ORIGINAL INSTRUCTIONS

CX60C
Mini Excavator

OPERATOR'S MANUAL

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CASE CONSTRUCTION

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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 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 CASE CONSTRUCTION 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. They will also provide any after-sales service you may require, and genuine CASE CONSTRUCTION spare parts, your guarantee of quality and match.

CASE CONSTRUCTION customer assistance is also available. Go to www.casece.com

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.

Always give the type and the Product Identification Number (PIN) 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

⚠ WARNING

IMPROPER OPERATION OF THIS MACHINE CAN CAUSE DEATH OR SERIOUS INJURY.
MAKE SURE THAT EVERY OPERATOR:
-learns and practices the safe use of machine controls in a safe, clear area before operating the machine on a job site.
-clears the work area of all bystanders.
-observes pertinent laws and regulations.
-follows the instructions in this operator's manual.
Failure to comply could result in death or serious injury.

W0189A

NOTICE: *do not use the excavator for operations which are foreign to its specifications and not included in this operator's manual. CASE CONSTRUCTION and CASE CONSTRUCTION dealer are 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 CASE CONSTRUCTION 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)

Interference may arise as a result of add-on equipment that 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:

- 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
- The add-on equipment must not interfere with the functioning of the on board electronics

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

Telematics (optional)

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

This machine can be 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 CONSTRUCTION **SiteWatch™** 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. 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:

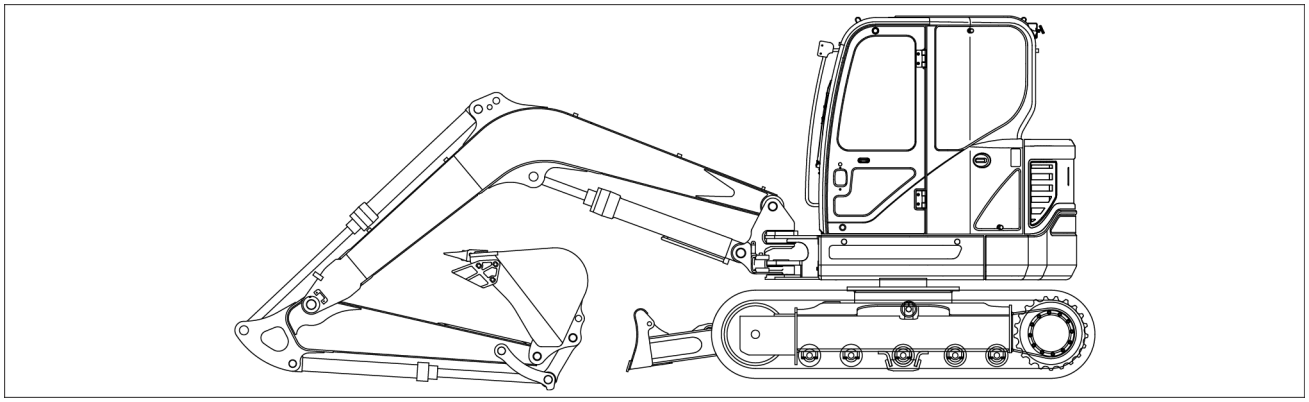
- You do not understand any information in this manual
- You need more information
- You need assistance

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

Your machine is a hydraulic excavator. It consists of an undercarriage fitted with tracks and a swing bearing which supports the upper-structure frame. The upper-structure 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.



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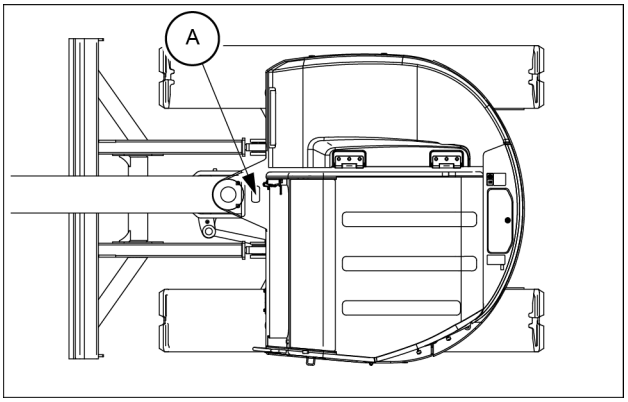
When ordering parts, obtaining information, or seeking assistance, always supply your CASE CONSTRUCTION Dealer with the type and serial number of your machine or accessories.

Write the following in the spaces below:

- Machine type.
- Machine PIN.
- Machine year of manufacture.
- Serial numbers of hydraulic and mechanical components.

Machine

The machine Product Identification Number (PIN) plate **(A)** is located in the upper part of the swing post.



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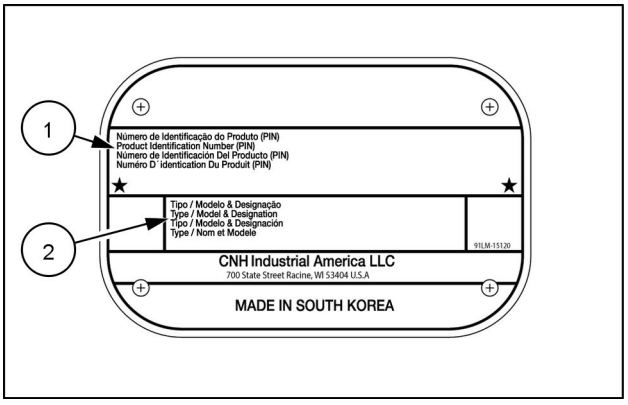
(1) Product Identification Number (PIN)_____

(2) Type/Model & designation_____



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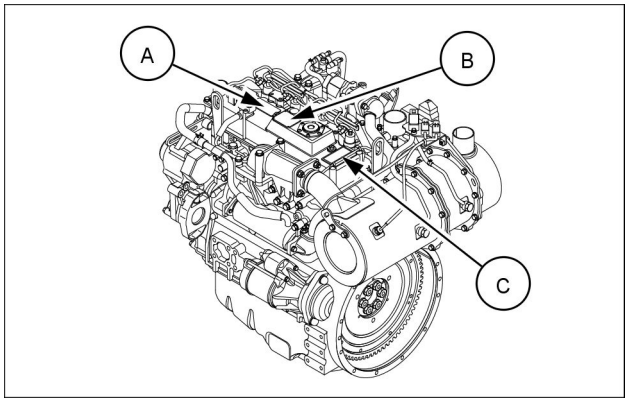
Engine

The engine serial number **(A)** is located on the engine name plate.



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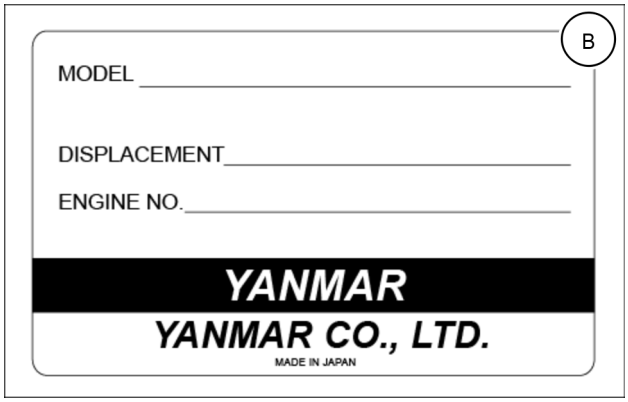
ID label (B)

This is attached on the cylinder head cover.



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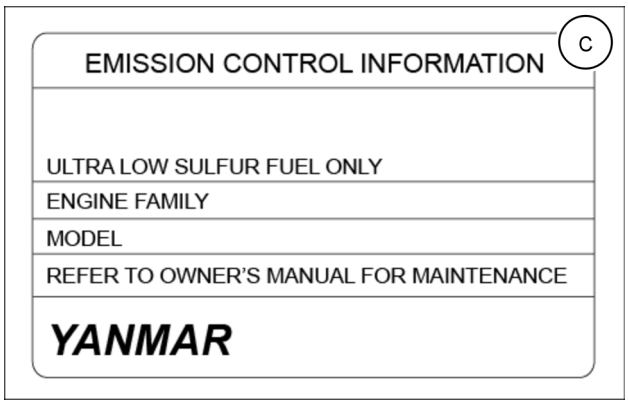
Emission decal (C)

The emission decal is affixed on the cylinder head cover. It describes important details for using the engine. Make sure to read before using the engine. Also, the emission decal describes details regarding the engine only.



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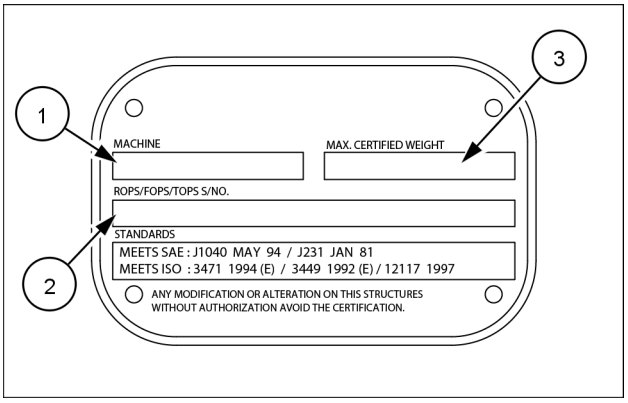
Roll Over Protective Structure (ROPS)

Complies with ISO 12117-2

(1) Machine Models:

(2) Product Part Number:

(3) Maximum machine mass:



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Component serial numbers

Hydraulic pump:

Swing reduction gear:

Travel reduction gears:

Travel control valve:

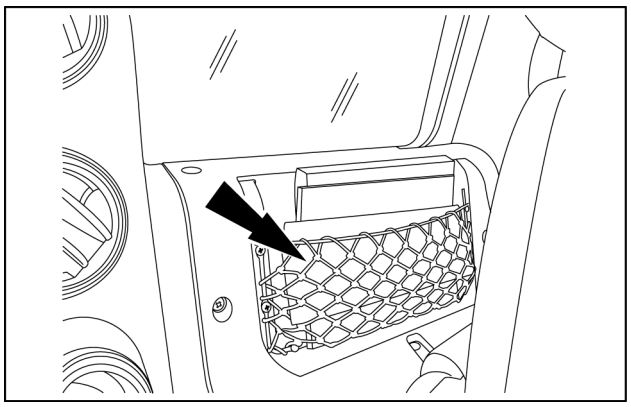
Attachment control valve:

Swing control valve:

Operator's manual storage on the machine

Always keep the manual in the location provided for that purpose (in the pocket or in the storage compartment located in the rear side of the cab).

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.



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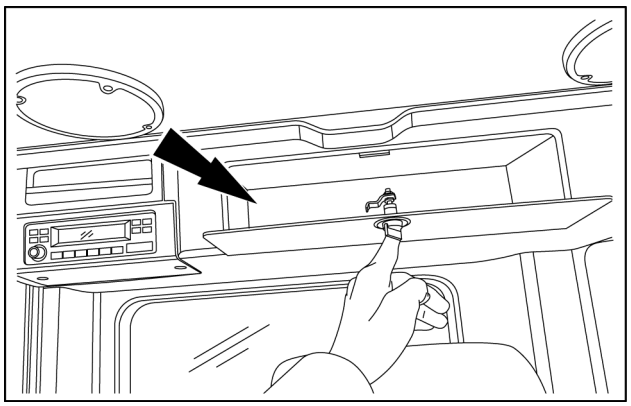

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Machine orientation

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 travel motors are positioned at the rear and the operator is facing the direction in which the machine advances (forward).

A. Front

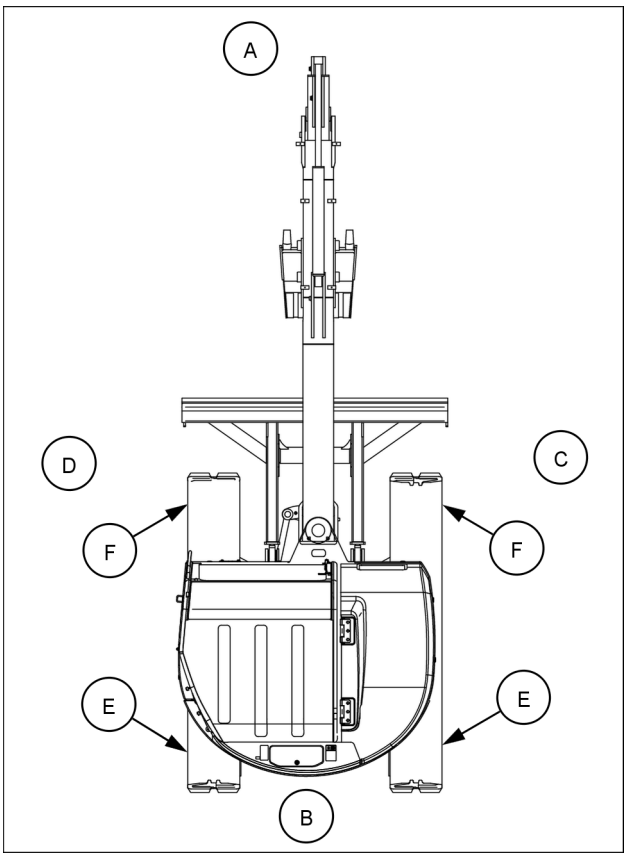
B. Rear

C. Right-hand side

D. Left-hand side

E. Travel motor

F. Idler wheel



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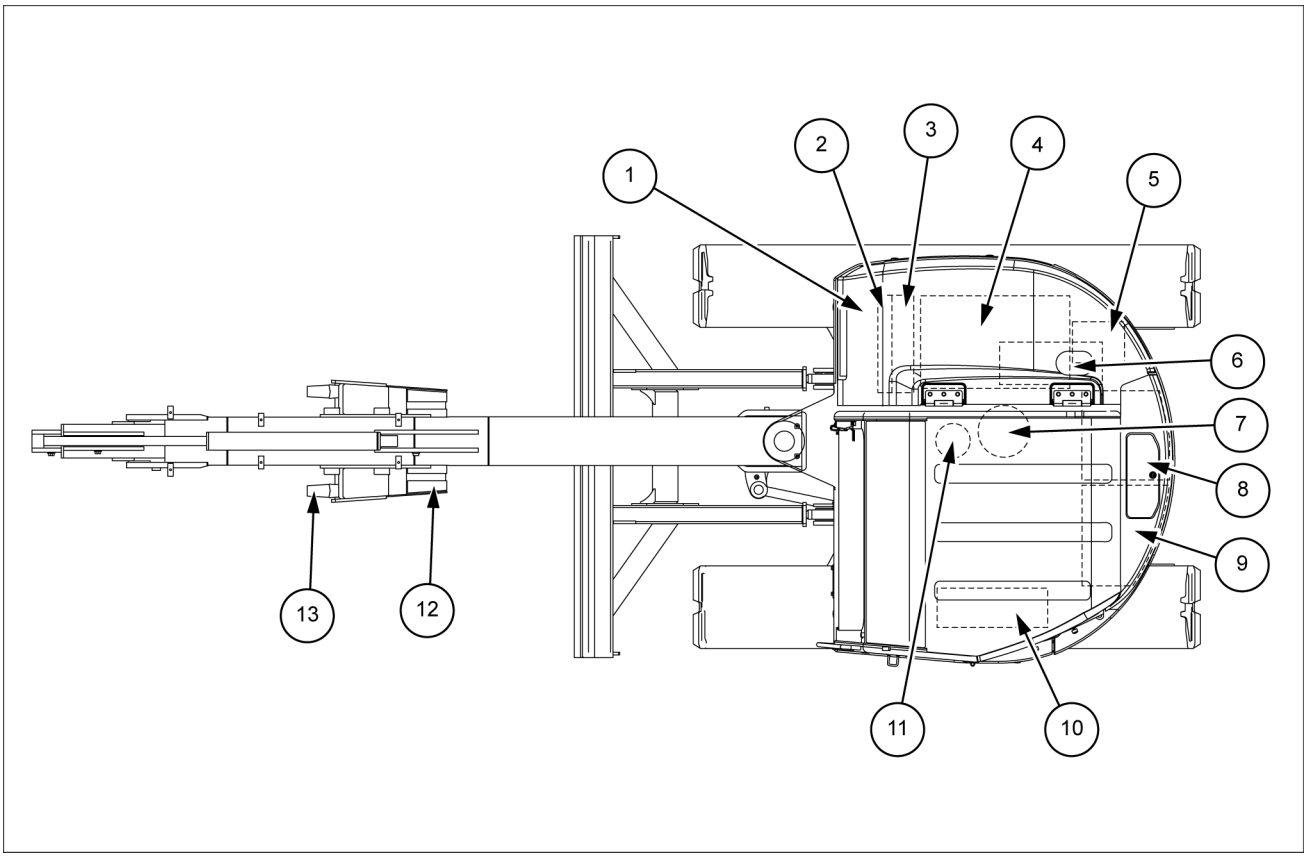
Machine components



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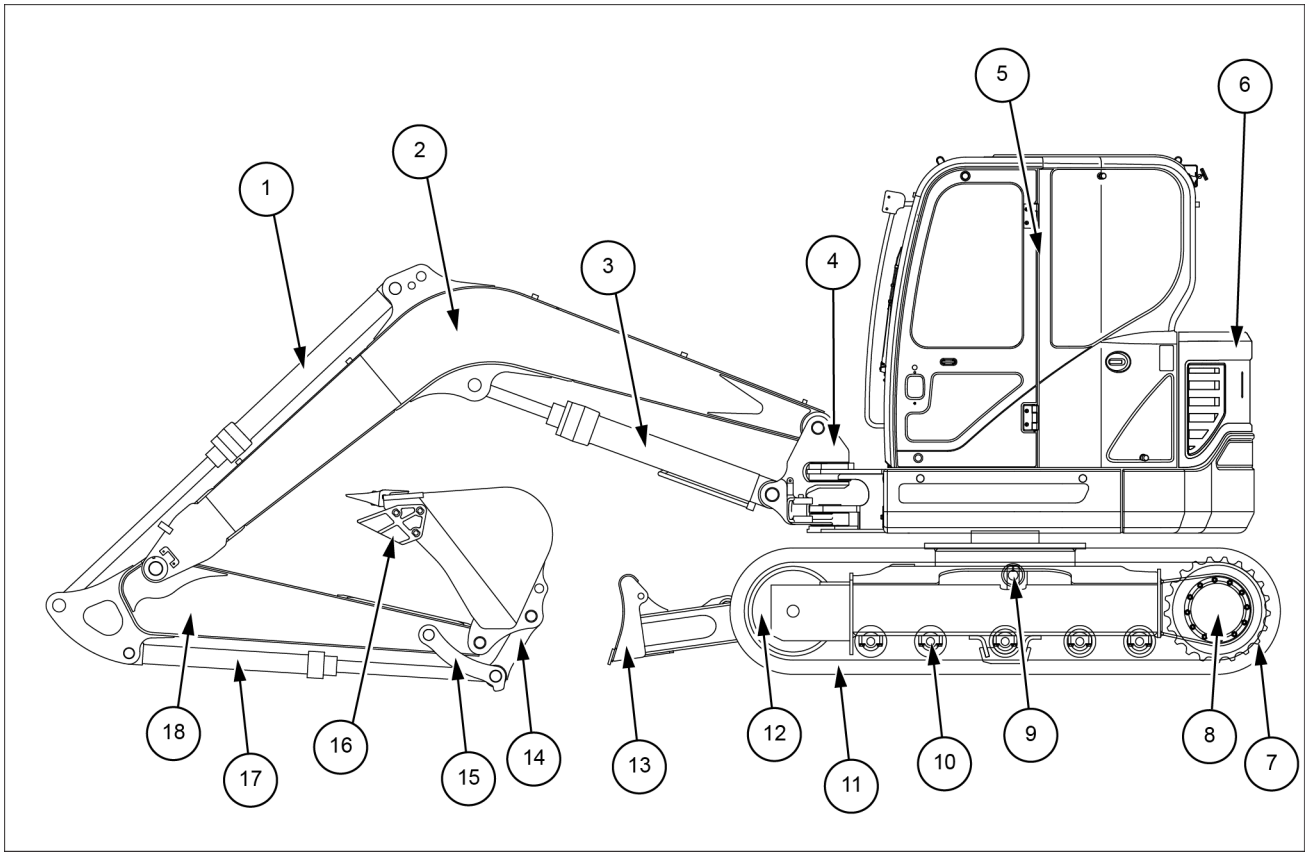
1. Engine hood
2. Radiator
3. Oil cooler
4. Engine
5. Main pump
6. Muffler
7. Swing motor
8. Hydraulic tank
9. Fuel tank
10. Main control valve
11. Hydraulic center joint
12. Bucket
13. Tooth



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1. Arm cylinder
2. Boom cylinder
3. Swing post
4. Cab
5. Counterweight
6. Sprocket
7. Travel motor
8. Upper roller
9. Lower roller
10. Track
11. Idler wheel
12. Dozer blade
13. Control rod
14. Control link
15. Side cutter
16. Bucket cylinder
17. Arm

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 - Utility precautions

YOU MUST FOLLOW safety precautions when you work near buried utility lines.

During operation, it is likely that you will be working around or near buried utility lines that may include, but are not limited to:

- Electrical power line
- Gas line
- Water line
- Communication line - telephone or cable television
- Sewer line

NOTE: *Before construction work begins it is your responsibility to be aware of all utility lines in the area of your project and to avoid them.*

ALWAYS have all local utility companies mark the location of their lines.

In U.S.A. and Canada call one of many One Call System Director services. If you do not know the local number, call the national number (U.S.A. and Canada only): 1-888-258-0808. This number will direct you to the state or regional utility that assists with excavation activity.

NOTE: *Check with local authorities for laws, regulations, and/or strict penalties requiring you to locate and avoid existing utilities.*

Call all utility companies before you perform any machine operation

After you locate any buried utility lines, carefully dig a hole to the utility line by hand and/or with automatic vacuum equipment. Verify the location and depth of the line.

Where applicable, know the utility color code.

Electric	Red
Gas, Oil, or Petroleum	Yellow
Communication, Telephone, Television	Orange
Water	Blue
Sewer	Green or Brown
Proposed Excavation	White
Surveying	Pink
Reclaimed Water and Slurry	Purple

Coordinate all excavation activity with the proper authorities and professionals before beginning.

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.

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.

⚠ 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.

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 than 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 or 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 hand-holds, steps, and/or 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.

Never mount or dismount from a moving machine.

Do not use the controls or accessories as hand-holds when you enter or exit the cab.

⚠ 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.

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.

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 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.

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.

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.

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

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. 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 adequate.
- 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 familiar with hand signals in daily use on the work-site so as to be able to obtain help with tight maneuvers 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 exiting 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 work-site 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, swing 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 signs. Keep the signs clean so that they are completely legible at all times.

⚠ 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 dozer blade.
- 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 (these actions cause 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.
- 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 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 safe. If bridges are to be crossed, make sure they are 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 must 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.

- 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 you exit 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 to "O" (Off) position when engine is running. The electrical systems can be damaged.
- When the engine is stopped, always wait three minutes minimum before you 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 adjustment controls are in good condition and then adjust the seat to suit the operator's size and weight.

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 damage the machine. Always leave a safe distance between the quick coupler and the machine..
- 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. 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 upper-structure 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 understood the safety messages and instructions featuring in this manual.
- When carrying out service work always wear suitable attire. Avoid loose-fitting clothing.
- Release pressure completely in the hydraulic system before disconnecting the hydraulic lines. 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.
- Poorly 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. Use only genuine CASE CONSTRUCTION parts.
- Pressurized hydraulic fluid or grease that 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 upper-structure carriage as authorized by CASE CONSTRUCTION and in accordance with the instructions, disconnect the batteries, disconnect the alternator B+ and D+ terminal wires, and connect the welding apparatus ground 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 upper-structure (or vice-versa). Never connect the welding apparatus ground 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 program: counterweight, swing 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 line when the engine is running and immediately after it has been shut down. Wait for two minutes after engine shut down before you do any maintenance or inspections to allow the pressure to drop in the line.
- 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 ⚠

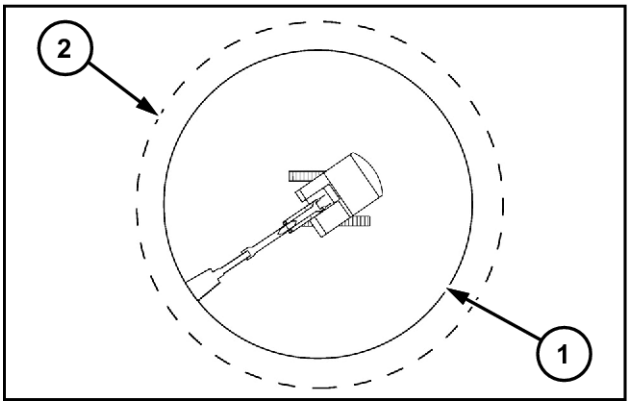
- For the implement operation and maintenance, refer to the operator's manual provided with the implement.

⚠ 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.



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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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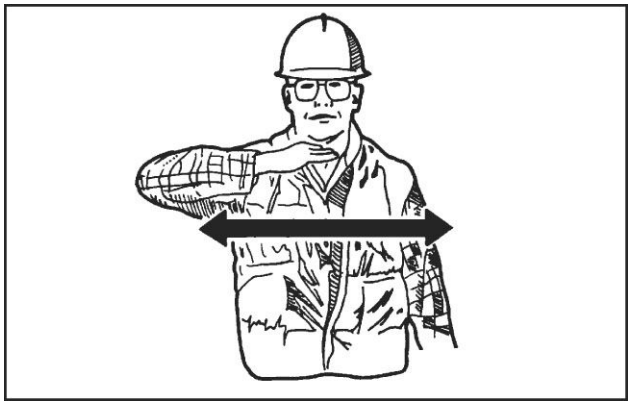
Hand signals

When operating the machine, always work with a signalman when you carry out tasks that require fine control and/or require you to work in areas with poor or impaired visibility. Make sure that you and the signalman understand the signals to be used.

Start the engine

PDE0002ATBP1 1

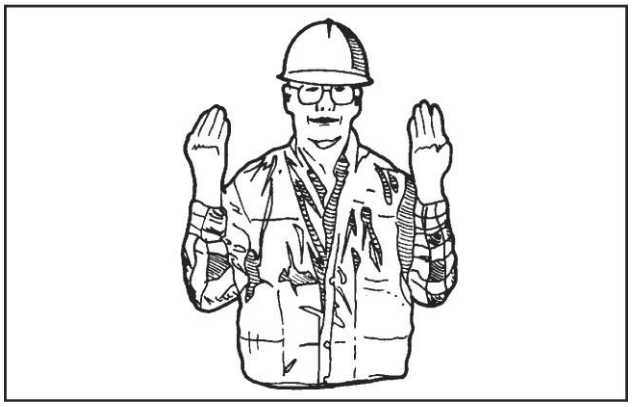
Shut down the engine



PDE0002TBP1 2

Come to me

Wave hands back and forth (palms inwards).



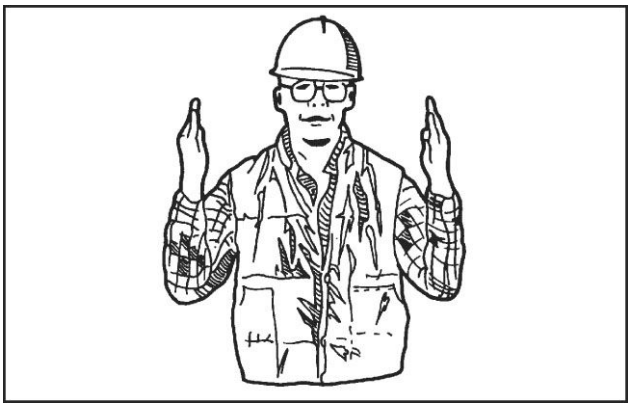
PDE0003ATBP1 3

Move away from me

Wave hands back and forth (palms outwards).

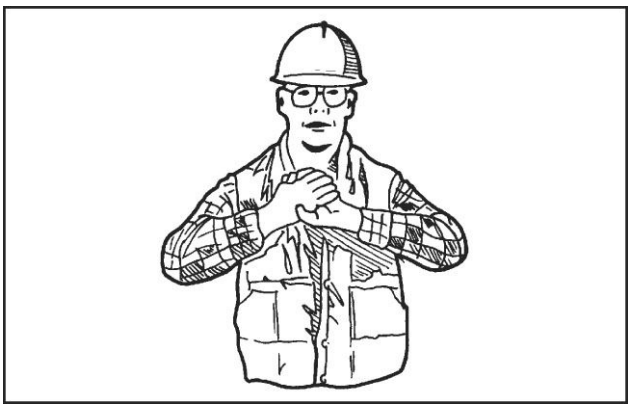
PDE0003TBP1 4

Go this far



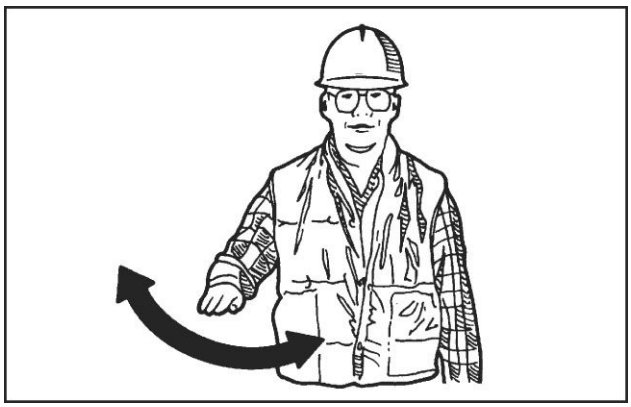
PDE0004ATBP1 5

All stop and hold



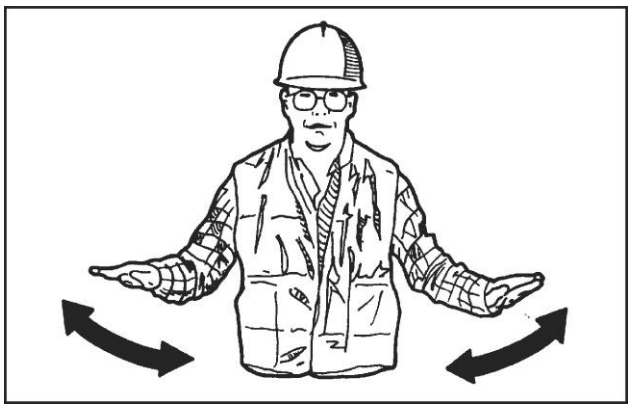
PDE0004TBP1 6

Stop
Wave one hand back and forth.



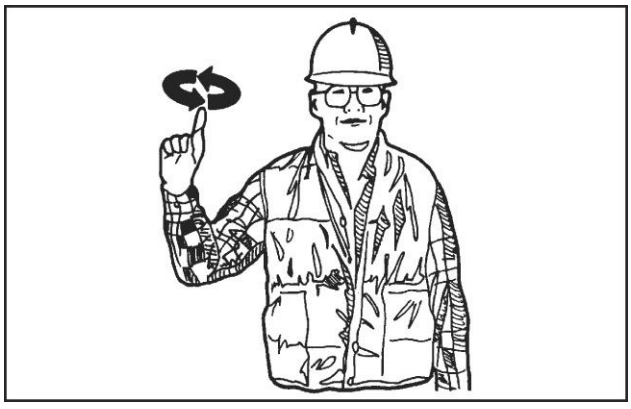
PDE0005ATBP1 7

Emergency stop
Wave hands back and forth.



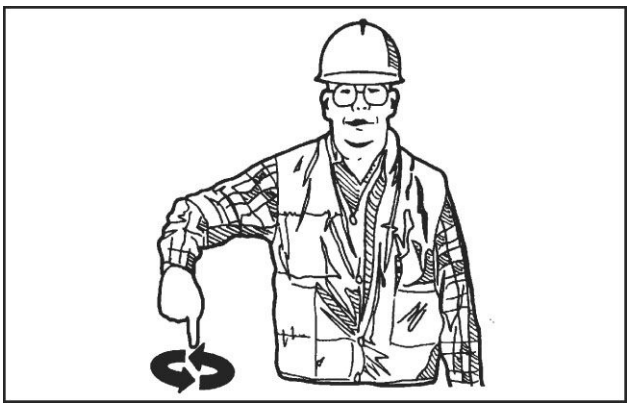
PDE0005TBP1 8

Raise load or tool



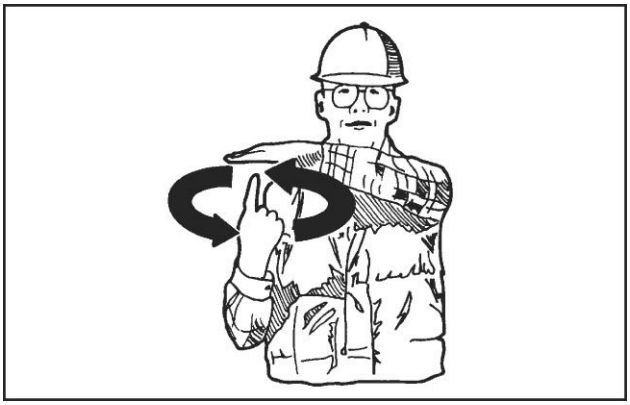
PDE0006ATBP1 9

Lower load or tool



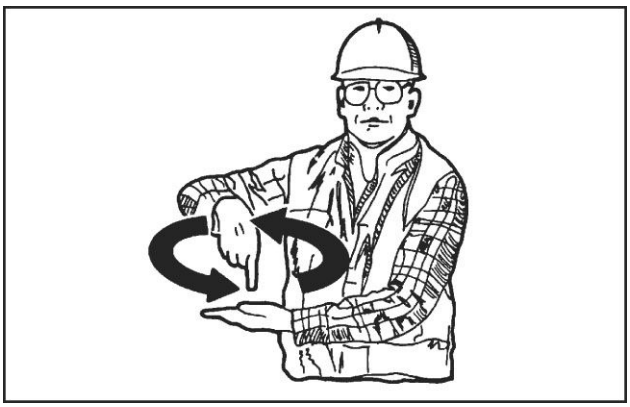
PDE0006TBP1 10

Slowly raise the load or tool



PDE0007ATBP1 11

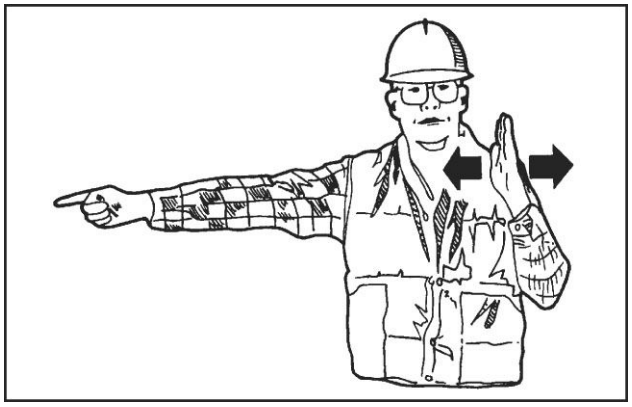
Slowly lower the load or tool



PDE0007TBP1 12

Turn machine left (swing load left)

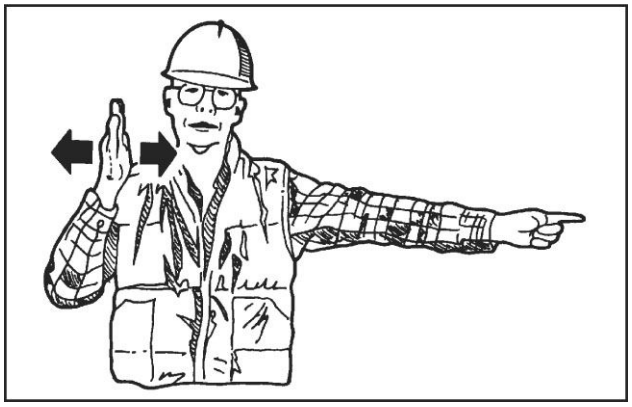
To stop movement, stop moving hand and clench fist.



PDE0008ATBP1 13

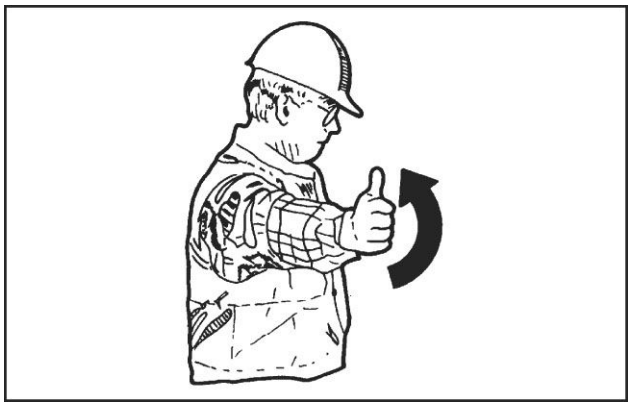
Turn machine right (swing load right)

To stop movement, stop moving hand and clench fist.



PDE0008TBP1 14

Raise tool

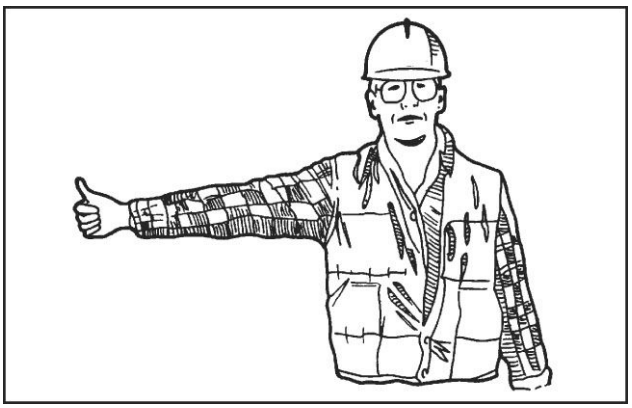


PDE0009ATBP1 15

Lower tool

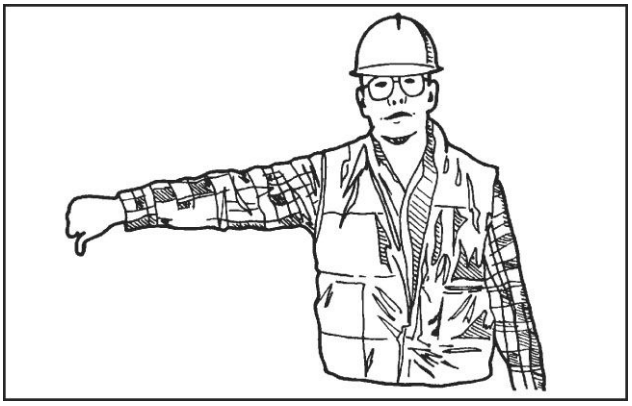
PDE0009TBP1 16

Lift boom



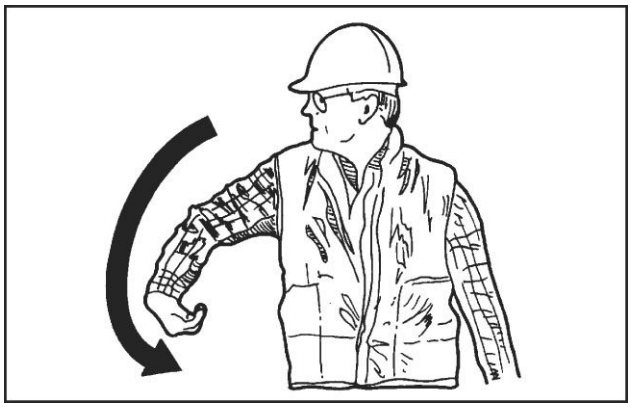
PDE0010ATBP1 17

Lower boom



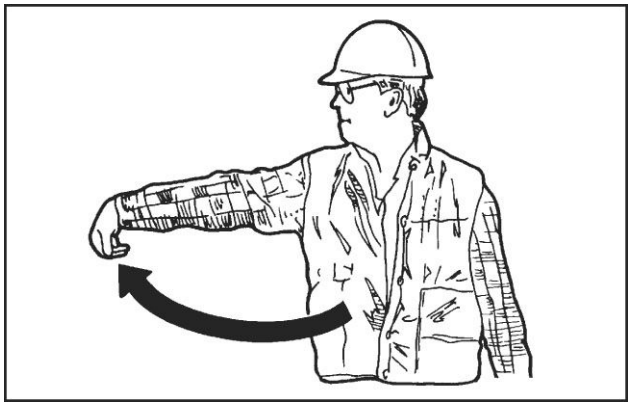
PDE0010TBP1 18

Retract dipper



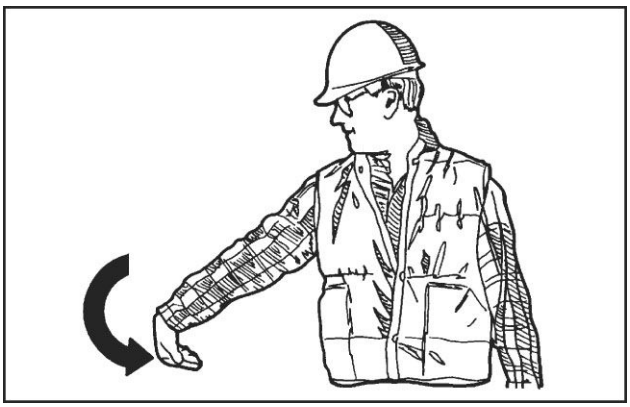
PDE0011ATBP1 19

Extend dipper



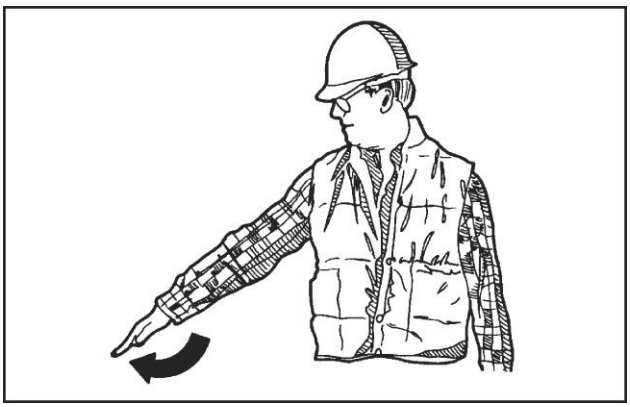
PDE0011TBP1 20

Fill tool



PDE0012ATBP1 21

Empty tool



PDE0012TBP1 22

California proposition 65 warning

CALIFORNIA
PROPOSITION 65 WARNING
Diesel engine exhaust and some of its constituents
are known to the State of California to cause cancer,
birth defects and other reproductive harm.
Battery post, terminals and related accessories
contain lead and lead compounds.
Wash hands after handling

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

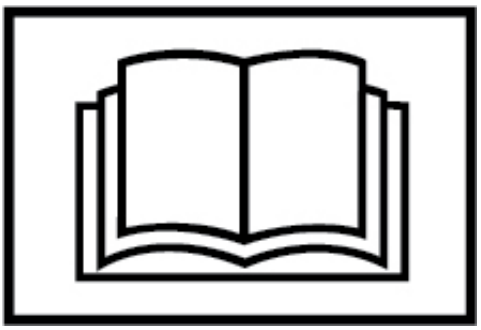
The following safety signs are on your machine as a guide for your safety and for the safety of those working with you. Walk around the machine and note the content and the location of all safety signs before you operate your machine.

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

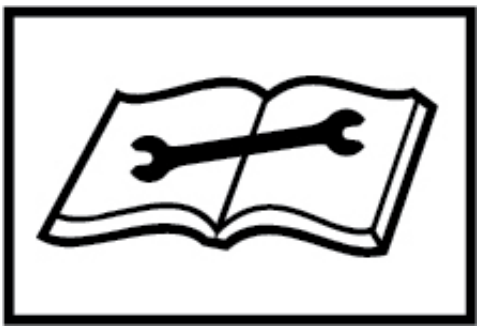
NOTICE: *do not use solvent, gasoline, or other harsh chemicals. Solvents, gasoline, and other harsh chemicals may damage or remove safety signs.*

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.

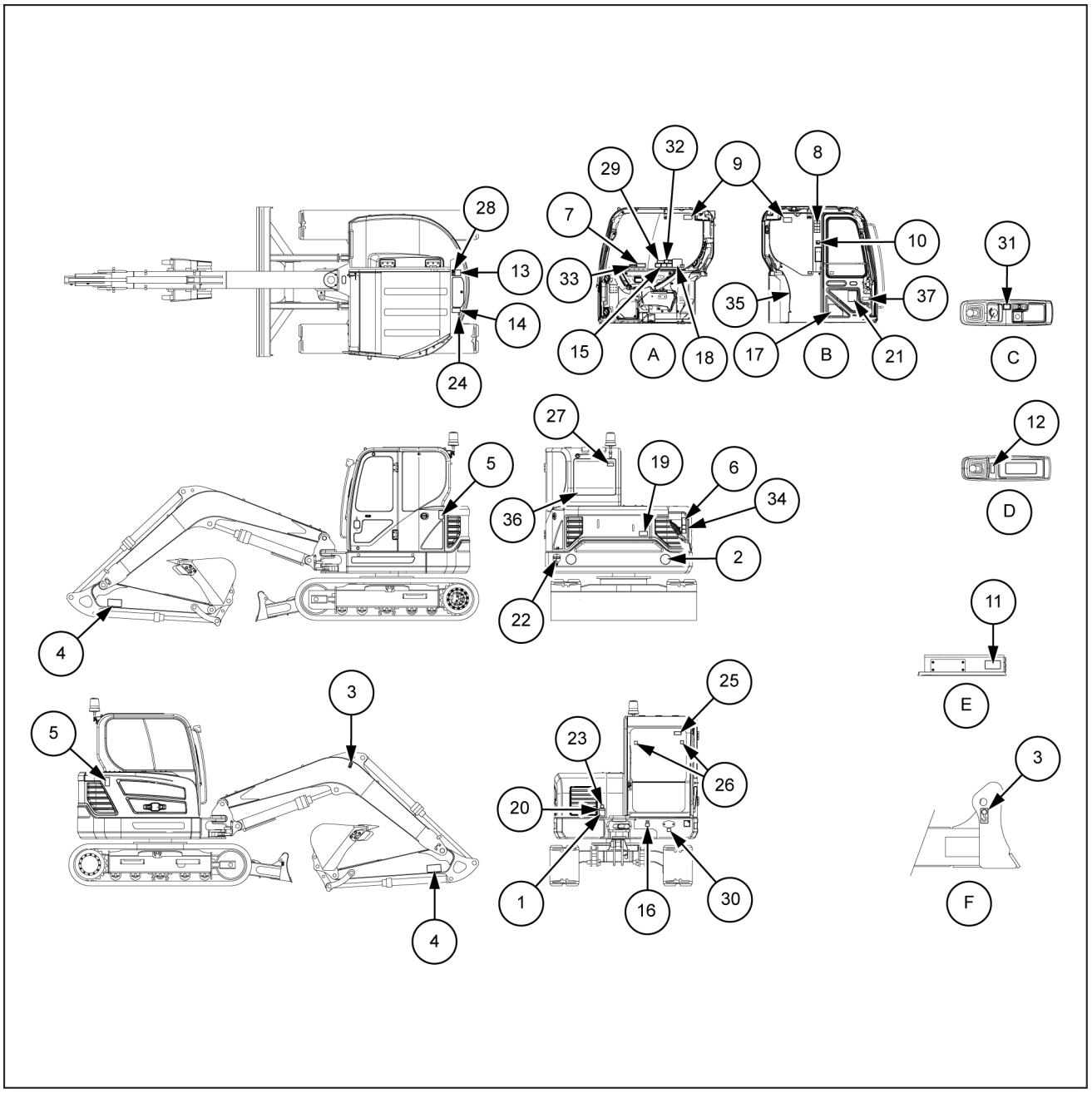


Safety signs that display the "Read service manual" symbol direct you to the service manual. If you doubt your ability to perform service operations, contact your CASE CONSTRUCTION dealer.



Sign positions

When you replace a safety sign or other machine decal, make sure you position it as shown below.



SMIL16MEX1423GB 1

A. Cab inside - Right-hand
B. Cab inside - Left-hand
C. Console box - Right-hand
D. Console box - Left-hand
E. Operator’s seat base
F. Side plate - Left hand / Right hand

(1) Batteries

⚠ 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

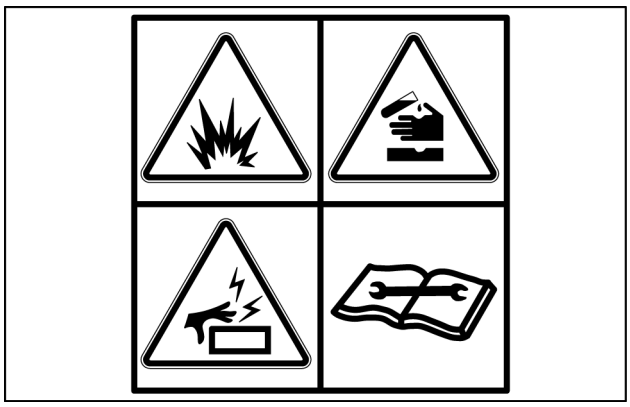
Explosive gas!
Batteries emit explosive hydrogen gas and other fumes while charging. Ventilate the charging area. Keep the battery away from sparks, open flames, and other ignition sources. Never charge a frozen battery.
Failure to comply could result in death or serious injury.

W0005A

⚠ 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



SMIL16MEX0009AA 2

Location: this sign is located on the screen plate.

Quantity: 1

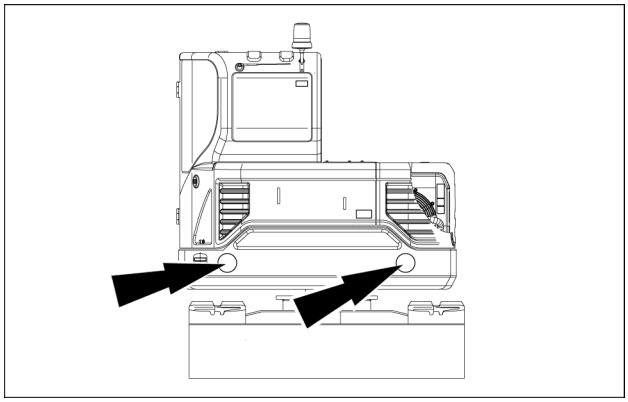
This sign shows that it is necessary to consult this manual before handling the batteries.

(2) Reflecting sign

Location: the two reflecting signs are located in the rear side of the machine, on the counterweight.

Quantity: 2

The reflecting sign increases the night-time visibility.



SMIL16MEX1077AA 3

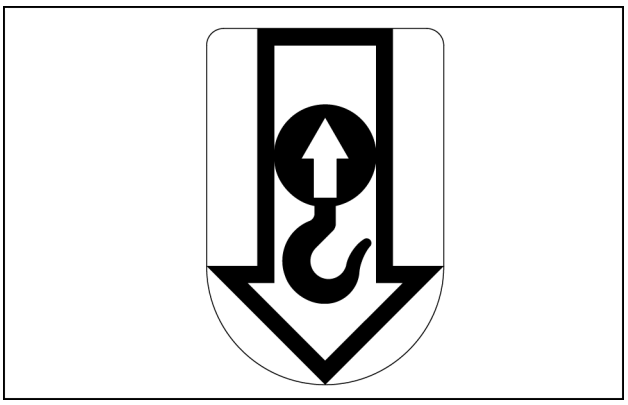
(3) Lifting location

Location: this signs are located on the boom and on the dozer blade.

Quantity: 2

This sign shows the location where a sling is attached to handle the excavator.

Never use any location other than the lifting location that this sign shows.



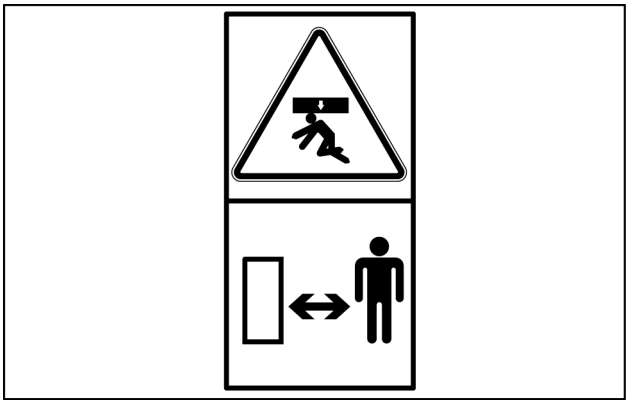
SMIL15CEX0450AA 4

(4) Keep out of work range of attachment

⚠ WARNING

Falling object hazard!
Loss of hydraulic pressure or movement of a control can cause raised equipment to fall. Never work under an implement or attachment supported only by the hydraulic system. Always use suitable equipment to support an implement or attachment that must be serviced in a raised position.
Failure to comply could result in death or serious injury.

W0325A



SMIL16MEX0003AA 5

Location: this sign is located on both side of the arm.

Quantity: 2

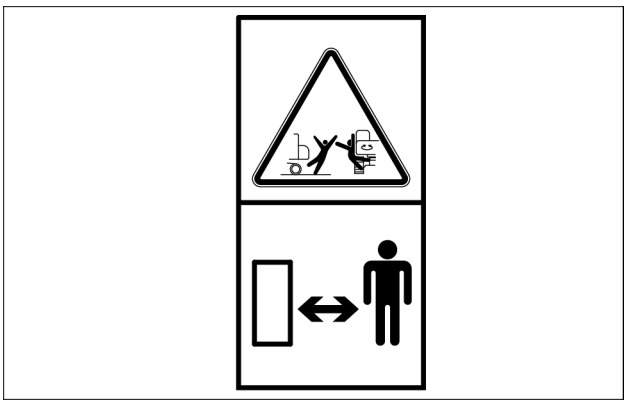
This sign warns the operator that entry into the work range of the attachment is forbidden while the engine is running.

(5) Keep out of work range of upper structure

⚠ DANGER

Avoid injury!
Keep clear of the swing area. Ensure that any person near the working site is outside the swing area before you start or operate the machine. Sound the horn before you start or operate the machine.
Failure to comply will result in death or serious injury.

D0123A



SMIL16MEX0478AA 6

Location: this sign is located on the side of the engine hood.

Quantity: 2

This sign cautions the operator that entry into the work range of the upper structure is forbidden while the engine is running.

