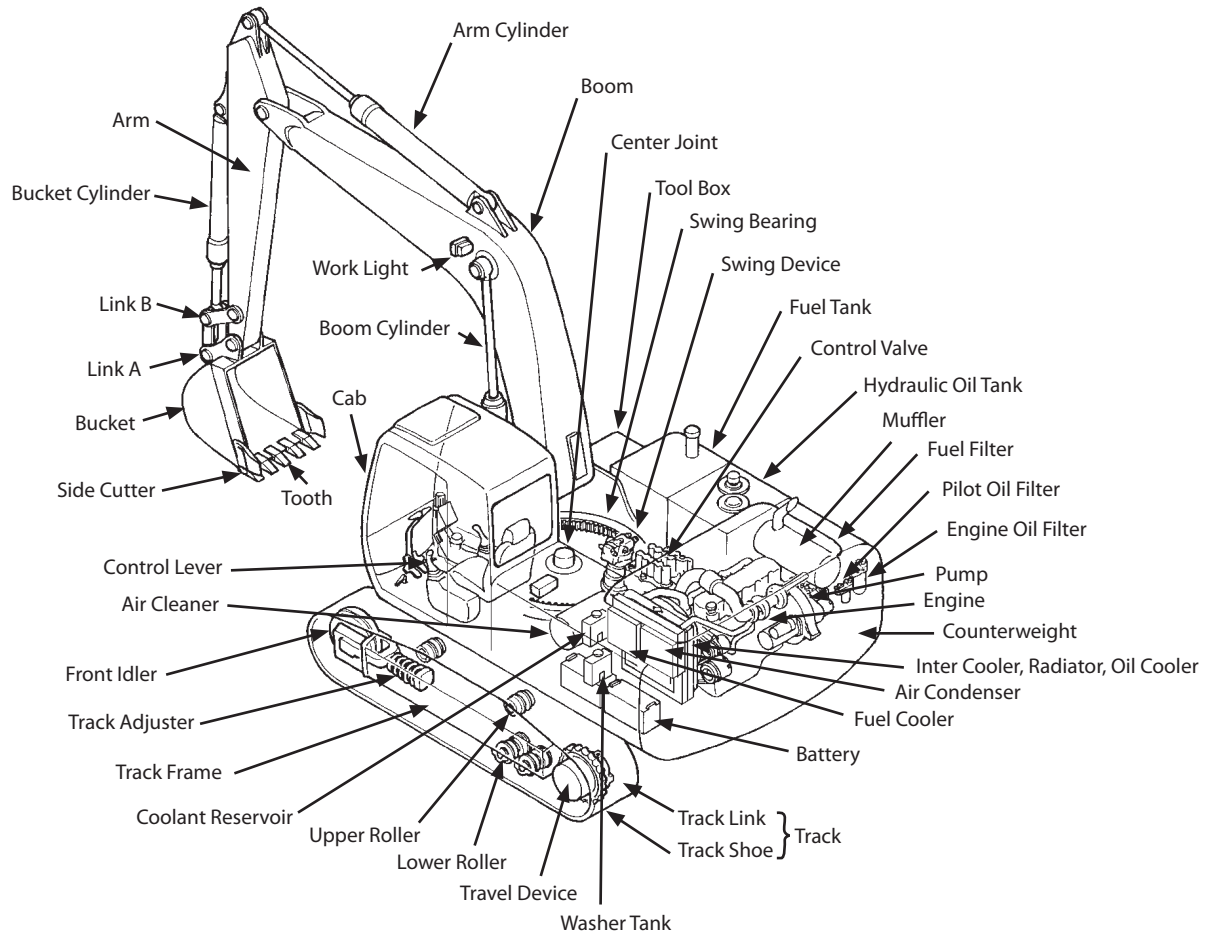
USE CORRECT FUELS AND LUBRICANTS

IMPORTANT: Always use recommended fuels and lubricants.

Failure to do so will result in machine damage and loss of Hitachi product warranty.

MAINTENANCE

LAYOUT



M1U1-01-005

MAINTENANCE

MAINTENANCE GUIDE TABLE

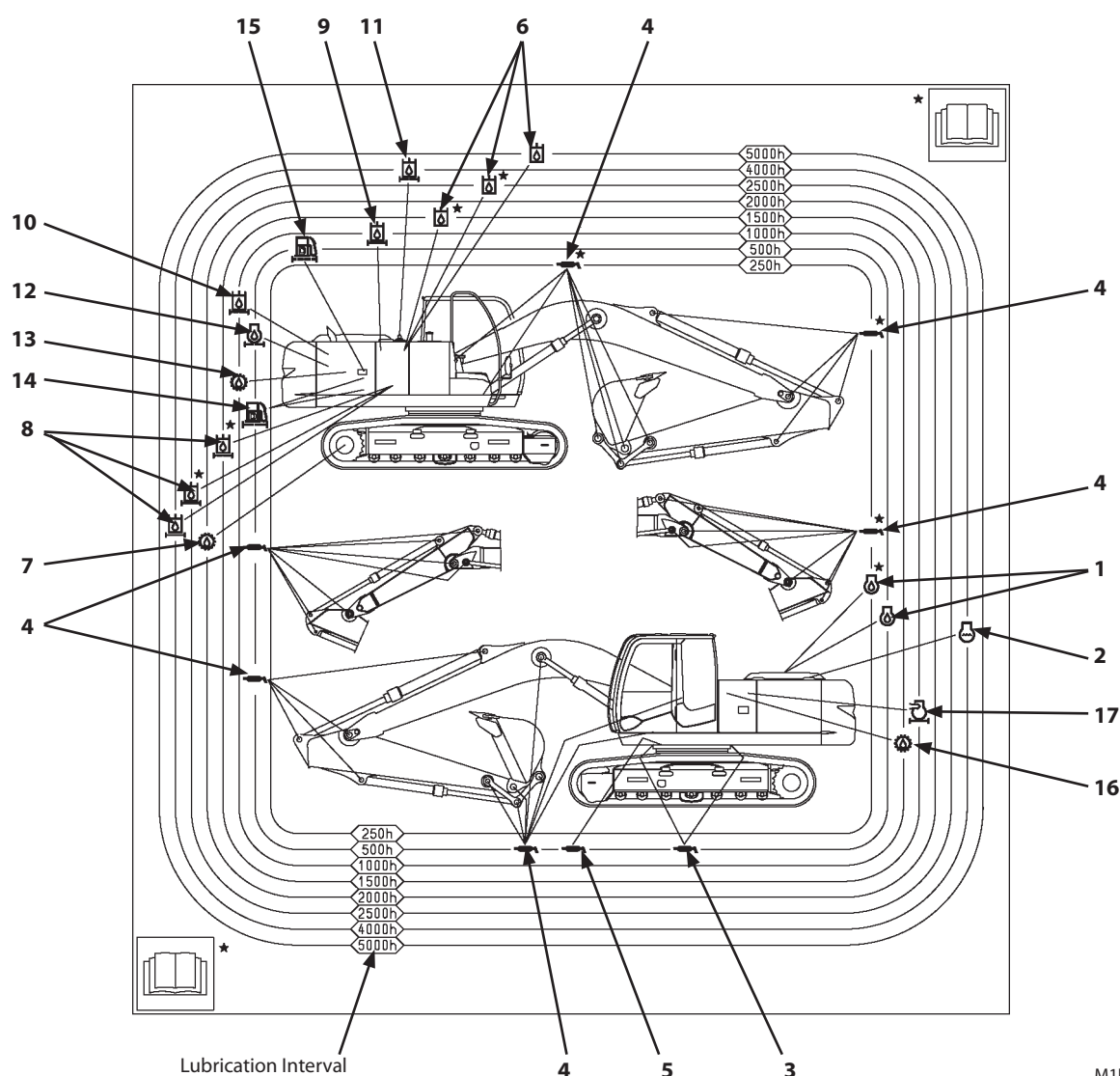
The maintenance guide table is affixed to the reverse side of the tool box cover. Lubricate and/or service the parts at the intervals as instructed in the table so that all necessary maintenance can be performed regularly.

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

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

MAINTENANCE

Maintenance Guide Table



M1U1-07-007

	Item	Page		Item	Page
1	Engine Oil	7-28	10	Hydraulic Oil Filter (Pilot)	7-43
2	Coolant (Long-Life Coolant)	7-68	11	Hydraulic Oil Filter (Air Breather)	7-44
3	Grease	7-18	12	Engine Oil Filter	7-29
4	Grease	7-16	13	Gear Oil (Pump/Transmission) ★1	7-31
5	Grease	7-19	14	Fuel Filter (Main/Pre)	7-57
6	Hydraulic Oil	7-39	15	Fuel Solenoid Pump Strainer	7-59
7	Gear Oil (Travel Device)	7-34	16	Gear Oil (Swing Device)	7-32
8	Hydraulic Oil Filter (Suction)	7-39	17	Air Cleaner Element	7-61
9	Hydraulic Oil Filter (Main)	7-42			

NOTE: ★1. ZX180-3, 200-3, 270-3, 330-3 class

MAINTENANCE

PREPARE MACHINE FOR MAINTENANCE

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

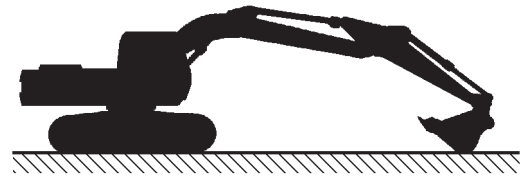
1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

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

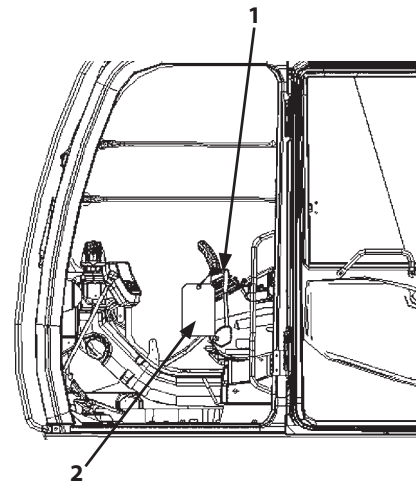
4. Run the engine at slow idle speed without load for five minutes.
5. Turn the key switch OFF. Remove the key from the key switch. (If maintenance must be performed with engine running, do not leave machine unattended.)
6. Pull pilot control shut-off lever (1) to the LOCK position.
7. Before performing any work on the machine, attach a tag (2) on the right control lever.

! 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.



M104-07-021

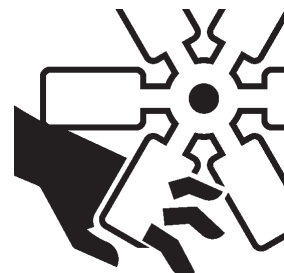


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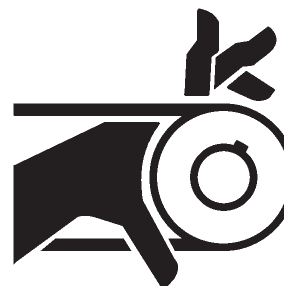


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SA-2294



SA-026

MAINTENANCE

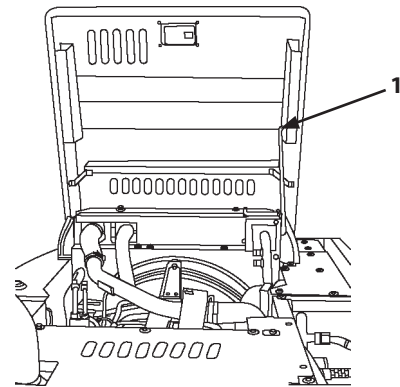
HOOD AND ACCESS COVERS

ZX120-3, 180-3 Class



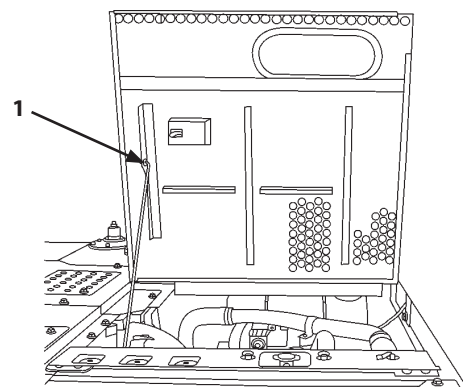
WARNING:

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



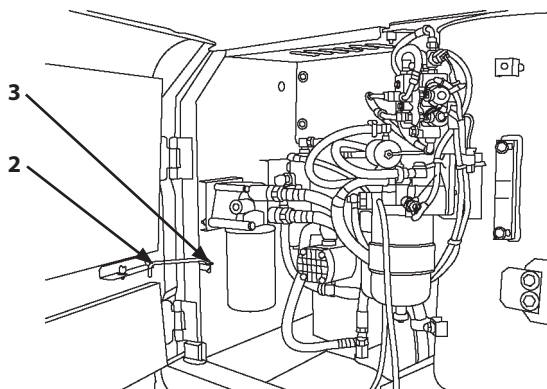
Engine Cover ZX120-3 Class

M1U1-07-099



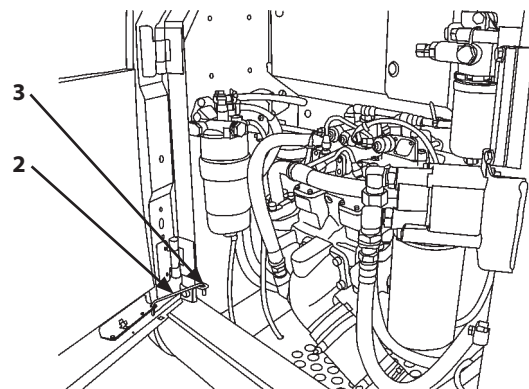
Engine Cover ZX180-3 Class

M1U1-07-090



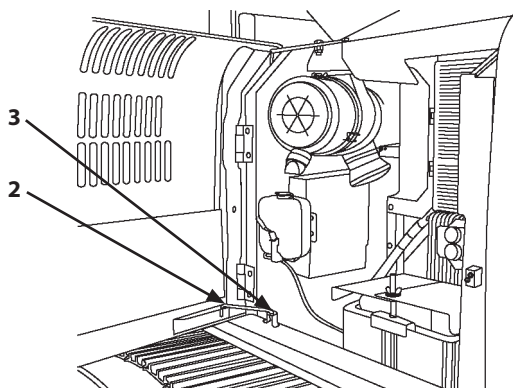
Right Cover ZX120-3 Class

M1U1-07-100



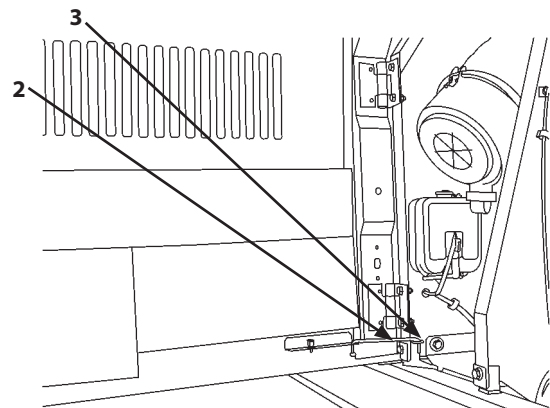
Right Cover ZX180-3 Class

M1U1-07-098



Left Cover ZX120-3 Class

M1U1-07-101



Left Cover ZX180-3 Class

M1U1-07-092

MAINTENANCE

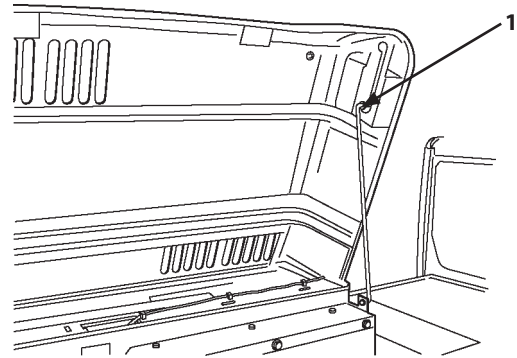
HOOD AND ACCESS COVERS

ZX200-3, 270-3, 330-3 Class



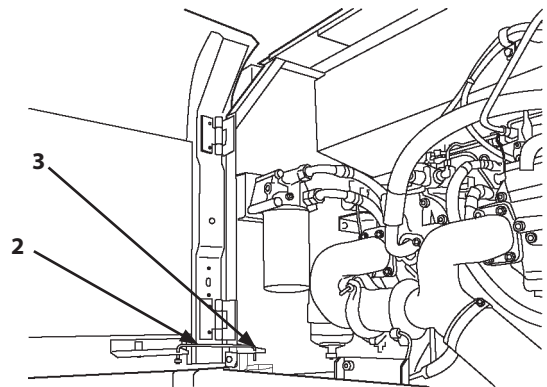
WARNING:

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



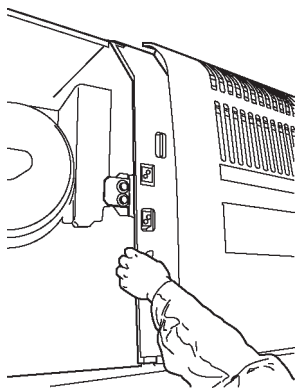
Engine Cover

M1U1-07-030



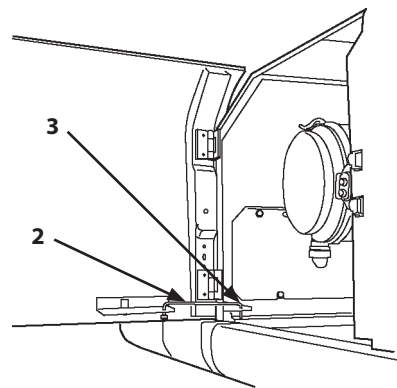
Right Cover

M1U1-07-032



Rear Left Cover

M1U1-07-033



Front Left Cover

M1U1-07-031

MAINTENANCE

PERIODIC REPLACEMENT OF PARTS

To ensure safe operation, be sure to conduct periodic inspection of the machine. In addition, the parts listed below, if defective, may pose serious safety/fire hazards. It is very difficult to gauge the extent of deterioration, fatigue, or weakening of the parts listed below simply by visual inspection alone. For this reason, replace these parts at the intervals shown in the table below. However, if any of these parts are found to be defective, replace before starting operation, regardless of the interval. Also, when replacing hoses, check the clamps for deformation, cracks, or other deterioration, and replace as necessary. Be sure to perform periodic inspection of all hoses, as shown below, and replace or retighten any defective parts found, as necessary. Consult your authorized dealer for correct replacement.

Periodic Replacement Parts			Replacement Intervals
Engine		Fuel hose (Fuel tank to Supply pump)	Every 2 years
		Oil filter hose (Engine to oil filter)	Every 2 years
		Heater hose (Heater to engine)	Every 2 years
Hydrau- lic 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
	Front Attachment	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
Clear hatch (If equipped)			Every 5 years

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

IMPORTANT:

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

MAINTENANCE

MAINTENANCE GUIDE

A. GREASING (See Page 7-16)

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

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

IMPORTANT: Grease bucket and link pivots every day until break-in operation (50 hours) is complete. When the bucket joint boss end faces are not finished with WC thermal spraying, grease the bucket two joint pin sections at an interval of every 250 hours.

B. ENGINE (See Page 7-28)

Parts		Quantity	Interval (hours)						
			8	50	100	250	500	1000	2000
1. Engine Oil	Oil Level Check	1							
2. Engine Oil	Change	ZX120-3, 180-3 Class 17.0 L (4.5 US gal)				★			
		ZX200-3, 270-3 Class 23.0 L (6.1 US gal)				★			
		ZX330-3 Class 41.0 L (10.8 US gal)				★			
3. Engine Oil Filter	Replacement	1				★			

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

MAINTENANCE

C. TRANSMISSION (See Page 7-31)

Parts			Quantity	Interval (hours)						
				8	50	100	250	500	1000	2000
1. Pump Transmission	Oil Level Check		1							
	Change	ZX180-3, 200-3, 270-3 Class	1.0 L (1.1 US qt)							
		ZX330-3 Class	1.4 L (1.5 US qt)							
2. Swing Reduction Gear	Oil Level Check		1							
	Change	ZX120-3 Class	3.2 L (3.4 US qt)							
		ZX180-3, 200-3 Class	6.2 L (1.6 US gal)							
		ZX270-3 Class (Except ZX270-3, 270LC-3)	9.1 L (2.4 US gal)							
		ZX270-3, 270LC-3	11.7 L (3.1 US gal)							
		ZX330-3 Class	17.0 L (4.5 US gal)							
3. Travel Reduction Gear	Oil Level Check		2							
	Change	ZX120-3 Class	4.0 L x2 (4.2 US qt)							
		ZX180-3, 200-3 Class	6.8 L x2 (1.8 US gal)							
		ZX270-3 Class (Except ZX270-3, 270LC-3)	7.8 L x2 (2.1 US gal)							
		ZX270-3, 270LC-3	9.2 L x2							
		ZX330-3 Class	(2.4 US gal)							

D. HYDRAULIC SYSTEM (See Page 7-35)

Parts			Quantity	Interval (hours)									
				8	50	100	250	300	500	1000	1500	2500	5000
1. Check Hydraulic Oil Level			1										
2. Change Hydraulic Oil	ZX120-3 Class	130 L (34.3 US gal)							*	*	*	*	
	ZX180-3 Class	190L (50.2 US gal)							*	*	*	*	
	ZX200-3 Class	200L (52.8 US gal)							*	*	*	*	
	ZX270-3 Class	243 L (64.2 US gal)							*	*	*	*	
	ZX330-3 Class	298 L (78.7 US gal)							*	*	*	*	
3. Suction Filter Cleaning			1	When changing hydraulic oil									
4. Replace Hydraulic Oil Tank Filter	Std. Model	1						*	*				
	K Model, L Model	1											
5. Replace Pilot Oil Filter			1										
6. Replace Air Breather Element			1										
7. Check Hoses and Lines	for leaks	–											
	for cracks, bend, etc.	–											

 **NOTE:** * 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” on page 7-37. See recommended oil chart.

MAINTENANCE

E. FUEL SYSTEM (See Page 7-50)

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

F. AIR CLEANER (See Page 7-61)

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

G. COOLING SYSTEM (See Page 7-63)

Parts		Quantity	Interval (hours)						
			8	50	100	250	500	1000	2000
1. Check Coolant Level		1							
2. Check and Adjust Fan Belt Tension		1		★★					
3. Change Coolant	ZX120-3 Class	16 L (4.2 US gal)	Twice a year * ₁						
	ZX180-3 Class	18 L (4.8 US gal)	Twice a year * ₁						
	ZX200-3, 270-3 Class	26 L (6.9 US gal)	Twice a year * ₁						
	ZX330-3 Class	32 L (8.5 US gal)	Twice a year * ₁						
4. Clean Radiator, Oil Cooler Core and Inter Cooler	Outside	1					* ₂		
	Inside	1	Once a year						
5. Clean Oil Cooler, Radiator and Inter Cooler Front Screen		1					* ₂		
6. Clean Air Conditioner Condenser		1					* ₂		
7. Clean Fuel Oil Cooler		1					* ₂		
8. Clean Air Conditioner Front Screen (Opt.)		1					* ₂		

 **NOTE:** ★★ Maintenance required only during first time check.

*₁ When genuine Hitachi Long-Life Coolant is used, change every two years or 4000 operating hours, whichever comes first.

*₂ Shorten the maintenance interval when the machine is operated in dusty areas.

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

MAINTENANCE

H. ELECTRICAL SYSTEM (See Page 7-70)

I. MISCELLANEOUS (See Page 7-76)

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

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

MAINTENANCE

Brand Names of Recommended Grease

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

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

*1 Front Joint Pin and Swing Bearing

*2 Swing Gear

Recommended Engine Oil

IMPORTANT: Use only genuine Hitachi engine oil as shown below or engine oil equivalent to DH-1 specified in JASO. Failure to do so may deteriorate the engine performance and/or shorten the engine service life. Please be noted that all engine failures caused by using engine oil other than specified are excluded from Hitachi Warranty Policy. Consult your nearest Hitachi dealer for the unclear points.

Brand Names of Recommended Engine Oil

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

MAINTENANCE

Brand Names of Recommended Oil

Application	Swing and Travel Reduction Gear		Pump Transmission		
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)	-10 to 35 °C (14 to 95 °F)	25 to 40 °C (77 to 104 °F)
Manufacturer					
British Petroleum	BP Gear oil	SAE80W-90		BP Vanellus C3	
				30	40
Caltex Oil	Thuban	SAE 90		RPM DELO 300 Oil	
				30	40
Esso	Esso Gear Oil	GP80W-90		Essolube D-3	
				30	40
Idemitsu Kosan	Apollo Gear	HE90	Apoloil super wide 15W-40	Apoloil diesel motive	
				S-330	S-340
Mobil Oil	Mobilube	GX80W-90		Mobil Delvac	
				1330	1340
Nippon Oil	Gear Lube SP90	✱2	Hidiesel S3		
			15W-40 ✱1	-20 to 35 °C (-4 to 95 °F) 10W-30	
Shell Oil	Shell Spirax	EP90	Rymla D		
				30	40
Remarks	API GL 4 Class		API CD Class		

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

 *1 Engine oil for pump transmission

 *2 Gear oil for swing and travel reduction device.

Brand Names of Recommended Hydraulic Oil

Kind of Lubricant	Hydraulic Oil					
Where to be applied	Hydraulic System					
Change Interval	5000 hours		2500 hours		1500 hours	
Environmental Temp.	-20 to 40 °C (-4 to 104 °F)	-10 to 40 °C (14 to 104 °F)	-20 to 40 °C (-4 to 104 °F)	-10 to 40 °C (14 to 104 °F)	-20 to 40 °C (-4 to 104 °F)	-10 to 40 °C (14 to 104 °F)
Manufacturer						
Hitachi	Super EX 46HN					
Idemitsu Kosan			Super Hydro 46 WRHU			
British Petroleum					Bartran HV46	
Caltex Oil						Rando Oil HD46
Texaco INC.						Rando Oil HD46
Chevron U.S.A INC.						Chevron AW46
Esso						NUTO H46
Mobil Oil						DTE 25
Shell Oil				Tellus Oil S46		Tellus Oil 46
Remarks	Anti-wear type hydraulic oil					

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

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

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

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

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

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

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

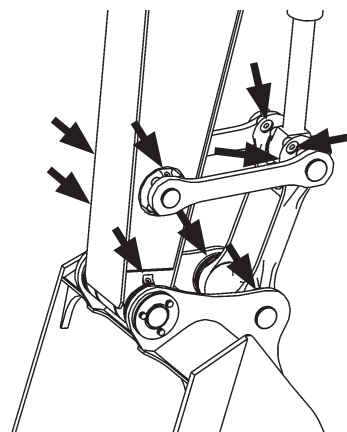
MAINTENANCE

A. GREASING

1 Front Joint Pins

Bucket --- every 250 hours

Link Pins --- every 500 hours

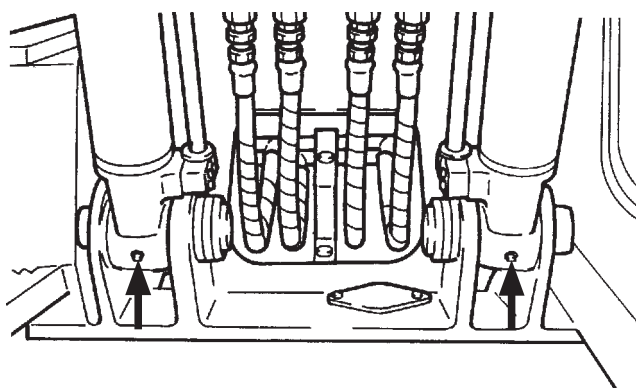


ZX120-3, 180-3, 200-3, 270-3, 330-3 Class

M178-07-007

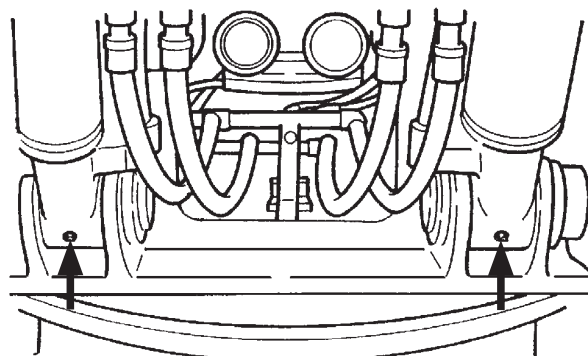
Others --- every 500 hours

• Boom Cylinder Bottom



ZX120-3, 180-3 Class

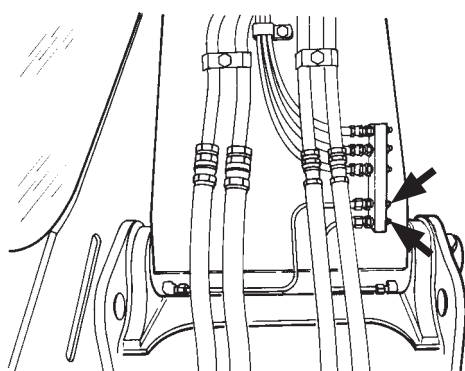
M104-07-002



ZX200-3, 270-3, 330-3 Class

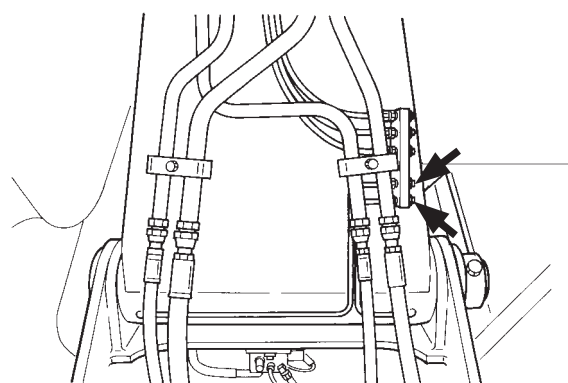
M157-07-156

• Boom Foot



ZX120-3, 180-3 Class

M154-07-002

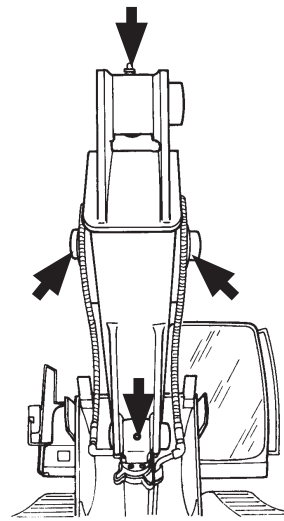


ZX200-3, 270-3, 330-3 Class

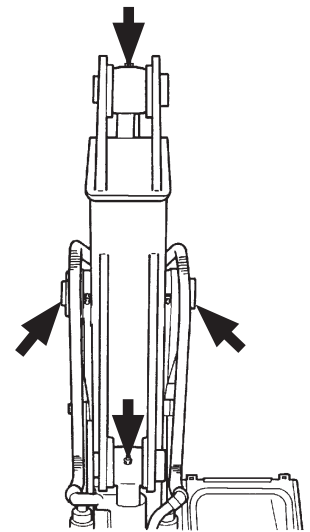
M157-07-155

MAINTENANCE

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

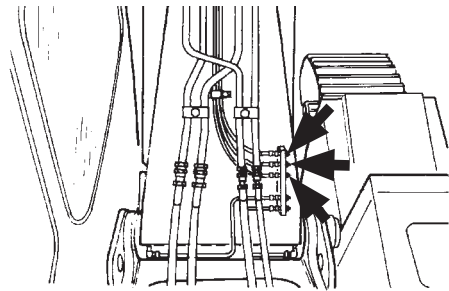


ZX120-3, 180-3 Class
M154-07-003

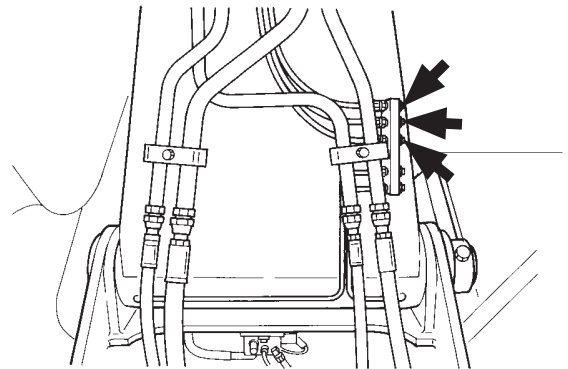


ZX200-3, 270-3, 330-3 Class
M157-07-157

- Boom Cylinder Rod Pins and Arm Cylinder Bottom Pin.
(Centralized greasing system)



ZX120-3, 180-3 Class
M175-07-036



ZX200-3, 270-3, 330-3 Class
M157-07-155

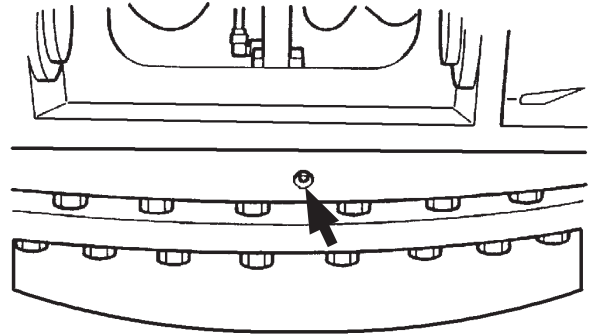
MAINTENANCE

2 Swing Bearing --- every 500 hours

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

Each time you leave the cab

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



M157-07-159

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

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

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

Model	Capacity
ZX120-3 Class	0.25 L (0.26 US qt)
ZX180-3, 200-3 Class	0.30 L (0.32 US qt)
ZX270-3 Class	0.35 L (0.37 US qt)
ZX330-3 Class	0.40 L (0.42 US qt)

12. Take care not to supply excessive grease.

MAINTENANCE

3 Swing Internal Gear --- every 500 hours

CAUTION: Adding or changing swing internal gear grease and rotating the upperstructure must be done by one person. Before you start, clear the area of all persons.

Each time you leave the cab

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

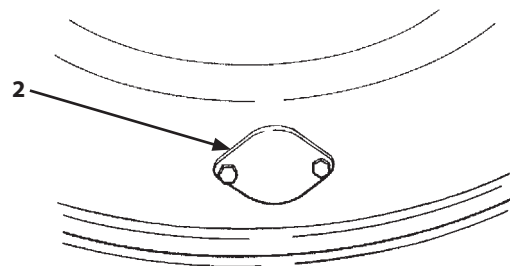
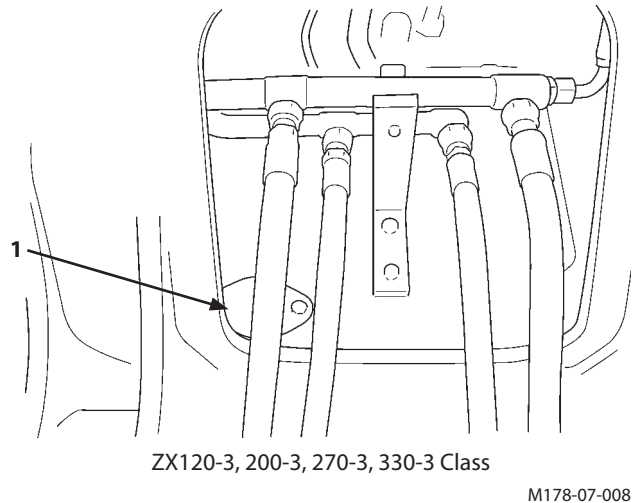
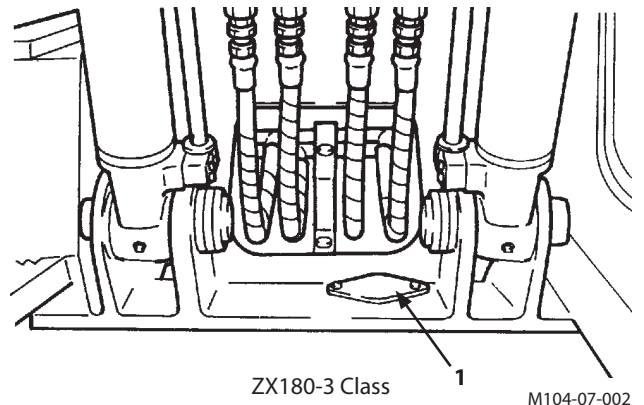
1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

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. Open the tool box cover on the upperstructure and remove cover (1).
8. Grease must be to the top of all internal gear teeth of the swing bearing and be free of contamination. Add approximately 0.5 kg of grease, if required. If the grease is contaminated, remove grease and replace with clean grease.

IMPORTANT: If water or mud is found in the swing gear area, see **Operating in Water or Mud** in the "Driving the Machine" section.

9. Install cover (1).
10. If grease shows any sign of water or mud, replace all the grease on the internal gear. Remove cover (2) from the bottom of the swing gear housing, located near the center joint.
11. Install cover (2).



Model	Capacity
ZX120-3 Class	9 L (2.4 US gal)
ZX180-3, 200-3, 270-3 Class	17 L (4.5 US gal)
ZX330-3 Class	19 L (5.0 US gal)

MAINTENANCE

ELECTRIC GREASE GUN (Only ZX330-3 class)



CAUTION: Since the electric grease gun is not a water-resistance type, avoid leaving it in a place exposed to rain and water. Do not use the electric grease gun in rain fall. Failure to do so may lead to an unexpected accident such as leak. No specified daily maintenance is required. Take care not to allow any part of the grease gun, especially motor section, to come in contact with other objects or do not leave the grease gun contaminated, possibly resulting in unexpected injury such as electric shock. Always keep the grease gun clean by wiping off contamination. Failure to do so may cause the grease gun to slip down resulting in possible personal injury.



WARNING: Do not operate an electric grease gun in explosive atmosphere. An electric tool may create sparks and ignite combustible fluid, dust, or fumes. Avoid electrifying the grease gun in damp or wet locations.



WARNING: The grease gun develops high pressure up to 41.4 MPa (422 kgf/cm²). Use goggles and heavy gloves for protection during operation.

- IMPORTANT:**
- In case the grease gun becomes inoperable, do not continuously operate it further. Damage to the motor or a risk of fire may result.
 - When a battery pack is not in use, store the battery pack keeping away from a metallic product such as a paper clip, coin, key, nail, or screw. Short circuit of the battery may create sparks leading to hazards such as burns, or fires.
 - Always be sure to use the attached battery pack. Using a battery pack other than the attached one may cause a risk of fire.

MAINTENANCE

ELECTRIC GREASE GUN

Specifications

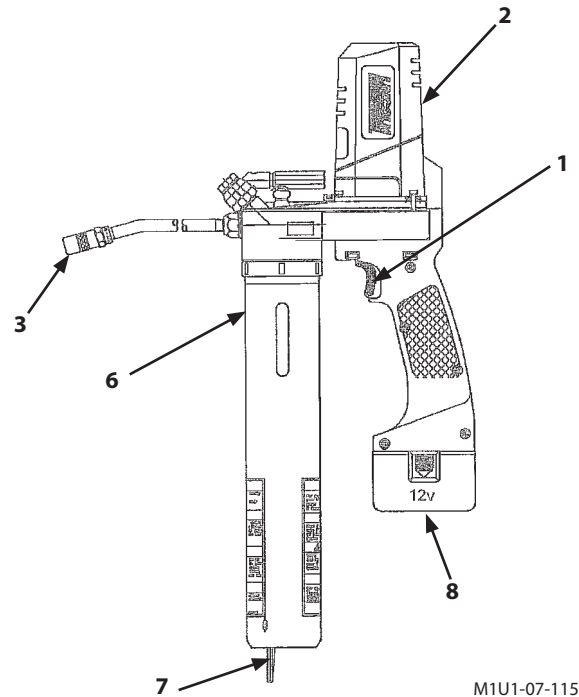
Operating voltage	12 V
Maximum operating pressure	41.4 MPa (422 kgf/cm ²)
Grease cartridge capacity	411 cc
Operating temperature range	-18 to 50 °C
Operating current (at pressure 6.9 MPa (70 kgf/cm ²))	4 A
Grease	Consistency: 2 or less
Grease output (at pressure 6.9 MPa (70 kgf/cm ²))	194 cc/minute
Weight	3.76 kg

Attachments

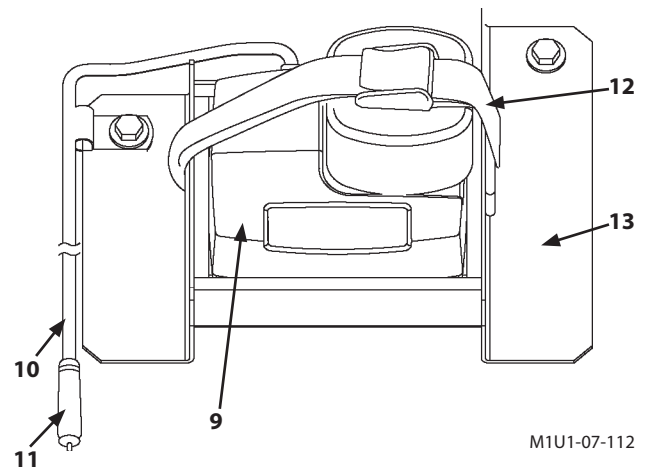
Battery pack	
Output voltage	12 V
Capacity	1300 mAh
Battery charger	
Charge time	1 hour
Output voltage (at1.7 A)	14.5 V
Input voltage (at 350 mA)	100 V, 50 Hz

Components Name

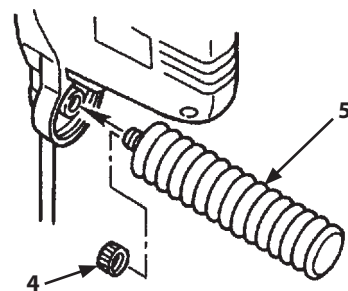
- 1- Switch
- 2- Motor assembly
- 3- Nozzle (CNP-2)
- 4- Cap
- 5- Cartridge grease
- 6- Oil barrel
- 7- Chain (Lever)
- 8- Battery pack
- 9- Battery charger
- 10- Cord
- 11- Plug
- 12- Band
- 13- Holding bracket



M1U1-07-115



M1U1-07-112



M16J-07-043

MAINTENANCE

Battery Charger Operation

Charging the Battery Pack General

Before using an electric grease gun for the first time, charge the battery pack (for approx. 12 hours). Refer to the descriptions on "Install/remove Battery Pack" for installing the battery pack to the electric grease gun.

When the battery pack is almost discharged, the battery performance sharply drops. In case greasing becomes difficult, it indicates the time to recharge the battery pack. If the battery is recharged before this condition is reached, the total work life of the battery pack is reduced.

 **NOTE:** *The battery pack temperature will increase during or immediately after operation. Do not recharge the battery pack soon after operation. The battery pack may not be fully recharged. Recharge the battery pack only after the battery pack temperature is approximately lowered to room temperature.*

 **CAUTION:** **Do not plug the vent holes at the top and bottom of the battery charger. When the atmospheric temperature is below 0 °C or above 40 °C, do not charge the battery pack.**

MAINTENANCE

Normal Charging Method

After checking that the electric source voltage meets the voltage shown on the battery charger specification plate, connect the battery charger to the electric source.

Conduct the first battery charge for 12 hours before using the battery pack. Install the battery pack in the battery charger. As long as the red light is kept ON, it indicates that the battery pack is being charged. When the red light goes OFF and the green light comes ON, charging of the battery pack is complete. As long as the green light is ON, the battery charger is kept operated in the trickle charging mode. The trickle charging mode is maintained until the battery is used. Disconnect the plug from the electric source after using the battery charger.

 **NOTE:** *Trickle charge means auto-maintenance charge operation to compensate the self-discharge of the battery pack.*

Installing/Removing Battery Pack

Removing Battery Pack

Depress 2 battery release buttons on each side of the battery pack and pull the battery back out of the electric grease gun.

Installing Battery Pack

After aligning the battery pack with the specified location on the electric grease gun handle, push the battery pack into the handle until it locks in place.

Electric Source

Supply the power to the battery charger through the lighter receptacle with the output of 12 V or 24 V.

MAINTENANCE

- IMPORTANT:**
- Do not use the attached battery charger except for charging the attached battery pack. If a battery other than the attached one is charged personal injury and damage may result due to explosion. Never attempt to charge the attached battery pack by a battery charger other than attached one under any circumstances.
 - Prevent the battery charger from being exposed to rain, snow or frost.
 - Do not abuse the cord. Never carry the battery charger with the cord. Take care not to break the cord by pulling it from the receptacle. When disconnecting the battery charger, pull on the plug. Do not pull the cord. Immediately replace the damaged or worn power cord and the damaged relief valve. Do not operate the battery charger with a damaged cord or plug connected. Never attempt to repair the power cord.
 - Do not disassemble the battery charger and/or battery pack. Risk of electric shock or fire may result if incorrectly reassembled.
 - Do not incinerate the battery pack. It can explode in a fire.
 - Never attempt to charge any other cordless tool or battery pack with this battery charger.
 - Never short-circuit between the battery terminals. Damage and/or fires may result due to effect of very high temperature.
 - Properly dispose the expended battery pack. The battery pack is a chargeable nickel-cadmium battery. This type of battery is required to be recycled or disposed of in a proper method. Drop off the expended battery pack at your local replacement battery retailer or your recycling center.
 - Do not store the battery charger and/or battery pack in locations where the atmospheric temperature may reach or exceed more than 50 °C. The battery pack will deteriorate.

MAINTENANCE

Preparation for Using Electric Grease Gun

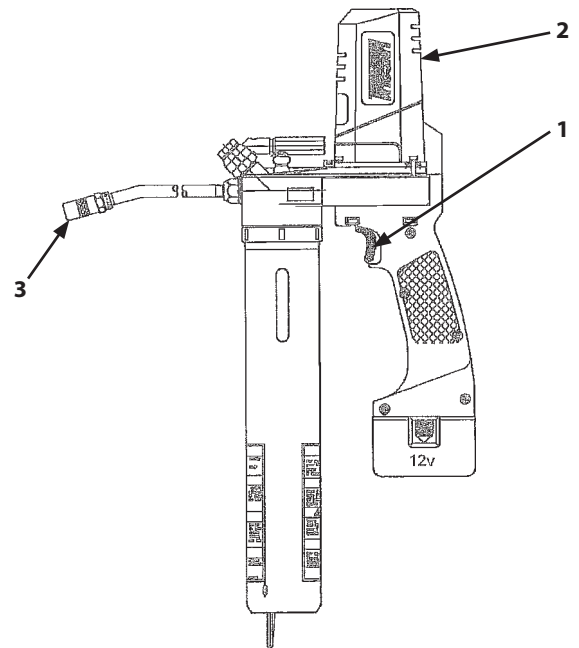
Installing cartridge grease

IMPORTANT: Take care not to allow sand and/or dust to mix in grease when installing cartridge grease (5).

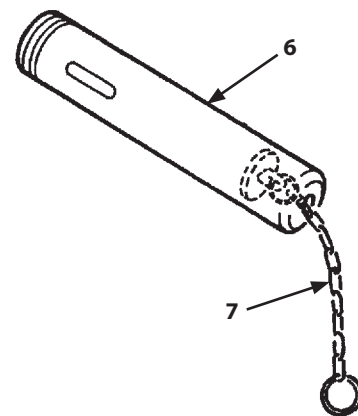
1. Turn to remove oil barrel (6) from motor assembly (2).
2. Fully pull out chain (7) from oil barrel (6). Attach chain (7) to a notch on the bottom of oil barrel (6).
3. After removing cap (4) from cartridge grease (5), install cartridge grease (5) to the screw threads on motor assembly (2).

IMPORTANT: Be alert that if cartridge grease (5) is diagonally or forcibly screwed in, damage to the screw threads may result so that cartridge grease (5) may not be installed to motor assembly (2).

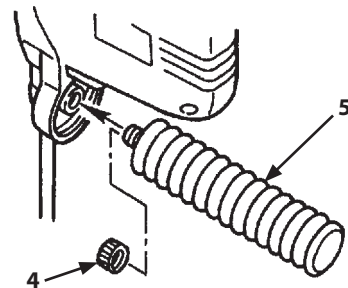
4. Screw oil barrel (6) in the original position on motor assembly (2). Detach chain (7) from the notch.



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M16J-07-042



M16J-07-043

MAINTENANCE

Greasing Method

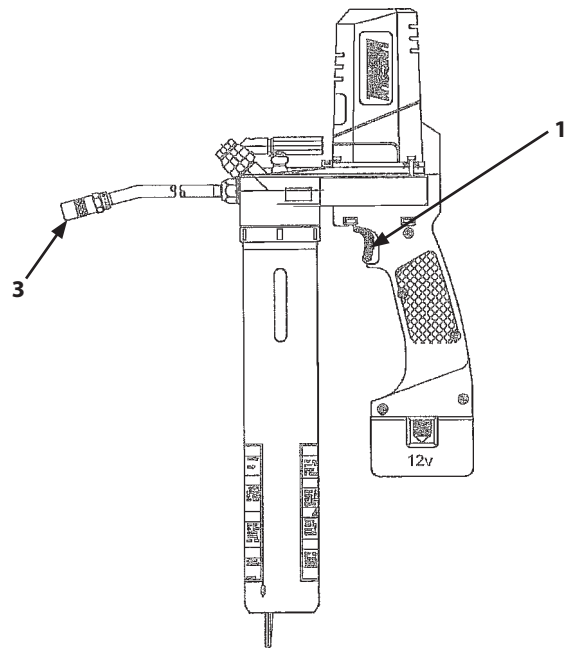
IMPORTANT: When lubricating a closed space with grease, the motor rotation becomes slow as soon as grease is sufficiently filled in the lubrication space. End greasing by releasing switch (1). If greasing is continued further, burning of the motor may result.

1. Drive the motor by pulling switch (1). Grease is discharged from the tip of nozzle (3).

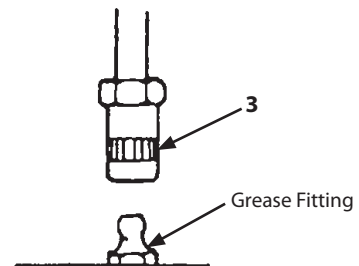
 **NOTE:** When the grease gun is first used, it takes some time before discharging grease until air is bled from the motor assembly.

2. After cleanly wiping the tips of the grease fitting through which grease is added and gun nozzle (3), press the tip of nozzle (3) to chuck the grease fitting.
3. Pull switch (1) to discharge grease. When grease is normally added, old grease is discharged through the clearance around the grease fitting.
4. After completing greasing, allow the inner pressure to release from the grease fitting by tilting nozzle (3) before disconnecting the tip of nozzle (3) from the grease fitting. Certain amount of grease escapes at this time.

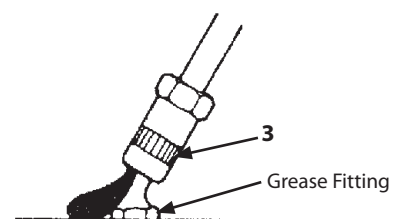
 **NOTE:** If the motor rotation becomes very slow or stops during greasing, immediately release switch (1). The electric grease gun is a high speed type so that slight amount of grease may escape from the plunger. This is not a fault.



M1U1-07-115



M16J-07-045

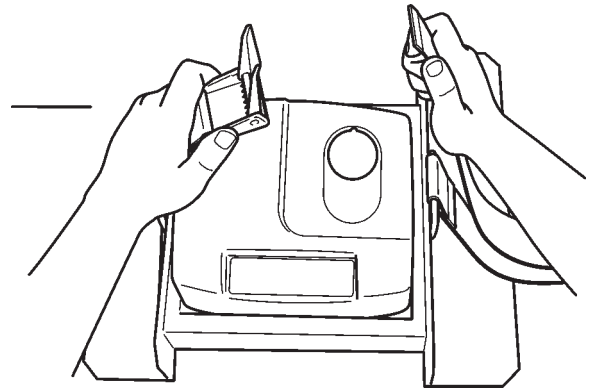


M16J-07-046

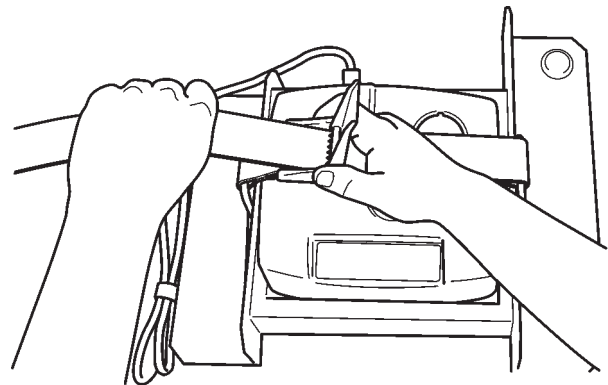
MAINTENANCE

After Using Grease Gun

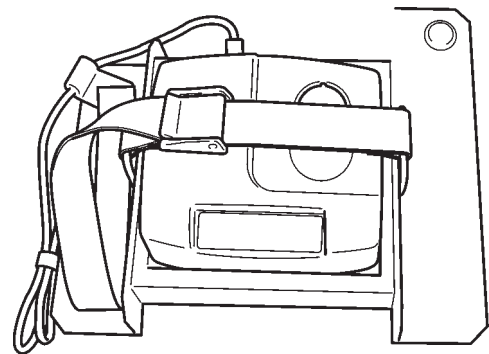
IMPORTANT: Securely fasten the single battery charger or the battery charger with the battery pack installed to the holding bracket with a band attached to the holding bracket so that the battery charger and/or the battery pack does not come off the bracket. Failure to do so may cause the battery pack and/or battery charger to come off the holding bracket, possibly resulting in damage to the battery pack and/or battery charger.



M1U1-07-061



M1U1-07-062



M1U1-07-063

MAINTENANCE

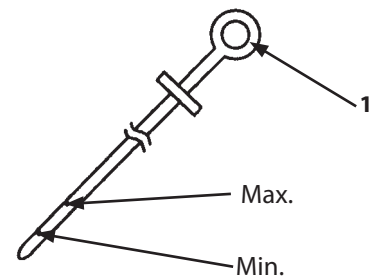
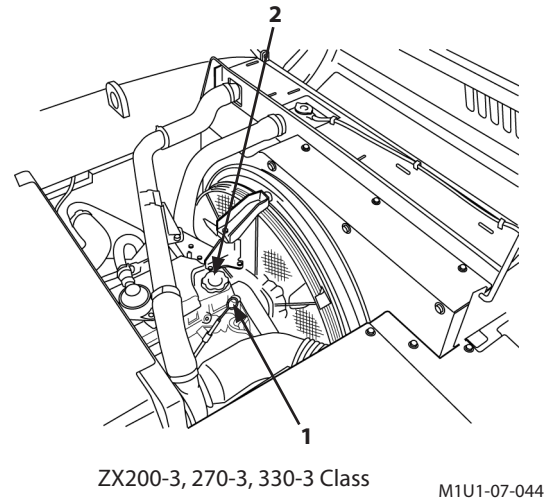
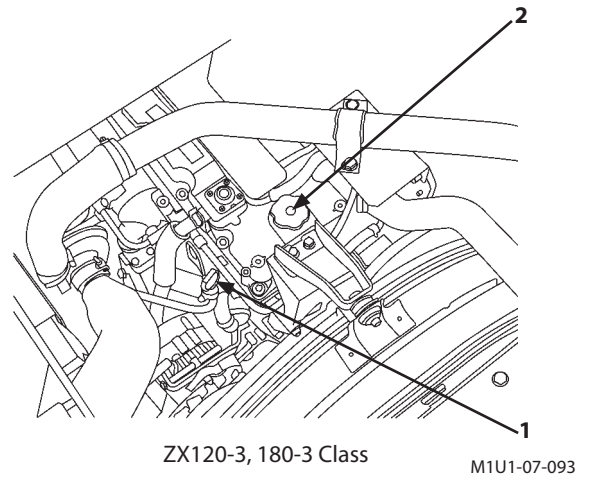
B. ENGINE

1 Engine Oil Level --- check daily

IMPORTANT: For most accurate readings, check the oil level every day before starting the machine. Be sure the machine is on a level surface.

1. Remove dipstick (1). Wipe oil off with a clean cloth. Reinsert dipstick (1).
2. Remove dipstick (1) again. Read level. Oil level must be between the circle marks.
3. If necessary, add oil via oil filler cap (2).
Be sure to use only recommended oil (see Recommended Engine Oil Chart).

 **NOTE:** Checking the oil level immediately after shut down will result in inaccurate readings. Be sure to allow the oil to settle for at least 10 minutes before checking.



MAINTENANCE

2 Change Engine Oil --- every 500 hours

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

3 Replace Engine Oil Filter --- every 500 hours

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

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

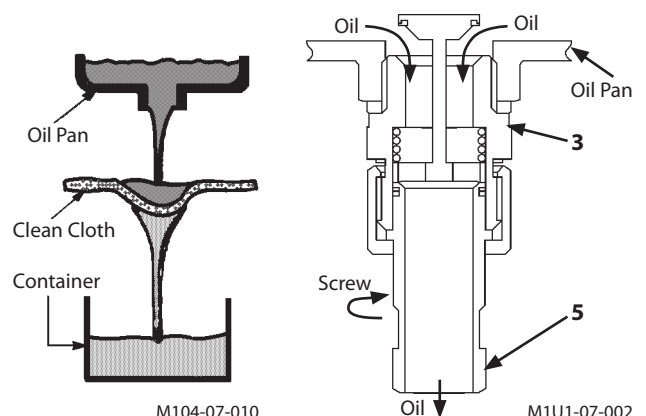
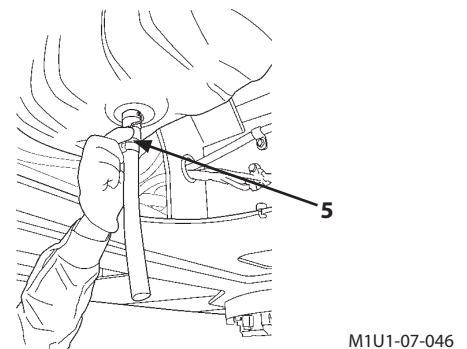
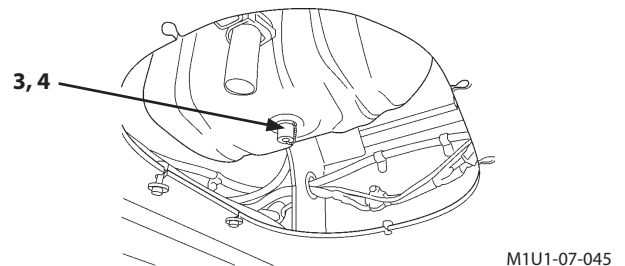
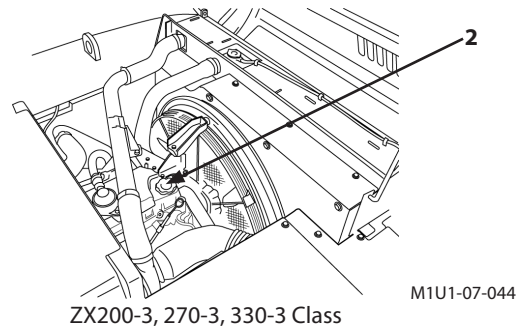
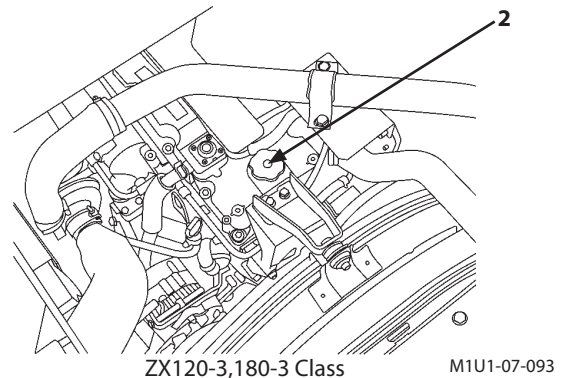
IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.

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

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

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

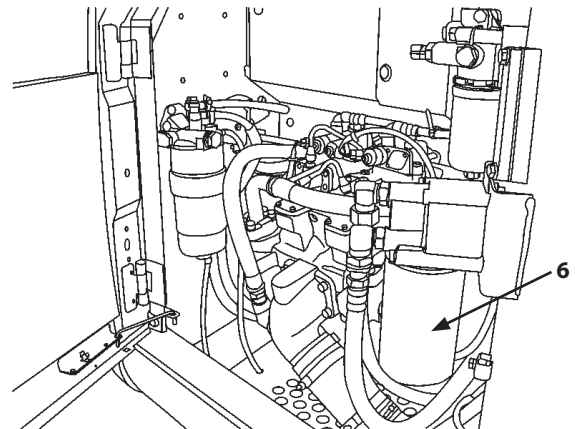
8. Remove oil filler cap (2).
9. Remove cap (4) from oil pan drain valve (3). Install drainer (5) to drain valve. (3)
10. Screw drainer (5) into drain valve (3). Drain valve (3) will be opened to drain oil.
11. Remove oil filler cap (2). Then, allow oil to drain through a clean cloth into a 50-liter (13 US gal) container.
12. After all oil has been drained, inspect the cloth for any debris such as small pieces of metal.
13. Remove drainer (5). Install cap (4) to drain valve (3).



MAINTENANCE

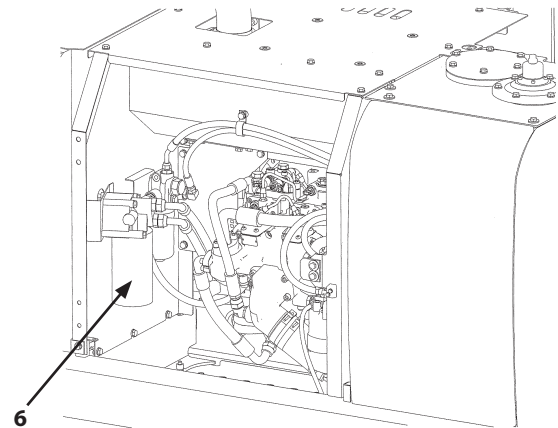
14. Open the right access cover and secure the cover with rod.
15. Remove the filter cartridges of engine oil filter (6) by turning it counterclockwise with the filter wrench.
16. Clean the filter gasket contact area on the engine.
17. Apply a thin film of clean oil to the gasket of new filter (6).
18. Install new filter (6). Turn the filter cartridge 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 more using the filter wrench.
Be careful not to overtighten.
20. Remove the oil filler cap. Fill the engine with recommended oil. Check that oil level is between the circle marks on the dipstick after 15 minutes.
21. Install the oil filler cap.
22. Start the engine. Run the engine at slow idle for 5 minutes.
23. Check that the engine oil pressure indicator on the monitor panel goes out immediately. If not, stop the engine immediately and find the cause.
24. Stop the engine. Remove the key from the key switch.
25. Check for any leakage at the drain plug.
26. Check oil level on the dipstick.

IMPORTANT: Do not re-use the cartridge element.



