

ORIGINAL INSTRUCTIONS

CX235C SR
Crawler Excavator

OPERATOR'S MANUAL

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1 - GENERAL INFORMATION

Note to the Owner

Improper operation of this machine can cause injury or death. Before using this machine, make certain that every operator:

- Is instructed in safe and proper use of the machine.
- Reads and understands the Manual(s) pertaining to the machine.
- Reads and understands ALL Safety Decals on the machine.
- Clears the area of other persons.
- Learns and practices safe use of machine controls in a safe, clear area before operating this machine on a job site.

It is your responsibility to observe pertinent laws and regulations and follow CASE CONSTRUCTION instructions on machine operation and maintenance.

Your machine has been designed and built to the highest standards of quality. It conforms to all current safety regulations. However, the risk of accidents can never be completely excluded. That is why it is essential to observe elementary safety rules and precautions.

Read this manual carefully, paying particular attention to the instructions concerning safety, operation and maintenance so as to avoid the risk of injury while operating or servicing the machine.

The standard attachments and tools of this machine are designed to carry out all kinds of earthmoving and rehandling operations. If you want to use this machine to handle a load (pipes, culverts, formwork, etc.), make sure that it is designed to carry out this kind of work. For this type of application, the machine must be equipped with safety valves, an overload indicator, a load handling chart corresponding to the type of machine and its attachment and a load fixing point. All legal requirements must also be strictly observed.

Do not use this machine for any application or purpose other than those described in this manual. If the machine is to be used for work involving the use of special attachments, accessories or equipment, consult your CASE CONSTRUCTION Dealer in order to make sure that any adaptations or modifications made are in keeping with the machine's technical specifications and with prevailing safety requirements.

Any modification or adaptation which is not approved by the manufacturer may invalidate the machine's initial conformity with safety requirements.

The machine must undergo regular inspections, the frequency of which varies according to the type of use. Consult your CASE CONSTRUCTION Dealer.

NOTICE: *The engine and fuel system on your machine is designed and built to government emissions standards. Tampering by dealers, customers, operators and users is STRICTLY PROHIBITED BY LAW. Failure to comply could result in government fines, rework charges, invalid warranty, legal action and possible confiscation of the machine until rework to original condition is completed. Engine service and/or repairs must be done by a certified technician only.*

Your CASE CONSTRUCTION Dealer is at your disposal for any further information. He will also provide any after-sales service you may require, and genuine CASE CONSTRUCTION spare parts, your guarantee of quality and match.

You can obtain manuals on the operation, maintenance and repair of your machine from your CASE CONSTRUCTION Dealer. To ensure quick and efficient service, consult your CASE CONSTRUCTION Dealer for assistance in ordering the correct manuals for your machine.

Your CASE CONSTRUCTION Dealer can deal with orders for operator's manuals, parts catalogues and service manuals.

Always give the type and serial number of your machine so that your CASE CONSTRUCTION Dealer can supply you with the right manuals for your machine.

CASE CONSTRUCTION reserves the right to make changes in the specification and design of the machine without prior notice and without incurring any obligation to modify units previously sold.

The description of the models shown in this manual has been made in accordance with the technical specifications known as of the date of design of this document.

All data given in this manual is subject to production variations. Dimensions and weights are provided with approximate values and the machine fitting shown in the illustrations may not correspond with standard models. For precise information on specific machine models and versions, please consult your CASE CONSTRUCTION Dealer.

Intended use

NOTICE: *do not use the excavator for operations which are foreign to its specifications and not included in this manual in order to prevent serious injury to persons or damage to the machine. The manufacturer/dealer is not responsible for damage caused by improper use.*

The excavator has been designed to carry out digging and earth moving operations through the use of a bucket. Operations that involve the use of hydraulic hammers are also possible. Other operations, such as moving suspended loads, are only possible if the specific variant approved by the manufacturer is present.

Using the excavator and its equipment for different operations, such as towing, transporting and lifting people, is considered inappropriate and is prohibited.

Electro-Magnetic Compatibility (EMC)

This machine complies strictly with the European Regulations on electro-magnetic emissions. However, interference may arise as a result of add-on equipment which may not necessarily meet the required standards. As such interference can result in serious malfunction of the unit and/or create unsafe situations, you must observe the following:

- Ensure that each piece of non- CASE CONSTRUCTION equipment fitted to the machine bears the CE mark.
- The maximum power of emission equipment (radio, telephones, etc.) must not exceed the limits imposed by the national authorities of the country where you use the machine.
- The electro-magnetic field generated by the add-on system should not exceed **24 V/m** at any time and at any location in the proximity of electronic components.

Failure to comply with these rules will render the CASE CONSTRUCTION warranty null and void.

Telematics

NOTE: *the CASE CONSTRUCTIONSiteWatch™ website (www.casesitewatch.com) will not be accessible until the CASE CONSTRUCTIONSiteWatch™ subscription for this machine is registered by an authorized CASE CONSTRUCTION dealer. Contact an authorized CASE CONSTRUCTION for details.*

This machine is equipped with a telematics system. This is an asset-monitoring system that combines Internet, cellular, and GPS technologies. A transponder unit is mounted on the equipment that wirelessly communicates with the user interface CASE CONSTRUCTIONSiteWatch™ at www.casesitewatch.com. Using cellular technology, the transponder can send equipment data, including location, on/off status, usage and production metrics, diagnostic data, movement alarms, and unauthorized usage to the interface. The system will help cut costs and keep accurate records. See the furnished guide for operating your telematics system.

Manual scope and required training level

Introduction to this manual

This manual gives information about the use of your CASE CONSTRUCTION machine as intended and under the conditions foreseen by CASE CONSTRUCTION during normal operation, routine service, and maintenance.

This manual does not contain all the information that relates to periodic service, conversions, and repairs that only trained service personnel can perform. Some of these activities may require appropriate facilities, technical skills, and/or tools that CASE CONSTRUCTION does not supply with the machine.

The manual contains the chapters as shown on the Contents pages. See the Index at the end of this manual to locate specific items about your CASE CONSTRUCTION machine.

Normal operation

Normal operation consists of the use of this machine for the purpose CASE CONSTRUCTION intends by an operator that:

- Is familiar with the machine and any mounted equipment or towed equipment
- Complies with the information on operation and safe practices as specified by CASE CONSTRUCTION in this manual and by the signs on the machine

Normal operation includes:

- Preparation and storage of the machine
- Addition and removal of ballast
- Connection and disconnection of mounted equipment and/or towed equipment
- Adjustment and configuration of the machine and equipment for the specific conditions of the job site, field, and/or crop
- Movement of components into and out of working positions

Routine service and maintenance

Routine service and maintenance consists of the daily activities necessary to maintain the proper machine function. The operator must:

- Be familiar with the machine characteristics
- Comply with the information on routine service and safe practices as specified by CASE CONSTRUCTION in this manual and by the signs on the machine

Routine service can include:

- Fueling
- Cleaning
- Washing

- Topping up fluid levels
- Greasing
- Replacing consumable items such as light bulbs

Periodic service, conversions, and repairs

Periodic service consists of activities that are necessary to maintain the expected life of the CASE CONSTRUCTION machine. These activities have defined intervals.

Trained service personnel familiar with the machine characteristics must perform these activities at the defined intervals. Trained service personnel must comply with the information on periodic service and safe practices as partly specified by CASE CONSTRUCTION in this manual and/or other company literature.

Periodic service includes:

- Oil change service for the engine, hydraulic circuits, or transmission
- Periodic exchange of other substances or components as required

Conversion activities rebuild the CASE CONSTRUCTION machine in a configuration that is appropriate for a specific job site, crop, and/or soil conditions (e.g., installation of dual wheels). Conversion activities must be done:

- By trained service personnel familiar with the machine characteristics
- By trained service personnel that comply with the information on conversion as partly specified by CASE CONSTRUCTION in this manual, assembly instructions, and/or other company literature

Repair activities restore proper function to a CASE CONSTRUCTION machine after a failure or degradation of performance. Dismantling activities occur during the scrapping and/or dismantling of the machine.

Trained service personnel familiar with the machine characteristics must perform these activities. Trained service personnel must comply with the information for repair as specified by CASE CONSTRUCTION in the service manual.

Before you operate

Read this manual before you start the engine or operate this CASE CONSTRUCTION machine. Contact your CASE CONSTRUCTION dealer if:

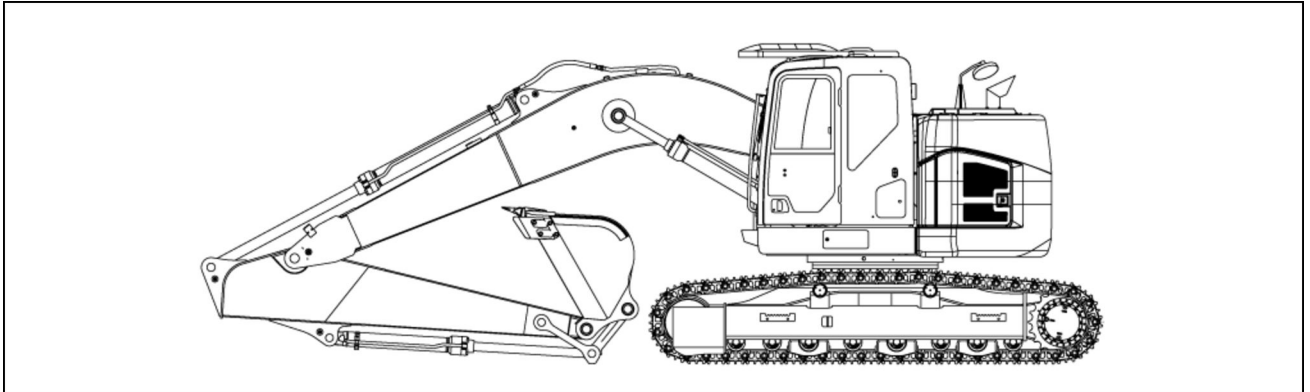
- You do not understand any information in this manual
- You need more information
- You need assistance

All persons training to operate, or who will operate this CASE CONSTRUCTION machine should be old enough to possess a valid local vehicle operating permit (or meet other applicable local age requirements). These persons

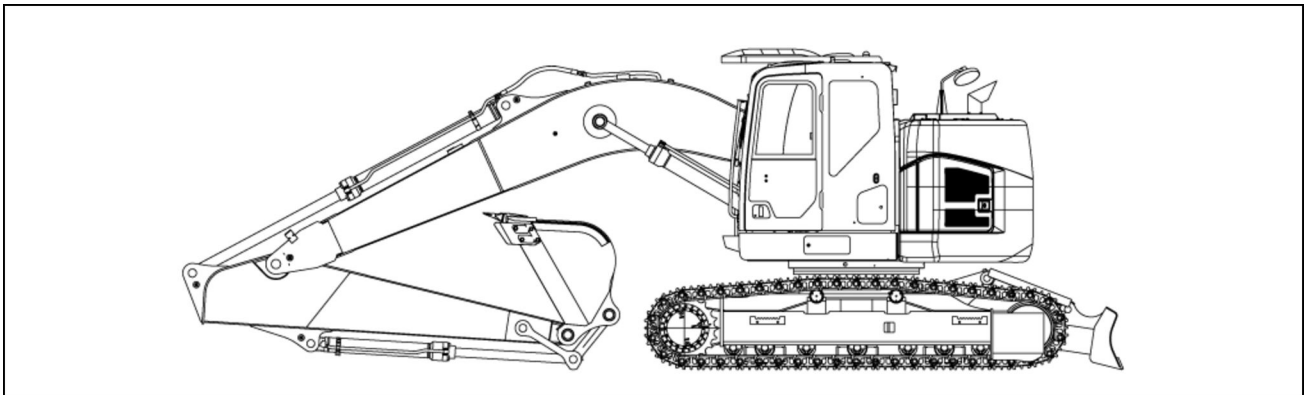
must demonstrate the ability to operate and service the CASE CONSTRUCTION machine in a correct and safe manner.

Product identification

The CX235C SR is a crawler hydraulic excavator. It consists of an undercarriage fitted with tracks and a turntable bearing which supports the upperstructure frame. The upperstructure frame supports the attachment, at the front end of the machine, plus the engine, hydraulics and cab. When the operator works the controls, the engine-driven pump delivers hydraulic fluid to the control valves. The control valves distribute the hydraulic fluid to the various cylinders and hydraulic motors employed. A cooling system maintains the hydraulic fluid at normal operating temperature.



SMIL20CEX2447EA 1
CX235C SR LC



SMIL20CEX2448EA 2
CX235C SR with blade

When ordering parts, obtaining information or assistance, always supply your CASE CONSTRUCTION Dealer with the type and serial number of your machine or accessories. Write the following in the spaces below: the type, serial number and year of manufacture of your machine, accessories and the serial numbers of the various hydraulic and mechanical components.

Machine

- (1) Designation / Model:
Hydraulic Excavator CX235C SR
- (2) Product identification number (PIN):
- (3) Country of manufacturing

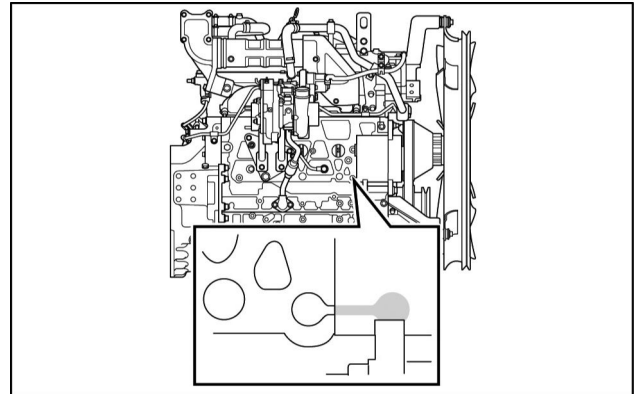


KHP19681 3

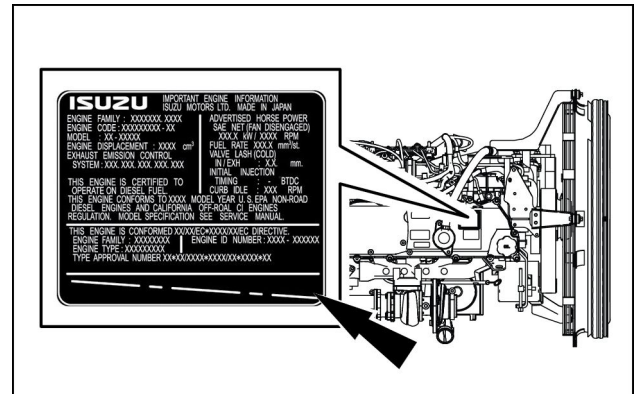
Engine

Manufacturer and model: ISUZU GI-4HK1X

Serial number:



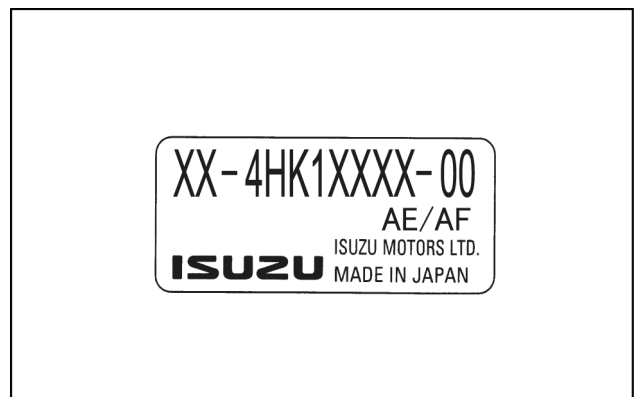
SMIL14CEX1604AA 4



SMIL18CEX0808AA 5

ID label

The engine ID label is located on the cylinder head cover.

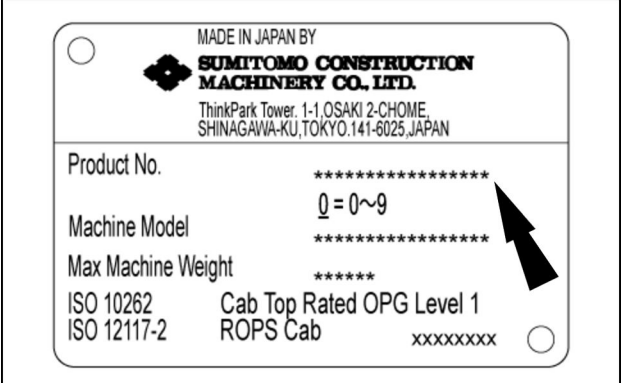


SMIL14CEX1606AA 6

Cab protection ROPS (Roll Over Protective Structure)

Complies with ISO 12117-2.

Product identification number:



MADE IN JAPAN BY
SUMITOMO CONSTRUCTION MACHINERY CO., LTD.
 ThinkPark Tower, 1-1, OSAKI 2-CHOME,
 SHINAGAWA-KU, TOKYO, 141-6025, JAPAN

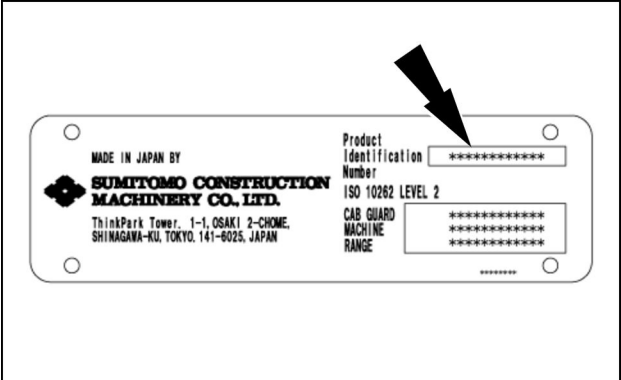
Product No. *****
Q = 0~9
 Machine Model *****
 Max Machine Weight *****
 ISO 10262 Cab Top Rated OPG Level 1
 ISO 12117-2 ROPS Cab xxxxxxxx

SMIL20CEX2489AA 7

Cab protection FOPS (Falling Objects Protective Structure)

Complies with ISO 10262 level 2 (with bolt-on top guard).

Product identification number:



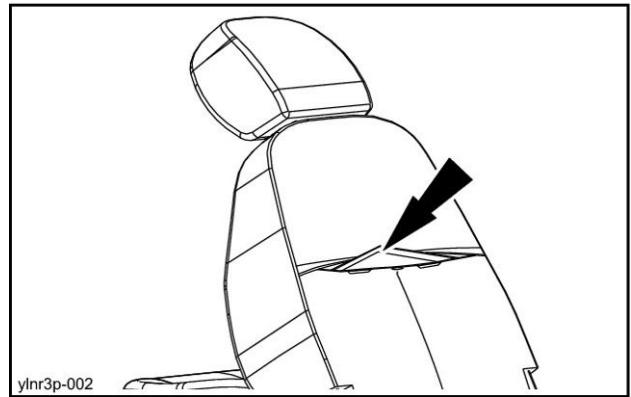
MADE IN JAPAN BY
SUMITOMO CONSTRUCTION MACHINERY CO., LTD.
 ThinkPark Tower, 1-1, OSAKI 2-CHOME,
 SHINAGAWA-KU, TOKYO, 141-6025, JAPAN

Product Identification Number *****
 ISO 10262 LEVEL 2
 CAB GUARD MACHINE RANGE *****

SMIL20CEX2490AA 8

Operator's manual storage on the machine

Always keep the manual in the location provided for that purpose (behind the operator's seat). Make sure it is always complete and in good condition. If you wish to obtain extra copies, or copies in languages other than that of the country of use, consult your CASE CONSTRUCTION Dealer.



ylnr3p-002

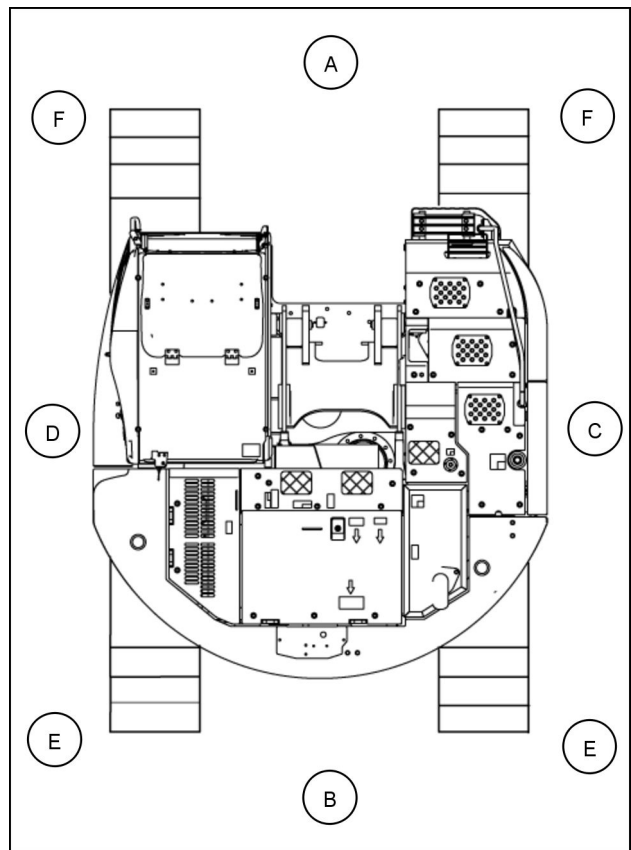
YLN3P-002 1

Machine orientation

The terms "Right-hand", "Left-hand", "Front" and "Rear" are used in this manual to indicate the sides as they are seen from the operator's seat when the cab is over the idler wheels.

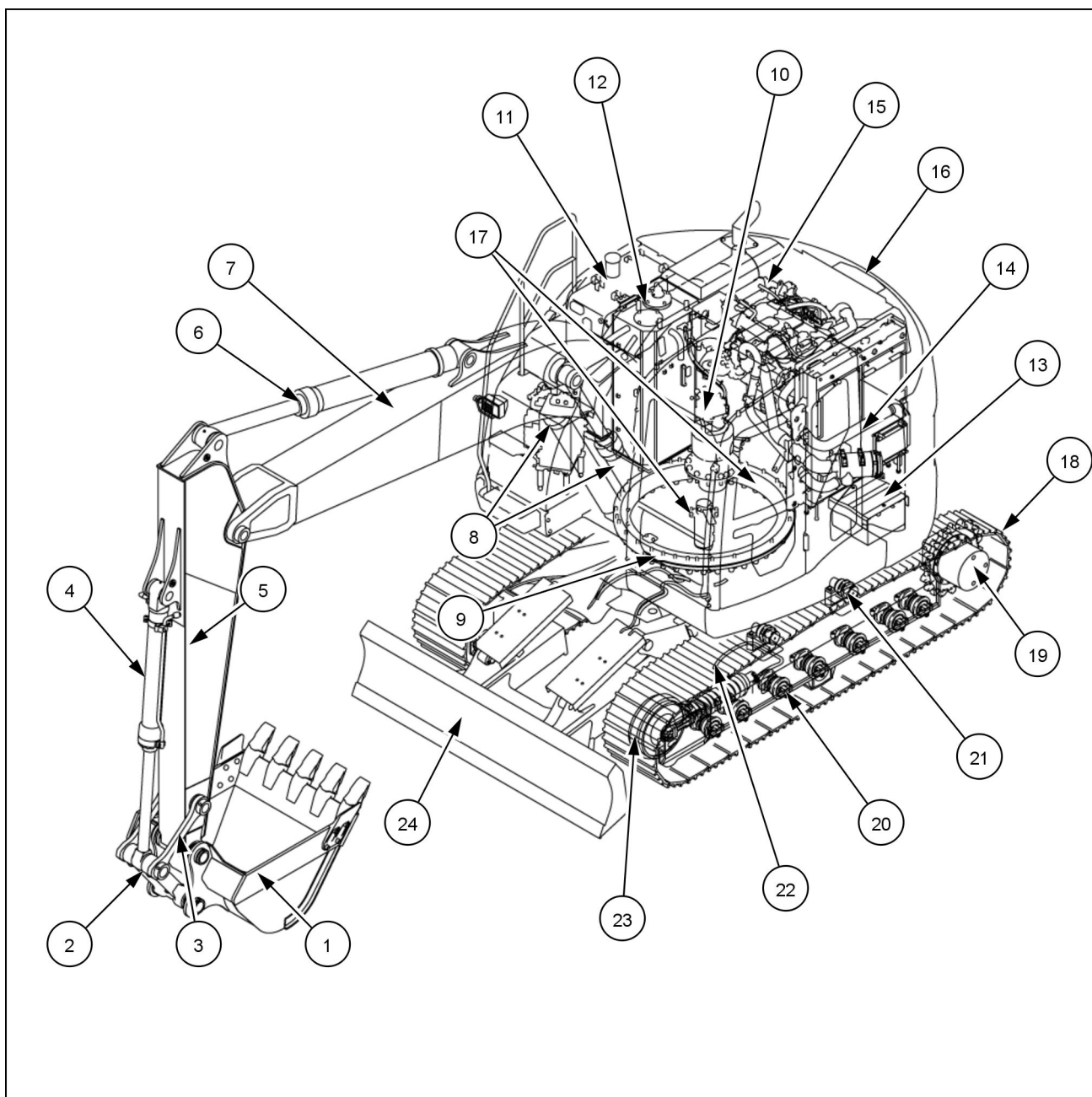
NOTE: the illustration shows the machine in normal travel position. In normal travel position, the cab is over the idler wheels. The travel reduction gears are at the rear of the upperstructure. This manual uses the terms "right", "left", "front" and "rear" to show the side viewed from the operator's seat when the cab is located above the idler wheel.

- A. Front
- B. Rear
- C. Right-hand side
- D. Left-hand side
- E. Travel motor
- F. Idler wheel



SMIL20CEX2449BA 1

Machine components



SMIL20CEX2450GA 1

- | | |
|--------------------------------|----------------------------------|
| 1. Bucket | 13. Battery |
| 2. Bucket link | 14. Air filter |
| 3. Arm link | 15. Engine compartment |
| 4. Bucket cylinder | 16. Counterweight |
| 5. Arm | 17. Swing component |
| 6. Arm cylinder | 18. Shoes |
| 7. Boom | 19. Travel reduction gear |
| 8. Boom cylinder | 20. Lower roller |
| 9. Cab / Operation compartment | 21. Upper roller |
| 10. Swing motor assembly | 22. Recoil spring |
| 11. Fuel tank | 23. Idler wheel |
| 12. Hydraulic tank | 24. Blade (CX235C SR with blade) |

2 - SAFETY INFORMATION

Signal word definitions

Personal safety



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

 DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury.

 WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury.

 CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

Machine safety

NOTICE: Notice indicates a situation that, if not avoided, could result in machine or property damage.

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine or property damage. The word Notice is used to address practices not related to personal safety.

Information

NOTE: Note indicates additional information that clarifies steps, procedures, or other information in this manual.

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

Safety rules

General safety rules

Use caution when you operate the machine on slopes. Raised equipment, full tanks and other loads will change the center of gravity of the machine. The machine can tip or roll over when near ditches and embankments or uneven surfaces.

Never permit anyone other than the operator to ride on the machine.

Never operate the machine under the influence of alcohol or drugs, or while you are otherwise impaired.

When digging or using ground-engaging attachments, be aware of buried cables. Contact local utilities to determine the locations of services.

Pay attention to overhead power lines and hanging obstacles. High voltage lines may require significant clearance for safety.

Hydraulic oil or diesel fuel leaking under pressure can penetrate the skin, causing serious injury or infection.

- DO NOT use your hand to check for leaks. Use a piece of cardboard or paper.
- Stop the engine, remove the key, and relieve the pressure before you connect or disconnect fluid lines.
- Make sure that all components are in good condition. Tighten all connections before you start the engine or pressurize the system.
- If hydraulic fluid or diesel fuel penetrates the skin, seek medical attention immediately.
- Continuous long term contact with hydraulic fluid may cause skin cancer. Avoid long term contact and wash the skin promptly with soap and water.

Keep clear of moving parts. Loose clothing, jewelry, watches, long hair, and other loose or hanging items can become entangled in moving parts.

Wear protective equipment when appropriate.

DO NOT attempt to remove material from any part of the machine while it is being operated or while components are in motion.

General maintenance safety

Keep the area used for servicing the machine clean and dry. Clean up spilled fluids.

Service the machine on a firm, level surface.

Install guards and shields after you service the machine.

Close all access doors and install all panels after servicing the machine.

Make sure that all guards and shields are in good condition and properly installed before you operate the machine. Never operate the machine with shields removed. Always close access doors or panels before you operate the machine.

Dirty or slippery steps, ladders, walkways, and platforms can cause falls. Make sure these surfaces remain clean and clear of debris.

A person or pet within the operating area of a machine can be struck or crushed by the machine or its equipment. DO NOT allow anyone to enter the work area.

Raised equipment and/or loads can fall unexpectedly and crush persons underneath. Never allow anyone to enter the area underneath raised equipment during operation.

Never operate the engine in enclosed spaces as harmful exhaust gases may build up.

Before you start the machine, be sure that all controls are in neutral or park lock position.

Start the engine only from the operator's seat. If you bypass the safety start switch, the engine can start with the transmission in gear. Do not connect or short across terminals on the starter solenoid. Attach jumper cables as described in the manual. Starting in gear may cause death or serious injury.

Always keep windows, mirrors, all lighting clean to provide the best possible visibility while you operate the machine.

Operate controls only when seated in the operator's seat, except for those controls expressly intended for use from other locations.

Before you leave the machine:

1. Park the machine on a firm, level surface.
2. Lower the attachment to the ground.
3. Put all controls in neutral position.
4. Place the gate lock lever in central position.
5. Turn off the engine and remove the key.

Do not attempt to clean, lubricate, clear obstructions, or make adjustments to the machine while it is in motion or while the engine is running.

Always make sure that working area is clear of tools, parts, other persons and pets before you start operating the machine.

Unsupported hydraulic cylinders can lose pressure and drop the equipment, causing a crushing hazard. Do not leave equipment in a raised position while parked or during service, unless the equipment is securely supported.

Jack or lift the machine only at jack or lift points indicated in this manual.

Incorrect towing procedures can cause accidents. When you tow a disabled machine follow the procedure in this manual. Use only rigid tow bars.

Stop the engine, remove the key, and relieve pressure before you connect or disconnect fluid lines.

Stop the engine and remove the key before you connect or disconnect electrical connections.

Scalding can result from incorrect removal of coolant caps. Cooling systems operate under pressure. Hot

coolant can spray out if you remove a cap while the system is hot. Allow the system to cool before you remove the cap. When you remove the cap, turn it slowly to allow pressure to escape before you completely remove the cap.

Replace damaged or worn tubes, hoses, electrical wiring, etc.

The engine, transmission, exhaust components, and hydraulic lines may become hot during operation. Take care when you service such components. Allow surfaces to cool before you handle or disconnect hot components. Wear protective equipment when appropriate.

When welding, follow the instructions in the manual. Always disconnect the battery before you weld on the machine. Always wash your hands after you handle battery components.

Fire and explosion prevention

Fuel or oil that is leaked or spilled on hot surfaces or electrical components can cause a fire.

Crop materials, trash, debris, bird nests, or flammable material can ignite on hot surfaces.

Always have a fire extinguisher on or near the machine.

Make sure that the fire extinguisher(s) is maintained and serviced according to the manufacturer's instructions.

At least once each day and at the end of the day, remove all trash and debris from the machine especially around hot components such as the engine, transmission, exhaust, battery, etc. More frequent cleaning of your machine may be necessary depending on the operating environment and conditions.

At least once each day, remove debris accumulation around moving components such as bearings, pulleys, belts, gears, cleaning fans, etc. More frequent cleaning of your machine may be necessary depending on the operating environment and conditions.

Inspect the electrical system for loose connections and frayed insulation. Repair or replace loose or damaged parts.

Do not store oily rags or other flammable material on the machine.

Do not weld or flame cut any items that contain flammable material. Clean items thoroughly with non-flammable solvents before welding or flame-cutting.

Do not expose the machine to flames, burning brush, or explosives.

Promptly investigate any unusual smells or odors that may occur during operation of the machine.

Before performing maintenance for electrical systems or electric welding, always place the key of the battery master switch in "O" (Off) position or disconnect the negative — terminal of the batteries, in order to cut off the electric circuit.

General battery safety

Always wear eye protection when you work with batteries.

Do not create sparks or have open flame near a battery.

Ventilate the area when you charge a battery or use a battery in an enclosed area.

Disconnect the negative — terminal first and reconnect the negative — terminal last.

When you weld on the machine, disconnect both terminals of the battery.

Do not weld, grind, or smoke near a battery.

When you use auxiliary batteries or connect jumper cables to start the engine, use the procedure shown in the operator's manual. Do not short across terminals.

Follow the manufacturer's instructions when you store and handle batteries.

Battery post, terminals, and related accessories contain lead and lead compounds. Wash hands after handling.

Battery acid causes burns. Batteries contain sulfuric acid. Avoid contact with skin, eyes, or clothing. Antidote (external): Flush with water. Antidote (eyes): flush with water for 15 minutes and seek medical attention immediately.

Antidote (internal) : Drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately.

Keep out of reach of children and other unauthorized persons.

Seat belts

Seat belts must be worn at all times.

Seat belt inspection and maintenance:

- Keep seat belts in good condition.
- Keep sharp edges and items that can cause damage away from the belts.
- Periodically check belts, buckles, retractors, tethers, slack take-up system, and mounting bolts for damage and wear.
- Replace all parts that have damage or wear.

- Replace belts that have cuts that can make the belt weak.
- Check that bolts are tight on the seat bracket or mounting.
- If the belt is attached to the seat, make sure that the seat or seat brackets are mounted securely.
- Keep seat belts clean and dry.
- Clean belts only with soap solution and warm water.
- Do not use bleach or dye on the belts because this can make the belts weak.

Operator protective structure

Your machine is equipped with an operator protective structure, such as: a Roll Over Protective Structure (ROPS), Falling Objects Protective Structure (FOPS), or a cab with a ROPS. A ROPS may be a can frame or a two-posted or four-posted structure used for the protection of the operator to minimize the possibility of serious injury. The mounting structure and fasteners forming the mounting connection with the machine are part of the ROPS.

The protective structure is a special safety component of your machine.

DO NOT attach any device to the protective structure for pulling purposes. DO NOT drill holes to the protective structure.

The protective structure and interconnecting components are a certified system. Any damage, fire, corrosion, or modification will weaken the structure and reduce your protection. If this occurs, THE PROTECTIVE STRUCTURE MUST BE REPLACED so that it will provide the same protection as a new protective structure. Contact your dealer for protective structure inspection and replacement.

After an accident, fire, tip over, or roll over, the following MUST be performed by a qualified technician before returning the machine to field or job-site operations:

- The protective structure MUST BE REPLACED.
- The mounting or suspension for the protective structure, operator's seat and suspension, seat belts and mounting components, and wiring within the operator's protective system MUST be carefully inspected for damage.
- All damaged parts MUST BE REPLACED.

DO NOT WELD, DRILL HOLES, ATTEMPT TO STRAIGHTEN, OR REPAIR THE PROTECTIVE STRUCTURE. MODIFICATION IN ANY WAY CAN REDUCE THE STRUCTURAL INTEGRITY OF THE STRUCTURE, WHICH COULD CAUSE DEATH OR SERIOUS INJURY IN THE EVENT OF FIRE, TIP OVER, ROLL OVER, COLLISION, OR ACCIDENT.

Seat belts are part of your protective system and must be worn at all times. The operator must be held to the seat inside the frame in order for the protective system to work.

Air-conditioning system

The air-conditioning system is under high pressure. Do not disconnect any lines. The release of high pressure can cause serious injury.

The air-conditioning system contains gases that are harmful to the environment when released into the atmosphere. Do not attempt to service or repair the system.

Only trained service technicians can service, repair, or recharge the air-conditioning system.

Personal Protective Equipment (PPE)

Wear Personal Protective Equipment (PPE) such as hard hat, eye protection, heavy gloves, hearing protection, protective clothing, etc.

Do Not Operate tag

Before you start servicing the machine, attach a 'Do Not Operate' warning tag to the machine in an area that will be visible.

Hazardous chemicals

If you are exposed to or come in contact with hazardous chemicals you can be seriously injured. The fluids, lubricants, paints, adhesives, coolant, etc. required for the function of your machine can be hazardous. They may be attractive and harmful to domestic animals as well as humans.

Material Safety Data Sheets (MSDS) provide information about the chemical substances within a product, safe handling and storage procedures, first aid measures, and procedures to take in the event of a spill or accidental release. MSDS are available from your dealer.

Before you service your machine check the MSDS for each lubricant, fluid, etc. used in this machine. This information indicates the associated risks and will help you service the machine safely. Follow the information in the

MSDS, and on manufacturer containers, as well as the information in this manual, when you service the machine.

Dispose of all fluids, filters, and containers in an environmentally safe manner according to local laws and regulations. Check with local environmental and recycling centers or your dealer for correct disposal information.

Store fluids and filters in accordance with local laws and regulations. Use only appropriate containers for the storage of chemicals or petrochemical substances.

Keep out of reach of children or other unauthorized persons.

Applied chemicals require additional precautions. Obtain complete information from the manufacturer or distributor of the chemicals before you use them.

Utility safety

When digging or using ground-engaging equipment, be aware of buried cables and other services. Contact your local utilities or authorities, as appropriate, to determine the locations of services.

Make sure that the machine has sufficient clearance to pass in all directions. Pay special attention to overhead power lines and hanging obstacles. High voltage lines may require significant clearance for safety. Contact local authorities or utilities to obtain safe clearance distances from high voltage power lines.

Retract raised or extended components, if necessary. Remove or lower radio antennas or other accessories. Should a contact between the machine and an electric

power source occur, the following precautions must be taken:

- Stop the machine movement immediately.
- Apply the parking brake, stop the engine, and remove the key.
- Check if you can safely leave the cab or your actual position without contact with electrical wires. If not, stay in your position and call for help. If you can leave your position without touching lines, jump clear of the machine to make sure that you do not make contact with the ground and the machine at the same time.
- Do not permit anyone to touch the machine until power has been shut off to the power lines.

Electrical storm safety

Do not operate machine during an electrical storm.

If you are on the ground during an electrical storm, stay away from machinery and equipment. Seek shelter in a permanent, protected structure.

If an electrical storm should strike during operation, remain in the cab. Do not leave the cab or operator's platform. Do not make contact with the ground or objects outside the machine.

Mounting and dismounting

Mount and dismount the machine only at designated locations that have handholds, steps, and/or ladders.

Do not jump off of the machine.

Make sure that steps, ladders, and platforms remain clean and clear of debris and foreign substances. Injury may result from slippery surfaces.

Face the machine when you mount and dismount the machine.

Maintain a three-point contact with steps, ladders, and handholds.

Do not use the controls or accessories as handholds when you enter or exit the cab.

Never mount or dismount from a moving machine.

Working at heights

When the normal use and maintenance of the machine requires you to work at heights:

- Correctly use installed steps, ladders, and railings.
- Never use ladders, steps, or railings while the machine is moving.

- Do not stand on surfaces that are not designated as steps or platforms.

Do not use the machine as a lift, ladder, or platform for working at heights.

Lifting and overhead loads

Never use loader buckets, forks, etc. or other lifting, handling, or digging equipment to lift persons.

Loader buckets, forks, etc. or other lifting, handling, or digging equipment and its load will change the center of gravity of the machine. This can cause the machine to tip on slopes or uneven ground.

Do not use raised equipment as a work platform.

Know the full area of movement of the machine and equipment and do not enter or permit anyone to enter the area of movement while the machine is in operation.

Load items can fall off the loader bucket or lifting equipment and crush the operator. Care must be taken when lifting a load. Use proper lifting equipment.

Never enter or permit anyone to enter the area underneath raised equipment. Equipment and/or loads can fall unexpectedly and crush persons underneath it.

Do not lift load higher than necessary. Lower loads to transport. Remember to leave appropriate clearance to the ground and other obstacles.

Do not leave equipment in raised position while parked or during service, unless securely supported. Hydraulic cylinders must be mechanically locked or supported if they are left in a raised position for service or access.

Equipment and associated loads can block visibility and cause an accident. Do not operate with insufficient visibility.

Before using the machine

- Avoid loose fitting clothing, loose or uncovered long hair, jewelry or any other items which could get caught up in machinery.
- Different types of job will require different types of protective equipment. Items such as hard hats, safety shoes, heavy gloves, reflector type jackets, respirators, ear protection and eye protection may be required. Before starting a job, determine what protective equipment will be necessary. Use this equipment at all times.
- Do not attempt to operate this machine unless you have first read and perfectly understood the safety messages and instructions appearing in this manual.
- Operating the machine requires full attention and care on the part of the operator can avoid accidents. Get to know the machine's possibilities and limitations and the working space required. There are areas of poor visibility in the working range of the machine. Have someone guide you for all areas where visibility is not perfect.
- Grease, oil, mud or (in winter) ice on the steps and access handles can cause accidents. Make sure they are kept clean at all times.

- Every day, inspect the machine to detect any signs of hydraulic fluid leakage. Tighten the connections or replace any defective components as necessary.
- Remove any obstructions which hinder visibility. Keep the windshield, rear view mirror and windows clean at all times.
- Make sure the windshield wiper works correctly.
- Make sure you are perfectly familiar with hand signals in daily use on the worksite so as to be able to obtain help with tight manoeuvres or when carrying out operations where visibility is poor.
- Before undertaking any travel or working operations during hours of darkness, make sure the lighting and signaling equipment is fully operative.
- Before any travel operation, make sure that the doors and hoods are properly latched.
- Check that no tools or other items have been left on the machine (be it on the undercarriage or the upperstructure) or in the operator's compartment.
- The operator must be alone on the machine at all times. Do not allow anyone to stand on or around the machine.
- To get in or out of the cab, it is imperative that the upperstructure frame is in line with the undercarriage.

- When alighting from or getting into the operator's compartment, always face the machine and use the steps and access handles.
- Be sure you know the position and function of each control. Incorrect operation of the controls can cause serious injuries.
- Check all controls and safety devices in a safe, open area before starting work.
- Keep away from dangerous areas such as ditches, overhangs, rocky areas, etc. Make a survey of the work-site and determine the possible dangers before using the machine.
- Before parking the machine, make sure that the ground is stable. Plan the worksite so that the ground is flat, hard and level.
- Before moving the machine to work in a new area, walk around to determine all possible causes of accidents there. Holes, obstacles, debris and other danger risks in the working area can cause serious injury.
- Be ready to meet emergencies. Always carry a first aid kit and if possible, fire extinguisher (not supplied) within easy reach on board. Make sure the fire extinguisher is regularly serviced in conformance with the manufacturer's instructions.
- Check the fastening of the main components: counterweight, turntable bearing and operator's compartment. In the event of problems, consult your CASE CONSTRUCTION Dealer.
- Make sure you understand the symbols used on the machine safety decals. Keep the decals clean so that they are perfectly legible at all times.
- Work out a means of convenient escape from the machine (emergency exit via the windshield or the rear window glass) in the event of the machine turning over or tipping over or the cab door being jammed.
- Make sure you are perfectly familiar with traffic regulations and special safety equipment requirements before transporting this machine on a public highway.
- When loading trucks, never swing the load over the truck cab.
- Before undertaking any travel on the job site, make sure the itinerary to be followed is completely safe. If bridges are to be crossed, make sure they are perfectly capable of supporting the weight of the machine.
- Always steer round large obstacles such as boulders, big trees, etc.

Quick coupler (optional)

- Every day, check that the locking bar functions correctly and that it is not fouled by foreign matter. Clean the locking system if necessary.
- If you are obliged to use the quick coupler with buckets not manufactured by CASE CONSTRUCTION, make sure the diameter of the pins and the width between the bucket lugs meet the dimensions needed to fit the quick coupler (pins, washers, bushings, etc.). Consult your CASE CONSTRUCTION Dealer.

Operating the machine

- When working on a public highway, use standard traffic signs and take into consideration the working range of the upperstructure and its attachments. Local or national regulations stipulate the number, type and location of reflector strips.
- Avoid running the engine in a confined space. If there is no alternative, proper ventilation must be provided at all times.
- Do not allow anyone else on the machine. The passenger could fall or cause an accident.
- Never operate the working or travel controls unless you are properly seated in the operator's seat with the seat belt correctly fastened.
- Before starting the engine, check the direction of travel (in forward drive, the reduction gears should be to the rear of the machine).
- Do not work near overhead high-voltage electric lines without checking beforehand that all necessary measures have been taken to respect the minimum distances:
Less than 57000 volts: **3 m (9.8 ft)**.
More than 57000 volts: **5 m (16.4 ft)**.
- Study the position of any existing pipelines or conduits before starting work. Electrical cables, gas and water pipes and other underground installations can cause serious injury.
- Always make allowance for working conditions (sloping or rough ground), the site and weather conditions when driving the machine.
- Do not allow anyone to stand in the machine working area. Accidental operation of the upperstructure swing control or of an attachment control could cause an accident. Stop all operations until everyone has moved away.
- Before operating the dozer blade (if equipped) make sure that there is no one in the working area of the latter.
- Operate all controls gradually to ensure smooth machine operation.
- Whenever load handling operations are to be carried out, it is imperative to adhere strictly to the instructions given in this manual and local legislation.
- It is forbidden to use the machine to carry out tasks other than those for which it is intended. Never use the equipment for sweeping the ground to level out rubble or push objects (transversal stress on the attachment).
- Stop the engine and remove the ignition key when the machine is not in use, even for short periods of time.

- The working area of the end attachment that is mounted may interfere with the machine. Interference may be caused due to the type of end attachment or installation of parts such as a cab guard. Always maintain a safe margin of distance. (Be careful of tool swing or accidental operations.)
- To access or exit the operator's compartment, the left-hand control arm must be in the raised position. Never forget this basic requirement.
- Never leave the operator's compartment while the engine is running.
- To get in or out of the cab, it is imperative that the upperstructure frame is in line with the undercarriage.
- Dust, smoke or mist can reduce visibility and cause an accident. Reduce speed or come to a complete halt until visibility has improved.
- Never jump down from the machine. When alighting from the machine or the upperstructure, always face the machine and use the steps and access handles.
- In the event of an operating problem or failure, move the machine to a safe place, lower the attachment to the ground, shut down the engine and remove the ignition key. Locate the problem, report it if necessary and take the necessary steps to warn others not to attempt to operate the machine.
- Before tilting the seat back forward, it is mandatory to raise the armrests to avoid any accidental operation of the control levers.
- Never turn the key of the battery master switch in "O" (Off) position when engine is running, the electrical systems can be damaged.
- When the engine is stopped, always wait three minutes minimum before to place the key of the battery master switch in "O" (Off) position, otherwise the program of the machine controllers will not exit successfully.

Preventing risks caused by vibrations

The machine's vibration affects the comfort and in some cases the health and safety of the operator. To reduce vibration risks to a minimum:

1. Make sure that the machine, the equipment and the tool are suitable for the work to be carried out.
2. Make sure that the machine is in good condition and that servicing intervals are complied with.
3. Check the track tension adjustment and the play in equipment linkages.
4. Make sure that the operator's seat and its adjustment controls are in good condition and then adjust the seat to suit the operator's size and weight. The operator's

seat complies with the ISO 7096, 2000 standard, EM 6 class.

During work:

1. Operate all controls gradually to ensure smooth machine operation.
2. Modify the machine's operation to suit the working conditions.
3. During travel, adjust the machine's speed, reducing it if necessary.
4. Make sure that the machine's operating radius is in good condition, and free of obstacles and holes.

Quick coupler (optional)

- Never place the control switch in the unlocked position when the machine is working.
- Each time a bucket is installed on the quick coupler, close the bucket and raise the attachment so as to be able to make a visual check that the bucket pin is correctly engaged in the latching hook.
- The quick coupler modifies the working range of the machine. In certain attachment positions the tool may foul the machine. Always leave a safety distance.
- Never carry out load handling using the front or rear anchoring points used to install the tool on the quick coupler.
- Never put your hands inside the quick coupler and never attempt to adjust or repair the quick coupler if the engine is running.

Parking the machine

When parking the machine, proceed as follows:

1. Position the machine on flat, level ground, away from soft ground, excavations or poorly shored cavities.
2. Place the upperstructure and the attachment in line with the undercarriage, retract the attachment and dig the bucket into the ground.
3. Lower the dozer blade (if equipped) until it rests on the ground.
4. Place the gate lock lever in central position before leaving the operator's compartment.
5. Stop the engine and remove the ignition key.
6. Lock the cab door.

7. Make sure that the hoods and doors are properly latched.
8. Check that no part of the machine is encroaching on the highway. If this cannot be avoided, install the necessary regulation signaling equipment.

Maintenance and adjustments

- Do not try to service this machine unless you have first read and perfectly understood the safety messages and instructions featuring in this manual.
 - When carrying out service work always wear suitable dress. Avoid loose-fitting clothing.
 - Release pressure completely in the hydraulic system before disconnecting the hydraulic piping. Hydraulic oil escaping under pressure can cause serious injury.
 - Before doing maintenance work on the machine, shut down the engine and allow it to cool down. Otherwise, you could be burned.
 - Before commencing any work on the machine, place a "Do not operate" tag on the right-hand control arm.
 - Always wear eye protection when using a tool that might project metal particles. Use a hammer with a soft face, such as copper, for installing pins.
 - Badly carried out maintenance or adjustments can cause serious injuries. If you do not understand a servicing or adjustment procedure, consult your CASE CONSTRUCTION Dealer.
 - If the attachment is raised or if the machine moves without an operator, serious injury can result. Before carrying out maintenance on this machine, proceed as follows:
Park the machine on flat, level ground.
Lower the attachment until it is resting on the ground.
Lower the dozer blade (if equipped) until it rests on the ground.
Stop the engine and remove the ignition key.
Lock the tracks to prevent any machine movement.
 - Any unauthorized modifications made to this machine can cause serious injury. Do not undertake any modifications without first consulting your CASE CONSTRUCTION Dealer. Any modifications made must be in conformity with the technical specifications of the machine and any current safety legislation requirements.
 - Certain components of the machine are subject to type approval. When replacing such components, it is mandatory to make sure that they conform to regulations. For safety's sake, use genuine CASE CONSTRUCTION parts.
 - Pressurized hydraulic fluid or grease which penetrates the skin can cause serious injury. Take the necessary safety precautions (safety clothing and protection for face and hands) to avoid such risks. Also, before using these products, read the manufacturer's instructions concerning their use. If hydraulic fluid penetrates the skin, call a doctor immediately.
 - Coolant solution is toxic.
- Avoid contact with skin, eyes and clothing.
Antidote:
External: rinse thoroughly with water and remove soiled clothes.
Internal: do not induce vomiting. Rinse the mouth out with water. Seek medical advice.
Eyes: rinse thoroughly with water and seek medical advice.
- The pressure in the track tension cylinders is high. Follow the procedure described in this manual carefully for increasing or reducing track tension.
 - When carrying out a welding operation on the undercarriage or upperstructure carriage as authorized by the manufacturer and in accordance with his instructions, disconnect the batteries, disconnect the alternator B+ and D+ terminal wires and connect the welding apparatus earth cable to the component on which the welding operation is to be performed. Never connect the welding apparatus to the undercarriage when welding on the upperstructure (or vice-versa). Never connect the welding apparatus earth to a component of the hydraulic system.
 - When using compressed air, take the necessary precautions to protect your face.
 - Clean the machine regularly. Accumulations of grease, dirt and debris can cause injuries or damage the machine.
 - Periodically inspect the fastening of the main components, as part of the machine maintenance programme: counterweight, turntable bearing and operator's compartment. In the event of problems, consult your CASE CONSTRUCTION Dealer.
 - If the accumulator is not functioning correctly, consult your CASE CONSTRUCTION Dealer. Never try to carry out any servicing operation on the accumulator. If this instruction is not followed serious injury can result.
 - The accumulator is charged with nitrogen under high pressure. Do not weld or allow flames to come near to the accumulator.
 - There is high pressure fuel in the feed pipe when the engine is running and immediately after it has been shut down. Wait for 2 minutes after engine shut down before you do any maintenance or inspections to allow the pressure to drop in the pipe.
 - High-voltage is charged to the controller and/or to the injector while the engine is running and immediately after it has been shut down.
Do not touch the controller or the injector.
If it is necessary to touch them for maintenance purposes, consult your CASE CONSTRUCTION Dealer.

⚠ Using an Implement other than a bucket ⚠

- When using a special implement (hydraulic breaker, cutter crusher etc.), refer to the operator's manual provided with the implement.

⚠ Implement operation and maintenance ⚠

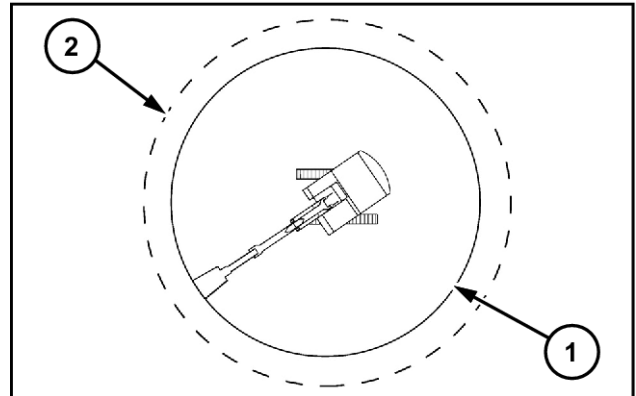
- For the implement operation and maintenance, refer to the operator's manual provided with the implement.

⚠ Safety area ⚠

The safety area is the space necessary for the machine to operate at the maximum range of the tool and at full swing **360° plus 2 m (6.56 ft)**.

(1) Working area.

(2) Safety area.



SMIL13CEX2517AB 1

Ecology and the environment

Soil, air, and water quality is important for all industries and life in general. When legislation does not yet rule the treatment of some of the substances that advanced technology requires, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

Familiarize yourself with the relative legislation applicable to your country, and make sure that you understand this legislation. Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, anti-freeze, cleaning agents, etc., with regard to the effect of these substances on man and nature and how to safely store, use, and dispose of these substances. Your CASE CONSTRUCTION dealer can also provide assistance.

Helpful hints

- Avoid the use of cans or other inappropriate pressurized fuel delivery systems to fill tanks. Such delivery systems may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of these products contain substances that may be harmful to your health.
- Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
- Avoid spillage when you drain fluids such as used engine coolant mixtures, engine oil, hydraulic fluid, brake fluid, etc. Do not mix drained brake fluids or fuels with lubricants. Store all drained fluids safely until you can dispose of the fluids in a proper way that complies with all local legislation and available resources.
- Do not allow coolant mixtures to get into the soil. Collect and dispose of coolant mixtures properly.
- Do not open the air-conditioning system yourself. It contains gases that should not be released into the

atmosphere. Your CASE CONSTRUCTION dealer or air-conditioning specialist has a special extractor for this purpose and can recharge the system properly.

- Repair any leaks or defects in the engine cooling system or hydraulic system immediately.
- Do not increase the pressure in a pressurized circuit as this may lead to a component failure.
- Protect hoses during welding. Penetrating weld splatter may burn a hole or weaken hoses, allowing the loss of oils, coolant, etc.

Battery recycling

Batteries and electric accumulators contain several substances that can have a harmful effect on the environment if the batteries are not properly recycled after use. Improper disposal of batteries can contaminate the soil, groundwater, and waterways. CASE CONSTRUCTION strongly recommends that you return all used batteries to a CASE CONSTRUCTION dealer, who will dispose of the used batteries or recycle the used batteries properly. In some countries, this is a legal requirement.



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Hand signals

When operating the machine, never attempt to carry out tasks calling for fine control or working in areas where visibility is poor or impaired without seeking the assistance of a signalman. Make perfectly sure that you and the signalman understand the signals to be used.

Start the engine



PDE0002ATBP1 1

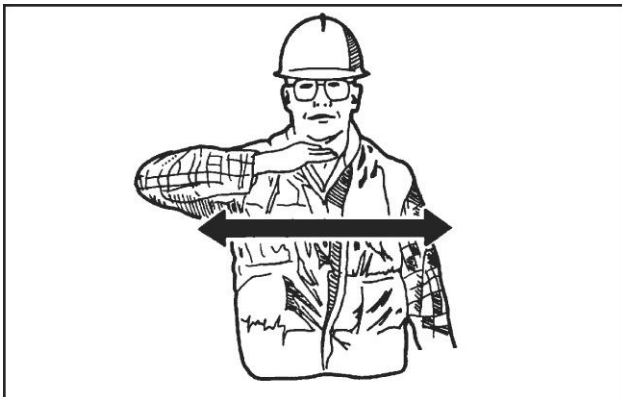
Move away from me

Wave hands back and forth (palms outwards).



PDE0003TBP1 4

Shut down the engine



PDE0002TBP1 2

Go this far



PDE0004ATBP1 5

Come to me

Wave hands back and forth (palms inwards).



PDE0003ATBP1 3

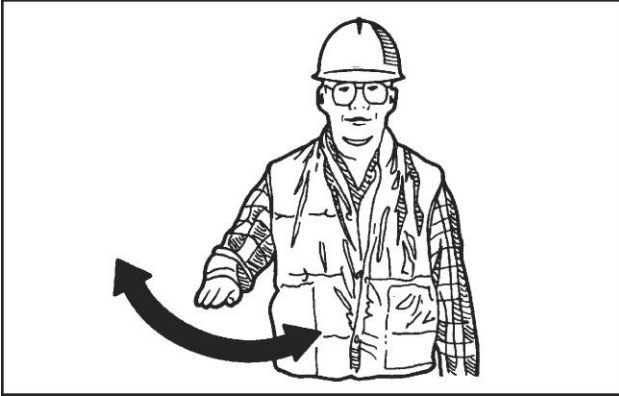
All stop and hold



PDE0004TBP1 6

Stop

Wave one hand back and forth.



PDE0005ATBP1 7

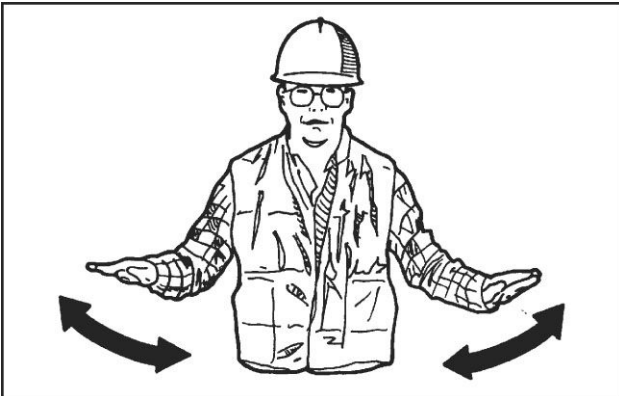
Lower load or tool



PDE0006TBP1 10

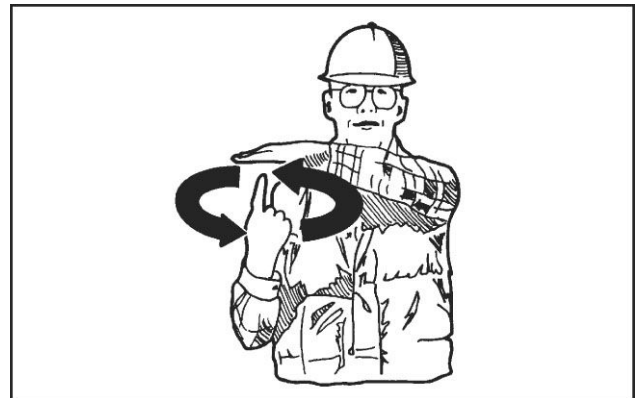
Emergency stop

Wave hands back and forth.



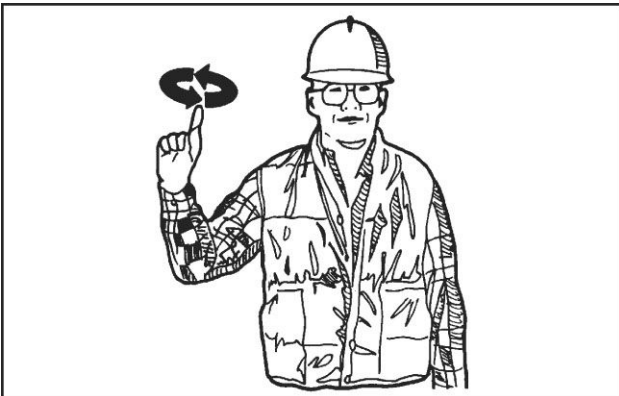
PDE0005TBP1 8

Slowly raise the load or tool



PDE0007ATBP1 11

Raise load or tool



PDE0006ATBP1 9

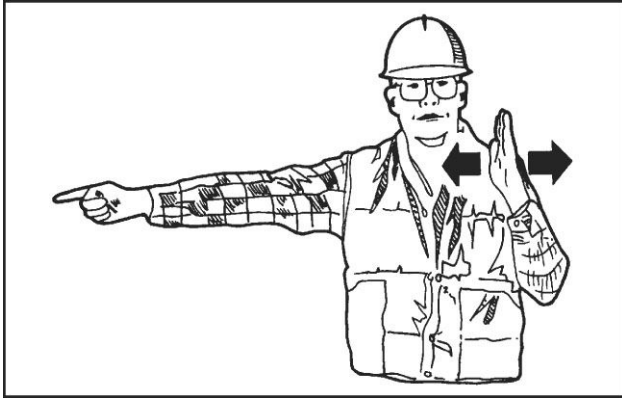
Slowly lower the load or tool



PDE0007TBP1 12

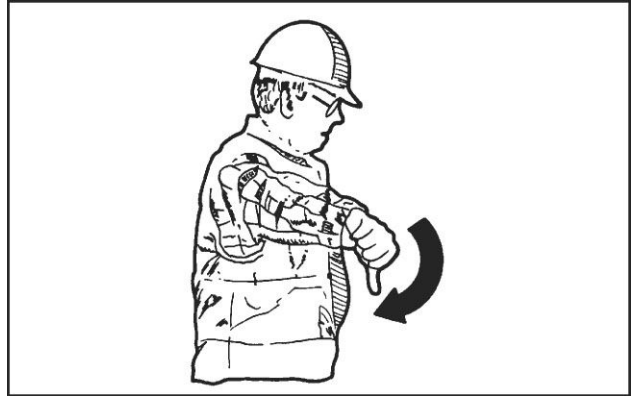
Turn machine left (swing load left)

To stop movement, stop moving hand and clench fist.



PDE0008ATBP1 13

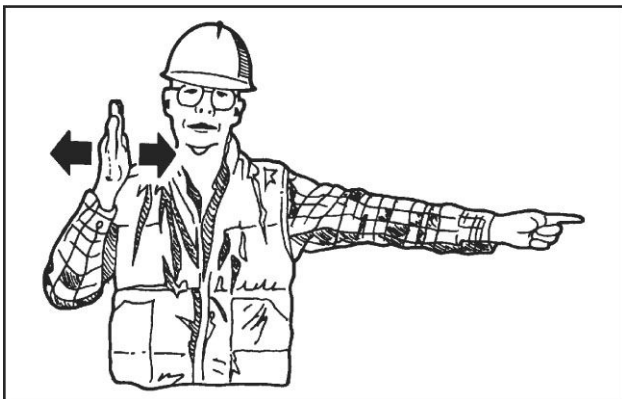
Lower tool



PDE0009TBP1 16

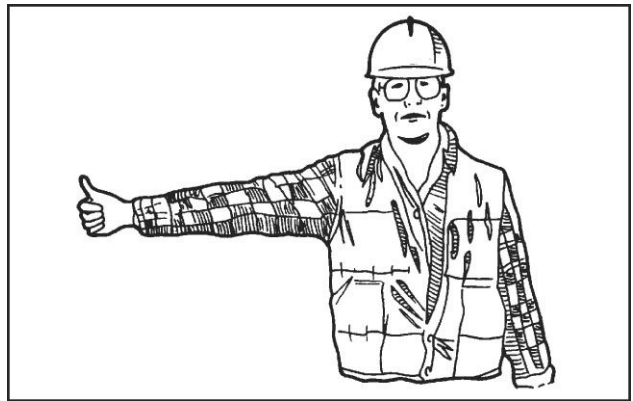
Turn machine right (swing load right)

To stop movement, stop moving hand and clench fist.



PDE0008TBP1 14

Lift boom



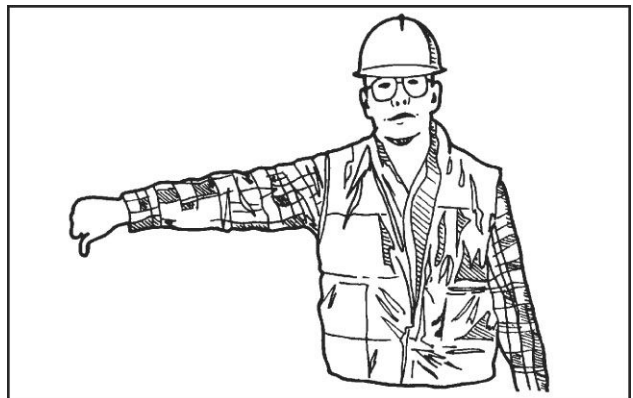
PDE0010ATBP1 17

Raise tool



PDE0009ATBP1 15

Lower boom



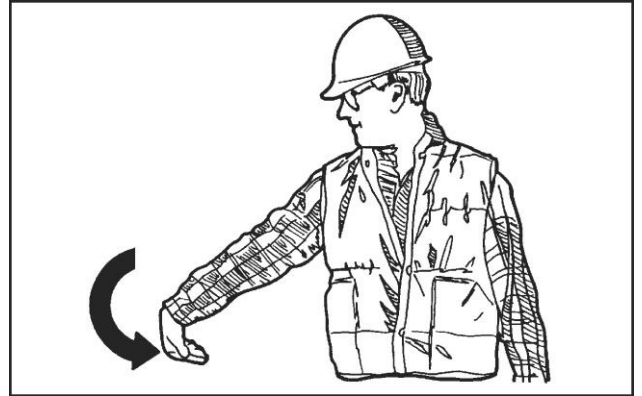
PDE0010TBP1 18

Retract arm



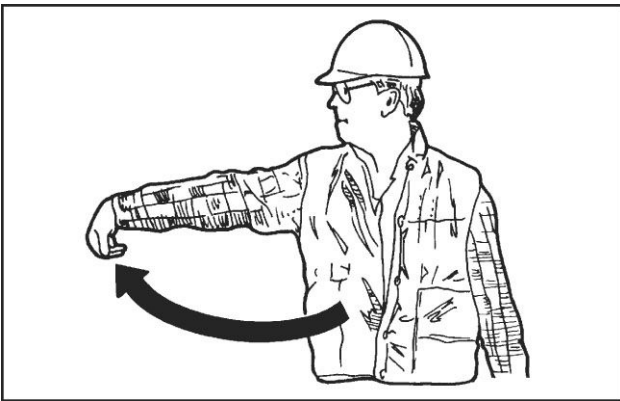
PDE0011ATBP1 19

Fill tool



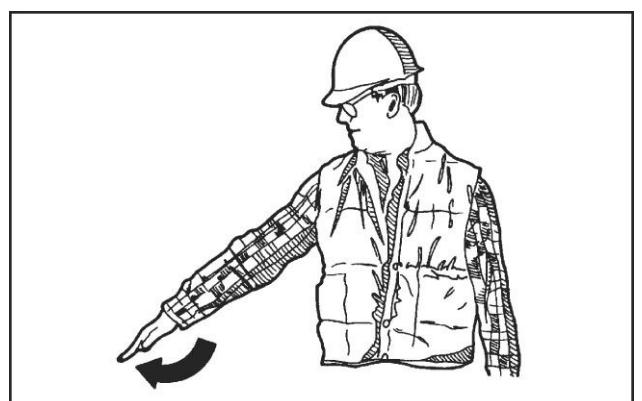
PDE0012ATBP1 21

Extend arm



PDE0011TBP1 20

Empty tool



PDE0012TBP1 22

Safety signs

⚠ WARNING

Avoid injury!

An illegible or missing decal can have far-reaching consequences. Inspect decals daily. Failure to comply could result in death or serious injury.

W0228A

⚠ WARNING

Avoid injury!

Make sure decals are perfectly legible. Clean decals regularly. Replace all damaged, missing, painted over, or illegible decals. See your dealer for replacement decals. When replacing parts bearing decals, be sure to put new decals on each new part.

Failure to comply could result in death or serious injury.

W0229A

The following safety signs are on your machine as a guide for your safety and for the safety of those working with you. Walk around the machine and note the content and the location of all safety signs before you operate your machine.

Keep all safety signs clean and legible. Clean safety signs with a soft cloth, water, and gentle detergent.

NOTICE: *do not use solvent, gasoline, or other harsh chemicals. Solvents, gasoline, and other harsh chemicals may damage or remove safety signs.*

Replace all safety signs that are damaged, missing, painted over, or illegible. If a safety sign is on a part you or your CASE CONSTRUCTION dealer replaces, make sure that you or your CASE CONSTRUCTION dealer install the safety sign on the new part. See your CASE CONSTRUCTION dealer for replacement safety signs.

Safety signs that display the "Read operator's manual" symbol direct you to the operator's manual for further information regarding maintenance, adjustments, or procedures for particular areas of the machine. When a safety sign displays this symbol, consult the appropriate page of the operator's manual.

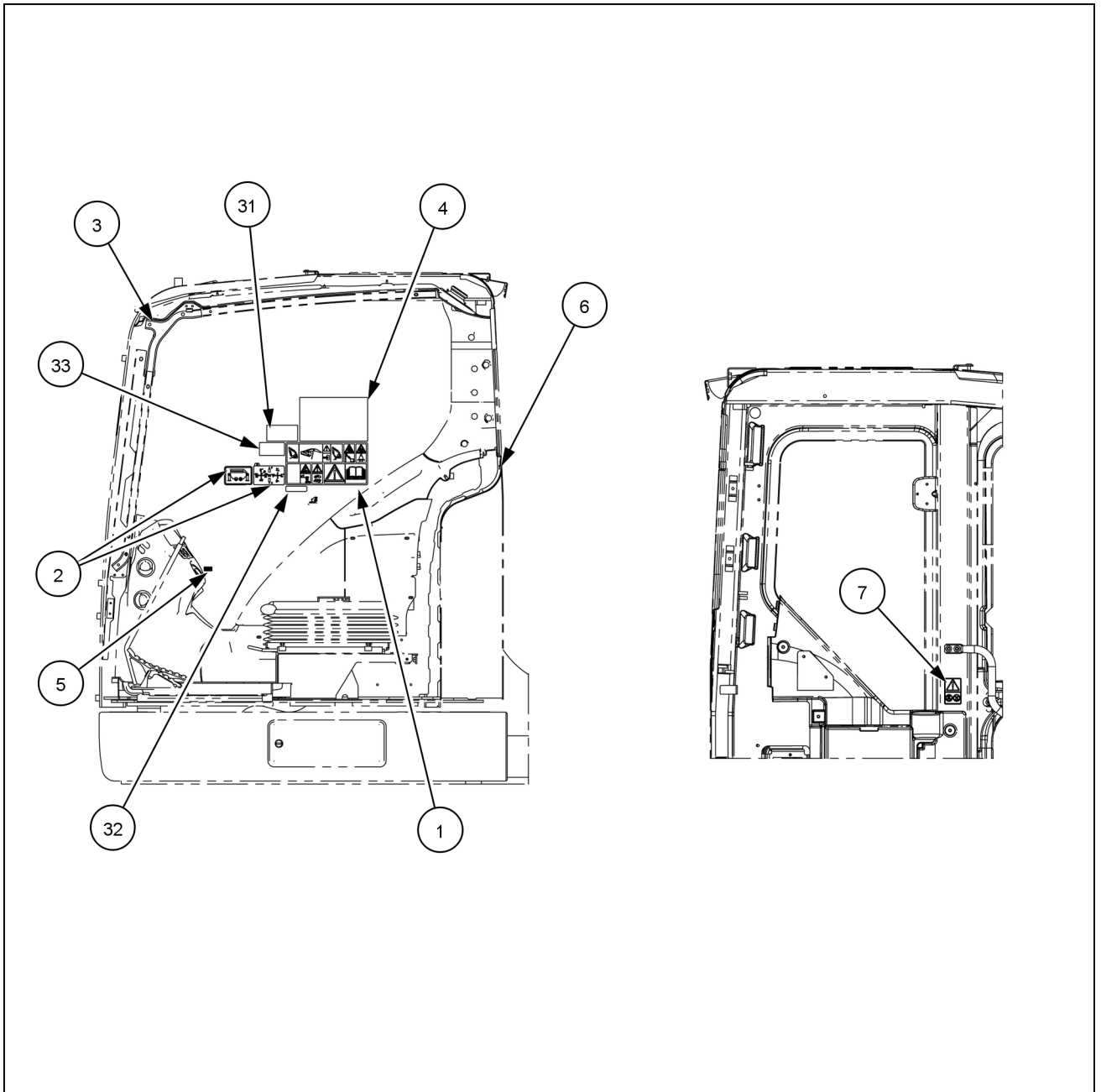


Safety signs that display the "Read service manual" symbol direct you to the service manual. If you doubt your ability to perform service operations, contact your CASE CONSTRUCTION dealer.

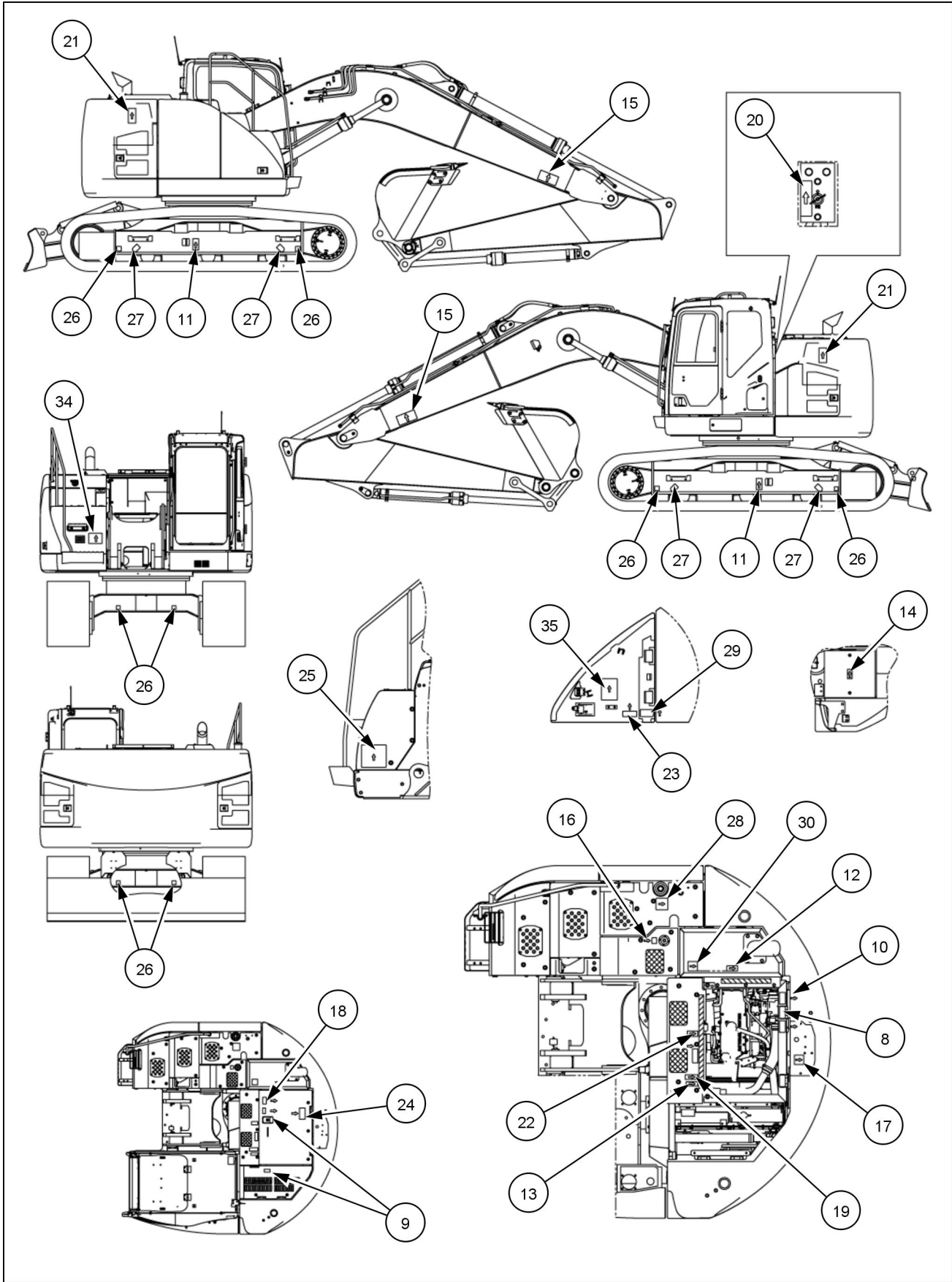


Decal positions

When replacing a decal, make sure it is located as shown below.



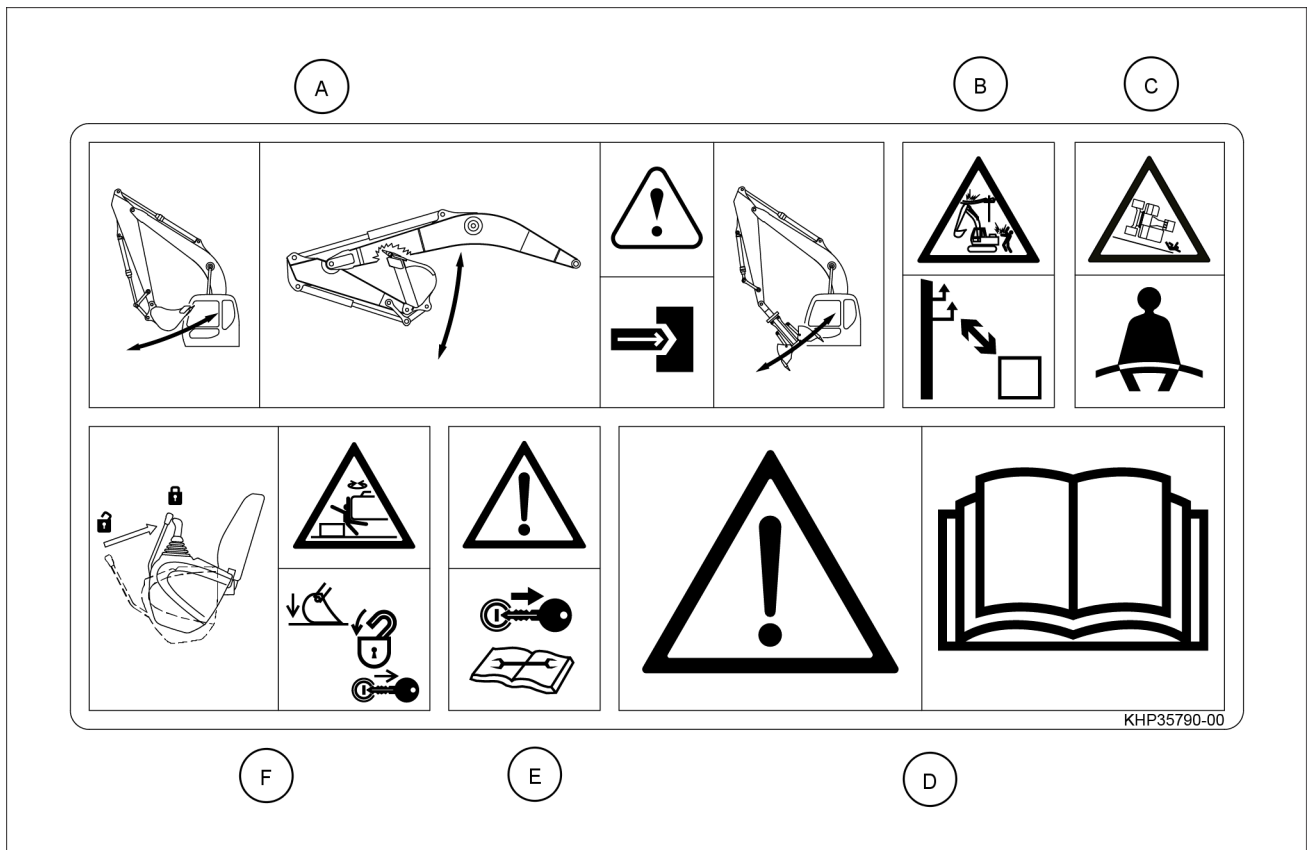
SMIL20CEX2467GA 1



Decal placement diagrams

(1) Table of safety precautions

Part number: KHP35790



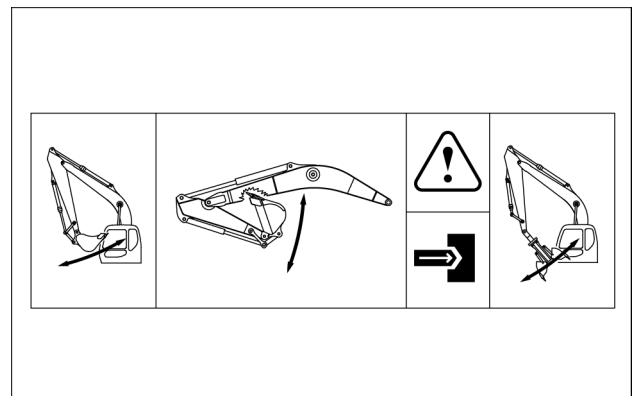
KHP35790 3

(1A) Interference with attachments

The end attachment used for machine operation (e.g. bucket, hydraulic breaker, clamshell..) may hit the cab and/or the boom depending upon the length of the arm, the size of the bucket or the installation of a quick coupler.

Always check the operating range of the machine with the specific attachment in use. Avoid abrupt operation in order to keep proper clearance between the attachment and the cab or boom or other significant parts of the machine.

Collisions between attachment and cab or boom or other significant parts of the machine can cause serious damages.

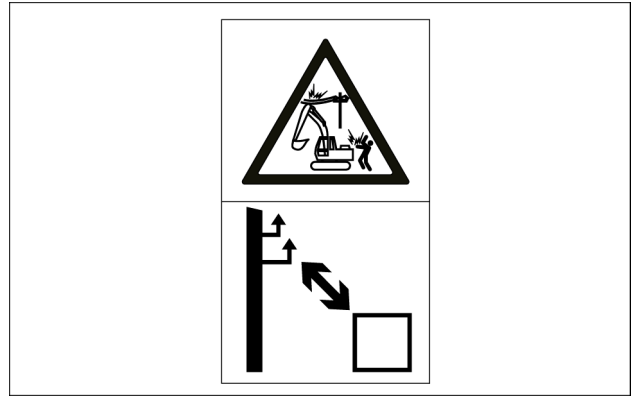


KHP35790_A 4

(1B) Danger electric line

When working near overhead high-voltage electric lines, there is a high risk of electric shocks.

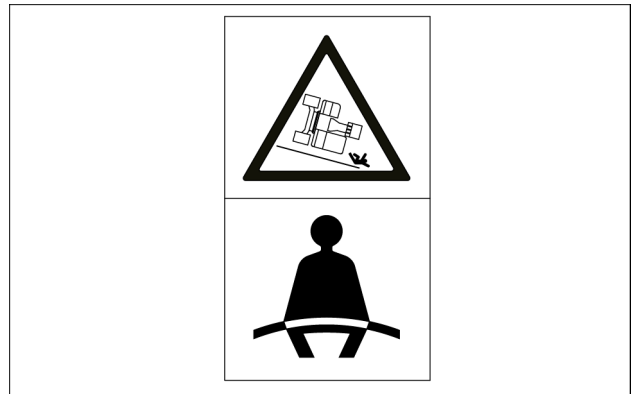
Always keep minimum distances to the electric lines in order to avoid serious damages to the machine, and to avoid serious injuries to the bystanders.



KHP35790_B 5

(1C) Seat belt

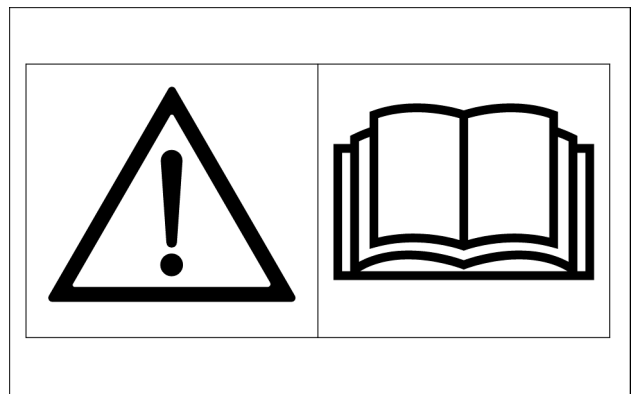
Always fasten the seat belt before starting machine operation.



KHP35790_C 6

(1D) Operator's manual

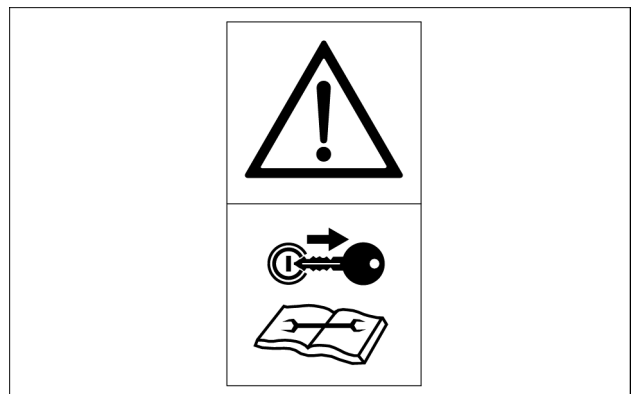
Make sure to read the operator's manual to understand how operate the machine properly and safely.



KHP35790_D 7

(1E) Maintenance or inspection

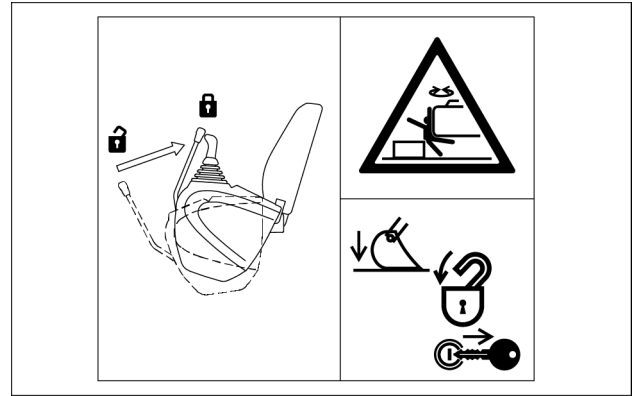
Always stop the engine and remove the starter key before any maintenance operation or inspection of the machine.



KHP35790_E 8

(1F) Parking the machine

Before leaving the operator's compartment, always lower the bucket to the ground, place the gate lock lever in locked position, stop the engine and remove the starter key in order to prevent any unintended movement of the machine.



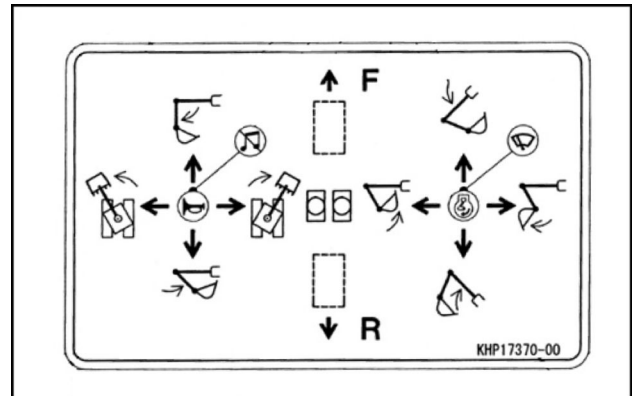
KHP35790_F 9

(2) Functions of operation levers

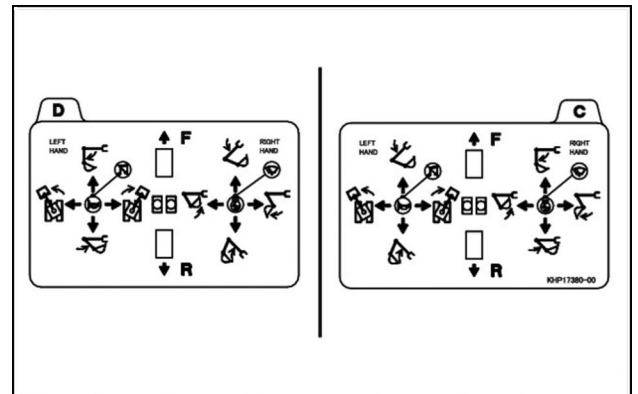
Part number: KHP17370

Part number: KHP17380 (Optional).

Functions of the left control lever and the right control lever.



KHP17370 10



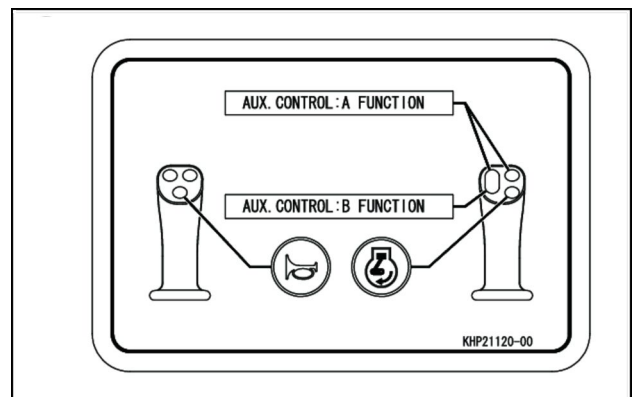
6E680147 11

(2A) Functions of operation levers (optional version)

Location: this sign is located on the right-hand windows of the cab.

Part number: KHP21120

This sign describes the functions of the right control lever.



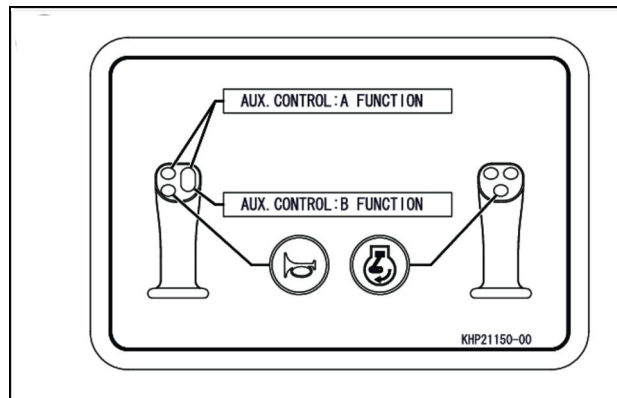
7B236A9F 12

(2B) Functions of operation levers (optional version)

Location: this sign is located on the right-hand windows of the cab.

Part number: KHP21150

This sign describes the functions of the left control lever



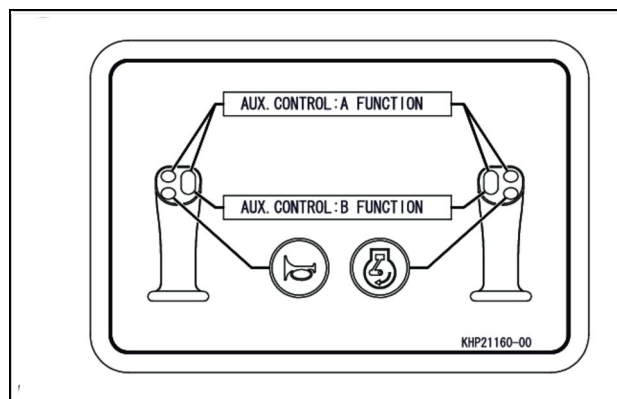
9D26D073 13

(2C) Functions of operation levers (optional version)

Location: this sign is located on the right-hand windows of the cab.

Part number: KHP21160

This sign describes the functions of operation levers.



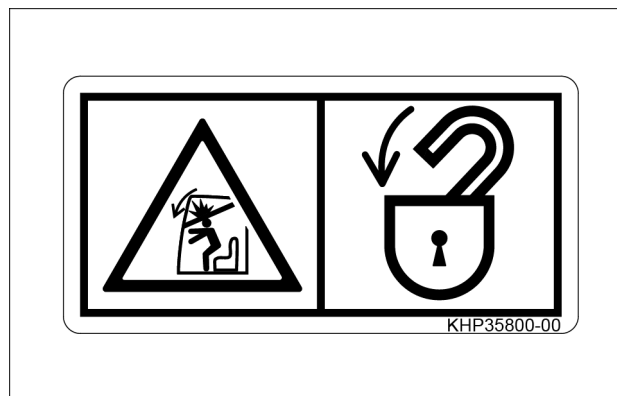
BDC826DF 14

(3) Windshield locking

Part number: KHP35800

Always lock the windshield when it is set in open position.

Windshield not locked may fall down and can affect safe and proper operation of the machine, and can even cause injuries.



KHP35800 15

(4) Loads handling chart

Part number: KRP30100 (CX235C SR LC)

Part number: KRP30090 (CX235C SR with blade)

Always make sure to lift loads not exceeding the maximum values prescribed by the loads handling chart.