(6A) Engine hood support caution - Stop the engine

⚠ WARNING

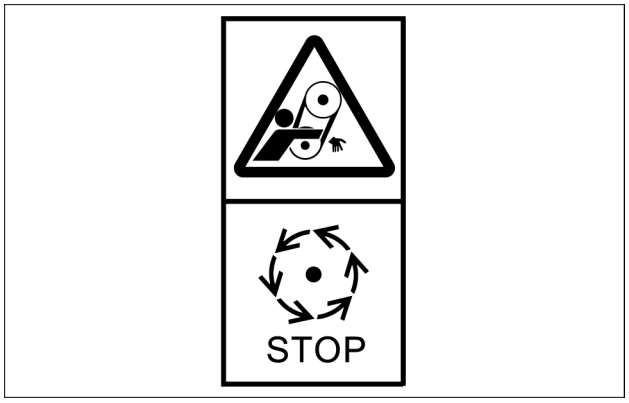
Entanglement hazard!
Always stop the engine and engage the parking brake, unless otherwise instructed in this manual, before checking and/or adjusting any drive belt or chain.
Failure to comply could result in death or serious injury.

W0097A

Location: this sign is located on the side of the radiator.

Quantity: 1

This sign indicates that you should stop the engine before opening the hood.



SMIL16MEX0013AA 7

(6B) Engine hood support caution - High pressure hoses and radiator

⚠ 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

⚠ WARNING

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 death or serious injury.

W0178A

SMIL16MEX1544BA 8

Location: this signs is located on the side of the radiator.

Quantity: 1

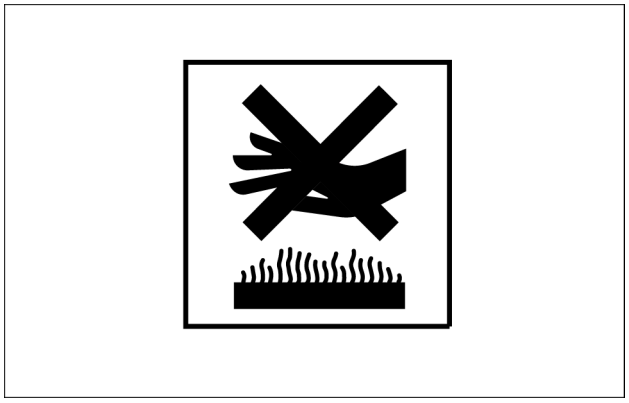
This sign warns you not to loosen the high pressure hoses, not to touch the radiator, and not to remove the radiator cap before the temperature of the cooling system drops.
Start working after the cooling system is sufficiently cooled down.

(6C) Engine hood support caution - Hot surfaces

⚠ WARNING

Burn hazard!
Exhaust surfaces are hot! Always wear protective gloves when cleaning or working on the muffler, catalytic converter, or exhaust stack.
Failure to comply could result in death or serious injury.

W0329A



SMIL16MEX0361AA 9

Location: this sign is located on the side of the radiator.

Quantity: 1

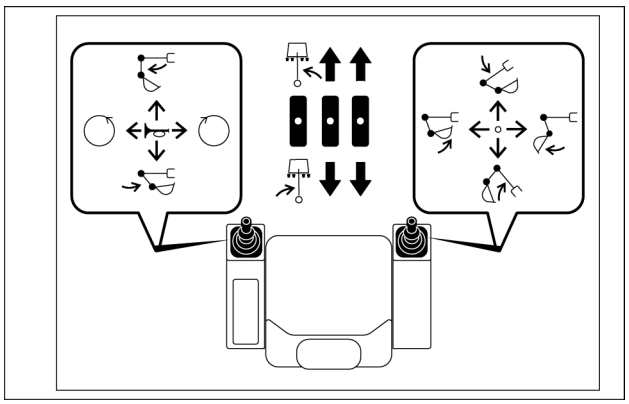
This sign warns to never touch the engine or the muffler when they are still hot.

(7) Functions of operation levers

Location: this sign is located in right-hand window of the cab.

Quantity: 1

This sign describes the functions of operation levers.



SMIL16MEX1519AA 10

(8) Danger electric line - Interference with attachments

⚠ WARNING

Fold zone!
The booms may hit the cab when folding. Use extra care during manual boom folding and unfolding.
Failure to comply could result in death or serious injury.

W0032A

⚠ CAUTION

Electrocution hazard!
Contact with overhead power lines can cause severe electrical burns or death from electrocution. Make sure there is enough clearance between equipment and overhead power lines.
Failure to comply could result in minor or moderate injury.

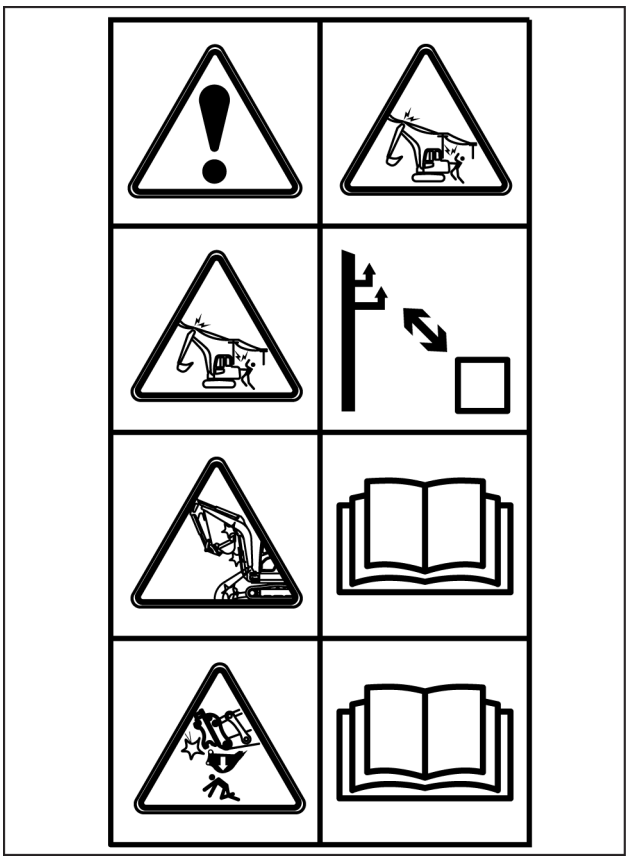
C0103A

Location: this sign is located on the right–hand side window of the cab.

Quantity: 1

This sign shows that work near overhead high-voltage electric lines must not be done without checking beforehand that all necessary measures have been taken to respect the minimum distances.

The cab and/or the boom may collide with the arm or the bucket (at the end of the attachment) depending upon the length of the arm, the size of the bucket, the angle of the boom swing, or the installation of a quick coupler or other attachment. Be sure to avoid abrupt operation and secure proper clearance in order to prevent collision with the cab and the fuselage.



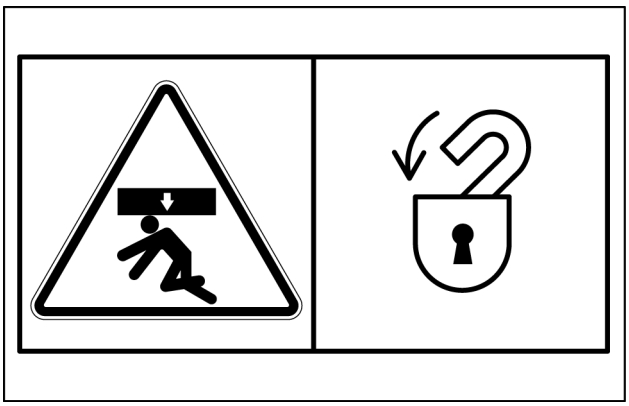
SMIL16MEX0002BA 11

(9) Safety front window

Location: this sign is located on the both sides window of the cab.

Quantity: 2

Be careful that the window may be promptly closed. During the machine movements the window could fall injuring the operator.



SMIL16MEX0005AA 12

(10) Emergency exit

⚠ WARNING

Avoid injury!
A safety sign indicates which window to use as an emergency exit. Remove this window only in an emergency. Do not place any object that could be an obstacle in case of evacuation in front of this window.
Failure to comply could result in death or serious injury.

W1435A

SMIL16MEX1421AA 13

Location: this sign is located above the hammer in the cab.

Quantity: 1

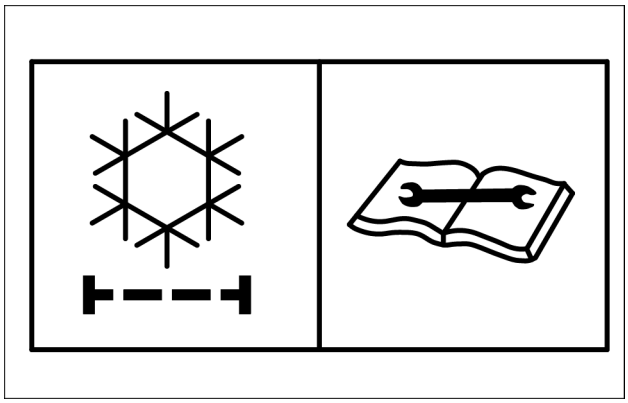
This sign shows how to use the emergency exit.
In case of emergency, use the hammer to break the identified window of the cab.

(11) Instructional sign for air conditioning filter

Location: this sign is located on the lower side of the operator's seat base.

Quantity: 1

Read this Operator's Manual before perform maintenance on the air conditioning filter.



SMIL16MEX0481AA 14

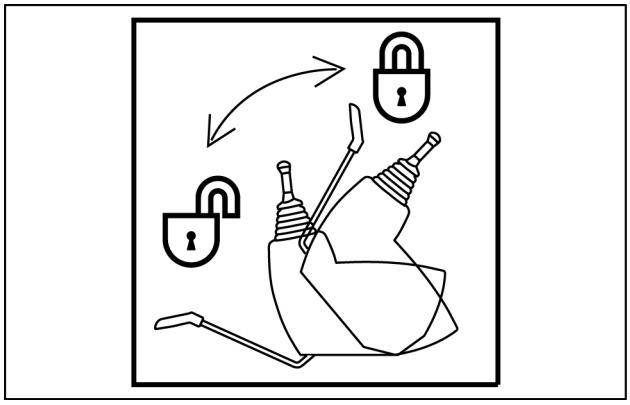
(12) Parking the machine

Location: this sign is located on the left-hand console box.

Quantity: 1

To prevent unauthorized and unintended movement of the machine, always do the following before you leave the operator's compartment:

1. Lower the bucket to the ground completely.
2. Place the safety lock lever in the raised position.
3. Stop the engine.
4. Remove the key.



SMIL16MEX0015AA 15

(13) Hydraulic oil

⚠ 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

SMIL16MEX0008AA 16

Location: this sign is located on the rear door.

Quantity: 1

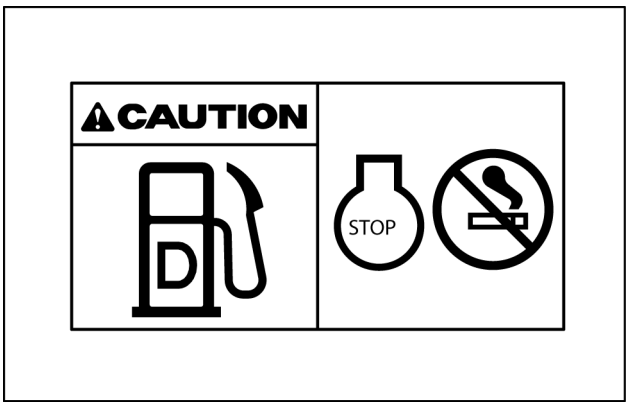
This sign warns you not to open the filler cap while engine running or at high hydraulic oil temperature.
This sign warns you to loosen the cap slowly and release the internal pressure completely.
This sign warns you not to mix with different brand oils.

(14) Fuel tank

⚠ CAUTION

Fuel vapors are explosive and flammable.
Do not smoke while handling fuel. Keep fuel away from flames or sparks. Shut off engine and remove key before servicing. Always work in a well-ventilated area. Clean up spilled fuel immediately.
Failure to comply could result in minor or moderate injury.

C0195A



SMIL16MEX0006AA 17

Location: this sign is located on the rear door.

Quantity: 1

This sign shows the position of the fuel tank and the fuel to use.
This sign warns you to stop the engine when refueling and to keep all lights or flames at a safe distance while refueling.

(15) Frame general warning

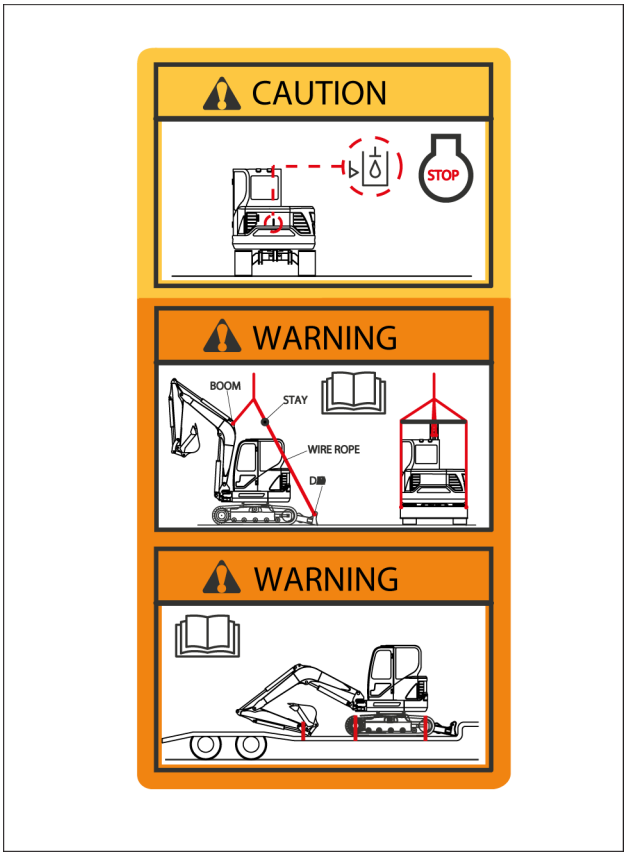
Location: this sign is located on the right-hand side window of the cab.

Quantity: 1

This sign warns you to refill the recommended hydraulic oil up to the specified level.

When lift the excavator, ensure that the wire rope is proper size. Follow the instructions in this manual.

This sign indicates that you always need to read the operator's manual before you transport the machine.



SMIL16MEX1072BA 18

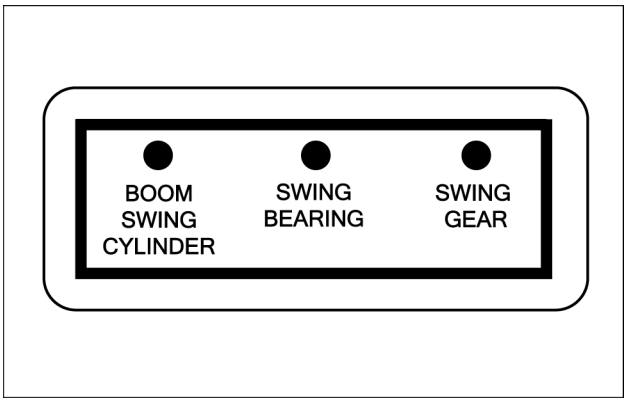
(16) Grease point

Location: this sign is located on the front side of the upper structure, close to the greasing points.

Quantity: 1

This sign indicates the location of the following grease points:

- Boom swing cylinder.
- Swing bearing.
- Swing gear.



SMIL16MEX1424AA 19

(17) Service instructions

Location: this sign is located on the left–hand side of the cab.

Quantity: 1

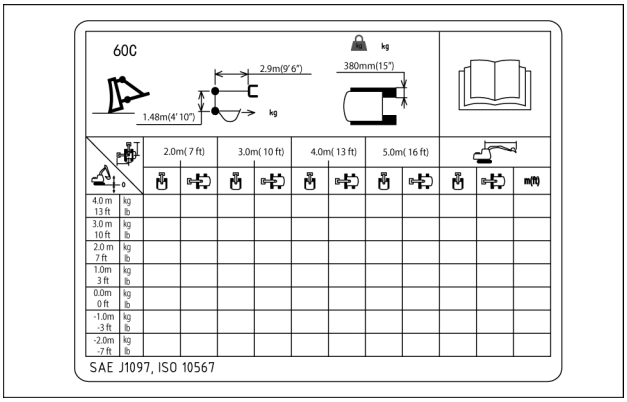
This sign describes the service locations and the service intervals.

(18) Load handling (optional)

Location: this sign is located on the left–hand side of the cab.

Quantity: 1

The load handling indicates the rated lift capacities that shall be considered at different distances from the swing axis.



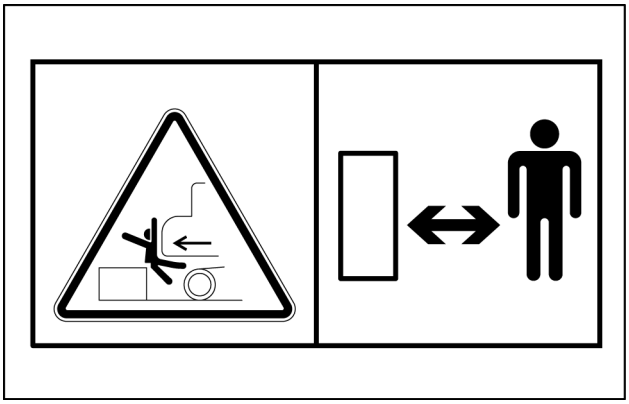
SMIL16MEX1409AA 20

(19) Keep out of work range of upper structure

⚠ DANGER

Avoid injury!
Keep clear of the swing area. Ensure that any person near the working site is outside the swing area before you start or operate the machine. Sound the horn before you start or operate the machine.
Failure to comply will result in death or serious injury.

D0123A



SMIL16MEX0004AA 21

Location: this sign is located on the both sides of the counterweight.

Quantity: 2

This sign cautions the operator that entry into the work range of the upper structure is forbidden while the engine is running.

(20) Electric welding

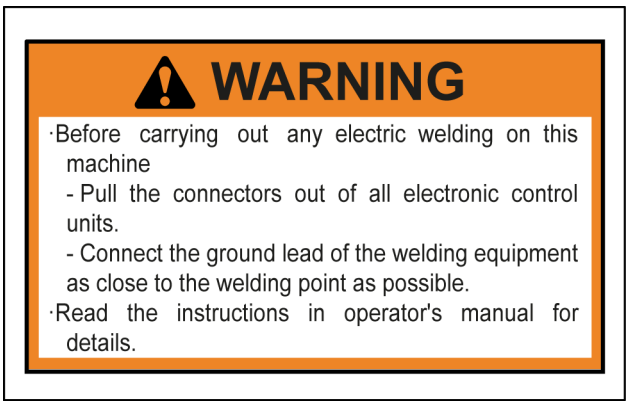
Location: this sign is located on the screen plate.

Quantity: 1

Before carrying out any electric welding on the machine, follow the below procedure:

- Pull the connectors out of all electric control units.
- Connect the ground lead of the welding equipment as close to the welding point as possible.

Read the safety instruction in this Operator's Manual.



SMIL16MEX0017AA 22

(21) Machine control pattern

⚠ 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

The machine control pattern can easily be changed to the "ISO type" or to the "A type" by changing the position of the lever-pattern.

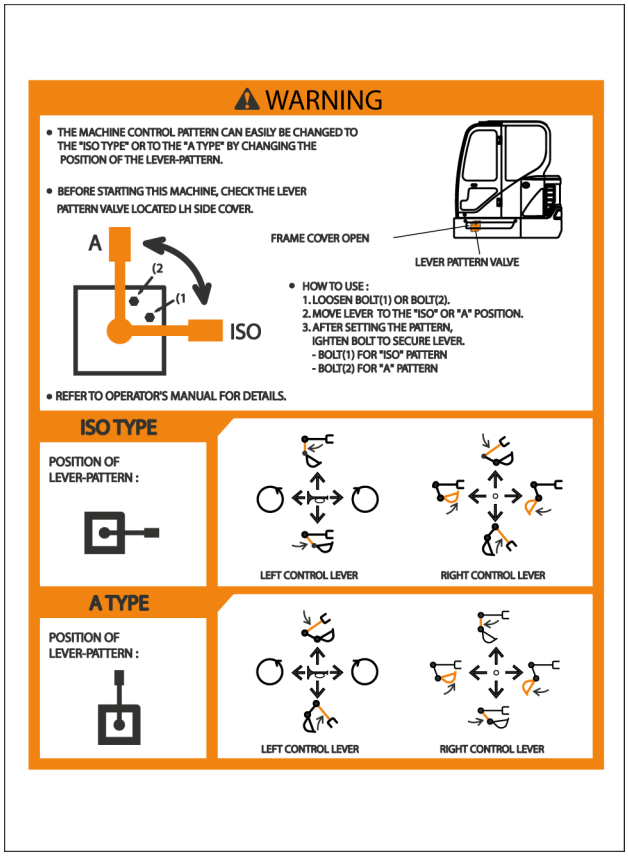
How to use:

1. Loosen bolt **(1)** or bolt **(2)**.
2. Move lever to the "ISO" or "A" position.
3. After setting the pattern, tighten the bolt to secure the lever.

NOTE: *Tighten bolt **(1)** for the "ISO" pattern. Tighten bolt **(2)** for the "A" pattern.*

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

Quantity: 1



SMIL16MEX1075BA 23

(22) Accumulator

⚠ WARNING

Pressurized system!
Do not drop the accumulator. A charged accumulator contains nitrogen compressed to 31 bar (450 psi). If the charging valve breaks away from the accumulator, the escaping nitrogen will propel the accumulator at a dangerous rate of speed.
Failure to comply could result in death or serious injury.

W0957A

⚠ WARNING

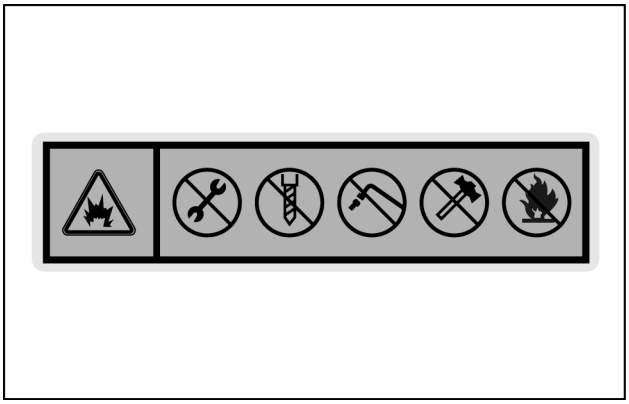
Pressurized system!
Do not expose the accumulator to temperatures above 49 °C (120 °F). A charged accumulator contains nitrogen compressed to 31 bar (450 psi). High heat will cause the safety plug to blow out of the accumulator, and the escaping nitrogen will propel the accumulator at a dangerous rate of speed.
Failure to comply could result in death or serious injury.

W0958A

Location: this sign is located on the accumulator of the solenoid valve.

Quantity: 1

This sign warns that accumulator is filled with high pressure gas so that near-by fire activity or welding is prohibited. Only trained service technicians should service or repair of the accumulator. See your CASE CONSTRUCTION dealer.



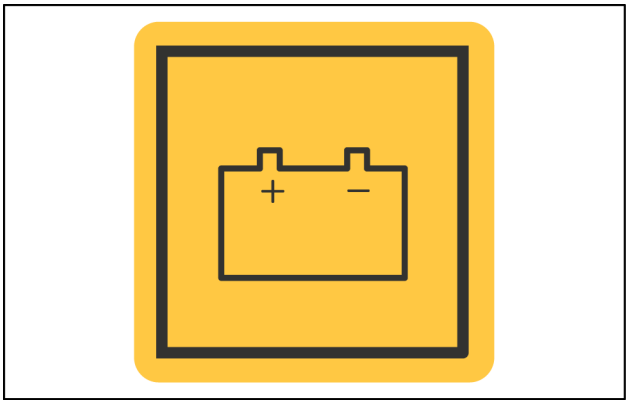
SMIL16MEX0018AA 24

(23) Battery position

Location: this sign is located on the right–hand side of the tool box.

Quantity: 1

This sign indicates the position of the battery.



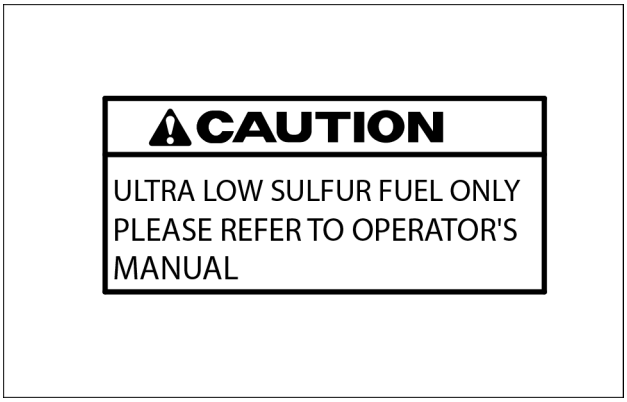
SMIL16MEX0016AA 25

(24) Ultra low sulfur fuel

Location: this sign is located on the left–hand side of the fuel filler neck.

Quantity: 1

This sign indicates to use low sulfur fuel only (sulfur content < **15 ppm**).



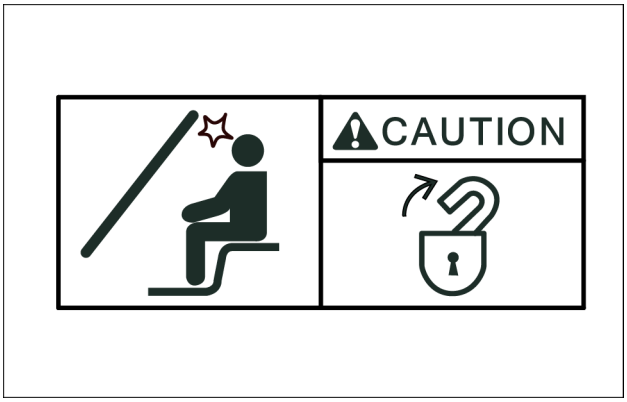
SMIL16MEX0486AA 26

(25) Warning front window

Location: this sign is located on the front window of the cab.

Quantity: 1

Be careful that the front window may be promptly closed.



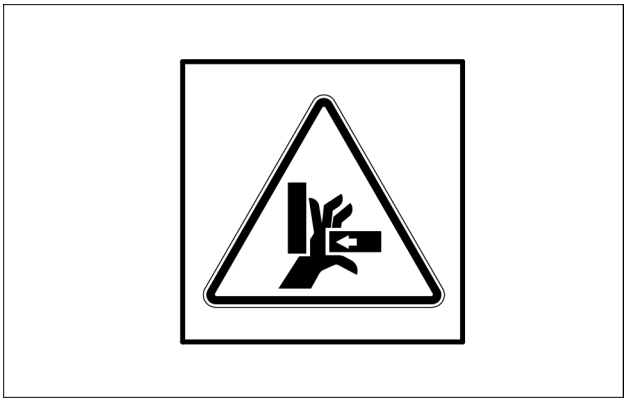
SMIL16MEX0480AA 27

(26) Stay fix-cab

Location: this sign is located on the front window of the cab.

Quantity: 1

This sign warn the operator to be sure to support the stay when the window needs to be opened.
The opened window may be closed by the external or natural force.

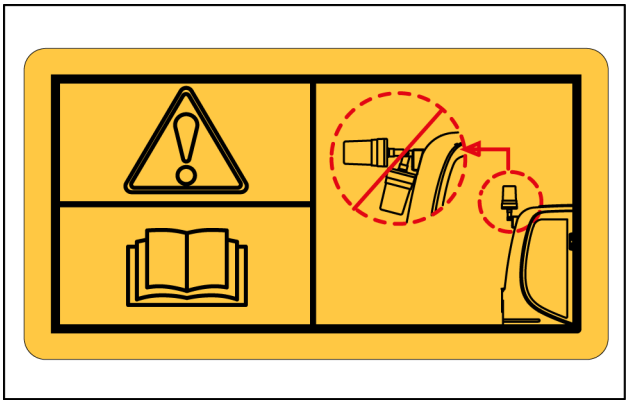


SMIL16MEX0483AA 28

(27) Beacon light

Location: this sign is located on the rear outside of the cab.

This sign indicates to make sure that the beacon light maintains a vertical position.
A horizontal position can result in a decrease in life time of the light due to the infiltration of foreign substances such as dust or water.
During the machine transfer, change the position of the light to the horizontal position.



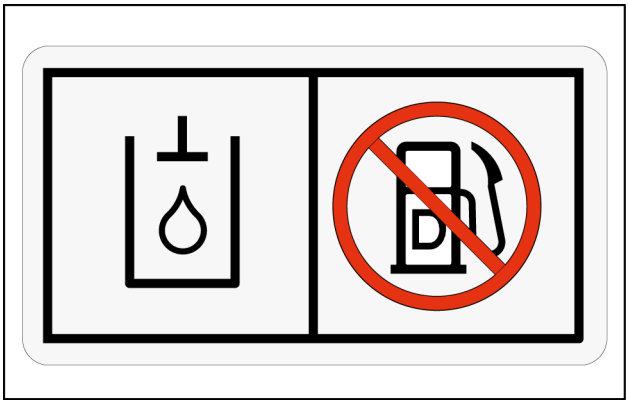
SMIL16MEX0021AA 29

(28) Hydraulic tank

Location: this sign is located on the rear door.

Quantity: 1

This sign warns you to fill only hydraulic oil and not to not fill the diesel fuel.



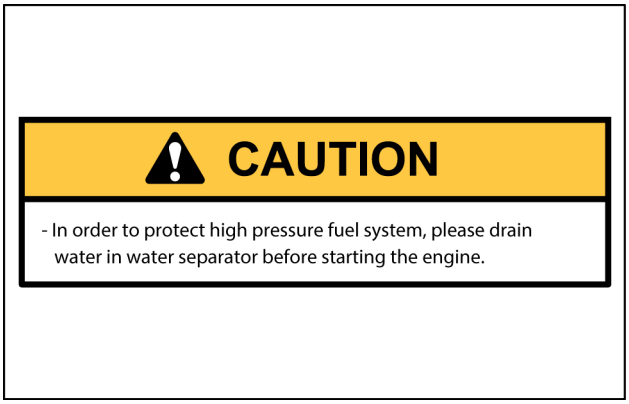
SMIL16MEX0014AA 30

(29) Water separator

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

Quantity: 1

This sign warns you that in order to protect the high pressure fuel system, please drain the water in the water separator before starting the engine



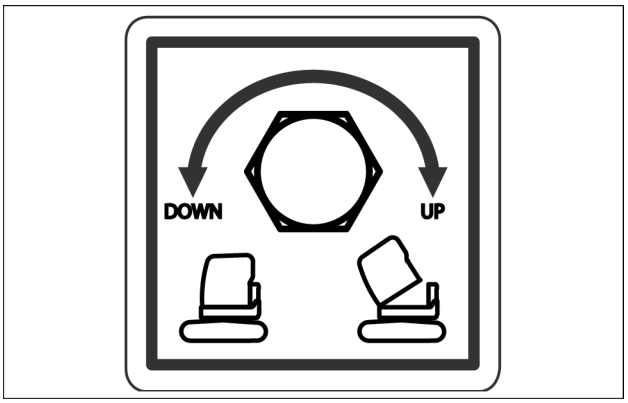
SMIL16MEX0020AA 31

(30) Cab tilting

Location: this sign is located on the front side of the upper structure.

Quantity: 1

This sign indicates the position of the cab tilting lever.



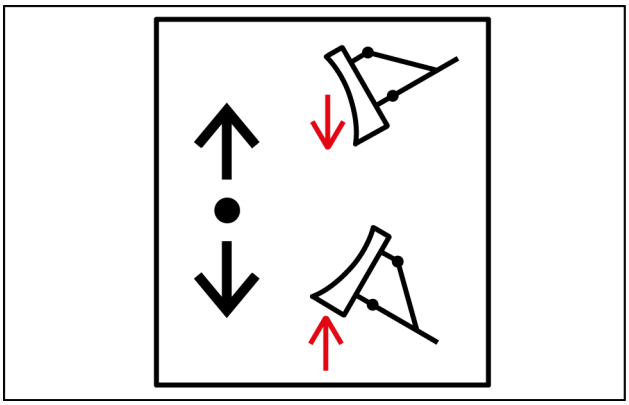
SMIL16MEX1073AA 32

(31) Dozer blade operation

Location: this sign is located on the right-hand console box.

Quantity: 1

This sign describes the blade operations.

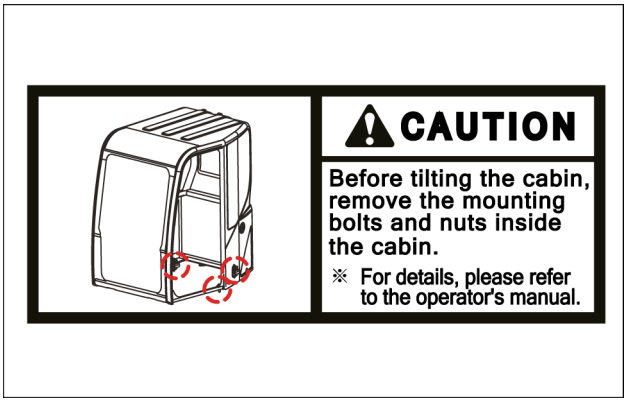


SMIL16MEX0010AA 33

(32) Cab tilting caution

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

Before tilting the cabin, remove the mounting bolts and nuts inside the cabin.
For the complete procedure, read this Operator's Manual.



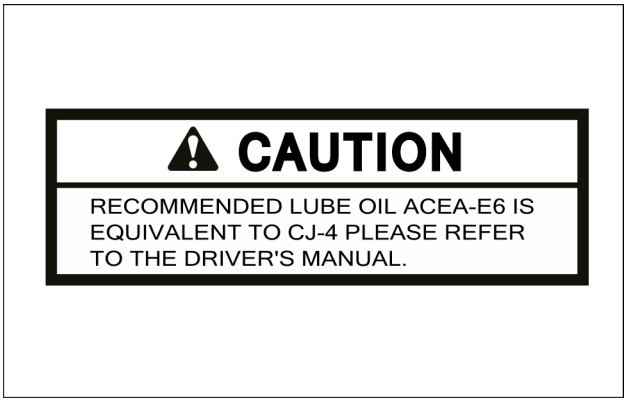
SMIL16MEX1074AA 34

(33) Lubrication oil

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

Quantity: 1

This sign recommends to use a specific or equivalent lubrication oil.



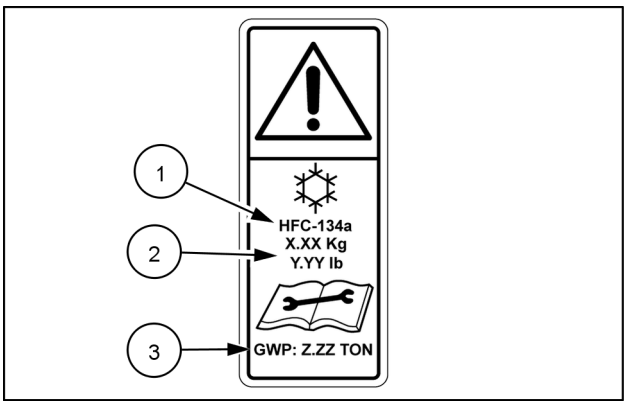
SMIL16MEX1071AA 35

(34) Air conditioning refrigerant

WARNING

Explosion hazard!
Air-conditioning refrigerant boils at -26 °C (-15 °F)!
-NEVER expose any part of the air-conditioning system to a direct flame or excessive heat.
-NEVER disconnect or disassemble any part of the air-conditioning system.
Discharging refrigerant gas into the atmosphere is illegal in many countries.
Failure to comply could result in death or serious injury.

W0340B



SMIL16MEX2335AA 36

Cab location: this sign is located in the engine room, adjacent to the service point for changing the gas.

Quantity: 1

This sign indicates that the vehicle uses a fluorinated greenhouse gas and shows:

(1) The designation for such gas.

(2) The quantity of the gas included on the air conditioning system.

(3) The Global Warming Potential (GWP) of the gas.

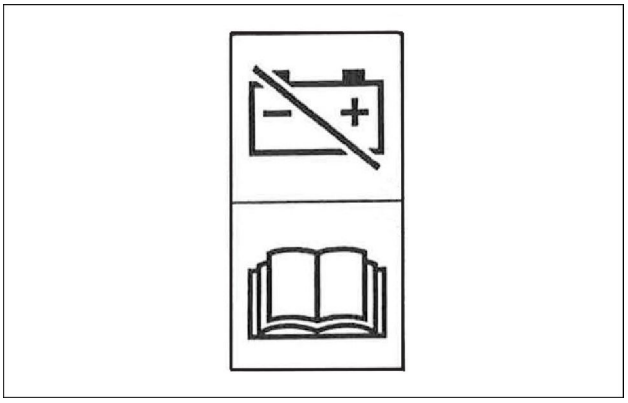
- **1 kg** (**2.2 lb**) of R134a is equal to **1.43 t** of GWP.

(35) Battery disconnect switch

Location: this sign is located behind the operator's seat, next to the battery disconnect switch.

Quantity: 1

This sign warns to read the operator's manual before disconnect the battery.

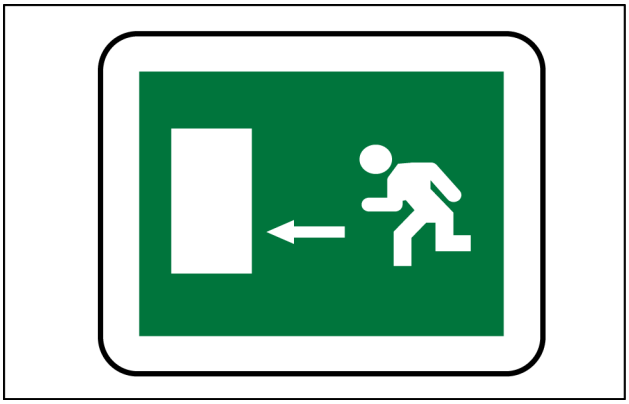


SMIL16MEX0942AA 37

(36) Break the glass to exit

Location: these signs are located on the rear window.

This sign warns you to break the glass in case of emergency with the cab door locked.



SMIL16MEX3217AA 38

(37) Compliant to Canadian Regulation ICES-002

Location: this sign is located on internal side of the cab access door.

Quantity: 1

Part number: 48076360

This sign shows compliance to Canadian Regulation ICES-002 (vehicles, boats and other devices propelled by an internal combustion engine, electrical means or both).

SMIL16MEX3227AA 39

3 - CONTROLS AND INSTRUMENTS

Access to operator's platform

Door and steps

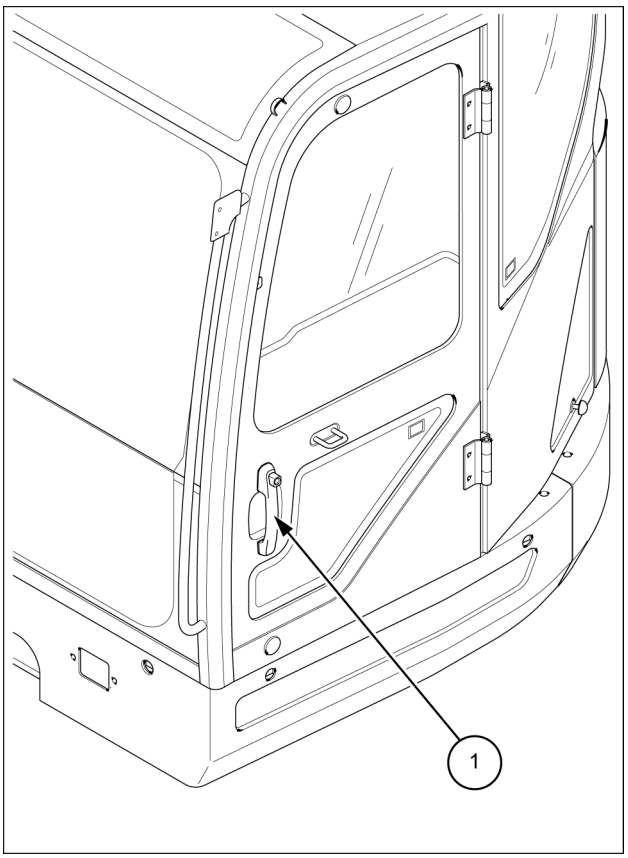
Cab door

⚠ CAUTION

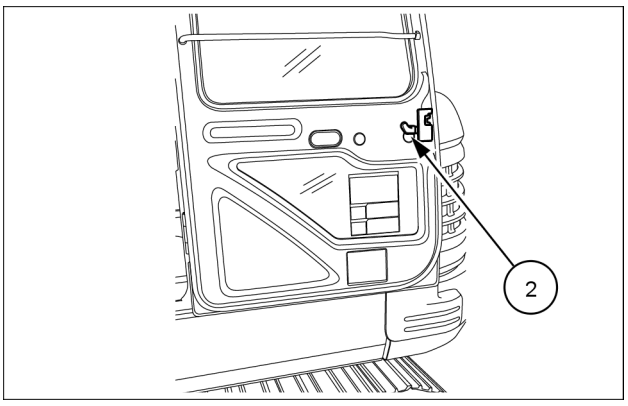
Pinch hazard!
Be careful not to get your hand, clothes, etc. caught in the door when closing it.
Failure to comply could result in minor or moderate injury.

C0046A

To open the door from outside the cab, use the handle **(1)** shown in Figure **1**.
To open the door from inside the cab, use the handle **(2)** shown in Figure **2**.



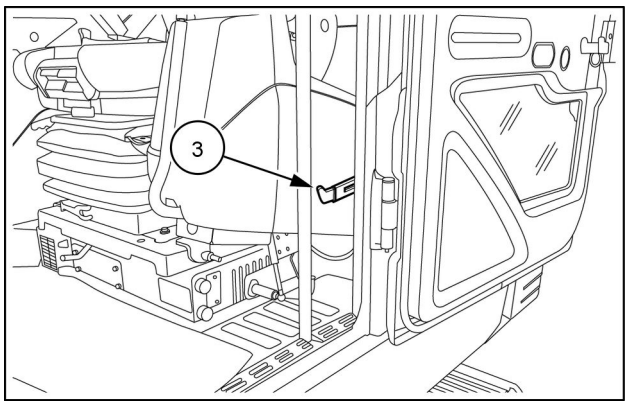
SMIL16MEX0698BB 1



SMIL16MEX0578AA 2

The door can be latched in completely open position. To latch and unlatch the door, operate the lever **(3)**.

NOTICE: *do not leave the door ajar. Fix it in a latched position. Before performing work with the door open, lock it securely.*



SMIL16MEX1374AA 3

Steps and access handles

⚠ 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

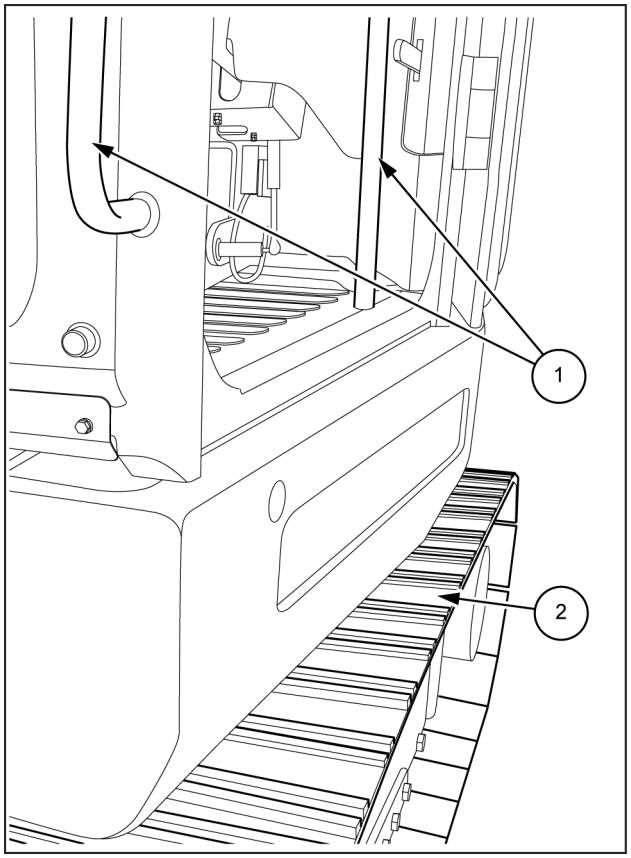
Fall hazard!
Jumping on or off the machine could cause an injury. Always face the machine, use the handrails and steps, and get on or off slowly. Maintain a three-point contact to avoid falling: both hands on the handrails and one foot on the step, or one hand on the handrail and both feet on the steps.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

W0141A

⚠ WARNING

Fall hazard!
When entering or exiting the cab, never use the control levers as handholds. Always mount and dismount the machine in a safe way. Maintain a three-point contact with steps, ladders, and/or handholds.
Failure to comply could result in death or serious injury.

W1340B



SMIL16MEX2000BB 4

To get in or out of the machine, always face the machine and use the handrails **(1)**, and track shoes **(2)**.

Ensure safety by always maintaining at least three-point contact of hands and feet with the handrails, and track shoes.
If grasping the door handrail when mounting or dismounting or moving on the track, open and lock the door securely in the open position. Otherwise, the door may move suddenly, causing you to loose balance and fall.

Operator's seat

Operator's seat

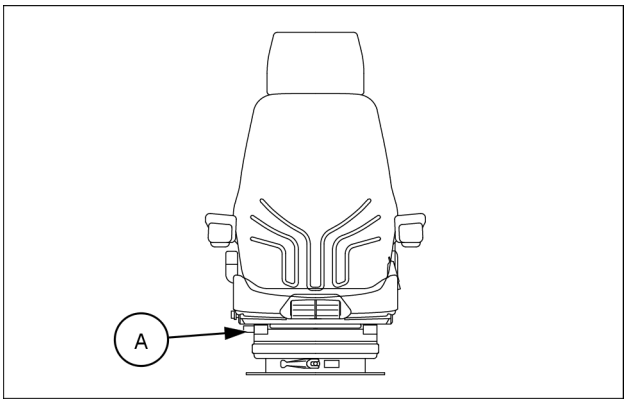
In order to operate the machine correctly and with maximum efficiency and comfort, adjust the seat to suit the weight and size of the operator.

Fore and aft adjustment

- Pull the lever **(A)**.
- Slide the seat to the required position.
- Release the lever **(A)**.

NOTE: *the seat can be positioned over a range of* ***130 mm*** *(****5 in****) in 13 steps.*

NOTE: *do not lift the lever* ***(A)*** *with your leg or your calf.*

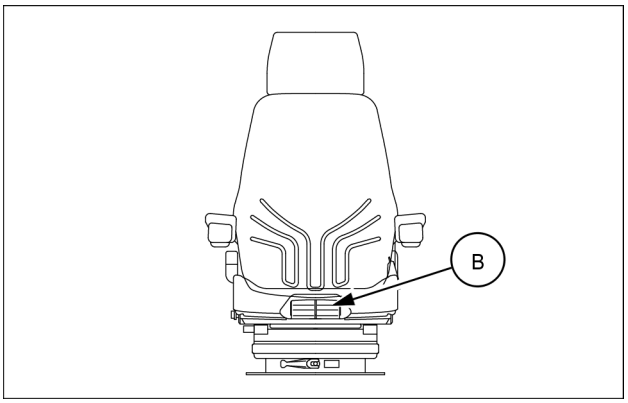


SMIL16MEX0696AA 1

Height adjustment

- Pull the lever **(B)**.
- Adjust the height the required position.
- Release the lever **(B)**.

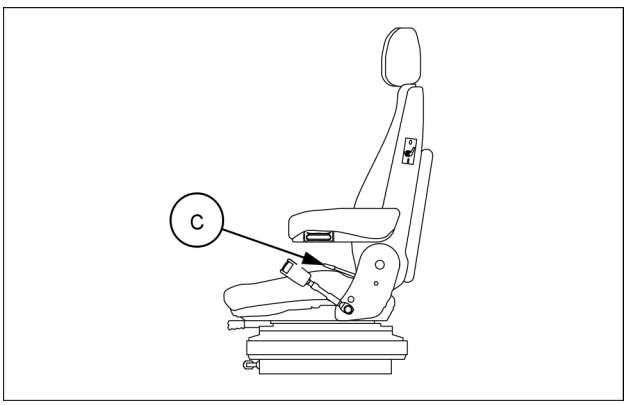
NOTE: *the seat can be positioned over a range of* ***60 mm*** *(****2 in****).*



SMIL16MEX0696AA 2

Seat back angle adjustment

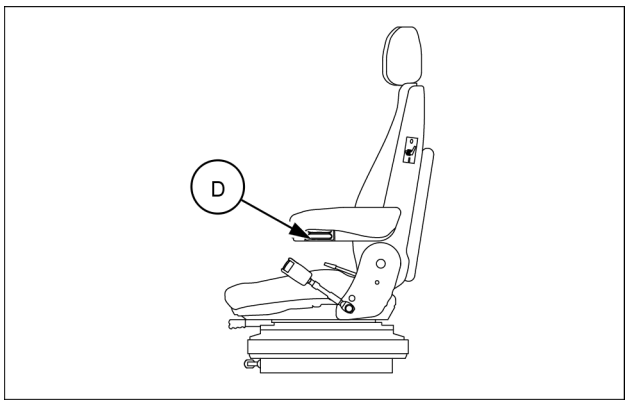
- Pull the lever **(C)**.
- Adjust the seat-back to the desired position.
- Release the lever **(C)**.



SMIL16MEX0697AA 3

Armrest angle adjustment

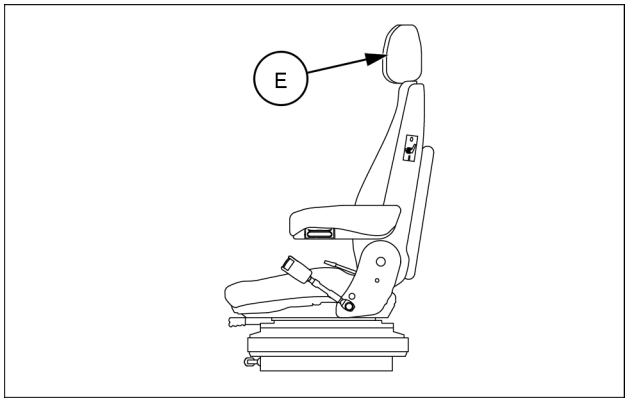
To adjust the armest operate the push-button **(D)** to the right and to the left.



SMIL16MEX0697AA 4

Headrest adjustment

- The headrest **(E)** can be adjusted upwards or downwards and backwards or forwards.

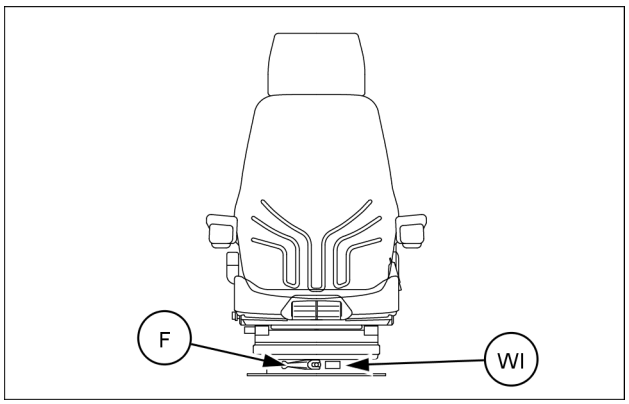


SMIL16MEX0697AA 5

Weight adjustment

- Use the lever **(F)** with the seat empty to set the operator's weight.

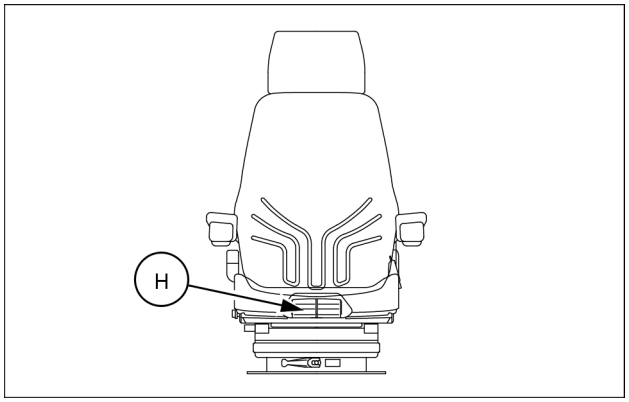
  WI: weight indicator



SMIL16MEX0696AA 6

Seat pan depth adjustment

- To adjust the depth of the seat pan, pull the right-hand handle **(H)** upwards and move the seat cushion backwards or forwards to the desired position.
- Release the handle **(H)**.

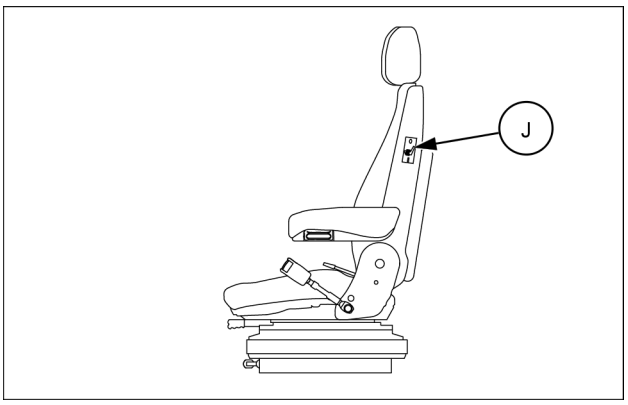


SMIL16MEX0696AA 7

Seat heater

Press the switch **(J)** to turn on/off the seat heater.

- **(I)** position: seat heater ON
- **(O)** position: seat heater OFF

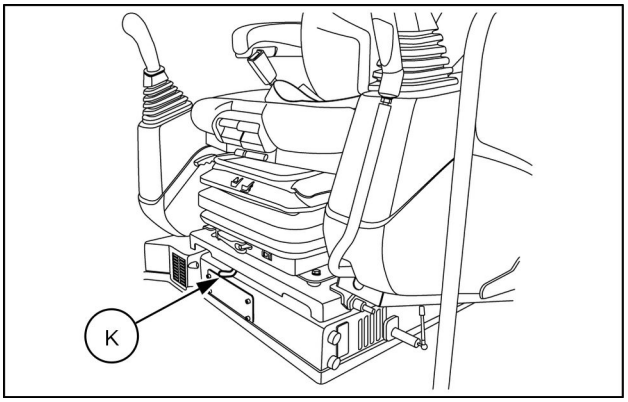


SMIL16MEX0697AA 8

Seat and console box adjustment

Use the lever **(K)** to move the seat and the console box in order to fit the contours of the operator's body.