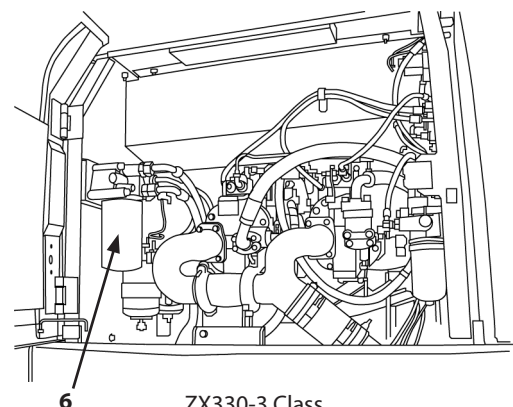
ZX180-3 Class

M1U1-07-098



ZX120-3, 200-3, 270-3 Class

M1U1-07-070



ZX330-3 Class

M1U1-07-014

MAINTENANCE

C. TRANSMISSION

1 Pump Transmission (ZX180-3, 200-3, 270-3, 330-3 Class)

Check Oil Level --- every 250 hours

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

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

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

Change Oil --- every 1000 hours

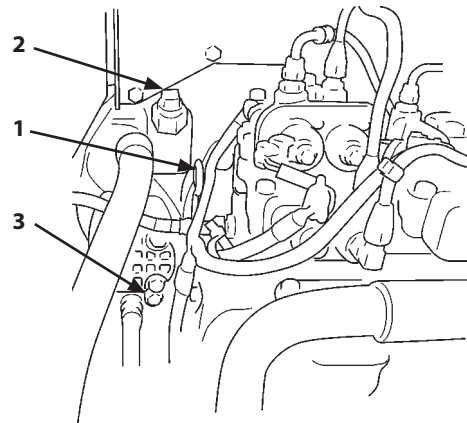
1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

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

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

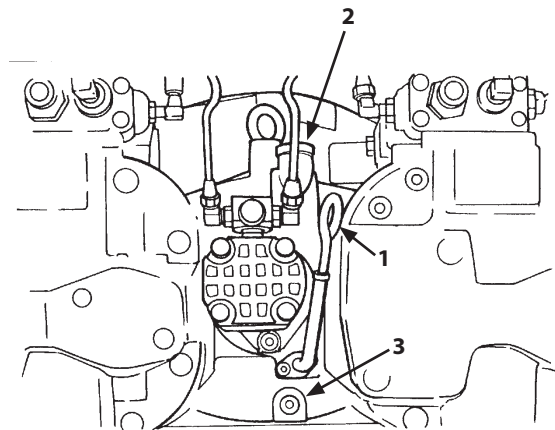
! CAUTION: Oil may be hot just after operation. Wait for oil to cool before starting work.

7. Remove filler plug (2).
8. Remove drain plug (3). Allow oil to drain through a clean cloth into a 2-liter (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).



ZX180-3, 200-3, 270-3 Class

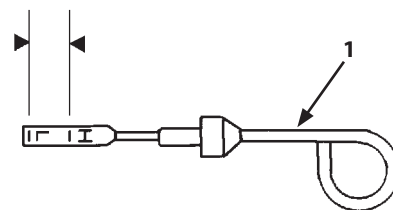
M178-07-085



ZX330-3 Class

M110-07-015

Specified Range



M1G6-07-004

MAINTENANCE

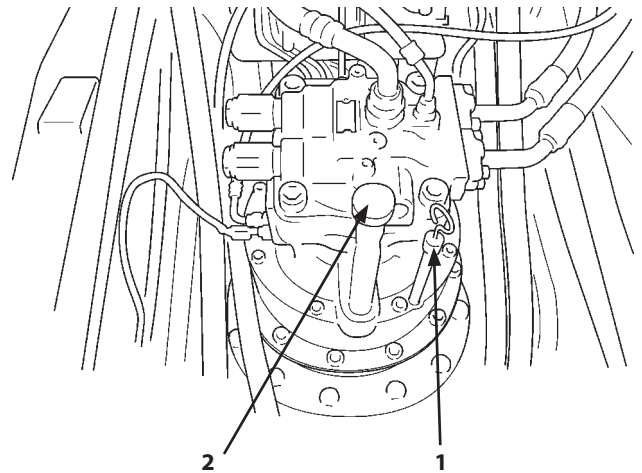
2 Swing Reduction Gear

Check Oil Level --- every 250 hours

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

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

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



M178-07-086

Change Gear Oil --- every 1000 hours

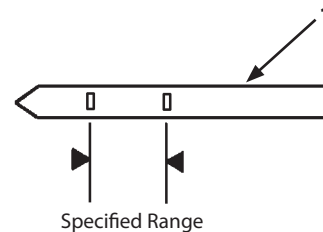
1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

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

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

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

7. Remove the drain plug mounted on the end of drain pipe to drain oil.
8. Reinstall the drain plug.
9. Remove oil filler cap (2) and add oil until it is between the marks on dipstick (1).
10. Reinstall oil filler cap (2).



M104-07-017

MAINTENANCE

3 Travel Reduction Gear

Check Oil Level --- every 250 hours

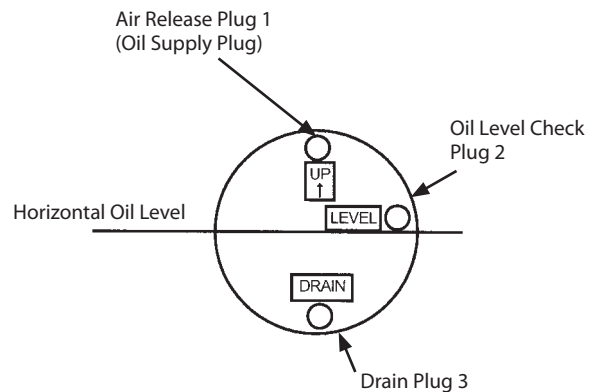
1. Park the machine on a level surface.
2. Rotate the travel motor until the imaginary line through plug (1) and plug (3) is vertical.
3. Lower the bucket to the ground.
4. Turn the auto-idle switch off.

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

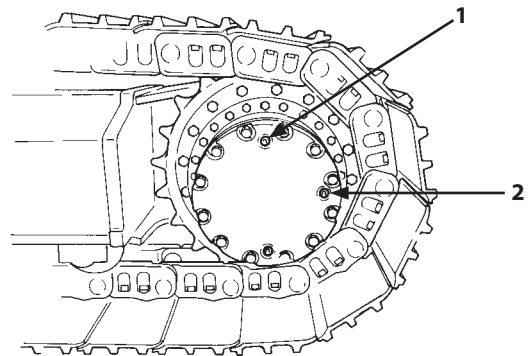
5. Run the engine at slow idle speed without load for five minutes.
6. Stop the engine. Remove the key from the key switch.
7. Pull the pilot control shut-off lever to the LOCK position.

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

8. After gear oil has cooled, slowly loosen air release plug (1) to release pressure.
9. Remove air release plug (1) and oil level check plug (2). Oil must be up to the bottom of hole.
10. If necessary, add oil until oil flows out of 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 50 N·m (5 kgf·m).
12. Check the gear oil level in the other travel reduction gear.



M104-07-019



M157-07-170

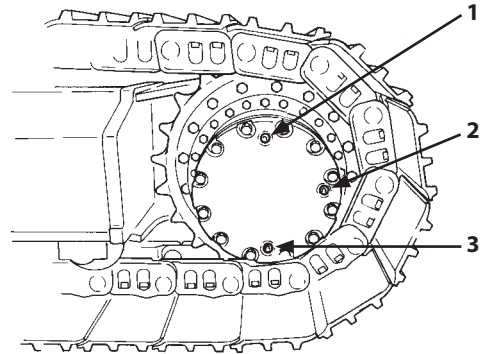
MAINTENANCE

Change Gear Oil --- every 2000 hours

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

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

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



M157-07-170

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

8. After gear oil has cooled, slowly loosen air release plug (1) to release pressure, and temporarily retighten plug (1).
9. Remove drain plug (3) and plug (1), in that order, to drain oil.
10. Clean drain plug (3). Wrap the threads of drain plug (3) with sealing-type tape. Install plug (3). Tighten plug (3).
Tightening Torque: 50 N·m (5 kgf·m)
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: 50 N·m (5 kgf·m)
14. Repeat steps 8. to 13. for the other travel reduction gear.

MAINTENANCE

D. HYDRAULIC SYSTEM

INSPECTION AND MAINTENANCE OF HYDRAULIC EQUIPMENT



CAUTION: During operation, the parts of the hydraulic system become very hot.
Allow the machine to cool down before beginning inspection or maintenance.

1. Be sure that the machine is parked on a level, firm surface before servicing hydraulic equipment.
2. Lower the bucket to the ground and stop the engine.
3. Begin servicing hydraulic components only after components, hydraulic oil and lubricants are completely cooled, and after releasing residual pressure.
 - 3.1 Bleed air from the hydraulic oil tank to release internal pressure.
 - 3.2 Allow the machine to cool down.
Note that servicing heated and pressurized hydraulic components may cause hot parts and/or oil to fly off or escape suddenly, possibly resulting in personal injury.
 - 3.3 Keep body parts and face away from plugs or screws when removing them.
Hydraulic components may be pressurized even when cooled.
 - 3.4 Never attempt to service or inspect the travel and swing motor circuits on slopes. They are highly pressurized due to self-weight.
4. When connecting hydraulic hoses and pipes, take special care to keep seal surfaces free from dirt and to avoid damaging them. Keep these precautions in mind:
 - 4.1 Wash hoses, pipes, and the tank interior with a washing liquid and thoroughly wipe it out before reconnecting them.
 - 4.2 Only use O-rings that are free of damage or defects. Be careful not to damage them during reassembly.
 - 4.3 Do not allow high pressure hoses to twist when connecting them. The life of twisted hoses will be shortened considerably.
 - 4.4 Carefully tighten low pressure hose clamps.
Do not overtighten them.

MAINTENANCE

5. When adding hydraulic oil, always use the same brand of oil; do not mix brands of oil. As the machine is filled with Super EX 46 HN when it is shipped from the factory, use it as a general rule. When selecting to use another brand of oil listed in the table "Brand names of recommended hydraulic oil", be sure to completely change the oil in the system.
6. Do not use hydraulic oils other than those listed in the table "Brand names of recommended hydraulic oil".
7. Never run the engine without oil in the hydraulic oil tank.

MAINTENANCE

BREAKER MAINTENANCE

Change Hydraulic Oil and Replace Hydraulic Oil Tank Filter

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

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

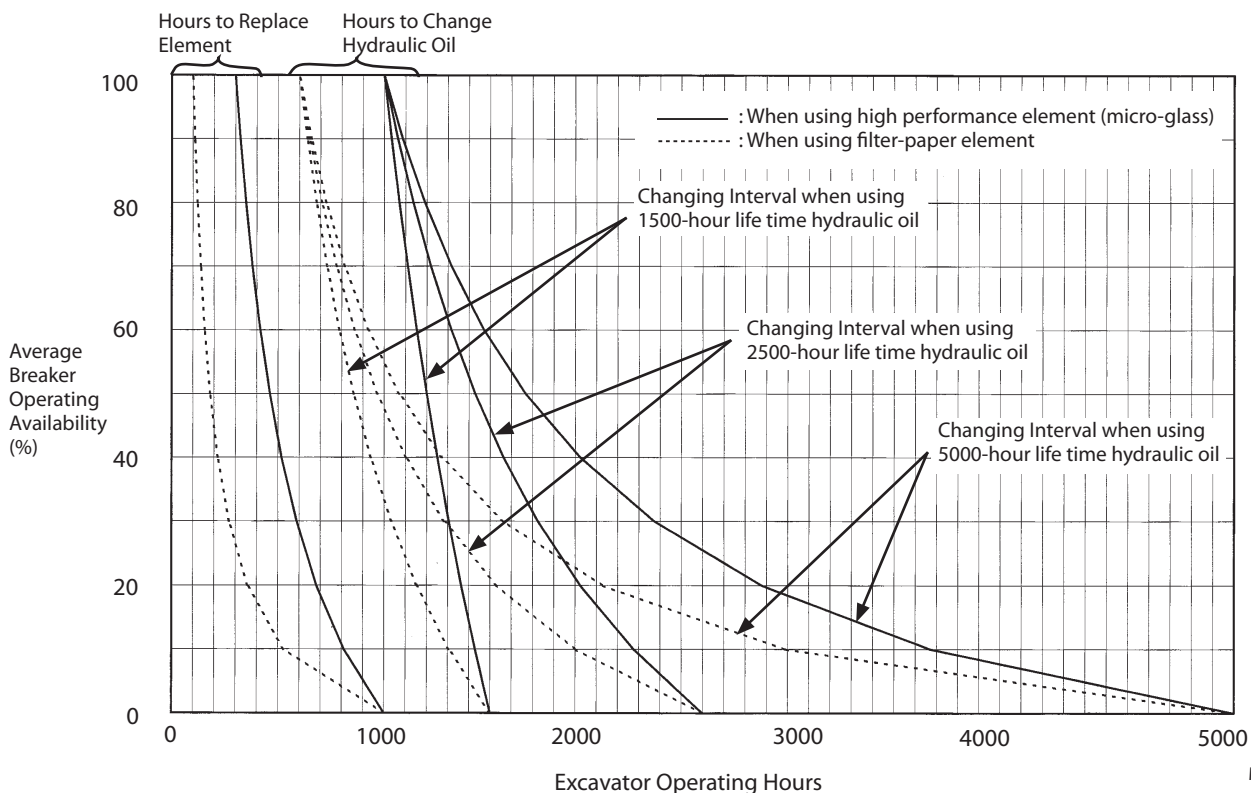
Changing intervals (Hours)

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

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

** : Use the high performance element (micro-glass) on excavators engaged in demolition and logging work (K Model, L Model).

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



M1U1-05-006

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

NOTE: K Model and L Model are equipped with a full-flow filter restriction indicator. If a filter-paper element is used, this indicator does not operate. (Refer to the Hydraulic System in the Maintenance section.)

MAINTENANCE

1 Check Hydraulic Oil Level --- daily

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

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

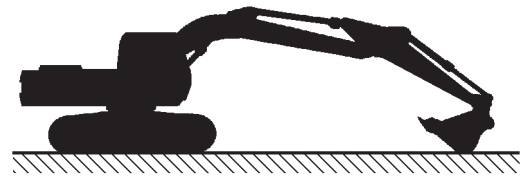
IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.

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

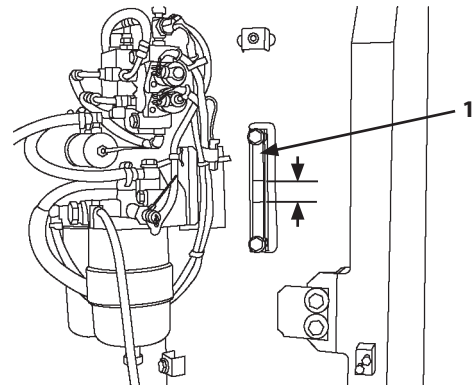
CAUTION: The hydraulic oil tank is pressurized. Push the pressure release button on the tank cap to release pressure, and carefully remove the cap.

To add oil:

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

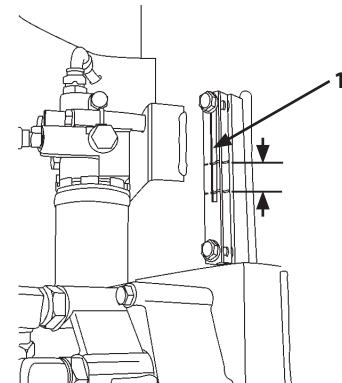


M104-07-021



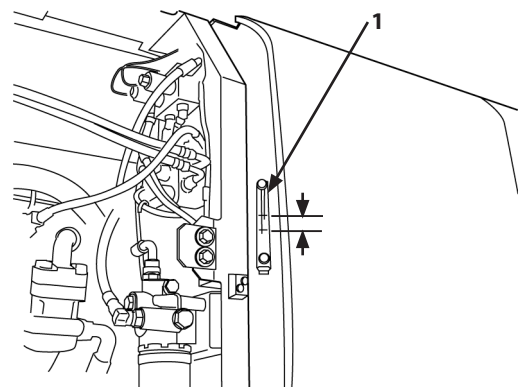
ZX120-3 Class

M1U1-07-102



ZX180-3 Class

M1U1-07-075



ZX200-3, 270-3, 330-3 Class

M1U1-07-048

MAINTENANCE

2 Change Hydraulic Oil

3 Suction Filter Cleaning

Std. Model --- every 5000 hours, 2500 hours or 1500 hours

K Model , L Model --- every 1000 hours

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

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

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

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

5. Run the engine at slow idle speed without load for five minutes.
6. Stop the engine. Remove the key from the key switch.
7. Pull the pilot control shut-off lever to the LOCK position.
8. Clean the top of the hydraulic oil tank to keep dirt out of the hydraulic system.

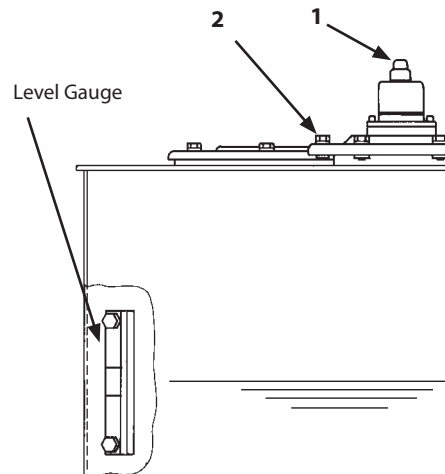
CAUTION: The hydraulic oil tank is pressurized. Push pressure release button (1) on the air breather before removing the air breather.

9. Push pressure release button (1) on the air breather.
10. Remove cover (2).
11. Remove oil using a suction pump. The hydraulic oil tank capacity, up to specified oil level, is approximately A.

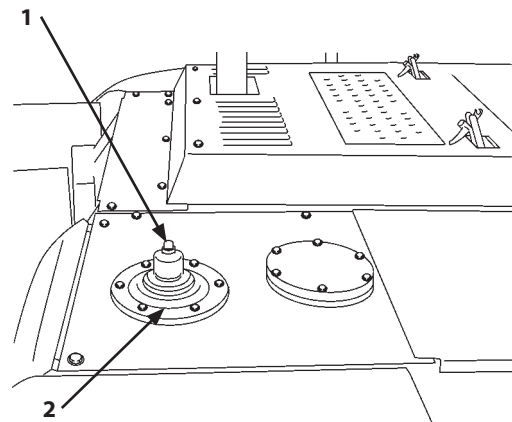
Model	A
ZX120-3 Class	130 L (34.3 US gal)
ZX180-3 Class	190 L (50.2 US gal)
ZX200-3 Class	200 L (52.8 US gal)
ZX270-3 Class	243 L (64.2 US gal)
ZX330-3 Class	298 L (78.7 US gal)



M104-07-117



M157-07-016



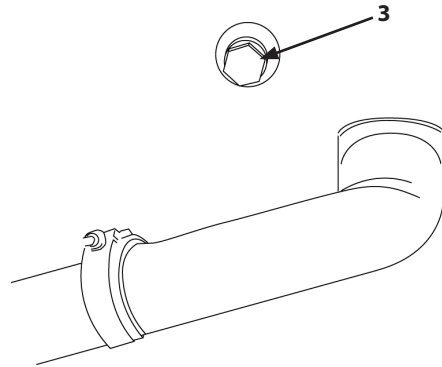
M1U1-07-042

MAINTENANCE

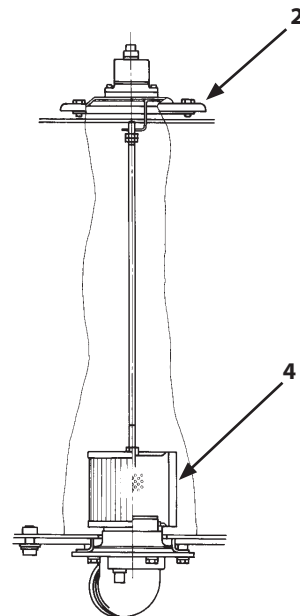
12. Remove drain plug (3). Allow oil to drain.
13. Remove suction filter and rod assembly (4).
14. Clean the filter and tank interior. If the filter is to be replaced, install new filter on the rod as shown. Tighten nut to 15 to 20 N•m (1.5 to 2.0 kgf•m, 11.0 to 14.5 lbf•ft).

Model	A
ZX120-3 Class	732 mm (28.8 in)
ZX180-3, 200-3, 270-3, 330-3 Class	869 mm (34.2 in)

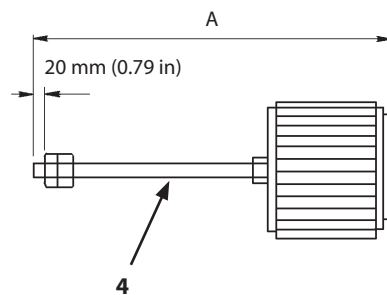
15. Install filter and rod assembly (4). Make sure the filter is positioned correctly on the outlet.
16. Replace the hydraulic tank oil filter. (See "Maintenance Every 500 Hours" Section)
17. Clean, install and tighten drain plug (3).
18. Add oil until it is between the marks on the oil level gauge.
19. Install cover (2). Make sure filter and rod assembly (4) are in correct positions. Tighten the bolts to 50 N•m (5 kgf•m, 36 lbf•ft).
20. Be sure to bleed air from the system following the procedures shown next page.



M1U1-07-047



M157-07-062



M107-07-070

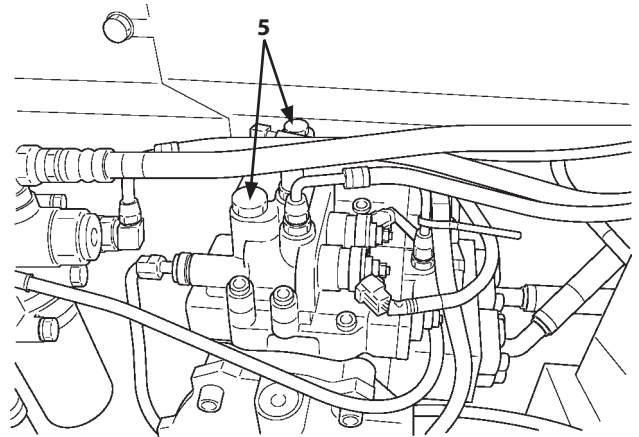
MAINTENANCE

Air Bleeding Procedures

IMPORTANT: If the hydraulic pump is not filled with oil, it will be damaged when the engine is started.

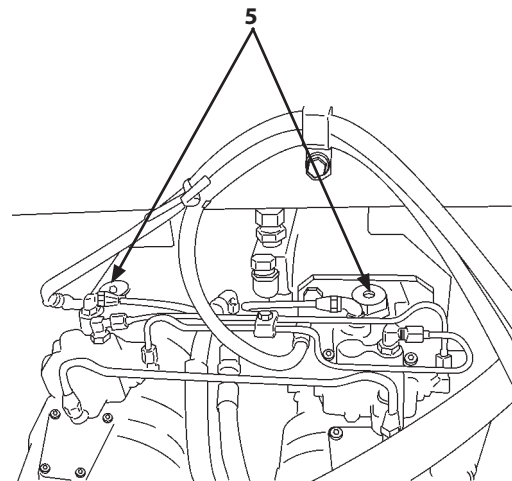
The machine is equipped with two main pumps. Bleed air from these pumps after changing hydraulic oil.

1. Remove air bleed plug (5) on each pump.
2. Fill the pump with oil through air bleed plug (5) port on each pump until oil flows out of air bleed plug (5) hole.
3. Temporarily tighten air bleed plug (5) on each pump, start the engine and run at slow idle. Loosen one of air bleed plugs (5) slightly until oil flows from plug port to release trapped air completely. Tighten air bleed plug (5). Repeat this step for the rest of plugs (5).
4. Purge air from the hydraulic system by running the engine at slow idle and operating the control levers slowly and smoothly for 15 minutes.
5. Position the machine as illustrated in the oil level checking procedure.
6. Lower the bucket to the ground.
7. Turn the auto-idle switch off.
8. Stop the engine. Remove the key from the key switch.
9. Pull the pilot control shut-off lever to the LOCK position
10. Check the hydraulic oil tank gauge. Remove cover (2) to add oil if necessary.



ZX120-3 Class

M175-07-005



ZX180-3, 200-3, 270-3, 330-3 Class

M1U1-07-035

MAINTENANCE

4 Replace Hydraulic Oil Tank Filter --- every 1000 hours

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

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

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



SA-039

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

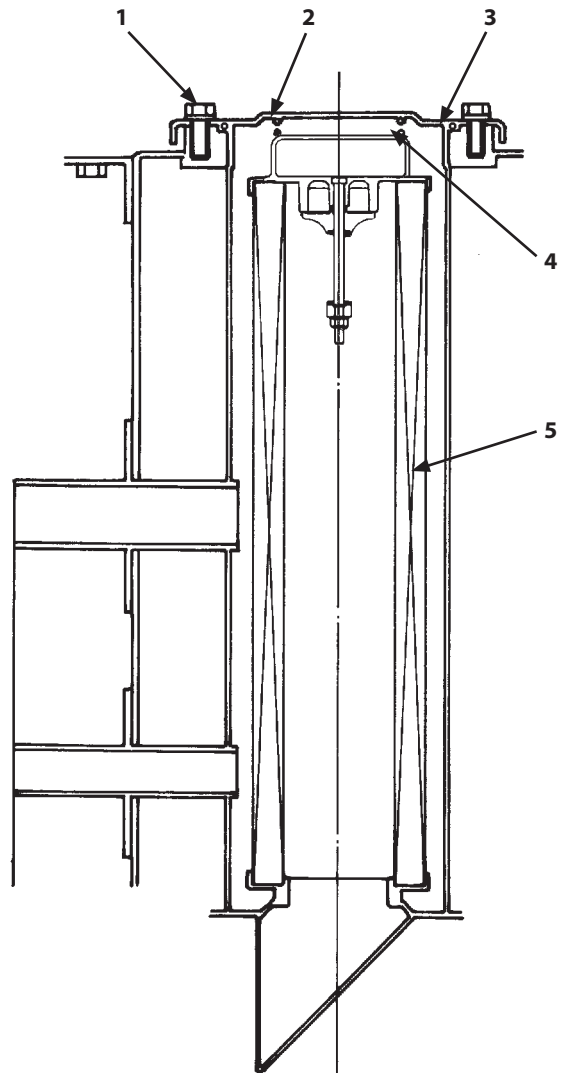
7. Push the pressure release button on the hydraulic oil tank to release pressure.

NOTE: There is spring (4) tension under cover (2). Hold down cover (2) when removing last two bolts (1).

8. Hold down filter cover (2) against light spring (4) load when removing last two bolts (1). Remove filter cover (2).
9. Remove spring (4), and element (5).

NOTE: Remove element (5) and inspect for metal particles and debris in the bottom of the filter can. Excessive amounts of brass and steel particles can indicate a failed hydraulic pump, motor, valve or an impending failure. A rubber type of material can indicate cylinder packing failure.

10. Discard element (5) and O-ring (3).
11. Install a new element (5) and spring (4).
12. Install filter cover (2) with a new O-ring (3).
13. Install and tighten bolts (1) to 50 N•m (5 kgf•m, 36 lbf•ft).



M178-07-069

MAINTENANCE

5 Replace Pilot Oil Filter --- every 1000 hours

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

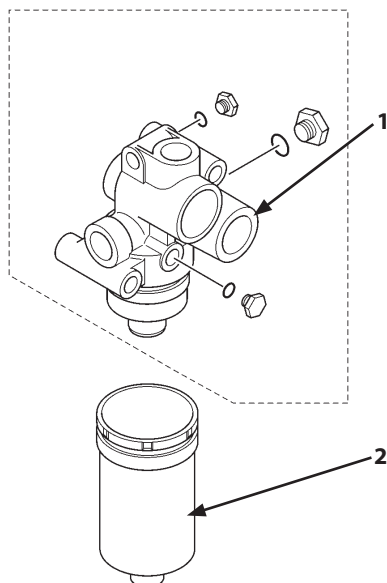
IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.

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

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

7. Remove the filter cartridges of pilot oil filter (2) by turning it counterclockwise with the filter wrench.
8. Clean the filter O-ring contact area on filter head (1).
9. Apply a thin film of clean oil to the gasket of new filter (2).
10. Install new filter (2). Turn the filter cartridge clockwise by hand until the O-ring touches the contact area. Be sure not to damage the O-ring when installing filter (2).

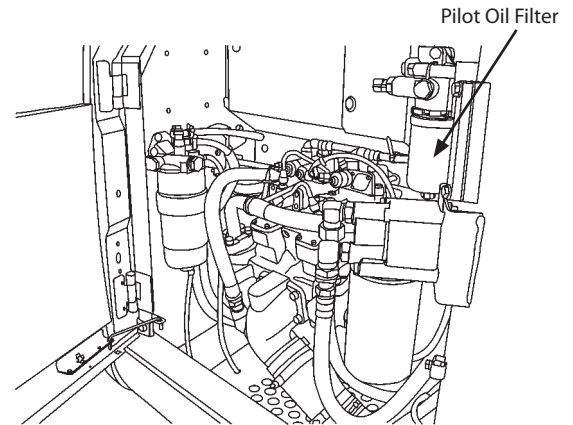
IMPORTANT: Do not re-use the filter cartridge.



M1U1-07-050

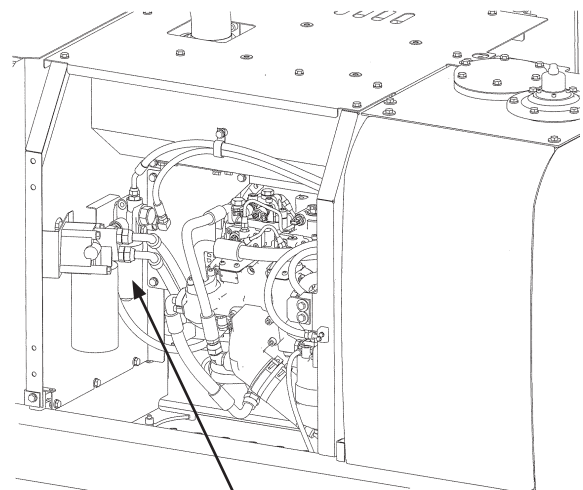


M104-07-021



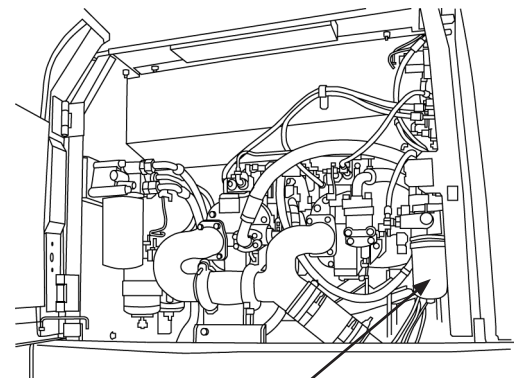
ZX180-3 Class

M1U1-07-098



Pilot Oil Filter
ZX120-3, 200-3, 270-3 Class

M1U1-07-070



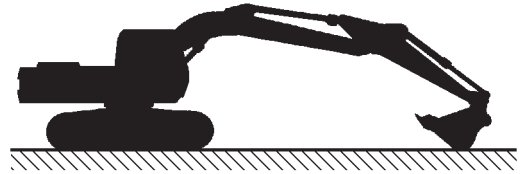
Pilot Oil Filter
ZX330-3 Class

M1U1-07-014

MAINTENANCE

6 Replace Air Breather Element --- every 4000 hours

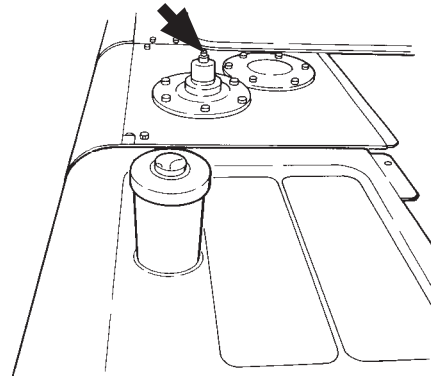
CAUTION: Hydraulic oil may be hot just after operation. Hot hydraulic oil may spout, possibly causing severe burns. Be sure to wait for oil to cool before starting work.



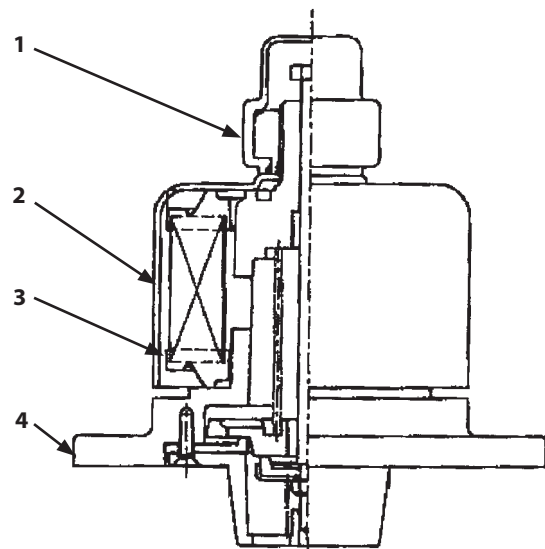
M104-07-021

Replacement Procedures

1. Park the machine on solid and level ground. Fully extend the bucket cylinder, fully retract the arm cylinder, and lower the bucket to the ground as illustrated to the right. Stop the engine.
2. Before replacing element (3), be sure to bleed air pressure from the hydraulic oil tank by pressing the air bleed valve on the hydraulic oil tank.
3. Turn cover (2) clockwise about 1/4 turn. Turn cap (1) counterclockwise to remove it.
4. Turn cover (2) counterclockwise to remove it. Then, remove element (3).
5. Install new element (3). Tighten to install cover (2) until cover (2) comes in contact with 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 rotate, securely tighten cover (2) by rotating counterclockwise 5 to 10° by hand.
7. Take care never to allow water and/or contaminant to stay between cover (2) and body (4) (air breathing port).
8. Replace element (3) periodically to keep hydraulic oil clean and to extend hydraulic components service life.



M157-07-185



M1G6-07-001

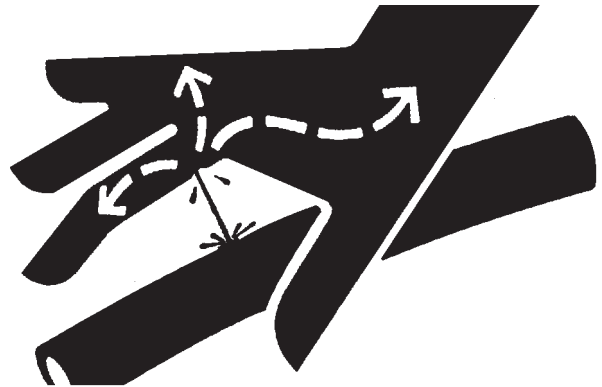
MAINTENANCE

7 Check Hoses and Lines

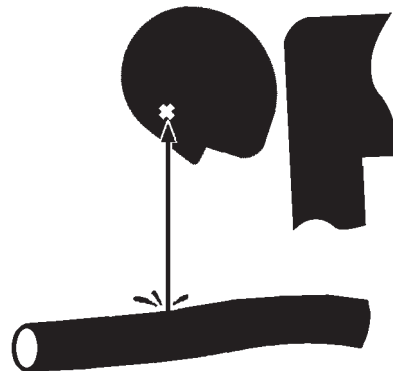
- daily
- every 250 hours

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. To avoid this hazard, search for leaks with a piece of cardboard. Take care to protect hands and body from high-pressure fluids. If an accident occurs, see a doctor familiar with this type of injury immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.

- CAUTION:** Hydraulic oil and lubricant leaks can lead to fire that may result in serious injury. To avoid this hazard :
- Park the machine on a firm, level surface.
Lower the bucket to the ground.
Stop the engine. Remove key from the key switch.
Pull the pilot control shut-off lever to the LOCK position.
 - Check for missing or loose clamps, kinked hoses, lines or hoses that rub against each other, damaged oil cooler, and loose oil cooler flange bolts, for leaks.
Check hoses, lines and oil cooler at the check points indicated below for leaks and other damage that may result in future leaks.
If any abnormalities are found, replace or retighten them, as shown in Tables 1-3.
 - Tighten, repair or replace any missing, loose or damaged clamps, hoses, lines, oil cooler, and loose oil cooler flange bolts.
Do not bend or strike high-pressure lines.
Never install bent or damaged hoses or lines.



SA-031



SA-292

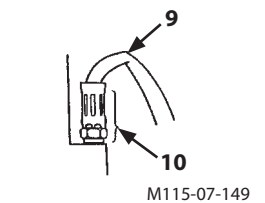
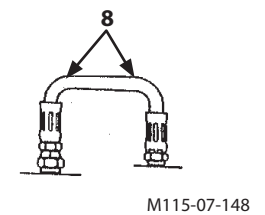
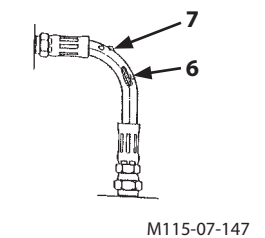
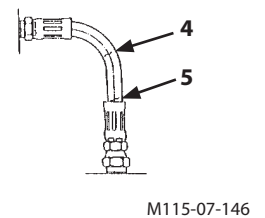
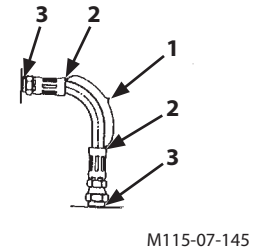
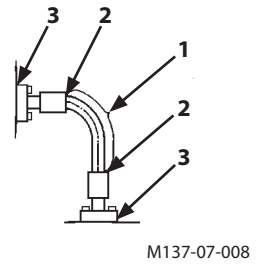


SA-044

MAINTENANCE

Table 1. Hoses

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
Every 250 hours	Hose covers	Crack (4)	Replace
	Hose ends	Crack (5)	Replace
	Hose covers	Exposed reinforcement (6)	Replace
	Hose covers	Blister (7)	Replace
	Hose	Bend (8)	Replace
	Hose	Collapse (9)	Replace (Use proper bend radius)
	Hose ends and fittings	Deformation or corrosion (10)	Replace



NOTE: Refer to the illustrations in Fig.1 for each check point location or for a description of the abnormality. Use genuine Hitachi parts.

Fig. 1

MAINTENANCE

Table 2. Lines

Interval (hours)	Check Points	Abnormalities	Remedies
Daily	Contact surfaces of flange joints	Leak (11)	Replace O-ring and/or retighten bolts
	Welded surfaces on joints	Leak (12)	Replace
Every 250 hours	Joint neck	Crack (13)	Replace
	Welded surfaces on joints	Crack (12)	Replace
	Clamps	Missing Deformation Loose	Replace Replace Retighten

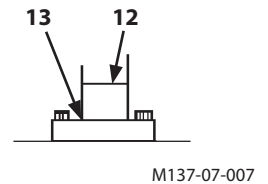
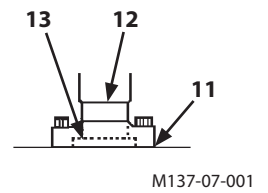


Fig. 2

Table 3. Hose and Lines

Interval (hours)	Check Points	Abnormalities	Remedies
Daily Check	Flexible master coupling	Leak (14)	Replace or retighten

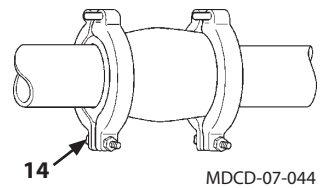


Fig. 3

Table 4. Oil cooler

Interval (hours)	Check Points	Abnormalities	Remedies
Every 250 hours	Contact surfaces of flange joints	Leak (15)	Replace O-ring and/or retighten bolts
	Oil cooler	Leak (16)	Replace
	Coupling and rubber hose	Leak (17)	Retighten or replace

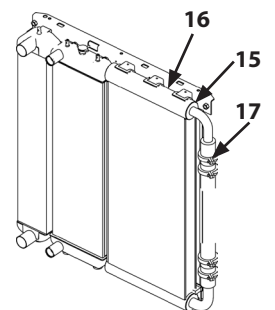


Fig. 4

NOTE: Refer to the illustrations in Fig. 2,3 and 4 for each check point location or for a description of the abnormality. Use genuine Hitachi parts.

MAINTENANCE

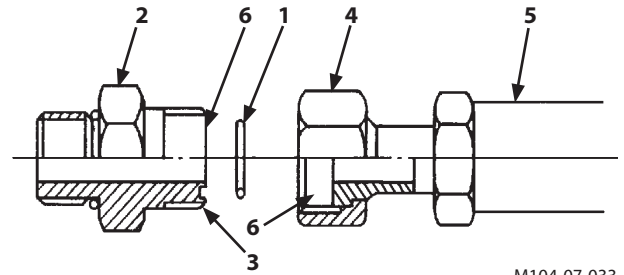
SERVICE RECOMMENDATIONS FOR HYDRAULIC FITTINGS

Two hydraulic fitting designs are used on this machine.

Flat Face O-ring Seal Fitting (ORS Fitting)

An O-ring is used on the sealing surfaces to prevent oil leakage.

1. Inspect fitting sealing surfaces (6). They must be free of dirt or defects.
2. Replace O-ring (1) with a new one when assembling fitting (2).
3. Lubricate O-ring (1) and install it into groove (3) using petroleum jelly to hold it in place.
4. Tighten fitting (2) by hand, pressing the fitting joint together to ensure O-ring (1) remains in place and is not damaged.
5. Tighten fitting (2) or nut (4) to the torque values shown. Do not allow hose (5) to twist when tightening fittings.
6. Check for leaks. If oil leaks from a loose connection, do not tighten fitting (2). Open the connection, replace O-ring (1) and check for correct O-ring position before tightening the connection.



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Torque specifications		±10%			
Width across flats (mm)		27	32	36	41,46
Fastening torque	N•m	95	140	180	210
	(kgf•m)	(9.5)	(14)	(18)	(21)

MAINTENANCE

Metal Face Seal Fittings

Fittings are used on smaller hoses and consist of a metal flare (10) and a metal flare seat (9).

1. Inspect flare (10) and flare seat (9). They must be free of dirt or obvious defects.

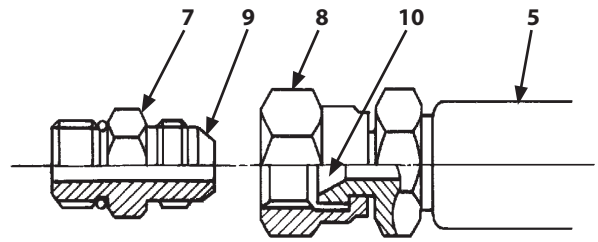
IMPORTANT: Defects in the tube flare cannot be repaired. Overtightening a defective flare fitting will not stop a leak.

2. Tighten fitting (7) by hand.
3. Tighten fitting (7) or nut (8) to the torque values shown.
Do not allow hose (5) to twist when tightening fittings.

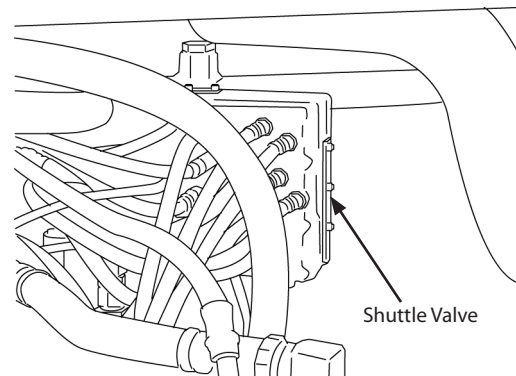
Width across flats (mm)		17	19	22	27
Fastening torque	N•m	25	30	40	80
	(kgf•m)	(2.5)	(3)	(4)	(8)

Pilot Piping Fittings (For shuttle valve)

Width across flats (mm)		17, 19
Fastening torque	N•m	35
	(kgf•m)	(3.5)



M202-07-051



M1U1-07-043

MAINTENANCE

E. FUEL SYSTEM

Recommended Fuel

Use high quality DIESEL FUEL only (JIS K-2204) (ASTM 2-D). Kerosene must NOT be used.

Refueling

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

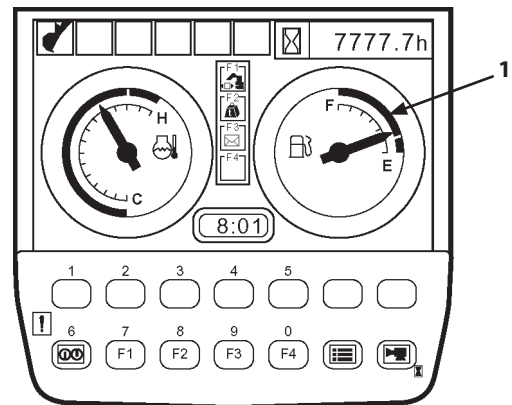
IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.

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

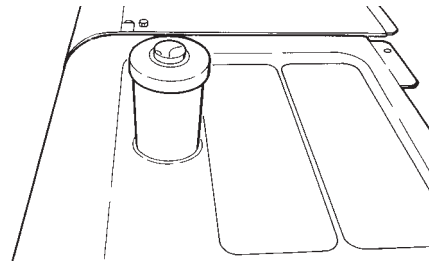
CAUTION: Handle fuel carefully. Shut the engine off before fueling. Do not smoke while you fill the fuel tank or work on fuel system.

7. Check fuel level gauge (3) or fuel gauge (1) of the monitor panel. Add fuel if necessary.

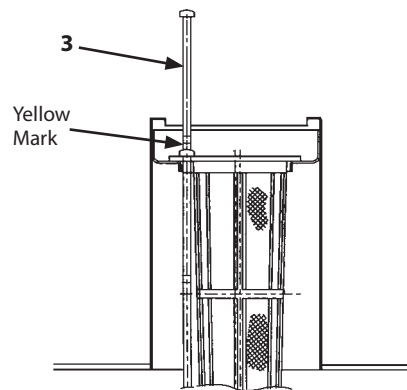
IMPORTANT: Keep all dirt, dust, water and other foreign materials out of the fuel system.



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MAINTENANCE

8. To avoid condensation, fill the tank at the end of each day's operation. Take care not to spill fuel on the machine or ground.

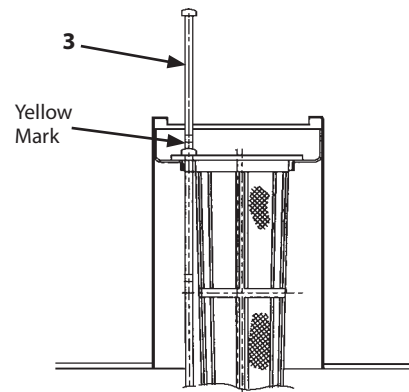
Model	Tank Capacity
ZX120-3 Class	250 L (66 US gal)
ZX180-3 Class	320 L (85 US gal)
ZX200-3 Class	400 L (106 US gal)
ZX270-3 Class	500 L (132 US gal)
ZX330-3 Class	630 L (166 US gal)

Do not fill the tank more than specified. Stop filling when a yellow mark on fuel level gauge (3) becomes visible. Be sure to position the fuel service nozzle so that any part of the nozzle does not obstruct rising of float-type fuel level gauge (3).

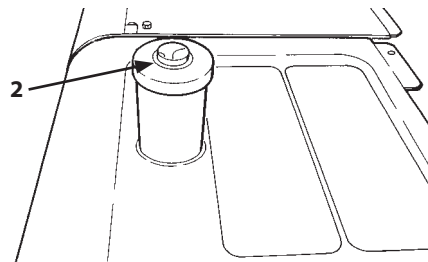
9. Reinstall filler cap (2) on the filler tube. Be sure to lock filler cap (2) with the key to prevent the cap from being lost as well as to prevent vandalism.

NOTE: Take precautions for Fueling with Automatic Fueling Device (Optional).

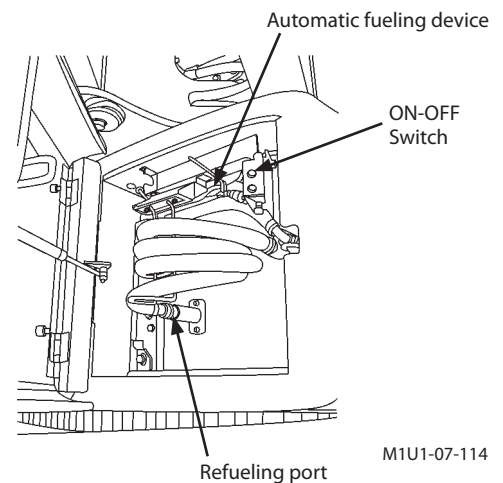
Avoid overfilling. Never fail to remove filler cap (2) when refueling with the automatic fueling device and be sure to stop fueling when the yellow mark on the float becomes visible.



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MAINTENANCE

1 Drain Fuel Tank Sump --- daily

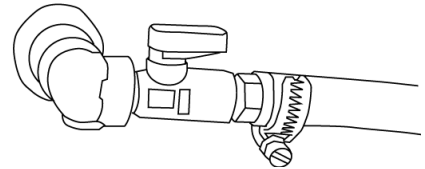
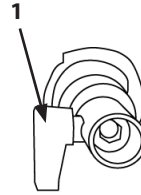
1. Park the machine on a level surface with the upperstructure rotated 90° for easier access.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.



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

4. Run the engine at slow idle speed without load for five minutes.
5. Turn the key switch OFF. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.
7. Open drain cock (1) for several seconds to drain water and sediment. Close drain cock (1).



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MAINTENANCE

2 Drain Fuel Filter --- daily

IMPORTANT: The engine may be damaged if you do not drain fuel filter daily.
Fuel main filter and pre-filter separates that may mixed with the fuel.

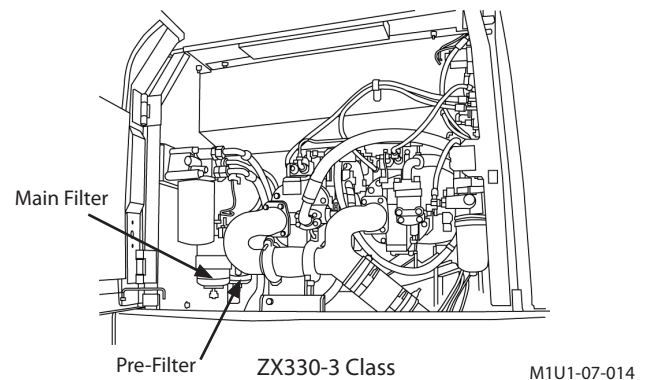
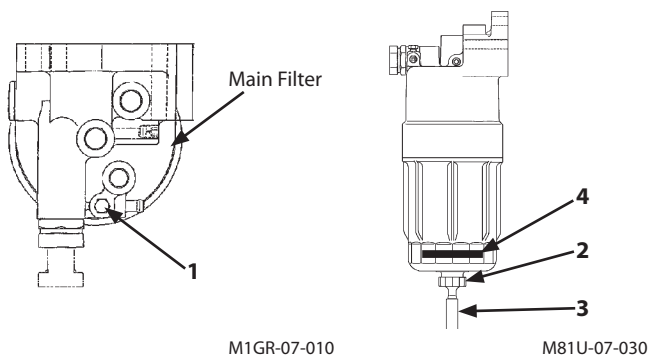
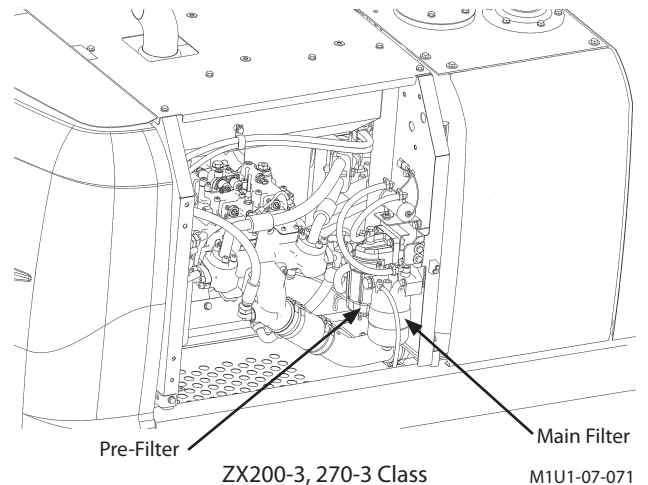
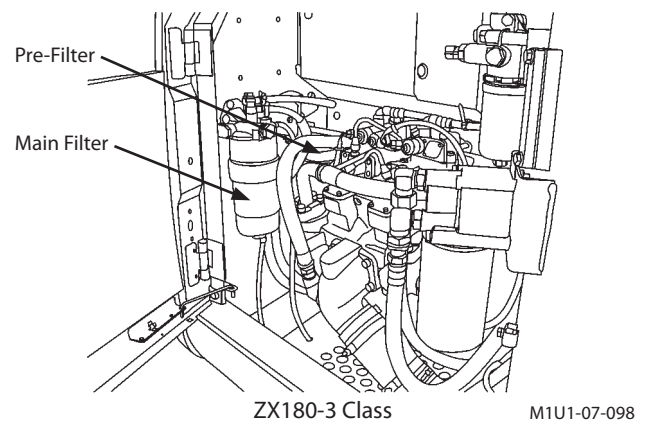
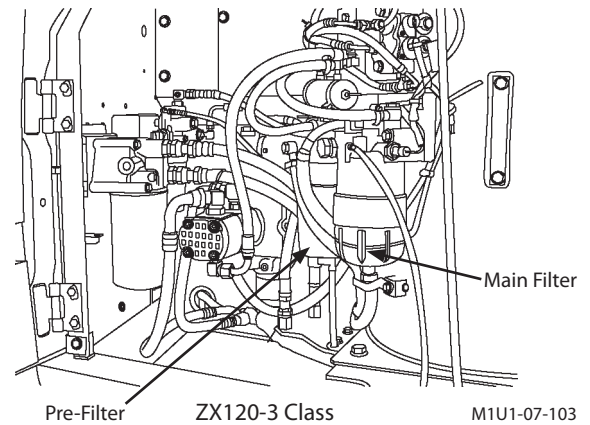
Fuel filter contains a float (4) which rises as water accumulates.

Be sure to drain daily the water accumulated in the filter until float (4) goes to the bottom of case.

Draining Procedures (Main Filter)

1. Place 0.5 liters or larger capacity container under drain hose (3) to collect the drained water.
2. Rotate drain plug (2) on the bottom of the filter about 4-turns counterclockwise. Drain the water accumulated in the filter until float (4) goes to the bottom of case. If it is difficult to drain, loosen plug (1) on the top of the main filter.
3. After draining water, securely tighten drain plug (2) and plug (1).
4. Start the engine. Check drain plug (2) and plug (1) for fuel leaks.

Wrench size: 10 mm



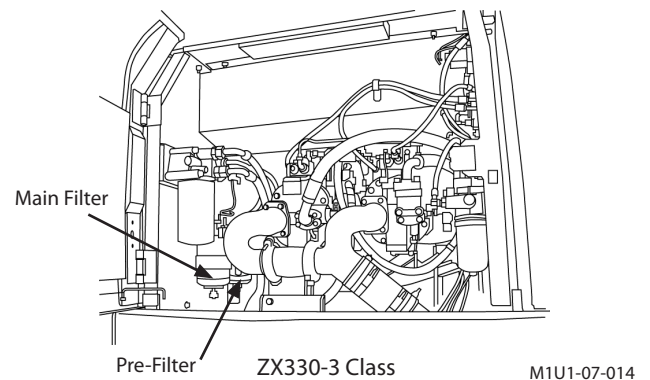
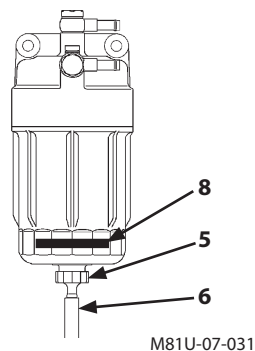
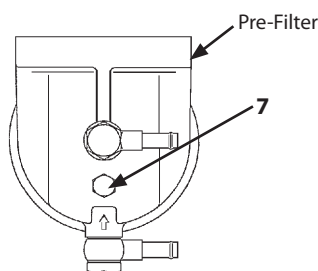
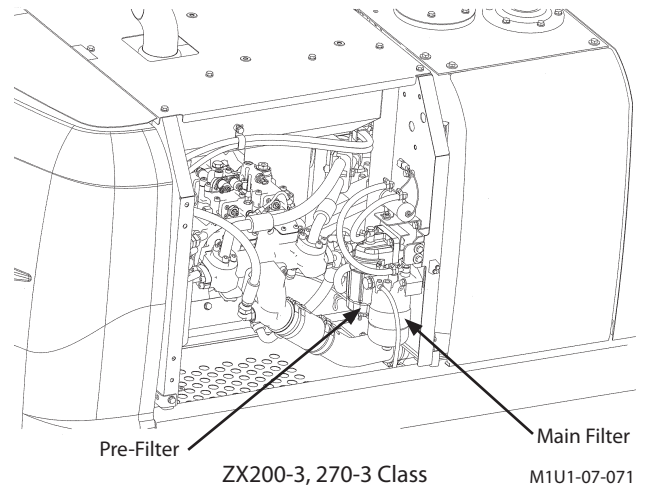
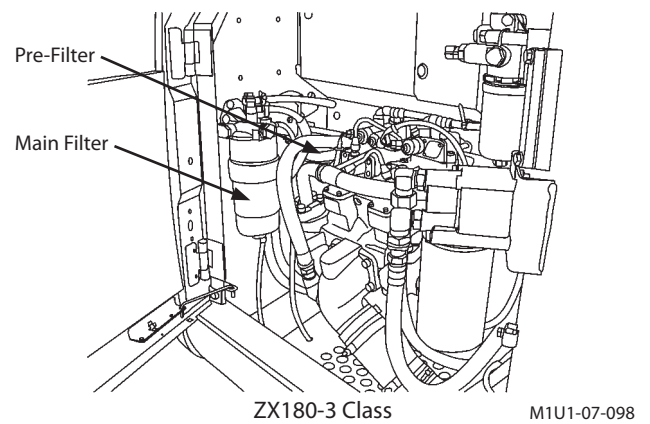
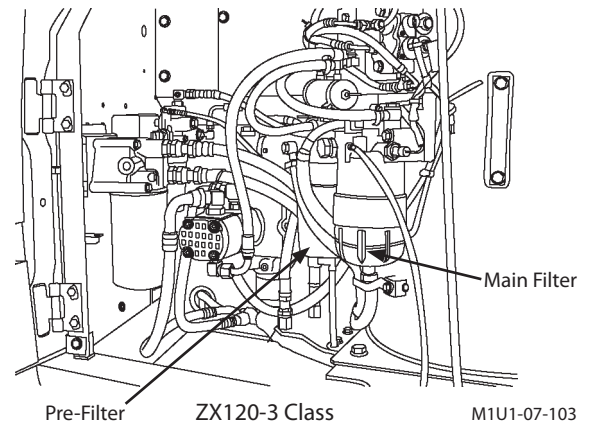
MAINTENANCE

Draining Procedures (Pre-Filter)

1. Place 0.5 liters or larger capacity container under drain hose (6) to collect the drained water.
2. Rotate drain plug (5) on the bottom of the filter counterclockwise. Drain the water accumulated in the filter until float (8) goes to the bottom of case. If it is difficult to drain, loosen plug (7) on the top of the fuel pre-filter.
3. After draining water, securely tighten drain plug (5) and plug (7).
4. Start the engine. Check drain plug (5) and plug (7) for fuel leaks.

IMPORTANT: After draining water mixed in fuel, bleed air from the fuel supply system.

Wrench size: 14 mm



MAINTENANCE

Air Bleeding Procedures

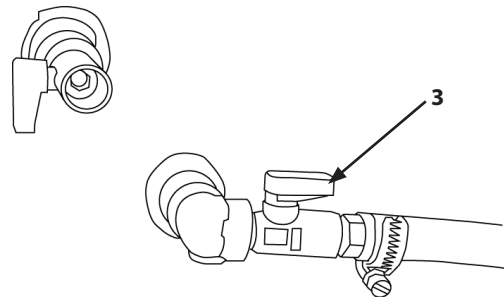
IMPORTANT: Air in the fuel system may make the engine hard to start or make it run irregularly. After draining water and sediment from the fuel filter, replacing the fuel filter, cleaning the fuel solenoid pump strainer or running the fuel tank dry, be sure to bleed the air from the fuel system.

This machine is equipped with a fuel solenoid pump.

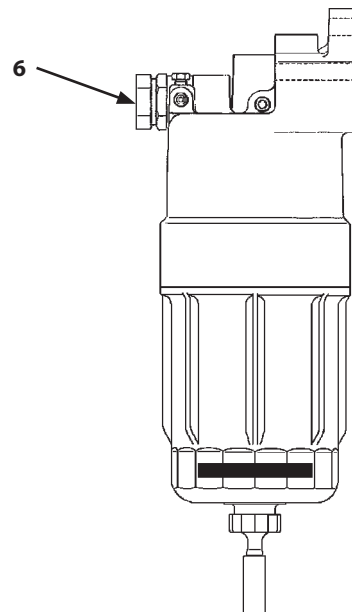
CAUTION: Fuel leaks may lead to fires.

1. Check that fuel cock (3) on the bottom of the fuel tank is opened.
2. Turn the key switch ON and hold it in that position for approx. 3 minutes. Thereby, the electrical fuel pump operates, starting to bleed air.
3. While holding the key switch in the ON position, reciprocate fuel main filter priming pump (6). After air is bled from the main filter, return priming pump (6) to the original position.
4. After the main filter is filled with fuel, hold the key switch in the ON position for 30 seconds.
5. Start the engine. Check the fuel supply system for fuel leaks.

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. Then, after waiting for more than 30 seconds, turn the key switch ON again. Failure to do so may cause damage to the electrical pump and/or discharging the batteries.



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M81U-07-030

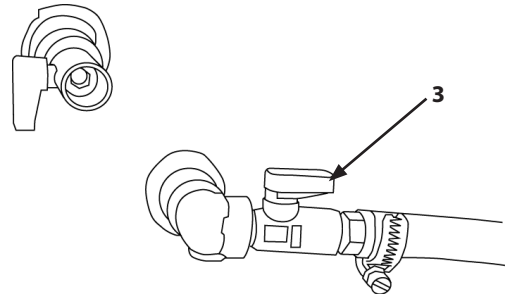
MAINTENANCE

Air Bleeding by Priming Pump

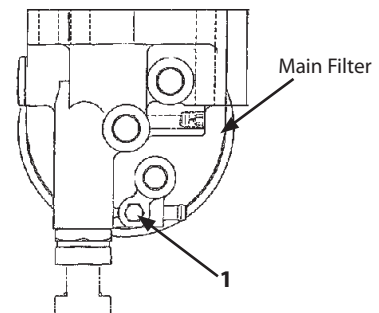
In case air is not bled due to malfunction of the fuel solenoid pump, operating the priming pump only can bleed air.

1. Check that fuel cock (3) on the bottom of the fuel tank is opened.
2. Loosen air bleed plug (1) on the fuel main filter.
3. Supply fuel by reciprocating priming pump (6). After no air bubbles are spouted through air bleed plug (1), tighten air bleed plug (1).
4. After tightening air bleed plug (1), reciprocate priming pump (6) approx. 150 strokes.
5. Wipe off any spilled fuel.
6. Start the engine. Check that no fuel leaks are present. If the engine does not start, repeat the above procedures from step 1.

Wrench size: 10 mm



M1U1-07-015



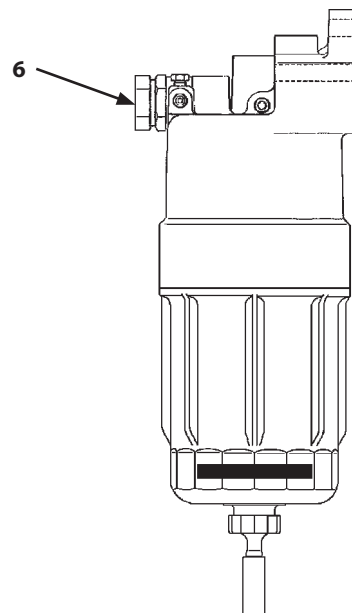
M1GR-07-010

Air Bleeding by Cranking

Bleed air from the fuel system after changing the common rail.

Bleeding Procedures

1. Bleed air until the engine supply pump entrance enough according to the above-mentioned procedures.
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, then try again.



M81U-07-030

MAINTENANCE

3 Replace Fuel Main Filter Element --- every 500 hours

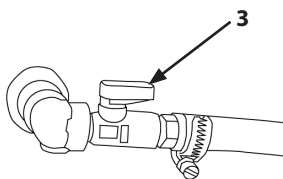
IMPORTANT: Be sure to use only genuine Hitachi elements for the main fuel filter element and the pre-filter element. Failure to do so may deteriorate the engine performance and/or shorten the engine service life. Please be noted that all engine failures caused by using other manufacturers' elements are excluded from Hitachi Warranty Policy.