CASE CX235C SR Excavator Lift Capacities									
2.10m Arm					2.10m Arm				
Including 90° to 180° and 180° to 270°					Including 90° to 180° and 180° to 270°				
Operating at 100% Boom Angle - 5 to 10°					Operating at 100% Boom Angle - 5 to 10°				
Load	4.0m	4.5m	5.0m	5.5m	Load	4.0m	4.5m	5.0m	5.5m
1.0m	10000	10000	10000	10000	1.0m	10000	10000	10000	10000
1.5m	10000	10000	10000	10000	1.5m	10000	10000	10000	10000
2.0m	10000	10000	10000	10000	2.0m	10000	10000	10000	10000
2.5m	10000	10000	10000	10000	2.5m	10000	10000	10000	10000
3.0m	10000	10000	10000	10000	3.0m	10000	10000	10000	10000
3.5m	10000	10000	10000	10000	3.5m	10000	10000	10000	10000
4.0m	10000	10000	10000	10000	4.0m	10000	10000	10000	10000
4.5m	10000	10000	10000	10000	4.5m	10000	10000	10000	10000
5.0m	10000	10000	10000	10000	5.0m	10000	10000	10000	10000
5.5m	10000	10000	10000	10000	5.5m	10000	10000	10000	10000
6.0m	10000	10000	10000	10000	6.0m	10000	10000	10000	10000
6.5m	10000	10000	10000	10000	6.5m	10000	10000	10000	10000
7.0m	10000	10000	10000	10000	7.0m	10000	10000	10000	10000
7.5m	10000	10000	10000	10000	7.5m	10000	10000	10000	10000
8.0m	10000	10000	10000	10000	8.0m	10000	10000	10000	10000
8.5m	10000	10000	10000	10000	8.5m	10000	10000	10000	10000
9.0m	10000	10000	10000	10000	9.0m	10000	10000	10000	10000
9.5m	10000	10000	10000	10000	9.5m	10000	10000	10000	10000
10.0m	10000	10000	10000	10000	10.0m	10000	10000	10000	10000

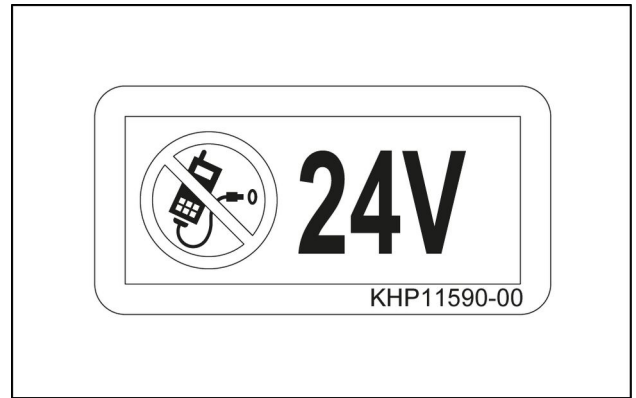
KRP30100 16

(5) Cigarette lighter socket **24 V**

Part number: KHP11590

24 V electric socket. Connect only **24 V** devices to this socket.

Connecting devices functioning at different voltage can cause damages to the device itself and to the electrical system of the machine.

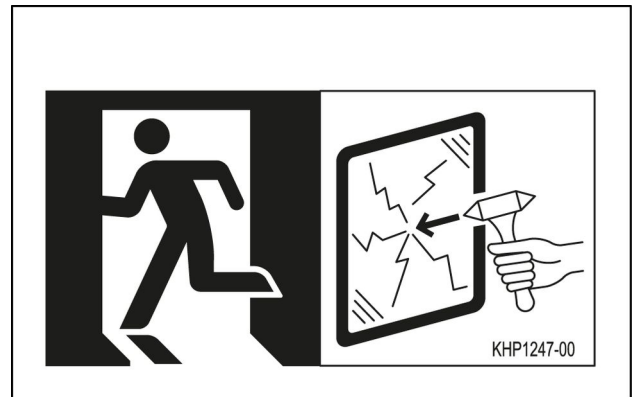


SMIL14CEX1620AB 17

(6) Emergency exit

Part number: KHP1247

In case of emergency, use the emergency hammer to break the rear window and get out from the machine.



SMIL14CEX1621AB 18

(7) Handling precautions in operation compartment

Part number: KHP35810

Welding or modification to the cab structure is strictly forbidden.

Welding or modification to the cab structure affects cab's strength, and compromises operator's protection.

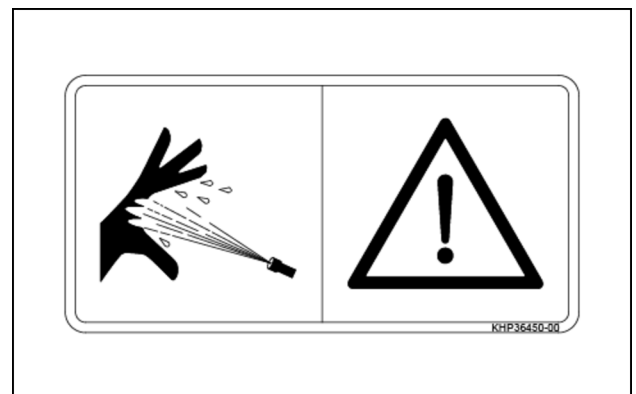


KHP35810 19

(8) Warning decal of high pressure common rail

Part number: KHP36450

Common rail injection system contains fuel under extreme pressure that can cause fatal injuries. Do not open the common rail pump, or loosen the common rail high pressure lines, or touch any other component of the common rail injection system. Consult the CASE CONSTRUCTION dealer for service.

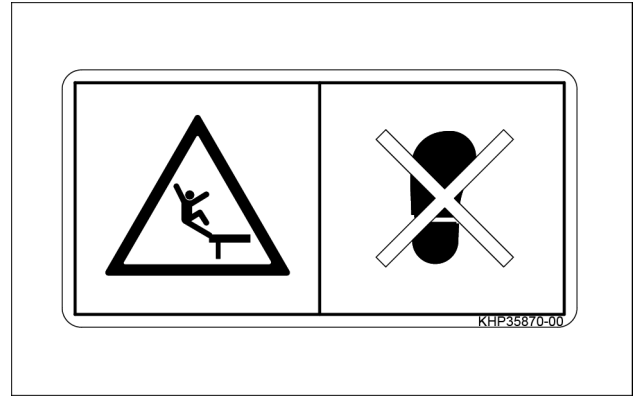


KHP36450 20

(9) Engine hood

Part number: KHP35870

Do not step over platforms that are not guarded by handrails in order to avoid the risk of falling.

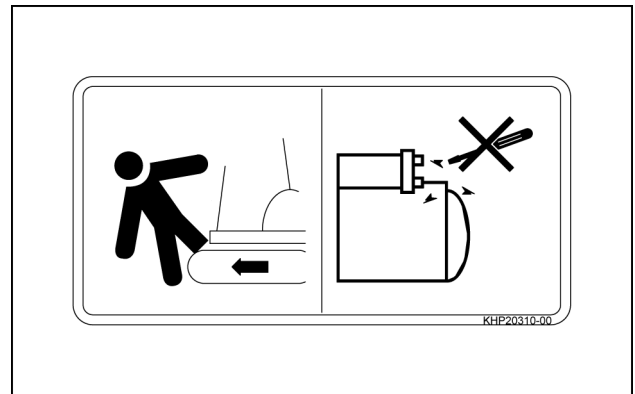


KHP35870 21

(10) Starting the engine

Part number: KHP20310

Do not try to start the engine by auxiliary tools. Machine may start to move suddenly and unintendedly causing serious injuries to the operator and to the bystanders.



KHP20310 22

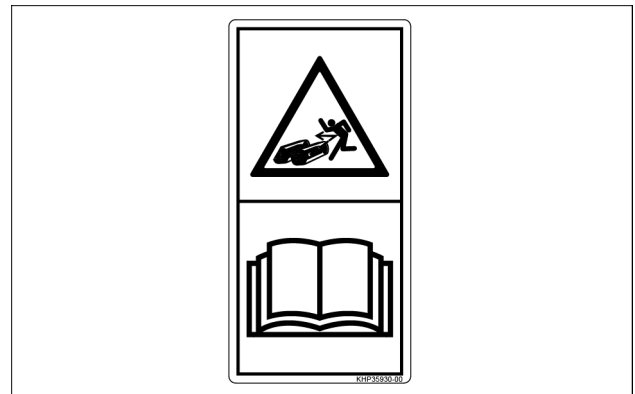
(11) Check valve

Part number: KHP35930

Track tensioning cylinder contains pressurized fluid.

During maintenance of the track tensioning cylinder, fluid may spray out from the check valve on the tensioning cylinder and can cause serious injuries.

Always make sure to read operator's manual to understand proper practices and precautions to be tackled for maintenance of the track tensioning system.



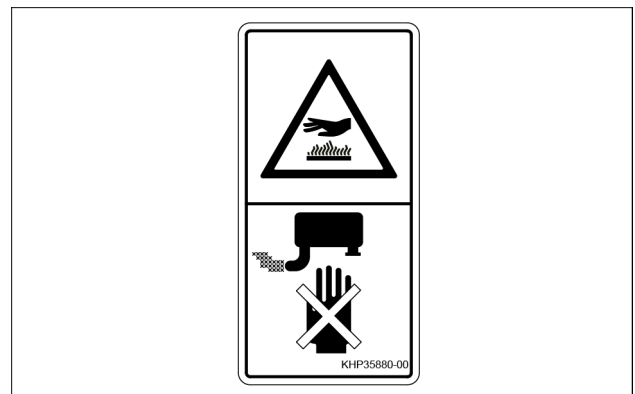
KHP35930 23

(12) Muffler

Part number: KHP35880

Do not touch the muffler right after engine stop.

Muffler surface is hot and touching it can cause serious injuries.



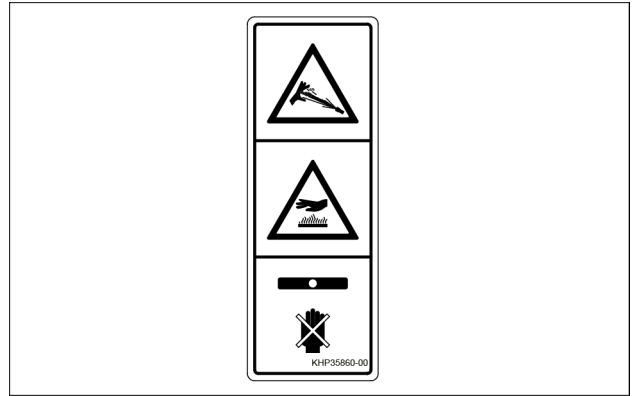
KHP35880 24

(13) Radiator

Part number: KHP35860

Do not loosen or open the radiator cap when coolant is hot and under pressure, it can cause serious injuries.

Cool down the engine before opening the radiator cap, then loosen the radiator cap slowly to relieve pressure in the coolant circuit.



KHP35860 25

(14) Batteries

Part number: KHP35900

Prevent battery explosion by keeping sparks, open flames and cigarettes away from the batteries.

Always make sure to read operator's manual to understand proper practices and precautions to be tackled for maintenance of batteries.



KHP35900 26

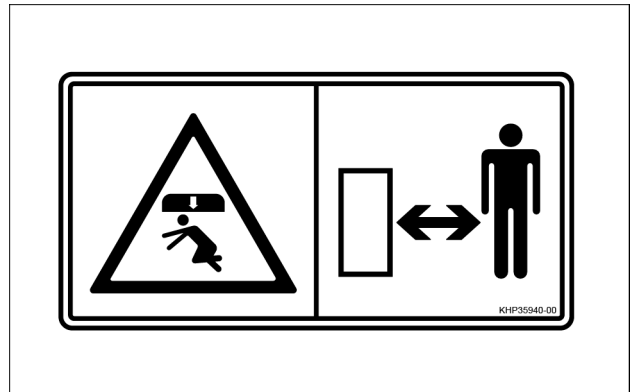
(15) Keep out of work range of attachment

Part number: KHP35940

Always make sure to keep the working range of the machine front equipment clear from obstacles and from bystanders.

Always sound the horn before start operating the machine.

The machine front equipment may hit or crush the bystanders causing serious injuries.



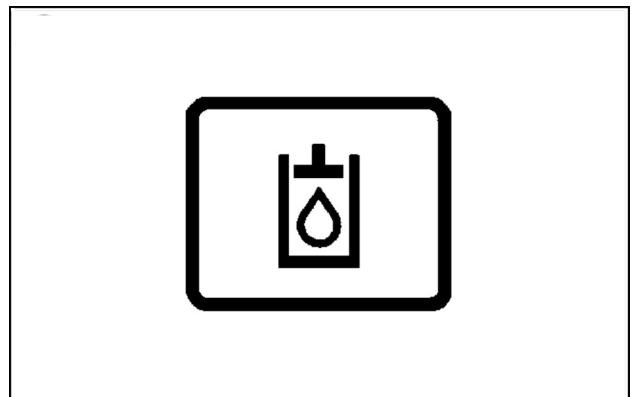
KHP35940 27

(16) Hydraulic tank

Part number: KHP1330

Hydraulic tank contains pressurized hot fluid that can cause serious injuries.

Always shut down the engine, cool down the machine and release pressure in the hydraulic tank before doing any maintenance operation to the hydraulic tank or to the hydraulic system.



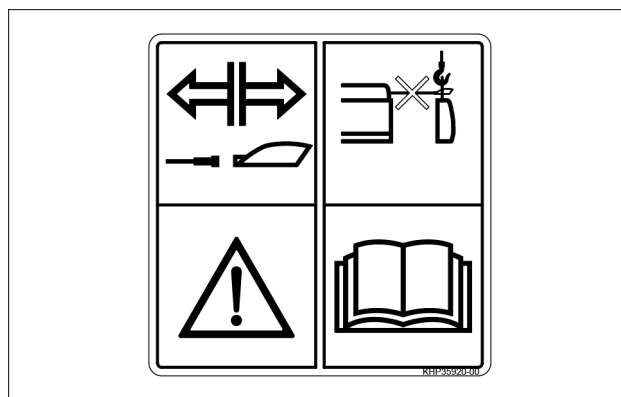
223C7EC4 28

(17) Camera wiring precautions

Part number: KHP35920

Always disconnect the wiring of the cameras before removal of the counterweight.

Make sure to read operator's manual to understand proper procedures to be used for removal of the counterweight.



KHP35920 29

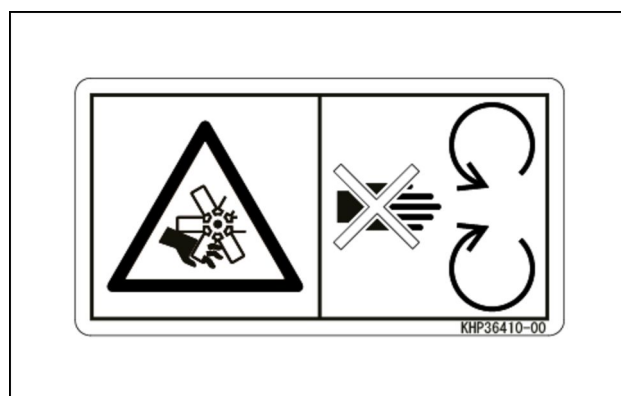
(18) Fan

Part number: KHP36410

When the engine is running, keep away from the engine cooling fan, from the fan belt and from the other rotating parts of the mechanical fan drive system.

The engine cooling fan and other rotating parts can cause serious injuries.

Always stop and cool down the engine before making any maintenance operation in the engine compartment.



KHP36410 30

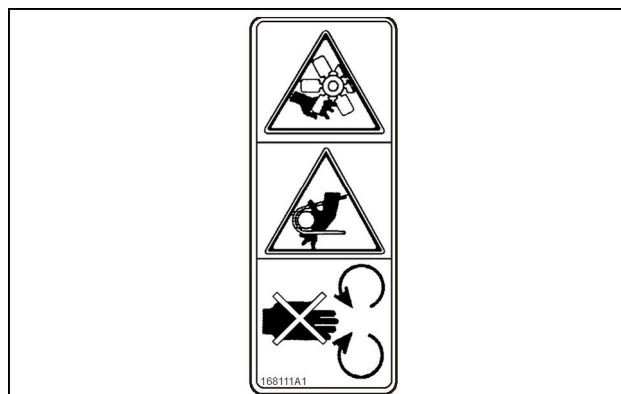
(19) Fan belt

Part number: KHP36420

When the engine is running, keep away from the engine cooling fan, from the fan belt and from the other rotating parts of the mechanical fan drive system.

The engine cooling fan and other rotating parts can cause serious injuries.

Always stop and cool down the engine before making any maintenance operation in the engine compartment.

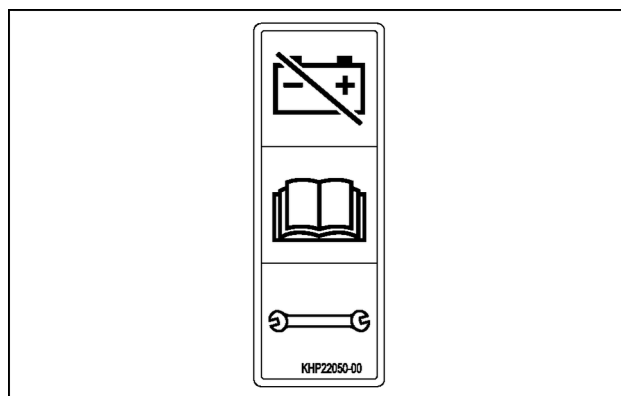


SMIL16CEX1397AB 31

(20) Handling precautions for battery disconnect switch

Part number: KHP22050

Make sure to read operator's manual to understand proper procedures for usage of the battery disconnect switch.



SMIL14CEX1645AB 32

(21) Keep out of work range of upper structure

Part number: KHP35820

Always make sure to keep the working range of the machine upper structure clear from obstacles and from bystanders.

Always sound the horn before start operating the machine.

The machine upper structure may hit or crush the bystanders causing serious injuries.



KHP35820 33

(22) Engine operation

Part number: KHP36470

Always stop and cool down the engine before making any maintenance operation in the engine compartment.

Do not step on the engine as this can cause serious damages to the engine components and serious injuries to the operator.

Make sure to read operator's manual to understand proper procedures for the engine maintenance.

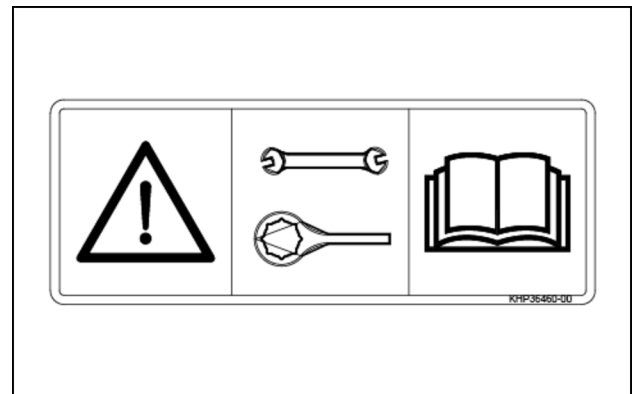


KHP36470 34

(23) Fuel filter replacement

Part number: KHP36460

Always perform the fuel filter replacement after reading the operator's manual.

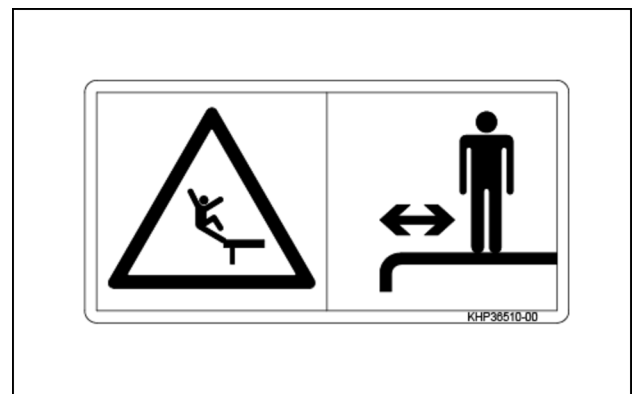


KHP36460 35

(24) Risk of falling

Part number: KHP36510

Keep away from the edge of the counterweight in order to avoid the risk of falling.



KHP36510 36

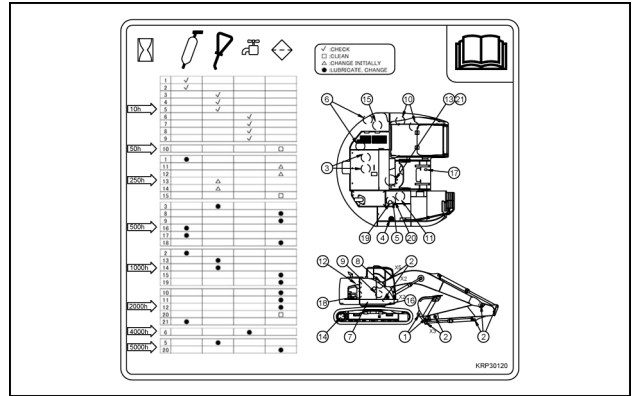
(25) Service table

Part number: KRP30120 (CX235C SR LC)

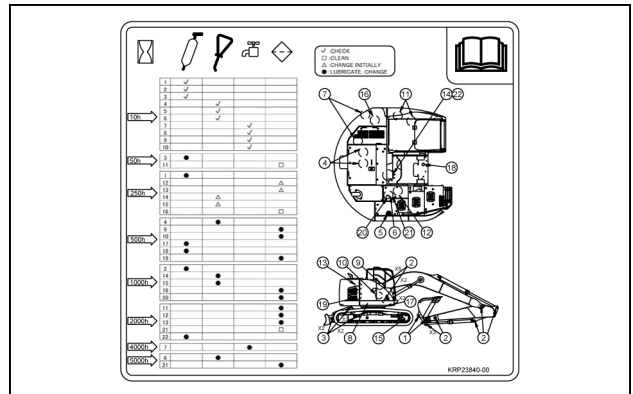
Part number: KRP23840 (CX235C SR with blade)

Reference chart indicating proper timing for machine maintenance.

Make sure to read operator's manual to understand proper procedures for servicing the machine.



KRP30120 37

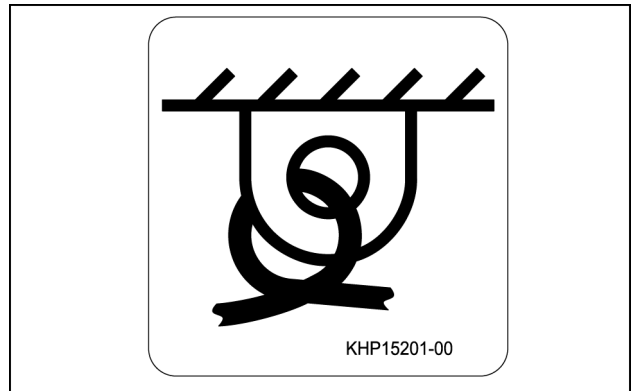


KRP23840 38

(26) Lashing point decal

Part number: KHP15201

Point on machine structure for securing the machine during transport.

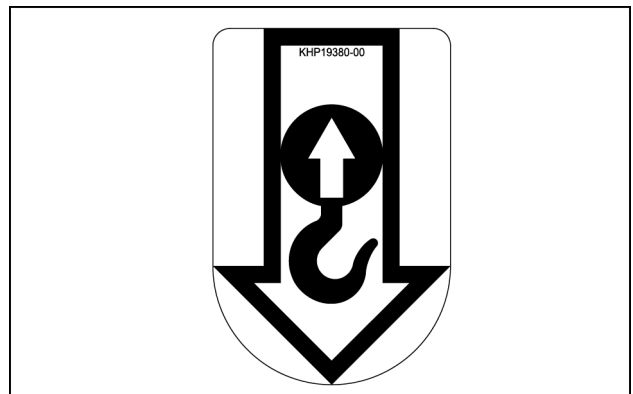


SMIL15CEX0447AA 39

(27) Lifting location

Part number: KHP19380

Machine area where the lifting devices shall be routed.



SMIL15CEX0450AA 40

(28) Fuel tank

Part number: KHP38040

Do not perform welding and avoid any operation generating sparks close to the fuel tank.

Fuel is flammable and flames can cause serious injuries.

Using any other kind of fuel will cause serious damages to the machine.

Make sure to read operator's manual to understand proper procedures to be used for storage and usage of Ultra Low Sulfur diesel fuel.

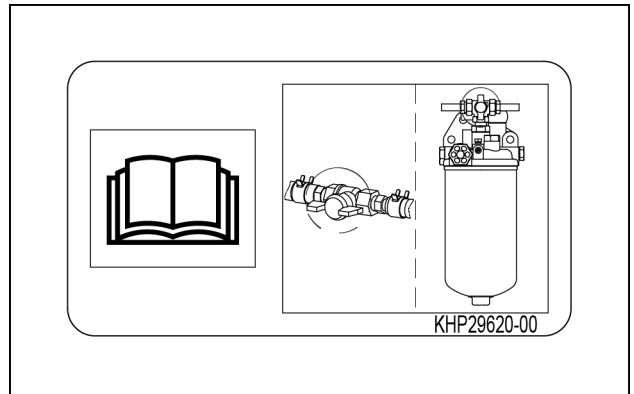


KHP38040 41

(29) Fuel Line Valve

Part number: KHP29620

Thoroughly read and understand the operator's manual before starting inspection and service of the fuel system.



KHP29620 42

(30) Cautions for Burns and Slipping

Part number: KHP36500

Do not touch the intercooler hose right after engine stop. Hose surface is hot and touching it can cause serious injuries.

Do not step on the intercooler hose in order to avoid the risk of slipping.



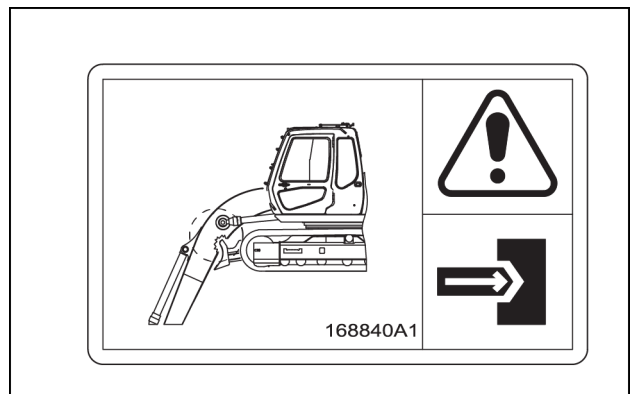
KHP36500_ 43

(31) Caution for Blade (CX235C SR with blade)

Part number: KHP1384

Never fully lower the boom when operating with the front equipment and the blade on the same side.

Collision between the boom and the blade can cause serious damages to the machine frames.

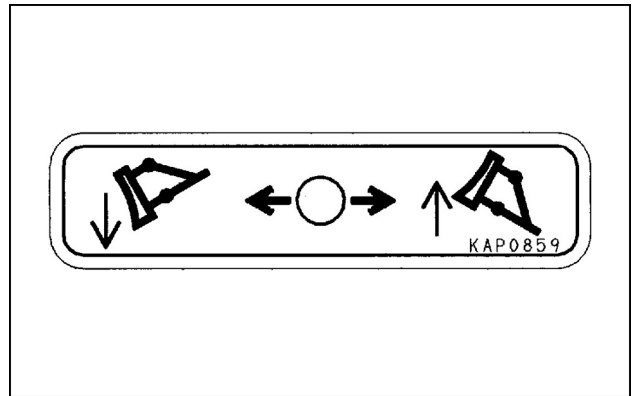


KHP1384 44

(32) Blade Operation (CX235C SR with blade)

Part number: KAP0859

Functions of the blade control lever.

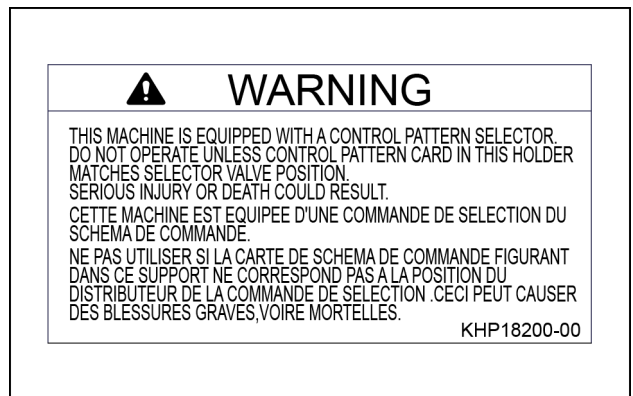


KHP0859 45

(33) Precautions for Operation Pattern

Part number: KHP18200

Before starting machine operation, check that the operating pattern shown on the control pattern card is consistent with the operating pattern of control levers.



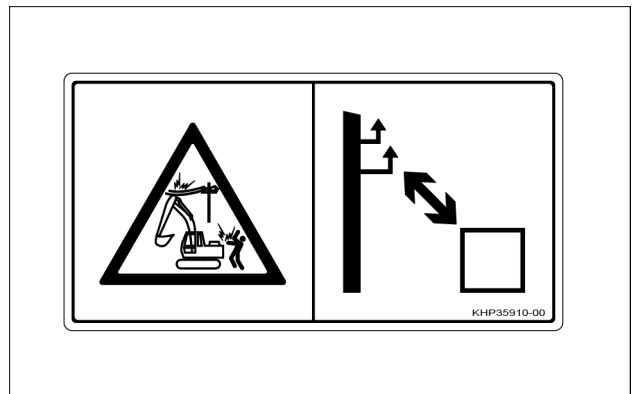
KHP18200 46

(34) Electric shock

Part number: KHP35910

When working near overhead high-voltage electric lines, there is a high risk of electric shocks.

Always keep minimum distances to the electric lines in order to avoid serious damages to the machine, and to avoid serious injuries to the bystanders.

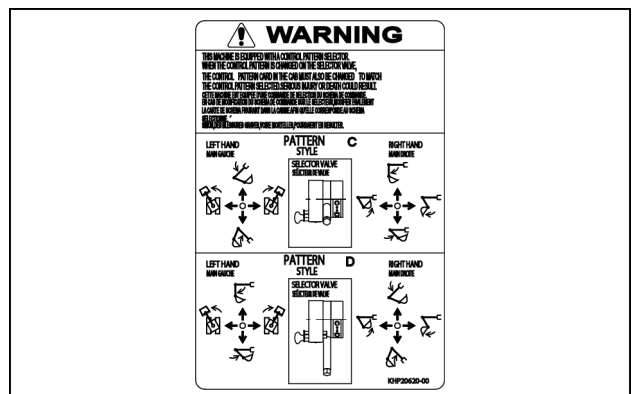


KHP35910 47

(35) 2Way Type (Optional)

Part number: KHP20620

Do not operate until the control type card in the holder matches the selector valve position on this machine. Failure to observe this caution may cause breakdown of this machine and a personal injury.



KHP20620 48

3 - CONTROLS AND INSTRUMENTS

Access to operator's platform

Door and steps

⚠ CAUTION

Pinch hazard!

Be careful not to get your hand, clothes, etc. caught in the door when closing it.

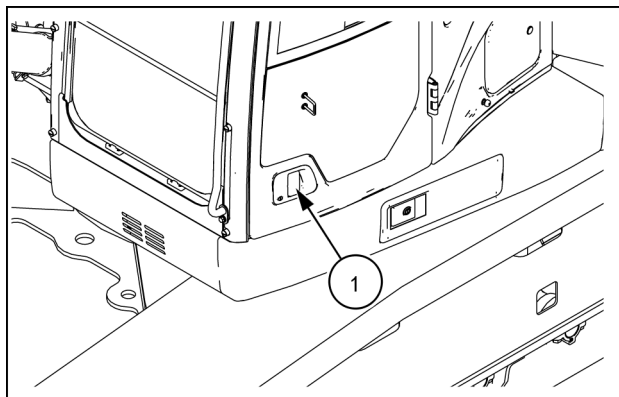
Failure to comply could result in minor or moderate injury.

C0046A

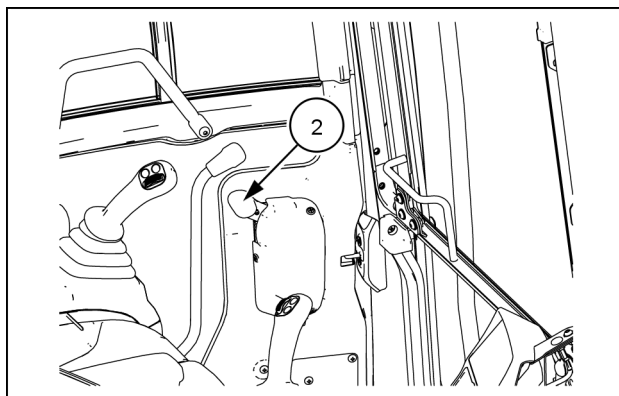
Cab door

To open the door, use the handle (1) from the outside and use the handle (2) from the inside.

NOTICE: Before opening the door from the inside, make sure to place the gate lock lever in lock position. The left-hand control lever might be touched inadvertently when opening the door, and the machine may thus move suddenly and inadvertently causing severe incidents.



SMIL17CEX0080AA 1

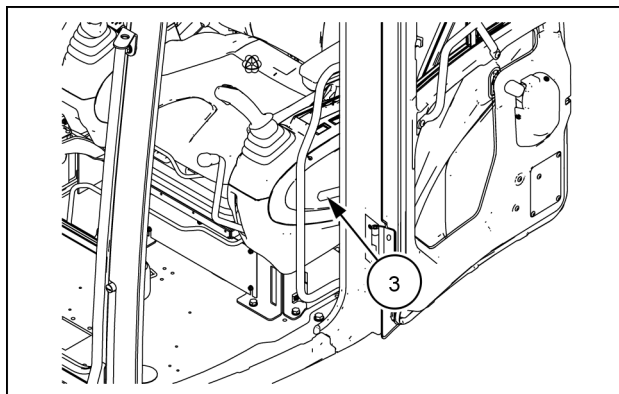


SMIL17CEX0081AA 2

The door can be latched in completely open position.

NOTICE: Never work leaving the door ajar. Before performing any work with the door open, make sure to lock it in the completely open position.

To unlatch the door, stop machine operation, set the gate lock lever in lock position, and tilt the lever (3) downward.



SMIL17CEX0082AA 3

Steps and access handles

⚠ WARNING

Fall hazard!

In order to enter or exit the cab, the upper structure frame must be in line with the undercarriage.
Failure to comply could result in death or serious injury.

W0225A

⚠ WARNING

Fall hazard!

Clean the steps and access handles to remove all traces of grease, oil, mud, and ice (in winter).
Failure to comply could result in death or serious injury.

W0139A

⚠ WARNING

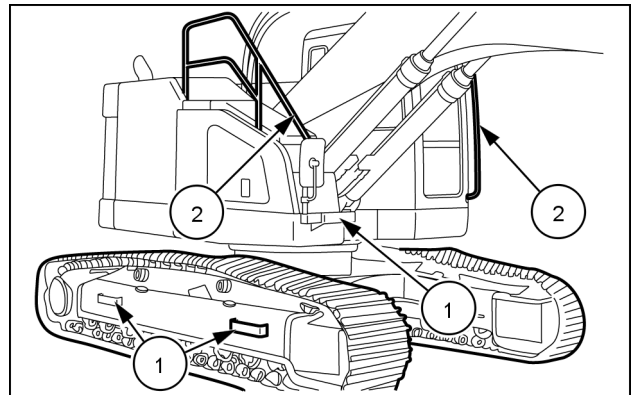
Fall hazard!

Jumping on or off the machine could cause an injury. Always face the machine, use the handrails and steps, and get on or off slowly. Maintain a three-point contact to avoid falling: both hands on the handrails and one foot on the step, or one hand on the handrail and both feet on the steps.
Failure to comply could result in death or serious injury.

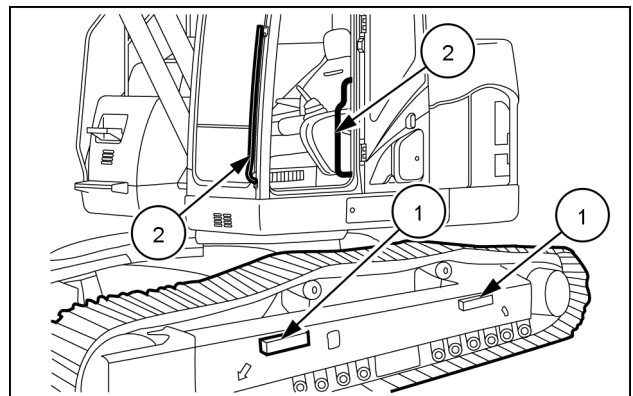
W0141A

To get in or out of the machine use the steps (1), the tracks and the access handles (2).

NOTICE: never use the left console, the left-hand control lever or the gate lock lever in place of the handles when getting on or off the operator's compartment.



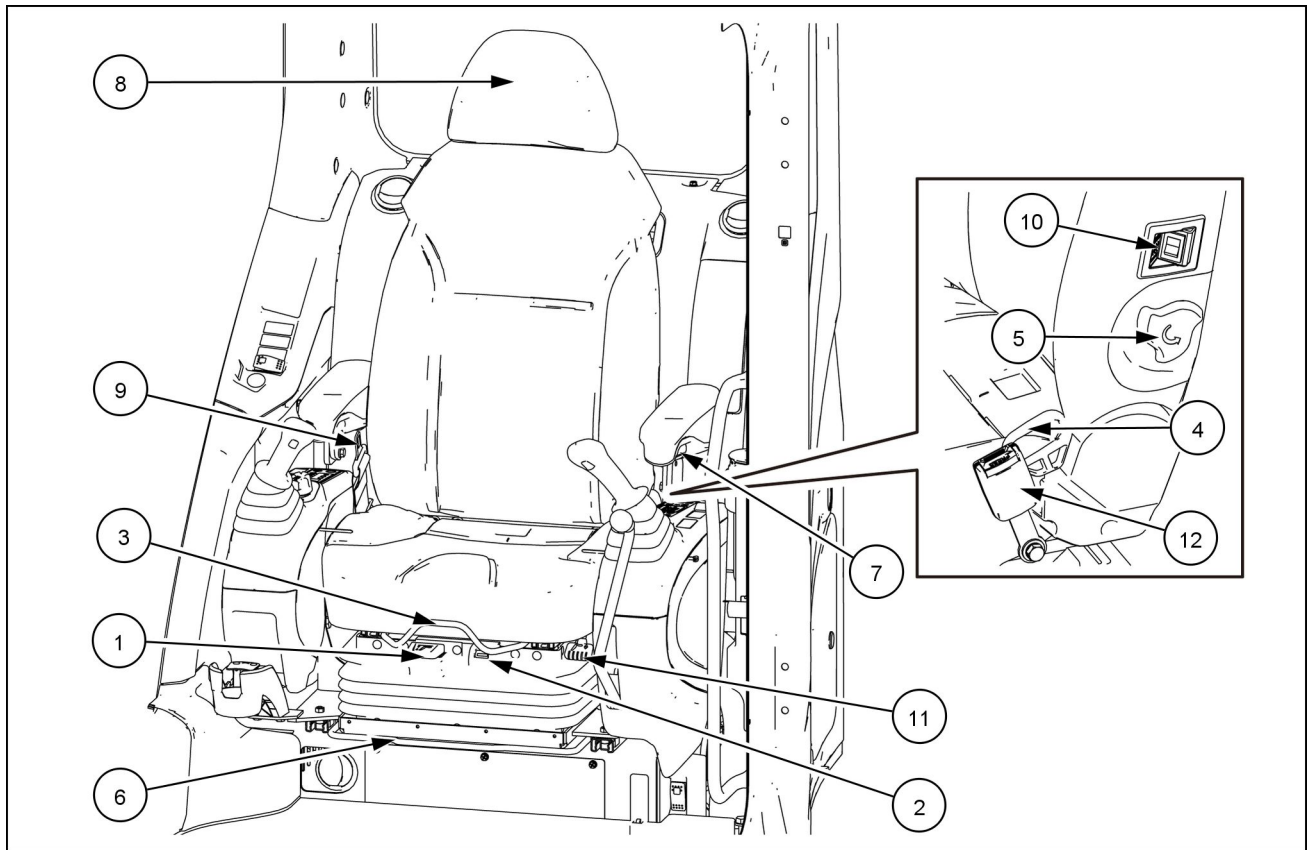
SMIL20CEX2493AA 4



SMIL20CEX2494AA 5

Operator's seat

Operator's seat



SMIL19CEX2699FA 1

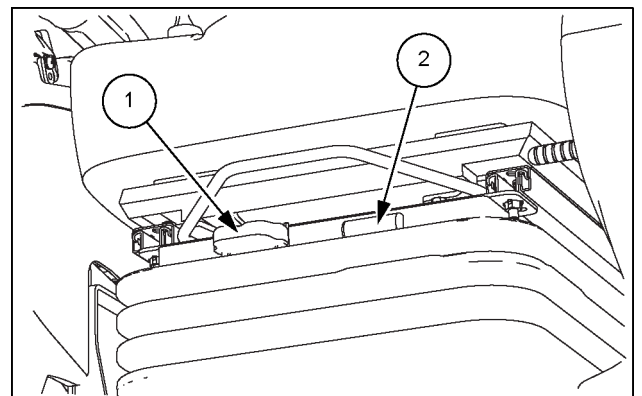
- | | |
|--|--------------------------------------|
| 1. Combined height and weight adjustment | 7. Armrest angle adjustment |
| 2. Weight adjustment indicator | 8. Headrest adjustment |
| 3. Fore and aft adjustment | 9. Seat belt |
| 4. Seat back angle adjustment | 10. Seat heater (optional) |
| 5. Lumbar support adjustment | 11. Seat angle adjustment (optional) |
| 6. Seat and control arm assembly fore and aft adjustment | 12. Seat belt buckle |

In order to operate the machine correctly and with maximum efficiency and comfort, adjust the seat to suit the weight and size of the operator.

Combined height and weight adjustment

- Lower the handle (1) to decrease the rigidity of the suspension.
- Raise the handle (1) to obtain harder suspension.

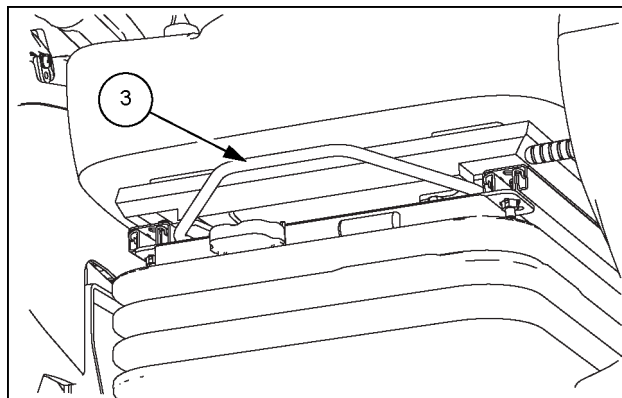
NOTICE: the indicator (2) must be green when the operator is sitting on the seat.



SMIL14CEX1655AB 2

Fore and aft adjustment

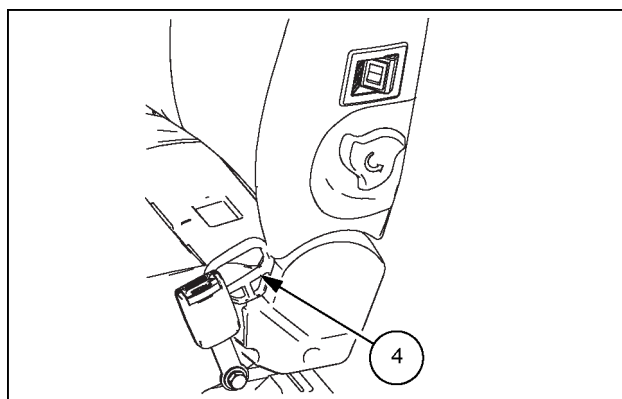
- Hold the control **(3)** in the raised position.
- Slide the seat to the required position.
- Release the control **(3)**.



SMIL14CEX1656AB 3

Seat back angle adjustment

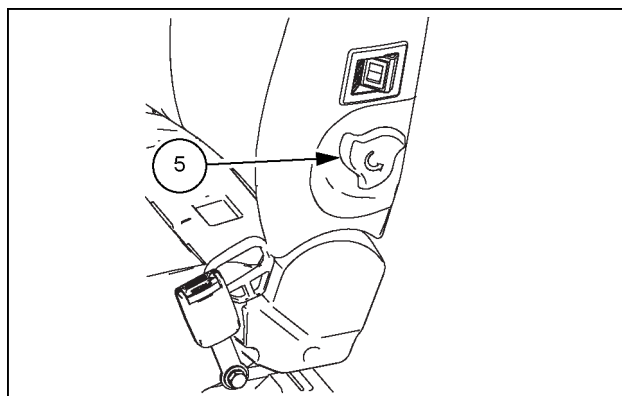
- Hold the lever **(4)** in the raised position.
- Move with the seat-back to the desired position.
- Release the lever **(4)**.



SMIL14CEX1657AB 4

Lumbar support adjustment

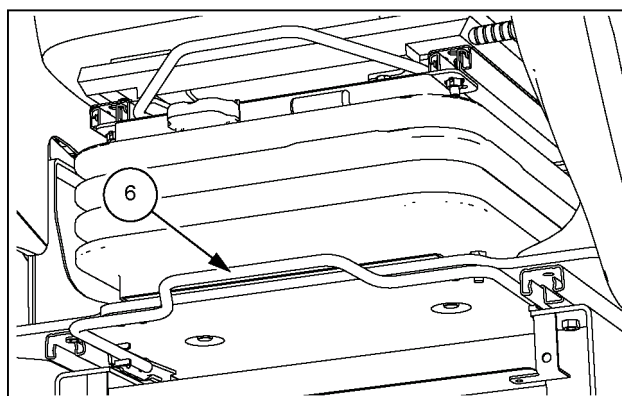
- Turn the dial **(5)** to adjust the bulge of the lumbar area in four levels.



SMIL14CEX1658AB 5

Seat and control arm assembly fore and aft adjustment

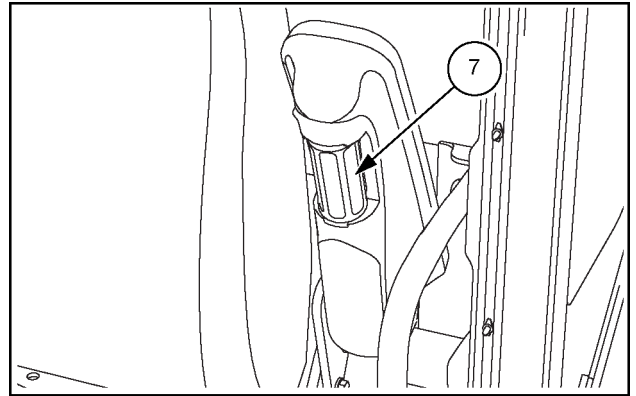
- Pull the control **(6)** upwards.
- Slide the seat and control arm assembly to the desired position.
- Release the control **(6)**.



SMIL14CEX1659AB 6

Armrest angle adjustment

- Raise the armrest.
- Adjust the armrest to the desired angle using the knob (7).
- Lower the armrest.

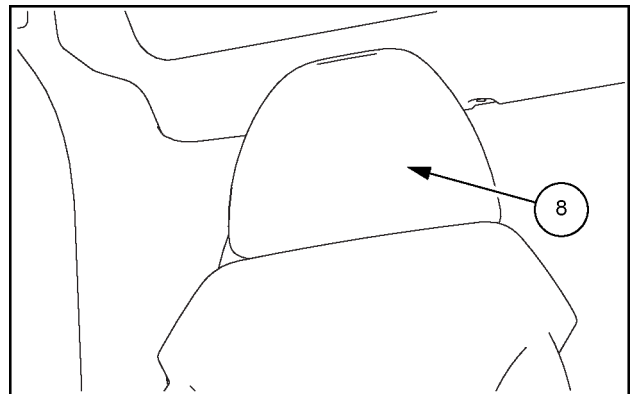


SMIL14CEX1660AB 7

Headrest adjustment

- The headrest (8) can be adjusted upwards and downwards and backwards and forwards.

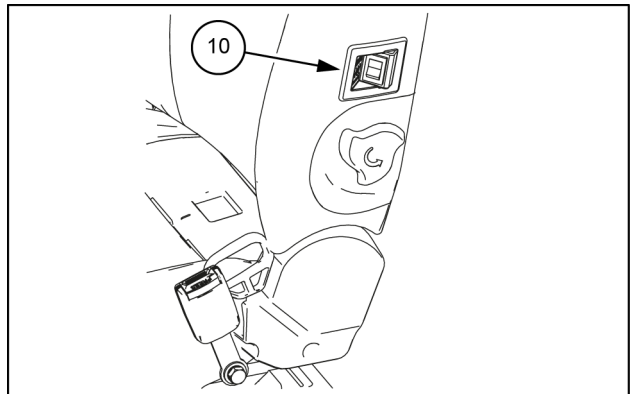
NOTE: to make the headrest return to its initial position (to the rear), tilt it completely forwards and then release it.



SMIL14CEX1661AB 8

Seat heater (optional)

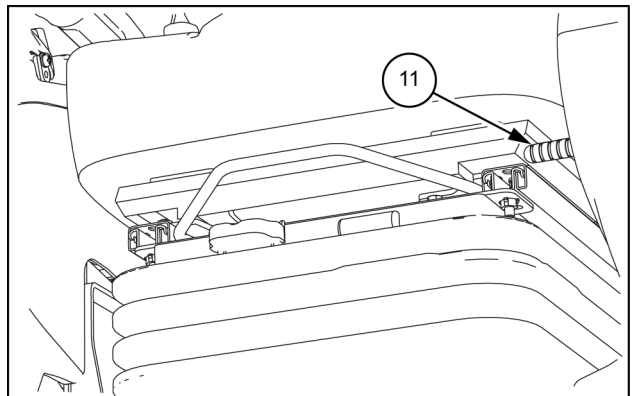
- When the switch (10) is turned on, both the backrest and the seat area will be warmed.



SMIL14CEX1662AB 9

Seat angle adjustment section (optional)

- Pull up the lever (11) to adjust the inclination of the seat.
- Release the lever at an appropriate angle.



SMIL14CEX1663AB 10

Seat belt

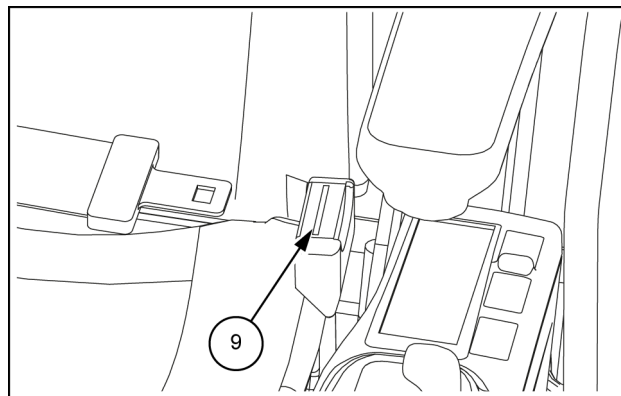
⚠ WARNING

Equipment failure could cause accident or injury!

Always fasten the seat belt securely before you operate the machine. Inspect seat belt parts for wear and damage. Replace any and all worn or damaged parts of the seat belt prior to operation.

Failure to comply could result in death or serious injury.

W0046C



- Sit comfortably on the operator's seat.
- Pull out a long section of belt.
- Engage the belt in the fastening system (9).

NOTE: if the section of belt pulled out is not long enough, release it, so it rolls up and then pull it out again.

To release the seat belt press down the releasing lever of the fastening system (9).

NOTICE: the seat belt must be kept clean. Use only soap and water to clean the belt, do not use bleach or dyes.

Forward controls

Forward controls

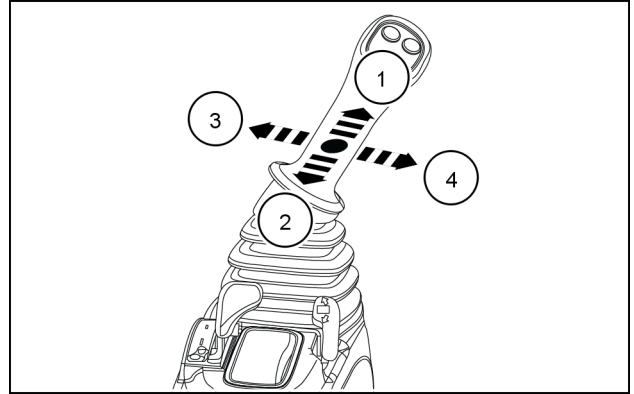
Control levers

Left-hand control lever:

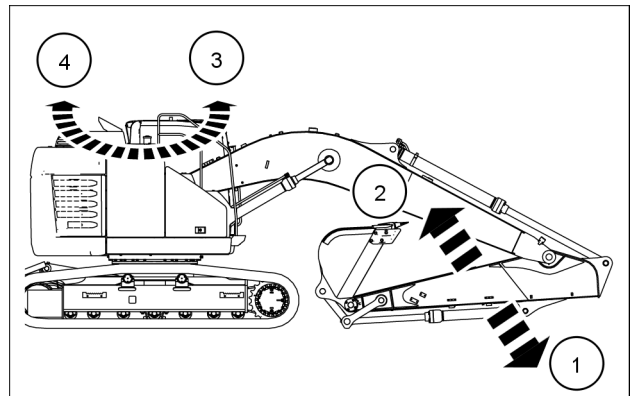
1. The arm extends.
2. The arm retracts.
3. The upper structure swings to the left.
4. The upper structure swings to the right.

NOTE: The speed of movement of the arm or the swing depends on the control lever tilt angle. In the intermediate position two movements can be obtained simultaneously.

NOTE: when the upper structure swing control is released, the upper structure may continue to rotate due to the force of inertia. In this event, make allowance for the extra movement by releasing the control slightly earlier.



SMIL15CEXY854AA 1

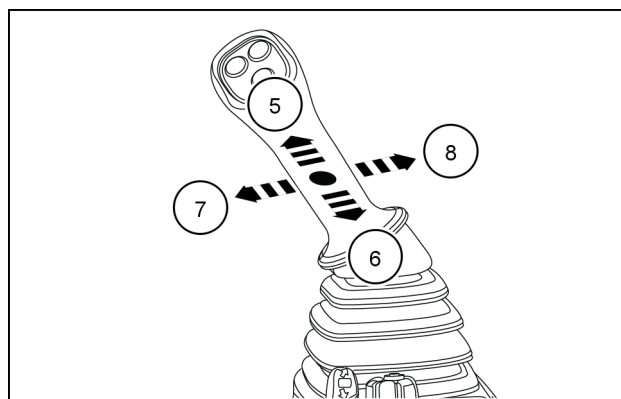


SMIL17CEX5206AA 2

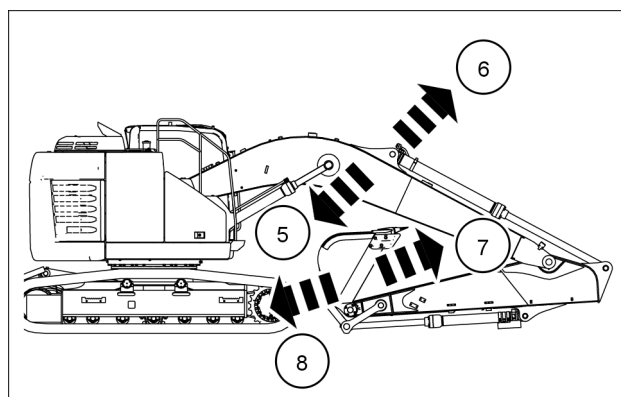
Right-hand control lever:

5. The boom lowers.
6. The boom raises.
7. The bucket retracts (filling).
8. The bucket extends (dumping).

NOTE: The speed of movement of the boom or the bucket depends on the control lever tilt angle. In the intermediate position two movements can be obtained simultaneously.



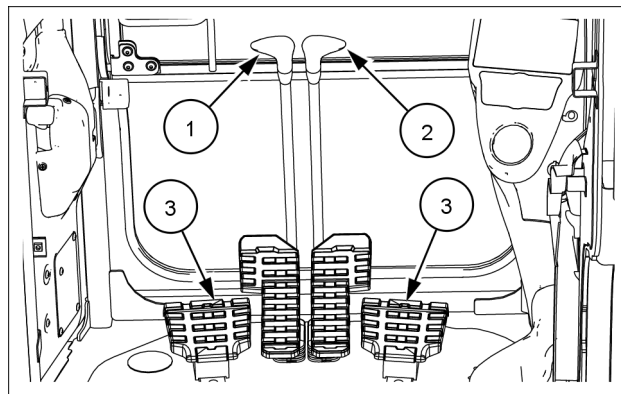
SMIL15CEXY853AA 3



SMIL17CEX5207AA 4

Travel controls

1. Left-hand travel control lever and pedal
2. Right-hand travel control lever and pedal
3. Footrest



SMIL17CEX5210AA 5

The travel control levers and pedals are used to move the machine.

(N): neutral

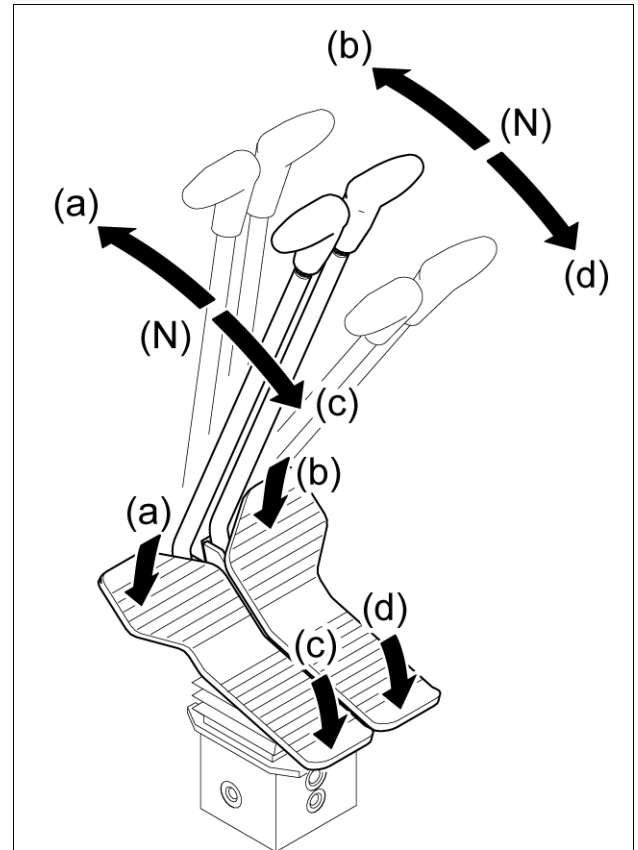
(a) + (b): machine moves forward.

(c) + (d): machine moves backward.

(b) + (c): opposite simultaneous rotation of the tracks with consequent counterclockwise rotation of the machine around its centre axis.

(a) + (d): opposite simultaneous rotation of the tracks with consequent clockwise rotation of the machine around its centre axis.

(a), (b), (c), (d): positions to move one track only. Consequently the machine steers pivoting on the stationary track.



NH0159 6

Forward controls (Optional)

⚠ WARNING

Avoid injury!

Inspect the work area or job site to make sure that machine operation can be done safely. Confirm that the lever operation is the same as indicated on the control pattern labels. If not, immediately change the machine control pattern or the label displayed to match the machine control pattern.

Failure to comply could result in death or serious injury.

W1339A

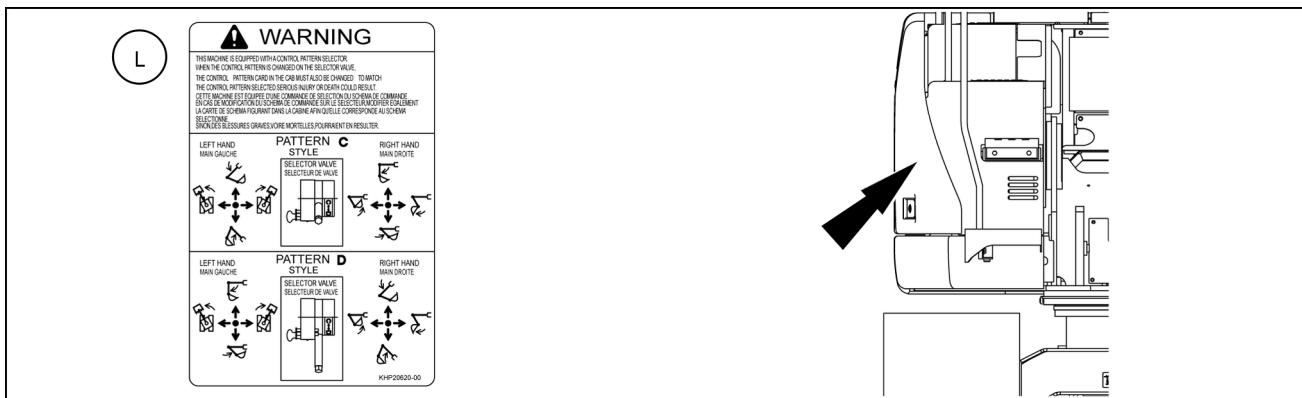
Selection of control pattern

The machine can be equipped with a selector valve that allows to set two different patterns of the hydraulic controls of the front equipment. The patterns are called C and D. Refer to the next pages for description of the patterns.

NOTICE: Before starting machine operation, check that the operating pattern of control levers is consistent with the position selected on the valve. Furthermore, check that the pattern shown on the control mapping sheet into the cab is consistent with the operating pattern of the control levers.

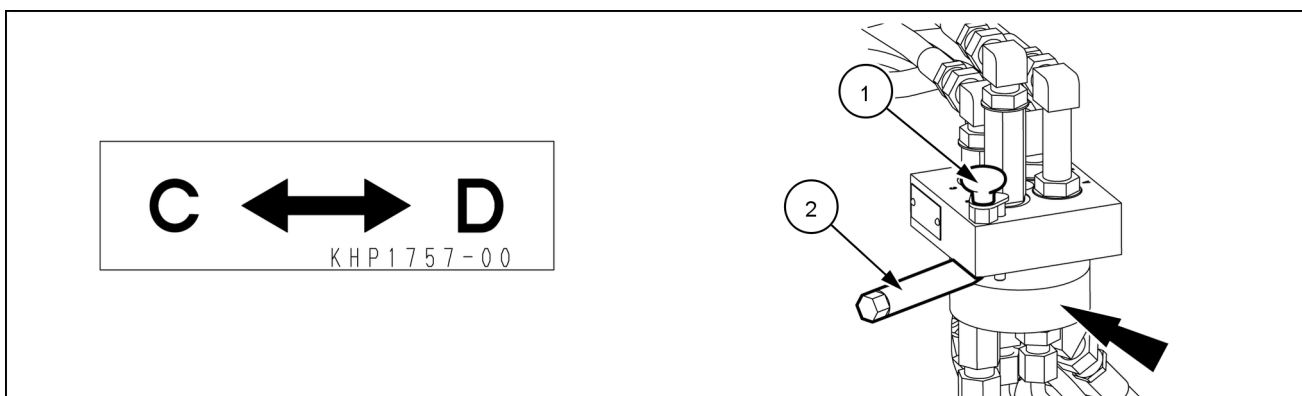
To select the desired control pattern proceed as follows:

1. Lower the attachment to the ground, and stop the engine.
2. Open the front right-hand door.
3. Read and understand the warning label (L) located inside the cover.



SMIL20CEX2495EB 1

5. Pull the locking knob (1) and move the lever (2) to set the desired control pattern C or D. Release the locking knob.



SMIL20CEX2495EA 2

6. Close the front right-hand door.

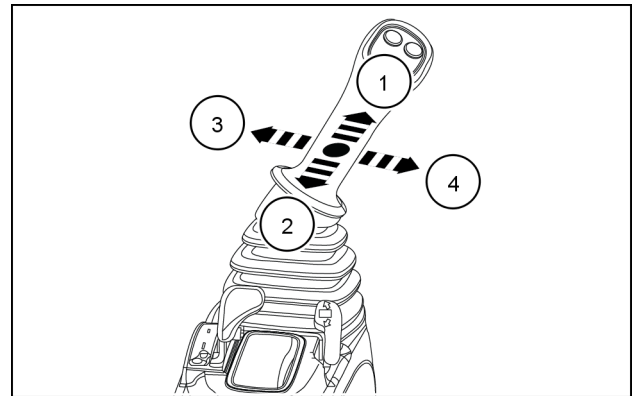
D position: ISO control pattern

Left-hand control lever:

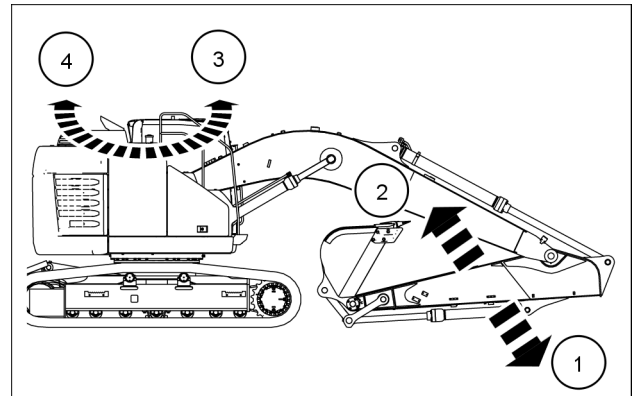
1. The arm extends.
2. The arm retracts.
3. The upper structure swings to the left.
4. The upper structure swings to the right.

NOTE: The speed of movement of the arm or the swing depends on the control lever tilt angle. In the intermediate position two movements can be obtained simultaneously.

NOTE: when the upper structure swing control is released, the upper structure may continue to rotate due to the force of inertia. In this event, make allowance for the extra movement by releasing the control slightly earlier.



SMIL15CEXY854AA 3

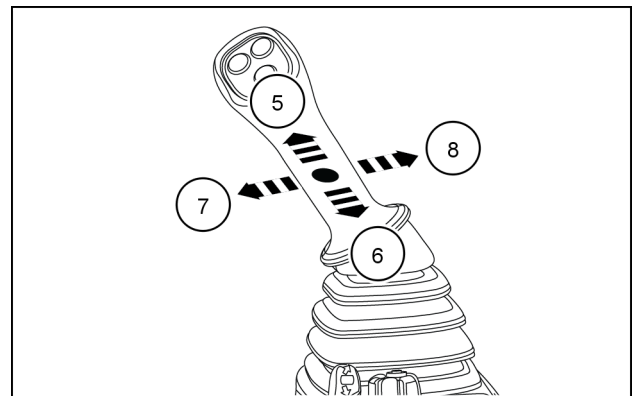


SMIL17CEX5206AA 4

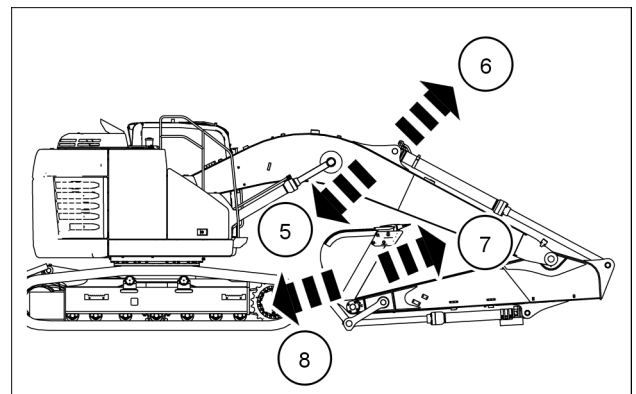
Right-hand control lever:

5. The boom lowers.
6. The boom raises.
7. The bucket retracts (filling).
8. The bucket extends (dumping).

NOTE: The speed of movement of the boom or the bucket depends on the control lever tilt angle. In the intermediate position two movements can be obtained simultaneously.



SMIL15CEXY853AA 5



SMIL17CEX5207AA 6

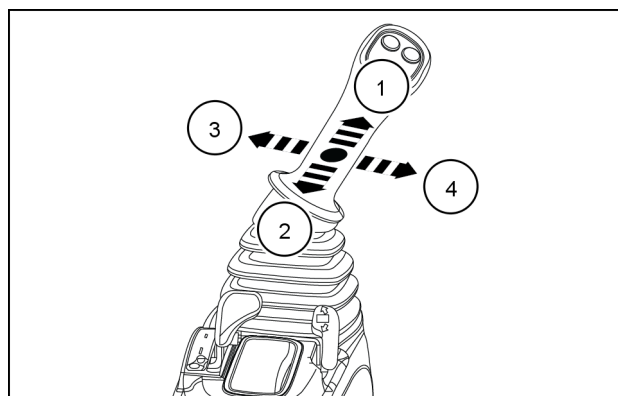
C position: BHL control pattern

Left-hand control lever:

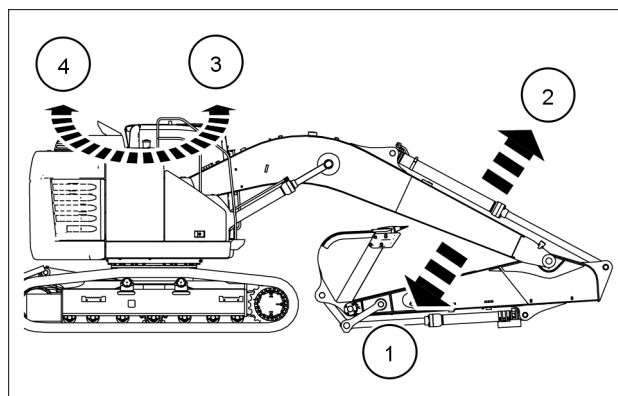
1. The boom lowers.
2. The boom raises.
3. The upper structure swings to the left.
4. The upper structure swings to the right.

NOTE: The speed of movement of the boom or the swing depends on the control lever tilt angle. In the intermediate position two movements can be obtained simultaneously.

NOTE: when the upper structure swing control is released, the upper structure may continue to rotate due to the force of inertia. In this event, make allowance for the extra movement by releasing the control slightly earlier.



SMIL15CEXY854AA 7

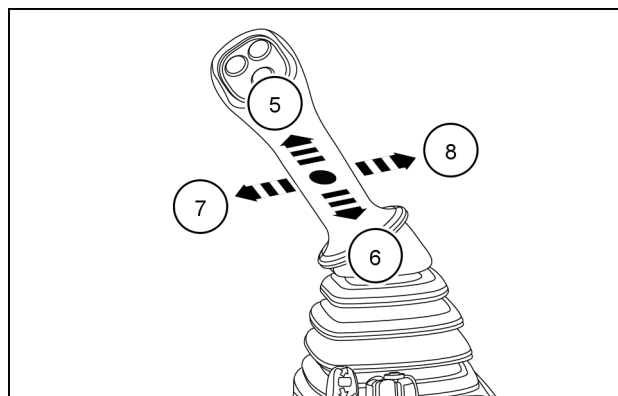


SMIL17CEX5206AA 8

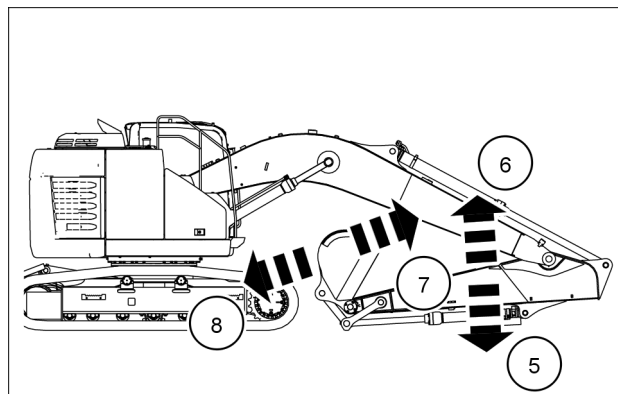
Right-hand control lever:

5. The arm extends.
6. The arm retracts.
7. The bucket retracts (filling).
8. The bucket extends (dumping).

NOTE: The speed of movement of the arm or the bucket depends on the control lever tilt angle. In the intermediate position two movements can be obtained simultaneously.



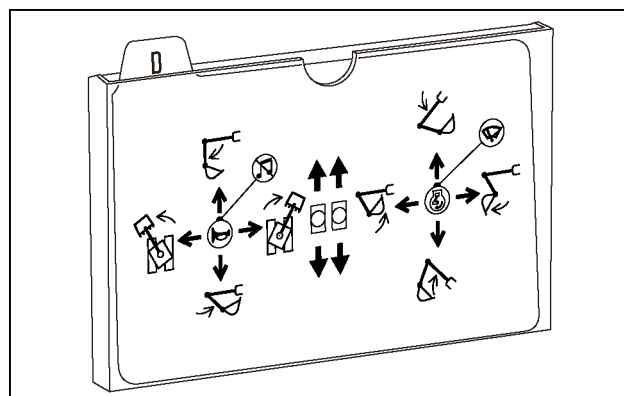
SMIL15CEXY853AA 9



SMIL17CEX5207AA 10

Confirmation of the control pattern selection

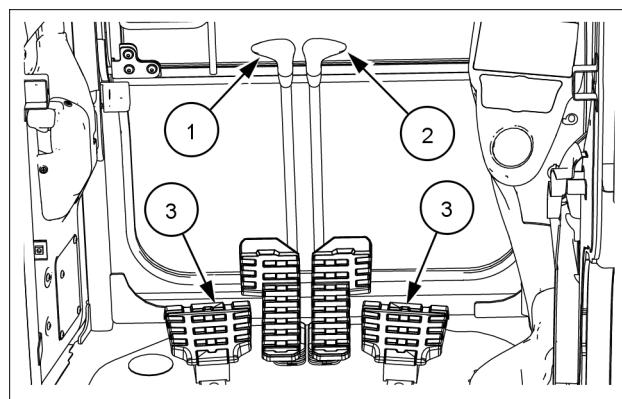
1. Get onto the cab and make sure to place the sheet that maps the operating controls to the side corresponding to the selected control pattern (C or D).
2. Start the engine and check that the operating pattern of control levers is consistent with the position selected on the valve and shown by the mapping sheet.



SMIL14CEX1671AA 11

Travel controls

1. Left-hand travel control lever and pedal
2. Right-hand travel control lever and pedal
3. Footrest



SMIL17CEX5210AA 12

The travel control levers and pedals are used to move the machine.

(N): neutral

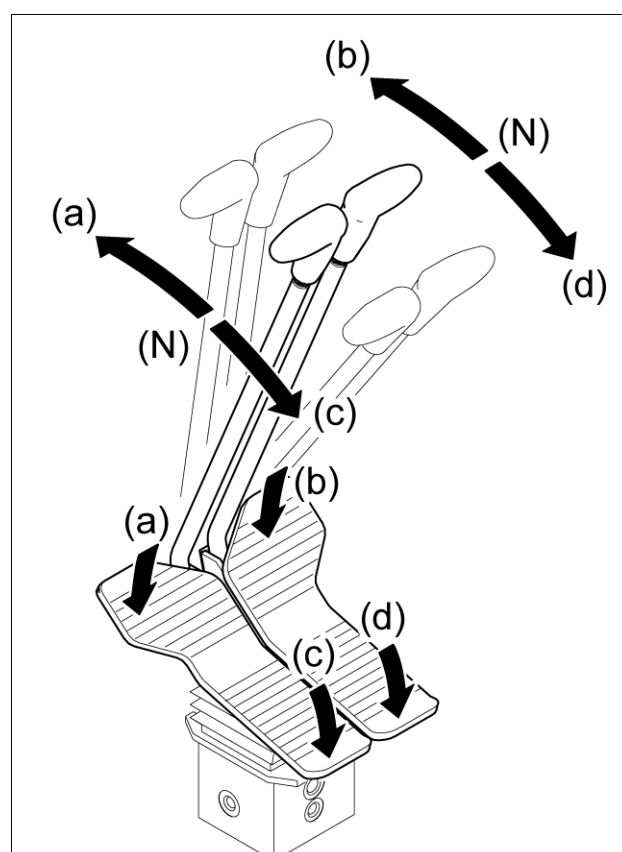
(a) + (b): machine moves forward.

(c) + (d): machine moves backward.

(b) + (c): opposite simultaneous rotation of the tracks with consequent counterclockwise rotation of the machine around its centre axis.

(a) + (d): opposite simultaneous rotation of the tracks with consequent clockwise rotation of the machine around its centre axis.

(a), (b), (c), (d): positions to move one track only. Consequently the machine steers pivoting on the stationary track.



NH0159 13

Windshield

⚠ CAUTION

Pinch hazard!

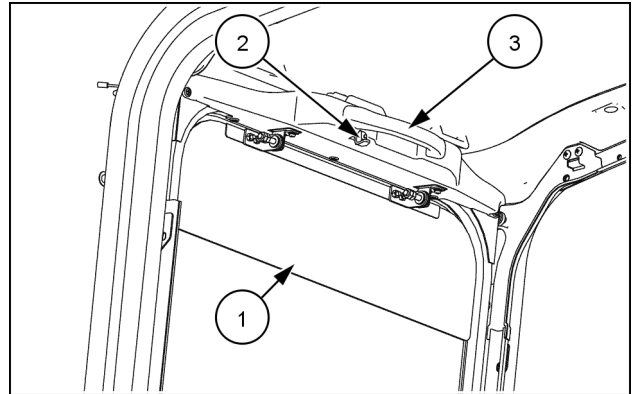
Make sure you correctly follow the instructions in this manual when handling the windshield. If you do not handle the windshield correctly, it could slip and injure your fingers or hands.

Failure to comply could result in minor or moderate injury.

C0045A

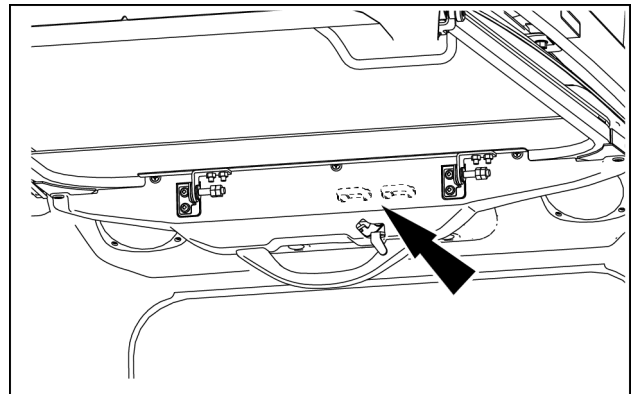
Opening

1. Fold the sun shield **(1)** back against the windshield and operate the lever **(2)**.
2. Hold the lower and upper handles **(3)** and carefully raise the windshield.



SMIL17CEX0900AA 1

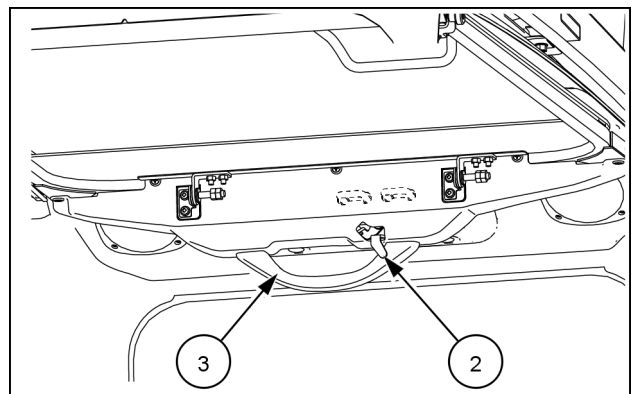
3. Pull the windshield to the rear until it engages perfectly behind the cab.



SMIL17CEX0899AA 2

Closing

1. Operate the lever **(2)** to release the windshield.
2. Hold both handles **(3)** and carefully lower the windshield. Make sure the window is completely down.
3. Make sure the top of the windshield is correctly latched.

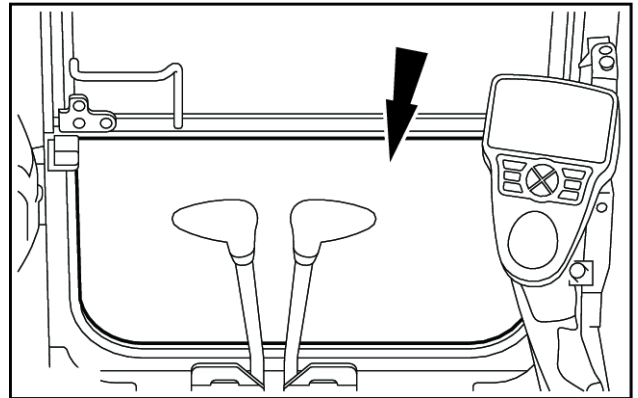


SMIL17CEX0899AA 3

Front lower window

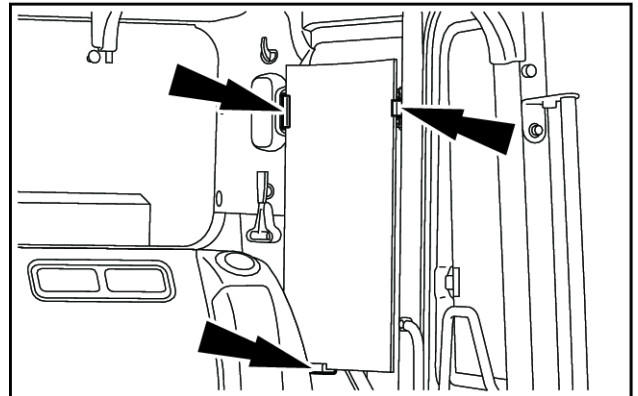
The front lower window may only be removed when the windshield is open.

1. Remove the window from its housing by sliding it upward.



SMIL13CEX2594AB 1

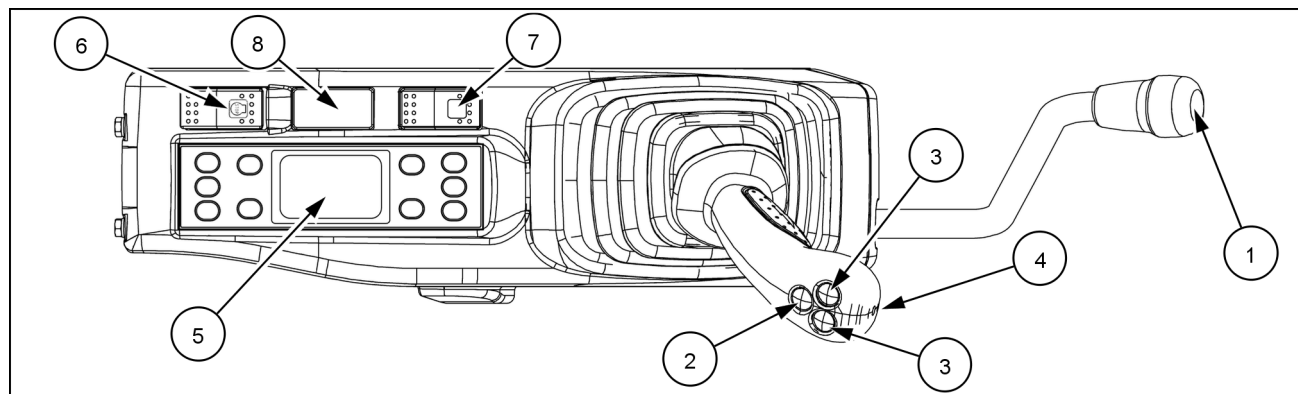
2. Place the window in the storage position provided to the left of the operator's seat and then engage it correctly.



SMIL13CEX2595AB 2

Left-hand side controls

Left-hand side controls



SMIL20CEX2497EA 1

(1) Gate lock lever.

(2) Horn button.

(3) Not active.

(4) Radio mute button: the radio mute button is located underneath the control lever. Push the button to mute the volume. Push it again to resume the volume.

NOTICE: make sure to sound the horn before starting the engine and resuming machine operation.

(5) Control of heating, ventilation or air conditioning.

(6) Emergency stop switch (refer to Chapter 4).

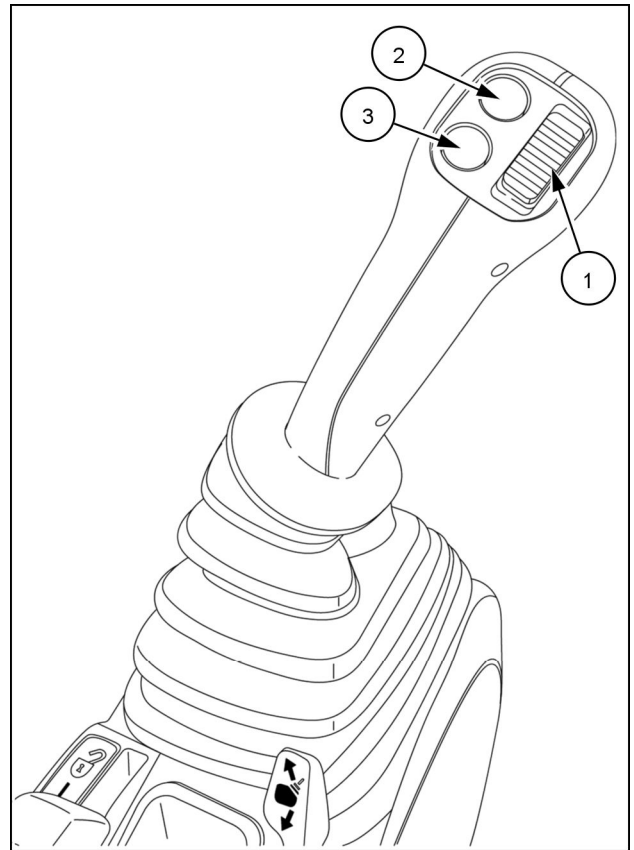
(7) Overload warning switch (refer to Chapter 9).

NOTE: The overload warning alarm is mainly intended for safe operation in loads handling application. Do not activate it during digging or truck loading application.

(8) Hydraulic quick coupling system activation switch (optional, refer to Chapter 9).

When the machine is equipped with the auxiliary low-flow hydraulic circuit, the left-hand control lever includes:

1. Proportional switch to operate double-acting hydraulic attachments.
2. ON/OFF button to operate the preferred operating direction of the double-acting hydraulic attachment.
3. Horn button.



SMIL15CEXY839BA 2

Gate lock lever

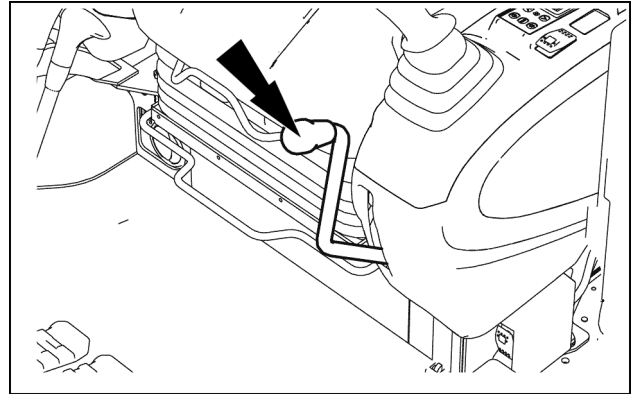
⚠ WARNING

Unexpected machine movement!

**When the machine is not in operation, the gate lock lever must be in the LOCK position.
Failure to comply could result in death or serious injury.**

W1487A

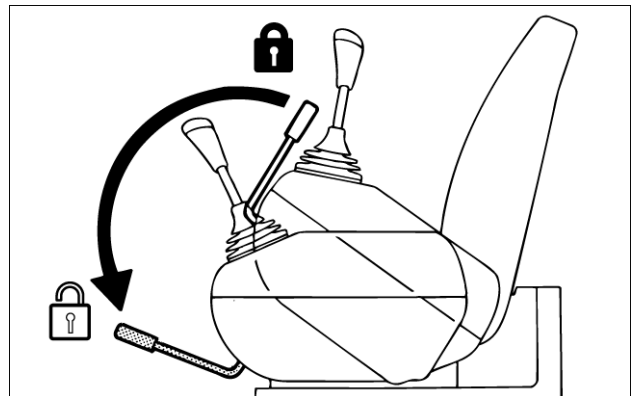
The gate lock lever allows to cancel the functioning of the control levers and pedals.



SMIL17CEX0199AA 1

The gate lock lever has two positions:

Unlock position: when the gate lock lever is in unlock position, the attachment, the travel functions and the swing functions can be operated.

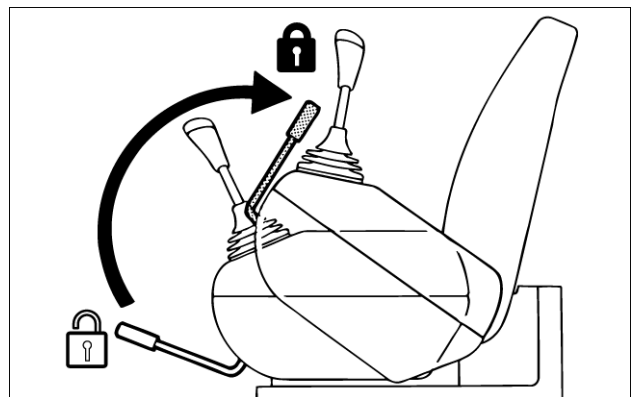


NH0003 2

Lock position: when the gate lock lever is in lock position, all the functions are disabled and the left hand console is fully raised. The operator can thus easily get off the cab.

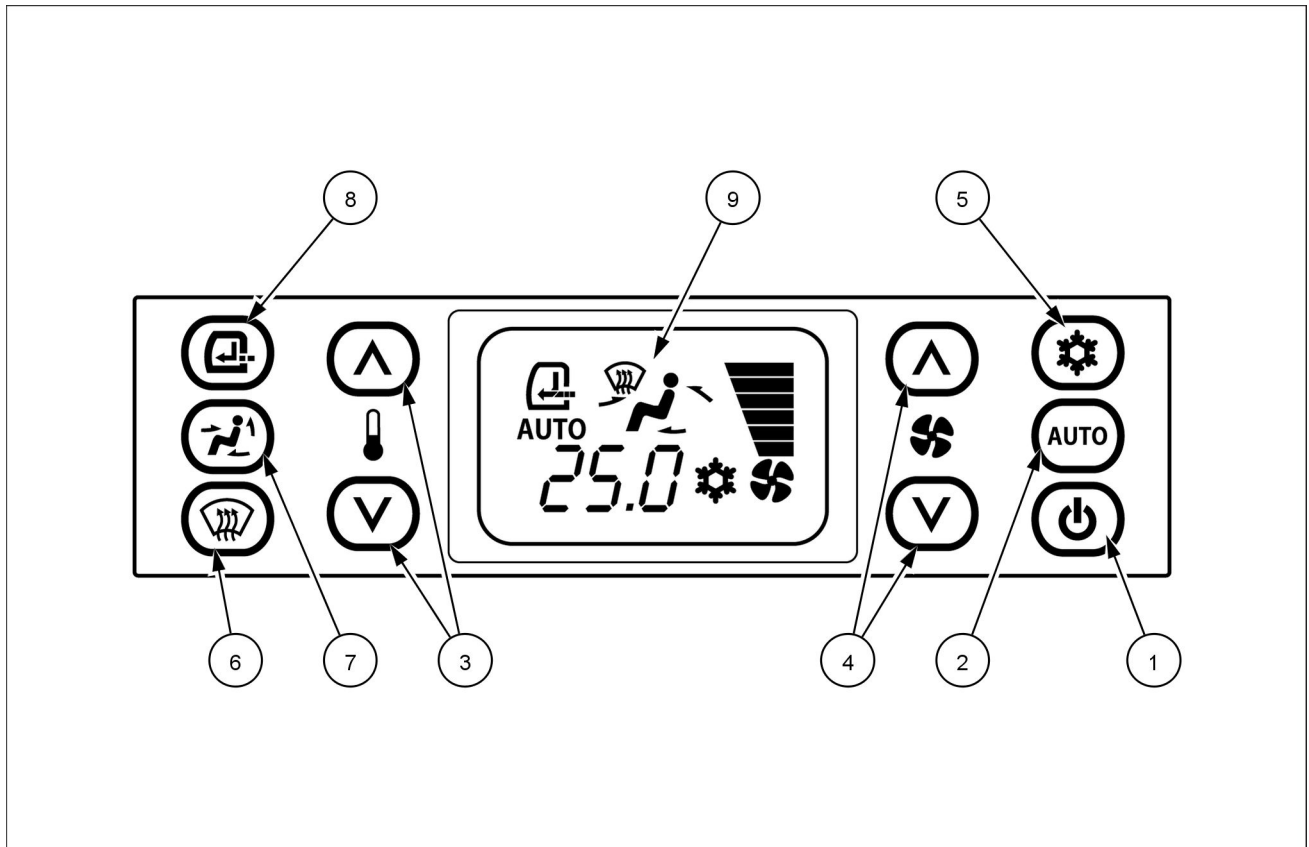
NOTE: Set the gate lock lever to lock position when ending machine operation and leaving the machine.

NOTE: the engine must be started with the gate lock lever in lock position. If the gate lock lever is in unlock position, the engine does not start.



NH0002 3

Heating, ventilation, or air-conditioning control



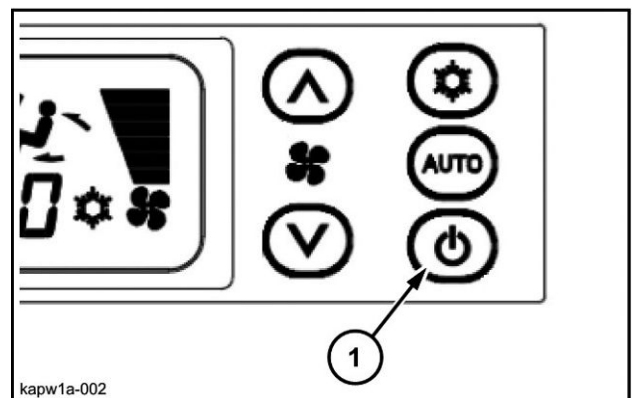
SMIL18CEX0530FB 1

- | | |
|---------------------|-------------------------|
| 1. On/Off | 6. Windshield defroster |
| 2. Automatic | 7. Air flow direction |
| 3. Temperature | 8. Air recycling |
| 4. Ventilation | 9. Display screen |
| 5. Air conditioning | |

On/Off

This push-button (1) is for turning the system On or Off.