- Pull the lever **(K)** to adjust forward or backward over **90 mm** (**3.5 in**).



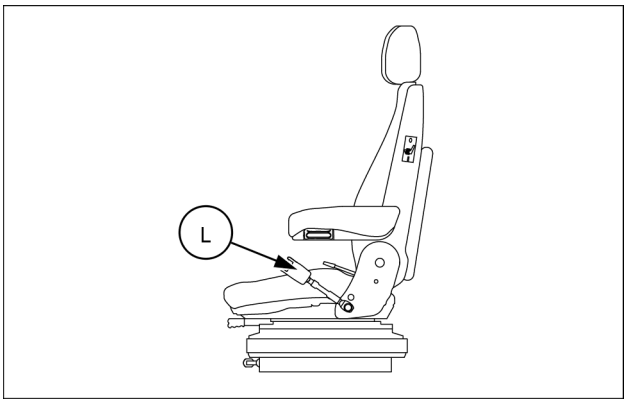
SMIL16MEX1126AA 9

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



SMIL16MEX0697AA 10

- Sit comfortably on the operator's seat.
- Pull the seat belt completely across your body.
- Insert the latch plate into the buckle **(L)**, then tug on the belt to make sure the belt is securely latched. Make sure that the belt is not twisted.
- Adjust the position of the seat belt as low across your body as possible.

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 on the release button of the buckle **(L)**.

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

⚠ WARNING

Unexpected machine movement!
Pilot controls have two different backhoe controls patterns; before operating the machine, check which control function is active.
Failure to comply could result in death or serious injury.

W0185A

This machine is equipped with a lever pattern valve that allows the operator to select between the " ISO type" controls pattern or the " A type" controls pattern by changing the position of the valve.
Before starting machine operation, select the desired controls pattern, and change the position of the valve accordingly. Refer to page **4-13**.

Control levers

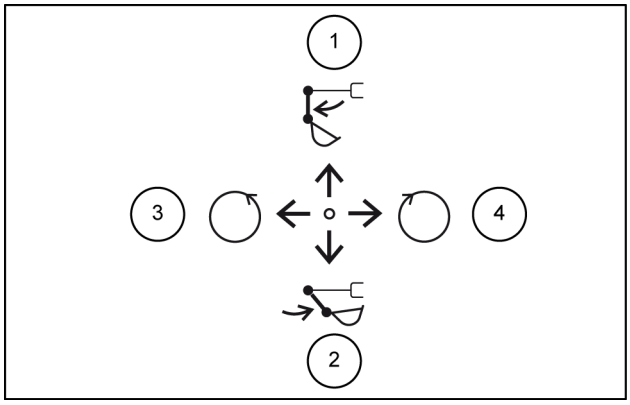
Pattern: ISO type

Left-hand control lever:

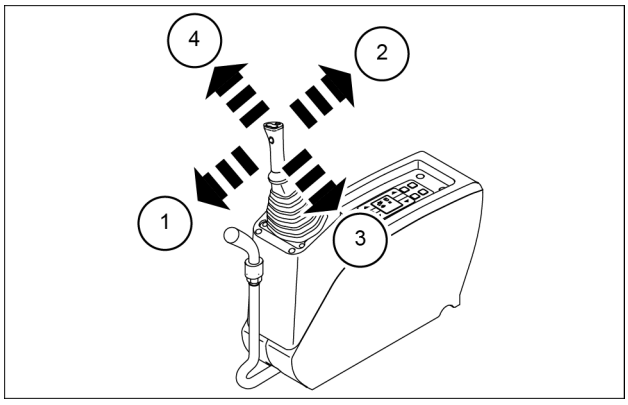
1. The dipper arm extends.
2. The dipper arm retracts.
3. The upper structure swings to the left–hand side.
4. The upper structure swings to the right–hand side.

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.*

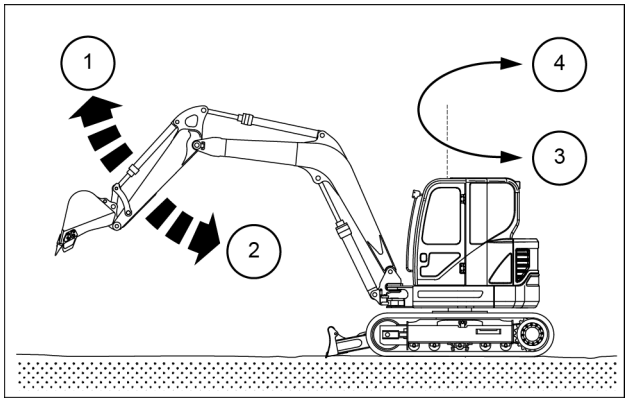
NOTE: *when the upper structure swing control is released, the upper structure may continue to rotate due to the force of inertia. In this event, make allowance for the extra movement by releasing the control slightly earlier.*



SMIL16MEX3075AB 1



SMIL16MEX0490AB 2

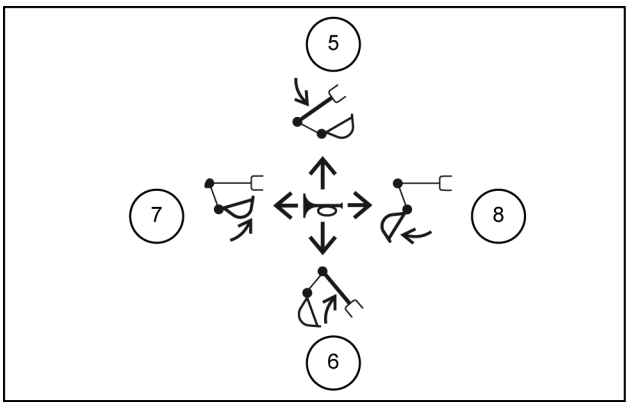


SMIL16MEX0700AB 3

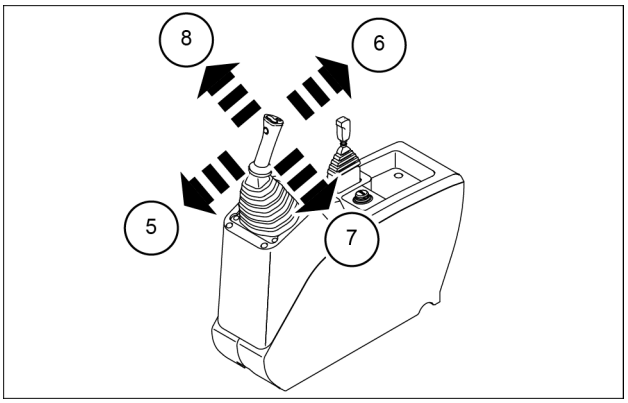
Right-hand control lever:

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

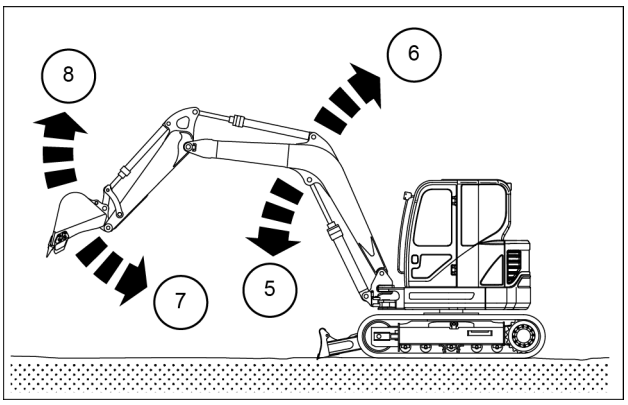
NOTE: *the speed of movement of the boom or the bucket depends on the control lever tilt angle. In the intermediate position two movements can be obtained simultaneously.*



SMIL16MEX3076AB 4



SMIL16MEX0492AB 5



SMIL16MEX0701AB 6

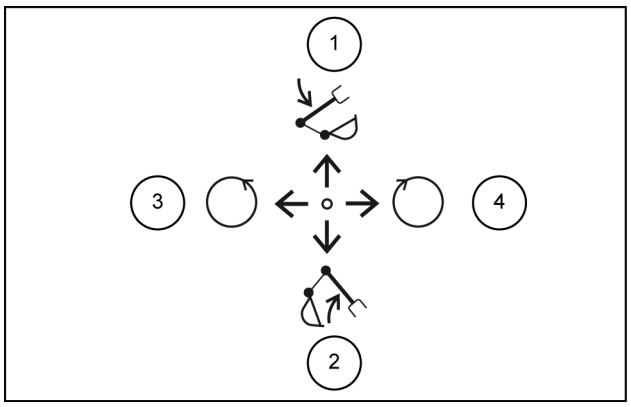
Pattern: A type

Left-hand control lever:

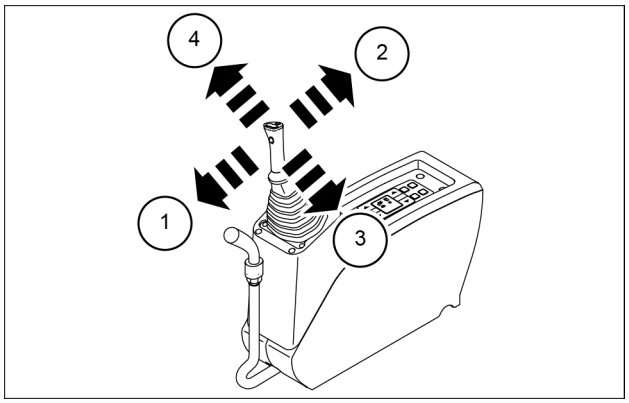
1. The boom lowers.
2. The boom raises.
3. The upper structure swings to the left–hand side.
4. The upper structure swings to the right–hand side.

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.*

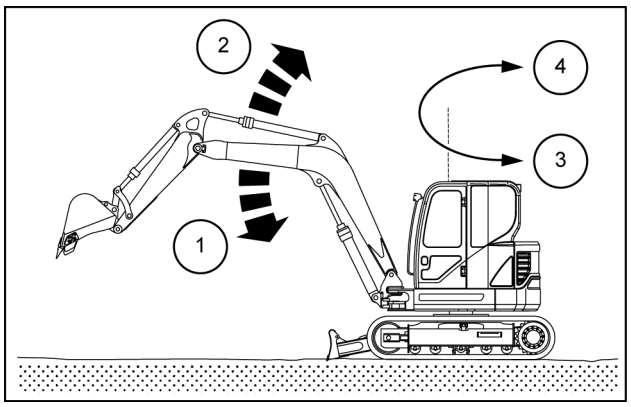
NOTE: *when the upper structure swing control is released, the upper structure may continue to rotate due to the force of inertia. In this event, make allowance for the extra movement by releasing the control slightly earlier.*



SMIL16MEX3077AB 7



SMIL16MEX0490AB 8

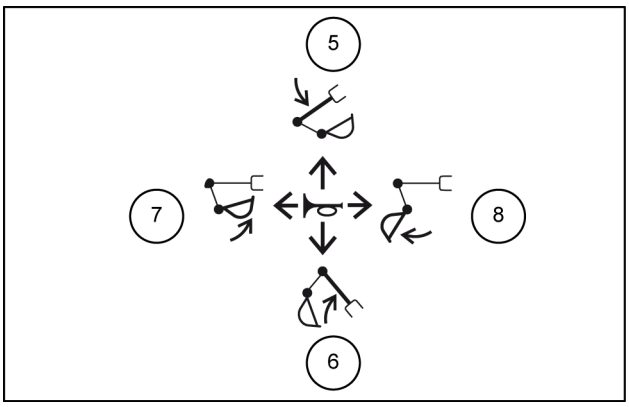


SMIL16MEX3176AB 9

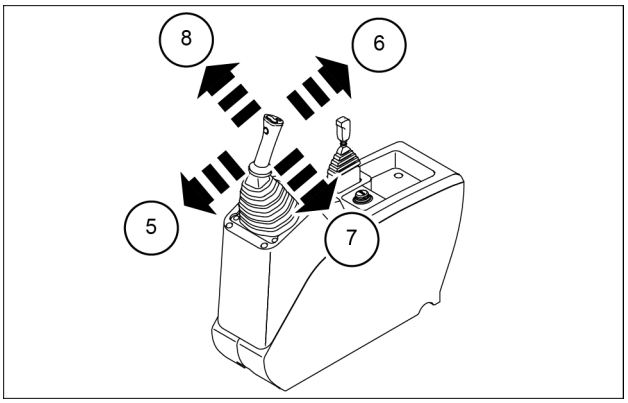
Right-hand control lever:

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

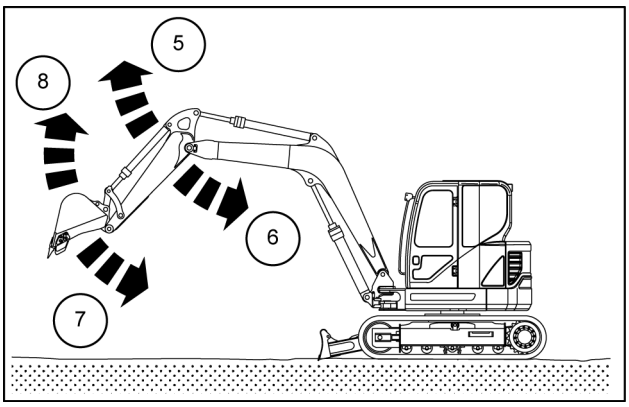
NOTE: *the speed of movement of the boom or the bucket depends on the control lever tilt angle. In the intermediate position two movements can be obtained simultaneously.*



SMIL16MEX3076AB 10



SMIL16MEX0492AB 11



SMIL16MEX3177AB 12

Travel control levers and pedals

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

(N): neutral

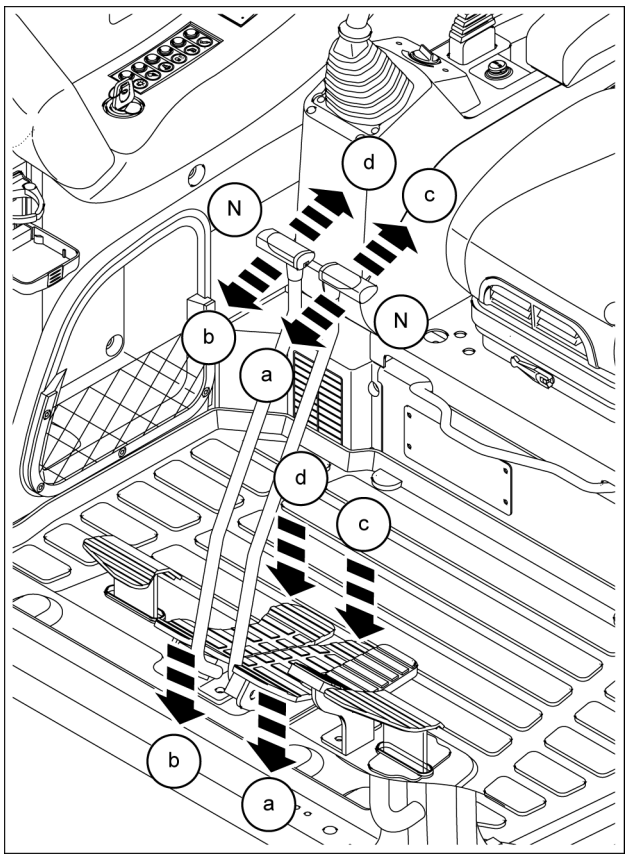
(a) + **(b)**: machine moves forward.

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

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

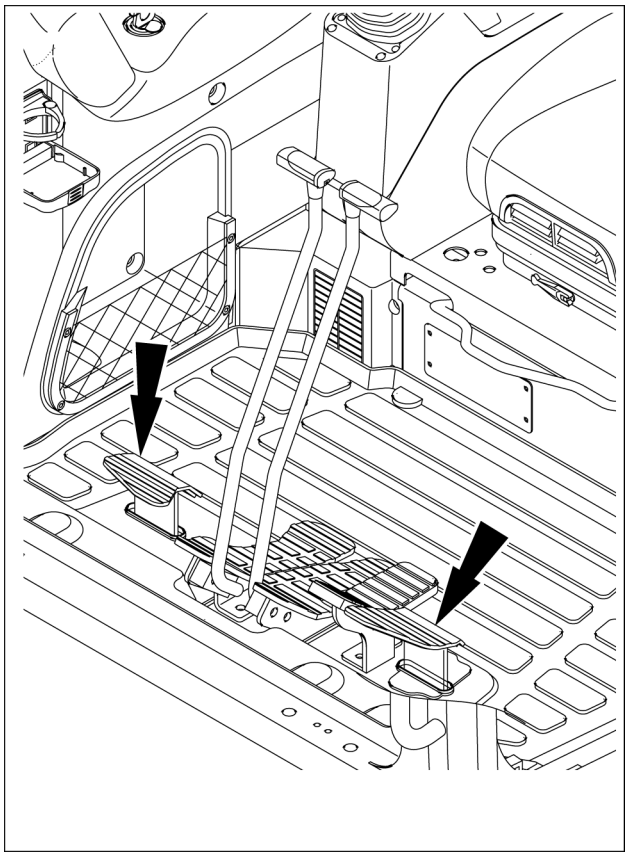
(a) + **(d)**: opposite simultaneous rotation of the tracks with consequent clockwise rotation of the machine around its center axis.

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



SMIL16MEX1040BB 13

Footrest

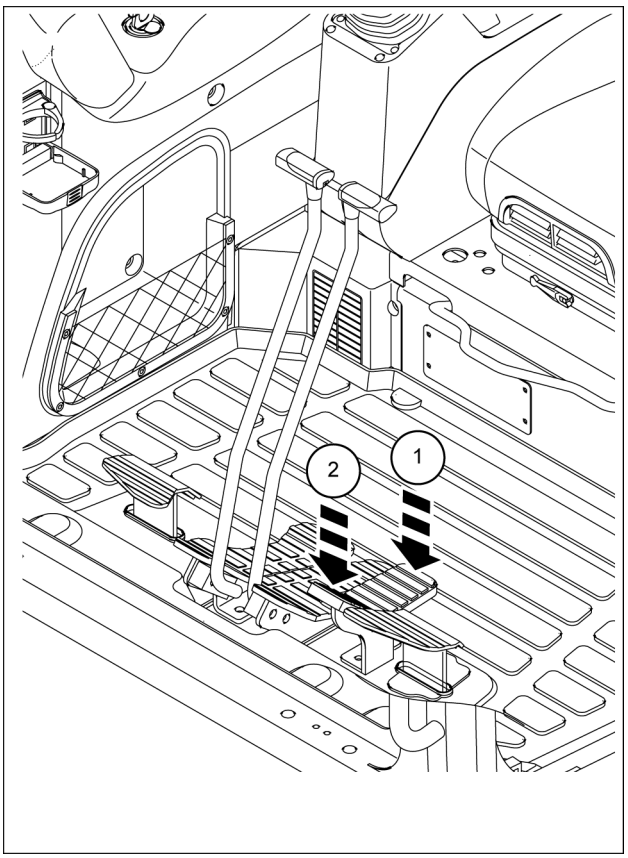


SMIL16MEX1041BB 14

Boom swing pedal

This pedal is used to swing the boom to the right-hand and left-hand direction.
Press the pedal to rearward **(1)** to swing the boom to the right-hand direction.
Press the pedal to forward **(2)** to swing the boom to the left-hand direction.

NOTICE: *make particular attention when swing the boom to the left-hand side: the attachment may collide with the cab.*



SMIL16MEX1042BB 15

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

Hold the grips **(1)** located on both sides of the windshield frame.

Press the buttons **(2)** located on the grips **(1)**.

Move the grips **(1)** to the inside to release the lock latches.

Push the windshield upward.

Release both grips carefully until the lock latches are in the locked position.

Closing

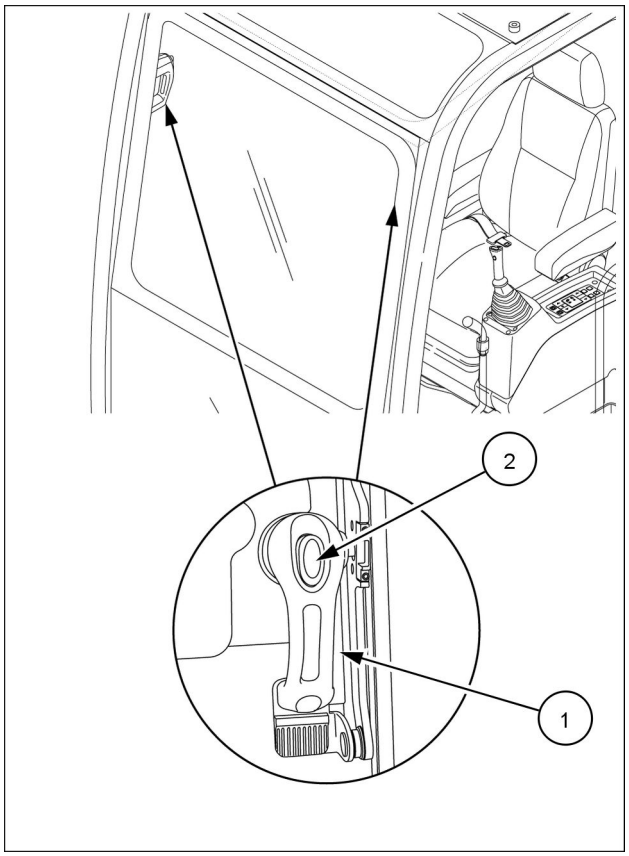
Hold the grips **(1)** located on both sides of the windshield frame.

Press the buttons **(2)** located on the grips **(1)**.

Move the grips **(1)** to the inside to release the lock latches.

Hold both grips **(1)** and push the windshield downward.

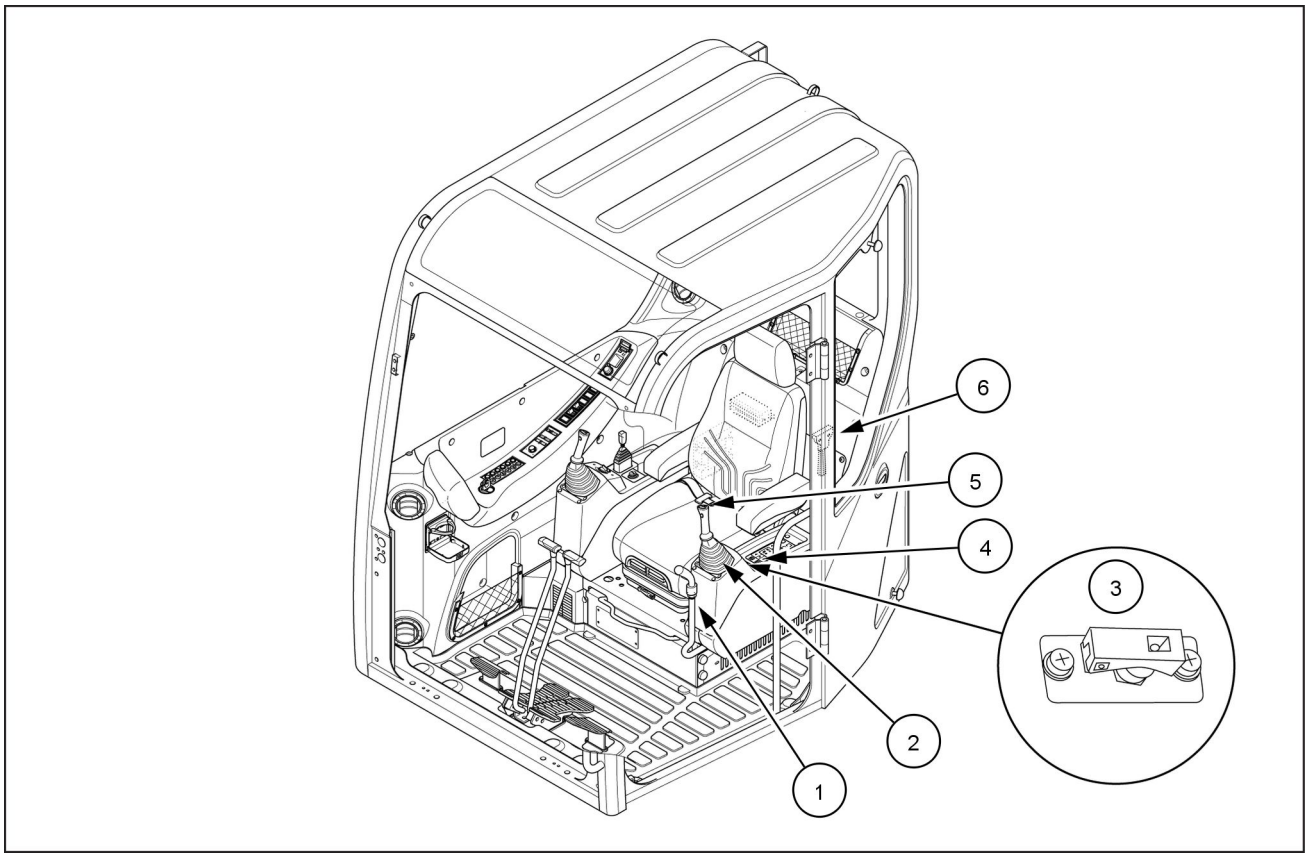
Release both grips carefully until the lock latches are in the locked position.



SMIL16MEX1088BB 1

Left-hand side controls

Left-hand side controls



SMIL16MEX3228FA 1

(1) Safety lock lever (refer to page **3-15**).

(2) Left-hand control lever (refer to page **3-6**).

(3) Hydraulic quick coupling system activation switch (optional)

(4) Air–conditioning control panel (refer to page **3-16**)

(5) Horn switch. The horn switch is located on the top of the left-hand control lever. Pressing the horn switch, the horn sounds.

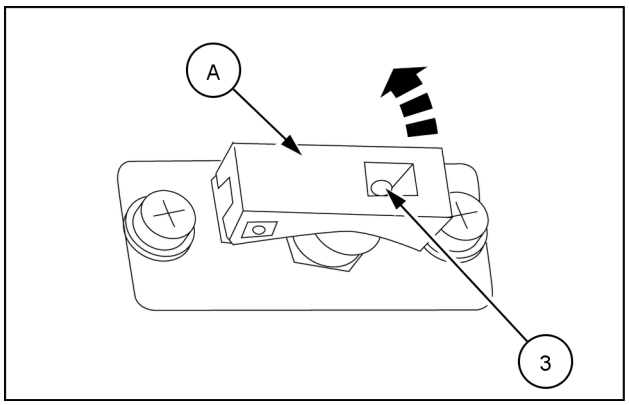
(6) Emergency exit hammer (refer to page **3-20**).

Hydraulic quick coupling system activation switch (optional)

The hydraulic quick coupling system activation switch **(3)** is used to engage or disengage the hydraulic quick coupling system.

This activation switch has a toggle **(A)** for preventing erroneous switch operation. Pull up the toggle **(A)** in the direction of the arrow to use the activation switch.

The buzzer sounds when the hydraulic quick coupling system activation switch is pressed to disengage the moving hook. The buzzer stops when the switch is released to engage the moving hook.



SMIL16MEX3223AA 2

To connect or disconnect an attachment, proceed as follows:

1. Place the attachment in full curled position for disconnecting.
2. Pull up the toggle **(A)**, then push and hold the hydraulic quick coupling activation switch **(3)** in release position.

   NOTE: *the right-hand control lever tilted to left-hand direction (bucket-in) activates the pins of the quick coupler.*
3. Tilt the right-hand control lever to the left-hand direction for disconnecting the attachment.
4. Release the switch and pull down the toggle in the original position.

Safety lock lever

⚠ WARNING

Unexpected machine movement!
When you must leave the operator's seat, always place the safety lever in the LOCKED position. If the safety lever is unlocked and the control lever is moved unexpectedly, a serious accident could result. Failure to comply could result in death or serious injury.

W1241A

⚠ CAUTION

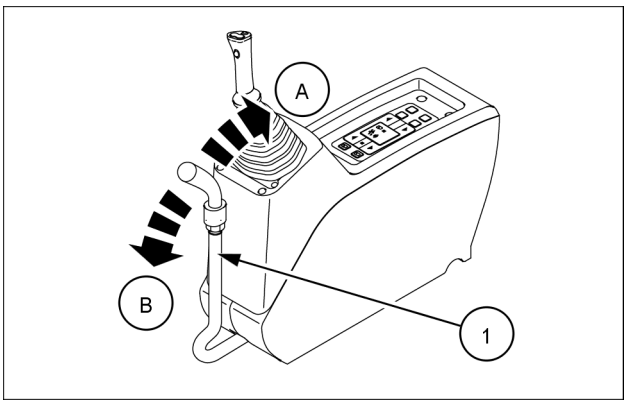
Fall hazard!
When entering or exiting the cab, never use the control levers as handholds. Always mount and dismount the machine in a safe way. Maintain a three-point contact with steps, ladders, and/or handholds. Failure to comply could result in minor or moderate injury.

C0075B

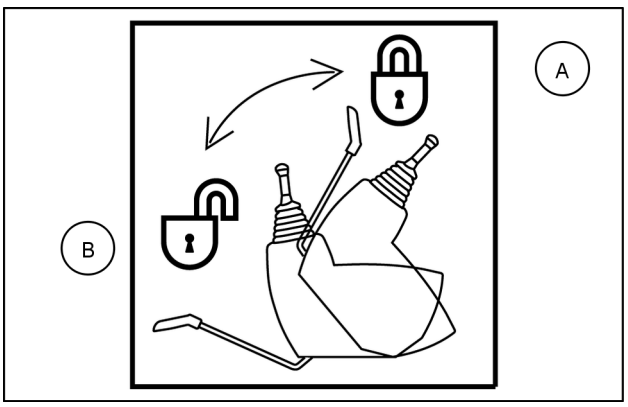
The safety lever operates on two positions:

A. Lock position: when the safety lever **(1)** is in lock position **(A)**, all the functions are disabled.

B. Unlock position: when the safety lever **(1)** is in unlock position **(B)**, the machine is operative.

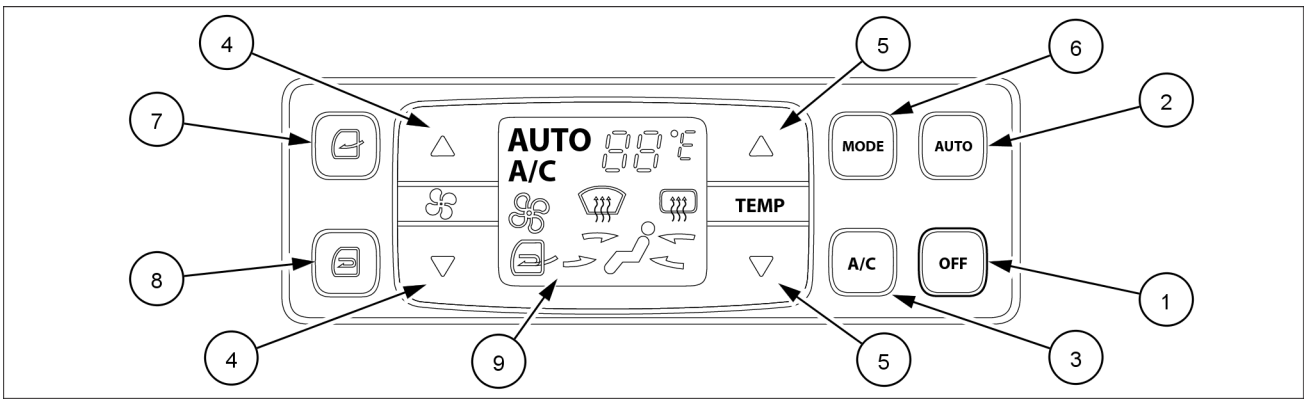


SMIL16MEX0499AA 1



SMIL16MEX0015AA 2

Heating, ventilation, or air-conditioning control



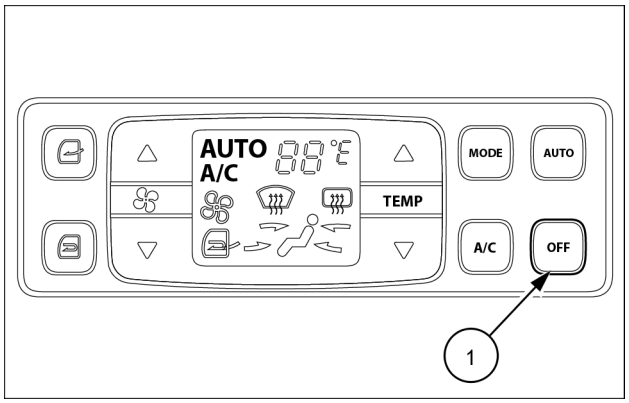
SMIL16MEX0501EA 1

1. OFF push-button
2. AUTO push-button
3. Air–conditioning A/C push-button
4. Fan speed push-button
5. Temperature control push-buttons
6. MODE push-button
7. Fresh air push-button
8. Air recirculation push-button
9. Display

1. OFF push-button

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

NOTE: *when the system is turned On it will operate at the same setting as the one selected previously.*

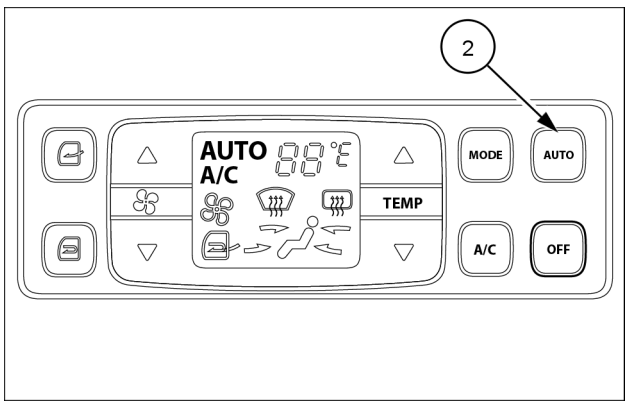


SMIL16MEX0571AA 2

2. AUTO push-button

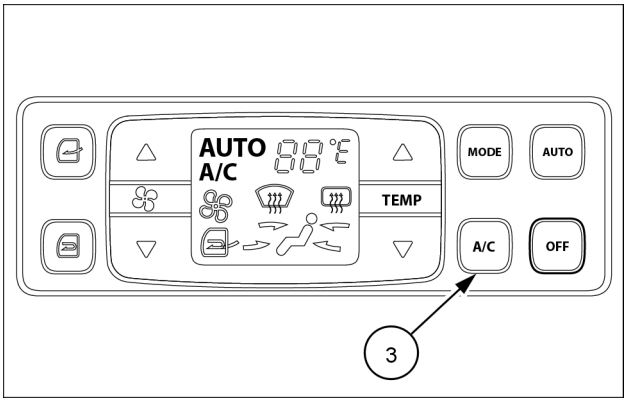
The push-button **(2)** is used for automatic adjustment of the air flow, the direction of flow, and starting or stopping of the air conditioning. AUTO will appear on the display.

In AUTO mode, the air-conditioning system and the heater system automatically keeps the optimum condition in accordance with temperature configuration sensing ambient and cab inside temperature.



SMIL16MEX0571AA 3

3. Air–conditioning A/C push-button



SMIL16MEX0571AA 4

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.*

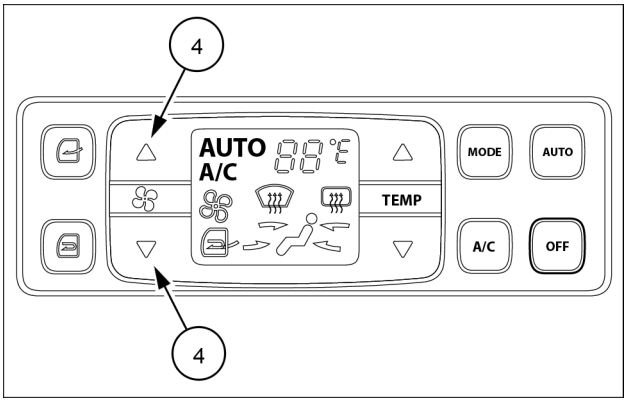
The push–button **(3)** turns on the air–conditioning compressor and " A/C" will appear on the display.

In accordance with the temperature sensed by the evaporator sensor, the air–conditioning compressor turns on or off automatically.

The air–conditioning operates to remove vapor and drains water through a drain hose.

NOTE: *water can be sprayed into the cab in case that the drain cock at the ending point of drain hose has a problem. In this case, replace the drain cock.*

4. Fan speed push-button

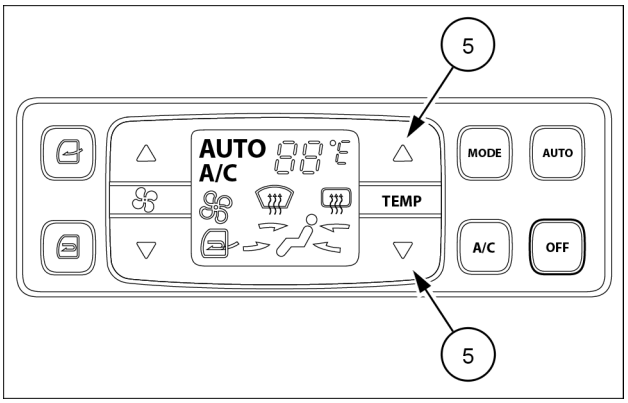


SMIL16MEX0571AA 5

The push-buttons **(4)** enable the air flow to be increased or reduced. To increase the flow of air, press the upper button. To decrease the flow of air, press the lower button.

The push-buttons **(4)** provide four steps to increase the fan speed and four steps to decrease the fan speed. The maximum step and the minimum step beeps five times.

5. Temperature control push-button



SMIL16MEX0571AA 6

The push buttons **(5)** allow the temperature to be raised or lowered within **17 °C** (**63 °F**) and **32 °C** (**89.6 °F**). To increase the temperature, press the upper button. To lower the temperature, press the lower button. The temperature reading will appear on the display screen.

The maximum temperature and the minimum temperature beeps five times.

Temperature unit can be changed between °C and °F. To change the unit temperature, push simultaneously the up and down push–buttons more than 5 seconds.

NOTE: *default set temperature: °C.*

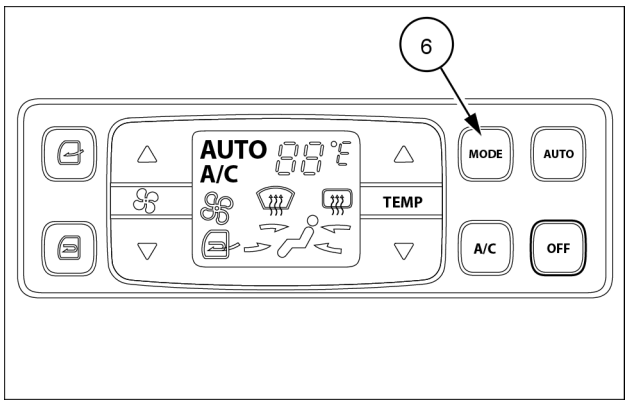
The maximum cool temperature or the maximum warm temperature operates as indicated in the following table:

Temperature	Compressor	Fan speed	In/Out air	Mode
Maximum cool	ON	Maximum (high)	Recirculation	Vent
Maximum warm	OFF	Maximum (high)	Fresh air	Foot

6. MODE push-button

The push-button **(6)** beeps and displays the symbol on the display corresponding to the following modes: vent, vent/foot, foot, foot/defrosting, vent.

When the defrosting switch is in ON position, the fresh air/recirculation air push-button turns to fresh air mode and the air conditioning system turns ON.

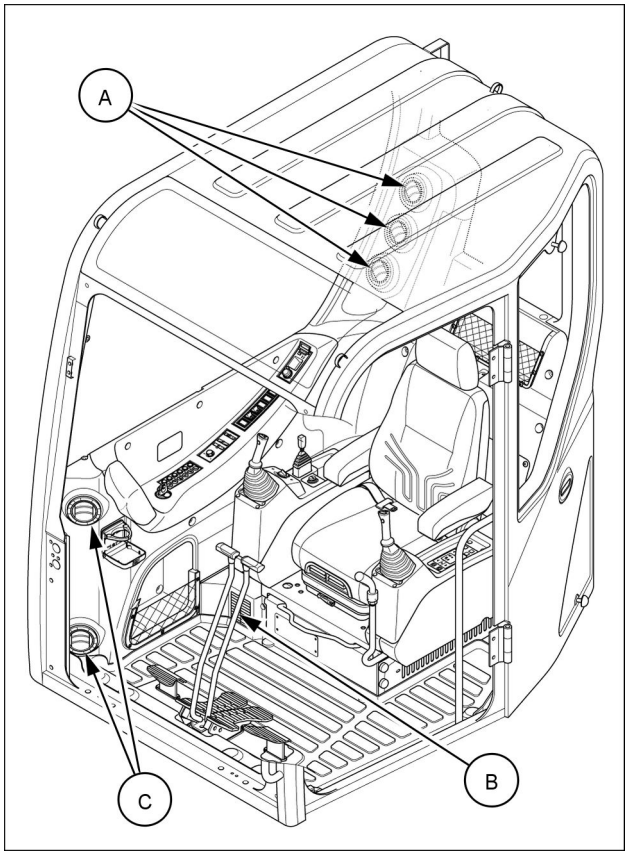


SMIL16MEX0571AA 7

Mode		(A)	(B)	(C)
Vent		X		
Vent - Foot		X	X	
Foot			X	
Foot - Defrosting			X	X

The outlet control louvers **(A)**, **(B)**, and **(C)** allows to control the direction of air.

The outlet control louvers can be closed or opened.



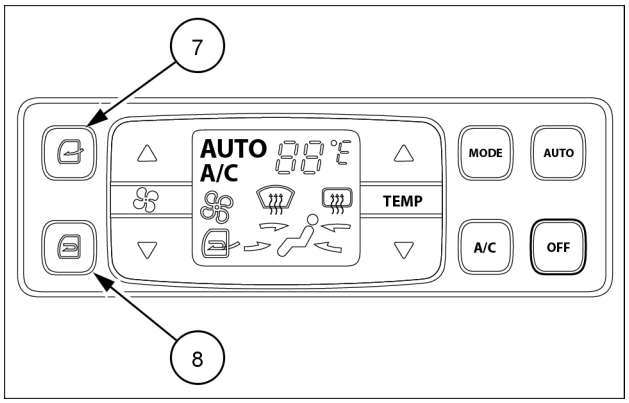
SMIL16MEX1047BA 8

7. Fresh air push-button / 8. Air recirculation push-button

The push-button **(7)** allows external air to enter the operator's cab.

The push-button **(8)** recycle the internal air of the cab. Indication of the air recirculation will appear on the display screen.

NOTE: *change air occasionally when using the air recirculation for a long time.*



SMIL16MEX0571AA 9

Self-check function

The air–conditioning panel can perform an automatic self-check for system errors.

To perform the automatic self-check, press the air recirculation push–button over five times within two seconds while pressing the AUTO switch. All symbols of the display blink five times.

If no errors are detected, the panel returns to normal operation.

If errors are detected, it is possible to switch OFF the air–conditioning panel or press the AUTO push–button. In this case, the diagnostic function is cancelled and the panel returns to normal operation.

During the error check, the corresponding error code blinks on the temperature display panel. The error blinks every **0.5 s**. If error codes are more than two, each code blinks two times in sequence.

Error code list

Error code	Description	Fail safe function
11	Cab inside error	**25 °C** (**77.0 °F**) alternate value control
12	Ambient sensor	**20 °C** (**68.0 °F**) alternate value control
14	Evaporator sensor	**1 °C** (**33.8 °F**) alternate value control
15	Temperature actuator	If opening amount is **0 %**, the alternate value is **0 %**. If not, the alternate value is **100 %**.
16	Mode actuator 1	The alternate value is VENT
17	Mode actuator 2	The alternate value is VENT
18	Intake actuator	

Emergency exit hammer

⚠ WARNING

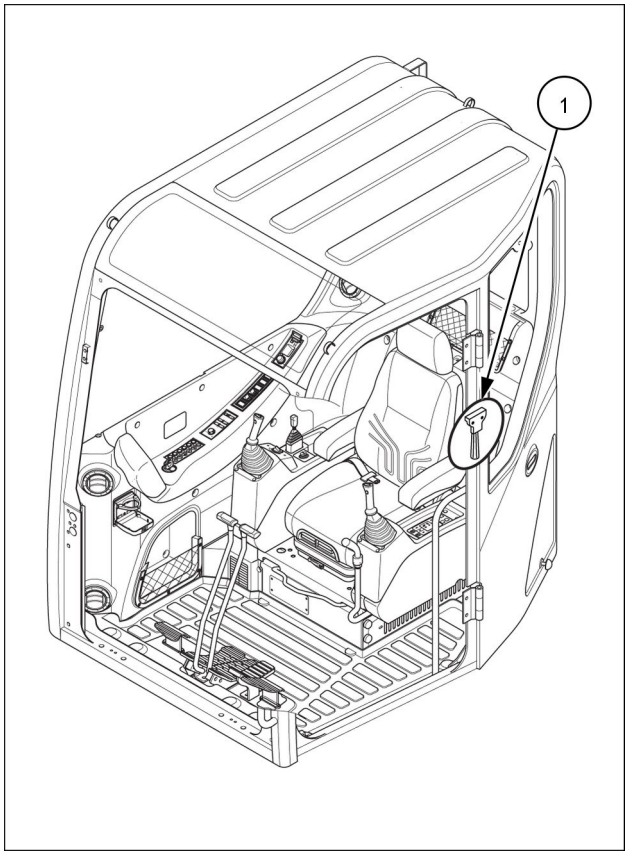
Avoid injury!
A safety sign indicates which window to use as an emergency exit. Remove this window only in an emergency. Do not place any object that could be an obstacle in case of evacuation in front of this window.
Failure to comply could result in death or serious injury.

W1435A

Only in case of emergency, use the installed safety hammer **(1)** for breaking the windshield of the cab, and then exit carefully.

Consult your CASE CONSTRUCTION dealer for windshield installation.

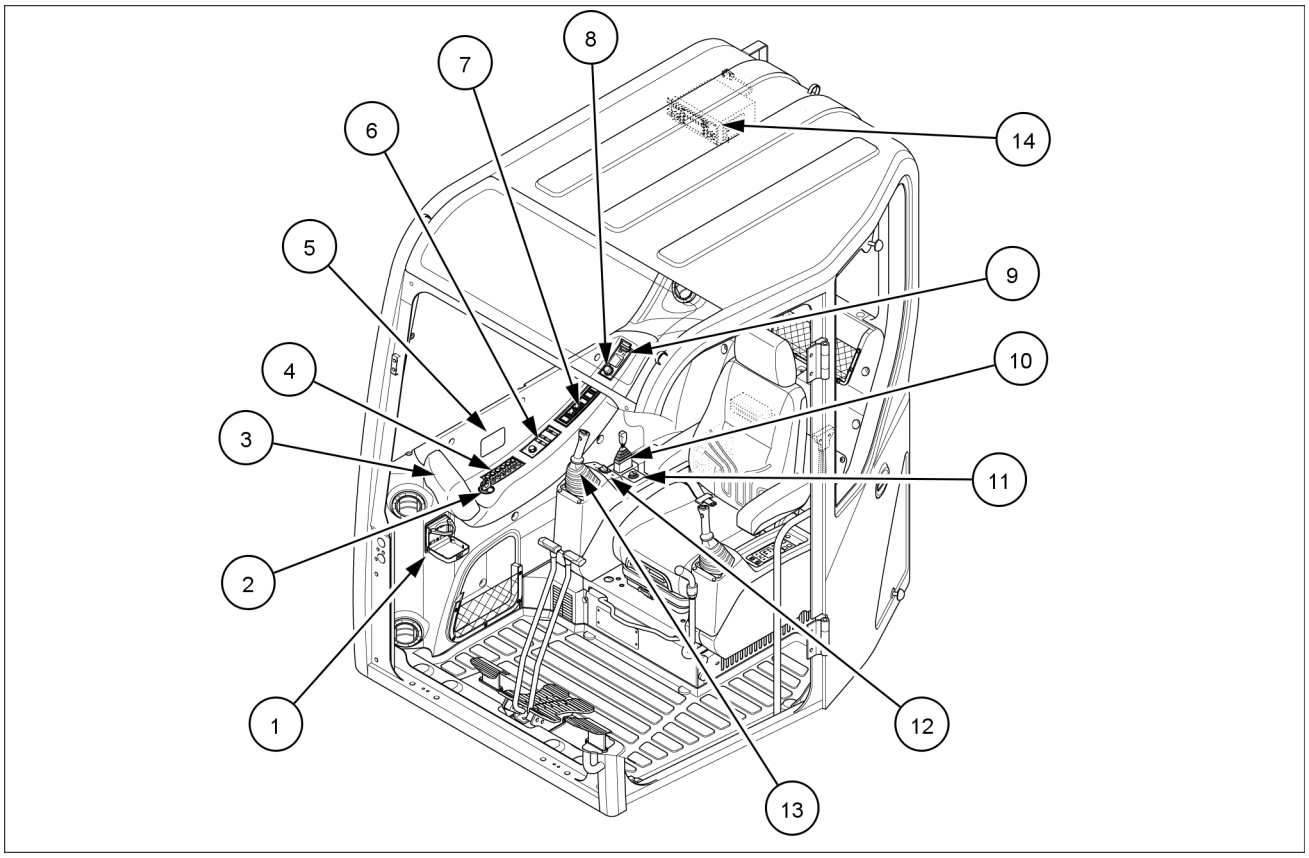
NOTICE: *do not break the windshield of the cab except when it is absolutely necessary, such as to escape in an emergency.*



SMIL16MEX1049BA 1

Right-hand side controls

Right-hand side controls



SMIL16MEX1048FA 1

(1) Beverage can holder

(2) Starter switch

(3) Instrument cluster (refer to page **3-27**)

(4) Push-button panel

(5) Ashtray

(6) Remote controller (refer to page **3-52**)

(7) Switch panel

(8) **12 V** socket

(9) USB/Aux socket (hands-free device, refer to page **3-52**)

(10) Dozer blade control lever (refer to page **3-57**)

(11) Cigarette lighter and **12 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: *if you continuously push in the cigarette lighter, you can cause serious damage to the device and the machine electrical system.*

NOTICE: *connect only **12 V**, **120 W** devices to the socket. Connecting devices functioning at different voltage can cause damages to the device itself and to the electrical system.*

(12) Engine speed knob

(13) Right–hand control lever (refer to **3-6**)

(14) Radio and USB player (refer to page **3-60**).

Starter switch

The starter switch has three positions:

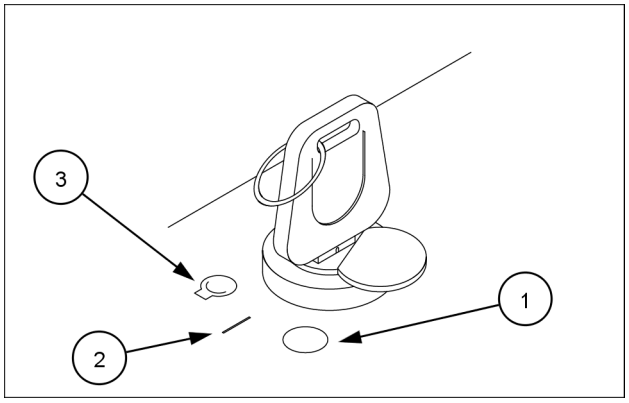
(1) OFF: engine shut–down.

(2) ON: contact, all the systems of the machine operate. The buzzer sounds for **1 s**.

NOTICE: *if this alarm does not sound, the electric circuit is abnormal. Contact the CASE CONSTRUCTION dealer for inspection and maintenance.*

(3) START: engine ignition.

NOTE: *the starter key is also used to lock the cab door, the engine hood, and the storage compartment.*



SMIL16MEX0507AA 2

Illumination push-button

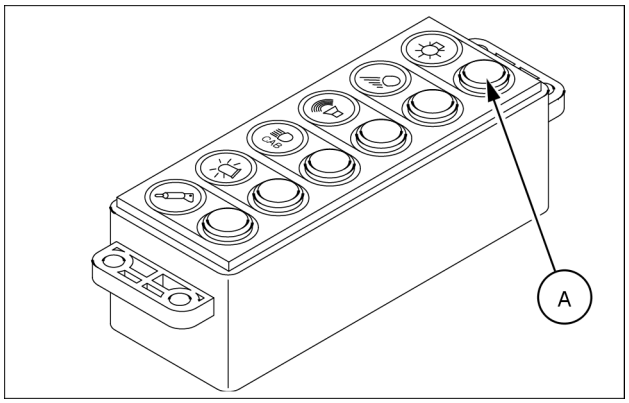
Press the push–button **(A)** to turn on the illumination lights of:

air conditioner and heater controller;

radio and USB player;

USB socket, DPF switch, engine speed knob, and cigar lighter.

Press again the push–button **(A)** to turn off the same illumination lights.

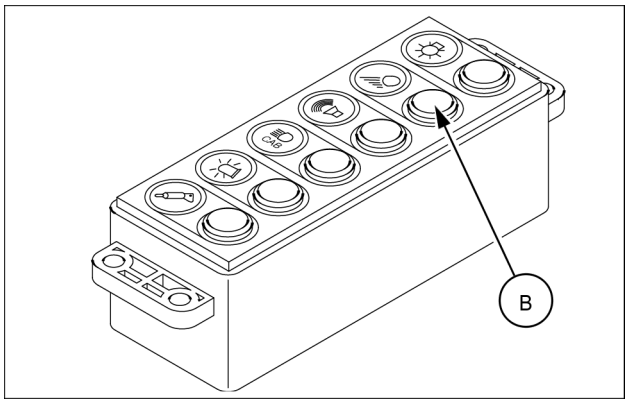


SMIL16MEX0506AA 3

Work light push–button

Press the push–button **(B)** to turn on the work light and the pilot light on the panel.

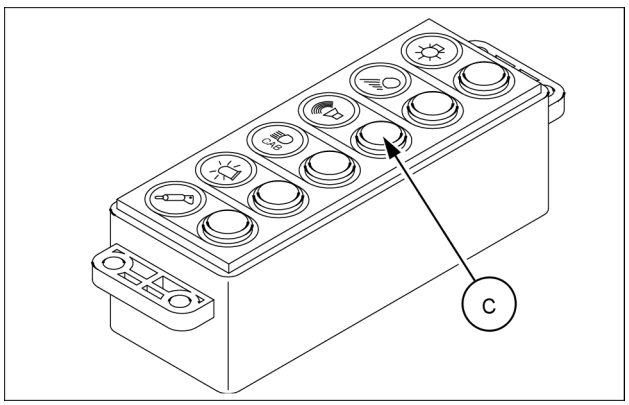
Press again the push–button **(B)** to turn off the work light and the pilot light on the panel.