Procedures:

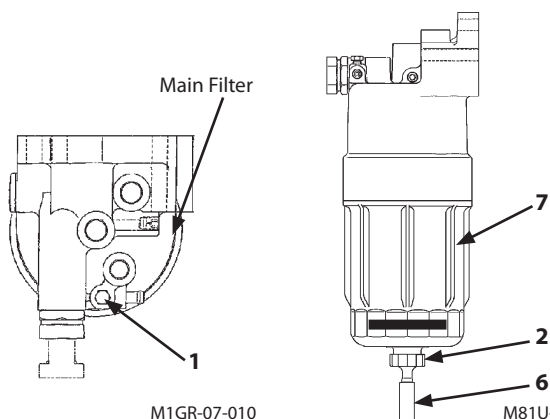
1. Close cock (3) on the bottom of the fuel tank.
2. Place a 1-liter or larger capacity drain container under drain hose (6).
3. Loosen air bleed plug (1) and drain plug (2). Drain fuel until fuel does not flow out of the filter.
4. Remove transparent filter case (7) using the exclusive tool.
5. When transparent filter case (7) is removed, the element is exposed. Remove the element by hand.
6. Install a new element. Tighten transparent filter case (7) to 30 ± 2 N·m (3 ± 0.2 kgf·m) using the exclusive tool.
7. Tighten air bleed plug (1) and drain plug (2).
8. Open cock (3) on the bottom of the fuel tank.
9. Bleed air from the fuel supply system.

After replacing the fuel filter element, bleed air from the fuel supply system. (Refer to the air bleed procedures described on page 7-55.)

Wrench size: 10 mm

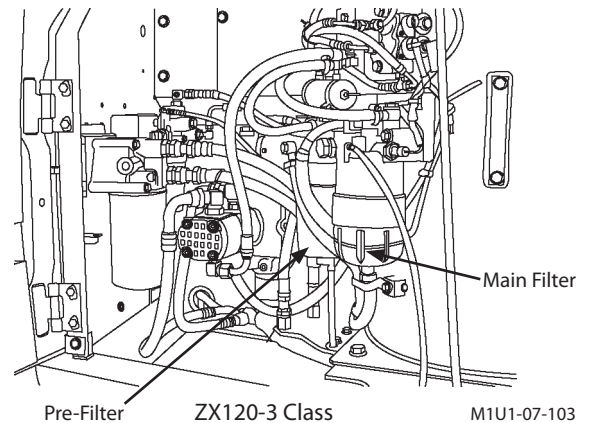


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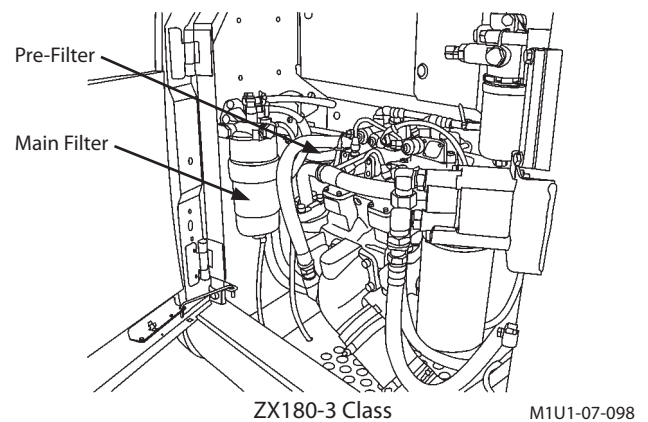


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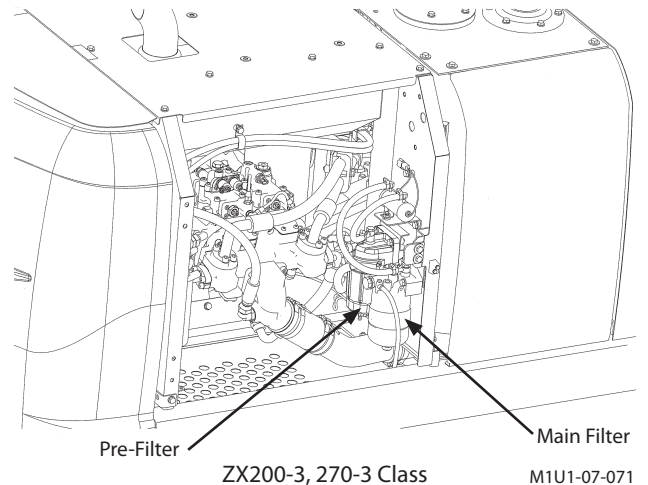
M81U-07-030



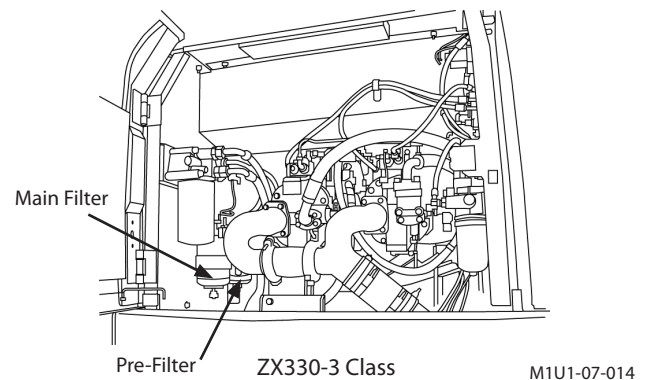
M1U1-07-103



M1U1-07-098



M1U1-07-071



M1U1-07-014

MAINTENANCE

4 Replace Fuel Pre-Filter Element --- every 500 hours

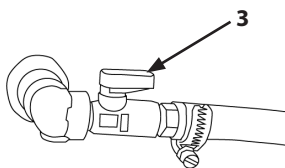
IMPORTANT: Be sure to use only genuine Hitachi elements for the main fuel filter element and the pre-filter element. Failure to do so may deteriorate the engine performance and/or shorten the engine service life. Please be noted that all engine failures caused by using other manufacturers' elements are excluded from Hitachi Warranty Policy.

Procedures:

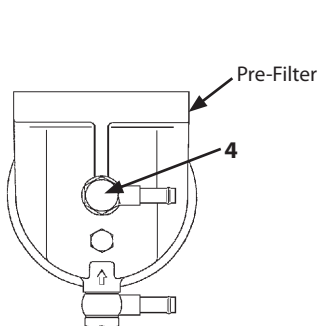
1. Close cock (3) on the bottom of the fuel tank.
2. Place a 1-liter or larger capacity container under drain hose (9).
3. Loosen air bleed plug (4) and drain plug (5). Drain fuel until fuel does not flow out of the filter.
4. Remove transparent filter case (8) using an exclusive tool.
5. When transparent filter case (8) is removed, the element is exposed. Remove the element by hand.
6. Install a new element. Tighten transparent filter case (8) to 30 ± 2 N·m (3 ± 0.2 kgf·m) using the exclusive tool.
7. Tighten air bleed plug (4) and drain plug (5).
8. Open cock (3) on the bottom of the fuel tank.
9. Bleed air from the fuel supply system.

After replacing the fuel filter element, bleed air from the fuel supply system. (Refer to the air bleed procedures described on page 7-55.)

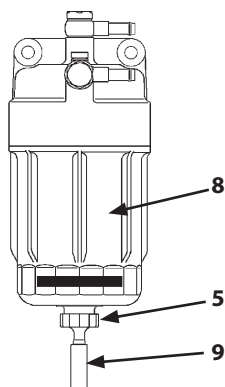
Wrench size: 14 mm



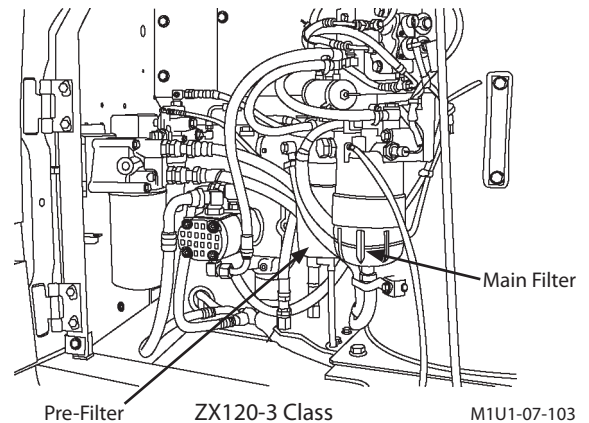
M1U1-07-015



M1U1-07-004

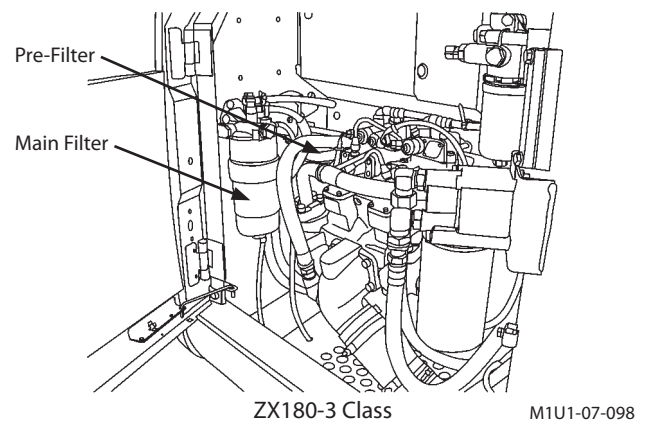


M81U-07-031



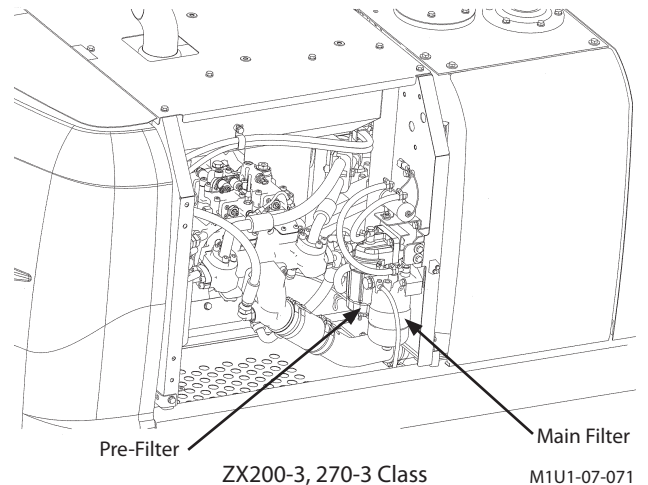
ZX120-3 Class

M1U1-07-103



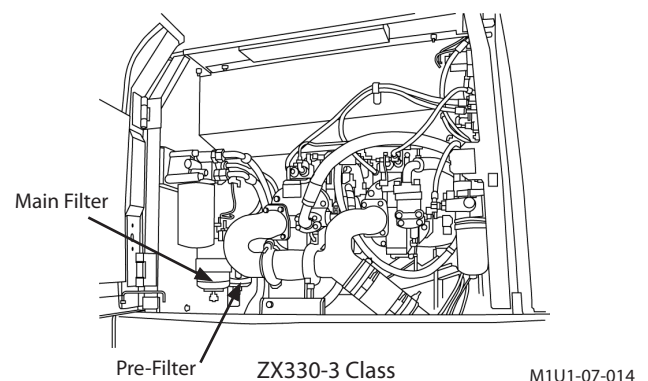
ZX180-3 Class

M1U1-07-098



ZX200-3, 270-3 Class

M1U1-07-071



ZX330-3 Class

M1U1-07-014

MAINTENANCE

5 Clean Fuel Solenoid Pump Strainer --- every 500 hours

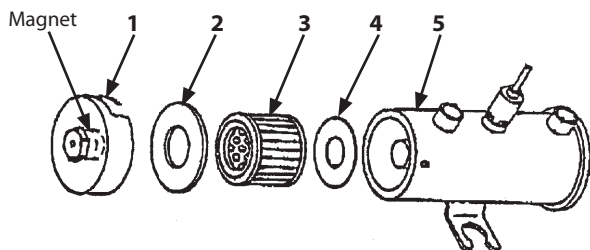
Cleaning

When strainer (3) is disassembled, be sure to replace gasket (2) and (4). Install cover (1) and the magnet only after sufficiently cleaning them. After being assembled, closely check the air-tightness of strainer (3).

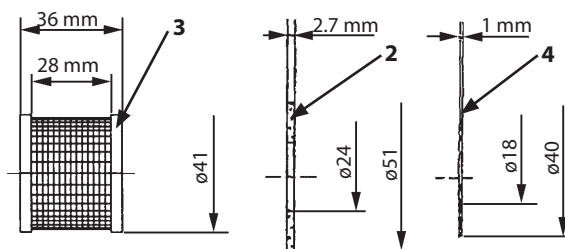
Disassembling/Assembling

To remove cover (1), loosen with a spanner. After cover (1) is removed, gasket (2), strainer (3), and gasket (4) are easily removed in order. Wash removed strainer (3) with light oil. Install strainer (3) in the reverse order of disassembling. At that time, install gasket (2) into cover (1) first. Then, securely tighten cover (1) to pump (5) using a spanner.

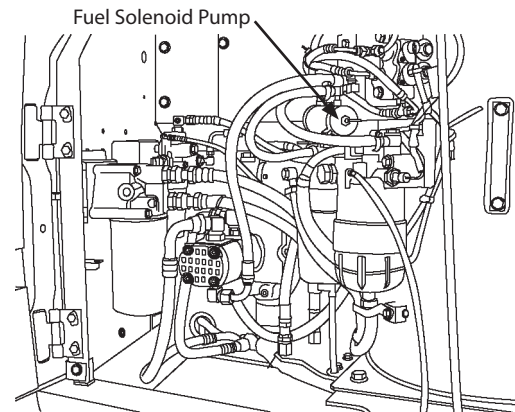
 **NOTE:** Wrench size: 17 mm



M1GR-07-004

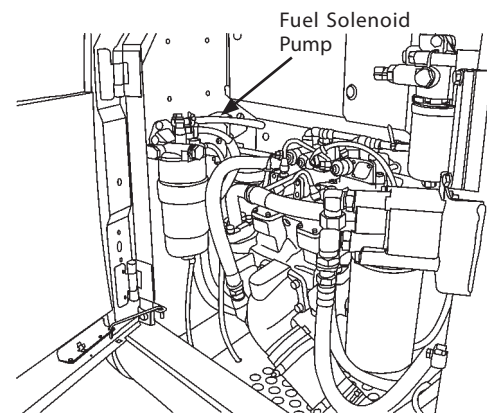


M1U1-07-006



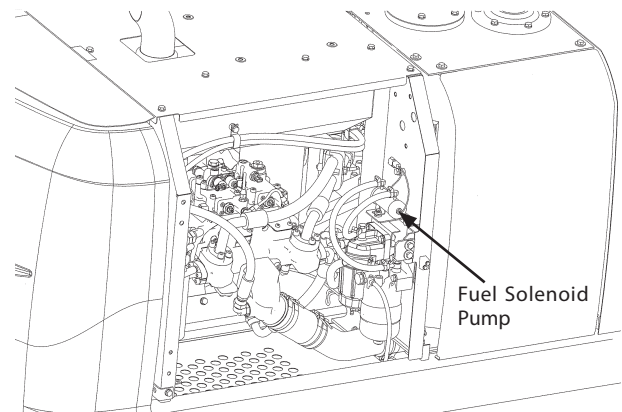
ZX120-3 Class

M1U1-07-103



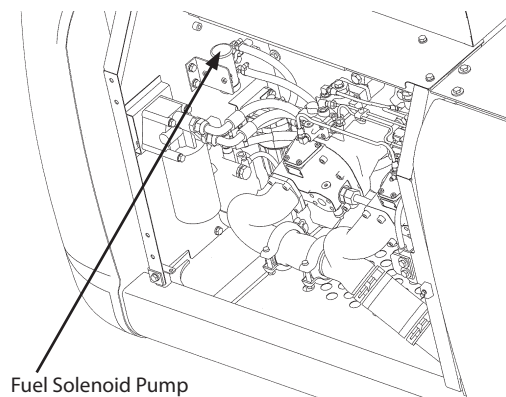
ZX180-3 Class

M1U1-07-098



ZX200-3, 270-3 Class

M1U1-07-071



ZX330-3 Class

M1U1-07-074

MAINTENANCE

6 Check Fuel Hoses

--- daily
--- every 250 hours

CAUTION: Fuel leaks can lead to fires that may result in serious injury.
To avoid this hazard :

1. Park the machine on a firm, level surface. Lower the bucket to the ground. Stop the engine. Remove the key from the key switch. Pull the pilot control shut-off lever to the LOCK position.
2. Check for kinked hoses, and hoses that rub against each other parts for leaks.
Check hoses at the check points indicated below for leaks and other damage that may result in future leaks. If any abnormalities are found, replace or retighten them, as shown in Table 4.
3. Repair or replace any loose or damaged hoses. Never install bent or damaged hoses.

Table 4. Hoses

Interval (hours)	Check Points	Abnormalities	Remedies
Daily	Hose ends	Leak (1)	Retighten or replace
	Soutache braid hose	Friction (2) Crack (2)	Replace Replace
Every 250 hours	Soutache braid hose	Crack (3)	Replace
	Hose ends	Crack (4)	Replace
	Hose	Bend (5)	Replace
	Hose	Collapse (6)	Replace (Use proper bend radius)
	Hose ends and fittings	Deformation or corrosion (7)	Replace

NOTE: Refer to the illustrations in Fig.1 for each check point location or for a description of the abnormality. Use genuine Hitachi parts.

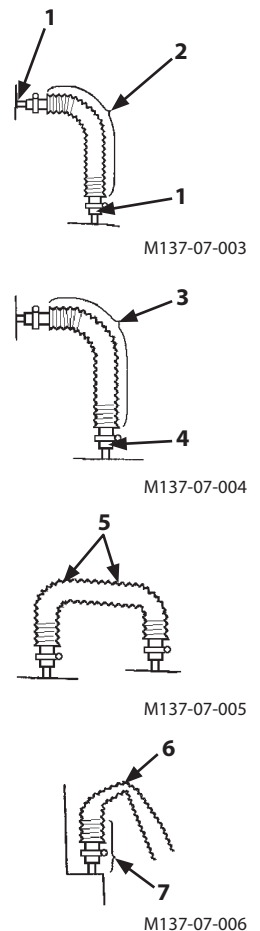


Fig. 1

MAINTENANCE

F. AIR CLEANER

- 1 **Clean Air Cleaner Outer Element**
--- every 250 hours or when the restriction indicator comes ON

- 2 **Replace Air Cleaner Outer and Inner Elements**
--- after cleaning six times or after one year

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

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

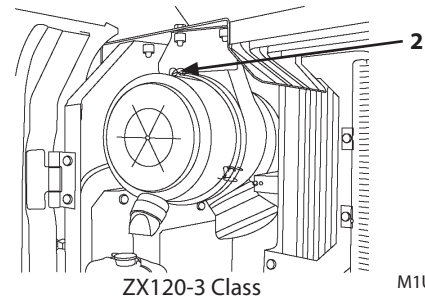
4. Run the engine at slow idle speed without load for five minutes.
5. Stop the engine. Remove the key from the key switch.
6. Pull the pilot control shut-off lever to the LOCK position.
7. Loosen clamps (2) to remove the cover.

IMPORTANT: Do not install the element and/or the cover forcibly when installing the clamps. Failure to do so may result in deformation of the clamps, element, and/or cover.

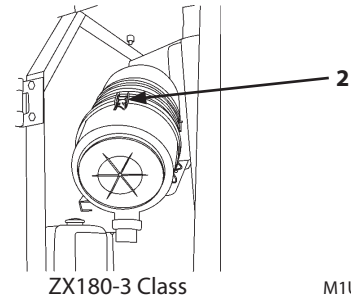
8. Remove outer element (1).
9. Tap outer element (1) with the palm of your hand, NOT ON A HARD SURFACE.

CAUTION: Use reduced compressed air pressure. (Less than 0.2 MPa, 2 kgf/cm²). Clear area of bystanders, guard against flying chips, and wear personal protection equipment including goggles or safety glasses.

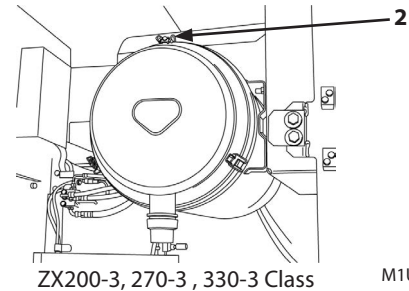
10. Clean outer element (1) using compressed air. Direct the air to the inside of the filter element, blowing out.
11. Clean the filter interior before installing outer element (1).
12. Install outer element (1).
13. Install cover and tighten clamps (2).
14. Start the engine and run at slow idle.
15. Check the air filter restriction indicator on the monitor panel. If the air filter restriction indicator comes ON, stop the engine and replace outer element (1).



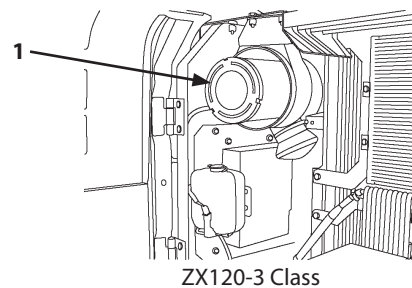
M1U1-07-104



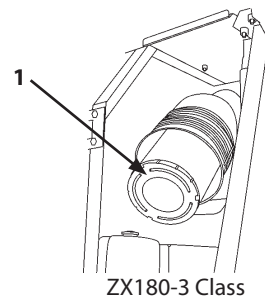
M1U1-07-079



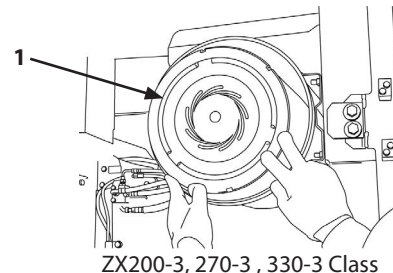
M1U1-07-027



M1U1-07-105



M1U1-07-080

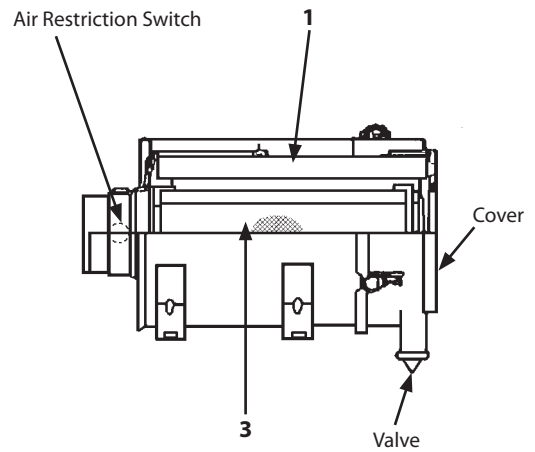


M1U1-07-028

MAINTENANCE

16. When replacing the air cleaner filter element, replace both outer (1) and inner (3) elements together. Remove outer element (1). Clean the filter interior before removing inner element (3). Remove inner element (3). First install inner element (3) and then install outer element (1).

IMPORTANT: Do not reuse inner element (3). Always replace the new one.



M157-07-061

MAINTENANCE

G. COOLING SYSTEM

Coolant

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

If the air temperature is expected to fall below 0 °C (32 °F), fill the cooling system with an genuine Hitachi Long-Life Coolant (LLC) and soft water mix. As a general rule, the ratio of LLC should range between 30 % and 50 % as shown in the table below. If the ratio is below 30 %, the system may develop rust, and if it is above 50 %, the engine may over-heat.

MAINTENANCE

LLC Mixing Table (ZX120-3 Class)

Air temperature		Mixing ratio	Refill capacities	
			LLC	Soft water
°C	°F	%	liters	liters
-1	30	30	4.8	11.2
-4	25	30	4.8	11.2
-7	19	30	4.8	11.2
-11	12	30	4.8	11.2
-15	5	35	5.6	10.4
-20	-4	40	6.4	9.6
-25	-13	45	7.2	8.8
-30	-22	50	8.0	8.0

LLC Mixing Table (ZX180-3 Class)

Air temperature		Mixing ratio	Refill capacities	
			LLC	Soft water
°C	°F	%	liters	liters
-1	30	30	5.4	12.6
-4	25	30	5.4	12.6
-7	19	30	5.4	12.6
-11	12	30	5.4	12.6
-15	5	35	6.3	11.7
-20	-4	40	7.2	10.8
-25	-13	45	8.1	9.9
-30	-22	50	9.0	9.0

LLC Mixing Table (ZX200-3, 270-3 Class)

Air temperature		Mixing ratio	Refill capacities	
			LLC	Soft water
°C	°F	%	liters	liters
-1	30	30	7.8	18.2
-4	25	30	7.8	18.2
-7	19	30	7.8	18.2
-11	12	30	7.8	18.2
-15	5	35	9.1	16.9
-20	-4	40	10.4	15.6
-25	-13	45	11.7	14.3
-30	-22	50	13.0	13.0

LLC Mixing Table (ZX330-3 Class)

Air temperature		Mixing ratio	Refill capacities	
			LLC	Soft water
°C	°F	%	liters	liters
-1	30	30	9.6	22.4
-4	25	30	9.6	22.4
-7	19	30	9.6	22.4
-11	12	30	9.6	22.4
-15	5	35	11.2	20.8
-20	-4	40	12.8	19.2
-25	-13	45	14.4	17.6
-30	-22	50	16.0	16.0



CAUTION:

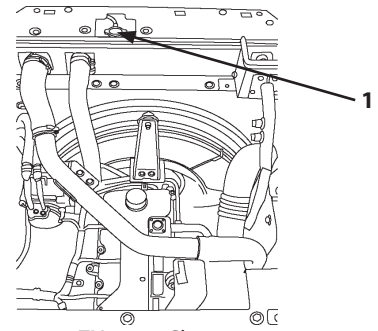
- Antifreeze is poisonous; if ingested, it can cause serious injury or death. Induce vomiting and get emergency medical attention immediately.
- When storing antifreeze, be sure to keep it in a clearly marked container with a tight lid. Always keep ANTIFREEZE out of the reach of children.
- If antifreeze is accidentally splashed into eyes, flush with water for 10 to 15 minutes and get emergency medical attention.
- When storing or disposing of antifreeze, be sure to comply with all local regulations.

MAINTENANCE

1 Check Coolant Level --- daily

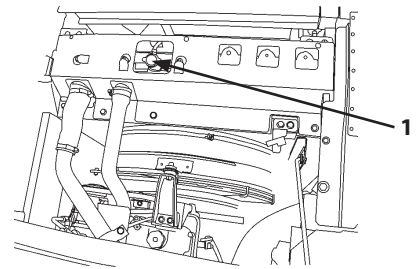
CAUTION: Do not loosen radiator filler cap (1) unless the system is cool. Loosen cap (1) slowly to the stop. Release all pressure before removing cap (1).

With the engine cold, the coolant level must be between the FULL and LOW marks on coolant reservoir (2), located behind the radiator access door. If the coolant level is below the low mark, add coolant to coolant reservoir (2). If coolant reservoir (2) is empty, add coolant to the radiator and then to coolant reservoir (2).



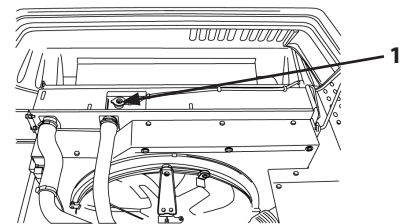
ZX120-3 Class

M1U1-07-106



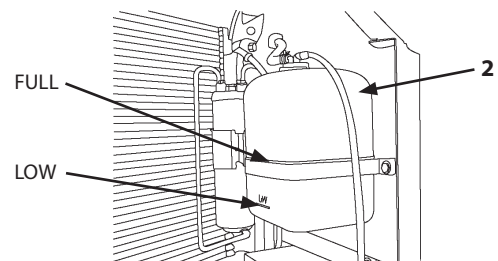
ZX180-3 Class

M1U1-07-081



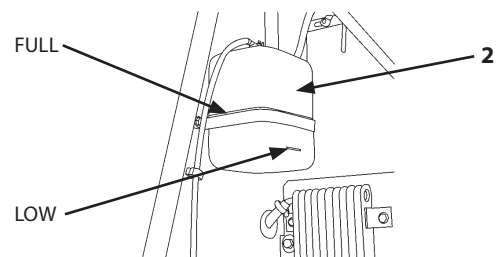
ZX200-3, 270-3, 330-3 Class

M1U1-07-024



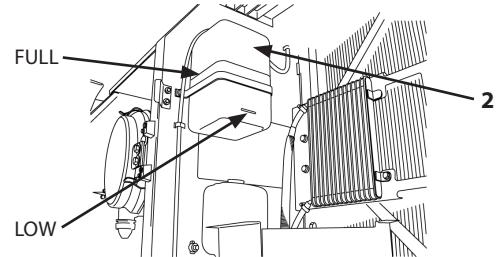
ZX120-3 Class

M1U1-07-107



ZX180-3 Class

M1U1-07-082



ZX200-3, 270-3, 330-3 Class

M1U1-07-022

MAINTENANCE

2 Check and Adjust Fan Belt Tension (ZX120-3, 180-3 Class) --- every 100 hours (first time after 50 hours)

IMPORTANT: Loose fan belt may result in insufficient battery charging, engine overheating as well as a rapid, abnormal belt wear. Belts that are too tight, however, can damage both bearings and belts.

Visually check the belt for wear. Replace if necessary. Check fan belt tension by depressing the midpoint between fan pulley (3) and alternator pulley (4) with the thumb. Deflection must be A with a depressing force of approximately 98 N (10 kgf, 22 lbf).

Model	A
ZX120-3, 180-3 Class	7 to 8 mm (0.28 to 0.32 in)

Checking

Check the drive belt for any wear and/or damage. Replace the belt as needed. Check the belt tension if required.

Adjust Drive Belt Tension

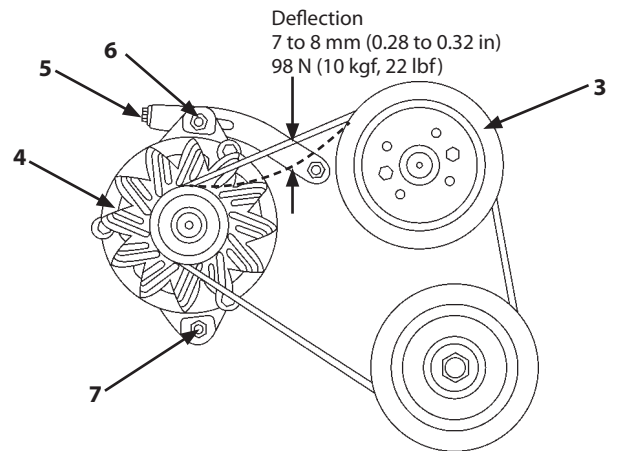
1. Loosen lock nut (6) and alternator lower mounting bolt (7).
2. Rotate tension adjust bolt (5) to adjust the belt tension.
3. After completing adjustment, tighten lock nut (6) and alternator lower mounting bolt (7) to specifications.

Standard Tightening Torque:

Nut: 25 N·m (2.5 kgf·m, 18 lbf·ft)

Bolt: 52 N·m (5.2 kgf·m, 38 lbf·ft)

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.



ZX120-3, 180-3 Class

M1U1-07-089

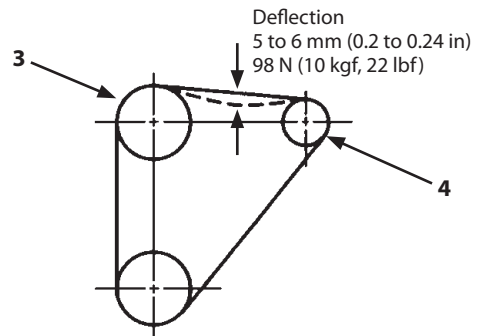
MAINTENANCE

2 Check and Adjust Fan Belt Tension (ZX200-3, 270-3, 330-3 Class) --- every 100 hours (first time after 50 hours)

IMPORTANT: Loose fan belt may result in insufficient battery charging, engine overheating as well as a rapid, abnormal belt wear. Belts that are too tight, however, can damage both bearings and belts.

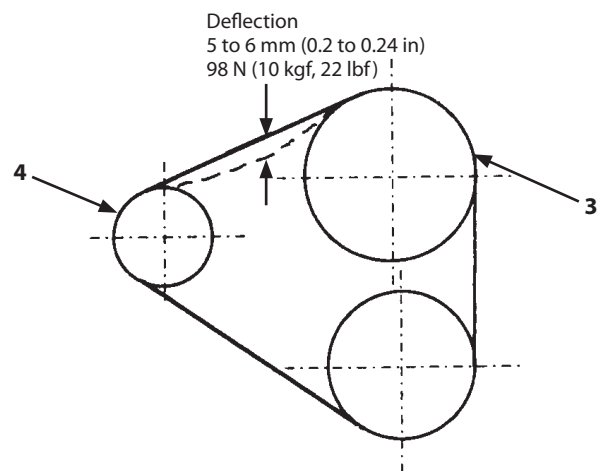
Visually check the belt for wear. Replace if necessary. Check fan belt tension by depressing the midpoint between fan pulley (3) and alternator pulley (4) with the thumb. Deflection must be A with a depressing force of approximately 98 N (10 kgf, 22 lbf).

Model	A
ZX200-3, 270-3, 330-3 Class	5 to 6 mm (0.2 to 0.24 in)



ZX200-3, 270-3 Class

M178-07-030

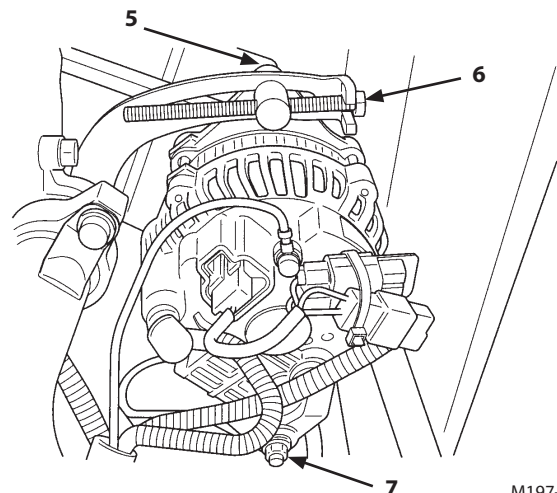


ZX330-3 Class

M1HM-07-001

If tension is not within specifications, loosen nuts (5) and (7) for the adjusting plate and alternator bracket. Move the alternator by bolt (6) until tension is correct. Tighten nuts (5) and (7).

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

MAINTENANCE

3 Change Coolant --- twice a year (in spring and autumn)

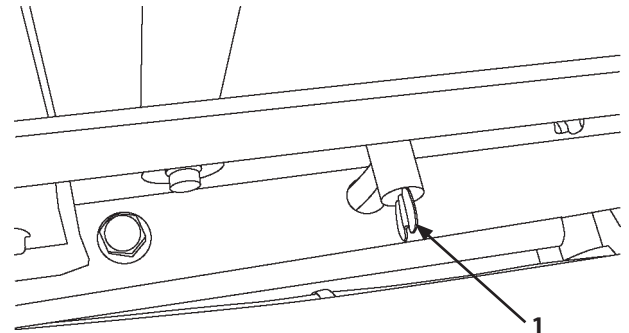
 **NOTE:** When genuine Hitachi Long-Life coolant is used, change every two years or 4000 hours, whichever comes first.

Clean Radiator Interior --- when changing coolant

 **CAUTION:** Do not loosen the radiator cap until the system is cool. Loosen the cap slowly to the stop. Release all pressure before removing the cap.

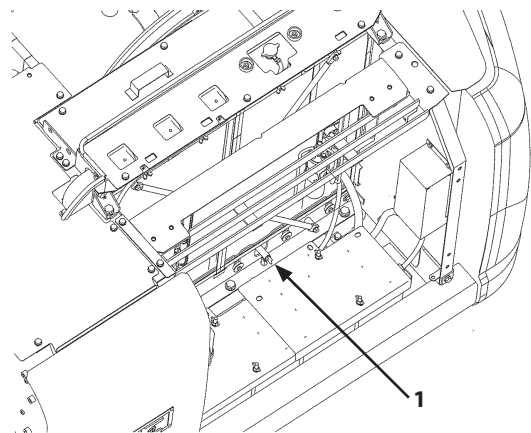
IMPORTANT: Use fresh water or normal tap water as a coolant. Do not use strong acid or alkaline water. Use the coolant with genuine Hitachi Long-Life Coolant (LLC) mixed by 30 to 50 %.

1. Remove the radiator cap. Open drain cock (1) on the radiator to allow the coolant to drain completely.
2. Close drain cock (1). Fill the radiator with tap water and a radiator cleaner agent. Start the engine and run at a speed slightly higher than slow idle; when the needle of the temperature gauge reaches the green zone, run the engine for about ten more minutes.
3. Stop the engine and open drain cock (1). Flush out the cooling system with tap water, until draining water is clear. This helps remove rust and sediment.
4. Close drain cock (1). Fill the radiator with tap water and LLC at the specified mixing ratio. When adding coolant, do so slowly to avoid mixing air bubbles in the system.
5. Run the engine to sufficiently bleed the air from the cooling system.
6. After adding coolant, operate the engine for several minutes. Check the coolant level again, and add coolant if necessary.



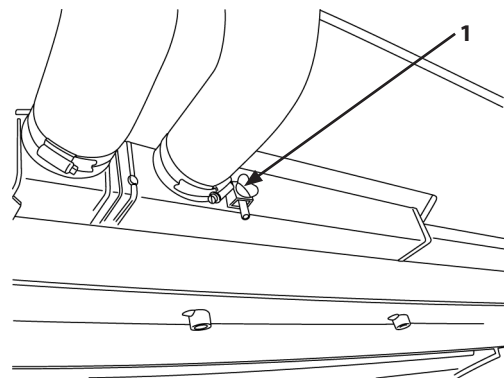
ZX120-3 Class

M1U1-07-108



ZX180-3, 200-3, 270-3 Class

M1U1-07-072



ZX330-3 Class

M1U1-07-029

MAINTENANCE

- 4** Clean Radiator, Oil Cooler Core and Inter Cooler
Outside --- every 500 hours
Inside --- once a year

- 5** Clean Oil Cooler, Radiator and Inter Cooler Front Screen
--- every 500 hours

- 6** Clean Air Conditioner Condenser
--- every 500 hours

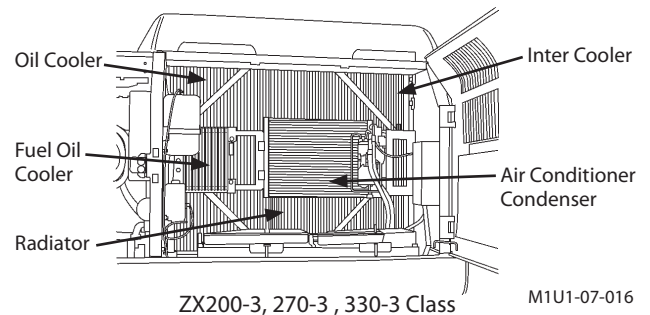
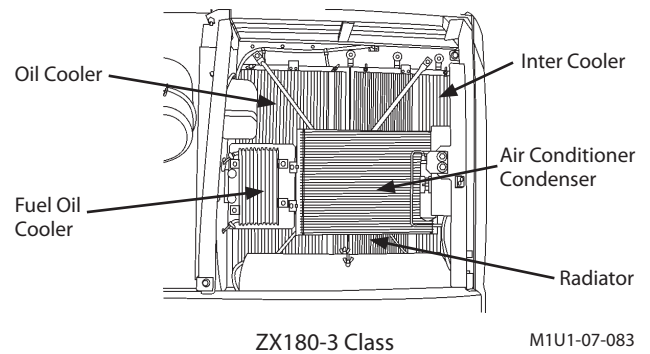
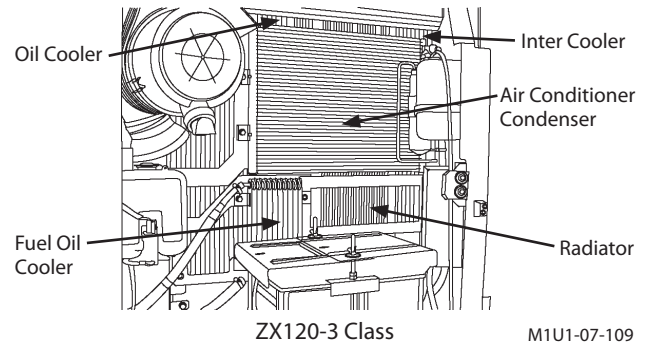
- 7** Clean Fuel Oil Cooler
--- every 500 hours

- 8** Clean Air Conditioner Front Screen (Opt.) --- every 500 hours

! CAUTION: Use reduced compressed air pressure (Less than 0.2 MPa, 2 kgf/cm²) for cleaning purposes. Clear the area of bystanders, guard against flying chips, and wear personal protection equipment including eye protection.

IMPORTANT: When operating the machine in a dusty environment, check the screen every day for dirt and clogging. If clogged, remove, clean and reinstall the screen.

1. Open the radiator access door and hood.
2. Clean the air conditioner condenser.
3. Remove the oil cooler front screen and clean it.
4. Clean both the radiator and oil cooler using compressed air (Less than 0.2 MPa, 2 kgf/cm²) or water.



MAINTENANCE

H. ELECTRICAL SYSTEM

IMPORTANT: Improper radio communication equipment and associated parts, and/or improper installation of radio communication equipment effects the machine's electronic parts, causing involuntary movement of the machine.

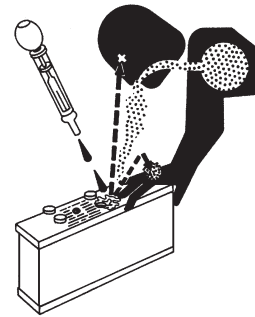
Also, improper installation of electrical equipment's may cause machine failure and/or a fire on the machine.

Be sure to consult your authorized dealer when installing a radio communication equipment or additional electrical parts, or when replacing electrical parts.

Never attempt to disassemble or modify the electrical/electronic components. If replacement or modification of such components is required, contact your authorized dealer.



SA-032



SA-036

BATTERIES

! WARNING: Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check the battery electrolyte level.

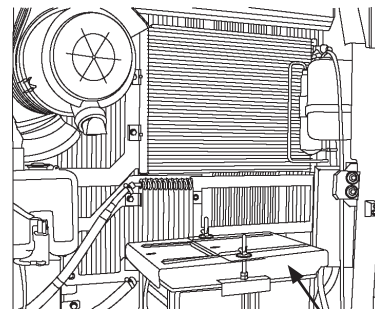
Do not leave cover (1) removed. Do not keep tools, metals or flammable materials around the battery or inside the battery room. If a metal tool is placed across the battery terminal and a vehicle component such as the engine block, sparks may be created, possibly resulting in fire and/or explosion.

Do not continue to use or charge the battery when electrolyte level is lower than specified. Explosion of the battery may result.

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into the eyes.

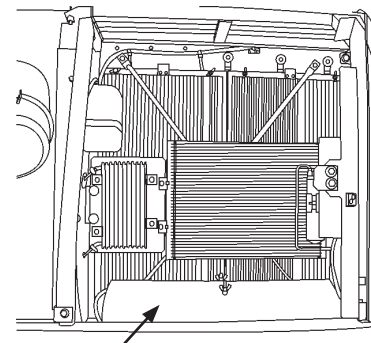
Avoid hazard by:

1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Using proper booster battery starting procedures.



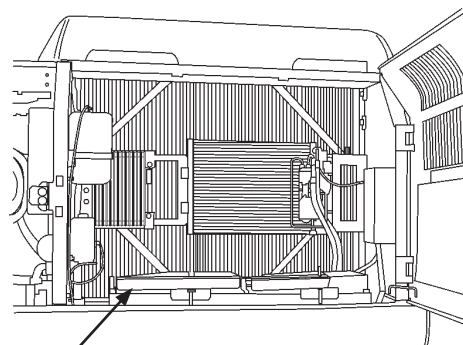
ZX120-3 Class
Batteries Location

M1U1-07-109



ZX180-3 Class
Batteries Location

M1U1-07-084



ZX200-3, 270-3, 330-3 Class
Batteries Location

M1U1-07-016

MAINTENANCE

If you spill acid on yourself:

- 1. Flush your skin with water.**
- 2. Apply baking soda or lime to help neutralize the acid.**
- 3. If splashed in eyes, flush with water for 10 to 15 minutes. Get medical attention immediately.**

If acid is swallowed:

- 1. Drink large amounts of water or milk.**
- 2. Then drink milk of magnesia, beaten eggs, or vegetable oil.**
- 3. Get medical attention immediately.**

IMPORTANT: Add water to batteries in freezing weather before you begin operating your machine for the day, or else charge the batteries.

IMPORTANT: If the battery is used with the electrolyte level lower than the specified lower level, the battery may deteriorate quickly.

IMPORTANT: Do not refill electrolyte more than the specified upper level. Electrolyte may spill, damaging the painted surfaces and/or corroding other machine parts.

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

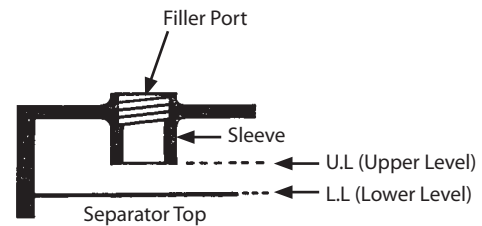
MAINTENANCE

Electrolyte Level Check --- every one month

1. Check the electrolyte level at least once a month.
2. Park the machine on level ground and stop the engine.
3. Check the electrolyte level.
 - 3.1 When checking the level from the battery side:
Clean around the level check lines with a wet towel.
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 distilled water or commercial battery fluid. Be sure to refill with distilled water before recharging (operating the machine). After refilling, securely tighten the filler plug.
 - 3.2 When impossible to check the level from the battery side or no level check mark is indicated on the side:
After removing the filler plug from the top of the battery. Check the electrolyte level by viewing through the filler port. It is difficult to judge the accurate electrolyte level in this case. Therefore, when the electrolyte level is flush with the U.L, the level is judged to be proper. Then, referring to the right illustrations, check the level. When the electrolyte level is lower than the bottom end of the sleeve, refill with distilled water or commercial battery fluid up to the bottom end of the sleeve. Be sure to refill with distilled water before recharging (operating the machine). After refilling, securely tighten the filler plug.
 - 3.3 When an indicator is available to check the level, follow its check result.
4. Always keep clean around the battery terminals to prevent battery discharge. Check terminals for loose and/or rust. Coat terminals with grease or petroleum jelly to prevent corrosion build up.



M146-07-109



M146-07-110

Proper



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

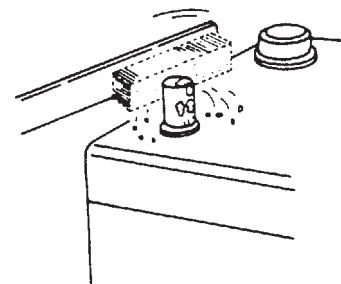
M146-07-111

Lower



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

M146-07-112



M409-07-072

MAINTENANCE

Check electrolyte specific gravity --- 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.

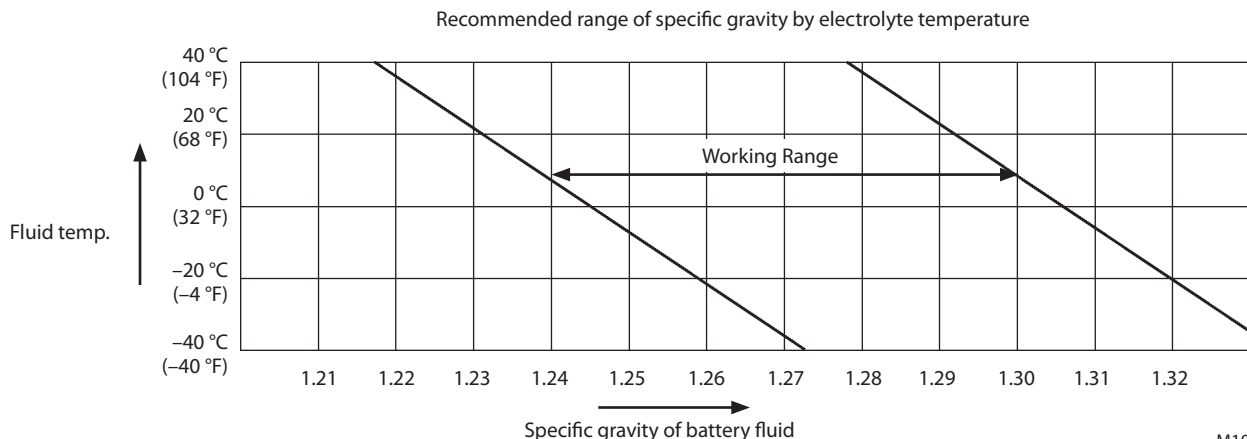
If acid is swallowed:

1. Drink large amounts of water or milk.
2. Then drink milk of magnesia, beaten eggs, or vegetable oil.
3. Get medical attention immediately.

IMPORTANT: Check the specific gravity of the electrolyte after it is cooled, not immediately after operation.

Check the electrolyte specific gravity in each battery cell.

The lowest limit of the specific gravity for the electrolyte varies depending on electrolyte temperature. The specific gravity should be kept within the range shown below. Charge the battery if the specific gravity is below the limit.



M104-07-054

REPLACE BATTERIES

Your machine has two 12-volt batteries with negative (–) ground.

If one battery in a 24-volt system has failed but the other is still good, replace the failed battery with one of the same type. For example, replace a failed maintenance-free battery with a new maintenance-free battery. Different types of batteries may have different rates of charge. This difference could overload one of the batteries and cause it to fail.

MAINTENANCE

Remove and Installing Batteries

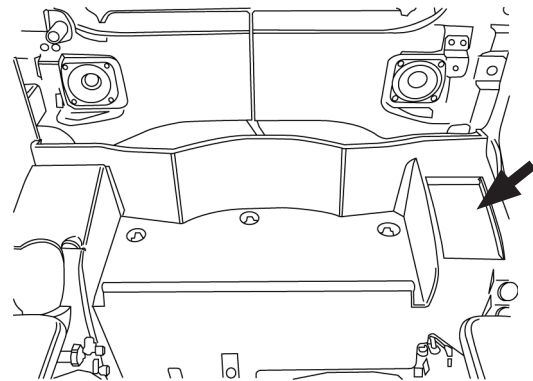
CAUTION: When removing the battery disconnect the negative (–) terminal (ground) first, while taking care not to cause a short circuit. When installing the battery, connect the positive (+) terminal before connecting the negative (–) terminal.

REPLACING FUSES

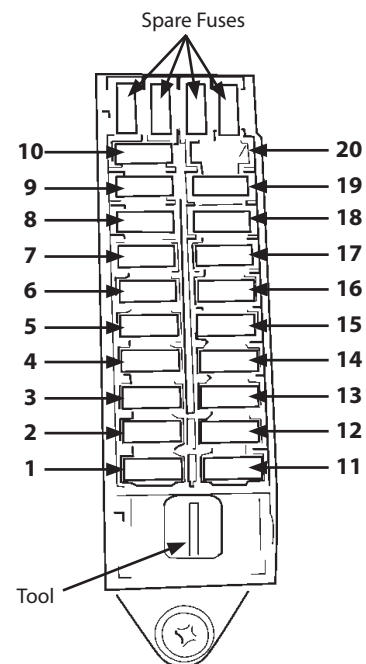
If any electrical equipment fails to operate, first check the fuses. Fuse box is located behind the operator's seat. A fuse location/specification decal is attached to the fuse box cover. Remove the fuse box cover by lifting it upward. Spare fuses are located on the underside of the cover.

IMPORTANT: Be sure to install fuses with correct amperage ratings to prevent electrical system damage due to overload.

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



M1U1-07-017



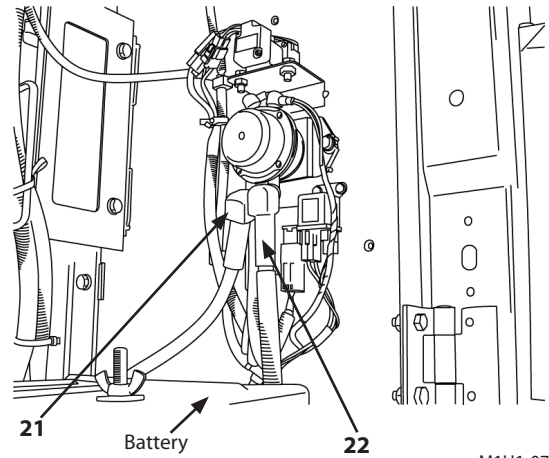
M178-07-034

MAINTENANCE

- Fusible Link (Main Fuse)

In case the starter will not rotate even if the key switch is turned to the START position, fusible link may be the cause of the trouble. Remove the cover next to the engine coolant reservoir to check the fuse. Replace it if blown.

21- + Side (Red)	45A
22- - Side (Black)	65A



M1U1-07-023

MAINTENANCE

I. MISCELLANEOUS

1 Check Bucket Teeth --- daily

Check the bucket teeth for wear and looseness

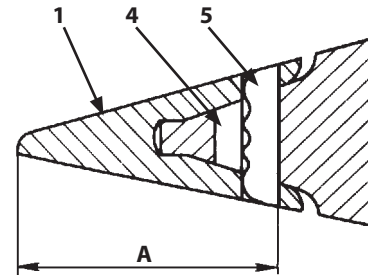
Replace teeth (1) if tooth wear exceeds the designated service limit shown below.

Dimension A in mm (in)		
Model	New	Limit of Use
ZX120-3 Class ZX160LC-3	166 (6.5)	85 (3.3)
ZX180LC-3, 180LCN-3 ZX200-3 Class	200 (7.9)	95 (3.7)
ZX270-3 Class	230 (9.1)	110 (4.3)
ZX330-3 Class	230 (9.1)	115 (4.5)

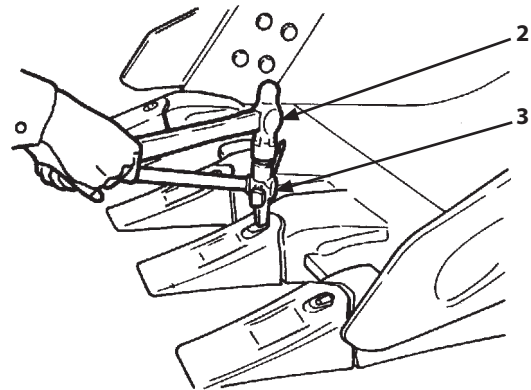
Replacing procedure

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 locking pin (5). Be careful not to damage rubber pin lock (4) while removing locking pin (5).
2. Remove tooth (1). Inspect locking pin (5) and rubber pin lock (4) for damage, replace if necessary. Short locking pins (5) and damaged rubber pin locks (4) must be replaced with new ones.

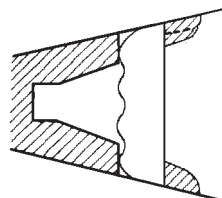


M104-07-056

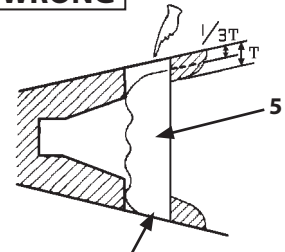


M104-07-116

RIGHT



WRONG

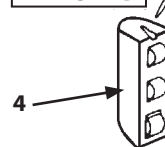


Flush one end of the locking pin to evaluate. In this instance, the locking pin is too short.

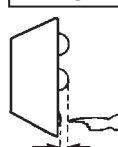
M104-07-118

M104-07-058

WRONG



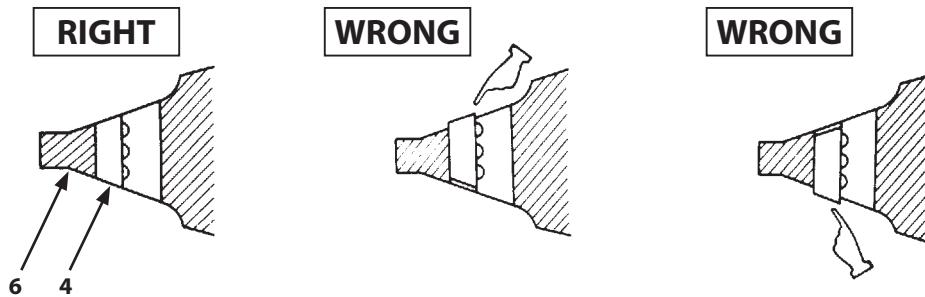
WRONG



M104-07-059

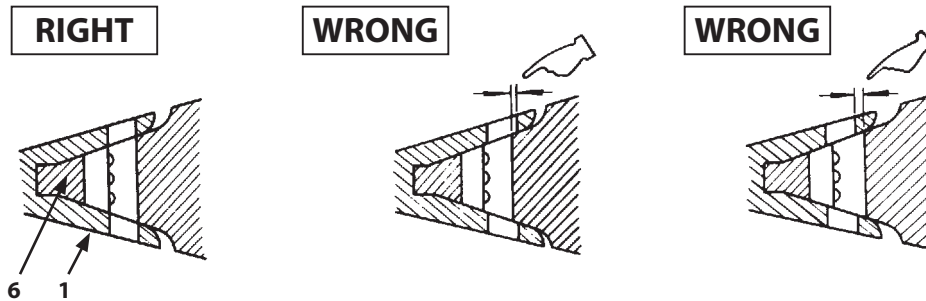
MAINTENANCE

3. Clean shank (6) surface.
4. Install rubber pin lock (4) into shank (6) hole as shown.



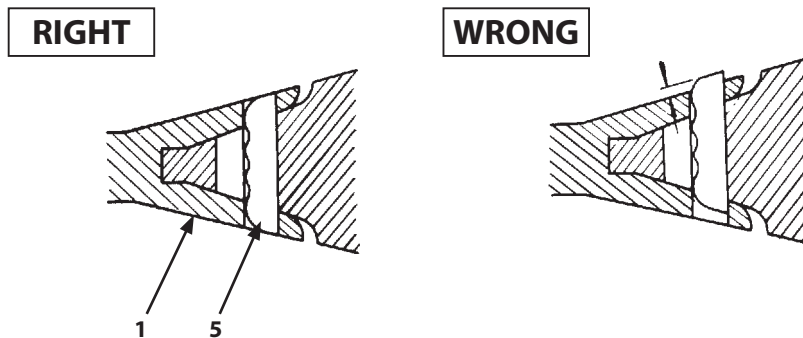
M104-07-060

5. Position new tooth (1) over shank (6).



M104-07-061

6. Drive locking pin (5) fully into the hole as shown.



M104-07-062

IMPORTANT: Check the bucket teeth periodically to ensure that wear does not exceed the designed service limit.

MAINTENANCE

Check Bucket Teeth for H and BE Type Front or Super V Type Bucket Teeth (ZX 200-3, 330-3 Class)

--- daily

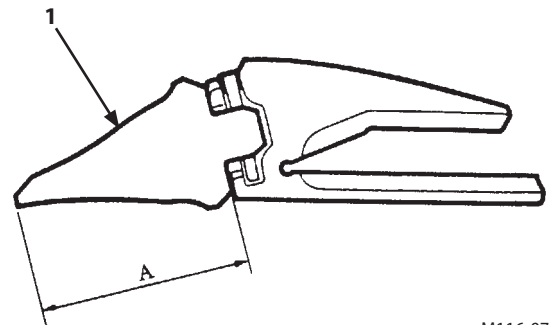
Check for wearing and looseness of the Bucket tooth points.

1. Replacement intervals

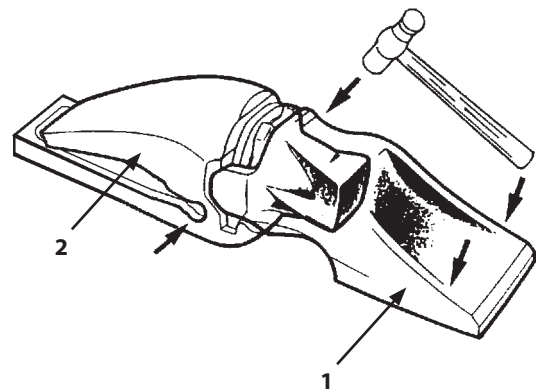
When tooth points (1) wear beyond the service limit, replace them.

Dimension A in mm (in)

ZX200-3 Class	Part No.	New	Limit of Use
0.8 m ³ Reinforced Hoe Bucket with Super V Type Bucket Teeth	4383048	211 (8.3)	90 (3.5)
ZX330-3 Class	Part No.	New	Limit of Use
1.40 m ³ Hoe Bucket with Super V Type Bucket Teeth	4400250	232 (9.1)	99 (3.9)
Rock Bucket 1.38 m ³ 1.50 m ³	4400253	229 (9.0)	112 (4.4)



M116-07-124



M116-07-125

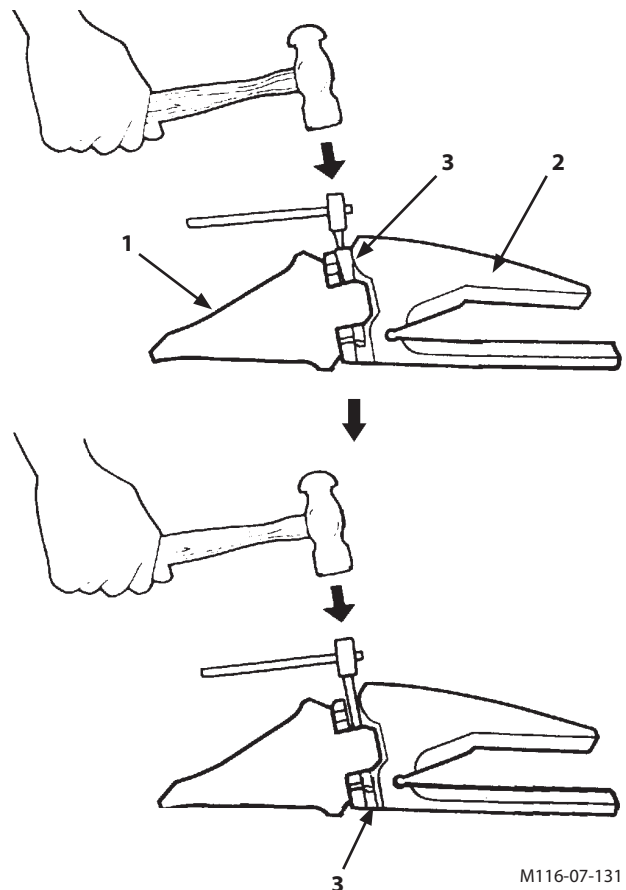
NOTE: When tooth point (1) is used in excess of the service limit, a hole will be made on tooth point (1), which makes the nose exposed and worn out, and will eventually break or let tooth point (1) fall off.

2. Replacement

(1) Removing the tooth point

CAUTION: Guard against injury from flying pieces of metal. Wear goggles or safety glasses.

- a. Preparations for removing tooth point.
Hit the left and right top ends and the left and right lugs of tooth point (1) alternately with hammer to knock off pebbles, soil, etc., stuck in the gap between tooth point (1) and adapter (2).
- b. Inserting lock removal tool.
Remove pebbles, dirt, etc., completely from the gap between lock pin (3) and adapter (2). Place pin-removing jig on the top end of lock pin (3) and hit it with hammer to remove lock pin (3).
When driving out the pin, first hit with a shorter jig until top end of lock pin (3) comes to the upper end position of the lug of tooth point (1), and then use the longer jig to remove lock pin (3).