NOTICE: When the system is turned On it will operate at the same setting as the one selected previously.

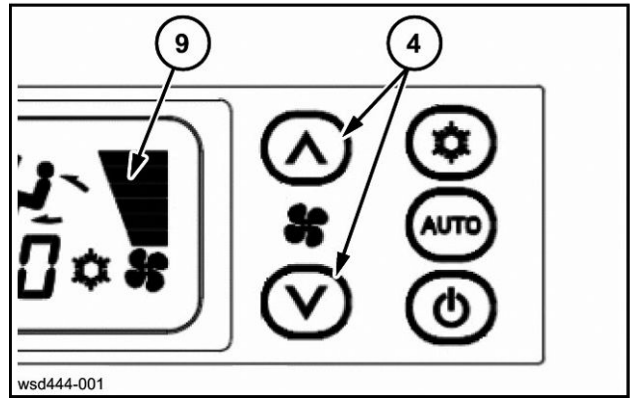


kapw1a-002

KAPW1A-002 2

Ventilation

These push buttons **(4)** enable the air flow to be increased or reduced. To increase the flow of air, press the top button. To decrease the flow of air, press the lower button. The segments on the display screen **(9)** will increase or decrease depending on the flow selected.

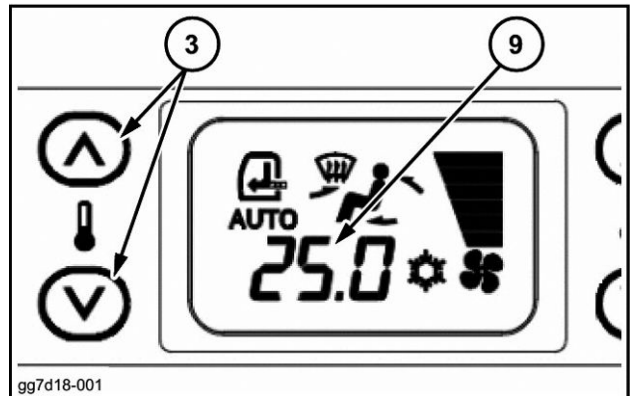


WSD444-001 3

Temperature

These push buttons **(3)** allow the temperature to be raised or lowered within an **18 °C (64.4 °F)** and **32 °C (89.6 °F)**. To increase the temperature, press the up button. To lower the temperature, press the low button. The temperature reading will appear on the display screen **(9)**.

NOTICE: The temperature reading can be displayed in degrees Celsius or degrees Fahrenheit. To select the scale required, press the two push buttons **(3)** simultaneously for five to ten seconds. The degrees Fahrenheit temperature will be followed by an "F".



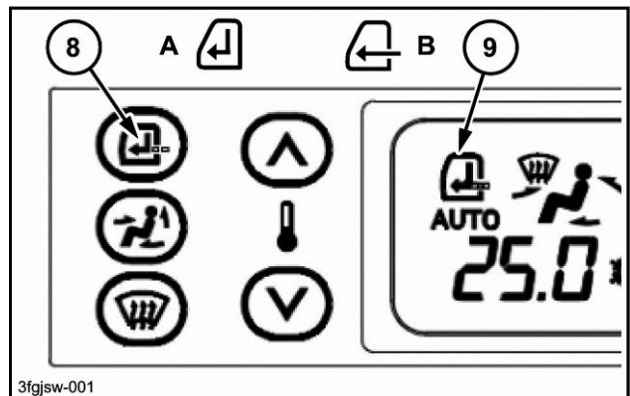
GG7D18-001 4

Air recycling

This button **(8)** allows for two different types of air circulation to be selected. Fresh air from outside or recycled air from inside. The type of circulation will be changed each time the button is pressed. Indication of the type of flow direction selected will appear on the display screen **(9)**.

(A) Internal air circulated

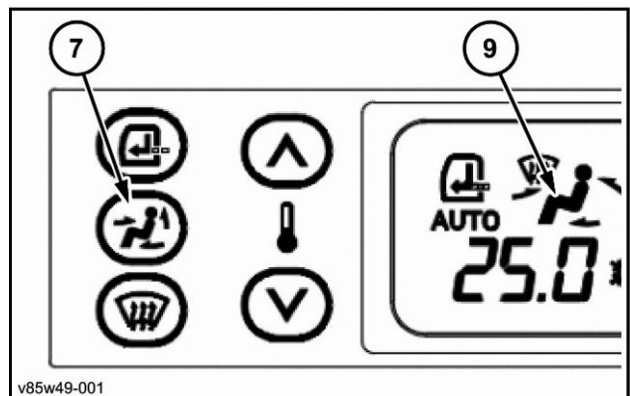
(B) External air enters



3FGJSW-001 5

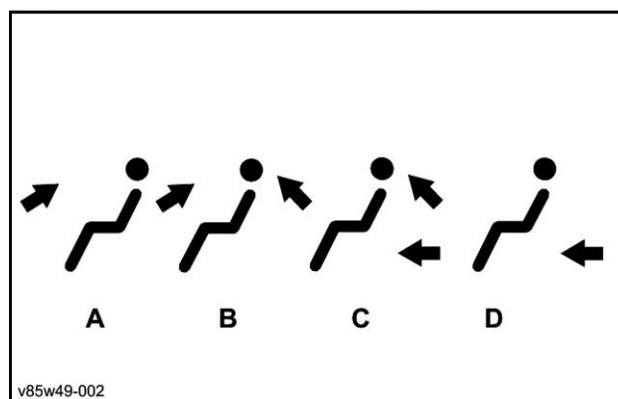
Air flow direction

This button **(7)** allows four different types of air flow direction to be selected. To select the type of air flow direction, press the button **(7)** successively until the type of flow direction required is obtained. Indication of the type of flow direction selected will appear on the display screen **(9)**.



V85W49-001 6

- (A) Upper front distribution.
- (B) Upper rear distribution.
- (C) High force upper distribution and low force rear distribution.
- (D) Lower rear distribution (feet) and windshield.

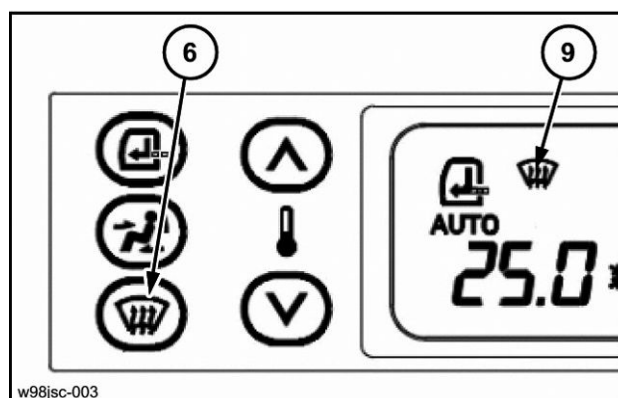


V85W49-002 7

Windshield defroster

This button (6) allows the windshield to be defrosted. Press the button to defrost the windshield. The display screen will show that the defroster is working (9). To turn the defroster off, press the button again and the indication on the display screen will disappear.

NOTICE: When this button is used, the control (7) is deactivated.



W98JSC-003 8

Air conditioning

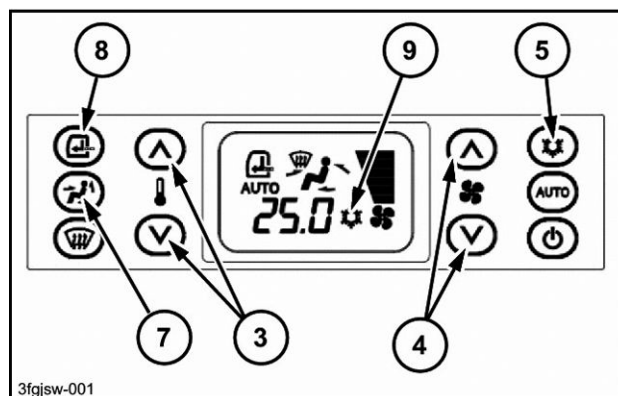
NOTE: Operate the air conditioning system at least once a week, if only for a short time.

NOTE: When using the air conditioning, it is essential for all the operator's compartment windows, the windshield and the cab door to be kept closed. The air vents must be kept in open position.

The air conditioning can be used in two different ways: manual or automatic air conditioning.

Manual:

This button (5) is used to turn the air conditioning on and off. When the air conditioning is running, confirmation is given on the display screen (9). Manual adjustments can be made using controls (3), (4), (7) and (8).

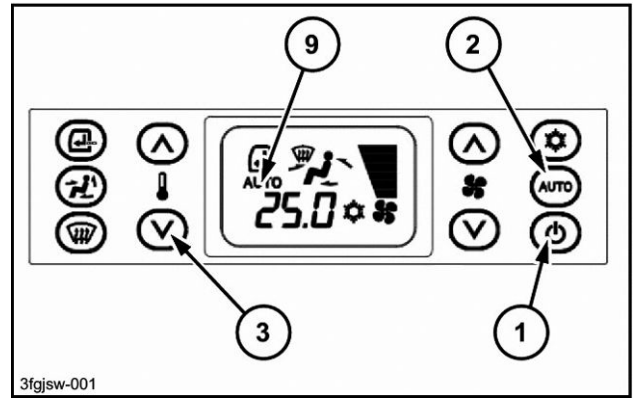


6CSC9W-001 9

Automatic:

This button **(2)** is used for automatic adjustment of the volume, the direction of flow and starting or stopping of the air conditioning. AUTO will appear on the display screen **(9)**. In automatic mode, the only possible manual adjustment is to the temperature **(3)**.

If a control other than the temperature control is operated, the automatic mode will be cancelled and AUTO will disappear from the display **(9)**. To stop the system, press buttons **(1)** or **(2)**.



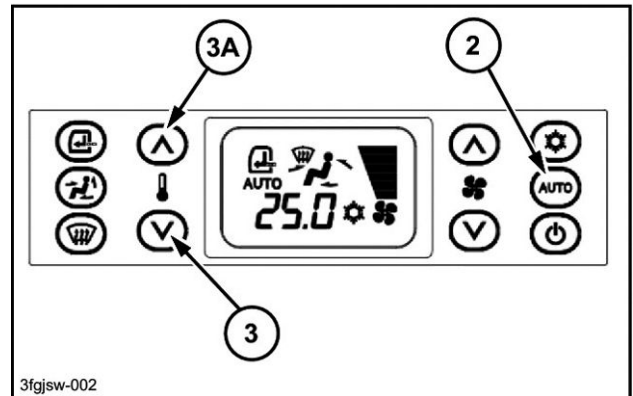
8TWEZ7-001 10

To obtain hot or cold air quickly:

Cold air: Quit the automatic mode by pressing button **(2)** then press button **(3)** down to the minimum temperature of **18 °C (64.4 °F)**. Ventilation will be at maximum and cold air flow will come from the front.

Hot air: Quit the automatic mode by pressing button **(2)** then press button **(3A)** up to the maximum temperature of **32 °C (89.6 °F)**. Ventilation will be at maximum and the flow of hot air will come from the rear at foot level.

NOTICE: To ensure correct functioning and full effectiveness of the air conditioning system, it must be run at least once a week, even if only for a short time.



8TWEZ7-002 11

Cab internal lighting

The room lamp allows to have internal lighting near to the operator's station. The room lamp has a control switch with three operating positions:

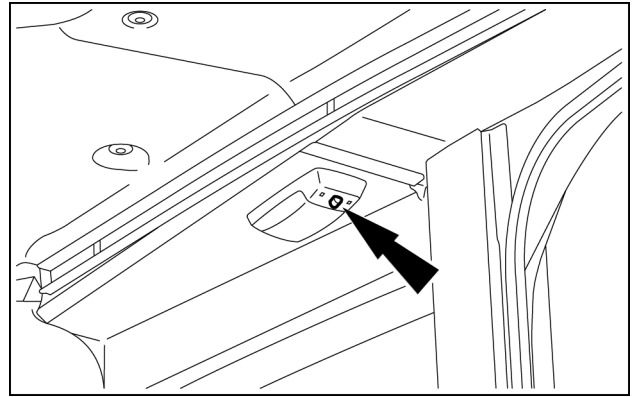
- OFF
- DOOR
- ON

When the switch is set in DOOR position, the room lamp turns on automatically when the door is opened, and turns off automatically when the door is closed.

NOTE: If the door is left open for more than **30 s**, the lamp is forcedly turned off in order to prevent drain of the battery charge.

The ON position of the switch allows to turn on the room lamp only if the starter key is set in ACC or ON position.

NOTICE: Never leave the room lamp switch in ON position. The battery charge may be drained out. As the need for lighting ends, set the switch to OFF or DOOR position.



SMIL17CEX0904AA 1

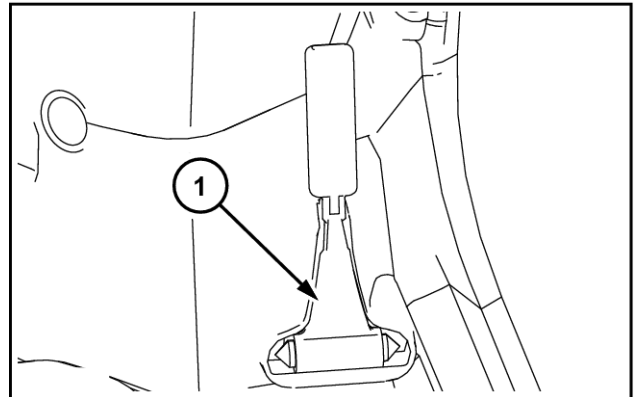
Emergency exit hammer

Located on the left-hand cab, use the hammer (1) to break the rear window, and then push the window strongly and escape outside.

Consult your CASE CONSTRUCTION dealer for window installation.

NOTICE: Do not break the rear window except when it is absolutely necessary, such as to escape in an emergency.

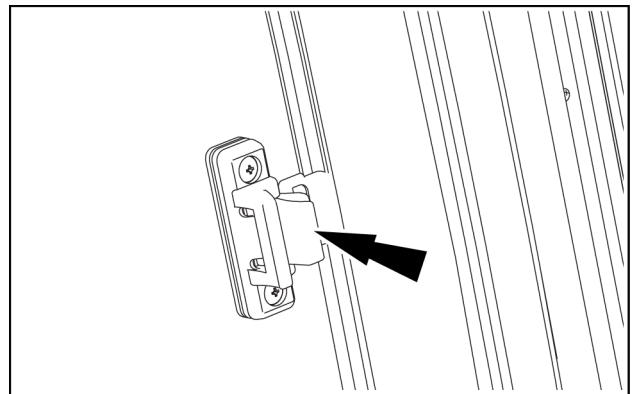
NOTICE: Do not place anything in front of the window. Doing so may obstruct an emergency escape.



SMIL13CEX2621AB 1

Sliding windows on door

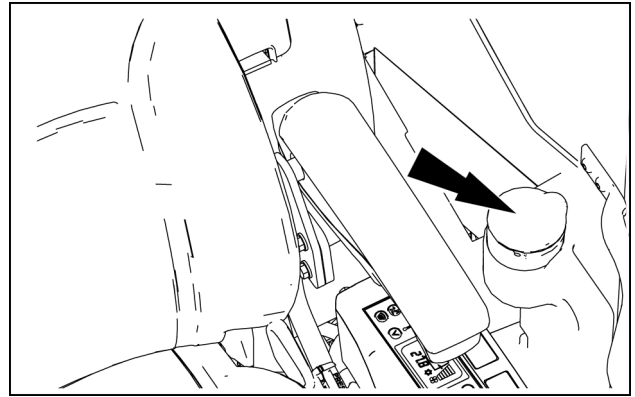
The two windows on the cab door can be opened singularly or simultaneously. Release the lock and slide each window in order to open it.



SMIL14CEX2569AA 1

Ash tray

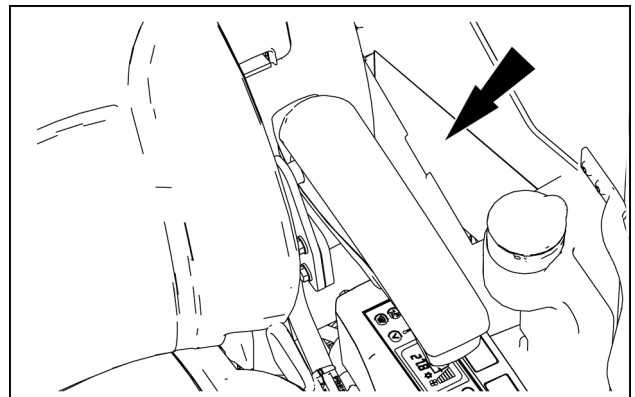
Located leftward the operator's seat.



SMIL17CEX0200AA 1

Magazine rack

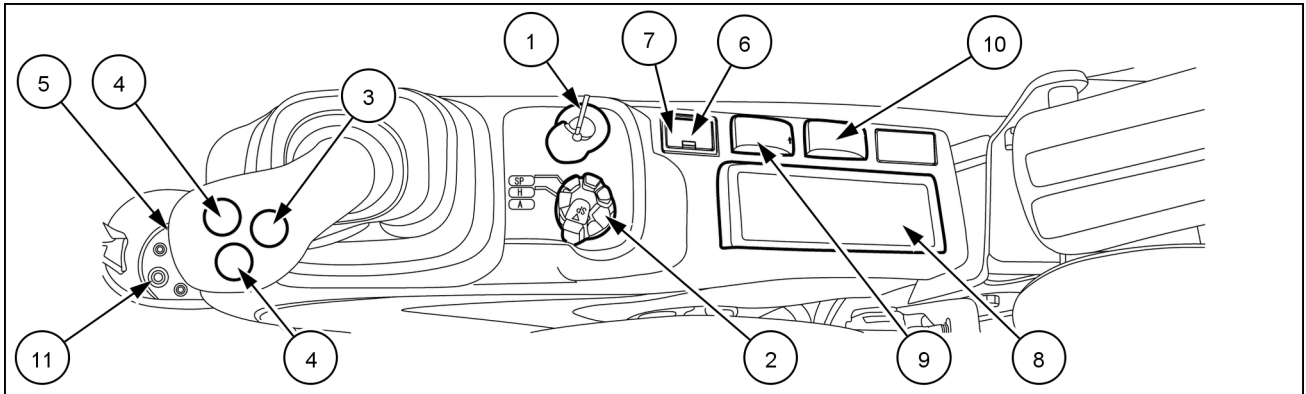
Located leftward the operator's seat.



SMIL17CEX0200AA 1

Right-hand side controls

Right-hand side controls



SMIL20CEX2498EA 1

(1) Starter switch (4 positions): ON (contact), START (engine ignition), OFF (engine shut-down) and ACC (accessory current supply).

NOTICE: when the starter key is in ON position, if the anti-theft protection has been programmed, it will be necessary to enter the password. Refer to page 4-1.

NOTE: the starter key is also used to lock the cab door, the engine hood, the storage compartment, the side doors and the fuel tank cap.

(2) Engine speed throttle and work mode selector.

(3) Engine low idle speed button: the engine low idle speed button enables to set the engine speed to low idle at a touch without moving the engine speed throttle. If operating at engine speed different from low idle, press and release the engine low idle speed button to get down the engine speed to low idle. Press and release the button again to resume the engine speed set by the engine speed throttle.

(4) Not active.

(5) One-touch wiper button: press and hold down the button to operate the wiper.

(6) Auxiliary port.

(7) USB port.

(8) Radio.

(9) Travel alarm switch.

(10) Rotary light switch: this control is used to turn the rotating warning light on or off. When you press ON (operate), the rotating warning light and the indicator lamp on the switch light up. When you press OFF (stop), the rotating warning light goes out.

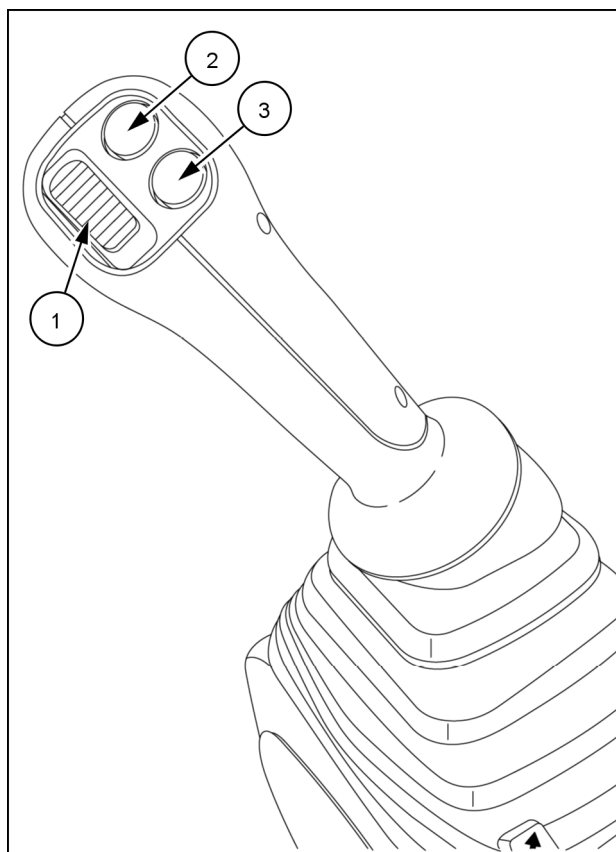
(11) Beverage can holder.

When the machine is equipped with an auxiliary high-flow hydraulic circuit, the right-hand control lever includes:

1. Proportional switch to operate double-acting hydraulic attachments.
2. ON/OFF button to operate single-acting hydraulic attachments.
3. Engine low idle speed button.

NOTE: The auxiliary high-flow hydraulic circuit can be equipped with two alternative controls: the auxiliary pedal or the ON/OFF button and proportional switch on the right-hand control lever. Check which type of control is actually fitted on the machine before start operating the attachment.

NOTICE: Do not operate controls for auxiliary high-flow hydraulic circuit without setting any flow rate/pressure combination. The circuit would work by default at maximum pressure, and this may lead to severe damages to the attachment. For the setting procedure of auxiliary high-flow hydraulic circuit, refer to Chapter 9.



SMIL15CEXY838BA 2

(1) Storage tray.

(2) Horn volume lowering switch: the horn volume lowering switch allows to change the volume of the horn. Press the ON side of the switch to lower the volume of the horn. Press the OFF side of the switch to resume the normal volume of the horn.

(3) 12 V power supply socket: the device is active with the starter key in ON position, or while the engine is running.

NOTICE: connect only 12 V devices to the socket. Connecting devices functioning at different voltage can cause damages to the device itself and to the electrical system.

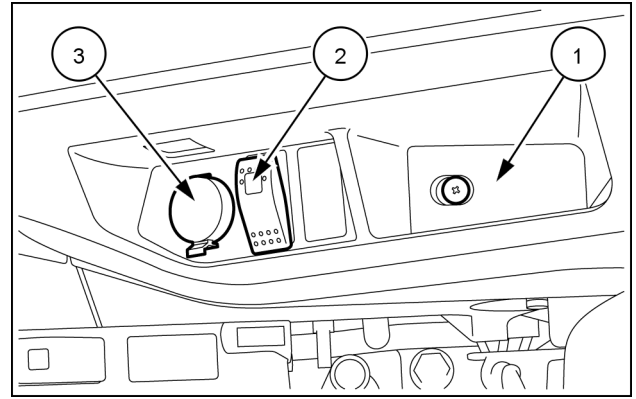
(4) Cigarette lighter and 24 V power supply socket: the device is active with the starter key in ON position, or while the engine is running.

To operate the cigarette lighter, push it down to engage its heating position.

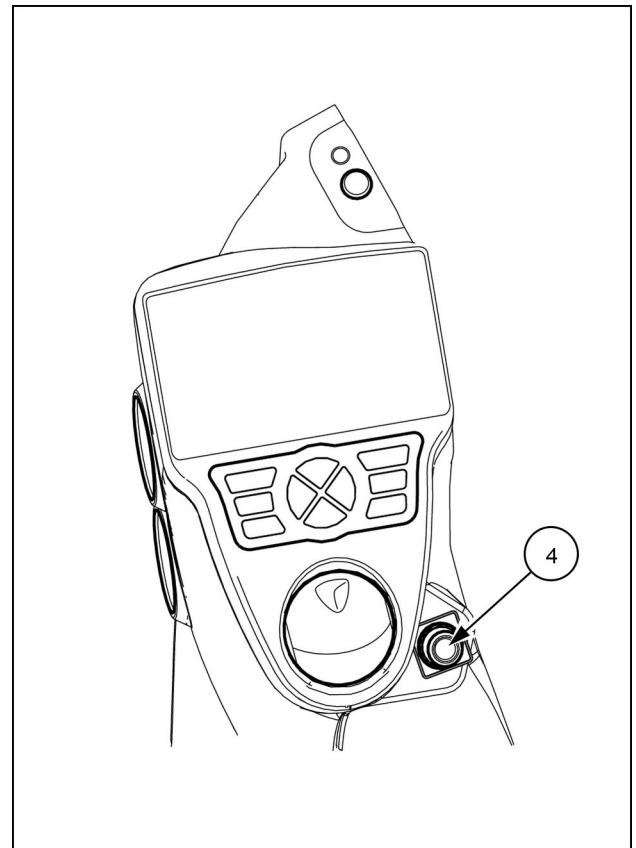
NOTICE: keep pushing the cigarette lighter can cause serious damages to the device and to the machine electrical system.

NOTICE: the electrical system may be damaged if the cigarette lighter does not return to its original position after 30 s. Pull it out manually and consult the CASE CONSTRUCTION dealer.

NOTICE: connect only 24 V devices to the socket. Connecting devices functioning at different voltage can cause damages to the device itself and to the electrical system.



SMIL21CEX0039AA 3



SMIL19CEX2698BA 4

Dozer blade control lever

⚠ WARNING

Hazard to bystanders!

ALWAYS make sure the work area is clear of bystanders and domestic animals before starting this procedure. Know the full area of movement of the machine. Do not permit anyone to enter the area of movement during this procedure.

Failure to comply could result in death or serious injury.

W0245A

The dozer blade control lever is located beside the right-hand console. Basic operation of dozer blade control lever:

- Pull the lever to raise the dozer blade.
- Push the lever to lower the dozer blade.

The operation of the dozer blade stops when the lever is released. The lever returns to the neutral position.

Use the blade only for light work such as dozing of soft soil or mud.

Do not forcibly push down or dig deeply with the blade.

When operating in an area with many rocks and stones, pay attention not to damage the blade.

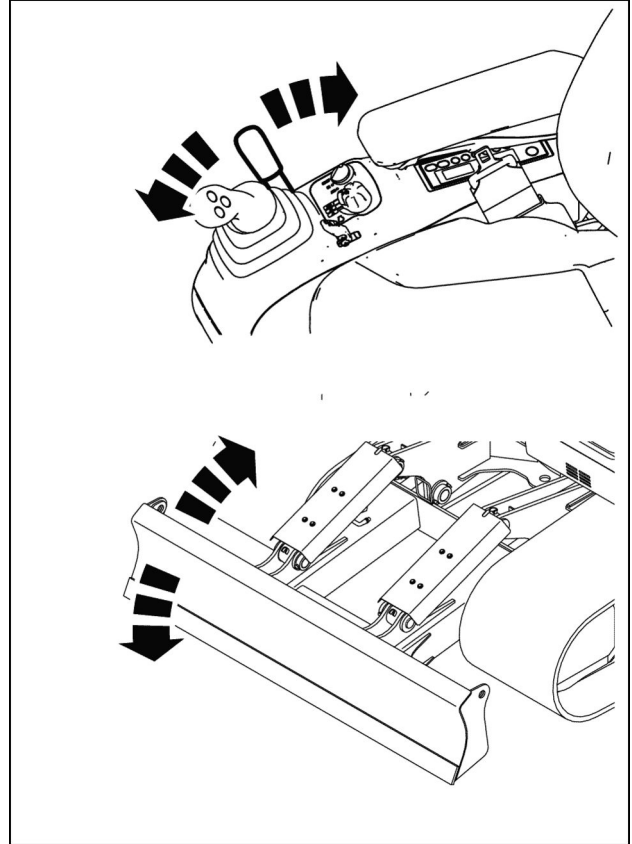
During blade operations, avoid application of concentrated or lateral load to the blade. Severe damages may be caused to the blade structure.

When the blade is used as an outrigger during the operation, check that the ground has the sufficient strength, and be sure that the edge surface of the blade is contacting the ground uniformly. Severe damages may be caused to the blade structure if the machine is supported only at one side of the blade.

NOTICE: Make sure to lower the blade to the ground before stopping machine operation.

If the engine is stopped with the blade in raised position, it is still possible to lower the blade proceeding as follows:

1. Turn the starter key to ON position.
2. Set the gate lock lever in unlock position.
3. Push the blade control lever to lower the dozer blade.



SMIL17CEX0197BA 1

Instrument cluster

(1) Ambient sensor.

NOTE: Do not place any object on the ambient sensor: the climate control system may not correctly control the temperature inside the cab.

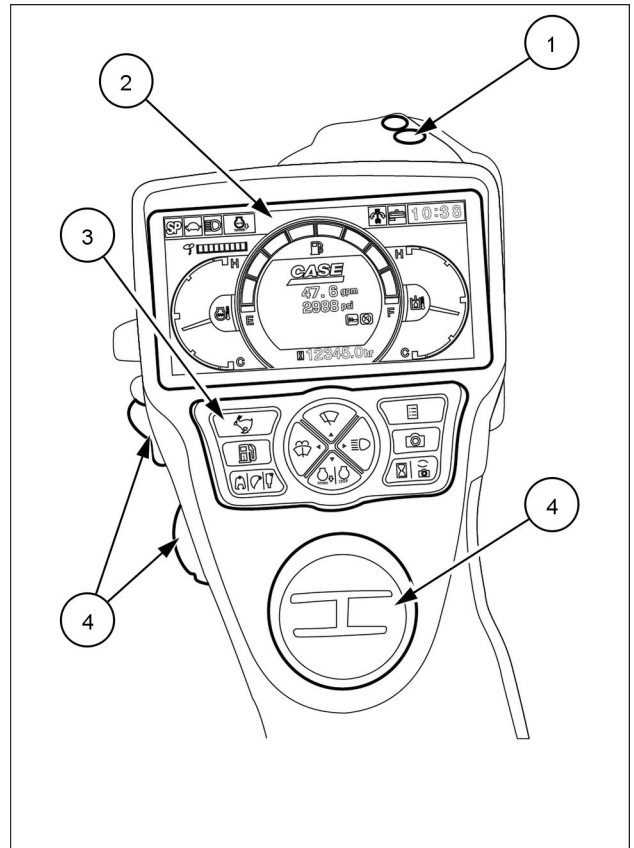
(2) Display.

(3) Control buttons.

(4) Air vents.

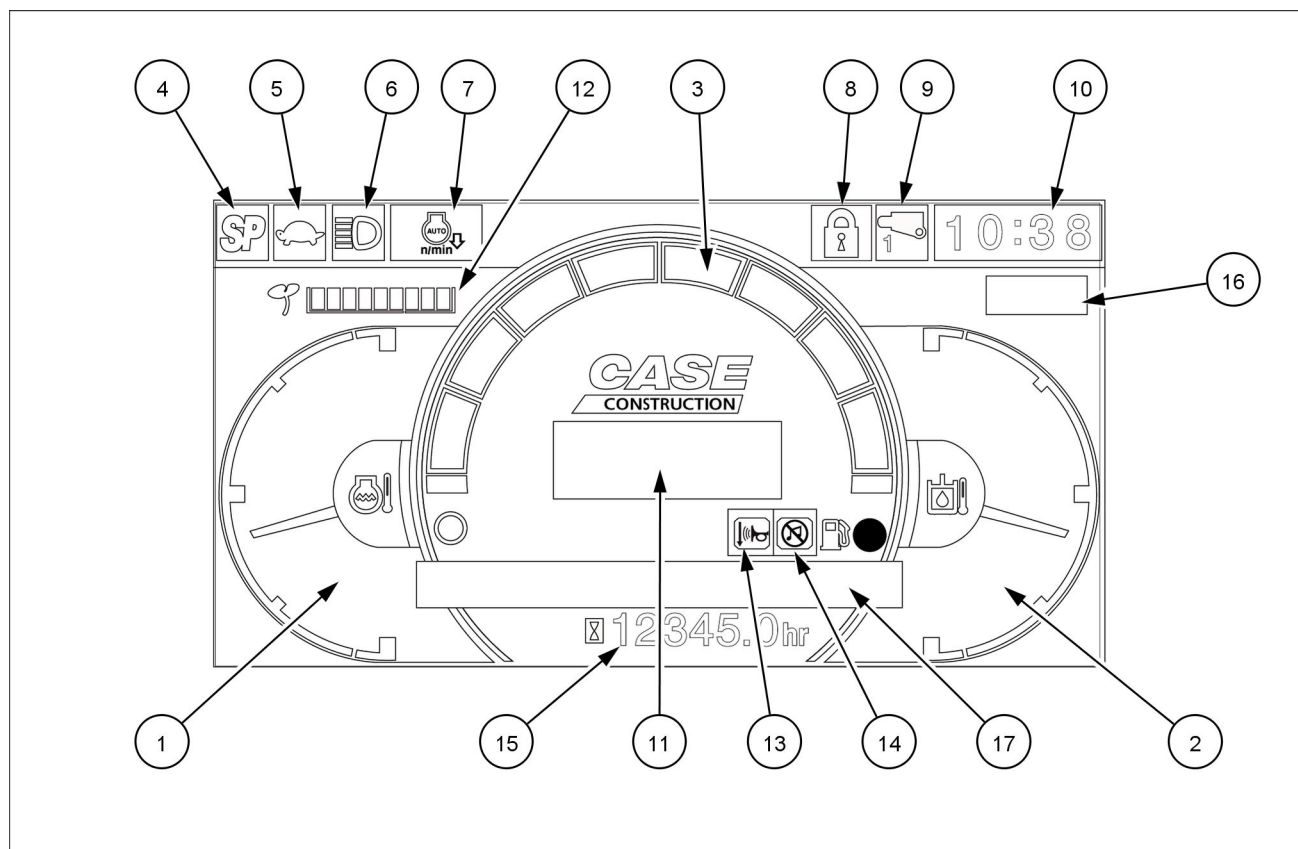
NOTE: The air vents should be manually set. Make sure to set the opening and the direction of the air vents in order to grant the desired condition into the cab environment.

NOTICE: Make sure to keep the instrument cluster protected from water and from any kind of fluid in order to prevent damage. Use only a soft, dry cloth to clean the instrument cluster.

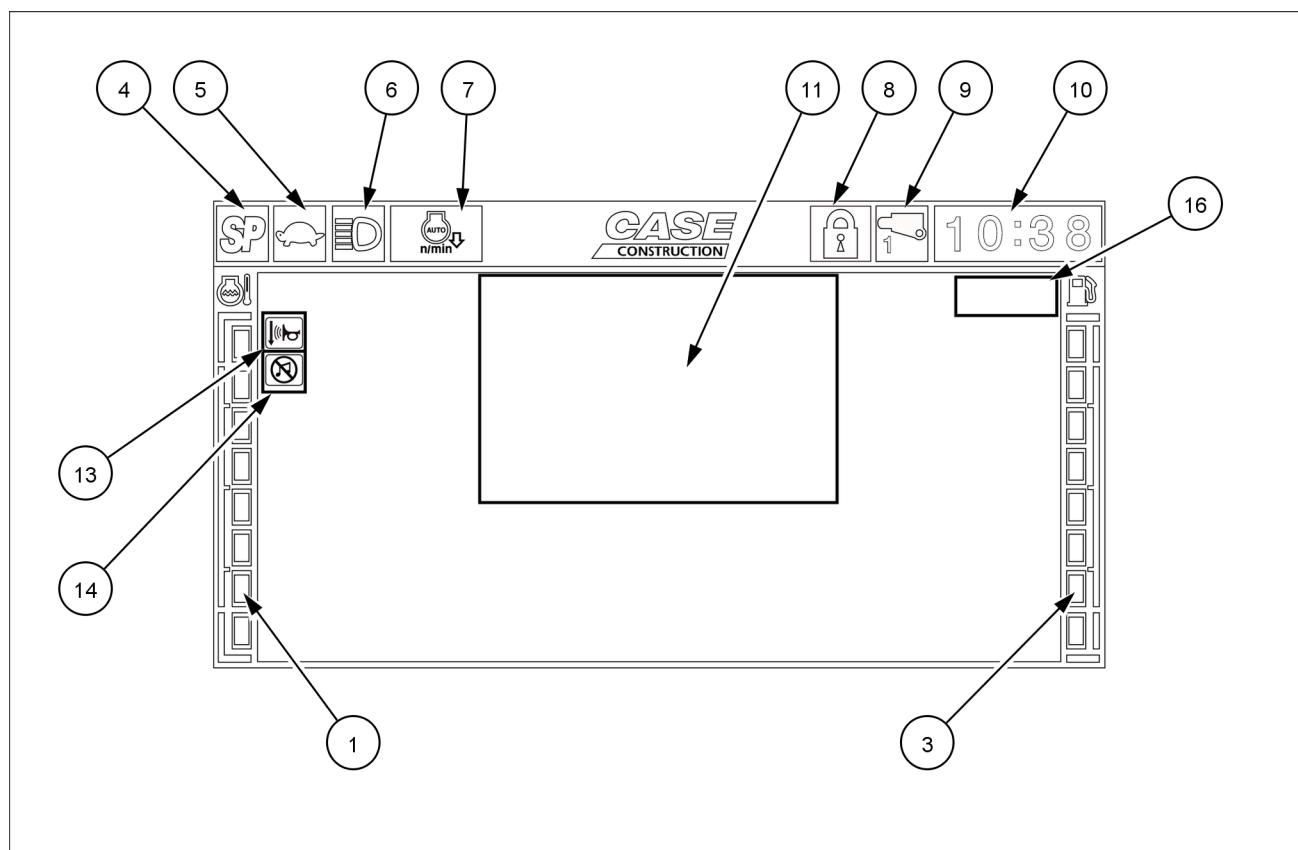


SMIL18CEX0532BB 1

Display



SMIL18CEX0554FB 2



SMIL18CEX0534FB 3

- | | |
|---|---|
| 1. Engine coolant temperature gauge | 10. Date and Time |
| 2. Hydraulic oil temperature gauge | 11. Auxiliary hydraulics setting/Large temporary icon |
| 3. Fuel gauge | 12. Eco gauge |
| 4. Work mode icon | 13. Auto pressure boost icon |
| 5. Travel mode icon | 14. Radio mute icon |
| 6. Working light icon | 15. Hour meter and trip meter |
| 7. Engine auto idle icon and auto stop icon | 16. Fuel economy display/Diagnostic Trouble Code |
| 8. Anti-theft icon | 17. Messages |
| 9. Attachment selection icon | |

1. Engine coolant temperature gauge.
Displays the temperature of the engine coolant. The lower zone indicates that the engine coolant temperature is low. When the temperature gauge display reaches the upper zone, an alarm sounds and the OVER HEAT message is displayed. Lower the engine speed. If the temperature does not go down, stop the engine, remove the starter key, and investigate the cause.



Engine auto idle is set.



Engine auto stop is set.



Auto idle and auto stop are both set.

2. Hydraulic oil temperature gauge
Displays the temperature of the hydraulic oil. The lower zone indicates that the hydraulic oil temperature is low. When the temperature gauge display reaches the upper zone, an alarm sounds and the OVER HEAT message is displayed. Lower the engine speed. If the temperature does not go down, stop the engine, remove the starter key, and investigate the cause.

8. Anti-theft icon.

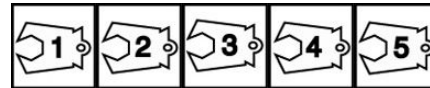
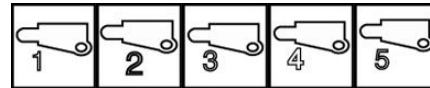


The anti-theft protection function is set up.

3. Fuel gauge
Displays the remaining amount of fuel by the number of lit segments. When all are lit, it indicates that the fuel tank is full. When only 1 is lit, an alarm sounds and the LOW FUEL message is displayed.

NOTE: It is not necessary to wait until the fuel tank is empty before filling with fuel. If the tank becomes empty, air bleeding of the fuel system is required.

9. Attachment selection icon.



4. Work mode icon.



The A work mode is selected.



The H work mode is selected.



The SP work mode is selected.

5. Travel mode icon.



The slow speed travel mode is selected.



The fast speed travel mode is selected.

6. Working lights icon.



The working lights are on.

7. Engine auto idle icon and auto stop icon.

10. Date and time.

11. Auxiliary hydraulics setting. When an option circuit is mounted, the selected flow and pressure are displayed.



MUC8LU-043Z 4

Large temporary icon.

A large icon appears temporary in the middle of the display in order to indicate a specific operating condition

- Wiper speed



1st speed



2nd speed



Stop

- Engine preheating



12. Eco gauge

The number of indicators on this gauge increases when the operating state is energy-saving operation. If high-load operations are performed, the number of gauge indicators decreases.

The state of energy-saving operations is indicated.

- No mechanical abnormalities will occur even if the number of gauge indicators decreases. However, to help conserve the environment, try to perform energy-saving operations within the green range, so long as doing so does not hinder work.

Key points for energy-saving operations

- Try to use H mode or A mode instead of SP mode.
- Avoid sharp lever operations.
- Avoid high load and relief operations.
- Use auto idle and one-touch idle.

Also, use idle stop to stop unnecessary idling.

Ask your CASE CONSTRUCTION Dealer about how to turn the eco gauge display "On" and "Off".

13. Auto pressure boost icon



Displayed when the maximum output state is entered automatically for the attachment.

14. Radio mute icon.



Radio is muted.

15. Hour meter and trip meter.

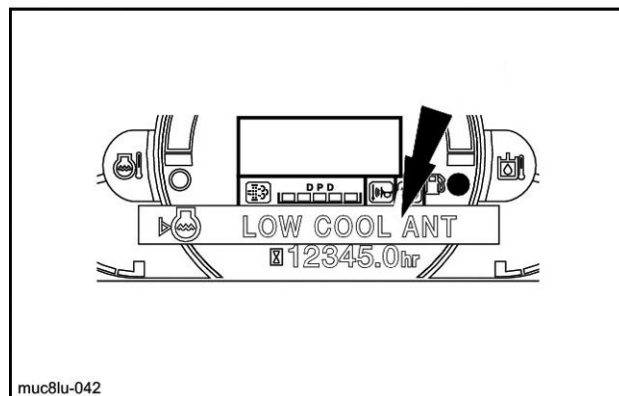
The hour meter indicates the total engine operating hours in units of **0.1 h 6 min**. The trip meter allows to set a partial operating hour counter, which can be reset to 0 h at any time. The hours are indicated in units of **0.1 h 6 min**.

16. Fuel economy display and DTC (Diagnostic Trouble Code) display

The instantaneous time/fuel consumption "gph" is displayed.

The DTC (Diagnostic Trouble Code) is displayed here.

17. Messages



The messages on the bottom of the display are intended to provide significant information related to the machine operation. A message combines an icon and a text. Some messages are accompanied by an alarm as they are displayed. A message can have a red, orange or green background depending upon the type of message, according to its level of urgency and importance.

An alarm also sounds when some of these messages are displayed.

NOTICE: If a message is displayed, perform action according to the message.

NOTICE: If the message is still displayed after action, consult your CASE CONSTRUCTION Dealer.

NOTE: The language of the displayed messages can be changed, consult your CASE CONSTRUCTION Dealer.

• LOW OIL PRESSURE



Indicates that the engine oil level is low. An alarm sounds. Stop the engine and remove the starter key, and then inspect the oil level.

NOTE: If the measures above are not performed immediately when this message is displayed, the engine stops automatically.

• OVER HEAT



Indicates that the engine coolant temperature is high. An alarm sounds. Lower the engine speed. If the temperature does not go down, stop the engine and remove the starter key. Wait for the temperature of the cooling system to go down, and then inspect the coolant level inside the reservoir tank and radiator. Check the radiator and oil cooler.

• BOOST TEMP HIGH



Indicates that the temperature of the turbocharger air that is being supplied to the engine is abnormally high. An alarm sounds. The engine automatically enters idling mode as a preventative measure. Stop the machine, operate the engine at idling speed, and wait until the message disappears. If the turbocharger air temperature continues to rise, the engine stops automatically. Consult your CASE CONSTRUCTION Dealer.



Indicates that an overload condition is detected during the handling of an object. Place the load onto the ground and check the load conditions making reference to the chart located inside the cab.

- ALTERNATOR



Indicates that there is a problem in the alternator. An alarm sounds. Stop the engine and remove the starter key, and then inspect the alternator. Consult your CASE CONSTRUCTION Dealer.

- CHECK ENGINE



Indicates that there is a problem (short or disconnection) in the electrical system of the engine. An alarm sounds. Stop the engine and remove the starter key, and then inspect the electrical system. Consult your CASE CONSTRUCTION Dealer.

- ELECTRIC PROBLEM



Indicates that there is a problem in the electrical system. An alarm sounds. In this case, stop the engine and remove the starter key, and then investigate the cause or consult your CASE CONSTRUCTION Dealer.

- ENGINE STOP



Indicates that the engine has been stopped by the emergency stop switch. An alarm sounds. To start the engine again, press on the back of the emergency stop switch, turn the starter key to OFF position, and then restart the engine.

- IMPROPER SHUT DOWN



Indicates that the engine has been stopped without cooling it down. Restart the engine, and keep it at a low idle for at least **5 min.**

- CHECK CAMERA



Indicates that the cameras or the camera wirings have a failure. Stop the engine, and contact your CASE CONSTRUCTION dealer immediately.

- OVER LOAD

- LOW COOLANT



Indicates that the level of the coolant in the engine cooling system is low. An alarm sounds. Stop the engine and remove the starter key. Wait for the temperature of the cooling system to go down, and then inspect the coolant level inside the reservoir tank and radiator.

- AIR FILTER



Indicates that the air cleaner element is clogged. Stop the engine, and clean or replace the air cleaner element.

- LOW FUEL



Indicates that the fuel level in the tank is low. Stop the engine, and add fuel to the fuel tank.

- HYDRAULIC OIL FILTER



The hydraulic oil filter must be replaced.

- CHECK FLOW RATE



Check whether the flow is suitable for the attachment.

- AUXILIARY SET-UP REQUIRED



Indicates that the operation with the hydraulic attachment is attempted without any set up of the auxiliary hydraulics. Check the type of attachment currently in use, and set the auxiliary hydraulic circuit to the pattern that properly matches this type of attachment.

- SERVICE DUE



Indicates that one or more periodical maintenance operations are due. Check the maintenance chart, and carry out the required maintenance operations.

- ENGINE IDLING



Indicates that the engine is idling because engine idling is selected.

- AUTO WARM UP



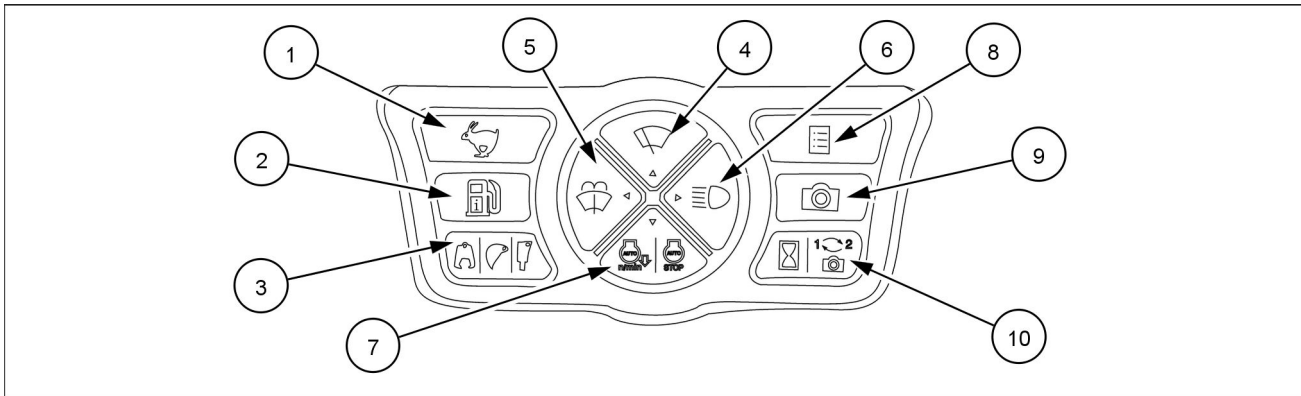
Indicates that the auto warm-up of the machine systems is in progress.



Indicates that the engine is going to stop automatically within **10 s**. If needed, set the gate lock lever in unlock position to restart normal operation.

- IDLE SHUT DOWN

Control buttons



SMIL18CEX0535EB 6

1. Travel mode select button

The selection toggles between slow speed mode ("Turtle") and fast speed mode ("Rabbit") every time the travel mode selector switch is pressed.

NOTICE: perform all changes to the travel mode while the machine is stopped.

Use the "Turtle" mode to travel on slope, off-road or soft ground.

Use the "Rabbit" mode to travel on a hard, flat, maintained road.

NOTE: the slow speed mode is automatically selected when the engine is started.

NOTE: if the fast speed mode is selected on the machine, it automatically switches to slow speed mode when the load increases on uphill road, and automatically returns to fast speed mode as the load decreases.

2. Fuel consumption indicator button

Push to show alternately on the display the cumulative average fuel consumption or the cumulative fuel consumption amount.

- Cumulative average fuel consumption: displayed in L/hr.

- Cumulative fuel consumption: displayed in L.

Push the fuel consumption indicator button for 3 seconds to reset the cumulative average fuel consumption and cumulative fuel consumption amount.

3. Attachment selection button

When using a hydraulic attachment, press the button to set the auxiliary hydraulic circuit to the pattern that properly matches the type of attachment used.

Set the breaker mode for using a single acting hydraulic attachment such as hydraulic breaker. The breaker icon appears on the display.

Set the crusher mode for using a double acting hydraulic attachment such as hydraulic crusher. The crusher icon appears on the display.

NOTICE: before changing the setting of the auxiliary hydraulic circuit, stop operation and set the machine in parking position.

4. Wiper button

The button sets three operating conditions: "Off", "Intermittent" and "Continuous".

When the button is pressed to operate the wiper intermittently, (I) is displayed on the monitor.

When the button is pressed again to operate the wiper continuously, (II) is displayed on the monitor.

When the button is pressed again to stop the wiper, "Off" is displayed on the monitor.

NOTICE: Do not operate the wiper when the front glass is dry. Doing so could damage the wiper.

5. Windshield washer button

Press and hold the windshield washer button to activate the wiper and the washer to clean the windshield. Release the button to stop the cleaning operation.

NOTICE: Do not operate the washer when the reservoir is empty. Doing so could damage the electric pump.

6. Working lights button

Press the working lights button to turn on the working lights on the front of the machine.

Press the button again to turn the working lights off.

7. Idle mode button

Press the button to select the automatic control mode of engine idling or stopping.

If auto idle mode is selected, the engine speed drops automatically to low idle if any lever or pedal is not operated for **5 s**. The auto idle icon appears on the display. To restore the engine speed, operate any control lever, or turn the engine speed throttle.

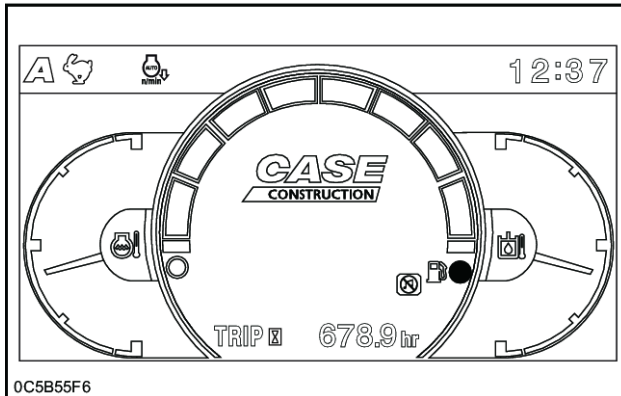
If auto stop mode is selected, the message IDLE SHUT DOWN is displayed, an alarm sounds, and the engine stops automatically **10 s** thereafter if the engine speed is kept at **1200 RPM** or below and the gate lock lever is kept in lock position for **3 min**. The auto stop icon appears on the display.

If the sequence of auto idle and auto stop is selected, auto idle activates as described before, and if the gate lock lever is also set to the lock position, idle shutdown eventually activates after **3 min**. The combined icon appears on the display.

NOTE: To restart the engine, turn the starter key to OFF position and then start the engine.

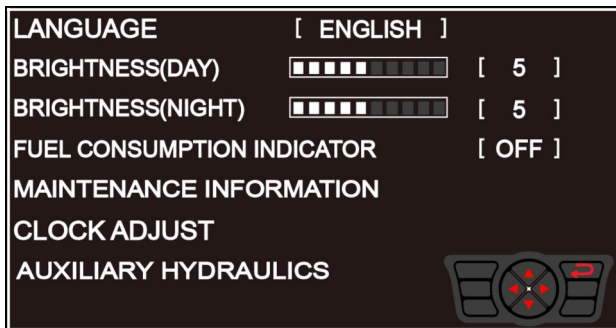
8. Display mode selector button

Press the display mode selector button to select the set of information visualized on the display:
The operating mode shows gauges, icons, warning and messages related to the functioning of the machine.



0C5B55F6 7

The user information mode provides access to the configuration tabs for the set up of the main functionalities of the machine.



SMIL16CEX1658AA 8

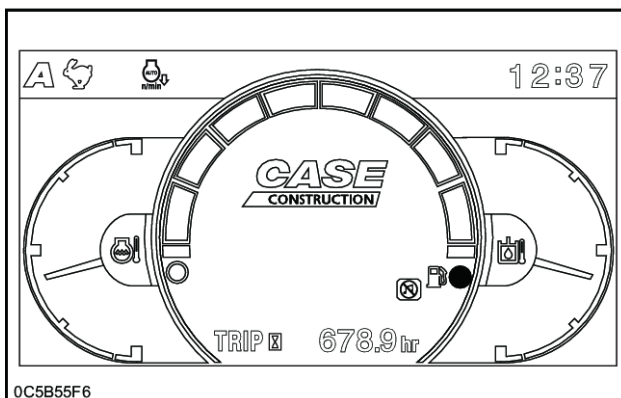
The mode of the display toggles every time the selector button is pressed.

NOTICE: During machine operation, make sure to select the operating mode of the display.

9. Camera view selector button

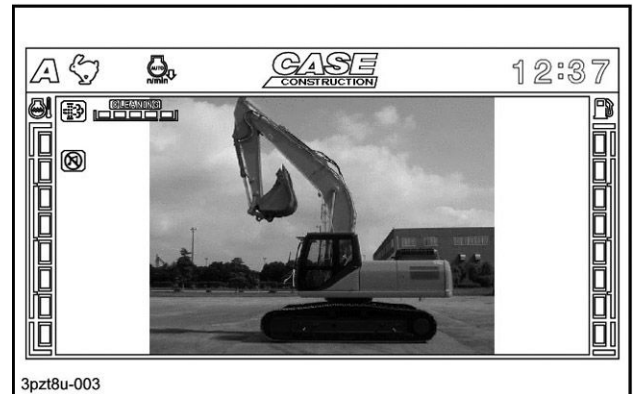
If the rear camera is equipped, press the camera view selector button to select the operating mode of the display between the following modes:

MODE-1: Indicators + Machine information



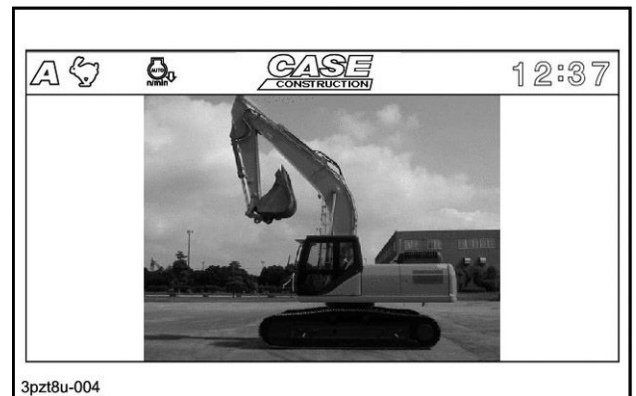
0C5B55F6 9

MODE-2: Camera image + Machine information



3PZT8U-003Z 10

MODE-3: Camera images + icons



3PZT8U-004Z 11

The operating mode of the display toggles every time the selector button is pressed.

10. Hour meter/Trip meter button

The information is shown on the bottom of the display in the operating MODE-1. The hour meter indicates the total engine operating hours in units of **0.1 h (6 min)**. The hour meter cannot be reset. The trip meter allows to set a partial operating hour counter, which can be reset to **0 h** at any time. The hours are indicated in units of **0.1 h (6 min)**. To reset the trip meter press and hold the hour meter button while the trip meter is displayed. The displayed engine operating hours will be reset to **0 h**. The hour meter is displayed by default. To display the trip meter, press the hour meter button: the trip meter will be thus displayed for approximately **1 min**, after which the hour meter will be displayed again.

NOTE: The display disappears when the starter key is turned to OFF position. The hour meter can be anyway displayed for **20 s** by pressing the hour meter button.

NOTE: The hour meter is not displayed in the operating MODE-2 or MODE-3.

User information mode

Press the button **(1)** to access the user information mode of the display.

Press the button **(3)** as indicated into the next pictures in order to scroll down to the intended setting tab.



GQ1BE4-004Z 12

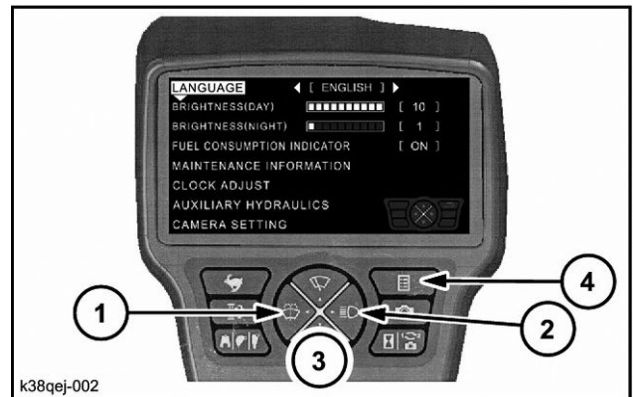
LANGUAGE setting

The first tab of the user information mode allows to set the language of the messages on the display.

Press the button **(1)** or **(2)** to select the desired language.

If other settings are needed, press the button **(3)** to scroll down to the next tab.

Otherwise, press the button **(4)** to confirm the selection and to reset the operating mode of the display.



K38QEJ-002 13

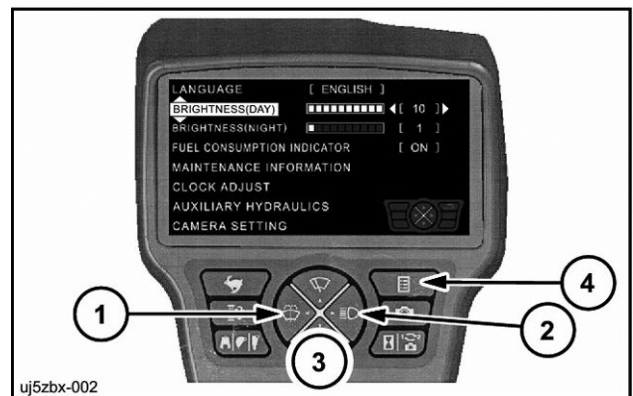
BRIGHTNESS (DAY) setting

The second tab of the user information mode allows to set the brightness of the display in daylight.

Press the button **(2)** to increase the brightness of the display, press the button **(1)** to decrease the brightness of the display.

If other settings are needed, press the button **(3)** to scroll down to the next tab.

Otherwise, press the button **(4)** to confirm the selection and to reset the operating mode of the display.



UJ5ZBX-002 14

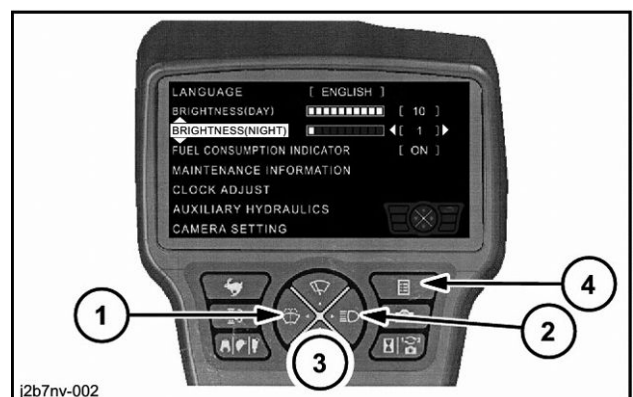
BRIGHTNESS (NIGHT) setting

The third tab of the user information mode allows to set the brightness of the display in low ambient lighting.

Press the button **(1)** or **(2)** to set the brightness of the display as described in the previous tab.

If other settings are needed, press the button **(3)** to scroll down to the next tab.

Otherwise, press the button **(4)** to confirm the selection and to reset the operating mode of the display.



J2B7NV-002 15

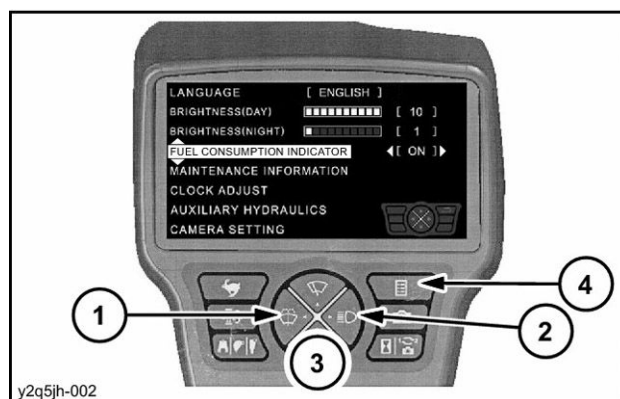
FUEL CONSUMPTION INDICATOR setting

The fourth tab of the user information mode allows to set the display of the fuel consumption indicator.

Press the button **(1)** or **(2)** to set the fuel consumption indicator ON or OFF.

If other settings are needed, press the button **(3)** to scroll down to the next tab.

Otherwise, press the button **(4)** to confirm the selection and to reset the operating mode of the display.



Y2Q5JH-002 16

MAINTENANCE INFORMATION setting

The fifth tab of the user information mode allows to set the time sheet of the main maintenance operations.

Press the button **(2)** to show the setting pages.

Press the button **(1)** or **(2)** to select the page that includes the intended maintenance operation.

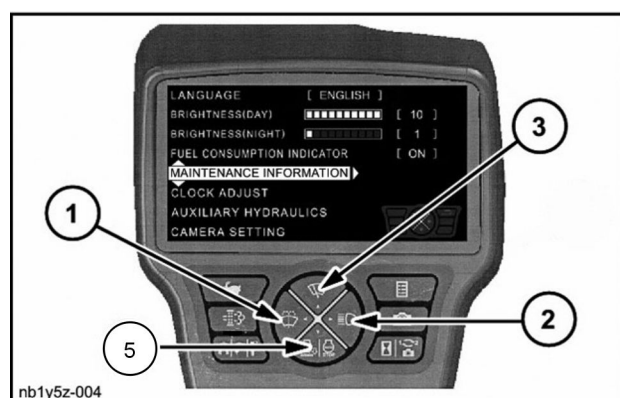
NOTE: the main maintenance operations are included into the pages 1, 2, and 3.

Press the button **(3)** or **(5)** to select the intended maintenance operation into the page. If service is due shortly, the remaining time is displayed in yellow. If the due timing for service has passed, the delay is displayed in red. As the intended maintenance operation has been performed, press and hold the button **(2)** to reset the remaining time to the next service. An alarm sounds to confirm the reset.

When the time sheets have been set, press the button **(4)** to return to the user information mode.

If other settings are needed, press the button **(3)** to scroll down to the next tab.

Otherwise, press the button **(4)** to reset the operating mode of the display.



NB1Y5Z-004Z 17

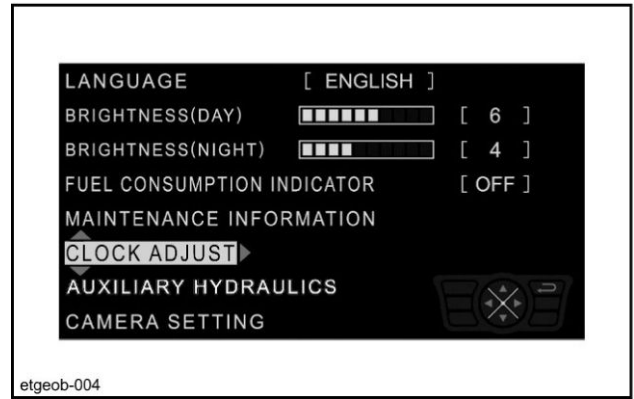


NB1Y5Z-005Z 18

CLOCK ADJUST setting

The sixth tab of the user information mode allows to set the clock on the display.

Press the button **(2)** to show the setting frame.



ETGEOB-004 19

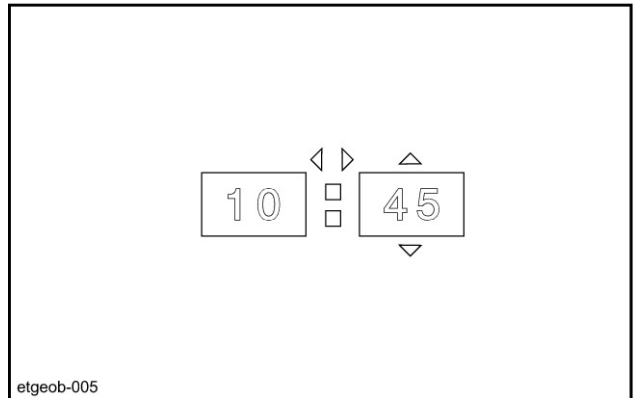
Press the button **(1)** or **(2)** to select between hours or minutes.

Press the button **(3)** or **(5)** to set the correct value of either hours or minutes.

When the clock has been set, press the button **(4)** to return to the user information mode.

If other settings are needed, press the button **(3)** to scroll down to the next tab.

Otherwise, press the button **(4)** to reset the operating mode of the display.



ETGEOB-005 20

AUXILIARY HYDRAULICS setting

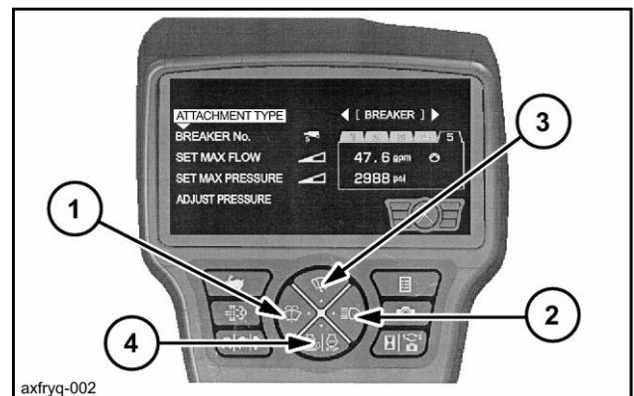
The seventh tab of the user information mode allows to set the circuit type and the maximum flow rate of the auxiliary high-flow hydraulic circuit.

Press the button **(2)** to show the setting frame.



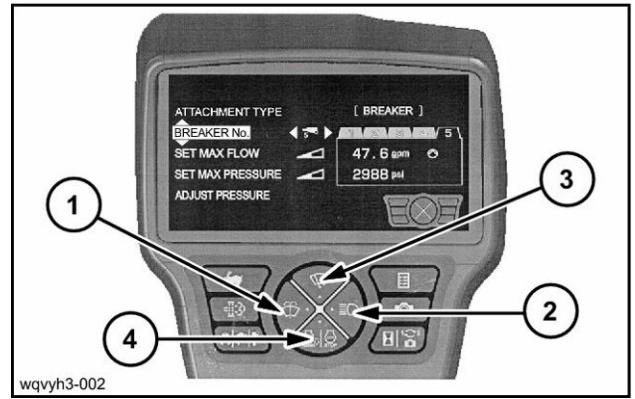
8KYGS8-002 21

1. Press the button **(3)** or **(4)** and select "ATTACHMENT TYPE".
2. Press the button **(1)** or **(2)** and select " BREAKER" or "CRUSHER" for attachment type.



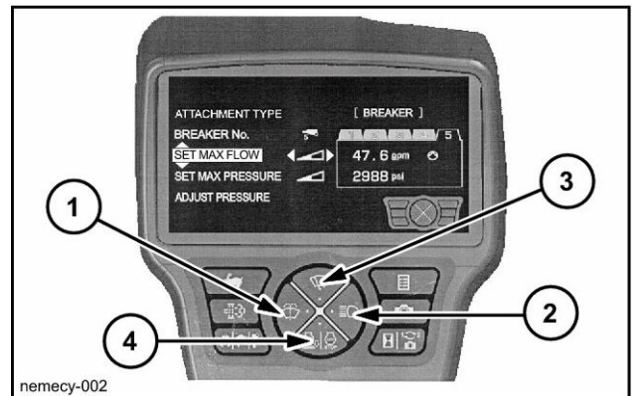
AXFRYQ-002 22

1. Press the button **(3)** or **(4)** and select " BREAKER NUMBER" or "CRUSHER NUMBER".
2. Press the button **(1)** or **(2)** and select the breaker or crusher number
3. Press the button **(1)** to move to the left. Press the button **(2)** to move to the right.



WQVYH3-002 23

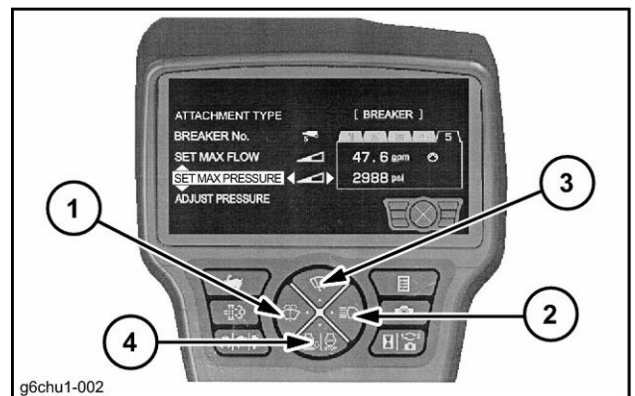
1. Press the button **(3)** or **(4)** and select "SET MAX FLOW".
2. Press the button **(1)** or **(2)** and select maximum number or flow rate.
3. Pressing the button **(1)** decreases the number. Pressing the button **(2)** increases the number.



NEMECY-002 24

Pressure Setting (if equipped)

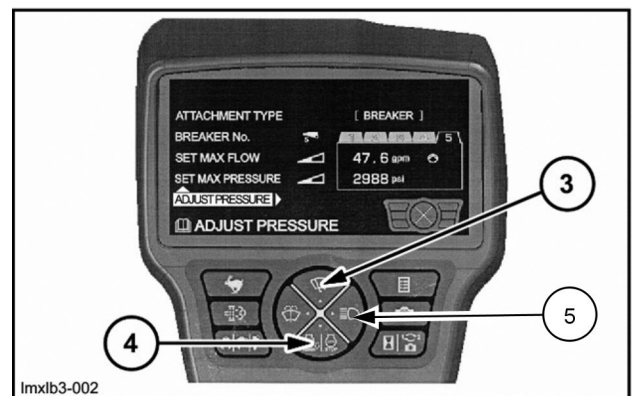
1. Press the button **(3)** or **(4)** to select "SET MAX PRESSURE".
2. Press the button **(1)** or **(2)** to select maximum number or pressure.
3. Pressing the button **(1)** decreases the number. Pressing the button **(2)** increases the number.



G6CHU1-002 25

Adjust pressure: When the valve with the maximum flow or maximum pressure is changed, the system adjusts the proportional relief solenoid valve.

1. Press the button **(3)** or **(4)**.
2. Select "ADJUST PRESSURE" and press the button **(5)**.



LMXLB3-002 26

When adjusting the pressure, depress the option pedal completely, or slide the proportional switch to maximum.

- If low flow and high pressure are selected, the adjustment setting may not input.
- If high flow and low pressure are selected, the adjustment setting may not input.



LMXLB3-009 27

Pressure adjustment method

1. Raise the oil temperature according to (Warm Up the Machine to Operating Temperature).



LMXLB3-003 28

2. Put the engine throttle switch in SP mode.



LMXLB3-004 29

3. Press the option pedal for the "Breaker/crusher's" completely, or slide the proportional switch to maximum.

NOTE: Make adjustments before connecting to an attachment.



LMXLB3-005 30

4. Hold the switch until "Pressure adjusting complete" is displayed on the screen.



LMXLB3-006 31

5. Operation complete



LMXLB3-007 32

6. Returns automatically.

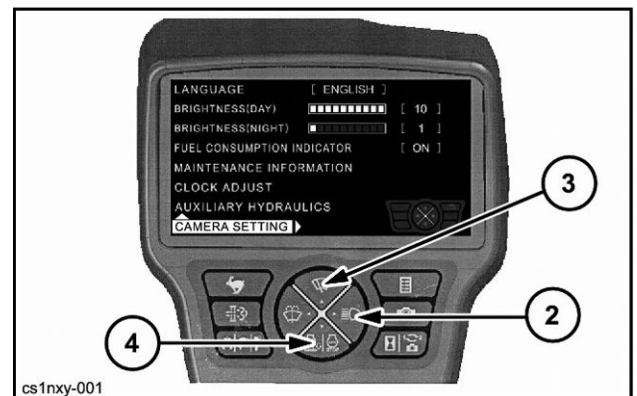


LMXLB3-008 33

Camera setting

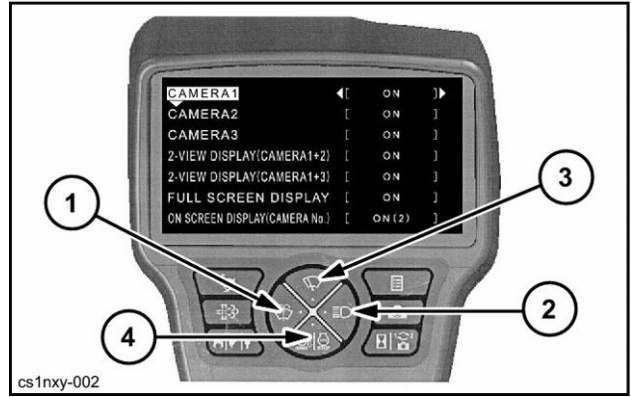
The eighth tab of the user information mode allows to set the view of the external cameras.
The menu changes depending on the number of cameras installed.

Press the button (2) to show the setting frame.



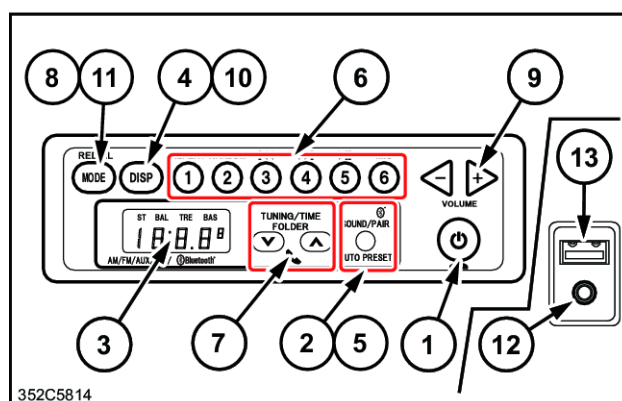
CS1NXY-001 34

1. Camera1
 1. Push button **(3)** or **(4)**.
 2. Select item Camera1".
 3. Push button **(1)** or **(2)**.
 4. Select item "On" or "On mirror view" or "Off".
2. Camera2
 1. Push button **(3)** or **(4)**.
 2. Select item "Camera2".
 3. Push button **(1)** or **(2)**.
 4. Select item "On" or "On mirror view" or "Off".
3. Camera3
 1. Push button **(3)** or **(4)**.
 2. Select item "Camera3".
 3. Push button **(1)** or **(2)**.
 4. Select item "On" or "On mirror view" or "Off".
4. 2–View display (Camera1+2)
 1. Push button **(3)** or **(4)**.
 2. Select item "2-View display (Camera1+2)".
 3. Push button **(1)** or **(2)**.
 4. Select item "On" or "Off".
5. 2-View display (CAMERA1+3)
 1. Push button **(3)** or **(4)**.
 2. Select item "2-View display (Camera1+3)".
 3. Push button **(1)** or **(2)**.
 4. Select item "On" or "Off".
6. Full screen display
 1. Push button **(3)** or **(4)**.
 2. Select item "Full screen display".
 3. Push button **(1)** or **(2)**.
 4. Select item "On" or "Off".
7. On screen display (Camera No.)
 1. Push button **(3)** or **(4)**.
 2. Select item "On screen display (Camera No.)".
 3. Push button **(1)** or **(2)**.
 4. Select item "On **(1)**" or "On **(2)**" or "On **(3)**" or "Off".



CS1NXY-002 35

Radio



352C5814

352C5814 1

NOTICE: Do not let water get into the speaker cases or the radio to avoid a breakdown. Keep the window closed when it rains and when washing the machine. Do not use benzene, paint thinner or any other solvent to clean the display. Wipe off the water with a soft, dry cloth. Do not try to disassemble the radio.

1. Power button (POWER)
Push the "POWER" button to turn on the radio. The band and then the frequency are displayed.
Push again the "POWER" button to turn off the radio. The clock is displayed.
2. Sound adjustment (SOUND)
Push the "SOUND" button to switch BAL → TRE → BAS .
- In BAL state: push the ▲/▼ tuning button (7) the regulate the balance.
Push the ▲ UP button to increase the right speaker volume; push the ▼ DOWN button to increase the left speaker volume. The volumes can be increased up to the level 7 maximum.
- In TRE state: push the ▲/▼ tuning button (7) to regulate the treble.
Push the ▲ UP button to increase the treble of 1 step; push the ▼ DOWN button to decrease the treble of 1 step. The treble can be increased up to the level 7 maximum.
- In BAS state: push the ▲/▼ tuning button (7) to regulate the bass.
Push the ▲ UP button to increase the bass of 1 step; push the ▼ DOWN button to decrease the bass of 1 step. The treble can be increased up to the level 7 maximum.
Push again the "SOUND" button in BAS state to end the sound adjustment.
3. Display unit
The display shows the clock, radio frequency, band name and operation mode.
4. Clock/Frequency button (DISP)
Push the "DISP" button to show: "Frequency" → "Clock" → "Band name".
Each push changes the visualization.
5. Auto store (SOUND/AUTO PRESET)
Push the button to store 6 radio stations in the memory for the selected signal band (FM1, FM2, AM).
6. Choose of the preset radio stations (PRESET STATION)
Push the button (1-6) to tune the radio to the stored station on the selected signal band (FM1, FM2, AM) .
To store a radio station in the memory, tune the radio to the station desired and hold down one of the button (1-6).
7. Tuning button (TUNE)
Push and hold the "TUNE" button to tune automatically the radio to the next station. To stop the tuning, release and push again the button.
Push the ▲ button to increase the frequency; push the ▼ button to decrease the frequency. Hold down either button to change the frequency continuously.
8. Mode switch button (MODE)
Push the button to switch AM → FM1 → FM2 → AUX → USB → BT.
9. Volume adjustment buttons (VOL◀, VOL▶)
Push the VOL◀ button to decrease the volume; Push the VOL▶ button to increase the volume. Hold down either button to change the volume continuously.
10. Clock adjustment (DISP)
To adjust the clock, push and hold the "DISP" button when the clock is shown on the display.
- Hour adjustment
With the hour on the display flashing, use the tuning button ▲/▼ to adjust the value.
Push the UP ▲ button to increase the value.
Push the DOWN ▼ button to decrease the value.
Pressing the "DISP" button shifts from hour to minute adjustment.
- Minute adjustment
With the minutes on the display flashing, use the tuning button ▲/▼ to adjust the value.
Push the UP ▲ button to increase the value.
Push the DOWN ▼ button to decrease the value.

The display returns automatically to the frequency visualization if no button is pushed within 1 second.

Push the "DISP" button again to end the clock adjustment

11. REDIAL

Hold down the "MODE" button (8) to redial. The message "RE" is shown on the display for 3 seconds. After redialing, the message "DL" flashes on the display and a phone ring sound is played from the speaker. Redialing works in any kind of radio band signal. If the radio is switched off, push and hold the "MODE" button (8) to turn on the radio and redial.

12. External input jack (AUX IN) — vehicle body side

Connect here a 3,5" plug audio source to play the audio from the radio speakers.

13. External input terminal (USB) - Vehicle body side

Connect here an external USB audio source to play the audio from the radio speakers.

Listen to the radio

1. Turn the starter switch key to "ACC" or "ON" , then push the "POWER" button (1) to turn on the radio.
2. Select the "MW (AM)" or "FM" signal by pushing the "MODE" button (8) .
3. Select a station through a preset button (1-6) or the tuning buttons Δ/V .
4. Adjust the volume with the $\triangleleft/\triangleright$ buttons.
5. Push the "POWER" button (1) to switch off the radio.

Manual tuning

Push the UP Δ button to increase the frequency.
Push the DOWN ∇ button to decrease the frequency.

Automatic Station Selection (Seek)

Push and hold the "TUNE" Δ button (7) to increase the frequency until the radio is tuned on a clearly audible radio station. The search stops.

Push and hold the "TUNE" ∇ button (7) to search for a radio station by decreasing the frequency.

Setting the preset buttons

1. Push the "MODE" button (8) to select "MW (AM)" or "FM" signal, then push the tuning buttons to select the broadcasting station to store in the radio memory.
2. Hold down the button (1-6) where to store the selected broadcasting station until the preset button number flashes three times on the display. At the preset button is now stored the selected station. If a previous station was stored in the preset button, the new station replaces the old one.
3. Repeat the steps 1 and 2 to preset other broadcasting stations.

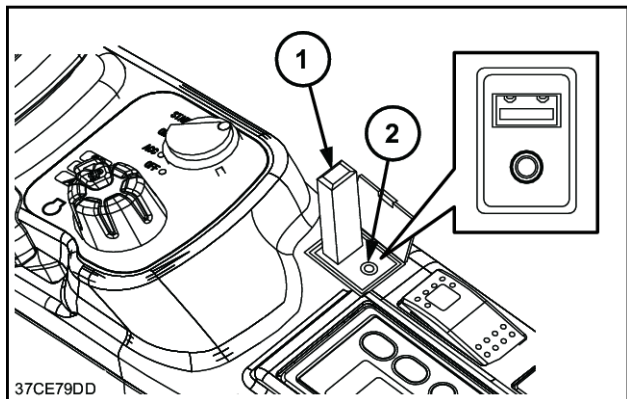
Auto preset

Push the "SOUND/AUTO PRESET" button (5) to store automatically the first 6 clearly audible radio station in the 6 preset buttons.

NOTE: If a previous station was stored in the preset button, the new station replaces the old one.

External input

- Audio from a portable audio device can be played through the radio speaker.
- Always keep appropriate volume for the portable audio device.



1. USB memory
2. AUX input terminal

AUX

- Push the "MODE" button (8) to switch the audio source until the message "AUX" is shown on the display.

- Connect the portable audio device to the AUX input terminal with an audio cable without resistance. The cable must have a 3,5" jack. Do not use a connection cable with the wrong size or wrong shape jack.

- The volume also can be adjusted with the volume buttons on the radio unit.

USB

- Files in MP3/WMA/AAC formats are supported.

- Push the "MODE" button (8) to switch the audio source until the message "USB" is shown on the display.

- Connect a USB memory to the USB input terminal. Playable data stored in the memory is played automatically.

Button functions with USB selected as an audio source:

UP Δ /DOWN ∇	Folder navigation up/down
Preset 1	Repeat the track
Preset 2	Random track
Preset 3 - short press	Previous track

Preset 3 - long press	Fast forward (while being pressed)
Preset 4 - short press	Next track
Preset 4 - long press	Rewind (while being pressed)
Preset 5	Play/pause
Volume adjustment button 	Volume up
Volume adjustment button 	Volume down

Bluetooth

- Push the "MODE" button **(8)** to switch the audio source until the message "BT" is shown on the display.

- Pair the Bluetooth device. For details on pairing, refer to "Bluetooth Pairing"

- For details on how to use a mobile phone connected via Bluetooth, refer to "Use of Cellular Phone Connected via Bluetooth"

Button functions with Bluetooth selected as an audio source:

Preset 3 - short press	Previous track
Preset 4 - short press	Next track
Preset 5	Play/pause
Volume adjustment button 	Volume up
Volume adjustment button 	Volume down

Bluetooth Pairing

NOTICE: To use Bluetooth audio devices, the devices to be connected with a wireless connection must be registered in advance. This registration is called pairing. If a device has never been paired, pairing must be performed.

1. With "BT" shown on the display, hold down the "AUTO PRESET" button **(5)**. The "WA" message is shown on the display and the unit proceeds to pairing preparation.

2. When pairing preparation is complete, the message "PA" is shown on the display and the unit enters pairing standby status.
3. Search for the device to pair such as a mobile phone or a portable audio device.
4. When pairing is completed successfully, the message "PO" is shown on the display. If pairing is not completed within a time limit (180 seconds) or an error occurs, the message "Px" is shown on the display. If pairing is failed, repeat from step 1 to perform pairing.

Use of Cellular Phone Connected via Bluetooth

- When the paired cellular phone receives a call, the message "CL" blinks on the display and the speaker will play the ringtone. Even if the radio is switched off, it turns automatically on.

- To answer to the call, push any kind of radio button except from the "POWER" **(1)** and the volume buttons  .

- To reject a call, press the "POWER" button **(1)**. The call is interrupted and the radio is restored to its previous state.

- To adjust the speaker volume during the call, push the volume adjustment buttons  . To turn on/off the microphone, push the "PRESET" button **(6)**.

- Push the "POWER" button **(1)** to terminate a call. The radio is restored to its previous state.

- Hold down the "MODE" button **(8)** to redial. The message "RE" is shown on the display for 3 seconds. After redialling, the message "DL" flashes on the display and a phone ring sound is played from the speaker.

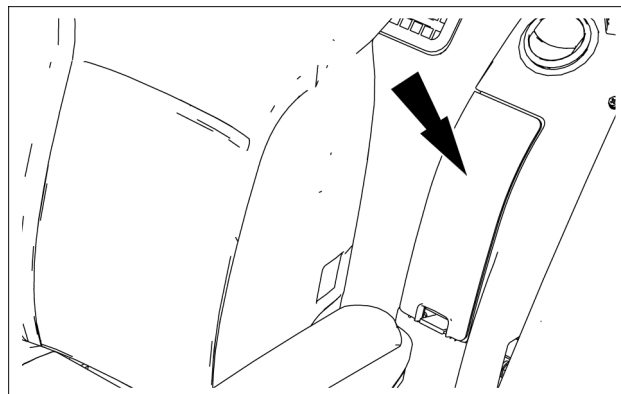
Memory Erasure

Disconnecting the battery from the vehicle electrical circuit, the radio loses the stored radio stations in the Preset buttons 1-6.

Rearward controls

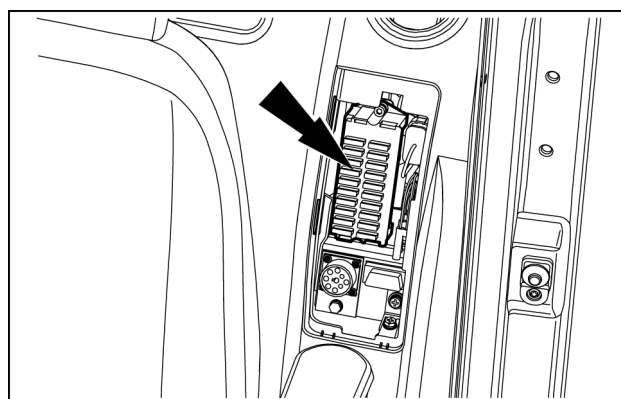
Fuse box

Located on the left-hand side, behind the operator's seat.



SMIL17CEX5125AA 1

The fuse box can be readily accessed by removing the protective cover.

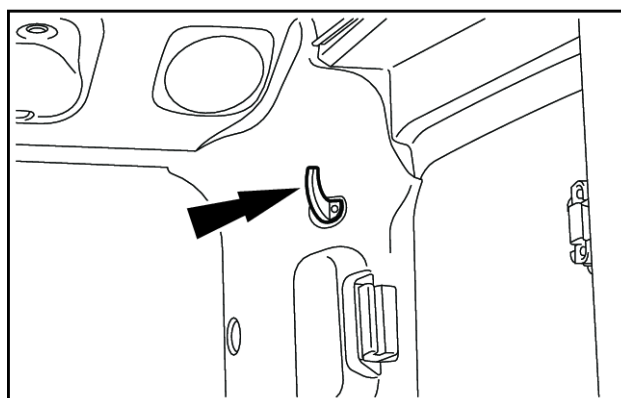


SMIL20CEX2499AA 2

Coat hanger hook

The hook is on the rear left-hand cab upright.

NOTICE: Take care not to obscure the view with clothes that are too bulky.

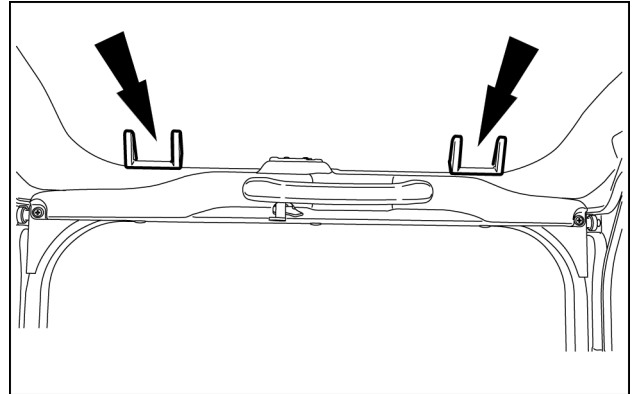


SMIL13CEX2626AB 1

Overhead controls

Roof curtain

To open the roof curtain, slide it toward the rear using the handles. To close the curtain slide it toward the front.



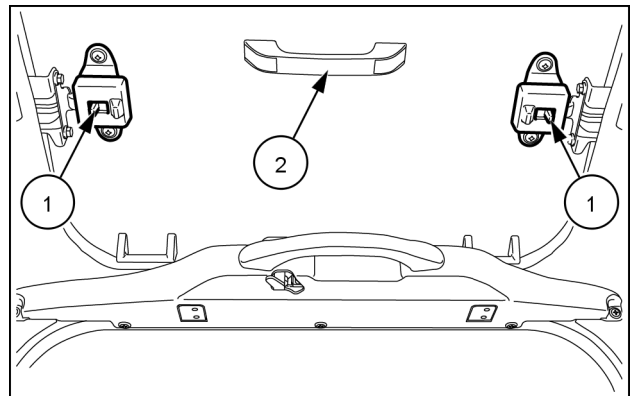
SMIL20CEX2500AA 1

Roof hatch

To open the roof hatch, push the two locking levers (1) to the inside, and follow the opening movement by holding the handle (2).

NOTICE: The roof hatch is fitted with two gas struts, and the opening movement shall thus be followed through by hand in order not to damage the machine.

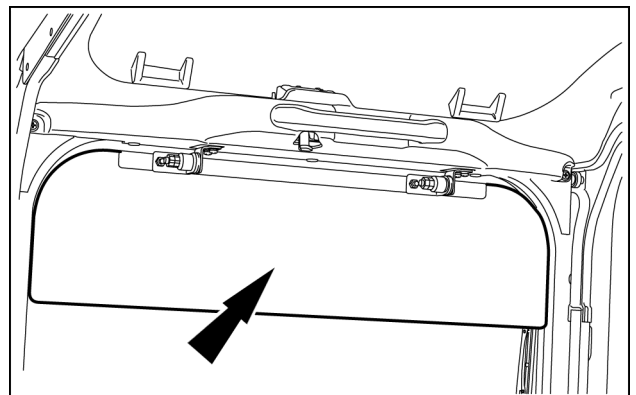
To close the roof hatch, pull it down until the two locking levers (1) are engaged.



SMIL17CEX0898AA 1

Sun shield (if equipped)

The sun shield is fixed to the windshield and can easily be positioned as required.



SMIL20CEX2501AA 1

Exterior controls

Cab protection (ROPS and FOPS)

⚠ DANGER

Crushing hazard!

Do not change the Roll Over Protective Structure (ROPS) in any way. Unauthorized changes such as welding, drilling, or cutting will weaken the ROPS and decrease your protection. Have an authorized dealer replace the ROPS if damage of any kind occurs. **DO NOT TRY TO REPAIR THE ROPS.**

Failure to comply will result in death or serious injury.

D0037A

⚠ WARNING

Roll-over hazard!

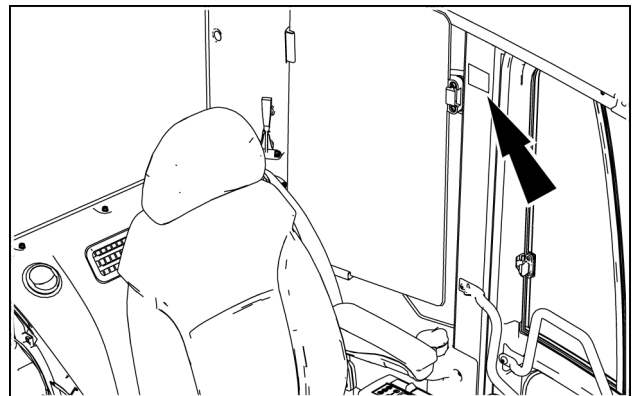
After an accident, fire, tip over, or roll over, a qualified technician **MUST** replace the Roll-Over Protective Structure (ROPS) before returning the machine to the field or job site operation.