SMIL16MEX0506AA 4

Travel alarm push–button

The travel alarm push–button **(C)**, when pressed, activates a buzzer to alarm surrounding the machine when the machine travels forward and backward.

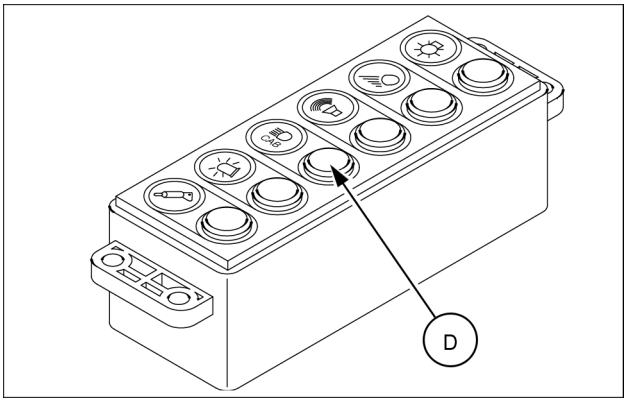


SMIL16MEX0506AA 5

Cab light push–button

Press the push–button **(D)** to turn on the cab light and the pilot light on the panel.

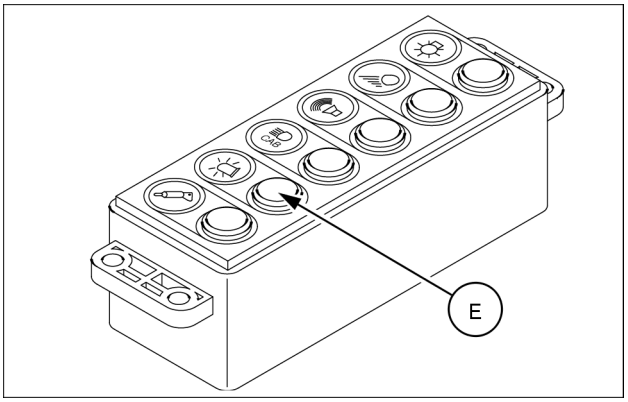
Press again the push–button **(D)** to turn off the cab light and the pilot light on the panel.



SMIL16MEX0506AA 6

Rotating beacon push-button (optional)

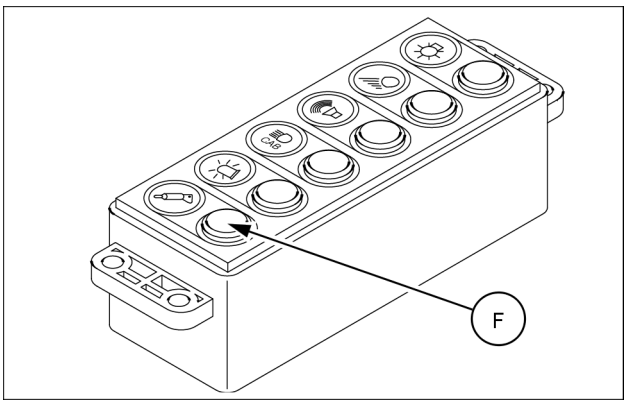
Press the beacon push-button **(E)** to activate the beacon light on the cab and the indicator light on the switch.



SMIL16MEX0506AA 7

Breaker (optional)

Press the breaker push-button **(F)** to activate the breaker.



SMIL16MEX0506AA 8

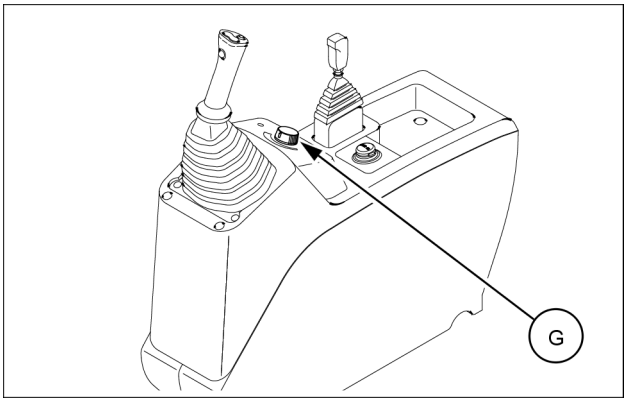
Engine speed knob

The engine speed knob **(G)** has ten dial settings.

The setting 1 is the low idle, the setting 10 is the high idle.

Rotate clockwise the engine speed knob to increase the engine speed.

Rotate counterclockwise the engine speed knob to decrease the engine speed.

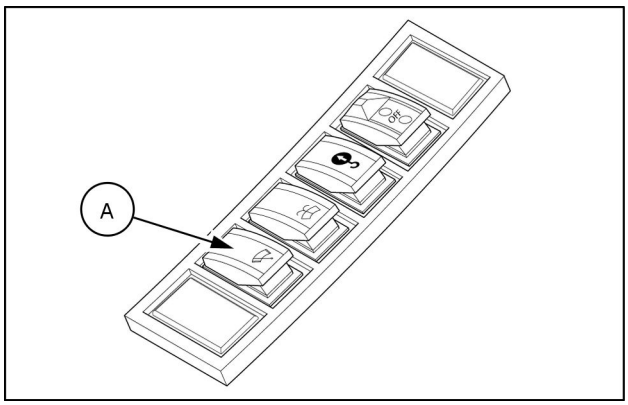


SMIL16MEX0510AA 9

Wiper switch

Press the wiper switch **(A)** to activate the wiper.

NOTE: *wiper motor does not operate with the windshield opened.*

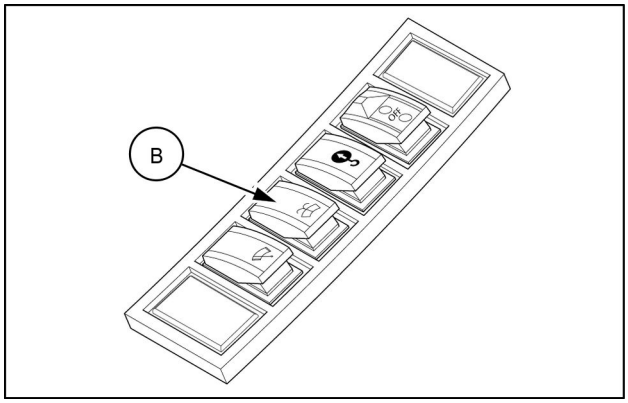


SMIL16MEX3229AA 10

Washer switch

Press the washer switch **(B)** to activate the washer.

The washer liquid is sprayed and the wiper is operative only while the switch is pressed. If the washer switch **(B)** is released, it returns to initial position.

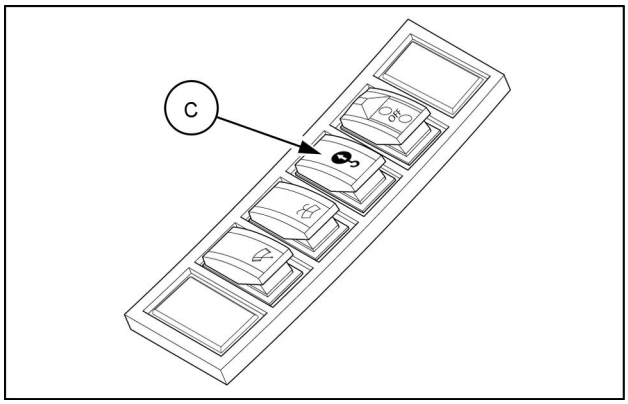


SMIL16MEX3229AA 11

Overload warning switch (optional)

The overload warning switch **(C)** when pressed activates the overload warning function: when the machine is overloaded, a buzzer sounds and the red warning light in the instrument cluster turns ON.

When the overload warning switch is depressed, the buzzers stops sounds and the red warning light in the instrument cluster turns OFF.



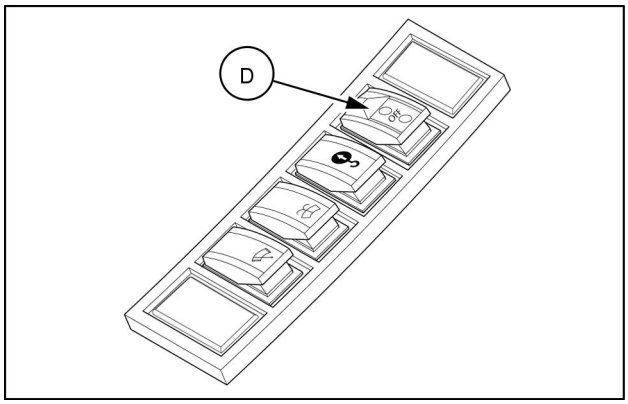
SMIL16MEX3229AA 12

Diesel Particulate Filter (DPF) switch

The Diesel Particulate Filter (DPF) switch **(D)** is used to select the regeneration function of the DPF system.

The DPF switch **(D)** has three positions:

1. Inhibit position
2. OFF position
3. Manual regeneration position



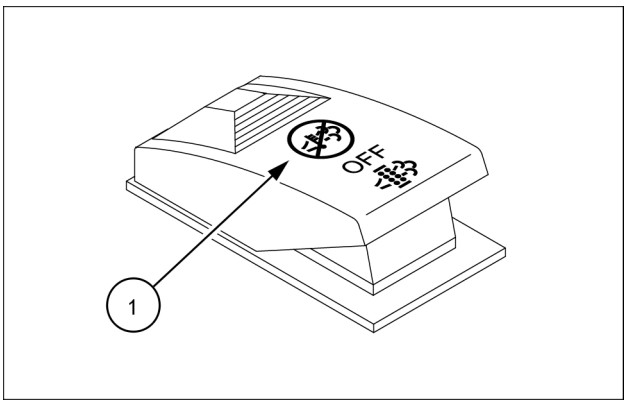
SMIL16MEX3229AA 13

(1) Inhibit position

This position **(1)** disables any automatic or manual regeneration of the DPF system.

This function may be used by operator to prevent the regeneration when the machine is operating in a hazardous environment concerned about high temperature.

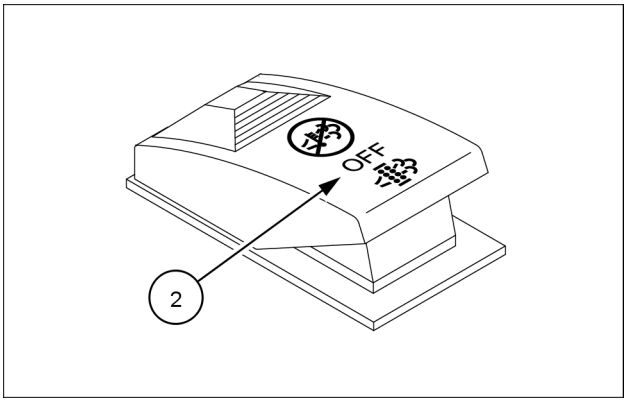
It is strongly recommended to activate this position only when high temperatures may cause a hazardous condition.



SMIL16MEX0509AA 14

(2) OFF position

This position **(2)** activates an automatic regeneration of the DPF system.



SMIL16MEX0509AA 15

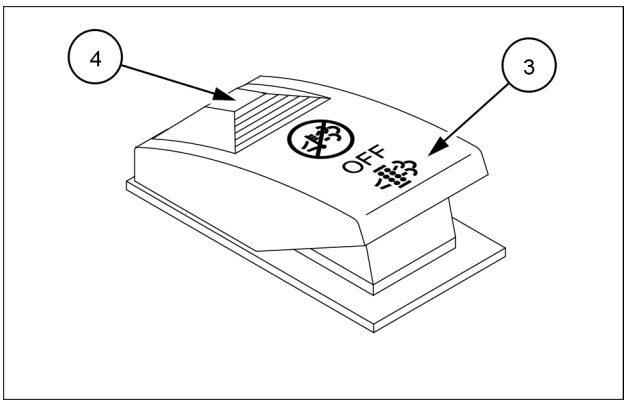
(3) Manual regeneration position

This position **(3)** activates a manual regeneration of the DPF system when the machine is in the following conditions:

- the machine is not working
- the engine runs at low idle speed
- the DPF soot level is high enough to allow regeneration.

The DPF switch can be positioned in the manual regeneration position only if the safety button **(4)** is pulled backward.

The DPF switch returns to the OFF position when the manual regeneration position is released.



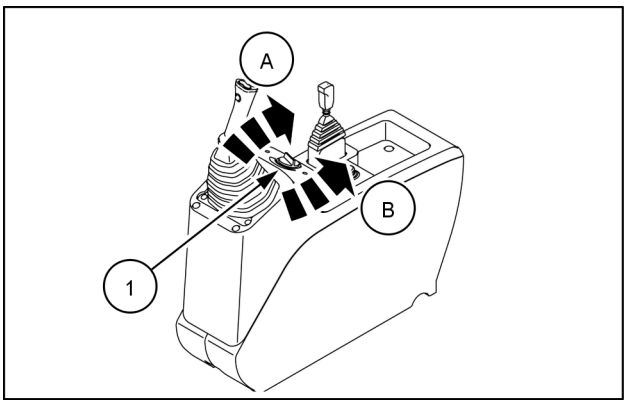
SMIL16MEX0509AA 16

Engine speed control

The engine speed control knob **(1)** is used to increase or decrease the rotation speed of engine (RPM).

- Turn the lever clockwise **(A)** to increase engine RPM.
- Turn the lever counterclockwise **(B)** to decrease engine RPM.

NOTE: *when stop the engine, turn the engine speed control lever completely counterclockwise **(B)** and then turn the starter key OFF.*



SMIL16MEX3169AA 1

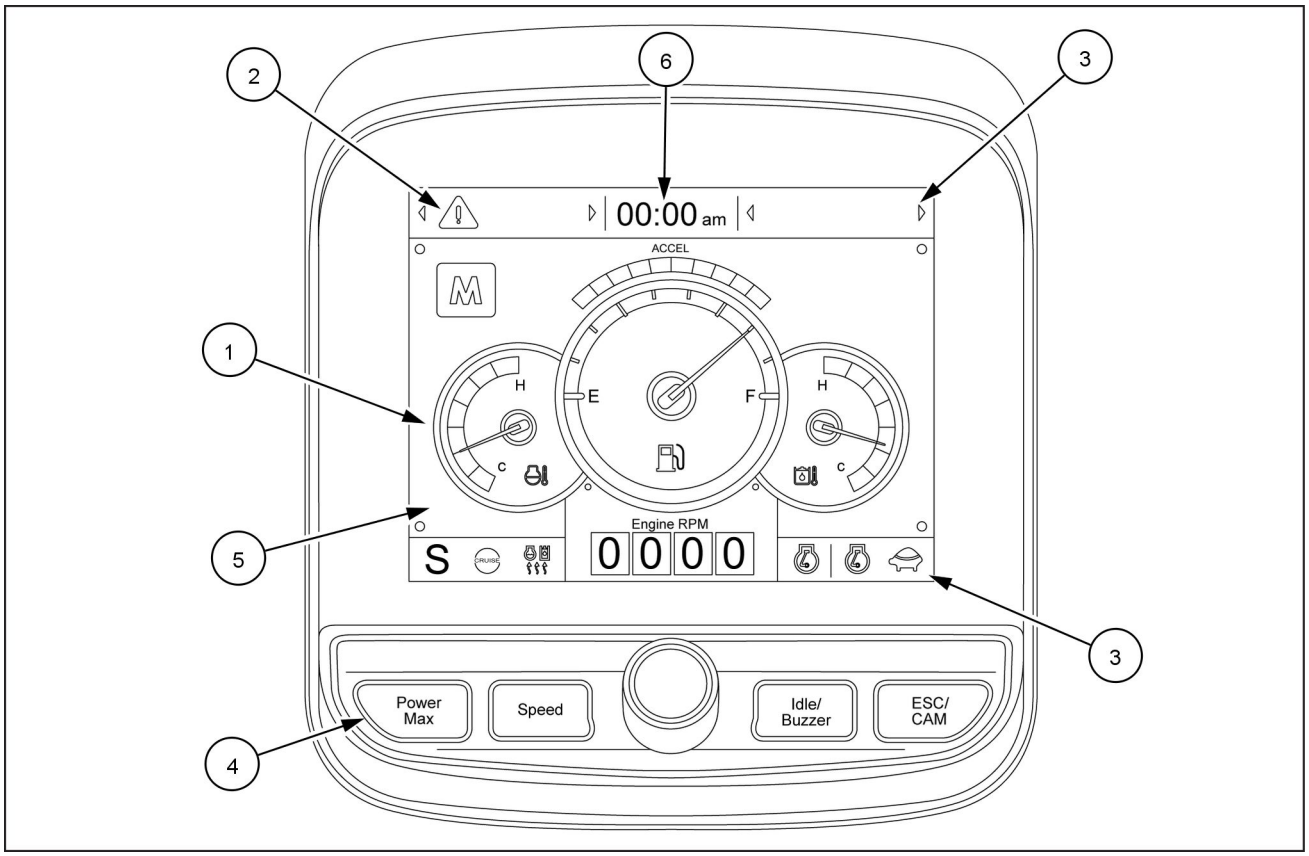
Instrument cluster

The instrument cluster consists of a Liquid Crystal Display (LCD) screen and switches as shown below.

The LCD warns the operator in case of abnormal machine operation or conditions for the appropriate operation and inspection.
The LCD shows set and display for modes, monitoring and utilities.

The switches set the machine operation modes.

NOTE: *the cluster installed on this machine does not entirely guarantee the condition of the machine. Daily inspection should be performed. When the cluster provides a warning, immediately check the problem and perform the required action*



SMIL16MEX3090FA 1

(1) Gauges
(2) Warning lights
(3) Pilot lights
(4) Switches
(5) Main menu
(6) Time display

1. GAUGES

Operation screen

When you first turn starting switch ON, the operation screen will appear.

(A): Default menu (A type)

(B): Option (B type)

(C): Option (C type)

NOTE: *operation screen can be selected by the screen type menu of the display.*

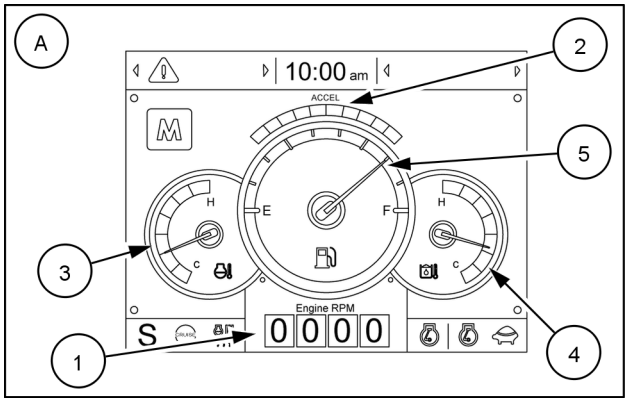
(1) Engine RPM

(2) Accelerator dial

(3) Engine coolant temperature gauge

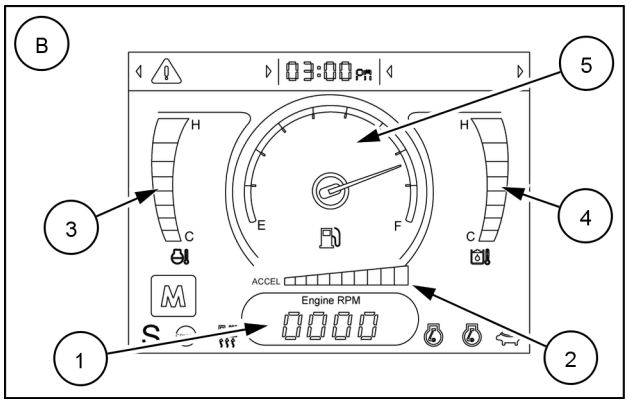
(4) Hydraulic oil temperature gauge

(5) Fuel level gauge



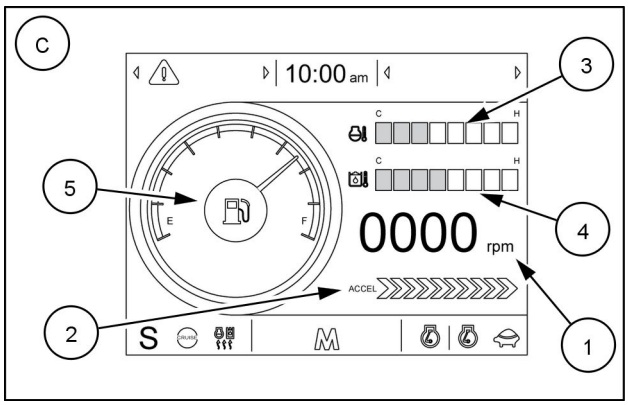
SMIL16MEX3091AA 2

(A): Default menu (A type)



SMIL16MEX3092AA 3

(B): Option (B type)



SMIL16MEX3093AA 4

(C): Option (C type)

(1) Engine RPM

The engine RPM display shows the RPM of the engine.

(2) Accelerator dial

The acceleration dial indicates the level of acceleration from 0 to 10 steps.

(3) Engine coolant temperature gauge

The engine coolant temperature gauge indicates the temperature of the coolant.

Black range **(A)**: between **40 – 115 °C** (**104 – 239 °F**)

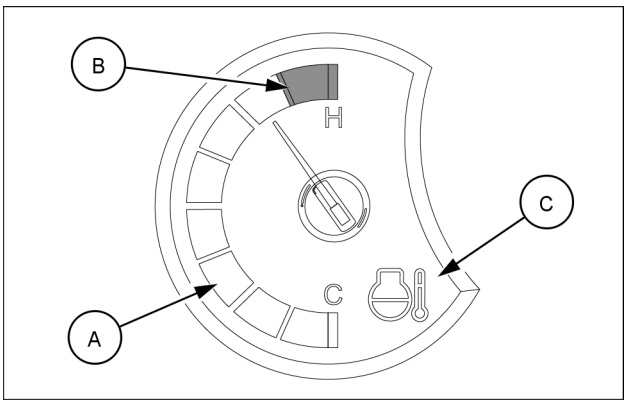
Red range **(B)**: above **115 °C** (**239 °F**)

If the indicator is in the red range **(B)** or light **(C)** turns ON in red, stop the engine and check the engine cooling system.

When the red range **(B)** or light **(C)** turns ON in red, do not stop abruptly the engine, but run the engine at medium speed to allow it to cool gradually, then stop the engine.

NOTICE: *if the engine is stopped without cooled down running, the temperature of engine parts will rise suddenly, and this can cause severe engine trouble.*

NOTICE: *if the gauge indicates the red range or light turns ON in red even though the machine is on the normal condition, consult your CASE CONSTRUCTION dealer.*



SMIL16MEX0614AA 5

(4) Hydraulic oil temperature gauge

The hydraulic oil temperature gauge indicates the temperature of the hydraulic oil.

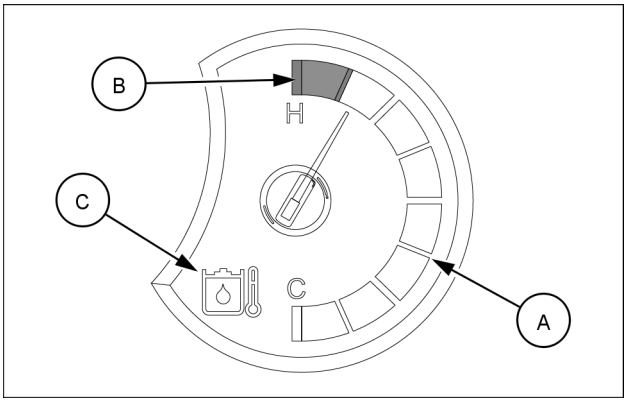
Black range **(A)**: between **40 – 105 °C** (**104 – 221 °F**)

Red range **(B)**: above **105 °C** (**221 °F**)

If the indicator is in the red range **(B)** or light **(C)** turns ON in red, reduce the load on the system.

If the gauge stays in the red range, stop the machine and check the cause of the problem.

NOTICE: *if the gauge indicates the red range or light turns ON in red even though the machine is on the normal condition, consult your CASE CONSTRUCTION dealer.*



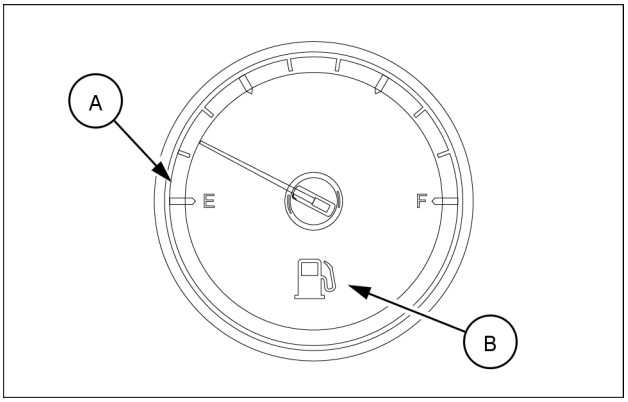
SMIL16MEX0615AA 6

(5) Fuel level gauge

The fuel gauge indicates the amount of fuel in the fuel tank.

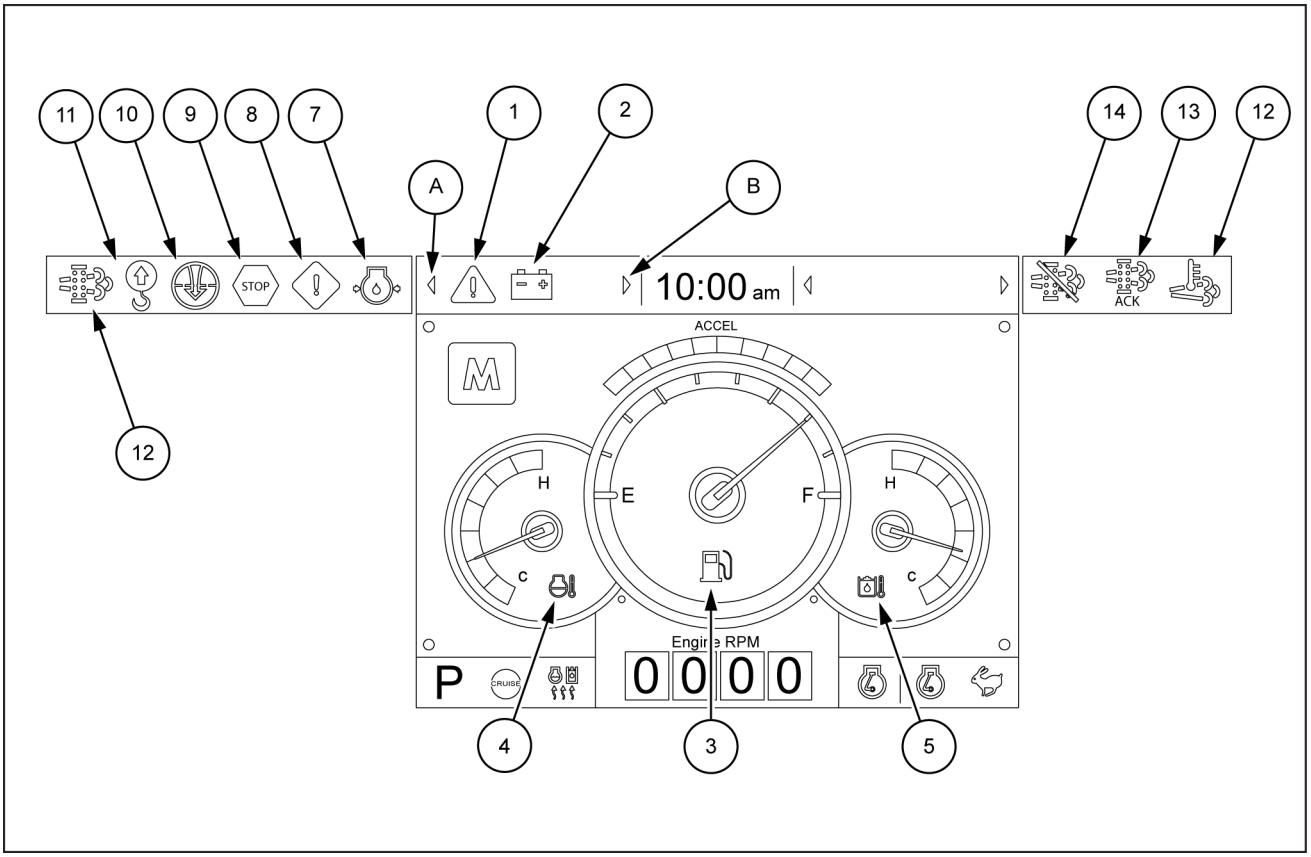
Fill the fuel when the red range **(A)** or light **(B)** turns ON in red.

NOTICE: *if the gauge indicates the red range or the light turns ON in red even though the machine is on the normal condition, consult your CASE CONSTRUCTION dealer.*



SMIL16MEX0616AA 7

2. WARNING LIGHTS



SMIL16MEX0520FB 8

(A) Previous page button

(B) Next page button

(1) Emergency warning light

(2) Battery charging warning light

(3) Fuel level warning light

(4) Engine coolant temperature warning light

(5) Hydraulic oil temperature warning light

(6) Engine oil pressure warning light

(7) Check engine warning light

(8) Stop engine warning light

(9) Air cleaner warning light

(10) Overload warning light

(11) Diesel Particulate Filter (DPF) warning light

(12) High Exhaust System Temperature (HEST) warning light

(13) Diesel Particulate Filter (DPF) regeneration acknowledge warning light

(14) Diesel Particulate Filter (DPF) regeneration inhibit warning light

NOTE: *each warning light on the left-top of the LCD pops up on the center of LCD and the buzzer sounds when the each warning happens. The pop-up warning light moves to the original position, the lights turn ON, and the buzzer stops when the buzzer stop switch is pushed or the pop-up is touched.*

NOTE: *when more than four warning icons appear on the display, you can check all lights using the previous page button* ***(A)*** *or the next page button* ***(B)*** *near the warning lights.*

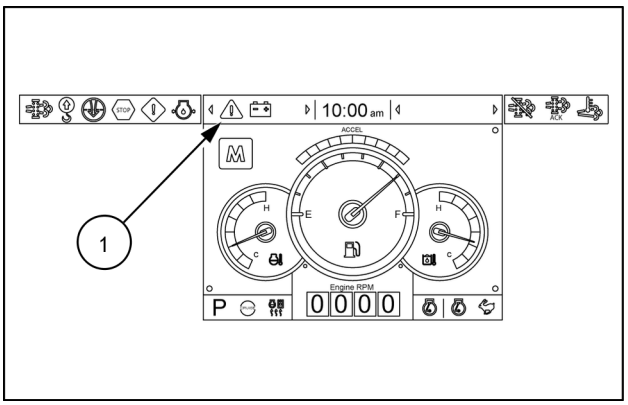
(1) Emergency warning light

This light appears and the buzzer sounds when one of the following conditions occur:

- Engine coolant overheating (over **115 °C** (**239 °F**))
- Hydraulic oil overheating (over **105 °C** (**221 °F**))
- Machine Control Unit input voltage abnormal
- Accelerator dial circuit abnormal or open

The pop-up warning icon moves to the original position and the buzzer stops when the buzzer stop switch is pushed or pop-up is touched. This is same as following warning lights.

When this light turns ON, the machine must be checked and serviced immediately.

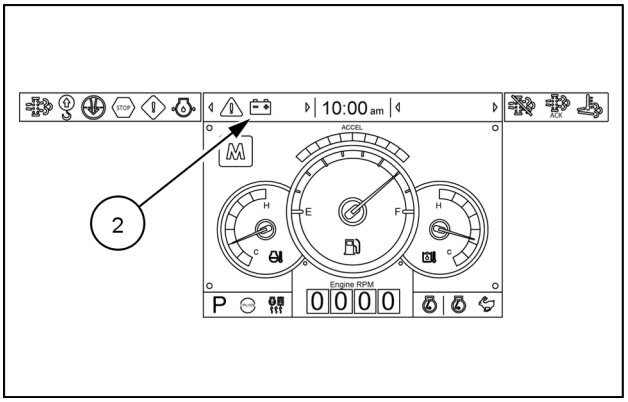


SMIL16MEX3094AA 9

(2) Battery charging warning light

This light turns ON when the battery charging voltage is low.

Check the battery charging circuit when this light is ON.

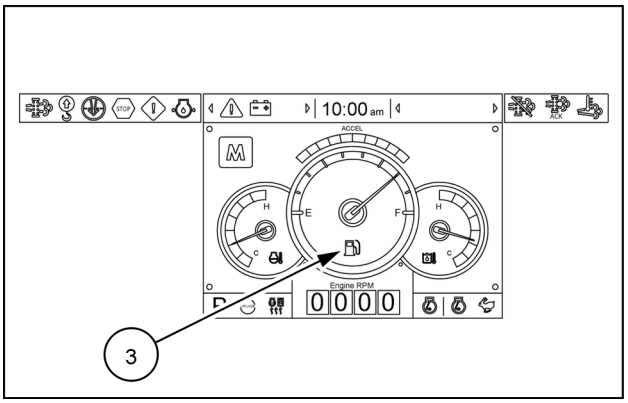


SMIL16MEX3094AA 10

(3) Fuel level warning light

This light turns ON and the buzzer sounds when the level of fuel is below **10 %**.

Fill the fuel immediately when the light is ON.



SMIL16MEX3094AA 11

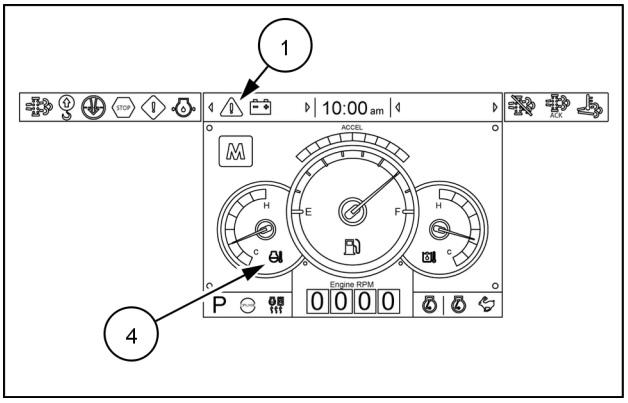
(4) Engine coolant temperature warning light

The light **(1)** pops up on the center of LCD and the buzzer sounds when the engine coolant temperature is over **115 °C** (**239 °F**).

The pop-up light moves to the original position and turns ON when the buzzer stop switch is pushed or pop-up is touched.

Also, the buzzer stops and light **(4)** stays ON.

Check the cooling system when the light **(4)** turns ON.



SMIL16MEX3094AA 12

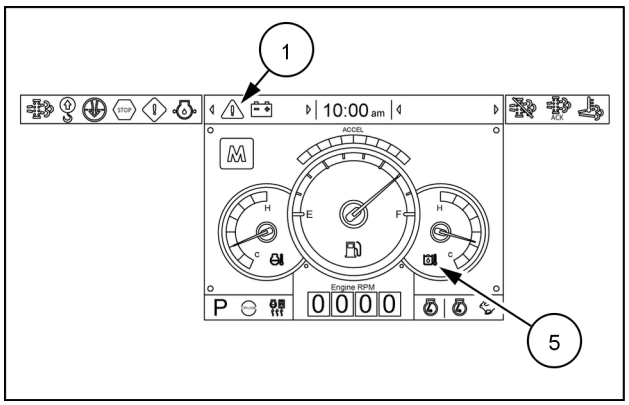
(5) Hydraulic oil temperature warning light

The light **(1)** pops up on the center of LCD and the buzzer sounds when the hydraulic oil temperature is over **105 °C** (**221 °F**).

The pop-up light moves to the original position and turns ON when the buzzer stop switch is pushed or pop-up is touched.

Also, the buzzer stops and light **(5)** stays ON.

Check the hydraulic oil level when the light **(5)** turns ON.

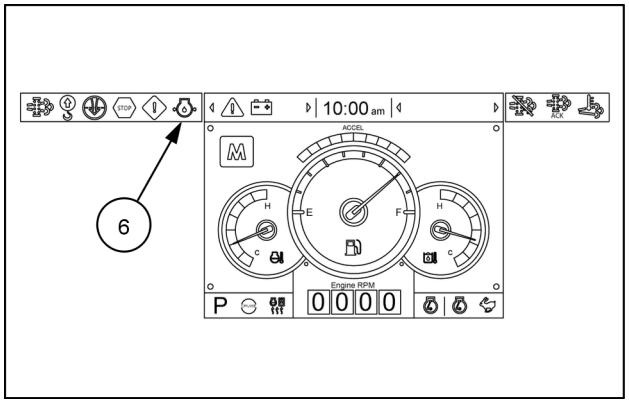


SMIL16MEX3094AA 13

(6) Engine oil pressure warning light

This light turns ON when the engine oil pressure is low.

If the light **(6)** turns ON, stop the engine immediately and check the oil level.



SMIL16MEX3094AA 14

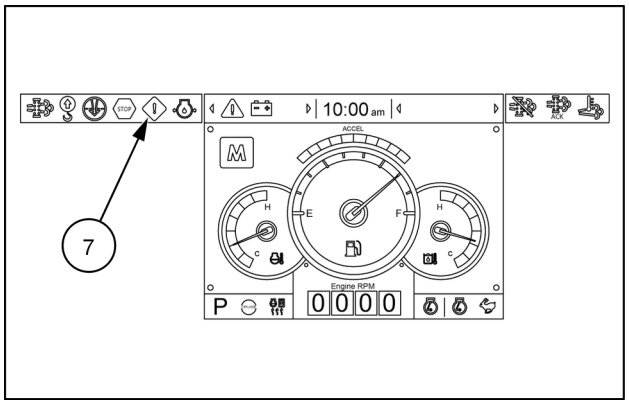
(7) Check engine warning light

This light turns ON when the communication between the Machine Control Unit (MCU) and the Engine Control Module (ECM) on the engine is abnormal, or if the cluster receives any fault code from the ECM.

Check the communication line between them.

If the communication line is correct, check the fault codes on the instrument cluster.

Also, this light pops up when the level of the DPF soot is high.



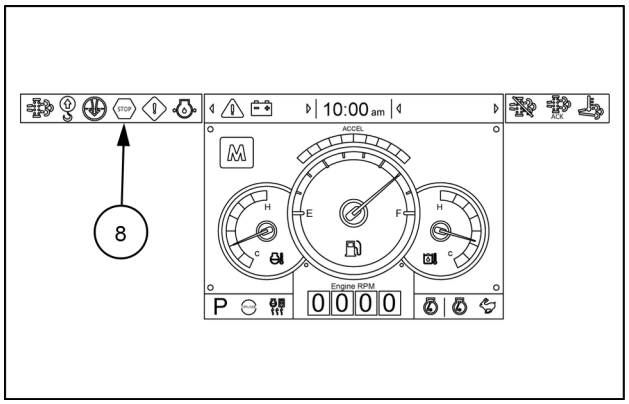
SMIL16MEX3094AA 15

(8) Stop engine warning light

If the light turns ON, stop the engine immediately and check the engine.

Check the fault codes on the instrument cluster.

NOTE: *please contact your CASE CONSTRUCTION dealer.*

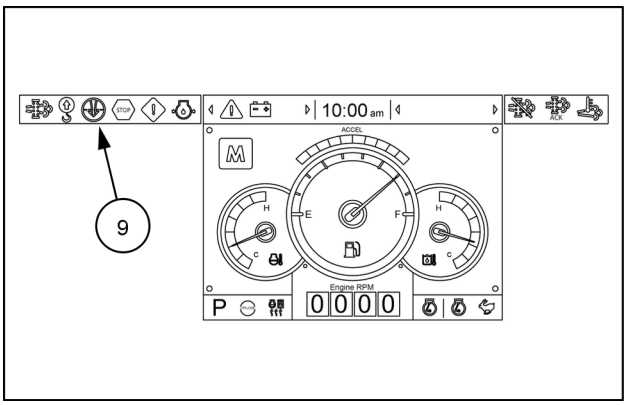


SMIL16MEX3094AA 16

(9) Air cleaner warning light

This light turns ON when the filter of air cleaner is clogged.

Check and clean the filter or replace it.

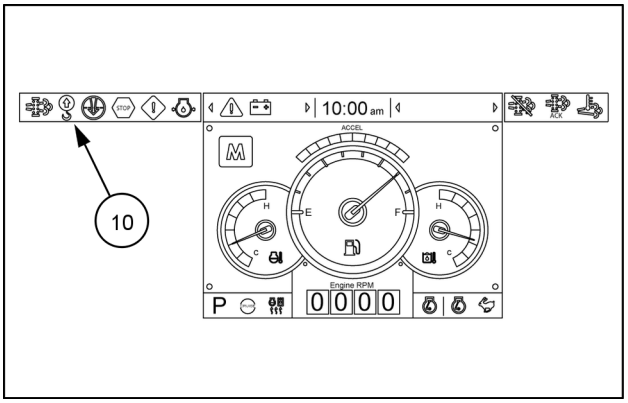


SMIL16MEX3094AA 17

(10) Overload warning light (Optional)

When the machine is overload, the overload warning light turns ON if the overload switch is ON position.

Reduce the machine load.



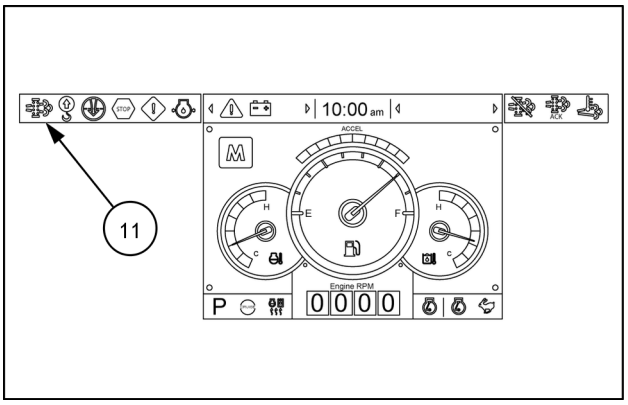
SMIL16MEX3094AA 18

(11) Diesel Particulate Filter (DPF) warning light

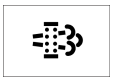
This light turns ON or blinks when the regeneration is needed, as described in the following table.

The consequences of delaying regeneration are:

- Poor performance caused by increasing exhaust gas pressure
- Higher fuel consumption
- Shorter filter lifetime



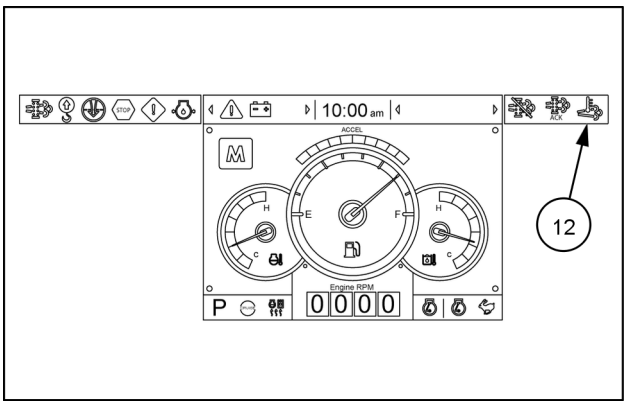
SMIL16MEX3094AA 19

Condition	Warning light			Remedy
	DPF	Check the engine (pop up)	Stop the engine (pop up)	
				
Normal	Off	Off	Off	• Automatic regeneration
Low soot level	On	Off	Off	• Push DPF switch to OFF position if DPF switch is in inhibit position. • Engine power may be reduced automatically (soot medium)
Medium soot level	Blink	Off	Off	
High soot level	On	On	Off	• Engine power and speed will be reduced automatically • Initiate a manual regeneration, refer to page **6-60**
Stop	On	Off	On	• Stop the engine immediately. • Please contact your CASE CONSTRUCTION dealer.

⚠ WARNING

Fire hazard!
During the particulate matter catalyst forced regeneration process the exhaust stack and fixed hood area becomes extremely hot. Park the machine outside and away from combustible or highly flammable material.
Failure to comply could result in death or serious injury.

W1346A



SMIL16MEX3094AA 20

(12) High Exhaust System Temperature (HEST) warning light

This warning light indicates, when illuminated, that exhaust temperatures are high due to regeneration of the DPF.

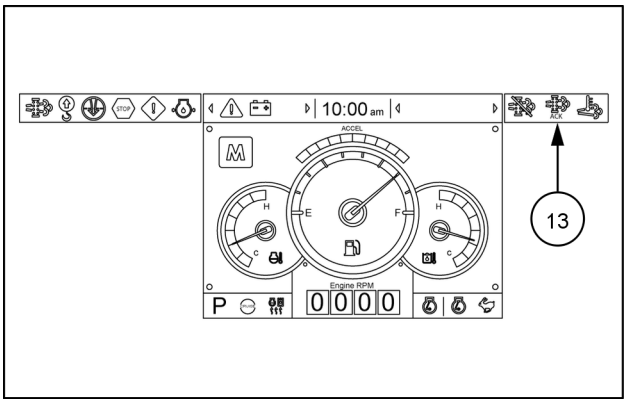
The light will also illuminate during a manual regeneration.

NOTICE: *when this light is illuminated, the exhaust gas temperature could reach* ***600 °C (1112 °F****).*

NOTE: *this light does not indicate to service the engine. This light warns of the high exhaust temperatures.*

(13) Diesel Particulate Filter (DPF) regeneration acknowledge warning light

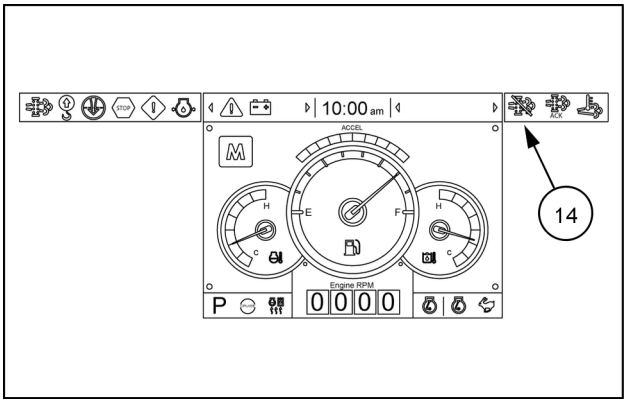
This light turns ON during the regeneration function is operating. This light turns OFF when the regeneration function is completed.



SMIL16MEX3094AA 21

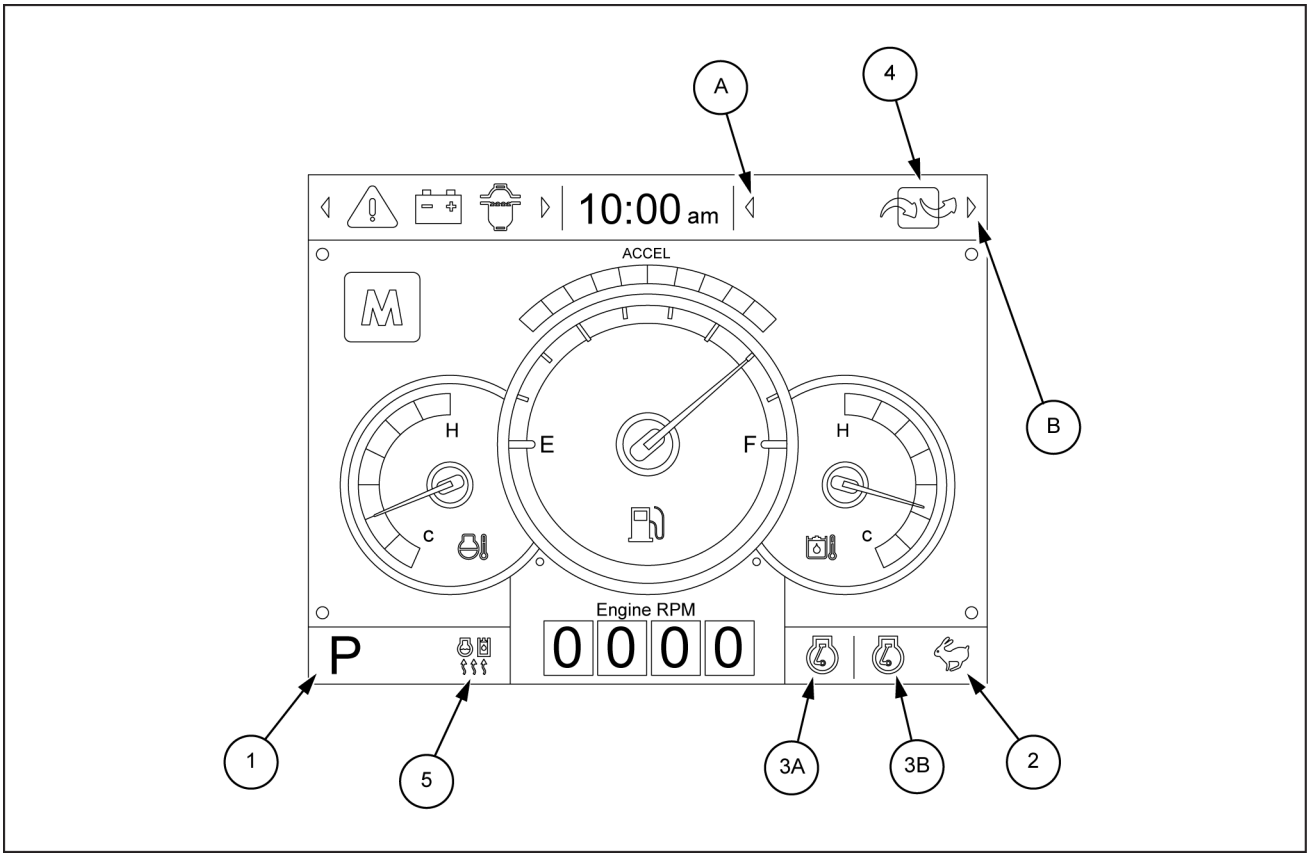
(14) Diesel Particulate Filter (DPF) regeneration inhibit warning light

This light indicates, when illuminated, that the DPF switch is pushed to the inhibit position, therefore the automatic and the manual regeneration cannot be performed.



SMIL16MEX3094AA 22

3. PILOT LIGHTS



SMIL16MEX0521FB 23

(A) Previous page button

(B) Next page button

(1) Power mode pilot light

(2) Travel mode pilot light

(3A) Auto idle mode pilot light

(3B) Auto idle status pilot light

(4) Maintenance pilot light

(5) Warming up pilot light

NOTE: *when more than four pilot lights are ON, you can check all lights using the previous page button* ***(A)*** *or the next page button* ***(B)*** *near the pilot lights.*

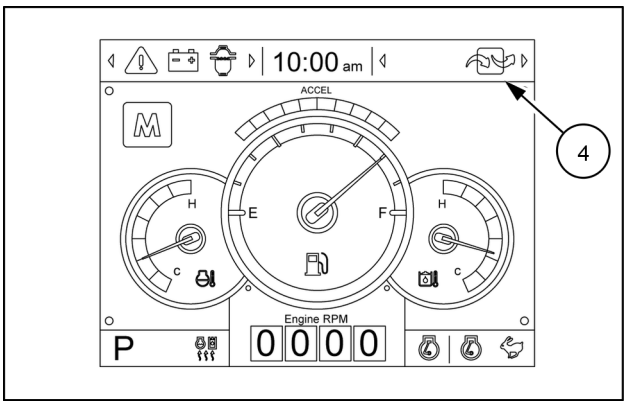
	Mode	Pilot light	Selected mode
(1)	Power mode	P	Heavy duty power work mode
		S	Standard power mode
(2)	Travel mode		Low speed traveling
			High speed traveling
(3)	Auto idle mode		Auto idle mode **(3A)**, white color light. This light turns ON when the idle mode is selected.
			Auto idle status **(3B)**, green color light. This light turns ON when all the control levers and the control pedals are in neutral position, and the auto idle mode is selected.

(4) Maintenance pilot light

This light is ON when the consuming parts are needed to change or replace.

It means that the change or replacement interval of the consuming parts remains below **30 h**.

Check the message in maintenance information of main menu. Also, this light turns ON for **3 min** when the starter switch is ON position.

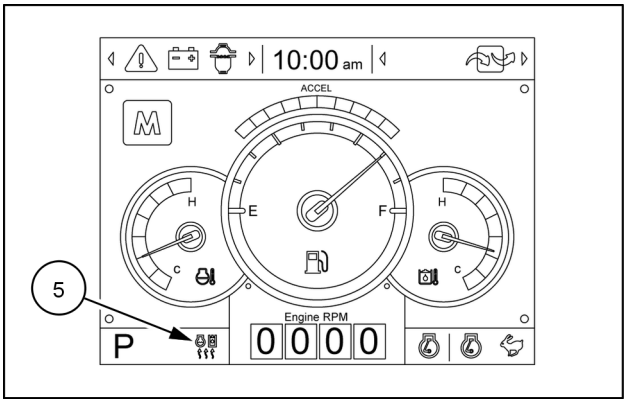


SMIL16MEX3095AA 24

(5) Warming up pilot light

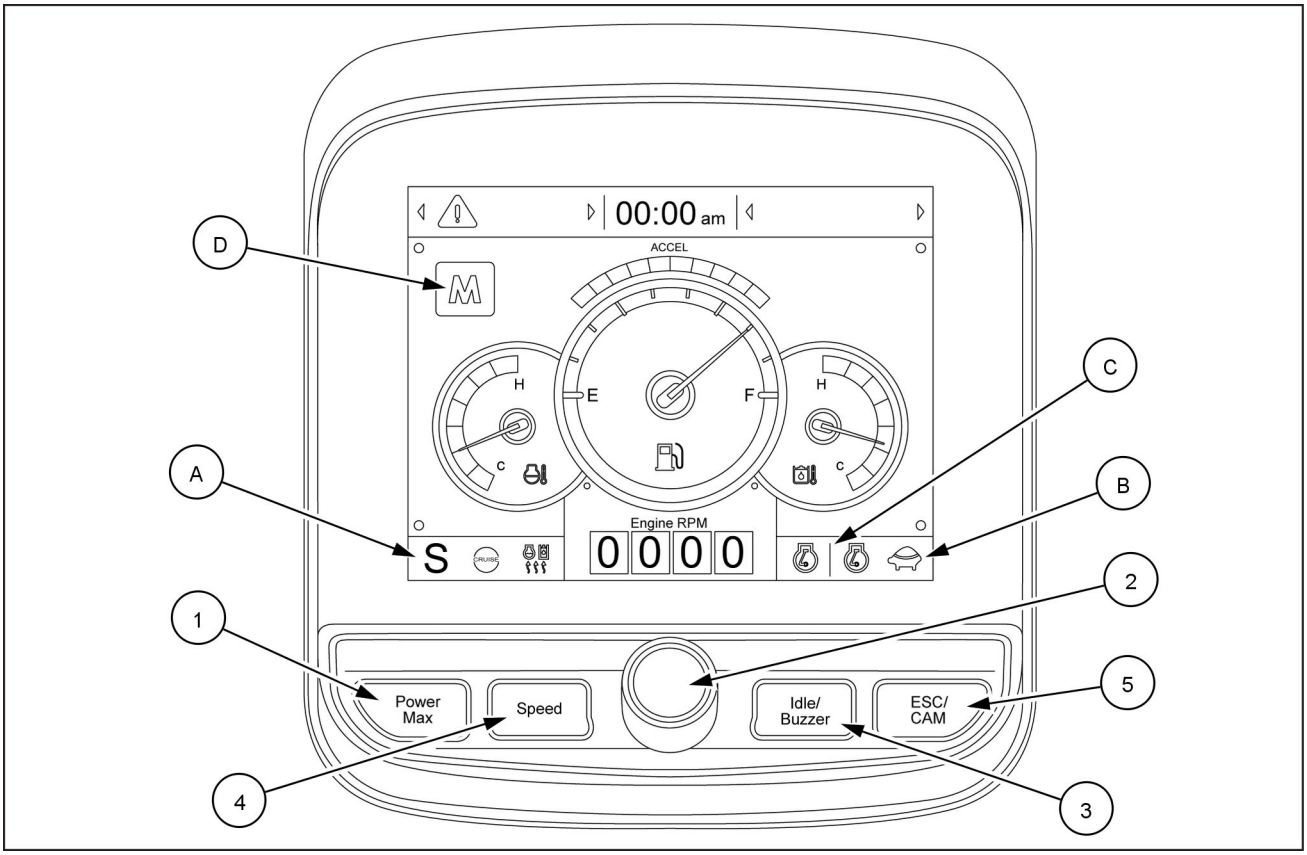
This light is ON when the coolant temperature is below **30 °C** (**86 °F**).