M116-07-131

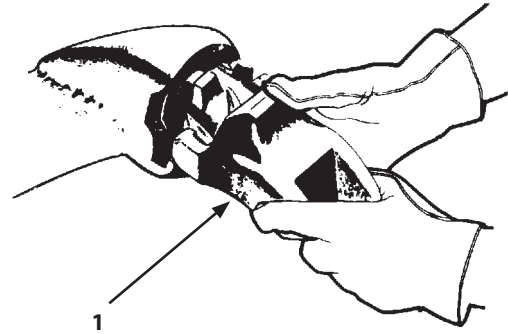
MAINTENANCE

c. Removing the tooth point

Turn tooth point (1) to the left, twist and pull it toward you to remove it.

Remove the plug, and check if rubber has cracking; if it has, replace the rubber with new one.

While the pin and plug can withstand several replacements of tooth point (1), be sure to check whether they are usable or not when replacing tooth point (1).



M113-07-078

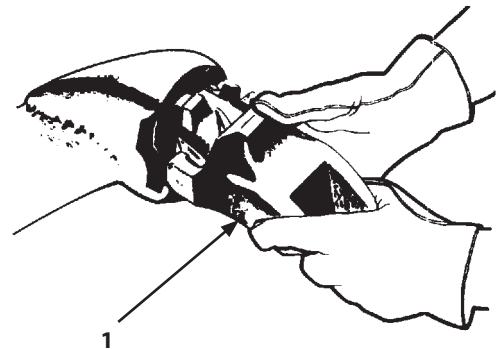
(2) Mounting the tooth point

a. Mounting the tooth point

Clean the top end of the adapter nose. If pebbles, dirt, etc., are stuck to the adapter nose, tooth point (1) will not insert properly and the pin cannot be driven in.

Also check that lock pin (3) has no cracks.

Insert tooth point (1) slowly until tooth point (1) comes to the end of the adapter nose while twisting and turning it to the right.

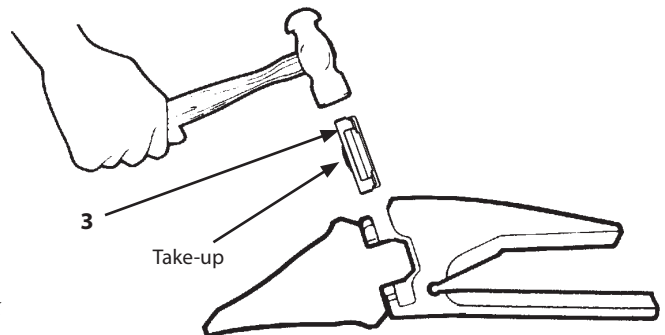


M113-07-080

b. Inserting the pin

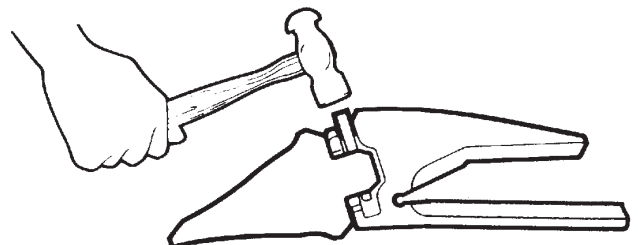
(1) Insert lock pin (3) with take-up facing toward the adapter nose.

(2) With tooth point (1) fully inserted onto adapter (2), tap lock pin (3) into tooth point (1) with a hammer until the top of lock pin (3) comes flat with the nose surface. (i.e. until the take-up on lock pin (3) fits into the grooves of tooth point (1).)



M113-07-001

- NOTE:** • Since rubber is susceptible to corrosion, do not use grease, oil and other oily materials when inserting lock pin (3).
- When mounting welding-type nose and adapter (2) onto the bucket, lock pin (3) should be removed from the nose when preheating and welding. Otherwise, the rubber will be spoiled.



M116-07-128

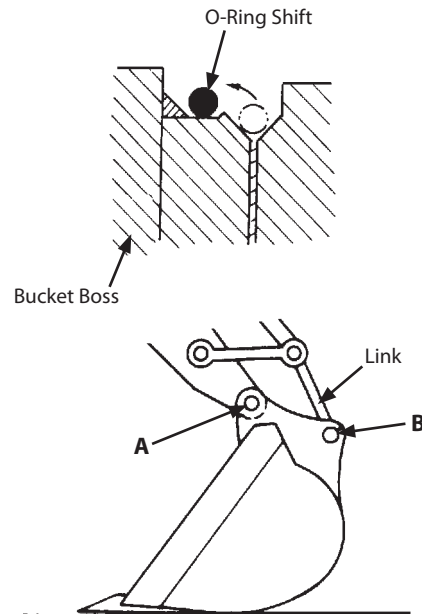
MAINTENANCE

2 Change Bucket



CAUTION: When driving the connecting pins in or out, guard against injury from flying pieces of metal or debris; wear goggles or safety glasses, and safety equipment appropriate to the job.

1. Park the machine on a level surface. Lower the bucket to the ground and position it with the flat surface resting on the ground. Be sure the bucket will not roll when the pins are removed.
2. Slide the O-rings out of the way, as shown.
3. Remove bucket pins A and B to separate the arm and bucket. Clean the pins and pin bores. Apply sufficient grease to the pins and pin bores.
4. Align the arm and alternate bucket. Be sure the bucket will not roll.
5. Install bucket pins A and B.
6. Install the locking pins and snap rings on pins A and B.
7. Adjust bucket linkage clearance for pin A. See adjusting bucket linkage clearance procedure.
8. Apply grease to pin joints A and B.
9. Start the engine and run at slow idle. Slowly operate the bucket in both directions to check for any interference in bucket movement. Do not operate a machine that has any movement interference. Correct interference problem.



M104-07-063

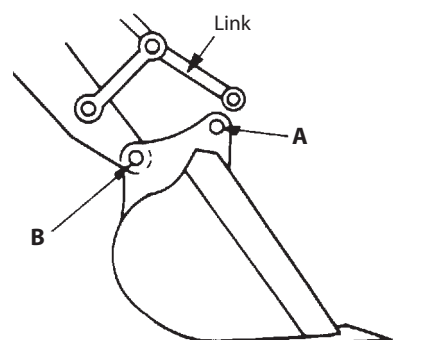
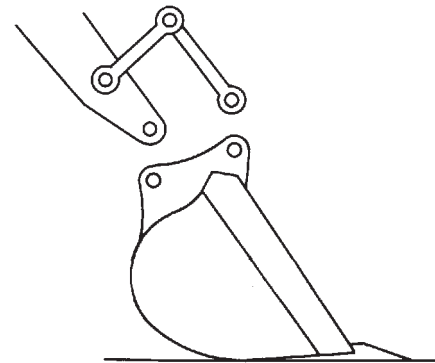
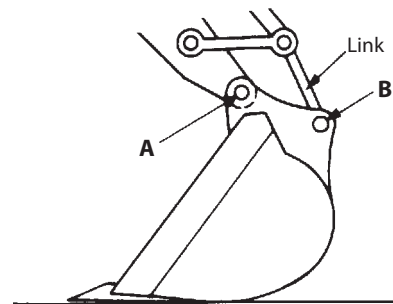
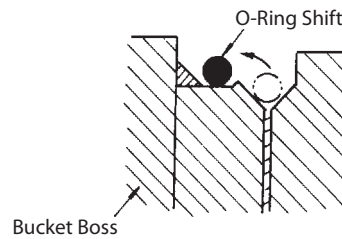
MAINTENANCE

3 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, and safety equipment appropriate to the job.

IMPORTANT: Provide ample space for turning the bucket 180°. Before starting converting work, keep bystanders clear of the machine. When using a signal person, coordinate hand signals before starting.

1. Park the machine on a level surface. Lower the bucket to the ground and position it with the flat surface resting on the ground. Be sure the bucket will not roll when the pins are removed.
2. Slide the O-rings out of the way, as shown.
3. Remove bucket pins A and B to separate the arm and bucket. Clean the pins and pin bores. Apply sufficient grease to the pins and pin bores.
4. Turn the bucket 180°. Be sure the bucket will not roll.
5. Align the arm and bucket. Install bucket pins A and B, then install the locking pins and snap rings on pins A and B.
6. Apply grease to pin joints A and B.
7. Start the engine and run at slow idle. Slowly operate the bucket in both directions and check for any interference in bucket movement. Do not operate a machine that has any movement interference. Correct interference problem.



M104-07-064

MAINTENANCE

4 Adjust Bucket Linkage

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 as follows:

1. Park the machine on a level surface. Lower the bucket to the ground with the flat side down so that the bucket will not roll.
2. Run the engine at slow idle. With the bucket on the ground, slowly swing counterclockwise slightly until the top of the left bucket boss contacts the arm.
3. Stop the engine. Pull the pilot control shut-off lever to the LOCK position.

 **NOTE:** Bolt (1) does not need to be removed to remove shims (2). Shims (2) are of a split type that can be easily pushed off with a screwdriver after bolts (1) have been loosened.

4. Slightly loosen three (M14) bolts (1) using a 22 mm wrench. Remove all shims (2) from clearance (c) between plate (3) and bucket.
5. Push and hold bolts (1) to remove all clearance (a) between arm and boss (4). Holding boss (4) against arm increases clearance (b). Measure distance (b) using a feeler gauge. This distance should not be adjusted below 0.5 mm (0.02 in).

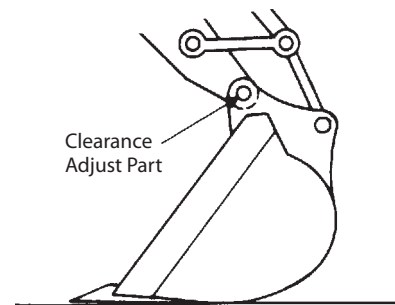
6. Install as many shims (2) into clearance (b) as possible.

 **NOTE:** Remaining shims (2) must be installed in clearance (c) to prevent arm end face or bolt damage.

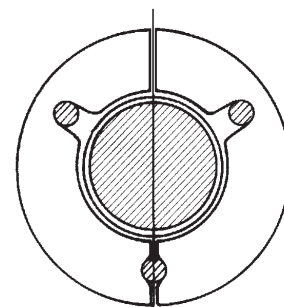
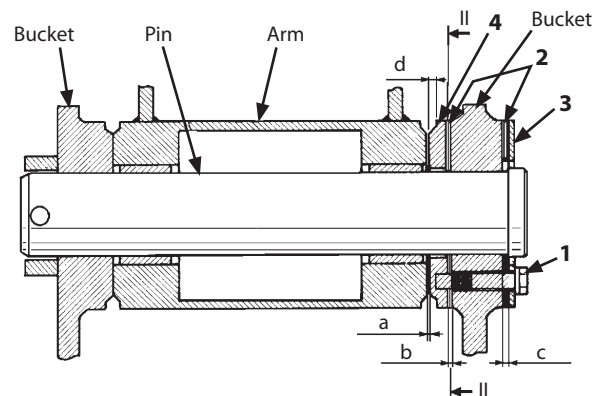
7. Install remaining shims (2) into clearance (c) and tighten bolts (1) to 140 N·m (14 kgf·m, 103 lbf·ft).

 **NOTE:** The total number of shims (2) used is A.
A : 12 (6 pairs)

8. Replace boss (4) if measurement (d) is 5 mm (0.2 in) or less.



M503-07-056



SECTION II

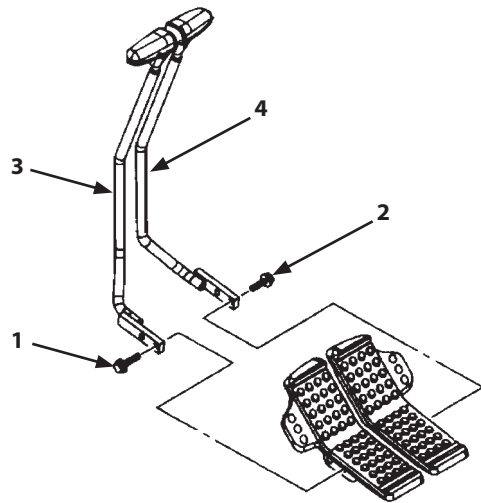
M104-07-066

MAINTENANCE

5 Remove Travel Levers

The travel levers may be removed if desired.

1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.
4. Turn the key switch OFF. Remove the key from the key switch.
5. Pull the pilot control shut-off lever to the LOCK position.
6. Remove bolts (1) and (2) to remove levers (3) and (4) from brackets.



M178-07-077

 **NOTE:** Wrench size 17 mm
Tightening torque 50 N·m (5 kgf·m, 37 lbf·ft)

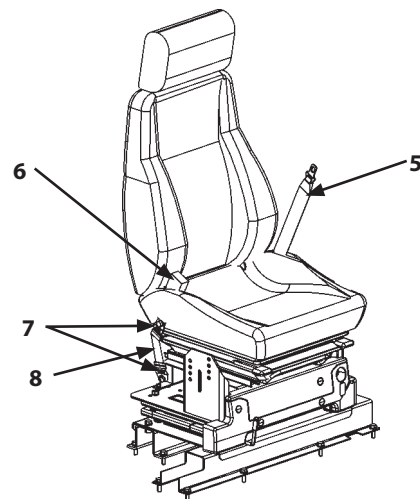
6 Check and Replace Seat Belt

Check --- daily
Replace --- every 3 years

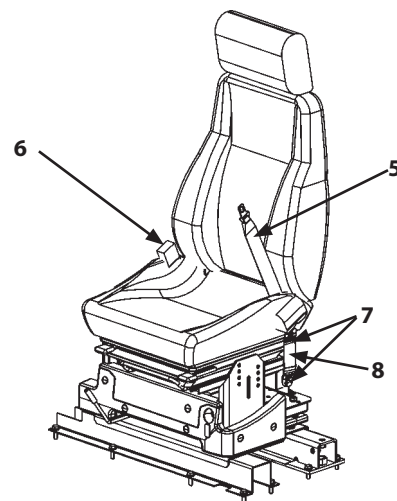
Always maintain seat belt (5) in a functional condition and replace when necessary to ensure proper performance.

Prior to operating the machine, thoroughly examine belt (5), buckle (6) and attaching hardware (7) and tether belt (8). If any item is damaged or materially worn, replace seat belt (5) or component before operating the machine.

We recommend that seat belt (5) be replaced every three years regardless of its apparent condition.



M1U1-07-008

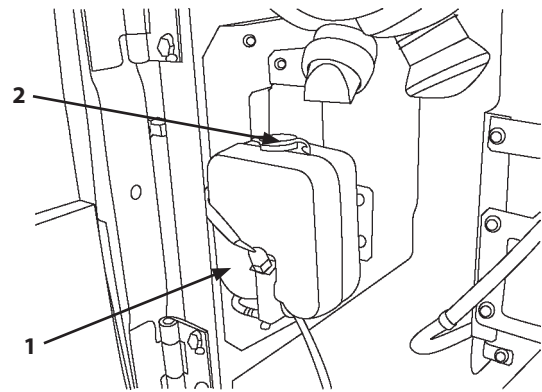


M1U1-07-009

MAINTENANCE

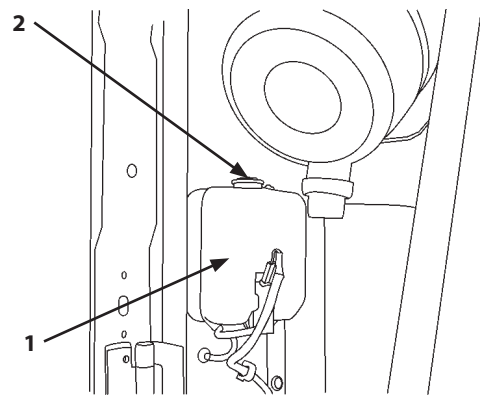
7 Check Windshield Washer Fluid Level --- as required

Check fluid in windshield washer tank (1).
If the fluid level is low, remove cap (2) and add fluid via the opening.
During winter season, use all season windshield washer which will not freeze.



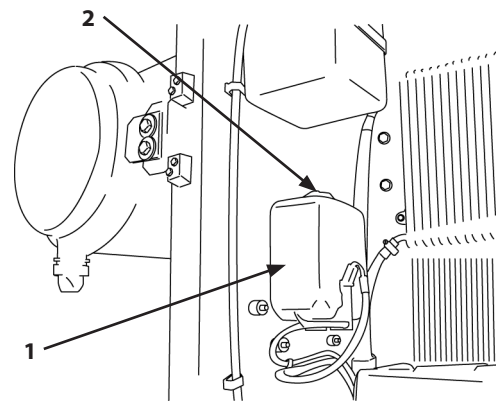
ZX120-3 Class

M1U1-07-110



ZX180-3 Class

M1U1-07-085



ZX200-3, 270-3, 330-3 Class

M1U1-07-036

MAINTENANCE

8 Check Track Sag --- every 50 hours

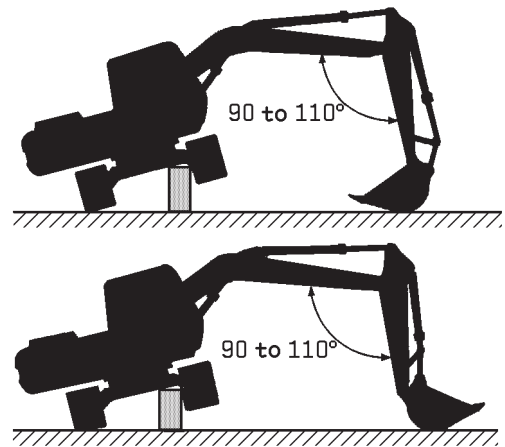
Swing the upperstructure 90° and lower the bucket to raise the track off the ground as shown.

Keep the angle between the boom and arm 90 to 110° and position the bucket's round side on the ground. Place blocks under the machine frame to support the machine. Rotate the raised track in reverse two full rotations and then forward two full rotations.

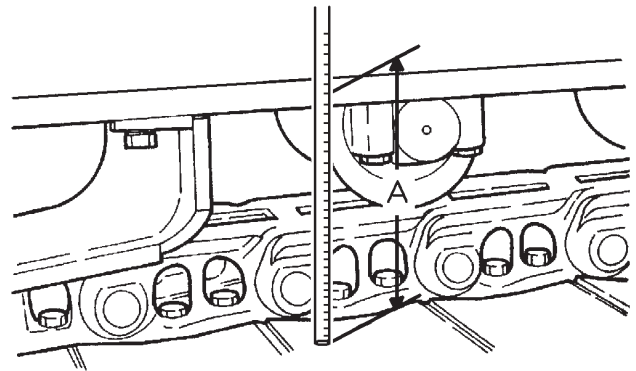
Measure distance (A) at the middle of the track frame from the bottom of the track frame to the back face of the track shoe.

Track sag specifications

Model	A
ZX120-3 Class (Except ZX110M-3, 130L-3)	250 to 280 mm (9.8 to 11.0 in)
ZX110M-3, 130L-3	265 to 295 mm (10.4 to 11.6 in)
ZX160LC-3	285 to 320 mm (11.2 to 12.6 in)
ZX180-3, 200-3, 270-3 Class (Except ZX160LC-3, 270-3, 270LC-3)	300 to 335 mm (11.8 to 13.2 in)
ZX270-3, 270LC-3 ZX330-3 Class	340 to 380 mm (13.4 to 15.0 in)



SA-283



M107-07-068

 **NOTE:** Check track sag after thoroughly removing soil stuck on the track area by washing.

Adjust Track Sag

Precautions for Adjusting Track Sag

1. If track sag is not within specifications, loosen or tighten the track following the procedures shown on the next page.
2. When adjusting track sag, lower the bucket to the ground to raise one track off the ground. Repeat this procedure to raise the other track. Each time, be sure to place blocks under the machine frame to support the machine.
3. After adjusting track sag of both tracks, move the machine back and forth several times.
4. Check track sag again. If track sag is not within specifications, repeat adjustment until correct sag is obtained.

MAINTENANCE

Loosen the Track

CAUTION: Do not loosen valve (1) quickly or loosen it too much as high-pressure grease in the adjusting cylinder may spout out. Loosen carefully, keeping body parts and face away from valve (1). Never loosen grease fitting (2).

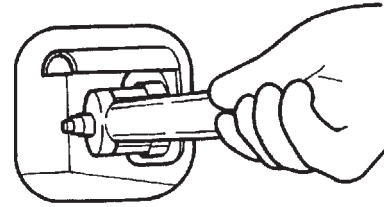
IMPORTANT: When gravel or mud is packed between sprockets and track links, remove it before loosening.

1. To loosen the track, slowly turn valve (1) counterclockwise using long socket 24; grease will escape from the grease outlet.
2. Between 1 to 1.5 turns of valve (1) is sufficient to loosen the track.
3. If grease does not drain smoothly, slowly rotate the raised track.
4. When proper track sag is obtained, turn valve (1) clockwise and tighten to 90 N·m (9 kgf·m, 67 lbf·ft).

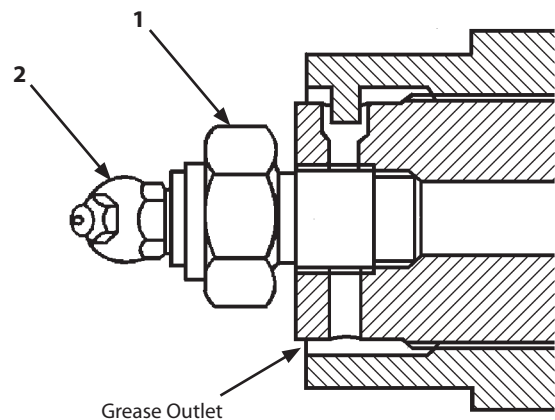
Tighten the Track

CAUTION: It is abnormal if the track remains tight after turning valve (1) counterclockwise or if the track is still loose after charging grease to fitting (2). In such cases, NEVER ATTEMPT TO DISASSEMBLE the track or track adjuster, because of dangerous high-pressure grease inside the track adjuster. See your authorized dealer immediately.

To tighten the track, connect a grease gun to grease fitting (2) and add grease until the sag is within specifications.



M107-07-075



M104-07-119

MAINTENANCE

9 Clean and Replace Air Conditioner Filter Clean Filter

Circulating Air Filter --- every 500 hours

Fresh Air Filter --- every 500 hours

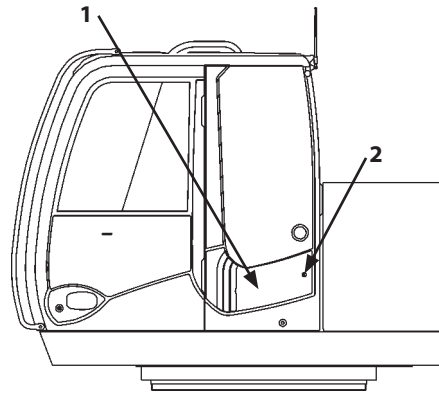
Replace Filter

Circulating Air Filter --- After cleaning 6 times or so

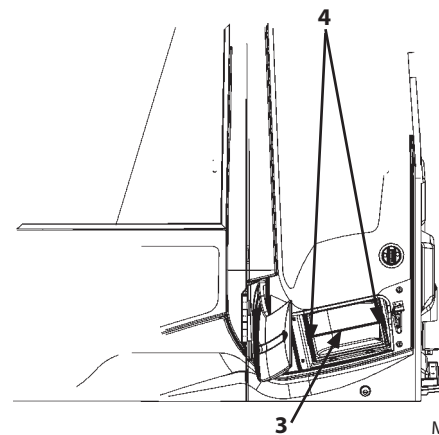
Fresh Air Filter --- After cleaning 6 times or so

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).



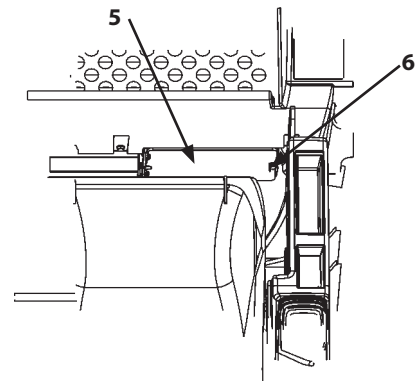
M1U1-07-010



M1U1-07-011

Removing Circulating Air Filter

1. Circulating air filter (5) is located under the rear deck.
2. Holding grips (6), pull them toward you to remove.



M1U1-07-012

MAINTENANCE

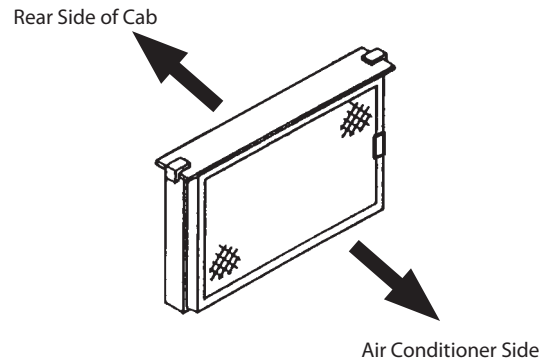
CAUTION: Use reduced compressed air pressure (less than 0.2 MPa, 2 kgf/cm²) for cleaning purposes. Clear the area of bystanders, guard against flying chips, and wear personal protection equipment including eye protection.

Cleaning

Clean both the external and internal filters by blowing compressed air or washing with water.

When washing the filters with water, follow the procedures below:

1. Wash with tap water.
2. Soak the filters in neutral detergent-mixed water for approx. 5 minutes.
3. Wash the filters with water again.
4. Dry the filters.

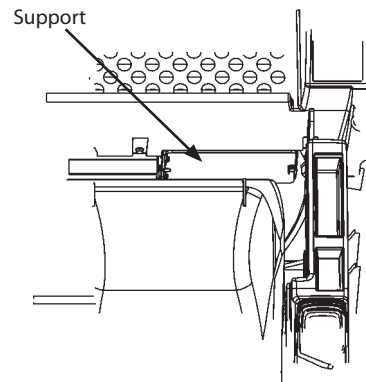


M1U1-07-013

Installation

When installing the cleaned circulating and/or fresh air filter or new filters, follow the reverse order of the Removing Filter procedures described on the front page.

- **Fresh Air Filter**
Use attention when installing the filter so that the notch faces the back of the cab and the stamped arrows face the air conditioner unit. After installing the filter, install the upper cover while aligning it with the duct.
- **Circulating Air Filter**
While contacting the attached filter plate onto the duct, install the filter so that the clips align with the duct mounting holes.



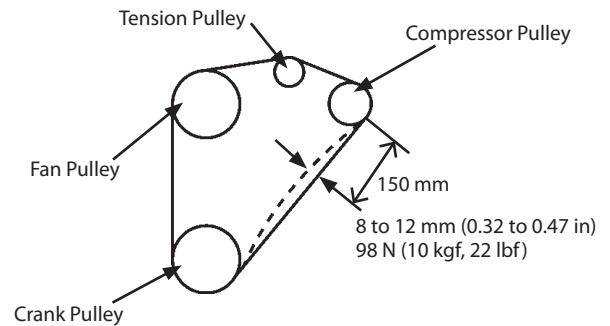
M1U1-07-012

MAINTENANCE

10 Check Air Conditioner --- daily

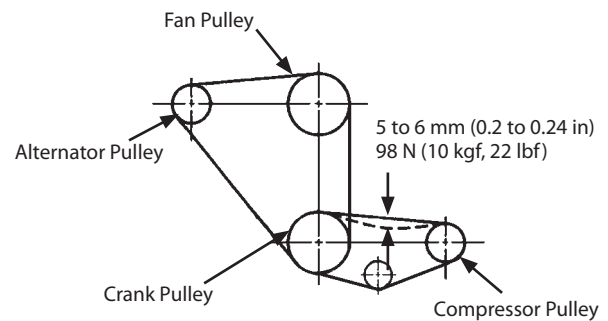
1. Check pipe connections for refrigerant gas leakage.
If oil seepage is found around pipe connections, it indicates possible gas leakage.
2. Check the condenser.
If the condenser fins become clogged with dirt or insects, the cooling effect will be decreased. Be sure to keep it clean at all times. (Refer to "Clean Radiator Core" in Maintenance Section.)
3. Check the compressor
After operating the air conditioner for 5 to 10 minutes, touch the high-pressure side and low-pressure side pipes with your hand. If normal, the high-pressure side pipe will be hot, and the low-pressure side cold.
4. Check mounting bolts for looseness.
Confirm that the compressor mounting bolts and other mounting/fastening bolts are securely tightened.
5. Inspect belt, check and adjust tension.
Visually check the compressor and fan belts for wear. Check and adjust belt tension, referring to the illustration (right).

If cool air does not come out, or any other abnormalities are found in air conditioner system, see your authorized dealer for inspection.



ZX120-3, 180-3 Class

M1U1-07-086



ZX200-3, 270-3, 330-3 Class

M1GR-07-007

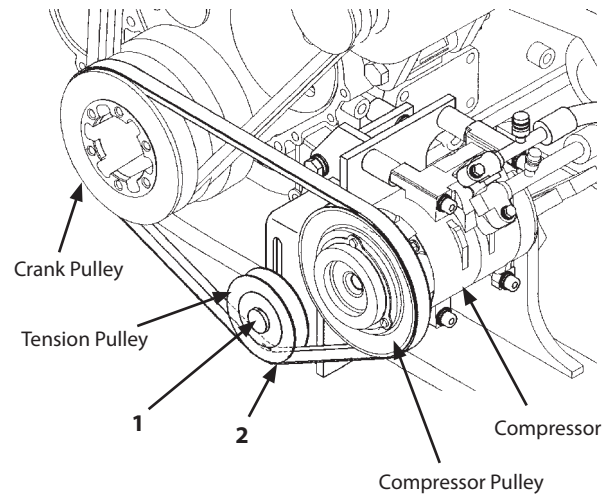
MAINTENANCE

Adjust Compressor Belt Tension

Visually check the belt for wear. Replace if necessary. Check compressor belt tension by depressing the midpoint between compressor pulley and crank pulley with the thumb. Deflection must be 9 to 12 mm (0.35 to 0.47 in) with a depressing force of approximately 98 N (10 kgf, 22 lbf).

If tension is not within specifications, loosen bolt (1). Move the tension pulley by adjusting bolt (2) until tension is correct. Tighten bolt (1).

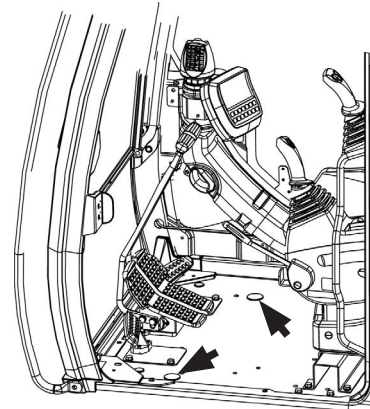
IMPORTANT: When a new belt is installed, be sure to re-adjust the tension after operating the engine for 3 to 5 minutes at slow idle speed to be sure that the new belt is seated correctly.



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 two cleaning holes.



M1G6-07-013

M1U1-07-052

MAINTENANCE

- 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.

MAINTENANCE

17 Check Tightening Torque of Bolts and Nuts --- every 250 hours (first time after 50 hours)

Check tightness after the first 50 hours then every 250 hours. Tighten to torque shown if any are loose. Bolts and nuts should be replaced with those of the same or higher grade.

For tightening nuts and bolts other than specified in the table below, refer to the Tightening Torque Chart at the end of this section.

IMPORTANT: Check and tighten bolts and nuts using a torque wrench.

ZX120-3 Class

No.	Descriptions	Bolt Dia	Q'ty	Wrench Size	Torque	
		mm		mm	N·m	(kgf·m)
1	Engine cushion rubber mounting bolt and nut	16	4	24	240	(24)
2	Engine bracket mounting bolt (Pump side)	12	8	19	110	(11)
3	Hydraulic oil tank mounting bolt	16	4	24	270	(27)
4	Fuel tank mounting bolt	16	4	24	270	(27)
5	Radiator mounting bolt (Upper side)	10	4	17	50	(5)
	Radiator mounting bolt (Lower side)	12	3	19	90	(9)
6	Pump transmission mounting bolt	10	8	17	65	(6.5)
7	Control valve mounting bolt	14	4	22	140	(14)
	Control valve bracket mounting bolt	16	4	24	270	(27)
8	Swing device mounting bolt	20	10	30	510	(51)
9	Swing motor mounting bolt	10	7	8	65	(6.5)
10	ORS fittings for hydraulic hoses and piping			17	25	(2.5)
				19	30	(3)
				22	40	(4)
				27	95	(9.5)
				32	140	(14)
				36	180	(18)
				41	210	(21)
11	Hycolin tube mounting nut	—	—	17	35	(3.5)
12	Battery mounting nut	10	4	17	50	(5)
13	Cab mounting nut	16	4	24	210	(21)
	Cab mounting anchor bolt	20	1	30	550	(55)
	Cab cushion rubber mounting bolt	12	8	19	110	(11)
14	Cover mounting bolt	6		10	10	(1)
		10	—	17	50	(5)
		12		19	90	(9)
15	Flexible master coupling of piping	1/4-28UNF	—	11	6	(0.6)
	T-bolt clamp of high pressure piping	—	8	10	6	(0.6)
16	Swing bearing mounting bolt to	(Upperstructure)	18	30	27	400
		(Undercarriage)	16	36	24	270
17	Travel device mounting bolt	ZX110-3, 120-3, 130K-3	16	28	24	320
		ZX110M-3, 130L-3	16	32	24	320
	Travel reduction device cover mounting bolt	ZX110-3, 120-3, 130K-3	14	8	22	180
		ZX110M-3, 130L-3	14	12	22	180
	Sprocket mounting bolt	ZX110-3, 120-3, 130K-3	16	32	24	270
		ZX110M-3, 130L-3	20	32	30	470
18	Upper roller mounting bolt	ZX110-3, 120-3, 130K-3	12	8	19	100
		ZX110M-3, 130L-3	16	16	24	270
19	Lower roller mounting bolt	ZX110-3	16	48	24	310
		ZX120-3, 130K-3	16	56	24	310
		ZX110M-3, 130L-3	18	48	27	460
20	Track shoe mounting bolt	ZX110-3	16	328	24	420
		ZX120-3, 130K-3	16	352	24	420
		ZX110M-3, 130L-3	20	336	27	820
21	Track guard mounting bolt	ZX110M-3, 130L-3	18	8	27	510

MAINTENANCE

17 Check Tightening Torque of Bolts and Nuts --- every 250 hours (first time after 50 hours)

Check tightness after the first 50 hours then every 250 hours. Tighten to torque shown if any are loose. Bolts and nuts should be replaced with those of the same or higher grade.

For tightening nuts and bolts other than specified in the table below, refer to the Tightening Torque Chart at the end of this section.

IMPORTANT: Check and tighten bolts and nuts using a torque wrench.

ZX180-3 Class

No.	Descriptions		Bolt Dia	Q'ty	Wrench Size	Torque	
			mm		mm	N•m	(kgf•m)
1	Engine cushion rubber mounting bolt and nut (Pump side)		18	4	27	400	(40)
	Engine cushion rubber mounting bolt and nut (Fan side)		16	4	24	240	(24)
2	Engine bracket mounting bolt (Pump side)		12	8	19	110	(11)
3	Hydraulic oil tank mounting bolt		18	4	27	400	(40)
4	Fuel tank mounting bolt		16	4	24	270	(27)
5	Radiator mounting bolt (Upper side)		16	2	24	270	(27)
	Radiator mounting bolt (Lower side)		16	3	24	270	(27)
6	Pump transmission mounting bolt		10	8	17	65	(6.5)
7	Control valve mounting bolt		16	4	24	210	(21)
	Control valve bracket mounting bolt		16	4	24	270	(27)
8	Swing device mounting bolt		20	12	30	500	(50)
9	Swing motor mounting bolt		12	8	10	90	(9)
10	ORS fittings for hydraulic hoses and piping				17	25	(2.5)
					19	30	(3)
					22	40	(4)
					27	95	(9.5)
					32	140	(14)
					36	180	(18)
				41	210	(21)	
11	Hycolin tube mounting nut		—	—	17	35	(3.5)
12	Battery mounting nut		10	4	17	50	(5)
13	Cab mounting nut		16	4	24	210	(21)
	Cab mounting anchor bolt		22	2	32	550	(55)
	Cab cushion rubber mounting bolt		12	8	19	110	(11)
14	Cover mounting bolt		6	—	10	10	(1)
			10	—	17	50	(5)
			12	—	19	90	(9)
15	Flexible master coupling of piping		1/4-28UNF		11	6	(0.6)
	Jubilee clamp of high pressure piping		—	9	7	6	(0.6)
			—	11	7	6	(0.6)
			—	4	8	6	(0.6)
	T-bolt clamp of high pressure piping		—	9	10	6	(0.6)
16	Swing bearing mounting bolt to	(Upperstructure)	20	37	30	510	(51)
		(Undercarriage)	20	36	30	490	(49)
17	Travel device mounting bolt		20	28	30	630	(63)
	Travel reduction device cover mounting bolt		14	12	22	180	(18)
	Sprocket mounting bolt		20	32	30	480	(48)
18	Upper roller mounting bolt		16	16	24	270	(27)
19	Lower roller mounting bolt		18	72	27	460	(46)
20	Track shoe mounting bolt	ZX160LC-3	20	344	27	820	(82)
		ZX180LC-3, 180LCN-3	20	392	27	820	(82)
21	Track guard mounting bolt		18	16	27	500	(50)

MAINTENANCE

17 Check Tightening Torque of Bolts and Nuts --- every 250 hours (first time after 50 hours)

Check tightness after the first 50 hours then every 250 hours. Tighten to torque shown if any are loose. Bolts and nuts should be replaced with those of the same or higher grade.

For tightening nuts and bolts other than specified in the table below, refer to the Tightening Torque Chart at the end of this section.

IMPORTANT: Check and tighten bolts and nuts using a torque wrench.

ZX200-3 Class

No.	Descriptions		Bolt Dia	Q'ty	Wrench Size	Torque		
			mm		mm	N•m	(kgf•m)	
1	Engine cushion rubber mounting bolt and nut (Pump side)		18	4	27	400	(40)	
	Engine cushion rubber mounting bolt and nut (Fan side)		14	4	22	180	(18)	
2	Engine bracket mounting bolt (Pump side)		16	8	24	270	(27)	
	Engine bracket mounting bolt (Fan side)		10	8	17	65	(6.5)	
3	Hydraulic oil tank mounting bolt		20	4	30	550	(55)	
4	Fuel tank mounting bolt		16	4	24	270	(27)	
5	Radiator mounting bolt (Upper side)		16	4	24	210	(21)	
	Radiator mounting bolt (Lower side)		16	3	24	210	(21)	
6	Pump transmission mounting bolt		10	8	17	65	(6.5)	
7	Control valve mounting bolt		16	4	24	210	(21)	
	Control valve bracket mounting bolt		16	4	24	270	(27)	
8	Swing device mounting bolt		20	14	30	500	(50)	
9	Swing motor mounting bolt		12	8	10	90	(9)	
10	ORS fittings for hydraulic hoses and piping				17	25	(2.5)	
					19	30	(3)	
					22	40	(4)	
					27	95	(9.5)	
					32	140	(14)	
					36	180	(18)	
				41	210	(21)		
11	Hycolin tube mounting nut		—	—	17	35	(3.5)	
12	Battery mounting nut		10	4	17	50	(5)	
13	Cab mounting nut		16	4	24	210	(21)	
	Cab mounting anchor bolt		22	2	32	550	(55)	
	Cab cushion rubber mounting bolt		12	8	19	110	(11)	
14	Cover mounting bolt		6	—	10	10	(1)	
			8	—	13			
			10	—	17	50	(5)	
			12	—	19	90	(9)	
15	Flexible master coupling of piping		8 1/4-28UNF	4 pairs	13	11 to 13	(1.1 to 1.3)	
					11	6	(0.6)	
	Jubilee clamp of high pressure piping				9	7	6	(0.6)
					11	7	6	(0.6)
					4	8	6	(0.6)
T-bolt clamp of high pressure piping			9	10	6	(0.6)		
16	Swing bearing mounting bolt to	(Upperstructure)	20	37	30	510	(51)	
		(Undercarriage)	20	36	30	490	(49)	
17	Travel device mounting bolt		20	28	30	630	(63)	
	Travel reduction device cover mounting bolt		14	12	22	180	(18)	
	Sprocket mounting bolt		20	36	30	490	(49)	
18	Upper roller mounting bolt		16	16	24	270	(27)	
19	Lower roller mounting bolt	ZX200-3, 210H-3, 210K-3	18	64	27	460	(46)	
		ZX200LC-3, 210LCH-3, 210LCK-3	18	72	27	460	(46)	
20	Track shoe mounting bolt	ZX200-3, 210H-3, 210K-3	20	368	27	820	(82)	
		ZX200LC-3, 210LCH-3, 210LCK-3	20	392	27	820	(82)	
21	Track guard mounting bolt	ZX200-3, 210H-3, 210K-3	18	8	27	500	(50)	
		ZX200-3, 210LCH-3, 210LCK-3	18	16	27	500	(50)	

MAINTENANCE

17 Check Tightening Torque of Bolts and Nuts --- every 250 hours (first time after 50 hours)

Check tightness after the first 50 hours then every 250 hours. Tighten to torque shown if any are loose. Bolts and nuts should be replaced with those of the same or higher grade.

For tightening nuts and bolts other than specified in the table below, refer to the Tightening Torque Chart at the end of this section.

IMPORTANT: Check and tighten bolts and nuts using a torque wrench.

ZX240-3, 240LC-3, 250H-3, 250LCH-3, 250K-3, 250LCK-3

No.	Descriptions		Bolt Dia	Q'ty	Wrench Size	Torque	
			mm		mm	N•m	(kgf•m)
1	Engine cushion rubber mounting bolt and nut (Pump side)		18	4	27	400	(40)
	Engine cushion rubber mounting bolt and nut (Fan side)		14	4	22	180	(18)
2	Engine bracket mounting bolt (Pump side)		16	8	24	270	(27)
	Engine bracket mounting bolt (Fan side)		10	8	17	65	(6.5)
3	Hydraulic oil tank mounting bolt		18	4	27	400	(40)
4	Fuel tank mounting bolt		20	4	30	550	(55)
5	Radiator mounting bolt (Upper side)		16	4	24	210	(21)
	Radiator mounting bolt (Lower side)		16	3	24	270	(27)
6	Pump transmission mounting bolt		10	8	17	65	(6.5)
7	Control valve mounting bolt		16	4	24	210	(21)
	Control valve bracket mounting bolt		16	4	24	270	(27)
8	Swing device mounting bolt		22	14	32	650	(65)
9	Swing motor mounting bolt		12	8	10	90	(9)
10	ORS fittings for hydraulic hoses and piping				17	25	(2.5)
					19	30	(3)
					22	40	(4)
					27	95	(9.5)
					32	140	(14)
					36	180	(18)
				41	210	(21)	
11	Hycolin tube mounting nut		—	—	17	35	(3.5)
12	Battery mounting nut		10	4	17	25	(2.5)
13	Cab mounting nut		16	4	24	210	(21)
	Cab mounting anchor bolt		22	2	32	550	(55)
	Cab cushion rubber mounting bolt		12	8	19	110	(11)
14	Cover mounting bolt		6	—	10	10	(1)
			8	—	13	10	(1)
			10	—	17	50	(5)
15	Flexible master coupling of piping		8 1/4-28UNF	4 pairs	13	11 to 13	(1.1 to 1.3)
		11			6	(0.6)	
	Jubilee clamp of high pressure piping			9	7	6	(0.6)
	T-bolt clamp of high pressure piping			4	8	6	(0.6)
16	Swing bearing mounting	(Upperstructure)	22	35	32	650	(65)
	bolt to	(Undercarriage)	22	36	32	650	(65)
17	Travel device mounting bolt		20	32	30	630	(63)
	Travel reduction device cover mounting bolt		14	12	22	180	(18)
	Sprocket mounting bolt		20	40	30	550	(55)
18	Upper roller mounting bolt		16	16	24	270	(27)
19	Lower roller mounting bolt	ZX240-3, 250H-3, 250K-3	18	64	27	460	(46)
		ZX240LC-3, 250LCH-3, 250LCK-3	18	72	27	460	(46)
20	Track shoe mounting bolt	ZX240-3, 250H-3, 250K-3	20	376	27	860	(86)
		ZX240LC-3, 250LCH-3, 250LCK-3	20	408	27	860	(86)
21	Track guard mounting bolt	ZX240-3, 240LC-3, 250K-3, 250LCK-3	18	8	27	500	(50)
		ZX250H-3, 250LCH-3	18	16	27	500	(50)

MAINTENANCE

17 Check Tightening Torque of Bolts and Nuts --- every 250 hours (first time after 50 hours)

Check tightness after the first 50 hours then every 250 hours. Tighten to torque shown if any are loose. Bolts and nuts should be replaced with those of the same or higher grade.

For tightening nuts and bolts other than specified in the table below, refer to the Tightening Torque Chart at the end of this section.

IMPORTANT: Check and tighten bolts and nuts using a torque wrench.

ZX270-3, 270LC-3

No.	Descriptions	Bolt Dia	Q'ty	Wrench Size	Torque	
		mm		mm	N·m	(kgf·m)
1	Engine cushion rubber mounting bolt and nut (Pump side)	18	4	27	400	(40)
	Engine cushion rubber mounting bolt and nut (Fan side)	14	4	22	180	(18)
2	Engine bracket mounting bolt (Pump side)	16	8	24	270	(27)
	Engine bracket mounting bolt (Fan side)	10	8	17	65	(6.5)
3	Hydraulic oil tank mounting bolt	18	4	27	400	(40)
4	Fuel tank mounting bolt	20	4	30	550	(55)
5	Radiator mounting bolt (Upper side)	16	4	24	210	(21)
	Radiator mounting bolt (Lower side)	16	3	24	270	(27)
6	Pump transmission mounting bolt	10	8	17	65	(6.5)
7	Control valve mounting bolt	16	4	24	210	(21)
	Control valve bracket mounting bolt	16	4	24	270	(27)
8	Swing device mounting bolt	22	14	32	650	(65)
9	Swing motor mounting bolt	12	8	10	90	(9)
10	ORS fittings for hydraulic hoses and piping			17	25	(2.5)
				19	30	(3)
				22	40	(4)
				27	95	(9.5)
				32	140	(14)
				36	180	(18)
				41	210	(21)
11	Hycolin tube mounting nut	—	—	17	35	(3.5)
12	Battery mounting nut	10	4	17	25	(2.5)
13	Cab mounting nut	16	4	24	210	(21)
	Cab mounting anchor bolt	22	2	32	550	(55)
	Cab cushion rubber mounting bolt	12	8	19	110	(11)
14	Cover mounting bolt	6	—	10	10	(1)
		8	—	13	10	(1)
		10	—	17	50	(5)
15	Flexible master coupling of piping	8 1/4-28UNF	4 pairs	13	11 to 13	(1.1 to 1.3)
				11	6	(0.6)
	Jubilee clamp of low pressure piping			9	7	(0.6)
				4	8	(0.6)
	T-bolt clamp of low pressure piping		9	10	6	(0.6)
16	Swing bearing mounting bolt (Upperstructure)	22	35	32	650	(65)
	(Undercarriage)	22	36	32	650	(65)
17	Travel device mounting bolt	20	40	30	630	(63)
	Travel reduction device cover mounting bolt	14	12	22	180	(18)
	Sprocket mounting bolt	20	48	30	550	(55)
18	Upper roller mounting bolt	18	16	27	460	(46)
19	Lower roller mounting bolt ZX270-3	22	56	32	840	(84)
	ZX270LC-3	22	64	32	840	(84)
20	Track shoe mounting bolt ZX270-3	22	360	32	1160	(116)
	ZX270LC-3	22	384	32	1160	(116)
21	Track guard mounting bolt	22	8	32	750	(75)

MAINTENANCE

17 Check Tightening Torque of Bolts and Nuts --- every 250 hours (first time after 50 hours)

Check tightness after the first 50 hours then every 250 hours. Tighten to torque shown if any are loose. Bolts and nuts should be replaced with those of the same or higher grade.

For tightening nuts and bolts other than specified in the table below, refer to the Tightening Torque Chart at the end of this section.

IMPORTANT: Check and tighten bolts and nuts using a torque wrench.

ZX330-3 Class

No.	Descriptions		Bolt Dia	Q'ty	Wrench Size	Torque	
			mm		mm	N·m	(kgf·m)
1	Engine cushion rubber mounting bolt and nut		18	4	27	400	(40)
2	Engine bracket mounting bolt (Pump side)		12	8	19	110	(11)
	Engine bracket mounting bolt (Fan side)		10	10	17	65	(6.5)
3	Hydraulic oil tank mounting bolt		18	4	27	400	(40)
4	Fuel tank mounting bolt		20	4	30	550	(55)
5	Radiator mounting bolt (Upper side)		10	6	17	65	(6.5)
	Radiator mounting bolt (Lower side)		16	4	24	270	(27)
6	Pump transmission mounting bolt		10	8	17	65	(6.5)
7	Control valve mounting bolt		16	4	24	210	(21)
	Control valve bracket mounting bolt		16	4	24	270	(27)
8	Swing device mounting bolt		22	14	32	650	(65)
9	Swing motor mounting bolt		12	8	12	90	(9)
10	ORS fittings for hydraulic hoses and piping				17	25	(2.5)
					19	30	(3)
					22	40	(4)
					27	95	(9.5)
					32	140	(14)
					36	180	(18)
					41	210	(21)
50	260	(26)					
11	Hycolin tube mounting nut		—	—	17	35	(3.5)
12	Battery mounting nut		10	4	17	25	(2.5)
13	Cab mounting nut		16	4	24	210	(21)
	Cab mounting anchor bolt		22	2	32	550	(55)
	Cab cushion rubber mounting bolt		12	8	19	110	(11)
14	Cover mounting bolt		6	—	10	10	(1)
			10	—	17	50	(5)
			12	—	17	90	(9)
15	Flexible master coupling of piping		—	5 pairs	13	11 to 13	(1.1 to 1.3)
	T-bolt clamp of high pressure piping				17	21 to 23	(2.1 to 2.3)
16	Swing bearing mounting bolt to	(Upperstructure)	27	36	41	1250	(125)
		(Undercarriage)	27	36	41	1250	(125)
17	Travel device mounting bolt		20	48	30	630	(63)
	Travel reduction device cover mounting bolt		14	12	22	180	(18)
	Sprocket mounting bolt		22	44	32	680	(68)
18	Upper roller mounting bolt		18	16	27	460	(46)
19	Lower roller mounting bolt	ZX330-3, 350H-3, 350K-3	22	68	32	840	(84)
		ZX330LC-3, 350LCH-3, 350LCK-3	22	76	32	840	(84)
20	Track shoe mounting bolt	ZX330-3, 350H-3, 350K-3	22	360	32	1130	(113)
		ZX330LC-3, 350LCH-3, 350LCK-3	22	384	32	1130	(113)
21	Track guard mounting bolt	ZX330-3, 330LC-3, 350K-3, 350LCK-3	22	24	32	750	(75)
		ZX350H-3	22	24	32	750	(75)
			18	16	27	500	(50)
		ZX350LCH-3	22	28	32	750	(75)
			18	16	27	500	(50)

MAINTENANCE

Tightening Torque Chart

Bolt Dia.	Wrench Size	Hexagon Wrench Size	   M552-07-091			   M552-07-090			   M157-07-225		
			N•m	(kgf•m)	(lbf•ft)	N•m	(kgf•m)	(lbf•ft)	N•m	(kgf•m)	(lbf•ft)
M8	13	6	30	(3.0)	(22)	20	(2.0)	(15)	10	(1.0)	(7.4)
M10	17	8	65	(6.5)	(48)	50	(5.0)	(37)	20	(2.0)	(15)
M12	19	10	110	(11)	(81)	90	(9)	(66)	35	(3.5)	(26)
M14	22	12	180	(18)	(135)	140	(14)	(103)	55	(5.5)	(41)
M16	24	14	270	(27)	(200)	210	(21)	(155)	80	(8.0)	(59)
M18	27	14	400	(40)	(295)	300	(30)	(220)	120	(12)	(89)
M20	30	17	550	(55)	(410)	400	(40)	(295)	170	(17)	(125)
M22	32	17	750	(75)	(550)	550	(55)	(410)	220	(22)	(160)
M24	36	19	950	(95)	(700)	700	(70)	(520)	280	(28)	(205)
M27	41	19	1400	(140)	(1030)	1050	(105)	(770)	400	(40)	(295)
M30	46	22	1950	(195)	(1440)	1450	(145)	(1070)	550	(55)	(410)
M33	50	24	2600	(260)	(1920)	1950	(195)	(1440)	750	(75)	(550)
M36	55	27	3200	(320)	(2360)	2450	(245)	(1810)	950	(95)	(700)



CAUTION: If fixing bolts for counterweight are loosened, consult your nearest authorized dealer.

IMPORTANT: Make sure bolt and nut threads are clean before installing.
 Apply lubricant (e. g. white zinc B solved into spindle oil) to bolts and nuts to stabilize their friction coefficient.



NOTE: Tightening torque required is shown in N•m.
 For example, when tightening a bolt or nut with a wrench of 1 m length, turning the end of it with a force of 120 N, the torque produced will be:

$$1\text{ m} \times 120\text{ N} = 120\text{ N}\cdot\text{m}$$

To produce the same torque with a wrench of 0.25 m:

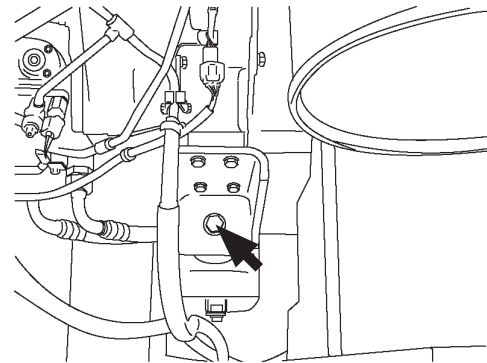
$$0.25\text{ m} \times \boxed{}\text{ N} = 120\text{ N}\cdot\text{m}$$

Necessary force will be:

$$120\text{ N}\cdot\text{m} \div 0.25\text{ m} = 480\text{ N}$$

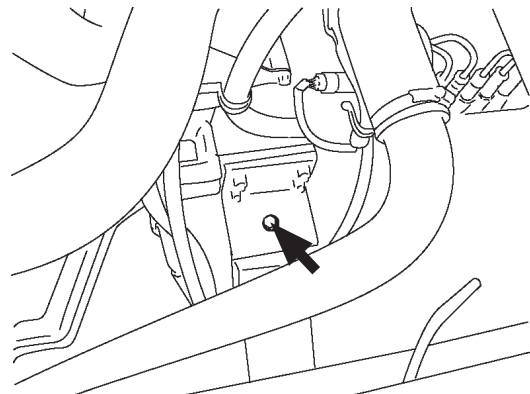
MAINTENANCE

1. Engine cushion rubber mounting bolts and nuts



Pump Side

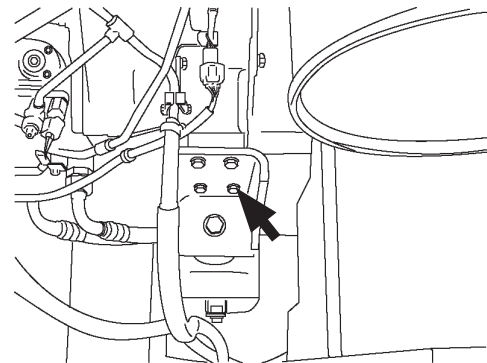
M1U1-07-040



Fan Side

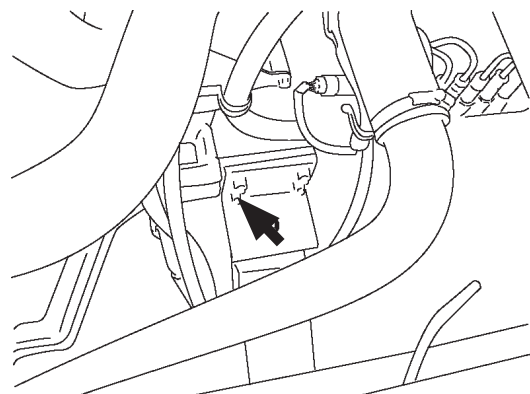
M1U1-07-034

2. Engine bracket mounting bolts



Pump Side

M1U1-07-040



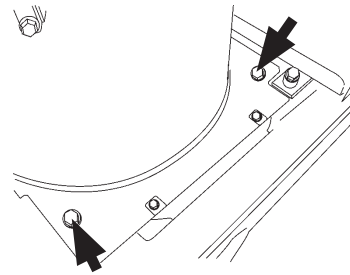
Fan Side

M1U1-07-034

(ZX200-3, 270-3, 330-3 Class)