Failure to comply could result in death or serious injury.

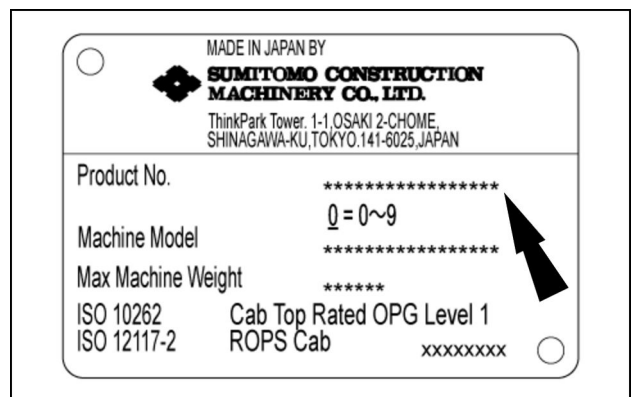
W0134A

This machine is equipped with a cab Roll-Over Protective Structure (ROPS).

NOTICE: If the cab's ROPS (guaranteed high-strength member) is damaged, replace the cab. When replacing the cab, check the parts list for the part number of the cab appropriate for the model. If the wrong cab is mounted, the cab could be damaged when the machine rolls over, which could result in the death or serious injury to the operator or damage to the machine.



SMIL19CEX2701AA 1



SMIL20CEX2489AA 2

This machine is equipped with a cab Falling Object Protective Structure (FOPS) compliant to Level 2 as defined by ISO 10262.

Level 2 is intended for protection from large objects, e.g. large rocks, large debris and other large objects encountered in applications such as construction and demolition.

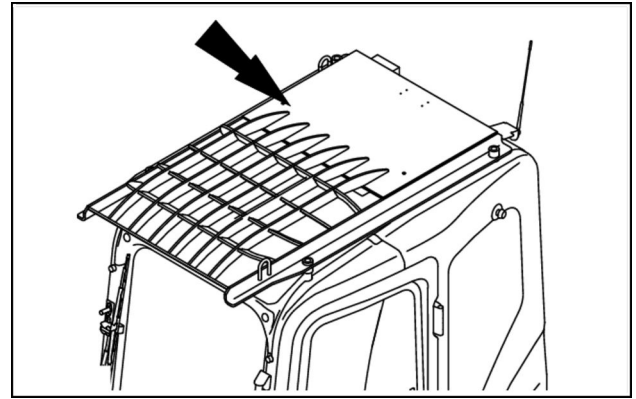
The protective structure, the fitting supports and fastening elements on the machine are an integral part of the structure.

After a fire, corrosion or collisions, any possible damage to the cab protection structure must be carefully evaluated by specialised and qualified personnel.

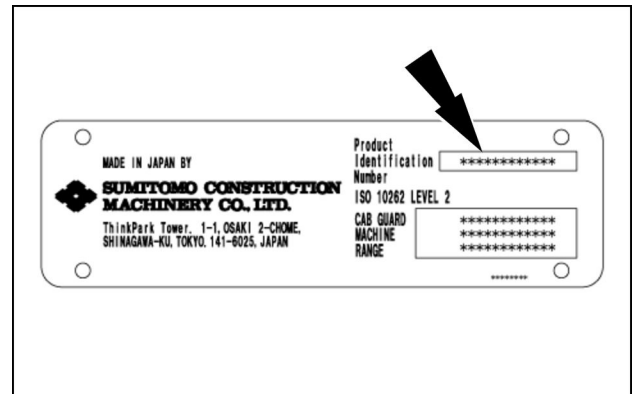
In any case, all damaged parts must be replaced with genuine spare parts, in order to return the machine to its original conditions.

For an inspection of the functions of the cab's protective structures or to get parts or entire structures replaced, please consult your CASE CONSTRUCTION Dealer.

Match the part number. Do not perform modifications.



SMIL13CEX2661AB 3

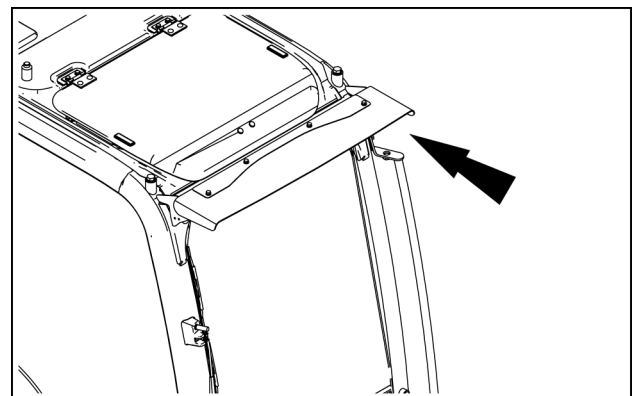


SMIL20CEX2490AA 4

Rain deflector (if equipped)

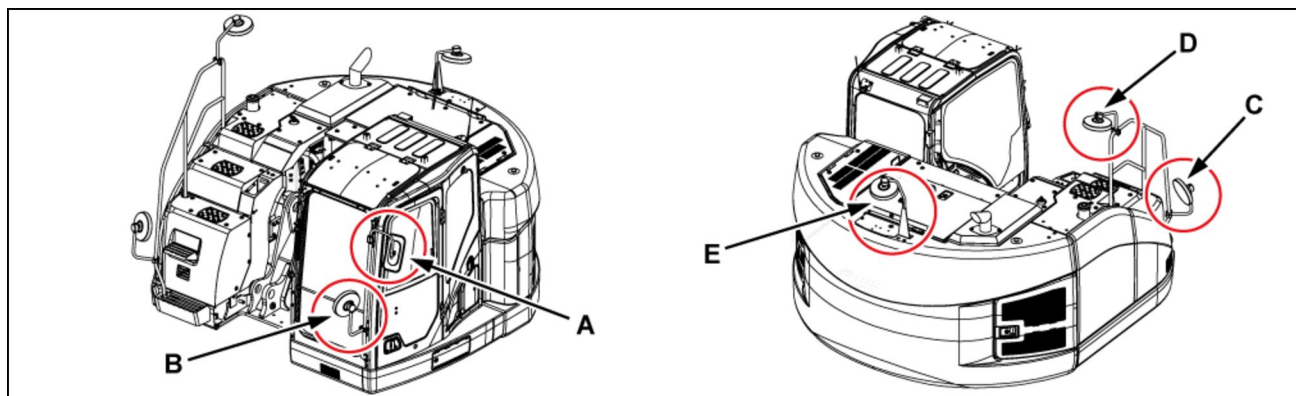
The rain deflector reduces the amount of rain on the upper part of the windshield and protects the cab lights.

NOTICE: The rain deflector is not compatible with Front Guard Protective Structure.



SMIL20CEX2409AA 1

Mirrors



SMIL20CEX2452EA 1

(A) Top-left side mirror — (B) Bottom-left side mirror — (C) Bottom-right side mirror — (D) Top-right side mirror — (E) Rear counterweight mirror

Installation and positioning of the mirrors

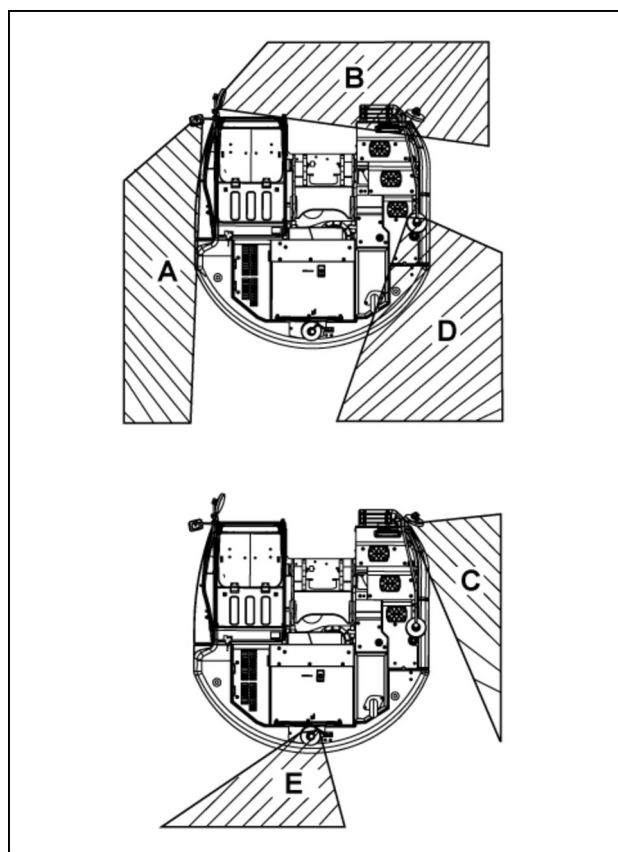
⚠ WARNING

Avoid injury and/or machine damage!
Keep the mirrors clean and properly adjusted.
Failure to comply could result in death or serious injury.

W1078A

The external mirrors, along with the external cameras, ensure proper visibility around the machine during operation.

The hatched areas in the pictures indicate the zones that can be viewed by each mirror.



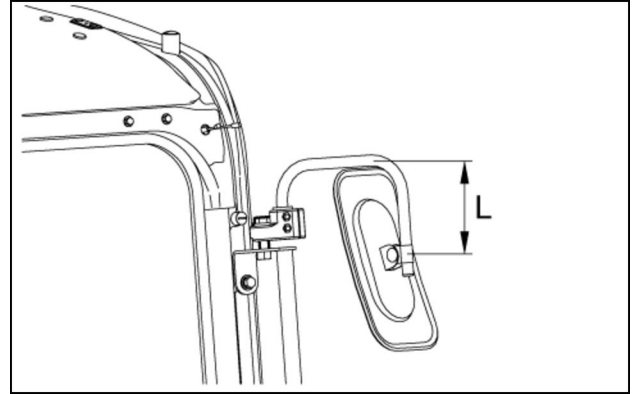
SMIL20CEX2453BA 2

Top-left side mirror (A)

Install the mirror as shown.

The dimension (L) is **165 mm (6.5 in.)**.

The tightening torque of the bolt (1) is **71.6 – 91.2 N·m (52.8 – 67.3 lb ft)**.

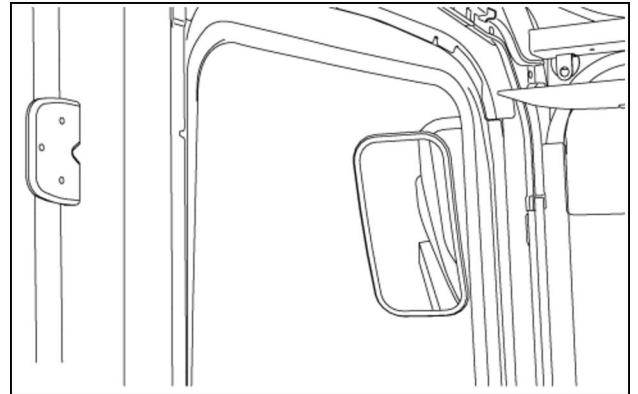


SMIL20CEX2455AA 3

Position the mirror so that the rear, left-hand side of the machine is visible

The tightening torque of the bolts on the mirror is **4.5 – 5.5 N·m (3.3 – 4.1 lb ft)**

NOTICE: After you install and position all of the mirrors, check the visibility around the machine from the operator's seat. Set the seat into the desired position, and make sure to confirm all the reference views in the mirrors. If necessary, fine tune the positioning of the mirrors in order to ensure proper visibility around the machine.



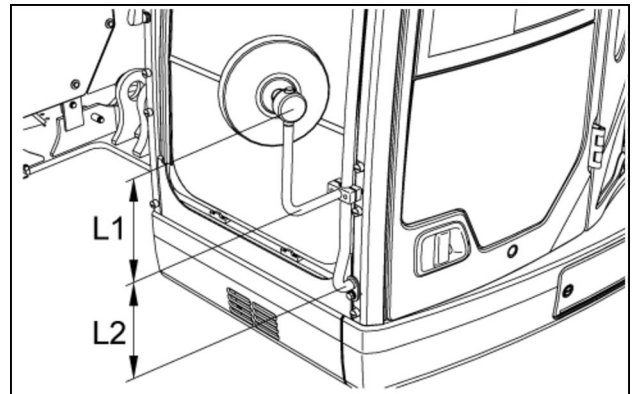
SMIL20CEX2462AA 4

Bottom-left side mirror (B)

Install the mirror as shown.

The dimension (L1) is **285 mm (11.2 in.)**.

The dimension (L2) is **170 mm (6.7 in.)**.

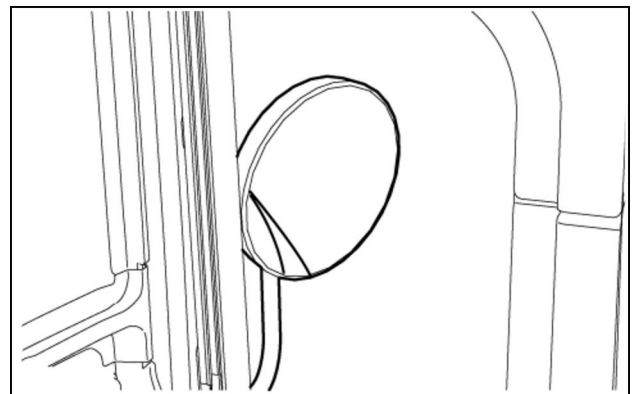


SMIL20CEX2457AA 5

Position the mirror so that the rear, right-hand side of the machine is visible.

The tightening torque of the bolts on the mirror is **4.5 – 5.5 N·m (3.3 – 4.1 lb ft)**

NOTICE: After you install and position all of the mirrors, check the visibility around the machine from the operator's seat. Set the seat into the desired position, and make sure to confirm all the reference views in the mirrors. If necessary, fine tune the positioning of the mirrors in order to ensure proper visibility around the machine.



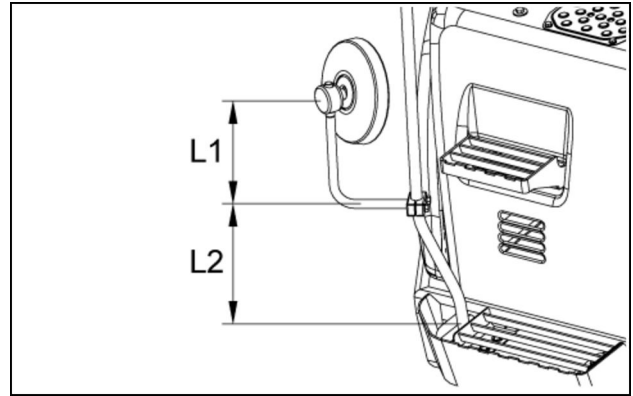
SMIL20CEX2463AA 6

Bottom-right side mirror (C)

Install the mirror as shown.

The dimension (L1) is **285 mm (11.2 in)**.

The dimension (L2) is **420 mm (16.5 in)**.

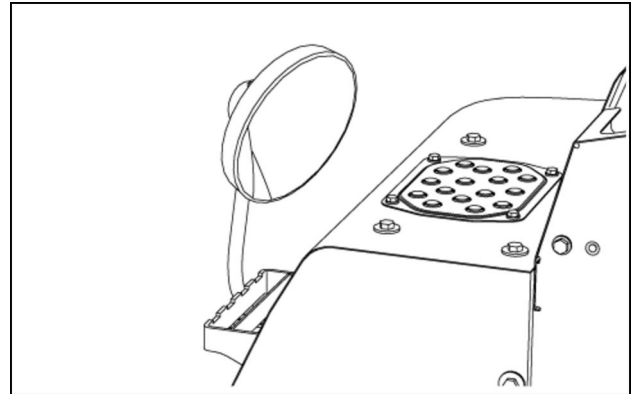


SMIL20CEX2456AA 7

Position the mirror so that the, right-hand side of the machine is visible.

The tightening torque of the bolts on the mirror is **4.5 – 5.5 N·m (3.3 – 4.1 lb ft)**

NOTICE: After you install and position all of the mirrors, check the visibility around the machine from the operator's seat. Set the seat into the desired position, and make sure to confirm all the reference views in the mirrors. If necessary, fine tune the positioning of the mirrors in order to ensure proper visibility around the machine.



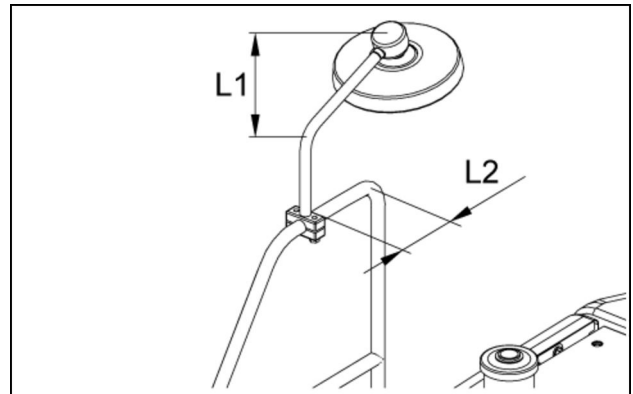
SMIL20CEX2459AA 8

Top-right side mirror (D)

Install the mirror as shown.

The dimension (L1) is **285 mm (11.2 in)**.

The dimension (L2) is **200 mm (7.9 in)**.

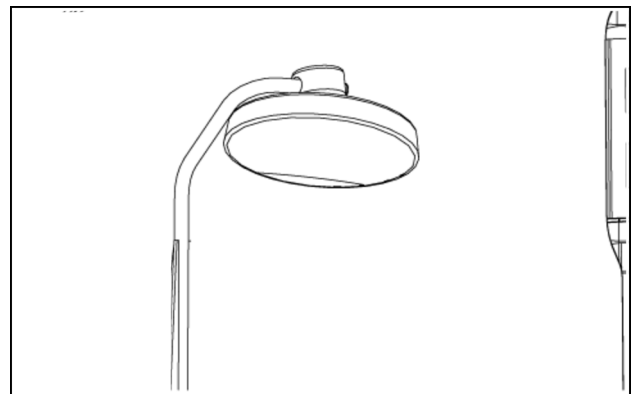


SMIL20CEX2458AA 9

Position the mirror so that the rear side of the machine is visible.

The tightening torque of the bolts on the mirror is **4.5 – 5.5 N·m (3.3 – 4.1 lb ft)**

NOTICE: After you install and position all of the mirrors, check the visibility around the machine from the operator's seat. Set the seat into the desired position, and make sure to confirm all the reference views in the mirrors. If necessary, fine tune the positioning of the mirrors in order to ensure proper visibility around the machine.

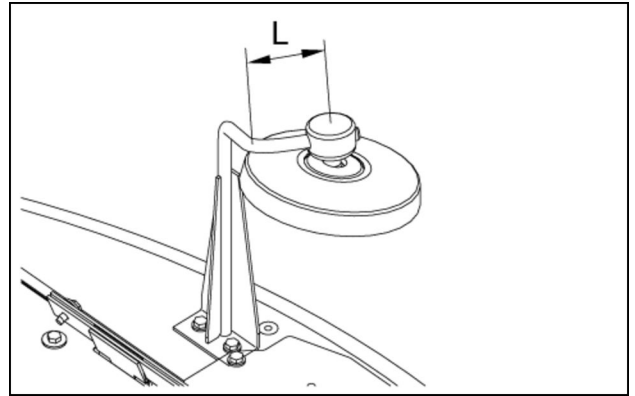


SMIL20CEX2461AA 10

Rear counterweight mirror (E)

Install the mirror as shown.

The dimension (L1) is 80 mm (3.1 in).

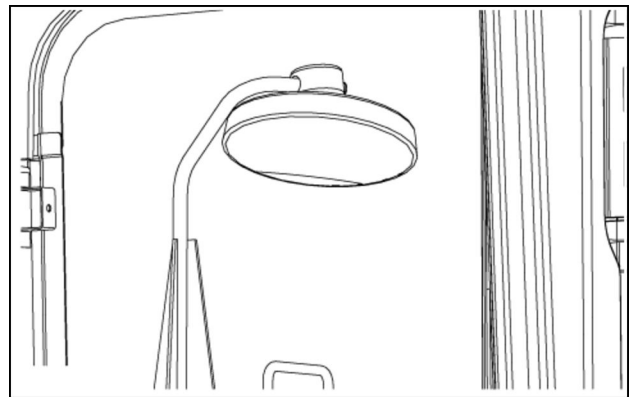


SMIL20CEX2460AA 11

Position the mirror so that the rear side of the machine is visible.

The tightening torque of the bolts on the mirror is **4.5 – 5.5 N·m (3.3 – 4.1 lb ft)**

NOTICE: After you install and position all of the mirrors, check the visibility around the machine from the operator's seat. Set the seat into the desired position, and make sure to confirm all the reference views in the mirrors. If necessary, fine tune the positioning of the mirrors in order to ensure proper visibility around the machine.

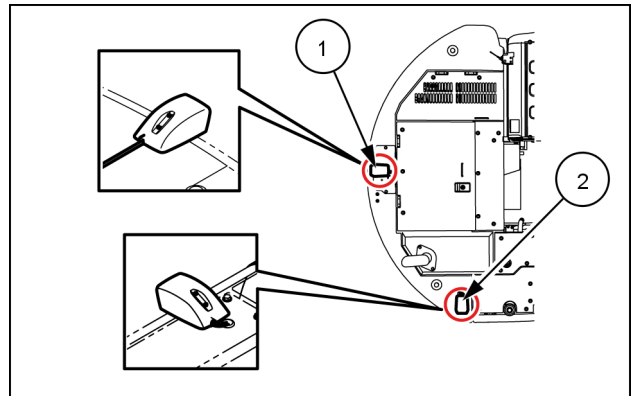


SMIL20CEX2461AA 12

Cameras

The external cameras, along with the external mirrors, ensure proper visibility around the machine during operation.

A rear camera **(1)** is installed on the counterweight. A right-side camera **(2)** can be installed over the right-hand door.



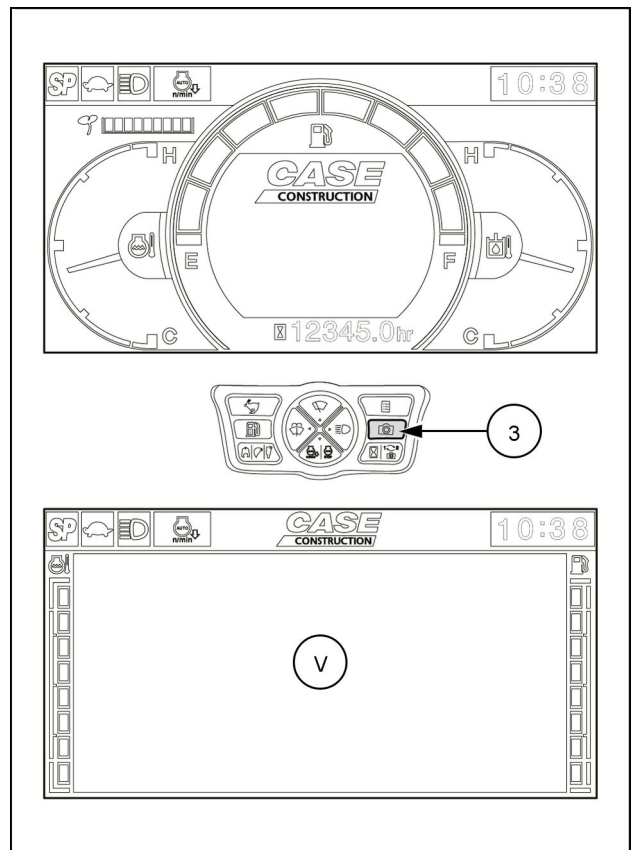
SMIL20CEX2502AA 1

Press the camera view selector button **(3)** to view the camera screen.

If either the rear or right-side camera is equipped, the view of the camera **(V)** is shown on the center of the display.

NOTICE: Never operate the machine while only looking at the images on the display. Make sure to check the area around the machine by the direct view or through the mirrors.

NOTICE: If any mud, raindrops, snow, etc. are adhered to the camera lens, the images on the display are deteriorated. Wipe away dirt with a wet and soft cloth, and then wipe it with a dry and soft cloth. Make sure not to scratch the cameras.

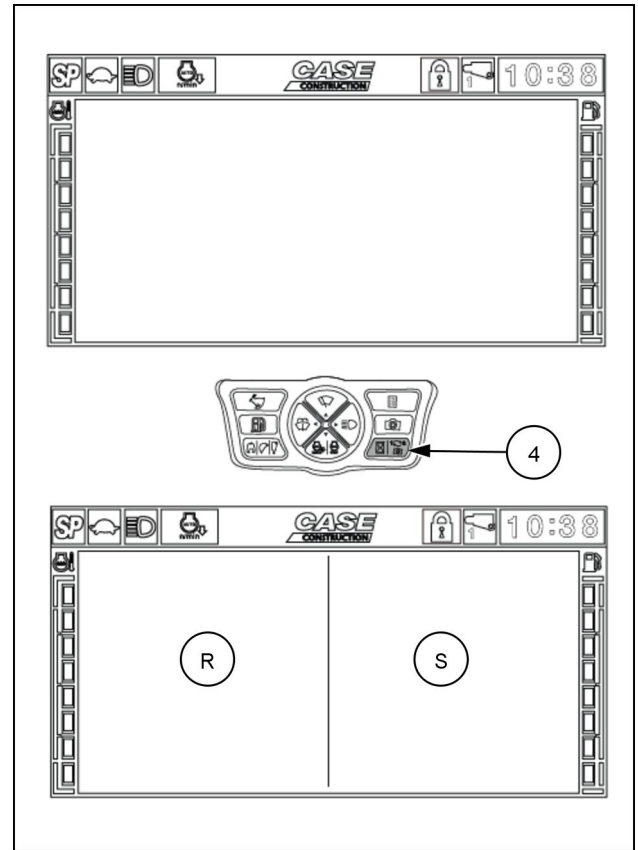


SMIL18CEX0560BB 2

If both the rear and right-side cameras are equipped, the view of each camera or the simultaneous view of both cameras can be shown on the display.

To select the desired camera view, press the button **(4)**. The selection toggles between the rear camera view, the side camera view, and the simultaneous view of both cameras.

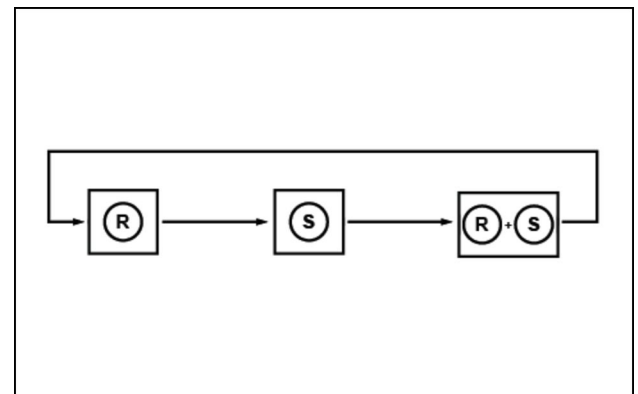
The simultaneous view of both cameras is set as follows. The view of the rear camera **(R)** is shown on the left side of the display. The view of the right side camera **(S)** is shown on the right side of the display.



SMIL18CEX1577BB 3

The sequence of the camera views is set by default as indicated in the picture. The rear camera view comes up first, then the side camera view, and finally the simultaneous view of both cameras.

NOTE: Consult the CASE CONSTRUCTION Dealer in order to modify the setting of the camera views.



SMIL18CEX1578AA 4

Side doors

⚠ WARNING

Moving parts!

Make sure all entry and mechanical access doors are properly closed before operating the machine.
Failure to comply could result in death or serious injury.

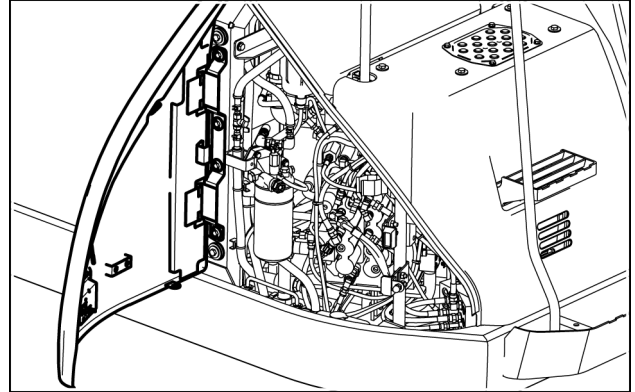
W0238A

Open the side doors until they are fixed by the stays. Close the side doors unlocking the stays. Make sure to close the doors firmly. Use the starter key to lock the doors.

Front right-hand door

The front right-hand door allows to access the compartment including the control valve, the fuel filters, the fuel feed pump, the windshield washer reservoir and the fuel tank filler pump (if equipped).

NOTE: Never leave tools inside the compartment.

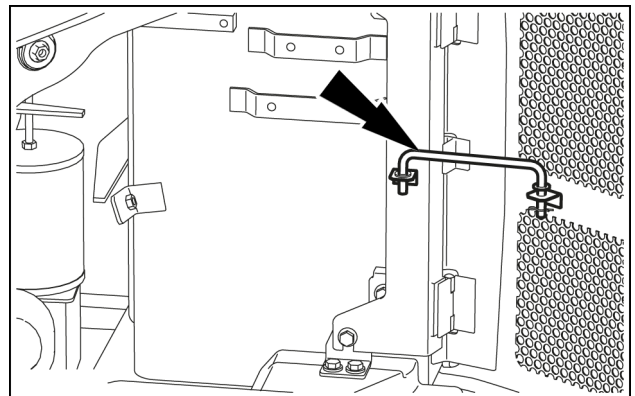


SMIL21CEX0087AA 1

Rear right-hand door

The rear right-hand door allows to access the compartment including the engine oil filter, the hydraulic pilot filter, the hydraulic accumulator and the hydraulic pump.

NOTE: Never leave tools inside the compartment.

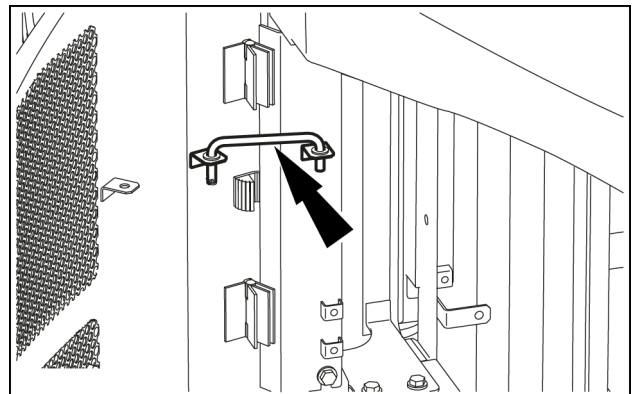


SMIL20CEX2504AA 2

Rear left-hand door

The rear left-hand door allows to access the compartment including the radiators, the engine air cleaner, the battery, the battery disconnect switch, the reserve tank for engine coolant and the air conditioning dryer.

NOTE: Never leave tools inside the compartment.



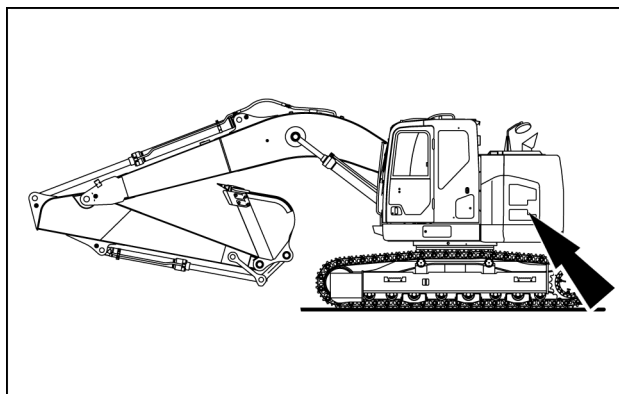
SMIL20CEX2505AA 3

Battery disconnect switch

The battery disconnect switch is located near the batteries. It can thus be reached by opening the rear left-hand door.

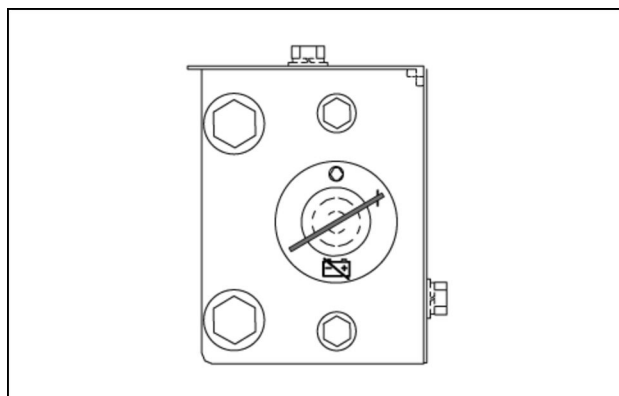
The battery disconnect switch allows to cut off any power supply in the electrical system of the machine.

NOTE: When the switch is turned to OFF position, all electrical circuits are cut off and the stations stored on the radio presets and the time set for the clock will be cleared.



SMIL20CEX2506AA 4

The battery disconnect switch shall be in ON position (I) for normal operation.



SMIL21CEX0040AA 5

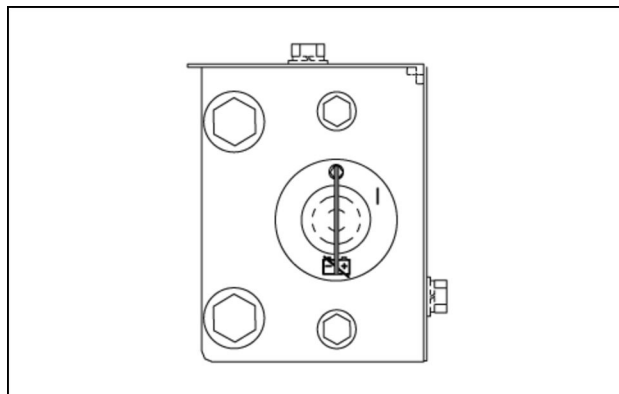
The battery disconnect switch shall be turned to OFF position (O) only when taking the actions below for inspection, repair and welding:

1. Batteries removal.
2. Electrical system connectors removal.
3. Service on the electrical system.
4. Long-term storage.

NOTICE: Never turn the battery disconnect switch to OFF position with the engine running. This could damage the electrical system.

The battery disconnect switch shall never be turned to OFF position within **3 min** after the engine is stopped.

NOTICE: Never turn the battery disconnect switch to OFF position within **3 min** after the starter key is turned off. The machine control system and the engine control system will be damaged.



SMIL21CEX0041AA 6

Engine hood

⚠ WARNING

Rotating parts!
Shut off the engine before opening the engine hood.
Failure to comply could result in death or serious injury.

W1059A

⚠ WARNING

Falling object hazard!
Risk of injury from **FALLING ENGINE HOOD**. Latch the hood in the fully open position prior to working within the engine compartment.
Failure to comply could result in death or serious injury.

W1090B

⚠ WARNING

Unexpected machine movement!
Before you operate the machine, check that the engine hood is securely closed.
Failure to comply could result in death or serious injury.

W1486A

To open or close the engine hood, reach the service platform in the center of the machine. Refer to page **6-4**.

Opening

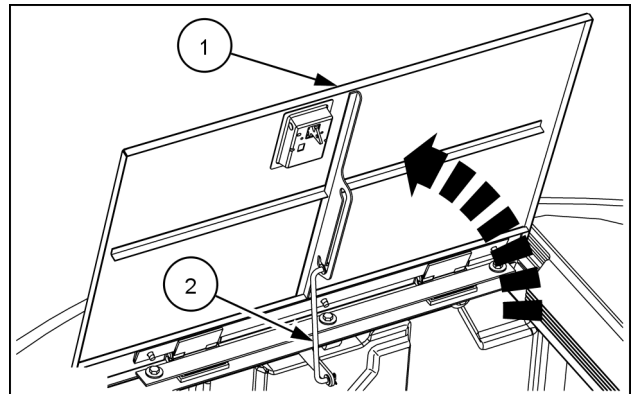
Stand on the service platform. Unlock the latch with the starter key.

Pull the latch, grab the hood handle **(1)**, and raise the engine hood.

Raise the hood until the stay **(2)** will reach the end of the guide. The engine hood is thus fixed in the open position.

NOTICE: Never leave the hood handle before the stay reaches the end of the guide. The engine hood will fall down causing serious injury to the operator.

NOTICE: Do not open the engine hood during strong wind. The wind pressure on the hood surface will generate an excessive pushing force. Failing to comply may cause severe damage to the machine components, and serious injury to the operator.



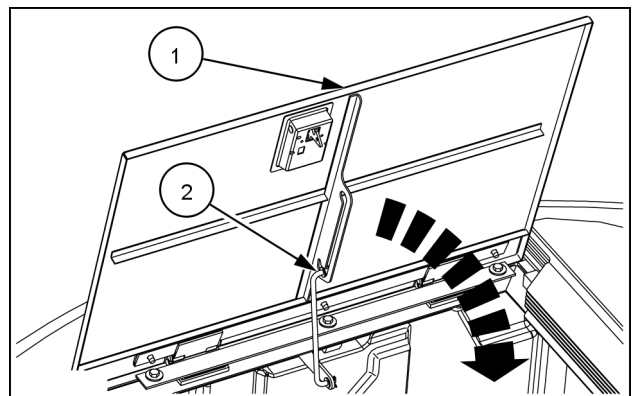
SMIL20CEX2507AA 1

Closing

Stand on the service platform. Grab the hood handle **(1)** with the left hand.

Raise a little the engine hood, lead the stay **(2)** into the guide so to unlock it, and close the engine hood.

Lock the latch with the starter key.



SMIL20CEX2508AA 2

Lower panels

⚠ WARNING

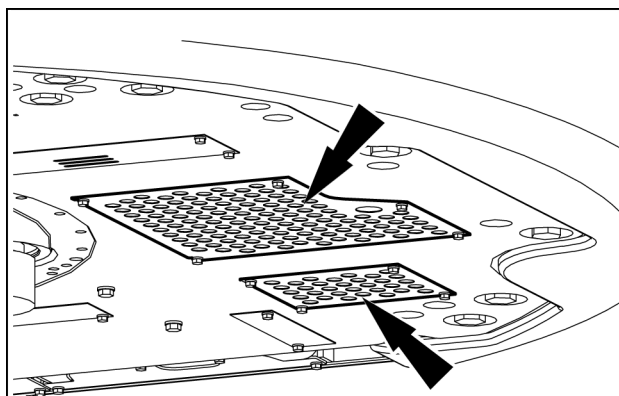
Moving parts!

Make sure the lower panels are properly closed before driving the machine.

Failure to comply could result in death or serious injury.

W0910A

Located on the bottom side of the upper frame. The lower panels give access to the engine oil drain plug, to the hydraulic tank drain plug, to the fuel tank drain plug.



SMIL21CEX0001AA 1

Windshield washer reservoir

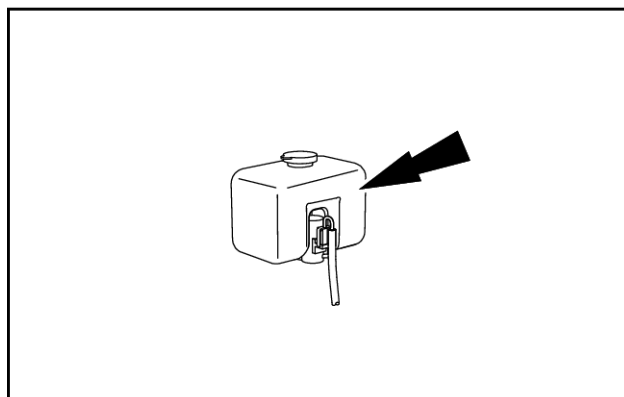
The windshield washer reservoir is located inside one of the left-hand compartments behind the cab.

Make sure to check the reservoir level each day in order not to let the windshield washing fluid run out completely.

NOTICE: Never operate the windshield washer when the reservoir is empty. This will cause damage to the electric pump.

NOTE: In cold weather, add anti-freeze to the windshield washing fluid.

NOTE: The reservoir can be lifted out of its support in order to ease the maintenance operations.



SMIL13CEX2650AB 1

Towing holes

⚠ WARNING

Misuse hazard!

Towing is a delicate maneuver that is always carried out at the risk of the user. The manufacturer's warranty does not apply to incidents or accidents that occur during towing. Where possible, carry out the repairs at the site.

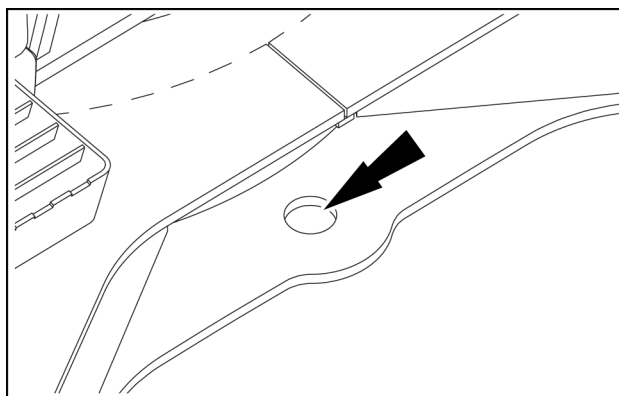
Failure to comply could result in death or serious injury.

W0286A

Located at the front and rear of the undercarriage. These holes are used to tow heavy objects, up to **10 t (22046.23 lb)**.

Make sure that the slings, chains and accessories are in perfect condition and can bear the load to be moved.

NOTICE: Towing must always be done in alignment with the undercarriage.



SMIL14CEX2589AA 1

Storage compartment

⚠ WARNING

Moving parts!

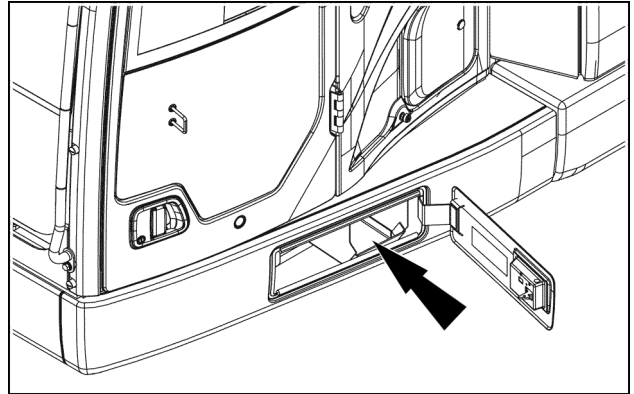
**Make sure the storage box cover is closed properly before driving the machine.
Failure to comply could result in death or serious injury.**

W0288A

The storage compartment is located on the left of the upperstructure, below the cab. It is intended for storage of emergency tools and of small spare parts.

Open the compartment cover with the starter key.

NOTICE: Make sure to close and lock the compartment before starting machine operation. Leaving the compartment open can cause serious damages to the machine, and may cause serious injuries to the bystanders.



SMIL17CEX0897AA 1

Fire extinguisher

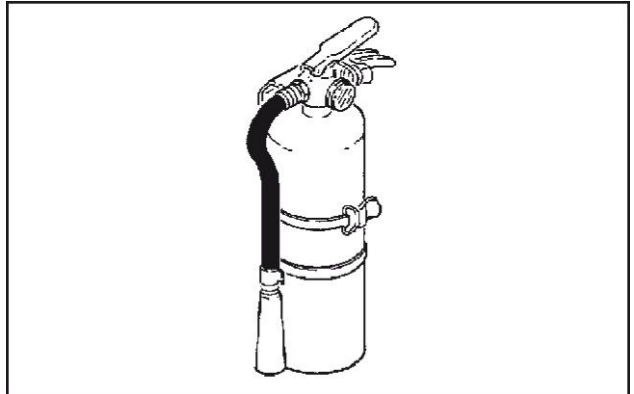
It is strongly recommended to have a fire extinguisher available and to keep it inside the front storage box.

Service specifications:

Every month: examine the fire extinguisher and make sure it is not damaged.

Every six months: have an approved specialist empty and refill the powder in the fire extinguisher.

Every year: have an approved specialist examine the fire extinguisher.



CS98M573TBP1 1

Fuel tank

⚠ WARNING

Fire hazard!

When handling diesel fuel, observe the following precautions:

1. Do not smoke.
 2. Never fill the tank when the engine is running.
 3. Wipe up spilled fuel immediately.
- Failure to comply could result in death or serious injury.**

W0099A

Fill the fuel tank with low sulfur Diesel fuel only. Refer to Chapter 6 for the detailed specifications and prescriptions about the fuel to be used.

NOTICE: Never put any moisture elimination product (water draining agent) in the fuel tank. Doing so may damage the fuel system, and thus the engine.

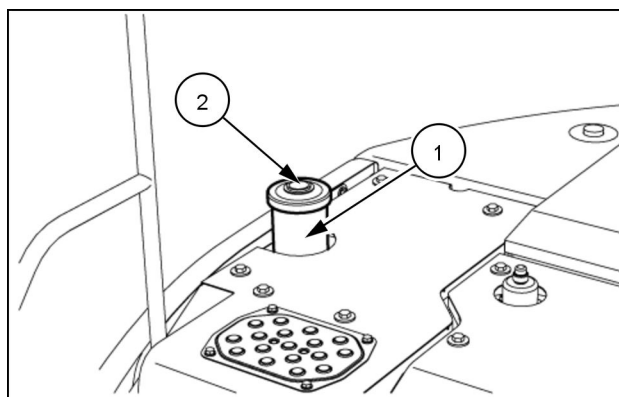
NOTICE: If the machine is operated in cold climate, fill the fuel tank at the end of each working day to prevent the formation of condensation.

To refill the fuel tank proceed as follows:

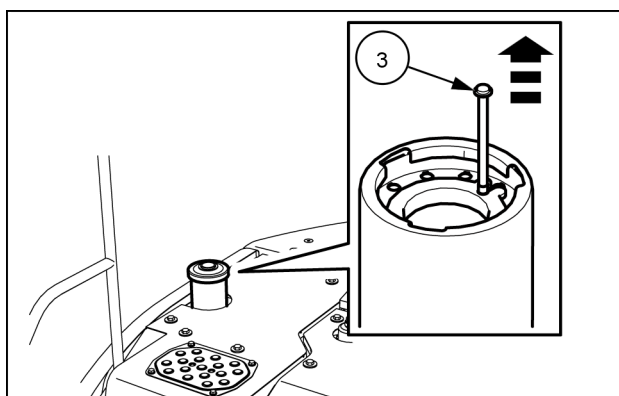
1. Stop the engine, and remove the starter key.
2. Get over the fuel tank. Clean the area around the fuel filler neck (1).
3. Slide the protective plate over the cap (2) of the fuel filler neck, and unlock the cap with the starter key.
4. Turn the cap (2) counterclockwise and open the filler neck.

NOTICE: Never remove the mesh filter inside the fuel filler neck. Doing so may damage the fuel system, and thus the engine.

5. Refill until the needle indicator (3) gets up from the filler neck.
6. Put the cap (2) on the filler neck. Turn the cap clockwise until it engages the stopper on the filler neck.
7. Lock the cap (2) with the starter key.



SMIL20CEX2454AA 1



SMIL21CEX0037AA 2

Fuel tank filler pump (if equipped)

⚠ WARNING

Fire hazard!

When handling diesel fuel, observe the following precautions:

1. Do not smoke.
2. Never fill the tank when the engine is running.
3. Wipe up spilled fuel immediately.

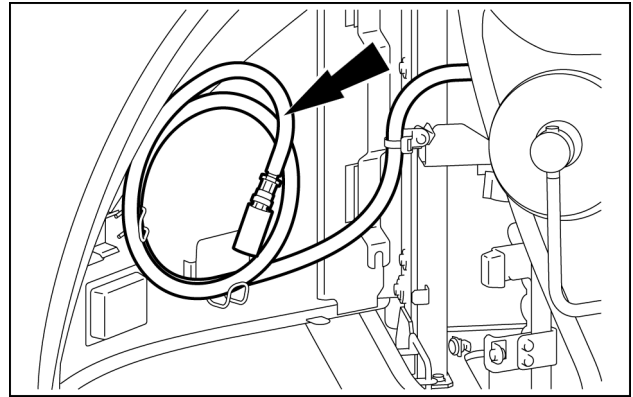
Failure to comply could result in death or serious injury.

W0099A

NOTICE: Do not put a moisture elimination product (water draining agent) in the fuel tank. It may damage the engine.

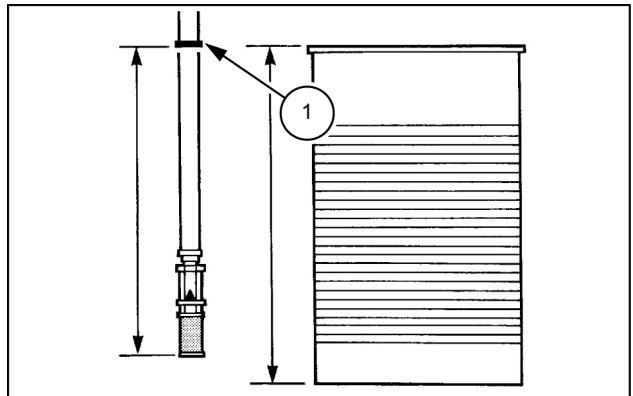
NOTICE: The fuel tank filler pump is located inside the compartment on the right front of the upperstructure. Use only for suitable fuel.

1. Park the machine on flat, horizontal ground, stop the engine and turn the starter key to ON position.
2. Take the inlet pipe out of the front right-hand compartment.



SMIL21CEX0002AA 1

3. Measure the height of the drum and place the identification clamp (1) of the suction tube at a length slightly less than that of the drum height.
4. Make sure that the end strainer of the suction tube is correctly attached and then insert the suction tube in the drum.



SMIL14CEX2515AB 2

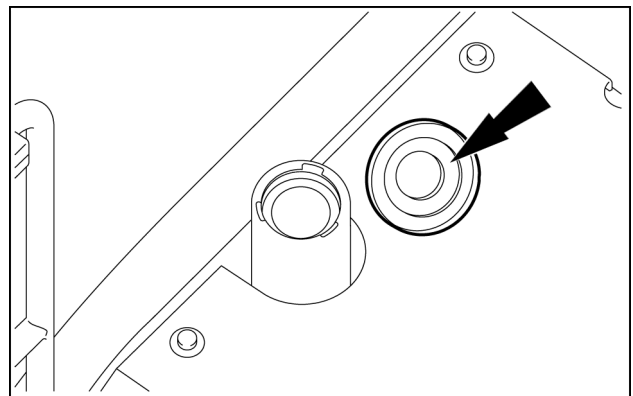
5. Remove the fuel tank filler cap.

⚠ WARNING

Burn hazard!

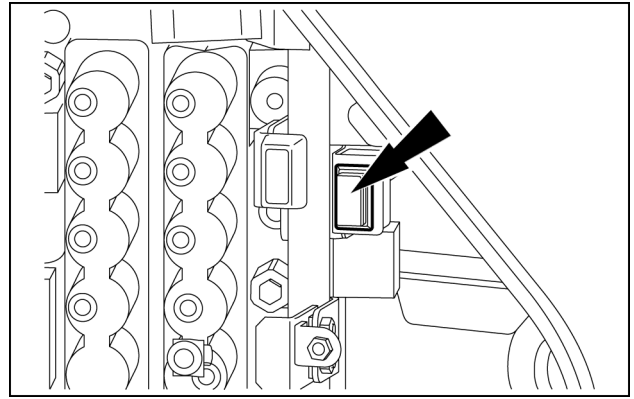
If the filler cap remains on during the refueling process, removing the cap after refueling could cause an accident. To reduce this risk, **ALWAYS** remove the fuel tank filler cap before refueling with the fuel tank filling pump. Failure to comply could result in death or serious injury.

W0247A



SMIL21CEX0003AA 3

6. Select the filling method using the selector switch located on the right side of the filling pump:
 - Auto mode: the pump stops filling automatically and the audible alarm sounds when the fuel tank is full.
 - Manual mode: monitor the filling from the fuel tank gauge. Stop when the fuel reaches the maximum level.



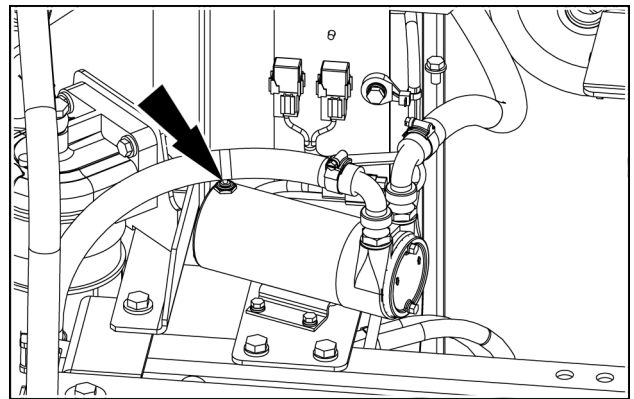
SMIL21CEX0004AA 4

7. Turn the main switch of the pump to ON position. Filling begins.
8. When the fuel tank is full, turn the main switch of the pump to OFF position. In Auto mode, the audible alarm device will cease to function.

NOTE: It is possible to stop filling at any time by turning the main switch of the pump to OFF position.

9. Run the pump for a few moments to empty the pipe outside the drum. Clean and replace the inlet pipe in the front right-hand compartment.
10. Refit the fuel tank filler cap.
11. Turn the starter key to OFF position.

NOTE: The pump is equipped with a 10 A fuse.



SMIL21CEX0005AA 5

4 - OPERATING INSTRUCTIONS

Starting the unit

Anti-theft protection

A security function can be set up in order to prevent an undesired usage of the machine, or even the theft of the machine. The security function locks the display by a password when the machine is started. Furthermore, the security function limits the machine functionality as the engine is started without entering the password.

The set up of the security function is indicated by a specific icon on the display:



The security function is set up.

To set up the security function and the password, consult the CASE CONSTRUCTION dealer.

NOTICE: Consult the CASE CONSTRUCTION dealer in case of forgotten password.

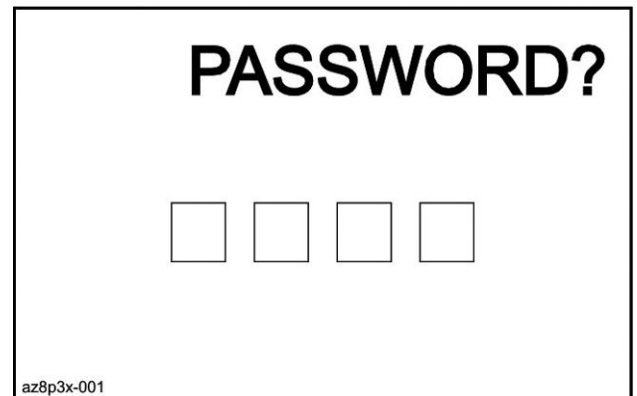
Activation of the security function

The activation of the security function has to be decided when shutting down the engine.

To activate the security function, turn the starter key to OFF position, then to ON position, finally to OFF position again after 2 sec. A warning alarm sounds, and the security function icon is displayed.

At the next machine start, the request for entering the password will be displayed.

As the key is turned to ON position, the request for entering the password is displayed.



AZ8P3X-001 1

Enter the password according to the following instruction.
Move the cursor to the left with the front glass washer button **(1)**.

Move the cursor to the right with the working light button **(2)**.

Increase the value (0, 1, 2, 3...) with the front glass wiper button **(3)**.

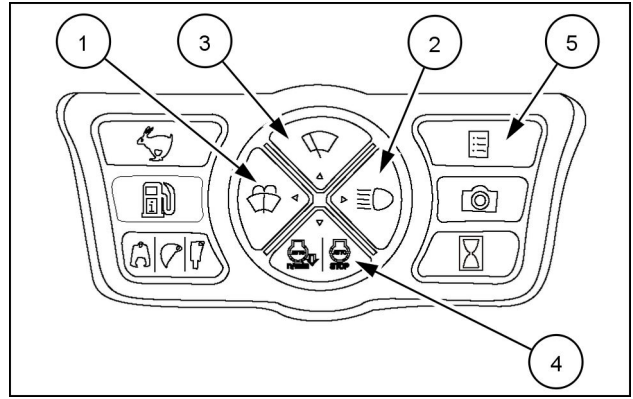
Decrease the value (...3, 2, 1, 0) with the engine idling select button **(4)**.

Press the menu button **(5)** to confirm the password.

As the password is properly entered, the display is unlocked, and the machine can be started.

If the password is wrongly entered, the ERROR message is displayed: turn the starter key to OFF position, and repeat the procedure to enter the password. If the engine is started up without entering the password, the machine goes into an immobilized state:

1. A warning buzzer, and the travel alarm if equipped, sound continuously.
2. The engine speed is limited to low idle.
3. The swing function is disabled.
4. If any lever or pedal is operated, the engine stops automatically.



SMIL16CEX1781AB 2



az8p3x-002

AZ8P3X-002 3

Starting the engine

⚠ WARNING

Avoid injury!

Before starting the engine, securely fasten the seat belt. The seat belt can help ensure your safety if it is properly used and maintained. Never wear a seat belt loosely or with slack in the belt system. Never wear the belt if it is twisted or pinched between the seat structures.

Failure to comply could result in death or serious injury.

W0142A

⚠ WARNING

Hazard to bystanders!

Make sure the area surrounding the machine is clear of all persons before starting the engine.

Failure to comply could result in death or serious injury.

W0090A

⚠ WARNING

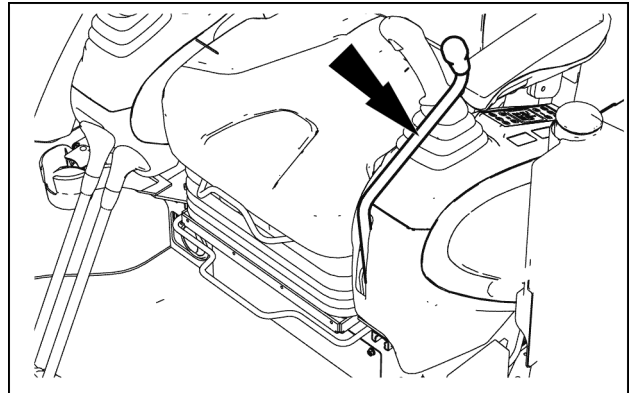
Toxic gas and asphyxiation hazard!

Diesel exhaust contains dangerous compounds. Never operate the engine in a closed building or area. Proper ventilation is required under all circumstances.

Failure to comply could result in death or serious injury.

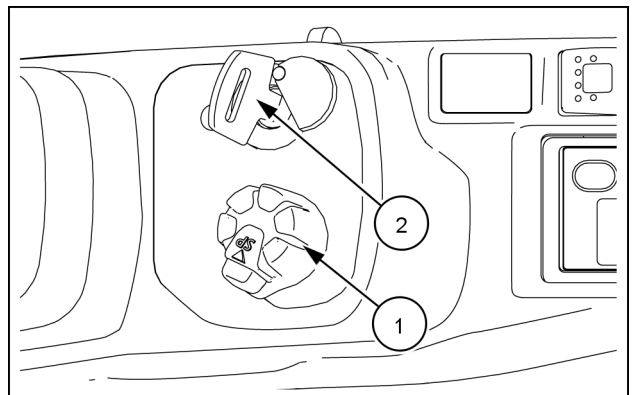
W1302A

1. Check that there is no abnormality in the machine.
2. Confirm that the engine hood and the side doors are closed and locked.
3. Confirm that the gate lock lever is in lock position.
4. Set each operation lever in neutral.
5. Securely fasten the seat belt.



SMIL17CEX0198AA 1

6. Confirm that the engine speed throttle (1) is in low idle position.
7. Turn the starter key (2) to ON position.



SMIL19CEX2696AA 2

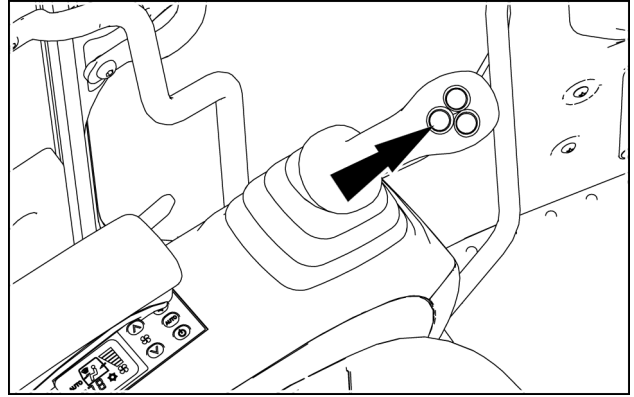
8. Unlock the display if the security function had been activated. When operating the machine in severe winter climates, the engine preheating icon is displayed as the engine is being preheated automatically.



The engine is preheating.

Wait for the auto preheat to complete and the icon to disappear.

9. Sound the horn with the button on the left control lever to warn that the machine is starting up.
10. Turn the starter key (2) to START position. The engine running takes approximately 1 s to stabilize after it has been cranked up. Release the starter key as soon as the engine is running regularly.



SMIL19CEX2697AA 3

NOTICE: The cranking up of the engine may be difficult in severe winter climate. If the engine does not start after 10 s of operation of the starter motor, turn the key to OFF position and wait 2 min before attempting a new cranking.

NOTICE: When the engine is started in severe winter climate, moisture vapor may be temporarily generated resulting in a whitened smoke.

NOTICE: Immediately after the engine is started, the engine sound is louder compared to the sound after the engine is warmed up, and also the color of the exhaust smoke becomes more whitened or more blackened than the smoke emitted during the normal operation. The engine sound and the color of the exhaust smoke get smoothed after the engine is warmed up.

NOTICE: Due to resonance, vibration might come up while the engine is running at low speed. Increasing slightly the engine speed reduces the vibration.

Bringing the machine up to operating temperature

Before starting operation, the main systems of the machine should be warmed up to their normal operating temperature.

NOTE: The normal operating temperature for the hydraulic fluid is **50 – 80 °C (122 – 176 °F)** . This corresponds to four segments lit on the hydraulic temperature gauge.

NOTE: The normal operating temperature for the engine coolant is **75 – 90 °C (167 – 194 °F)**. This corresponds to four segments lit on the coolant temperature gauge.

A warm-up procedure should thus be carried out in order to grant a proper and safe usage of the machine, and in order to grant the best machine performance and fuel efficiency.

NOTICE: The warm-up of the machine is mandatory when operating in severe winter climates.

NOTICE: The warm-up of the machine prevents wear and severe damages to the engine, to the fuel system and to the hydraulic system.

NOTICE: The exhaust pipe becomes extremely hot while the engine is idling. Make sure that there is no flammable material such as plants, dried grass, paper waste, oil and old tires close to the exhaust pipe before starting warm-up procedure.

NOTICE: Never cover the grids of the radiators with flammable materials.

Automatic machine warm up

Regardless of the ambient conditions, the machine control system allows to carry out an automatic warm-up procedure that brings the temperature of the main operating fluids to the proper level for machine operation.

Start the engine with the speed throttle in the low idle position and let the machine complete the automatic warm-up procedure. During the automatic warm-up, the engine speed and the engine load are automatically managed in order to match the warm-up cycle to the ambient conditions and to optimize the warm-up cycle in respect to the machine operating parameters.

NOTE: the engine speed and the noise of the hydraulics are supposed to change during the warm-up cycle.

NOTICE: The automatic warm-up procedure is the recommended operating practice. However, the automatic warm-up procedure can be overridden either by changing the engine speed manually or by operating any operation lever.

As the procedure starts up, the message AUTO WARM UP is displayed:



The automatic warm-up procedure takes about **5 – 10 min** depending on the ambient conditions.

After completion of the automatic warm-up procedure, the AUTO WARM UP message disappears, and the engine speed gets back to low idle.

Manual machine warm up

A manual machine warm-up can be carried out referring to the following procedure:

1. Set the engine speed throttle three steps over the low idle position.
2. Start the engine and let it run approximately for **5 – 10 min** with no load.
3. When the coolant temperature reaches the second segment on the coolant temperature gauge, set the engine speed throttle in intermediate position.
4. Set the gate lock lever to unlock position.
5. Move the bucket control slowly until the bucket is fully curled.
6. Operate the arm until the it is completely retracted, and hold the position for **30 s**.
7. Extend the arm completely, and hold the position for **30 s**.
8. Repeat the sequence of extending and retracting the arm until the temperature of the hydraulic fluid raises over the first two segments on the hydraulic temperature gauge, corresponding to **25 °C (77 °F)**.

NOTICE: *Never overload the hydraulic system until the temperature of the hydraulic fluid reaches 25 °C (77 °F). If the hydraulic system is overloaded with the temperature of the hydraulic fluid below 25 °C (77 °F) it will be severely damaged.*

9. Gently operate the controls for travel, front equipment and swing for 3 to 4 times to circulate warmed hydraulic fluid into the whole circuit.

Check the followings after reaching normal operating temperature of the fluids:

- Exhaust gas is normal.
- No unusual noise or vibration.
- No leak of oil, fuel or water.
- No unusual noise when activating the hydraulic equipment.
- Inspection of the horn, buzzer, working lights and instrument cluster.
- Proper display of the temperature gauges.
- Check the visibility from the rear view mirrors, the side view mirrors and the cameras before operation. Adjust and clean up dirt as necessary.
- Check each operation (travel, front equipment and swing).

If any of the following occurs during the warm-up procedure, stop the engine immediately.

- Engine speed increases or decreases rapidly.
- Engine sound and exhaust gas color are abnormal.
- Messages are displayed, and a warning alarm sounds.

Operating the machine in hot or cold weather

In cold weather

- Make sure to use fluids and lubricants which have specifications suitable for operation at low ambient temperatures.
- Check the batteries for full charge state.
- Fill up the fuel tank after completing the work, and then drain water before starting work on the next day in order to prevent dew condensation and invasion of water to the fuel system.
- Use fuel which is rated to the outside air temperature, or proper anti-freeze in order to prevent crystal generation at **-2 °C (28 °F)**.

NOTICE: Before transporting the machine to a cold region, fill the tank with fuel that has a low freezing temperature.

In hot weather

- Make sure to use fluids and lubricants which have specifications suitable for operation at high ambient temperatures.
- Keep the coolant at the correct level in the coolant reservoir and in the radiator.
- Use the correct solution of ethylene glycol and water in the cooling system.
- Test the radiator cap before hot weather starts. Replace the cap as required.
- Clean all dirt and debris from the radiator, cooler and engine area.
- Check the condition of the fan drive belt.

Operation under dusty and sandy conditions

- Frequently inspect the element of the air cleaner and clean or replace the element and the dust cup regardless of service due.
- Tightly close the breather cap of the hydraulic tank to prevent invasion of sand and dust to the hydraulic circuits.
- Make sure to thoroughly clean the grease fittings before greasing any lubrication point of each pin and bush.
- Make sure to clean the radiator fin and oil cooler fin and the radiator grid.

Operation on seashore

- Inspect tightness of the plugs/ cocks/bolts in each point in order to prevent salt corrosion.
- Thoroughly wash the machine after the work, especially take good care of the electrical equipment and hydraulic cylinder to prevent corrosion.

Operation on highly humid land or soft land

- Keep the machine as dry as possible during operation and make sure to carry out regular lubrication. Moisture and mud water cause deterioration and corrosion of paints/wirings/metal components.

Operating the machine

⚠ WARNING

Misuse hazard!

Follow the operating instructions in this chapter. Any other practice that has not received the prior approval of the manufacturer is considered to be strictly forbidden.

Failure to comply could result in death or serious injury.

W0281A

⚠ WARNING

Hazard to bystanders!

Always know the location of all workers in your area. Warn them before you start working on the machine. Always keep all unauthorized bystanders clear of the area.

Failure to comply could result in death or serious injury.

W0176A

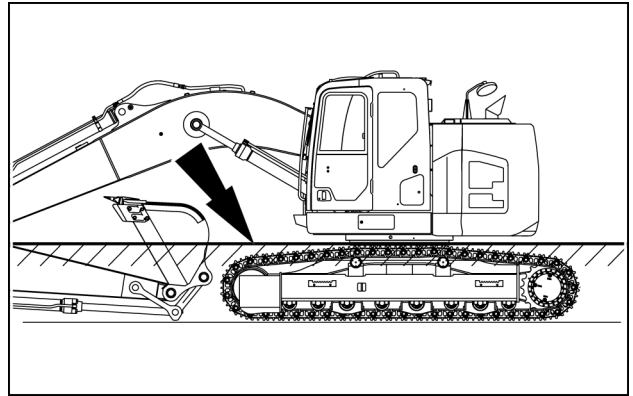
- Pay attention to work condition characteristics of ground and climate condition before operating the machine.
- Inspect every possible risk before operating the machine. Holes on working site, obstructions and hazardous materials such as debris are subject to cause serious accident.
- Pay attention to location of pipes and cables before commencing work. Electric cables, gas pipes, water pipes and underground installations may cause serious injury. If the work takes place adjacent to high voltage power lines make sure to check the following work range:
Less than 57000 V: 4 m (13.1 ft)
57000 V or more: 5 m (16.4 ft)
- Sit on the operator's seat, adjust it so as to be able to easily reach the console, and then fasten the safety belt.
- Check that the cab door is tightly secured at position of open or close.
- Sound the horn.
- Start up the engine.
- Check all the indicator lamps and gauges are operating properly.
- Set the gate lock lever to unlock position.

The following operation may cause damage to the machine:

- Do not use weight of the machine as an impact force for excavation.
- Do not use traveling force of the machine for excavation.
- Avoid abrupt change of swing direction when swinging the upper structure.
- Never hit or push objects with side of the bucket. Do not sweep ground with the bucket to level rubbles.
- Open and close the bucket for several times to loosen soil and mud when soil and mud are tightly packed in the bucket.
- After work, remove mud from the machine and clean it.

Operating the machine on soft ground or in water

- The machine could gradually sink when working on soft ground. Pay attention to undercarriage during work.
- Before operating the machine in water, check the water depth and the footing. Permissible water depth is up to the upper rollers.
- After operation underwater or on soft ground, apply grease to the attachment and the turntable bearings. Clean and inspect the undercarriage as well.
- In case of accidental sinking in water or soil up to the swing body, replacement of grease and service are required. Terminate operation, and contact the CASE CONSTRUCTION dealer.



SMIL21CEX0035AA 1

NOTICE: Do not operate in a fast flowing stream.

Operating the machine on sloping ground

⚠ WARNING

Driving hazard!

Hillside operations can be dangerous. Rain, snow, ice, loose gravel, or soft ground, etc. can change the ground conditions. You must make a judgment if it is safe to operate your machine on any hillside or ramp.

Failure to comply could result in death or serious injury.

W0144A

⚠ WARNING

Overturning hazard!

Before parking the machine, make sure the ground is stable. Plan the worksite so that the ground is flat, hard, and level.

Failure to comply could result in death or serious injury.

W0258A

The machine gradeability is **35° (70%)**.

NOTICE: Do not operate the engine when incline of the machine is **35° or more**. The engine or the hydraulic system may be damaged.

During hillside operations, be extra careful.

- Maintain the maximum engine speed.
- Make sure that the low speed travel is selected.
- Always keep the travel reduction gears pointing down towards the bottom of the slope.
- Always travel in the same direction as the slope, to prevent the machine from turning over. Never decelerate when descending a slope.
- Raise the bucket about **40 cm (15.75 in)** away from ground when ascending a slope. Contact the bucket on ground to avoid slipping the machine when descending a slope.
- Avoid swinging to a direction of travel on a **15°** slope, or avoid swinging perpendicular to direction of travel on a **10°** slope.
- During digging operation, avoid swinging the upperstructure towards the bottom of the slope with the bucket full.

Digging and loading operations

Use the H work mode for general digging and truck loading operations.

Use the SP work mode for heavy digging operation.

Filling

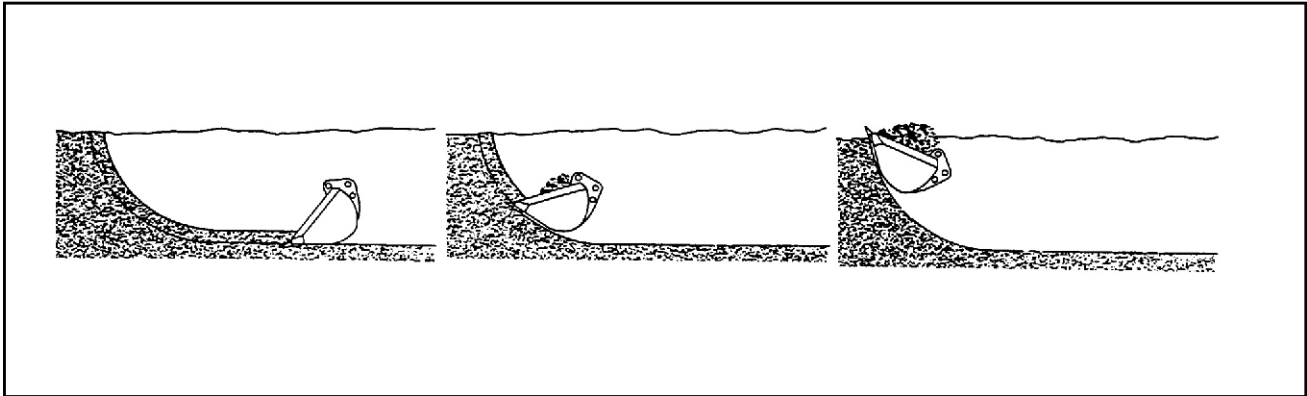
Fill the bucket by manoeuvring the arm.

Keep the bottom of the bucket parallel to the cut.

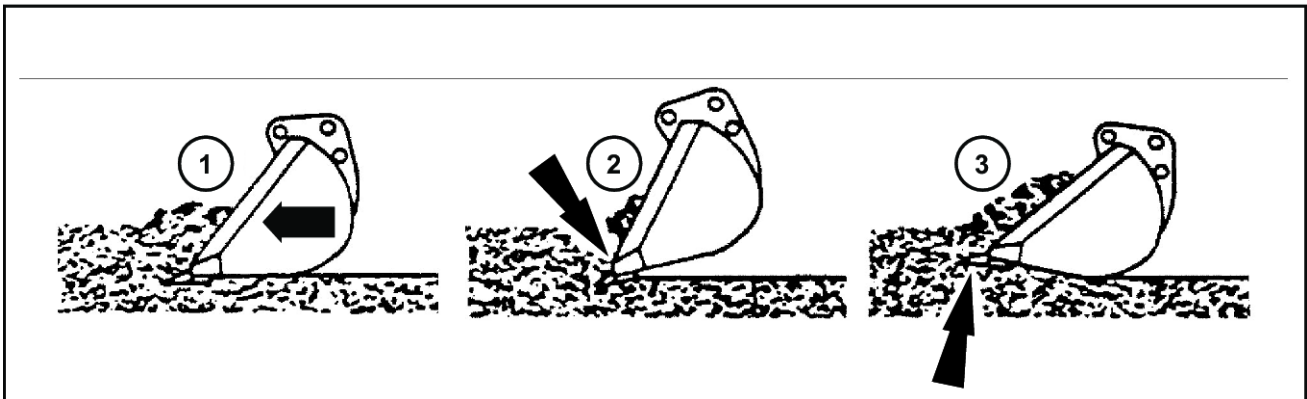
The bucket teeth and blade must cut the ground like the blade of a knife.

The depth of dig varies depending on the type of material.

Excavating method



SMIL13CEX2693EA 2



SMIL13CEX2694EB 3

1. Correct
2. Incorrect. The bucket will dig in and cause a stall.
3. Incorrect. The bucket is pushed upwards. This will also increase the cycle time.

Lowering the attachment in the event of a failure

⚠ WARNING

Unexpected machine movement!

Only use the following procedure in case of machine failure. Always use extreme caution during operations. Keep other persons away from the bucket, attachment, and boom. The bucket or attachment can move unexpectedly during operations due to weight of the bucket, attachment, arm, or boom.

Failure to comply could result in death or serious injury.

W1364A

⚠ CAUTION

Crushing hazard!

Keep away from the space under the bucket or attachment when lowering the bucket or attachment. In cases where the machine fails and the engine stops, lower the attachment using the procedure described in this manual.

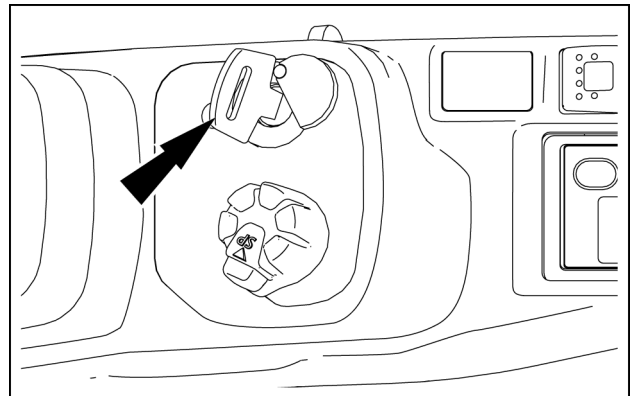
Failure to comply could result in minor or moderate injury.

C0169A

NOTICE: the procedure should be completed within five minutes after the engine stops. The accumulator pressure will gradually falls which will disable the ability to lower the attachment.

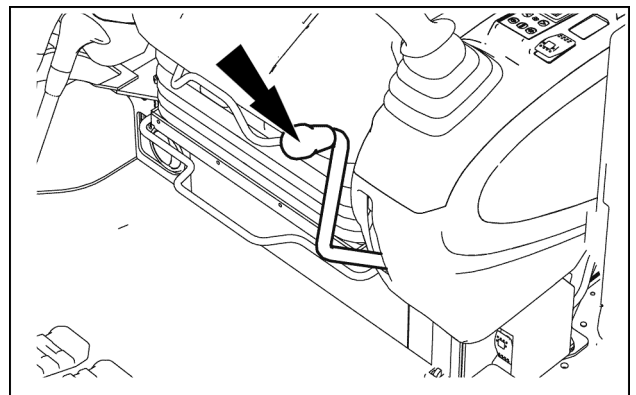
If the engine breaks down, use the following procedure to lower the attachment:

1. Turn the starter key to ON position.



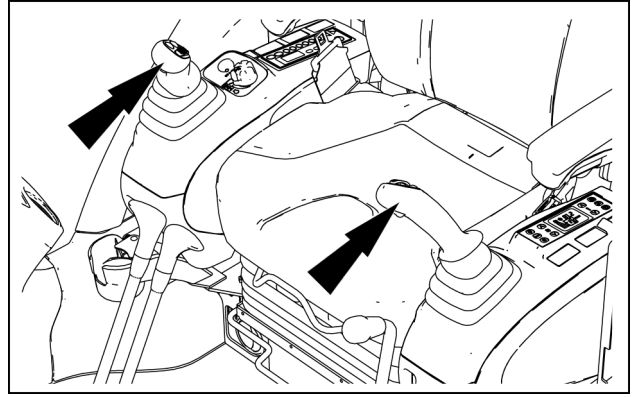
SMIL19CEX2696AA 1

2. Set the gate lock lever to unlock position.



SMIL17CEX0199AA 2

3. Slowly operate the control levers to lower the attachment to the ground.



SMIL17CEX0109AA 3

Bucket replacement

⚠ CAUTION

Avoid injury!

Handle all parts carefully. Do not place your hands or fingers between parts. Use Personal Protective Equipment (PPE) as indicated in this manual, including protective goggles, gloves, and safety footwear.

Failure to comply could result in minor or moderate injury.

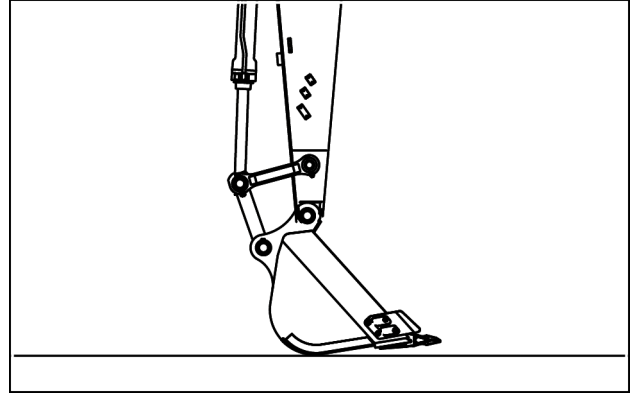
C0145A

To remove the bucket from the linkage, proceed as follows:

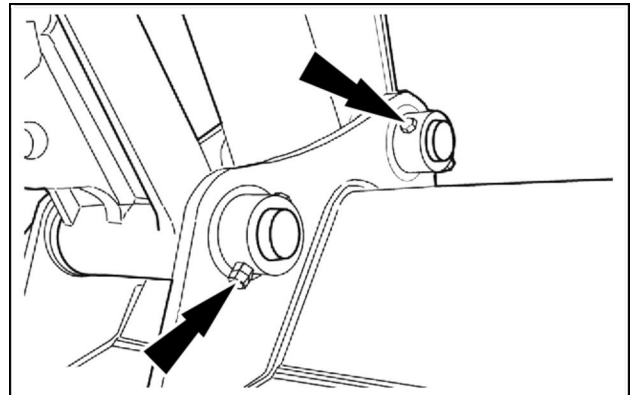
1. Operate the arm and bucket controls so that the arm stands vertical and the bottom side of the bucket leans against a hard and level ground.

NOTICE: never push the bucket onto the ground. The bucket pins should be unloaded in order to be properly extracted from the bushings.

2. Place the gate lock lever to lock position, stop the engine and remove the starter key.
3. Slide the O-ring seals onto the inner bosses of the bucket.
4. Unlock the bucket pins by removing either the retaining pins or the locking bolts. Check the locking tools for wear or damage. Make sure to properly store the locking tools to prevent damage.
5. Place a punch on the flat edge of the pin (1), and push it out using a hammer. Extract the pin (2) using the same procedure. Make sure to properly handle and store the bucket pins to prevent damage.



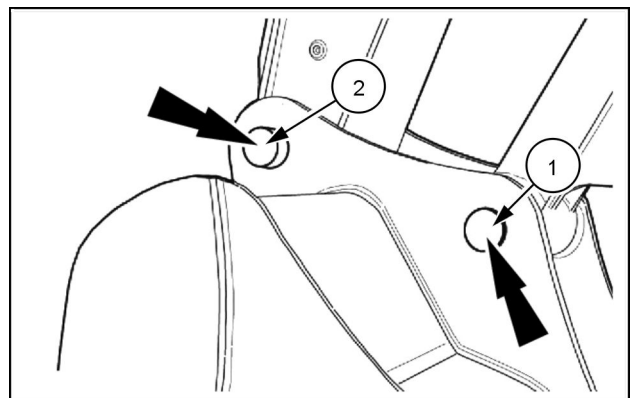
SMIL16CEX0478AA 1



SMIL13CEX2827AB 2

6. Get onto the cab, start the engine and place the gate lock lever to unlock position.
7. Gently retract the bucket cylinder to release the bucket connecting rod from the bucket hangers.
8. Gently operate the arm and boom controls to release the arm top from the bucket hangers. Check the O-ring seals and the mounting spacers for wear or damage. Make sure to properly store the O-ring seals and the mounting spacers to prevent damage.

NOTICE: If the bucket linkage does not easily come out from the bucket hangers, lower the bucket to the ground. In order to unstick the mating surfaces, gently operate the bucket control to extend the bucket cylinder or the boom control to push down the arm top.



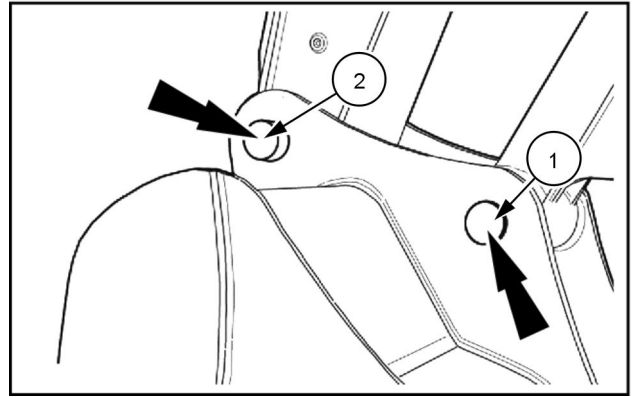
SMIL13CEX2828AB 3

To mount the bucket to the linkage, proceed as follows:

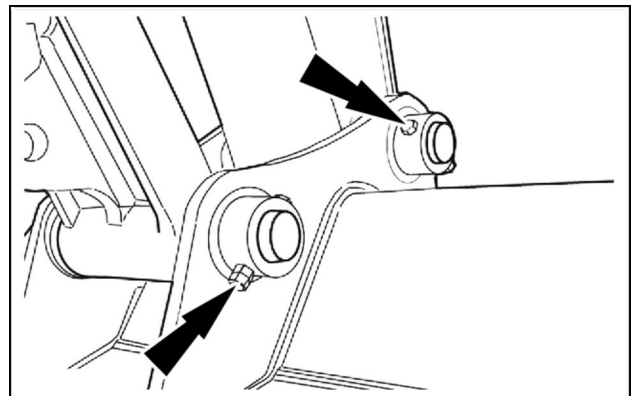
1. Make sure that the machine and the bucket stand both onto a hard and level ground. The bucket should stand on its bottom side.
2. Place the O-ring seals onto the inner bosses of the bucket.
3. Position the machine close to the bucket, and gently operate the boom and arm controls in order to align the arm top between the respective bosses on the bucket.
4. Place the gate lock lever to lock position, stop the engine and remove the starter key.
5. Position the mounting spacers if required. Place a punch on the flat edge of the pin **(2)**, and push it in using a hammer.

NOTICE: Make sure to insert the pin by its chamfered edge. Make sure to insert the pin from the bucket side opposite to the locking boss.

6. Push the pin until the locking hole on the pin is aligned to the locking hole on the bucket boss. Install either the retaining pin or the locking bolt.
7. Get into the cab, start the engine and place the gate lock lever to unlock position.
8. Gently extend the bucket cylinder to align the bucket connecting rod between the respective bosses on the bucket.
9. Place the gate lock lever to lock position, stop the engine and remove the starter key.
10. Insert the pin **(1)** and lock it as described for the pin **(2)**.
11. Slide down the O-ring seals. Grease the bucket pins.



SMIL13CEX2828AB 4



SMIL13CEX2827AB 5

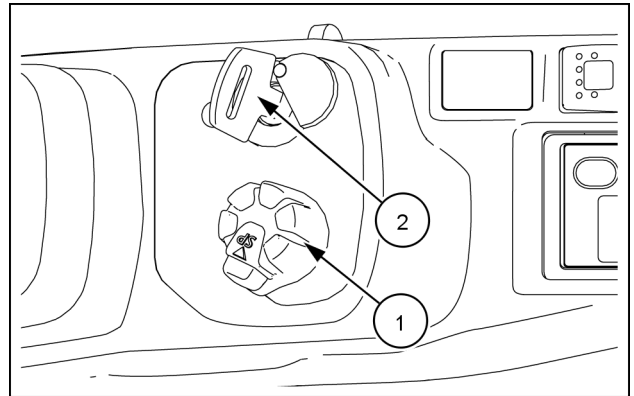
Stopping the unit

Stopping the engine

1. Lower the attachment until it is resting on the ground.
2. Turn the engine throttle **(1)** to low idle position.
3. Let the engine run for about **5 min.**

NOTICE: If the engine is stopped suddenly, the lubricated section on the turbocharger gets dried from the high heat, leading to a turbocharger failure.

4. Turn the starter key **(2)** to OFF position.

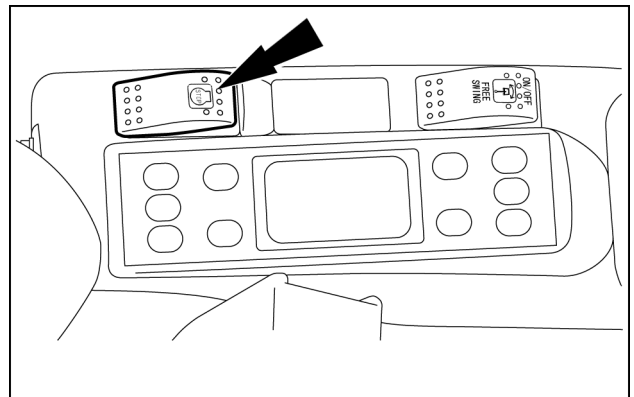


SMIL19CEX2696AA 1

Emergency stop switch

In the event of an emergency or if it is not possible to stop the engine using the starter key, press the emergency stop switch on the left-hand console.

NOTE: This switch should only be used in case of an emergency. Do not use it on a day-to-day basis to stop the engine.



SMIL21CEX0006AA 2

Moving the unit

Machine travel

⚠ WARNING

Controls can be reversed!

In the normal travel position, the operator's compartment is above the idler wheels and the travel reduction gears are to the rear of the upper structure. If the upper structure is turned 180 degrees in relation to the undercarriage, the controls are reversed.

Failure to comply could result in death or serious injury.

W0289A

⚠ WARNING

Hazard to bystanders!

Always sound the horn before starting the machine. Make sure the work area is clear of other persons, domestic animals, tools, etc. before you operate the machine. Never allow anyone in the work area during machine operation.

Failure to comply could result in death or serious injury.

W0304A

NOTE: increase the engine speed before start traveling. Fold the attachment to raise it to **40 – 50 cm (15.7 – 19.7 in)** above ground.

NOTICE: Before start traveling with CX235C SR with blade, make sure to fully raise the blade in order not to stick on the ground while traveling. Make sure to avoid interference between the blade and the bucket when the front equipment is set in position for traveling or transport.

Selection of travel speed

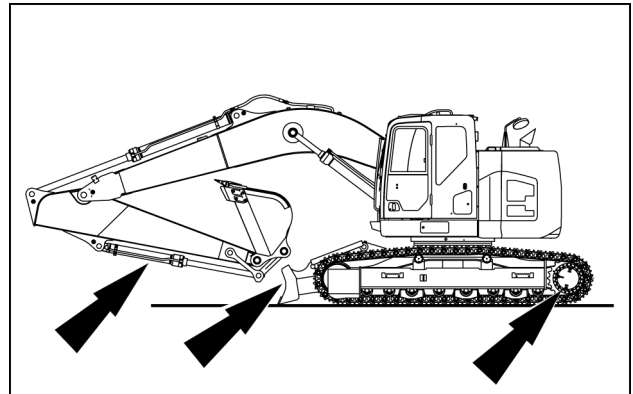
⚠ WARNING

Loss of control hazard!

Avoid pressing the travel speed button while traveling. Avoid shifting to FAST speed when traveling downhill or when loading/unloading from a trailer.

Failure to comply could result in death or serious injury.

W0390A



SMIL20CEX2468AA 1

Before start traveling, make sure to select the proper travel mode between "Turtle" and "Rabbit".

As the travel mode is selected, the travel speed varies with the tilting angle of the travel control levers and pedals. Refer to Chapter 8 for speed ranges.

Travel alarm

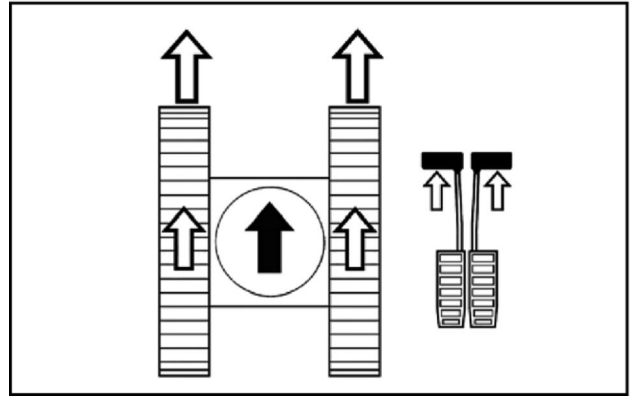
The travel alarm sounds depending on the position of the switch located on the right hand console:

AUTO OFF position: the alarm sounds for only **10 s** each time the travel controls are activated.

CONT position: the alarm sounds continuously each time the travel controls are activated.

Straight line travel (forward travel)

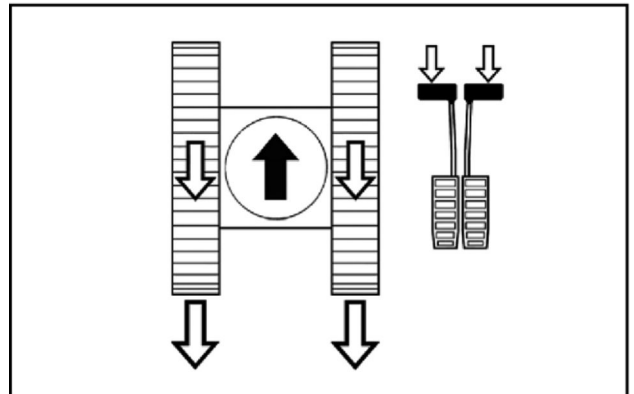
Press the two pedals (or push the two levers) forward at the same time.



SMIL13CEX2679AB 2

Straight line travel (reverse travel)

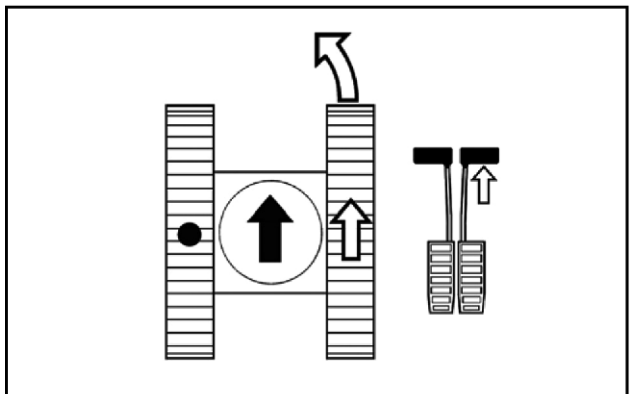
Press the two pedals (or pull the two levers) rearwards at the same time.