The light is OFF when the engine coolant temperature is above **30 °C** (**86 °F**), or when **10 min** have passed since starting the engine.



SMIL16MEX3095AA 25

4. SWITCHES



SMIL16MEX3096FA 26

(1) Power mode switch

(2) Selection knob

(3) Auto idle/Buzzer stop switch

(4) Travel speed switch

(5) Escape (previous menu)/Rear camera

(A) Power mode pilot light

(B) Travel speed pilot light

(C) Auto idle pilot light

(D) Main menu quick touch button

NOTE: *when press the switch, the relevant pilot lights are displayed on the LCD.*

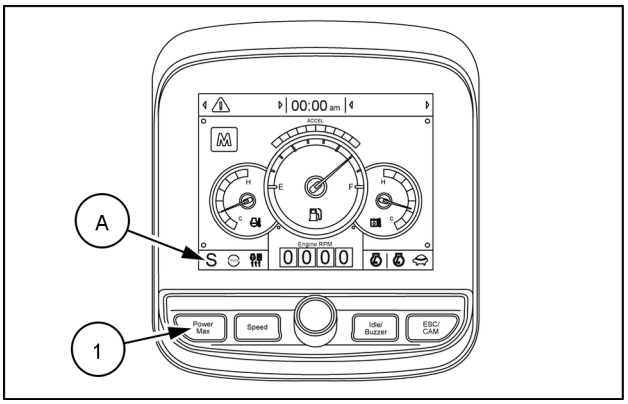
(1) Power mode switch

Press this switch to select the machine power mode. The power mode pilot light turns ON in the pilot mode light position **(A)**.

Pilot mode light:

- P: heavy duty power mode
- S: standard power mode

The pilot light changes in this order: S, P, S.



SMIL16MEX3097AA 27

(2) Selection knob

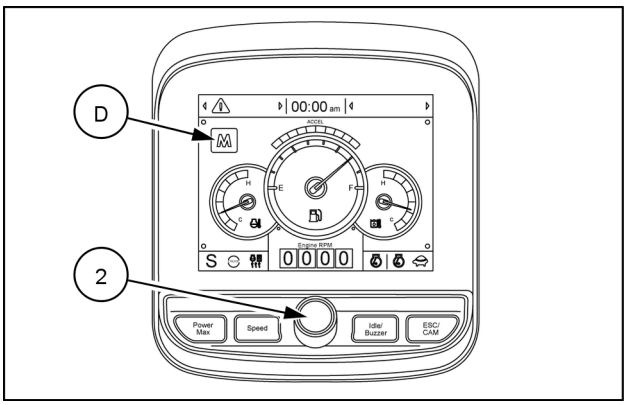
This knob is used to select or change the menu and the input value.

Knob pushing (or main menu quick touch button **(D)** pushing)

- Long (more than **2 s**): return to the operation screen
- Medium (**0.5 – 2 s**): return to the previous screen
- Short (less than **0.5 s**): select menu

Knob rotation

- Clockwise turning: down direction/Increase input value
- Counterclockwise turning: Up direction/Decrease input value



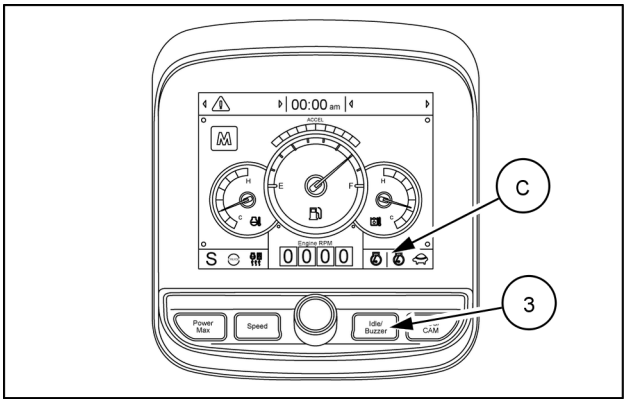
SMIL16MEX3097AA 28

(3) Auto idle/Buzzer stop switch

This switch has two functions:

1. Press the switch to activate or deactivate the auto idle function **(C)**.
2. Press the switch to stop the buzzer when sounds.

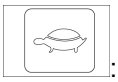
NOTE: *the buzzer sounds if the machine has a problem. Pushing the switch, the buzzer stops but the warning light relevant to the problem continues to blink, until the problem is solved.*

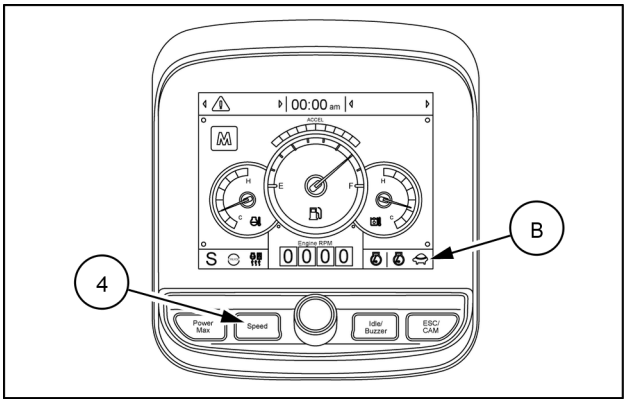


SMIL16MEX3097AA 29

(4) Travel speed switch

Press this switch to select the travel speed mode (the relevant travel speed light **(B)** turns ON).

-  : low speed, **2.2 km/h** (**1.4 mph**)
-  : high speed, **4.2 km/h** (**2.6 mph**)



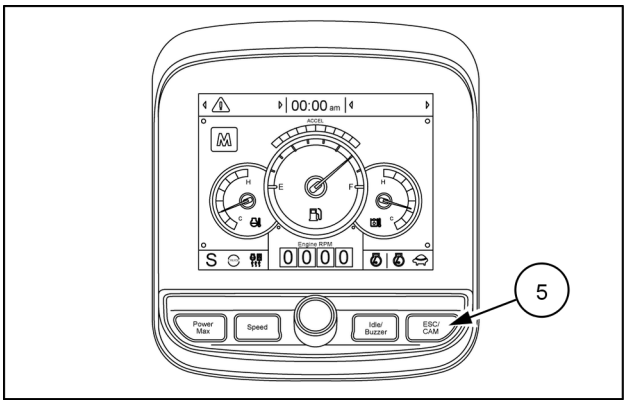
SMIL16MEX3097AA 30

(5) Escape (previous menu)/Rear camera

Press this switch to return to the previous menu or to return from sub menu screen to main menu screen.

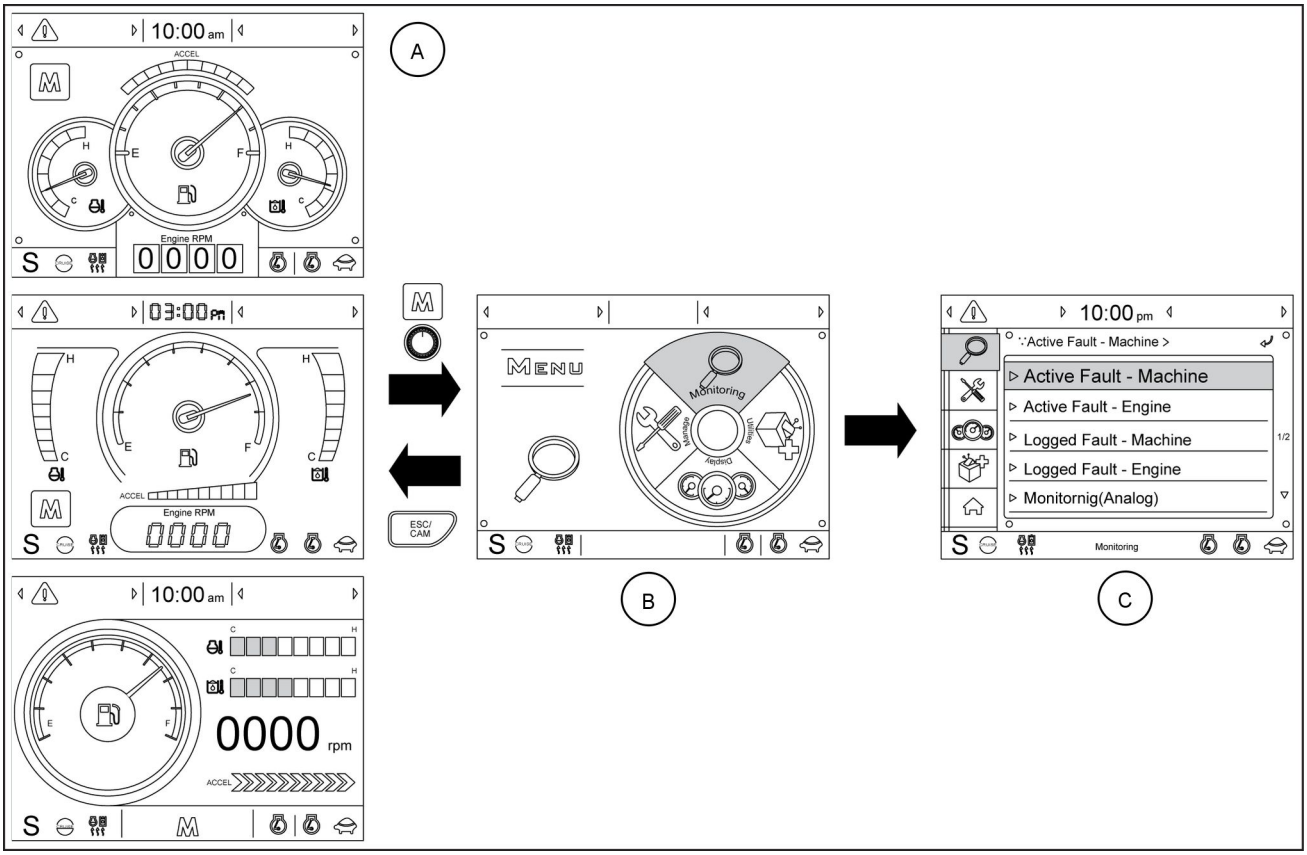
In the operation screen, push this switch to display the view of the camera (if equipped).

NOTE: *if the camera is not installed, the switch is used only as escape function.*



SMIL16MEX3097AA 31

5. MAIN MENU



SMIL16MEX3098FA 32

(A) Operation screen (Default type, or optional B type, or optional C type)

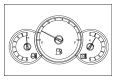
(B) Main menu screen

(C) Sub menu screen

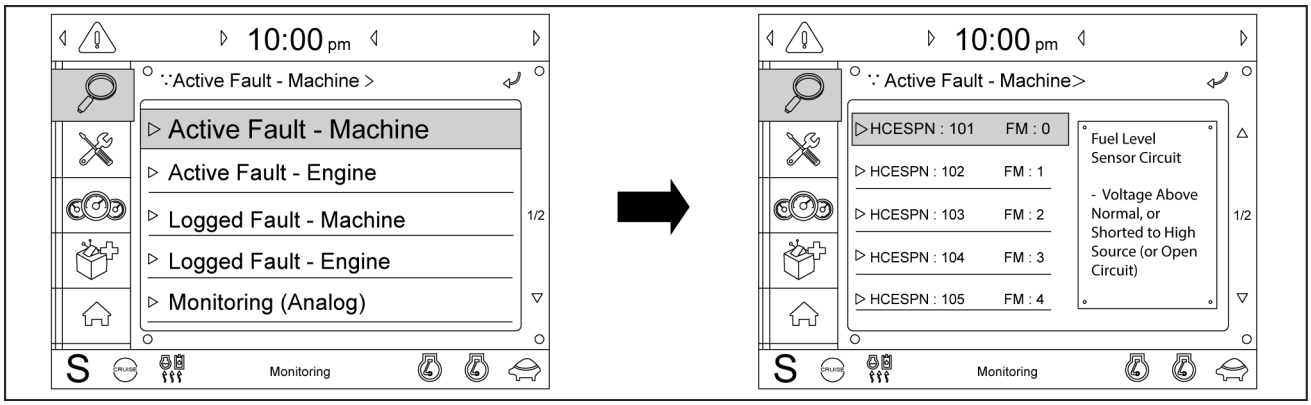
To select the main menu screen **(B)** from the operation screen **(A)**, push the selection knob or the main menu quick touch button M.

To return to the operation screen **(A)** from the main menu screen **(B)**, push the escape switch ESC/CAM.

To select one of the sub menu screens, rotate the selection knob, select the sub menu, push the selection knob.

	Main menu	Sub menu	Description
(1)	Monitoring	**(A)** Active fault – Machine	MCU
		**(B)** Active fault – Engine	ECU
		(C) Logged fault – Machine	MCU
		(C) Logged fault – Engine	ECU
		(D) Monitoring (Analog)	Machine information
		(E) Monitoring (Digital)	Switch status
		(F) Monitoring (Digital)	Output status
(2)	Manage-ment	**(A)** ESL mode setting	ESL mode setting
		**(B)** Change password	Change password
		(C) Maintenance information	Replacement of oil and filters
		(D) Machine information	Instrument cluster, MCU, engine, machine
		(E) A/S phone number	A/S phone number, A/S phone number change
		(F) Service menu	Delete logged faults, software download, operating hours, power shift
(3)	Display	**(A)** Clock	Clock
		**(B)** Screen type	A type, B type, C type
		(C) Brightness setting	Manual, Auto
		(D) Unit setting	Temperature, pressure
		(E) Language	12 languages
		(F) Calibration	Calibration of the touch screen
(4)	Utilities	**(A)** Camera setting	Camera settings
		**(B)** Mode	operation mode selection
		(C) Video	Play music and video files

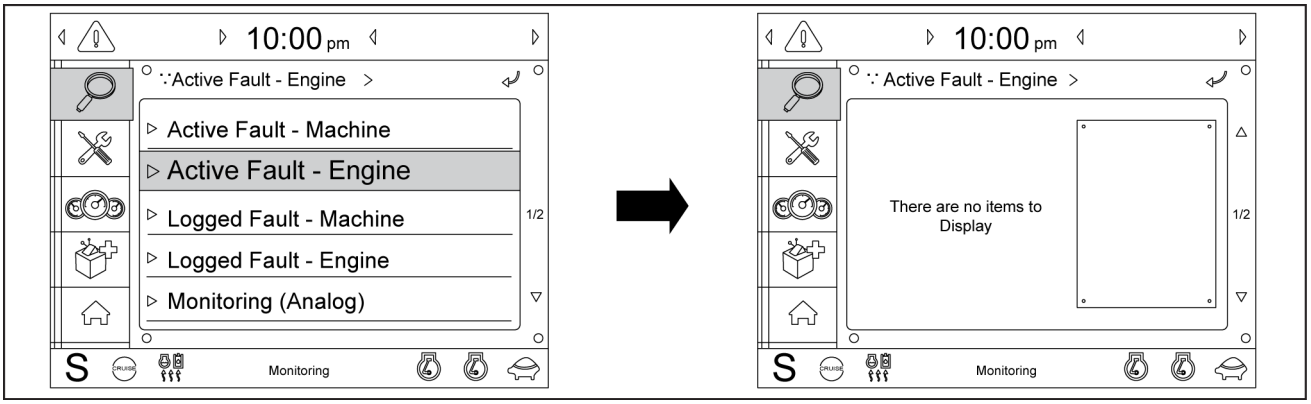
(1) MONITORING



SMIL16MEX0523EA 33

(A) Active fault – Machine

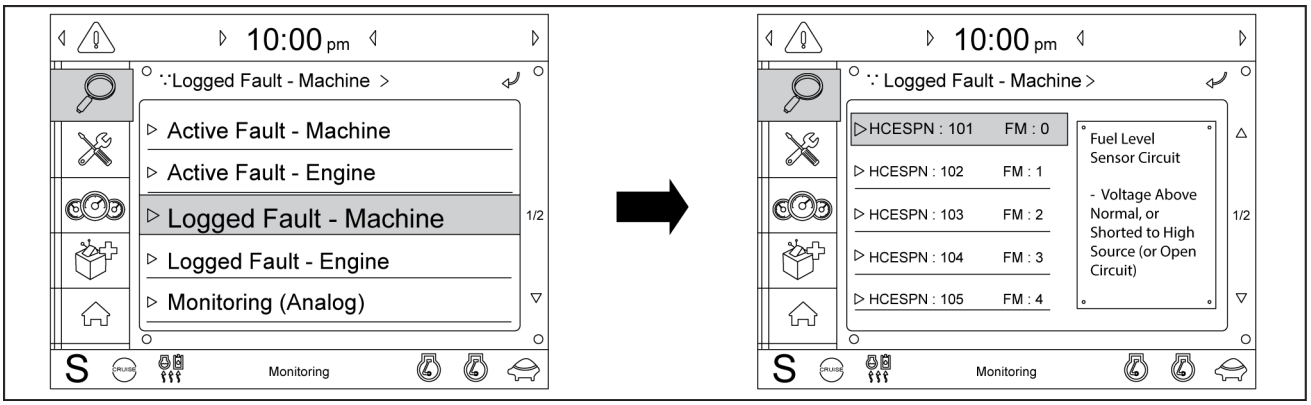
The active faults of the MCU can be checked by this menu.



SMIL16MEX0524EA 34

(B) Active fault – Engine

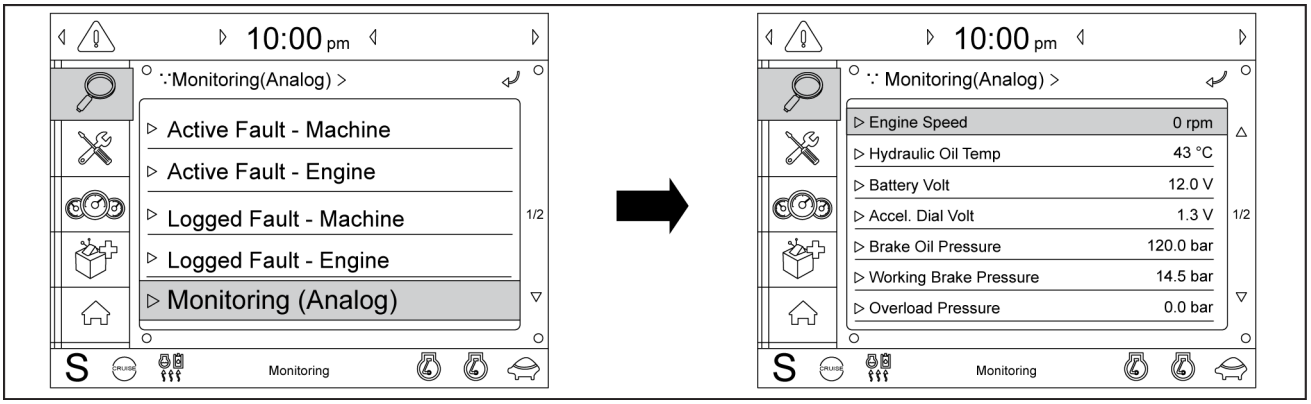
The active faults of engine ECU can be checked by this menu.



SMIL16MEX0525EA 35

(C) Logged fault – Machine/Engine

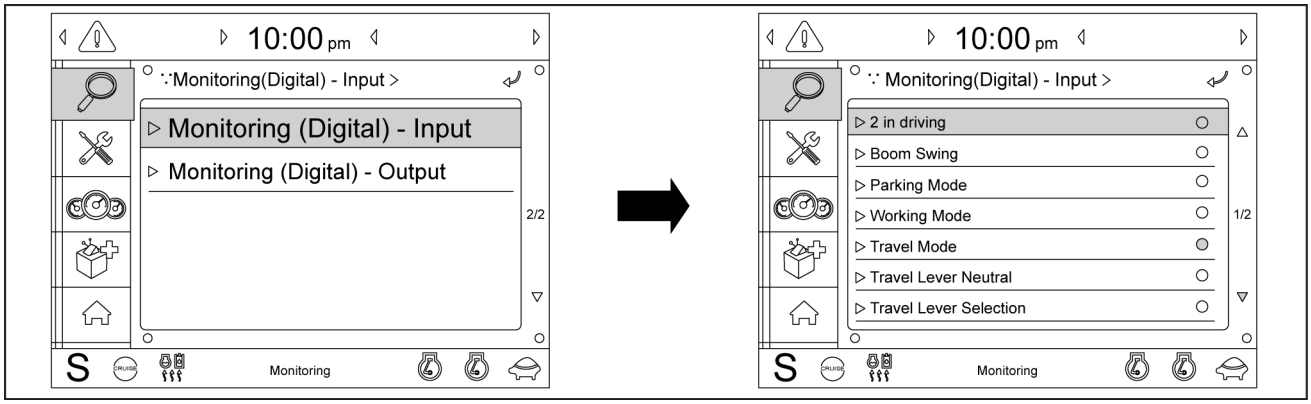
The logged faults of the MCU or engine ECU can be checked by this menu. (Only for the service person).



SMIL16MEX0526EA 36

(D) Monitoring (Analog)

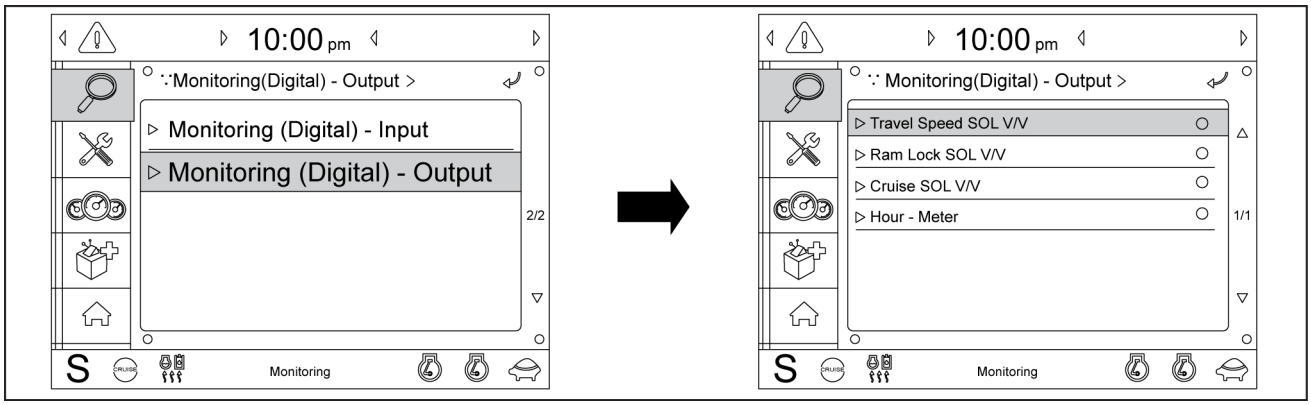
The machine status such as the engine RPM, the oil temperature, the voltage, the pressure, etc. can be checked by this menu.



SMIL16MEX0527EA 37

(E) Monitoring (Digital)

The switch status can be confirmed by this menu. A blue light confirms the selection of the activated switches.

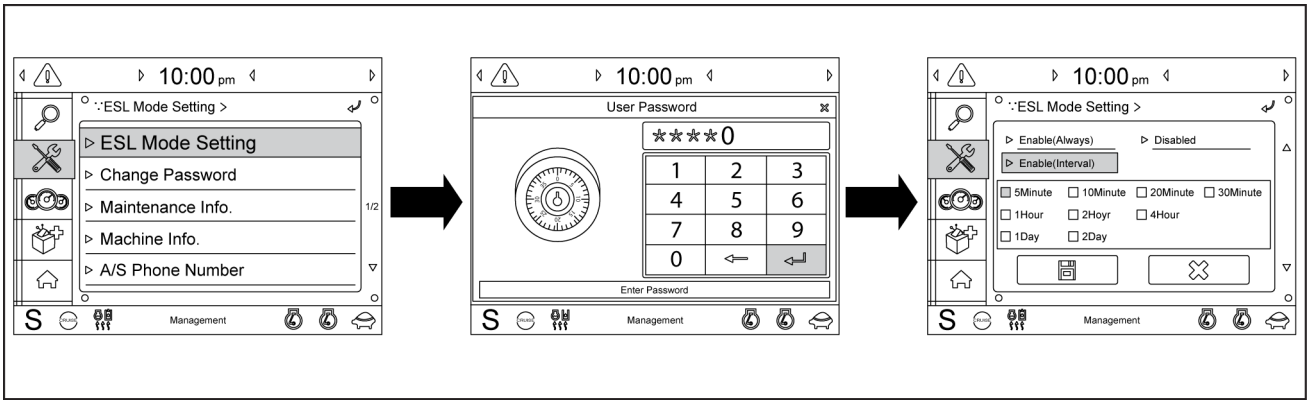


SMIL16MEX0528EA 38

(F) Monitoring (Digital)

The output status can be confirmed by this menu. A blue light confirms the selection of the output status.

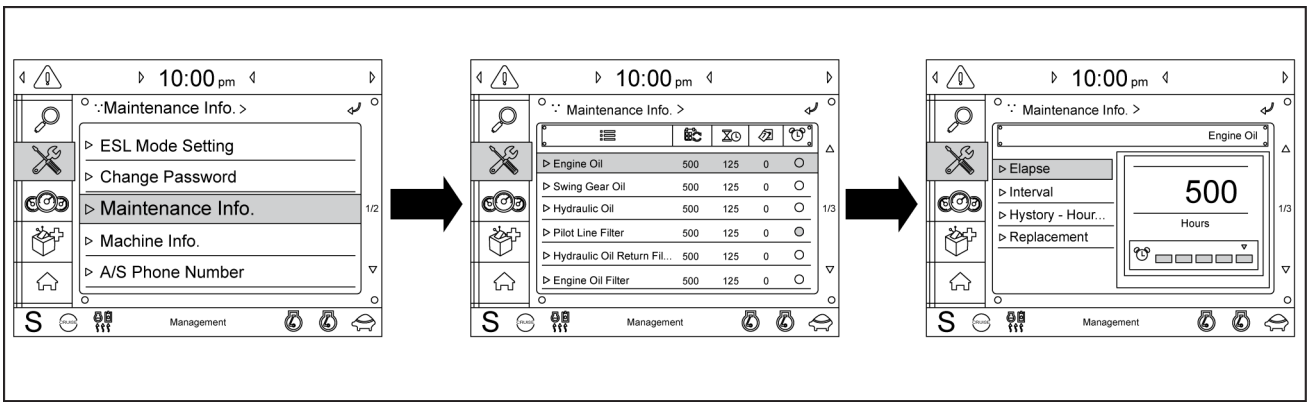
(2) MANAGEMENT



SMIL16MEX0529EA 39

(A) ESL mode setting and (B) Change password

For more information about ESL mode setting and change password, refer to page **4-1**.



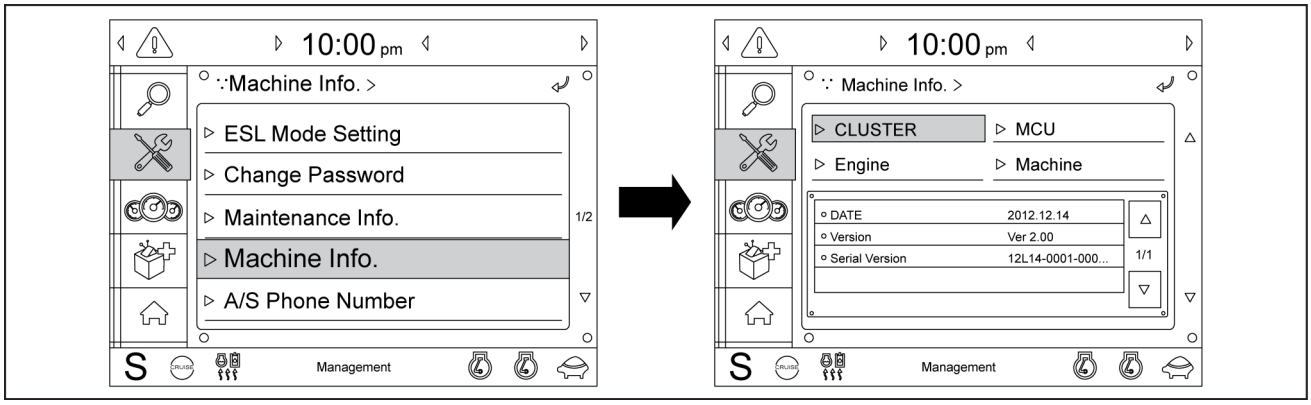
SMIL16MEX0531EA 40

(C) Maintenance information

- Elapse: maintenance elapsed time
- Interval the change or replace interval can be changed in the unit of **50 h**
- History-hour: maintenance replacement history
- Replacement: the elapsed time will be reset to zero (0)

Change or replace interval

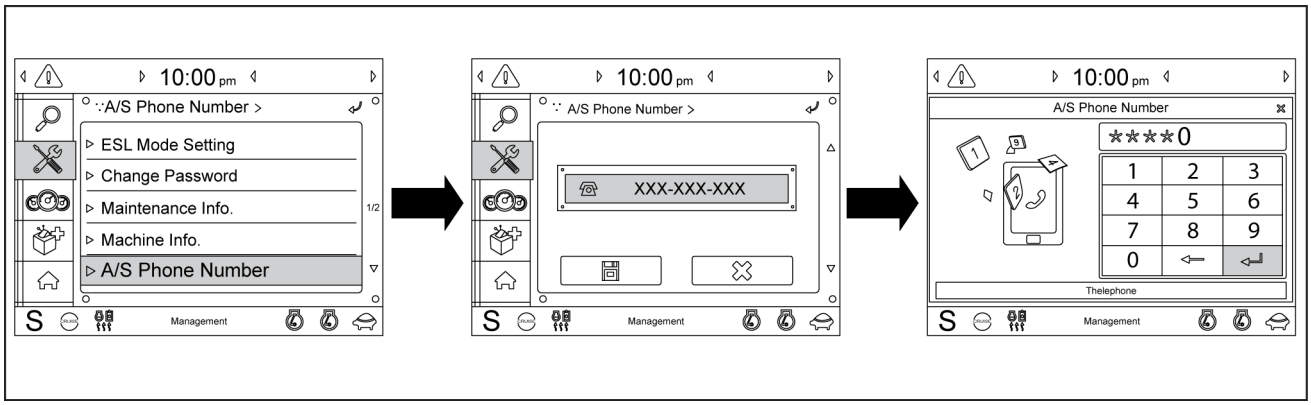
	Item	Interval
1	Engine oil	**500 h**
2	Travel reduction gear oil	**1000 h**
3	Hydraulic oil	**5000 h**
4	Pilot line filter	**1000 h**
5	Hydraulic oil return filter	**1000 h**
6	Engine oil filter	**500 h**
7	Fuel filter	**500 h**
8	Pre-filter	**500 h**
9	Hydraulic tank breather	**1000 h**
10	Air cleaner	**500 h**
11	Radiator coolant	**2000 h**



SMIL16MEX0532EA 41

(D) Machine information

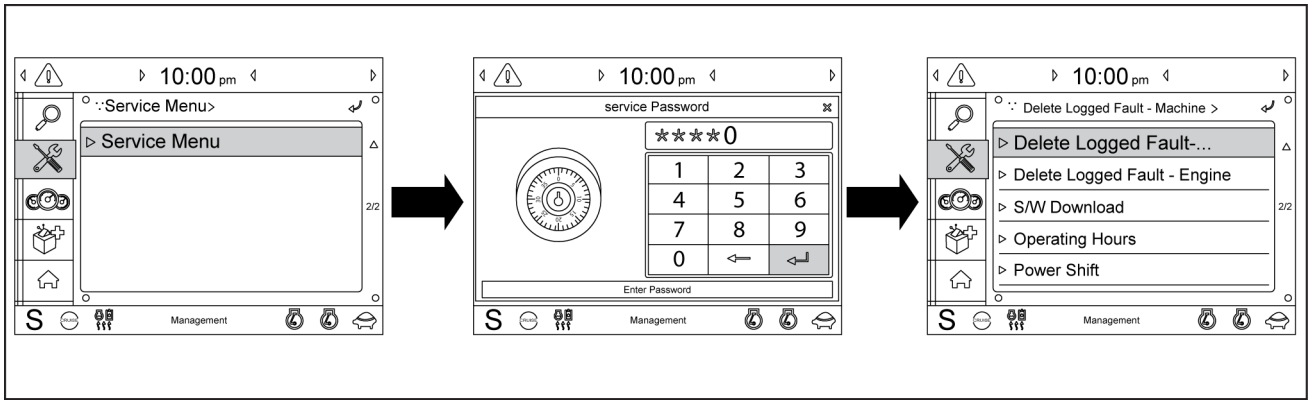
This menu confirms the identification of the cluster, the MCU, the engine and the machine.



SMIL16MEX0533EA 42

(E) A/S phone number

The A/S phone number can be checked and changed.

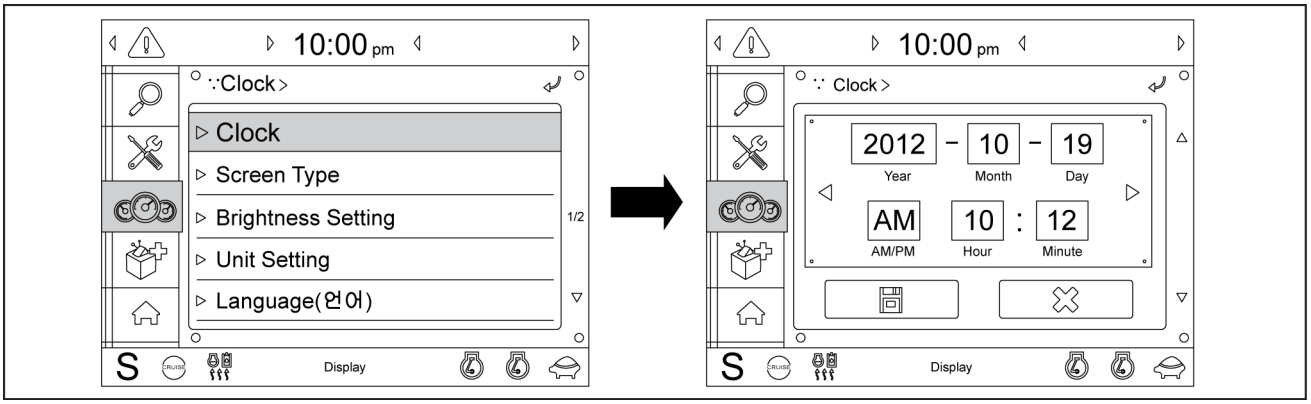


SMIL16MEX0534EA 43

(F) Service menu

- Delete logged fault: logged faults of MCU or ECU can be deleted
- Software download: update and display software about operating system, application, image and font
- Operating hours: operating hours since the machine line out can be checked
- Power shift: set the power shift mode (standard/option)

(3) DISPLAY

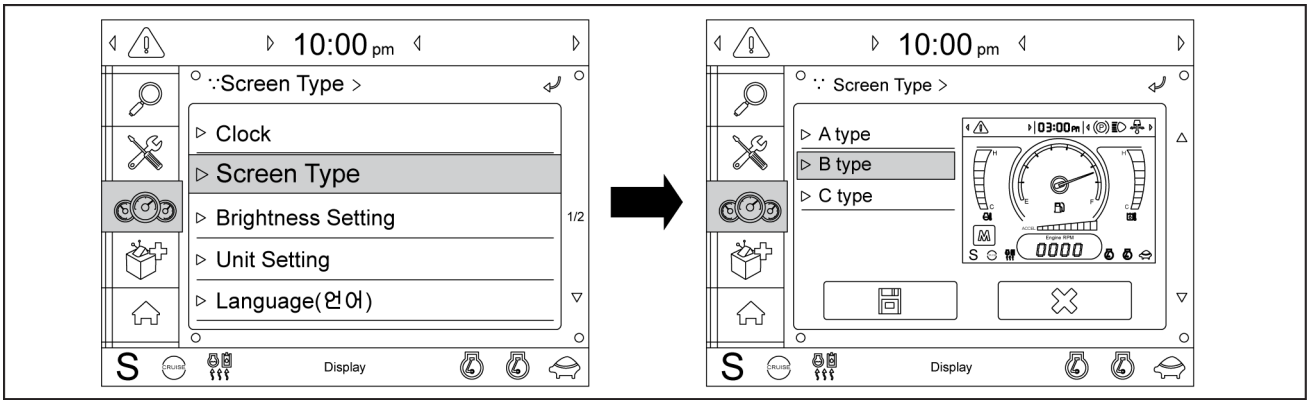


SMIL16MEX0535EA 44

(A) Clock

The first line has three spots (****-**-**) that represent Year/Month/Day each.

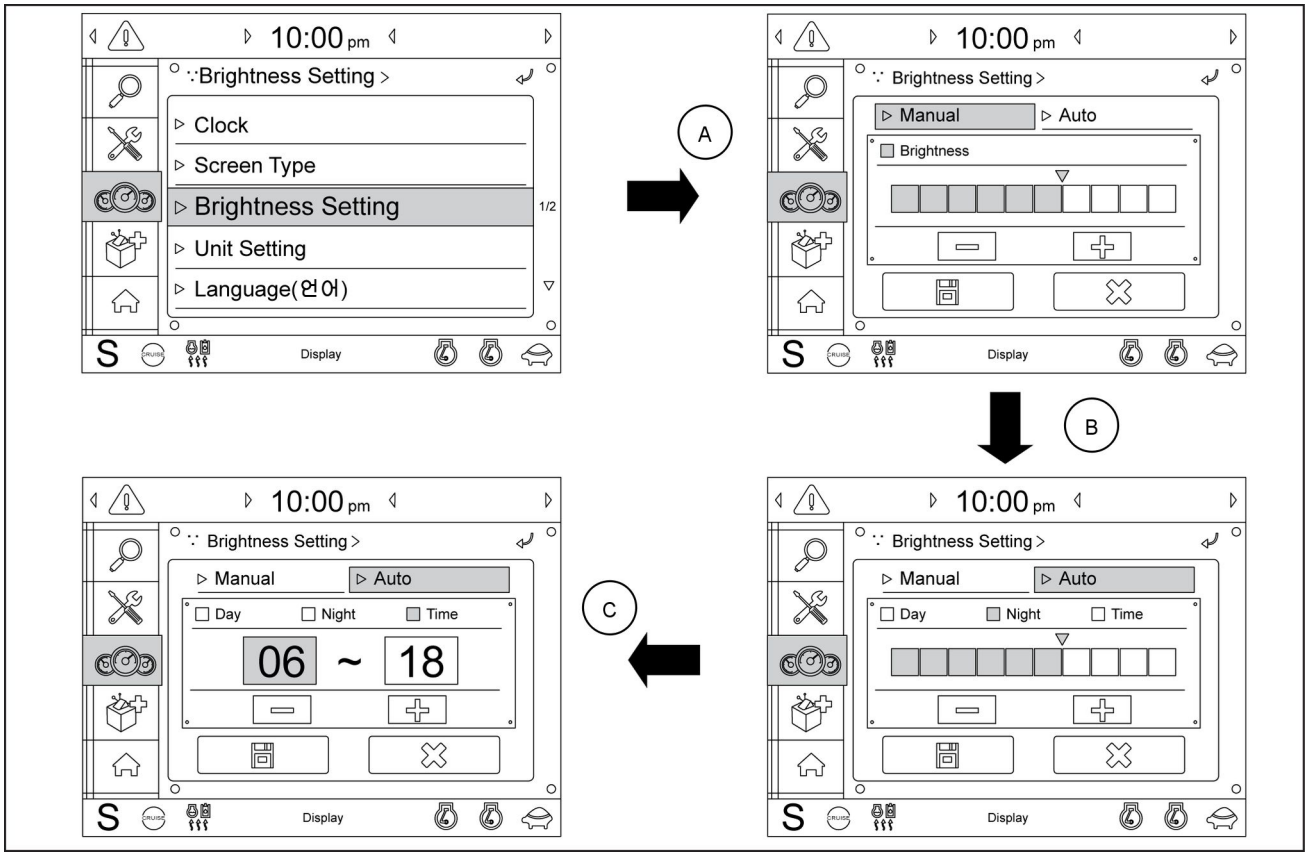
The second line shows the current time. (AM or PM, 0:00 to 12:59)



SMIL16MEX0536EA 45

(B) Screen type

The screen type (A, B, or C) of the LCD can be selected by this menu.



SMIL16MEX3099FA 46

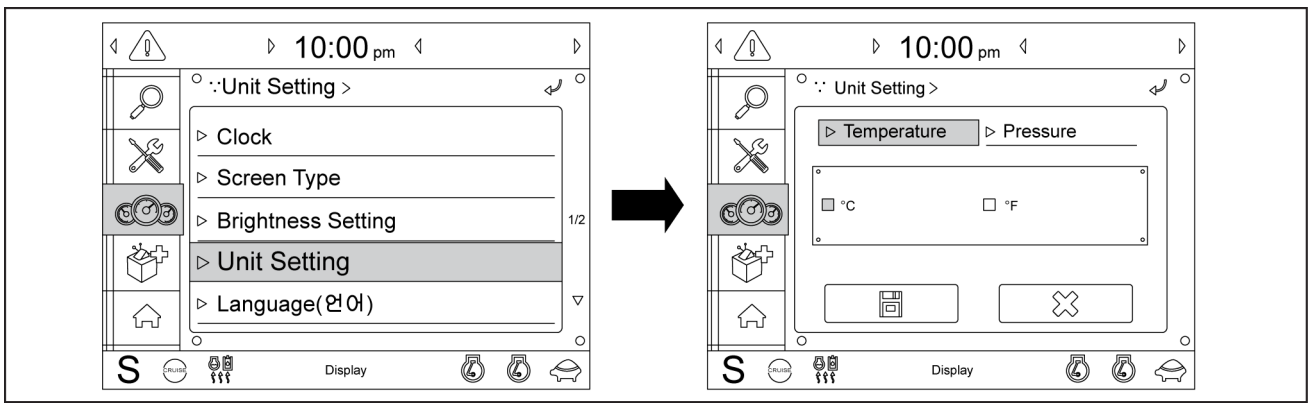
(C) Brightness setting

A. Manual (1st – 10th step)

B. Auto (day/night)

C. Auto (time)

If "Auto" is chosen, the brightness for day and night can be differently set up. Also, users can define which day time interval. (Set day starting time and ending time)

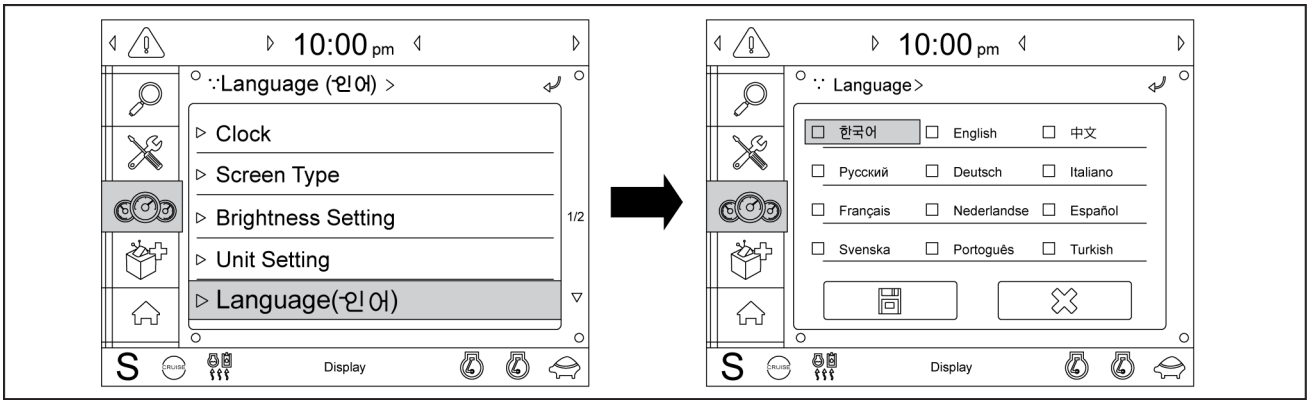


SMIL16MEX0538EA 47

(D) Unit setting

Temperature: °C – °F

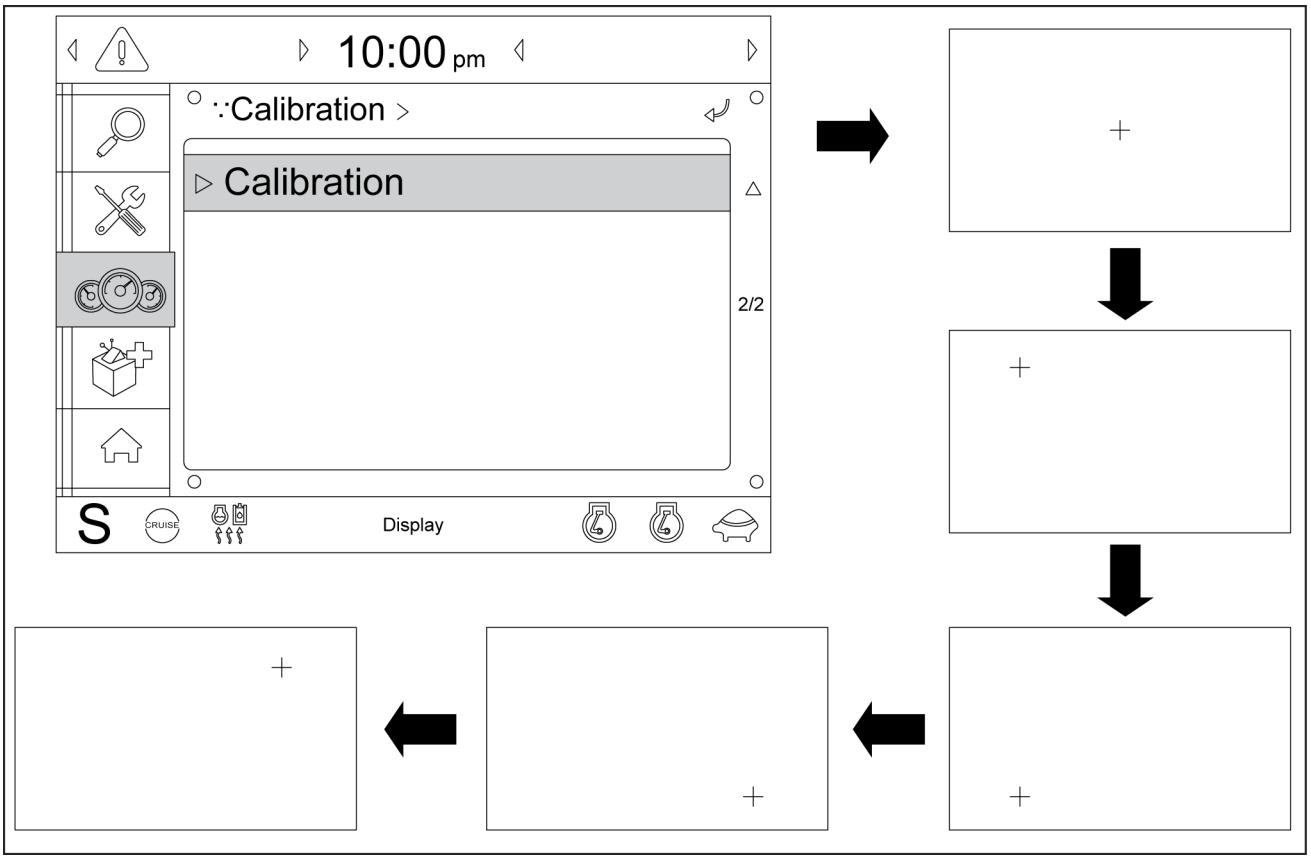
Pressure: bar - MPa - kgf/cm2 - psi



SMIL16MEX0539EA 48

(E) Language

User can select preferable language and all displays are changed to the selected language.

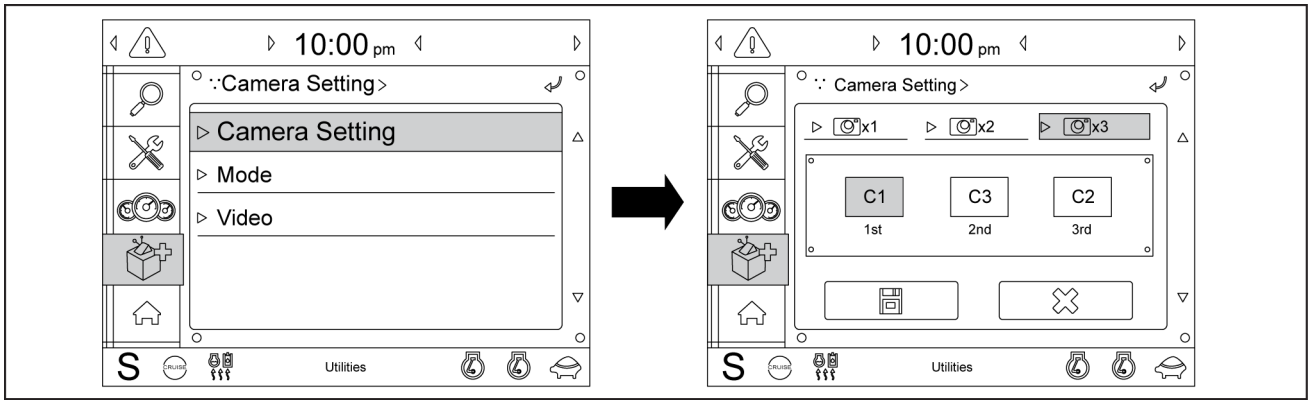


SMIL16MEX0540FA 49

(F) Calibration

When touch awareness goes wrong, use this function. Fall in the next step if you touch the middle point of cross with fingernail. If you touch total five points as shown, the setting is completed.

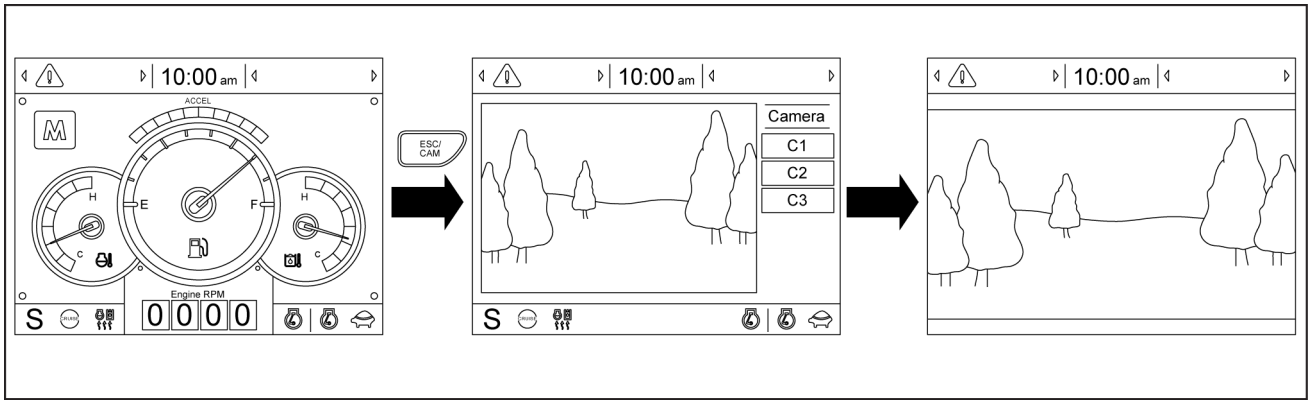
(4) UTILITIES



SMIL16MEX0541EA 50

(A) Camera setting

Three cameras can be installed on the machine and the display order can be set by this menu. If the machine is not equipped with the camera, this menu is not used.