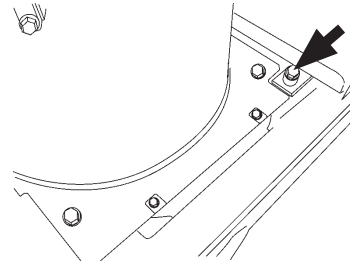
MAINTENANCE

3. Hydraulic oil tank mounting bolts



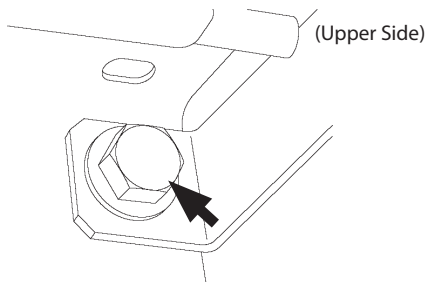
M1U1-07-038

4. Fuel tank mounting bolts



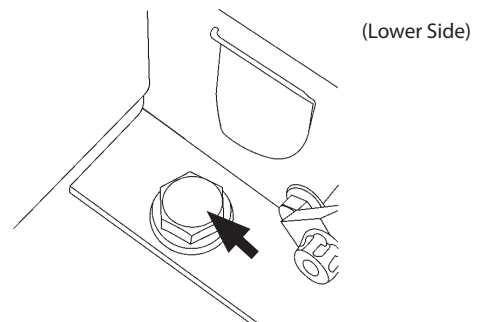
M1U1-07-038

5. Radiator mounting bolts



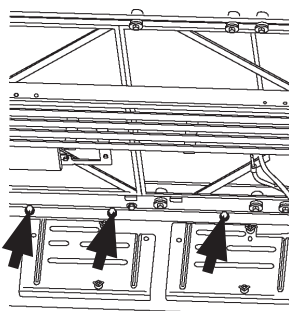
ZX120-3, 180-3 Class

M1U1-07-096



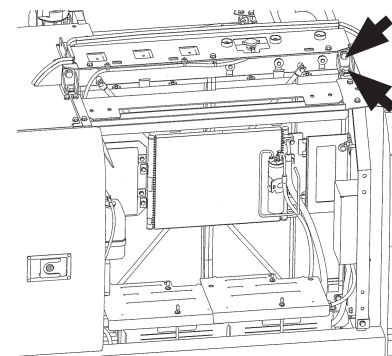
ZX120-3, 180-3 Class

M1U1-07-097



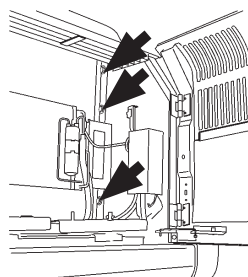
ZX330-3 Class

M1U1-07-057



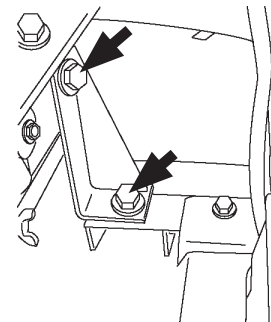
ZX200-3 Class

M1U1-07-073



ZX330-3 Class

M1U1-07-055

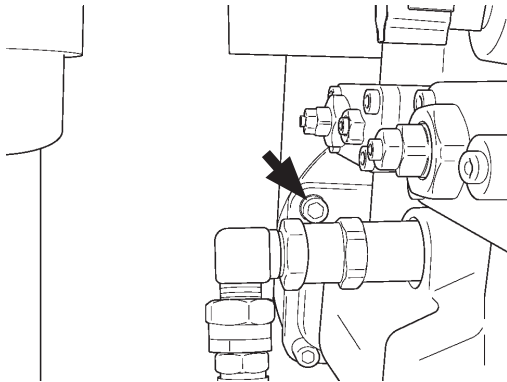


ZX270-3 Class

M1U1-07-056

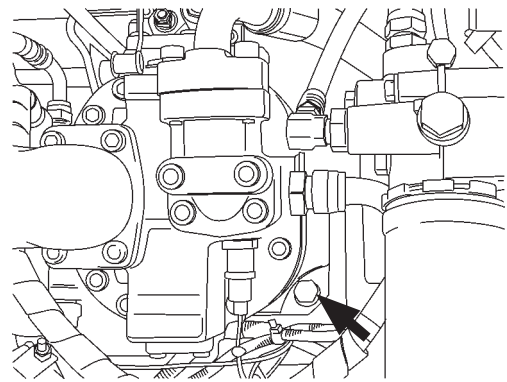
MAINTENANCE

6. Pump transmission mounting bolts



ZX120-3 Class

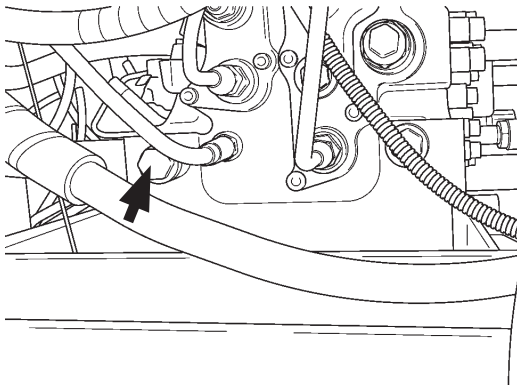
M175-07-024



ZX180-3, 200-3, 270-3, 330-3 Class

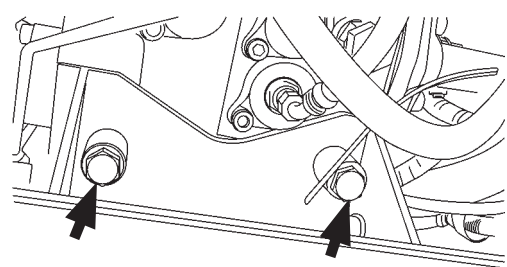
M1U1-07-021

7. Control valve mounting bolts



ZX120-3 Class

M175-07-023

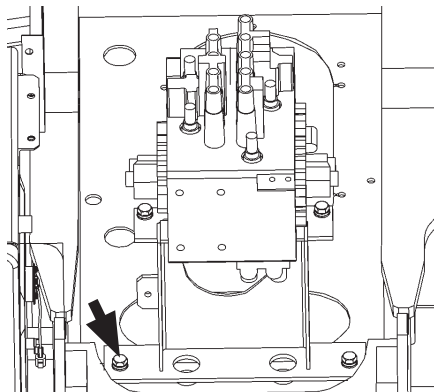


ZX180-3, 200-3, 270-3, 330-3 Class

M1U1-07-025

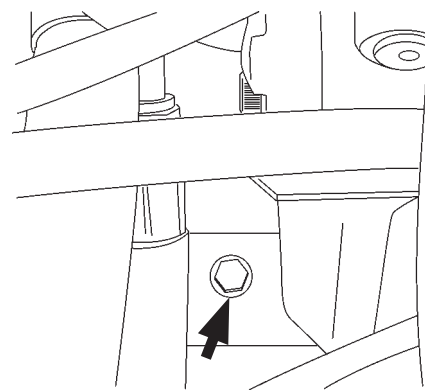


Control valve bracket mounting bolts



ZX120-3 Class

M175-07-026

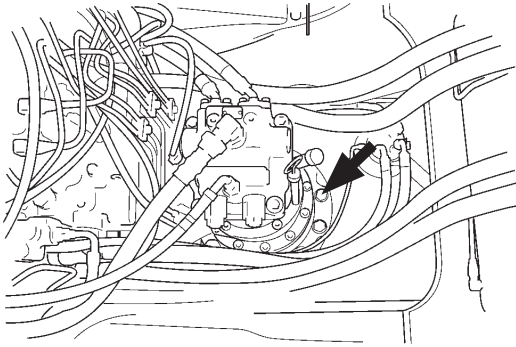


ZX180-3, 200-3, 270-3, 330-3 Class

M1U1-07-041

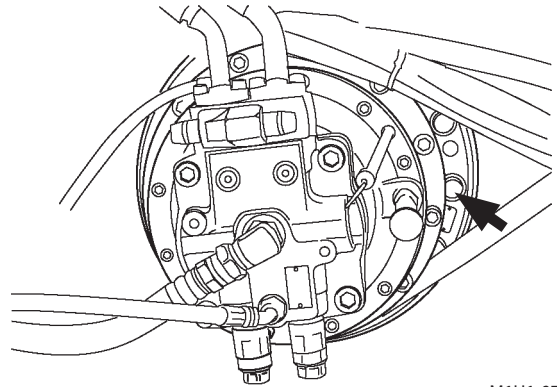
MAINTENANCE

8. Swing device mounting bolts



ZX120-3 Class

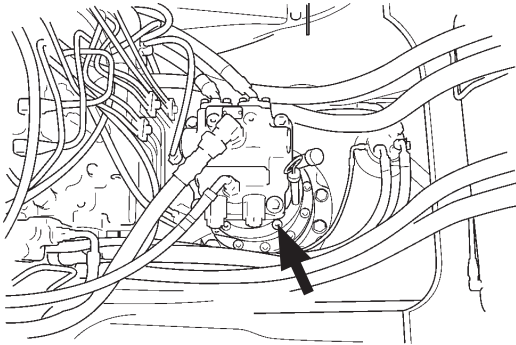
M175-00-002



ZX180-3, 200-3, 270-3, 330-3 Class

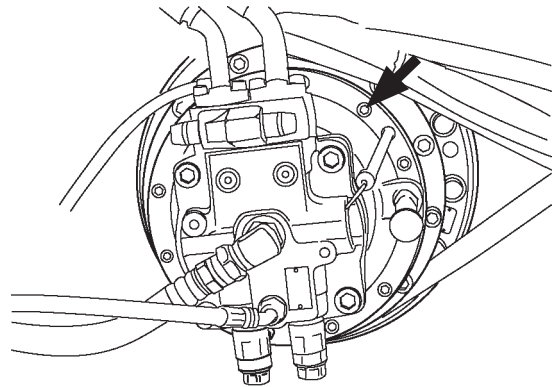
M1U1-07-053

9. Swing motor mounting bolts



ZX120-3 Class

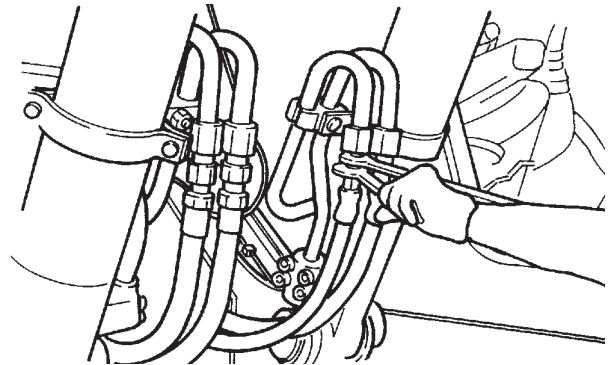
M175-00-002



ZX180-3, 200-3, 270-3, 330-3 Class

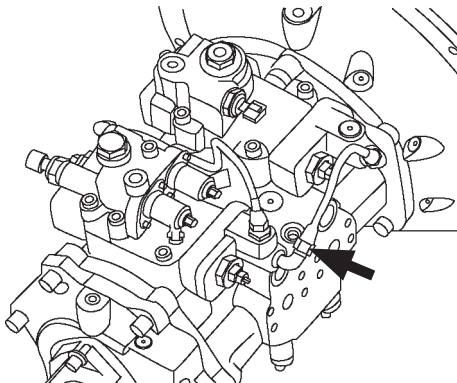
M1U1-07-053

10. ORS fittings for hydraulic hoses and pipings



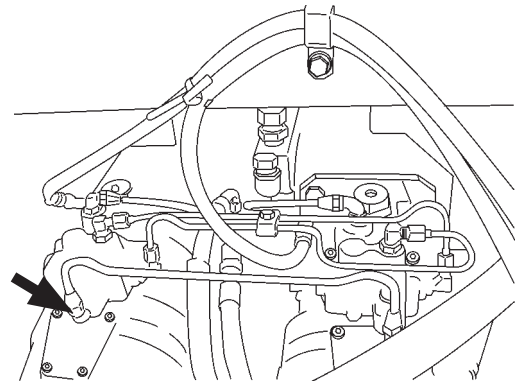
M104-07-079

11. Hycolin tube mounting nuts



ZX120-3 Class

M1U1-07-111

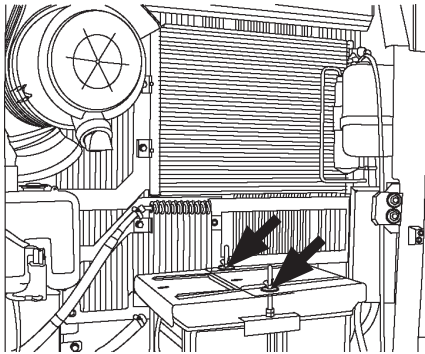


ZX180-3, 200-3, 270-3, 330-3 Class

M1U1-07-035

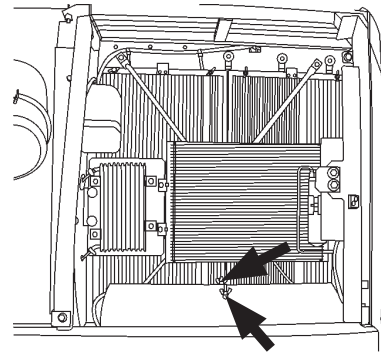
MAINTENANCE

12. Battery mounting nuts



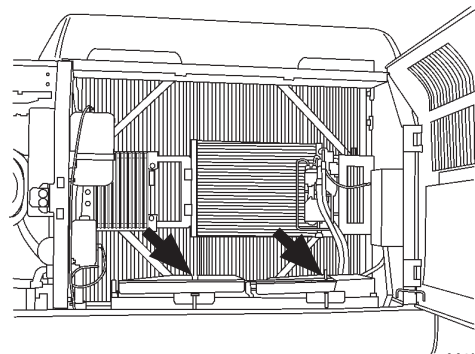
ZX120-3 Class

M1U1-07-109



ZX180-3 Class

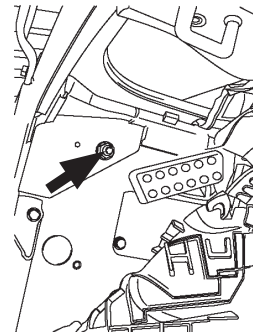
M1U1-07-083



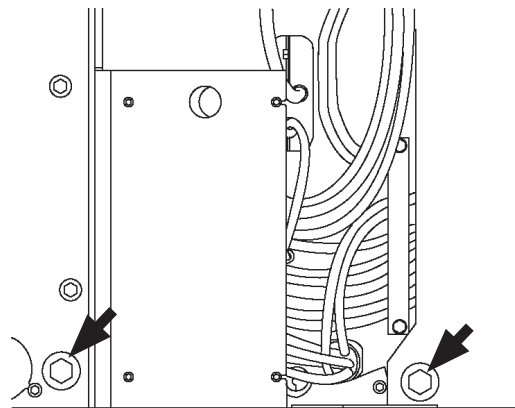
ZX200-3, 270-3, 330-3 Class

M1U1-07-016

13. Cab mounting nuts



M1U1-07-026

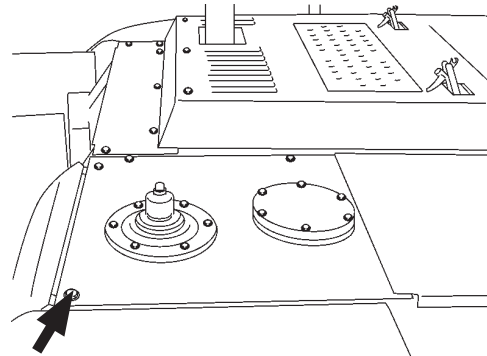


Anchor Bolt Bottom View

M1U1-07-054

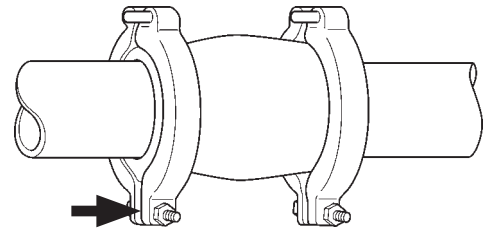
MAINTENANCE

14. Cover mounting bolts



M1U1-07-042

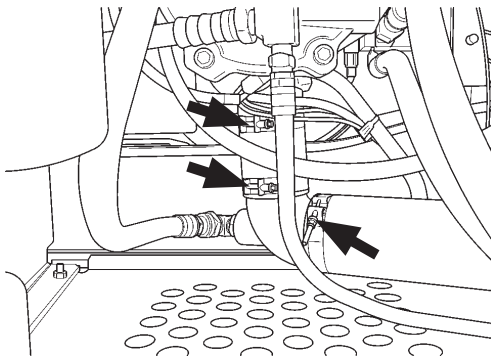
15. Flexible master couplings



Flexible Master Coupling

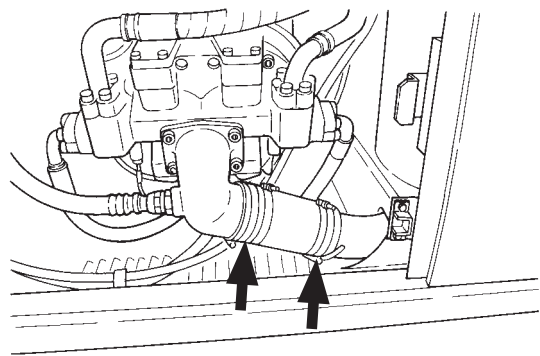
M1G6-07-008

Jubilee and T-bolt clamps



ZX120-3 Class

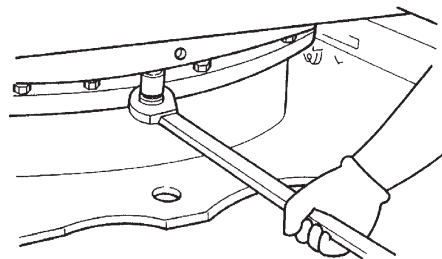
M175-07-016



ZX180-3, 200-3, 270-3, 330-3 Class

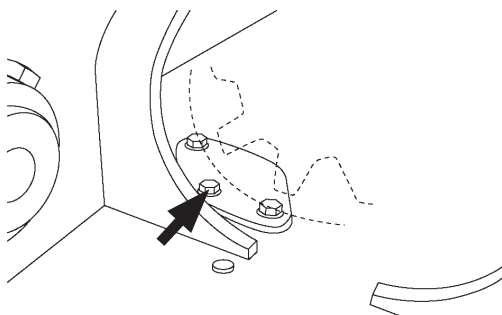
M157-07-215

16. Swing bearing mounting bolts to the upperstructure



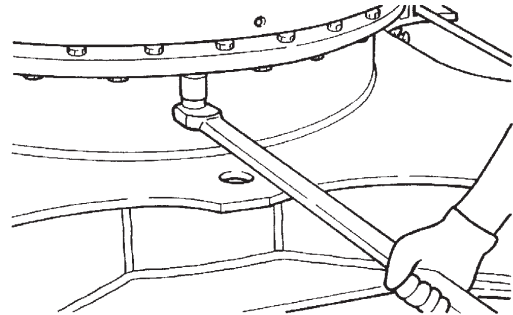
M107-07-088

Swing bearing mounting bolts to the undercarriage



ZX120-3 Class

M1U1-07-113

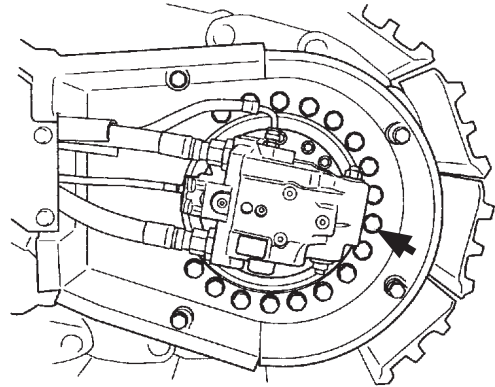


ZX180-3, 200-3, 270-3, 330-3 Class

M107-07-089

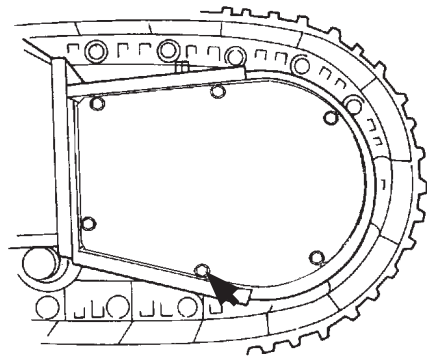
MAINTENANCE

17. Travel device mounting bolts



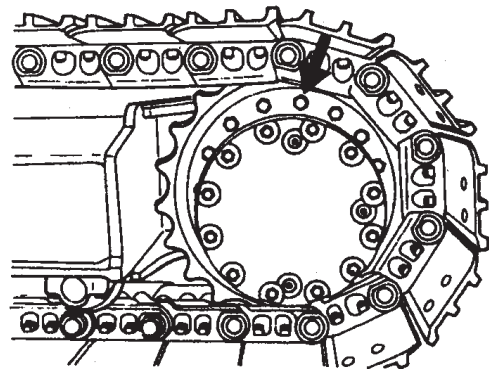
M164-07-005

Travel reduction device cover mounting bolts



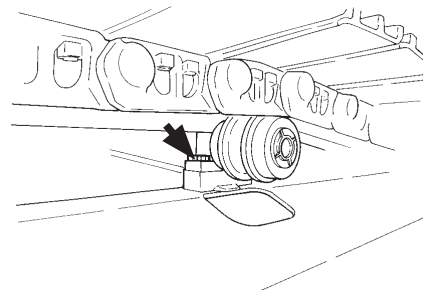
M1G6-07-007

Sprocket mounting bolts



M154-07-050

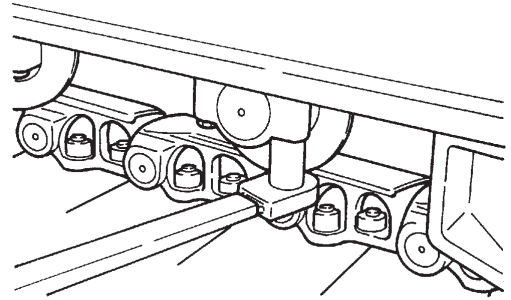
18. Upper roller mounting bolts



M157-07-224

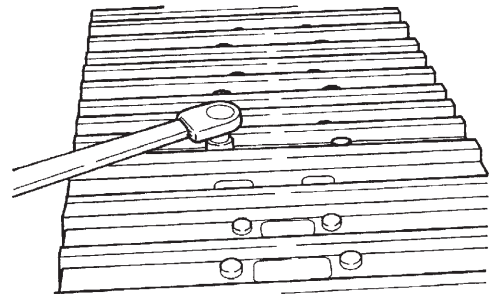
MAINTENANCE

19. Lower roller mounting bolts



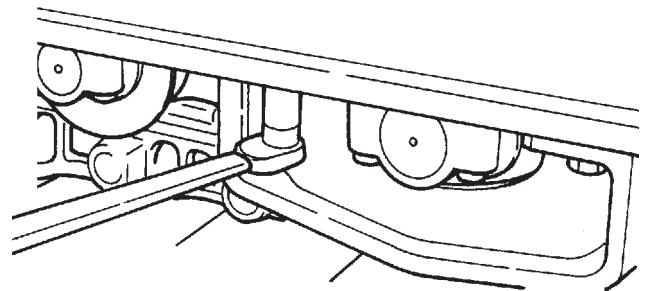
M107-07-092

20. Track shoe mounting bolts



M107-07-093

21. Track guard mounting bolts



M107-07-094

MAINTENANCE UNDER SPECIAL ENVIRONMENTAL CONDITIONS

MAINTENANCE UNDER SPECIAL ENVIRONMENTAL CONDITIONS

Operating Conditions	Precautions for Maintenance	
Muddy Soil, Rainy or Snowy Weather	Before Operation:	Check the tightness of plugs and all drain cocks.
	After Operation:	Clean the machine and check for cracks, damaged, loose or missing bolts and nuts. Lubricate all necessary parts without delay.
Near the Ocean	Before Operation:	Check tightness of plugs and all drain cocks.
	After Operation:	Thoroughly clean the machine with fresh water to wash off salt. Service electrical equipment often to prevent corrosion.
Dusty Atmosphere	Air Cleaner:	Clean the element regularly at shorter service intervals.
	Radiator:	Clean the oil cooler screen to prevent clogging of the radiator core.
	Fuel System:	Clean the filter element and strainer regularly at shorter service intervals.
	Electrical Equipment:	Clean them regularly, in particular, the commutator surface of the alternator and starter.
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.
Freezing Weather	Fuel:	Use high quality fuel suitable for low temperature.
	Lubricant:	Use high quality low viscosity hydraulic oil and engine oil.
	Engine Coolant:	Be sure to use antifreeze.
	Battery:	Fully charge the batteries regularly at shorter service intervals. If not fully charged, electrolyte may freeze.
	Tracks:	Keep the track clean. Park the machine on a hard surface to prevent the tracks from freezing to the ground.
Falling Stones	Cab:	Provide a cab guard to protect the machine from falling stones when necessary.

MEMO

STORAGE

STORING THE MACHINE

1. Inspect the machine. Repair worn or damaged parts. Install new parts if necessary.
2. Clean the primary air cleaner element.
3. Retract all hydraulic cylinders, if possible. If not, coat exposed cylinder rods with grease.
4. Lubricate all grease points.
5. Park the tracks on long stable blocks.
6. Wash the machine.
7. Remove the batteries and store them in a dry protected place after charging fully. If not removed, disconnect the negative battery cable from the (-) terminal.
8. Add an antirust agent to the coolant. In cold weather, add an antifreeze, or drain the coolant completely. Be sure to attach a "No Water in Radiator" tag on a clearly visible location if the system is drained.
9. Loosen the alternator belt and fan belt.
10. Paint necessary areas to prevent rust.
11. Store the machine in a dry, protected place. If stored outside, cover with a waterproof cover.
12. If the machine is stored for a long time, operate hydraulic functions for travel, swing and digging two to three times for lubrication, at least once a month.
Be sure to check the coolant level and lubrication conditions before operating.

Precautions for Disconnecting or Connecting

Batteries

In case the batteries are kept disconnected for more than one month or when the batteries are reconnected, contact your nearest Hitachi dealer. Resetting of the ICF (Information Controller) may be required.

STORAGE

REMOVING THE MACHINE FROM STORAGE



CAUTION: Start the engine **ONLY** in a well-ventilated place.

1. Remove grease from the cylinder rods if coated.
2. Adjust alternator and fan belt tension.
3. Fill the fuel tank. Bleed air from the fuel system. Check all fluid levels.
4. Start the engine.
Run the engine at half speed for several minutes before full load operation.
5. Cycle all hydraulic functions several times.
6. Carefully check all systems before operating the machine at full load.



NOTE: When the machine has been stored for a long time, be sure to perform the following steps as well:

- (a) Check condition of all hoses and connections.
- (b) Warm up the engine.
- (c) Stop the engine.
- (d) Install new fuel filters. Replace the engine oil filter and fill the engine with oil.

IMPORTANT: If the machine has not been used for a long time, oil films on sliding surfaces may have broken down. Cycling hydraulic functions for travel, swing and digging two to three times is necessary to lubricate the sliding surfaces.

TROUBLESHOOTING

IMPOSSIBLE TO START THE ENGINE

Problem		Cause	Solution
Engine will not start	Starter does not rotate or is not powerful	Discharged battery Disconnected, loose, or corroded battery terminals Lowered pilot control shut-off lever. Disconnected, loose, or corroded starter ground line terminals. Faulty pilot control shut-off lever electrical system Too high engine oil viscosity Faulty starter and/or electrical system	Charge or replace battery. After repairing the corroded area, securely tighten the connectors. Pull pilot control shut-off lever up. After repairing the corroded area, securely tighten the connectors. See your authorized dealer. Change engine oil with appropriate viscosity. See your authorized dealer.
	Starter rotates	No fuel Air in the fuel system Clogged fuel filter Frozen fuel Faulty injection pump Faulty engine control system The engine stop SW is ON. Faulty preheat system	After checking that no fuel is leaking, refill fuel. Bleed air. After draining water, replace the element. Warm the fuel pump with hot water or wait until the atmospheric temperature rises. See your authorized dealer. See your authorized dealer. Move the engine stop switch to the upward position to start the engine. See your authorized dealer.
Even though the engine is started, the engine stalls soon		Too slow idle speed Clogged fuel filter Clogged pre-fuel filter Faulty engine control system Clogged air cleaner Faulty injection pump	See your authorized dealer. After draining water, replace the element. Clean or replace the element. See your authorized dealer. Clean or replace the element. See your authorized dealer.
Engine runs irregularly		Faulty fuel system Water or air in the fuel system Faulty engine control system	See your authorized dealer. Drain water or bleed air. See your authorized dealer.

TROUBLESHOOTING

ENGINE

Problem	Cause	Solution
Engine Not Developing Full Power	Air filters plugged	Replace filter elements.
	Fuel line restricted	Repair or replace fuel line.
	Contaminated fuel	Drain fuel tank and clean outlet screen. Refill.
	Fuel filters plugged	Change filters.
	Plugged vent in fuel tank cap	Clean or install new cap.
	Injection nozzles dirty or malfunctioning	See your authorized dealer.
	Injection pump linkage adjustment	See your authorized dealer.
	Wrong fuel	Use correct fuel.
	Wrong oil	Use correct oil.
	Turbocharger failure	See your authorized dealer.
	Injection pump out of timing	See your authorized dealer.
	Exhaust restriction	Remove muffler and run engine.
	Engine is too hot or cold	See below.
	Engine failure	See your authorized dealer.
	Valve clearance	Check and adjust valves.
	Intake or exhaust system leakage	See your authorized dealer.
Engine Overheats	Low coolant level	Add coolant.
	Thermostat	See your authorized dealer.
	Engine overloaded	Check hydraulic relief valves.
	Radiator cap faulty	Install new cap.
	Radiator core or oil cooler core plugged	Clean radiator and oil cooler.
	Radiator screen plugged	Clean screen.
	Injection pump out of timing	See your authorized dealer.
	Fan damaged	Replace fan.
	Air cleaner plugged	Clean air cleaner.
	Alternator and fan belt loose	Tighten or install new belt.
	Pulley grooves worn	Replace pulleys.
	Cooling system passages dirty	Flush cooling system.
	Temperature gauge or sending unit	See your authorized dealer.

TROUBLESHOOTING

ENGINE

Problem	Cause	Solution
Coolant Temperature Too Low	Thermostat Temperature gauge or sending unit	See your authorized dealer. See your authorized dealer.
Low Engine Oil Pressure	Engine oil pump or pump drive Low oil level Engine oil pressure regulation valve Plugged oil pump intake screen Plugged oil filter Oil leaks Oil diluted with fuel or coolant Engine temperature too high Wrong oil	See your authorized dealer. Add oil. See your authorized dealer. See your authorized dealer. Install a new oil filter. Check for leaks. See your authorized dealer. Check cooling system. Drain oil. Use correct oil.
Engine Uses Too Much Oil	Wrong oil Oil leaks Engine temperature too high Plugged air cleaner Internal engine component wear	Drain oil. Use correct oil. Check engine oil drain plug. Check cooling system. Clean element or install new element. See your authorized dealer.
Engine Uses Too Much Fuel	Plugged or dirty air intake system Wrong fuel Fuel injection nozzles Injection pump out of time	Clean air intake system. Use correct fuel. See your authorized dealer. See your authorized dealer.
Excessive Black or Gray Exhaust Smoke	Wrong fuel Plugged or dirty air intake or exhaust system Injection pump out of timing Injection nozzles dirty or faulty Basic engine failures	Drain tank. Use correct fuel. Clean air intake and exhaust system. See your authorized dealer. See your authorized dealer. See your authorized dealer.

TROUBLESHOOTING

ENGINE

Problem	Cause	Solution
Nothing Works	Battery	Recharge or replace.
Nothing Works (Except clock)	Battery relay	Replace relay.
Batteries Undercharged	Loose or corroded connections Alternator belt loose Alternator not charging Fuse Key switch failure	Clean and tighten or replace batteries. Tighten or install new belt. See your authorized dealer. Replace fuse. Replace key switch.
Starting Motor Will Not Turn	Battery undercharged or dead Battery cables making poor connections Fusible link Key switch Start relay Starter solenoid Starter Starter pinion jammed in flywheel gear Major engine failure	Recharge or replace battery. Clean connections. Replace fusible link. See your authorized dealer. See your authorized dealer. See your authorized dealer. Repair or replace start motor. Repair or replace starter. See your authorized dealer.
Starter Solenoid Chatters	Poor connections at batteries or starter Low battery charge Starter solenoid "hold-in" windings open	Clean connections. Recharge or replace batteries. See your authorized dealer.
Starter Motor Turns but Will Not Crank Engine	Starter pinion gear not engaging flywheel ring gear Pinion shift mechanism jammed or malfunctioning Pinion gear teeth broken Flywheel gear teeth broken	See your authorized dealer. See your authorized dealer. See your authorized dealer. See your authorized dealer.
Engine Cranks Slowly	Battery cables damaged or broken internally Battery or starter cable connections loose or corroded	Inspect and replace cables. Clean and tighten connections.

TROUBLESHOOTING

ENGINE

Problem	Cause	Solution
Exhaust Gas is White	Wrong fuel Cold engine Thermostat faulty or too "cool" Injection pump out of time Coolant leakage into engine cylinder	Drain tank. Use correct fuel. Run engine until warm. See your authorized dealer. See your authorized dealer. See your authorized dealer.
Turbocharger Excessively Noisy or Vibrates	Bearings not lubricated Worn bearings Air leak in engine, intake or exhaust manifold Improper clearance between turbine wheel and turbine housing Broken blades on turbine	Insufficient oil pressure. Check for restricted turbocharger oil line. See your authorized dealer. Inspect, repair. See your authorized dealer. Remove exhaust elbow and air inlet hose and inspect.
Oil Dripping from Turbocharger Adapter	Damaged or worn bearings and/or worn seals Excessive crankcase pressure Turbocharger oil return line carbon build up where line passes exhaust manifold	See your authorized dealer. Inspect and clean air cleaner. Check for proper engine service intervals or dirt enter into engine. Check vent tube to ensure tube is not plugged. Clean. Remove line. Inspect, clean.
Excessive Drag in Turbocharger Rotating Members	Carbon build-up behind turbine wheel caused by combustion deposits Dirt build-up behind compressor wheel caused by air intake leaks Bearing seizure or dirty or worn bearings, caused by excessive temperature, unbalanced wheel, dirty oil, oil starvation, or insufficient lubrication	Inspect, clean. Inspect, clean. See your authorized dealer.

TROUBLESHOOTING

ELECTRICAL SYSTEM

Problem	Cause	Solution
Engine Cranks Slowly	Battery discharged or will not hold a charge Starter "dragging" Low battery voltage	Replace battery. See your authorized dealer. Recharge or replace battery.
Starter Motor Continues to Run After Engine Starts	Start relay stuck Starter solenoid stuck Starter not disengaging Key switch	See your authorized dealer. See your authorized dealer. See your authorized dealer. See your authorized dealer.
Charging Indicator Light On-Engine Running	Loose or glazed alternator belt Engine rpm slow Excessive electrical load from added accessories Loose or corroded electrical connections on battery, ground strap, starter, or alternator Battery voltage low Alternator or regulator Indicator circuit	Check belt. Replace if glazed, tighten if loose. Adjust rpm to specification. Remove accessories or install higher output alternator. Inspect, clean, or tighten electrical connections. Change or replace battery. See your authorized dealer. See your authorized dealer.
Noisy Alternator	Worn drive belt Worn pulleys Pulley misaligned Alternator bearing	Replace belt. Replace pulleys and belt. Adjust alternator mount. Loosen alternator belts. Turn pulley by hand. If any roughness is felt, repair alternator.
No Monitor Panel Indicators Work	Fuse Wiring harness	Replace fuse. See your authorized dealer.
Individual Light in Monitor Panel is Not Working	Bulb Fuse Wiring harness	Replace bulb. Replace fuse. See your authorized dealer.

TROUBLESHOOTING

ELECTRICAL SYSTEM

Problem	Cause	Solution
No Indicators in Gauge Panel Operate	Circuit board Wiring harness Fuse	See your authorized dealer. See your authorized dealer. Replace fuse.
Indicator Light in Gauge Panel is Inoperative	Fuse Sender Wiring harness failure	Replace fuse. Do sender check. See your authorized dealer.
Coolant Temperature Gauge Does Not Work	Fuse Gauge Gauge sender Wiring harness	Replace fuse. See your authorized dealer. Do coolant temperature gauge sender check. See your authorized dealer.
Indicator Lights Do Not Operate Auto-idle	Fuse Auto-idle switch	Replace fuse. See your authorized dealer.
Fuel Gauge Does Not Work	Fuse Gauge Wiring harness	Replace fuse. See your authorized dealer. See your authorized dealer.

TROUBLESHOOTING

MODE SELECTION

Problem	Cause	Solution
Work Mode Selector Does Not Work	Mode switch	See your authorized dealer.
	Electrical connector	See your authorized dealer.
	Wire harness (between Main controller (MC) and Monitor)	See your authorized dealer.
	Main controller (MC)	See your authorized dealer.
	Solenoid valve unit	See your authorized dealer.
Fast/Slow Travel Speed Does Not Function	Travel mode switch	See your authorized dealer.
	Pilot pressure switch (Travel)	See your authorized dealer.
	Pump 1,2 pressure sensors	See your authorized dealer.
	Pump 1,2 control pressure sensors	See your authorized dealer.
	Pump delivery pressure sensor wire harness	See your authorized dealer.
	Main controller (MC)	See your authorized dealer.
	Solenoid valve unit	See your authorized dealer.
Auto-Idle Does Not Work	Damaged travel motors	See your authorized dealer.
	Fuse	Replace fuse.
	Switch panel	See your authorized dealer.
	Electrical connector	See your authorized dealer.
	Wire harness	See your authorized dealer.
	ECM	See your authorized dealer.
	Pressure switches (Travel, Front)	See your authorized dealer.
	Main controller (MC)	See your authorized dealer.

TROUBLESHOOTING

CONTROL LEVERS

Problem	Cause	Solution
Moves Hard	Corroded joint	See your authorized dealer.
	Worn out pusher	See your authorized dealer.
Does Nothing	Worn out pusher	See your authorized dealer.
	Pilot valve	See your authorized dealer.
Does Not Return to Neutral	Pilot valve	See your authorized dealer.
Too Much Play	Worn out pivot joint	See your authorized dealer.
Lever is Not Vertical In Neutral	Pilot valve	See your authorized dealer.

HYDRAULIC SYSTEM

Problem	Cause	Solution
Hydraulic Functions are Slow	Low oil level	Fill reservoir to full mark.
	Cold oil	Push hydraulic warm up switch.
	Wrong oil	Drain tank. Use correct oil.
	Engine speed too slow	Increase speed or see your authorized dealer.
	Pilot circuit	See your authorized dealer.
	Worn pump	See your authorized dealer.
	Restricted pump suction line	See your authorized dealer.
Hydraulic Oil Overheats	Wrong oil	Use correct oil.
	Air leak in pump suction line	See your authorized dealer.
	Oil lines restricted	See your authorized dealer.
	Low oil level	Fill reservoir to full mark.
	Plugged filters	Install new filters.
	Worn pump	See your authorized dealer.
	Plugged radiator or oil cooler	Clean and straighten fins.
	Oil cooler bypass	See your authorized dealer.

TROUBLESHOOTING

HYDRAULIC SYSTEM

Problem	Cause	Solution
Hydraulic Oil Overheats	Relief valve Contaminated oil Travel motors Improperly adjusted hydraulic components	See your authorized dealer. Drain oil and refill. See your authorized dealer. See your authorized dealer.
Oil Foams	Air leak in line from reservoir to pump Kinks or dents in oil lines Wrong oil Water in oil High or low oil level	Repair leak or see your authorized dealer. Check lines. Use correct oil. Change oil. Correct level.
Low or No Oil Pressure	Wrong oil Improperly adjusted hydraulic components No oil in system Worn cylinder packing Relief valve	Use correct oil. See your authorized dealer. Fill with correct oil. See your authorized dealer. See your authorized dealer.
No Hydraulic Functions (Noise from pumps)	Hydraulic pump Decreased set-pressure of main relief valve in control valve Lack of hydraulic oil Damaged suction line or hose Clogged suction filter Sucked air from oil suction port	See your authorized dealer. See your authorized dealer. Add oil. See your authorized dealer. Clean. Tighten.
Hydraulic Cylinders Operate but Cannot Lift Load	Hydraulic pump worn Main relief valve pressure low Hydraulic oil level low Suction screen plugged Pump suction line leaking Pressure sensors Solenoid valve	See your authorized dealer. See your authorized dealer. Add oil. Clean strainer and system. Inspect suction line. See your authorized dealer. See your authorized dealer.

TROUBLESHOOTING

HYDRAULIC SYSTEM

Problem	Cause	Solution
One Control Lever Does Not Work	Relief valve pressure low Tube or hose damaged Hydraulic fittings loose Damaged O-rings in fittings Hydraulic Pump Pilot valve Pilot lines	See your authorized dealer. Repair or replace. Tighten. Install new O-ring. See your authorized dealer. See your authorized dealer. Repair or replace.
One Cylinder Does Not Work	Control valve spool damaged or contaminated with dirt Hydraulic lines damaged Fittings loose O-ring in fitting damaged Pilot valve Pilot lines	See your authorized dealer. Repair or replace. Tighten. Install new O-ring. See your authorized dealer. Repair or replace.
One Cylinder Does Not Work or Has Little Power	Piston seals leaking Cylinder rod damaged Pilot lines Pilot valve Failed wiring harness	See your authorized dealer. See your authorized dealer. Repair or replace. See your authorized dealer. See your authorized dealer.
Both Travel Motors Do Not Work	Center joint failure	See your authorized dealer.
One Travel Motor Does Not Work	Travel motor Parking brake not releasing Pilot valve Pilot lines	See your authorized dealer. See your authorized dealer. See your authorized dealer. Repair or replace.
Travel is Not Smooth	Track adjustment Front idler or rollers damaged Track frame bent	Adjust tension. See your authorized dealer. See your authorized dealer.

TROUBLESHOOTING

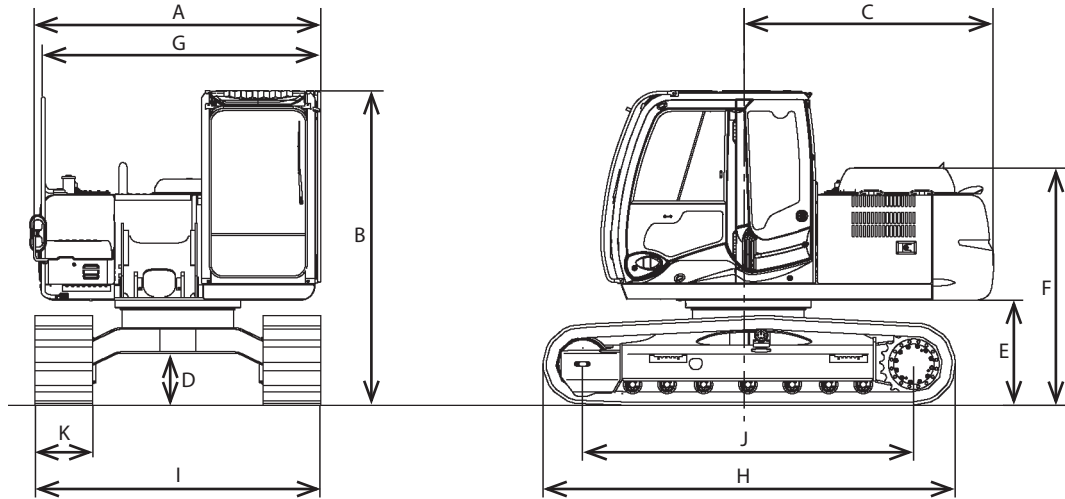
HYDRAULIC SYSTEM

Problem	Cause	Solution
Travel is Not Smooth	Rocks or mud "jammed" in track frame	Remove and repair.
	Travel brake not releasing	See your authorized dealer.
Swing Does Not Work	Swing brake release valve	See your authorized dealer.
	Swing motor	See your authorized dealer.
	Pilot valve	See your authorized dealer.
Swing is Not Smooth	Swing gear	See your authorized dealer.
	Swing bearing	See your authorized dealer.
	Lack of grease	Apply grease.
	Combination valve	See your authorized dealer.
Engine Stops When Travel or/ and Control Lever Moved	Failure of connector contact	Repair or replace.
	Failed wiring harness	See your authorized dealer.
	Failed Main controller	See your authorized dealer.

SPECIFICATIONS

SPECIFICATIONS

ZX110-3, 110M-3



M1U1-12-001

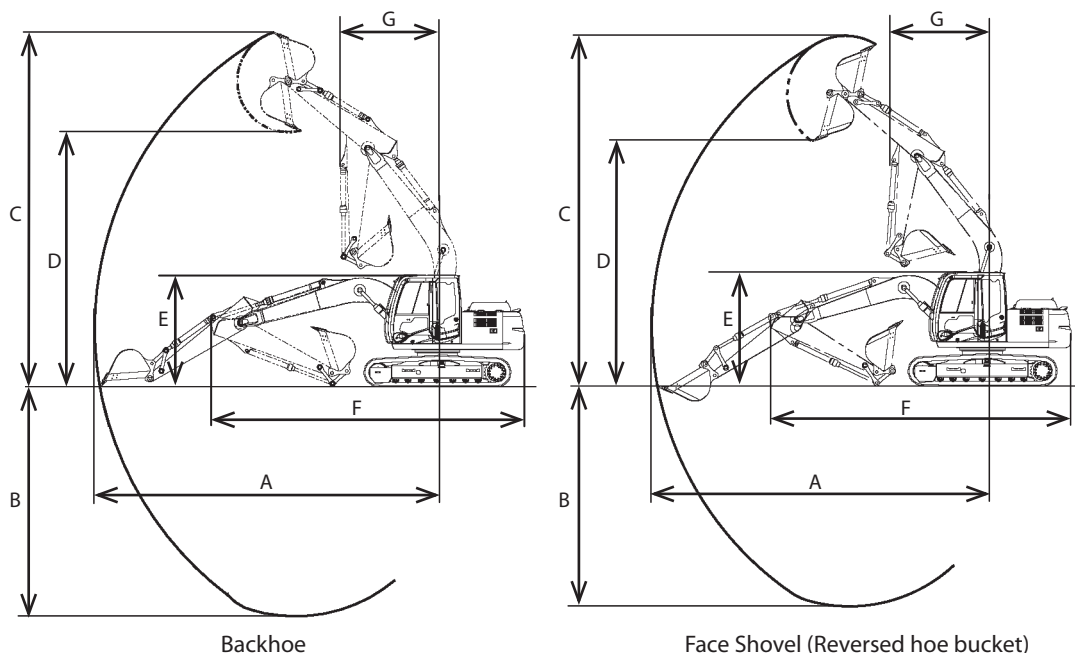
Model	ZX110-3	ZX110M-3
Type of Front-End Attachment	2.26 m (7 ft 5 in) Arm	
Bucket Capacity (Heaped)	PCSA 0.45 m ³ (0.59 yd ³), CECE 0.4 m ³	
Operating Weight	10900 kg (24000 lb)	13100 kg (28900 lb)
Base Machine Weight	8400 kg (18500 lb)	10700 kg (23600 lb)
Engine	ISUZU AJ-4JJ1XYSA-03, 66 kW (90 PS)/1800 min ⁻¹ (rpm) * 69 kW (94 PS)/2000 min ⁻¹ (rpm)	
A : Overall Width (Excluding Rearview Mirrors)	2490 mm (8 ft 2 in)	2690 mm (8 ft 10 in)
B : Cab Height	2740 mm (9 ft 0 in)	2950 mm (9 ft 8 in)
C : Rear End Swing Radius	2130 mm (7 ft 0 in)	
D : Minimum Ground Clearance	* 440 mm (1 ft 5 in)	* 595 mm (1 ft 11 in)
E : Counterweight Clearance	* 890 mm (2 ft 11 in)	* 1100 mm (3 ft 7 in)
F : Engine Cover Height	* 2050 mm (6 ft 9 in)	* 2260 mm (7 ft 5 in)
G : Overall Width of Upperstructure	2460 mm (8 ft 1 in)	
H : Undercarriage Length	3340 mm (11 ft 0 in)	3790 mm (12 ft 5 in)
I : Undercarriage Width	2490 mm (8 ft 2 in)	2690 mm (8 ft 10 in)
J : Sprocket Center to Idler Center	2620 mm (8 ft 7 in)	2990 mm (9 ft 10 in)
K : Track Shoe Width	500 mm (Grouser Shoe) (20 in)	700 mm (Grouser Shoe) (28 in)
Ground Pressure	37 kPa (0.38 kgf/cm ² , 5.4 psi)	28 kPa (0.29 kgf/cm ² , 4.1 psi)
Swing Speed	13.9 min ⁻¹ (13.9 rpm)	
Travel Speed (fast/slow)	5.5/3.6 km/h (3.4/2.2 mph)	4.2/2.4 km/h (2.6/1.5 mph)
Gradeability	35° (tanθ = 0.70)	

NOTE: * H/P mode
* The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

WORKING RANGES

ZX110-3, 110M-3



M1U1-12-003

Model		ZX110-3					
Item	Category	1.96 m (6 ft 5 in) Arm		2.26 m (7 ft 5 in) Arm		2.81 m (9 ft 3 in) Arm	
		Backhoe	Shovel	Backhoe	Shovel	Backhoe	Shovel
A: Maximum Digging Reach	mm (ft·in)	7490 (24' 7")	7640 (25' 1")	7760 (25' 6")	7910 (25' 11")	8240 (27' 0")	8390 (27' 6")
*1 B: Maximum Digging Depth	mm (ft·in)	4780 (15' 8")	4930 (16' 2")	5080 (16' 8")	5230 (17' 2")	5630 (18' 6")	5780 (19' 0")
*1 C: Maximum Cutting Height	mm (ft·in)	7940 (26' 1")	8140 (26' 9")	8110 (26' 7")	8310 (27' 3")	8360 (27' 5")	8570 (28' 1")
*1 D: Maximum Dumping Height	mm (ft·in)	5530 (18' 2")	5620 (18' 5")	5700 (18' 8")	5800 (19' 0")	5960 (19' 7")	6060 (19' 11")
E: Overall Height	mm (ft·in)	2740 (9' 0")		2740 (9' 0")		*2 2740 (9' 0")	
F: Overall Length	mm (ft·in)	7280 (23' 11")		7280 (23' 11")		*2 7300 (23' 11")	
G: Minimum Swing Radius	mm (ft·in)	2370 (7' 9")		2400 (7' 11")		2660 (8' 9")	

Model		ZX110M-3					
Item	Category	1.96 m (6 ft 5 in) Arm		2.26 m (7 ft 5 in) Arm		2.81 m (9 ft 3 in) Arm	
		Backhoe	Shovel	Backhoe	Shovel	Backhoe	Shovel
A: Maximum Digging Reach	mm (ft·in)	7490 (24' 7")	7640 (25' 1")	7760 (25' 6")	7910 (25' 11")	8240 (27' 0")	8390 (27' 6")
*1 B: Maximum Digging Depth	mm (ft·in)	4580 (15' 0")	4730 (15' 6")	4880 (16' 0")	5020 (16' 6")	5430 (17' 10")	5570 (18' 3")
*1 C: Maximum Cutting Height	mm (ft·in)	8140 (26' 9")	8340 (27' 4")	8320 (27' 4")	8520 (27' 11")	8570 (28' 1")	8770 (28' 9")
*1 D: Maximum Dumping Height	mm (ft·in)	5730 (18' 10")	5820 (19' 1")	5910 (19' 5")	6010 (19' 9")	6170 (20' 3")	6260 (20' 7")
E: Overall Height	mm (ft·in)	2950 (9' 8")		2950 (9' 8")		*2 2950 (9' 8")	
F: Overall Length	mm (ft·in)	7260 (23' 10")		7260 (23' 10")		*2 7280 (23' 11")	
G: Minimum Swing Radius	mm (ft·in)	2370 (7' 9")		2400 (7' 11")		2660 (8' 9")	

 NOTE: *1 The dimensions do not include the height of the shoe lug.
 *2 The dimensions asterisked are for transport pin position.

SPECIFICATIONS

SHOE TYPES AND APPLICATIONS

ZX110-3

Shoe Width		500 mm (20") Grouser Shoe	600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	510 mm (20") Flat Shoe	700 mm (28") Triangular Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	10900 (24000)	11100 (24500)	11300 (24900)	11300 (24900)	11200 (24700)
Base Machine Weight	kg (lb)	8400 (18500)	8700 (19200)	8900 (19600)	8900 (19600)	8700 (19200)
Cab Height	mm (ft•in)	2740 (9' 0")	2740 (9' 0")	2740 (9' 0")	2750 (9' 0")	2790 (9' 2")
Minimum Ground Clearance	mm (ft•in)	* 440 (1' 5")	* 440 (1' 5")	* 440 (1' 5")	470 (1' 7")	* 440 (1' 5")
Undercarriage Length	mm (ft•in)	3340 (11' 0")	3340 (11' 0")	3340 (11' 0")	3360 (11' 0")	3440 (11' 3")
Undercarriage Width	mm (ft•in)	2490 (8' 2")	2590 (8' 6")	2690 (8' 10")	2500 (8' 2")	2690 (8' 10")
Ground Pressure		37 kPa (0.38 kgf/cm ² , 5.4 psi)	31 kPa (0.32 kgf/cm ² , 4.5 psi)	27 kPa (0.28 kgf/cm ² , 3.9 psi)	37 kPa (0.38 kgf/cm ² , 5.4 psi)	27 kPa (0.28 kgf/cm ² , 3.9 psi)

Shoe Width		500 mm (20") Pad Crawler Shoe	500 mm (20") Rubber Pad Shoe
Application		For Paved Road (Option)	For Paved Road (Option)
Operating Weight	kg (lb)	10900 (24000)	11300 (24900)
Base Machine Weight	kg (lb)	8500 (18700)	8900 (19600)
Cab Height	mm (ft•in)	2780 (9' 1")	2760 (9' 1")
Minimum Ground Clearance	mm (ft•in)	500 (1' 8")	480 (1' 7")
Undercarriage Length	mm (ft•in)	3420 (11' 3")	3380 (11' 1")
Undercarriage Width	mm (ft•in)	2490 (8' 2")	2490 (8' 2")
Ground Pressure		37 kPa (0.38 kgf/cm ² , 5.4 psi)	38 kPa (0.39 kgf/cm ² , 5.5 psi)

-  **NOTE:** • The specifications for the front-end attachment are for a 2.26 m (7 ft 5 in) arm with PCSA 0.45 m³ (0.59 yd³) standard bucket.
- 600 mm (24 in), 700 mm (28 in) grouser shoe, 510 mm (20 in) flat shoe, 700 mm (28 in) triangular shoe, 500 mm (20 in) pad crawler shoe, and 500 mm (20 in) rubber pad shoe should not be used on gravel or rocky ground.
 - * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

SHOE TYPES AND APPLICATIONS

ZX110M-3

Shoe Width		700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	960 mm (38") High Grouser Shoe	760 mm (30") Triangular Shoe	900 mm (35") Triangular Shoe
Application		For Weak Footing (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Weak Footing (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	13100 (28900)	13400 (29500)	14000 (30900)	13800 (30400)	13600 (30000)
Base Machine Weight	kg (lb)	10700 (23600)	11000 (24300)	11500 (25400)	11400 (25100)	11200 (24700)
Cab Height	mm (ft•in)	2950 (9' 8")	2950 (9' 8")	2980 (9' 9")	3010 (9' 11")	3000 (9' 10")
Minimum Ground Clearance	mm (ft•in)	* 595 (1' 11")	* 595 (1' 11")	* 600 (2' 0")	* 610 (2' 0")	* 600 (2' 0")
Undercarriage Length	mm (ft•in)	3790 (12' 5")	3790 (12' 5")	3790 (12' 5")	3790 (12' 5")	3790 (12' 5")
Undercarriage Width	mm (ft•in)	2690 (8' 10")	2790 (9' 2")	2950 (9' 8")	2750 (9' 0")	2890 (9' 6")
Ground Pressure		28 kPa (0.29 kgf/cm ² , 4.1 psi)	25 kPa (0.25 kgf/cm ² , 3.6 psi)	22 kPa (0.22 kgf/cm ² , 3.2 psi)	27 kPa (0.28 kgf/cm ² , 3.9 psi)	23 kPa (0.23 kgf/cm ² , 3.3 psi)

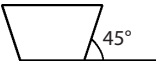
-  **NOTE:** • The specifications for the front-end attachment are for a 2.26 m (7 ft 5 in) arm with PCSA 0.45 m³ (0.59 yd³) standard bucket.
- 800 mm (31 in) grouser shoe, 960 mm (38 in) high grouser shoe, 760 mm (30 in), and 900 mm (35 in) triangular shoe should not be used on gravel or rocky ground.
 - * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

BUCKET TYPES AND APPLICATIONS

ZX110-3, 110M-3

[]: ZX110M-3

Bucket	Bucket Capacity m ³ (yd ³)		Bucket Width mm (in)		Front-End Attachment			
	PCSA Heaped	CECE Heaped	With Side Cutters	Without Side Cutters	1.96 m (6' 5") Arm	2.26 m (7' 5") Arm	2.81 m (9' 3") Arm	2.26 m (7' 5") Arm and extension
Hoe Bucket	0.19 (0.25)	0.17	550 (22")	450 (18")	●	●	●	○
	0.30 (0.39)	0.25	700 (28")	580 (23")	●	●	●	○
	0.40 (0.52)	0.33	800 (31")	680 (27")	●	●	●	○
	0.45 (0.59)	0.40	970 (38")	850 (33")	●	●	*○ [●]	—
	0.50 (0.65)	0.45	1010 (40")	890 (35")	●	○	— [○]	—
	0.59 (0.77)	0.50	1070 (42")	950 (37")	○	□	—	—
Reinforced Hoe Bucket	0.45 (0.59)	0.40	970 (38")	850 (33")	●	●	*○ [●]	—
One Point Ripper	—			—	■ [-]	■ [-]	—	—
Slope-Finishing Blade	—		1000 (39") x 1600 (63")		◇	◇	◇	—
V-Type Bucket	—				○	○	○	—
Clamshell Bucket (Cente-pull type)	0.30 (0.39)		—	560 (22")	●	●	—	—
Clamshell Bucket (Shell-push type)	0.30 (0.39)		—	685 (27")	●	●	—	—

 **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/m³ (2700 lb/yd³) as a standard.

Loading:

For loading operation of dry, loosened earth and sand.

Their bulk density shall be less than 1.10 t/m³ (1850 lb/yd³) as a standard.

Rock digging:

For digging/loading operation of mountain gravels, blasted rock, hard clay, soft rock and so on.

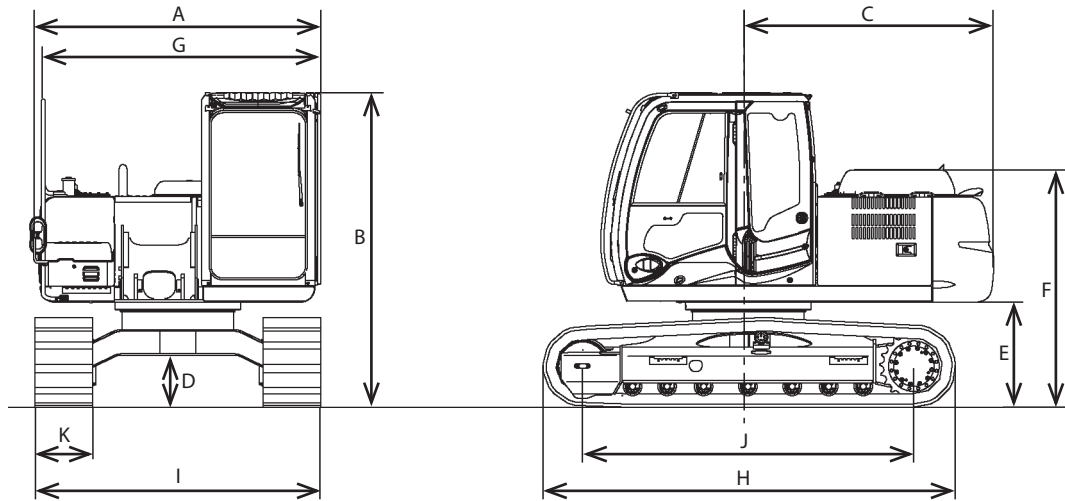
- * Applicable only to 700 mm (28 in) grouser shoe.

IMPORTANT: Using inapplicable buckets may cause serious damage to the front structure such as boom, arm and hydraulic cylinders.

SPECIFICATIONS

SPECIFICATIONS

ZX120-3



M1U1-12-001

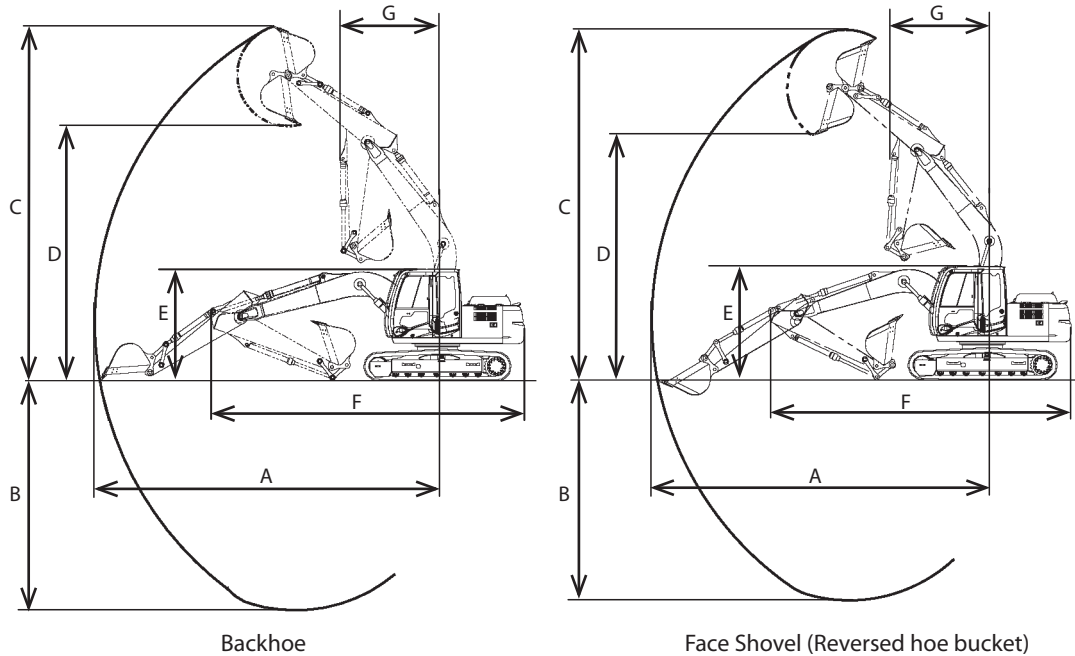
Model	ZX120-3
Type of Front-End Attachment	2.52 m (8 ft 3 in) Arm
Bucket Capacity (Heaped)	PCSA 0.50 m ³ (0.65 yd ³), CECE 0.45 m ³
Operating Weight	12100 kg (26700 lb)
Base Machine Weight	9400 kg (20700 lb)
Engine	ISUZU AJ-4JJ1XYSA-03, 66 kW (90 PS)/1800 min ⁻¹ (rpm) * 69 kW (94 PS)/2000 min ⁻¹ (rpm)
A : Overall Width (Excluding Rearview Mirrors)	2490 mm (8 ft 2 in)
B : Cab Height	2740 mm (9 ft 0 in)
C : Rear End Swing Radius	2130 mm (7 ft 0 in)
D : Minimum Ground Clearance	* 440 mm (1 ft 5 in)
E : Counterweight Clearance	* 890 mm (2 ft 11 in)
F : Engine Cover Height	* 2050 mm (6 ft 9 in)
G : Overall Width of Upperstructure	2460 mm (8 ft 1 in)
H : Undercarriage Length	3580 mm (11 ft 9 in)
I : Undercarriage Width	2490 mm (8 ft 2 in)
J : Sprocket Center to Idler Center	2880 mm (9 ft 5 in)
K : Track Shoe Width	500 mm (20 in) (Grouser Shoe)
Ground Pressure	38 kPa (0.39 kgf/cm ²) (5.5 psi)
Swing Speed	13.7 min ⁻¹ (13.7 rpm)
Travel Speed (fast/slow)	5.5/3.4 km/h (3.4/2.1 mph)
Gradeability	35° (tanθ = 0.70)

 NOTE: * H/P mode
* The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

WORKING RANGES

ZX120-3



M1U1-12-003

Model		ZX120-3					
Item	Category	2.10 m (6 ft 11 in) Arm		2.52 m (8 ft 3 in) Arm		3.01 m (9 ft 11 in) Arm	
		Backhoe	Shovel	Backhoe	Shovel	Backhoe	Shovel
A: Maximum Digging Reach	mm (ft•in)	7960 (26' 1")	8110 (26' 7")	8320 (27' 4")	8460 (27' 9")	8790 (28' 10")	8920 (29' 3")
*1 B: Maximum Digging Depth	mm (ft•in)	5150 (16' 11")	5300 (17' 5")	5570 (18' 3")	5710 (18' 9")	6060 (19' 11")	6200 (20' 4")
*1 C: Maximum Cutting Height	mm (ft•in)	8370 (27' 6")	8560 (28' 1")	8570 (28' 1")	8770 (28' 9")	8900 (29' 2")	9100 (29' 10")
*1 D: Maximum Dumping Height	mm (ft•in)	5960 (19' 7")	6080 (19' 11")	6160 (20' 3")	6250 (20' 6")	6490 (21' 4")	6570 (21' 7")
E: Overall Height	mm (ft•in)	2740 (9' 0")		2740 (9' 0")		*2 2740 (9' 0")	
F: Overall Length	mm (ft•in)	7660 (25' 2")	7650 (25' 1")	7660 (25' 2")		*2 7670 (25' 2")	
G: Minimum Swing Radius	mm (ft•in)	2370 (7' 9")		2390 (7' 10")		2640 (8' 8")	

NOTE: *1 The dimensions do not include the height of the shoe lug.
 *2 The dimensions asterisked are for transport pin position.

SPECIFICATIONS

SHOE TYPES AND APPLICATIONS

ZX120-3

Shoe Width		500 mm (20") Grouser Shoe	600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	510 mm (20") Flat Shoe	700 mm (28") Triangular Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	12100 (26700)	12400 (27300)	12600 (27800)	12600 (27800)	12500 (27600)
Base Machine Weight	kg (lb)	9400 (20700)	9700 (21400)	9900 (21800)	9900 (21800)	9800 (21600)
Cab Height	mm (ft·in)	2740 (9' 0")	2740 (9' 0")	2740 (9' 0")	2750 (9' 0")	2790 (9' 2")
Minimum Ground Clearance	mm (ft·in)	* 440 (1' 5")	* 440 (1' 5")	* 440 (1' 5")	470 (1' 7")	* 440 (1' 5")
Undercarriage Length	mm (ft·in)	3580 (11' 9")	3580 (11' 9")	3580 (11' 9")	3600 (11' 10")	3680 (12' 1")
Undercarriage Width	mm (ft·in)	2490 (8' 2")	2590 (8' 6")	2690 (8' 10")	2500 (8' 2")	2690 (8' 10")
Ground Pressure		38 kPa (0.39 kgf/cm ² , 5.5 psi)	32 kPa (0.33 kgf/cm ² , 4.6 psi)	28 kPa (0.29 kgf/cm ² , 4.1 psi)	38 kPa (0.39 kgf/cm ² , 5.5 psi)	27 kPa (0.28 kgf/cm ² , 3.9 psi)

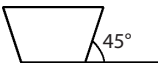
Shoe Width		500 mm (20") Single Grouser Shoe	500 mm (20") Pad Crawler Shoe	500 mm (20") Rubber Pad Shoe
Application		For Weak Footing (Option)	For Paved Road (Option)	For Paved Road (Option)
Operating Weight	kg (lb)	12400 (27300)	12200 (26900)	12600 (27800)
Base Machine Weight	kg (lb)	9700 (21400)	9500 (20900)	9900 (21800)
Cab Height	mm (ft·in)	2740 (9' 0")	2780 (9' 1")	2760 (9' 1")
Minimum Ground Clearance	mm (ft·in)	* 440 (1' 5")	500 (1' 8")	480 (1' 7")
Undercarriage Length	mm (ft·in)	3650 (12' 0")	3660 (12' 0")	3620 (11' 11")
Undercarriage Width	mm (ft·in)	2490 (8' 2")	2490 (8' 2")	2490 (8' 2")
Ground Pressure		38 kPa (0.39 kgf/cm ² , 5.5 psi)	38 kPa (0.39 kgf/cm ² , 5.5 psi)	39 kPa (0.40 kgf/cm ² , 5.7 psi)

-  **NOTE:** • The specifications for the front-end attachment are for a 2.52 m (8 ft 3 in) arm with PCSA 0.50 m³ (0.65 yd³) standard bucket.
- 600 mm (24 in), 700 mm (28 in) grouser shoe, 510 mm (20 in) flat shoe, 700 mm (28 in) triangular shoe, 500 mm (20 in) single grouser shoe, 500 mm (20 in) pad crawler shoe, and 500 mm (20 in) rubber pad shoe should not be used on gravel or rocky ground.
- * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

BUCKET TYPES AND APPLICATIONS

ZX120-3

Bucket	Bucket Capacity m ³ (yd ³)		Bucket Width mm (in)		Front-End Attachment			
	PCSA Heaped	CECE Heaped	With Side Cutters	Without Side Cutters	2.10 m (6' 11") Arm	2.52 m (8' 3") Arm	3.01 m (9' 11") Arm	2.52 m (8' 3") Arm and extension
Hoe Bucket	0.19 (0.25)	0.17	550 (22")	450 (18")	●	●	●	○
	0.30 (0.39)	0.25	700 (28")	580 (23")	●	●	●	○
	0.40 (0.52)	0.33	800 (31")	680 (27")	●	●	●	○
	0.45 (0.59)	0.40	970 (38")	850 (33")	●	●	○	○
	0.50 (0.65)	0.45	1010 (40")	890 (35")	●	●	*○	—
	0.59 (0.77)	0.50	1070 (42")	950 (37")	●	○	—	—
	0.66 (0.86)	0.55	—	1030 (41")	□	—	—	—
Reinforced Hoe Bucket	0.50 (0.65)	0.45	1010 (40")	890 (35")	●	●	*○	—
One Point Ripper	0.59 (0.77)	0.50	1070 (42")	950 (37")	●	○	—	—
One Point Ripper	—	—	—	—	■	■	—	—
Slope-Finishing Blade	—	—	1000 (39") x 1600 (63")		◇	◇	◇	—
V-Type Bucket	—	—			○	○	○	—
Clamshell Bucket (Cente-pull type)	0.30 (0.39)	—	—	560 (22")	●	●	—	—
Clamshell Bucket (Shell-push type)	0.40 (0.52)	—	—	590 (23")	●	●	—	—

 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/m³ (2700 lb/yd³) as a standard.