SMIL13CEX2680AB 3

Turning to the left (forward travel)

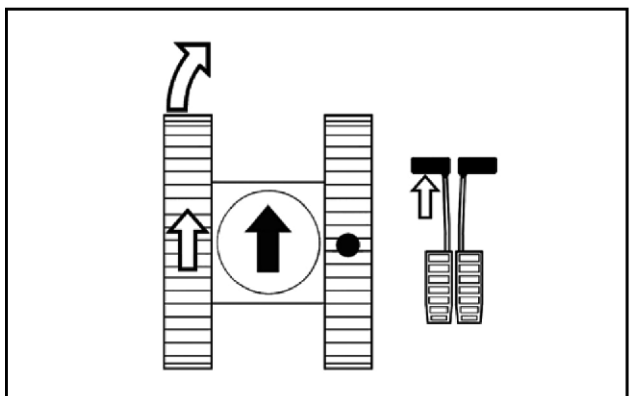
Simply press the right-hand pedal or push the right-hand lever forwards.



SMIL13CEX2681AB 4

Turning to the right (forward travel)

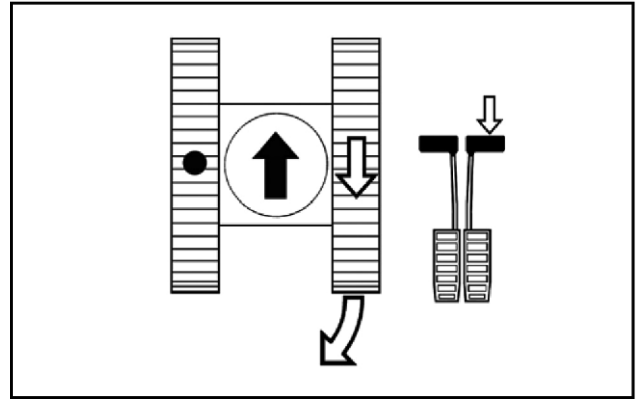
Simply press the left-hand pedal or push the left-hand lever forwards.



SMIL13CEX2682AB 5

Turning to the left (reverse travel)

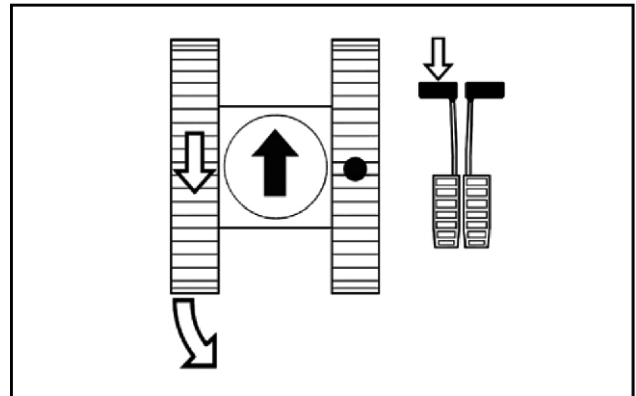
Simply press the right-hand pedal or pull the right-hand lever rearwards.



SMIL13CEX2683AB 6

Turning to the right (reverse travel)

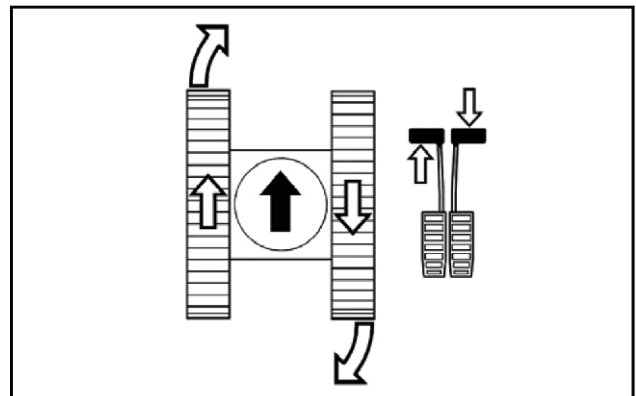
Simply press the left-hand pedal or pull the left-hand lever rearwards.



SMIL13CEX2684AB 7

Turning on the spot, to the right

Press the left-hand pedal or push the left-hand lever forwards and at the same time press the right-hand pedal or pull the right-hand lever rearwards.

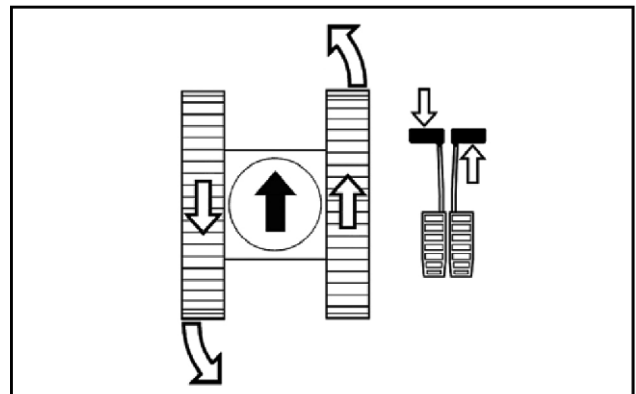


SMIL13CEX2685AB 8

Turning on the spot, to the left

Press the right-hand pedal or push the right-hand lever forwards and at the same time press the left-hand pedal or pull the left-hand lever rearwards.

NOTE: Turning on the spot cannot be done if high speed travel mode is selected.



SMIL13CEX2686AB 9

Gradual turn on the move

Press one of the pedals or push one of the levers and, at the same time, press the other pedal or push the other lever in the same direction, but slightly harder.

Stopping travel

To come to a complete halt, simply release the levers or pedals and they will return to neutral.

NOTICE: Allow as much time as possible to stop the machine.

NOTICE: Avoid abrupt stopping as much as practicable.

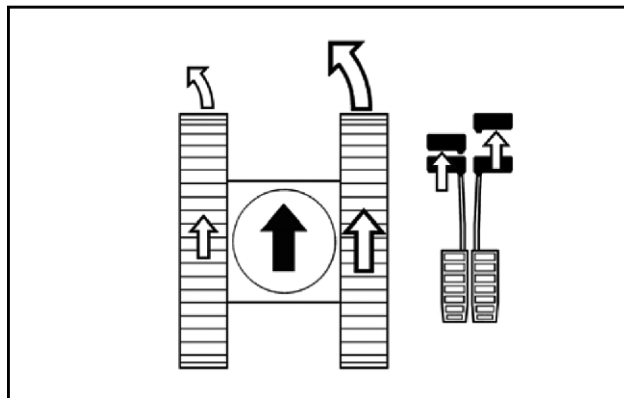
NOTICE: Park or stop the machine on level solid ground in safe area.

Cautions for traveling

1. Start traveling operation after checking location of the travel unit before commencing travel operation.
2. Select ground as flat and solid as possible for traveling.
3. Travel bypassing obstructions.

NOTICE: when using wide shoes avoid traveling on rough ground. Wider shoes tend to cause deformation or crack of the shoes.

4. Travel with decreased traveling speed on rough ground.
5. Encourage a large turn for changing direction and avoid abrupt pivoting turns or spinning turns as much as possible.
6. Check the route to travel in advance.
7. Prepare a personnel to signal operator whenever moving the machine in a location with poor visibility.
Pay attention to permissible weight of bridge when crossing the bridge.
8. Take necessary measure such as placing plates so as not to damage surface of paved road.
9. Slow down and loosen tension of the track shoes when traveling on place with gravels and cobbles.



SMIL13CEX2687AB 10

Parking the unit

Parking the machine

⚠ WARNING

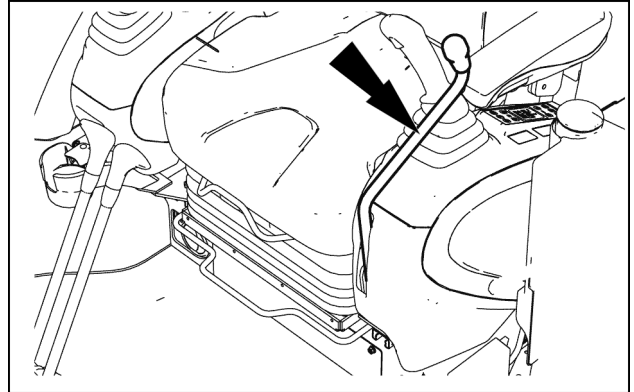
Fall hazard!

Jumping on or off the machine could cause an injury. Always face the machine, use the handrails and steps, and get on or off slowly. Maintain a three-point contact to avoid falling: both hands on the handrails and one foot on the step, or one hand on the handrail and both feet on the steps.

Failure to comply could result in death or serious injury.

W0141A

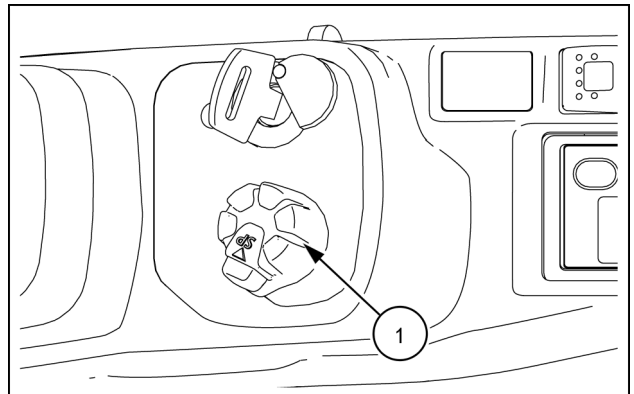
1. Park the machine on a hard and level ground, and orient the upper structure frame parallel to the undercarriage.
2. Operate the boom, arm, and attachment controls so that the arm stands vertical and the attachment rests on the ground.
3. Lower the blade to the ground.
4. Set the gate lock lever to lock position.



SMIL17CEX0198AA 1

5. Turn the engine throttle (1) to low idle position.
6. Let the engine run for about 5 min

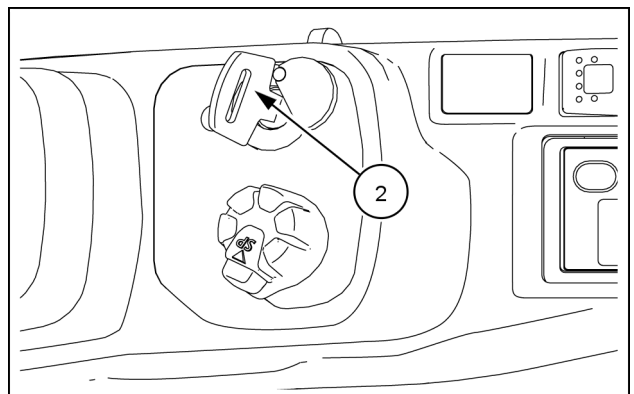
NOTICE: If the engine is stopped suddenly, the lubricated section on the turbocharger gets dried from the high heat, leading to a turbocharger failure.



SMIL19CEX2696AA 2

7. Turn the starter key (2) to OFF position.

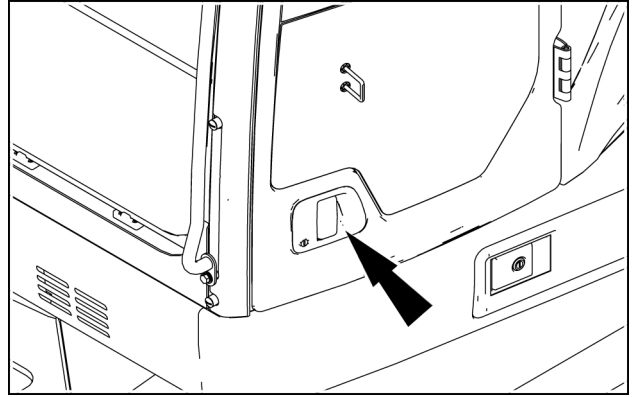
NOTE: If the security function is set up, it can be activated according to the procedure described on page 4-1



SMIL19CEX2696AA 3

8. Remove the starter key, get off the cab and lock the cab door. Check that the hood and the side doors are properly locked, and that the lower panels are properly fixed.

NOTE: Make sure that any portion of the machine is interfering public road. Install appropriate traffic signs if any portion interferes public road.



SMIL19CEX2700AA 4

5 - TRANSPORT OPERATIONS

Road transport

Loading the machine onto a transport trailer

⚠ WARNING

Improper operation or service of this machine can result in an accident.
Assign a supervisor to direct worksite operations. Agree on all safety measures, procedures, and suitable hand signals.
Failure to comply could result in death or serious injury.

W0287A

⚠ WARNING

Transport hazard!
The machine can slip or fall from a ramp or trailer. Make sure the ramp and trailer are not slippery. Remove all oil, grease, ice, etc. Move the machine on or off the trailer with machine centered on the trailer or ramp.
Failure to comply could result in death or serious injury.

W0152A

Make sure to check the total weight, length, width and height of the machine to be transported. Refer to Chapter 8.

Make sure to use a trailer with a rated capacity and dimensions sufficient to transport the machine. If a rear loading type trailer is used for road transport, make sure that ramps are available to climb onto the trailer bed. Use ramps which have sufficient width, length, thickness and strength. The ramp slope should be **15°** or less.

Investigate beforehand the conditions of the road to be traveled, weight and size limits, and special local traffic regulations. Obtain any permits required from proper government agencies for machine transportation.

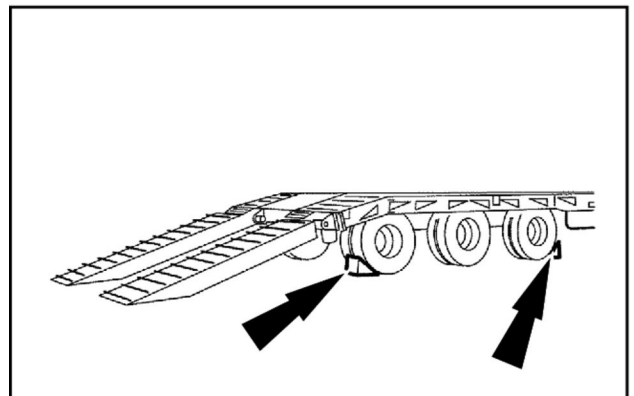
Trailer setup

Position the trailer on firm and level ground.

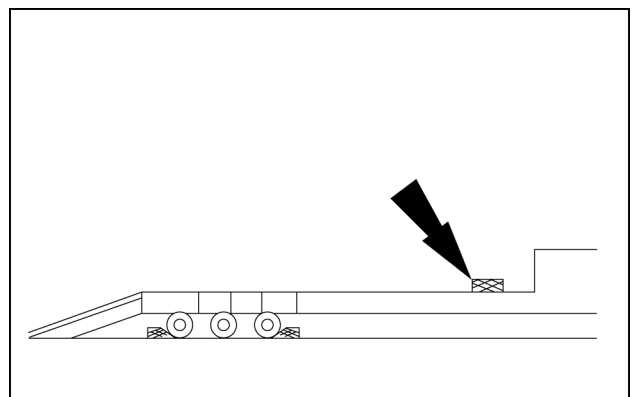
Put blocks to the tires of the trailer to prevent trailer from moving.

If a rear loading type trailer is used for road transport, prepare the loading ramps. If the ramps are included in the trailer frame, lower them to the ground. If the ramps are external to the trailer, match them to the rear edge of the trailer avoiding any bump between trailer bed and external ramps.

If loading a machine with blade, secure a block to the trailer bed at the resting position of the machine. The block must be of a suitable size and strength to keep the blade in lifted position around **40 cm (15.7 in)** above the trailer bed. Refer ahead in this Chapter.



SMIL13CEX2717AB 1



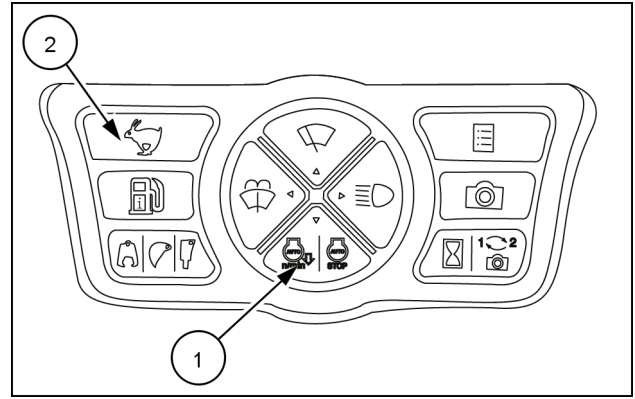
SMIL20CEX0025AA-01 2

Machine setup

Accurately clean the machine undercarriage and tracks to prevent mud or debris from skidding during transport.

Make sure to deactivate the auto idle function and the auto shut-down function. Press the idle mode button **(1)** until any idle icon on the display turns off.

Press the travel mode selector button **(2)** to select the low travel speed. The "Turtle" icon appears on the display.



SMIL18CEX0768AB 3

Loading the machine on a rear loading type trailer (with front equipment installed)

If any heavy attachment is fitted on the machine, such as a hydraulic breaker or a hydraulic crusher, remove the attachment before loading the machine onto the trailer. Refer to the Operator's Manual of the attachment, and strictly follow the specific procedure to remove the attachment from the machine.

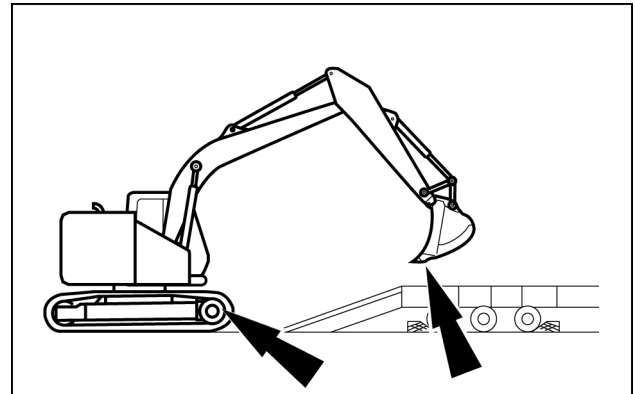
CX235C SR LC

Select the H work mode.

Align the machine to the trailer, so as the travel motors face the trailer ramps.

NOTICE: Starting from this position, the travel control levers must be pulled backward to move on the ramps and on the trailer bed. Confirm the travel control directions before start moving onto the ramps.

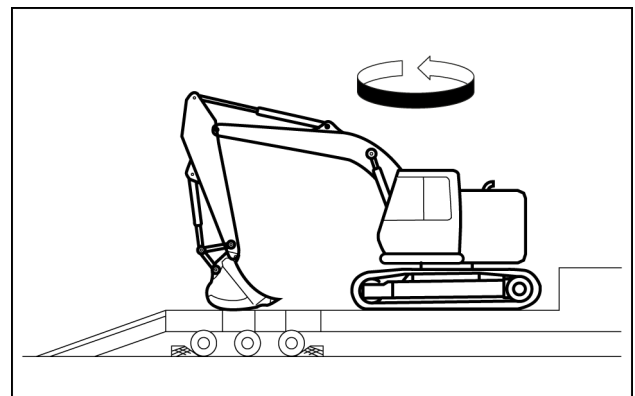
Get close to the ramps and operate the arm and bucket controls so that the arm stands vertical and the bottom side of the bucket is about **20 cm (7.9 in)** above the trailer bed.



SMIL20CEX0039AA 4

Slowly climb the trailer ramps keeping the bucket close to the trailer bed. Slowly travel on the trailer bed to reach the resting position, giving particular attention to the attachment so as not to touch the trailer bed.

Slowly turn the upper structure **180°**.



SMIL20CEX0044AA 5

CX235C SR with blade

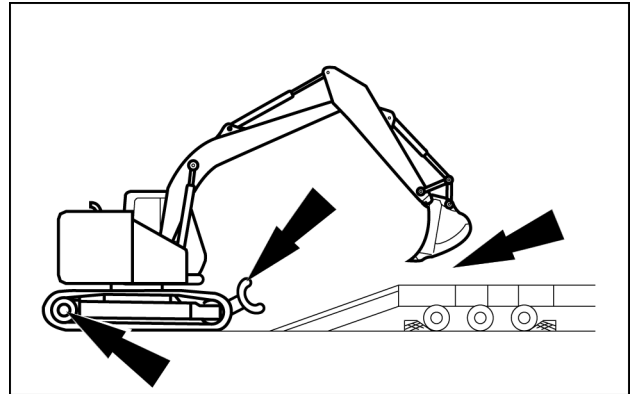
Select the H work mode.

Align the machine to the trailer, so as the blade faces the trailer ramps. Fully raise the blade.

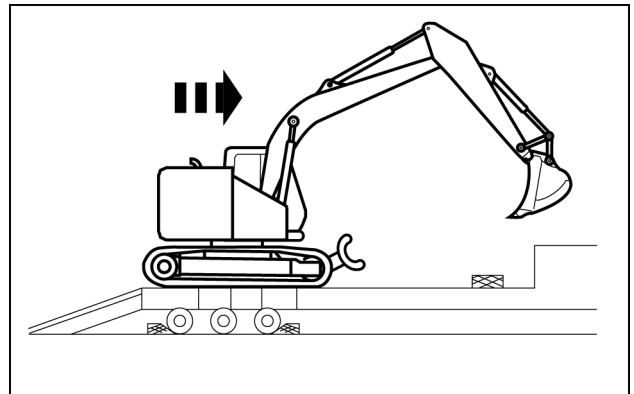
NOTICE: Starting from this position, the travel control levers must be pushed forward to move on the ramps and on the trailer bed. Confirm the travel control directions before start moving onto the ramps.

Get close to the ramps and operate the arm and bucket controls so that the arm is slightly extended and the bottom side of the bucket is about **20 cm (7.9 in)** above the trailer bed.

Slowly climb the trailer ramps keeping the bucket close to the trailer bed. Slowly travel on the trailer bed to reach the resting position, giving particular attention to the attachment so as not to touch the trailer bed.



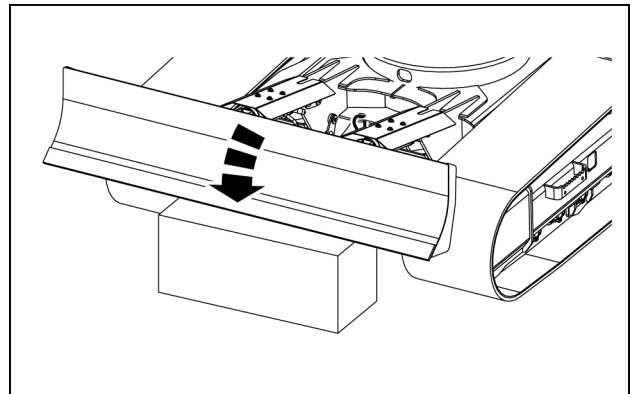
SMIL20CEX0040AA 6



SMIL20CEX0045AA 7

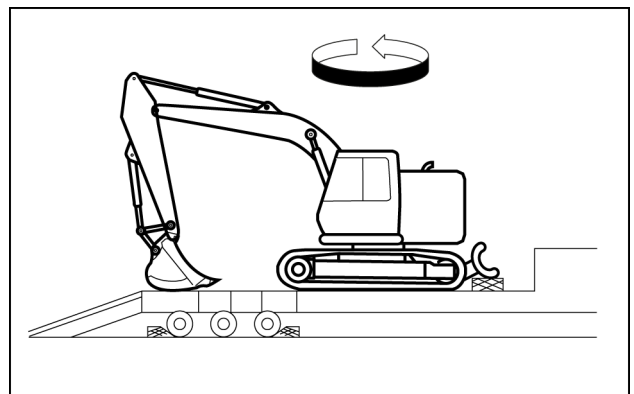
After reaching the resting position, lower the blade on the supporting block.

Make sure that there is enough space between the block and the tracks to route the tie-down chains.



SMIL19CEX2664AA 8

Slowly turn the upper structure **180°**.



SMIL20CEX0047AA 9

Loading the machine on a rear loading type trailer (without front equipment installed)

⚠ WARNING

Tip-over hazard!

The counterweight **MUST** be removed before transporting the machine without an attachment. Consult your dealer.

Failure to comply could result in death or serious injury.

W0260A

⚠ WARNING

Pressurized system!

Before removing the attachment from the machine, make sure the air pressure and hydraulic oil pressure are at zero.

Failure to comply could result in death or serious injury.

W0284A

If the machine has to be transported without the complete front equipment (boom and arm), the counterweight should be removed from the base machine. Loading the base machine on the trailer with the counterweight installed affects the stability of the base machine itself, and definitely compromises its climbing ability.

NOTICE: The use of lifting systems is necessary for removal and installation of the machine front attachment and of the counterweight. Refer to your CASE CONSTRUCTION dealer for proper removal and installation procedure.

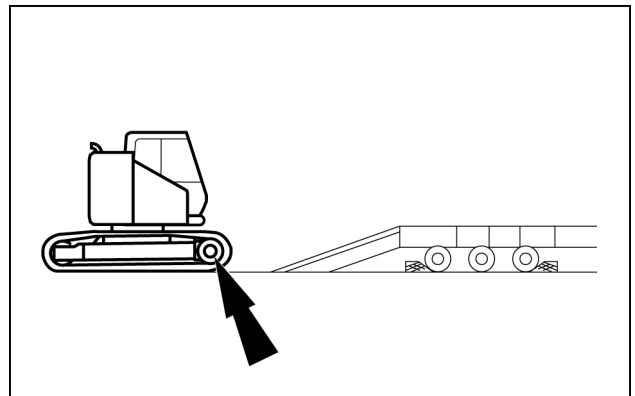
CX235C SR LC

Select the H work mode.

Align the machine to the trailer, so as the travel motors face the trailer ramps.

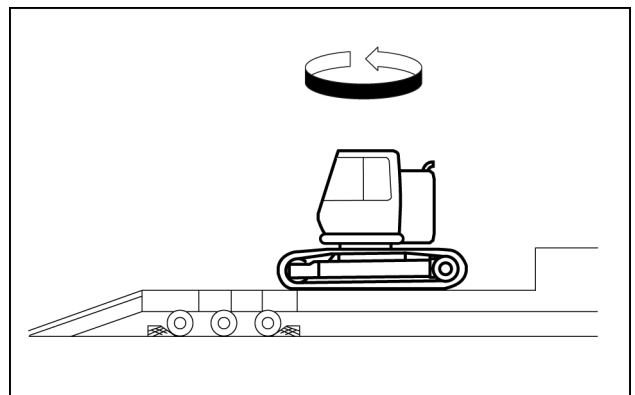
NOTICE: Starting from this position, the travel control levers must be pulled backward to move on the ramps and on the trailer bed. Confirm the travel control directions before start moving onto the ramps.

Slowly climb the trailer ramps. Slowly travel on the trailer bed to reach the resting position.



SMIL20CEX0043AB 10

Slowly turn the upper structure 180°.



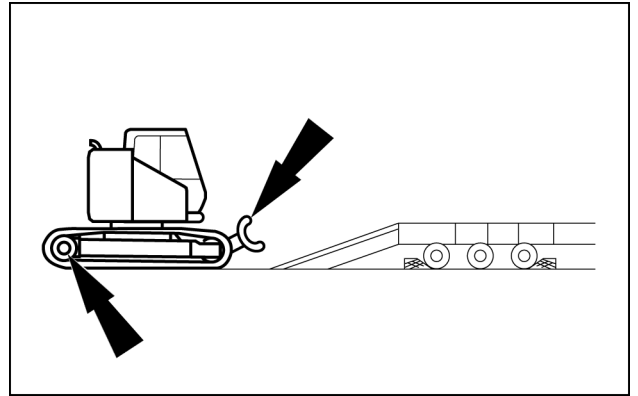
SMIL20CEX0048AB 11

CX235C SR with blade

Select the H work mode.

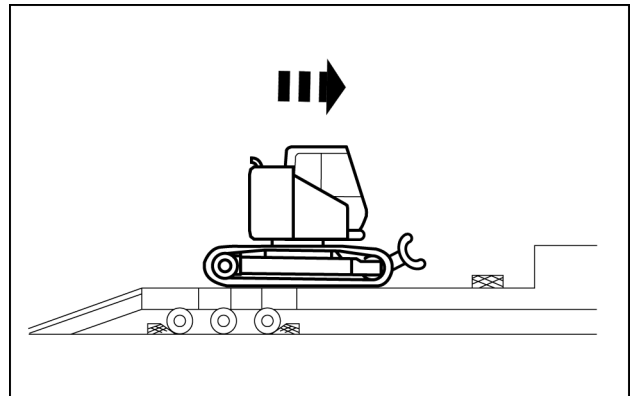
Align the machine to the trailer, so as the blade faces the trailer ramps. Fully raise the blade.

NOTICE: Starting from this position, the travel control levers must be pushed forward to move on the ramps and on the trailer bed. Confirm the travel control directions before start moving onto the ramps.



SMIL20CEX0041AB 12

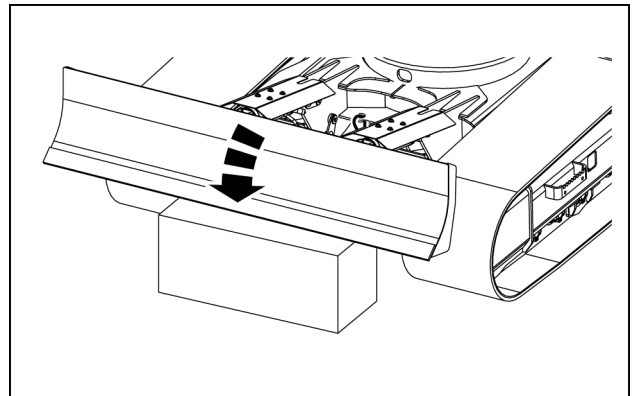
Slowly climb the trailer ramps. Slowly travel on the trailer bed to reach the resting position.



SMIL20CEX0049AB 13

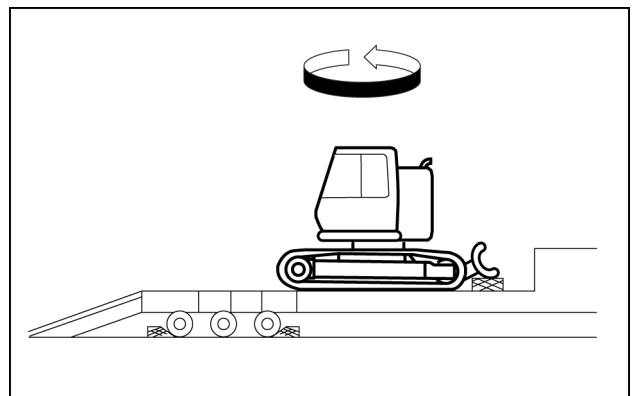
After reaching the resting position, lower the blade on the supporting block.

Make sure that there is enough space between the block and the tracks to route the tie-down chains.



SMIL19CEX2664AA 14

Slowly turn the upper structure **180°**.

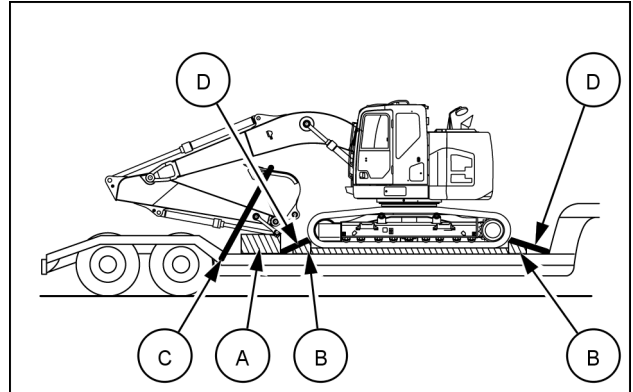


SMIL20CEX0050AB 15

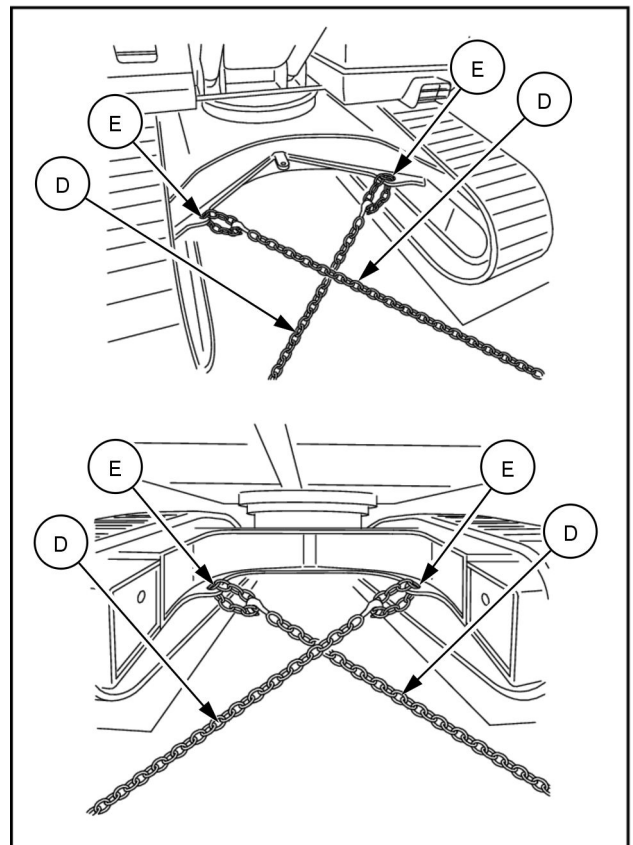
Tie downs for shipping

CX235C SR LC

1. Set the machine in the position for transport: fully retract the arm and curl the bucket slowly.
2. Place the block **(A)** on the trailer floor as show in the picture, and lower the boom slowly until the bucket linkage lays on the block.
3. Check the overall height between the ground and the highest point of the machine and check the overall width of the machine. Make sure to be within the size limits defined before transport, in order to confirm documents and permissions already got to comply to the local traffic regulations.
4. Place the gate lock lever in lock position. Stop the engine and remove the starter key.
5. Get off the machine. Retract the radio antenna. Fold the rear view mirrors.
6. Lock the cab door and the side panels.
7. Check the condition of the tie-down points on the trailer.
8. Put chocks **(B)** against the edges of the tracks.
9. Pass a wire rope **(C)** around the bucket to secure the front equipment to the trailer.
10. Fix one end of a tie-down chain **(D)** to each of the four lashing points **(E)** identified on the inside of the lower frame.
11. Set the chains in an X shape as shown in the picture, and fix them to the tie-down points on the trailer. Tension the chains evenly to secure the machine to the trailer.
12. Carry out a final check of the tie-down condition.
13. If a rear loading type trailer is used for road transport, lift or remove the loading ramps.
14. Remove blocks from the tires of the trailer.



SMIL20CEX2471AA 1

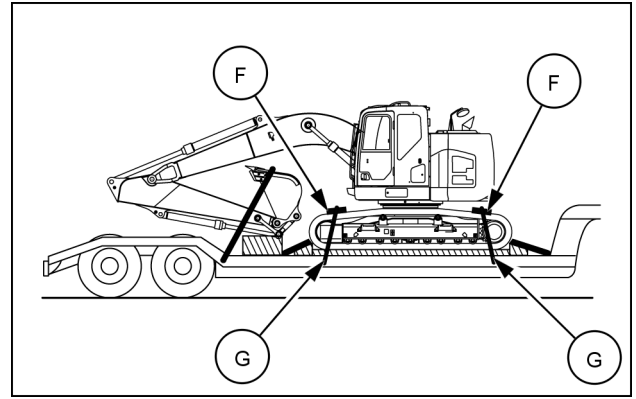


SMIL13CEX2729BA 2

The machine may be further secured onto the trailer bed with a vertical tie-down.

Put pads **(F)** over the tracks in the positions identified along the sides of the lower frame. Route the wire ropes **(G)** across the tracks, and tie-down on the vertical direction.

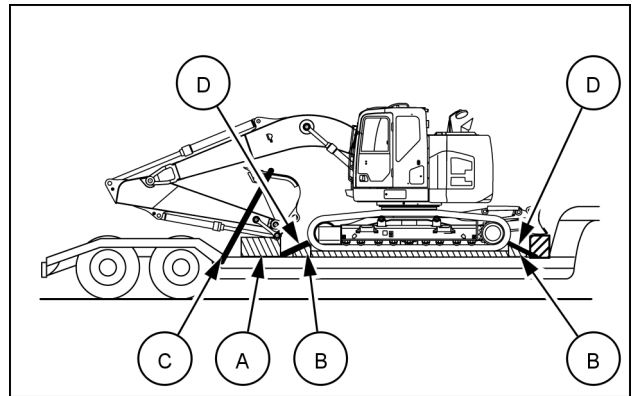
NOTICE: Make sure not to tie-down the machine only in the vertical direction: the required tie-down force would be high, and this will cause damages to the tracks and to the other traction components.



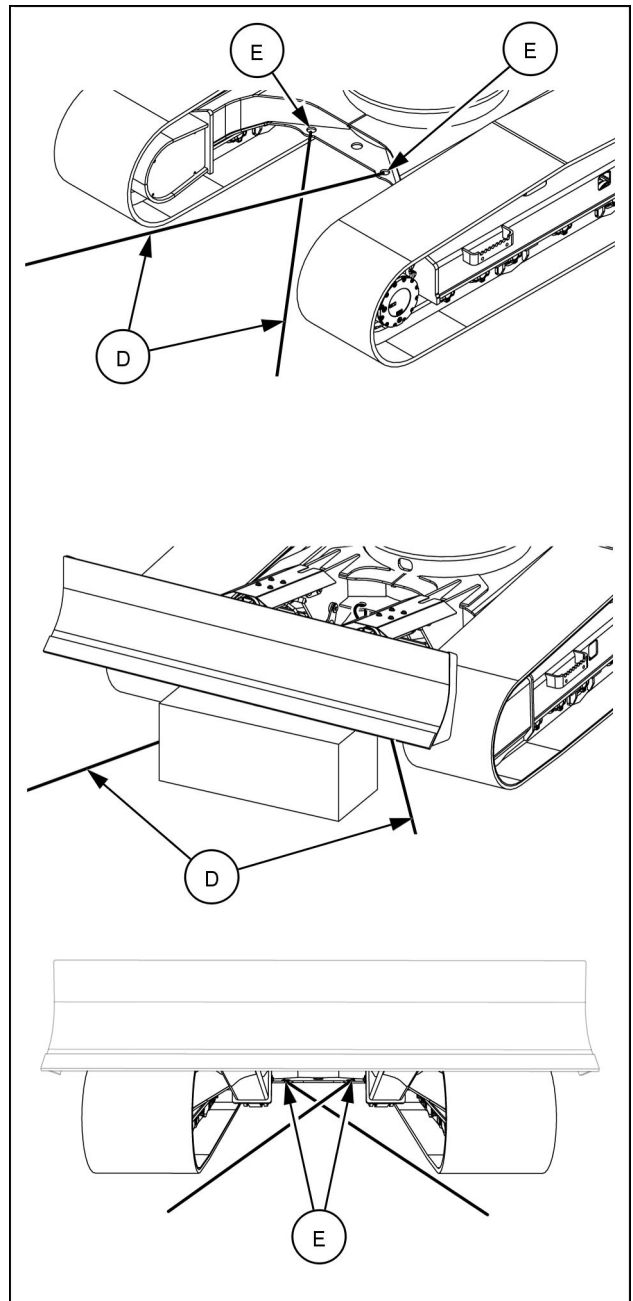
SMIL20CEX2470AA 3

CX235C SR with blade

1. Set the machine in the position for transport: fully retract the arm and curl the bucket slowly.
2. Place the block **(A)** on the trailer floor as show in the picture, and lower the boom slowly until the bucket linkage lays on the block.
3. Check the overall height between the ground and the highest point of the machine and check the overall width of the machine. Make sure to be within the size limits defined before transport, in order to confirm documents and permissions already got to comply to the local traffic regulations.
4. Place the gate lock lever in lock position. Stop the engine and remove the starter key.
5. Get off the machine. Retract the radio antenna. Fold the rear view mirrors.
6. Lock the cab door and the side panels.
7. Check the condition of the tie-down points on the trailer.
8. Put chocks **(B)** against the edges of the tracks.
9. Pass a wire rope **(C)** around the bucket to secure the front equipment to the trailer.
10. Fix one end of a tie-down chain **(D)** to each of the four lashing points **(E)** identified on the inside of the lower frame.
11. Set the chains in an X shape as shown in the picture, and fix them to the tie-down points on the trailer. Tension the chains evenly to secure the machine to the trailer.
12. Carry out a final check of the tie-down condition.
13. If a rear loading type trailer is used for road transport, lift or remove the loading ramps.
14. Remove blocks from the tires of the trailer.



SMIL20CEX2472AA 4

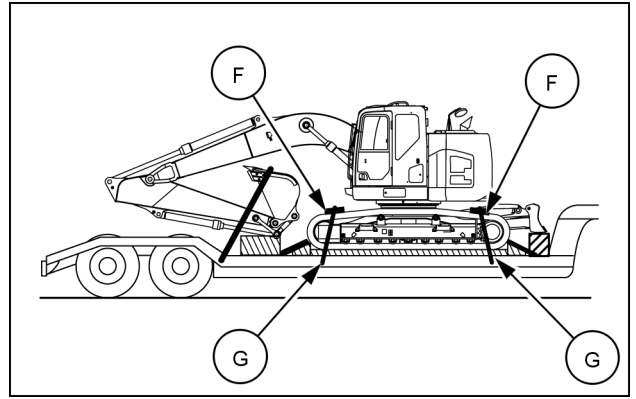


SMIL20CEX0035CA 5

The machine may be further secured onto the trailer bed with a vertical tie-down.

Put pads **(F)** over the tracks in the positions identified along the sides of the lower frame. Route the wire ropes **(G)** across the tracks, and tie-down on the vertical direction.

NOTICE: Make sure not to tie-down the machine only in the vertical direction: the required tie-down force would be high, and this will cause damages to the tracks and to the other traction components.



SMIL20CEX2474AA 6

Unloading the machine from a transport trailer

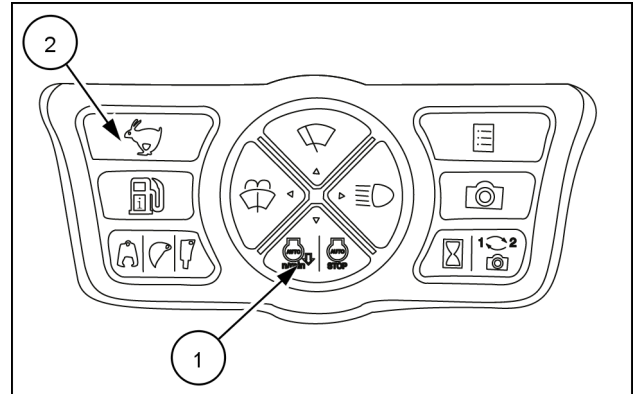
Rear loading type transport trailer

CX235C SR LC

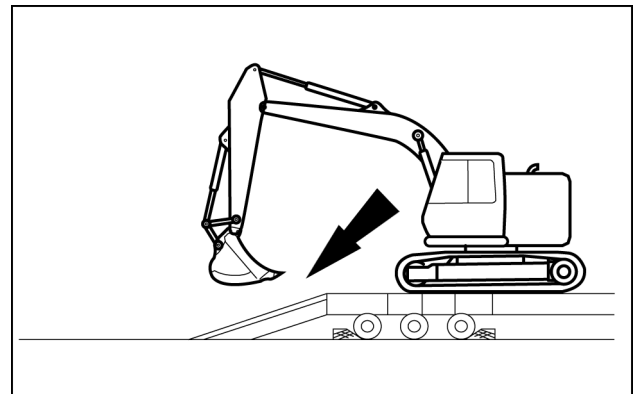
1. Position the trailer on firm and level ground. Put blocks to the tires of trailer to prevent trailer from moving.
2. Remove chains, wire ropes, chocks, blocks and other devices used to secure the machine during road transport.
3. Prepare the loading ramps. If the ramps are included in the trailer frame, lower them to the ground. If the ramps are external to the trailer, match them to the rear edge of the trailer avoiding any bump between trailer bed and external ramps.
4. Get on the machine and start the engine.
5. Make sure to deactivate the auto idle function and the auto shut-down function. Press the idle mode button **(1)** until any idle icon on the display turns off. Press the travel mode selector button **(2)** to select the low travel speed. The "Turtle" icon appears on the display.
6. Select the H work mode and set the gate lock lever to unlock position.
7. If the front equipment is installed, operate the arm and bucket controls so that the arm stands vertical and the bottom of the bucket is about **20 cm (7.9 in)** above the trailer bed.

NOTICE: Starting from this position, the travel control levers must be pushed forward to move on the trailer bed and on the ramps. Confirm the travel control directions before start moving.

8. Travel slowly towards the back of the trailer and stop as reaching the ramps. If the front equipment is installed, operate boom and arm softly in order to get the bucket close to the ground ahead of the ramps. Avoid to fully extend the bucket cylinder to prevent damaging it due to accidental impacts with the ground.
9. Move down on ramps with extreme care while operating boom and arm softly in order to keep the bucket close to the ground and so to grant machine stability.
10. Pass through the ramps completely and stop the machine once it gets on the ground.



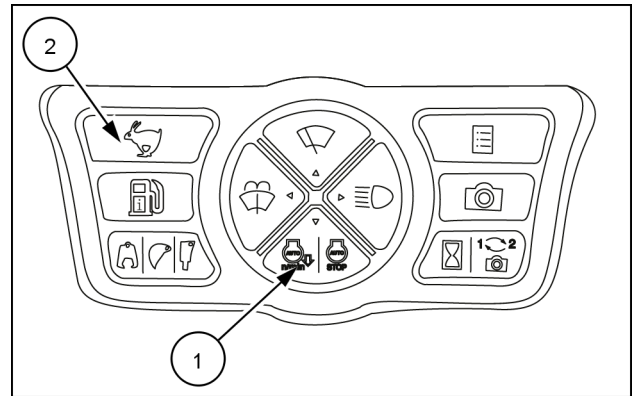
SMIL18CEX0768AB 1



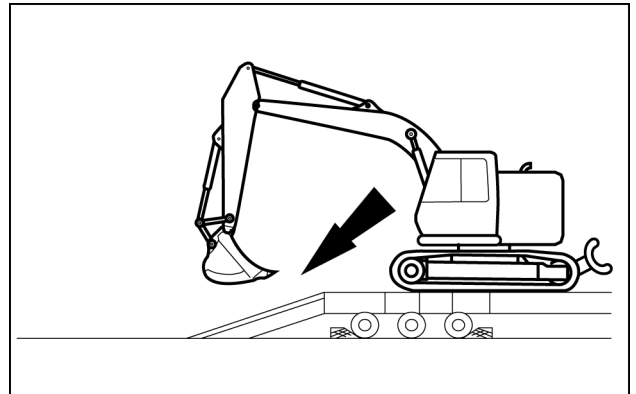
SMIL20CEX0653AA 2

CX235C SR with blade

1. Position the trailer on firm and level ground. Put blocks to the tires of trailer to prevent trailer from moving.
 2. Remove chains, wire ropes, chocks, blocks and other devices used to secure the machine during road transport.
 3. Prepare the loading ramps. If the ramps are included in the trailer frame, lower them to the ground. If the ramps are external to the trailer, match them to the rear edge of the trailer avoiding any bump between trailer bed and external ramps.
 4. Get on the machine and start the engine.
 5. Make sure to deactivate the auto idle function and the auto shut-down function. Press the idle mode button **(1)** until any idle icon on the display turns off. Press the travel mode selector button **(2)** to select the low travel speed. The "Turtle" icon appears on the display.
 6. Select the H work mode and set the gate lock lever to unlock position.
 7. Fully raise the blade from the supporting block.
 8. If the front equipment is installed, operate the arm and bucket controls so that the arm stands vertical and the bottom of the bucket is about **20 cm (7.9 in)** above the trailer bed.
- NOTICE:** Starting from this position, the travel control levers must be pulled backward to move on the trailer bed and on the ramps. Confirm the travel control directions before start moving.
9. Travel slowly towards the back of the trailer and stop as reaching the ramps. If the front equipment is installed, operate boom and arm softly in order to get the bucket close to the ground ahead of the ramps. Avoid to fully extend the bucket cylinder to prevent damaging it due to accidental impacts with the ground.
 10. Move down on ramps with extreme care while operating boom and arm softly in order to keep the bucket close to the ground and so to grant machine stability.
 11. Pass through the ramps completely and stop the machine once it gets on the ground.



SMIL18CEX0768AB 3



SMIL20CEX0652AA 4

Shipping transport

Lifting the machine with a crane

WARNING

Improper operation or service of this machine can result in an accident.
Assign a supervisor to direct worksite operations. Agree on all safety measures, procedures, and suitable hand signals.
Failure to comply could result in death or serious injury.

W0287A

WARNING

Crushing hazard!
The lifting systems must be operated by qualified personnel who are aware of the correct procedures to follow. Make sure all lifting equipment is in good condition, and all hooks are equipped with safety latches.
Failure to comply could result in death or serious injury.

W0256A

WARNING

Crushing hazard!
This operation may be dangerous. You are advised to wear suitable clothing and respect all relevant safety messages.
Failure to comply could result in death or serious injury.

W0283A

WARNING

Hazard to bystanders!
ALWAYS make sure the work area is clear of bystanders and domestic animals before starting this procedure. Know the full area of movement of the machine. Do not permit anyone to enter the area of movement during this procedure.
Failure to comply could result in death or serious injury.

W0245A

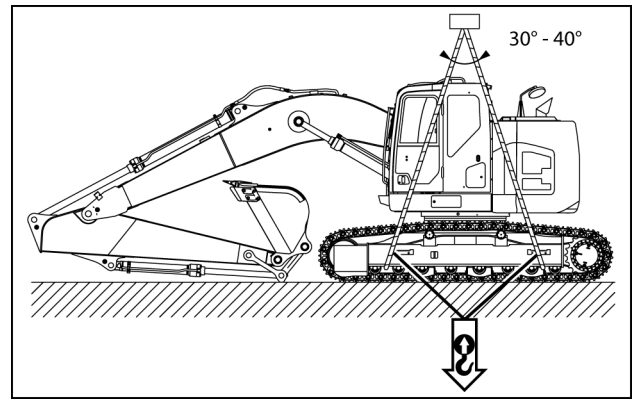
5 - TRANSPORT OPERATIONS

Retract the attachment, bucket and arm cylinders fully extended then place the attachment on the ground. Shut-down the engine and leave the operator's compartment.

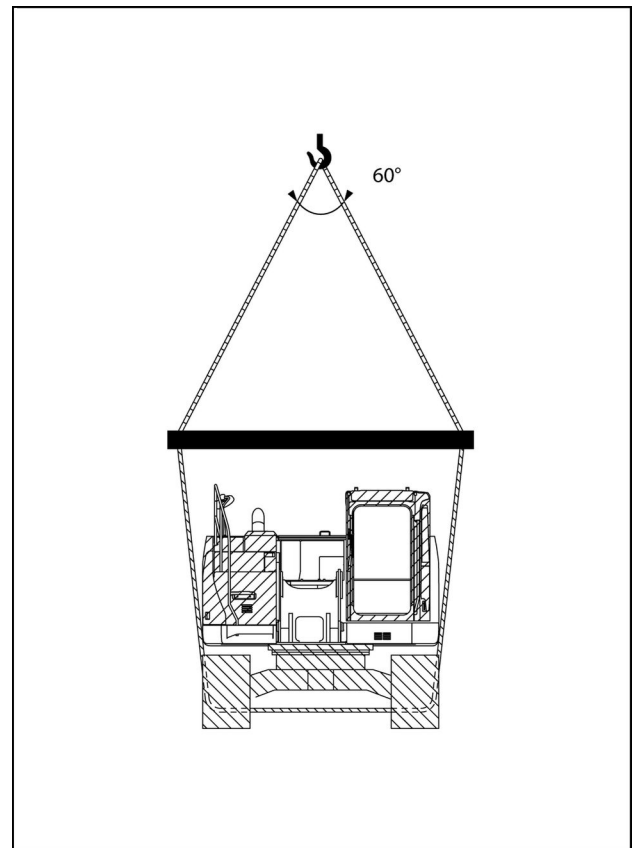
NOTICE: before handling the machine, make sure the slings are in perfect condition and that they are capable of supporting the weight of the machine.

NOTICE: it is imperative to use the sling points indicated on the machine decals.

NOTICE: The machine must be handled very slowly and horizontally.



SMIL21CEX0043AA 1



SMIL21CEX0044BA 2

Recovery transport

Towing the machine

⚠ WARNING

Misuse hazard!

Towing is a delicate maneuver that is always carried out at the risk of the user. The manufacturer's warranty does not apply to incidents or accidents that occur during towing. Where possible, carry out the repairs at the site.

Failure to comply could result in death or serious injury.

W0286A

⚠ WARNING

Hazard to bystanders!

The operator must be the only person on the machine when towing. Make sure that nobody else is on the machine or within its working range.

Failure to comply could result in death or serious injury.

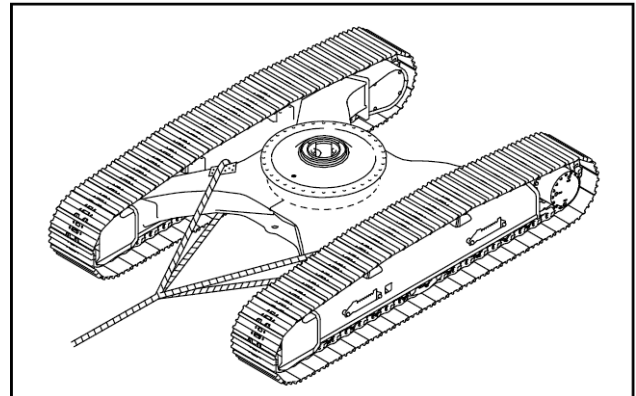
W0259A

As far as possible try to carry out repairs on spot or consult your CASE CONSTRUCTION Dealer.

NOTICE: the machine must be towed very slowly, over a short distance and only if it is really unavoidable. Always tow the machine in alignment with the undercarriage.

If the machine is bogged down, it must be towed as follows:

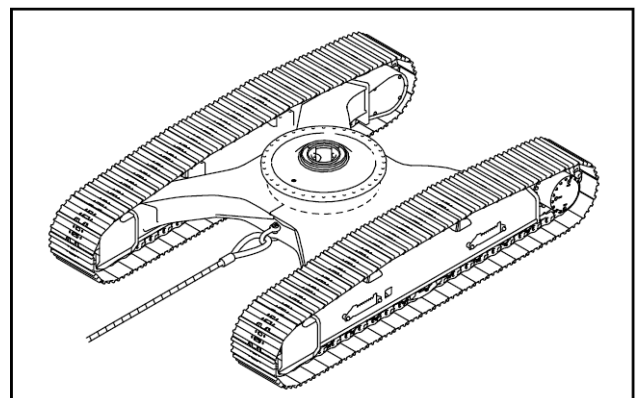
1. Make sure that it can be towed without risk of further damage.
2. Make sure that the shackles, chains and tackle are in perfect condition and strong enough to move the load.
3. Attach the shackles, chains and tackle to the undercarriage taking care to protect any salient angles.
4. Pull the machine without jerking, very slowly and in alignment with the undercarriage.



SMIL13CEX2731AA 1

Towing a load

To tow a load of up to **10 t (22046 lb)**, use one of the towing holes provided for this purpose.



SMIL13CEX2732AA 2

6 - MAINTENANCE

General information

Basic instructions

⚠ WARNING

Improper operation or service of this machine can result in an accident.
If you do not understand a maintenance procedure, or doubt your ability to perform a maintenance procedure correctly, see your authorized dealer.
Failure to comply could result in death or serious injury.

W0157A

⚠ WARNING

Improper operation or service of this machine can result in an accident.
Raised equipment or machine movement without an operator can cause serious injury. Always do the following before performing any maintenance:
Park the machine on flat, level ground.
Lower the attachment to the ground.
Shut down the engine and remove the ignition key.
Lock the tracks.
Failure to comply could result in death or serious injury.

W0944D

⚠ WARNING

Falling object hazard!
Risk of injury from FALLING ENGINE HOOD. Latch the hood in the fully open position prior to working within the engine compartment.
Failure to comply could result in death or serious injury.

W1090B

NOTICE: be sure all the service operations in this section are carried out punctually at the intervals given, in order to ensure optimum performance levels and maximum safety when using the machine.

- Before any maintenance operation, park the machine on a hard and level ground, away from obstacles, and lower the attachment and the dozer blade (if equipped) to the ground.
- Unless otherwise specified, carry out all maintenance operations with the engine stopped and the key removed from the starter switch. Wait for all circuits to cool down before you start work.
- Clean the grease fittings before lubrication. Clean around plugs and filler holes before adding fluid. No dust or dirt must enter the components or the circuits. Wear suitable clothing and remember to use the necessary safety equipment.
- When carrying out service work on the machine, place the "Do not operate" tag on the instrument panel. Never climb down from the operator's compartment leaving the engine running.
- Remove the necessary lower panels during maintenance of certain machine components. Make sure the lower panels are properly closed before operating the machine.

Any modification to the machine without prior authorization could cause serious injury. Do not make any modifications without authorization. Consult your CASE CONSTRUCTION Dealer.

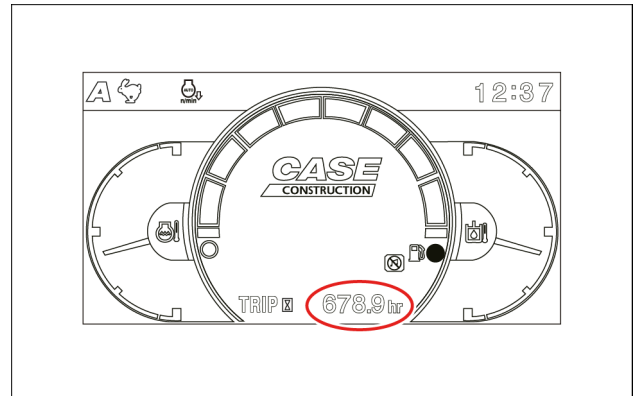
NOTICE: if you use your machine in particularly harsh conditions (dusty or corrosive atmosphere, etc.), the servicing intervals should be reduced accordingly.

NOTICE: take particular care to replace all filters regularly. Clean filters mean longer engine running life.

NOTE: oil and fluid should not be thrown on the ground. They must be stored and removed by a company which is responsible for their recycling or their disposal.

Hour meter

The machine control system is readily warning about the need of specific maintenance operations. However, some other maintenance operations have to be carried out on a regular basis without any specific warning. Make sure to get acquainted with the main time intervals indicated into this Chapter, and make sure to check the hour meter at the beginning of every working day in order to anticipate the need for maintenance operations at a certain time interval.



SMIL18CEX0504AA 1

Daily inspections

Every day, before starting work, it is necessary to inspect the machine and service certain of its components.

General remarks

- Check signs of leaking oil or water.
- Check that all screws and nuts are correctly tightened.
- Wipe off any dust (engine, operator's compartment etc.).
- Check for any signs of damage.

Engine

- Check the oil level and change the oil if necessary.
- Check the coolant level.
- Check the radiator for signs of clogging or deterioration.
- Check the radiator fan belt tension.
- Check the air filter is clean and not restricted.
- Check the components for signs of leaking oil or water.
- Check the condition of all lines.

Undercarriage

- Check the pad hardware.
- Check the condition of the tracks.
- Check that the upper and lower track rollers and the idler wheels are not leaking oil.

Upperstructure

- Check the fuel tank level.
- Check the hydraulic tank level.
- Check that the hydraulic oil is clean.
- Check the components for signs of leaking oil or water.
- Check the condition of all lines.
- Make sure there are no electrical short circuits.
- Check the battery connections are properly tightened.
- Adjust the rear view mirrors.
- Check the cameras.

Attachment

- Check the cylinders are not leaking oil.
- Check the condition of all lines.
- Check the condition of the bucket and its tools.

After starting the engine

- Did the engine start correctly? Are the exhaust fumes normal? Any strange noises?
- Check for abnormal noise on the hydraulic components.
- Check the components for signs of leaking oil or water.
- Check the audible alarm devices, working lights and windshield wipers.
- Check that all circuits (travel, swing and tool) are functioning correctly.

NOTICE: *if the slightest defect is found, repair it immediately before using the machine or consult your CASE CONSTRUCTION Dealer.*

Service platform

⚠ WARNING

Fall hazard!

Take correct measures to make sure steps, ladders, and platforms remain clean and clear of debris or foreign substances.

Failure to comply could result in death or serious injury.

W1183A

⚠ WARNING

Rotating parts!

It is forbidden to stand on the platform when the engine is running. Turn off the engine and wait at least one minute until all moving parts have completely stopped before accessing the platform.

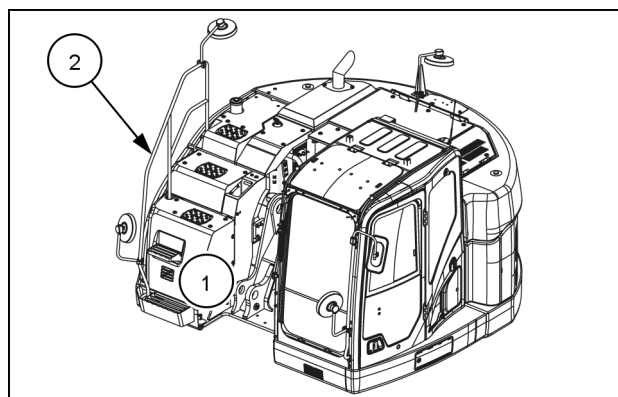
Failure to comply could result in death or serious injury.

W1200A

The machine is equipped with a platform that allows to carry out regular maintenance operations into the engine compartment and on other components located in the center of the machine, as for example the swing reduction unit and the hydraulic tank.

To access the service platform, proceed as follows:

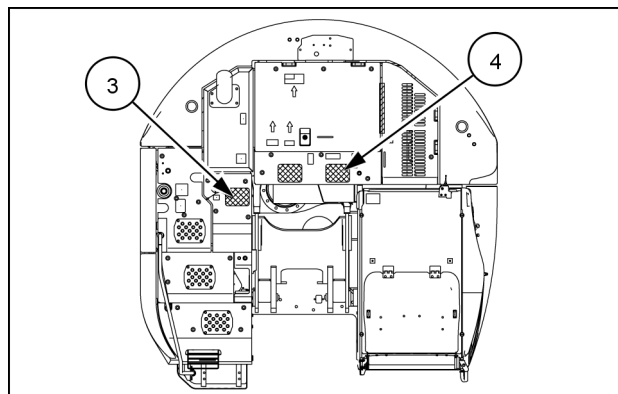
1. Access the ladder (1) on the right-front of the machine.
Climb the ladder grabbing the handrail (2).



SMIL21CEX0033AA 1

2. Step onto the platform (3).
3. Step down from the platform (3) onto the service platform (4).

NOTICE: Make sure to stand on the service platform with the feet laying completely onto the anti-skid surface.



SMIL21CEX0042AA 2

Fluids and lubricants

By using appropriate fluids and lubricants the excavator can operate in ambient temperatures ranging from **-10 °C (5 °F)** to **45 °C (113 °F)**. Refer to the list of fluids and lubricants contained in this manual.

NOTICE: When operating the machine in ambient temperatures outside the above mentioned range, consult your **CASE CONSTRUCTION Dealer** for specific machine provision and for specific fluids and lubricants to be used.

	Quantity		CASE CON- STRUCTION specification	Reference specification
Fuel tank	320 L (85 US gal)	—	—	EN 590:1999
Engine oil	23.1 L (6.1 US gal)	NO.1 ENGINE OIL™ SUPER SAE 15W-40	MAT3622	SAE 15W40 ACEA E7 API CI-4
Swing reduction unit	5.0 L (1.3 US gal)	HYPOID GEAR OIL EP SAE 80W-90	MAT3516-A	SAE 80W/90 API GL-5
Travel reduction unit	5.0 L (1.3 US gal)	HYPOID GEAR OIL EP SAE 80W-90	MAT3516-A	SAE 80W/90 API GL-5
Engine coolant	31 L (8.2 US gal)	EXTENDED LIFE OAT COOLANT/ANTIFREEZE CONCENTRATE (*)	MAT3724 Grade OAT-EG1	ASTM D6210 TYPE I-FF
		EXTENDED LIFE OAT COOLANT/ANTIFREEZE 50/50 PREMIXED	MAT3724 Grade OAT-EG2	ASTM D6210 TYPE III-FF
Hydraulic oil tank (**)	114 L (30.1 US gal)	PREMIUM HYDRAULIC OIL HV46 MULTI-GRADE ANTIWEAR	—	ISO 6743-4 L-HV46
Grease	—	MULTI-PURPOSE GREASE EP / AW / NLGI 2	MAT3555-A	NLGI 2

(*) Concentrate antifreeze to be mixed 50/50 with distilled (deionized) water.

(**) The total capacity of the hydraulic system is: **252 L (66.6 US gal)**

Engine coolant

EXTENDED LIFE OAT COOLANT/ANTIFREEZE is the reference genuine product for machine service.

NOTICE: *Never add Supplemental Coolant Additives (SCA) when using **EXTENDED LIFE OAT COOLANT/ANTIFREEZE**.*

EXTENDED LIFE OAT COOLANT/ANTIFREEZE has to be used if refilling of the cooling system is needed. Refer to the dedicated procedure and recommendations described in Chapter 6.

EXTENDED LIFE OAT COOLANT/ANTIFREEZE shall be used for the replacement of engine coolant according to the maintenance program of the machine. The replacement shall also be tackled in case of repair or replacement of components of the cooling system. Refer to the dedicated procedure described in Chapter 6.

The engine cooling system shall always be refilled with coolant solution made by mixture of antifreeze and distilled (deionized) water.

NOTICE: *Never refill the cooling system with only antifreeze. Never refill the cooling system with only water.*

Using **EXTENDED LIFE OAT COOLANT/ANTIFREEZE**, a 50/50 mixture of antifreeze and distilled (deionized) water grants proper performance of the engine cooling system in the above mentioned operating temperature range of the machine.

EXTENDED LIFE OAT COOLANT/ANTIFREEZE is available as:

- 50/50 PREMIXED coolant solution ready for usage.
- CONCENTRATE antifreeze to be mixed 50/50 with distilled (deionized) water.

NOTICE: *If operating in extreme winter climate, a coolant solution made by 60/40 antifreeze/distilled (deionized) water mixture shall be used in order to grant proper performance of the engine cooling system.*

NOTICE: *Never use coolant solution with more than **60%** of antifreeze. This affects the cooling capacity of the mixture.*

When the coolant solution is prepared starting from the CONCENTRATE product, the antifreeze concentration in the mixture of antifreeze and distilled (deionized) water can be determined with a refractometer designed to measure ethylene glycol content.

If distilled (deionized) water is not available, use water for dilution with the following properties:

Property	Maximum limit
Total Solids	340 ppm
Total Hardness	170 ppm
Chloride (Cl)	40 ppm
Sulfate (SO ₄)	100 ppm
Acidity pH	5.5 to 9.0

NOTICE: *Never use hard water, sea water and softened sea water that has been conditioned with salt. The minerals and salts present in potable water can cause corrosion and deposits resulting in shortened engine life.*

Fuel

Use only Low Sulphur Diesel that meets the National Regulations for commercial diesel fuel.

NOTICE: *Never use Diesel fuel having a sulphur content higher than 350 ppm.*

Using other types of fuel may lead to stalled engine output or deterioration in fuel economy.

NOTICE: *The warranty shall be invalid if any serious defect is caused by usage of any other fuel. Using any fuel other than the prescribed type will cause damages to the fuel supply system, to the fuel injection system, and to the engine block. CASE CONSTRUCTION will not be responsible to any of such damages.*

If the temperature drops below the fuel cloud point, output deficiency or engine start problems may occur due to wax crystals.

NOTICE: *If operating in severe winter climate, consult the fuel supplier or the CASE CONSTRUCTION dealer for specific diesel fuel to be used.*

The diesel fuel to be used on the machine shall:

- be free from dust particles, even minute ones.
- have the proper viscosity.
- have a high cetane number.
- present great fluidity at low temperatures.
- have low sulphur content.
- have very little residual carbon.

NOTICE: *Never use a mix of diesel fuel and old engine oil. The fuel injection system and the exhaust after treatment system will be severely damaged.*

NOTICE: *consult the fuel supplier or the CASE CONSTRUCTION Dealer regarding appropriate use of fuel additives.*

NOTICE: *in order to prevent condensation during cold weather, fill the fuel tank to full after completing the day's work.*

Fuel storage:

Long storage can lead to the accumulation of impurities and condensation in the fuel. Engine trouble can often be traced to the presence of water in the fuel. The storage tank must be placed outside and the temperature of the fuel should be kept as low as possible. Drain off water and impurities regularly.

Disposal of fluids, lubricants, and spare parts

Fluids, lubricants and spare parts used on the machine are not fully compatible with the environment. Make sure to carry out all maintenance operations using appropriate tools, in order to avoid any risk of damaging the environment.

NOTE: *for example, make sure that the receptacle for collecting oil to be replaced is not leaking.*

Never spread fluids or lubricants on the ground or into water. Consult the CASE CONSTRUCTION Dealer or the Local Environmental Agency in order to obtain information on the correct method of disposing fluids and lubricants used on the machine.

Never throw away spare parts as filters or batteries. Consult the CASE CONSTRUCTION Dealer or the Local Environmental Agency in order to obtain information on the correct method of disposing filters, batteries or other spare parts used on the machine.

Engine oil recommended operating temperature range

CASE CONSTRUCTION prescribes the use of engine oils that meet CNH Industrial standard **MAT3622** in your engine.

You may use other engine oils only if they meet **API CI-4** or **ACEA E7** performance requirements.

CASE CONSTRUCTION engine oils exceed API and ACEA performance requirements.

NOTE: Do not put performance additives or other oil additive products in the engine crankcase. See your CASE CONSTRUCTION dealer for engine oil analysis test package information.

RECOMMENDED VISCOSITY GRADES AT VARYING AMBIENT TEMPERATURE LIMITS											
			(H)	SAE 10W-30							
				(H)	SAE 15W-40						
-40 °C	-30 °C	-20 °C	-10 °C	0 °C	10 °C	20 °C	30 °C	40 °C	50 °C		
-40 °F	-22 °F	-4 °F	14 °F	32 °F	50 °F	68 °F	86 °F	104 °F	122 °F		
(H) = Engine oil pan or coolant block heater recommended in this range											

Engine oil and filter service intervals

Always change engine oil and filter at the service intervals prescribed in the maintenance chart, or annually (whichever comes first).

CASE CONSTRUCTION defines the oil/filter change intervals given in this manual from tests with CASE CONSTRUCTION lubricants/filters.

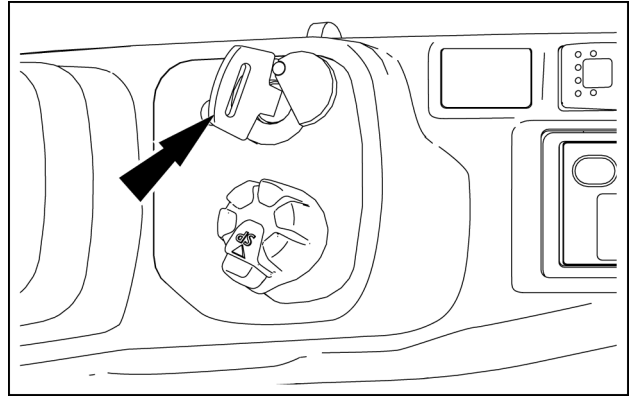
The service intervals for engine oil and filter are based on type of engine oil and oil filter used, and also on sulfur content of diesel fuel. Never use filters other than CASE CONSTRUCTION genuine filters. See the previous page for the approved sulfur content and for other prescriptions for diesel fuel to be used.

NOTICE: If diesel fuel with sulfur content higher than **350 ppm** and up to **1000 ppm** should be exceptionally used, the service intervals of engine oil, oil filter and fuel filters must be reduced by **50%**.

Releasing pressure in the hydraulic system

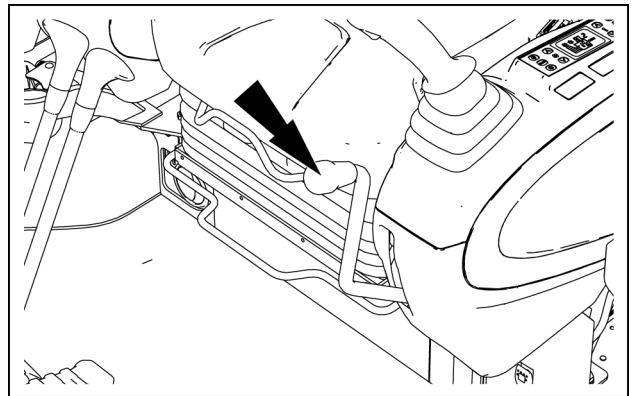
NOTICE: before carrying out any work on the hydraulic system, there should be no pressure in any of the circuits.

1. Place the machine on flat, level ground, lower the attachment to the ground and stop the engine.
2. Turn the starter key to ON position.



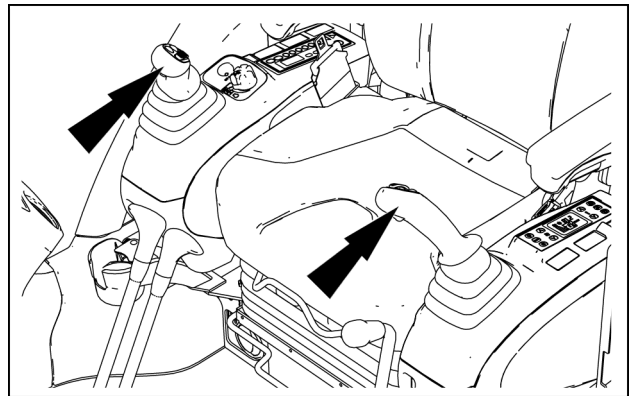
SMIL19CEX2696AA 1

3. Set the gate lock lever to unlock position.



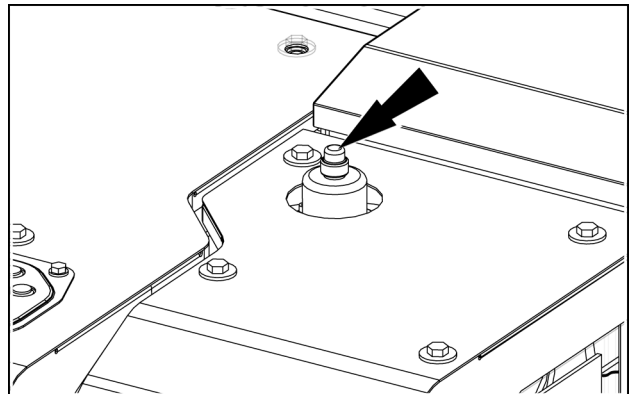
SMIL17CEX0108AA 2

4. Operate the control levers from right to left and front to rear a dozen times approximately.
5. Turn the starter key to OFF position.



SMIL17CEX0109AA 3

6. Keep pressed the button of the hydraulic tank breather to release all the residual pressure.



SMIL21CEX0007AA 4

Fuel system bleeding

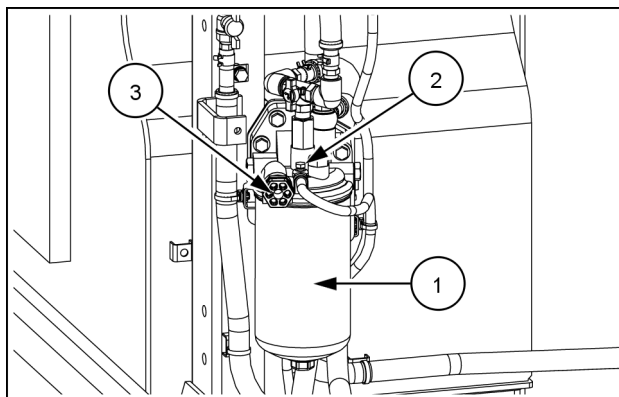
NOTICE: take all necessary precautions during the following operations; no foreign matter must enter the fuel system.

NOTICE: when you deal with fuel, please do not bring fire close. After exchange of the filter and scupper of fuel should wipe off the fuel which fell.

NOTICE: do not work in any environment in which anything other than fuel will get into fuel lines. (Sites with strong wind, blowing dust, etc.). Wash hands before operations. Do not use gloves. Do not open the packaging for the filter kit until you start the installation work. Do not reuse any fuel remaining within the cover. For persistent dirt within the cover, wipe it off with a clean rag, then clean with clean diesel fuel. Do not use parts cleaner because it could affect the case cover. Do not touch the inside of the element. Completely wipe off any spilt fuel after changing a filter element or in the system.

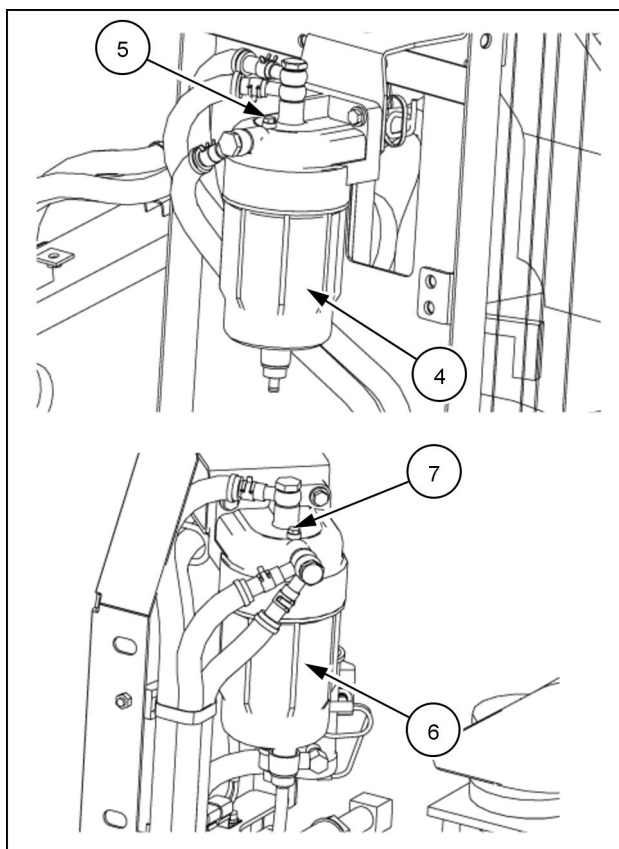
NOTICE: When the fuel tank has been emptied after replacement and/or draining water of the pre-fuel filter or the fuel filter (3) has been carried out, be sure to air as this may prevent fuel flow because of air entering inside.

- (1) Fuel filter
- (2) Air bleed plug
- (3) Priming pump



SMIL20CEX2480AA 1

- (4) Fuel pre-filter
- (5) Air bleed plug
- (6) Additional fuel pre-filter (if equipped)
- (7) Air bleed plug



SMIL18CEX0773BA 2

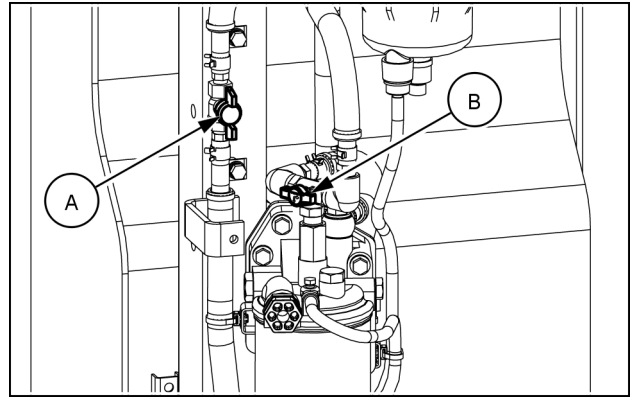
1. Set the fuel valves **(A)** and **(B)** as follows.
 Fuel cut valve **(A)**: open
 Fuel main filter valve **(B)**: to tank
2. Loosen the air bleed plug **(2)** on fuel filter **(1)**.
3. Turn the starter key to ON position to activate the fuel feed pump.

NOTICE: Do not keep the starter key to ON position for more than **5 min**. Failing to comply will result in serious damages to the fuel feed pump and to the electric system of the machine. If air bleeding is not completed after **5 min**, stop the procedure and turn the starter key to OFF position for **2 min**. Then turn the starter key to ON position again and complete the bleeding procedure.

4. Turn the handle of the priming pump **(3)** to the left and it will spring up due to the spring inside the handle.
5. By moving the priming pump **(3)**, the fuel that contains bubbles can be drained from the air bleed plug.
 Move the priming pump until no air comes out from the air bleed plug **(2)**.
6. Snug tighten the air bleed plug **(2)**.
7. Move the priming pump until the fuel filter is filled with fuel (10 times or more).
8. Wait about **1 min** and loosen the air bleed plug.
9. Repeat steps 6 through 8 until no air comes out from the air bleed plug (at least 3 times). Tighten the air bleed plug **(2)**.
 Air bleed plug tightening torque: **8 – 12 N·m (5.9 – 8.9 lb ft)**

NOTICE: Do not tighten the air bleed plug more than its specified torque. Doing so might damage the O-rings.

10. Loosen the air bleed plug **(5)** of the fuel pre-filter.
 Move the priming pump **(3)** until no air comes out from the air bleed plug.
11. Tighten the air bleed plug **(5)**.
 Air bleed plug tightening torque: **8 – 12 N·m (5.9 – 8.9 lb ft)**
12. Repeat the steps from 10 to 11 for the additional pre-filter **(6)** if equipped.
13. Move the priming pump **(3)** until it becomes harder to move.
14. Return the priming pump **(3)** back to its original position.
15. Turn the starter key to OFF position.

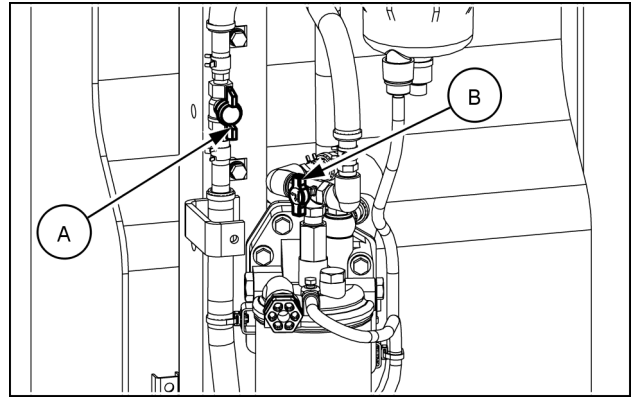


SMIL21CEX0028AA 3

16. Set the fuel valves **(A)** and **(B)** as follows.
Fuel cut valve **(A)**: open
Fuel main filter valve **(B)**: to engine

Completely wipe off any spilled fuel around the air bleed plugs **(2)**, **(5)**, and **(7)** if equipped.

17. Start the engine, and keep the speed to low idle. If the engine does not start at this stage, repeat the steps from 1 to 16, and then try to start it again.
18. Reach the front right-hand compartment, and check for any fuel leak from the components of the fuel supply line.
19. Get onto the cab, and gradually increase the engine speed to the maximum. Keep max speed for **2 min**, then set the engine speed to low idle position.
20. Reach the front right-hand compartment, and check for any fuel leak from the components of the fuel supply line.



SMIL21CEX0027AA 4

Protecting the electronic and electrical systems during battery charging or welding

⚠ DANGER

Improper operation or service of this machine can result in an accident.

Any unauthorized modifications made to this machine can have serious consequences. Consult an authorized dealer on changes, additions, or modifications that may be required for this machine. Do not make any unauthorized modifications.

Failure to comply will result in death or serious injury.

D0030A

⚠ DANGER

Battery acid causes burns. Batteries contain sulfuric acid.

Avoid contact with skin, eyes or clothing. Antidote (external): Flush with water. Antidote (eyes): flush with water for 15 minutes and seek medical attention immediately. Antidote (internal): Drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately.

Failure to comply will result in death or serious injury.

D0117A

Whenever carrying out a welding operation on the undercarriage or upperstructure carriage as authorized by the manufacturer and in accordance with his instructions, disconnect the batteries, disconnect the alternator B+ and D+ terminal wires and connect the welding apparatus earth cable to the component on which the welding operation is to be performed. Never connect the welding apparatus to the undercarriage when welding on the upperstructure (or vice-versa). Never connect the welding apparatus earth to a component of the hydraulic system.

To avoid damage to the electronic/electrical systems, always observe the following:

- Never make or break any of the charging circuit connections, including the battery connections, when the engine is running.
- Never short any of the charging components to ground.
- Make sure to set the battery disconnect switch to OFF position in advance or cut-off the connection of the ground cable when executing arc welding to the machine.
- Always disconnect the negative cable from the battery when charging the battery in the machine with a battery charger.

NOTICE: position the welder ground clamp as close to the welding area as possible. If welding in close proximity to a computer module, then the module should be removed from the machine. Never allow welding cables to lay on, near or across any electrical wiring or electronic component while welding is in progress.

NOTICE: if welding must be performed on the unit, either the machine, the battery ground cable must be disconnected from the machine battery. The electronic monitoring system and charging system will be damaged if this is not done.

Maintenance planning

Maintenance chart

Maintenance action	Change fluid				Drain fluid				Page no.
	Grease	Replace	Check	Adjust	Cleaning	Adjust			
Break-in period									
Grease points (Bucket)	x								6-16
Cab protection (ROPS and FOPS)		x							6-16
Tightening torques		x							6-16
Track shoe bolt torque		x							6-16
Hydraulic oil return filter			x						6-16
Pilot line filter			x						6-16
Swing reduction unit oil				x					6-16
Travel reduction units oil				x					6-16
Every 10 hours									
Engine oil level		x							6-17
Engine coolant level		x							6-18
Hydraulic oil level		x							6-19
Fan and alternator drive belt		x							6-20
Fuel tank					x				6-20
Fuel pre-filters					x				6-21
Every 50 hours									
Air conditioner filters						x			6-22
Grease points (Blade)	x								6-24
Every 250 hours									
Grease points (Bucket)	x								6-25
Swing reduction unit oil		x							6-26
Travel reduction units oil		x							6-27
Engine primary air filter					x				6-28
Battery electrolyte level		x							6-31
Fan and alternator drive belt							x		6-34
Hydraulic oil tank					x				6-35
Tightening torques		x							6-36
Track shoe bolt torque		x							6-37
Track rollers and idler wheels		x							6-38
Cab protection (ROPS and FOPS)		x							6-38
Every 500 hours									
Turntable bearing	x								6-39
Engine oil and filter				x					6-41
Fuel pre-filter			x						6-43
Fuel filter			x						6-44
Radiator and coolers						x			6-45
Every 1000 hours									
Grease points (Boom and arm)	x								6-46
Hydraulic tank breather			x						6-49
Engine air filters			x						6-50
Hydraulic fluid analysis		x							6-52
Engine valve rocker clearance adjustment		x							6-52
Swing reduction unit oil				x					6-53
Travel reduction units oil				x					6-55
Alternator		x							6-56
Starter motor		x							6-56

6 - MAINTENANCE

Maintenance action	Change fluid					Drain fluid					Page no.
	Replace					Cleaning					
	Check			Adjust							
	Grease										
Every 2000 hours											
Hydraulic oil suction filter						x					6-57
Hydraulic oil return filter			x								6-58
Pilot line filter			x								6-59
Air conditioner filters			x								6-60
Swing reduction gear	x										6-60
Every 4000 hours											
Engine coolant				x							6-61
Pump outlet hoses		x									6-66
Hydraulic hoses		x									6-66
Every 5000 hours											
Hydraulic oil and filters				x							6-67
When necessary											
Fuel feed pump						x					6-70
Track tension		x									6-71
Fuel tank strainer						x					6-73
Gas spring inspection		x									6-74
Bulb replacement			x								6-75
Bucket teeth			x								6-78
Cylinders		x									6-80
Plastic and resin parts						x					6-80
Air-conditioning system		x									6-81

Break-in period

Grease points (Bucket)

Lubricate the bucket linkage every **10 h** within the first **50 h**: to lubricate the bucket linkage refer to page **6-25**.

Cab protection (ROPS and FOPS)

Check the cab protections after **50 h**: To check the cab protections refer to page **6-38**.

Tightening torques

Check the tightening torques after **50 h**: To check the tightening torques refer to table on page **6-36**.

Track shoe bolt torque

Check the tracks shoes bolts torque after **50 h**: To check the tightening torques refer to table on page **6-37**.

Hydraulic oil return filter

Replace the hydraulic return filter after **250 h**: To replace the hydraulic return filter perform the operations described on page **6-58**.

Pilot line filter

Replace the pilot filter after **250 h**: To replace the pilot filter perform the operations described on page **6-59**.

Swing reduction unit oil

Replace the swing reduction gear oil after **250 h**: To replace the swing reduction gear oil perform the operations described on page **6-60**.

Travel reduction units oil

Replace the travel reduction gear oil after **250 h**: To replace the travel reduction gear oil perform the operations described on page **6-27**.

Every 10 hours

Engine oil level

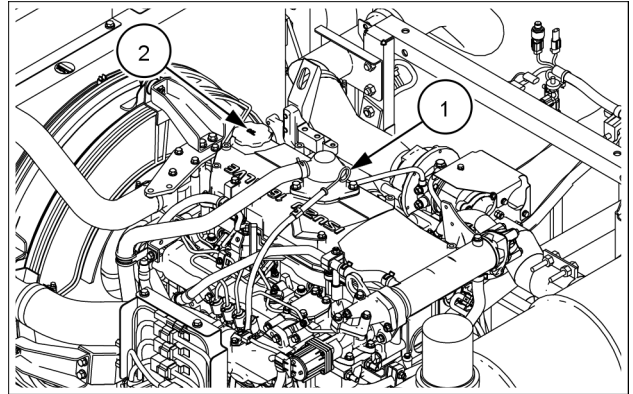
Check the engine oil level every **10 h** or every day

Lubricant: **NO.1 ENGINE OIL™ SUPER SAE 15W-40**

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key.
2. After **30 min** or more, reach the service platform in the center of the machine. Refer to page **6-4**. Raise and fix the engine hood.

Remove the oil gauge **(1)**, and wipe oil off the gauge with a clean cloth.

Reinsert the oil gauge into the guide tube as far as it will go, and then take it out.

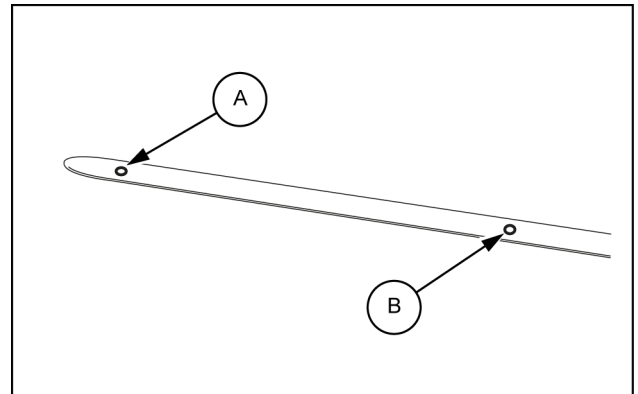


SMIL17CEX4707AA 1

3. The engine oil level is optimal when the oil level is between the mark **(A)** (minimum) and mark **(B)** (maximum).
4. If the oil level is at or below the mark **(A)** (minimum) on the oil gauge, remove the fill plug **(2)** and pour in oil until the level reaches the mark **(B)** (maximum).

NOTE: Make sure that the oil level is not above the **(B)** (maximum) on the oil gauge. Doing so will cause such problems as poor fuel economy and an abnormal rise in coolant temperature.

5. Install the fill plug **(2)**.



SMIL14CEX2746AB 2

Engine coolant level

⚠ WARNING

Hazardous chemicals!

Coolant can be toxic. Avoid contact with skin, eyes, and clothing. Antidotes:

EXTERNAL - Rinse thoroughly with water. Remove soiled clothing.

INTERNAL - Rinse the mouth with water. **DO NOT** induce vomiting. Seek immediate medical attention.

EYES - Flush with water. Seek immediate medical attention.

Failure to comply could result in death or serious injury.

W0282A

Check the coolant level in the reserve tank every **10 h** or every day

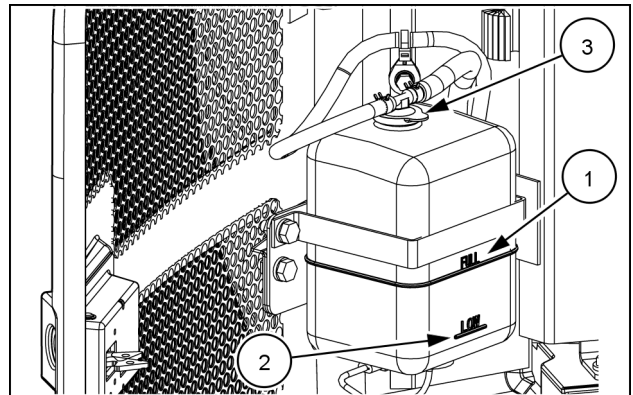
Fluid: **EXTENDED LIFE OAT COOLANT/ANTIFREEZE**

NOTICE: make sure that the level of the engine coolant is checked after the engine has cooled down.

NOTICE: the refilling of the engine coolant should be done only if the level of coolant in the reserve tank is at the **LOW** mark.

NOTICE: If the refilling frequency is higher than **250 h**, CASE CONSTRUCTION recommends not to further refill the system: carefully inspect the cooling circuit for damages, replace any damaged part, and then replace the whole fluid into the cooling system. Refer to the dedicated procedure described ahead in this Chapter.