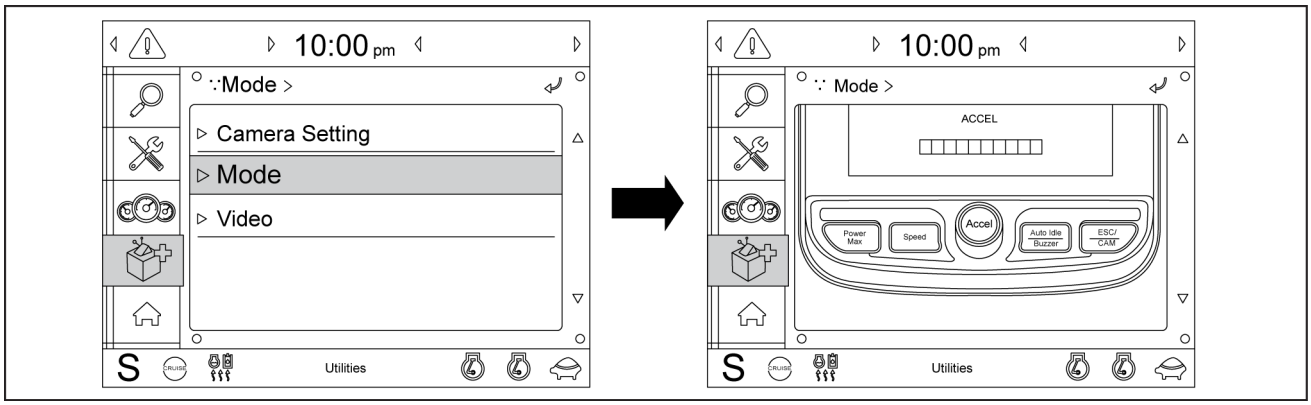
SMIL16MEX0542EA 51

In the operation screen, if the ESC/CAM switch is pushed, the rear view camera is displayed or stopped.

Turn the select knob in clockwise direction to show the next screen. Turn the select knob in counterclockwise direction to show the previous screen.

Touch the screen to change the camera channel

Push the select knob or touch the screen to enlarge the displayed screen.

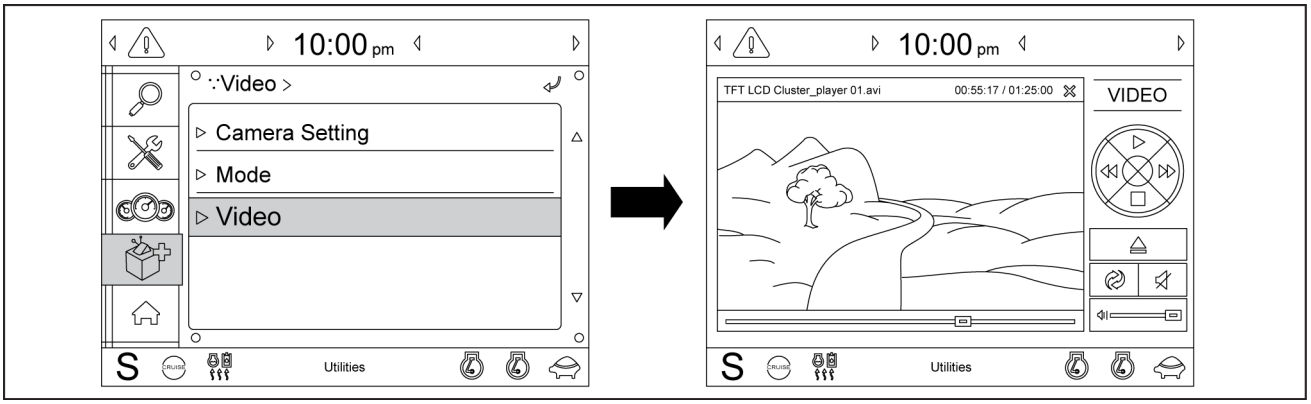


SMIL16MEX0543EA 52

(B) Mode

When the buttons of the instrument cluster are not operative, you can control using touch screen instead of these buttons.

You can only control in this mode screen.

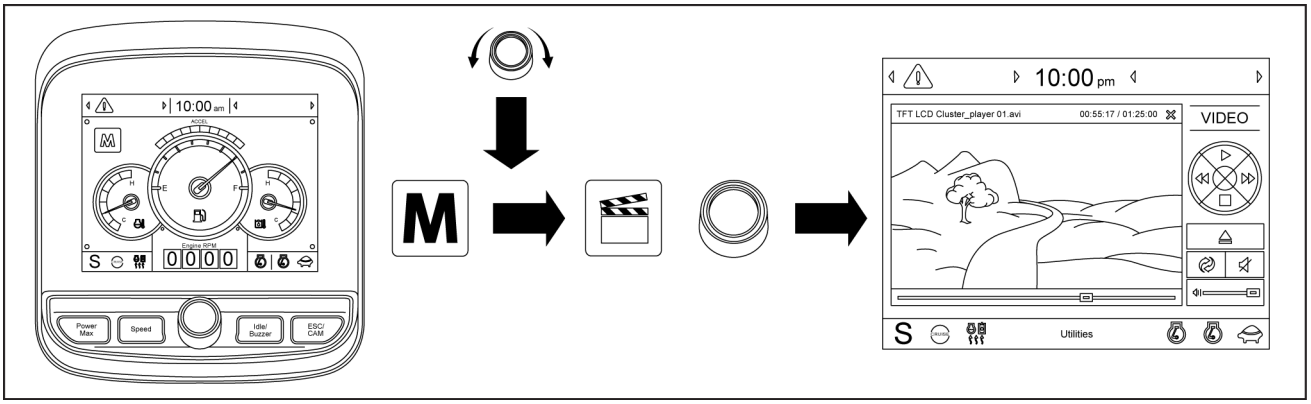


SMIL16MEX0544EA 53

(C) Video

Play MP4 or codec file of an external hard disk through the USB port.

The USB port is located under the cluster.



SMIL16MEX0545EA 54

For safety, over **1100 RPM** of engine, the screen turns into the operation screen with MP4 or codec file playing.

	Function	Control
1	Previous track	Power mode switch or touch
2	Next track	Speed switch or touch
3	Play	Touch
4	Pause	Touch
5	Contents display	Touch
6	Mute	Touch

	Function	Control
7	Sound volume	Speed switch or touch
8	Stop	ESC/CAM switch or touch
9	File name	-
10	Current time/Total time	-
11	Current playing time	-

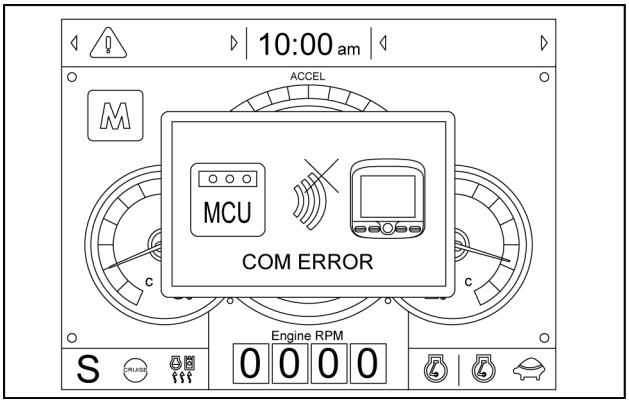
6. COMMUNICATION ERROR AND LOW VOLTAGE WARNING POP-UP

Communication error pop-up

This communication error pop-up appears on the instrument cluster when there is a communication error with the MCU.

This communication error pop-up appears only in the operation screen. With the other screens there is only the buzzer alarm.

If the communication with the MCU returns normal, the communication error pop-up disappears automatically.



SMIL16MEX0518AA 55

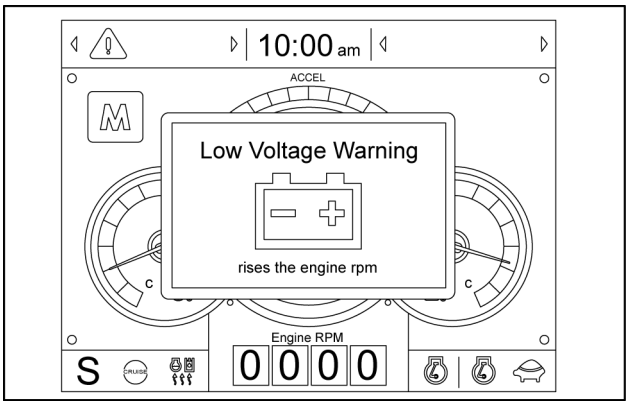
Low voltage warning pop-up

This warning pop-up appears on the instrument cluster when the battery voltage is low.

This warning pop-up appears only in the operation screen. With the other screens there is only the buzzer alarm.

This warning pop-up disappears touching the screen or pressing the buzzer stop switch.

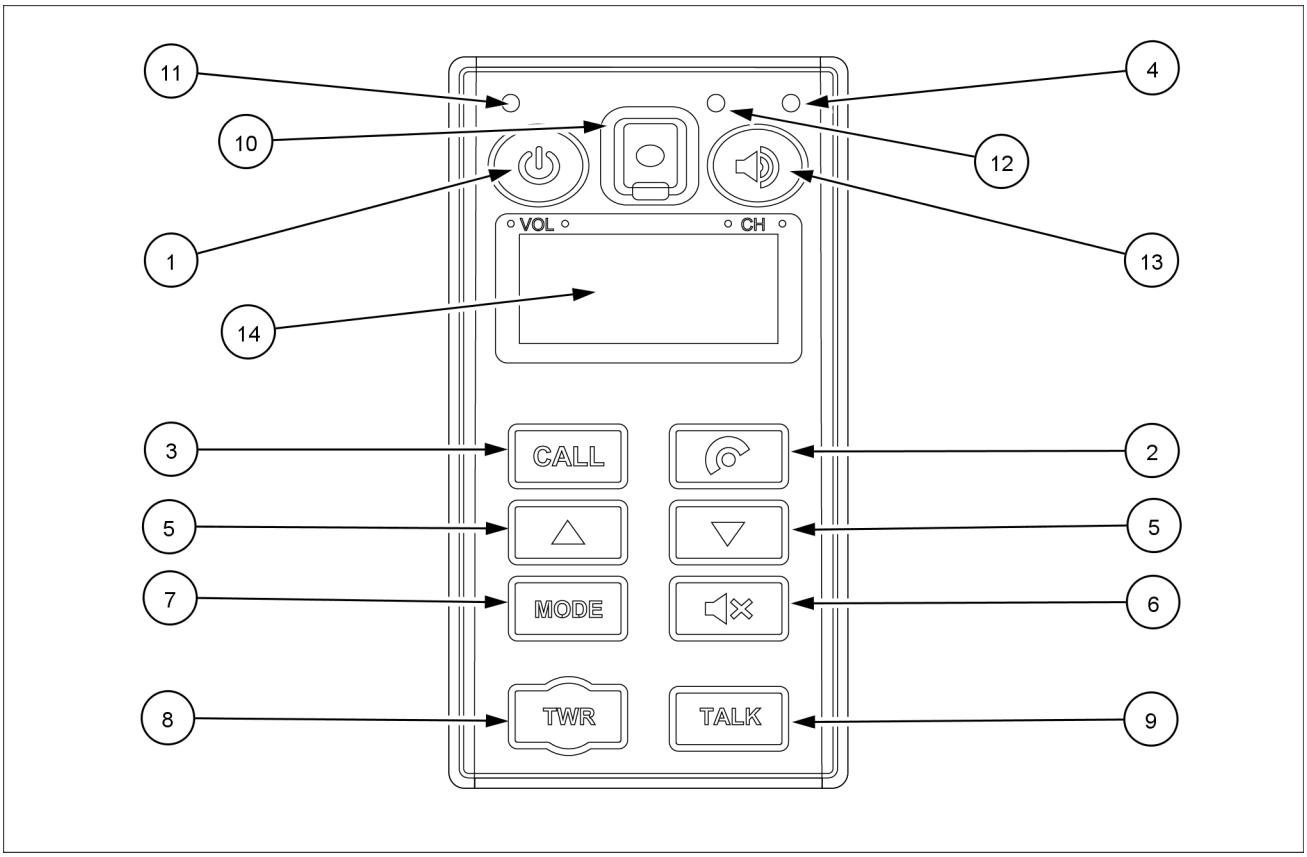
If the battery voltage is low, buzzer sounds every minute. When the battery voltage is higher than **11.5 V**, the pop-up disappears.



SMIL16MEX0519AA 56

Remote controller

The remote controller allows to dial a call or to have a conversation without holding your handset.



SMIL16MEX0512FA 1

(1) Power and volume knob

(2) Mode/Audio button

(3) CALL button

(4) Hands–free jack microphone

(5) SEEK button

(6) MUTE button

(7) MODE button

(8) Radio calling mode button

(9) TALK button

(10) Radio hands–free jack

(11) External speaker microphone

(12) External speaker LED

(13) External speaker switch

(14) Display

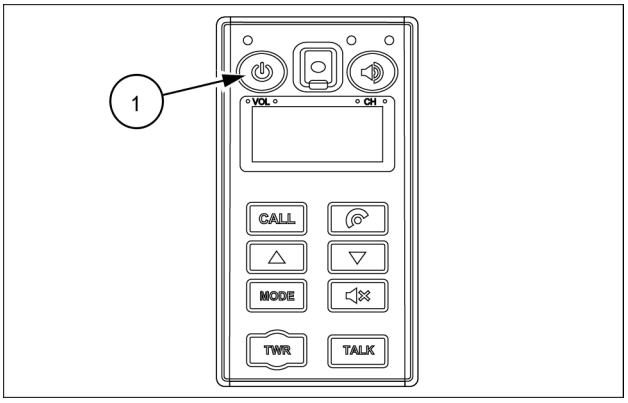
(1) Power and volume knob

Use this knob **(1)** to turn on the audio or hands–free ON or OFF.

Turn the knob to right to increase the volume (over 7 steps).

Turn the knob to left to decrease the volume.

NOTE: *this knob adjusts the audio volume when the audio mode is selected.*

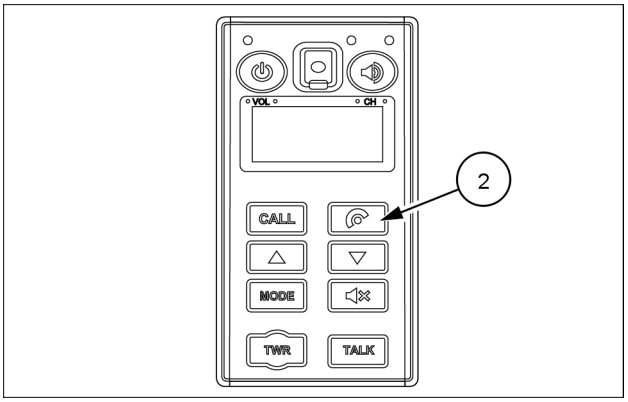


SMIL16MEX0511AA 2

(2) Mode/Audio button

Use this button **(2)** to select the hands–free mode or the audio mode.

- Light ON: hands–free mode is selected
- Light OFF: audio mode is selected

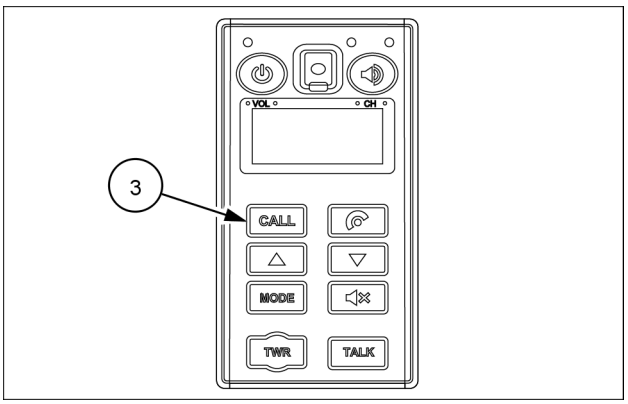


SMIL16MEX0511AA 3

(3) CALL button

Use this button **(3)** to answer a call and to ring off.

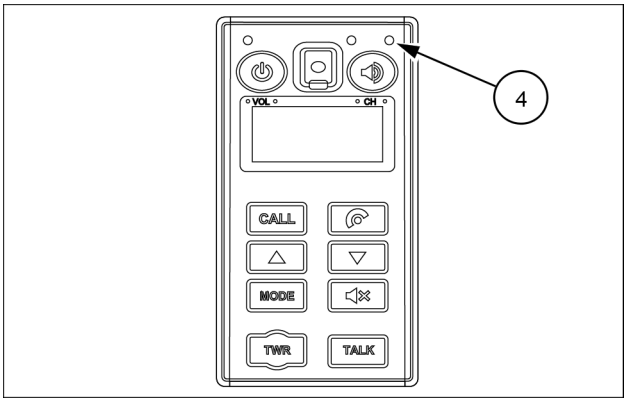
For calling, press the button **(3)** for **0,5 – 1,5 s** until a beep sounds.



SMIL16MEX0511AA 4

(4) Hands-free jack microphone

The microphone **(4)** transfers the user voice to the receiver of the call when making a call by hands-free.



SMIL16MEX0511AA 5

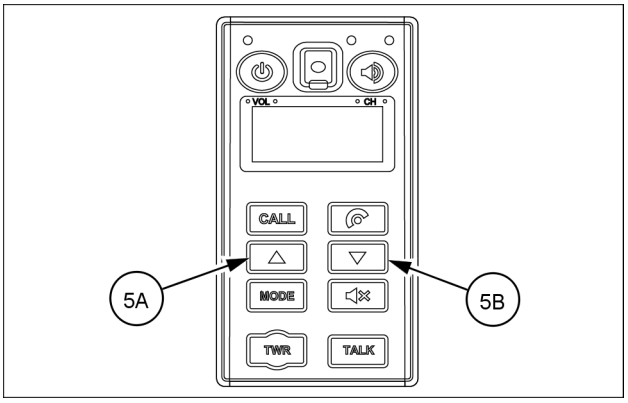
(5) SEEK button

Use the up seek button **(5A)** or the down seek button **(5B)** to automatically stop the radio to the next frequency of broadcasting.

These buttons allow to select the songs of the MP3 from USB.

The up seek button **(5A)** switches a station to a higher frequency or turn to the next song of the MP3.

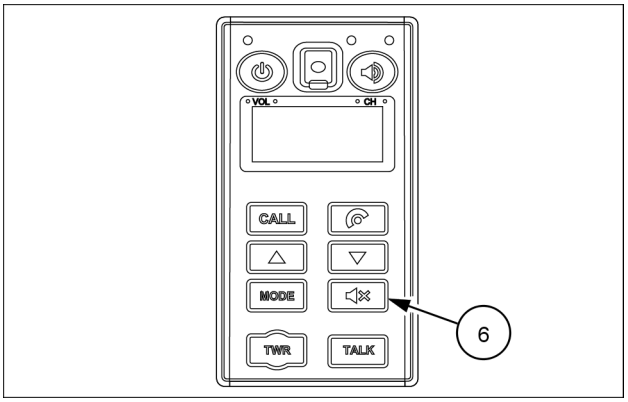
The down seek button **(5B)** switches a station to a lower frequency or turn to the previous song of the MP3.



SMIL16MEX0511AA 6

(6) MUTE button

Press the MUTE button **(6)** to silence the radio or the MP3 while broadcasting.

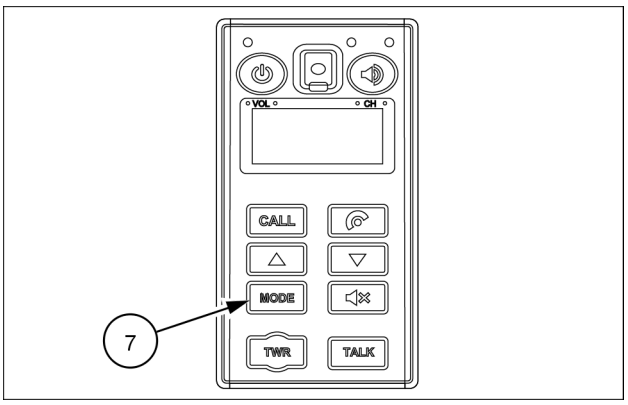


SMIL16MEX0511AA 7

(7) MODE button

Press the MODE button **(7)** to select the desired mode (Radio, MP3, AUX).

The display will show the selected mode.



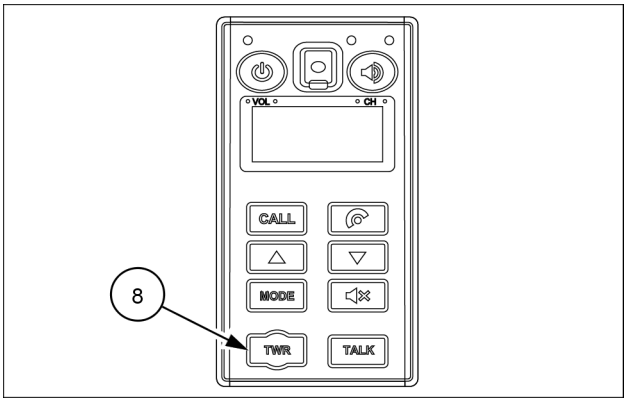
SMIL16MEX0511AA 8

(8) Radio calling mode button

Press the radio calling mode button **(8)** to activate or de-activate the radio hands-free function.

The LED turns on when this button is pressed. The LED turns OFF when the audio mode or the mobile phone hands-free calling mode is activated.

NOTE: *you can make a call to the external worker without holding the radio by hand. (The radio is not installed on the machine).*

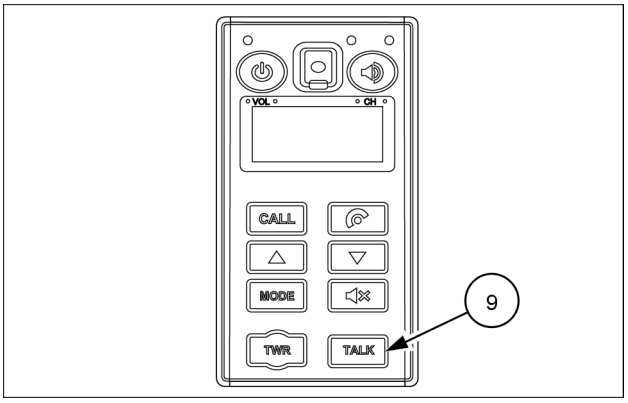


SMIL16MEX0511AA 9

(9) TALK button

Press the TALK button **(9)** to connect the call (when TALK button is activated).

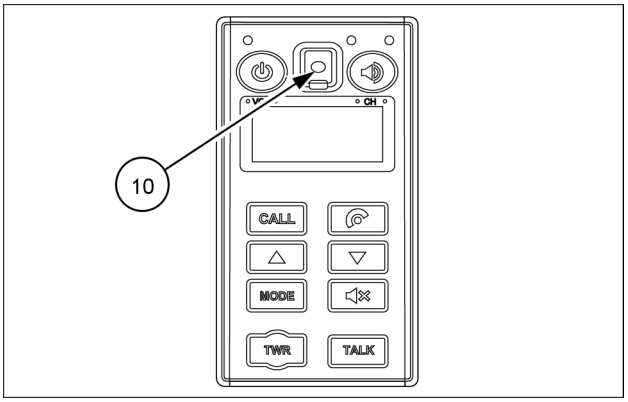
NOTE: *unlike mobile phones, when you want to talk through the radio, you need to press the button (Push-to-talk method). While a person is talking through the radio, the other person can only listen to him/her.*



SMIL16MEX0511AA 10

(10) Radio hands-free jack

Connect the jack cable to the hands-free jack **(10)** when call by radio hands-free.



SMIL16MEX0511AA 11

Hands-free device

(1) Mobile phone storage box

The mobile phone can be stored in the mobile phone storage box during call by hands-free.

(2) USB socket

The USB socket is used to charge the mobile phone.

(3) Private call jack socket

Use this socket to protect your privacy during calling, by using ear phone.

(4) Indicator light

This light turns on when the hands-free mode is selected.

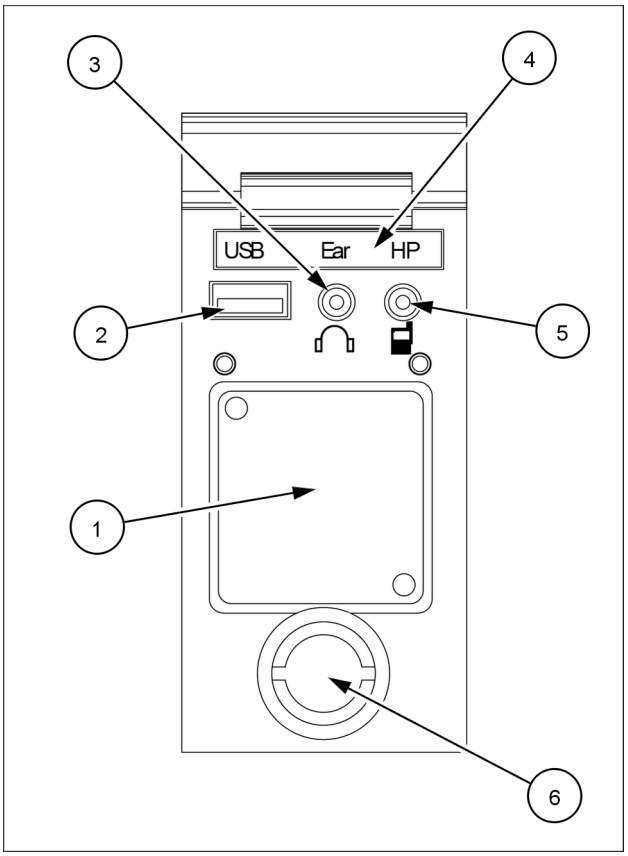
(5) Hands-free jack socket

Use this socket to connect the jack cable when call by hands-free. Use the special adapter when jack cable is not interchangeable. (Check the jack type of mobile phone before use).

(6) Service socket

Connect only **12 V**, **30 W** devices to the socket.

NOTICE: *connecting devices functioning at different voltage can cause damages to the device itself and to the electrical system.*



SMIL16MEX0513BA 12

How to select hands-free mode

Press the **Bluetooth®** button on the mobile phone.

Press the CALL button **(A)** for more than **6 s** for pairing (connection process of the mobile phone and the hands-free device). A beep sounds three times.

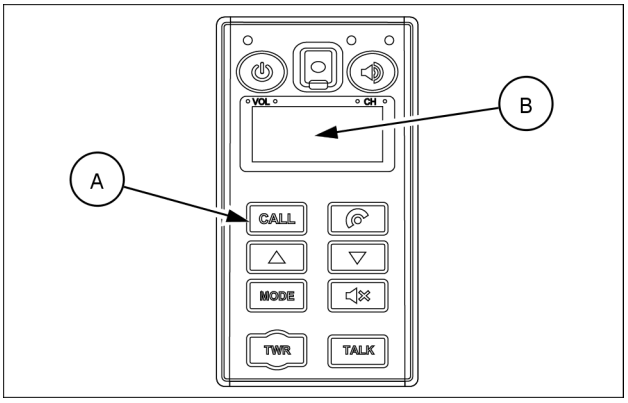
When the mobile phone finds the **Bluetooth®** of the machine, select and set the connection with **Bluetooth®** on the mobile phone.

NOTE: *the default password is 0000*

When the **Bluetooth®** pairing is made, the display **(B)** shows “CONNECTED”.

Once the **Bluetooth®** pairing is made, it will be automatically connected after **20 s** when starter key is ON.

When you want to deactivate the pairing, press and hold the CALL button **(A)** for more than **3 s**, then you can hear beep sounds twice and the function will be deactivated.



SMIL16MEX0511AA 13

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 on the right-hand console.
The basic operation of dozer blade control lever are the following:

- push the dozer blade control lever forward **(A)** to lower the dozer blade.
- pull the dozer blade control lever rearward **(B)** to raise 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.

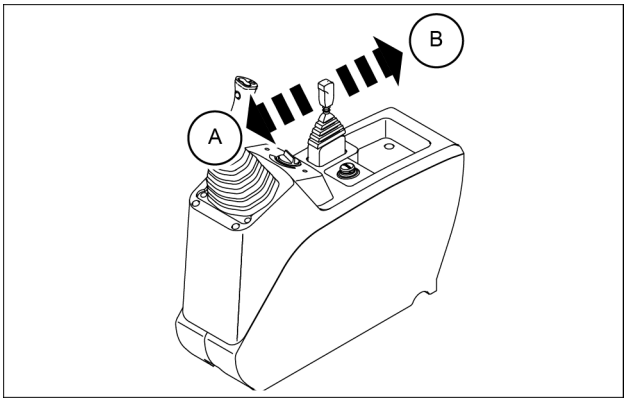
NOTICE: *during blade operations, avoid application of concentrated or lateral load to the blade. Severe damages may be caused to the blade structure.*

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.

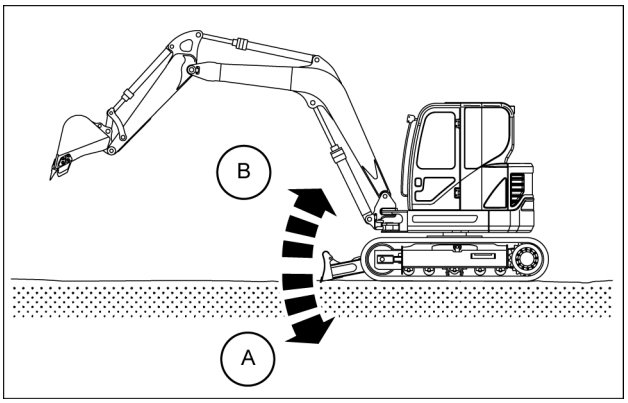
NOTICE: *make sure to lower the blade to the ground before stopping machine operation.*

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 safety lock lever in forward position.
3. Push the blade control lever to lower the dozer blade.



SMIL16MEX0496AB 1



SMIL16MEX1060AB 2

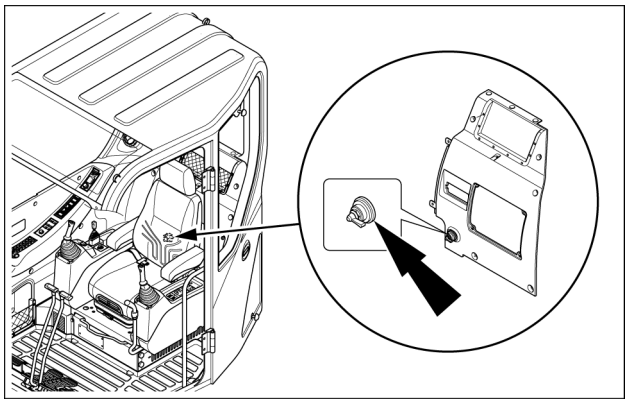
Rearward controls

Battery disconnect switch

The battery disconnect switch is located in the cab, behind the operator's seat.

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.*

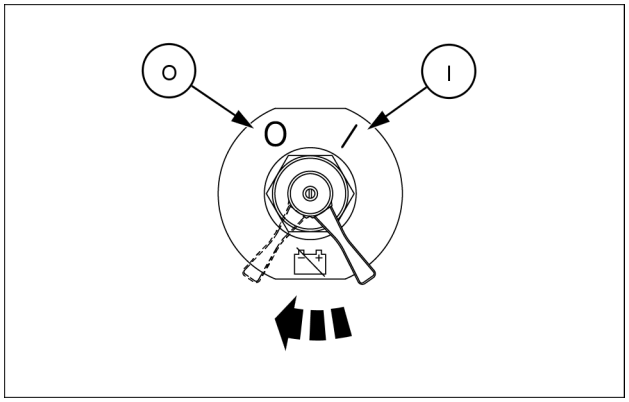


SMIL16MEX1061AA 1

Place the battery disconnect switch in the **(I)** position during normal operation.

Place the battery disconnect switch in the **(O)** position only during the following operations:

1. Battery removal.
2. Electrical system connector removal.
3. Electrical system service.
4. Long-term storage.
5. As required for inspections and repairs.
6. Welding



SMIL16MEX0410AA 2

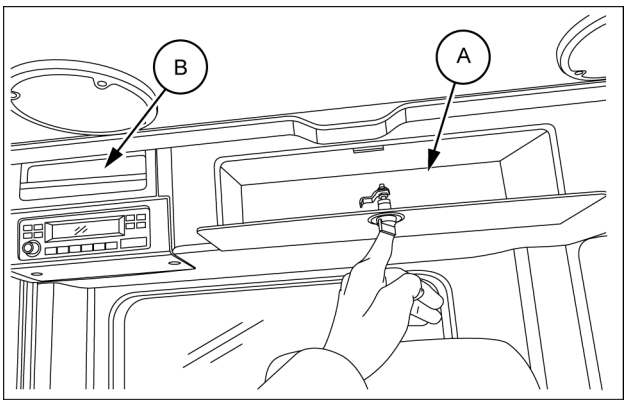
NOTICE: *never turn the battery disconnect switch to* ***(O)*** *position with the engine running. This could damage the electrical system.*

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

Storage compartment

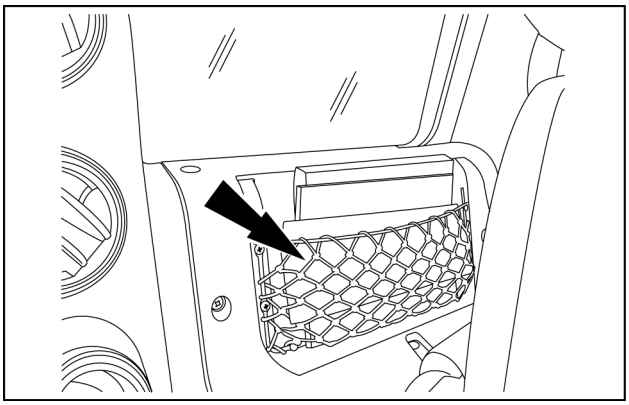
The machine is equipped with the following storage compartments, used to store various objects.

1. Two storage compartments **(A)** and **(B)** located in the upper part of the rear side of the cab. To open the storage compartment **(A)** turn the knob on the door.



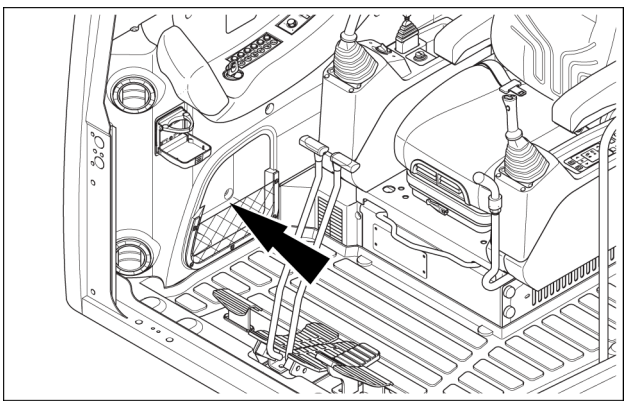
SMIL16MEX1062AB 1

2. A storage compartment located in the rear side of the cab



SMIL16MEX1056AA 2

3. A storage compartment located in the right-hand side of the cab.

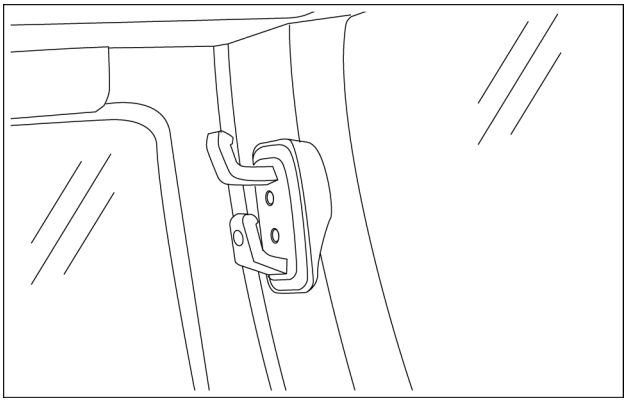


SMIL16MEX1063AB 3

Coat hanger hook

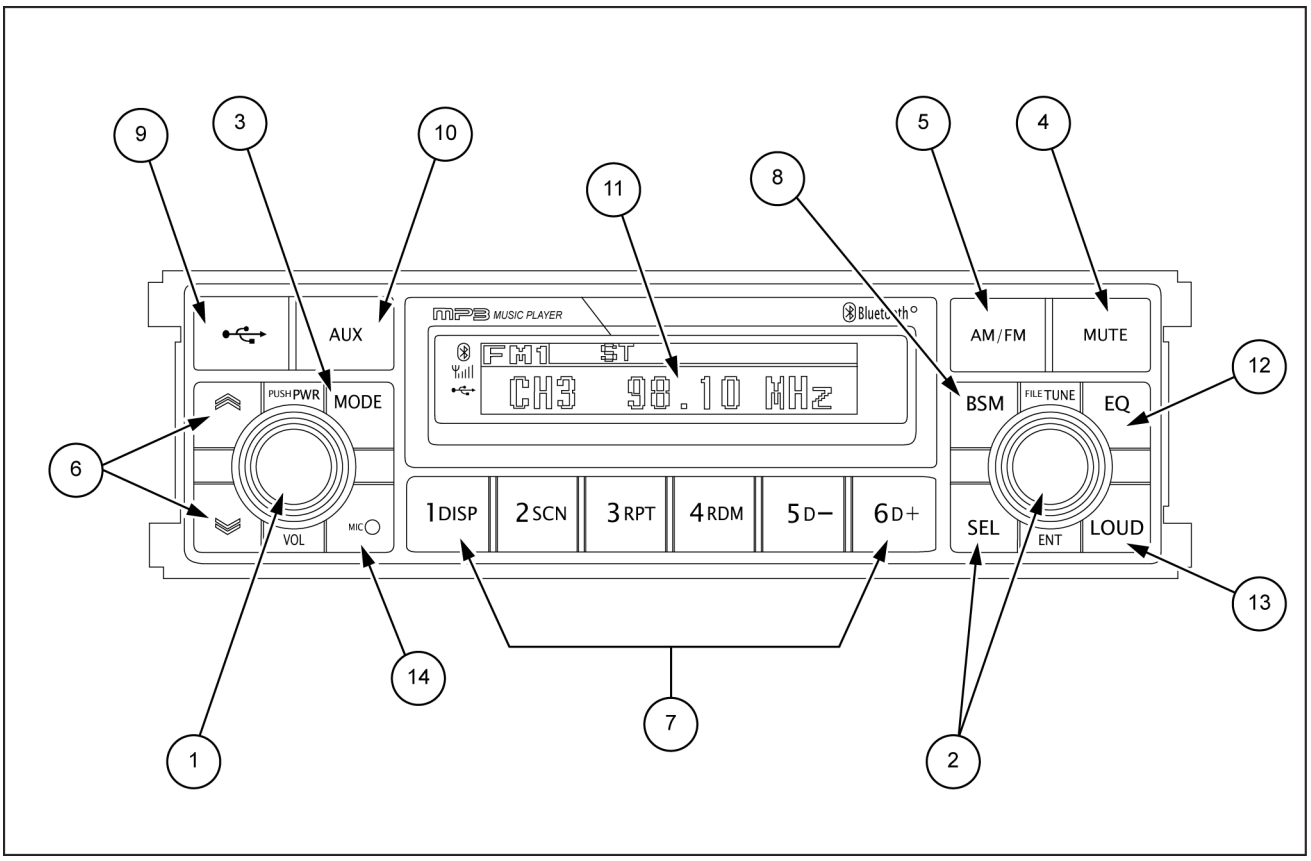
The hook is on the rear left-hand cab upright.

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



SMIL16MEX1064AA 1

Radio



SMIL16MEX0393FB 1

(1) Power and volume knob

(2) Audio selection knob and (SEL) button

(3) MODE button

(4) Audio MUTE button

(5) AM/FM selection button

(6) UP/DOWN tuning button

(7) Pre-set memory buttons

(8) Pre-set scan (PS) / Best Station Memory (BSM) button

(9) USB function

(10) Auxiliary (AUX) function

(11) Liquid Crystal Display (LCD) screen

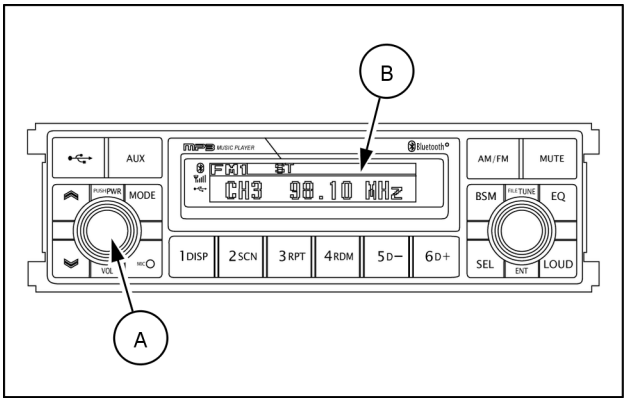
(12) Equalizer (EQ) button

(13) Loud button

(14) Microphone (MIC)

General

(1) Power and volume knob



SMIL16MEX3084AA 2

Power ON/OFF button

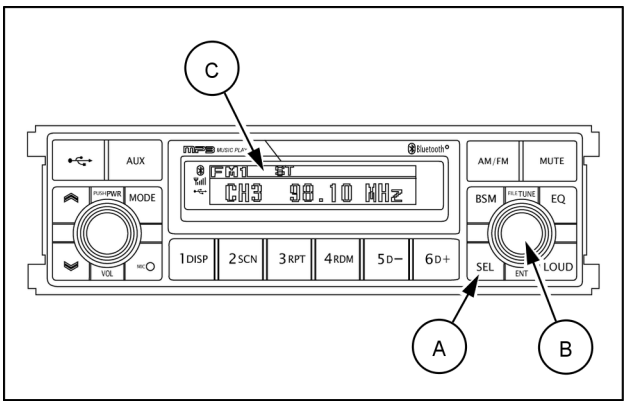
Press the power button **(A)** to turn the unit ON or OFF shortly. When the power is ON, the previous mode (last memory) will appear.

Volume up / down control

Turn the volume up/down button **(A)** right-hand to increase the volume level. The level will be shown in VOLUME xx on the LCD screen **(B)** .

Turn the volume up/down button **(A)** left-hand to decrease the volume level. After **5 s** of volume indication, the LCD screen **(B)** will return to the previous mode.

(2) Audio selection knob and (SEL) button



SMIL16MEX3084AA 3

The audio selection knob **(B)** allows you to adjust the sound. Each time you press SEL button **(A)** shortly, the LCD screen **(C)** shows each mode as follows:

- BASS
- TREBLE
- BAL (Balance)

NOTE: *when the button **(A)** is pressed, LCD screen **(C)** shows the selected function for **5 s** and then returns back to the previous mode. On selected function, level can be controlled by turning this button. The display will automatically return to normal indication in **5 s** after the last adjustment is made or when another function is activated.*

BASS control

To adjust the bass level, first select the bass mode by pressing the SEL button **(A)** until BASS indication appears on the LCD screen **(C)**.

Within **5 s** of choosing the BASS mode, turn the selection knob **(B)** right–hand/left-hand to adjust the bass level as desired. The BASS level will be shown on the LCD screen **(C)** from a minimum of BASS –10 to a maximum of BASS +10.

The LCD screen **(C)** will automatically return to the normal indication in **5 s** after the last adjustment or when another function is activated.

TREBLE control

To adjust the TREBLE level, first select the TREBLE mode by pressing the SEL button **(A)** until TREBLE indication appears on the LCD screen **(C)**.

Within **5 s** of choosing the TREBLE mode, turn the selection knob **(B)** right–hand/left-hand to adjust the TREBLE level as desired. The TREBLE level will be shown on the LCD screen **(C)** from a minimum of TREBLE -10 to a maximum of TREBLE +10.

The LCD screen **(C)** will automatically return to the normal indication in **5 s** after the last adjustment or when another function is activated.

BALANCE control

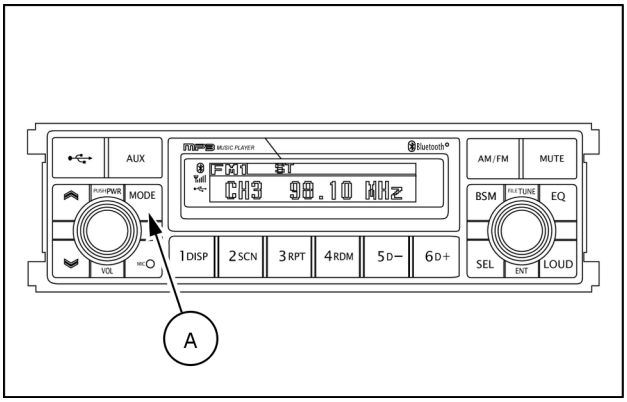
To adjust the left-hand/right-hand speaker balance, first select the BALANCE mode by pressing the SEL button **(A)** until the BAL indication appears on the LCD screen **(C)**.

Within **5 s** of choosing the BALANCE mode, turn the selection knob **(B)** right–hand/left-hand to adjust the BALANCE as desired. The balance position will be shown on the LCD screen **(C)** from BAL 10L (full left) to BAL 10R (full right). When the volume level between the left-hand and the right-hand speakers is equal, BAL L=R will be shown on the LCD screen **(C)**.

The LCD screen **(C)** will automatically return to the normal indication in **5 s** after the last adjustment or when another function is activated.

(3) Mode button

Press the mode button **(A)** to select RADIO / USB / AUX audio.

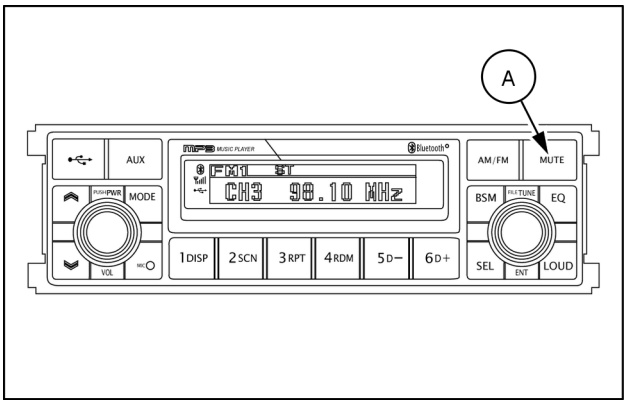


SMIL16MEX3084AA 4

(4) Audio mute button

Press the audio mute button **(A)** momentarily to mute volume and MUTE mark will blink on the LCD screen.

Press the audio mute button **(A)** again to return to the mode in use before the mute mode was activated.



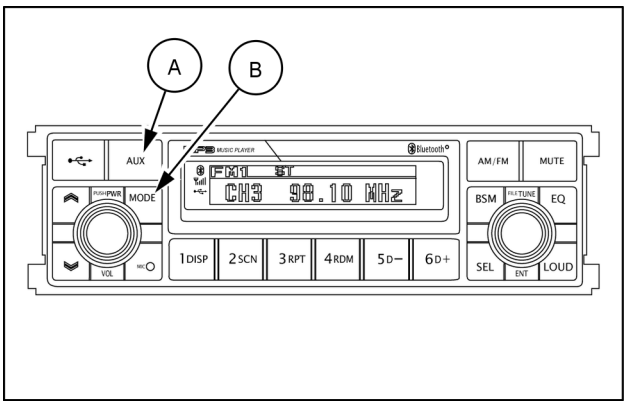
SMIL16MEX3084AA 5

(10) AUX function

If you want to listen to music from an external audio device, open the cover **(A)** of the AUX function, connect the external audio device using the AUX cable an push the MODE button **(B)** to switch the AUX mode.

If an audio file from an external Audio device is playing, the music sounds through the speakers of the cab.

Push the MODE button **(B)** to switch other radio modes and leave the AUX mode.

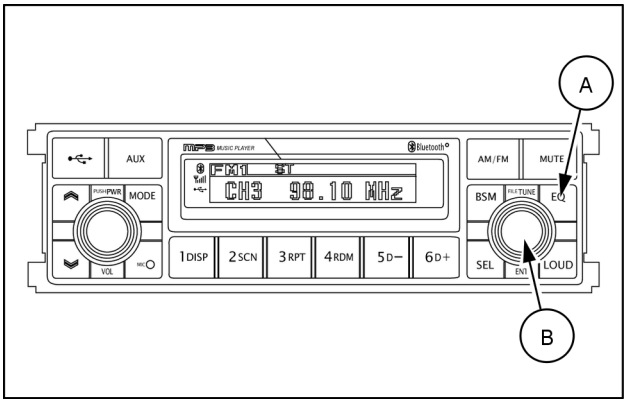


SMIL16MEX3084AA 6

(12) Equalizer (EQ) button

You can select an equalizer curve designed for four music types (POP, ROCK, CLASSIC, JAZZ) by pressing the equalizer (EQ) button **(A)**.

Within **5 s** of choosing the EQ mode, turn the selection knob **(B)** to select an equalizer curve as desired.



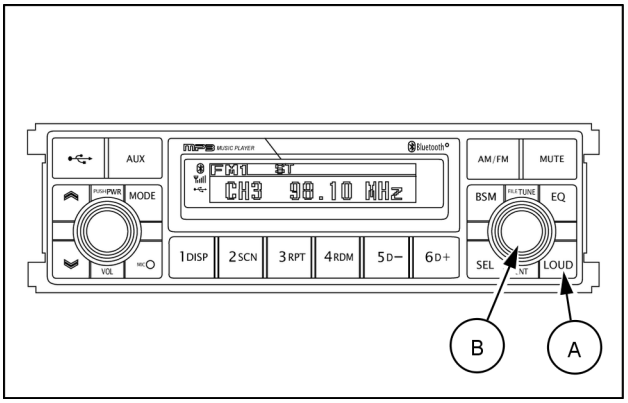
SMIL16MEX3084AA 7

(13) Loud button

When listening to music at low volume levels, this feature will boost the bass and treble response.

This action will compensate for the reduction in bass and treble performance experienced at low volume.

To select the loudness feature, press the loud button **(A)** until LOUD ON or LOUD OFF is displayed, then turn the selection knob **(B)** right–hand/left-hand to activate or deactivate loudness.



SMIL16MEX3084AA 8

Radio

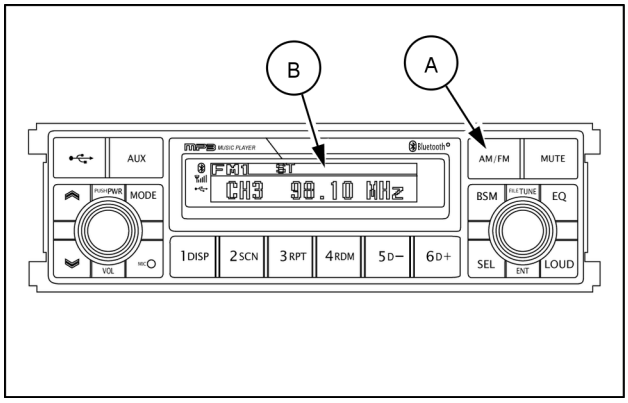
(5) AM/FM selection button

Press the selection button **(A)** to change the radio band.

Each time the selection button **(A)** is pressed, the LCD screen **(B)** shows the bands as follows :

- FM1
- FM2
- FM3
- AM
- LW

NOTE: *LW band is only available for Europe market.*

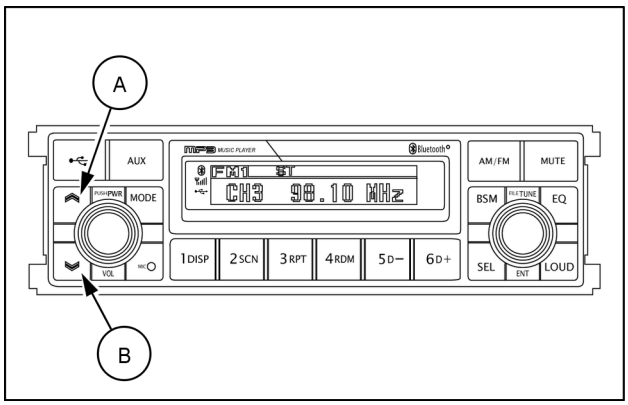


SMIL16MEX3084AA 9

(6) UP/DOWN tuning button

To automatically select a radio station, momentarily press the up tune seek button **(A)** or down tune seek button **(B)** for less than **3 s** to search for the closest radio station.

To manually select a radio station, press the up tune seek button **(A)** or down tune seek button **(B)** for longer than **3 s**. The radio frequency will move up or down step by step each time you press button.

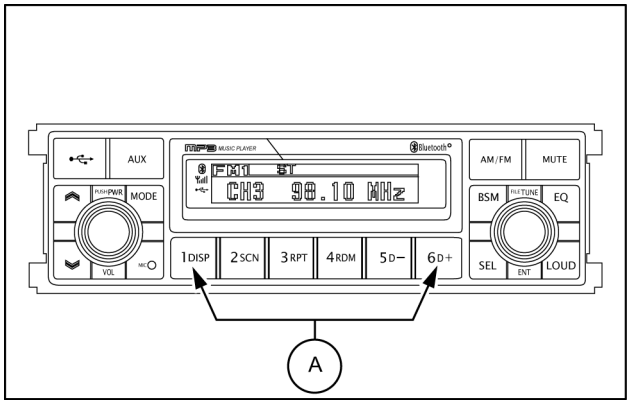


SMIL16MEX3084AA 10

(7) Pre-set memory button

1. Pre-set memory button 1, DISP ID3 v2 display
2. Pre-set memory button 2, SCN File scan
3. Pre-set memory button 3, RPT Repeat play selector
4. Pre-set memory button 4, RDM Random play selector
5. Pre-set memory button 5, D- Directory down
6. Pre-set memory button 6, D+ Directory up

Pressing these buttons **(A)** shortly will recall your favorite pre-set radio stations.



SMIL16MEX3085AB 11

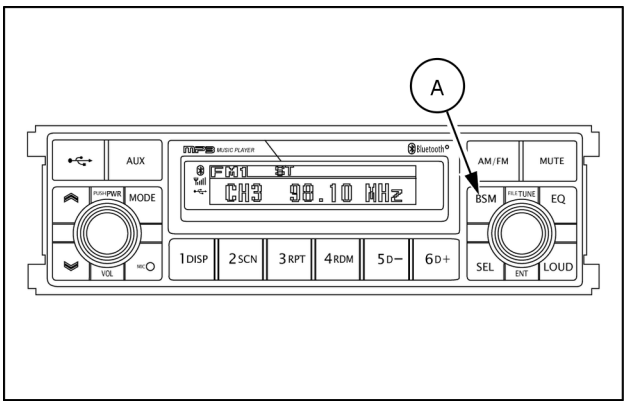
To store your favorite stations into any of the 6 pre-set memories in each band (AM/FM), use the following procedure :

A. Turn the radio ON and select the desired band.

B. Select the first station to be pre-set using the manual up/down or automatic seek tuning control button.

C. Press the chosen pre-set button to store your selected station into and continue to hold it in. The beep sound will be momentarily heard and the pre-set number will appear on the LCD screen indicating that the station is now set into that pre-set memory position and can be recalled at any time, by pressing that pre-set button.

(8) Pre-set scan (PS) / Best Station Memory (BSM) button



SMIL16MEX3084AA 12

Pre-set scan (PS).

Press the BSM button **(A)** shortly to scan the 6 pre-set station stored the memories on each band (AM/FM).