Loading:

For loading operation of dry, loosened earth and sand.

Their bulk density shall be less than 1.10 t/m³ (1850 lb/yd³) as a standard.

Rock digging:

For digging/loading operation of mountain gravels, blasted rock, hard clay, soft rock and so on.

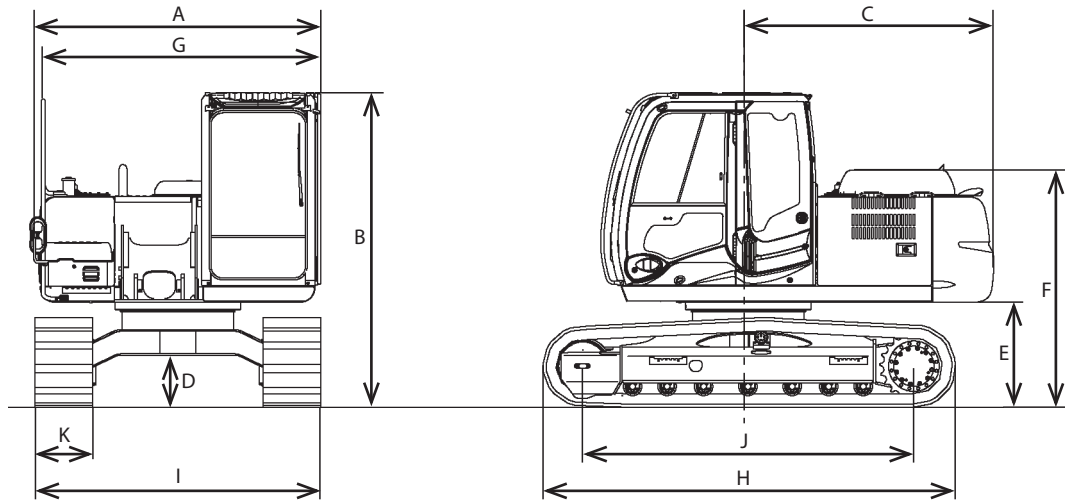
- * Applicable only to 700 mm (28 in) grouser shoe.

IMPORTANT: Using inapplicable buckets may cause serious damage to the front structure such as boom, arm and hydraulic cylinders.

SPECIFICATIONS

SPECIFICATIONS

ZX130K-3



M1U1-12-001

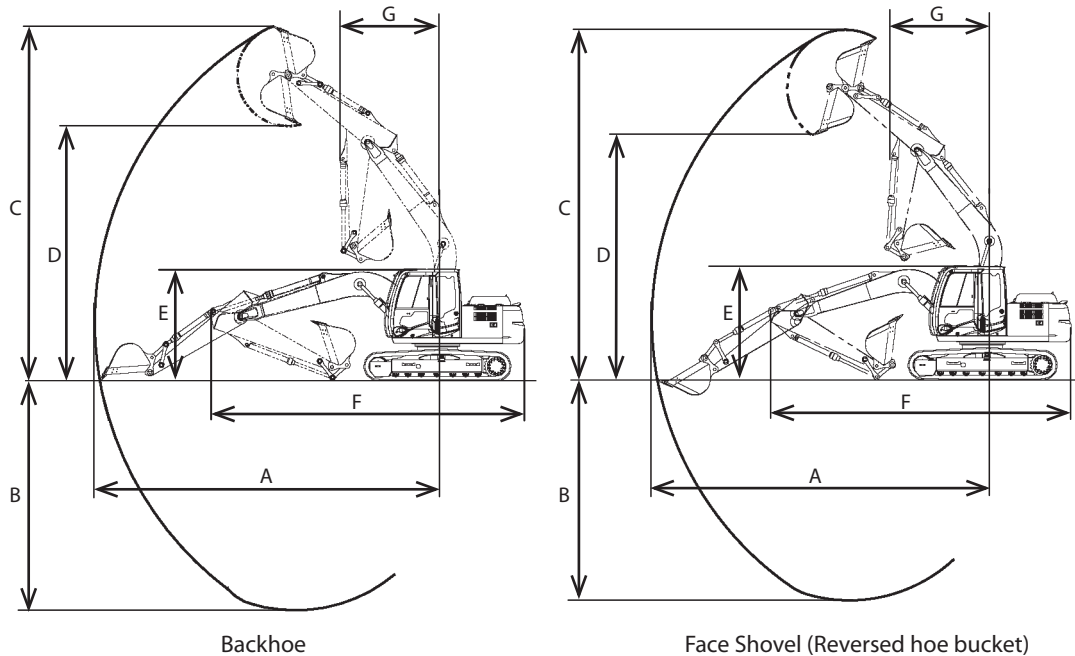
Model	ZX130K-3
Type of Front-End Attachment	2.52 m (8 ft 3 in) K Arm
Bucket Capacity (Heaped)	PCSA 0.50 m ³ (0.65 yd ³), CECE 0.45 m ³
Operating Weight	13100 kg (28900 lb)
Base Machine Weight	10200 kg (22500 lb)
Engine	ISUZU AJ-4JJ1XYSA-03, 66 kW (90 PS)/1800 min ⁻¹ (rpm) * 69 kW (94 PS)/2000 min ⁻¹ (rpm)
A : Overall Width (Excluding Rearview Mirrors)	2490 mm (8 ft 2 in)
B : Cab Height	2870 mm (9 ft 5 in)
C : Rear End Swing Radius	2130 mm (7 ft 0 in)
D : Minimum Ground Clearance	* 440 mm (1 ft 5 in)
E : Counterweight Clearance	* 890 mm (2 ft 11 in)
F : Engine Cover Height	* 2050 mm (6 ft 9 in)
G : Overall Width of Upperstructure	2460 mm (8 ft 1 in)
H : Undercarriage Length	3580 mm (11 ft 9 in)
I : Undercarriage Width	2490 mm (8 ft 2 in)
J : Sprocket Center to Idler Center	2880 mm (9 ft 5 in)
K : Track Shoe Width	500 mm (20 in) (Grouser Shoe)
Ground Pressure	41 kPa (0.42 kgf/cm ²) (5.9 psi)
Swing Speed	13.7 min ⁻¹ (13.7 rpm)
Travel Speed (fast/slow)	5.5/3.4 km/h (3.4/2.1 mph)
Gradeability	35° (tanθ = 0.70)

 NOTE: * H/P mode
* The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

WORKING RANGES

ZX130K-3



M1U1-12-003

Model		ZX130K-3	
Item	Category	2.52 m (8 ft 3 in) K Arm	
		Backhoe	Shovel
A: Maximum Digging Reach	mm (ft•in)	8320 (27' 4")	8460 (27' 9")
B: Maximum Digging Depth	mm (ft•in)	* 5570 (18' 3")	* 5710 (18' 9")
C: Maximum Cutting Height	mm (ft•in)	* 8570 (28' 1")	* 8770 (28' 9")
D: Maximum Dumping Height	mm (ft•in)	* 6160 (20' 3")	* 6250 (20' 6")
E: Overall Height	mm (ft•in)	2740 (9' 0")	
F: Overall Length	mm (ft•in)	7660 (25' 2")	
G: Minimum Swing Radius	mm (ft•in)	2390 (7' 10")	

NOTE: * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

SHOE TYPES AND APPLICATIONS

ZX130K-3

Shoe Width		500 mm (20") Grouser Shoe	600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	510 mm (20") Flat Shoe	500 mm (20") Pad Crawler Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)	For Paved Road (Option)
Operating Weight	kg (lb)	13100 (28900)	13400 (29500)	13600 (30000)	13600 (30000)	13200 (29100)
Base Machine Weight	kg (lb)	10200 (22500)	10500 (23100)	10700 (23600)	10700 (23600)	10300 (22700)
Cab Height	mm (ft•in)	2870 (9' 5")	2870 (9' 5")	2870 (9' 5")	2880 (9' 5")	2920 (9' 7")
Minimum Ground Clearance	mm (ft•in)	* 440 (1' 5")	* 440 (1' 5")	* 440 (1' 5")	470 (1' 7")	500 (1' 8")
Undercarriage Length	mm (ft•in)	3580 (11' 9")	3580 (11' 9")	3580 (11' 9")	3600 (11' 10")	3670 (12' 1")
Undercarriage Width	mm (ft•in)	2490 (8' 2")	2590 (8' 6")	2690 (8' 10")	2500 (8' 2")	2490 (8' 2")
Ground Pressure		41 kPa (0.42 kgf/cm ² , 5.9 psi)	35 kPa (0.36 kgf/cm ² , 5.1 psi)	30 kPa (0.31 kgf/cm ² , 4.4 psi)	42 kPa (0.43 kgf/cm ² , 6.1 psi)	41 kPa (0.42 kgf/cm ² , 5.9 psi)

Shoe Width		500 mm (20") Rubber Pad Shoe
Application		For Paved Road (Option)
Operating Weight	kg (lb)	13600 (30000)
Base Machine Weight	kg (lb)	10700 (23600)
Cab Height	mm (ft•in)	2890 (9' 6")
Minimum Ground Clearance	mm (ft•in)	480 (1' 7")
Undercarriage Length	mm (ft•in)	3620 (11' 11")
Undercarriage Width	mm (ft•in)	2490 (8' 2")
Ground Pressure		42 kPa (0.43 kgf/cm ² , 6.1 psi)

-  **NOTE:** • The specifications for the front-end attachment are for a 2.52 m (8 ft 3 in) K arm with PCSA 0.50 m³ (0.65 yd³) standard bucket.
- 600 mm (24 in), 700 mm (28 in) grouser shoe, 510 mm (20 in) flat shoe, 500 mm (20 in) pad crawler shoe, and 500 mm (20 in) rubber pad shoe should not be used on gravel or rocky ground.
 - * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

BUCKET TYPES AND APPLICATIONS

ZX130K-3

Bucket	Bucket Capacity m ³ (yd ³)		Bucket Width mm (in)		Front-End Attachment
	PCSA Heaped	CECE Heaped	With Side Cutters	Without Side Cutters	2.52 m (8' 3") K Arm
Hoe Bucket	0.19 (0.25)	0.17	550 (22")	450 (18")	●
	0.30 (0.39)	0.25	700 (28")	580 (23")	●
	0.40 (0.52)	0.33	800 (31")	680 (27")	●
	0.45 (0.59)	0.40	970 (38")	850 (33")	●
	0.50 (0.65)	0.45	1010 (40")	890 (35")	●
	0.59 (0.77)	0.50	1070 (42")	950 (37")	○
	0.66 (0.86)	0.55	—	1030 (41")	—
Reinforced Hoe Bucket	0.50 (0.65)	0.45	1010 (40")	890 (35")	●
	0.59 (0.77)	0.50	1070 (42")	950 (37")	○
Clamshell Bucket (Cente-pull type)	0.30 (0.39)	—	—	560 (22")	●
Clamshell Bucket (Shell-push type)	0.40 (0.52)	—	—	590 (23")	●

 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/m³ (2700 lb/yd³) as a standard.

Loading:

For loading operation of dry, loosened earth and sand.

Their bulk density shall be less than 1.10 t/m³ (1850 lb/yd³) as a standard.

Rock digging:

For digging/loading operation of mountain gravels, blasted rock, hard clay, soft rock and so on.

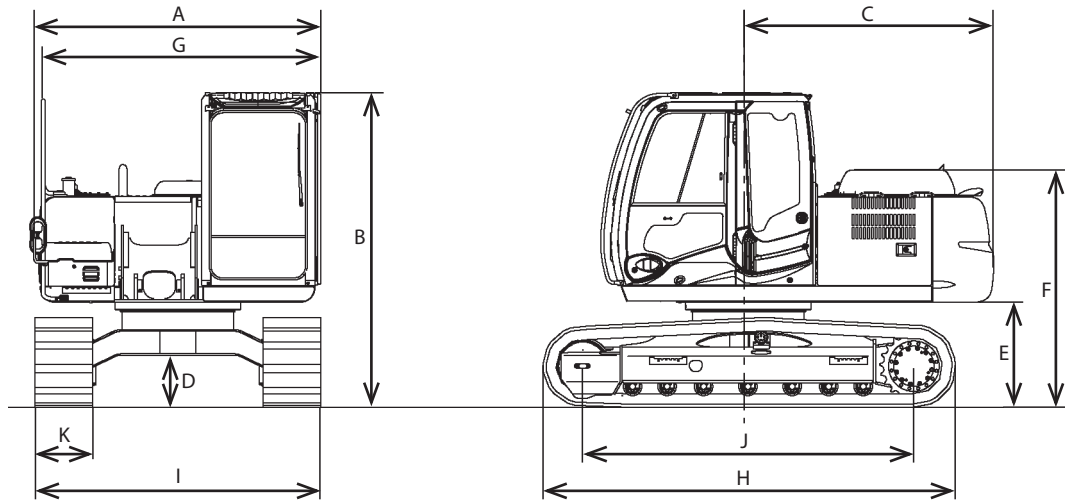
- * Applicable only to 700 mm (28 in) grouser shoe.

IMPORTANT: Using inapplicable buckets may cause serious damage to the front structure such as boom, arm and hydraulic cylinders.

SPECIFICATIONS

SPECIFICATIONS

ZX130L-3



M1U1-12-001

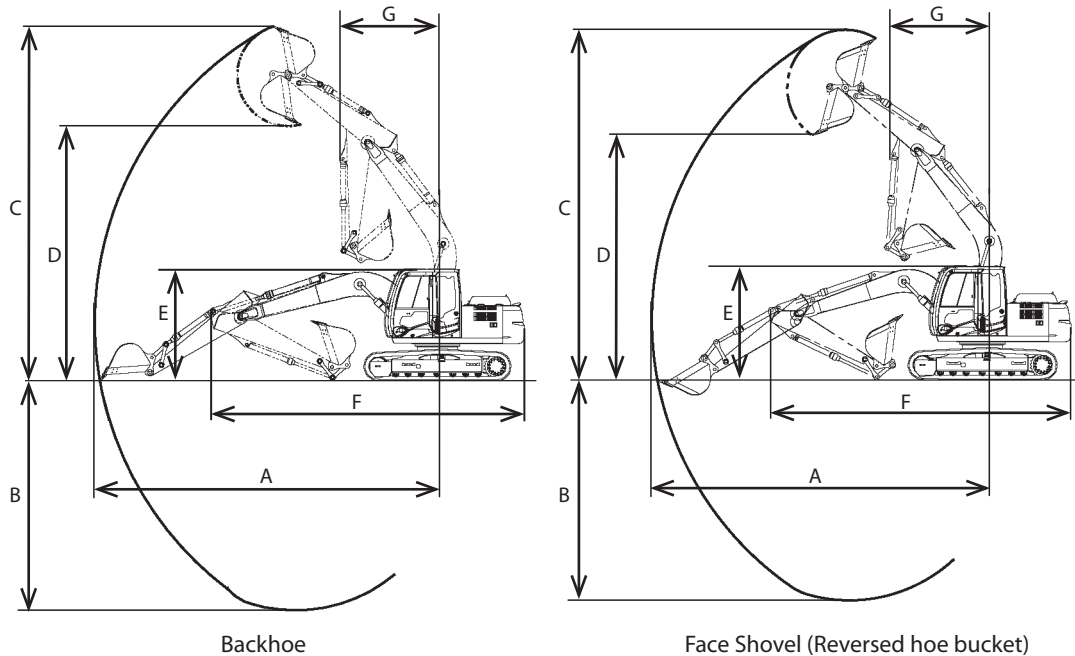
Model	ZX130L-3
Type of Front-End Attachment	2.52 m (8 ft 3 in) Reinforced Arm
Bucket Capacity (Heaped)	PCSA 0.50 m ³ (0.65 yd ³), CECE 0.45 m ³
Operating Weight	13800 kg (30400 lb)
Base Machine Weight	11100 kg (24500 lb)
Engine	ISUZU AJ-4JJ1XYSA-03, 66 kW (90 PS)/1800 min ⁻¹ (rpm) * 69 kW (94 PS)/2000 min ⁻¹ (rpm)
A : Overall Width (Excluding Rearview Mirrors)	2490 mm (8 ft 2 in)
B : Cab Height	2950 mm (9 ft 8 in)
C : Rear End Swing Radius	2130 mm (7 ft 0 in)
D : Minimum Ground Clearance	* 595 mm (1 ft 11 in)
E : Counterweight Clearance	* 1100 mm (3 ft 7 in)
F : Engine Cover Height	* 2260 mm (7 ft 5 in)
G : Overall Width of Upperstructure	2460 mm (8 ft 1 in)
H : Undercarriage Length	3790 mm (12 ft 5 in)
I : Undercarriage Width	2490 mm (8 ft 2 in)
J : Sprocket Center to Idler Center	2990 mm (9 ft 10 in)
K : Track Shoe Width	500 mm (20 in) (Grouser Shoe)
Ground Pressure	41 kPa (0.42 kgf/cm ²) (5.9 psi)
Swing Speed	13.7 min ⁻¹ (13.7 rpm)
Travel Speed (fast/slow)	4.4/2.5 km/h (2.7/1.6 mph)
Gradeability	35° (tanθ = 0.70)

 NOTE: * H/P mode
* The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

WORKING RANGES

ZX130L-3



M1U1-12-003

Model		ZX130L-3	
Item	Category	2.52 m (8 ft 3 in) Reinforced Arm	
		Backhoe	Shovel
A: Maximum Digging Reach	mm (ft•in)	8320 (27' 4")	8460 (27' 9")
B: Maximum Digging Depth	mm (ft•in)	* 5360 (17' 7")	* 5500 (18' 1")
C: Maximum Cutting Height	mm (ft•in)	* 8780 (28' 10")	* 8980 (29' 6")
D: Maximum Dumping Height	mm (ft•in)	* 6370 (20' 11")	* 6460 (21' 2")
E: Overall Height	mm (ft•in)	2950 (9' 8")	
F: Overall Length	mm (ft•in)	7660 (25' 2")	
G: Minimum Swing Radius	mm (ft•in)	2390 (7' 10")	

NOTE: * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

SHOE TYPES AND APPLICATIONS

ZX130L-3

Shoe Width		500 mm (20") Grouser Shoe	600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	500 mm (20") High Grouser Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Weak Footing (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	13800 (30400)	14000 (30900)	14200 (31300)	14600 (32200)	13900 (30600)
Base Machine Weight	kg (lb)	11100 (24500)	11300 (24900)	11500 (25400)	11900 (26200)	11200 (24700)
Cab Height	mm (ft•in)	2950 (9' 8")	2950 (9' 8")	2950 (9' 8")	2950 (9' 8")	2990 (9' 10")
Minimum Ground Clearance	mm (ft•in)	* 595 (1' 11")	* 595 (1' 11")	* 595 (1' 11")	* 595 (1' 11")	* 600 (2' 0")
Undercarriage Length	mm (ft•in)	3790 (12' 5")	3790 (12' 5")	3790 (12' 5")	3790 (12' 5")	3860 (12' 8")
Undercarriage Width	mm (ft•in)	2490 (8' 2")	2590 (8' 6")	2690 (8' 10")	2790 (9' 2")	2490 (8' 2")
Ground Pressure		41 kPa (0.42 kgf/cm ² , 5.9 psi)	35 kPa (0.36 kgf/cm ² , 5.1 psi)	30 kPa (0.31 kgf/cm ² , 4.4 psi)	27 kPa (0.28 kgf/cm ² , 3.9 psi)	41 kPa (0.42 kgf/cm ² , 5.9 psi)

Shoe Width		760 mm (30") Triangular Shoe
Application		For Weak Footing (Option)
Operating Weight	kg (lb)	14900 (32800)
Base Machine Weight	kg (lb)	12200 (26900)
Cab Height	mm (ft•in)	3010 (9' 11")
Minimum Ground Clearance	mm (ft•in)	660 (2' 2")
Undercarriage Length	mm (ft•in)	3920 (12' 10")
Undercarriage Width	mm (ft•in)	2750 (9' 0")
Ground Pressure		29 kPa (0.30 kgf/cm ² , 4.2 psi)

-  **NOTE:** • The specifications for the front-end attachment are for a 2.52 m (8 ft 3 in) reinforced arm with PCSA 0.50 m³ (0.65 yd³) standard bucket.
- 600 mm (24 in), 700 mm (28 in), 800 mm (31 in) grouser shoe, 500 mm (20 in) high grouser shoe, 760 mm (30 in) triangular shoe should not be used on gravel or rocky ground.
 - * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

BUCKET TYPES AND APPLICATIONS

ZX130L-3

Bucket	Bucket Capacity m ³ (yd ³)		Bucket Width mm (in)		Front-End Attachment
	PCSA Heaped	CECE Heaped	With Side Cutters	Without Side Cutters	2.52 m (8' 3") Reinforced Arm
Hoe Bucket	0.19 (0.25)	0.17	550 (22")	450 (18")	●
	0.30 (0.39)	0.25	700 (28")	580 (23")	●
	0.40 (0.52)	0.33	800 (31")	680 (27")	●
	0.45 (0.59)	0.40	970 (38")	850 (33")	●
	0.50 (0.65)	0.45	1010 (40")	890 (35")	●
	0.59 (0.77)	0.50	1070 (42")	950 (37")	○
Reinforced Hoe Bucket	0.50 (0.65)	0.45	1010 (40")	890 (35")	●
	0.59 (0.77)	0.50	1070 (42")	950 (37")	○
Clamshell Bucket (Cente-pull type)	0.30 (0.39)	—	—	560 (22")	●
Clamshell Bucket (Shell-push type)	0.40 (0.52)	—	—	590 (23")	●

 **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/m³ (2700 lb/yd³) as a standard.

Loading:

For loading operation of dry, loosened earth and sand.

Their bulk density shall be less than 1.10 t/m³ (1850 lb/yd³) as a standard.

Rock digging:

For digging/loading operation of mountain gravels, blasted rock, hard clay, soft rock and so on.

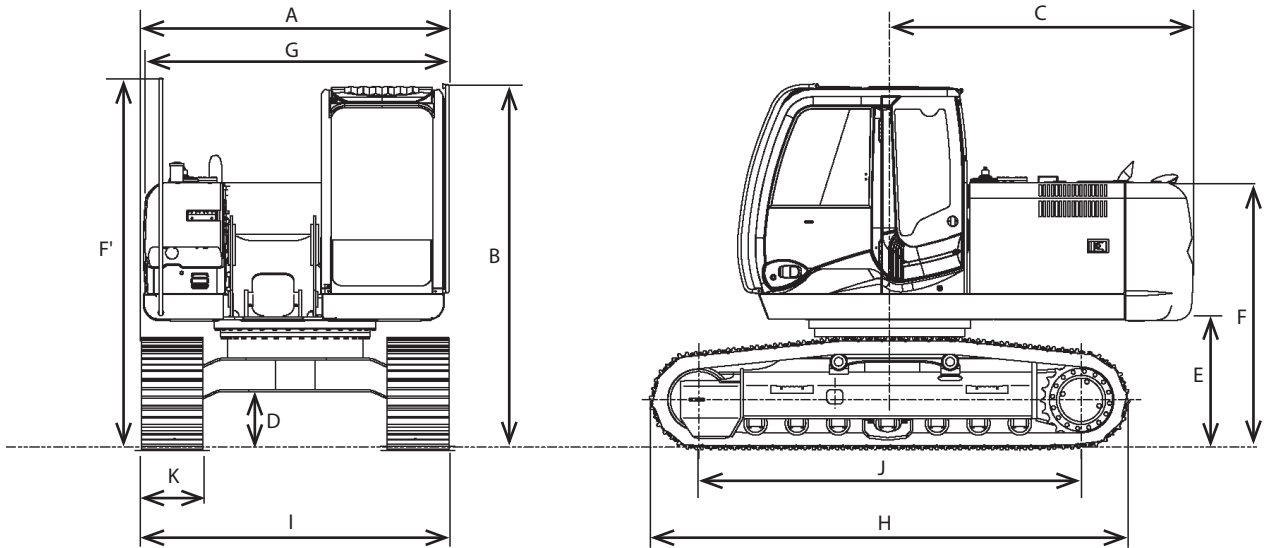
- * Applicable only to 700 mm (28 in) grouser shoe.

IMPORTANT: Using inapplicable buckets may cause serious damage to the front structure such as boom, arm and hydraulic cylinders.

SPECIFICATIONS

SPECIFICATIONS

ZX160LC-3



T1T1-01-01-001

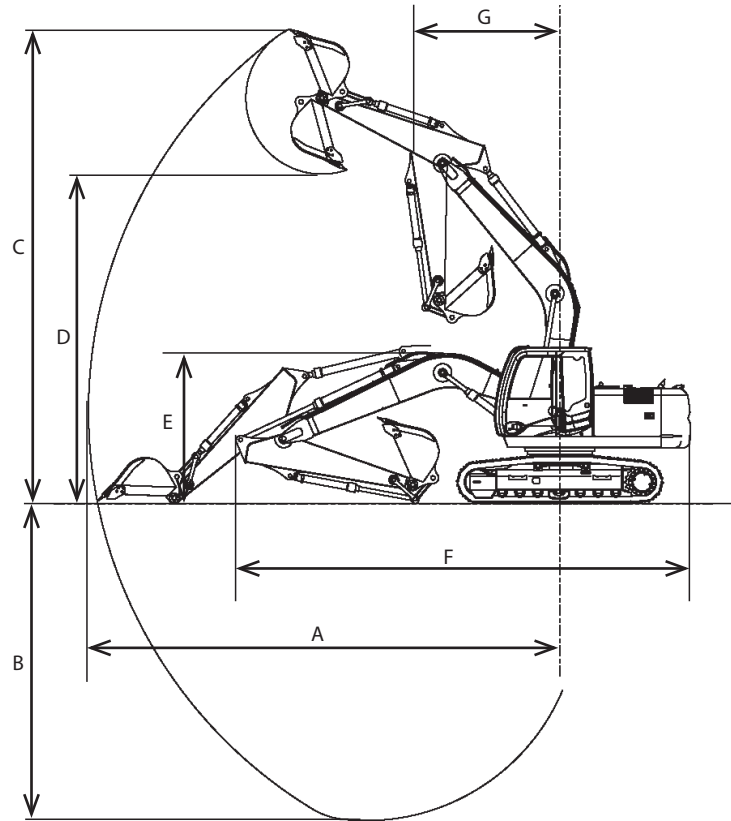
Model	ZX160LC-3
Type of Front-End Attachment	2.58 m (8 ft 6 in) Arm
Bucket Capacity (Heaped)	PCSA 0.6 m ³ (0.76 yd ³), CECE 0.55 m ³
Operating Weight	16500 kg (36400 lb)
Base Machine Weight	13000 kg (28700 lb)
Engine	Isuzu AI-4JJ1XYSA-01 90.2 kW/2200 min ⁻¹ (123 PS/2200 rpm)
A: Overall Width (Excluding back mirrors)	2500 mm (8 ft 2 in)
B: Cab Height	2950 mm (9 ft 8 in)
C: Rear End Swing Radius	2490 mm (8 ft 2 in)
D: Minimum Ground Clearance	* 470 mm (19 in)
E: Counterweight Clearance	* 1030 mm (3 ft 5 in)
F: Engine Cover Height	* 2140 mm (8 ft 0 in)
F': Overall Height of Handrail	3010 mm (9 ft 11 in)
G: Overall Width of Upperstructure	2480 mm (8 ft 2 in)
H: Undercarriage Length	3920 mm (12 ft 10 in)
I: Undercarriage Width	2490 mm (8 ft 2 in)
J: Sprocket Center to Idler Center	3100 mm (10 ft 2 in)
K: Track Shoe Width	500 mm (20 in) (Grouser shoe)
Ground Pressure	48 kPa (0.49 kgf/cm ² , 7.0 psi)
Swing Speed	13.3 min ⁻¹ (rpm)
Travel Speed (fast/slow)	5.3/3.4 km/h (3.3/2.2 mph)
Gradeability	35° (tanθ = 0.70)

 NOTE: *The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

WORKING RANGES

ZX160LC-3



T1T1-01-01-003

Item	Category	2.22 m (7 ft 4 in) Arm		2.58 m (8 ft 6 in) Arm		3.08 m (10 ft 1 in) Arm	
		mm	ft•in	mm	ft•in	mm	ft•in
A: Maximum Digging Reach		8520	27'12"	8870	29'2"	9330	30'7"
B: Maximum Digging Depth		* 5620	* 18'6"	* 5980	* 19'8"	* 6490	* 21'4"
C: Maximum Cutting Height		* 8620	* 28'4"	* 8880	* 29'2"	* 9130	* 29'11"
D: Maximum Dumping Height		* 5940	* 19'6"	* 6170	* 20'3"	* 6400	* 21'0"
E: Overall Height		3190	10'6"	3010	9'5"	3110	10'2"
F: Overall Length		8650	28'5"	8550	28'1"	8580	28'2"
G: Minimum Swing Radius		3290	10'10"	2910	9'7"	2920	9'7"

NOTE: * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

SHOE TYPES AND APPLICATIONS

ZX160LC-3

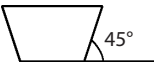
Shoe Width		500 mm (20") Grouser Shoe	600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	600 mm (24") Flat Shoe
Application		For Ordinary Ground (Standard)	For Ordinary Ground (Option)	For Weak Footing (Option)	For Paved Road (Option)
Operating Weight	kg (lb)	16500 (36400)	16700 (36800)	16900 (37300)	17500 (38600)
Base Machine Weight	kg (lb)	13000 (28700)	13200 (29100)	13400 (29500)	14000 (30900)
Cab Height	mm (ft•in)	2950 (9'8")	2950 (9'8")	2950 (9'8")	2990 (9'10")
Minimum Ground Clearance	mm (ft•in)	* 470 (19")	* 470 (19")	* 470 (19")	510 (20")
Undercarriage Length	mm (ft•in)	3920 (12'10")	3920 (12'10")	3920 (12'10")	3950 (12'10")
Undercarriage Width	mm (ft•in)	2490 (8'2")	2590 (8'6")	2690 (8'9")	2590 (8'6")
Ground Pressure		48 kPa (0.49 kgf/cm ² , 7.0 psi)	40 kPa (0.41 kgf/cm ² , 5.8 psi)	35 kPa (0.36 kgf/cm ² , 5.1 psi)	42 kPa (0.43 kgf/cm ² , 6.1 psi)

-  **NOTE:** • The specifications for the front-end attachment is for 2.58 m (8 ft 6 in) arm with PCSA 0.6 m³ (0.79 yd³) bucket.
- 600 mm (24 in), 700 mm (28 in) grouser shoe and 600 mm (24 in) flat shoe should not be used on gravel or rocky ground.
 - * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

BUCKET TYPES AND APPLICATIONS

ZX160LC-3

Bucket	Bucket Capacity m ³ (yd ³)		Bucket Width mm (in) (With side cutter)	Application	Front-End Attachment		
	PCSA (Heaped)	CECE (Heaped)			2.22 m (7'3") Arm	2.58 m (8'6") Arm	3.08 m (10'1") Arm
Hoe Bucket	0.52 (0.68)	0.45	910(36")		●	●	●
	0.60 (0.79)	0.55	1045 (41")		●	●	*●
	0.70 (0.92)	0.60	1125 (44")		●	○	□
	0.82 (1.07)	0.7	1260 (50")		○	□	—
Bucket reinforcement can be welded in four places upon customer's request	0.60 (0.79)	0.55	1045 (41")		●	●	*○
	0.70 (0.92)	0.6	1120 (44")		●	○	*□
V-Type Bucket					○	○	○
One Point Ripper	—		—		■	—	—
Clamshell Bucket		0.40 (0.52)	Bucket width 590 (23")	Side ditching	●	●	—
Slope-Finishing Blade	—		1700 (67")	Bank cutting finish	◇	◇	◇

 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/m³ (2700 lb/yd³) as a standard.

Loading:

For loading operation of dry, loosened earth and sand.

Their bulk density shall be less than 1.10 t/m³ (1850 lb/yd³) as a standard.

Rock digging:

For digging/loading operation of mountain gravels, blasted rock, hard clay, soft rock and so on.

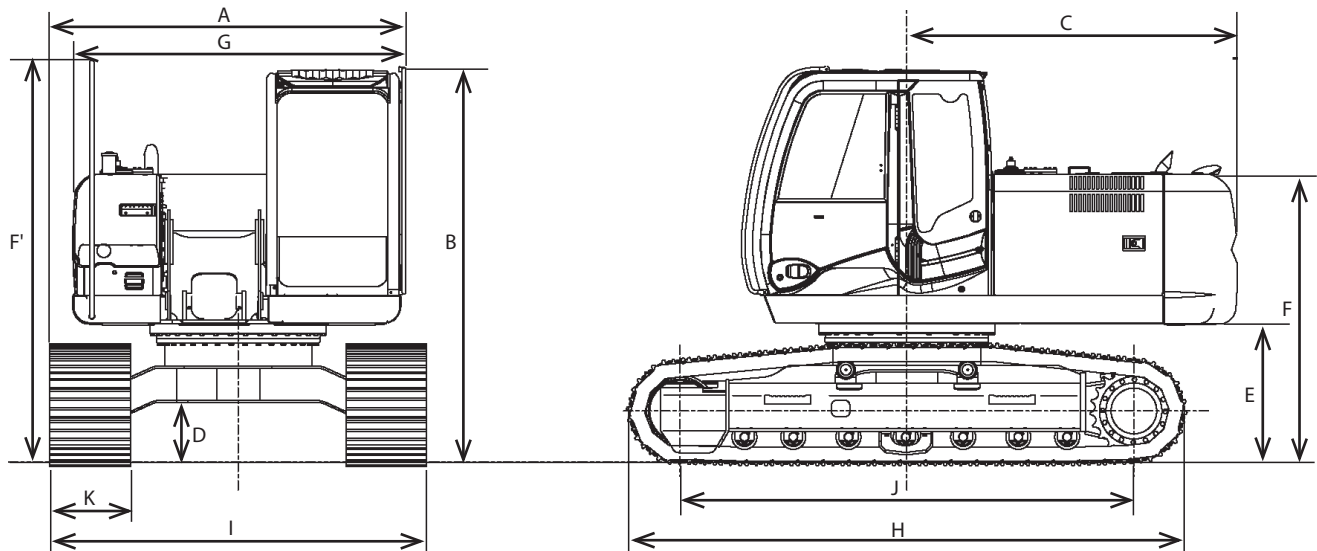
- * Applicable only to 700 mm (28 in) grouser shoe.

IMPORTANT: Using inapplicable buckets may cause serious damage to the front structure such as boom, arm and hydraulic cylinders.

SPECIFICATIONS

SPECIFICATIONS

ZX180LC-3, 180LCN-3



T1T1-01-01-002

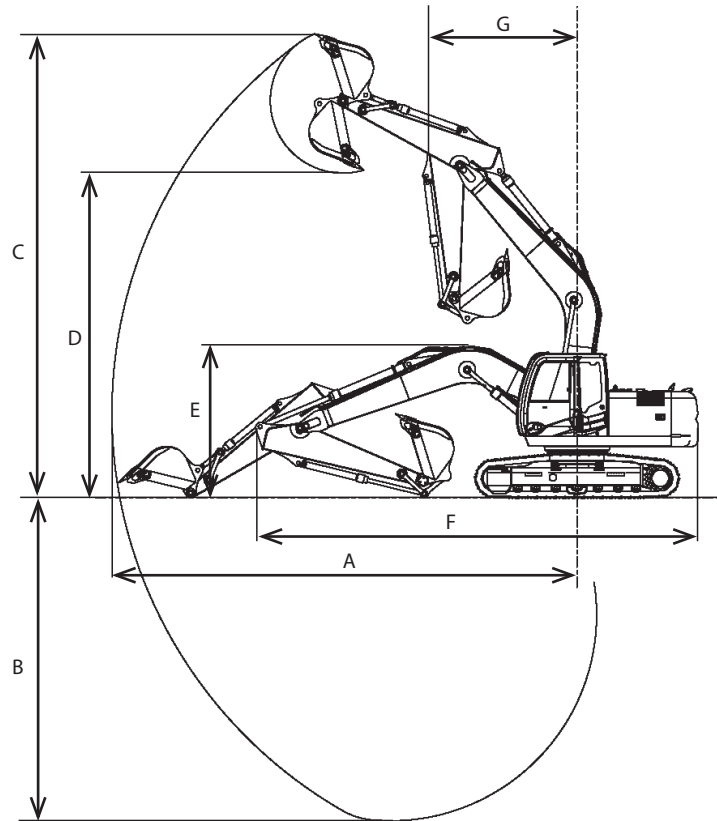
Model	ZX180LC-3	ZX180LCN-3
Type of Front-End Attachment	2.71 m (8 ft 11 in) Arm	
Bucket Capacity (Heaped)	PCSA 0.7 m ³ (0.92 yd ³), CECE 0.6 m ³	
Operating Weight	18300 kg (40350 lb)	18000 kg (39700 lb)
Base Machine Weight	14400 kg (31750 lb)	14100 kg (31100 lb)
Engine	Isuzu AI-4JJ1XYSA-01 90.2 kW/2200 min ⁻¹ (123 PS/2200 rpm)	
A: Overall Width (Excluding back mirrors)	2800 mm (9 ft 2 in)	2500 mm (8 ft 3 in)
B: Cab Height	2950 mm (9 ft 8 in)	
C: Rear End Swing Radius	2490 mm (9 ft 8 in)	
D: Minimum Ground Clearance	* 450 mm (18 in)	
E: Counterweight Clearance	* 1030 mm (3 ft 5 in)	
F: Engine Cover Height	* 2140 mm (7 ft 0 in)	
F': Overall Height of Handrail	3010 mm (9 ft 11 in)	
G: Overall Width of Upperstructure	2480 mm (8 ft 2 in)	
H: Undercarriage Length	4170 mm (13 ft 8 in)	
I: Undercarriage Width	2800 mm (9 ft 2 in)	2490 mm (8 ft 2 in)
J: Sprocket Center to Idler Center	3370 mm (11 ft 1 in)	
K: Track Shoe Width	600 mm (24 in) (Grouser shoe)	500 mm (20 in) (Grouser shoe)
Ground Pressure	41 kPa (0.42 kgf/cm ² , 5.9 psi)	48 kPa (0.49 kgf/cm ² , 7.0 psi)
Swing Speed	14.1 min ⁻¹ (rpm)	
Travel Speed (fast/slow)	5.3/3.4 km/h (3.4/2.2 mph)	
Gradeability	35° (tanθ = 0.70)	

NOTE: *The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

WORKING RANGES

ZX180LC-3, 180LCN-3



T1T1-01-01-004

Item	Category	2.26 m (7 ft 5 in) Arm		2.71 m (8 ft 11 in) Arm		3.21 m (10 ft 6 in) Arm	
		mm	ft•in	mm	ft•in	mm	ft•in
A: Maximum Digging Reach		9070	29'10"	9430	30'12"	9940	32'7"
B: Maximum Digging Depth		* 6120	* 20'1"	* 6570	* 21'7"	* 7070	* 23'2"
C: Maximum Cutting Height		* 9290	* 30'6"	* 9400	* 30'11"	* 9790	* 32'1"
D: Maximum Dumping Height		* 6450	* 21'2"	* 6570	* 21'7"	* 6940	* 22'9"
E: Overall Height		3100	10'2"	3080	10'2"	3390	11'2"
F: Overall Length		9000	29'7"	8970	29'6"	8970	29'5"
G: Minimum Swing Radius		3140	10'4"	3130	10'4"	3120	10'3"

NOTE: * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

SHOE TYPES AND APPLICATIONS

ZX180LC-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	600 mm (24") Flat Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (option)
Operating Weight	kg (lb)	18300 (40350)	18700 (41200)	19000 (41900)	19200 (42300)
Base Machine Weight	kg (lb)	14400 (31750)	14800 (32600)	15000 (33000)	15200 (33500)
Cab Height	mm (ft•in)	2950 (9'8")	2950 (9'8")	2950 (9'8")	2990 (9'10")
Minimum Ground Clearance	mm (ft•in)	* 450 (18")	* 450 (18")	* 450 (18")	490 (19")
Undercarriage Length	mm (ft•in)	4170 (13'8")	4170 (13'8")	4170 (13'8")	4200 (13'9")
Undercarriage Width	mm (ft•in)	2800 (9'2")	2900 (9'6")	3000 (9'10")	2800 (9'2")
Ground Pressure		41 kPa (0.42 kgf/cm ² , 6.0 psi)	36 kPa (0.37 kgf/cm ² , 5.1 psi)	31 kPa (0.32 kgf/cm ² , 4.5 psi)	43 kPa (0.44 kgf/cm ² , 6.2 psi)

ZX180LCN-3

Shoe Width		500 mm (20") Grouser Shoe	600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	600 mm (24") Flat Shoe
Application		For Ordinary Ground (Standard)	For Ordinary Ground (Option)	For Weak Footing (Option)	For Paved Road (Option)
Operating Weight	kg (lb)	18000 (39700)	18300 (40350)	18600 (41000)	19100 (42100)
Base Machine Weight	kg (lb)	14100 (31100)	14300 (31500)	14700 (32400)	15200 (33500)
Cab Height	mm (ft•in)	2950 (9'8")	2950 (9'8")	2950 (9'8")	2990 (9'10")
Minimum Ground Clearance	mm (ft•in)	* 450 (18")	* 450 (18")	* 450 (18")	490 (19")
Undercarriage Length	mm (ft•in)	4170 (13'8")	4170 (13'8")	4170 (13'8")	4200 (13'9")
Undercarriage Width	mm (ft•in)	2490 (8'2")	2590 (8'6")	2690 (8'10")	2590 (8'6")
Ground Pressure		48 kPa (0.49 kgf/cm ² , 7.0 psi)	41 kPa (0.42 kgf/cm ² , 6.0 psi)	35 kPa (0.36 kgf/cm ² , 5.1 psi)	42 kPa (0.43 kgf/cm ² , 6.1 psi)

 **NOTE:** • The specifications for the front-end attachment is for 2.71 m (8 ft 11 in) arm with PCSA 0.70 m³ (0.92 yd³) bucket.
 • 700, 800 mm (28, 31 in) grouser shoe and 600 mm (24 in) flat shoe should not be used on gravel or rocky ground.
 • * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

BUCKET TYPES AND APPLICATIONS

ZX180LC-3, 180LCN-3

Bucket	Bucket Capacity m ³ (yd ³)		Bucket Width mm (in)	Front-End Attachment		
	PCSA (Heaped)	CECE (Heaped)		2.26 m (7'5") Arm	2.71 m (8'11") Arm	3.21 m (10'6") Arm
Hoe Bucket	0.51 (0.67)	0.45	830 (33")	●	●	●
	0.70 (0.92)	0.60	1010 (40")	●	●	○
	0.80 (1.05)	0.70	1140 (45")	●	○	□
	0.91 (1.19)	0.80	1260 (50")	○	□	—
	1.10 (1.44)	0.90	1440 (57")	○	—	—
	1.20 (1.57)	1.00	—	□	—	—
Reinforced Hoe Bucket	0.70 (0.92)	0.60	1010 (40")	●	●	○
	0.80 (1.05)	0.70	1140 (45")	●	●	○
	0.91 (1.19)	0.80	1260 (50")	○	○	○
Ripper Bucket	0.60(0.78)	0.50	—	■	—	—
One Point Ripper	—	—	—	■	—	—
Slope-Finishing Blade	1000 (39") × 1800 (5'11")			◇	◇	◇
V-Type Bucket	—			○	○	○
Clamshell Bucket	0.6 (0.78)		940 (37")	●	●	—

 **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/m³ (2700 lb/yd³) as a standard.

Loading:

For loading operation of dry, loosened earth and sand.

Their bulk density shall be less than 1.10 t/m³ (1850 lb/yd³) as a standard.

Rock digging:

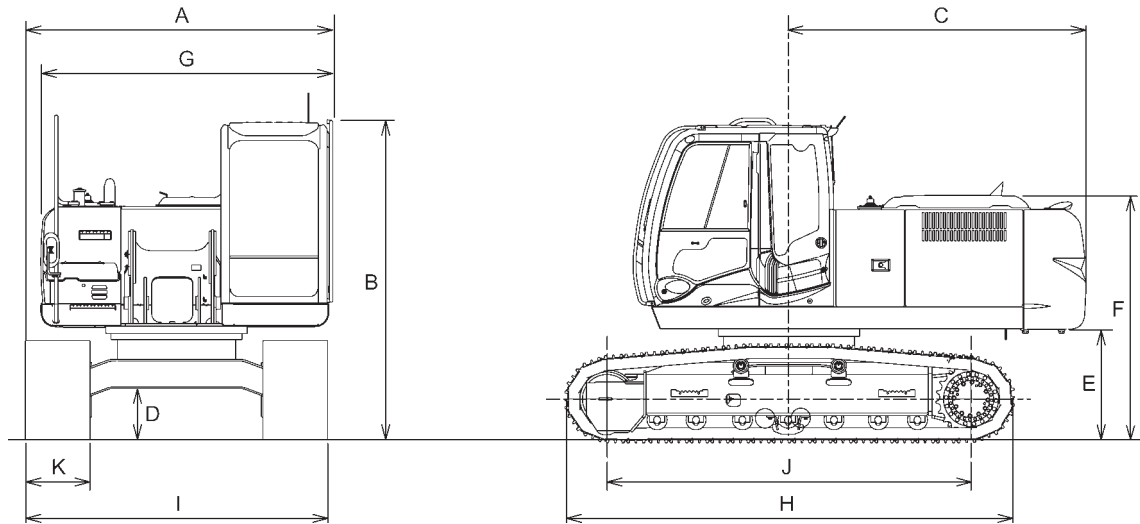
For digging/loading operation of mountain gravels, blasted rock, hard clay, soft rock and so on.

IMPORTANT: Using inapplicable buckets may cause serious damage to the front structure such as boom, arm and hydraulic cylinders.

SPECIFICATIONS

SPECIFICATIONS

ZX200-3, 200LC-3, 210H-3, 210LCH-3



T1V1-01-01-006

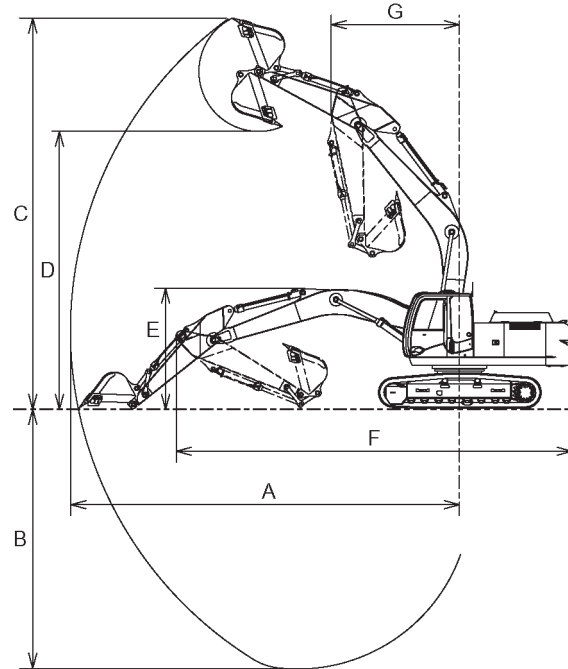
Model	ZX200-3	ZX200LC-3	ZX210H-3	ZX210LCH-3
Type of Front-End Attachment	2.91 m (9 ft 7 in) Arm			
Bucket Capacity (Heaped)	PCSA 0.8 m ³ (1.05 yd ³), CECE 0.7 m ³			
Operating Weight	19800 kg (43700 lb)	20400 kg (45000 lb)	21000 kg (46300 lb)	21500 kg (47400 lb)
Base Machine Weight	15400 kg (34000 lb)	16000 kg (35300 lb)	16400 kg (36200 lb)	16800 kg (37000 lb)
Engine	Isuzu AH-4HK1XYSA-02 122 kW/2000 min ⁻¹ (166 PS/2000 rpm)			
A: Overall Width (Excluding back mirrors)	2860 mm (9 ft 5 in)	2990 mm (9 ft 10 in)	2860 mm (9 ft 5 in)	2990 mm (9 ft 10 in)
B: Cab Height	2950 mm (9 ft 8 in)			
C: Rear End Swing Radius	2750 mm (9 ft 0 in)			
D: Minimum Ground Clearance	* 450 mm (18 in)			
E: Counterweight Clearance	* 1030 mm (3 ft 5 in)			
F: Engine Cover Height	* 2270 mm (7 ft 5 in)			
G: Overall Width of Upperstructure	2710 mm (8 ft 11 in)			
H: Undercarriage Length	4170 mm (13 ft 8 in)	4470 mm (14 ft 8 in)	4170 mm (13 ft 8 in)	4470 mm (14 ft 8 in)
I: Undercarriage Width	2800 mm (9 ft 2 in)	2990 mm (9 ft 10 in)	2800 mm (9 ft 2 in)	2990 mm (9 ft 10 in)
J: Sprocket Center to Idler Center	3370 mm (11 ft 1 in)	3660 mm (12 ft 0 in)	3370 mm (11 ft 1 in)	3660 mm (12 ft 0 in)
K: Track Shoe Width	600 mm (24 in) (Grouser shoe)			
Ground Pressure	44 kPa (0.45 kgf/cm ² , 6.4 psi)	42 kPa (0.43 kgf/cm ² , 6.1 psi)	47 kPa (0.48 kgf/cm ² , 6.8 psi)	44 kPa (0.45 kgf/cm ² , 6.4 psi)
Swing Speed	13.3 min ⁻¹ (rpm)			
Travel Speed (fast/slow)	5.5/3.5 km/h (3.4/2.2 mph)			
Gradeability	35° (tan θ = 0.70)			

 NOTE: * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

WORKING RANGES

ZX200-3, 200LC-3, 210H-3, 210LCH-3



T1V1-01-01-002

Model		ZX200-3, 200LC-3				ZX210H-3, 210LCH-3	
Item	Category	2.42 m (7 ft 11 in) Arm		2.91 m (9 ft 7 in) Arm		2.91 m (9 ft 7 in) H Arm	
		mm	ft·in	mm	ft·in	mm	ft·in
A: Maximum Digging Reach		9430	30'11"	9920	32'7"	9920	32'7"
B: Maximum Digging Depth		*6180	*20'3"	*6670	*21'11"	*6670	*21'11"
C: Maximum Cutting Height		*9670	*31'9"	*10040	*32'11"	*10040	*32'11"
D: Maximum Dumping Height		*6830	*22'5"	*7180	*23'7"	*7180	*23'7"
E: Overall Height		3180	10'5"	3010	9'11"	3010	9'11"
F: Overall Length		9605	31'6"	9520	31'3"	9520	31'3"
G: Minimum Swing Radius		3280	10'9"	3180	10'5"	3180	10'5"

NOTE: * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

SHOE TYPES AND APPLICATIONS

ZX200-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	*600 mm (24") Flat Shoe	*900 mm (35") Triangular Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	19800 (43700)	20200 (44500)	20500 (45200)	20700 (45600)	21900 (48300)
Base Machine Weight	kg (lb)	15400 (34000)	15800 (34800)	16100 (35500)	16300 (35900)	17500 (38600)
Cab Height	mm (ft·in)	2950 (9'8")	2950 (9'8")	2950 (9'8")	2990 (9'10")	2960 (9'8")
Minimum Ground Clearance	mm (ft·in)	**450 (18")	**450 (18")	**450 (18")	490 (19")	**460 (18")
Undercarriage Length	mm (ft·in)	4170 (13'8")	4170 (13'8")	4170 (13'8")	4200 (13'9")	4300 (14'1")
Undercarriage Width	mm (ft·in)	2800 (9'2")	2900 (9'6")	3000 (9'10")	2800 (9'2")	3100 (10'2")
Ground Pressure		44 kPa (0.45 kgf/cm ² , 6.4 psi)	39 kPa (0.40 kgf/cm ² , 5.7 psi)	34 kPa (0.35 kgf/cm ² , 5.0 psi)	46 kPa (0.47 kgf/cm ² , 6.7 psi)	32 kPa (0.33 kgf/cm ² , 4.7 psi)

ZX200LC-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	*600 mm (24") Flat Shoe	*900 mm (35") Triangular Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	20400 (45000)	20800 (45900)	21100 (46500)	21300 (47000)	22600 (49800)
Base Machine Weight	kg (lb)	16000 (35300)	16400 (36200)	16700 (36800)	16900 (37300)	18200 (40100)
Cab Height	mm (ft·in)	2950 (9'8")	2950 (9'8")	2950 (9'8")	2990 (9'10")	2960 (9'8")
Minimum Ground Clearance	mm (ft·in)	**450 (18")	**450 (18")	**450 (18")	490 (19")	**460 (18")
Undercarriage Length	mm (ft·in)	4470 (14'8")	4470 (14'8")	4470 (14'8")	4500 (14'9")	4600 (15'1")
Undercarriage Width	mm (ft·in)	2990 (9'10")	3090 (10'2")	3190 (10'6")	2990 (9'10")	3290 (10'10")
Ground Pressure		42 kPa (0.43 kgf/cm ² , 6.1 psi)	37 kPa (0.38 kgf/cm ² , 5.4 psi)	32 kPa (0.33 kgf/cm ² , 4.7 psi)	44 kPa (0.45 kgf/cm ² , 6.4 psi)	30 kPa (0.31 kgf/cm ² , 4.4 psi)

-  **NOTE:** • The specifications for the front-end attachment is for 2.91 m (9 ft 7 in) arm with PCSA 0.8 m³ (1.05 yd³) bucket.
 • * The specifications for the front-end attachment is for 2.91 m (9 ft 7 in) arm with PCSA 1.2 m³ (1.57 yd³) bucket.
 • 700, 800 mm (28, 31 in) grouser shoe, 600 mm (24 in) flat shoe and 900 mm (35 in) triangular shoe should not be used on gravel or rocky ground.
 • ** The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

SHOE TYPES AND APPLICATIONS

ZX210H-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	* ¹ 600 mm (24") Flat Shoe	* ¹ 900 mm (35") Triangular Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Paved Road (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	21000 (46300)	21200 (46700)	21800 (48100)	23000 (50700)
Base Machine Weight	kg (lb)	16400 (36200)	16600 (36600)	17100 (37700)	18300 (40300)
Cab Height	mm (ft•in)	2950 (9'8")	2950 (9'8")	2990 (9'10")	2960 (9'8")
Minimum Ground Clearance	mm (ft•in)	**450 (18")	**450 (18")	490 (19")	**460 (18")
Undercarriage Length	mm (ft•in)	4170 (13'8")	4170 (13'8")	4200 (13'9")	4300 (14'1")
Undercarriage Width	mm (ft•in)	2800 (9'2")	2900 (9'6")	2800 (9'2")	3100 (10'2")
Ground Pressure		47 kPa (0.48 kgf/cm ² , 6.8 psi)	40 kPa (0.41 kgf/cm ² , 5.8 psi)	49 kPa (0.50 kgf/cm ² , 7.1 psi)	34 kPa (0.35 kgf/cm ² , 5.0 psi)

ZX210LCH-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	* ² 600 mm (24") Flat Shoe	* ² 900 mm (35") Triangular Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	21500 (47400)	21700 (47800)	22000 (48500)	22200 (48900)	23500 (51800)
Base Machine Weight	kg (lb)	16800 (37000)	17000 (37500)	17300 (38100)	17600 (38800)	18800 (41400)
Cab Height	mm (ft•in)	2950 (9'8")	2950 (9'8")	2950 (9'8")	2990 (9'10")	2960 (9'8")
Minimum Ground Clearance	mm (ft•in)	450 (18")	450 (18")	450 (18")	490 (19")	460 (18")
Undercarriage Length	mm (ft•in)	** 4470 (14'8")	** 4470 (14'8")	** 4470 (14'8")	4500 (14'9")	** 4600 (15'1")
Undercarriage Width	mm (ft•in)	2990 (9'10")	3090 (10'2")	3190 (10'6")	2990 (9'10")	3290 (10'10")
Ground Pressure		44 kPa (0.45 kgf/cm ² , 6.4 psi)	38 kPa (0.39 kgf/cm ² , 5.5 psi)	34 kPa (0.35 kgf/cm ² , 5.0 psi)	46 kPa (0.47 kgf/cm ² , 6.7 psi)	32 kPa (0.33 kgf/cm ² , 4.7 psi)

-  **NOTE:** • The specifications for the front-end attachment is for 2.91 m (9 ft 7 in) arm with PCSA 0.8 m³ (1.05 yd³) bucket.
- *¹ The specifications for the front-end attachment is for 2.91 m (9 ft 7 in) arm with PCSA 0.91 m³ (1.19 yd³) bucket.
 - *² The specifications for the front-end attachment is for 2.91 m (9 ft 7 in) arm with PCSA 1.1 m³ (1.44 yd³) bucket.
 - 700, 800 mm (28, 31 in) grouser shoe, 600 mm (24 in) flat shoe and 900 mm (35 in) triangular shoe should not be used on gravel or rocky ground.
 - ** The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

BUCKET TYPES AND APPLICATIONS

ZX200-3, 200LC-3, 210H-3, 210LCH-3

Bucket	Bucket Capacity m ³ (yd ³)		Bucket Width mm (in) (With side cutter)	Application	Front-End Attachment					
	PCSA (Heaped)	CECE (Heaped)			ZX200-3		ZX200LC-3		ZX 210H-3	ZX 210LCH-3
					2.42 m (7'11") Arm	2.91 m (9'7") Arm	2.42 m (7'11") Arm	2.91 m (9'7") Arm	2.91 m (9'7") H Arm	2.91 m (9'7") H Arm
Hoe Bucket	0.51 (0.67)	0.45	830 (33")		●	●	●	●	●	●
	0.80 (1.05) HD	0.7	1150 (45")		●	●	●	●	●	●
	0.80 (1.05)	0.7	1140 (45")		●	●	●	●	●	●
	0.91 (1.19)	0.8	1260 (50")		●	○	●	●	○	●
	1.10 (1.44)	0.9	1440 (57")		□	—	○	○	—	○
	1.20 (1.57)	1.0	1450 (57") (Without side cutter)		□	—	□	—	—	—
Bucket reinforcement can be welded in four places upon customer's request	0.80 (1.05)	0.7	1140 (45")		●	●	●	●	●	●
	0.91 (1.19)	0.8	1260 (50")		●	○	●	●	○	●
Reinforced Hoe Bucket HD Type (Transverse-Type-Pin-Used Type)	0.80 (1.05)	0.7	1140 (45")		●	●	●	●	●	●
V-Type Bucket	—		90°	Excavating V-trenches	○	○	○	○	○	○
Ripper Bucket		0.50 (0.65)	800 (31.5") (Without side cutter)		■	—	■	—	—	—
One Point Ripper	—		—		■	—	■	—	—	—
Clamshell Bucket		0.60 (0.78)	Bucket width 940 (37")	Side ditching	●	●	●	●	●	●
Slope-Finishing Blade	—		1800 (70")	Bank cutting finish	◇	◇	◇	◇	◇	◇

 **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/m³ (2700 lb/yd³) as a standard.

Loading:

For loading operation of dry, loosened earth and sand.

Their bulk density shall be less than 1.10 t/m³ (1850 lb/yd³) as a standard.

Rock digging:

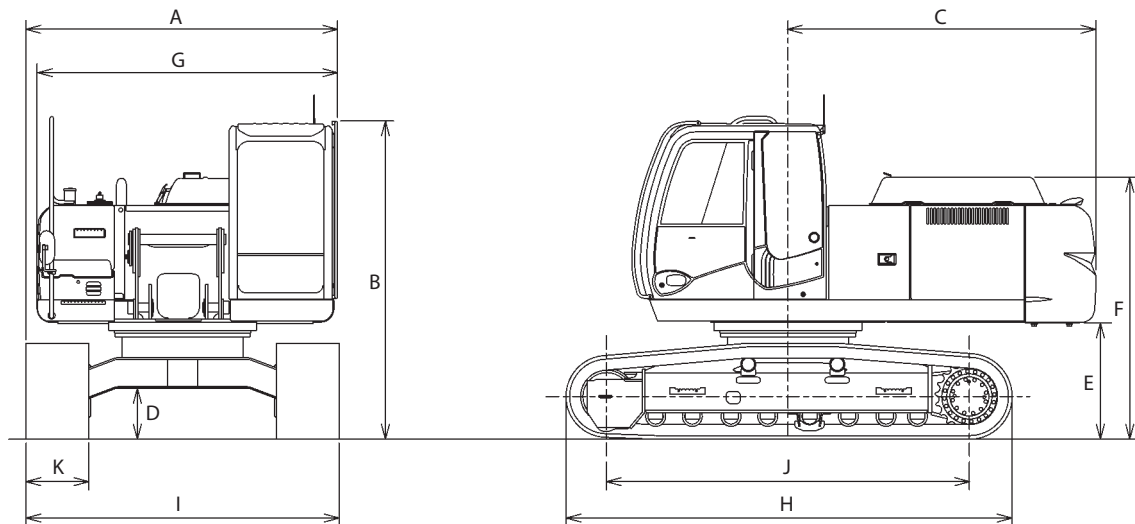
For digging/loading operation of mountain gravels, blasted rock, hard clay, soft rock and so on.

IMPORTANT: Using inapplicable buckets may cause serious damage to the front structure such as boom, arm and hydraulic cylinders.