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key.
2. Open the rear left-hand door.
3. Check that the level of the reserve tank is between the **FULL (1)** mark and the **LOW (2)** mark.
4. If the coolant level is at the **LOW** mark, remove the plug (3) and add coolant until the level is right below the **FULL** mark.
5. Install the plug (3).



SMIL21CEX0008AA 1

Hydraulic oil level

⚠ WARNING

Burn hazard!

Before performing any service on the hydraulic system, you must allow it to cool. Hydraulic fluid temperature should not exceed 40 °C (104 °F).

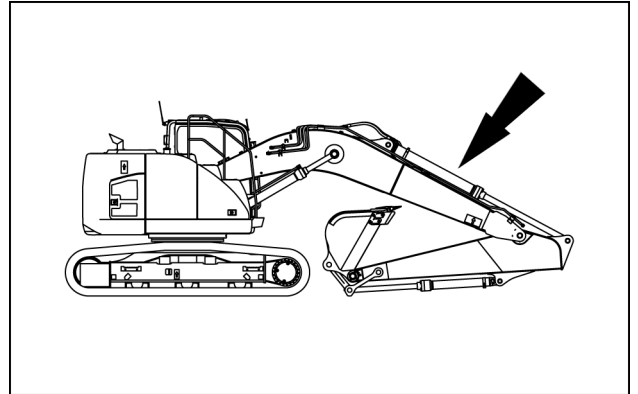
Failure to comply could result in death or serious injury.

W0241A

Check the hydraulic oil level every **10 h** or every day

Fluid: **PREMIUM HYDRAULIC OIL HV46 MULTI-GRADE ANTIWEAR**

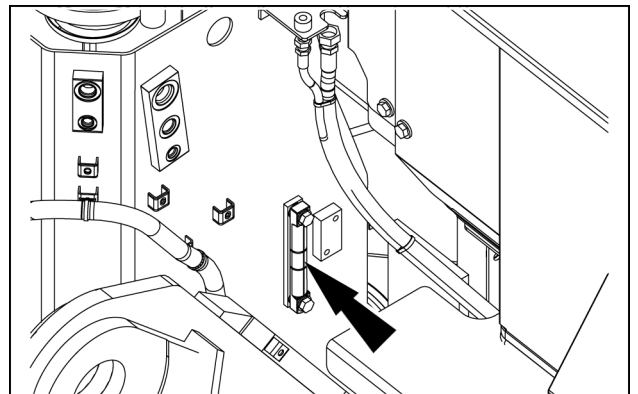
1. Park the machine on a flat and level place, and arrange the attachment as shown in the figure. Stop the engine, and remove the starter key.



SMIL20CEX2475AA 1

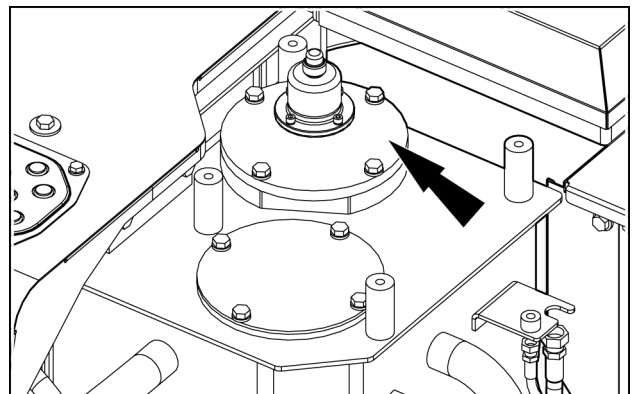
2. Reach the service platform in the center of the machine. Refer to page 6-4.

The oil level gauge is located behind the boom foot. The oil level should be in the middle of the band indicated by the two lines.



SMIL20CEX2476AA 2

3. If the hydraulic oil level is not in range proceed as follows:
 - Release all pressure in the hydraulic tank. Refer to page 6-9.
 - Remove the panel over the hydraulic tank. Clean the top surface of the hydraulic tank.
 - Remove the cover of the suction filter, and supply hydraulic fluid to the tank.
 - If necessary, replace the seal of the cover plate, and attach the cover of the suction filter.
 - Install the panel over the hydraulic tank.



SMIL20CEX2477AA 3

NOTICE: make sure that no contaminant (water, sand etc.) enters the reservoir during filling.

Fan and alternator drive belt

Visually check the fan and alternator drive belt every **10 h** or every day

1. Refer to page **6-34**.

NOTICE: Operating the engine with loosened belt may cause over heat of the engine or insufficient charging of the battery due to slipping belt in its housing.

Fuel tank

⚠ WARNING

Fire hazard!

When handling diesel fuel, observe the following precautions:

1. Do not smoke.
2. Never fill the tank when the engine is running.
3. Wipe up spilled fuel immediately.

Failure to comply could result in death or serious injury.

W0099A

Drain water and sediment from the fuel tank every **10 h** or every day

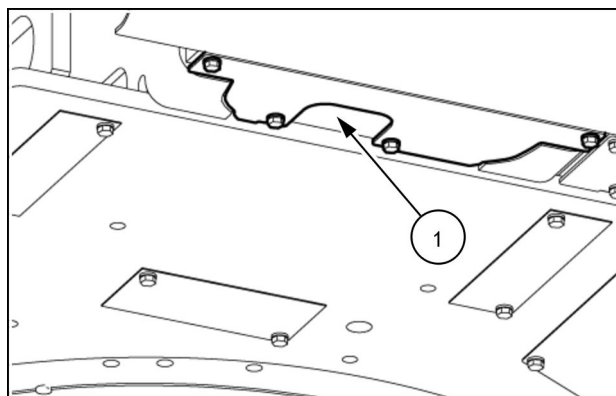
NOTICE: The fuel tank must be drained taking precautions so that any foreign material may get inside. Failing to comply will lead to severe damages to the fuel supply system and to the fuel injection system.

To drain water and sediment from the fuel tank proceed as follows:

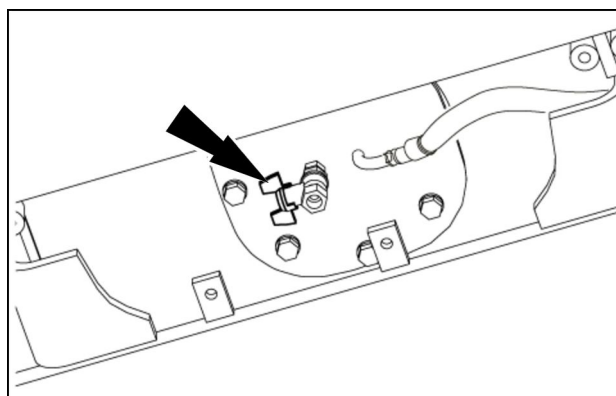
1. Park the machine on a hard and level ground. Orient the upper structure frame so that there is enough free space under the fuel tank to place a barrel of suitable capacity.
2. Stop the engine and remove the starter key.
3. Clean the hole on the lower panel **(1)** below the fuel tank to access the drain valve.
4. Place a container of a suitable capacity under the drain valve.
5. Open the valve and drain the accumulated sediment and water.

NOTICE: the drained materials shall be disposed according to the local Regulations for special wastes.

6. Close the drain valve.



SMIL21CEX0020AA 1



SMIL21CEX0019AA 2

Fuel pre-filters

Check the water deposit at the bottom of each filter body every **10 h** or every day.

The separation of water mixed to the fuel should be mainly done in the fuel pre-filter. Make sure to regularly drain water from the pre-filter in order to keep the overall performance of the filters and to avoid severe damages to the fuel injection system.

NOTICE: In cold weather, water may freeze on top of the filter bodies. Wait until ice melts before drainage.

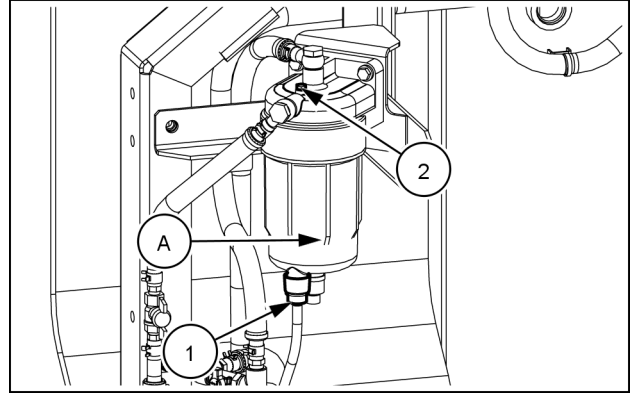
When the floating ring reaches the level indicated by the line **(A)**:

1. Place a container with an appropriate capacity under the pre-filter.
2. Loosen the drain plug **(1)** and the air bleed plug **(2)**, and then drain water and sediment.
3. When the floating ring reaches the bottom, tighten the drain plug **(1)** and the air bleed plug **(2)** to the torque of **2 – 3 N·m (1.48 – 2.21 lb ft)** **8 – 12 N·m (5.90 – 8.89 lb ft)** respectively.

NOTICE: Overtightening can damage the seal.

4. Check for any signs of leaks.

NOTICE: In cold weather, water may freeze on top of the pre-filter body. Wait until ice melts before drainage.



SMIL20CEX2478AA 1

Every 50 hours

Air conditioner filters

⚠ CAUTION

Flying debris!

Compressed air can propel dirt, rust, etc. into the air. Wear eye and face protection when using compressed air.

Failure to comply could result in minor or moderate injury.

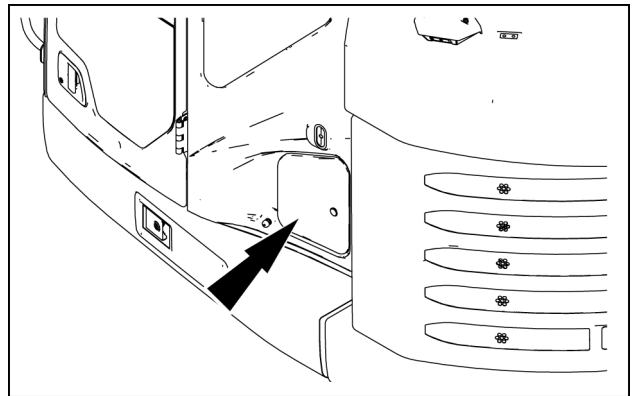
C0049A

Clean the air inlet filter every **50 h**

Clean the air circulation filter every **50 h**

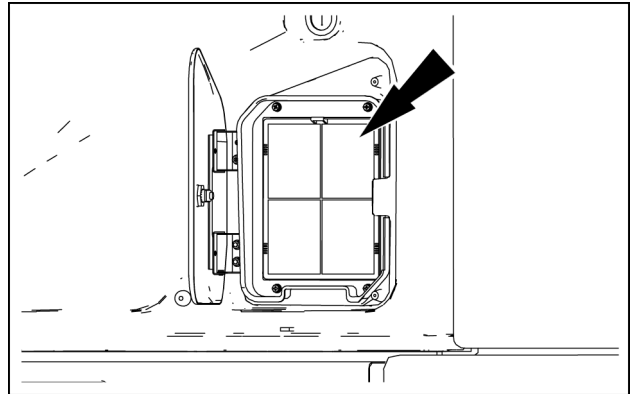
Air inlet filter

1. Open the cover of the air inlet filter with the starter key.



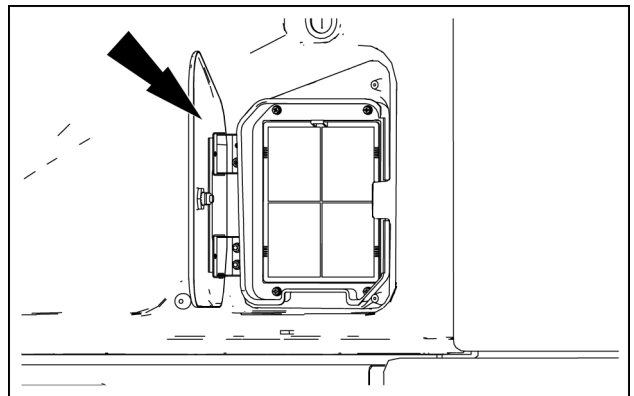
SMIL17CEX0110AA 1

2. Remove the filter and clean it with compressed air. If the filter is damaged, replace it.



SMIL17CEX0111AA 2

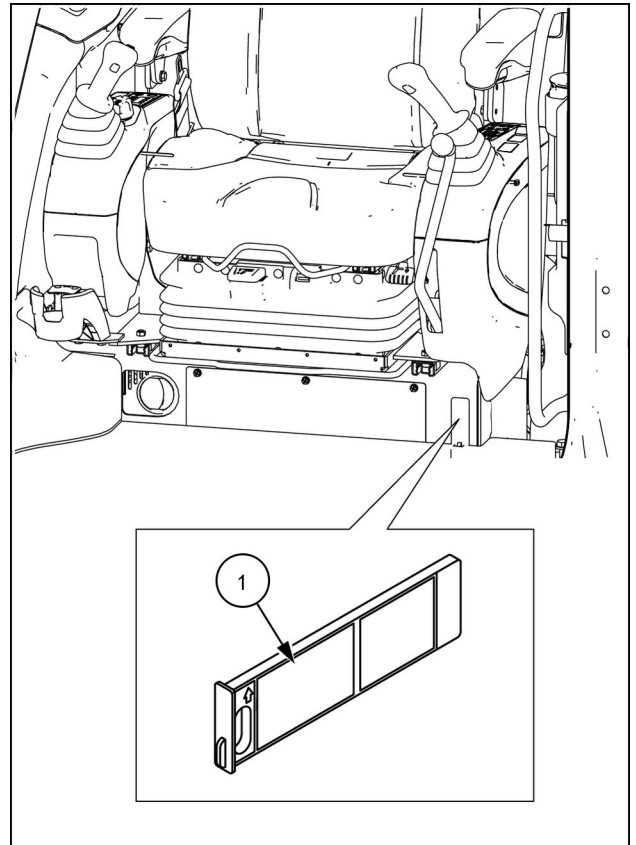
3. Install the air inlet filter.
4. Close the cover and lock it with the starter key.



SMIL17CEX0111AA 3

Air circulation filter

1. Extract the air circulation filter **(1)** and clean it with compressed air. If the filter is damaged, replace it.
2. Insert the air circulation filter **(1)** into its seat.

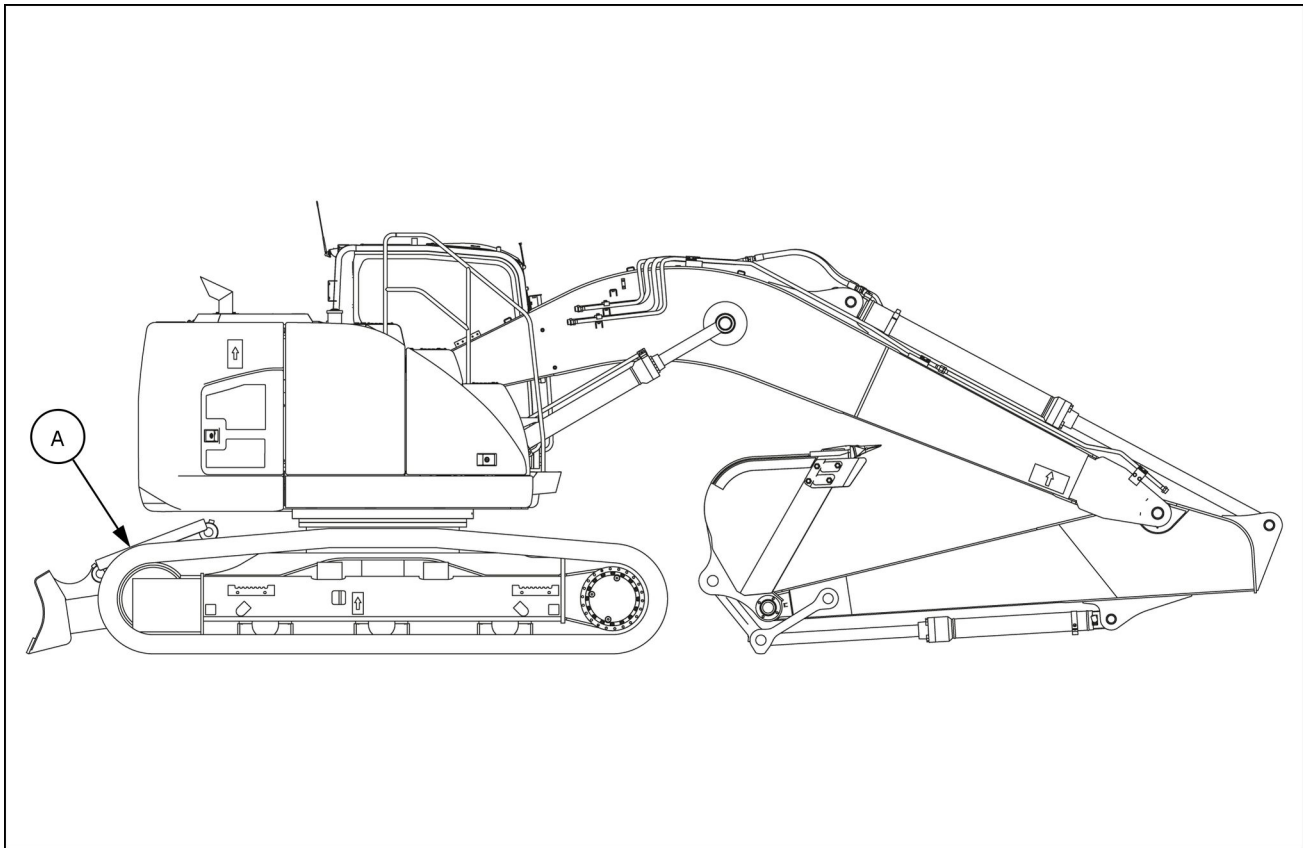


SMIL17CEX0554BA 4

Grease points (Blade)

Grease the blade every **50 h**.

Lubricant: **MULTI-PURPOSE GREASE EP / AW / NLGI 2**.



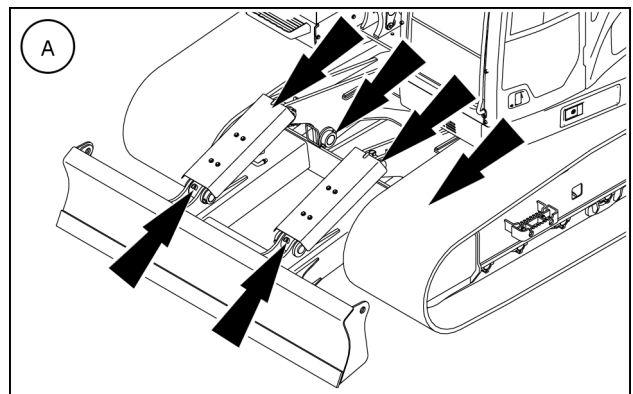
SMIL20CEX2481FA 1

NOTE: the blade shall be lubricated every **10 h** if non-genuine grease is used.

- Blade main pins: two grease fittings.
- Blade cylinders top pins: two grease fittings.
- Blade cylinders bottom pins: two grease fittings.

NOTICE: the blade shall be lubricated every **10 h** if the machine is operated in water or mud.

NOTE: after lubrication, refit the protective plastic caps to the grease fittings.



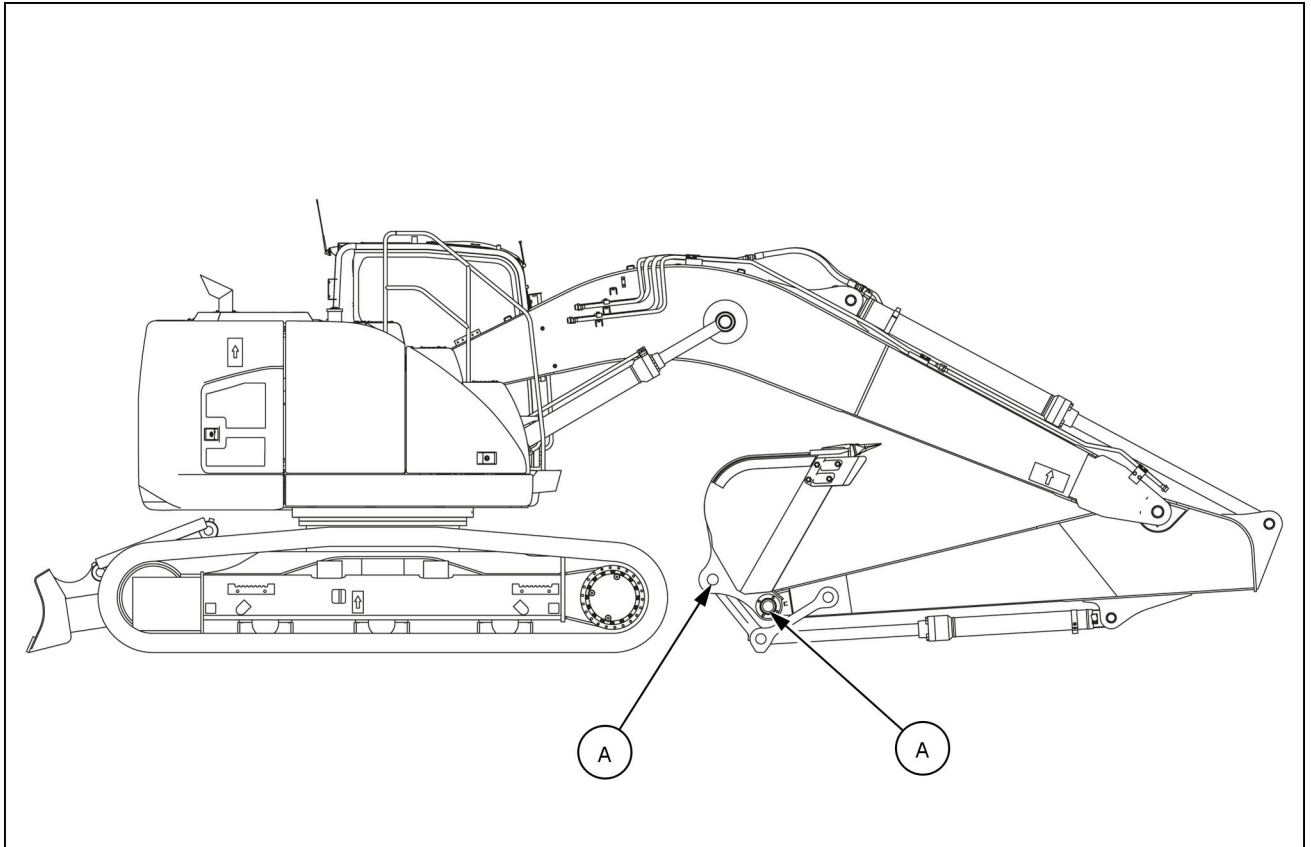
SMIL17CEX0552AA 2

Every 250 hours

Grease points (Bucket)

Grease the bucket linkage every **250 h**.

Lubricant: **MULTI-PURPOSE GREASE EP / AW / NLGI 2.**



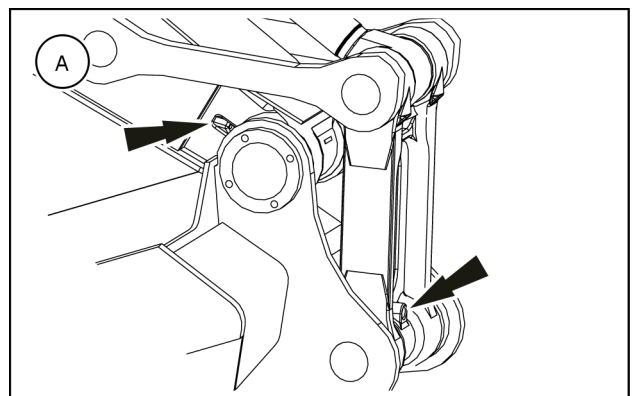
SMIL20CEX2481FA 1

NOTE: the bucket linkage shall be lubricated every **10 h** if non-genuine grease is used.

Bucket linkage: two grease fittings.

NOTICE: the bucket linkage shall be lubricated every **10 h** if the machine is operated in water or mud.

NOTICE: the bucket linkage shall be lubricated every **10 h** if any attachment other than a bucket is used.



SMIL14CEX2731AA 2

Swing reduction unit oil

⚠ WARNING

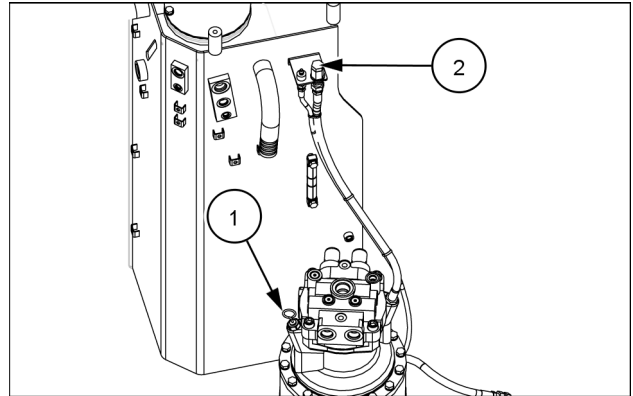
Hot surface possible!
Wait for all components to cool before performing any operation.
Failure to comply could result in death or serious injury.

W0251A

Check the swing reduction gear oil level every **250 h**.

Lubricant: **HYPOID GEAR OIL EP SAE 80W-90**

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key.
2. Reach the service platform in the center of the machine. Refer to page **6-4**.
3. Remove the oil gauge **(1)**, clean it with a neat cloth, and check the oil level. Oil needs to reach the hatched area.
If necessary, supply oil via the fill port **(2)**, and check the oil level again.
4. Attach the oil gauge **(1)**.



SMIL20CEX2482AA 1

Travel reduction units oil

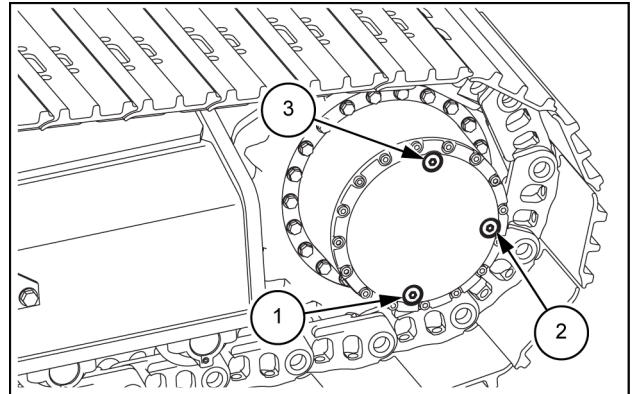
Check the travel reduction gears oil level every **250 h**.

Lubricant: **HYPOID GEAR OIL EP SAE 80W-90**

1. Park the machine on flat, horizontal ground.
2. Move the machine so that the drain plug **(1)** comes down to the lowest position.
3. Stop the engine and remove the starter key.
4. Slowly loosen the air bleed plug **(3)** to release the internal pressure of the case.
5. Remove the level plug **(2)**, and check the oil level. If the level comes up to the bottom edge of the port **(2)**, it is sufficient.

If necessary, add oil through the port **(3)** until the oil comes up to the bottom edge of the port **(2)**.

6. Check the O-ring seal of the level plug **(2)** for damages, and replace it if necessary. Insert the level plug **(2)** with seal tape wrapped around it.
7. Check the O-ring seal of the air bleed plug **(3)** for damages, and replace it if necessary. Insert the air bleed plug **(3)** with seal tape wrapped around it.
8. Repeat Steps **2** to **7** for the other travel reduction gear.
9. Run the machine slowly to check that there are no leaks.



SMIL14CEX2849AB 1

Engine primary air filter

⚠ CAUTION

Flying debris!

Compressed air can propel dirt, rust, etc. into the air. Wear eye and face protection when using compressed air.

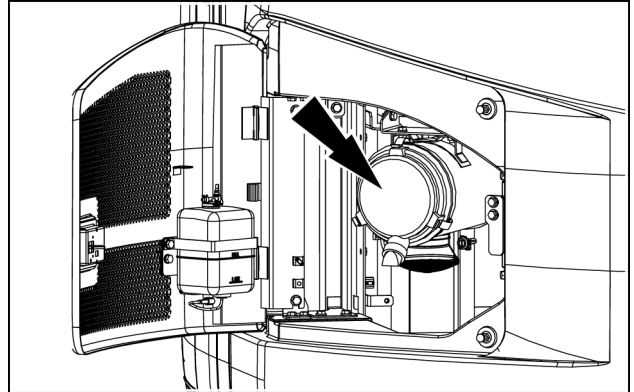
Failure to comply could result in minor or moderate injury.

C0049A

Clean the engine primary air filter every **250 h** or when the AIR FILTER message is displayed.

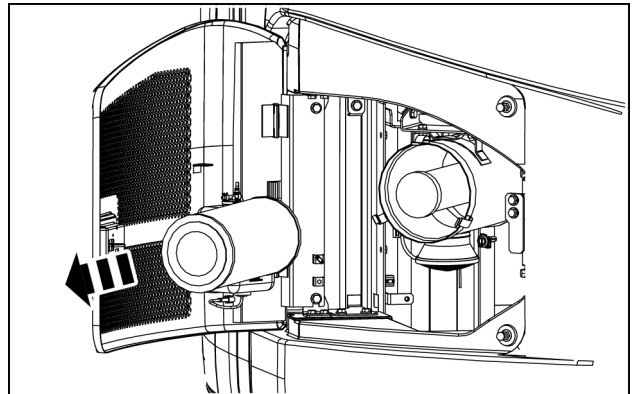
NOTE: The primary element can be cleaned. The secondary element cannot be cleaned and must be changed.

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key.
2. Open the rear left-hand door.
3. Release the fasteners, and remove the cover.



SMIL20CEX2484AB 1

4. Remove the primary element.



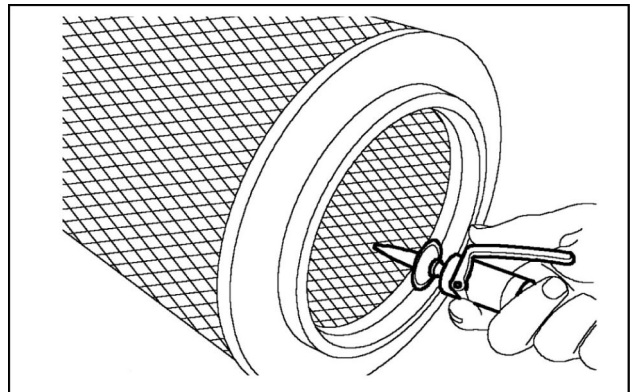
SMIL20CEX2483AB 2

When the primary element is dry:

Blow compressed air at very low pressure from the inside to the outside.

Hold the compressed air nozzle at a position at least **3 cm (1.181 in)** away from the inside wall of the element. When no more dust comes out of the primary element, cleaning is complete.

NOTE: Be sure to keep the compressed air pressure below **7 bar**.



SMIL14CEX2795AA 3

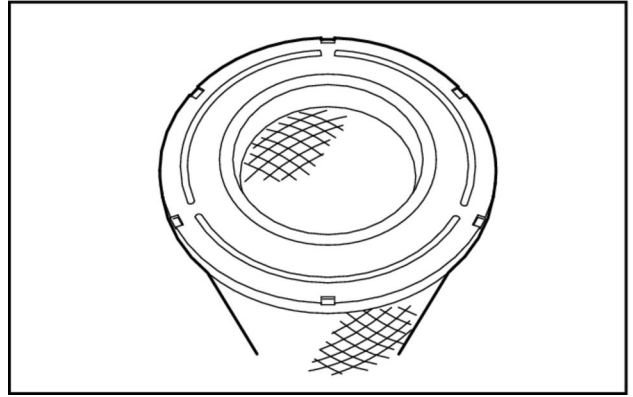
NOTE: Do not use compressed air if there is oil or soot in the element.

If the cartridge is greasy:

Clean it in water, with suitable detergent. (Consult your CASE CONSTRUCTION dealer).

Instructions for using the detergent are printed on the package.

NOTE: Dry the element out completely before installing it. It is advisable to keep a clean spare element ready that can be installed on the air cleaner while the cleaned element is drying.

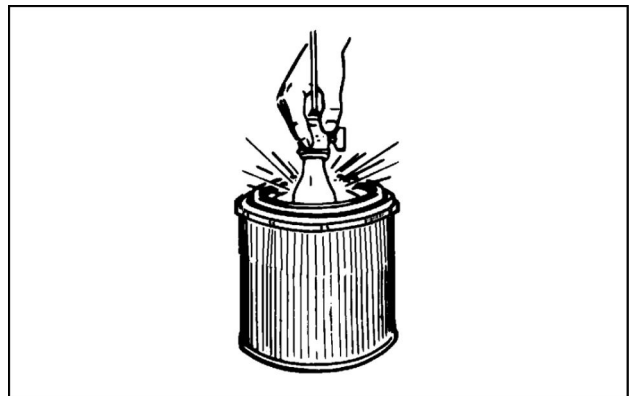


SMIL13CEX2757AA 4

Inspecting the element

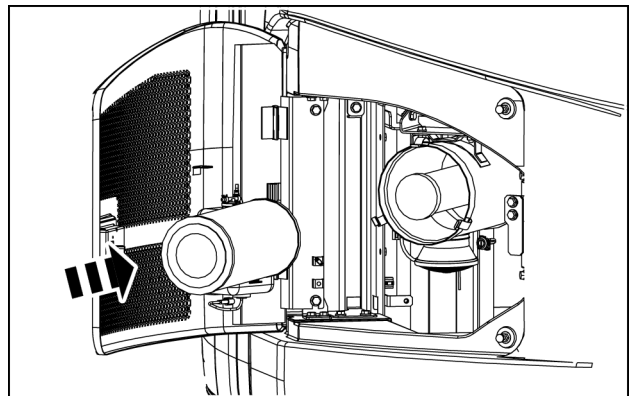
Check the element for damage by placing an inspection lamp inside the element.

NOTE: Change the element if light can be seen through a hole, however small.



SMIL14CEX2797AA 5

5. Clean the inside of the air cleaner case, and attach the primary element.
6. Attach the cover (with the "TOP" display facing up), and lock the fasteners.



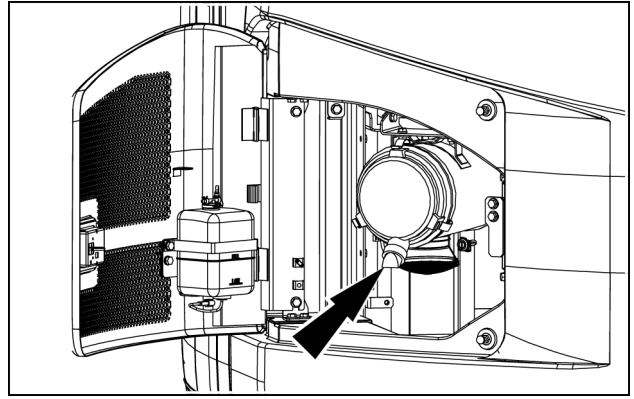
SMIL20CEX2483AB 6

NOTICE: The mass air flow (MAF) sensor is mounted on the inlet duct of the air cleaner. Output of the engine may be restricted if any dust is attached to the MAF sensor or failure of sensing part of the MAF sensor due to usage of retailed cleaning fluid.

Pay attention not to allow dust to invade the inlet duct when replacing the air cleaner element. Also, pay attention not to spray retailed cleaning fluids to the MAF sensor when using them.

7. Check that the dust ejector under the filter is operating correctly.

NOTE: If, after cleaning, smoke exhaust is abnormal, be sure to replace the primary element of the air cleaner.



SMIL20CEX2484AB 7

Battery electrolyte level

⚠ WARNING

Improper operation or service of this machine can result in an accident.

Before working on any component(s) of the electrical circuit, put the ignition key in the off (shut down) position. When disconnecting batteries, always disconnect the negative (-) cable first. When reconnecting batteries, always connect the negative (-) cable last.

Failure to comply could result in death or serious injury.

W0943A

⚠ WARNING

Battery acid causes burns. Batteries contain sulfuric acid.

Avoid contact with skin, eyes or clothing. Antidote (external): Flush with water. Antidote (eyes): flush with water for 15 minutes and seek medical attention immediately. Antidote (internal): Drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately.

Failure to comply could result in death or serious injury.

W0111A

⚠ WARNING

Battery gas can explode!

To prevent an explosion: 1. Always disconnect the negative (-) battery cable first. 2. Always connect the negative (-) battery cable last. 3. Do not short circuit the battery posts with metal objects. 4. Do not weld, grind, or smoke near a battery.

Failure to comply could result in death or serious injury.

W0011A

⚠ WARNING

Explosive gas!

Batteries emit explosive hydrogen gas and other fumes while charging. Ventilate the charging area. Keep the battery away from sparks, open flames, and other ignition sources. Never charge a frozen battery.

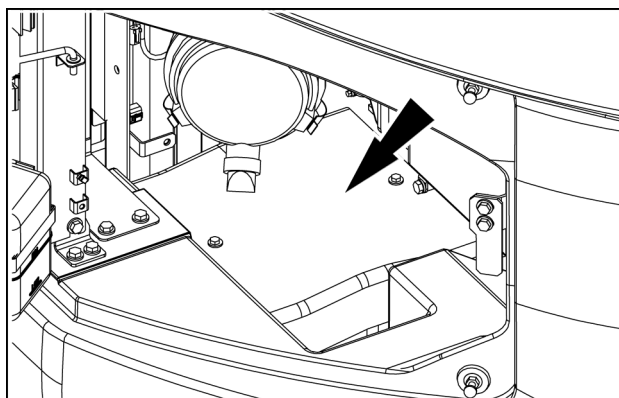
Failure to comply could result in death or serious injury.

W0005A

Check the electric charge of the battery every **250 h**.

Check of electrolyte level of the battery every **250 h**.

To access the batteries, open the rear left-hand door, and then remove the skid plate.

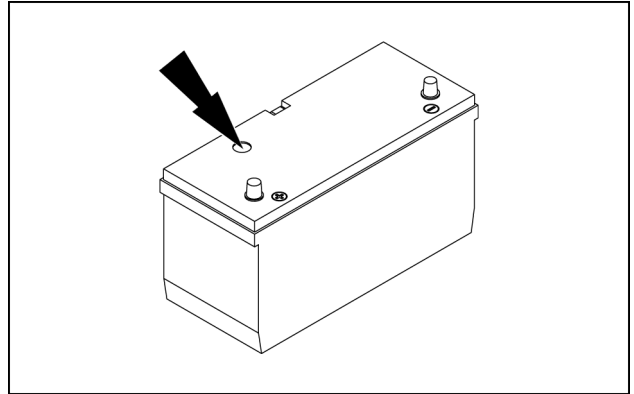


SMIL21CEX0009AA 1

Inspection of maintenance-free battery charge state

The charge indicator on the battery shows the state of charge of the battery:

- If the color is green the charge is correct.
- If the color is black the charge is insufficient. Recharge the battery until the indicator turns green.
- Transparent (colorless): replace the battery as soon as possible.



SMIL17CEX0428AA 2

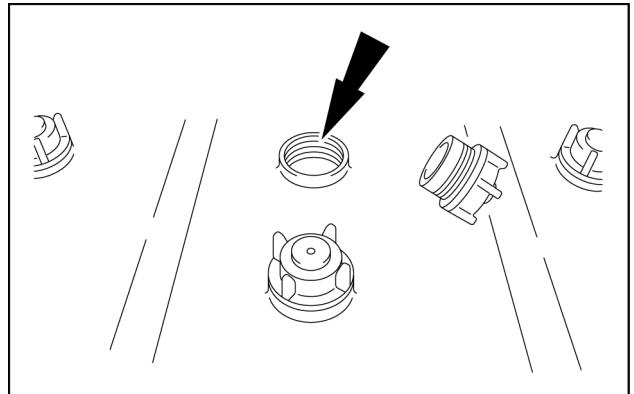
Checking the electrolyte level of a maintenance-free battery

Remove the cell caps and check the level in each battery cell.

- The level should be between **10 mm (0.4 in)** and **15 mm (0.6 in)** above the plates.
- Add distilled water if necessary, then install the cell caps.

NOTE: When adding distilled water at temperatures below **0 °C (32 °F)**, the batteries must be charged or the engine run for two hours approximately in order to ensure that the distilled water and the electrolyte are properly mixed.

NOTE: Make sure the battery terminals are clean and coated with grease and that the cables are properly tightened.

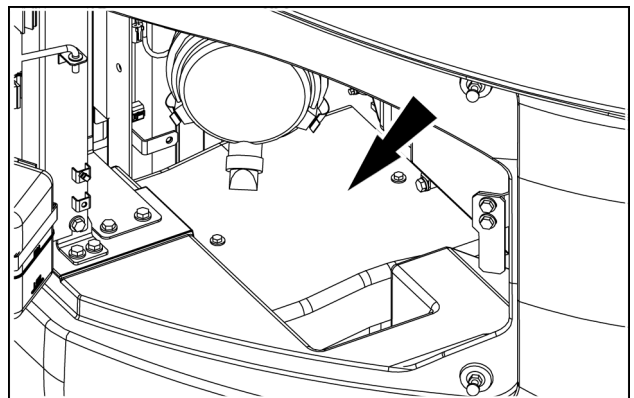


SMIL14CEX2831AA 3

Replacement of the battery

To replace the battery proceed as follows:

1. Set the battery disconnect switch to the OFF position. Remove the terminal protection caps, and cut-off the negative-terminal cable. Next, cut-off the positive-terminal cable. Remove the anti-sulfuration pellets and the battery clips.
2. Attach a new battery, and return the clips to their original positions.
3. Clean the cables and the battery terminals, and apply grease.
4. Attach new anti-sulfuration pellets, and connect the positive and the negative cable to the positive and the negative terminal of the battery respectively. Attach the terminal protection caps. Set the battery disconnect switch to the ON position.
5. Attach the skid plate.



SMIL21CEX0009AA 4

Starting the engine with booster batteries

⚠ WARNING

Improper operation or service of this machine can result in an accident.

An error connecting auxiliary starting cables or short-circuiting battery terminals can cause an accident. Connect auxiliary starting cables as instructed in this manual.

Failure to comply could result in death or serious injury.

W0263A

Make sure that the booster battery voltage corresponds to the voltage system of the machine **24 V**.

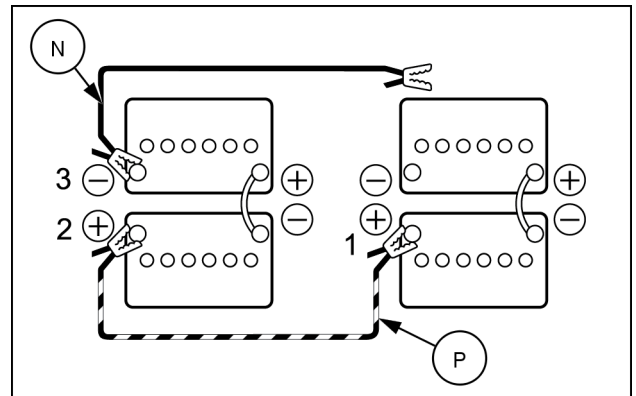
Make sure that the starter key is in OFF position and the gate lock lever in inward position.

Make sure to use supply cables of appropriate dimensions (at least **50 mm² (0.1 in²)**).

1. Connect one terminal of the positive jumper cable (**P**) to the positive (+) pole of the machine batteries.
2. Connect the other terminal of the positive jumper cable (**P**) to the positive (+) pole of the booster batteries.
3. Connect one terminal of the negative jumper cable (**N**) to the negative (-) pole of the booster batteries.
4. Connect the other terminal of negative jumper cable (**N**) to the upper frame of the machine (ground).

Turn the starter key to ON position and start the engine. After the engine has started proceed as follows:

1. Disconnect the terminal of negative jumper cable (**N**) from the upper frame of the machine (ground).
2. Disconnect the other terminal of the negative jumper cable (**N**) from the negative (-) pole of the booster batteries.
3. Disconnect the terminal of the positive jumper cable (**P**) from the positive (+) pole of the booster batteries.
4. Disconnect the other terminal of the positive jumper cable (**P**) from the positive (+) pole of machine batteries.



SMIL15CEX5131AA 5

Fan and alternator drive belt

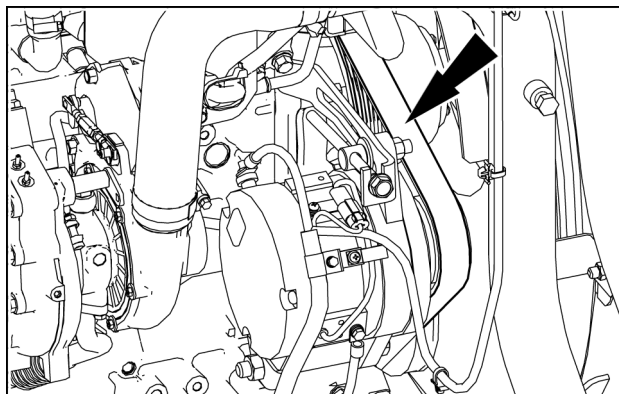
Check the belt tension every **250 h**.

NOTICE: Operating the engine with loosened belt may cause over heat of the engine or insufficient charging of the battery due to slipping belt in its housing.

Apply finger pressure of about **10 kg (22.0 lb)** center of the belt while the engine is shut down and the starter key is removed.

Loose of tension should be about **6 – 8 mm (0.236 – 0.315 in)**.

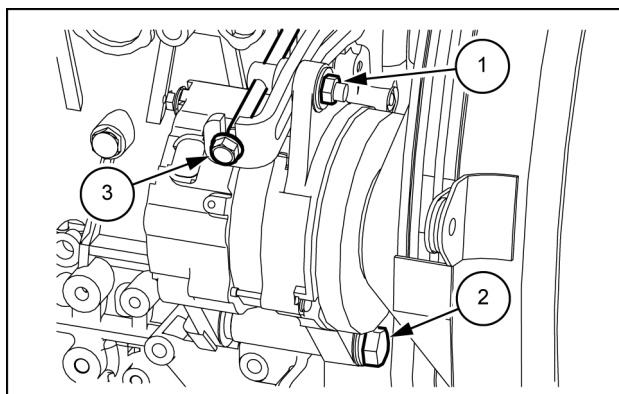
NOTE: Check any indication of damage on the pulley or belt due to wear. Check thoroughly to make sure that the belt is correctly engaged to groove of the pulley. The belt must be replaced if it is elongated, it has cracks or it is worn out.



SMIL20CEX0659AA 1

Adjustment of tension

1. Slightly loosen the lock nut **(1)** and the bolt **(2)** of the generator.
2. Turn the adjust bolt **(3)** of the generator so that the belt tension is within the specified range.
3. Tighten the lock nut **(1)** and the bolt **(2)** to the specified torque.
 Lock nut **(1)** tightening torque: **69 – 83 N·m (51 – 61 lb ft)**
 Bolt **(2)** tightening torque: **115 – 139 N·m (85 – 103 lb ft)**

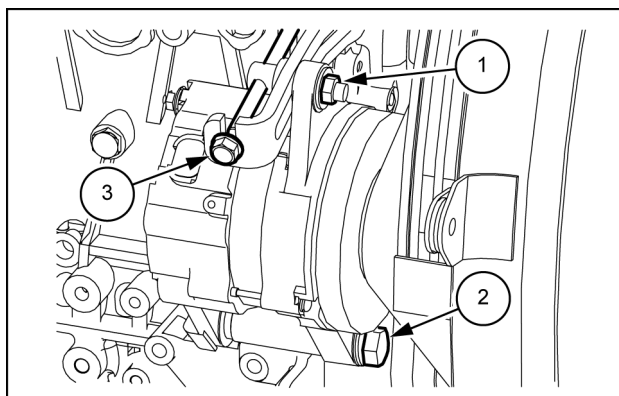


SMIL14CEX2790AB 2

Replacement of belt

NOTICE: If the belt breaks, the message **ALTERNATOR** is displayed. Stop the engine, remove the starter key, and then replace the belt.

1. Loosen the lock nut **(1)** and the bolt **(2)**.
2. Remove the belt.
3. Install a new belt, and adjust the belt tension.
4. After the adjustment, run the engine at the idling speed for approximately **5 min**, and then stop the engine to recheck the belt tension.



SMIL14CEX2790AB 3

Hydraulic oil tank

⚠ WARNING

Burn hazard!

Before performing any service on the hydraulic system, you must allow it to cool. Hydraulic fluid temperature should not exceed 40 °C (104 °F).

Failure to comply could result in death or serious injury.

W0241A

Drain water and sediment from the hydraulic oil tank every **250 h**

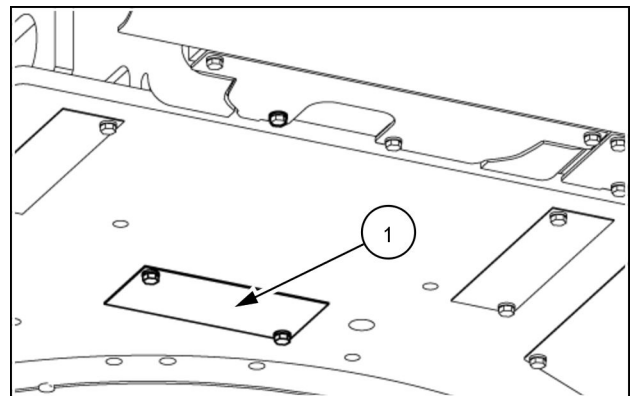
NOTICE: The hydraulic tank must be drained taking precautions so that any foreign material may get inside. Failing to comply will lead to severe damages to the hydraulic system.

To drain water and sediment from the hydraulic oil tank proceed as follows:

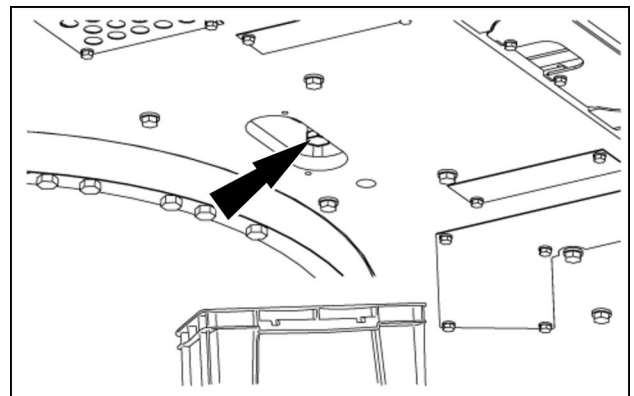
1. Park the machine on a hard and level ground. Orient the upper structure frame so that there is enough free space under the hydraulic tank to place a barrel of suitable capacity.
2. Stop the engine and remove the starter key.
3. Release all the pressure in the hydraulic tank. Refer to page 6-9.
4. Remove the lower panel (1) below the hydraulic tank to access the drain plug.
5. Place a container of a suitable capacity under the drain plug.
6. Open the plug and drain the accumulated sediment and water.

NOTICE: the drained materials shall be disposed according to the local Regulations for special wastes.

7. Close the drain plug, and install the lower panel below the hydraulic tank.
8. Check the level of the hydraulic fluid in the system, and refill if needed.



SMIL21CEX0021AA 1



SMIL21CEX0022AA 2

Tightening torques

Check the tightening torques every **250 h** (after the first **50 h** during the run-in period).

NOTICE: At the end of each working day, check all mounting nuts and screws for tightness and tighten if necessary. Make sure no hardware items are missing. Replace them, if necessary.

Component	Screw	Wrench	Torque setting
Travel reduction gears (*)	M16	24 mm	267 – 312 N·m (197 – 230 lb ft)
Drive sprocket (*)	M16	24 mm	267 – 312 N·m (197 – 230 lb ft)
Idler wheel (*)	M16	24 mm	267 – 312 N·m (197 – 230 lb ft)
Upper roller (*)	M20	30 mm	521 – 608 N·m (384 – 448 lb ft)
Lower roller (*)	M18	27 mm	371 – 432 N·m (274 – 319 lb ft)
Chain guide (*)	M18	27 mm	400 – 462 N·m (295 – 341 lb ft)
Counterweight	M33	50 mm	1670 – 1860 N·m (1232 – 1372 lb ft)
Turntable (lower frame)	M20	30 mm	468 – 545 N·m (345 – 402 lb ft)
Turntable (swing frame)	M20	30 mm	518 – 590 N·m (382 – 435 lb ft)
Swing reduction gear (*)	M20	30 mm	540 – 630 N·m (398 – 465 lb ft)
Front engine mount (*)	M16	24 mm	265 – 314 N·m (195 – 232 lb ft)
Rear engine mount (*)	M16	24 mm	265 – 314 N·m (195 – 232 lb ft)
Engine front bracket (*)	M10	17 mm	63 – 73 N·m (46 – 54 lb ft)
Engine rear bracket (*)	M16	24 mm	205 – 247 N·m (151 – 182 lb ft)
Radiator	M16	24 mm	147 – 176 N·m (108 – 130 lb ft)
Hydraulic pump flange (*)	M10	17 mm	63 – 72 N·m (46 – 53 lb ft)
Hydraulic pump (*)	M20	Hexagon wrench	367 – 496 N·m (271 – 366 lb ft)
Hydraulic tank (*)	M16	24 mm	232 – 276 N·m (171 – 204 lb ft)
Fuel tank (*)	M16	24 mm	232 – 276 N·m (171 – 204 lb ft)
Center joint (*) (lower frame)	M12	19 mm	109 – 127 N·m (80 – 94 lb ft)
Center joint (*) (swing frame)	M12	19 mm	88 – 107 N·m (65 – 79 lb ft)
Control valve (*)	M16	24 mm	267 – 312 N·m (197 – 230 lb ft)
Cab	M16	24 mm	149 – 173 N·m (110 – 128 lb ft)
Battery	M10	17 mm	19 – 29 N·m (14 – 21 lb ft)

NOTE: On the screws with mark (*), use **LOCTITE® 262™** or its equivalent.

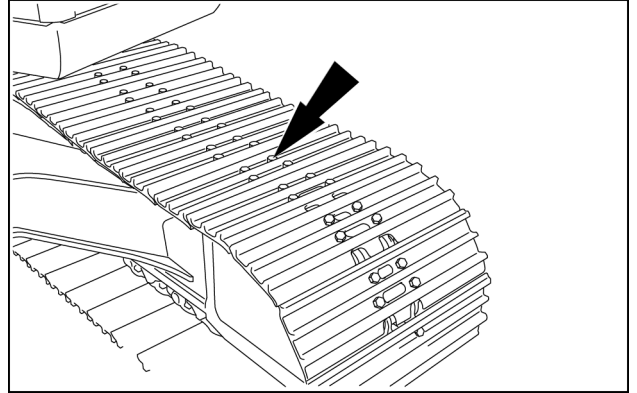
Track shoe bolt torque

Check the torque of the track shoe every **250 h** (after the first **50 h** during the run-in period)

NOTE: If the tracks are too tight, they wear quickly. If tracks are not tight enough, they wear quickly and the links can catch on the sprocket wheel or slide off the idler wheel or the sprocket wheel. Clean the tracks after work.

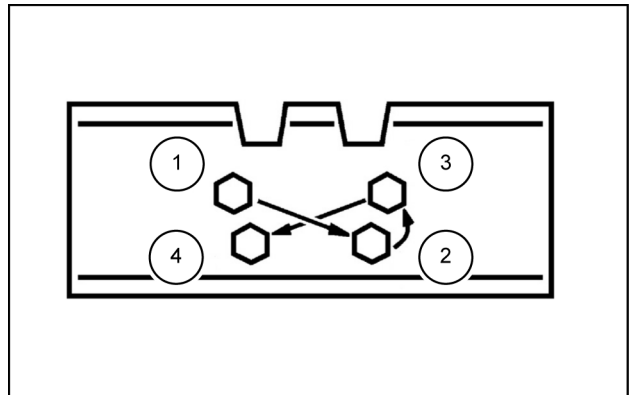
NOTE: Check the screws for tightness periodically. Do not use the machine with track pad screws loose. Otherwise, the screws may come out to cause damage to tracks.

The screws tightening torque must be **250 – 350 N·m**
(**184 – 258 lb ft**) + **120.0° (133.3 Grade)**.



SMIL17CEX3811AA 1

NOTE: Follow the specified order when tightening the screws.

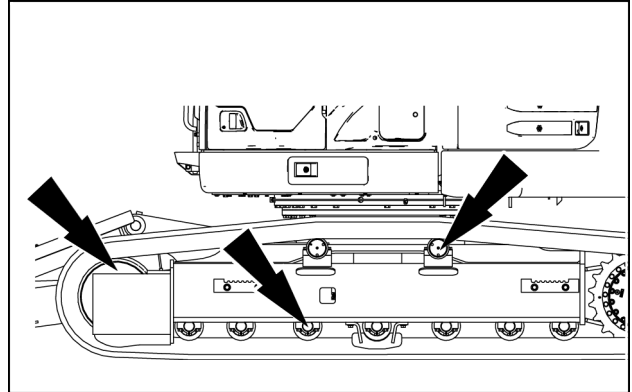


SMIL14CEX2859AA 2

Track rollers and idler wheels

Visually check the track rollers and the idler wheels every **250 h**

Floating seals are used on the upper/lower roller and the idler wheel. Although they endure enough until the average overhaul timing, visually check for oil leaks before work. If there is any oil leak, the components need to be replaced. Consult the CASE CONSTRUCTION dealer.



SMIL17CEX0131AA 1

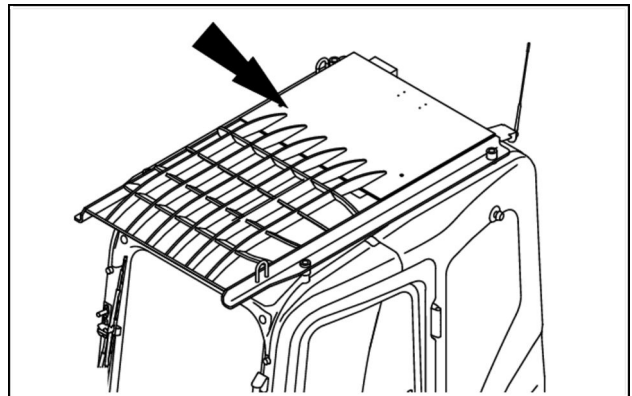
Cab protection (ROPS and FOPS)

Check the cab protection every **250 h** (after the first **50 h** during the run-in period)

Check the retaining hardware, if necessary retighten the screws.

Check the absence of cracks, rust or holes in the protective structure and the components that constitute it. Ageing, bad weather and accidents can cause damage. If you have even the slightest doubt regarding the condition of the structure, consult your CASE CONSTRUCTION Dealer.

If the protective structure has suffered any accident, it is necessary to replace the damaged components of the structure in order to restore the initial protection, consult your CASE CONSTRUCTION Dealer.



SMIL13CEX2661AB 1

Every 500 hours

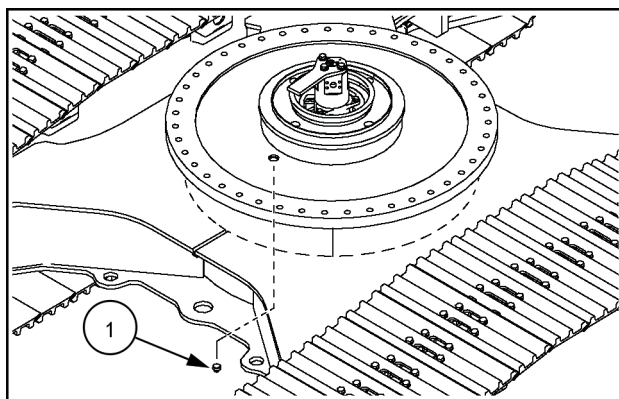
Turntable bearing

Check the greasing of the swing gears, and grease the turntable bearing every **500 h**.

Lubricant: **MULTI-PURPOSE GREASE EP / AW / NLGI 2**

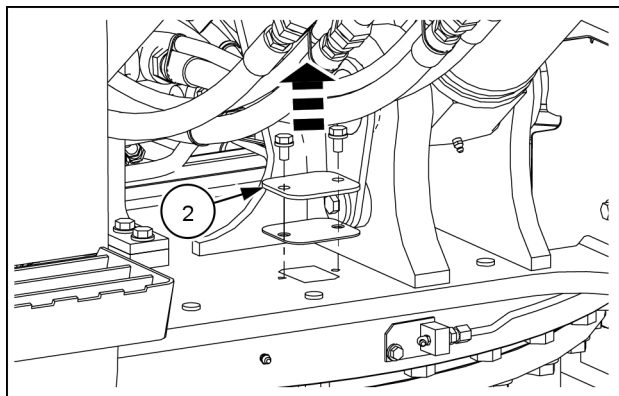
Prepare a can of loose and clean grease for checking the greasing of the swing gears. Prepare a gun and cartridges of clean grease for greasing the turntable bearing.

1. Park the machine on a hard and level ground. Orient the upper structure frame parallel to the undercarriage.
2. Operate the boom, arm, and attachment controls so that the arm stands vertical and the attachment rests on the ground.
3. Set the gate lock lever to lock position, stop the engine, and remove the starter key.
4. Remove the cover in the bottom of the lower frame. Remove the plug (1) so to drain water, and greasy mud. Snug tighten the plug (1).



SMIL14CEX4312AB 1

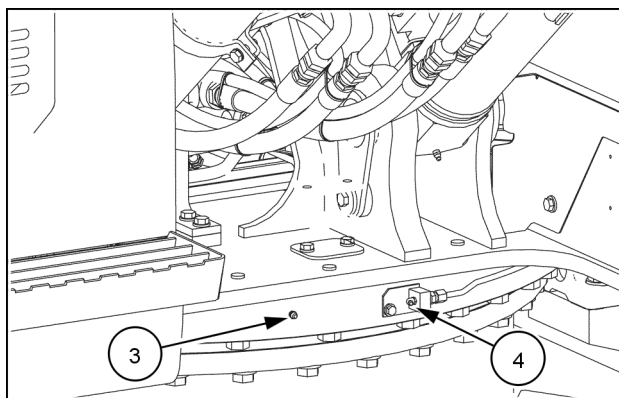
5. Check the greasing of the swing gears. Remove the inspection cover (2) on the front of the upper frame.
6. Remove all dirty grease.
7. Check the surfaces of the swing gears for excessive wearing or damages. If any excessive wearing or damage is found, immediately call the CASE CONSTRUCTION Dealer for inspection and repair.
8. Taking clean grease from the can, restore proper greasing of the surface of the teeth of the swing ring.



SMIL17CEX0134AA 2

NOTICE: do not grease the teeth at full height in order not to have too much grease spread beyond the swing ring.

9. Grease the turntable bearing. Remove the protective caps from the fittings (3) and (4) on the bearing.
10. Using the grease gun, inject clean grease into the fitting (3) so to push the old grease out from the lower sealing lip of the turntable bearing. Stop injecting as clean grease comes out from the lip.
11. Clean up the grease that exceeded the sealing lip, and reset the lip to its seating position.

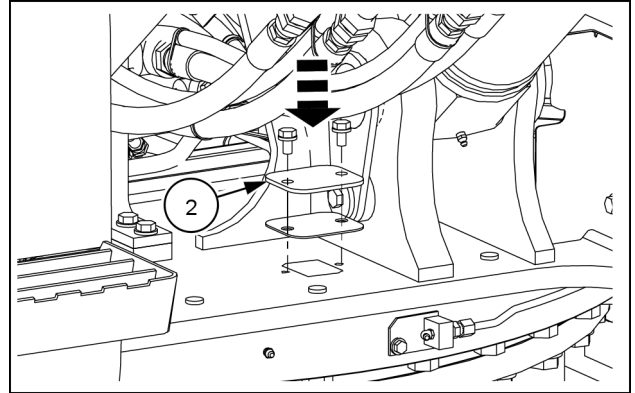


SMIL17CEX0137AA 3

NOTICE: Always check the sealing lip for excessive wearing or damages. If any excessive wearing or damage is found, immediately call the CASE CONSTRUCTION Dealer for inspection and repair.

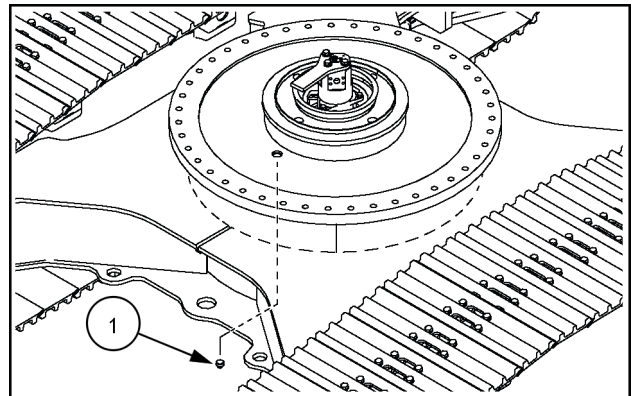
12. Inject the same amount of grease into the fitting (4). Reach the opposite side of the turntable bearing, clean up the grease that exceeded the sealing lip, and reset the lip to its seating position.
13. Get onto the cab, start the engine, and set the gate lock lever to unlock position.

14. Turn the upper frame **45°** clockwise. Set the gate lock lever to lock position, stop the engine, and remove the starter key.
15. Repeat the procedure described in the steps from 6 to 14 for three more times.
16. Complete the check of the greasing on the other half of the swing ring. Make sure to check the greasing every **45°**.
17. Install the inspection cover **(2)** on the front of the upper frame.



SMIL17CEX0134AA 4

18. Get onto the cab, start the engine, and set the gate lock lever to unlock position. Slowly turn the upper structure frame counterclockwise, and complete three **360°** rotations.
19. Stop the rotation. Slowly turn the upper structure frame clockwise and complete two **360°** rotations.
20. Stop the rotation. Set the gate lock lever to lock position, stop the engine, and remove the starter key.
21. Clean up any more grease that has come out from the sealing lip of the turntable bearing. Make sure that the sealing lip is reset to its seating position.
22. Clean the grease fittings on the turntable bearing, and install the protective caps.
23. Remove the plug **(1)** so to drain any more water and greasy mud. Tighten the plug **(1)**. Install the cover in the bottom of the lower frame.



SMIL14CEX4312AB 5

Engine oil and filter

Replace the engine oil every **500 h**

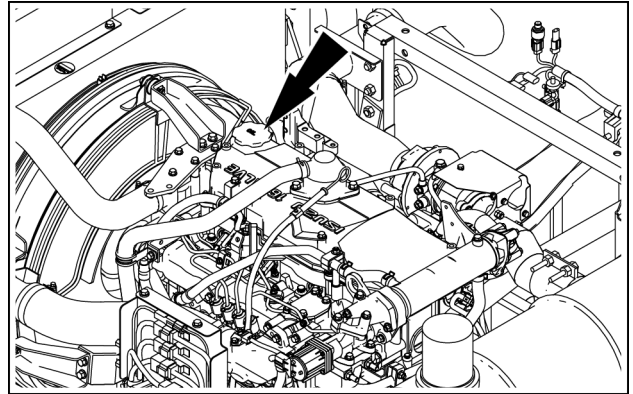
Replace the engine oil filter every **500 h**

Lubricant: **No.1 ENGINE OIL™ SUPER SAE 15W-40**

Quantity: **23.1 L (6.1 US gal)**

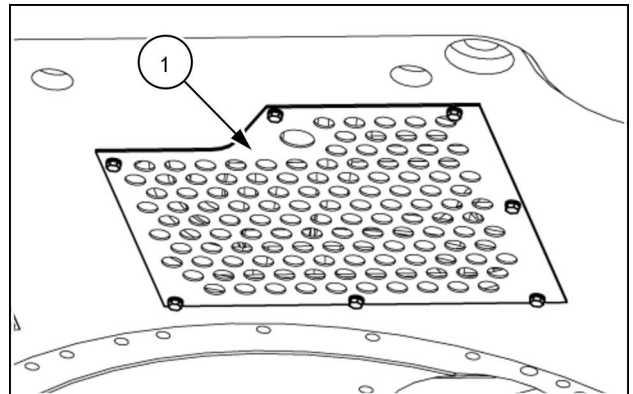
NOTE: Replace the oil while the engine is warm. Doing so helps the oil in flowing.

1. Park the machine on a flat and level place. Stop the engine and remove the starter key.
2. Reach the service platform in the center of the machine. Refer to page **6-4**.
3. Raise and lock the engine hood, and remove the filling plug.



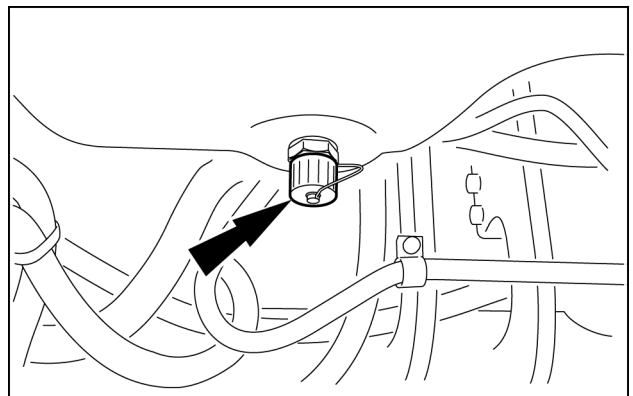
SMIL17CEX4707AA 1

4. Remove the lower panel (1) under the engine oil pan.



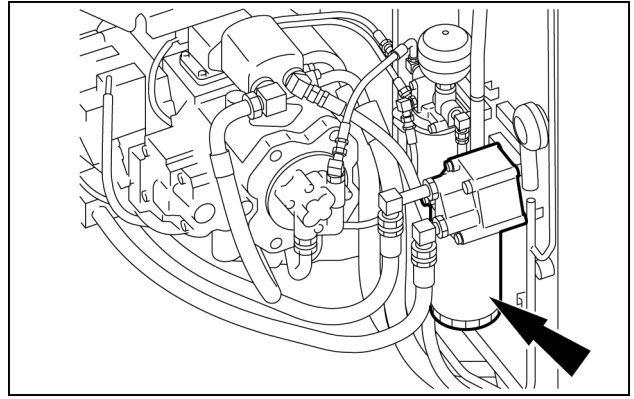
SMIL21CEX0023AA 2

5. Remove the protection cap from the drain valve on the engine oil pan.
6. Take out the extension drain hose provided with the machine from the left front storage compartment. Screw one end of the extension drain hose onto the drain valve on the engine, and put the other end into a container with an appropriate capacity to drain the oil.
7. Remove the extension drain hose, and attach the protection cap to the drain valve on the engine housing. Install the lower panel (1). Stow the extension drain hose in the left front storage compartment.



SMIL21CEX0045AA 3

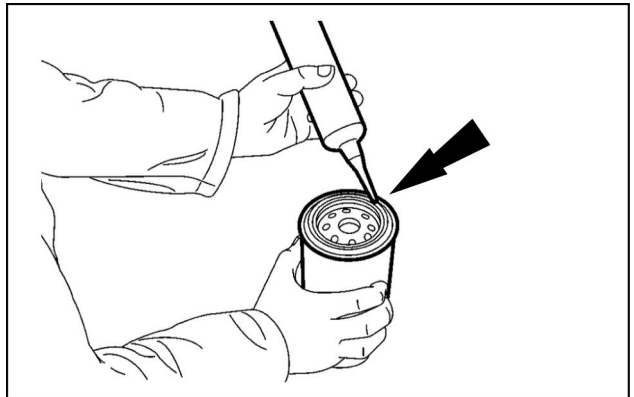
8. Open the rear right-hand door. Clean the area around the engine oil filter and remove it with the specific tool provided with the machine.



SMIL20CEX2485AA 4

9. Apply an oil film finely to the seal of a new filter.
10. Attach a new filter. Turn the filter until the seal touches the filter head, and then tighten it further a half turn by hand.

NOTE: Do not use a filter wrench for tightening the filter. Overtightening can damage the filter and its seal.

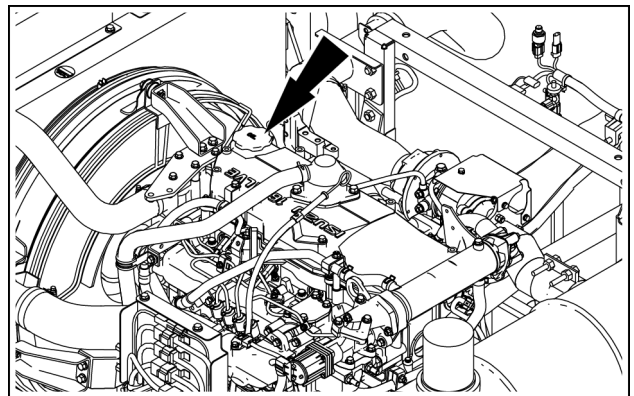


SMIL14CEX2751AA 5

11. Add new engine oil to the engine. Attach the filling plug.
12. Run the engine for several minutes to check that there is no leak.

Recheck the level, and add oil if necessary.

NOTE: always wait **15 min** to allow the oil to return to the sump before checking the oil level.



SMIL17CEX4707AA 6

Fuel pre-filter

⚠ WARNING

Fire hazard!

When handling diesel fuel, observe the following precautions:

1. **Do not smoke.**
 2. **Never fill the tank when the engine is running.**
 3. **Wipe up spilled fuel immediately.**
- Failure to comply could result in death or serious injury.**

W0099A

Replace the fuel pre-filter element every **500 h**

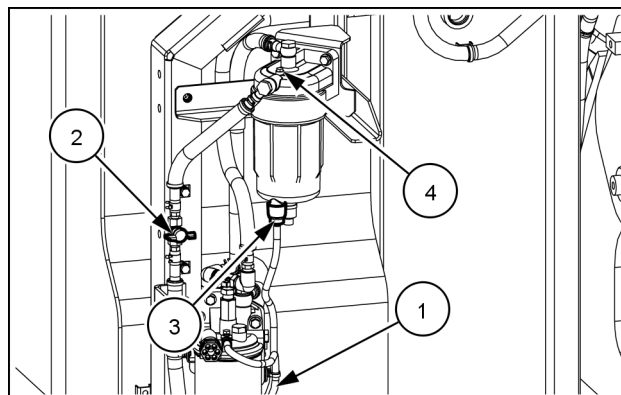
The filter element may get clogged earlier than **500 h** depending upon the quality of fuel, the integrity of filter, the functionality of the supply system, or other not regular conditions. In these cases, the message **FUEL FILTER** appears on the top of the display. Immediately stop machine operation, and replace the filter element in order to avoid severe damages to the fuel system.

NOTICE: The filter must be replaced taking precautions so that any foreign material may get into the filter body or the filter element. Failing to comply will lead to severe damages to the fuel supply system and to the fuel injection system.

NOTICE: Never reuse fuel that rests into the filter body. To clean the filter body, use clean diesel fuel only.

NOTICE: Use of fuel filters other than CASE CONSTRUCTION genuine components, is prohibited.

1. Place a container with an appropriate capacity below the end of the drain hose (1).
2. Close the fuel cut valve (2).
3. Loosen the drain plug (3) and the air bleed plug (4), and drain water from the pre-filter body.
4. Clean the area around the pre-filter body, and then remove it with the specific wrench supplied with the machine.
5. Install a new filter element. Replace the seal on the pre-filter body, and then install the body on the pre-filter head by turning it manually.



SMIL20CEX2479AA 1

NOTICE: never fill the pre-filter body with fuel before the installation.

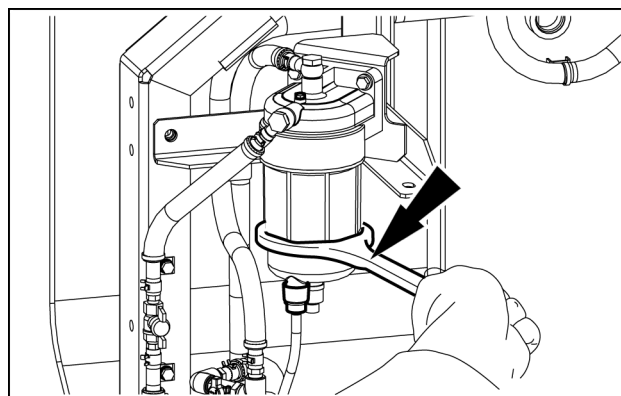
6. Tighten the body with the specific wrench. The tightening torque must be **28 – 32 N·m (20.65 – 23.60 lb ft)**
7. Replace the seal of the drain plug (3), and attach the drain plug (3). The tightening torque must be **2 – 3 N·m (1.48 – 2.21 lb ft)**.

NOTE: Never reuse the seal of the filter body and the seal of the drain plug (3). They shall always be replaced with new seals.

8. Tighten the air bleed plug (4). The tightening torque must be **8 – 12 N·m (5.9 – 8.9 lb ft)**.

NOTICE: Overtightening can damage the seals.

9. Bleed the fuel system. Refer to page **6-10**.



SMIL20CEX2486AA 2

Fuel filter

⚠ WARNING

Fire hazard!

When handling diesel fuel, observe the following precautions:

1. Do not smoke.
2. Never fill the tank when the engine is running.
3. Wipe up spilled fuel immediately.

Failure to comply could result in death or serious injury.

W0099A

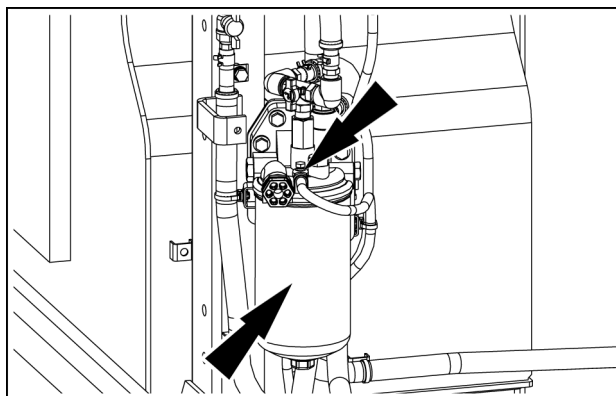
Replace the fuel filter element every **500 h**

NOTICE: Do not work in any environment in which anything other than fuel will get into fuel lines. (Sites with strong wind, blowing dust, etc.). Wash hands before operations. Do not use gloves. Do not open the packaging for the filter kit until you start the installation work. Do not reuse any fuel remaining within the cover. For persistent dirt within the cover, wipe it off with a clean rag, then clean with clean diesel fuel. Do not use parts cleaner because it could affect the case cover. Do not touch the inside of the element. Completely wipe off any spilled fuel after changing the filter element.

NOTE: If using a fuel filter other than the CASE CONSTRUCTION genuine filter, you will no longer be guaranteed against the trouble caused by use of the wrong filter.

Take the same procedure as that for the pre-filter.

NOTICE: The tightening torque of the filter cartridge must be **23 – 27 N·m (17.0 – 19.9 lb ft)**



SMIL20CEX2480AA 1

Bleed the fuel system. Refer to page **6-10**.

Radiator and coolers

⚠ WARNING

Flying debris!

Compressed air can propel dirt, rust, etc. into the air. Wear eye and face protection when using compressed air.

Failure to comply could result in death or serious injury.

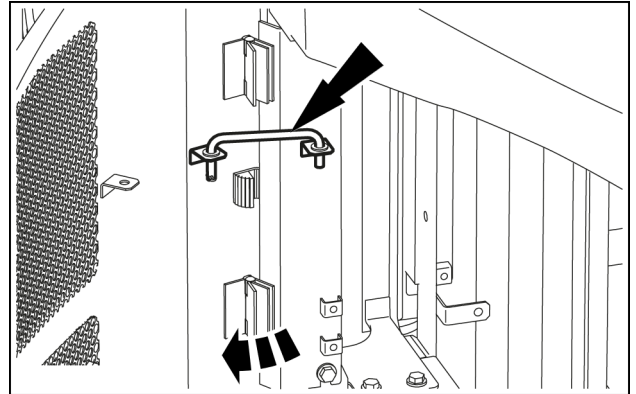
W0307A

Clean the radiator every **500 h**

NOTICE: *overheat may occur if the protection net, the radiator fin, or the oil cooler fin is clogged.*

1. Stop the engine, and remove the starter key.
2. Fully open the rear left-hand door and block it with the supporting strut, then open the engine hood.

NOTICE: *always check that the door is fixed firmly.*

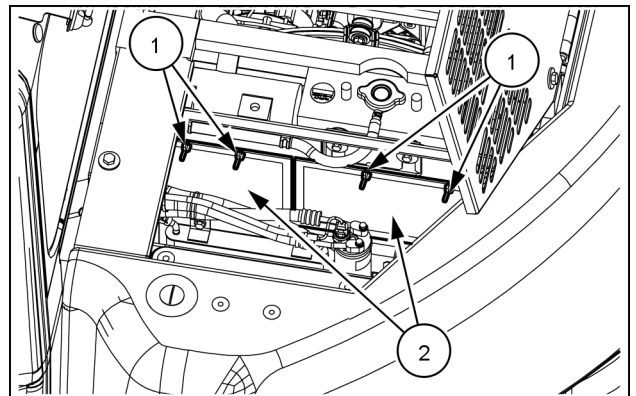


SMIL20CEX2505AA 1

3. Remove the one tach clip (1), and remove the protection grilles (2).
4. Use compressed air to blow away mud or dirt clogged in the nets and the radiator fin. Steam or compressed water may be used instead of compressed air.

NOTICE: *Apply high-pressure vehicle-wash steam from a sufficient distance away. If the steam outlet is too close, the radiator fin may deform.*

NOTICE: *In presence of greasy or oily dust, use perchlorethylene. Use of trichloroethylene is strictly forbidden.*



SMIL21CEX0010AA 2

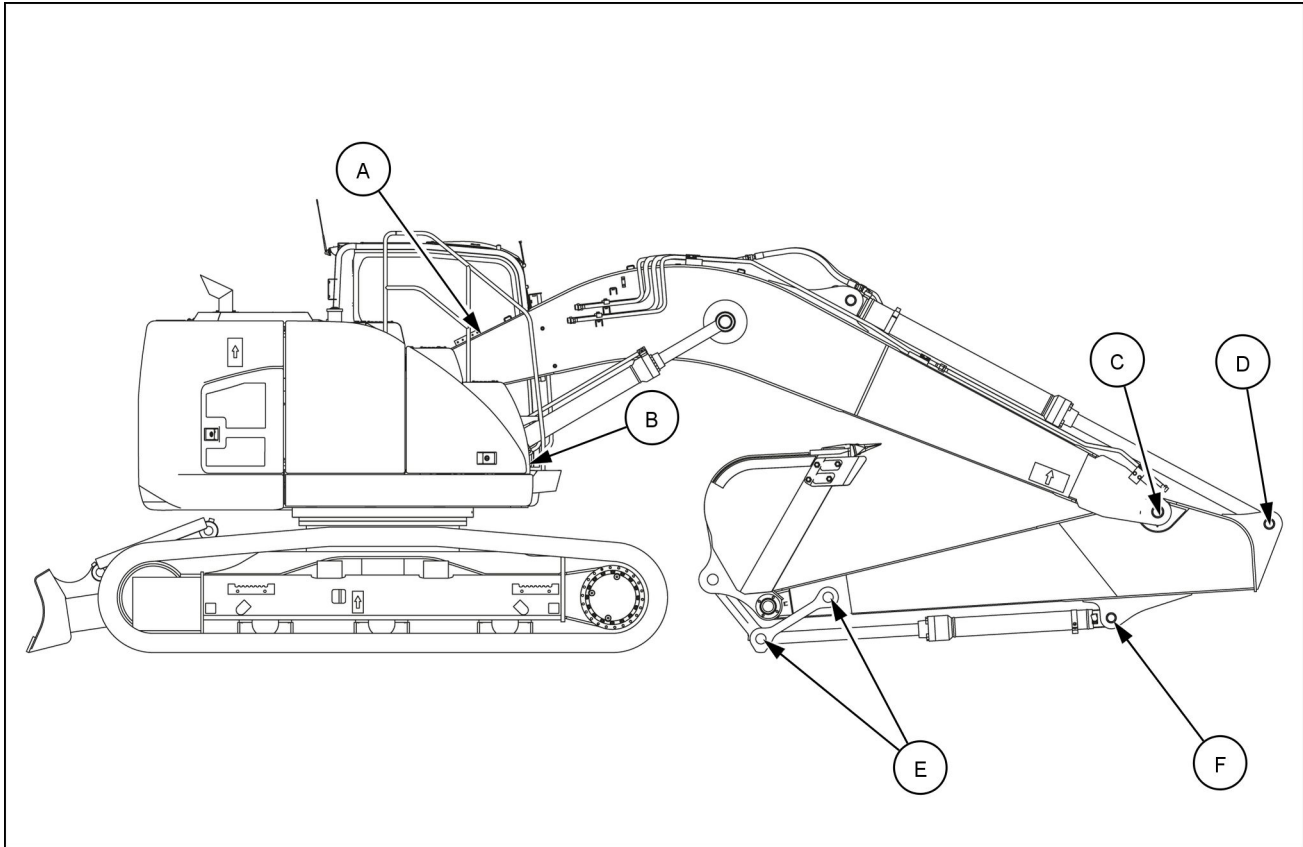
5. Install the protective grilles (2), then install the one tach clip (1).
6. Close and lock the rear left-hand door.
7. Close and lock the engine hood.

Every 1000 hours

Grease points (Boom and arm)

Grease the boom and arm every **1000 h**.

Lubricant: **MULTI-PURPOSE GREASE EP / AW / NLGI 2**



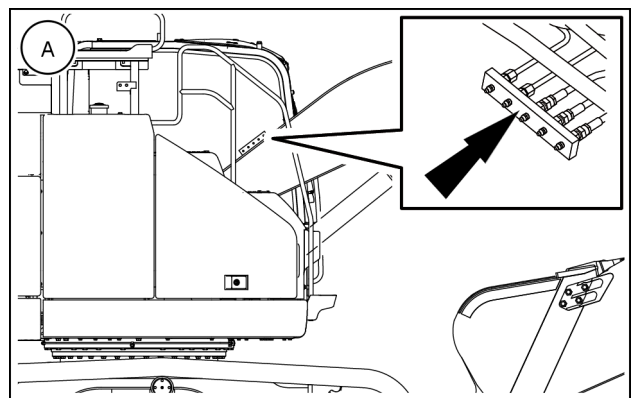
SMIL20CEX2481FA 1

NOTE: the boom and the arm shall be lubricated every **50 h** if non-genuine grease is used.

Boom bottom pin: two grease fittings.

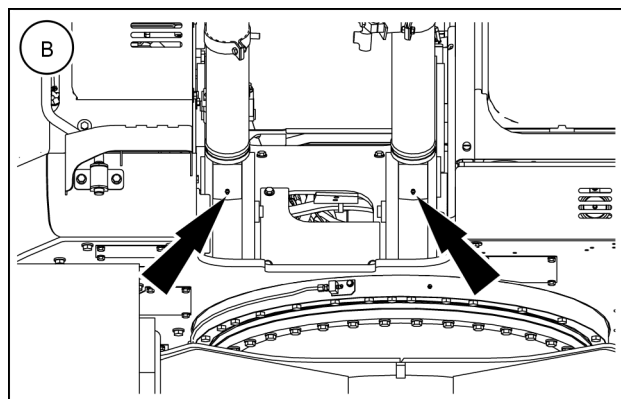
Boom cylinder top pin: two grease fittings.

Arm cylinder bottom pin: one grease fitting.



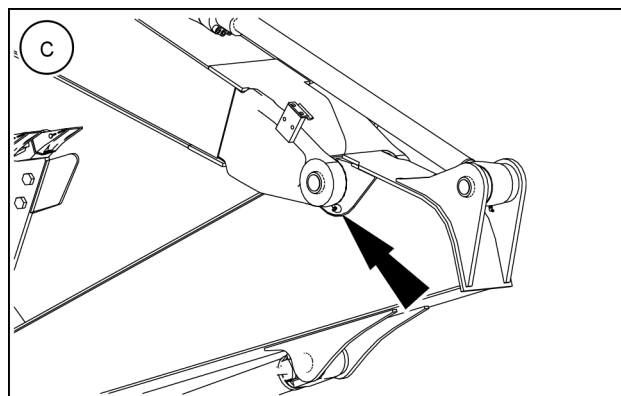
SMIL17CEX3572AA 2

Boom cylinder bottom pin: two grease fittings.



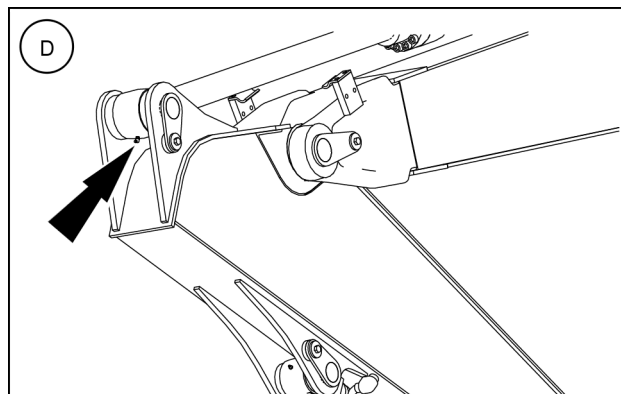
SMIL17CEX3573AA 3

Boom/arm linkage: one grease fitting.



SMIL17CEX3569AA 4

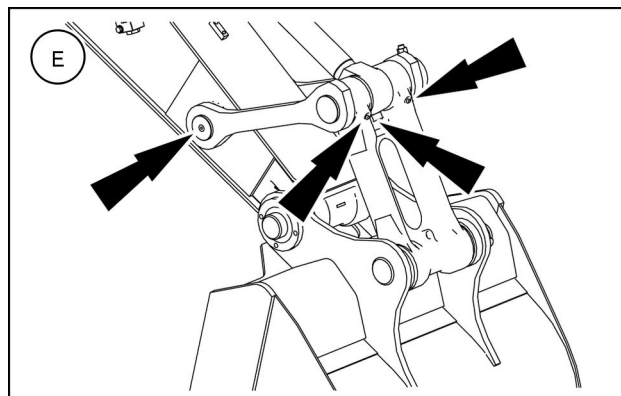
Arm cylinder top pin: one grease fitting.



SMIL17CEX3570AA 5

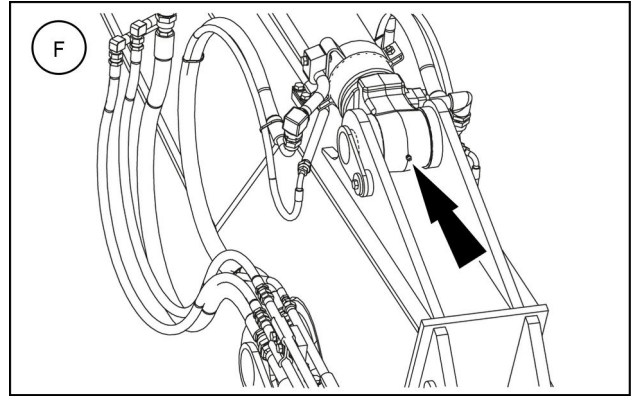
Arm link / Connecting rod: four grease fittings.

NOTICE: the arm link and the connecting rod shall be lubricated every **10 h** if any attachment other than a bucket is used.



SMIL14CEX2732AA 6

Bucket cylinder bottom pin: one grease fitting.

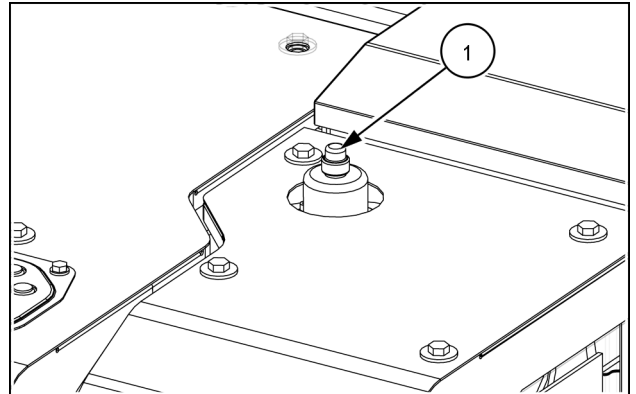


SMIL14CEX2733AA 7

Hydraulic tank breather

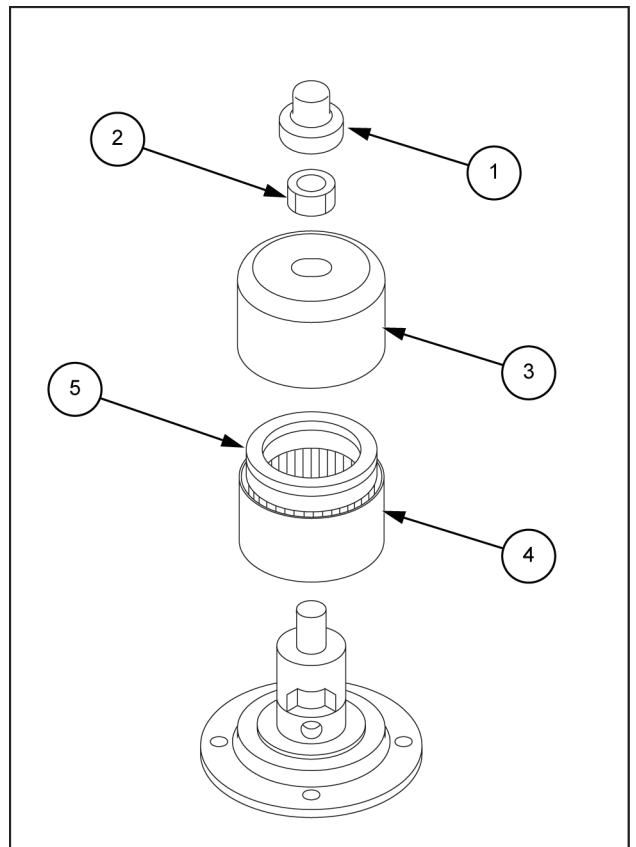
Replace the hydraulic tank breather every **1000 h**

1. Reach the service platform in the center of the machine. Refer to page **6-4**.
2. Keep pressed the button **(1)** on the top of the breather to release all the pressure in the hydraulic tank.
3. Remove the panel over the hydraulic tank. Clean the top surface of the hydraulic tank.