The unit will stop at each pre-set station (the pre-set number on the LCD screen will flash during pre-set scan operation) and remain on the selected frequency.

Press the BSM button **(A)** momentarily again to remain on the station currently being heard.

Best station memory (BSM)

Press the BSM button **(A)** for longer than **2 s** to activate the BSM tuning feature which will automatically scan and enter each station into memory.

If you have already set the pre-set memories to your favorite stations, activating the BSM tuning feature will erase those stations and enter the new ones.

This BSM feature is most useful when traveling in a new area where you are not familiar with the local stations.

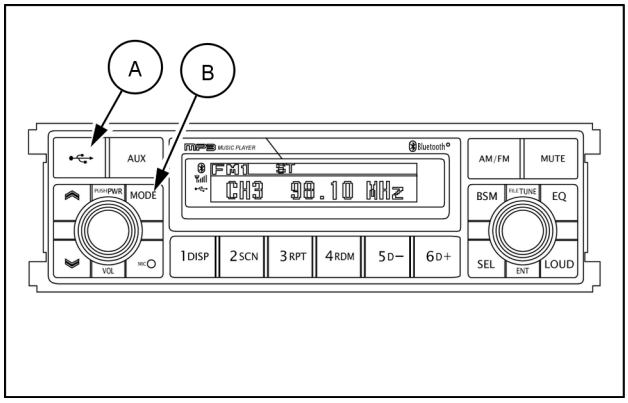
USB player

(9) USB function

Open the cover **(A)** of the USB port, connect a USB device and push the MODE button **(B)** to switch the USB mode if you want to listen to MP3 files stored in a USB device.

The radio will play automatically MP3 files in the USB device while the LCD screen will show “READING USB”.

If there are no files in the USB device, playback will revert back to the previous mode after displaying “NO FILE”.



SMIL16MEX3084AA 13

File selection and cue/review button

File selection function

This button is used to select file up / down.

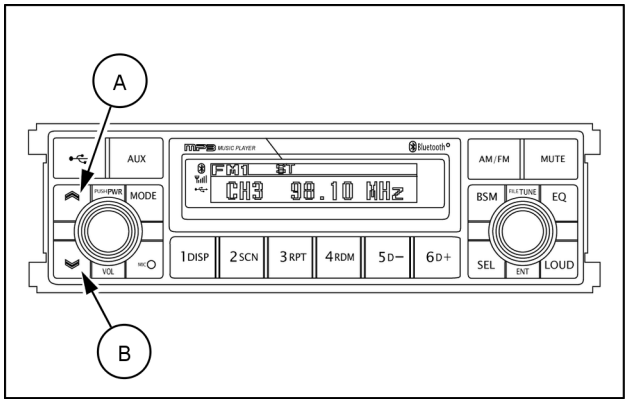
Each time the forward file select **(A)** is pressed, file number is increased.

Each time the backward file select **(B)** is pressed, file number is decreased.

Cue / review functions

High-speed audible search of file on a USB can be made by this button (the cue and review functions).

Press and hold the cue button **(A)** to advance rapidly in the forward direction or the review button **(B)** to advance rapidly in the backward direction.



SMIL16MEX3084AA 14

MP3 directory/file searching

The D- button **(A)** and the D+ button **(B)** are used to select a particular directory and file.

Press and hold for more than **3 s** while playing MP3 file.

Turn right-hand / left-hand the selection knob to search the directory. Press the button when you find the wanted directory.

For example, the directory search generally changes in two methods depending on the order of writing as follows.

Method 1 : ROOT, Dir01, Dir02, Dir03, Dir04, Dir05, Dir06, Dir07, ROOT

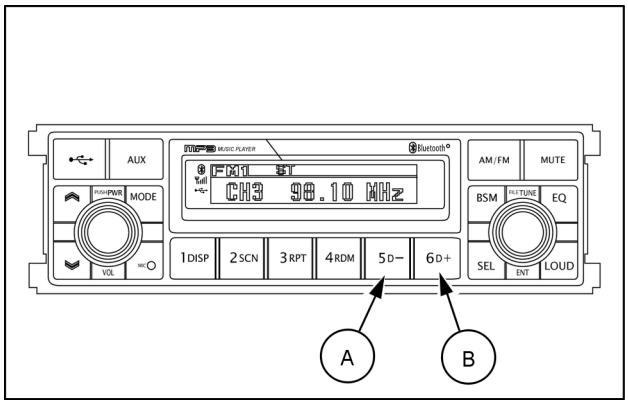
Method 2 : ROOT, Dir01, Dir02, Dir05, Dir03, Dir06, Dir04, Dir07, ROOT

If you want to search the file in the located directory, turn right-hand / left-hand the selection knob consecutively. Press the button when you find the wanted file. The unit will then play the selected file.

For instance, the file search changes in Dir01 as follows.

File01, File02, File03, File04, File01

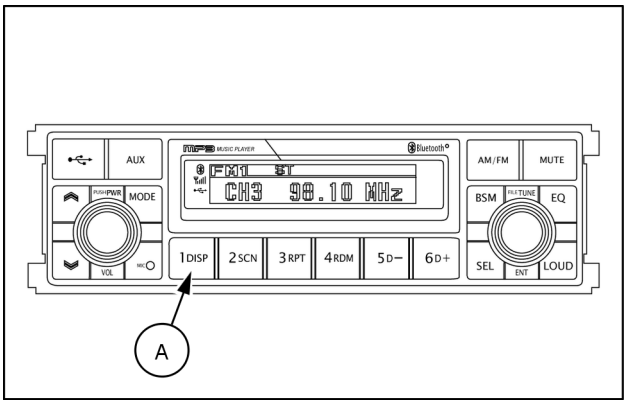
MP3 directory / file configuration



SMIL16MEX3084AA 15

ROOT												
Directory01												
File01	File02	File03	File04	Dir02			Dir03			Dir04		
				File05	File06	Dir05	File07	File08	Dir06	File09	File10	Dir07

ID3 v2 display



SMIL16MEX3084AA 16

Disp button **(A)** is used to change the display information.

While playing an MP3 file, you can change the file information shown on the LCD screen.

Each time you press DISP (display) **(A)**, the display changes to show the following.

NOTE: *if the MP3 disc does not have any ID3 information, the display will show NO ID3 on LCD screen.*

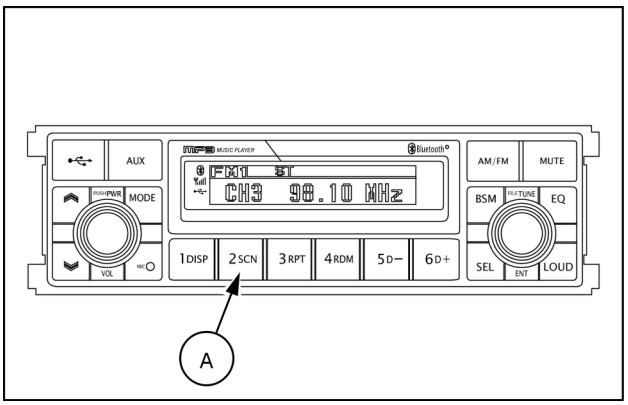
Directory name / file name (normal mode)

Album name / performer / title

File number / elapsed time

Directory name / file name (normal mode)

File scan (SCN)



SMIL16MEX3084AA 17

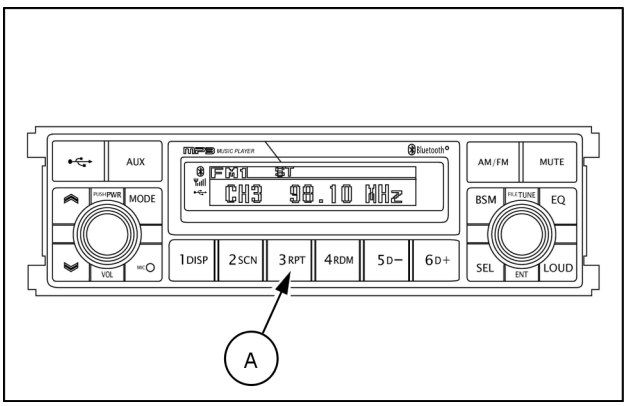
During USB play, press SCN button **(A)** to play the first **10 s** of each file on the whole file on the USB (SCN mark will appear on the LCD screen).

When a desired file is reached, press the SCN button **(A)** again to cancel the function.

The unit will then play the selected file.

NOTE: *in case of playing MP3 file, when the SCN (scan) button is pressed and held for longer than **2 s**, the SCN mark will blink on the LCD screen and all files in the selected directory will be introduced until the file scan mode is cancelled by pressing the SCN button **(A)** again or by activating the random or repeat functions.*

Repeat play selector (RPT)



SMIL16MEX3084AA 18

During USB play, press RPT button **(A)** to play the selected file repeatedly (RPT will appear on the LCD screen).

Play of the file will continue to repeat until this button **(A)** is pressed again and the RPT disappears from the LCD screen.

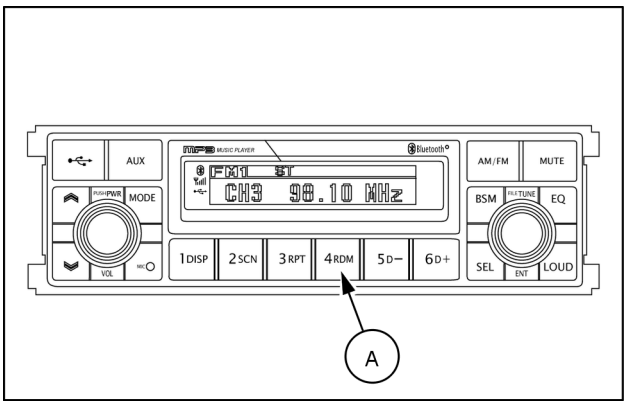
NOTE: *if you press the RPT button and hold the button for more than **2 s** while you play an MP3 file, "RPT" will flash on the display. The system will play all the files in the selected directory on repeat until you cancel repeat mode. To cancel repeat mode, press the RPT button again, or activate the scan or random modes. "RPT" will no longer flash on the display.*

Random play selector (RDM)

During USB play, press RDM button **(A)** to play the files on the USB in a random shuffled order (RDM will appear on the LCD screen). The file select function will also select file in the random order instead of the normal process.

To cancel random play mode, press the RDM button **(A)** again.

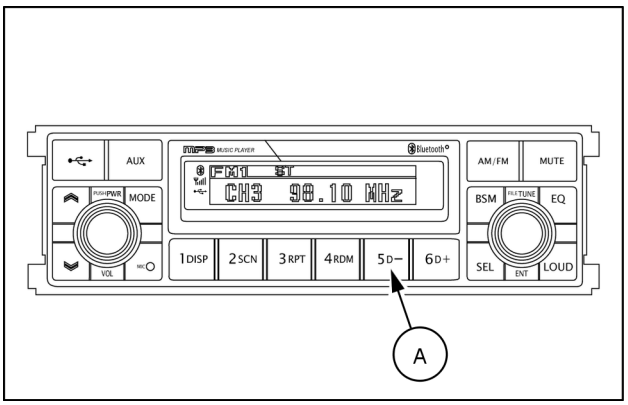
NOTE: *in case of MP3 file, when the random button is pressed and held longer than **2 s**, the RDM mark will blink on the LCD screen and play all files in directory randomly until the directory random mode is cancelled by pressing the random button again or by activating the scan or repeat functions (RDM mark will disappear from LCD screen).*



SMIL16MEX3084AA 19

Directory down

Press D- button **(A)** briefly while playing MP3. The previous directory is located each time you press this button.

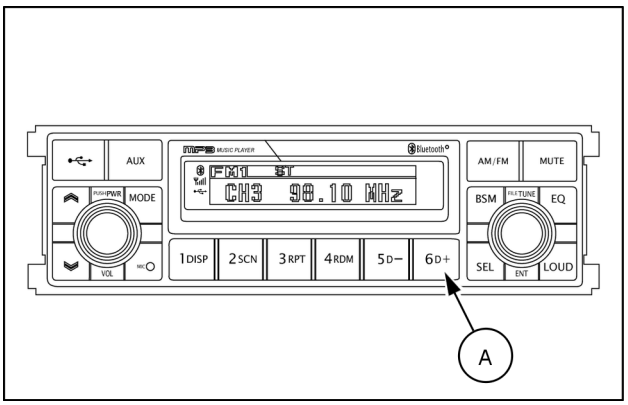


SMIL16MEX3084AA 20

Directory up

Press D+ button **(A)** briefly while playing MP3. The next directory is located each time you press this button.

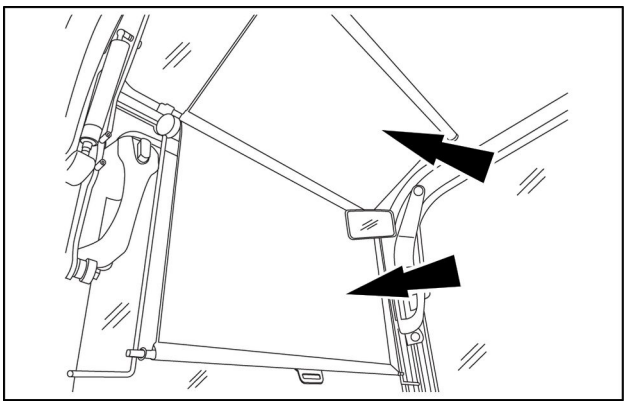
NOTE: *if the MP3 file does not have a directory, the unit play MP3 at 10-file intervals.*
If any MP3 file does not exist in USB, this button cannot operate.



SMIL16MEX3084AA 21

Sunshield

There are two sun shields in the cab fixed to the windshield and to the roof.
The sun shields can easily be positioned as required.



SMIL16MEX1351AA 1

Overhead controls

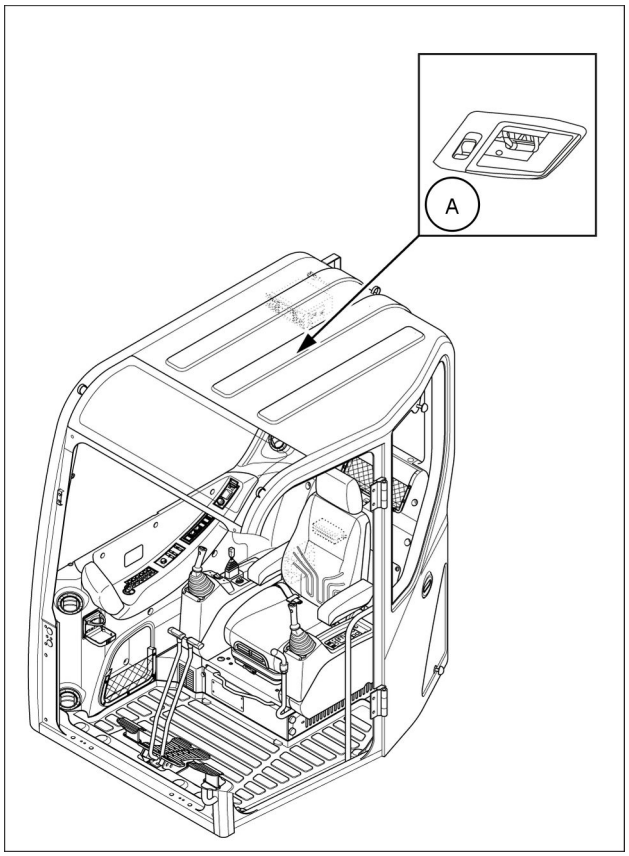
Cab internal lighting

The room lamp **(A)** is turned ON/OFF linked to open/close of the door.

The room lamp selection switch is equipped to select either one of the following status:

- OFF: the lamp is turned off always.
- DOOR: the lamp is turned on when the door is open, and off when closed.
- ON: the lamp is turned on always.

NOTICE: *make sure that the cab internal lighting is turned off after using it. Leaving it turned on may drain out the battery.*



SMIL16MEX1124BA 1

Exterior controls

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.

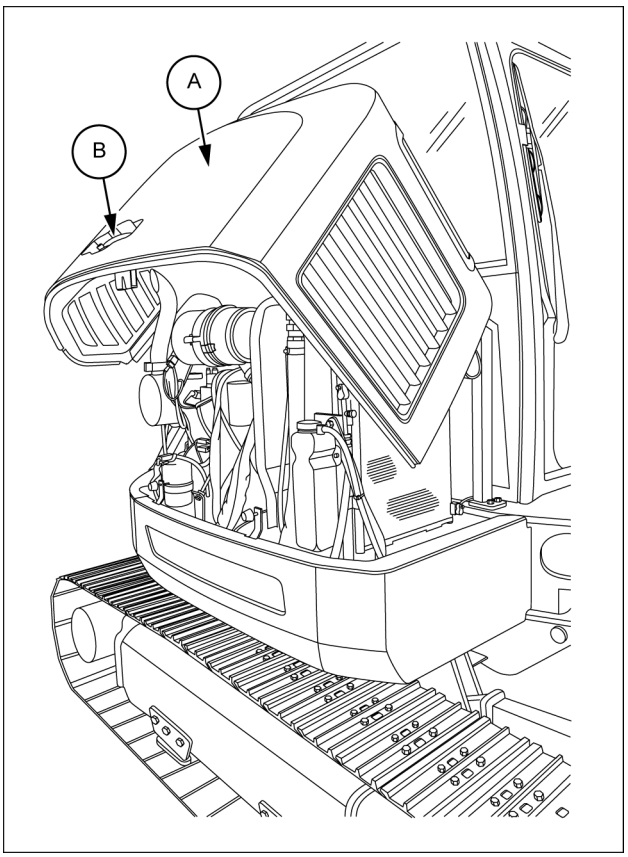
W0238A

Engine hood

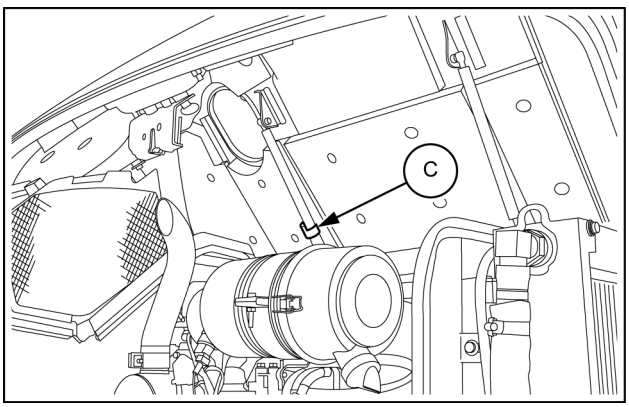
The engine hood **(A)** allows to access to the engine compartment including the engine, the muffler, the air cleaner, the radiator, and the engine filter.

To open the engine hood, use the handle **(B)** located in the center of the engine hood and raise the engine hood until the hook **(C)** lock the cylinder.

To close the engine hood, press the hook **(C)** and lower the engine hood using the handle **(B)**. Use the starter key to lock the engine hood.



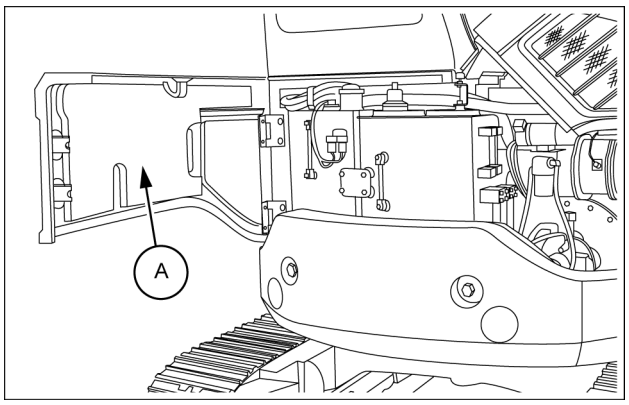
SMIL16MEX1065BB 1



SMIL16MEX1099AB 2

Rear door

The rear door **(A)** allows access to the fuel tank and to the hydraulic oil reservoir.



SMIL16MEX1066AB 3

Windshield washer reservoir

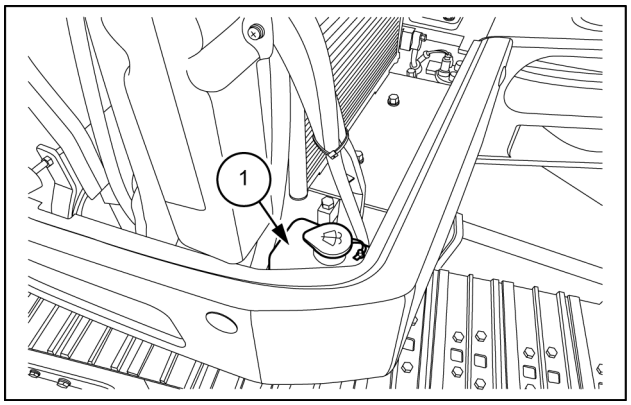
The windshield washer reservoir **(1)** is located in the right-hand side of the machine, next to the radiator. To access to the windshield washer reservoir, open the engine hood.

The windshield washer reservoir is equipped with an electric pump which is operated from the washer switch located in cab.

NOTICE: *never operate the windshield washer control when the reservoir is empty. This could cause damage to the electric pump.*

Remove the cap to add windshield washing fluid.

NOTICE: *in cold weather, add anti-freeze to the windshield washer water.*



SMIL16MEX1100AB 1

Cab tilting

⚠ WARNING

Crushing hazard!
When you tilt the cab, you must strictly adhere to the instructions in this manual. Keep all unauthorized personnel clear of the area. Do not operate any controls when you perform service under the tilted cab.
Failure to comply could result in death or serious injury.

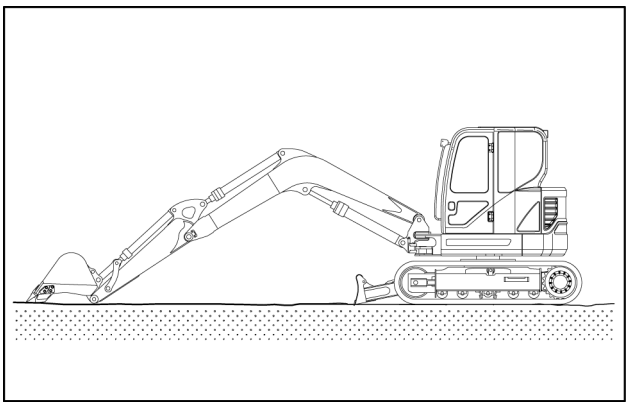
W1463A

NOTICE: *the cab tilting operation must be carefully performed by skilled service operators.*

NOTE: *by tilting the cab, service of hydraulic and electric system such as hydraulic components, hydraulic pipings, electric components, and electric wirings can be easily performed.*

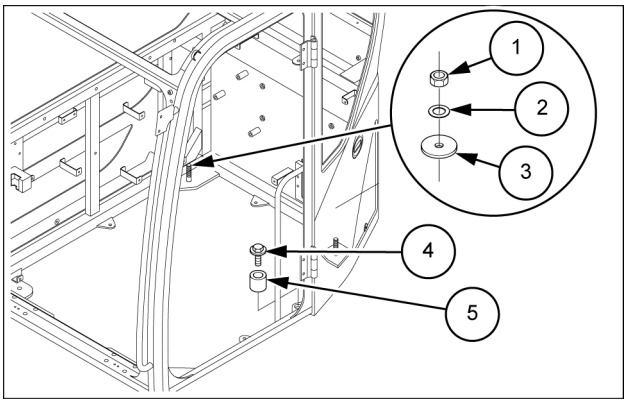
Forward tilting

1. Park the machine on a flat, level ground, lower the attachment to the ground and stop the engine.
2. Lower the operator's seat and move forward it and the console box.



SMIL16MEX1358AA 1

3. Remove the two panels located behind the operator's seat.
4. Remove the cab mounting nuts **(1)**, the plain washers **(2)**, the rebound washers **(3)**, the bolt **(4)**, and the pipe **(5)**.

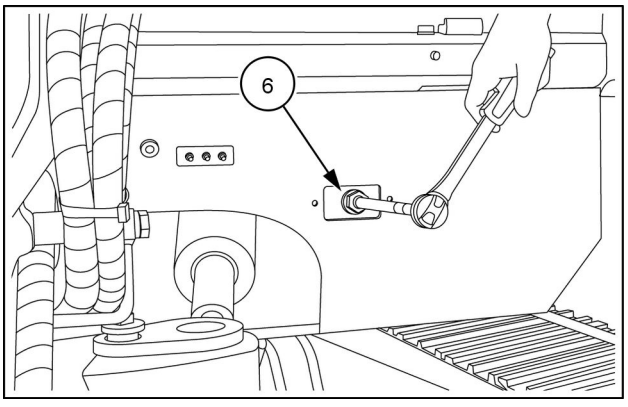


SMIL16MEX1068AB 2

5. Remove the cover of the screw **(6)** located on the front side of the upper structure.
6. Screw the bolt **(6)** to raise the cab.

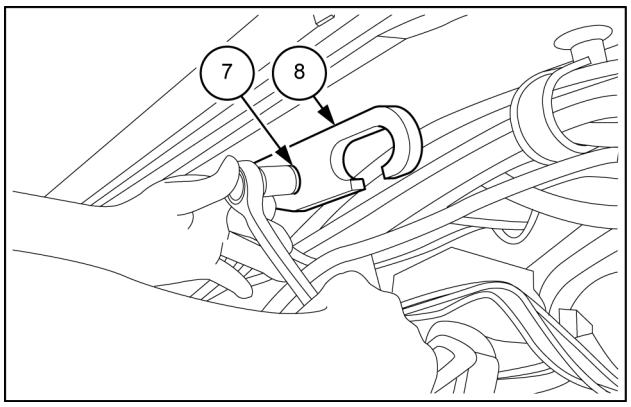
   NOTE: *the maximum tilting angle is **28 °**.*

   NOTE: *operate the bolt **(6)** only by hand tools. Tightening torque: less than **294 N·m** (**216.8 lb ft**).*



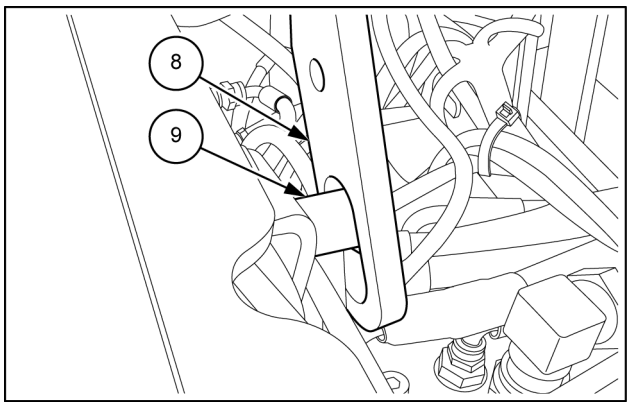
SMIL16MEX1109AA 3

7. Once the cab has reached the maximum elevation, unscrew the bolt **(7)** in order to unlock the bracket **(8)**.



SMIL16MEX1110AB 4

8. Lower and fix the bracket **(8)** by means of the stay **(9)** in order to secure the cab.



SMIL16MEX1111AB 5

Backward tilting

1. Raise the bracket **(8)** and fix it with the bolt **(7)**.
2. Unscrew the bolt **(6)** to lower the cab and install the cover of the screw.
3. Install the cab mounting nuts **(1)**, the plain washers **(2)**, the rebound washers **(3)**, the bolt **(4)** and the pipe **(5)**.
4. Install the two panels located behind the operator's seat, and then adjust the operator's seat and the console box.

Fuel tank

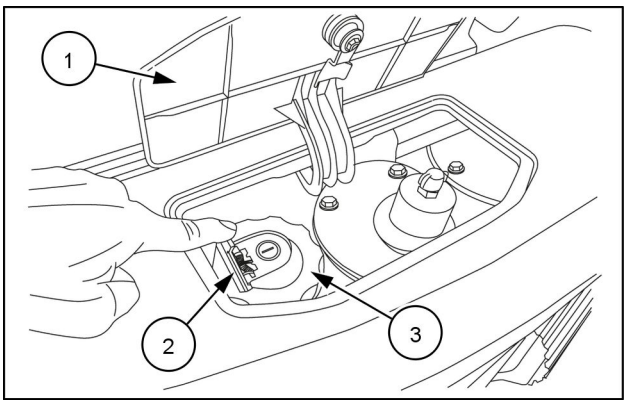
⚠ WARNING

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

Use the starter key to unlock the door **(1)** located in the upper part of the rear door.

Raise the protection cap **(2)** to access to the filling cap **(3)** of the fuel tank. Use the starter key to unlock the filling cap **(3)**.



SMIL16MEX1096AB 1

Furthermore, it is possible to access to the fuel tank **(4)** opening the engine hood and then the rear door.
Use the starter key to unlock the engine hood.
Use suitable fuel.

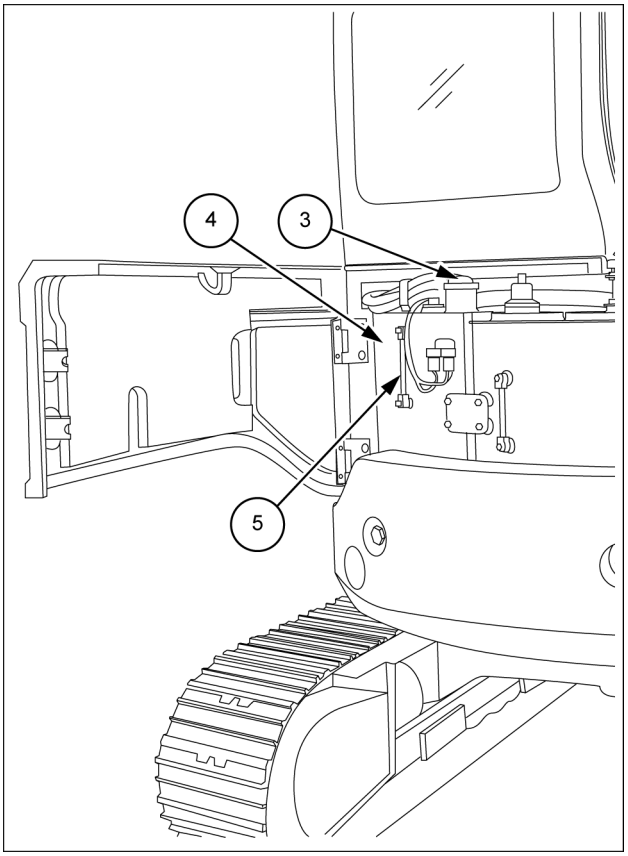
NOTE: *clean around the fuel cap* ***(3)*** *before you refuel the machine. Do not remove the filter in the neck of the fuel tank.*

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

NOTE: *in cold weather, use fuel corresponding to the ambient temperature.*

NOTICE: *in cold weather, fill the fuel tank after each working day to prevent the formation of condensation*

When install the fuel cap **(3)**, be sure to fit it in the neck accurately and then turn it all the way to the stopper to lock it.
The fuel tank is equipped with a maximum level visual gauge **(5)**.



SMIL16MEX1107BB 2

4 - OPERATING INSTRUCTIONS

Starting the unit

Anti-theft protection

Engine Starting Limit (ESL) mode setting

Engine Starting Limit (ESL) mode is designed to be a theft deterrent and prevent the unauthorized operation of the machine.

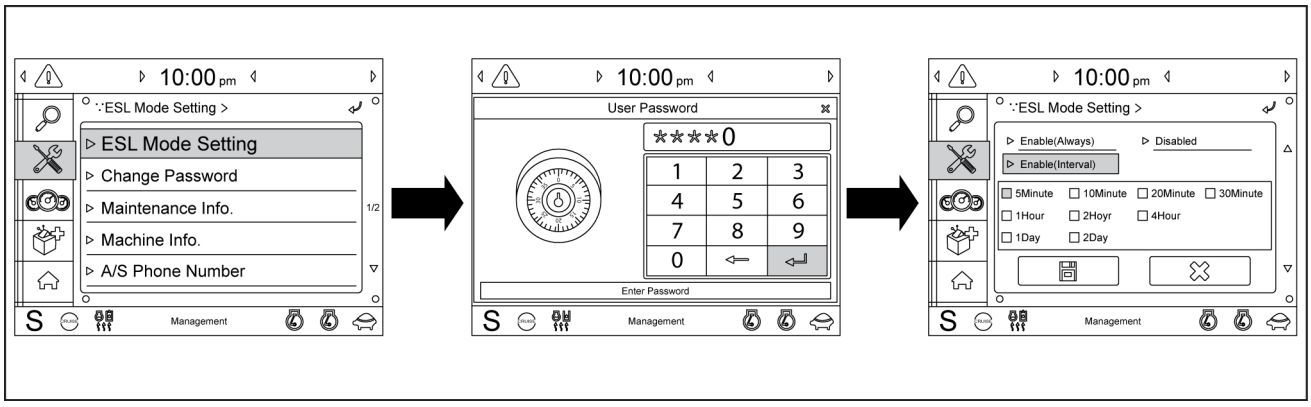
ESL mode can be selected in three different modes:

1. Disabled: ESL function is not used
2. Enable (always): the password is required whenever the operator starts the engine.
3. Enable (interval): the password is required when the operator starts the engine the first time. The operator can restarts the engine within an interval without input the password..

NOTE: *the default password is 00000*

NOTE: *the password length can be 5 to 10 digits.*

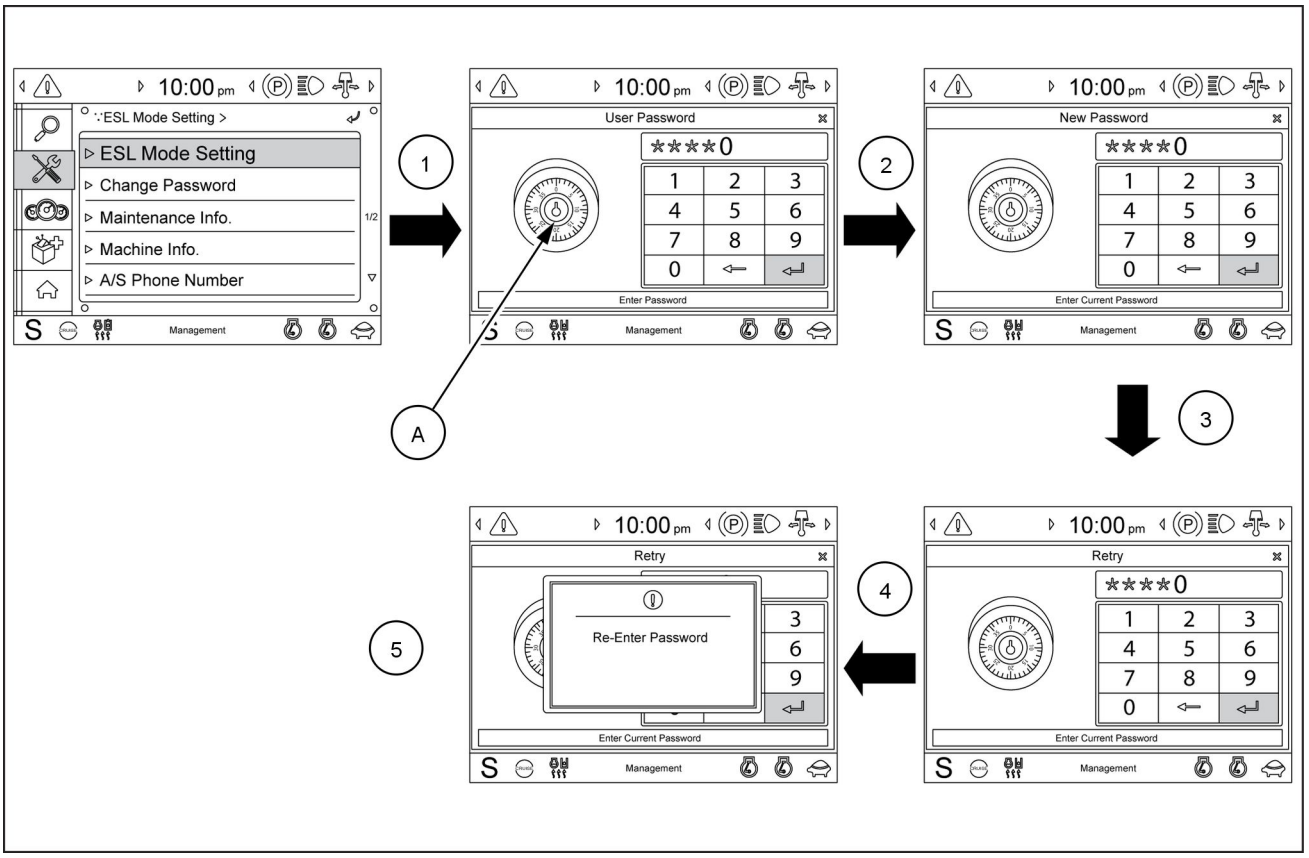
To set the ESL mode, enter to the “Management” sub menu screen from the main menu (refer to page **3-27**).



SMIL16MEX0529EA 1

Password change

To change the password, perform the following operations:



SMIL16MEX0530FA 2

(1) Select the Change password submenu.

(2) Enter the current password

NOTE: *the padlock* ***(A)*** *color is blue.*

(3) Enter the new password

NOTE: *the padlock* ***(A)*** *color is yellow.*

(4) Enter the new password again

(5) The new password is stored in the Machine Control Unit (MCU).

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.

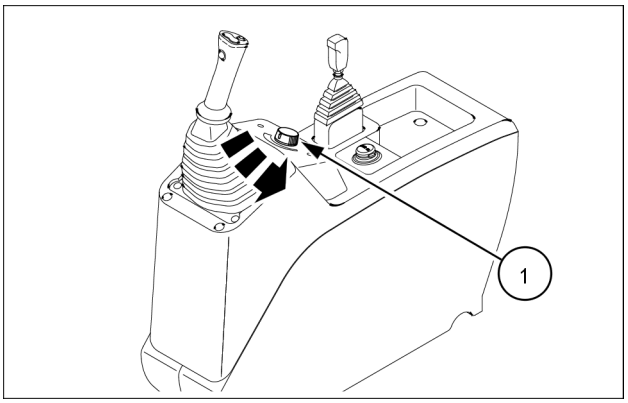
W0090A

⚠ 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.

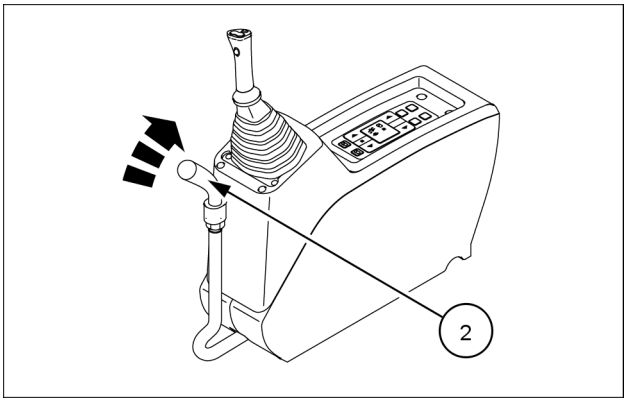
W1302A

1. Check that there is no abnormality in the machine.
2. Confirm that the engine hood and the rear door are closed and locked.
3. Confirm that the engine speed control **(1)** is in low idle position.



SMIL16MEX0510AA 1

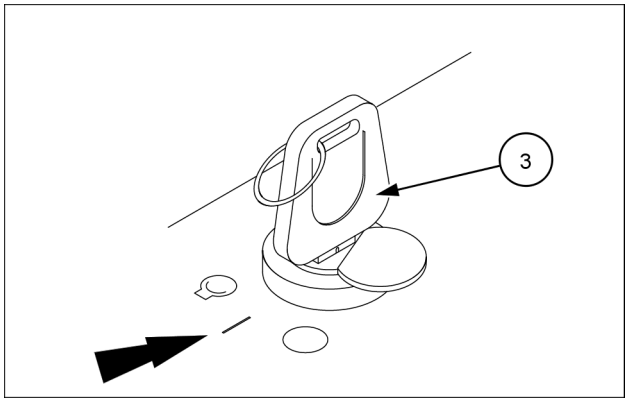
4. Confirm that the safety lock lever **(2)** is in lock position.
5. Set each operation lever in neutral.
6. Securely fasten the seat belt.



SMIL16MEX0499AA 2

7. Turn the starter key **(3)** to the ON position, and check that the buzzer sounds for four seconds.
8. If the ESL mode is set to enable, enter the password to start the engine (refer to page **4-1**).

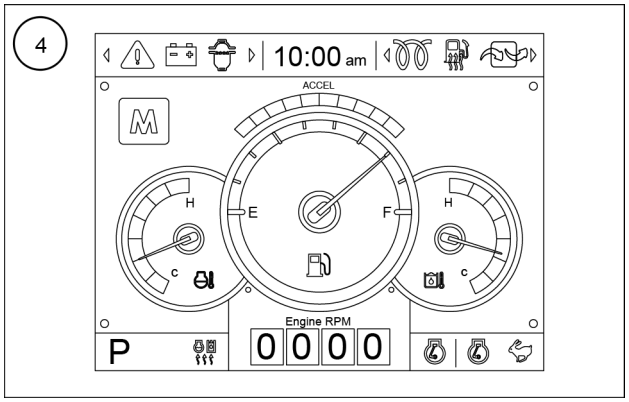
   NOTE: *if the password has failed 5 times, please wait 30 minutes before re-attempting to enter the password.*



SMIL16MEX0507AA 3

9. After initialization of the instrument cluster, the operating screen **(4)** is displayed on the display.
10. If the ambient temperature is below **10 °C** (**50 °F**), wait approximately **1 – 2 min**.

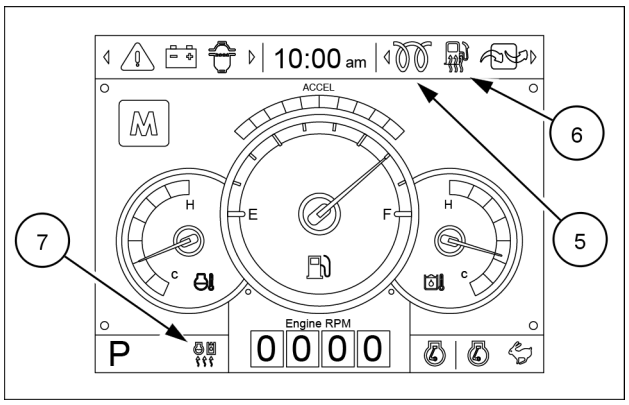
    NOTE: *the fuel warmer is automatically operative once the starter key is in ON position.*



SMIL16MEX0610AA 4

11. Sound the horn with the button on the left–hand control lever to warn that the machine is starting up.
12. Turn the starter key to START position when the engine preheat light **(5)** disappears.
    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.

    NOTE: *after about **5 min** the fuel warmer pilot light **(6)** and the warming up pilot light **(7)** turns off.*



SMIL16MEX0610AA 5

NOTICE: *the cranking up of the engine may be difficult in severe winter climates. 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 climates, 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, vibrations might increase 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, allow the main systems to warm up to their normal operating temperature.

***NOTE:** the normal operating temperature for the hydraulic fluid is **50 – 80 °C** (**122 – 176 °F**).*

***NOTICE:** do not operate the machine if the temperature of the hydraulic fluid is below **25 °C** (**77 °F**).*

The warm-up procedure is necessary for proper and safe machine usage. Proper warm-up allows for the best possible 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.*

1. Start the engine and let it run for approximately **5 – 10 min** with no load.
2. Set the engine speed lever to mid-range speed.
3. Set the safety lock lever to UNLOCK position (frontward position).
4. Operate the bucket control lever for **5 min**.

   ***NOTICE:** do not operate any control lever except the bucket control lever.*
5. Set the engine speed lever to high speed.
6. Operate the bucket control lever and the arm lever for approximately **5 – 10 min** with no load.

   ***NOTICE:** operate only the bucket control lever and the arm control lever.*
7. Complete the warm-up procedure by operating the controls for all cylinders, travel, and swing for 3 to 4 times to circulate warmed hydraulic fluid into the whole circuit.

Check the following items 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 light, and instrument cluster.
- Proper display of the engine coolant temperature gauge.
- Check the visibility from the view mirrors 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.
- The display screen displays any message and warning sound beeps.

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 **CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT** 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, hydraulic cylinder and track tension cylinder to prevent corrosion.
- Inspect and lubricate more frequently. Supply sufficient grease to replace all old grease in bearings which have been submerged in water for a long time.

Operation in mud, water, or rain work sites

- Keep the machine as dry as possible during operation and make sure to carry out regular lubrication. Moisture and muddy water cause deterioration and corrosion of paints/wiring/metal components.
- After completing operations, clean mud, rocks or debris from the machine. Inspect for damage, cracked welds or loosened parts.
- If the operations are in salt water or other corrosive materials, make sure to flush the affected equipment with fresh water.

Operation in rocky work sites

- Check for damage to the undercarriage and for looseness, flaws, wear and damage in bolts and nut.
- Loosen the track tension a little (not over than **10 mm** (**0.4 in**)) when working in such areas.
- Do not turn the undercarriage directly over the sharp edge rock.

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

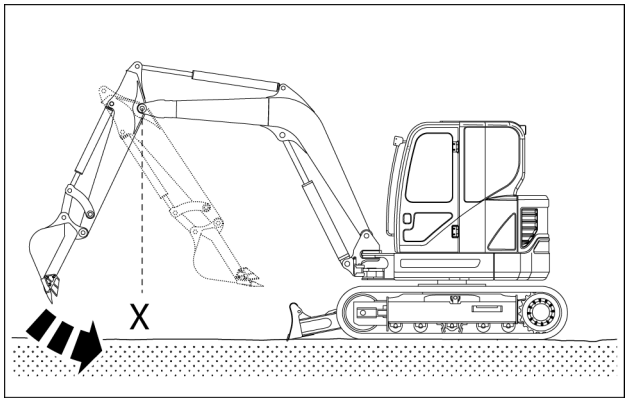
- Before you operate the machine, take notice of the job site ground conditions and characteristics. Take notice of the local climate.
- Inspect the job site for potential risks before operating the machine. Holes on working site, obstructions and hazardous materials such as debris are subject to cause 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 saat 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 light and gauges are operating properly.
- Push the safety lock lever forward.

NOTICE: *the following operations 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.

Normal operation of the machine

When rolling in the arm, the roll-in movement stops momentary at point **(X)** as shown, then recovers speed again after passing point **(X)**.



SMIL16MEX1081AB 1

The reason is that the movement by the arm weight is faster than the speed of oil flow into the cylinder. When lowering the boom, a sound may be heard continuously. This is caused by the oil flow in the valve.

When you swing the machine, a noise near the swing motor may be heard. The noise is generated by the brake valve.

If the machine is overloaded, a sound is caused by the relief valves, which protect the hydraulic systems.

NOTICE: *do not exceed the machine performance. It may result in accident or failure.*

NOTICE: *perform lifting operations within the specified load limit.*

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

When working on a sloping ground, the machine becomes unstable, unbalanced, and difficult to control. Therefore, the following operating prescriptions shall be strictly respected.

If the intended job site is located on a sloping ground, a hard horizontal area shall be prepared as operating base for the machine. Never work on slopes steeper then **10 °**.

Travel along slopes up to **20 °** is allowed only to reach a specific work area. Refer to “Machine travel - Precautions for travelling on slopes” in order to understand proper operating practices and precautions for traveling along slopes.

***NOTICE:** The machine grade ability is **30 °** (**58 %**). Never operate the engine when the incline of the machine is **30 °** or more. The engine or the hydraulic system may be damaged.*

Work with the undercarriage oriented along the slope, never across. Always keep the travel reduction gears pointing down towards the bottom of the slope. Lower and indent the blade into the ground.

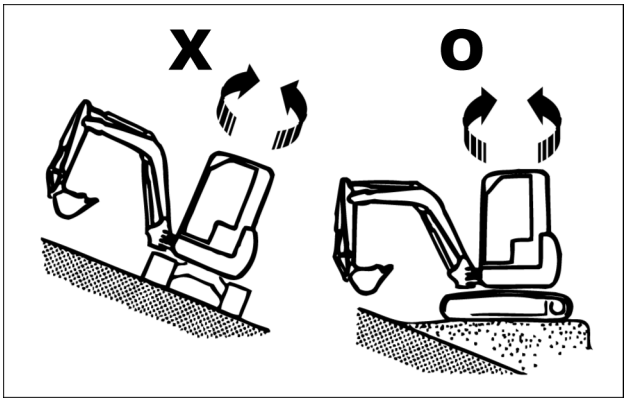
Make sure to define a safe working area around the machine, which shall be equal to the maximum reach of the front equipment plus **2 m** (**6.6 ft**). It is recommended to have a supplementary guiding operator on the ground out of the safe working area, in order to provide proper indications and prompt warnings to the machine operator.

Maintain the maximum engine speed.

Make sure that the low speed travel mode is selected.

Operate the control levers smoothly in order to prevent sudden movements that may cause the machine to slip or tip over.

Avoid full boom raising, as well as swing operation towards the bottom of the slope with the bucket loaded, or swing operation with any heavy attachment installed, in order not to affect the balance of the machine.



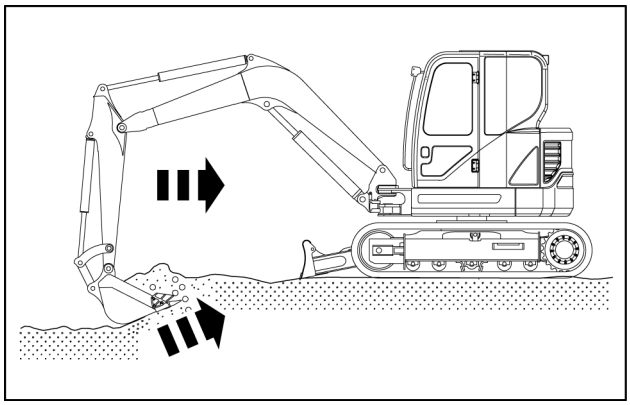
SMIL16MEX3166AB 2

Digging and loading operations

Set the tracks parallel to the line of the ditch to be excavated when digging a ditch. Do not swing while digging.

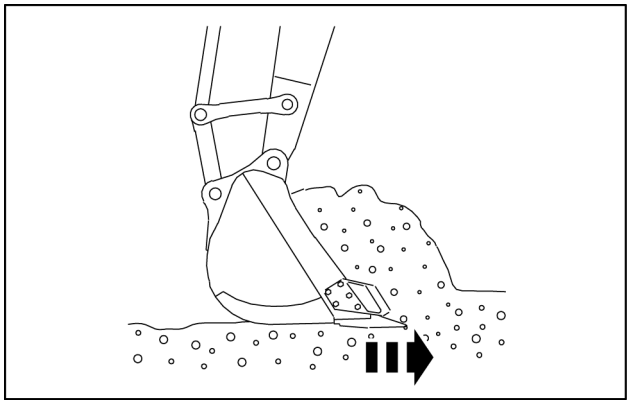
1. Do the digging work by arm.

Use the pulling force of arm for digging and use together with the digging force of the bucket if necessary.



SMIL16MEX2144AB 3

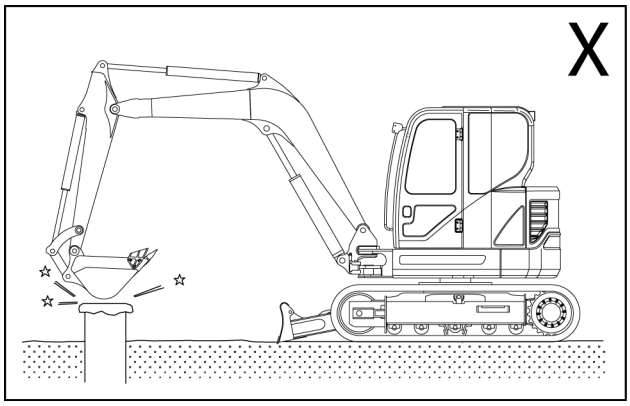
2. The digging resistance and wearing of tooth can be reduced by putting the end of bucket tooth to the digging direction.



SMIL16MEX1541AB 4

3. Do not use the bucket to crack hard objects like concrete or rocks.

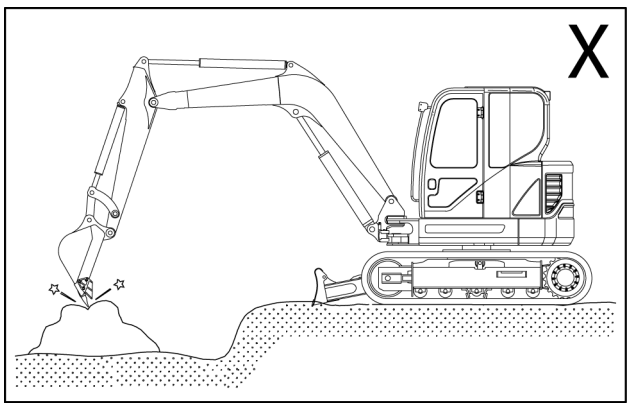
NOTICE: *this may break a tooth or pin, or bend boom.*



SMIL16MEX2146AA 5

4. Do not use the bucket to crack hard objects like concrete or rocks.

NOTICE: *this may break a tooth or pin, or bend boom.*



SMIL16MEX2147AA 6

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

⚠ WARNING

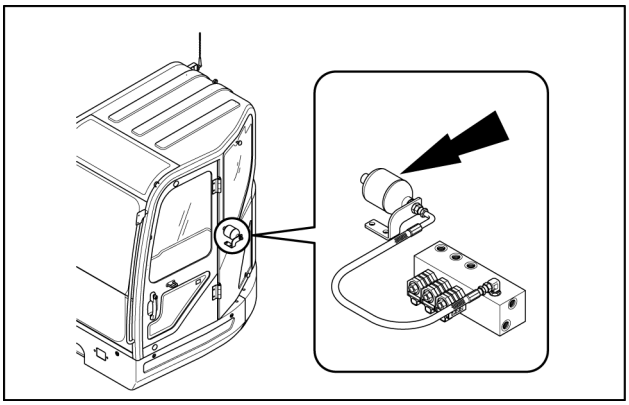
Crushing hazard!
Keep away from the space under the bucket or attachment when lowering the bucket or attachment. In cases where the machine fails and the engine stops, lower the attachment using the procedure described in this manual.
Failure to comply could result in death or serious injury.