SPECIFICATIONS

SPECIFICATIONS

ZX210K-3, 210LCK-3



M1U1-12-007

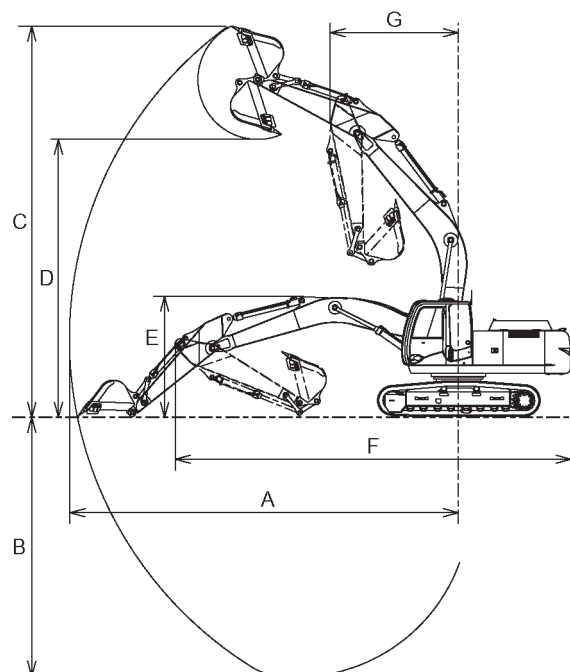
Model	ZX210K-3	ZX210LCK-3
Type of Front-End Attachment	2.91 m (9 ft 7 in) K Arm	
Bucket Capacity (Heaped)	PCSA 0.8 m ³ (1.05 yd ³), CECE 0.7 m ³	
Operating Weight	21100 kg (46500 lb)	21600 kg (47600 lb)
Base Machine Weight	16400 kg (36200 lb)	16800 kg (37000 lb)
Engine	Isuzu AH-4HK1XYSA-02 122 kW/2000 min ⁻¹ (166 PS/2000 rpm)	
A: Overall Width (Excluding back mirrors)	2860 mm (9 ft 5 in)	2990 mm (9 ft 10 in)
B: Cab Height	2950 mm (9 ft 8 in)	
C: Rear End Swing Radius	2750 mm (9 ft 0 in)	
D: Minimum Ground Clearance	*450 mm (18 in)	
E: Counterweight Clearance	* 1030 mm (3 ft 5 in)	
F: Engine Cover Height	* 2270 mm (7 ft 5 in)	
G: Overall Width of Upperstructure	2710 mm (8 ft 11 in)	
H: Undercarriage Length	4170 mm (13 ft 8 in)	4470 mm (14 ft 8 in)
I: Undercarriage Width	2800 mm (9 ft 2 in)	2990 mm (9 ft 10 in)
J: Sprocket Center to Idler Center	3370 mm (11 ft 1 in)	3660 mm (12 ft 0 in)
K: Track Shoe Width	600 mm (24 in) (Grouser shoe)	
Ground Pressure	47 kPa (0.48 kgf/cm ² , 6.8 psi)	45 kPa (0.46 kgf/cm ² , 6.5 psi)
Swing Speed	13.3 min ⁻¹ (rpm)	
Travel Speed (fast/slow)	5.5/3.5 km/h (3.4/2.2 mph)	
Gradeability	35° (tanθ = 0.70)	

NOTE: * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

WORKING RANGES

ZX210K-3, 210LCK-3



T1V1-01-01-002

Model	ZX210K-3, 210LCK-3	
Category	2.91 m (9 ft 7 in) K Arm	
Item	mm	ft·in
A: Maximum Digging Reach	9920	32'7"
B: Maximum Digging Depth	*6670	*21'11"
C: Maximum Cutting Height	*10040	*32'11"
D: Maximum Dumping Height	*7180	*23'7"
E: Overall Height	3010	9'11"
F: Overall Length	9520	31'3"
G: Minimum Swing Radius	3180	10'5"

 NOTE: * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

SHOE TYPES AND APPLICATIONS

ZX210K-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	600 mm (24") Flat Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)
Operating Weight	kg (lb)	21100 (46500)	21400 (47200)	23100 (50900)	21900 (48300)
Base Machine Weight	kg (lb)	16400 (36200)	16700 (36800)	18100 (39900)	17100 (37700)
Cab Height	mm (ft•in)	2950 (9'8")	2950 (9'8")	2950 (9'8")	2990 (9'10")
Minimum Ground Clearance	mm (ft•in)	*450 (18")	*450 (18")	*450 (18")	490 (19")
Undercarriage Length	mm (ft•in)	4170 (13'8")	4170 (13'8")	4170 (13'8")	4200 (13'9")
Undercarriage Width	mm (ft•in)	2800 (9'2")	2900 (9'6")	3000 (9'10")	2800 (9'2")
Ground Pressure		47 kPa (0.48 kgf/cm ² , 6.8 psi)	41 kPa (0.42 kgf/cm ² , 6.0 psi)	39 kPa (0.40 kgf/cm ² , 5.7 psi)	49 kPa (0.50 kgf/cm ² , 7.1 psi)

ZX210LCK-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	600 mm (24") Flat Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)
Operating Weight	kg (lb)	21600 (47600)	21800 (48100)	22100 (48700)	22300 (49200)
Base Machine Weight	kg (lb)	16800 (37000)	17100 (37700)	17400 (38400)	17600 (38800)
Cab Height	mm (ft•in)	2950 (9'8")	2950 (9'8")	2950 (9'8")	2990 (9'10")
Minimum Ground Clearance	mm (ft•in)	*450 (18")	*450 (18")	*450 (18")	490 (19")
Undercarriage Length	mm (ft•in)	4470 (14'8")	4470 (14'8")	4470 (14'8")	4500 (14'9")
Undercarriage Width	mm (ft•in)	2990 (9'10")	3090 (10'2")	3190 (10'6")	2990 (9'10")
Ground Pressure		45 kPa (0.46 kgf/cm ² , 6.5 psi)	38 kPa (0.39 kgf/cm ² , 5.5 psi)	34 kPa (0.35 kgf/cm ² , 5.0 psi)	46 kPa (0.47 kgf/cm ² , 6.7 psi)

 **NOTE:** • The specifications for the front-end attachment is for 2.91 m (9 ft 7 in) K arm with PCSA 0.8 m³ (1.05 yd³) bucket.
 • 700, 800 mm (28, 31 in) grouser shoe and 600 mm (24 in) flat shoe should not be used on gravel or rocky ground.
 • * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

BUCKET TYPES AND APPLICATIONS

ZX210K-3, 210LCK-3

Bucket	Bucket Capacity m ³ (yd ³)		Bucket Width mm (in) (With side cutter)	Application	Front-End Attachment	
	PCSA (Heaped)	CECE (Heaped)			ZX210K-3	ZX210LCK-3
					2.91 m (9'7") K Arm	2.91 m (9'7") K Arm
Hoe Bucket	0.51 (0.67)	0.45	830 (33")		●	●
	0.80 (1.05) HD	0.7	1150 (45")		●	●
	0.80 (1.05)	0.7	1140 (45")		●	●
	0.91 (1.19)	0.8	1260 (50")		○	●
	1.10 (1.44)	0.9	1440 (57")		—	○
Bucket reinforcement can be welded in four places upon customer's request	0.8 (1.05)	0.7	1140 (45")		●	●
	0.91 (1.19)	0.8	1260 (50")		○	●
Reinforced Hoe Bucket (Transverse-Type-Pin- Used Type)	0.8 (1.05)	0.7	1140 (45")		●	●
Clamshell Bucket		0.60 (0.78)	Bucket width 940 (37")	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/m³ (2700 lb/yd³) as a standard.

Loading:

For loading operation of dry, loosened earth and sand.

Their bulk density shall be less than 1.10 t/m³ (1850 lb/yd³) as a standard.

Rock digging:

For digging/loading operation of mountain gravels, blasted rock, hard clay, soft rock and so on.

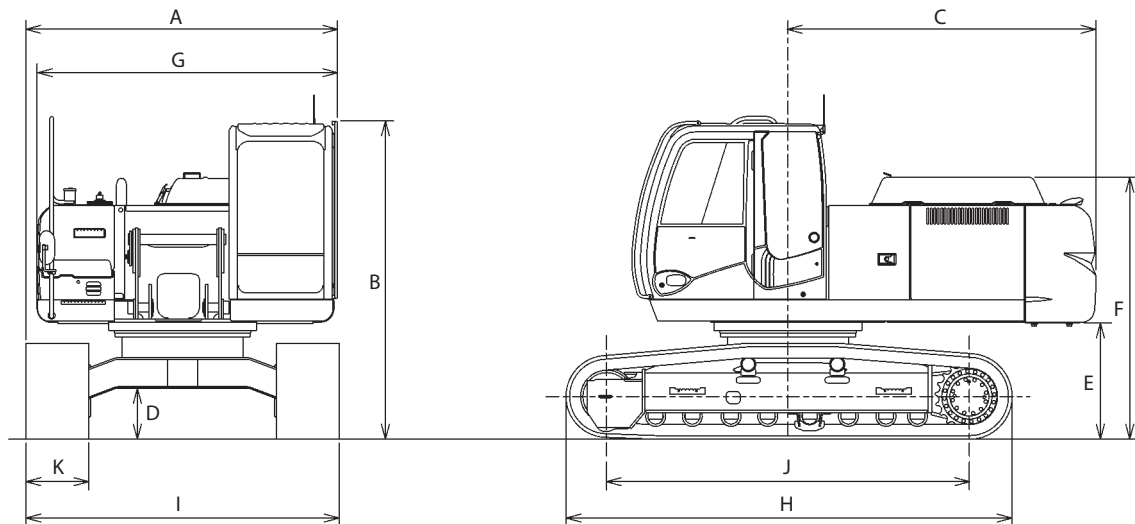
IMPORTANT: Using inapplicable buckets may cause serious damage to the front structure such as boom, arm and hydraulic cylinders.

IMPORTANT: The ZX210K-3, 210LCK-3 base machines must be modified when being applied exclusively to excavation work. (Refer to "Precautions for Operation Using A Bucket" in the OPERATING THE MACHINE section.)

SPECIFICATIONS

SPECIFICATIONS

ZX240-3, 240LC-3, 250H-3, 250LCH-3



M1U1-12-007

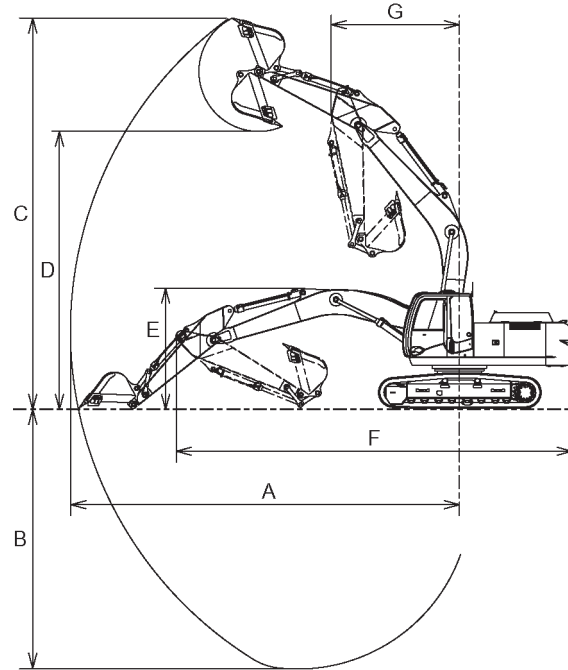
Model	ZX240-3	ZX240LC-3	ZX250H-3	ZX250LCH-3
Type of Front-End Attachment	2.96 m (9 ft 9 in) Arm		2.96 m (9 ft 9 in) H Arm	
Bucket Capacity (Heaped)	PCSA 1.0 m ³ (1.3 yd ³), CECE 0.9 m ³			
Operating Weight	23400 kg (51600 lb)	23900 kg (52700 lb)	24700 kg (54500 lb)	25300 kg (55800 lb)
Base Machine Weight	17800 kg (39200 lb)	18400 kg (40600 lb)	18900 kg (41700 lb)	19500 kg (43000 lb)
Engine	Isuzu AH-4HK1XYSA-01 132 kW/2000 min ⁻¹ (180 PS/2000 rpm)			
A: Overall Width (Excluding back mirrors)	2990 mm (9 ft 10 in)	3190 mm (10 ft 6 in)	2990 mm (9 ft 10 in)	3190 mm (10 ft 6 in)
B: Cab Height	3010 mm (9 ft 11 in)			
C: Rear End Swing Radius	2940 mm (9 ft 8 in)			
D: Minimum Ground Clearance	* 460 mm (18 in)			
E: Counterweight Clearance	* 1090 mm (3 ft 7 in)			
F: Engine Cover Height	* 2425 mm (8 ft 0 in)			
G: Overall Width of Upperstructure	2890 mm (9 ft 6 in)			
H: Undercarriage Length	4260 mm (14 ft 0 in)	4640 mm (15 ft 3 in)	4260 mm (14 ft 0 in)	4640 mm (15 ft 3 in)
I: Undercarriage Width	2990 mm (9 ft 10 in)	3190 mm (10 ft 6 in)	2990 mm (9 ft 10 in)	3190 mm (10 ft 6 in)
J: Sprocket Center to Idler Center	3463 mm (11 ft 4 in)	3845 mm (12 ft 7 in)	3463 mm (11 ft 4 in)	3845 mm (12 ft 7 in)
K: Track Shoe Width	600 mm (24 in) (Grouser shoe)			
Ground Pressure	51 kPa (0.52 kgf/cm ² , 7.4 psi)	47 kPa (0.48 kgf/cm ² , 6.8 psi)	54 kPa (0.55 kgf/cm ² , 7.8 psi)	50 kPa (0.51 kgf/cm ² , 7.3 psi)
Swing Speed	13.5 min ⁻¹ (rpm)			
Travel Speed (fast/slow)	5.5/3.4 km/h (3.4/2.1 mph)			
Gradeability	35° (tanθ = 0.70)			

NOTE: * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

WORKING RANGES

ZX240-3, 240LC-3, 250H-3, 250LCH-3



T1V1-01-01-002

Model	ZX240-3, 240LC-3						ZX250H-3, 250LCH-3	
	2.5 m (8 ft 2 in) Arm		2.96 m (9 ft 9 in) Arm		3.61m (11 ft 10 in) Arm		2.96 m (9 ft 9 in) H Arm	
Category	mm	ft•in	mm	ft•in	mm	ft•in	mm	ft•in
Item								
A: Maximum Digging Reach	9880	32'5"	10290	33'9"	10910	35'10"	10290	33'9"
B: Maximum Digging Depth	*6500	*21'4"	*6960	*22'10"	*7610	*25'0"	*6960	*22'10"
C: Maximum Cutting Height	*9950	*32'8"	*10160	*33'4"	*10560	*34'8"	*10160	*33'4"
D: Maximum Dumping Height	*6990	*22'11"	*7200	*23'8"	*7580	*24'10"	*7200	*23'8"
E: Overall Height	3370	11'1"	3070	10'1"	3320	10'11"	3070	10'1"
F: Overall Length	10270	33'8"	10150	33'4"	10200	33'6"	10150	33'4"
G: Minimum Swing Radius	3480	11'5"	3440	11'3"	3430	11'3"	3440	11'3"

NOTE: * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

SHOE TYPES AND APPLICATIONS

ZX240-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	600 mm (24") Flat Shoe	760 mm (30") Triangular Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	23400 (51600)	23800 (52500)	24000 (52900)	24200 (53400)	24400 (53800)
Base Machine Weight	kg (lb)	17800 (39200)	18200 (40100)	18500 (40800)	18600 (41000)	18800 (41400)
Cab Height	mm (ft•in)	3010 (9'11")	3010 (9'11")	3010 (9'11")	3020 (9'11")	3060 (10'1")
Minimum Ground Clearance	mm (ft•in)	* 460 (18")	* 460 (18")	* 460 (18")	500 (20")	* 460 (18")
Undercarriage Length	mm (ft•in)	4260 (14'0")	4260 (14'0")	4260 (14'0")	4280 (14'1")	4370 (14'4")
Undercarriage Width	mm (ft•in)	2990 (9'10")	3090 (10'2")	3190 (10'6")	2990 (9'10")	3150 (10'4")
Ground Pressure		51 kPa (0.52 kgf/cm ² , 7.4 psi)	44 kPa (0.45 kgf/cm ² , 6.4 psi)	39 kPa (0.40 kgf/cm ² , 5.7 psi)	53 kPa (0.54 kgf/cm ² , 7.7 psi)	41 kPa (0.42 kgf/cm ² , 6.0 psi)

ZX240LC-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	600 mm (24") Flat Shoe	760 mm (30") Triangular Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	23900 (52700)	24300 (53600)	24600 (54200)	24800 (54700)	25000 (55100)
Base Machine Weight	kg (lb)	18400 (40600)	18800 (41400)	19100 (42100)	19200 (42300)	19400 (42800)
Cab Height	mm (ft•in)	3010 (9'11")	3010 (9'11")	3010 (9'11")	3020 (9'11")	3060 (10'1")
Minimum Ground Clearance	mm (ft•in)	* 460 (18")	* 460 (18")	* 460 (18")	500 (20")	* 460 (18")
Undercarriage Length	mm (ft•in)	4640 (15'3")	4640 (15'3")	4640 (15'3")	4660 (15'4")	4750 (15'7")
Undercarriage Width	mm (ft•in)	3190 (10'6")	3290 (10'10")	3390 (11'2")	3190 (10'6")	3350 (11'0")
Ground Pressure		47 kPa (0.48 kgf/cm ² , 6.8 psi)	41 kPa (0.42 kgf/cm ² , 6.0 psi)	36 kPa (0.37 kgf/cm ² , 5.3 psi)	49 kPa (0.50 kgf/cm ² , 7.1 psi)	39 kPa (0.40 kgf/cm ² , 5.7 psi)

-  **NOTE:** • The specifications for the front-end attachment is for 2.96 m (9 ft 9 in) arm with PCSA 1.0 m³ (1.3 yd³) bucket.
 • 700, 800 mm (28, 31 in) grouser shoe, 600 mm (24 in) flat shoe and 760 mm (30 in) triangular shoe should not be used on gravel or rocky ground.
 • * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

SHOE TYPES AND APPLICATIONS

ZX250H-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	600 mm (24") Flat Shoe	760 mm (30") Triangular Shoe	900 mm (35") Triangular Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)	For Weak Footing (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	24700 (54500)	25000 (55100)	25300 (55800)	25400 (56000)	25600 (56400)	26600 (58600)
Base Machine Weight	kg (lb)	18900 (41700)	19200 (42300)	19500 (43000)	19600 (43200)	19800 (43700)	20900 (46100)
Cab Height	mm (ft·in)	3010 (9'11")	3010 (9'11")	3010 (9'11")	3020 (9'11")	3060 (10'1")	3060 (10'1")
Minimum Ground Clearance	mm (ft·in)	* 460 (18")	* 460 (18")	* 460 (18")	500 (20")	* 460 (18")	* 460 (18")
Undercarriage Length	mm (ft·in)	4260 (14'0")	4260 (14'0")	4260 (14'0")	4280 (14'1")	4370 (14'4")	4370 (14'4")
Undercarriage Width	mm (ft·in)	2990 (9'10")	3090 (10'2")	3190 (10'6")	2990 (9'10")	3150 (10'4")	3290 (10'10")
Ground Pressure		54 kPa (0.55 kgf/cm ² , 7.8 psi)	47 kPa (0.48 kgf/cm ² , 6.8 psi)	41 kPa (0.42 kgf/cm ² , 6.0 psi)	55 kPa (0.56 kgf/cm ² , 8.0 psi)	44 kPa (0.45 kgf/cm ² , 6.4 psi)	38 kPa (0.39 kgf/cm ² , 5.5 psi)

ZX250LCH-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	600 mm (24") Flat Shoe	760 mm (30") Triangular Shoe	900 mm (35") Triangular Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)	For Weak Footing (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	25300 (55800)	25600 (56400)	25900 (57100)	26000 (57300)	26200 (57800)	27400 (60400)
Base Machine Weight	kg (lb)	19500 (43000)	19800 (43700)	20100 (44300)	20200 (44500)	20500 (45200)	21600 (47600)
Cab Height	mm (ft·in)	3010 (9'11")	3010 (9'11")	3010 (9'11")	3020 (9'11")	3060 (10'1")	3060 (10'1")
Minimum Ground Clearance	mm (ft·in)	* 460 (18")	* 460 (18")	* 460 (18")	500 (20")	* 460 (18")	* 460 (18")
Undercarriage Length	mm (ft·in)	4640 (15'3")	4640 (15'3")	4640 (15'3")	4660 (15'4")	4750 (15'7")	4750 (15'7")
Undercarriage Width	mm (ft·in)	3190 (10'6")	3290 (10'10")	3390 (11'2")	3190 (10'6")	3350 (11'0")	3490 (11'5")
Ground Pressure		50 kPa (0.51 kgf/cm ² , 7.3 psi)	43 kPa (0.44 kgf/cm ² , 6.3 psi)	38 kPa (0.39 kgf/cm ² , 5.5 psi)	51 kPa (0.52 kgf/cm ² , 7.4 psi)	40 kPa (0.41 kgf/cm ² , 5.8 psi)	36 kPa (0.37 kgf/cm ² , 5.3 psi)

-  **NOTE:** • The specifications for the front-end attachment is for 2.96 m (9 ft 9 in) arm with PCSA 1.0 m³ (1.3 yd³) bucket.
- 700, 800 mm (28, 31 in) grouser shoe, 600 mm (24 in) flat shoe and 760, 900 mm (30, 35 in) triangular shoe should not be used on gravel or rocky ground.
 - * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

BUCKET TYPES AND APPLICATIONS

ZX240-3, 240LC-3, 250H-3, 250LCH-3

Bucket	Bucket Capacity m ³ (yd ³)		Bucket Width mm (in) (With side cutter)	Application	Front-End Attachment							
	PCSA (Heaped)	CECE (Heaped)			ZX240-3			ZX240LC-3			ZX250 H-3	ZX250 LCH-3
					2.5 m (8'2") Arm	2.96 m (9'9") Standard Arm	3.61m (11'10") Arm	2.5 m (8'2") Arm	2.96 m (9'9") Standard Arm	3.61m (11'10") Arm	2.96 m (9'9") Standard Arm	2.96 m (9'9") Standard Arm
Hoe Bucket	0.80 (1.05)	0.70	1080 (42.5")		●	●	●	●	●	●	●	●
	1.00 (1.31)	0.90	1260 (49.6")		●	●	●	●	●	●	●	●
	1.10 (1.44)	1.00	1350 (53.2")		○	○	□	○	○	○	○	○
	1.25 (1.64)	1.10	1490 (58.7")		○	○	—	○	○	□	○	○
	1.40 (1.83)	1.20	1630 (64.2")		□	—	—	□	—	—	—	—
Bucket reinforcement can be welded in four places upon customer's request	1.00 (1.31)	0.90	1260 (49.6")		●	●	○	●	●	●	●	●
	1.10 (1.44)	1.00	1350 (53.2")		○	○	□	○	○	○	○	○
Reinforced Hoe Bucket (HD Type)	1.00 (1.31)	0.90	1270 (50.0")		●	●	○	●	●	●	●	●
Reinforced Hoe Bucket HD Type (Transverse-Type-Pin-Used Type)	1.00 (1.31)	0.90	1270 (50.0")		●	●	○	●	●	●	●	●
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/m³ (2700 lb/yd³) as a standard.

Loading:

For loading operation of dry, loosened earth and sand.

Their bulk density shall be less than 1.10 t/m³ (1850 lb/yd³) as a standard.

Rock digging:

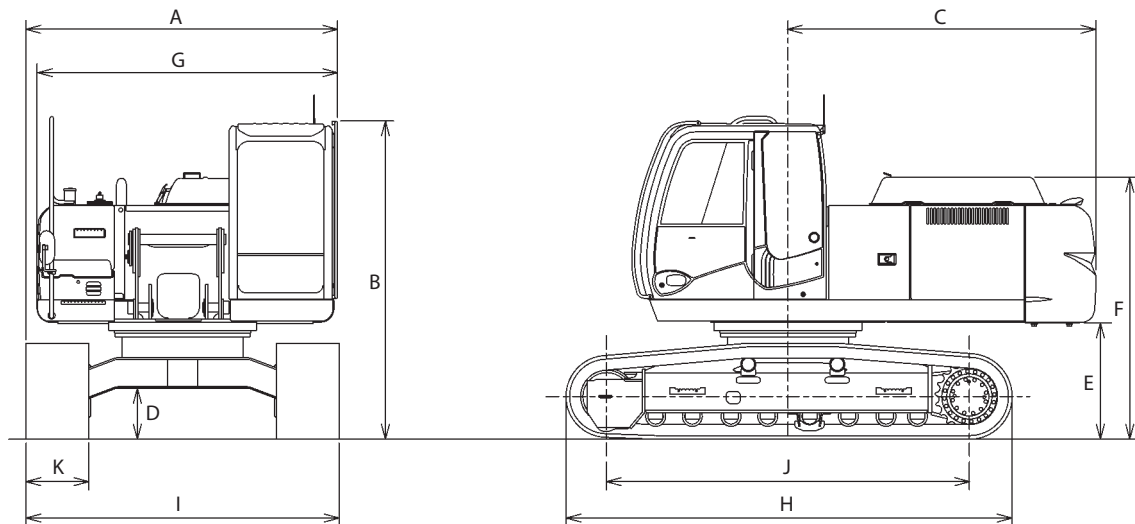
For digging/loading operation of mountain gravels, blasted rock, hard clay, soft rock and so on.

IMPORTANT: Using inapplicable buckets may cause serious damage to the front structure such as boom, arm and hydraulic cylinders.

SPECIFICATIONS

SPECIFICATIONS

ZX250K-3, 250LCK-3



M1U1-12-007

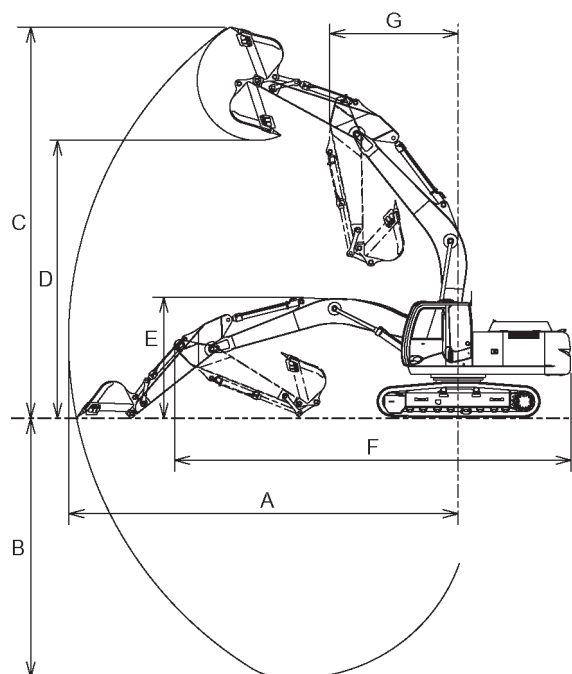
Model	ZX250K-3	ZX250LCK-3
Type of Front-End Attachment	2.96 m (9 ft 9 in) K Arm	
Bucket Capacity (Heaped)	PCSA 1.0 m ³ (1.3 yd ³), CECE 0.9 m ³	
Operating Weight	25400 kg (56000 lb)	26000 kg (57300 lb)
Base Machine Weight	19500 kg (43000 lb)	20100 kg (44300 lb)
Engine	Isuzu AH-4HK1XYSA-01 132 kW/2000 min ⁻¹ (180 PS/2000 rpm)	
A: Overall Width (Excluding back mirrors)	2990 mm (9 ft 10 in)	3190 mm (10 ft 6 in)
B: Cab Height	3140 mm (10 ft 4 in)	
C: Rear End Swing Radius	2940 mm (9 ft 8 in)	
D: Minimum Ground Clearance	*460 mm (18 in)	
E: Counterweight Clearance	* 1090 mm (3 ft 7 in)	
F: Engine Cover Height	* 2425 mm (8 ft 0 in)	
G: Overall Width of Upperstructure	2890 mm (9 ft 6 in)	
H: Undercarriage Length	4260 mm (14 ft 0 in)	4640 mm (15 ft 3 in)
I: Undercarriage Width	2990 mm (9 ft 10 in)	3190 mm (10 ft 6 in)
J: Sprocket Center to Idler Center	3463 mm (11 ft 4 in)	3845 mm (12 ft 7 in)
K: Track Shoe Width	600 mm (24 in) (Grouser shoe)	
Ground Pressure	56 kPa (0.57 kgf/cm ² , 8.1 psi)	52 kPa (0.53 kgf/cm ² , 7.5 psi)
Swing Speed	13.5 min ⁻¹ (rpm)	
Travel Speed (fast/slow)	5.5/3.4 km/h (3.4/2.1 mph)	
Gradeability	35° (tanθ = 0.70)	

NOTE: * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

WORKING RANGES

ZX250K-3, 250LCK-3



T1V1-01-01-002

Model	ZX250K-3, 250LCK-3	
Category	2.96 m (9 ft 9 in) K Arm	
Item	mm	ft·in
A: Maximum Digging Reach	10290	33'9"
B: Maximum Digging Depth	*6960	*22'10"
C: Maximum Cutting Height	*10160	*33'4"
D: Maximum Dumping Height	*7200	*23'8"
E: Overall Height	3070	10'1"
F: Overall Length	10150	33'4"
G: Minimum Swing Radius	3440	11'3"

NOTE: *The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

SHOE TYPES AND APPLICATIONS

ZX250K-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	600 mm (24") Flat Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)
Operating Weight	kg (lb)	25400 (56000)	25700 (56700)	26000 (57300)	26100 (57500)
Base Machine Weight	kg (lb)	19500 (43000)	19800 (43700)	20100 (44300)	20200 (44500)
Cab Height	mm (ft•in)	3140 (10'4")	3140 (10'4")	3140 (10'4")	3150 (10'4")
Minimum Ground Clearance	mm (ft•in)	* 460 (18")	* 460 (18")	* 460 (18")	500 (20")
Undercarriage Length	mm (ft•in)	4260 (14'0")	4260 (14'0")	4260 (14'0")	4280 (14'1")
Undercarriage Width	mm (ft•in)	2990 (9'10")	3090 (10'2")	3190 (10'6")	2990 (9'10")
Ground Pressure		56 kPa (0.57 kgf/cm ² , 8.1 psi)	48 kPa (0.49 kgf/cm ² , 7.0 psi)	42 kPa (0.43 kgf/cm ² , 6.1 psi)	57 kPa (0.58 kgf/cm ² , 8.2 psi)

ZX250LCK-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	600 mm (24") Flat Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)
Operating Weight	kg (lb)	26000 (57300)	26300 (58000)	26600 (58600)	26700 (58900)
Base Machine Weight	kg (lb)	20100 (44300)	20400 (45000)	20700 (45600)	20800 (45900)
Cab Height	mm (ft•in)	3140 (10'4")	3140 (10'4")	3140 (10'4")	3150 (10'4")
Minimum Ground Clearance	mm (ft•in)	* 460 (18")	* 460 (18")	* 460 (18")	500 (20")
Undercarriage Length	mm (ft•in)	4640 (15'3")	4640 (15'3")	4640 (15'3")	4660 (15'4")
Undercarriage Width	mm (ft•in)	3190 (10'6")	3290 (10'10")	3390 (11'2")	3190 (10'6")
Ground Pressure		52 kPa (0.53 kgf/cm ² , 7.5 psi)	45 kPa (0.46 kgf/cm ² , 6.5 psi)	39 kPa (0.40 kgf/cm ² , 5.7 psi)	53 kPa (0.54 kgf/cm ² , 7.7 psi)

 **NOTE:** • The specifications for the front-end attachment is for 2.96 m (9 ft 9 in) K arm with PCSA 1.0 m³ (1.3 yd³) bucket.
 • 700, 800 mm (28, 31 in) grouser shoe and 600 mm (24 in) flat shoe should not be used on gravel or rocky ground.
 • * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

BUCKET TYPES AND APPLICATIONS

ZX250K-3, 250LCK-3

Bucket	Bucket Capacity m ³ (yd ³)		Bucket Width mm (in) (With side cutter)	Application	Front-End Attachment	
	PCSA (Heaped)	CECE (Heaped)			ZX250K-3	ZX250LCK-3
					2.96 m (9'9") K Arm	2.96 m (9'9") K Arm
Hoe Bucket	0.80 (1.05)	0.70	1080 (42.5")		●	●
	1.00 (1.31)	0.90	1260 (49.6")		●	●
	1.10 (1.44)	1.00	1350 (53.2")		○	○
	1.25 (1.64)	1.10	1490 (58.7")		○	○
	1.40 (1.83)	1.20	1630 (64.2")		—	—
Bucket reinforcement can be welded in four places upon customer's request	1.00 (1.31)	0.90	1260 (49.6")		●	●
	1.10 (1.44)	1.00	1350 (53.2")		○	○
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/m³ (2700 lb/yd³) as a standard.

Loading:

For loading operation of dry, loosened earth and sand.

Their bulk density shall be less than 1.10 t/m³ (1850 lb/yd³) as a standard.

Rock digging:

For digging/loading operation of mountain gravels, blasted rock, hard clay, soft rock and so on.

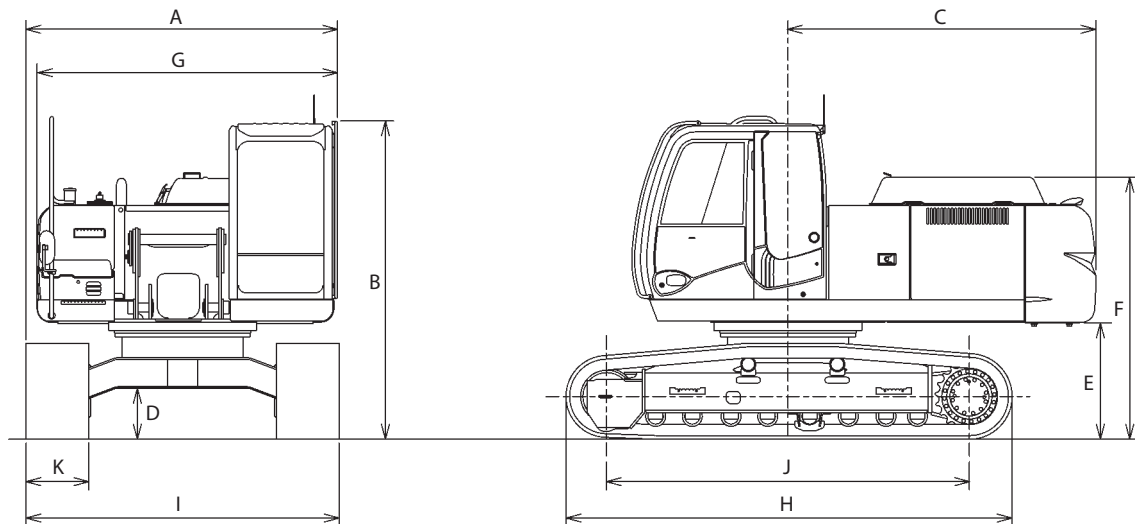
IMPORTANT: Using inapplicable buckets may cause serious damage to the front structure such as boom, arm and hydraulic cylinders.

IMPORTANT: The ZX250K-3, 250LCK-3 base machines must be modified when being applied exclusively to excavation work. (Refer to "Precautions for Operation Using A Bucket" in the OPERATING THE MACHINE section.)

SPECIFICATIONS

SPECIFICATIONS

ZX270-3, 270LC-3



M1U1-12-007

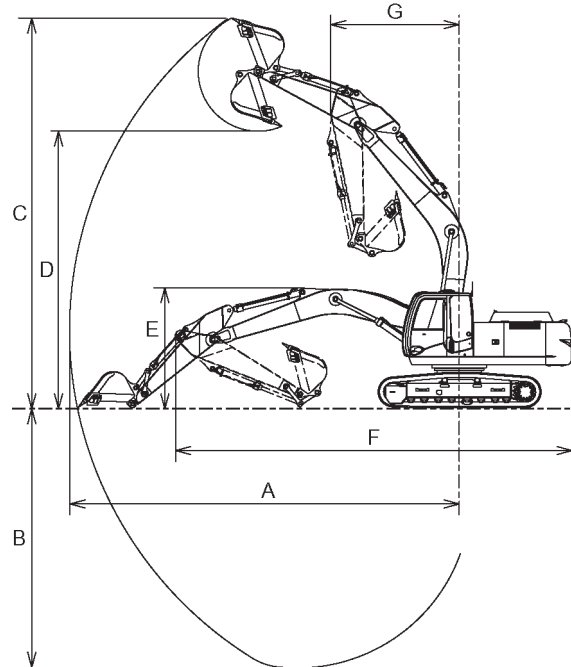
Model	ZX270-3	ZX270LC-3
Type of Front-End Attachment	3.11 m (10 ft 2 in) Arm	
Bucket Capacity (Heaped)	PCSA 1.1 m ³ (1.44 yd ³), CECE 1.0 m ³	
Operating Weight	27300 kg (60200 lb)	27800 kg (61300 lb)
Base Machine Weight	21300 kg (47000 lb)	21800 kg (48100 lb)
Engine	Isuzu AH-4HK1XSA-03 140 kW/2100 min ⁻¹ (190 PS/2100 rpm)	
A: Overall Width (Excluding back mirrors)	3190 mm (10 ft 6 in)	
B: Cab Height	3100 mm (10 ft 2 in)	
C: Rear End Swing Radius	2940 mm (9 ft 8 in)	
D: Minimum Ground Clearance	*510 mm (20 in)	
E: Counterweight Clearance	* 1180 mm (3 ft 11 in)	
F: Engine Cover Height	* 2515 mm (8 ft 3 in)	
G: Overall Width of Upperstructure	2890 mm (9 ft 6 in)	
H: Undercarriage Length	4670 mm (15 ft 4 in)	4940 mm (16 ft 3 in)
I: Undercarriage Width	3190 mm (10 ft 6 in)	
J: Sprocket Center to Idler Center	3728 mm (12 ft 3 in)	4052 mm (13 ft 4 in)
K: Track Shoe Width	600 mm (24 in) (Grouser shoe)	
Ground Pressure	55 kPa (0.56 kgf/cm ² , 8.0 psi)	52 kPa (0.53 kgf/cm ² , 7.5 psi)
Swing Speed	12.6 min ⁻¹ (rpm)	
Travel Speed (fast/slow)	5.5/3.3 km/h (3.4/2.0 mph)	
Gradeability	35° (tanθ = 0.70)	

 NOTE: *The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

WORKING RANGES

ZX270-3, 270LC-3



T1V1-01-01-002

Model		ZX270-3, 270LC-3					
Item	Category	2.42 m (7 ft 11 in) Arm		3.11 m (10 ft 2 in) Arm		3.76 m (12 ft 4 in) Arm	
		mm	ft•in	mm	ft•in	mm	ft•in
A: Maximum Digging Reach		10060	33'0"	10710	35'2"	10270	33'8"
B: Maximum Digging Depth		*6540	*21'6"	*7230	*23'9"	*7880	*25'10"
C: Maximum Cutting Height		*9890	*32'5"	*10260	*33'8"	*10460	*34'4"
D: Maximum Dumping Height		*6970	*22'10"	*7310	*24'0"	*7520	*24'8"
E: Overall Height		3410	11'2"	3170	10'5"	3310	10'10"
F: Overall Length		10440	34'3"	10340	33'11"	10390	34'1"
G: Minimum Swing Radius		4070	13'4"	3910	12'10"	3900	12'10"

NOTE: * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

SHOE TYPES AND APPLICATIONS

ZX270-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	600 mm (24") Flat Shoe	900 mm (35") Triangular Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	27300 (60200)	27900 (61500)	28200 (62200)	28200 (62200)	28900 (63700)
Base Machine Weight	kg (lb)	21300 (47000)	21900 (48300)	22200 (48900)	22200 (48900)	22900 (50500)
Cab Height	mm (ft•in)	3100 (10'2")	3100 (10'2")	3100 (10'2")	3260 (10'8")	3350 (11'0")
Minimum Ground Clearance	mm (ft•in)	* 510 (20")	* 510 (20")	* 510 (20")	550 (22")	* 510 (20")
Undercarriage Length	mm (ft•in)	4670 (15'4")	4670 (15'4")	4670 (15'4")	4670 (15'4")	4670 (15'4")
Undercarriage Width	mm (ft•in)	3190 (10'6")	3290 (10'10")	3390 (11'2")	3190 (10'6")	3490 (11'5")
Ground Pressure		55 kPa (0.56 kgf/cm ² , 8.0 psi)	48 kPa (0.49 kgf/cm ² , 7.0 psi)	42 kPa (0.43 kgf/cm ² , 6.1 psi)	57 kPa (0.58 kgf/cm ² , 8.2 psi)	39 kPa (0.40 kgf/cm ² , 5.7 psi)

ZX270LC-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	600 mm (24") Flat Shoe	900 mm (35") Triangular Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	27800 (61300)	28500 (62800)	28800 (63500)	28800 (63500)	29200 (64400)
Base Machine Weight	kg (lb)	21800 (48100)	22400 (49400)	22800 (50300)	22800 (50300)	23200 (51100)
Cab Height	mm (ft•in)	3100 (10'2")	3100 (10'2")	3100 (10'2")	3260 (10'8")	3350 (11'0")
Minimum Ground Clearance	mm (ft•in)	* 510 (20")	* 510 (20")	* 510 (20")	550 (22")	* 510 (20")
Undercarriage Length	mm (ft•in)	4940 (16'3")	4940 (16'3")	4940 (16'3")	4940 (16'3")	4940 (16'3")
Undercarriage Width	mm (ft•in)	3190 (10'6")	3290 (10'10")	3390 (11'2")	3190 (10'6")	3490 (11'5")
Ground Pressure		52 kPa (0.53 kgf/cm ² , 7.5 psi)	46 kPa (0.47 kgf/cm ² , 6.7 psi)	40 kPa (0.41 kgf/cm ² , 5.8 psi)	54 kPa (0.55 kgf/cm ² , 7.8 psi)	36 kPa (0.37 kgf/cm ² , 5.3 psi)

-  NOTE: • The specifications for the front-end attachment is for 3.11 m (10 ft 2 in) arm with PCSA 1.1 m³ (1.44 yd³) bucket.
• 700, 800 mm (28, 31 in) grouser shoe, 600 mm (24 in) flat shoe and 900 mm (35 in) triangular shoe should not be used on gravel or rocky ground.
• * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

BUCKET TYPES AND APPLICATIONS

ZX270-3, 270LC-3

Bucket	Bucket Capacity m ³ (yd ³)		Bucket Width mm (in) (With side cutter)	Application	Front-End Attachment					
	PCSA (Heaped)	CECE (Heaped)			ZX270-3			ZX270LC-3		
					2.42 m (7'11") Arm	3.11 m (10'2") Arm	3.76m (12'4") Arm	2.42 m (7'11") Arm	3.11 m (10'2") Arm	3.76m (12'4") Arm
Hoe Bucket	1.00 (1.31)	0.90	1260 (49.6")		●	●	●	●	●	●
	1.10 (1.44)	1.00	1350 (53.2")		●	●	○	●	●	●
	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")		○	○	—	○	○	□
Reinforced Hoe Bucket (HD Type)	1.10 (1.44)	1.00	1360 (53.5")		●	●	○	●	●	●
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/m³ (2700 lb/yd³) as a standard.

Loading:

For loading operation of dry, loosened earth and sand.

Their bulk density shall be less than 1.10 t/m³ (1850 lb/yd³) as a standard.

Rock digging:

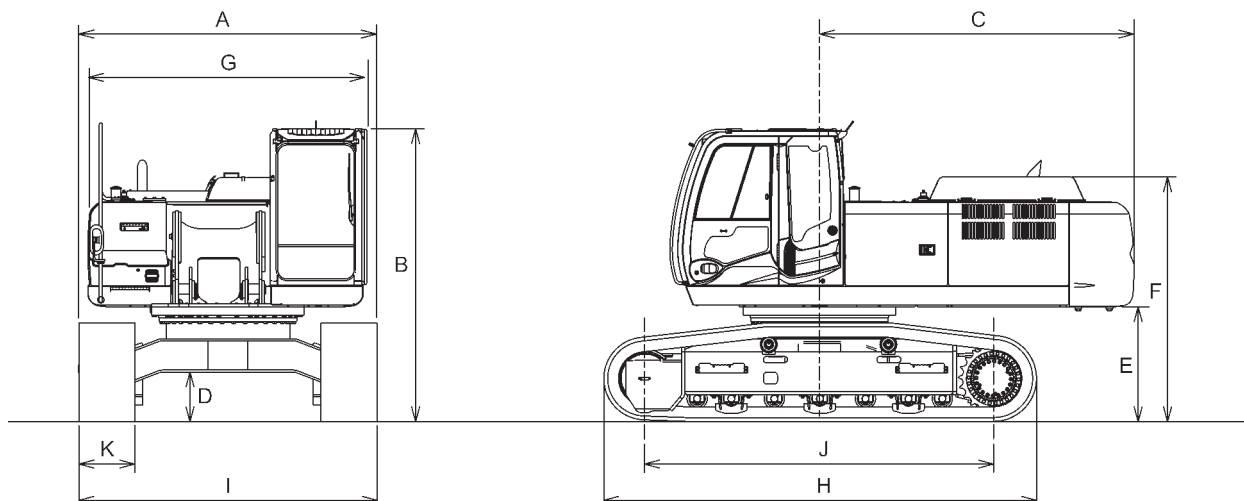
For digging/loading operation of mountain gravels, blasted rock, hard clay, soft rock and so on.

IMPORTANT: Using inapplicable buckets may cause serious damage to the front structure such as boom, arm and hydraulic cylinders.

SPECIFICATIONS

SPECIFICATIONS

ZX330-3, 330LC-3, 350H-3, 350LCH-3



T1V7-01-01-004

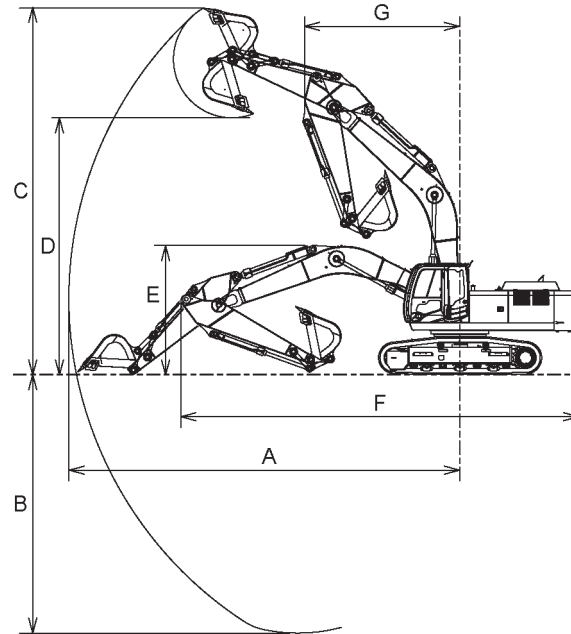
Model	ZX330-3	ZX330LC-3	ZX350H-3	ZX350LCH-3
Type of Front-End Attachment	3.2 m (10 ft 6 in) Arm		3.2 m (10 ft 6 in) H Arm	
Bucket Capacity (Heaped)	PCSA 1.4 m ³ (1.83 yd ³), CECE 1.2 m ³		PCSA 1.38 m ³ (1.81 yd ³), CECE 1.2 m ³	
Operating Weight	31600 kg (69700 lb)	32200 kg (71000 lb)	33700 kg (74300 lb)	34200 kg (75400 lb)
Base Machine Weight	24100 kg (53100 lb)	24600 kg (54200 lb)	25500 kg (56200 lb)	26000 kg (57300 lb)
Engine	Isuzu AH-6HK1XYSA-01 202 kW/1900 min ⁻¹ (275 PS/1900 rpm)			
A: Overall Width (Excluding back mirrors)	3190 mm (10 ft 6 in)			
B: Cab Height	3160 mm (10 ft 4 in)			
C: Rear End Swing Radius	3390 mm (11 ft 2 in)			
D: Minimum Ground Clearance	* 500 mm (20 in)			
E: Counterweight Clearance	* 1160 mm (3 ft 10 in)			
F: Engine Cover Height	* 2590 mm (8 ft 6 in)			
G: Overall Width of Upperstructure	2990 mm (9 ft 10 in)			
H: Undercarriage Length	4640 mm (15 ft 3 in)	4940 mm (16 ft 3 in)	4650 mm (15 ft 3 in)	4950 mm (16 ft 3 in)
I: Undercarriage Width	3190 mm (10 ft 6 in)			
J: Sprocket Center to Idler Center	3730 mm (12 ft 3 in)	4050 mm (13 ft 3 in)	3730 mm (12 ft 3 in)	4050 mm (13 ft 3 in)
K: Track Shoe Width	600 mm (24 in) (Grouser shoe)			
Ground Pressure	64 kPa (0.65 kgf/cm ² , 9.2 psi)	61 kPa (0.62 kgf/cm ² , 8.8 psi)	68 kPa (0.69 kgf/cm ² , 9.8 psi)	64 kPa (0.65 kgf/cm ² , 9.2 psi)
Swing Speed	10.7 min ⁻¹ (rpm)			
Travel Speed (fast/slow)	5.0/3.2 km/h (3.1/2.0 mph)			
Gradeability	35° (tanθ = 0.70)			

NOTE: * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

WORKING RANGES

ZX330-3, 330LC-3, 350H-3, 350LCH-3



T1V7-01-01-002

Model	ZX330-3, 330LC-3						ZX350H-3, 350LCH-3	
	2.67 m (8 ft 9 in) Arm		3.2 m (10 ft 6 in) Arm		4.0 m (13 ft 2 in) Arm		3.2 m (10 ft 6 in) H Arm	
Category	mm	ft•in	mm	ft•in	mm	ft•in	mm	ft•in
Item								
A: Maximum Digging Reach	10570	34'8"	11100	36'5"	11860	38'11"	11100	36'5"
B: Maximum Digging Depth	*6840	*22'5"	*7380	*24'3"	*8180	*26'10"	*7380	*24'3"
C: Maximum Cutting Height	*9990	*32'9"	*10360	*34'0"	*10750	*35'3"	*10360	*34'0"
D: Maximum Dumping Height	*6940	*22'9"	*7240	*23'9"	*7630	*25'0"	*7240	*23'9"
E: Overall Height	3470	11'5"	3270	10'9"	3600	11'10"	3270	10'9"
F: Overall Length	11130	36'6"	11000	36'1"	11090	36'5"	11000	36'1"
G: Minimum Swing Radius	4610	15'2"	4460	14'8"	4470	14'8"	4460	14'8"

NOTE: * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

SHOE TYPES AND APPLICATIONS

ZX330-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	600 mm (24") Flat Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)
Operating Weight	kg (lb)	31600 (69700)	32200 (71000)	32600 (71900)	32500 (71600)
Base Machine Weight	kg (lb)	24100 (53100)	24600 (54200)	25000 (55100)	24900 (54900)
Cab Height	mm (ft•in)	3160 (10'4")	3160 (10'4")	3160 (10'4")	3200 (10'6")
Minimum Ground Clearance	mm (ft•in)	* 500 (20")	* 500 (20")	* 500 (20")	540 (21")
Undercarriage Length	mm (ft•in)	4640 (15'3")	4650 (15'3")	4650 (15'3")	4650 (15'3")
Undercarriage Width	mm (ft•in)	3190 (10'6")	3290 (10'10")	3390 (11'2")	3190 (10'6")
Ground Pressure		64 kPa (0.65 kgf/cm ² , 9.2 psi)	56 kPa (0.57 kgf/cm ² , 8.1 psi)	49 kPa (0.50 kgf/cm ² , 7.1 psi)	66 kPa (0.67 kgf/cm ² , 9.5 psi)

ZX330LC-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	600 mm (24") Flat Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)
Operating Weight	kg (lb)	32200 (71000)	32800 (72300)	33200 (73200)	33100 (73000)
Base Machine Weight	kg (lb)	24600 (54200)	25300 (55800)	25600 (56400)	25600 (56400)
Cab Height	mm (ft•in)	3160 (10'4")	3160 (10'4")	3160 (10'4")	3200 (10'6")
Minimum Ground Clearance	mm (ft•in)	* 500 (20")	* 500 (20")	* 500 (20")	540 (21")
Undercarriage Length	mm (ft•in)	4940 (16'3")	4950 (16'3")	4950 (16'3")	4950 (16'3")
Undercarriage Width	mm (ft•in)	3190 (10'6")	3290 (10'10")	3390 (11'2")	3190 (10'6")
Ground Pressure		61 kPa (0.62 kgf/cm ² , 8.8 psi)	53 kPa (0.54 kgf/cm ² , 7.7 psi)	47 kPa (0.48 kgf/cm ² , 6.8 psi)	62 kPa (0.63 kgf/cm ² , 9.0 psi)

 **NOTE:** • The specifications for the front-end attachment is for 3.2 m (10 ft 6 in) arm with PCSA 1.4 m³ (1.83 yd³) bucket.
 • 700, 800 mm (28, 31 in) grouser shoe and 600 mm (24 in) flat shoe should not be used on gravel or rocky ground.
 • * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

SHOE TYPES AND APPLICATIONS

ZX350H-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	600 mm (24") Flat Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)
Operating Weight	kg (lb)	33700 (74300)	34000 (75000)	34400 (75800)	34300 (75600)
Base Machine Weight	kg (lb)	25500 (56200)	25800 (56900)	26200 (57800)	26100 (57500)
Cab Height	mm (ft•in)	3160 (10'4")	3160 (10'4")	3160 (10'4")	3200 (10'6")
Minimum Ground Clearance	mm (ft•in)	* 500 (20")	* 500 (20")	* 500 (20")	540 (21")
Undercarriage Length	mm (ft•in)	4650 (15'3")	4650 (15'3")	4650 (15'3")	4650 (15'3")
Undercarriage Width	mm (ft•in)	3190 (10'6")	3290 (10'10")	3390 (11'2")	3190 (10'6")
Ground Pressure		68 kPa (0.69 kgf/cm ² , 9.8 psi)	59 kPa (0.60 kgf/cm ² , 8.5 psi)	52 kPa (0.53 kgf/cm ² , 7.5 psi)	70 kPa (0.71 kgf/cm ² , 10.1 psi)

ZX350LCH-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	600 mm (24") Flat Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)
Operating Weight	kg (lb)	34200 (75400)	34600 (76300)	35000 (77200)	34900 (76900)
Base Machine Weight	kg (lb)	26000 (57300)	26400 (58200)	26800 (59100)	26700 (58900)
Cab Height	mm (ft•in)	3160 (10'4")	3160 (10'4")	3160 (10'4")	3200 (10'6")
Minimum Ground Clearance	mm (ft•in)	* 500 (20")	* 500 (20")	* 500 (20")	540 (21")
Undercarriage Length	mm (ft•in)	4950 (16'3")	4950 (16'3")	4950 (16'3")	4950 (16'3")
Undercarriage Width	mm (ft•in)	3190 (10'6")	3290 (10'10")	3390 (11'2")	3190 (10'6")
Ground Pressure		64 kPa (0.65 kgf/cm ² , 9.2 psi)	56 kPa (0.57 kgf/cm ² , 8.1 psi)	49 kPa (0.50 kgf/cm ² , 7.1 psi)	66 kPa (0.67 kgf/cm ² , 9.5 psi)

 **NOTE:** • The specifications for the front-end attachment is for 3.2 m (10 ft 6 in) arm with PCSA 1.4 m³ (1.83 yd³) bucket.
 • 700, 800 mm (28, 31 in) grouser shoe and 600 mm (24 in) flat shoe should not be used on gravel or rocky ground.
 • * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

BUCKET TYPES AND APPLICATIONS

ZX330-3, 330LC-3, 350H-3, 350LCH-3

Bucket	Bucket Capacity m ³ (yd ³)		Bucket Width mm (in) (With side cutter)	Application	Front-End Attachment							
	PCSA (Heaped)	CECE (Heaped)			ZX330-3			ZX330LC-3			ZX350 H-3	ZX350 LCH-3
					2.67 m (8'9") Arm	3.2 m (10'6") Arm	4.0 m (13'2") Arm	2.67 m (8'9") Arm	3.2 m (10'6") Arm	4.0m (13'2") Arm	3.2 m (10'6") H Arm	3.2 m (10'6") H Arm
Hoe Bucket (Super V) (Transverse-Type-Pin)	1.15 (1.50)	1.00	1230 (48.4")		●	●	●	●	●	●	—	—
	1.40 (1.83)	1.20	1410 (55.5")		●	●	○	●	●	●	—	—
	1.62 (2.12)	1.40	1590 (62.6")		○	○	—	○	○	□	—	—
	1.86 (2.43)	1.60	1640 (64.6")		□	—	—	□	—	—	—	—
			(Without side cutter)									
	1.40 (1.83)	1.20	1410 (55.5")		●	●	○	●	●	●	—	—
	1.40 (1.83)	1.20	1410 (55.5")		●	●	○	●	●	●	—	—
Bucket reinforcement can be welded in four places upon customer's request	1.40 (1.83)	1.20	1410 (55.5")		●	●	○	●	●	●	●	●
	1.62 (2.12)	1.40	1590 (62.6")		○	○	—	○	○	○	○	○
Rock Bucket	1.15 (1.50)	1.00	1160 (45.7")		■	■	—	■	■	—	■	■
(Super V)	1.38 (1.81)	1.20	1360 (53.5")		●	●	—	●	●	—	■	■
(Transverse-Type-Pin)	1.38 (1.81)	1.20	1360 (53.5")		●	●	—	●	●	—	■	■
(Super V)	1.50 (1.96)	1.30	1450 (57.1")		○	○	—	○	○	—	●	■
(Transverse-Type-Pin)	1.50 (1.96)	1.30	1450 (57.1")		○	○	—	○	○	—	●	■
Ripper Bucket	0.90 (1.18)	0.80 (1.05)	1010 (39.8") (Without side cutter)		■	■	—	■	■	—	■	■
One Point Ripper	—		—		■	■	—	■	■	—	■	■
Clamshell Bucket	1.00 (1.31)		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/m³ (2700 lb/yd³) as a standard.

Loading:

For loading operation of dry, loosened earth and sand.

Their bulk density shall be less than 1.10 t/m³ (1850 lb/yd³) as a standard.

Rock digging:

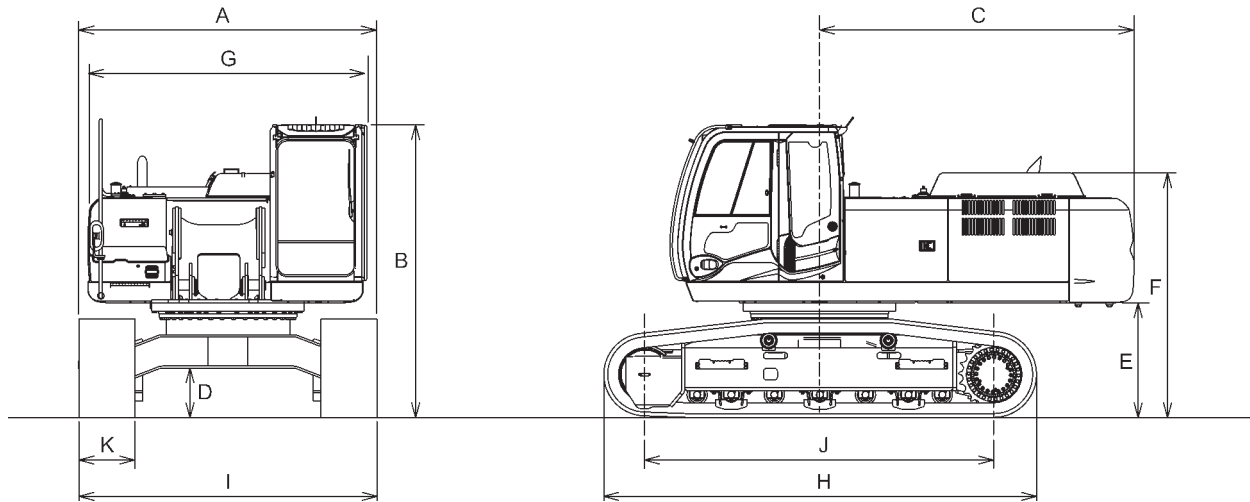
For digging/loading operation of mountain gravels, blasted rock, hard clay, soft rock and so on.

IMPORTANT: Using inapplicable buckets may cause serious damage to the front structure such as boom, arm and hydraulic cylinders.

SPECIFICATIONS

SPECIFICATIONS

ZX350K-3, 350LCK-3



T1V7-01-01-004

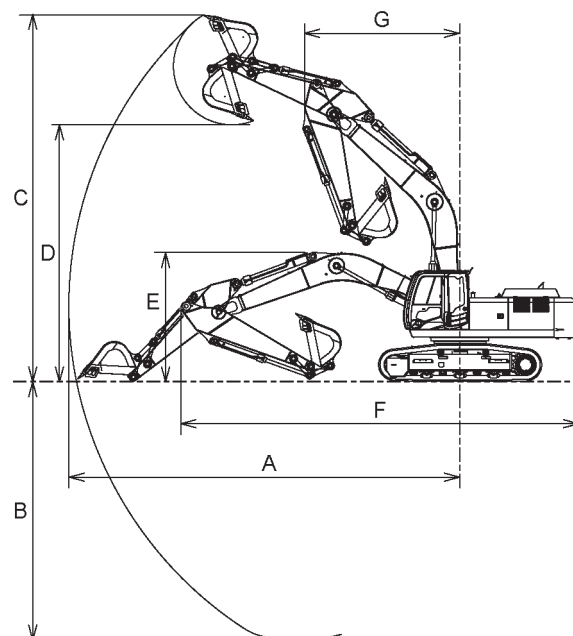
Model	ZX350K-3	ZX350LCK-3
Type of Front-End Attachment	3.2 m (10 ft 6 in) K Arm	
Bucket Capacity (Heaped)	PCSA 1.38 m ³ (1.81 yd ³), CECE 1.2 m ³	
Operating Weight	34400 kg (75800 lb)	35000 kg (77200 lb)
Base Machine Weight	26300 kg (58000 lb)	26900 kg (59300 lb)
Engine	Isuzu AH-6HK1XYSA-01 202 kW/1900 min ⁻¹ (275 PS/1900 rpm)	
A: Overall Width (Excluding back mirrors)	3190 mm (10 ft 6 in)	
B: Cab Height	3290 mm (10 ft 10 in)	
C: Rear End Swing Radius	3390 mm (11 ft 2 in)	
D: Minimum Ground Clearance	*500 mm (20 in)	
E: Counterweight Clearance	* 1160 mm (3 ft 10 in)	
F: Engine Cover Height	* 2590 mm (8 ft 6 in)	
G: Overall Width of Upperstructure	2990 mm (9 ft 10 in)	
H: Undercarriage Length	4650 mm (15 ft 3 in)	4950 mm (16 ft 3 in)
I: Undercarriage Width	3190 mm (10 ft 6 in)	
J: Sprocket Center to Idler Center	3730 mm (12 ft 3 in)	4050 mm (13 ft 3 in)
K: Track Shoe Width	600 mm (24 in) (Grouser shoe)	
Ground Pressure	70 kPa (0.71 kgf/cm ² , 10.1 psi)	66 kPa (0.67 kgf/cm ² , 9.5 psi)
Swing Speed	10.7 min ⁻¹ (rpm)	
Travel Speed (fast/slow)	5.0/3.2 km/h (3.1/2.0 mph)	
Gradeability	35° (tanθ = 0.70)	

 NOTE: *The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

WORKING RANGES

ZX350K-3, 350LCK-3



T1V7-01-01-002

Model		ZX350K-3, 350LCK-3	
Category		3.2 m (10 ft 6 in) K Arm	
Item		mm	ft·in
A: Maximum Digging Reach		11100	36'5"
B: Maximum Digging Depth		*7380	*24'3"
C: Maximum Cutting Height		*10360	*34'0"
D: Maximum Dumping Height		*7240	*23'9"
E: Overall Height		3270	10'9"
F: Overall Length		11000	36'1"
G: Minimum Swing Radius		4460	14'8"

 NOTE: *The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

SHOE TYPES AND APPLICATIONS

ZX350K-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	600 mm (24") Flat Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)
Operating Weight	kg (lb)	34400 (75800)	34800 (76700)	35100 (77400)	35000 (77200)
Base Machine Weight	kg (lb)	26300 (58000)	26700 (58900)	27000 (59500)	27000 (59500)
Cab Height	mm (ft•in)	3290 (10'10")	3290 (10'10")	3290 (10'10")	3330 (10'11")
Minimum Ground Clearance	mm (ft•in)	* 500 (20")	* 500 (20")	* 500 (20")	540 (21")
Undercarriage Length	mm (ft•in)	4650 (15'3")	4650 (15'3")	4650 (15'3")	4650 (15'3")
Undercarriage Width	mm (ft•in)	3190 (10'6")	3290 (10'10")	3390 (11'2")	3190 (10'6")
Ground Pressure		70 kPa (0.71 kgf/cm ² , 10.1 psi)	60 kPa (0.61 kgf/cm ² , 8.7 psi)	53 kPa (0.54 kgf/cm ² , 7.7 psi)	71 kPa (0.72 kgf/cm ² , 10.2 psi)

ZX350LCK-3

Shoe Width		600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	600 mm (24") Flat Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)
Operating Weight	kg (lb)	35000 (77200)	35400 (78000)	35800 (78900)	35700 (78700)
Base Machine Weight	kg (lb)	26900 (59300)	27300 (60200)	27700 (61100)	27600 (60800)
Cab Height	mm (ft•in)	3290 (10'10")	3290 (10'10")	3290 (10'10")	3330 (10'11")
Minimum Ground Clearance	mm (ft•in)	* 500 (20")	* 500 (20")	* 500 (20")	540 (21")
Undercarriage Length	mm (ft•in)	4950 (16'3")	4950 (16'3")	4950 (16'3")	4950 (16'3")
Undercarriage Width	mm (ft•in)	3190 (10'6")	3290 (10'10")	3390 (11'2")	3190 (10'6")
Ground Pressure		66 kPa (0.67 kgf/cm ² , 9.5 psi)	57 kPa (0.58 kgf/cm ² , 8.2 psi)	50 kPa (0.51 kgf/cm ² , 7.3 psi)	67 kPa (0.68 kgf/cm ² , 9.7 psi)

 **NOTE:** • The specifications for the front-end attachment is for 3.2 m (10 ft 6 in) K arm with PCSA 1.38 m³ (1.81 yd³) bucket.
• 700, 800 mm (28, 31 in) grouser shoe and 600 mm (24 in) flat shoe should not be used on gravel or rocky ground.
• * The dimensions do not include the height of the shoe lug.