SMIL21CEX0007AA 1

4. Remove the button **(1)** from the breather.
5. Remove the nut **(2)** and the cover **(3)**.
6. Remove and discard the used filter element **(4)**.
7. Attach a new element **(4)** with the seal **(5)** facing up.
8. Attach the cover **(3)** together with the nut **(2)**.
9. Attach the button **(1)**.
10. Install the panel over the hydraulic tank.



SMIL14CEX2782BB 2

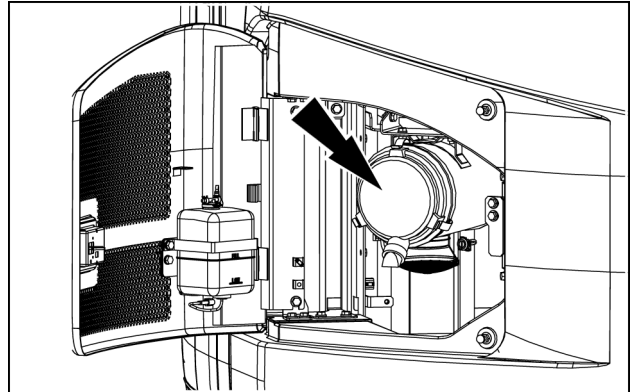
Engine air filters

Change the primary element: every **1000 h** or after cleaning 6 times

Change the secondary element every **1000 h**

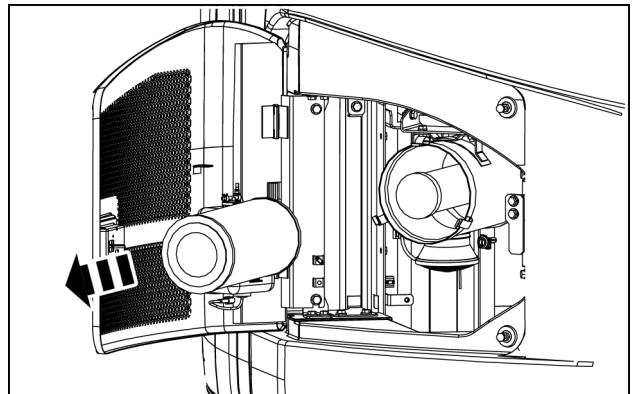
NOTICE: Be sure to carry out regular checks on the air filter, intake manifold, seals and hoses. At the same time, check the intake manifold screws and hose clamps for tightness. The hoses should be changed before they are worn.

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key.
2. Open the rear left-hand door.
3. Release the fasteners, and remove the cover.



SMIL20CEX2484AB 1

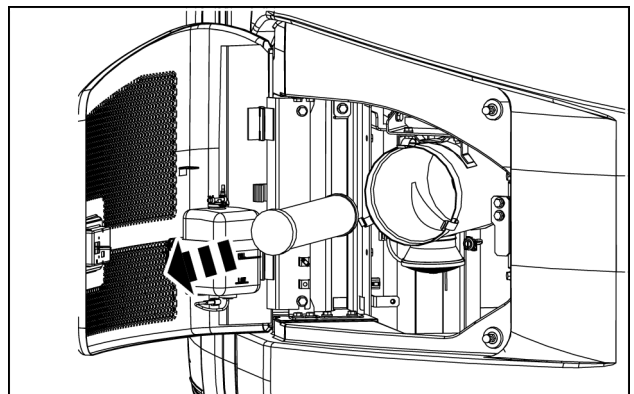
4. Remove the primary element.



SMIL20CEX2483AB 2

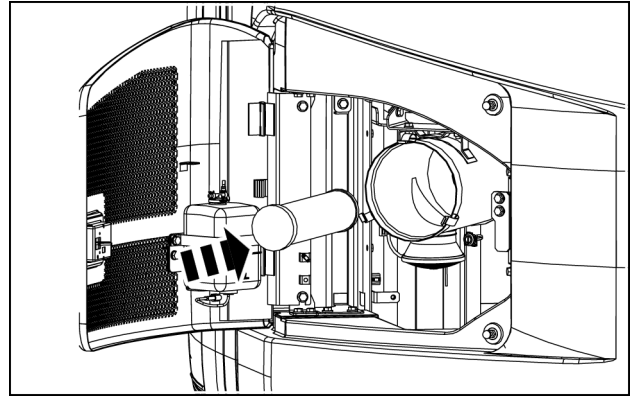
5. Remove the secondary element.

NOTICE: Make sure that the secondary element is replaced. Do not clean it.



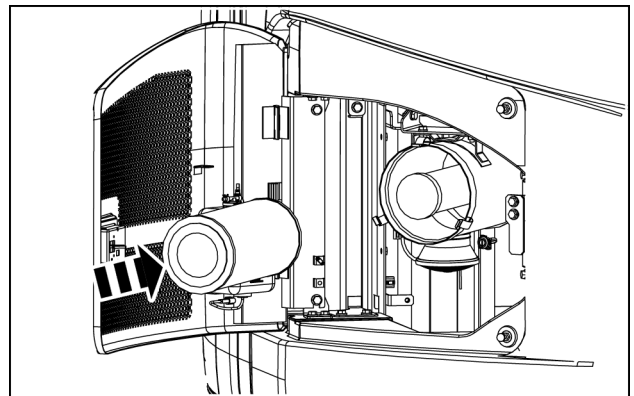
SMIL20CEX2492AA 3

6. Clean the inside of the air cleaner case, and attach the new secondary element.



SMIL20CEX2492AA 4

7. Attach the new primary element.



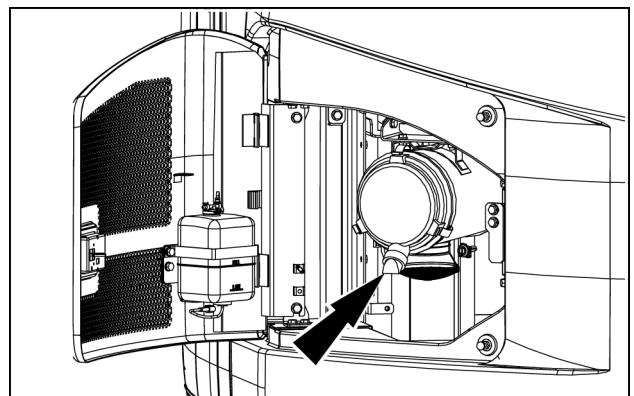
SMIL20CEX2483AB 5

8. Attach the cover (with the "TOP" display facing up), and lock the fasteners.

NOTICE: The mass air flow (MAF) sensor is mounted on the inlet duct of the air cleaner. Output of the engine may be restricted if any dust is attached to the MAF sensor or failure of sensing part of the MAF sensor due to usage of retailed cleaning fluid.

Pay attention not to allow dust to invade the inlet duct when replacing the air cleaner element. Also, pay attention not to spray retailed cleaning fluids to the MAF sensor when using them.

9. Check that the dust ejector under the filter is operating correctly.



SMIL20CEX2484AB 6

Hydraulic fluid analysis

Check the hydraulic oil condition every **1000 h**

NOTICE: *If any attachment other than a bucket is used, reduce the interval of the hydraulic oil analysis. Refer to Chapter 9.*

Ask your CASE CONSTRUCTION Dealer to analyze the hydraulic oil condition.

Engine valve rocker clearance adjustment

Check the clearance of the engine valve rocker every **1000 h**

Ask your CASE CONSTRUCTION Dealer to check the engine valve rocker clearance.

Swing reduction unit oil

⚠ WARNING

Hot surface possible!
Wait for all components to cool before performing any operation.
Failure to comply could result in death or serious injury.

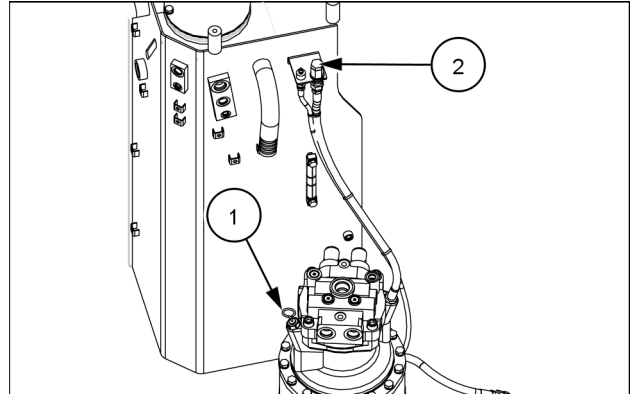
W0251A

Replace the swing reduction unit oil every **1000 h** (After **250 h** of operation in run-in period).

Lubricant: **HYPOID GEAR OIL EP SAE 80W-90.**

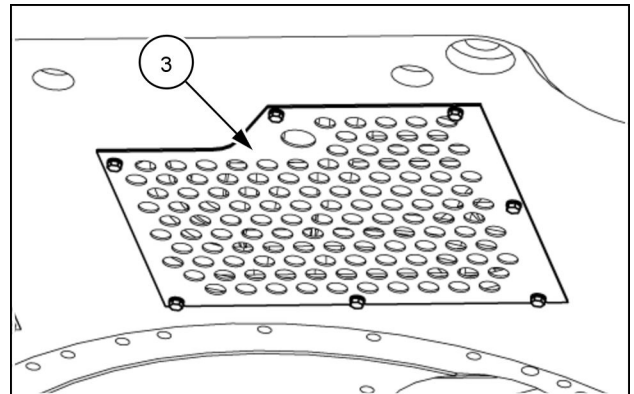
Quantity: **5 L (1.3 US gal).**

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key.
2. Reach the service platform in the center of the machine. Refer to page **6-4**.
3. Remove the oil gauge **(1)**. Clean the oil gauge with a neat cloth.
4. Remove the fill plug **(2)**.



SMIL20CEX2482AA 1

5. Remove the lower panel **(3)**.



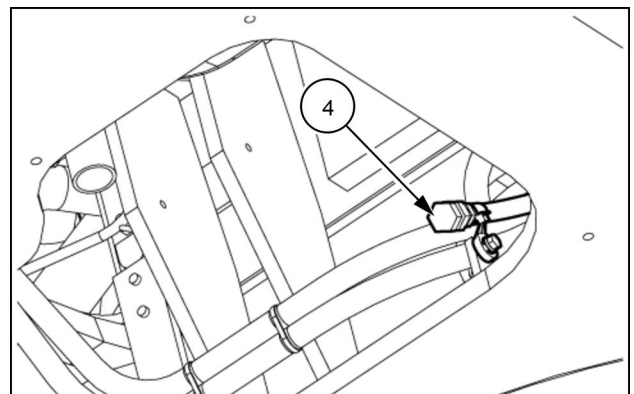
SMIL21CEX0023AA 2

6. Place a container with an appropriate capacity under the upper structure frame. Remove the oil drain plug **(4)** to drain oil.

NOTE: Draining oil requires a comparatively long time.

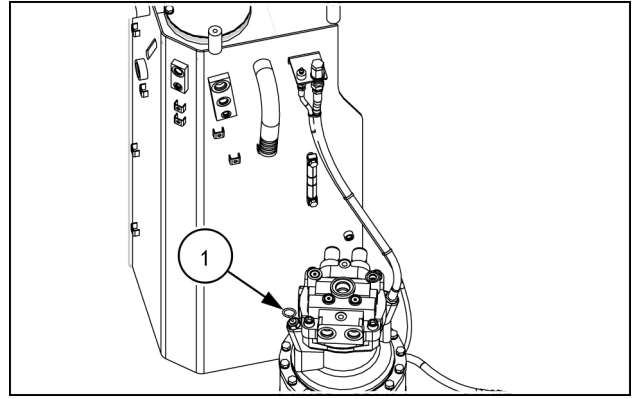
NOTE: Check the condition of the drained oil. If foreign objects, such as metal scrapings, are included, consult the CASE CONSTRUCTION dealer.

7. Attach the drain plug **(4)**, and install the lower panel **(3)**.



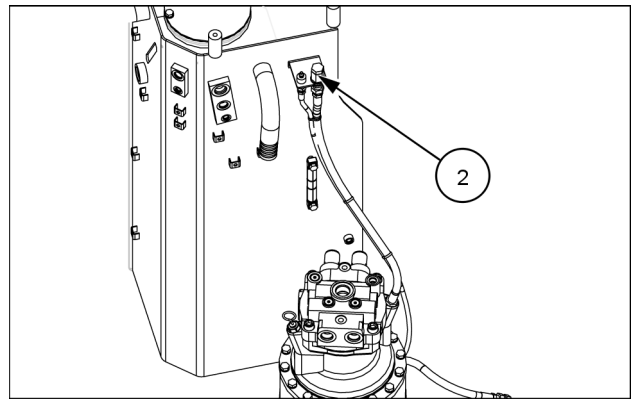
SMIL21CEX0024AA 3

8. Supply oil via the fill port **(2)**.
9. Attach the oil gauge **(1)** and check that the oil level is in the hatched area.



SMIL20CEX2482AA 4

10. Wait for **10 min** and check the oil level again. If necessary, supply additional oil via the fill port **(2)**.
Attach the fill plug **(2)**.



SMIL20CEX2482AA 5

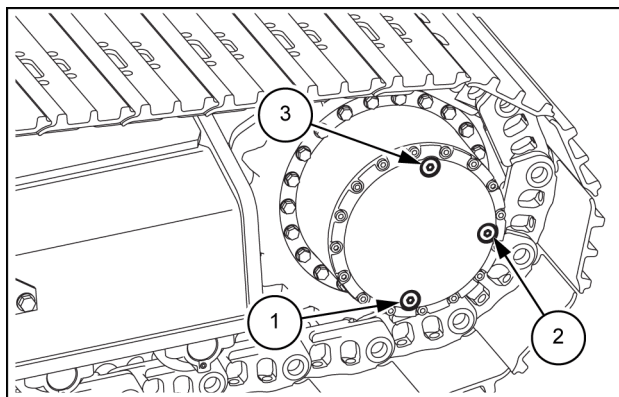
Travel reduction units oil

Replace the travel reduction units oil every **1000 h** (After **250 h** of operation in run-in period)

Lubricant: **HYPOID GEAR OIL EP SAE 80W-90**.

Quantity: **5 L (1.3 US gal)** (per travel reduction gear)

1. Park the machine on flat, horizontal ground.
2. Move the machine so that the drain plug **(1)** comes down to the lowest position.
3. Stop the engine, and remove the starter key.
4. Slowly loosen the air bleed plug **(3)** to release the internal pressure of the case.
5. Place a container with an appropriate capacity under the travel reduction gear.
6. Remove the level plug **(2)**.
7. Remove the drain plug **(1)**.



SMIL14CEX2850AB 1

NOTE: Check the condition of the drained oil. If there are pieces of metal or foreign objects in the oil, consult the **CASE CONSTRUCTION** dealer.

8. Replace the O-ring seal of the drain plug **(1)**. Insert the drain plug **(1)** with seal tape wrapped around it. Add oil through port **(3)** until the oil comes up to the bottom edge of the port **(2)**.
9. Replace the O-ring seal of the level plug **(2)**. Insert the level plug **(2)** with seal tape wrapped around it.
10. Replace the O-ring seal of the air bleed plug **(3)**. Insert the air bleed plug **(3)** with seal tape wrapped around it.
11. Repeat steps **2** to **10** for the other travel reduction gear.
12. Run the machine slowly to check that there are no leaks.

Alternator

Check the alternator every **1000 h**

⚠ WARNING

Improper operation or service of this machine can result in an accident.

Welding sparks can cause battery gases to explode. When welding on the machine, always disconnect the B+ and D+ wires from the alternator. Check the wire markings before reconnecting to ensure a correct connection.

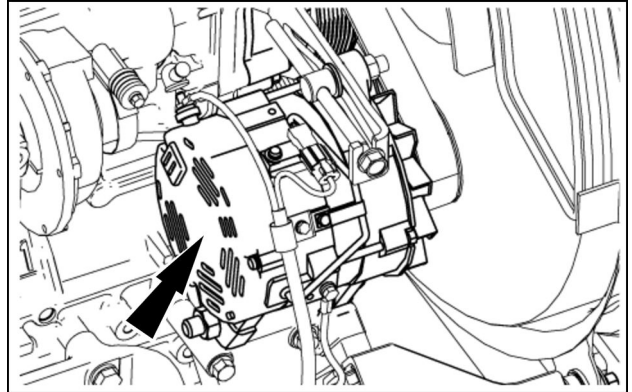
Failure to comply could result in death or serious injury.

W0253A

Ask your CASE CONSTRUCTION Dealer to check the alternator.

NOTICE: check that the terminal protectors are correctly installed.

NOTICE: do not use a steam cleaning machine or solvent to clean the alternator.



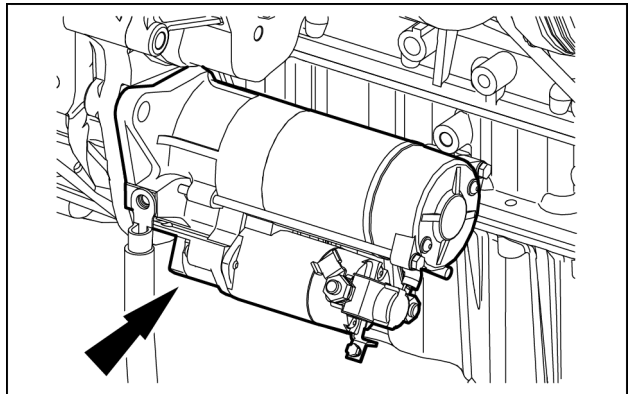
SMIL21CEX0018AA 1

Starter motor

Check the starter motor every **1000 h**

Ask your CASE CONSTRUCTION Dealer to check the starter motor.

NOTICE: check that the terminal protectors are correctly installed.



MCHP8N-012 1

Every 2000 hours

Hydraulic oil suction filter

⚠ WARNING

Burn hazard!

Before performing any service on the hydraulic system, you must allow it to cool. Hydraulic fluid temperature should not exceed 40 °C (104 °F).

Failure to comply could result in death or serious injury.

W0241A

⚠ WARNING

Pressurized system!

Never attempt to drain fluids or remove filters when the engine is running. Turn off the engine and relieve all pressure from pressurized systems before servicing the machine.

Failure to comply could result in death or serious injury.

W0905A

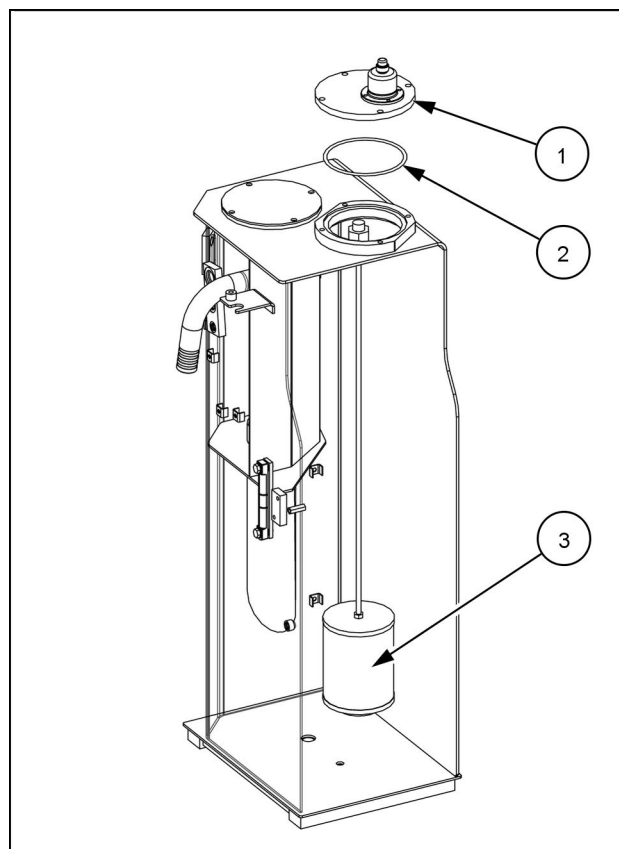
Clean the hydraulic oil suction filter every **2000 h**

NOTICE: If any attachment other than a bucket is used, reduce the interval of the hydraulic oil suction filter cleaning. Refer to Chapter 9.

NOTICE: If you find any metal particles on the old filters, consult the CASE CONSTRUCTION dealer.

NOTICE: Replace the hydraulic oil suction filter every **5000 h** of operation or when hydraulic fluid is replaced.

1. Reach the service platform in the center of the machine. Refer to page **6-4**
2. Release all the pressure in the hydraulic tank. Refer to page **6-9**.
3. Remove the panel over the hydraulic tank. Clean the top surface of the hydraulic tank, and clean the cover of the suction filter.
4. Remove the cover **(1)**, the O-ring **(2)**.
5. Remove the oil suction filter **(3)**, and clean it with a solvent.
Let it dry completely, and check for damage. If any damage is found on its surface, replace it with a new component.
6. Attach the suction filter **(3)** and the rod assembly.
7. Replace the O-ring **(2)**.
8. Attach the cover **(1)**.
9. Check the hydraulic fluid level, and supply it if necessary.
10. Install the panel over the hydraulic tank.



SMIL21CEX0011BA 1

Hydraulic oil return filter

⚠ WARNING

Burn hazard!

Before performing any service on the hydraulic system, you must allow it to cool. Hydraulic fluid temperature should not exceed 40 °C (104 °F).

Failure to comply could result in death or serious injury.

W0241A

⚠ WARNING

Pressurized system!

Never attempt to drain fluids or remove filters when the engine is running. Turn off the engine and relieve all pressure from pressurized systems before servicing the machine.

Failure to comply could result in death or serious injury.

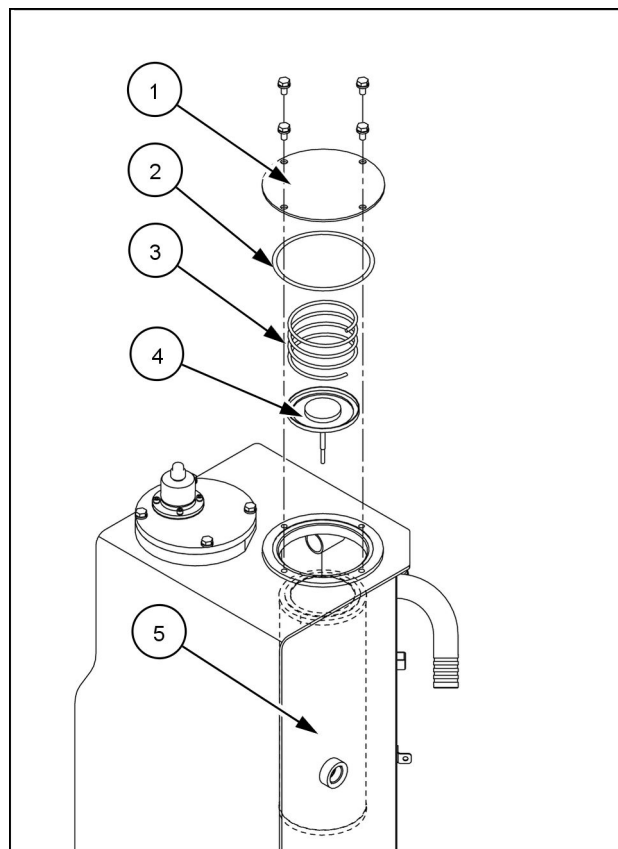
W0905A

Replace the hydraulic oil return filter every **2000 h** (After **250 h** of operation in run-in period).

NOTICE: When the machine is a new vehicle, or when the main components of the hydraulic system are already overhauled or replaced, replace the oil return filter after **250 h** of operation. After that, replace the filter at specified intervals.

NOTICE: If any attachment other than a bucket is used, reduce the interval of the hydraulic oil return filter replacement. Refer to Chapter 9.

1. Reach the service platform in the center of the machine.
Refer to page **6-4**
2. Release all the pressure in the hydraulic tank. Refer to page **6-9**.
3. Remove the panel over the hydraulic tank. Clean the top surface of the hydraulic tank, and clean the cover of the return filter.
4. Remove the cover **(1)** and the O-ring **(2)**.
5. Take out the spring **(3)**, the valve **(4)**, and the filter **(5)**.
6. Attach a new filter **(5)**.
Clean and attach the spring **(3)** and the valve **(4)**.
7. Replace the O-ring **(2)**.
8. Attach the cover **(1)**.
9. Check the hydraulic fluid level, and supply it if necessary.
10. Install the panel over the hydraulic tank.



SMIL21CEX0012BA 1

Pilot line filter

⚠ WARNING

Burn hazard!

Before performing any service on the hydraulic system, you must allow it to cool. Hydraulic fluid temperature should not exceed 40 °C (104 °F).

Failure to comply could result in death or serious injury.

W0241A

⚠ WARNING

Pressurized system!

Never attempt to drain fluids or remove filters when the engine is running. Turn off the engine and relieve all pressure from pressurized systems before servicing the machine.

Failure to comply could result in death or serious injury.

W0905A

Replace the pilot line filter every **2000 h** (After **250 h** of operation in run-in period).

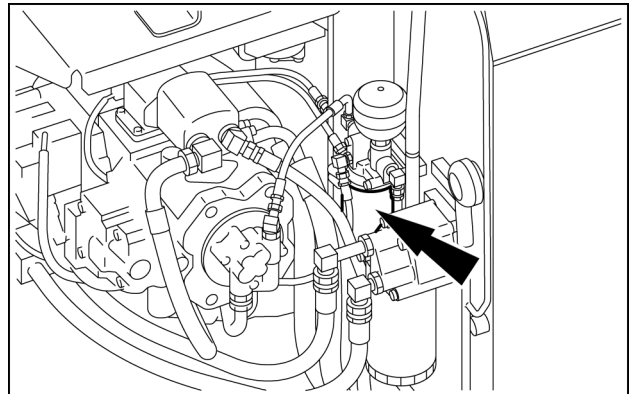
NOTICE: The accumulator of the pilot circuit contains high pressure gas. Do not perform welding and avoid any operation generating sparks and high temperature close to the accumulator.

NOTICE: When the machine is a new vehicle, or when the main components of the hydraulic system are already overhauled or replaced, replace the pilot filter after **250 h** of operation. After that, replace the filter at specified intervals.

NOTICE: If any attachment other than a bucket is used, reduce the interval of the pilot line filter replacement. Refer to Chapter 9.

1. Release all the pressure in the hydraulic tank. Refer to page **6-9**.
2. Open the rear right-hand door.
3. Unscrew and remove the filter using a wrench.
4. Coat the seal of the new filter with a fine film of clean oil.
5. Install the new filter.

Turn the filter until the seal comes into contact with the filter head then tighten by an extra third of a turn by hand.



SMIL21CEX0013AA 1

Air conditioner filters

Replace the air conditioning filters every **2000 h**

The air conditioning system has to be inspected by a specialist every 6 months.

To replace the air conditioning filters, proceed as follows:

1. Remove the air conditioning filters. Refer to page **6-22**.
2. Place the new filters in the housings according to the installation procedure.

Swing reduction gear

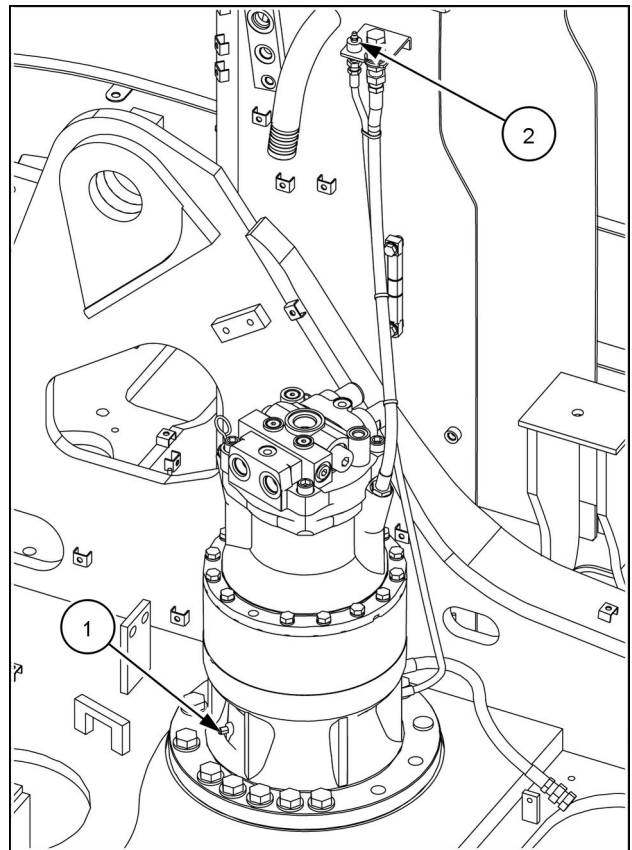
Grease the swing reduction gear every **2000 h**

Lubricant: **MULTI-PURPOSE GREASE EP / AW / NLGI 2**

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key.
2. Remove the air bleed plug (1).
3. Reach the service platform in the center of the machine. Refer to page **6-4**.
4. Supply grease from the greasing point (2).
5. Grease until a certain amount of grease overflows from the air bleed plug (1).

NOTICE: Greasing with the air bleed plug (1) unremoved will damage the inner seal.

6. Clean the air bleed port and apply the air bleed plug (1).



SMIL21CEX0014BA 1

Every 4000 hours

Engine coolant

⚠ WARNING

Hazardous chemicals!

Coolant can be toxic. Avoid contact with skin, eyes, and clothing. Antidotes:

EXTERNAL - Rinse thoroughly with water. Remove soiled clothing.

INTERNAL - Rinse the mouth with water. **DO NOT** induce vomiting. Seek immediate medical attention.

EYES - Flush with water. Seek immediate medical attention.

Failure to comply could result in death or serious injury.

W0282A

⚠ WARNING

Burn hazard!

Hot coolant can spray and scald if you remove the radiator or deaeration tank cap while the system is hot. To remove the cap: allow the system to cool, turn the cap to the first notch, and wait for all pressure to release. Remove the cap only after all pressure has released.

Failure to comply could result in death or serious injury.

W0367A

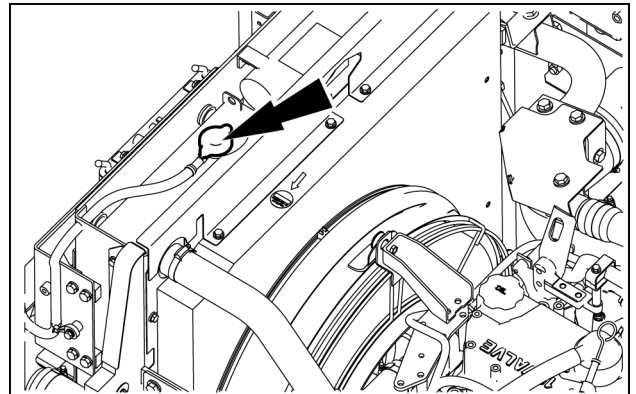
Replace the engine coolant every **4000 h** or every 2 years

Fluid: **EXTENDED LIFE OAT COOLANT/ANTIFREEZE**

Quantity (50/50 antifreeze/deionized water mixture): **31 L (8.2 US gal)**

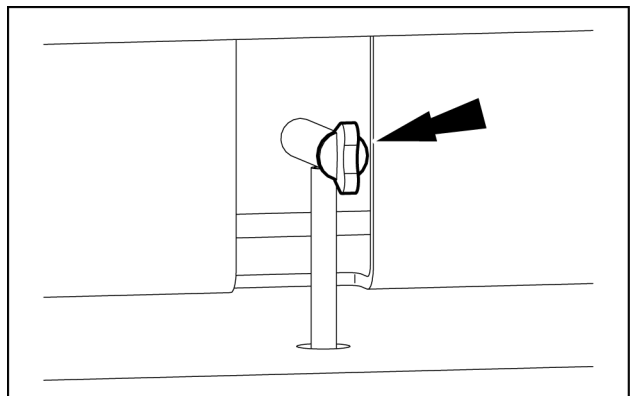
Draining the engine cooling system

1. Stop the engine and let it cool down.
2. Reach the service platform in the center of the machine. Refer to page **6-4**.
3. Disengage the latches and raise the engine hood. Fix the engine hood with the stay.
4. Remove the radiator cap.



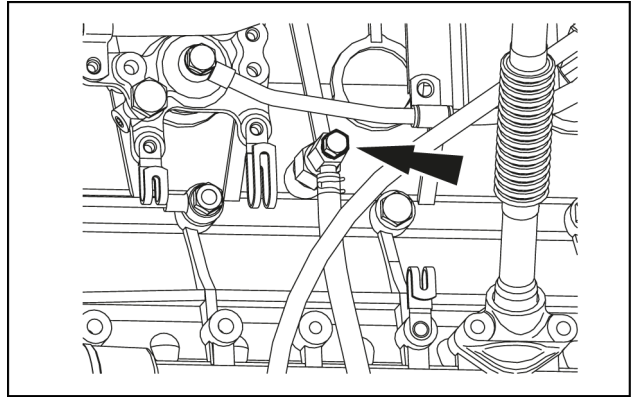
SMIL21CEX0036AA 1

5. Open the coolant drain cock of the radiator. Drain coolant from the radiator.



SMIL14CEX2754AA 2

6. Loosen the coolant drain plug on the right side of the engine block. Drain coolant inside the engine.



SMIL14CEX2755AA 3

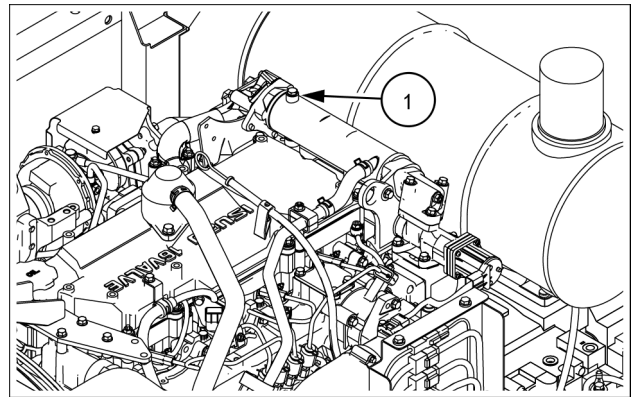
7. If engine has EGR system, loosen the air bleed plug (1) on the EGR cooler.
8. Close the coolant drain cock of the radiator.

NOTICE: The coolant drain cock of the radiator should be tightened by hand. It may be damaged if being tightened with tools such as pliers.

9. Close the coolant drain plug on the engine block.

NOTICE: the engine shall never be started with no water in the radiator. This causes the engine to seize up.

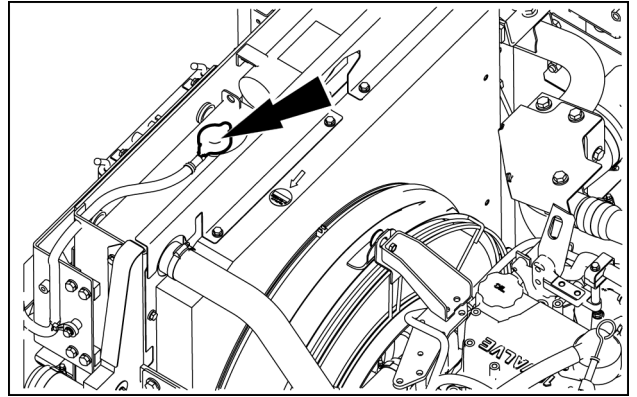
NOTICE: the drained coolant shall be disposed according to the local Regulations for coolant fluids.



SMIL17CEX4745AA 4

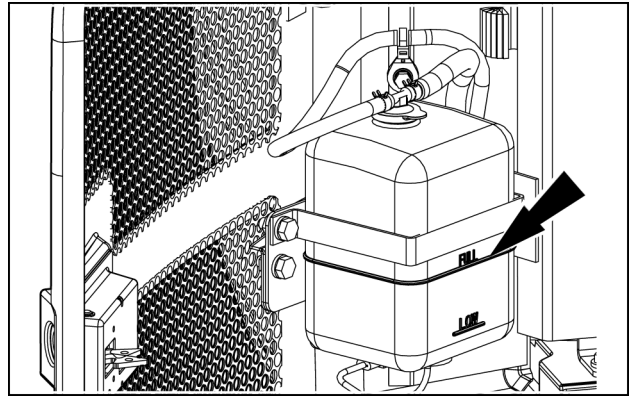
Flushing the engine cooling system

10. Inspect and clean the radiator cap. Inspect hoses and clamps of the engine cooling system. Make sure to replace any damaged parts.
11. Fill the radiator with tap water up to the edge of the coolant inlet.
12. Close the radiator cap.



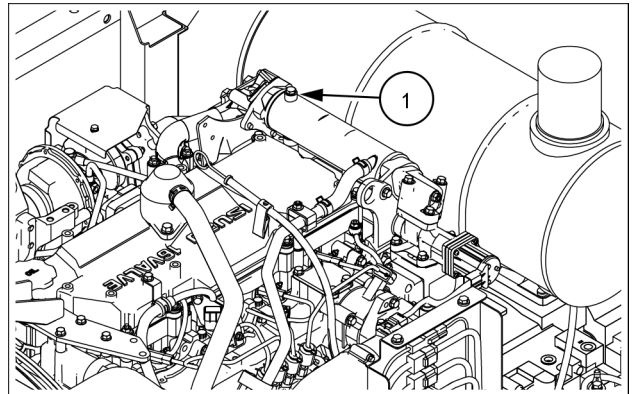
SMIL21CEX0036AA 5

13. Fill the reserve tank with tap water up to the FULL mark. Close the cap of the reserve tank.



SMIL21CEX0008AA 6

14. If engine has EGR system, snug tighten the air bleed plug (1) on the EGR cooler when tap water overflows from it.
15. Start the engine and let it run at low idle speed for **20 min**. Turn on the cab heating system, and set the temperature and the fan speed to intermediate level.
16. Stop the engine. Wait until the engine has cooled down. Check for leakages from the hoses of the engine cooling system.
17. Drain water completely from the engine cooling system. Repeat the flushing procedure (steps from 11 to 16) for 2 more times. If drained water is still not clean, further repeat the flushing procedure until clean water is drained from the engine.



SMIL17CEX4745AA 7

Filling the engine cooling system

18. Close the coolant drain cock of the radiator and close the coolant drain plug on the engine block.
19. If engine has EGR system, loosen the air bleed plug (1) on the EGR cooler.
20. Slowly supply coolant through the radiator coolant inlet. Add coolant up to the edge of the coolant inlet.

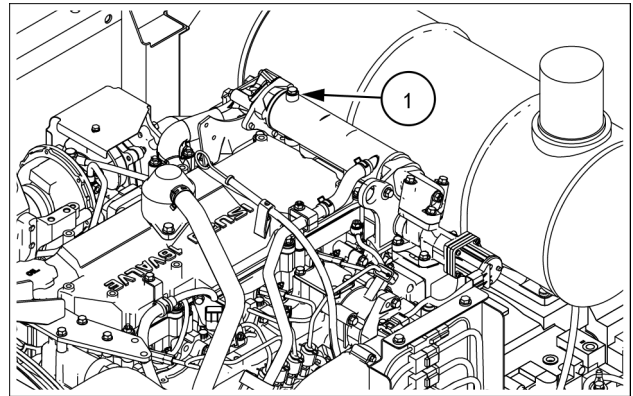
NOTICE: the coolant shall be added slowly in order to prevent the entry of air into the engine cooling system.

NOTE: push and release the radiator hoses while supplying coolant into the radiator to ease the flowing of the engine coolant into the cooling system.

21. If engine has EGR system, tighten the air bleed plug on the EGR cooler when coolant overflows from it.

Tightening torque: **24.5 – 30.5 N·m (18.07 – 22.50 lb ft)**

22. Close the radiator cap.
23. Fill the reserve tank with coolant up to the FULL mark. Close the cap of the reserve tank.
24. Start the engine and let it run at low idle speed for **3 – 5 min**, and then stop the engine.
25. Wait until the engine has cooled down. Slowly open the radiator cap and check for coolant level. If needed, add coolant up to the edge of the coolant inlet of the radiator.
26. Close the radiator cap.



SMIL17CEX4745AA 8

27. Start the engine and let it run at low idle speed for **3 min**. Turn on the cab heating system, and set the temperature and the fan speed to the maximum level.
28. Gradually increase the engine speed to H position. Let the engine run until the coolant temperature reaches **90 °C**. Make sure that coolant temperature stays at **90 °C** for some minutes.

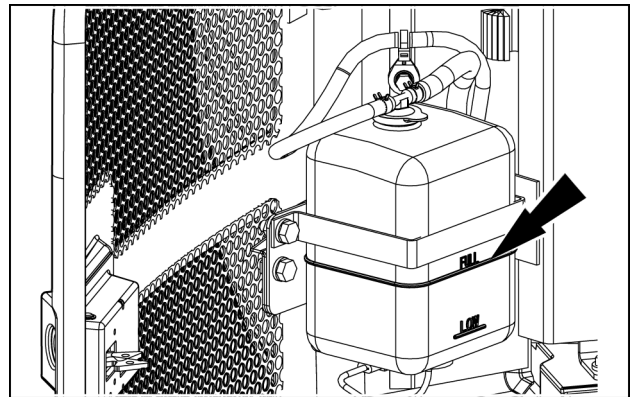
NOTICE: if coolant temperature gets quickly over **90 °C**, lower the engine speed to low idle. Stop the engine and check for leakages from the hoses of the cooling system.

29. Gradually decrease the engine speed to low idle and let it run for **3 min**. Stop the engine.
30. Wait until the engine has cooled down. Slowly open the radiator cap and check for coolant level. Add some coolant up to the edge of the coolant inlet of the radiator.

NOTICE: if too much coolant has to be added at this stage, carefully check for leakages into the engine cooling system.

31. Close the radiator cap.
32. Carry out final filling of the coolant reserve tank up to the FULL mark. Close the cap of the reserve tank.

NOTICE: the coolant level in the reserve tank shall be always double checked the morning after. The cooling circuit may take some more time to get stabilized. If needed, fill the reserve tank with coolant up to the FULL mark. Close the cap of the reserve tank.



SMIL21CEX0008AA 9

Pump outlet hoses

Check the outlet hose of main pump: Every 2 years or every **4000 h** (whichever comes first)

Checking the hydraulic system piping

Make sure there are no leaks from the hydraulic system hoses, pipes, plugs, connections and fittings and check that all nuts and screws are correctly tightened. In the event of problems, repair, change or tighten the component (s) concerned.

Hydraulic hoses

Check the boom, arm, and bucket cylinder hose: Every 2 years or every **4000 h** (whichever comes first)

Checking the hydraulic system piping

Make sure there are no leaks from the hydraulic system hoses, pipes, plugs, connections and fittings and check that all nuts and screws are correctly tightened. In the event of problems, repair, change or tighten the component (s) concerned.

Every 5000 hours

Hydraulic oil and filters

⚠ WARNING

Burn hazard!

Before performing any service on the hydraulic system, you must allow it to cool. Hydraulic fluid temperature should not exceed 40 °C (104 °F).

Failure to comply could result in death or serious injury.

W0241A

⚠ WARNING

Pressurized system!

Never attempt to drain fluids or remove filters when the engine is running. Turn off the engine and relieve all pressure from pressurized systems before servicing the machine.

Failure to comply could result in death or serious injury.

W0905A

⚠ CAUTION

Escaping fluid!

Hydraulic fluid or diesel fuel leaking under pressure can penetrate the skin and cause infection or other injury. To prevent personal injury: Relieve all pressure before disconnecting fluid lines or performing work on the hydraulic system. Before applying pressure, make sure all connections are tight and all components are in good condition. Never use your hand to check for suspected leaks under pressure. Use a piece of cardboard or wood for this purpose. If injured by leaking fluid, see your doctor immediately.

Failure to comply could result in minor or moderate injury.

C0104A

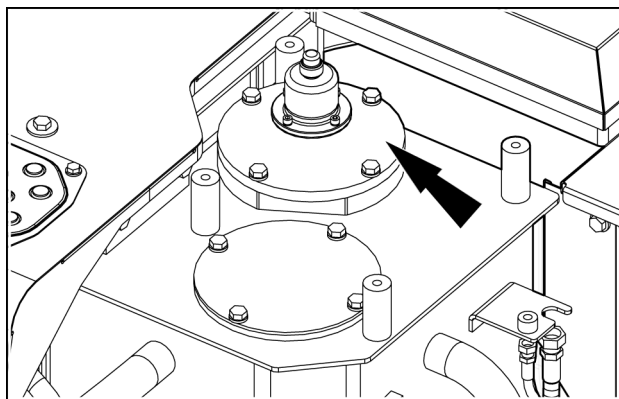
Replace the hydraulic oil and filters every **5000 h**

Fluid: **PREMIUM HYDRAULIC OIL HV46 MULTI-GRADE ANTIWEAR**

Quantity: **114 L (30.1 US gal)**

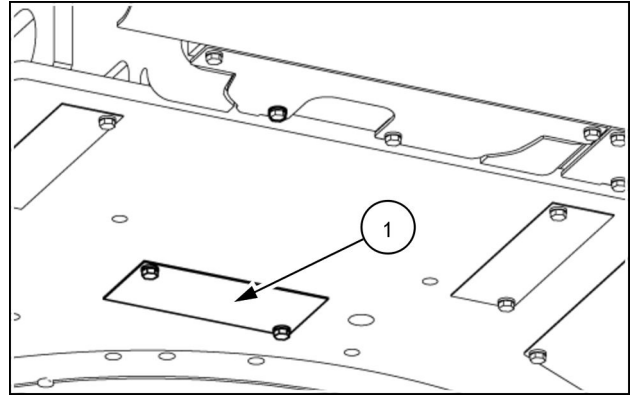
NOTICE: If any attachment other than a bucket is used, reduce the interval of the hydraulic oil and filters replacement. Refer to Chapter 9.

1. Park the machine on a hard and level ground. Orient the upper structure frame so that there is enough free space under the hydraulic tank to place a barrel of suitable capacity.
2. Stop the engine and remove the starter key.
3. Reach the service platform in the center of the machine. Refer to page 6-4 .
4. Release all the pressure in the hydraulic tank. Refer to page 6-9.
5. Remove the panel over the hydraulic tank. Clean the top surface of the hydraulic tank, and clean the cover of the suction filter.
6. Remove the cover of the hydraulic oil suction filter.
7. With a pump, remove the hydraulic oil from the hydraulic tank.

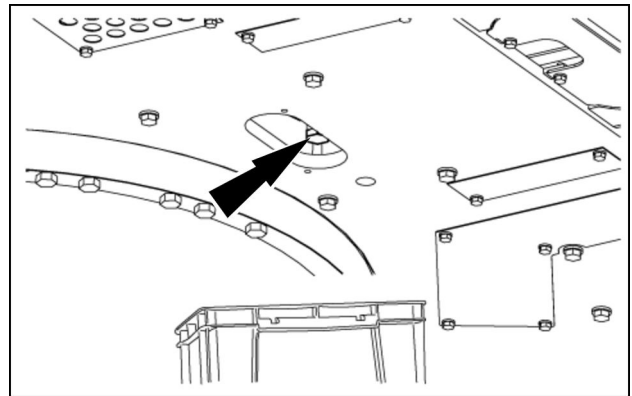


SMIL20CEX2477AA 1

8. Remove the lower panel (1) below the hydraulic tank to access the drain plug.
9. Place a container of a suitable capacity under the drain plug.
10. Open the plug to drain the remaining hydraulic fluid.
11. Replace the suction filter as described on page 6-57.
12. Replace the return filter as described on page 6-58.
13. Replace the O-ring and close the drain plug. Install the lower panel below the hydraulic tank.
14. Add new hydraulic oil to the tank.
15. Replace the O-ring, and attach the cover of the hydraulic oil suction filter.
16. Start the engine, and run it with no load for about **5 min.**
17. Move each control several times to remove all air from the system.
18. Swing the upper structure all the way from left to right equally twice or more.
19. Park the machine at the specified position, and then stop the engine.
20. Check the oil level of the hydraulic tank, refill it with oil as necessary. Check that there are no bubbles in the hydraulic tank.
21. Install the panel over the hydraulic tank.



SMIL21CEX0021AA 2



SMIL21CEX0022AA 3

Bleeding air from the hydraulic components

NOTE: After bleeding air from the components, stop the engine for five minutes and check there are no bubbles at the surface of the hydraulic fluid in the reservoir.

Hydraulic pump

Using a solvent, clean the periphery of the air bleed plug.

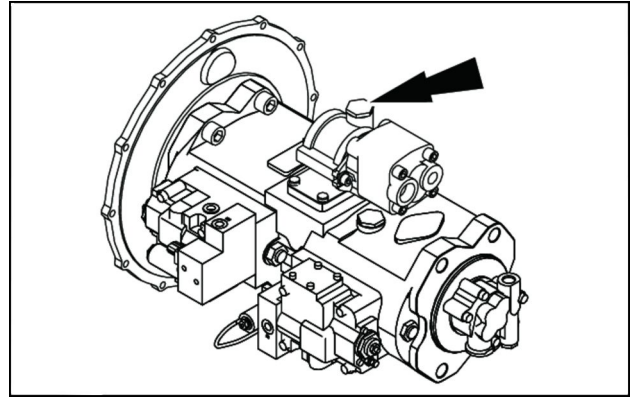
Loosen the air bleed plug, remove the plug if the fluid does not flow.

Fill the pump with new clean hydraulic fluid. Install and tighten the air bleed plug.

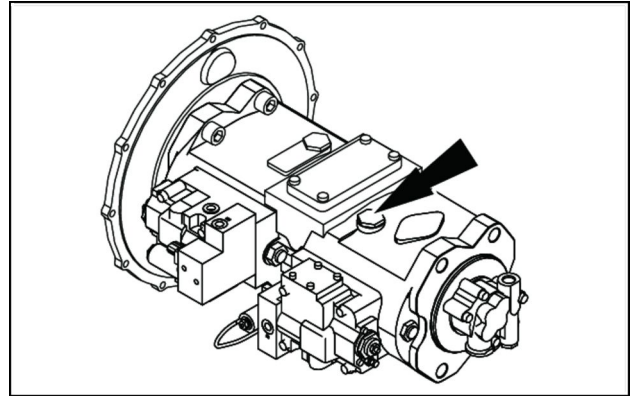
Start the engine and run it at low idle speed. Loosen the air bleed plug on the pump.

Tighten the plug when air free fluid comes out of the bleed plug hole.

Clean the area completely.



D7380F5E 4



FA215A6B 5

Swing reduction gear

Set the engine at a low idle, and loosen the hose connected with the joint of the drain port. Check that oil oozes from there. At this time, do not perform swing operation.

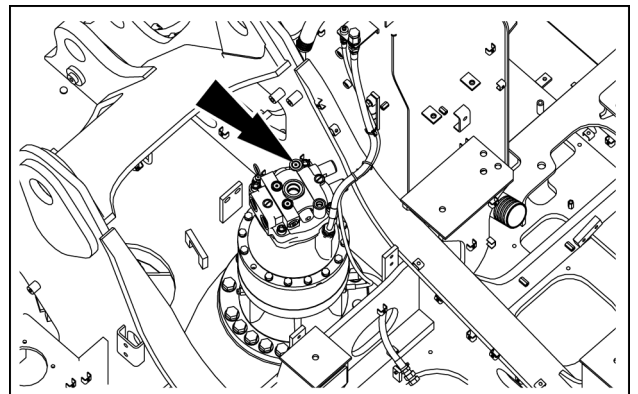
If oil does not ooze, stop the engine, remove the joint connected with the drain port, and fill the motor case with hydraulic fluid via the drain port.

Attach the joint of the drain port, and temporarily tighten the hose.

Set the engine at a low idle, and run it until oil oozes from the drain port.

After checking that oil has oozed, fully tighten the joint and the hose.

With the engine at a low idle, perform swing operation slowly right and left at two or more revolutions.



SMIL17CEX0103AA 6

Attachment cylinders

Start the engine and run it at low idle speed. Extend and retract the attachment cylinder rods four or five times without bringing them to end of stroke. Then repeat the operation three or four times, this time bringing the cylinder rods to end of stroke.

When necessary

Fuel feed pump

⚠ WARNING

Flying debris!

Compressed air can propel dirt, rust, etc. into the air. Wear eye and face protection when using compressed air.

Failure to comply could result in death or serious injury.

W0307A

Clean the electromagnetic fuel feed pump periodically

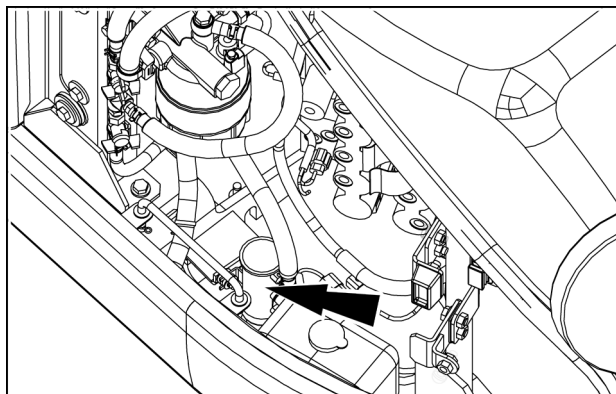
The fuel feed pump is located below the fuel main filter.

To clean the feed pump proceed as follows:

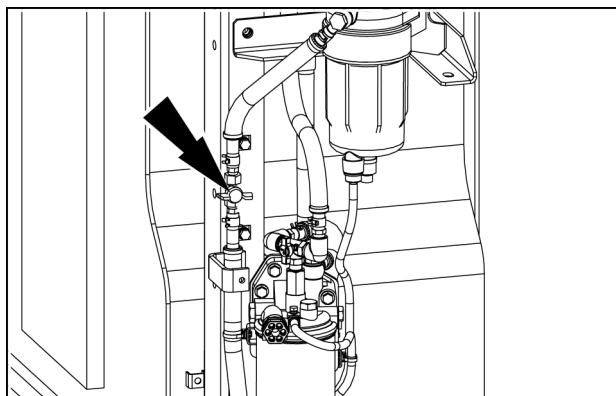
1. Place a container with an appropriate capacity under the feed pump.
2. Close the fuel cut valve.
3. Disconnect the electric cable from the feed pump. Carefully disconnect the fuel lines from the feed pump.
4. Remove the mounting screws and take out the feed pump for cleaning.
5. Open the pump body, and pull out the filter (2) and the seals (1) and (3).
6. Clean the filter by compressed air. Check the filter, and replace it if necessary.
7. Replace the seals (1) and (3).
8. Clean the body (4) and the cover (5) carefully.

Make sure that the feed pump is free from the accumulation of dirt.

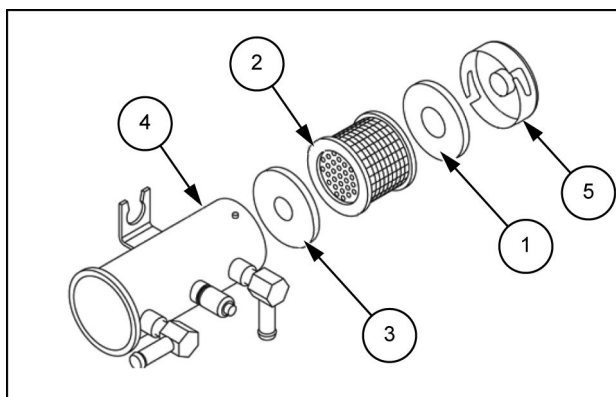
9. Attach the seals (1) and (3) to the filter (2) in the correct order, then carefully insert the seals and the filter into the pump body. Close the cover (5) onto the pump body (4).
10. Install the feed pump with the mounting screws.
11. Connect the fuel lines to the feed pump. Connect the electric cable to the feed pump.
12. Bleed the fuel system. Refer to page 6-10.



SMIL21CEX0015AA 1



SMIL21CEX0016AA 2



SMIL14CEX2767AB 3

Track tension

⚠ WARNING

Tip-over hazard!

Only raise the track as little as necessary.

Failure to comply could result in death or serious injury.

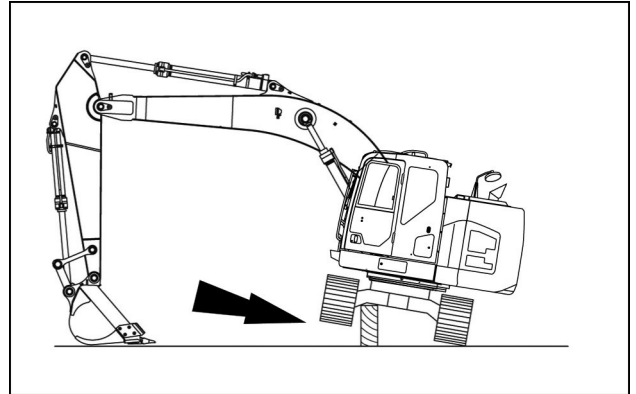
W0276A

Check the track tension periodically

NOTICE: if the tracks are too tight, they wear quickly. If tracks are not tight enough, they wear quickly and the links can catch on the sprocket wheel or slide off the idler wheel or the sprocket wheel. Clean the tracks after work.

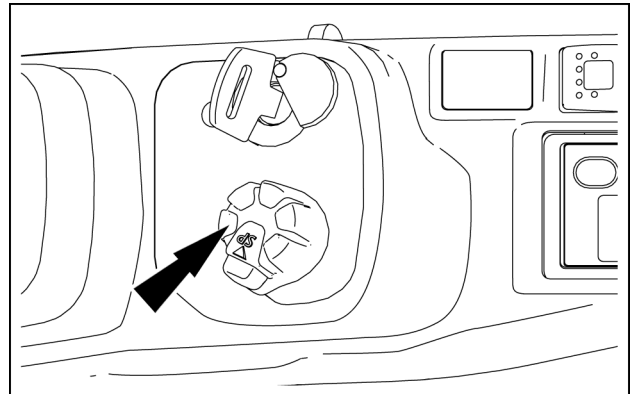
To check the tracks tension, proceed as follows:

1. Swing the upper structure perpendicular to the undercarriage. Lower the attachment to the ground, then lower the boom until the track is raised off the ground. Place a block under the undercarriage and raise the attachment off the ground.



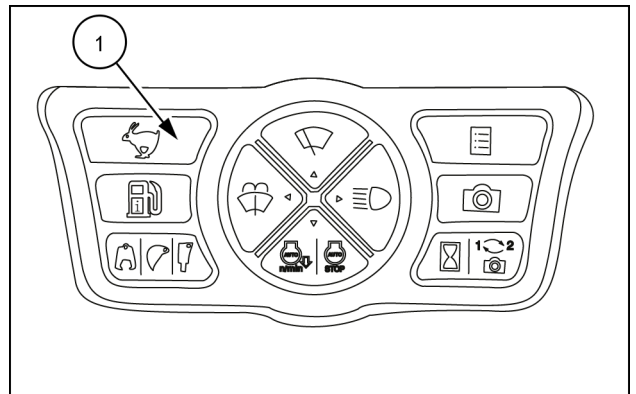
SMIL21CEX0017AA 1

2. Turn the engine speed throttle to the maximum speed position.



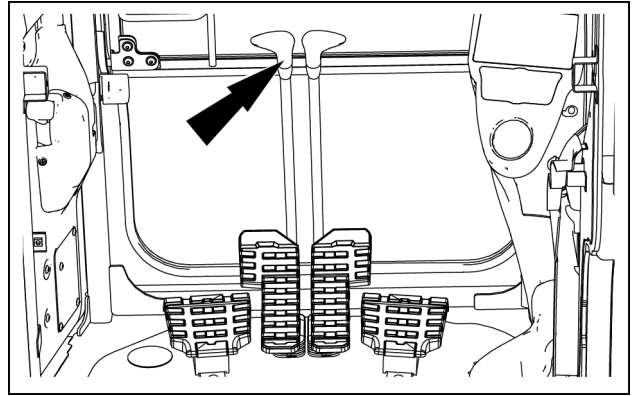
SMIL19CEX2696AA 2

3. Press the travel mode selector button (1) to set the "Rabbit" mode.



SMIL18CEX0768AB 3

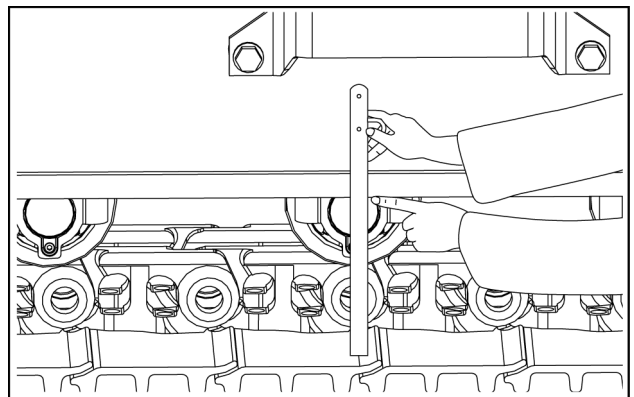
4. Operate the travel control lever to move the raised track forward and backward and shake off the mud.
5. Repeat the same operations for the other track.



SMIL17CEX5210AA 4

Checking the tension

1. If the track is not yet raised, perform the same procedure as for cleaning to put the machine into the required position.
2. Operate the travel control lever to move the raised track rearward for a while.
3. Stop the engine, and remove the starter key.
4. At the center of the track, measure the slack between the base of the undercarriage and the pad. The value must be within: **300 – 330 mm (11.8 – 13.0 in)**.
5. Adjust the tension as necessary, then lower the track to the ground.
6. Repeat the same operations for the other track.

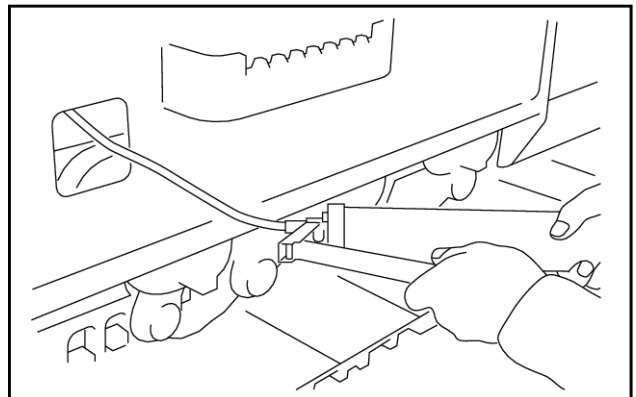


SMIL14CEX2855AA 5

Adjusting the tension

To increase the tension:

1. Clean the grease fitting adapter and the grease fitting.
2. Connect the grease pump. Inject the grease to obtain the right amount of track tension.
3. Remove the grease pump and clean the grease fitting.
4. Repeat the same operations for the other track.



SMIL13CEX2749AA 6

⚠ WARNING

Pressurized fluid can penetrate the skin and cause severe injuries.

The grease in the cylinder is under high pressure. Never loosen the grease fitting adaptor completely in order to speed up the flow of grease.

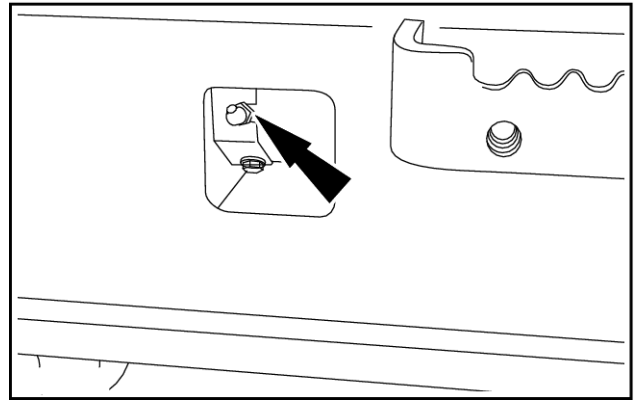
Failure to comply could result in death or serious injury.

W0261A

To reduce the tension:

1. Turn the grease fitting adaptor about 3 times to loosen it and drain grease from the cylinder.
2. When the track tension is correct, tighten the adaptor.
3. Clean the grease adapter and fitting, then lower the track to the ground.
4. Repeat the same operations for the other track.

NOTICE: if the grease fitting adaptor is damaged, grease may leak out. Check the condition of the grease fitting adaptor regularly and replace it if necessary.

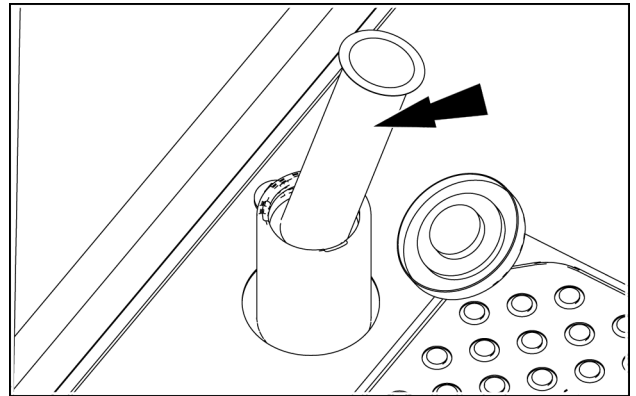


SMIL13CEX2750AB 7

Fuel tank strainer

Clean the fuel tank strainer periodically

Remove the fuel tank strainer, inspect it for damage. If damaged, discard and replace. If in good condition, clean it in an environmentally safe manner. Diesel fuel is a preferred cleaning agent. Fuel must not be added to the tank unless the strainer is in place and in good working condition.



SMIL21CEX0029AA 1

Gas spring inspection

⚠ WARNING

Explosive gas!

Gas struts contain high-pressure nitrogen gas. If handled improperly, they could explode.

- Do not disassemble.
 - Do not expose to flame or fire.
 - Do not puncture, weld, or melt.
 - Do not expose to shock by striking or turning.
 - The fill gas must be removed before disposal. Consult your dealer.
- Failure to comply could result in death or serious injury.

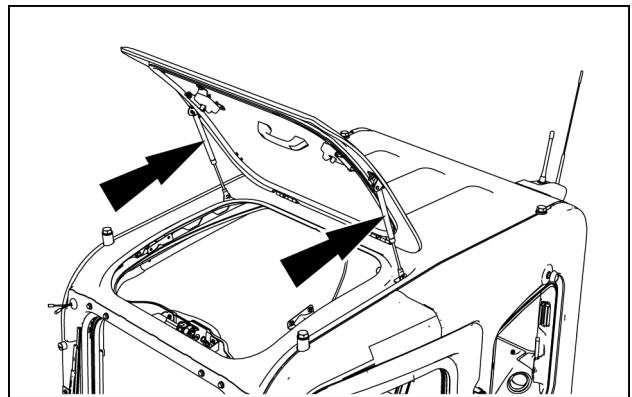
W0914A

Check the gas springs periodically

The cab sunroof is supported by gas springs.

In the following cases, request inspection, service, and replacement from the CASE CONSTRUCTION dealer:

- The cab sunroof does not open without force.
- The cab sunroof does not remain open.
- Oil or gas leak is found in the gas spring.

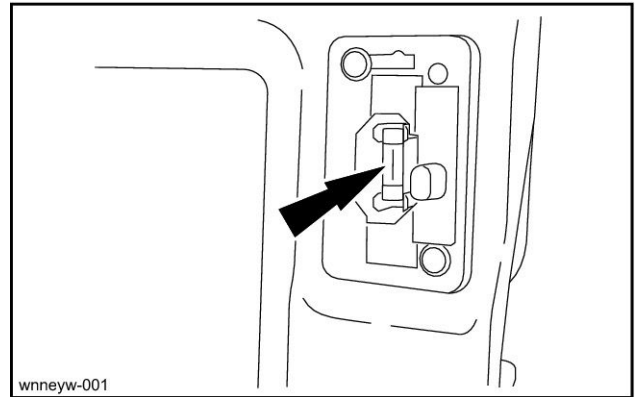


SMIL17CEX0127AA 1

Bulb replacement

Lighting in the operator compartment:

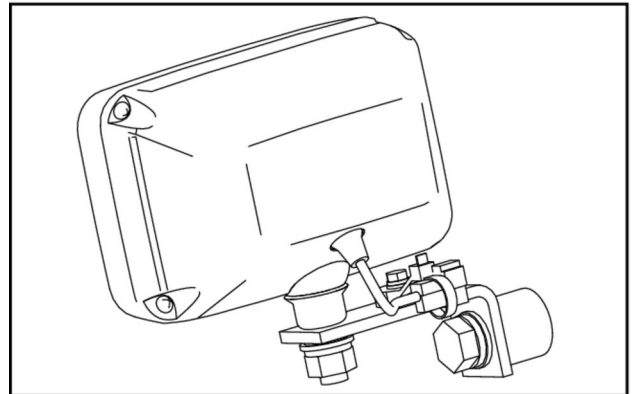
1. Remove the cover.
2. Remove the light bulb, then install a new light bulb of the same wattage (**10 W**).
3. Install the cover.



8YHY9K-001A 1

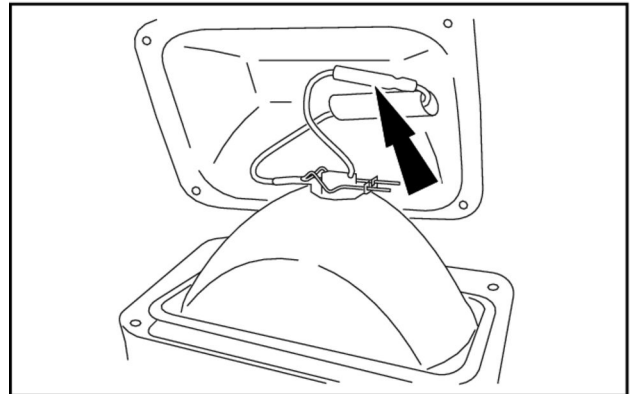
Attachment working lights:

1. Remove the 4 retaining screws.



2

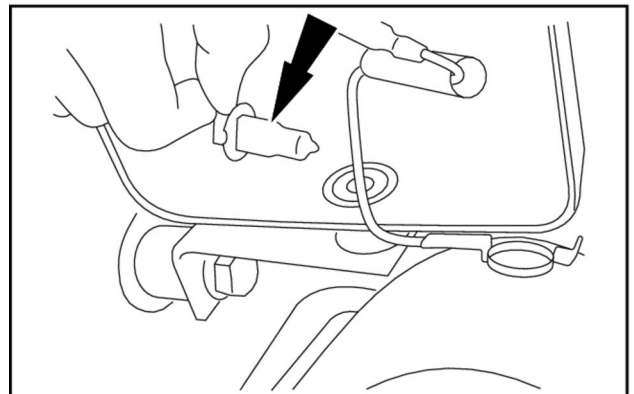
2. Tilt the working light and disconnect the plug.



3

3. Pull the clip outwards, remove the bulb and install a bulb of the same wattage (**70 W**).
4. Install the clip and reconnect the plug.
5. Put the working light back into position and install the mounting screws.

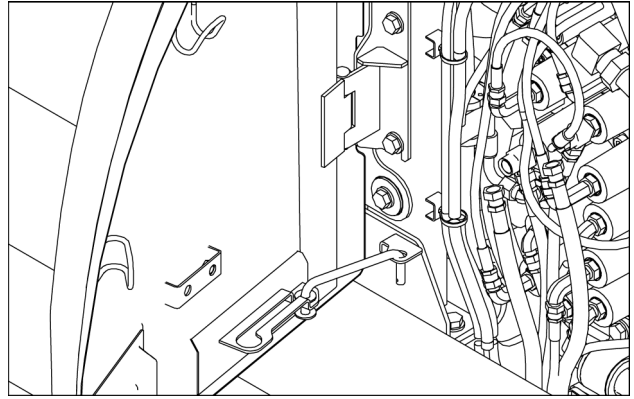
NOTICE: never put your fingers on a tungsten iodide bulb.



4

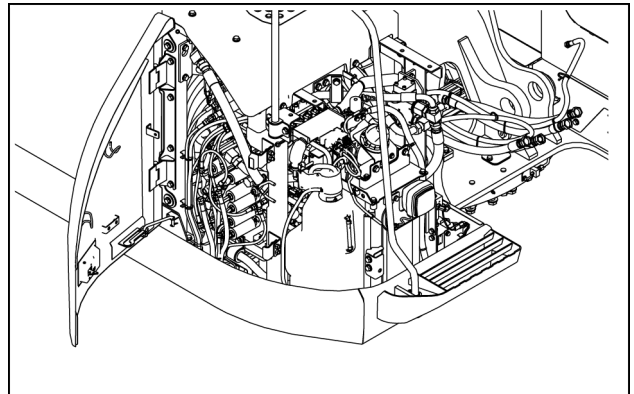
Upper structure and cab headlight:

1. Open the front right-hand door until it is fixed by the stay.



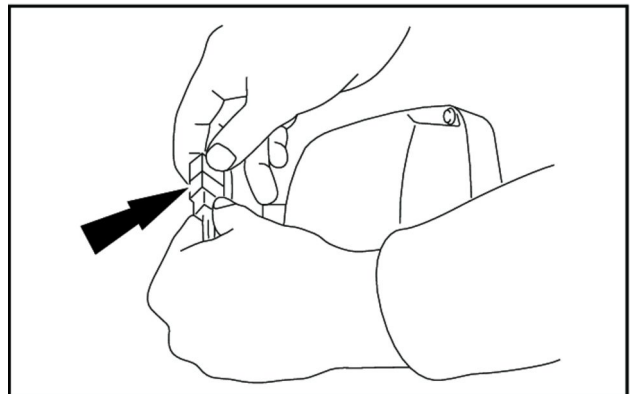
SMIL20CEX2503AA 5

2. Remove the right front cover.



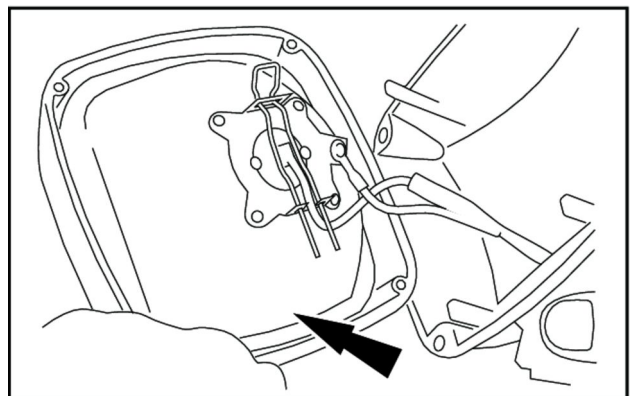
SMIL17CEX0138AA 6

3. Disconnect the plug.



SMIL13CEX2833AB 7

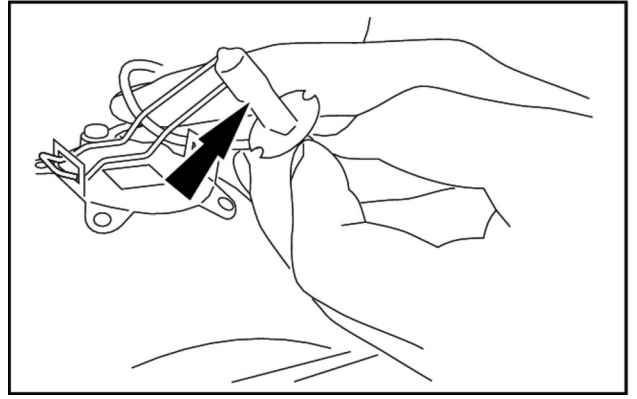
4. Remove the four screws and tilt the headlight.



SMIL13CEX2834AB 8

5. Pull the clip outward and remove the light bulb. Install a new light bulb of the same wattage (**70 W**).
6. Install the clip, put the headlight back in position.
7. Install the screws and the plug.
8. Install the switch bracket.

NOTICE: *never put your fingers on a tungsten iodide bulb.*



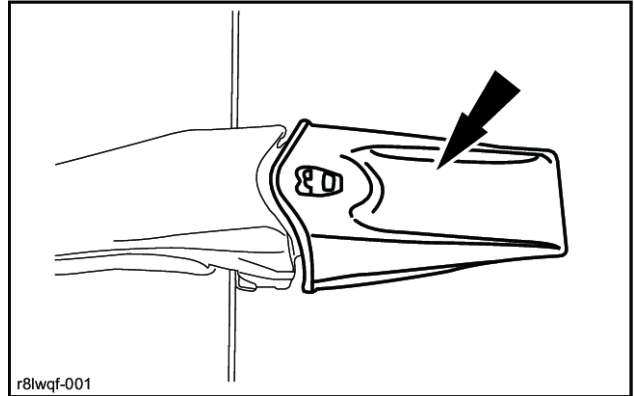
SMIL13CEX2835AB 9

Bucket teeth

1. The degree to which a tooth tip can be worn can be assessed visually.
2. It is possible to extend the life of a tooth tip which is wearing unevenly, in a non-symmetrical fashion.

NOTE: Do not wait for tooth tips to be completely worn through before changing them.

NOTICE: Never try to work with a missing tooth tip or a tooth tip which is worn through. The adaptor could be seriously damaged.



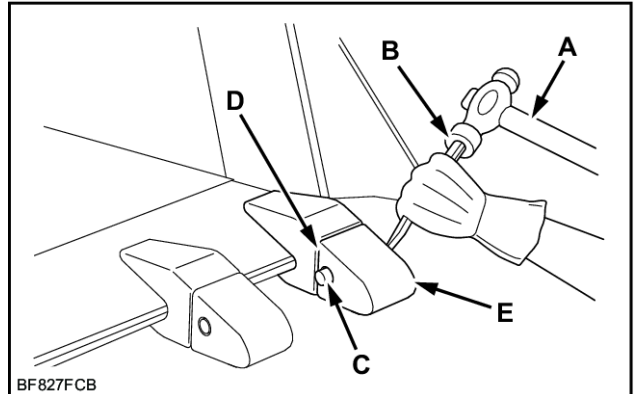
R8LWQF-001 1

NOTICE: When installing or removing a bucket tooth and a side cutter, place the bucket on blocks and securely fasten it.

Wear protective gear (protective eyewear, protective gloves, etc.) for this work.

Removal

3. Use the hammer (A) and punch with the chisel (B) to remove the locking pin (C) installed on the bucket, then remove the tooth (E).
4. Clean the adapter (D) and pin (C).

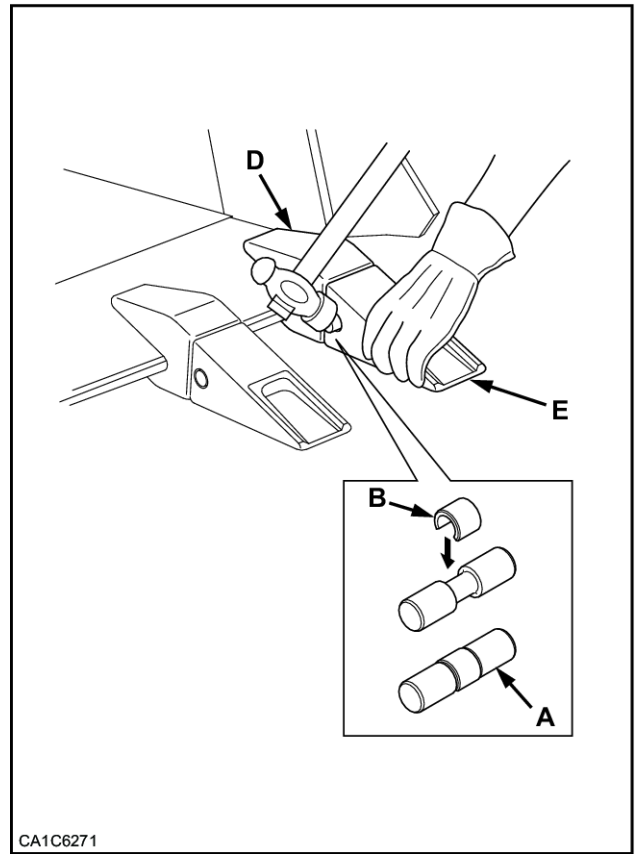


BF827FCB 2

Installation of Bucket Tooth

5. Clean the installation surface and fit the new tooth (E) into the adapter (D).
6. Partially insert the pin (A) with the washer (B) installed.
7. Insert the pin (A) with hammer into the hole in the tooth.

8. Check that the tooth is securely fastened.



CA1C6271

CA1C6271 3

Cylinders

A cylinder rod should be slightly oily. Check that there are no leaks after a period of work, when the whole hydraulic system is at normal operating temperature.

1. Wipe clean the rod and bearing on the cylinder to be cleaned.
2. Operate normally for **5 – 10 min.**
3. Extend the cylinder rod.
4. Carry out the leak test.

ROD APPEARANCE	TEST	CONCLUSION
Dry	Slight traces of oil when a piece of paper is wiped over 20 cm (7.9 in) of the rod.	Normal
Slightly greasy	Paper remains stuck to rod when run over rod.	Normal
Oily	Paper remains stuck when placed on rod.	Normal
Very oily or weeping	Each time the cylinder rod is extended, a ring of oil can be seen on the rod.	Consult your CASE CONSTRUCTION Dealer
Leakage	Each time the rod retracts, the excess oil drips from the gland.	

Plastic and resin parts

Use a soft, slightly humid, cloth to clean the panels, the consoles, and the switches. Use a soft, dry cloth to clean the instrument cluster.

NOTICE: *do not use gasoline, kerosene, paint solvents. The use of gasoline, kerosene, paint solvents, etc. will cause discoloration, cracks or deformation of the parts.*

Air-conditioning system

⚠ WARNING

Escaping refrigerant may cause frostbite!

Always wear protective goggles when handling refrigerant. If you get refrigerant in your eye, immediately flush your eyes with water for 15 minutes. Seek medical assistance immediately.

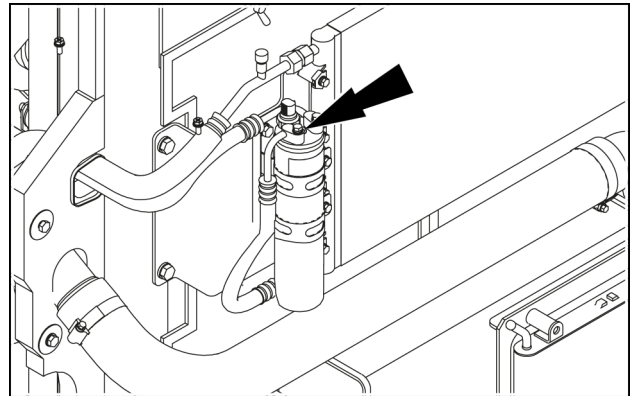
Failure to comply could result in death or serious injury.

W0339A

System charge check

To check the charge of the air conditioning system, proceed as follows:

1. Start the engine and turn on the air-conditioning system. Set the engine speed to **1400 – 1600 RPM**.
2. Open the rear left-hand door to access the air-conditioning dryer.
3. Let the system operate for about **5 min**, then check the inspection gauge of the dryer.

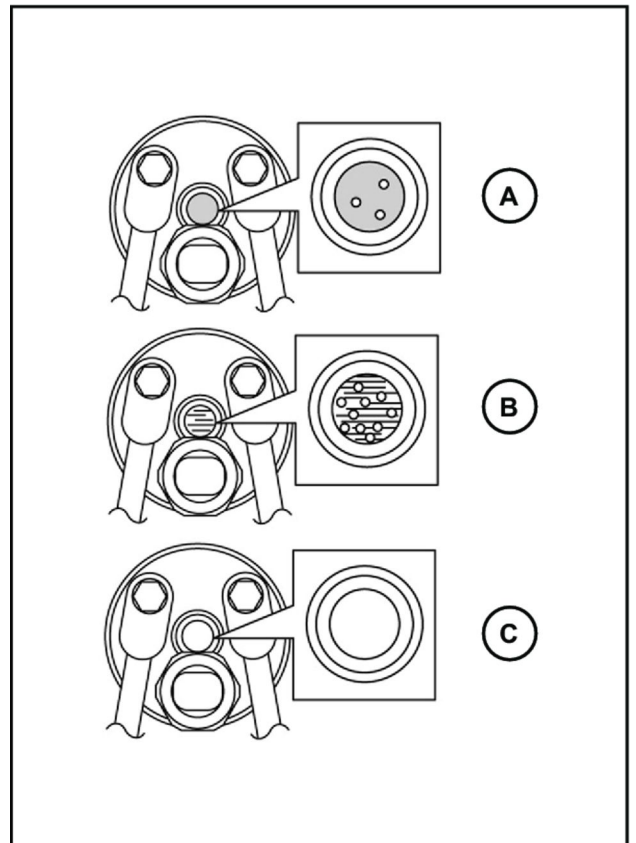


SMIL21CEX0093AA 1

Refer to the following conditions:

- A. The fluid in the gauge is at first transparent, then it quickly turns whitish with few small air bubbles, and stays in this condition. The charge status is correct.
 - B. The fluid in the gauge features at first many air bubbles, and stays in this condition. The system is underfilled. Call the CASE CONSTRUCTION dealer in order to inspect the system lines for leaks and to restore the correct charge status.
 - C. The fluid in the gauge is at first transparent with no air bubbles appearing, and stays in this condition. The system is overfilled. Call the CASE CONSTRUCTION dealer in order to restore the correct charge status.
4. Clean the lines and the connections of the air-conditioning system. Clean the radiator of the air-conditioning system in the radiators compartment.

NOTICE: Operate the air conditioning at least once every **50 h** in order to keep the compressor's seals lubricated. The recommended practice is to set the cab temperature to the lowest level, to set the cab ventilation fan to the maximum speed and thus to let the system run for **15 – 20 min**.



SMIL13CEX2895BB 2

Compressor belt check

The drive belt of the air-conditioning compressor shall be periodically checked in order to grant the proper operation of the air-conditioning system.

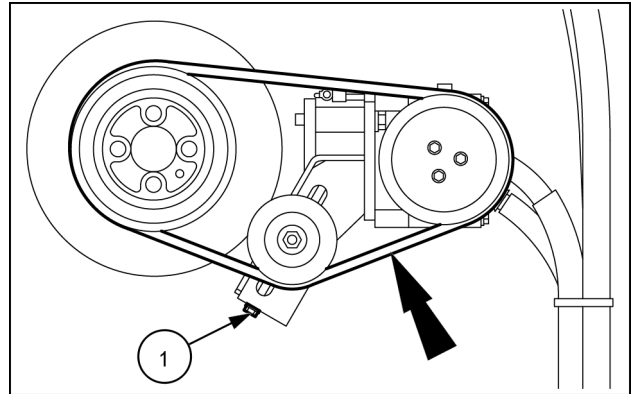
To check the drive belt of the air-conditioning compressor, proceed as follows:

1. Stop the engine, and remove the starter key.
2. Inspect the pulleys and the drive belt for excessive wear or damages. Make sure that the drive belt is correctly engaged to the grooves of the pulleys.

NOTICE: The drive belt shall be replaced if it is stretched or cracked in order not to let it worn out.

3. Check the tension of the drive belt by applying finger pressure of about **10 kg (22.0 lb)** on the point indicated by the black arrow. Loose of tension should be about **5 – 7 mm (0.2 – 0.3 in)**.

If needed, restore the proper tension by acting on the tensioning screw **(1)**.



SMIL16CEX0572AA 3

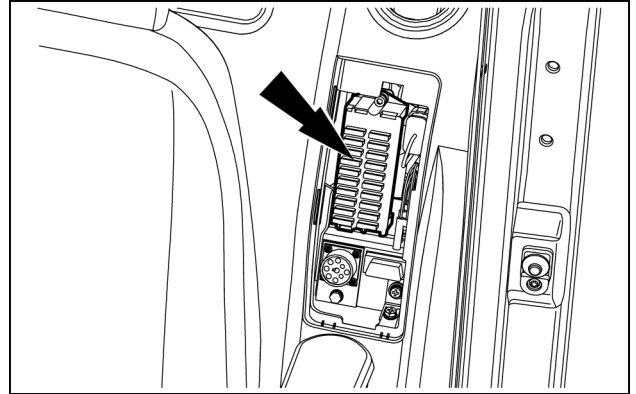
Fuse and relay locations

Fuses

NOTE: Before changing fuses or relays, turn the ignition key to the "Shut down" position, wait one minute minimum and place the key of the battery master switch in "O" (Off) position (if equipped).

NOTICE: never replace a fuse with a fuse of a different amperage.

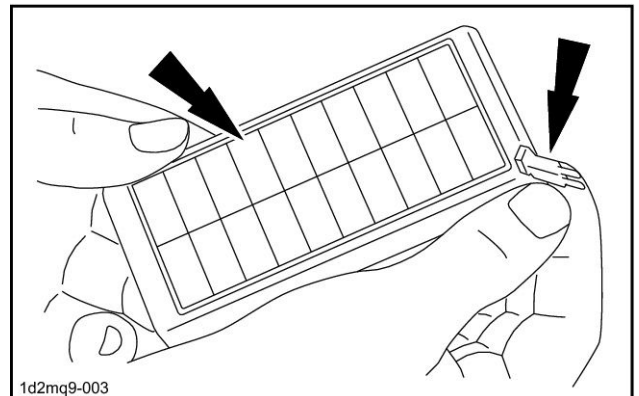
To access the fuse box, open the cover located behind the operator's seat.



SMIL20CEX2499AA 1

To access the fuses, remove the cover on the box. A notice on the cover gives the function and amperage of each fuse.

NOTE: To remove or install a fuse, use the notch in the upper right-hand corner of the cover.

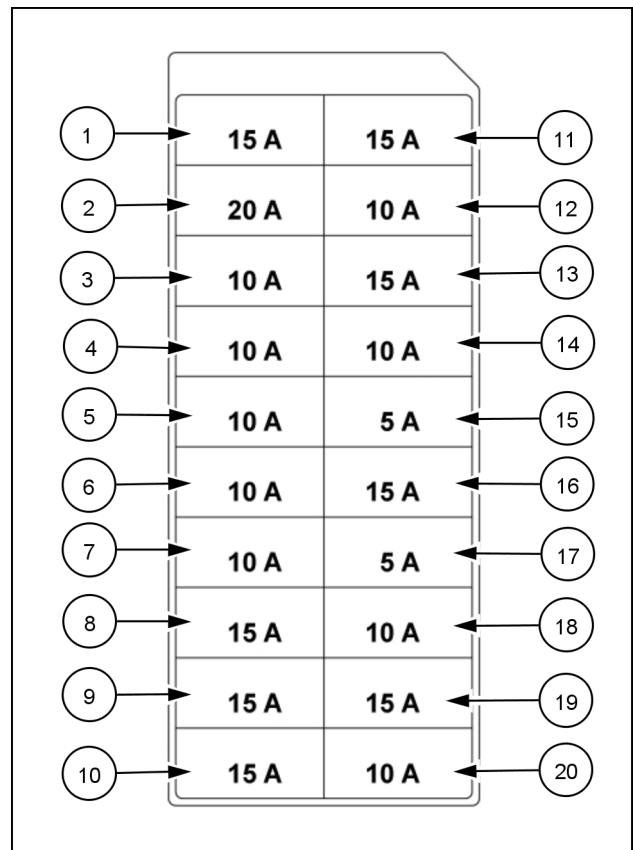


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1D2MQ9-003A 2

Fuse functions

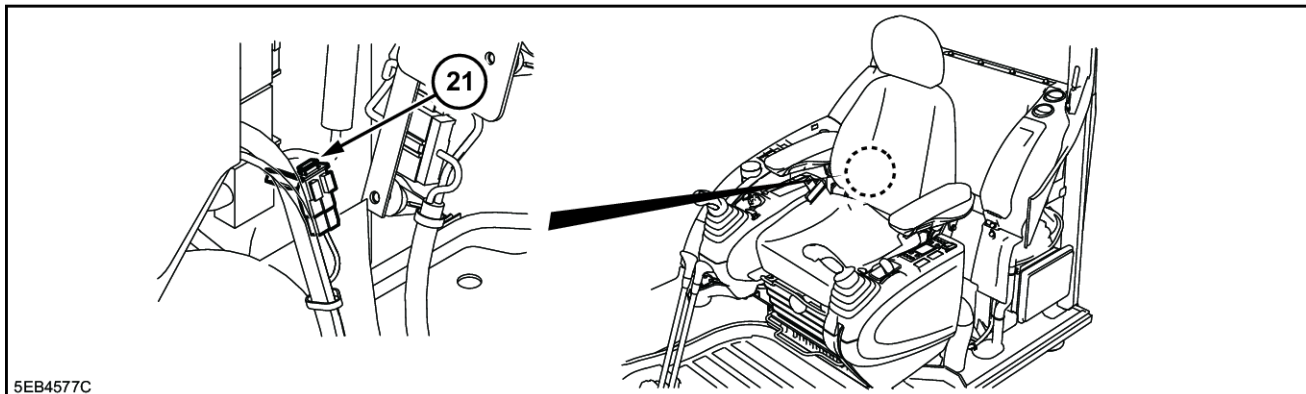
- (1) Key switch: **15 A**
- (2) Engine computer: **20 A**
- (3) GPS computer: **10 A**
- (4) Back-up (radio, room lamp): **10 A**
- (5) Gate lock lever: **10 A**
- (6) Solenoid: **10 A**
- (7) Horn: **10 A**
- (8) Cab top light: **15 A**
- (9) Boom, house light: **15 A**
- (10) Option power supply **15 A**
- (11) Wiper, washer: **15 A**
- (12) Rotary light: **10 A**
- (13) Cigar lighter, seat suspension: **15 A**
- (14) DC converter: **10 A**
- (15) Air conditioner unit: **5 A**
- (16) Air conditioner blower motor: **15 A**
- (17) Air conditioner compressor: **5 A**
- (18) Option power supply: **10 A**
- (19) Feed pump: **15 A**
- (20) Option line solenoid: **10 A**



SMIL20CEX2466BA 3

NOTE: The roof lamp and the radio have an additional external fuse location. A fuse (21) of 10 A is located under the right rear of the operator's seat.

NOTE: if CASE CONSTRUCTIONSiteWatch™ Telematics system is equipped, a dedicated 5 A fuse is added outside of the main fuse box. The fuse connector is located underneath the panels behind the operator's seat.



5EB4577C

5EB4577C 4

Storage

Preparing for storage

- The following procedure applies when the machine is to be stored for a month or more. Store the machine on flat, level ground, inside a building or, if not possible, outside and covered with a tarpaulin. Before storing the machine, carry out the following operations:

1. Clean the machine.
2. Make sure that the machine has no damaged or missing parts. Replace them if necessary.
3. Retract the cylinder rods as far as possible and lower the boom until the attachment is resting on the ground. Lower the dozer blade (if equipped) to the ground.
4. Grease the machine thoroughly. The exposed surfaces of the cylinder rods should be greased or covered with a protective film. Consult your CASE CONSTRUCTION Dealer.

NOTE: *when the machine resumes service, the film will disappear automatically.*

5. While the engine is still warm, drain the oil sump, replace the oil filter and fill with specified oil. Check the oil level and add more if necessary.
6. Clean or replace the air filter element.
7. Check the level of coolant solution. If the machine is within **100 h** of the next scheduled coolant change, change the coolant now.
8. Remove the battery, clean the battery housing, and check that there is no adhesion of battery fluid. Store the battery safely in a cool and dry place where temperature is **0 °C (32 °F)** or more. Alternatively, cut-off the cable from the negative (-) terminal of the battery, or turn the battery disconnect switch to the OFF position.
9. Apply a coating if it has any flaws or peelings.
10. Plug the air cleaner inlet and the exhaust pipe.
11. Remove the starter key, put the "Do not operate" tag on the right console, and set the gate lock lever to lock position.
12. Lock the hood, the side door, and the cab door.

Periodic checks

WARNING

**Inhalation hazard! Risk to operators and bystanders.
Avoid running the engine in confined areas. Make sure there is adequate ventilation at all times.
Failure to comply could result in death or serious injury.**

W0156A

Every month, check:

1. The battery charge and recharge the batteries if required.
2. The levels and top up if necessary.
3. The condition of all lines, connectors and clamps (rust). Grease if necessary.
4. The condition of the paintwork. Apply a coat of anti-rust treatment where necessary.
5. Unplug the air filter inlet and the exhaust pipe.
6. Run the engine at low speed following the starting up procedure and operate the attachment, swing and travel controls.
7. The grease on the cylinder rods.
8. Plug the air filter inlet and the exhaust pipe.

Starting up the machine

⚠ WARNING

Unexpected machine movement!

Before starting the engine, make sure all controls are in the neutral position.

Failure to comply could result in death or serious injury.

W0311A

⚠ WARNING

Inhalation hazard! Risk to operators and bystanders.

Avoid running the engine in confined areas. Make sure there is adequate ventilation at all times.

Failure to comply could result in death or serious injury.

W0156A

1. Drain the fuel tank, the pre-filter and the fuel filter, replace the filter elements if necessary.
2. Fill the fuel tank with suitable fuel.
3. Install the batteries or reconnect the cable to the negative (-) terminal.
4. Grease the machine thoroughly.
5. Check the condition of the fan drive belt and replace it if necessary.
6. Check the condition of the air conditioning drive belt and replace it if necessary.
7. Check the cooling system level and add more coolant if necessary.
8. Check the hydraulic fluid level, and supply it as necessary.
9. Check the gear oil level of the travel reduction gear and that of the swing reduction gear, and supply it as necessary.
10. Clean the cylinder rod.
11. Remove the lid of the air cleaner inlet and that of the exhaust pipe.
12. When starting the engine after long-term storage (one month or more), you need to check whether the turbocharger has run out of an oil film and make preparations for starting the engine. Be sure to consult our authorized service shop. For details of work, refer to the attached engine manual.
13. Remove the "Do not operate" tag, and start the engine following the engine starting procedure.
14. Check all the indicators and lamps carefully.

NOTICE: check the machine and the engine for leaks or for any parts that are broken, defective or missing.

7 - TROUBLESHOOTING

Fault code resolution

Engine - Troubleshooting

NOTE: This chapter describes the easy diagnostic methods for engine-related problems and the remedies for them. If you cannot find the cause of a problem or solve a problem, consult the CASE CONSTRUCTION dealer.

Problem	Possible Cause	Correction
The engine does not start	Defect in starter switch (Deactivation of starter)	Check the starter switch
	Poor running of starter (Starter running slowly)	Discharged battery, defect in starter, dirt or looseness of connectors
	Poor viscosity of engine oil	Inspect and, as necessary, replace
	Poor air bleeding for fuel system	Bleed it of air completely
	Cold engine (in cold weather)	Preheat suction air, or warm coolant
	No fuel in fuel tank	Add
	Low-quality fuel	Inspect and, as necessary, replace
	Clogging in fuel filter	Clean or replace
	Engine stuck	Consult the CASE CONSTRUCTION dealer
	Low compression	Consult the CASE CONSTRUCTION dealer
	Defect in fuel injection pump	Consult the CASE CONSTRUCTION dealer
	Battery disconnect switch is OFF	Set to ON
	No urea solution remaining in urea solution tank	Add
	Other urea solution than that of specified concentration added	Consult the CASE CONSTRUCTION dealer
The engine stops during operation	No fuel in fuel tank	Add
	Clogging in fuel filter	Clean or replace
	Air entry in fuel system	Retighten the connections of fuel lines
Abnormal oil pressure	Low oil level	Add
	Clogging in oil filter	Replace the oil filter
	Low oil viscosity	Replace with the oil of suitable viscosity for temperature
	Oil leaks from connections	Tighten the connections
	Defect in oil pressure switch	Consult the CASE CONSTRUCTION dealer
	Malfunction in oil pump	Consult the CASE CONSTRUCTION dealer
Exhaust gas from the engine is white or blue	Excess oil	Give an overhaul or replace components
	Very low oil viscosity	Replace with the oil of correct viscosity
	Overcooling by radiator	Adjust
	Incorrect fuel injection timing	Consult the CASE CONSTRUCTION dealer
	Low compression	Consult the CASE CONSTRUCTION dealer
Exhaust gas from the engine is black or deep gray	Wrong fuel	Replace with the correct fuel
	Incorrect valve clearance	Adjust
	Poor suction (Clogging in air cleaner)	Clean or replace the air cleaner
	Defect in fuel injection pump	Consult the CASE CONSTRUCTION dealer
	Low compression	Consult the CASE CONSTRUCTION dealer

7 - TROUBLESHOOTING

Problem	Possible Cause	Correction
Excessive consumption of fuel	Wrong fuel	Replace with the correct fuel
	Poor suction	Clean or replace the element
	Defect in fuel injection pump	Consult the CASE CONSTRUCTION dealer
	Poor injection of fuel injection nozzle	Consult the CASE CONSTRUCTION dealer
	Incorrect fuel injection timing	Consult the CASE CONSTRUCTION dealer
	Low compression	Consult the CASE CONSTRUCTION dealer
Excessive consumption of engine oil	Excess oil	Drain the oil down to the correct level
	Low oil viscosity	Replace with the oil of suitable viscosity for temperature
	Oil leaks	Retighten and, as necessary, replace
	Wear on cylinder piston ring	Consult the CASE CONSTRUCTION dealer
Abnormal noise (from fuel or mechanical system)	Low-quality fuel	Replace
	Damage inside muffler	Replace
Engine overheat (Too high coolant temperature)	Low coolant level	Add
	Coolant leaks	Repair
	Wear or damage on belt	Replace
	Wrong mixing ratio of anti-freeze	Replace
	Problems with radiator	Consult the CASE CONSTRUCTION dealer
	Damaged fan	Consult the CASE CONSTRUCTION dealer
	Problems with thermostat	Consult the CASE CONSTRUCTION dealer
	Problems with water pump	Consult the CASE CONSTRUCTION dealer
	Problems with coolant temperature gauge	Consult the CASE CONSTRUCTION dealer
Problems with battery charge	Incorrect belt tension	Adjust
	Problems with electric wires	Repair
	Problems with battery	Replace
	Problems with regulator	Consult the CASE CONSTRUCTION dealer
	Defect in alternator	Consult the CASE CONSTRUCTION dealer

8 - SPECIFICATIONS

Machine specifications

Engine

Manufacturer and model	ISUZU GI-4HK1X
Injection	Electronic-controlled High-pressure common rail
Number of cylinders	4
Bore x stroke	115 mm (4.53 in) x 125 mm (4.92 in)
Displacement	5193 cm ³ /rev (317 in ³ /rev)
Rated speed	1800 RPM
Rated power (ISO 9249)	117.3 kW (117.3 Hp)
Cooling	Water-cooled
Battery start	2 x 12 V 92 A·h
Voltage	24 V
Alternator	50 A
Starter	24 V, 5.0 kW

Hydraulic system

Maximum flow of the main pump (at 1800 RPM)	2 x 211 L/min (55.7 US gpm)
Rated working pressure	34.3 MPa (4975.2 psi)
Maximum working pressure (Power boost)	36.8 MPa (5337.8 psi)
Maximum flow of the blade pump (at 1800 RPM)	73.1 L/min (19.3 US gpm)
Rated working pressure	20.6 MPa (2988.0 psi)
Maximum flow of the pilot pump (at 1800 RPM)	18 L/min (4.8 US gpm)
Rated pilot pressure	3.9 MPa (565.7 psi)

Swing performance

Swing speed	11.8 RPM
Swing torque	64000 N·m (47204 lb ft)

Travel performance

Low speed	0 – 3.2 km/h (0 – 2.0 mph)
High speed	0 – 5.0 km/h (0 – 3.1 mph)
Drawbar pull	201000 N (45187 lb)
Grade ability	70% (35°)

Digging performance (Power boost engaged)

Bucket digging force	15200 daN (34171 lbf)
Arm digging force 2.40 m (94.49 in)	13200 daN (29675 lbf)
Arm digging force 2.94 m (115.75 in)	11000 daN (24729 lbf)

Tracks

Steel track	600 mm (24 in)
	800 mm (31 in)
Rubber pads	600 mm (24 in) (*)

NOTICE: (*) for operation on concrete surfaces or paved roads.

Working lights

One on upper structure	24 V, 70 W
One on attachment	24 V, 70 W
Two on cab	24 V, 70 W

Fluids and lubricants

By using appropriate fluids and lubricants the excavator can operate in ambient temperatures ranging from **-10 °C (5 °F)** to **45 °C (113 °F)**. Refer to the list of fluids and lubricants contained in this manual.

NOTICE: When operating the machine in ambient temperatures outside the above mentioned range, consult your **CASE CONSTRUCTION Dealer** for specific machine provision and for specific fluids and lubricants to be used.

	Quantity		CASE CON- STRUCTION specification	Reference specification
Fuel tank	320 L (85 US gal)	—	—	EN 590:1999
Engine oil	23.1 L (6.1 US gal)	NO.1 ENGINE OIL™ SUPER SAE 15W-40	MAT3622	SAE 15W40 ACEA E7 API CI-4
Swing reduction unit	5.0 L (1.3 US gal)	HYPOID GEAR OIL EP SAE 80W-90	MAT3516-A	SAE 80W/90 API GL-5
Travel reduction unit	5.0 L (1.3 US gal)	HYPOID GEAR OIL EP SAE 80W-90	MAT3516-A	SAE 80W/90 API GL-5
Engine coolant	31 L (8.2 US gal)	EXTENDED LIFE OAT COOLANT/ANTIFREEZE CONCENTRATE (*)	MAT3724 Grade OAT-EG1	ASTM D6210 TYPE I-FF
		EXTENDED LIFE OAT COOLANT/ANTIFREEZE 50/50 PREMIXED	MAT3724 Grade OAT-EG2	ASTM D6210 TYPE III-FF
Hydraulic oil tank (**)	114 L (30.1 US gal)	PREMIUM HYDRAULIC OIL HV46 MULTI-GRADE ANTIWEAR	—	ISO 6743-4 L-HV46
Grease	—	MULTI-PURPOSE GREASE EP / AW / NLGI 2	MAT3555-A	NLGI 2

(*) Concentrate antifreeze to be mixed 50/50 with distilled (deionized) water.

(**) The total capacity of the hydraulic system is: **252 L (66.6 US gal)**

Engine coolant

EXTENDED LIFE OAT COOLANT/ANTIFREEZE is the reference genuine product for machine service.

NOTICE: *Never add Supplemental Coolant Additives (SCA) when using **EXTENDED LIFE OAT COOLANT/ANTIFREEZE**.*

EXTENDED LIFE OAT COOLANT/ANTIFREEZE has to be used if refilling of the cooling system is needed. Refer to the dedicated procedure and recommendations described in Chapter 6.

EXTENDED LIFE OAT COOLANT/ANTIFREEZE shall be used for the replacement of engine coolant according to the maintenance program of the machine. The replacement shall also be tackled in case of repair or replacement of components of the cooling system. Refer to the dedicated procedure described in Chapter 6.

The engine cooling system shall always be refilled with coolant solution made by mixture of antifreeze and distilled (deionized) water.

NOTICE: *Never refill the cooling system with only antifreeze. Never refill the cooling system with only water.*

Using **EXTENDED LIFE OAT COOLANT/ANTIFREEZE**, a 50/50 mixture of antifreeze and distilled (deionized) water grants proper performance of the engine cooling system in the above mentioned operating temperature range of the machine.

EXTENDED LIFE OAT COOLANT/ANTIFREEZE is available as:

- 50/50 PREMIXED coolant solution ready for usage.
- CONCENTRATE antifreeze to be mixed 50/50 with distilled (deionized) water.

NOTICE: *If operating in extreme winter climate, a coolant solution made by 60/40 antifreeze/distilled (deionized) water mixture shall be used in order to grant proper performance of the engine cooling system.*

NOTICE: *Never use coolant solution with more than **60%** of antifreeze. This affects the cooling capacity of the mixture.*

When the coolant solution is prepared starting from the CONCENTRATE product, the antifreeze concentration in the mixture of antifreeze and distilled (deionized) water can be determined with a refractometer designed to measure ethylene glycol content.

If distilled (deionized) water is not available, use water for dilution with the following properties:

Property	Maximum limit
Total Solids	340 ppm
Total Hardness	170 ppm
Chloride (Cl)	40 ppm
Sulfate (SO ₄)	100 ppm
Acidity pH	5.5 to 9.0

NOTICE: *Never use hard water, sea water and softened sea water that has been conditioned with salt. The minerals and salts present in potable water can cause corrosion and deposits resulting in shortened engine life.*

Fuel

Use only Low Sulphur Diesel that meets the National Regulations for commercial diesel fuel.

NOTICE: *Never use Diesel fuel having a sulphur content higher than 350 ppm.*

Using other types of fuel may lead to stalled engine output or deterioration in fuel economy.

NOTICE: *The warranty shall be invalid if any serious defect is caused by usage of any other fuel. Using any fuel other than the prescribed type will cause damages to the fuel supply system, to the fuel injection system, and to the engine block. CASE CONSTRUCTION will not be responsible to any of such damages.*

If the temperature drops below the fuel cloud point, output deficiency or engine start problems may occur due to wax crystals.

NOTICE: *If operating in severe winter climate, consult the fuel supplier or the CASE CONSTRUCTION dealer for specific diesel fuel to be used.*

The diesel fuel to be used on the machine shall:

- be free from dust particles, even minute ones.
- have the proper viscosity.
- have a high cetane number.
- present great fluidity at low temperatures.
- have low sulphur content.
- have very little residual carbon.

NOTICE: *Never use a mix of diesel fuel and old engine oil. The fuel injection system and the exhaust after treatment system will be severely damaged.*

NOTICE: *consult the fuel supplier or the CASE CONSTRUCTION Dealer regarding appropriate use of fuel additives.*

NOTICE: *in order to prevent condensation during cold weather, fill the fuel tank to full after completing the day's work.*

Fuel storage:

Long storage can lead to the accumulation of impurities and condensation in the fuel. Engine trouble can often be traced to the presence of water in the fuel. The storage tank must be placed outside and the temperature of the fuel should be kept as low as possible. Drain off water and impurities regularly.

Disposal of fluids, lubricants, and spare parts

Fluids, lubricants and spare parts used on the machine are not fully compatible with the environment. Make sure to carry out all maintenance operations using appropriate tools, in order to avoid any risk of damaging the environment.

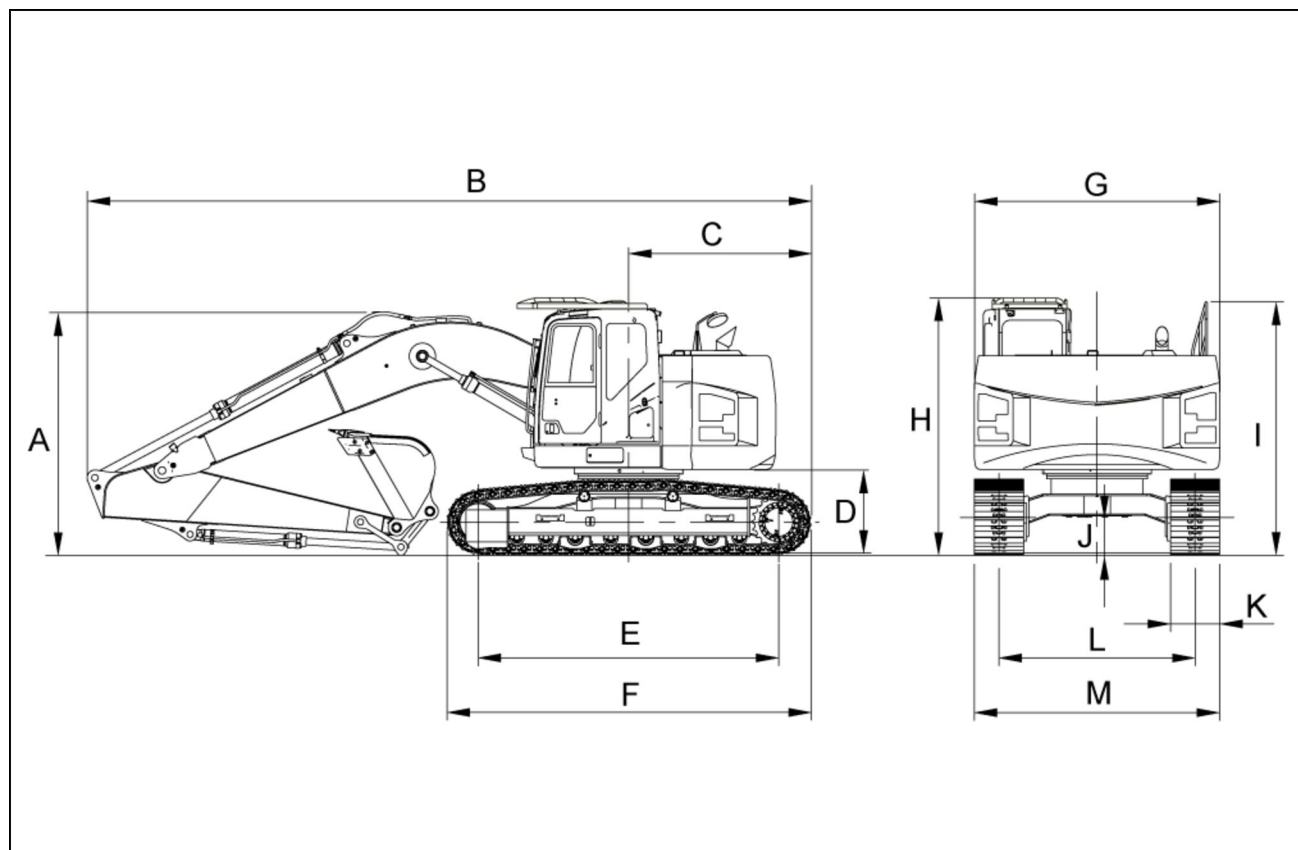
NOTE: *for example, make sure that the receptacle for collecting oil to be replaced is not leaking.*

Never spread fluids or lubricants on the ground or into water. Consult the CASE CONSTRUCTION Dealer or the Local Environmental Agency in order to obtain information on the correct method of disposing fluids and lubricants used on the machine.

Never throw away spare parts as filters or batteries. Consult the CASE CONSTRUCTION Dealer or the Local Environmental Agency in order to obtain information on the correct method of disposing filters, batteries or other spare parts used on the machine.

Dimensions

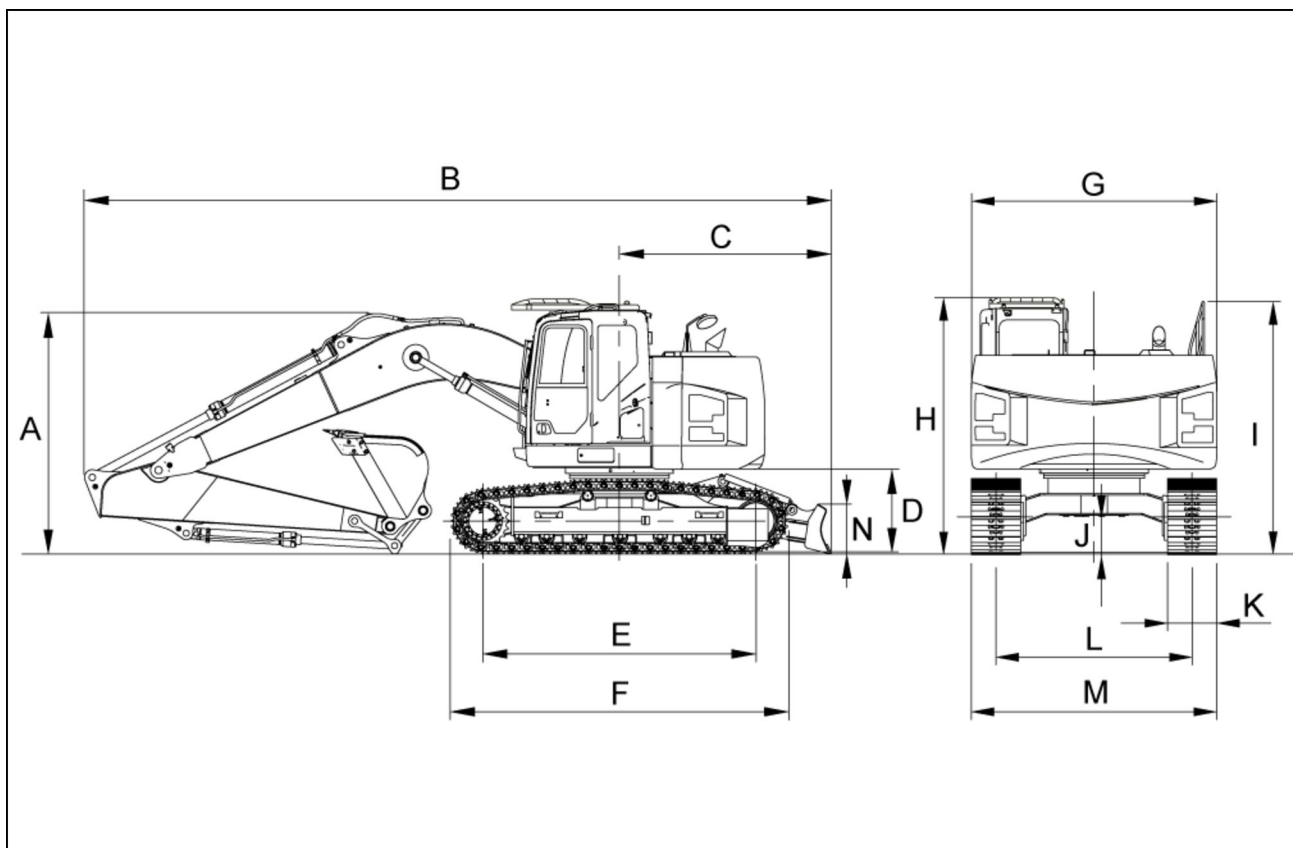
CX235C SR LC



SMIL21CEX0030FA 1

	Arm	2.40 m (94.49 in)	2.94 m (115.75 in)
(A)		3.18 m (125.20 in)	2.96 m (116.54 in)
(B)		8.92 m (351.18 in) [8.98 m (353.54 in) with rubber pads]	8.83 m (347.64 in) [8.89 m (350.00 in) with rubber pads]
(C)		2.23 m (87.80 in)[2.29 m (90.16 in) with rubber pads]	
(D) (without grousers)		1.02 m (40.16 in)[1.10 m (43.31 in) with rubber pads]	
(E)		3.66 m (144.09 in)	
(F)		4.47 m (175.98 in)[4.58 m (180.31 in) with rubber pads]	
(G)		2.99 m (117.72 in)	
(H)		3.14 m (123.62 in)[3.22 m (126.77 in) with rubber pads]	
(I)		3.09 m (121.65 in)[3.17 m (124.80 in) with rubber pads]	
(J) (without grousers)		0.44 m (17.32 in)[0.52 m (20.47 in) with rubber pads]	
(K) (standard track)		0.60 m (23.62 in)	
(L)		2.39 m (94.09 in)	
(M) 600 mm (23.6 in) track or pad		2.99 m (117.72 in)	
(M) 800 mm (31.5 in) track		3.19 m (125.59 in)	

Boom length: **5.70 m (224.41 in)**

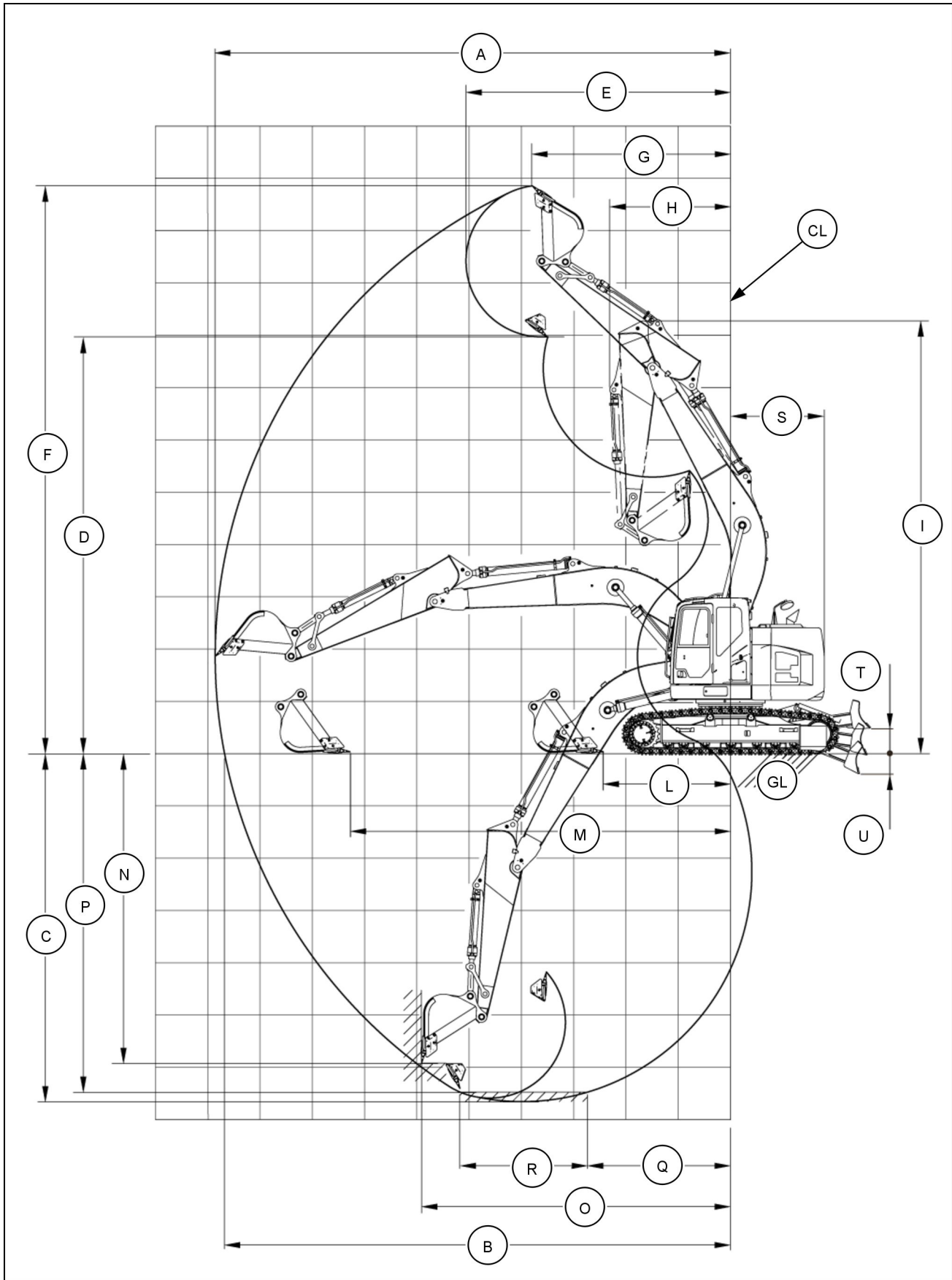
CX235C SR with blade

SMIL21CEX0031FA 2

	Arm	2.40 m (94.49 in)	2.94 m (115.75 in)
(A)		3.18 m (125.20 in)	2.96 m (116.54 in)
(B)		9.52 m (374.80 in) [9.50 m (374.02 in) with rubber pads]	9.43 m (371.26 in) [9.40 m (370.08 in) with rubber pads]
(C)		2.83 m (111.42 in) [2.82 m (111.02 in) with rubber pads]	
(D) (without grousers)		1.02 m (40.16 in) [1.10 m (43.31 in) with rubber pads]	
(E)		3.37 m (132.68 in)	
(F)		4.18 m (164.57 in) [4.29 m (168.90 in) with rubber pads]	
(G)		2.99 m (117.72 in)	
(H)		3.14 m (123.62 in) [3.22 m (126.77 in) with rubber pads]	
(I)		3.09 m (121.65 in) [3.17 m (124.80 in) with rubber pads]	
(J) (without grousers)		0.44 m (17.32 in) [0.52 m (20.47 in) with rubber pads]	
(K) (standard track)		0.60 m (23.62 in)	
(L)		2.20 m (94.09 in)	
(M) 600 mm (23.6 in) track or pad		2.80 m (110.24 in)	
(M) 800 mm (31.5 in) track		3.00 m (118.11 in)	
(N)		0.61 m (24.02 in)	

Boom length: **5.70 m (224.41 in)**

Working ranges CX235C SR LC — CX235C SR with blade



SMIL21CEX0032HB 3

8 - SPECIFICATIONS

	Arm	2.40 m (94.49 in)	2.94 m (115.75 in)
(A) Max digging reach		9.37 m (368.90 in)	9.85 m (387.80 in)
(B) Max digging reach at ground level (GL)		9.18 m (361.42 in)	9.67 m (380.71 in)
(C) Max digging depth		6.12 m (240.94 in)	6.65 m (261.81 in)
(D) Max dump height		7.63 m (300.39 in)	7.97 m (313.78 in)
(E) Max dump distance		4.64 m (182.68 in)	5.06 m (199.21 in)
(F) Max working height		10.52 m (414.17 in)	10.86 m (427.56 in)
(G) Reach at max working height		3.35 m (131.89 in)	3.79 m (149.21 in)
(H) Min equipment swing radius		2.55 m (100.39 in)	2.31 m (90.94 in)
(I) Height at min equipment swing radius		8.32 m (327.56 in)	8.28 m (325.98 in)
(L) Min clean up distance		2.98 m (117.32 in)	2.27 m (89.37 in)
(M) Max clean up distance		7.00 m (275.59 in)	7.49 m (294.88 in)
(N) Max digging depth on a vertical face		5.48 m (215.75 in)	5.92 m (233.07 in)
(O) Reach at max digging depth on a vertical face		5.71 m (224.80 in)	5.91 m (232.68 in)
(P) Max flat-bottomed trenching depth		5.91 m (232.68 in)	6.48 m (255.12 in)
(Q) Distance of flat-bottomed trench		2.73 m (107.48 in)	
(R) Flat-bottomed trench reference length		2.44 m (96.06 in)	
(S) Swing tail radius		1.72 m (67.72 in)	
(T) Maximum blade lift		0.49 m (19.29 in)	
(U) Maximum blade depth		0.39 m (15.35 in)	

NOTE: the dimensions of the working range are defined basing on the two reference lines **(GL)** (ground level) and **(CL)** (center line, i.e. rotation axis of the machine). All the dimensions related to the **(GL)** are defined with the grousers indented into the ground.

Operating weights

CX235C SR LC

With mono-block boom, 2.94 m (115.75 in) arm, 0.80 m³ (1.05 yd³) Bucket, 600 mm (23.6 in) track, operator, fluids, full fuel tank, and FOPS level 2 guard.	24200 kg (53352 lb)
Average ground contact pressure	54 kPa (7.8 psi)

CX235C SR with blade

With mono-block boom, 2.94 m (115.75 in) arm, 0.80 m³ (1.05 yd³) Bucket, 600 mm (23.6 in) track, operator, fluids, full fuel tank, and FOPS level 2 guard.	25600 kg (56438 lb)
Average ground contact pressure	57 kPa (8.3 psi)

9 - ACCESSORIES

Direct fit buckets

Direct fit buckets application as function of the arm

General Purpose buckets			Arm	
Capacity ISO 7451 (Heaped)	Width	Mass	2.40 m (94.49 in)	2.94 m (115.75 in)
0.80 m³ (1.05 yd³)	1030 mm (41 in)	645 kg (1422 lb)	○	○
0.90 m³ (1.18 yd³)	1130 mm (44 in)	685 kg (1510 lb)	○	●
1.00 m³ (1.31 yd³)	1260 mm (50 in)	740 kg (1631 lb)	●	■

- Density of material up to 2 t/m³
- Density of material up to 1.6 t/m³
- Density of material up to 1.2 t/m³

Auxiliary hydraulic circuits

Consult your CASE CONSTRUCTION Dealer to select the optional accessory compatible with your machine and to correctly adjust the flow required for its use.

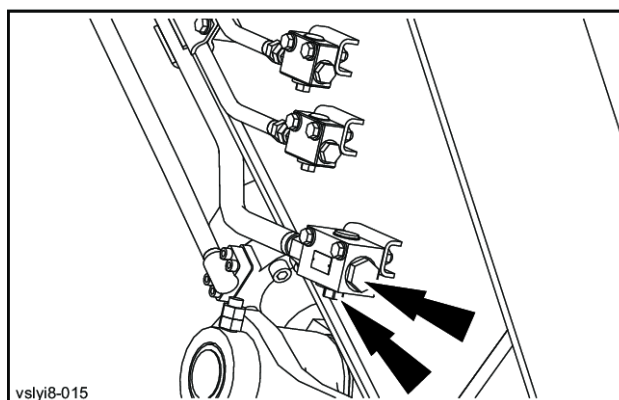
NOTICE: To prevent failure or damage to the tool, make sure that you select the correct circuit configuration and flow rate for the tool.

Auxiliary high-flow hydraulic circuit

Your machine can be equipped with one of the two following types of auxiliary high-flow hydraulic circuit. One type of circuit is specifically intended for usage with single acting hydraulic attachments, such as hydraulic breakers. The second type is intended for usage with either single-acting hydraulic attachments, such as hydraulic breakers, or double-acting hydraulic attachments, such as crushers.

Usage of a hydraulic breaker

1. Operate the controls of boom, arm and bucket in order to install the hydraulic breaker to the bucket linkage at the top of the arm.
2. Stop the engine. Set the starter key to ON position, and press the right-hand auxiliary pedal to release pressure inside the auxiliary high-flow hydraulic circuit.
3. Close the feed valves at the top of the arm. Install the connecting hoses between the attachment and the feed valves. Then reopen the feed valves.



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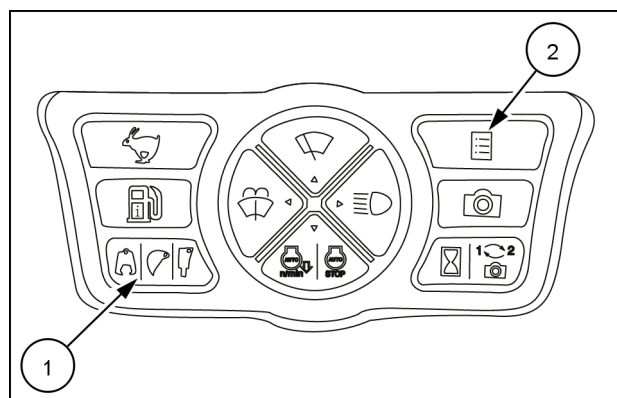
4. Start the engine. Press and hold the attachment selector button (1) for 1 s to get directly to the dedicated tab for operational settings of the auxiliary high-flow hydraulic circuit.
5. Select BREAKER as attachment type, and set the proper flow rate of the circuit.

NOTICE: The working pressure of the multifunction circuit can be set either manually or by display depending upon the machine provision. Refer ahead in this Chapter.

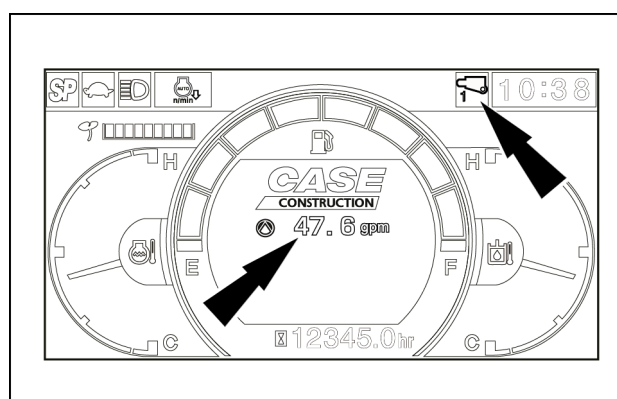
NOTICE: The working pressure of the auxiliary high-flow hydraulic circuit shall be set manually by the relief valve located behind the boom foot.

6. Press the menu button (2) to confirm the selection.
7. Resume the operating mode of the display. An icon on the top-right of the display indicates the type of attachment (breaker) and the storing number (1 to 5) of the flow rate currently in use. The pump setting (single) and the value of maximum flow rate are shown at the top-center of the display.

NOTICE: to prevent failure or damage to the tool, make sure that you select the correct circuit configuration and flow rate and pressure for the tool.

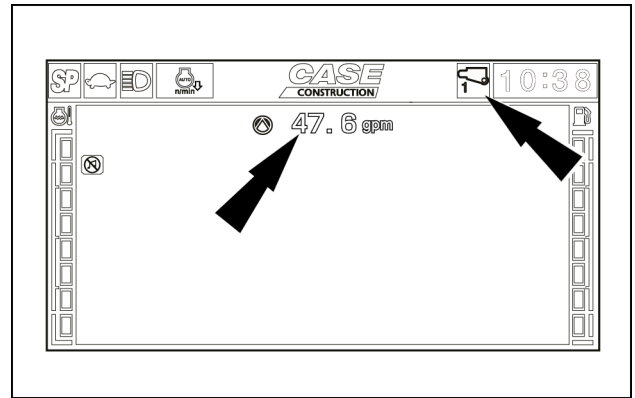


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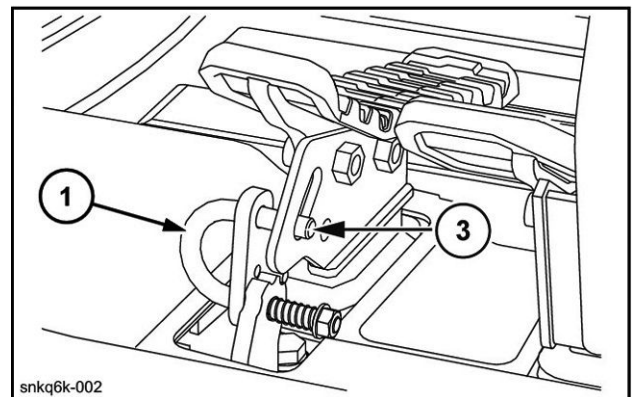
SMIL18CEX0556AA 3

Alternative display layout in case of rear view camera installed.



SMIL18CEX0557AA 4

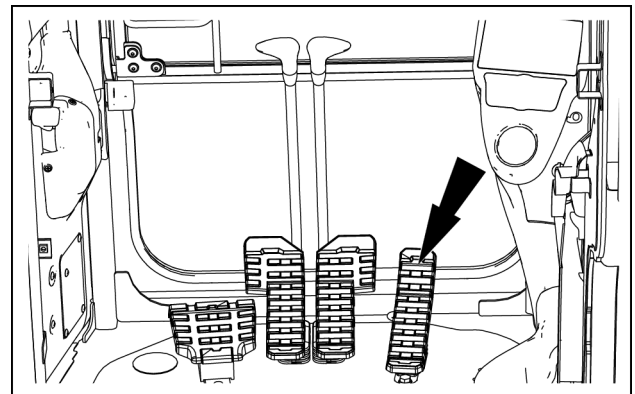
8. If the right-hand auxiliary pedal is equipped, engage the locking pin (1) of the pedal in the guiding hole (3).



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9. Press and hold the front side of the right-hand pedal to full stroke in order to operate the hydraulic breaker with the continuous selected flow providing a constant blowing frequency. Release the pedal to stop breaker operation.

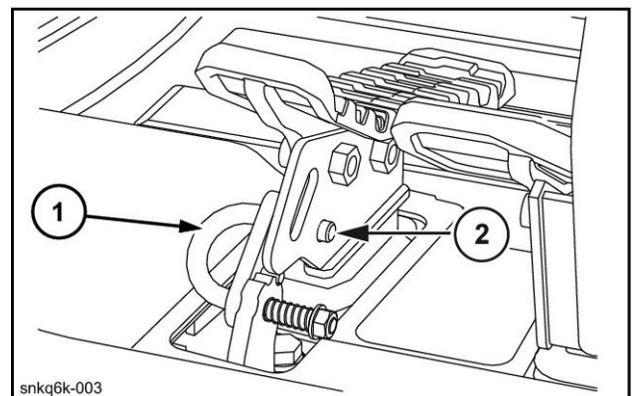
NOTICE: in Bucket mode, do not carry out operation using auxiliary line. If you do that the warning message "Auxiliary set-up required" will be displayed with alarm sound. Stop operation immediately and carry out auxiliary set-up.



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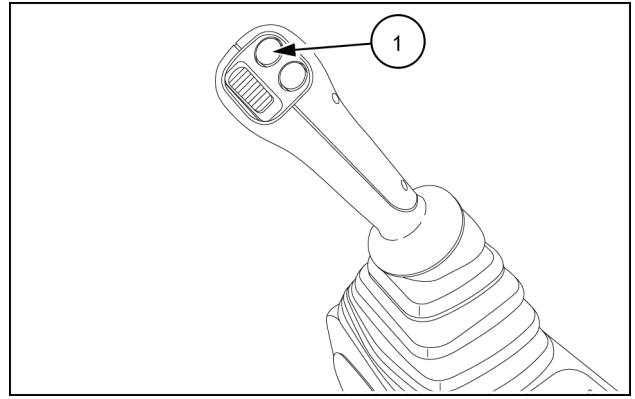
NOTICE: the auxiliary pedal shall always be locked when not in use.

To lock the auxiliary pedal, engage the locking pin (1) in the locking hole (2).



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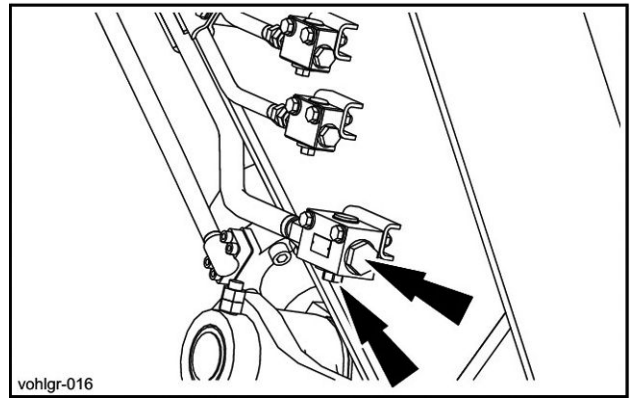
10. If the proportional controls on the right-hand lever are equipped, press and hold the ON/OFF button **(1)** to operate the hydraulic breaker with the continuous selected flow providing a constant blowing frequency. Release the button to stop breaker operation.



SMIL15CEXZ396AB 8

Usage of a hydraulic crusher

1. Operate the controls of boom, arm and bucket in order to install the hydraulic crusher to the bucket linkage at the top of the arm.
2. Stop the engine. Set the starter key to ON position, and press the right-hand auxiliary pedal to release pressure inside the auxiliary high-flow hydraulic circuit.
3. Close the feed valves at the top of the arm. Install the connecting hoses between the attachment and the feed valves. Then reopen the feed valves.

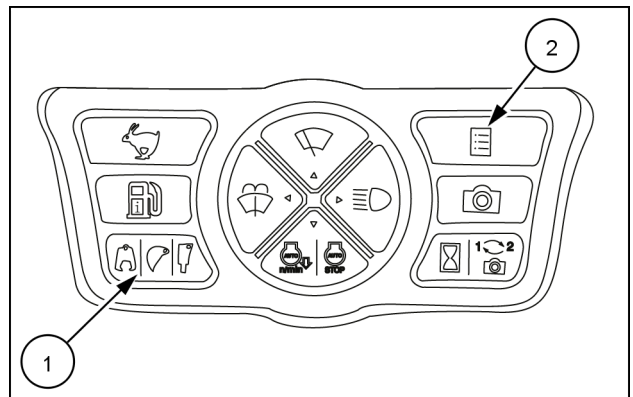


VOHLGR-016 9

4. Start the engine. Press and hold the attachment selector button (1) for 1 s to get directly to the dedicated tab for operational settings of the auxiliary high-flow hydraulic circuit.
5. Select CRUSHER as attachment type, and set the proper flow rate of the circuit.

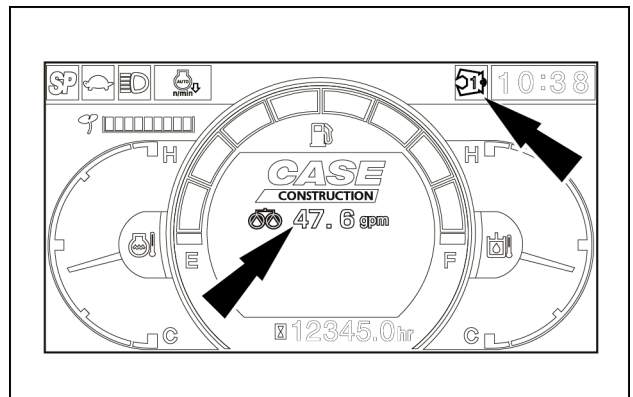
NOTICE: The working pressure of the multifunction circuit can be set either manually or by display depending upon the machine provision. Refer ahead in this Chapter.

NOTICE: The working pressure of the auxiliary high-flow hydraulic circuit shall be set manually by the relief valve located behind the boom foot.

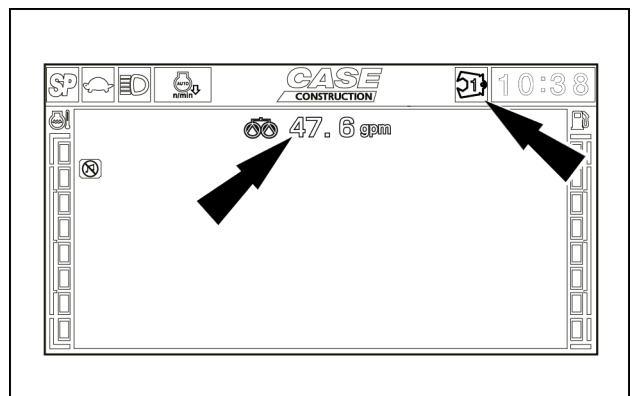


6. Press the menu button (2) to confirm the selection.
7. Resume the operating mode of the display. An icon on the top-right of the display indicates the type of attachment (crusher) and the storing number (1 to 5) of the flow rate currently in use. The pump setting (single or twin) and the value of maximum flow rate are shown at the top-center of the display.

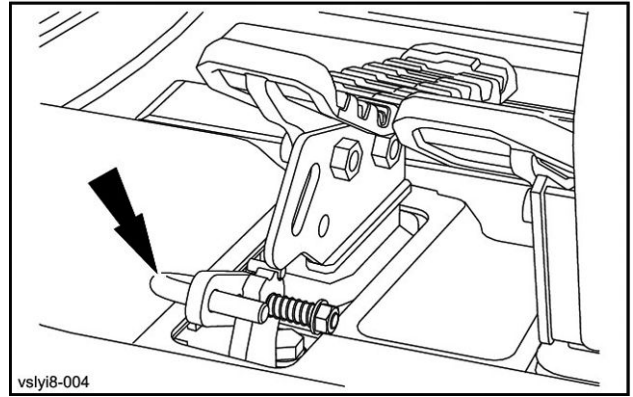
NOTICE: to prevent failure or damage to the tool, make sure that you select the correct circuit configuration and flow rate and pressure for the tool.



Alternative display layout in case of rear view camera installed.



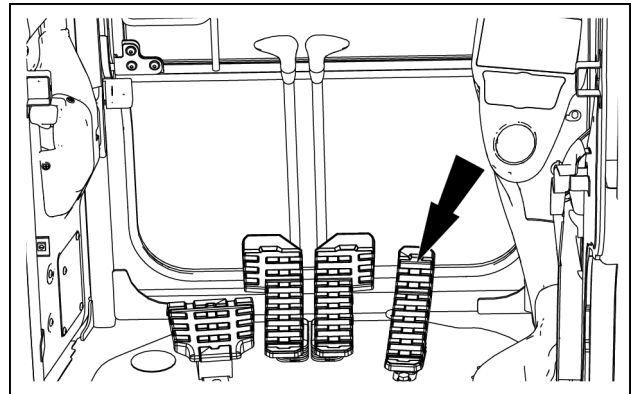
8. If the right-hand auxiliary pedal is equipped, place the locking pin of the pedal in outward position.



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9. Press one side of the right-hand pedal to close the crusher jaws, and press the other side of the pedal to open the crusher jaws. The crushing force increases with the pressing on the pedal in the closing direction. Release the pedal to hold the crusher jaws in position.

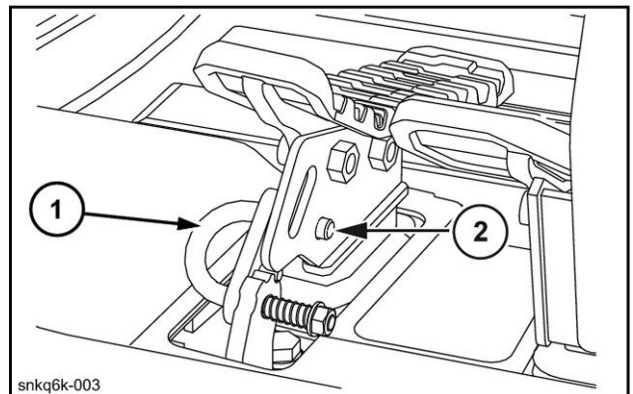
NOTICE: in bucket mode, do not carry out operation using auxiliary line. If you do that, the warning message "Auxiliary set-up required" will be displayed with intermittent whistle sound. Stop operation immediately and carry out auxiliary set-up.



SMIL17CEX1756AA 14

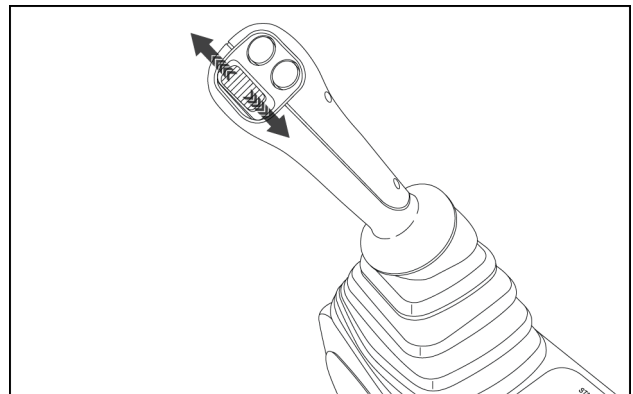
NOTICE: the auxiliary pedal shall always be locked when not in use.

To lock the auxiliary pedal, engage the locking pin (1) in the locking hole (2).



SNKQ6K-003A 15

10. If the proportional controls on the right-hand lever are equipped, slide up and down the proportional switch and confirm the control direction to open the crusher and the control direction to close the crusher. The crushing force increases with the sliding of the proportional switch in the closing direction. Release the switch to hold the crusher jaws in position.



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Setting ranges for auxiliary high-flow hydraulic circuit

The maximum flow rate of the auxiliary high-flow hydraulic circuit can be set by monitor. The setting ranges are related to the circuit type installed on the machine.

If single-acting circuit is installed, the maximum flow rate can be selected within the steps in the left column of the table below.

If multifunction circuit is installed, the setting ranges are related to the circuit mode. In the Single-acting mode, the maximum flow rate can be selected within the steps in the left column of the table below. In the Double-acting mode, the maximum flow rate can be selected within the steps either in the left column or in the right column of the table below.

NOTE: all the values for maximum flow rate are related to the SP work mode. If the auxiliary high-flow hydraulic circuit is used with a different work mode the actual flow will be lower.

1 pump flow	2 pumps flow
47 L/min (12.416 US gpm)	245 L/min (64.722 US gpm)
70 L/min (18.492 US gpm)	268 L/min (70.798 US gpm)
89 L/min (23.511 US gpm)	287 L/min (75.817 US gpm)
105 L/min (27.738 US gpm)	303 L/min (80.044 US gpm)
122 L/min (32.229 US gpm)	320 L/min (84.535 US gpm)
138 L/min (36.456 US gpm)	336 L/min (88.762 US gpm)
157 L/min (41.475 US gpm)	355 L/min (93.781 US gpm)
172 L/min (45.438 US gpm)	370 L/min (97.744 US gpm)
185 L/min (48.872 US gpm)	383 L/min (101.178 US gpm)
198 L/min (52.306 US gpm)	396 L/min (104.612 US gpm)

NOTE: Five flow rate values can be set and stored for usage of single-acting hydraulic attachments. Five flow rate values can be set and stored for usage of double-acting hydraulic attachments.

The working pressure of the auxiliary high-flow hydraulic circuit shall be set manually by the relief valve located about the main control valve.

The multifunction circuit can be optionally provided with the setting by display of the working pressure. The working pressure of the circuit can be thus selected in the range **18.5 – 34.5 MPa (2683.4 – 5004.2 psi)** by steps of **0.5 MPa (72.5 psi)**. Refer to Chapter 3 for the setting procedure.

NOTE: Five flow rate/pressure combinations can be set and stored for usage of single-acting hydraulic attachments. Five flow rate/pressure combinations can be set and stored for usage of double-acting hydraulic attachments.

Auxiliary low-flow hydraulic circuit

The machine can be equipped with an additional low-flow auxiliary hydraulic circuit to operate attachments featuring secondary hydraulic actuation for positioning, such as rotating grabs or tiltable buckets.

NOTE: the maximum flow rate of the auxiliary low-flow hydraulic circuit using the SP work mode is **70 L/min (18.5 US gpm)**. The maximum working pressure of the auxiliary low-flow hydraulic circuit is **20.6 MPa (2988 psi)**.

NOTE: an additional drainage line (**D**) is located on the left side of the arm. The drainage line (**D**) is intended to allow external drainage from an hydraulic motor.

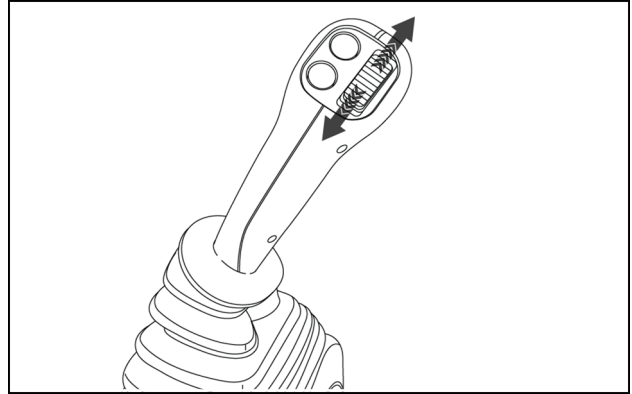
NOTICE: always keep each connecting hose on the same side of the arm. Never cross-over the connecting hoses between the two sides of the arm.

Use the proportional switch located on the left-hand control lever to operate the grab rotation or the bucket tilt with a variable power.

Make sure that the control pattern of the positioning actuation is as intended. Slide up and down the proportional switch and confirm the control directions (e.g. left/right).

NOTICE: if control directions for the positioning actuation are not as intended, check for an alternative set up of the hydraulic connections between the attachment and the machine.

NOTICE: if not using any hydraulic attachment, do not operate controls for auxiliary hydraulic circuits.



SMIL15CEXY964AB 17

Operating guidelines for usage of hydraulic attachments

Always select an hydraulic attachment which is suitable for installation on the machine, in order to avoid severe damages to the machine frames and to the machine systems. Make sure to select an hydraulic attachment which does not compromise the overall machine stability. Make sure to select an hydraulic attachment which properly matches the capacity of the auxiliary hydraulic circuit of the machine.

NOTICE: *make sure to know the maximum working pressure allowed by the attachment. Look for "Relief pressure range" or "Maximum pressure range" information into the specification sheet of the attachment. Set the maximum working pressure of the auxiliary hydraulic circuit according to this specification. The attachment will operate properly and effectively, and serious damages will be avoided to the attachment and to the machine.*

Contact your CASE CONSTRUCTION dealer for selection and provision of the mounting bracket for the attachment, and for selection and provision of the connecting hoses between the auxiliary hydraulic circuits and the attachment.

Make sure to read and understand the Operator's Manual of the hydraulic attachment.

Always refer to the Operator's Manual of the hydraulic attachment for proper and safe installation of the attachment to the machine.

Always refer to the Operator's Manual of the hydraulic attachment and to the following instructions in this manual for proper and safe usage of the attachment.

Always refer to the Operator's Manual of the hydraulic attachment for proper maintenance of the attachment. Always refer to the Operator's Manual of the machine for specific maintenance schedule related to the usage of any attachment other than a bucket (refer to the next page).

If not using any hydraulic attachment, make sure to apply the blanking plugs on the feed valves and on the connecting hoses to the attachment in order to avoid the penetration of foreign bodies.

Maintenance

A specific maintenance schedule shall be adopted for the machine if any hydraulic attachment is used over a significant period of time. In particular, the maintenance of the hydraulic system shall be more frequent because the usage of hydraulic attachments severely affects the properties of the hydraulic fluid.

The following table prescribes the required intervals for the maintenance operations to be performed on the hydraulic system of the machine depending upon the percentage of the usage of the attachment.

	10%	20%	40%	100%
Hydraulic oil level check	10 h	10 h	10 h	10 h
Hydraulic oil suction filter cleaning	800 h	600 h	300 h	100 h
Hydraulic oil return filter replacement				
Pilot filter replacement				
Hydraulic oil analysis				
Hydraulic oil and filters replacement	4000 h	3000 h	1500 h	600 h

Moreover, the following operations shall be performed every **10 h** if any attachment other than a bucket is used:

- lubricate the bucket pins and the whole bucket linkage.
- check the tightening torques, in particular if the machine is used in demolition applications.
- check the frames and the structures for damages or cracks, in particular if the machine is used in demolition applications.
- if an hydraulic attachment is used, check the hydraulic lines and connections towards the attachment.

Hydraulic quick coupling system

⚠ WARNING

Crushing hazard!

Never put your hands inside the quick coupler when the engine is running. Turn off the engine and wait for all movement to stop.

Failure to comply could result in death or serious injury.

W0252A

⚠ WARNING

Hazard to bystanders!

ALWAYS make sure the work area is clear of bystanders and domestic animals before starting this procedure. Know the full area of movement of the machine. Do not permit anyone to enter the area of movement during this procedure.

Failure to comply could result in death or serious injury.

W0245A

NOTICE: The quick coupler extends the length of the arm. Make sure to check the operating range of the coupled attachment in order to avoid risk of hitting the cab or the machine frame.

NOTICE: Never operate with a quick coupled hydraulic breaker over a long period of time, in order to reduce the risk of premature wear, failures or breakage of the quick coupler. Never use the breaker as a lever, as the stress would be borne by the quick coupler cylinder.

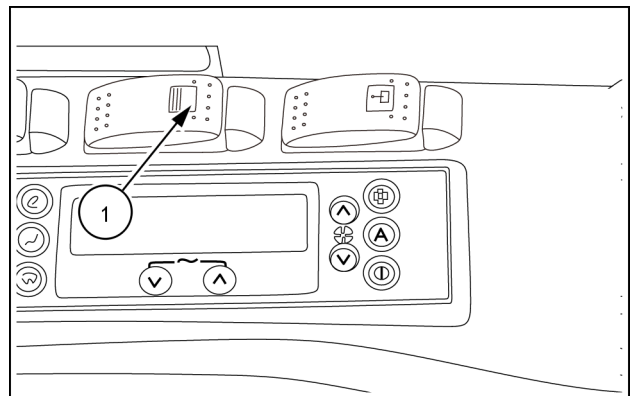
NOTICE: Make sure to read and understand the Operator's Manual of the hydraulic quick coupler for proper installation, usage and maintenance.

NOTICE: The CASE CONSTRUCTION quick coupling system is supplied by the high pressure hydraulic system of the machine. Refer to Chapter 8 for the maximum working pressure of the hydraulic system. Make sure to use a quick coupler that is suitable for proper and safe operation with high pressure hydraulics. For information consult the CASE CONSTRUCTION dealer.

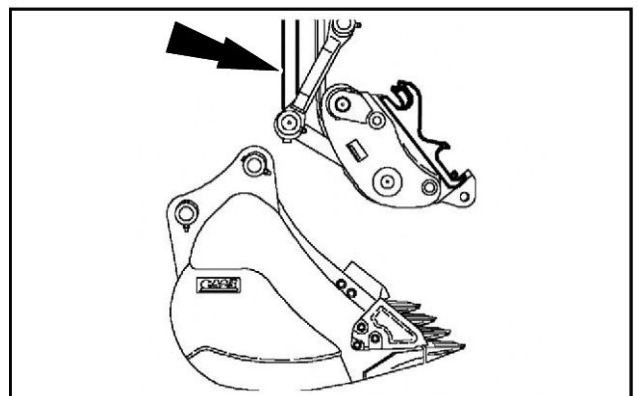
Attachment engagement

To engage the attachment using CASE CONSTRUCTION quick coupling system proceed as follows:

1. Make sure the attachment to be installed is laying safely on flat and level ground.
2. Select the H work mode.
3. Slide the lock device and press the front side of the quick coupler switch **(1)** to set the unlocking status of the quick coupling system. The audible alarm device starts sounding.
4. Operate the arm and bucket controls so that the arm is practically vertical, sloping slightly towards the cab to release the safety device. Extend the bucket cylinder rod completely and maintain the hydraulic pressure for approximately **5 – 10 s** so that the latching hook retracts.

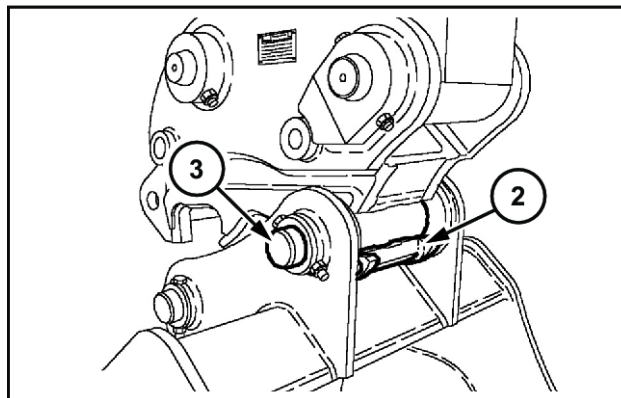


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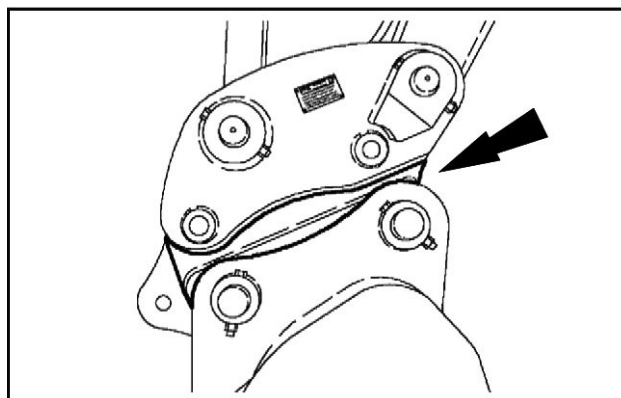
SMIL13CEX2697AB 2

5. Operate the arm and bucket controls so as to bring the quick coupler hook (2) around the attachment pin (3).



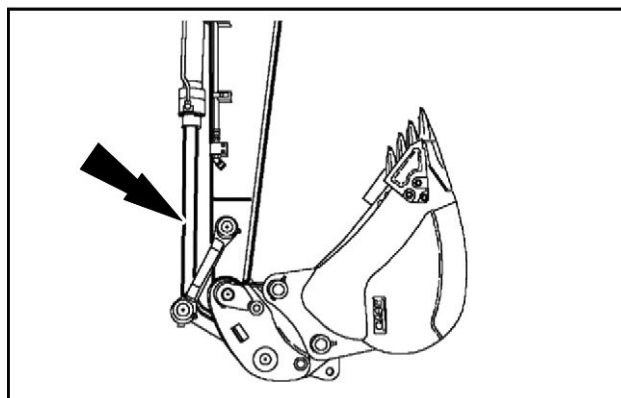
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6. Operate the bucket control lever so that the pin is completely engaged in the quick coupler hook.



SMIL13CEX2699AB 4

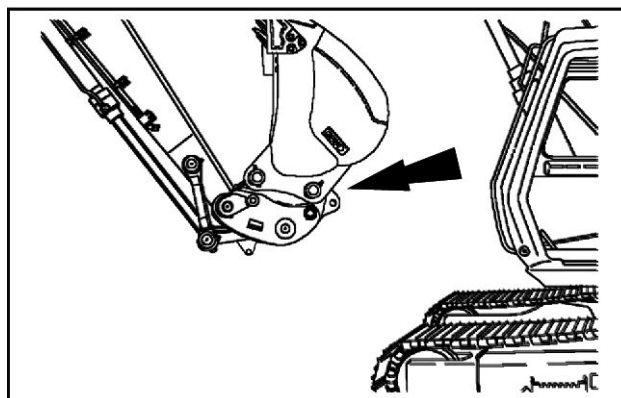
7. Operate the arm control to raise the arm and operate the bucket control to extend the bucket cylinder rod completely.



SMIL13CEX2700AB 5

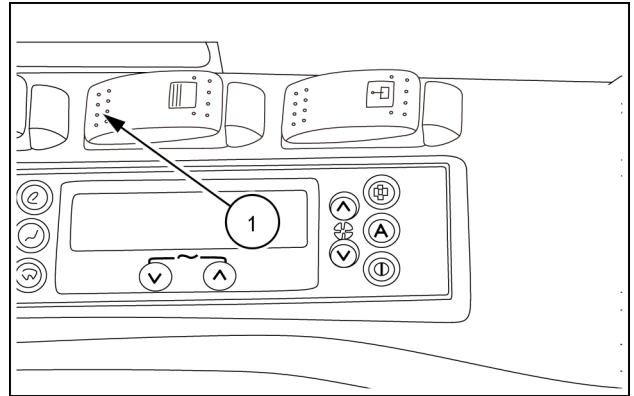
8. Raise the arm until the attachment pin is visible from the operator's seat.

NOTICE: The quick coupler extends the length of the arm and with certain attachments there is the risk to hit the cab in some operating positions. With this kind of attachments, it may not be possible to raise the arm until the attachment pin is visible from the operator's seat.



SMIL13CEX2701AB 6

9. Press the back side of the quick coupler switch **(1)** to set the locking status of the quick coupling system. The audible alarm device stops sounding.

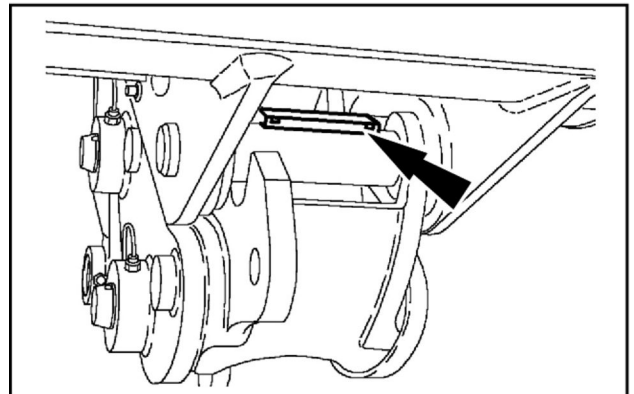


SMIL20CEX1397AA 7

10. Maintain the hydraulic pressure in the bucket cylinder for approximately **5 – 10 s** to allow the latching hook to close.
11. Confirm that the attachment pin is correctly engaged in the latching hook.

NOTE: the latching hook has a different color to ease the visual confirmation of the engagement of the pin.

NOTICE: If visual confirmation is not possible from the operator's seat, get down from the machine and make sure that the attachment pin is correctly engaged in the latching hook.

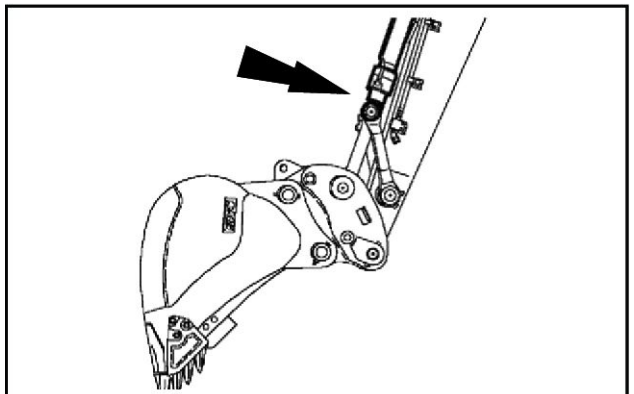


SMIL13CEX2702AB 8

12. Operate the bucket control to retract the cylinder rod and allow the safety device to engage.
13. To ensure that the bucket/attachment pins are securely held by the quick coupler, apply force to the bucket/attachment by pressing it against the ground.

NOTE: This operation is commonly known as “Bump Test” or “Ground test”.

NOTICE: If the quick coupler is used in conjunction with an hydraulic breaker, do not apply force with the chisel.

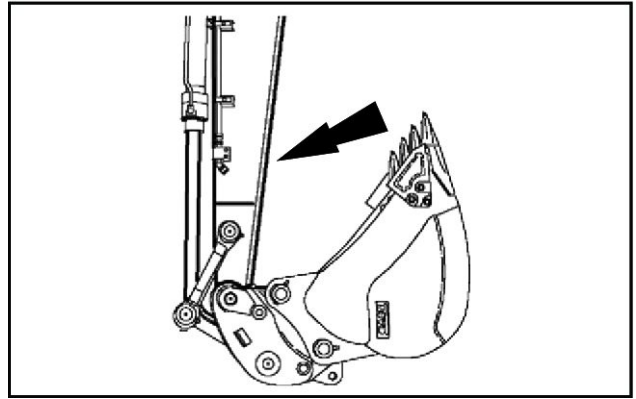


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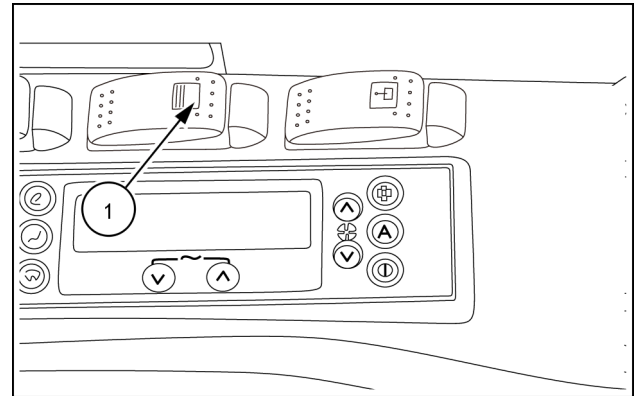
Attachment disengagement

To disengage the attachment using CASE CONSTRUCTION quick coupling system proceed as follows:

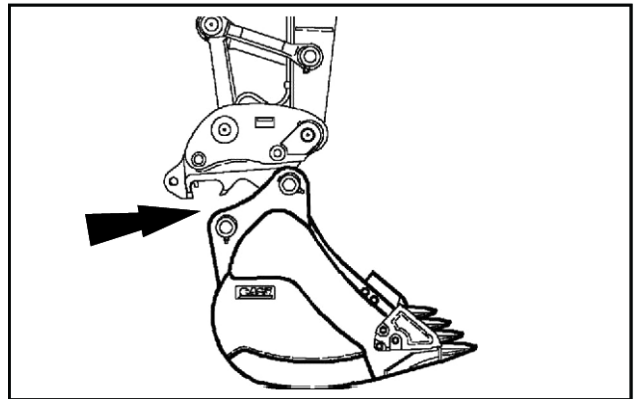
1. Operate the arm and bucket controls so that the arm is practically vertical, sloping slightly towards the cab, to release the safety device.
2. Slide the lock device and press the front side of the quick coupler switch **(1)** to set the unlocking status of the quick coupling system. The audible alarm device starts sounding.
3. Extend the bucket cylinder rod completely and maintain the hydraulic pressure for approximately **5 – 10 s** so that the latching hook retracts.
4. Operate the bucket and arm controls to lay the attachment safely on flat, level ground.
5. Operate the arm control to unhook the attachment.
6. Press the back side of the quick coupler switch **(1)** to set the locking status of the quick coupling system. The audible alarm device stops sounding.



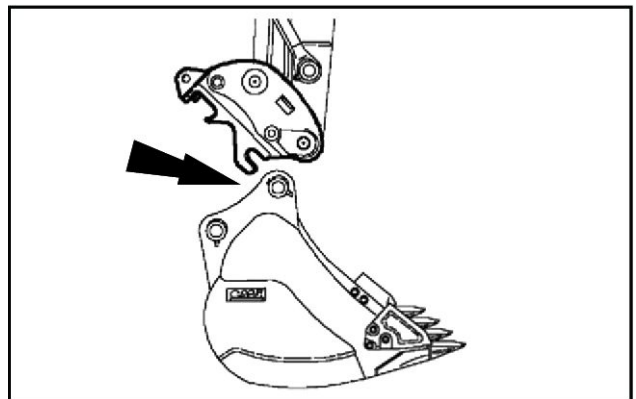
SMIL13CEX2704AB 10



SMIL20CEX1397AA 11



SMIL13CEX2705AB 12



SMIL13CEX2706AB 13

Loads handling

WARNING

Crushing hazard!

During load handling operations, it is very important to adhere strictly to the instructions given in this manual and local legislation.

Failure to comply could result in death or serious injury.

W0257A

WARNING

Improper operation or service of this machine can result in an accident.

When lifting a load the machine must be equipped with:

- safety valves,
- an overload indicator,
- a load fixing point,
- a load handling chart corresponding to the type of machine and to its attachment.

Failure to comply could result in death or serious injury.

W1168A

NOTICE: *the machine has been specifically designed to perform digging/loading works. To handle suspended loads the machine shall be equipped with the appropriate optional provision including safety valves, load lifting table and overload warning alarm. Make sure to handle suspended loads following strictly all current Regulations regarding this application, as well as the rules described in the SAFETY INFORMATION chapter.*

NOTICE: *Make provision for lifting devices that comply with current Regulations for lifting applications. Make sure that the lifting devices (hooks, chains etc.) are in perfect conditions without any sign of excessive wear. Make sure to use selflocking hooks in order to avoid unintended opening during lift operation. The lifting devices can be used exclusively for the lifting of parts not anchored to the ground. Never use them for towing operations, uprooting or tearing apart.*

NOTICE: *a suspended load can swing freely, and it can thus hit persons or the cab of the machine. Make sure that all bystanders are moved away from the field of action of the machine, and make sure to handle the load slowly. If the load starts to swing during the handling, lower it slowly to the ground and sling it in a way that avoid unintended swinging as much as possible.*

To handle suspended loads proceed as follows:

1. Remove the attachment and the pins from the arm top. Make sure to know the mass of the object to be handled and compare it with the data listed in the liftable loads chart **(1)** located in the cab. Do not lift loads exceeding the maximum values prescribed by the table.

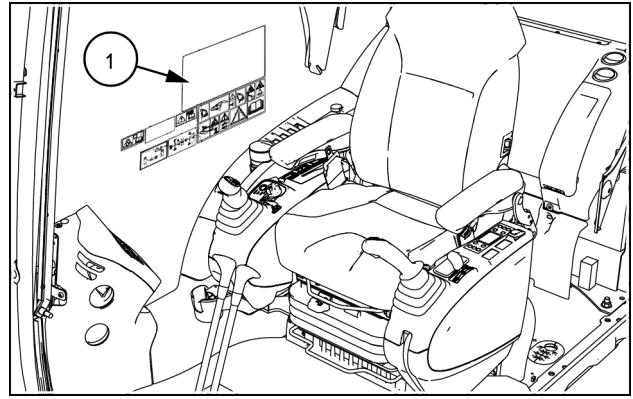
NOTICE: The weight of all lifting accessories must be deducted from the maximum lifting values prescribed by the table.

2. Press the ON side of the overload warning switch **(2)** to activate the overload warning alarm. The overload warning alarm is intended to avoid lifting of excessive loads. If an overload condition is detected during the handling of the load, the message OVER LOAD appears on the top of the display and the overload warning alarm sounds.

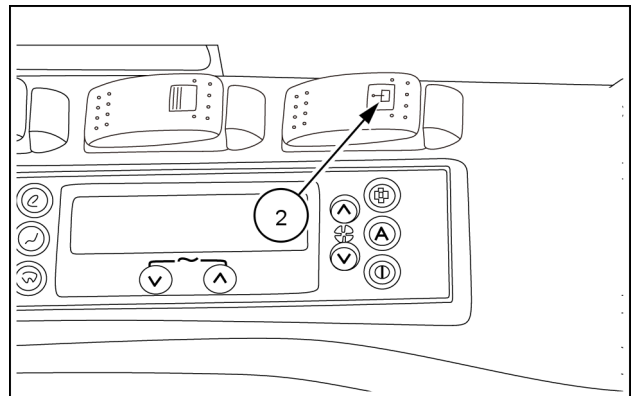


NOTICE: if an overload condition is detected during the handling of the load, place the load onto the ground and check the load conditions making reference to the chart located inside the cab.

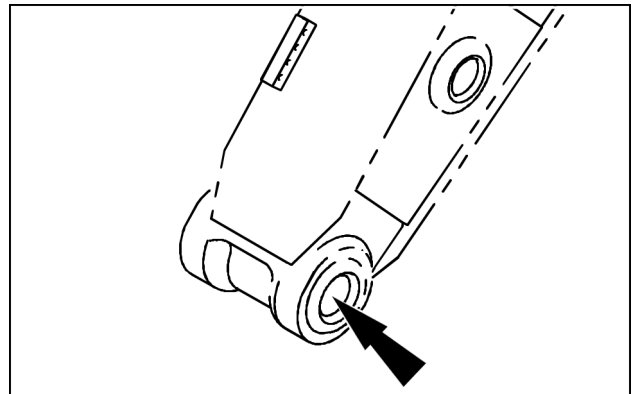
3. Secure the load to the arm top using slinging devices and chains adequate for the load to be lifted. In order to limit the swinging of the load, avoid slinging it with cables and/or chains too long.
4. Select the A work mode.
5. Check the surrounding working area and make sure that the path that may be travelled with the load is free from obstacles.
6. Lift slowly the load, avoiding sharp movements which could cause swinging of the load. Keep the load near the machine, to improve the stability and operate, preferably, along its longitudinal axis, rather than crossways. Lift the load from the ground the minimum height required.
7. Position and place the load where desired, making sure that it is resting on a solid base appropriate for its mass.
8. Remove the chains.



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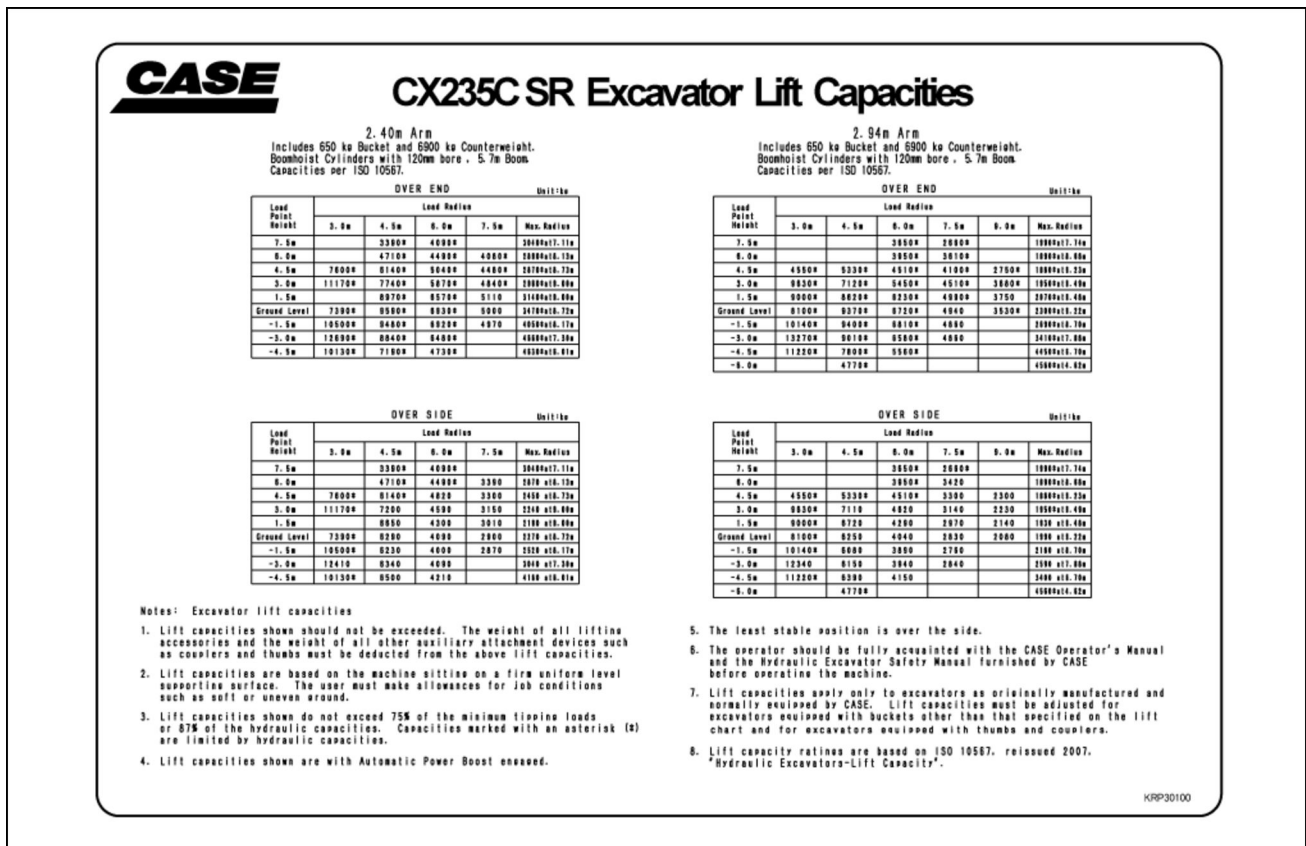


SMIL20CEX1397AA 2



SMIL17CEX2816AA 3

Loads handling chart



SMIL20CEX2464FA 4

1.: Lift capacities shown should not be exceeded. The weight of all lifting accessories and the weight of all other auxiliary attachment devices such as couplers and thumbs must be deducted from the above lift capacities.

2.: Lift capacities are based on the machine sitting on a firm uniform level supporting surface. The user must take allowances for job conditions such as soft or uneven ground.

3.: Lift capacities shown do not exceed **75%** of the minimum tipping loads or **87%** of the hydraulic capacities. Capacities marked with an asterisk are limited by hydraulic capacities.

4.: Lift capacities shown are with automatic power boost engaged.

5.: The least stable position is over the side.

6.: The operator should be fully acquainted with the CASE CONSTRUCTION operator's manual before operating the machine.

7.: Lift capacities apply only to excavators as originally manufactured and normally equipped by CASE CONSTRUCTION. Lift capacities must be adjusted for excavators equipped with buckets other than that specified on the lift chart and for excavators equipped with thumbs and couplers.

8.: Lift capacity ratings are based on **ISO 10567**, reissued 2007 "Hydraulic Excavators Lift Capacity".

Safety valves

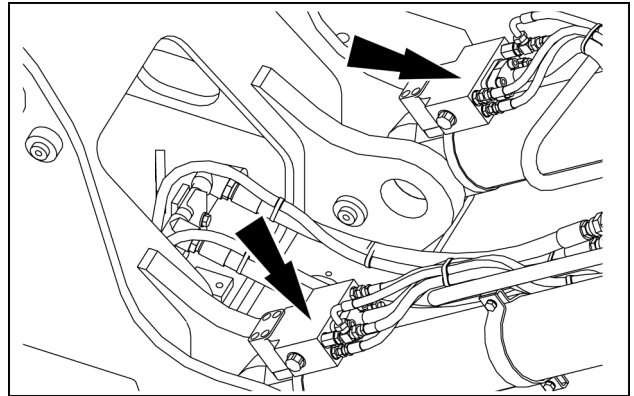
The safety valves are intended to prevent the front equipment from dropping down in the event of a breakage or burst of a hose in the hydraulic lines of boom and arm. The safety valves keep the front equipment in the position at the time of breakage, and thus allow the operator to slowly lower the attachment to the ground using the left and right control levers.

Moreover, the safety valves allow to keep the front equipment in the selected operating position reducing the leakages that occur in the neutral position of the boom spool and the arm spool in the main control valve.

NOTICE: prior to starting any handling of suspended loads check that the valves do not show clear evidence of damages or abnormal noises. In the event abnormal conditions are found, contact the CASE CONSTRUCTION dealer.

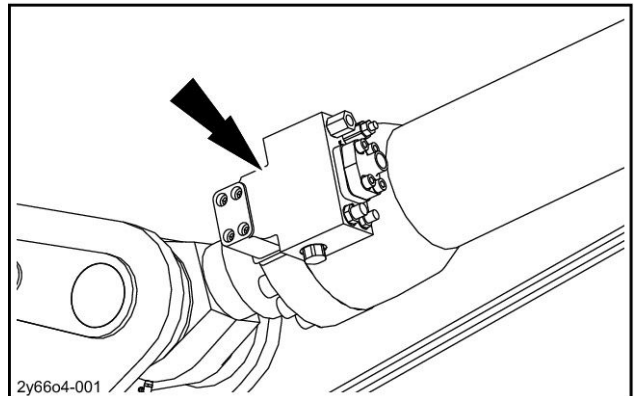
NOTICE: the pressure setting of the safety valves must be checked every 6 months. Consult the CASE CONSTRUCTION dealer.

On boom cylinders



SMIL20CEX2436AA 5

On arm cylinder



2y66o4-001

2Y66O4-001A 6

Front Guard Protective System

The Front Guard Protective Structure (FGPS) must be installed if the machine is operated in conditions where there is a risk of projection of rocks or debris towards the front of the cab, or a risk of collision of heavy objects with the front of the cab.

Two types of FGPS are available: a FGPS compliant to Level 1 as defined by ISO 10262, or a FGPS compliant to Level 2 as defined by ISO 10262.

Level 1 FGPS **(1)** is intended for protection from small rocks, light debris, wood chips, and other light objects encountered in applications such as construction site services, secondary sorting of crushed materials, roads maintenance, waste rehandling, landscaping.

NOTICE: The upper part of the Level 1 FGPS can be opened so to ease cleaning and maintenance of the windshield. Never start machine operation with the upper part of the FGPS opened. Failing to comply may result in death or serious injury.

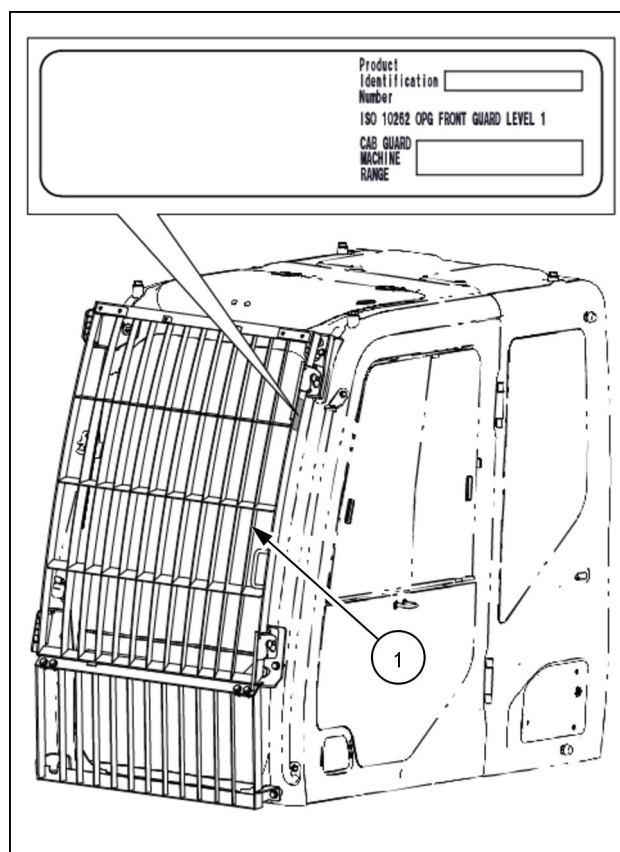
Level 2 FGPS **(2)** is intended for protection from heavy stones, rock or concrete blasts, steel scrap, logs and other heavy objects encountered in applications such as quarry, mining, primary and secondary demolition, scrap loading, log stacking.

The protective structures, the fitting supports and fastening elements on the machine are all parts of an integrated protective system.

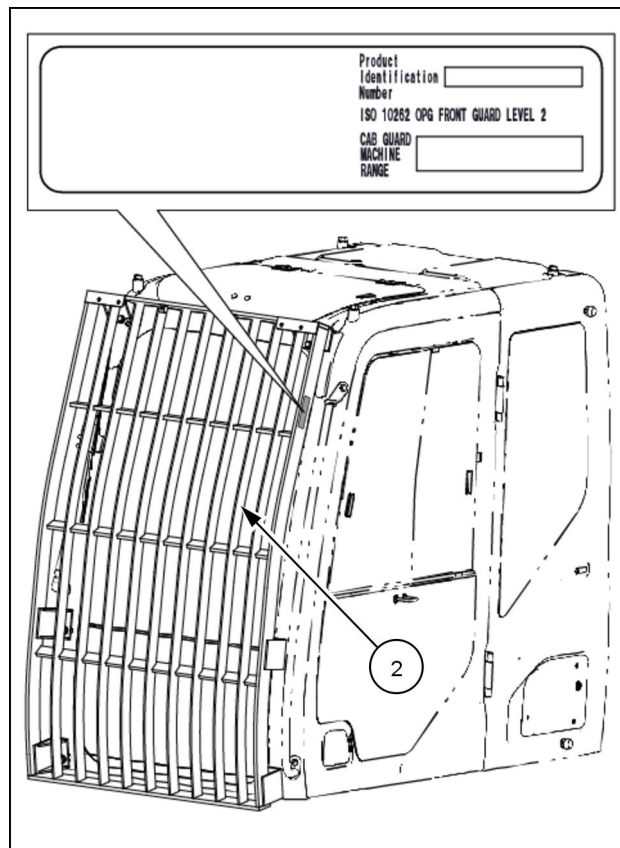
Never make modifications, or drill holes, or weld parts on protective structures. Doing so will result in death or serious injury.

Never attach any device to the protective structures for pulling purposes. Doing so will lead to serious damages to the protective structures.

After a fire, a collision, or a tip-over, or in case of corrosion, the cab protective structures shall be carefully checked for damages by specialised and qualified personnel. Moreover, all damaged parts must be replaced with genuine spare parts, in order to return the protective system to its original condition. Make sure to match the part number of each protective structure. Immediately call the CASE CONSTRUCTION dealer for inspection of the conditions of the cab's protective structures, or to get parts or entire structures replaced.



SMIL17CEX6873BA 1



SMIL17CEX6872BA 2

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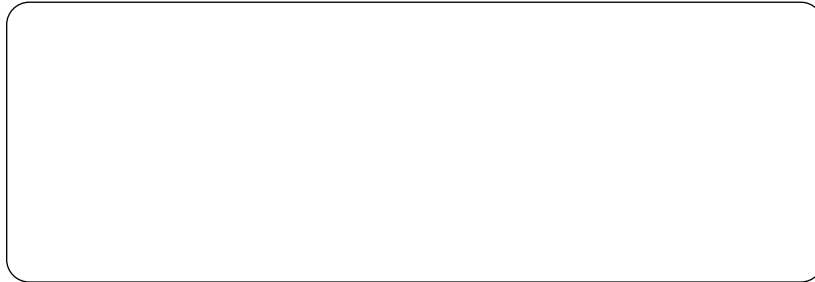
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Availability of some models and equipment builds varies according to the country in which the equipment is being used. For exact information about any particular product, please consult your Case dealer.

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