SPECIFICATIONS

BUCKET TYPES AND APPLICATIONS

ZX350K-3, 350LCK-3

Bucket	Bucket Capacity m ³ (yd ³)		Bucket Width mm (in) (With side cutter)	Application	Front-End Attachment	
	PCSA (Heaped)	CECE (Heaped)			ZX350K-3	ZX350LCK-3
					3.2 m (10'6") K Arm	3.2 m (10'6") K Arm
Hoe Bucket (Super V) (Transverse-Type-Pin)	1.15 (1.50)	1.00	1230 (48.4")		●	●
	1.40 (1.83)	1.20	1410 (55.5")		●	●
	1.62 (2.12)	1.40	1590 (62.6")		○	○
	1.86 (2.43)	1.60	1640 (64.6")		—	—
			(Without side cutter)			
	1.40 (1.83)	1.20	1410 (55.5")		●	●
	1.40 (1.83)	1.20	1410 (55.5")	●	●	
Bucket reinforcement can be welded in four places upon custom- er's request						
	1.40 (1.83)	1.20	1410 (55.5")		●	●
	1.62 (2.12)	1.40	1590 (62.6")		—	—
Clamshell Bucket	1.00 (1.31)		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/m³ (2700 lb/yd³) as a standard.

Loading:

For loading operation of dry, loosened earth and sand.

Their bulk density shall be less than 1.10 t/m³ (1850 lb/yd³) 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.

IMPORTANT: The ZX350K-3, 350LCK-3 base machines must be modified when being applied exclusively to excavation work. (Refer to "Precautions for Operation Using A Bucket" in the OPERATING THE MACHINE section.)

OPTIONAL ATTACHMENTS AND DEVICES

USING PAD CRAWLER SHOE

ZX120-3, 200-3 class

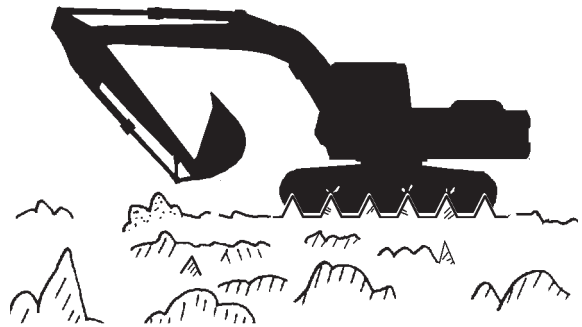
Pad crawler is a tract link on which a rubber pad is installed so the machine does not damage road surfaces when traveling. Be sure to observe all precautions for handling pad crawler. Avoid operating the machine in the following conditions:

Forbidden Operations

Do not operate on sharp, rocky, uneven surfaces, such as river rock, gravel, etc.

Do not allow engine oil, gasoline, etc. to remain on the track, and avoid traveling in oil in order to reduce the danger of slipping.

While raising the machine using the front attachment do not allow the other side track to drive, possibly causing personal injury, damaging or displacing pad crawler.



M107-05-051

OPTIONAL ATTACHMENTS AND DEVICES

TRAVELING AND OTHER CAUTIONS

Do not keep the pad crawler shoe under direct sunlight for more than three months.

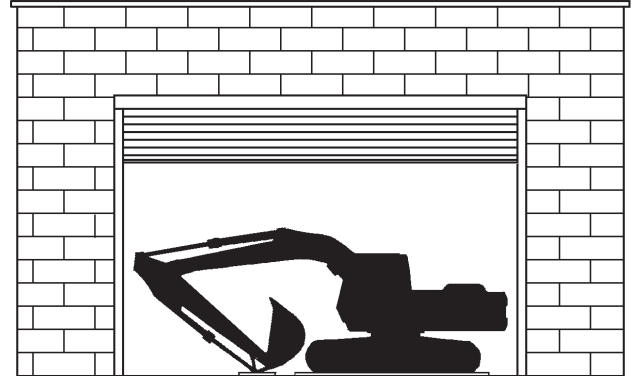
Avoid reckless steering operations on concrete road to the extent possible, as this will cause wear to the shoe lug. Also, avoid running on asphalt road of more than 60 °C (140 ° F) in temperature, as this will cause wear to the shoe as well as damage to the road surface.

Ease the machine down from the jacked-up position. Do not let it drop.

Pad crawler has large friction force. Therefore to avoid damaging the pad crawler slowly operate the control levers to gradually turn the machine.

After raising one side track with the front attachment, slowly lower the pad crawler equipped machine.

If the pad crawler becomes severely damaged, contact your nearest Hitachi Dealer for replacement.



M107-05-052

OPTIONAL ATTACHMENTS AND DEVICES

TRANSPORTING

Transporting

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

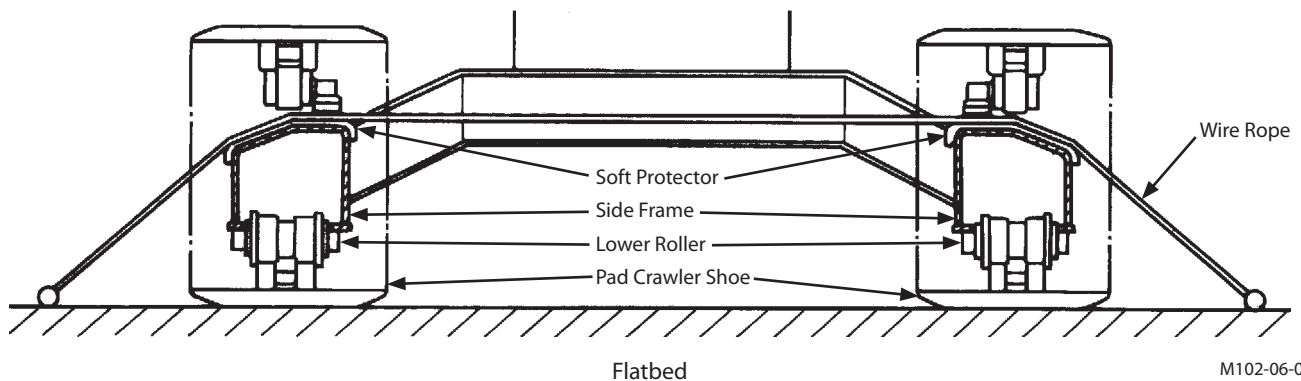
1. Place blocks in front of and behind the tracks.
2. Fasten each corner of the machine and front attachment to the trailer with a chain or cable.



M107-06-013

PRECAUTIONS FOR TRANSPORTING MACHINES WITH PAD CRAWLER SHOES

When transporting a machine with pad crawler shoes, be sure to fasten the right and left track frames securely to the flatbed with wire ropes and soft protectors, as shown. Do not allow wire ropes to come into direct contact with pad crawler shoes.



M102-06-004

OPTIONAL ATTACHMENTS AND DEVICES

Check Track Sag --- every 50 hours

Swing the upperstructure 90 ° and lower the bucket to raise the track off the ground as shown.

Keep the angle between the boom and arm 90 to 110 ° and position the bucket's round side on the ground. Place blocks under the machine frame to support the machine.

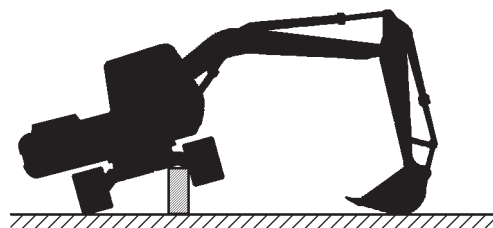
Rotate the raised track in reverse two full rotations and then forward two full rotations.

Measure distance (A) at the middle of the track frame from the bottom of the track frame to the back face of the track shoe.

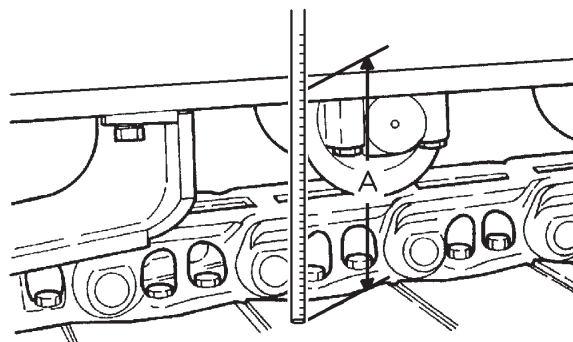
Track sag specifications

Model	A
ZX120-3 class	250 to 280 mm (9.8 to 11.0 in)
ZX200-3 class	300 to 335 mm (11.8 to 13.2 in)

 **NOTE:** Check track sag after thoroughly removing soil stuck on the track area by washing.



M104-07-067



M107-07-068

Adjust Track Sag

Precautions for Adjusting Track Sag

1. If track sag is not within specifications, loosen or tighten the track following the procedures shown on the next page.
2. When adjusting track sag, lower the bucket to the ground to raise one track off the ground. Repeat this procedure to raise the other track. Each time, be sure to place blocks under the machine frame to support the machine.
3. After adjusting track sag of both tracks, move the machine back and forth several times.
4. Check track sag again. If track sag is not within specifications, repeat adjustment until correct sag is obtained.

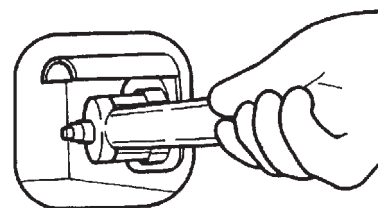
OPTIONAL ATTACHMENTS AND DEVICES

Loosen the Track

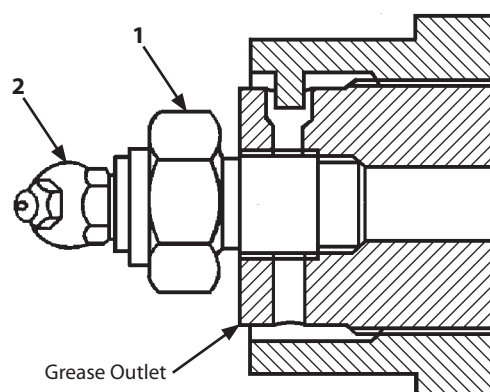
CAUTION: Do not loosen valve (1) quickly or loosen it too much as high-pressure grease in the adjusting cylinder may spout out. Loosen carefully, keeping body parts and face away from valve (1). Never loosen grease fitting (2).

IMPORTANT: When gravel or mud is packed between sprockets and track links, remove it before loosening.

1. To loosen the track, slowly turn valve (1) counterclockwise using long socket 19; grease will escape from the grease outlet.
2. Between 1 to 1.5 turns of valve (1) is sufficient to loosen the track.
3. If grease does not drain smoothly, slowly rotate the raised track.
4. When proper track sag is obtained, turn valve (1) clockwise and tighten to 90 N·m (9 kgf·m, 66 lbf·ft).



M107-07-075



M104-07-119

Tighten the Track

CAUTION: It is abnormal if the track remains tight after turning valve (1) counterclockwise or if the track is still loose after charging grease to fitting (2). In such cases, NEVER ATTEMPT TO DISASSEMBLE the track or track adjuster, because of dangerous high-pressure grease inside the track adjuster. See your authorized dealer immediately.

To tighten the track, connect a grease gun to grease fitting (2) and add grease until the sag is within specifications.

OPTIONAL ATTACHMENTS AND DEVICES

LONG ARM OPERATION --- IF EQUIPPED

ZX110-3, 110M-3, 120-3

- The optional [ZX110-3, 110M-3: 2.81 m (9' 3")] [ZX120-3: 3.01 m (9' 11")] long arm is only for light works such as loam loading, sludge handling, etc.. Do not use it for heavy works such as digging gravel.
When the arm is used for digging, apply shallow cut to the ground to avoid tough digging, or arm damage may result.
- When the machine is equipped with the [ZX110-3, 110M-3: 2.81 m (9' 3")] [ZX120-3: 3.01 m (9' 11")] long arm, the hoe-bucket size must be limited to the followings due to stability and strength of the machine;
 ZX110-3 *PCSA 0.40 m³ (0.52 yd³)
 PCSA 0.45 m³ (0.59 yd³)
 ZX110M-3 *PCSA 0.50 m³ (0.65 yd³)
 ZX120-3 *PCSA 0.45 m³ (0.59 yd³)
 PCSA 0.50 m³ (0.65 yd³)
 *with 700 mm (28 in) shoe
- When the machine is equipped with the long arm, connect the arm cylinder end to:
 Pin bore A (when the machine is in operation)
 Pin bore B (when the machine is transported)

IMPORTANT: Connect the arm cylinder rod end to pin bore B only when the machine is transported. Do not operate the digging or loading function with the arm cylinder connected to pin bore B as the bucket may hit the cab accidentally with this connection.

When transporting the machine, follow the procedure shown below to convert it into the transporting posture.

- Position the bucket cylinder with rod retracted a little from the fully extended position.
- Position the arm cylinder with rod retracted a little from the fully extended position.
- Lower the boom until the arm top comes into contact with the ground.



M163-05-001

Unit: mm (ft•in)

Arm Cylinder Rod End	Height of Front Attachment (H)					
	ZX110-3		ZX110M-3		ZX120-3	
Connected To:	Without Bucket	With Bucket	Without Bucket	With Bucket	Without Bucket	With Bucket
Pin Bore A	2810 (9' 2")	3070 (10' 2")	2840 (9' 2")	3060 (10' 2")	2810 (9' 2")	3100 (10' 2")
Pin Bore B	2520 (8' 3")	2680 (8' 9")	2560 (8' 3")	2690 (8' 9")	2540 (8' 3")	2680 (8' 9")

Dimensions include shoe lug height.

OPTIONAL ATTACHMENTS AND DEVICES

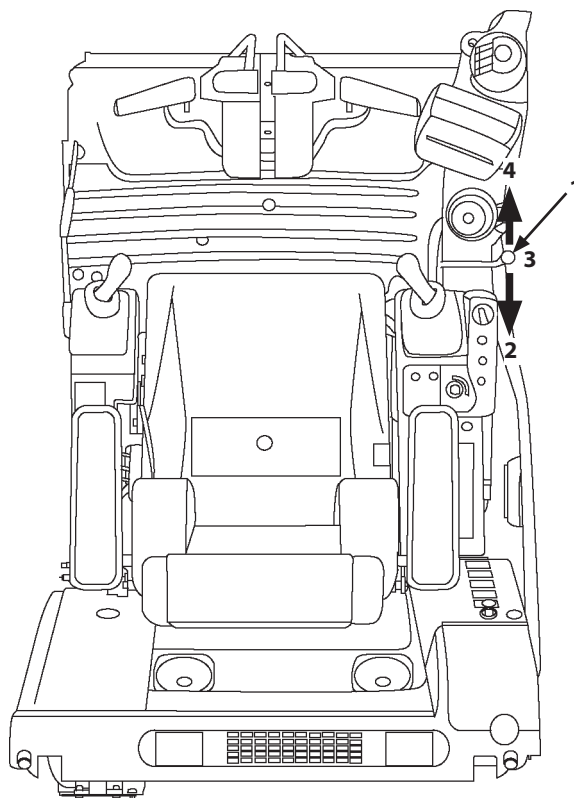
BLADE LEVER

ZX110-3, 120-3, 130L-3

Use blade lever (1) on the operator's right to raise and lower the blade.

When the lever is released, it automatically returns to neutral, keeping the blade in its position until the lever is operated again.

- 1- Blade Lever
- 2- Blade Raise
- 3- Neutral
- 4- Blade Lower



M1U4-13-001

PRECAUTIONS FOR BLADE OPERATION

This blade is designed as a light service attachment for the hydraulic excavator. Please keep the following points in mind:

1. This blade is designed to be used for dozing work only. Do not attempt to dig deeply with the blade. Doing so will damage not only the blade but the undercarriage as well.
2. Do not apply intensive or uneven loads. Never apply high-speed impact to the blade by running the machine into a load.
3. Jacking up the machine with this blade, the surface beneath the blade comes under high pressure, increasing the risk of surface collapse. Always be sure that the surface is strong enough to support the weight of the machine during operation. Avoid dangerously uneven distribution of weight on the blade by maintaining even contact between the blade and the ground.
4. Never use this blade as an outrigger.
5. Avoid contact between the bucket and the blade while digging.



M155-14-008

OPTIONAL ATTACHMENTS AND DEVICES

AVOID HITTING BLADE WITH FRONT-END ATTACHMENT

When operating the machine with the blade positioned towards the front, the bucket or boom cylinder may come into contact with the blade if you are not careful. Be sure to prevent this from happening.



WRONG

M155-14-009



WRONG

M155-14-010

AVOID HITTING BLADE WITH BUCKET

When crowding the arm into a traveling or transporting position, be careful not to let the bucket hit the blade.



WRONG

M155-14-010

AVOID STRIKING THE BLADE INTO A ROCK

Do not attempt to strike large rocks with the blade, as doing so will damage the blade and the blade cylinders, shortening their operating lives.



WRONG

M155-14-011

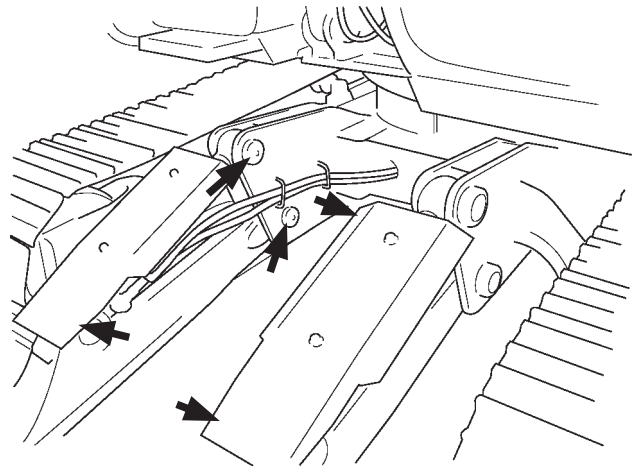
OPTIONAL ATTACHMENTS AND DEVICES

BLADE MAINTENANCE

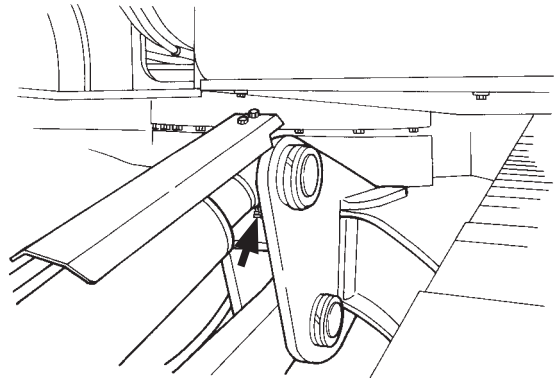
Greasing --- every 250 hours

Lubricate all fittings shown in the figure.

- Blade Joint Pins (4 points)
- Blade Cylinder Rod (2 points)
- Blade Cylinder Bottom (2 points)



M175-13-002



M198-07-017

Transportation Figure for Machine Equipped with Blade

When transporting the machine equipped with a blade and a long arm front attachment on a trailer, place the blade in the opposite position toward the front attachment. Otherwise, the bucket may come in contact with the blade.

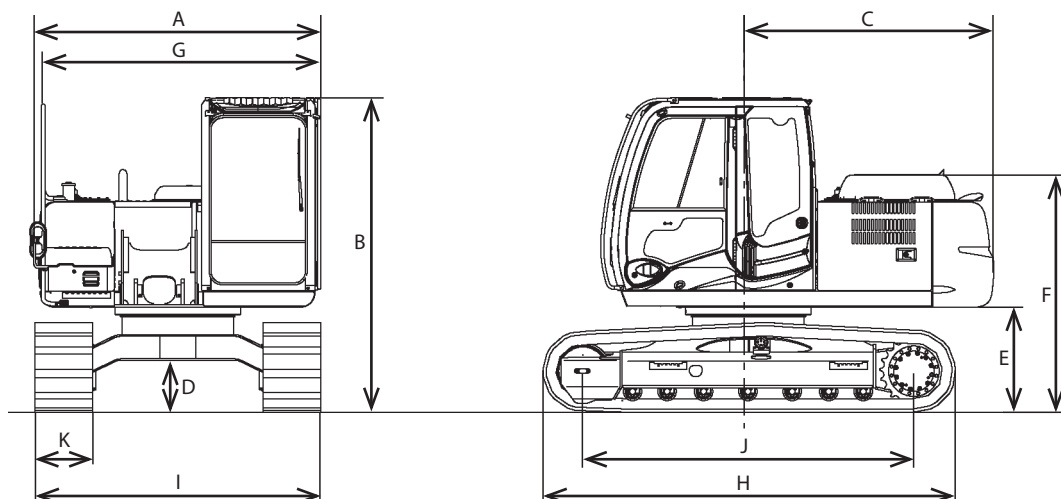


M175-13-005

OPTIONAL ATTACHMENTS AND DEVICES

SPECIFICATIONS

ZX110-3 with Blade



M1U1-12-001

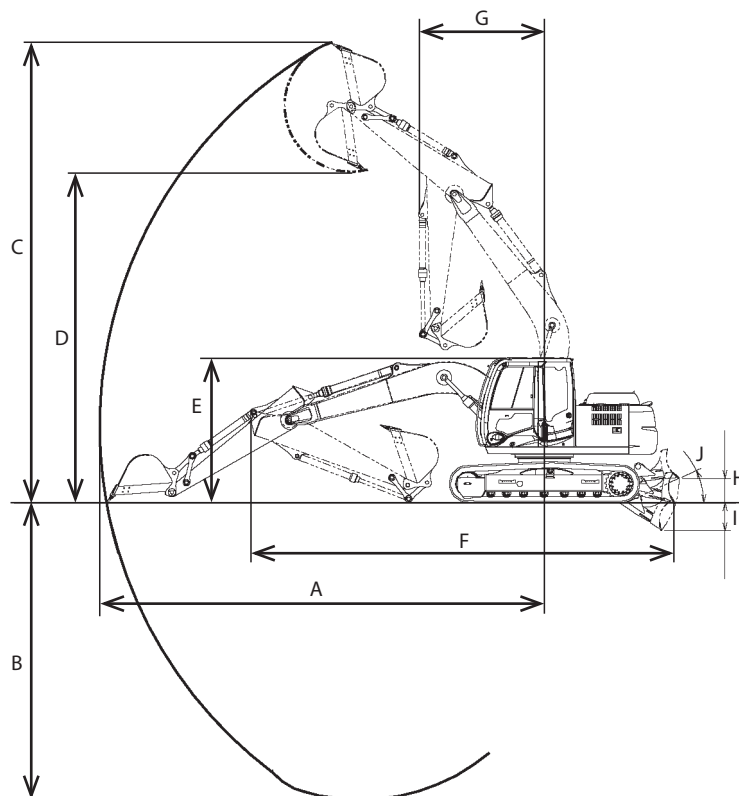
Model	ZX110-3 with Blade
Type of Front-End Attachment	2.26 m (7 ft 5 in) Arm
Bucket Capacity (Heaped)	PCSA 0.45 m ³ (0.59 yd ³), CECE 0.4 m ³
Operating Weight	11900 kg (26200 lb)
Base Machine Weight	9500 kg (20900 lb)
Engine	ISUZU AJ-4JJ1XYSA-03, 66 kW (90 PS)/1800 min ⁻¹ (rpm) * 69 kW (94 PS)/2000 min ⁻¹ (rpm)
A : Overall Width (Excluding Rearview Mirrors)	2490 mm (8 ft 2 in)
B : Cab Height	2740 mm (9 ft 0 in)
C : Rear End Swing Radius	2130 mm (7 ft 0 in)
D : Minimum Ground Clearance	* 440 mm (1 ft 5 in)
E : Counterweight Clearance	* 890 mm (2 ft 11 in)
F : Engine Cover Height	* 2050 mm (6 ft 9 in)
G : Overall Width of Upperstructure	2460 mm (8 ft 1 in)
H : Undercarriage Length	3340 mm (10 ft 11 in)
I : Undercarriage Width	2490 mm (8 ft 2 in)
J : Sprocket Center to Idler Center	2620 mm (8 ft 7 in)
K : Track Shoe Width	500 mm (20 in) (Grouser Shoe)
Ground Pressure	40 kPa (0.41 kgf/cm ² , 5.8 psi)
Swing Speed	13.9 min ⁻¹ (13.9 rpm)
Travel Speed (fast/slow)	5.5/3.6 km/h (3.4/2.2 mph)
Gradeability	35° (tanθ = 0.70)

 NOTE: * H/P mode
* The dimensions do not include the height of the shoe lug.

OPTIONAL ATTACHMENTS AND DEVICES

WORKING RANGES

ZX110-3 with Blade



M1U1-12-004

Model		ZX110-3 with Blade		
Category		1.96 m (6 ft 5 in) Arm	2.26 m (7 ft 5 in) Arm	2.81m (9 ft 3 in) Arm
Item				
A: Maximum Digging Reach	mm (ft·in)	7490 (24' 7")	7760 (25' 6")	8240 (27' 0")
*1 B: Maximum Digging Depth	mm (ft·in)	4780 (15' 8")	5080 (16' 8")	5630 (18' 6")
*1 C: Maximum Cutting Height	mm (ft·in)	7940 (26' 1")	8110 (26' 7")	8360 (27' 5")
*1 D: Maximum Dumping Height	mm (ft·in)	5530 (18' 2")	5700 (18' 8")	5960 (19' 7")
E: Overall Height	mm (ft·in)	2740 (9' 0")	2740 (9' 0")	*2 2740 (9' 0")
F: Overall Length	mm (ft·in)	7280 (23' 11")	7280 (23' 11")	7300 (23' 11")
G: Minimum Swing Radius	mm (ft·in)	2370 (7' 9")	2400 (7' 11")	2660 (8' 9")
H: Max. Raising Height	mm (ft·in)	480 (1' 7")		
I: Max. Digging Depth	mm (ft·in)	510 (1' 8")		
J: Blade Angle	degree	25		

NOTE: *1 The dimensions do not include the height of the shoe lug.

*2 The dimensions asterisked are for transport pin position.

OPTIONAL ATTACHMENTS AND DEVICES

SHOE TYPES AND APPLICATIONS

ZX110-3 with Blade

Shoe Width		500 mm (20") Grouser Shoe	600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	510 mm (20") Flat Shoe	700 mm (28") Triangular Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	11900 (26200)	12200 (26900)	12400 (27300)	12400 (27300)	12300 (27100)
Base Machine Weight	kg (lb)	9500 (20900)	9800 (21600)	10000 (22000)	10000 (22000)	9800 (21600)
Cab Height	mm (ft•in)	2740 (9' 0")	2740 (9' 0")	2740 (9' 0")	2750 (9' 0")	2790 (9' 2")
Minimum Ground Clearance	mm (ft•in)	✱ 440 (17")	✱ 440 (17")	✱ 440 (17")	470 (19")	490 (19")
Undercarriage Length	mm (ft•in)	3340 (10' 11")	3340 (10' 11")	3340 (10' 11")	3360 (11' 0")	3440 (11' 3")
Undercarriage Width	mm (ft•in)	2490 (8' 2")	2590 (8' 6")	2690 (8' 10")	2500 (8' 2")	2690 (8' 10")
Ground Pressure		40 kPa (0.41 kgf/cm ² , 5.8 psi)	34 kPa (0.35 kgf/cm ² , 5.0 psi)	30 kPa (0.31 kgf/cm ² , 4.4 psi)	41 kPa (0.42 kgf/cm ² , 6.0 psi)	29 kPa (0.30 kgf/cm ² , 4.2 psi)

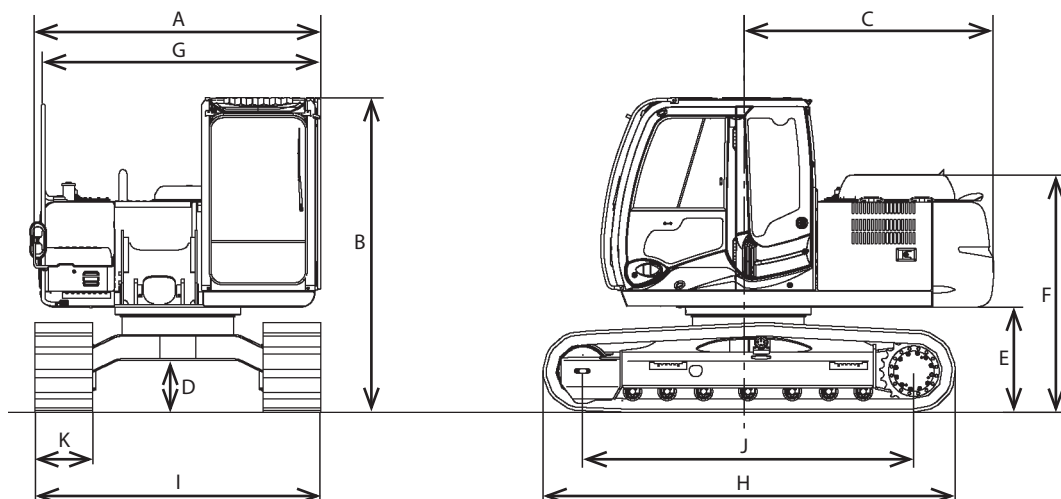
Shoe Width		500 mm (20") Pad Crawler Shoe	500 mm (20") Rubber Pad Shoe
Application		For Paved Road (Option)	For Paved Road (Option)
Operating Weight	kg (lb)	12000 (26500)	12400 (27300)
Base Machine Weight	kg (lb)	9600 (21200)	10000 (22000)
Cab Height	mm (ft•in)	2780 (9' 1")	2760 (9' 1")
Minimum Ground Clearance	mm (ft•in)	500 (1' 8")	480 (1' 7")
Undercarriage Length	mm (ft•in)	3420 (11' 3")	3380 (11' 1")
Undercarriage Width	mm (ft•in)	2490 (8' 2")	2490 (8' 2")
Ground Pressure		40 kPa (0.41 kgf/cm ² , 5.8 psi)	42 kPa (0.43kgf/cm ² , 6.1 psi)

-  **NOTE:** • The specifications for the front-end attachment are for a 2.26 m (7 ft 5 in) arm with PCSA 0.45 m³ (0.59 yd³) standard bucket.
- 600 mm (24 in), 700 mm (28 in) grouser shoe, 510 mm (20 in) flat shoe, 700 mm (28 in) triangular shoe, 500 mm (20 in) pad crawler shoe, and 500 mm (20 in) rubber pad shoe should not be used on gravel or rocky ground.
 - ✱ The dimensions do not include the height of the shoe lug.

OPTIONAL ATTACHMENTS AND DEVICES

SPECIFICATIONS

ZX120-3, 130L-3 with Blade



M1U1-12-001

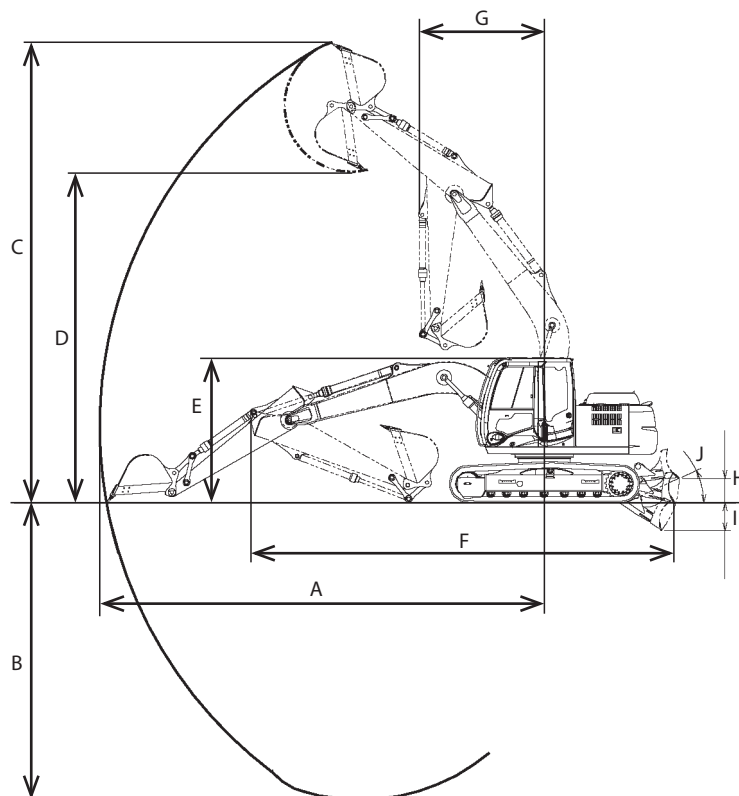
Model	ZX120-3 with Blade	ZX130L-3 with Blade
Type of Front-End Attachment	2.52 m (8 ft 3 in) Arm	2.52 m (8 ft 3 in) Reinforced Arm
Bucket Capacity (Heaped)	PCSA 0.50 m ³ (0.65 yd ³), CECE 0.45 m ³	
Operating Weight	13200 kg (29100 lb)	14900 kg (32800 lb)
Base Machine Weight	10500 kg (23100 lb)	12200 kg (26900 lb)
Engine	ISUZU AJ-4JJ1XYSA-03, 66 kW (90 PS)/1800 min ⁻¹ (rpm) * 69 kW (94 PS)/2000 min ⁻¹ (rpm)	
A : Overall Width (Excluding Rearview Mirrors)	2490 mm (8 ft 2 in)	
B : Cab Height	2740 mm (9 ft 0 in)	2950 mm (9 ft 8 in)
C : Rear End Swing Radius	2130 mm (7 ft 0 in)	
D : Minimum Ground Clearance	* 440 mm (1 ft 5 in)	* 595 mm (1 ft 11 in)
E : Counterweight Clearance	* 890 mm (2 ft 11 in)	* 1100 mm (3 ft 7 in)
F : Engine Cover Height	* 2050 mm (6 ft 9 in)	* 2260 mm (7 ft 5 in)
G : Overall Width of Upperstructure	2460 mm (8 ft 1 in)	
H : Undercarriage Length	3580 mm (11 ft 9 in)	3790 mm (12 ft 5 in)
I : Undercarriage Width	2490 mm (8 ft 2 in)	
J : Sprocket Center to Idler Center	2880 mm (9 ft 5 in)	2990 mm (9 ft 10 in)
K : Track Shoe Width	500 mm (Grouser Shoe) (20 in)	
Ground Pressure	41 kPa (0.42 kgf/cm ² , 5.9 psi)	44 kPa (0.45 kgf/cm ² , 6.4 psi)
Swing Speed	13.7 min ⁻¹ (13.7 rpm)	
Travel Speed (fast/slow)	5.5/3.4 km/h (3.4/2.1 mph)	4.9/2.7 km/h (3.0/1.7 mph)
Gradeability	35° (tanθ = 0.70)	

NOTE: * H/P mode
* The dimensions do not include the height of the shoe lug.

OPTIONAL ATTACHMENTS AND DEVICES

WORKING RANGES

ZX120-3, 130L-3 with Blade



M1U1-12-004

Model		ZX120-3 with Blade			ZX130L-3 with Blade
Category		2.10 m (6 ft 11 in)	2.52 m (8 ft 3 in)	3.01m (9 ft 11 in)	2.52 m (8 ft 3 in)
Item		Arm	Arm	Arm	Reinforced Arm
A: Maximum Digging Reach	mm (ft·in)	7960 (26' 1")	8320 (27' 4")	8790 (28' 10")	8320 (27' 4")
*1 B: Maximum Digging Depth	mm (ft·in)	5150 (16' 11")	5570 (18' 3")	6060 (19' 11")	5360 (17' 7")
*1 C: Maximum Cutting Height	mm (ft·in)	8370 (27' 6")	8570 (28' 1")	8900 (29' 2")	8780 (28' 10")
*1 D: Maximum Dumping Height	mm (ft·in)	5960 (19' 7")	6160 (20' 3")	6490 (21' 4")	6370 (20' 11")
E: Overall Height	mm (ft·in)	2740 (9' 0")	2740 (9' 0")	*2 2740 (9' 0")	*2 2950 (9' 8")
F: Overall Length	mm (ft·in)	7660 (25' 2")	7660 (25' 2")	*2 7670 (25' 2")	7960 (26' 1")
G: Minimum Swing Radius	mm (ft·in)	2370 (7' 9")	2390 (7' 10")	2640 (8' 8")	2390 (7' 10")
H: Max. Raising Height	mm (ft·in)	480 (1' 7")			490 (1' 7")
I: Max. Digging Depth	mm (ft·in)	510 (1' 8")			500 (1' 8")
J: Blade Angle	degree	25			27

NOTE: *1 The dimensions do not include the height of the shoe lug.

*2 The dimensions asterisked are for transport pin position.

OPTIONAL ATTACHMENTS AND DEVICES

SHOE TYPES AND APPLICATIONS

ZX120-3 with Blade

Shoe Width		500 mm (20") Grouser Shoe	600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	510 mm (20") Flat Shoe	700 mm (28") Triangular Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Paved Road (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	13200 (29100)	13500 (29800)	13700 (30200)	13700 (30200)	13500 (29800)
Base Machine Weight	kg (lb)	10500 (23100)	10800 (23800)	11000 (24300)	11000 (24300)	10900 (24000)
Cab Height	mm (ft·in)	2740 (9' 0")	2740 (9' 0")	2740 (9' 0")	2750 (9' 0")	2790 (9' 2")
Minimum Ground Clearance	mm (ft·in)	* 440 (1' 5")	* 440 (1' 5")	* 440 (1' 5")	470 (1' 7")	490 (1' 7")
Undercarriage Length	mm (ft·in)	3580 (11' 9")	3580 (11' 9")	3580 (11' 9")	3600 (11' 10")	3680 (12' 1")
Undercarriage Width	mm (ft·in)	2490 (8' 2")	2590 (8' 6")	2690 (8' 10")	2500 (8' 2")	2690 (8' 10")
Ground Pressure		41 kPa (0.42 kgf/cm ² , 5.9 psi)	35 kPa (0.36 kgf/cm ² , 5.1 psi)	30 kPa (0.31 kgf/cm ² , 4.4 psi)	42 kPa (0.43 kgf/cm ² , 6.1 psi)	30 kPa (0.31 kgf/cm ² , 4.4 psi)

Shoe Width		500 mm (20") Single Grouser Shoe	500 mm (20") Pad Crawler Shoe	500 mm (20") Rubber Pad Shoe
Application		For Paved Road (Option)	For Paved Road (Option)	For Paved Road (Option)
Operating Weight	kg (lb)	13500 (29800)	13300 (29300)	13700 (30200)
Base Machine Weight	kg (lb)	10800 (23800)	10600 (23400)	11000 (24300)
Cab Height	mm (ft·in)	2740 (9' 0")	2780 (9' 1")	2760 (9' 1")
Minimum Ground Clearance	mm (ft·in)	470 (1' 7")	500 (1' 8")	480 (1' 7")
Undercarriage Length	mm (ft·in)	3650 (12' 0")	3660 (12' 0")	3620 (11' 11")
Undercarriage Width	mm (ft·in)	2490 (8' 2")	2490 (8' 2")	2490 (8' 2")
Ground Pressure		42 kPa (0.43 kgf/cm ² , 6.1 psi)	41 kPa (0.42 kgf/cm ² , 5.9 psi)	43 kPa (0.44 kgf/cm ² , 6.2 psi)

-  **NOTE:** • The specifications for the front-end attachment are for a 2.52 m (8 ft 3 in) arm with PCSA 0.50 m³ (0.65 yd³) standard bucket.
- 600 mm (24 in), 700 mm (28 in) grouser shoe, 510 mm (20 in) flat shoe, 700 mm (28 in) triangular shoe, 500 mm (20 in) single grouser shoe, 500 mm (20 in) pad crawler shoe, and 500 mm (20 in) rubber pad shoe should not be used on gravel or rocky ground.
 - * The dimensions do not include the height of the shoe lug.

OPTIONAL ATTACHMENTS AND DEVICES

SHOE TYPES AND APPLICATIONS

ZX130L-3 with Blade

Shoe Width		500 mm (20") Grouser Shoe	600 mm (24") Grouser Shoe	700 mm (28") Grouser Shoe	800 mm (31") Grouser Shoe	500 mm (20") High Grouser Shoe
Application		For Ordinary Ground (Standard)	For Weak Footing (Option)	For Weak Footing (Option)	For Weak Footing (Option)	For Weak Footing (Option)
Operating Weight	kg (lb)	14900 (32800)	15100 (33300)	15300 (33700)	15700 (34600)	15000 (33100)
Base Machine Weight	kg (lb)	12200 (26900)	12400 (27300)	12600 (27800)	13000 (28700)	12300 (27100)
Cab Height	mm (ft•in)	2950 (9' 8")	2950 (9' 8")	2950 (9' 8")	2950 (9' 8")	2990 (9' 10")
Minimum Ground Clearance	mm (ft•in)	* 595 (1' 11")	* 595 (1' 11")	* 595 (1' 11")	* 595 (1' 11")	* 600 (2' 0")
Undercarriage Length	mm (ft•in)	3790 (12' 5")	3790 (12' 5")	3790 (12' 5")	3790 (12' 5")	3860 (12' 8")
Undercarriage Width	mm (ft•in)	2490 (8' 2")	2690 (8' 10")	2690 (8' 10")	2790 (9' 2")	2490 (8' 2")
Ground Pressure		44 kPa (0.45 kgf/cm ² , 6.4 psi)	37 kPa (0.38 kgf/cm ² , 5.4 psi)	32 kPa (0.33 kgf/cm ² , 4.6 psi)	29 kPa (0.30 kgf/cm ² , 4.2 psi)	44 kPa (0.45 kgf/cm ² , 6.4 psi)

Shoe Width		760 mm (30") Triangular Shoe
Application		For Weak Footing (Option)
Operating Weight	kg (lb)	16000 (35300)
Base Machine Weight	kg (lb)	13300 (29300)
Cab Height	mm (ft•in)	3010 (9' 11")
Minimum Ground Clearance	mm (ft•in)	660 (2' 2")
Undercarriage Length	mm (ft•in)	3920 (12' 10")
Undercarriage Width	mm (ft•in)	2750 (9' 0")
Ground Pressure		31 kPa (0.32 kgf/cm ² , 4.5 psi)

-  **NOTE:** • The specifications for the front-end attachment are for a 2.52 m (8 ft 3 in) reinforced arm with PCSA 0.50 m³ (0.65 yd³) standard bucket.
- 600 mm (24 in), 700 mm (28 in), 800 mm (31 in) grouser shoe, 500 mm (20 in) high grouser shoe, and 760 mm (30 in) triangular shoe should not be used on gravel or rocky ground.
 - * The dimensions do not include the height of the shoe lug.

OPTIONAL ATTACHMENTS AND DEVICES

OFFSET ARM FRONT

ZX110-3, 110M-3

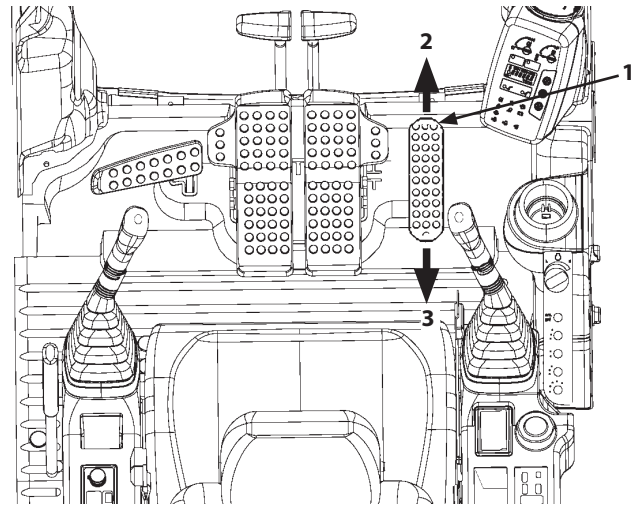
Offset Control Pedal

Pedal (1) is located at the operator's right foot. When pressed forward, it moves the arm to the right offset position.

When pushed backward, it moves the arm to the left offset position.

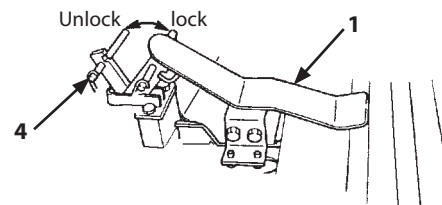
(2) Right Offset Position

(3) Left Offset Position



M178-13-001

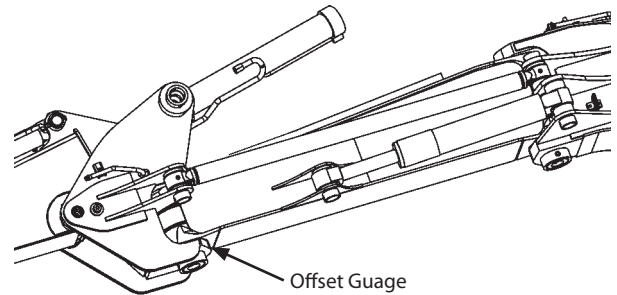
When traveling or using the arm in the center position, fix pedal (1) in the lock position with stopper (4) as illustrated here.



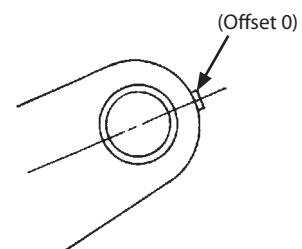
Pedal

M201-05-007

The center position of the arm (offset 0) can be confirmed by consulting the gauge at the top end of the boom.



M175-13-006



M175-13-009

OPTIONAL ATTACHMENTS AND DEVICES

OFFSET DIRECTION AND WORKING RANGE

Right and left offset directions are taken from the point of view of the operator. Accordingly, "left" offset means that the front attachment is moved towards the cab.

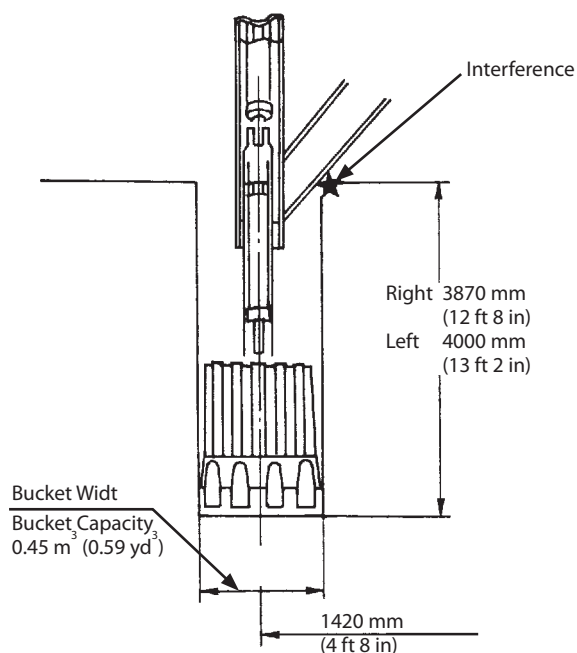
Maximum digging depth with maximum offset distance of 1420 mm (4 ft 8 in) is A due to interference of the boom with the ground surface, as illustrated.

A : 3870 mm (12 ft 8 in) Right
4000 mm (13 ft 2 in) Left

Working Range :

Offset distance can be selected up to a maximum distance of 1420 mm (4 ft 8 in) for both right and left directions.

1. Maximum digging depth with maximum offset distance using 0.45 m³ (0.59 yd³) bucket is as shown in the illustration.
2. Distance L from the end surface of the crawler to the farthest end of the bucket will differ with the width of the bucket and track shoes as shown below.

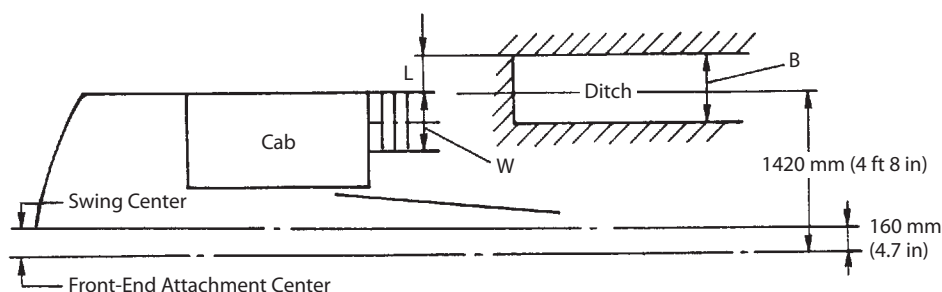


M104-11-006

Dimension L by width of Bucket and Shoe

ZX110-3				ZX110M-3	
Bucket		Shoe Width 500 mm (20 in)		Shoe Width 700 mm (28 in)	
Capacity* m ³ (yd ³)	Width mm (in)	Left Offset mm (in)	Right Offset mm (in)	Left Offset mm (in)	Right Offset mm (in)
0.19 (0.25)	550 (22)	290 (11)	610 (24)	165 (7)	485 (19)
0.30 (0.39)	700 (28)	365 (14)	685 (27)	240 (9)	560 (22)
0.40 (0.52)	800 (31)	415 (16)	735 (29)	290 (11)	610 (24)
0.45 (0.59)	970 (38)	500 (20)	820 (32)	375 (15)	695 (27)

* PCSA Heaped



M104-11-007

OPTIONAL ATTACHMENTS AND DEVICES

PRECAUTIONS FOR OPERATING WITH THE OFF-SET FUNCTION



CAUTION: Never jack up the machine with the front in the offset position. This is extremely dangerous, as the machine is unstable.

IMPORTANT:

- Never use a hydraulic breaker when the front is in the offset position, as this will damage the lower and upper booms.
- Do not perform heavy duty work, or dig gravel with the front in the offset position. Do not perform tamping work with a slope-finishing bucket attached. These operation will damage the lower and upper booms.

1. When digging with the front in the offset position, the bucket will come in contact with the track link if the arm is crowded.
Even if bucket does not touch the track link, watch for the bucket digging under the track, as this will cause instability.
2. Be sure to follow the precautions shown below.
 - (1) Do not use the 2.26 m (7' 5") arm and 2.81 m (9' 3") arm as it will interfere with the cab when in the offset position.
 - (2) Do not use the bucket as a pile driver with the boom in the offset position.
 - (3) When digging with the boom in offset position, be careful not to damage the cylinder stay.
3. In order to prevent the offset pins from getting rusty, operate the offset function regularly. Check offset function operation every time before starting work.

OPTIONAL ATTACHMENTS AND DEVICES

MAINTENANCE

Refer to the Greasing Front Joint Pins pages in the MAINTENANCE section.

Boom Foot, Boom Cylinder Bottom Side, Arm Cylinder Rod Side, and Bucket Cylinder Bottom Side Pins:
--- every 500 hours

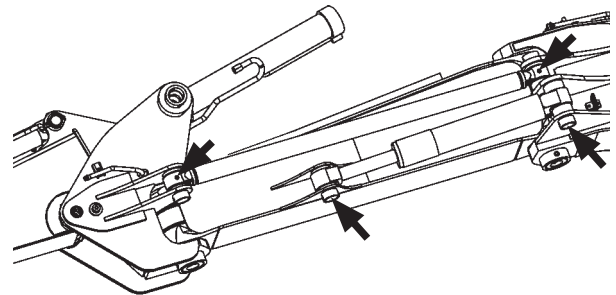
Refer to the Greasing Front Joint Pins pages in the MAINTENANCE section.

**Offset Front Attachment Joint Pins
Greasing Fittings Other Than Illustrated:**
--- every 250 hours

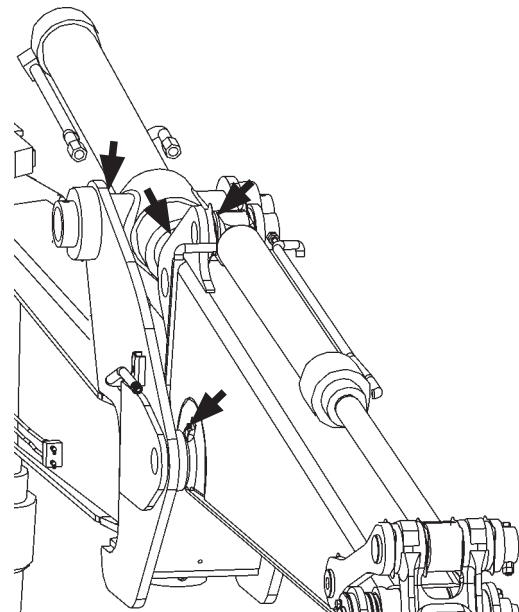
Add greasing to all illustrated grease fittings.

Offset Cylinder Bottom and Rod End Stay
--- every 500 hours

**Arm Cylinder Bottom and Rod End.
Bucket Cylinder Bottom End
Arm Joint Pin**
--- every 500 hours

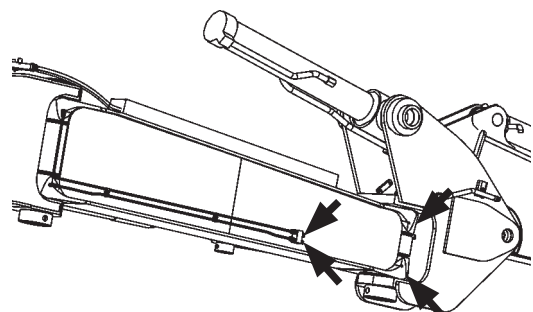


M175-13-006



M175-13-007

**Lower Boom and Upper Boom Joint Pin.
Upper Boom and Stay Cylinder Joint Pin.**
--- every 250 hours

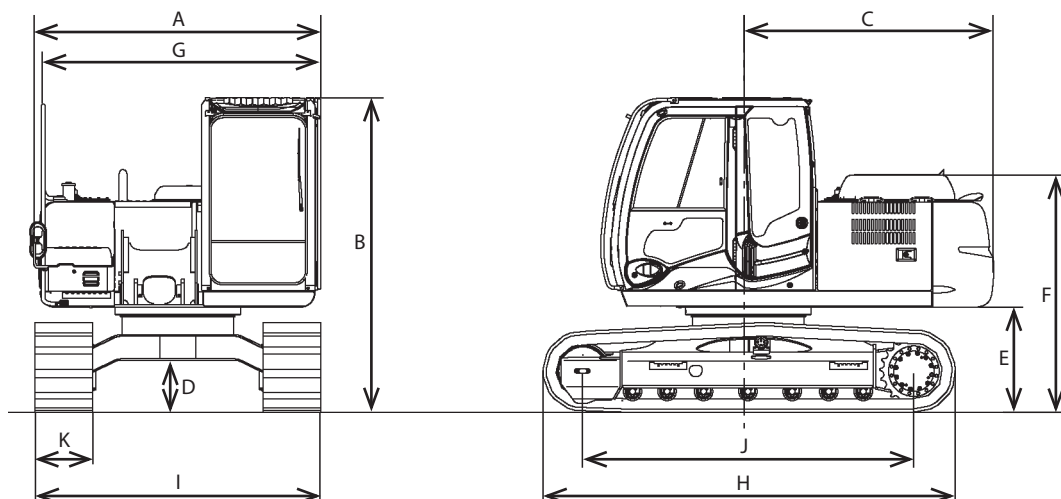


M175-13-008

OPTIONAL ATTACHMENTS AND DEVICES

SPECIFICATIONS

ZX110-3, 110M-3 Offset



M1U1-12-001

Model	ZX110-3 Offset	ZX110M-3 Offset
Type of Front-End Attachment	1.95 m (6 ft 5 in) Arm	
Bucket Capacity (Heaped)	PCSA 0.45 m ³ (0.59 yd ³), CECE 0.4 m ³	
Operating Weight	11700 kg (25800 lb)	13900 kg (30600 lb)
Base Machine Weight	8400 kg (18500 lb)	10700 kg (23600 lb)
Engine	ISUZU AJ-4JJ1XYSA-03, 66 kW (90 PS)/1800 min ⁻¹ (rpm) * 69 kW (94 PS)/2000 min ⁻¹ (rpm)	
A : Overall Width (Excluding Rearview Mirrors)	2490 mm (8 ft 2 in)	2690 mm (8 ft 10 in)
B : Cab Height	2740 mm (9 ft 0 in)	2950 mm (9 ft 8 in)
C : Rear End Swing Radius	2130 mm (7 ft 0 in)	
D : Minimum Ground Clearance	* 440 mm (1 ft 5 in)	* 595 mm (1 ft 11 in)
E : Counterweight Clearance	* 890 mm (2 ft 11 in)	* 1100 mm (3 ft 7 in)
F : Engine Cover Height	* 2050 mm (6 ft 9 in)	* 2260 mm (7 ft 5 in)
G : Overall Width of Upperstructure	2460 mm (8 ft 1 in)	
H : Undercarriage Length	3340 mm (11 ft 0 in)	3790 mm (12 ft 5 in)
I : Undercarriage Width	2490 mm (8 ft 2 in)	2690 mm (8 ft 10 in)
J : Sprocket Center to Idler Center	2620 mm (8 ft 7 in)	2990 mm (9 ft 10 in)
K : Track Shoe Width	500 mm (Grouser Shoe) (20 in)	700 mm (Grouser Shoe) (28 in)
Ground Pressure	40 kPa (0.41 kgf/cm ² , 5.8 psi)	29 kPa (0.30 kgf/cm ² , 4.3 psi)
Offset Distance	0 to 1420 mm (0 to 4 ft 8 in)	
Swing Speed	13.9 min ⁻¹ (13.9 rpm)	
Travel Speed (fast/slow)	5.5/3.6 km/h (3.4/2.2 mph)	4.2/2.4 km/h (2.6/1.5 mph)
Gradeability	35° (tanθ = 0.70)	

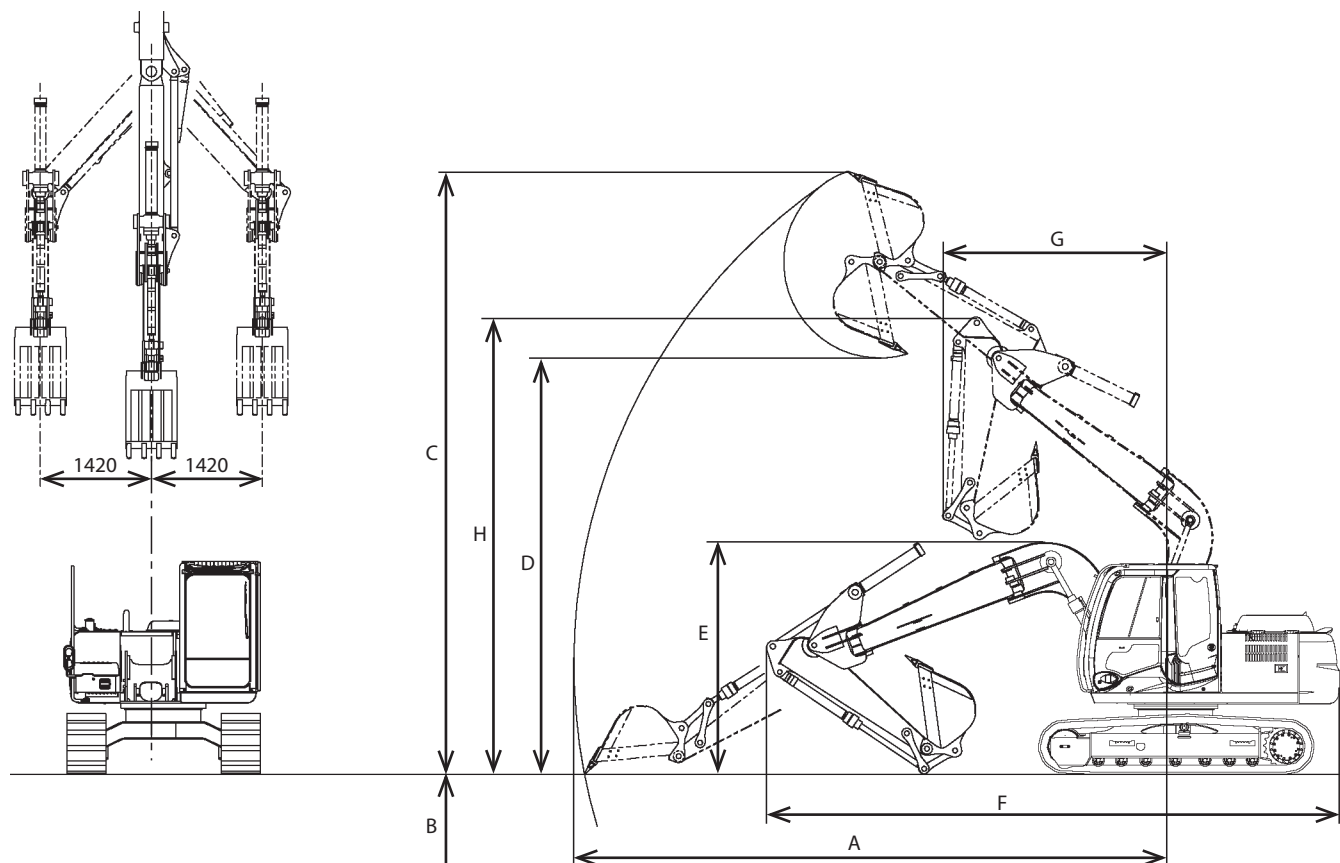
NOTE: * H/P mode

* The dimensions do not include the height of the shoe lug.

OPTIONAL ATTACHMENTS AND DEVICES

WORKING RANGES

ZX110-3, 110M-3 Offset



M1U1-12-002

Model		ZX110-3 Offset		ZX110M-3 Offset	
Item	Category	Off-Set Distance	Max. Off-Set Distance	Off-Set Distance	Max. Off-Set Distance
		(0 mm) (0")	(1420 mm) (4' 8")	(0 mm) (0")	(1420 mm) (4' 8")
A: Maximum Digging Reach	mm (ft·in)	7670 (25' 2")	7140 (23' 5")	7670 (25' 2")	7140 (23' 5")
*1 B: Maximum Digging Depth	mm (ft·in)	5340 (17' 6")	4800 (15' 9")	5140 (16' 10")	4600 (15' 1")
*1 C: Maximum Cutting Height	mm (ft·in)	7720 (25' 4")	7370 (24' 2")	7920 (26' 0")	7570 (24' 10")
*1 D: Maximum Dumping Height	mm (ft·in)	5330 (17' 6")	4980 (16' 4")	5530 (18' 2")	5180 (17' 0")
E: Overall Height	mm (ft·in)	3050 (10' 0")	2910 (9' 7")	3140 (10' 4")	2980 (9' 9")
F: Overall Length	mm (ft·in)	7320 (24' 0")	6830 (22' 5")	7320 (24' 0")	6830 (22' 5")
G: Minimum Swing Radius	mm (ft·in)	2940 (9' 8")	2500 (8' 2")	2940 (9' 8")	2500 (8' 2")
H: Front-End Attachment Height at Min. Swing Radius	mm (ft·in)	5850 (19' 2")	5510 (18' 1")	6050 (19' 10")	5710 (18' 9")

NOTE: *1 The dimensions do not include the height of the shoe lug.

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