W1468A

NOTICE: *the procedure should be completed within five minutes after the engine stops.*

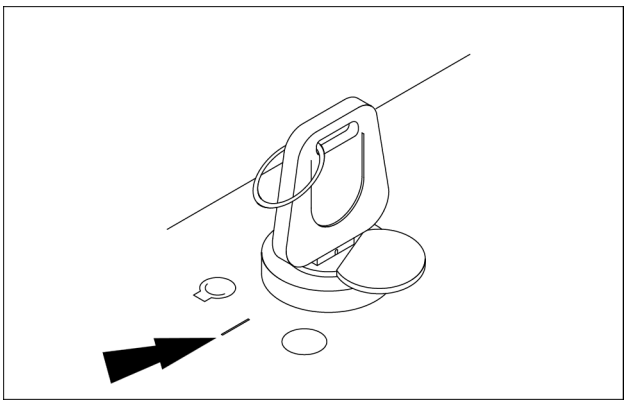
The pressure of the accumulator (located on the engine compartment) will gradually fall. This will disable the operator's ability to lower the attachment.

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



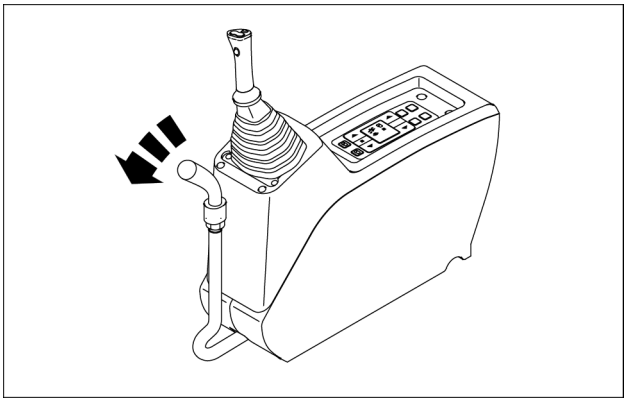
SMIL16MEX1082AA 1

1. Turn the starter key to ON position.



SMIL16MEX0507AA 2

2. Set the safety lock lever in UNLOCK position.
3. Slowly operate the control levers to lower the attachment to the ground.



SMIL16MEX0499AA 3

Bucket replacement

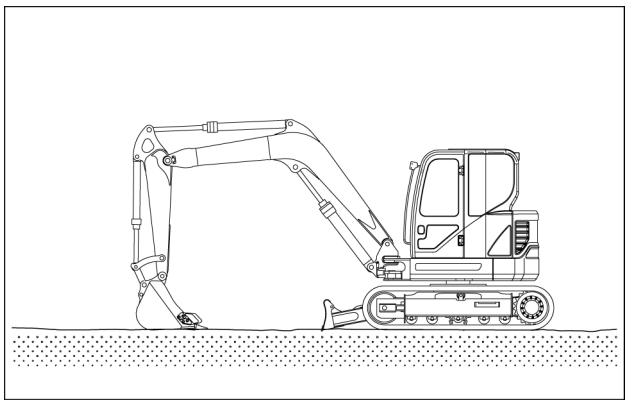
⚠ WARNING

Flying object!
Always wear eye or full face protection when performing this procedure.
Failure to comply could result in death or serious injury.

W0313A

Lower the bucket to the ground.

NOTE: *place the bucket in light contact with the ground. If the bucket is lowered strongly to the ground, the resistance will be increased and it will be difficult to remove the pins*



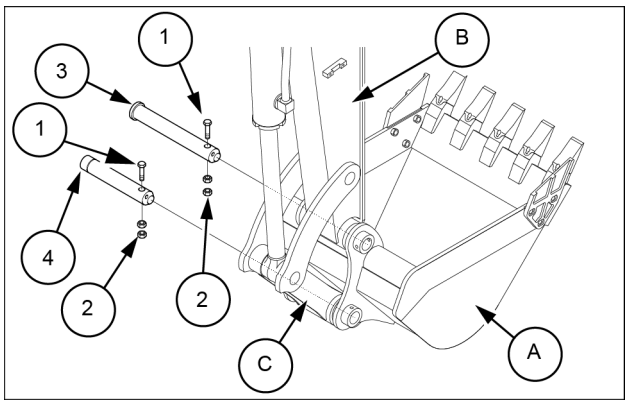
SMIL16MEX1083AA 1

Put the safety lock lever in LOCK position, and stop the engine.

Remove the stopper bolts **(1)** and the nuts **(2)**, then remove the pins **(3)** from the arm **(B)** and the pin **(4)** from the link **(C)**.

Remove the bucket **(A)**.

NOTE: *after the removal of the pins, make sure that they are not contaminated with sand or mud and that the seals of the bushing on both sides are not damaged.*

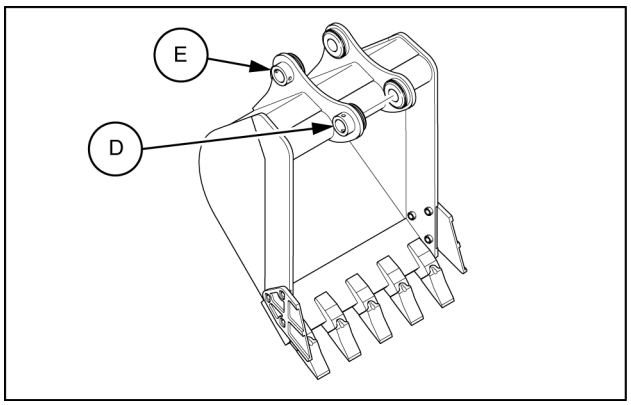


SMIL16MEX0041AB 2

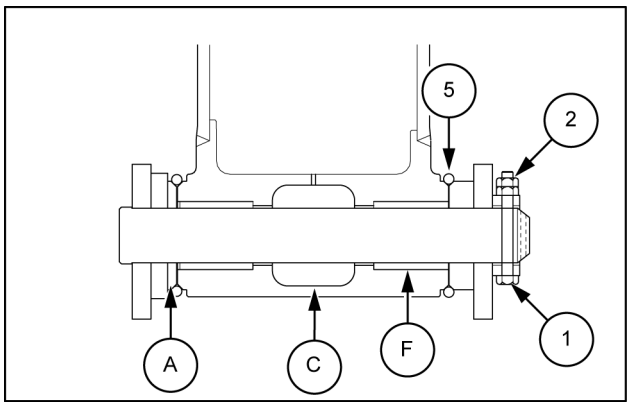
Align the arm **(B)** with the holes **(D)** and the link **(C)** with the holes **(E)**, then coat with grease and install the pins **(3)** and **(4)**.

When installing the bucket, the O-rings **(5)** are easily damaged, so fit the O-rings **(5)** on the boss of the bucket.

After knocking the pins, move the O-ring down to the regular groove. Install the stopper bolts **(1)** and the nuts **(2)** for each pin, then grease the pin.



SMIL16MEX0042AB 3



SMIL16MEX0043AB 4

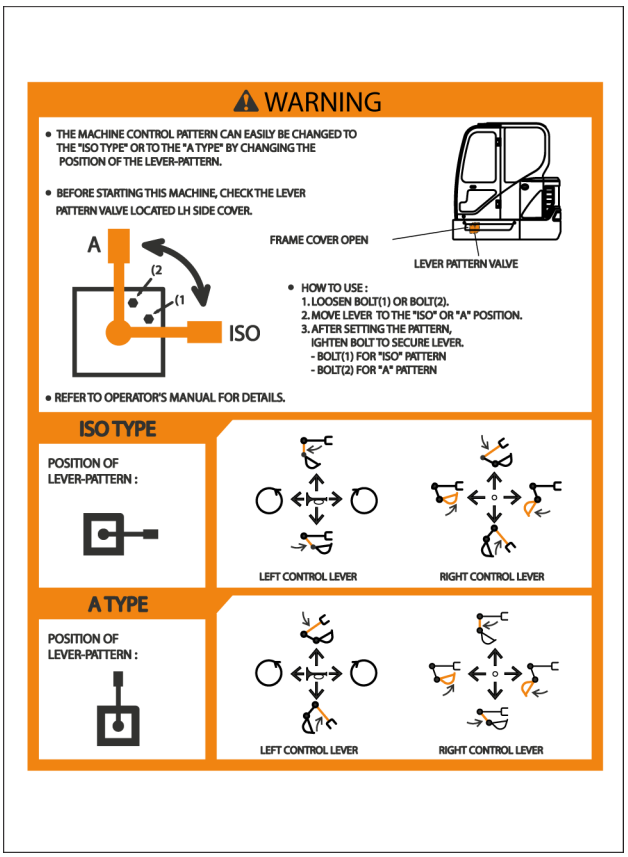
Hydraulic control lever operating pattern

⚠ WARNING

Unexpected machine movement!
Pilot controls have two different backhoe controls patterns; before operating the machine, check which control function is active.
Failure to comply could result in death or serious injury.

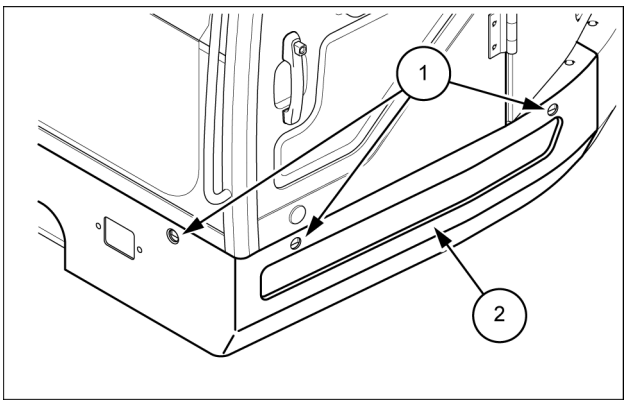
W0185A

NOTICE: *whenever a change is made to the machine control pattern, also replace the pattern label in the cab to match the new pattern.*

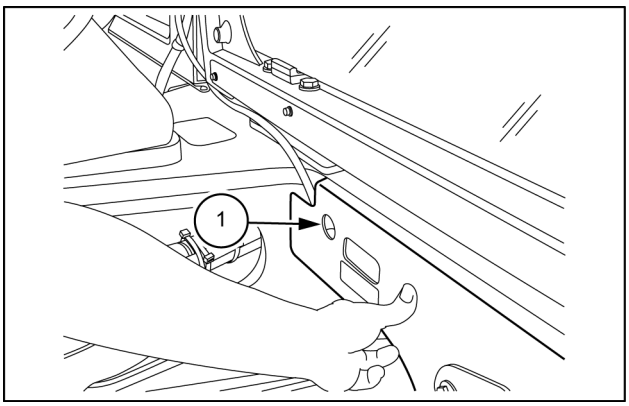


SMIL16MEX1075BA 1

To access the change pattern valve, remove the four bolts **(1)**, and then remove the left-hand panel **(2)**.



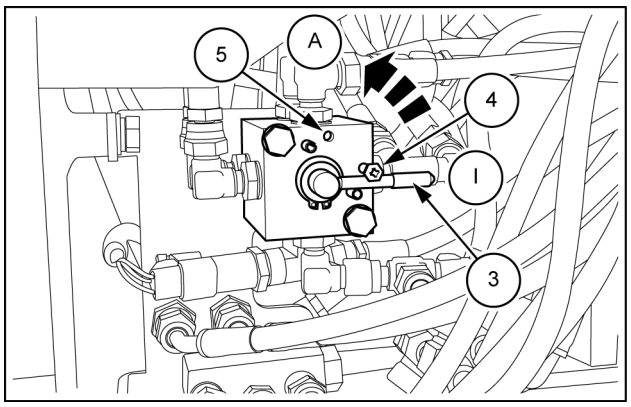
SMIL16MEX1127AB 2



SMIL16MEX2277AB 3

The machine control pattern can be changed from the “ISO” type pattern **(I)** to the “A” type pattern **(A)** changing the position of the lever **(3)** located on the pattern change valve. To change the pattern, perform the following operations:

1. Loosen the bolt **(4)**.
2. Rotate the lever **(3)** from the “ISO” type pattern **(I)** to the “A” type pattern **(A)**.
3. Tighten the bolt **(4)** in the threaded hole **(5)** to secure the lever **(3)**.

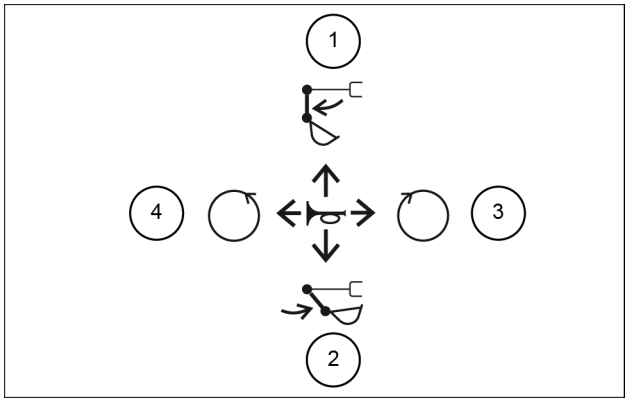


SMIL16MEX1112AB 4

Pattern: ISO type

Left–hand control lever control function

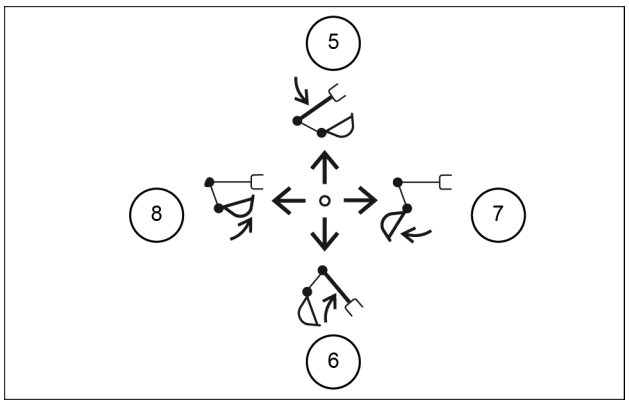
1. Arm out
2. Arm in
3. Swing right
4. Swing left



SMIL16MEX0587AB 5

Right–hand control lever control function

5. Boom lowering
6. Boom raising
7. Bucket out
8. Bucket in

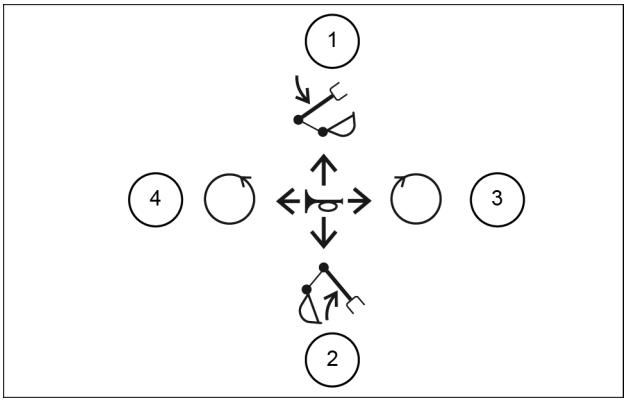


SMIL16MEX0588AB 6

Pattern: A type

Left–hand control lever control function

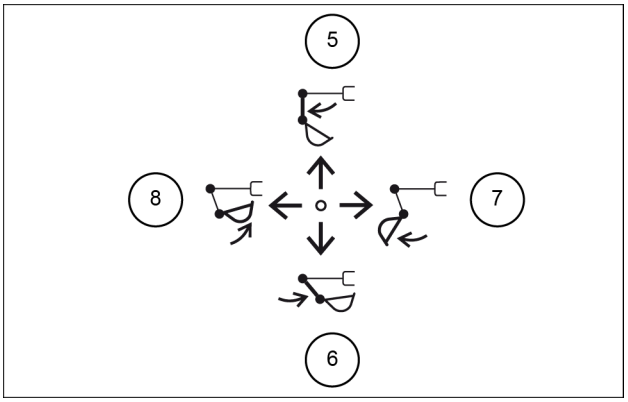
1. Boom lowering
2. Boom raising
3. Swing right
4. Swing left



SMIL16MEX0589AB 7

Right–hand control lever control function

5. Arm out
6. Arm in
7. Bucket out
8. Bucket in



SMIL16MEX0590AB 8

Caution while using rubber crawlers

Proper usage

The rubber crawlers offer excellent features which steel crawlers do not possess.
However, if they are used the same way as the steel crawlers, then their advantages cannot be fully exploited. Operation of the machine varies upon working site and conditions.

Although the rubber crawler offers many advantages thanks to the properties of its material, it also has disadvantages in terms of strength. As a consequence, it is necessary to be familiar with the characteristics of this kind of crawler.

	Rubber belt
Less vibration	⊗
Smooth operation	⊗
Low noise	⊗
Harmless for paved road	⊗
Easy handling	⊗
Resistant	Δ
Large traction force	⊗
⊗: Excellent O: Good	Δ: Normal

Rubber crawler warranty

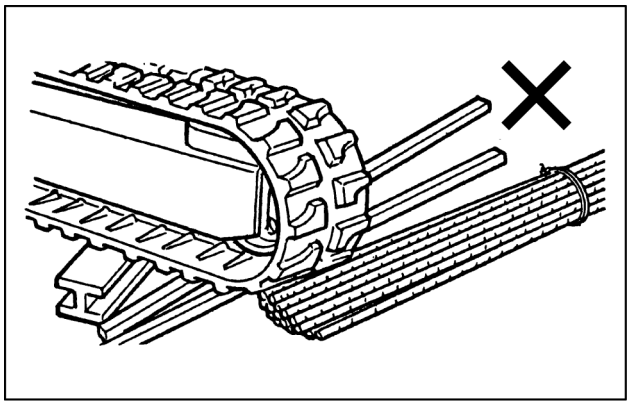
The warranty does not cover such damages to the rubber crawlers resulting from improper working or if their tension is inaccurate.

Forbidden operations

Do not carry out the following operations:

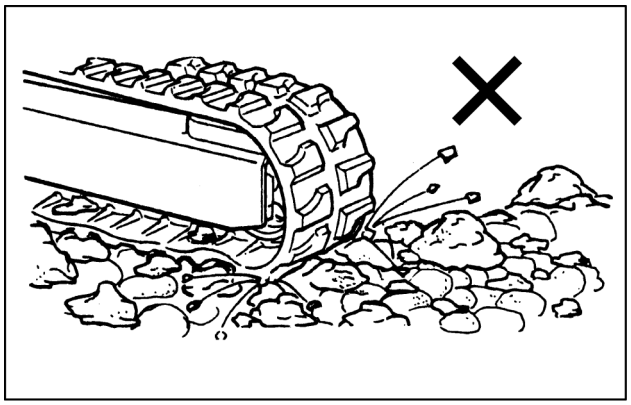
Do not travel nor work on following surfaces:

- Gravel.
- Rugged and solid rock bed.
- Reinforced concrete.
- Steel plate edges.



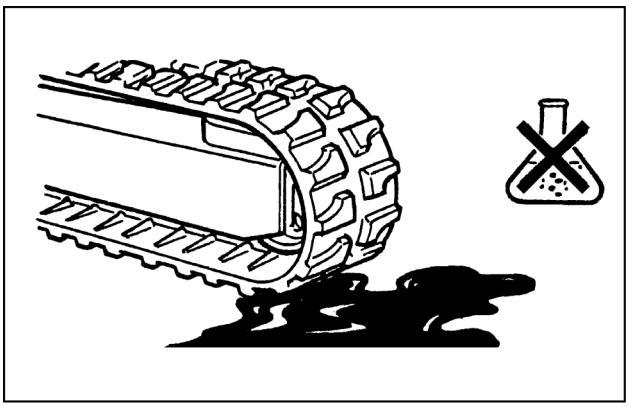
LELI11E0259AA 1

Do not operate and/or travel in such places as river beds where there are lots of stones of different sizes. Rocks may get caught into the grooves of the rubber crawlers, thus damaging the crawler or causing it to come off. The life of rubber crawler is shorter, if it skids or rubs against the soil.



LELI11E0260AA 2

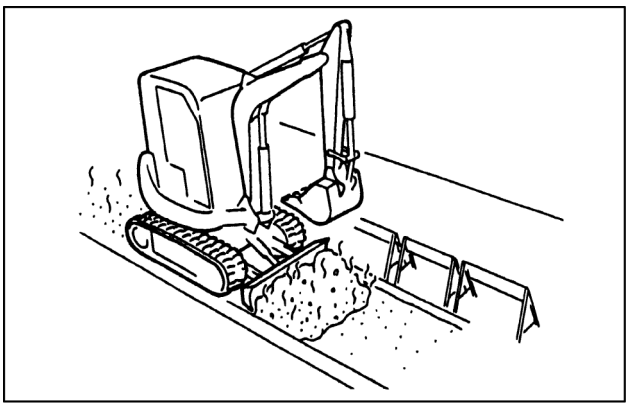
Do not let oil, fuel, solvents, etc., come in contact with rubber shoes. If this happens, wipe off crawlers with a cloth immediately.



LELI11E0261AA 3

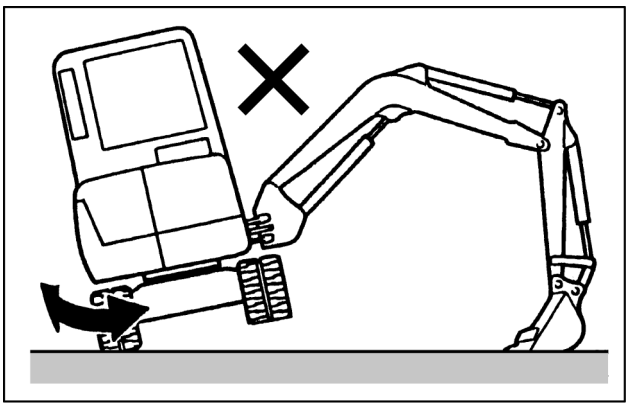
Do not enter such hot places as an open-air fire, or a steel plate left in the open sun.
Do not work in asphalt leveling.

When storing the machine for a long period (more than three months), keep it in a closed room where it will not be exposed to direct sunshine or rain.



LELI11E0262AA 4

When the machine travels only on one side of the crawler, and keeps the other side floating, the crawler may come off of the rollers or get damaged.



LELI11E0263AB 5

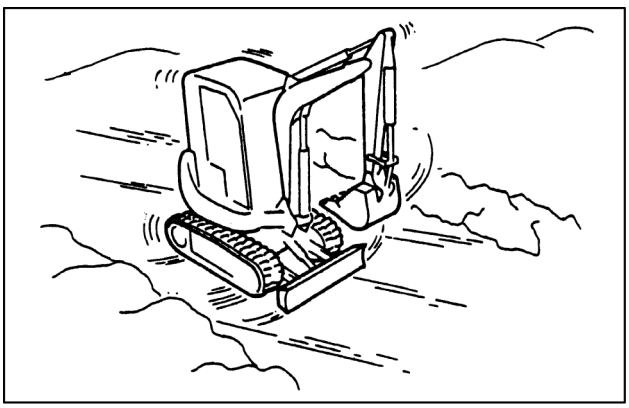
Precautions for use

Use care of the following when working.

Rubber crawlers slip easily on icy surfaces.
Take the necessary safety precautions.

Avoid making a spin turn on concrete surfaces.

Avoid abrupt changes of direction as this will cause an early wear or damage of the rubber crawlers.

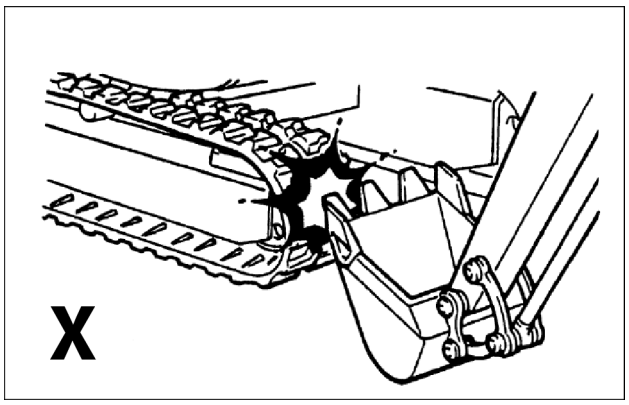


LELI11E0264AA 6

Use care so that the bucket does not damage the rubber crawler while working.

Do not move the machine pressing the bucket against a concrete surface or walls.

Lower the machine slowly, if it had previously been lifted by means of the attachment.

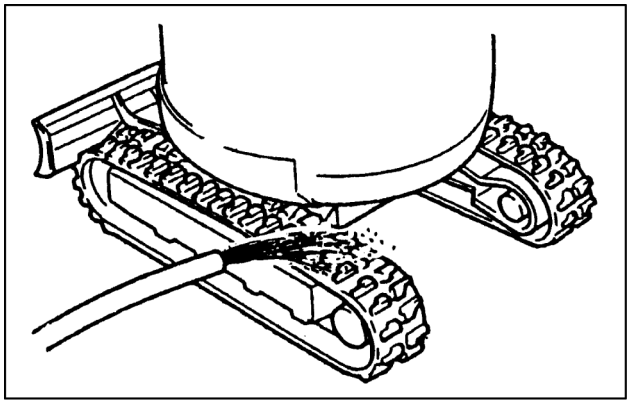


LELI11E00265AA 7

If the machine is operated in salty corrosive places, the core metal can detach easily. Do not use the rubber crawler under such circumstances. If the rubber crawlers come in contact with these substances wash them with water.

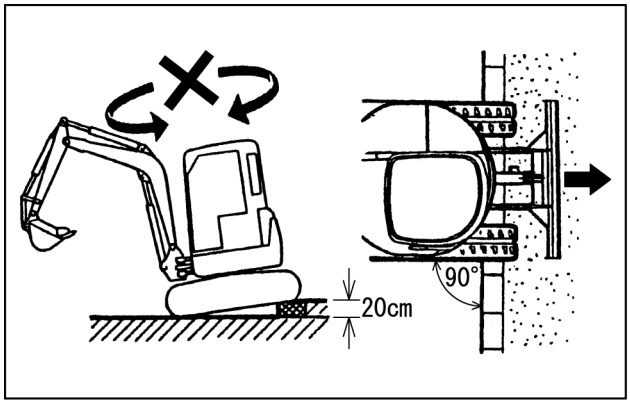
The rubber crawlers have to be used with a temperature range between **-25 °C** (**-13 °F**) and **+55 °C** (**131 °F**).

NOTE: *Use the rubber crawlers under proper tension, to prevent them from coming off the rollers. Operate the rubber crawler carefully even when tensioning is proper.*



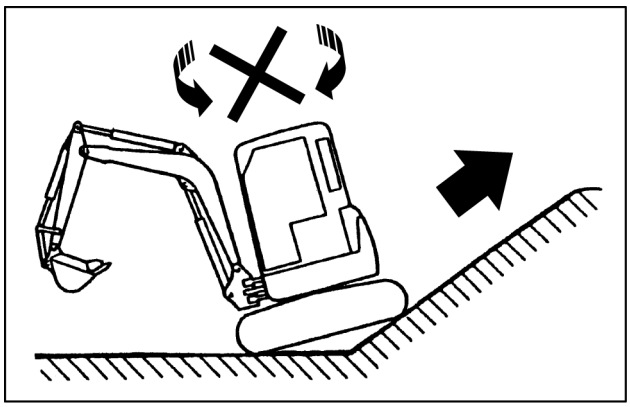
LELI11E0266AA 8

Avoid changing direction of the machine on places with different level (about **20 cm** (**7.87 in**)). To overcome the gap, place the machine perpendicular to the obstacle.



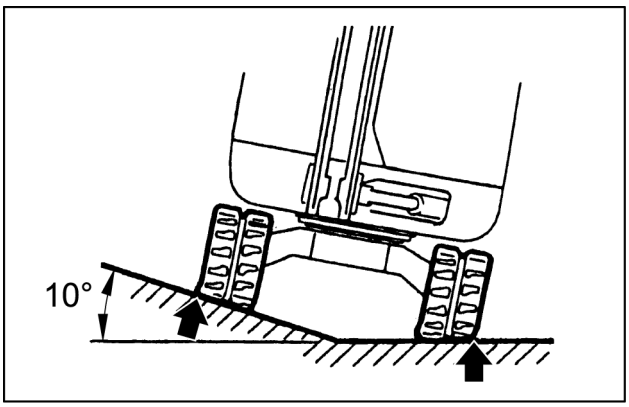
LELI11E0267AB 9

If approaching a slope in reverse is unavoidable, make sure not to make turns and not to change the travel direction while climbing between the level ground and the slope.



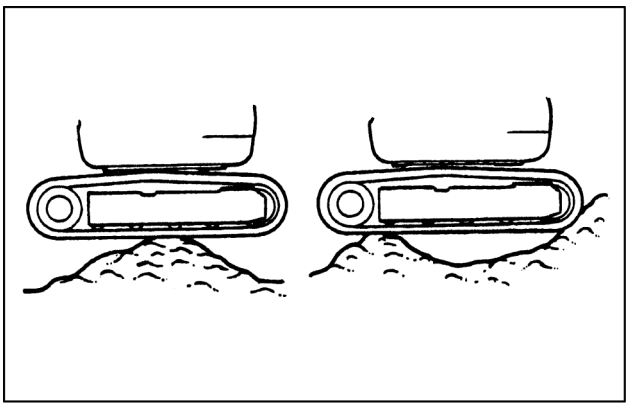
LELI11E0268AB 10

If you travel on a slope with the machine higher at one side, this will risks to damage the rubber crawler. Both machine sides must travel at the same level.



LELI11E0269AB 11

Do not change the direction of the machine with the rubber crawlers positioned on earth heaps, as this could cause the rubber crawler to come off or get damaged.



LELI11E0270AA 12

Stopping the unit

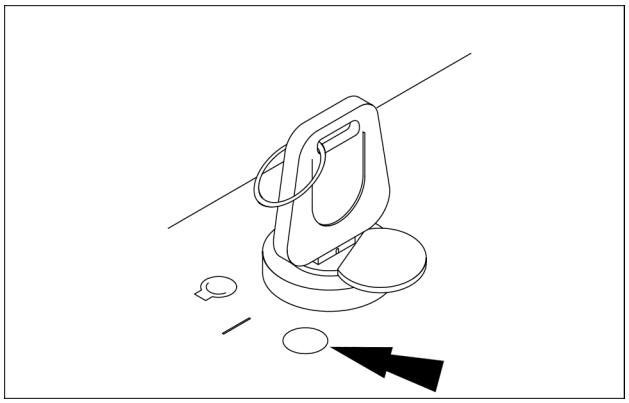
Stopping the engine

1. Lower the attachment until it is resting on the ground.
2. Set the safety lever backward (LOCK position).
3. Set the engine speed lever to low idle position and let the engine run for about **5 min**.

   NOTICE: *run the engine in idling for about **5 min**. Stopping the engine immediately after operating may cause a failure such as the engine seizing. Stop the engine after the engine temperature has dropped.*

   NOTICE: *make sure to run the engine in idling status before completely stopping it except for emergency.*

   NOTICE: *when the engine is stopped suddenly, the lubricated section on the turbocharger get dried from the high heat, leading to a turbocharger failure.*
4. Turn the starter key to the OFF position.
5. Remove the starter key to prevent other people using the machine.



SMIL16MEX0507AA 1

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.

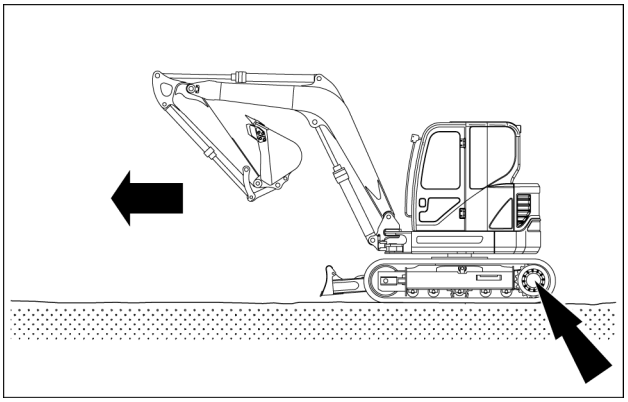
W0289A

⚠ 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 you start traveling. In order to maximize visibility, fully retract the arm and completely close the bucket.*



SMIL16MEX1084AA 1

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

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

As the travel mode is selected, the travel speed varies with the tilting angle of the travel control levers and pedals.

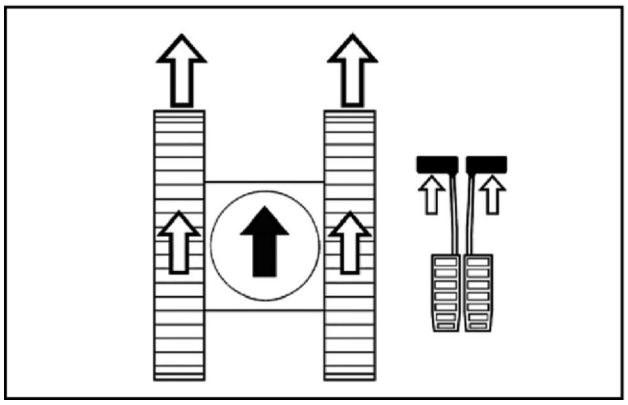
Travel alarm (optional)

The travel alarm is active when the travel alarm switch is turned ON.

A buzzer sounds continuously when the machine starts traveling forward or backward.

Straight line travel (forward travel)

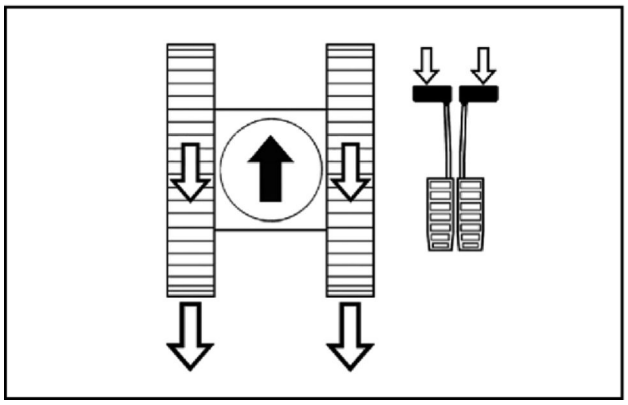
Press the two pedals (or push the two levers) forward at the same time.



SMIL13CEX2679AB 2

Straight line travel (reverse travel)

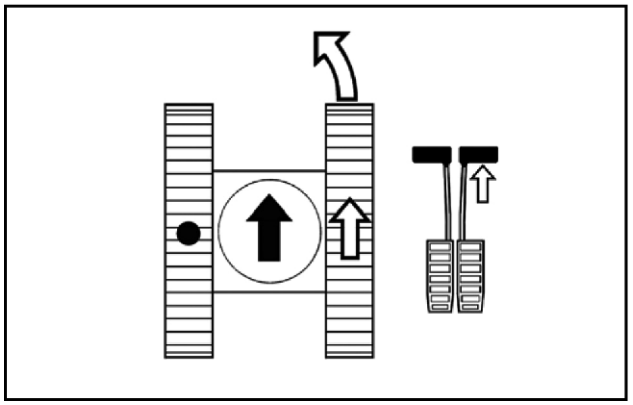
Press the two pedals (or pull the two levers) rearwards at the same time.



SMIL13CEX2680AB 3

Turning to the left (forward travel)

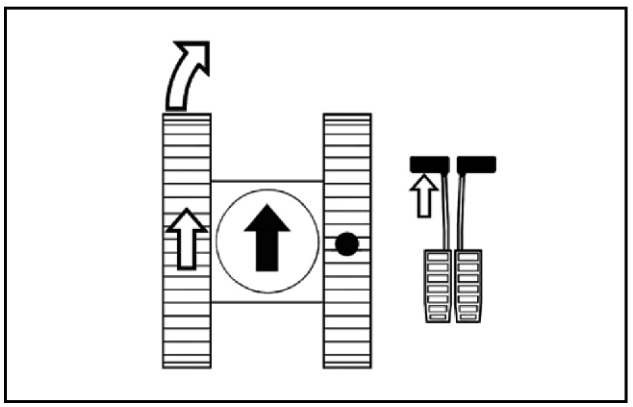
Press the right-hand pedal or push the right-hand lever forwards.



SMIL13CEX2681AB 4

Turning to the right (forward travel)

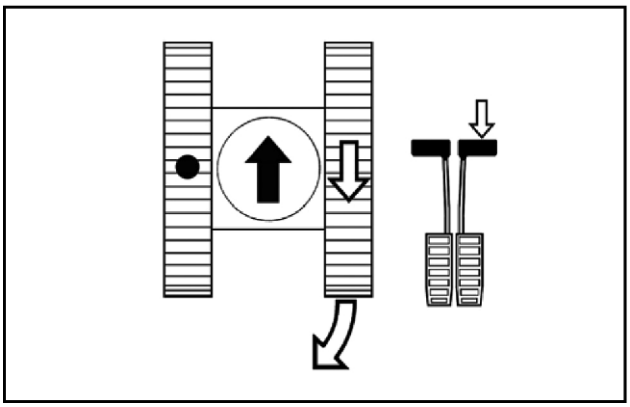
Press the left-hand pedal or push the left-hand lever forwards.



SMIL13CEX2682AB 5

Turning to the left (reverse travel)

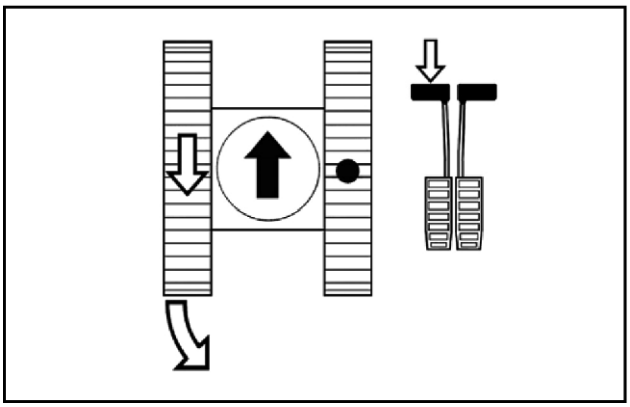
Press the right-hand pedal or pull the right-hand lever rearwards.



SMIL13CEX2683AB 6

Turning to the right (reverse travel)

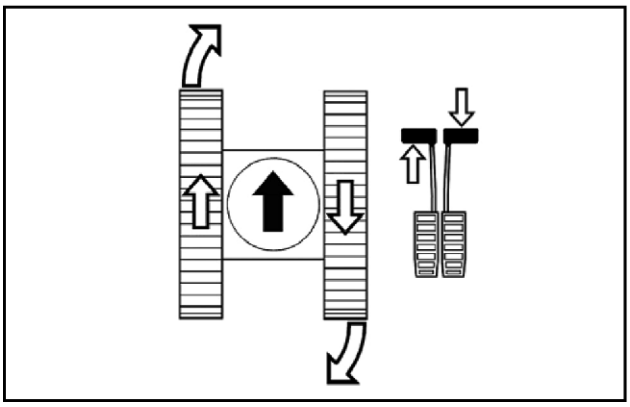
Press the left-hand pedal or pull the left-hand lever rearwards.



SMIL13CEX2684AB 7

Turning on the spot, to the right

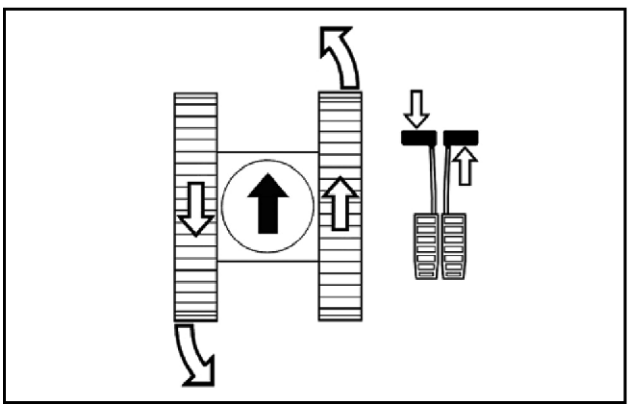
Press the left-hand pedal or push the left-hand lever forwards and at the same time press the right-hand pedal or pull the right-hand lever rearwards.



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.



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, release the levers or pedals and they will return to neutral.

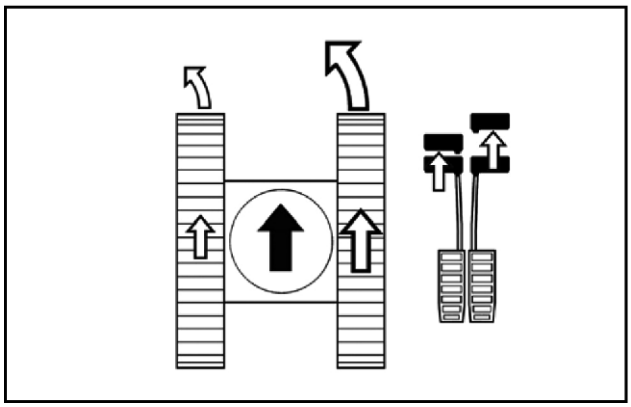
NOTICE: *allow as much time as possible to stop the machine.*

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. Check the location of the travel unit before you start traveling.
2. Select ground as flat and solid as possible for traveling.
3. Bypass obstructions during travel.
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 person to signal the 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 measures 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

Precautions for travelling on slopes

When traveling on a sloping ground, the machine becomes unstable, unbalanced, and difficult to control. Therefore, the following operating prescriptions shall be strictly respected.

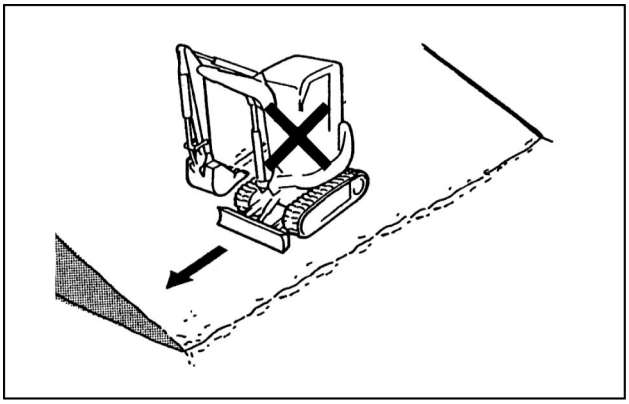
Always travel with the undercarriage oriented along the slope, never across. Never travel along a slope steeper than **20 °**.

If going across a slope is needed to reach a specific work place, make sure to follow an alternative path that is made by traveling along the slope, as outlined in the pictures.

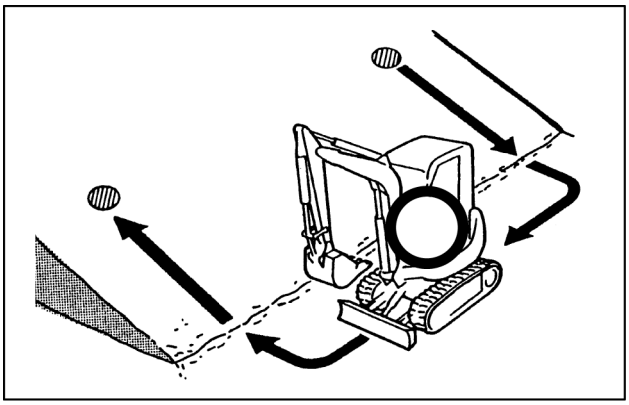
Always select the slow speed travel mode, and operate the travel controls in order not to suddenly increase or decrease the speed of the machine.

NOTICE: *never shift the travel mode to the fast speed range while traveling on slopes, as this suddenly increases the speed and makes the machine unstable and difficult to control.*

NOTICE: *when the hydraulic oil is not sufficiently warm, the machine may not be able to develop its full performance. Before traveling on a steep slope, make sure to carry out a complete preheat of the machine main systems.*



LELI11E0219AB 11



LELI11E0218AB 12

For uphill and downhill travel, approach the slope as outlined in the pictures.

The undercarriage shall be oriented along the slope, with the blade facing the direction of travel, and with the travel reduction gears on the back side.

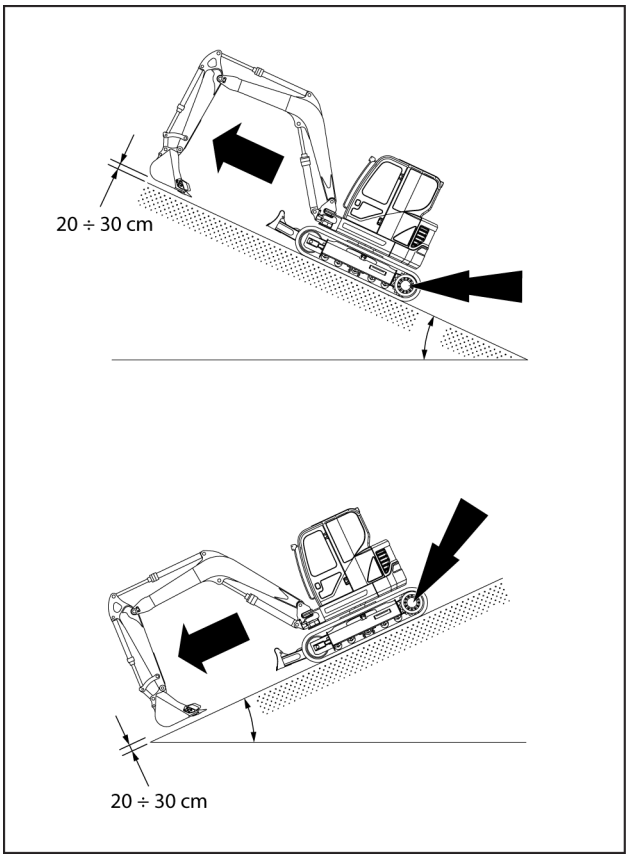
The upper-structure shall be aligned to the undercarriage, and shall be oriented in order to grant straight visibility to the direction of travel.

The front equipment shall be aligned to the direction of travel, and shall be positioned in order to have the arm in vertical position, and the bottom side of the bucket **20 – 30 cm** (**7.9 – 11.8 in**) from the ground.

When traveling along a slope, never swing the upper-structure or the boom from the straight position. In particular during uphill travel, never attempt to swing the upper structure towards the bottom of the slope: the machine could tip over.

If the machine starts to slide or loses stability when traveling along a slope, immediately lower the bucket to the ground and release the travel controls.

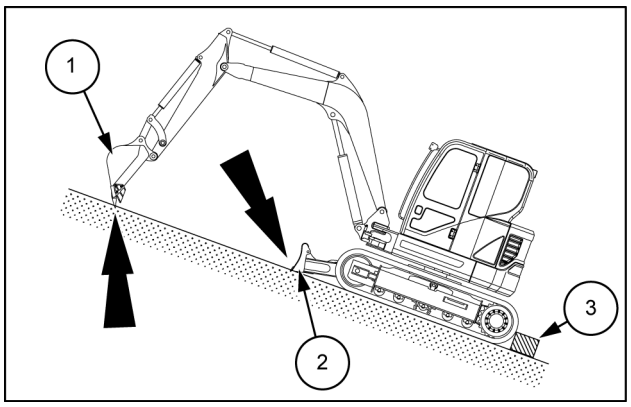
Never make turns when traveling along a slope in order not to affect the balance of the machine. If changing of the travel direction is needed, make sure to reach a horizontal area in order to complete the turning movement.



SMIL16MEX3179BB 13

If the engine stops when traveling along a slope, immediately lower and indent the bucket **(1)** and the dozer blade **(2)** into the ground. Release all the controls, set the safety lever to the LOCK position, set the engine speed throttle to the low idle position, and then start the engine again.

If the engine does not start, remove the starter key, and place the "Do not operate" tag on the machine controls. Get off the operator's compartment, and close the cab door. Block both crawlers by means of wedges **(3)**, and define a safe area of at least **3 m** (**9.8 ft**) around the machine, cleaning this area from obstacles and bystanders. Call the CASE CONSTRUCTION dealer for assistance.



SMIL16MEX3178AB 14

Parking the unit

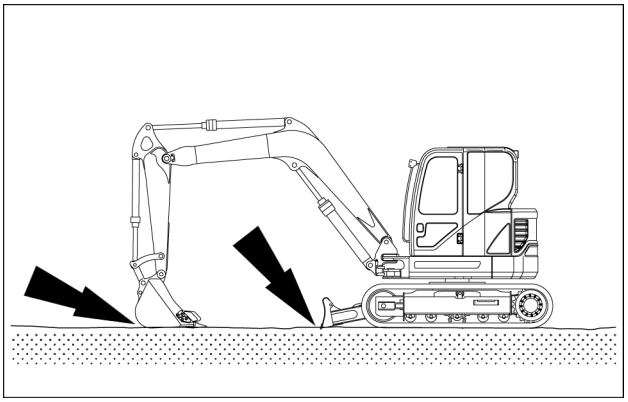
Parking the machine

⚠ 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.

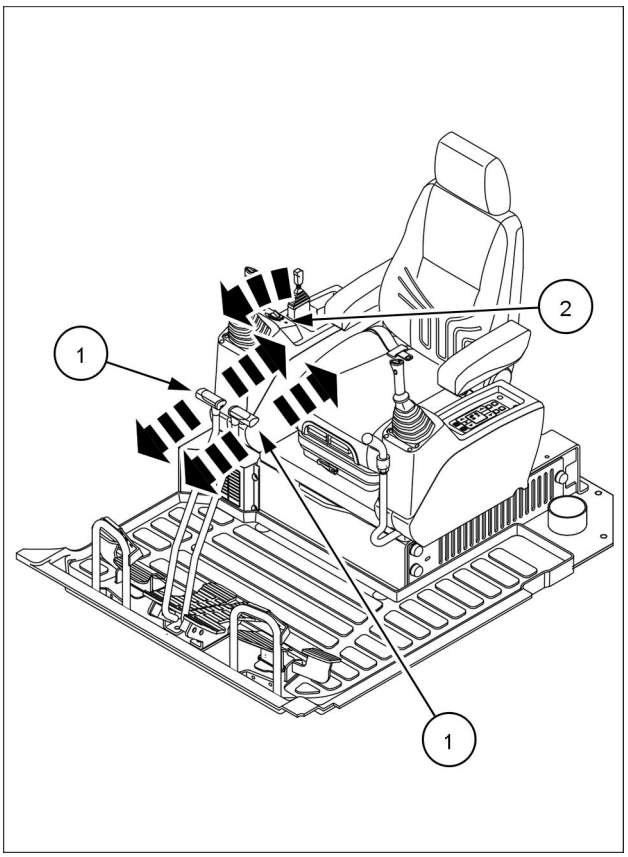
W0141A

- Always park the machine on a level and firm ground.
- Orient the upper structure frame parallel to the undercarriage. The front equipment shall be positioned on the same side of the blade, as indicated in the picture.
- Align the front equipment parallel to the upper structure.
- Lower the bucket to the ground.
- Lower the dozer blade to the ground.



SMIL16MEX1083AA 1

- Move both travel control levers **(1)** to the neutral position.
- Set the throttle control **(2)** to LOW IDLING.

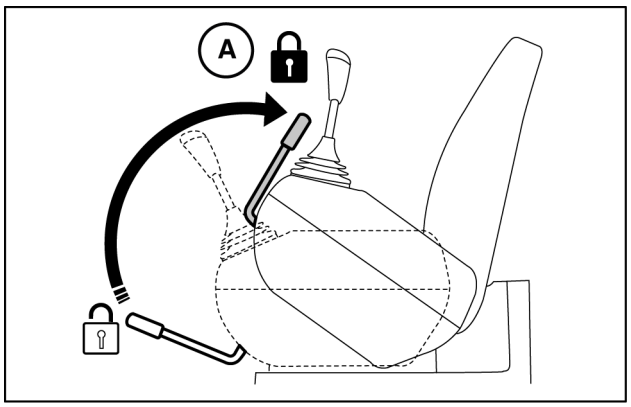


SMIL16MEX0558BA 2

- Set the safety lever to the LOCK position **(A)**.
- Stop the engine, and remove the starter key.

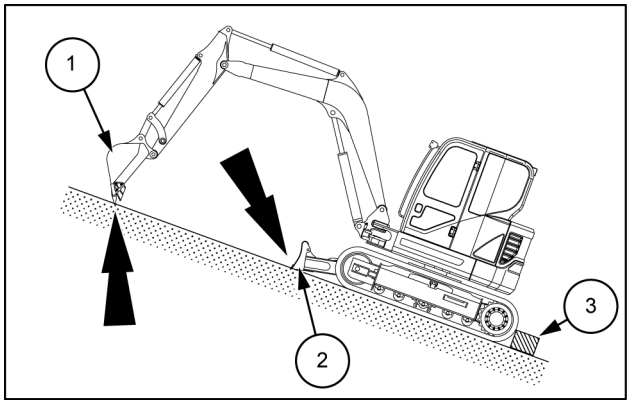
  NOTICE: *do not shut off the engine when running at full speed, but let it run at low idle speed for* ***5 min*** *in order to cool it down.*
- Block both crawlers by means of wedges.
- Close all windows of the cab.
- Using the starter key, lock the cab door, the engine guards, the cooler cover, and the fuel filler cover.

NOTE: *make sure that no part of the machine is interfering with any public road. Install appropriate traffic signs if any portion interferes public road.*



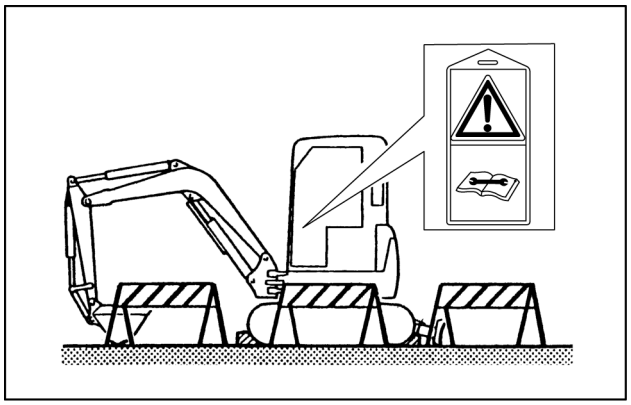
LELI11E0241AB 3

If parking on a slope is unavoidable, orient the undercarriage along the slope, and lower and indent the bucket **(1)** and the dozer blade **(2)** into the ground. Follow the parking procedure described above, and then make sure to block both crawlers by means of wedges **(3)** as outlined in the picture.



SMIL16MEX3178AB 4

If the machine is parked after an emergency stop, remove the starter key, and place the "Do not operate" tag on the machine controls. Get off the operator compartment, and close the cab door. Block both crawlers by means of wedges, and define a safe area of at least **3 m** (**9.8 ft**) around the machine, cleaning this area from obstacles and bystanders. Call the CASE CONSTRUCTION dealer for assistance.



LELI11E0243AA 5

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.

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.

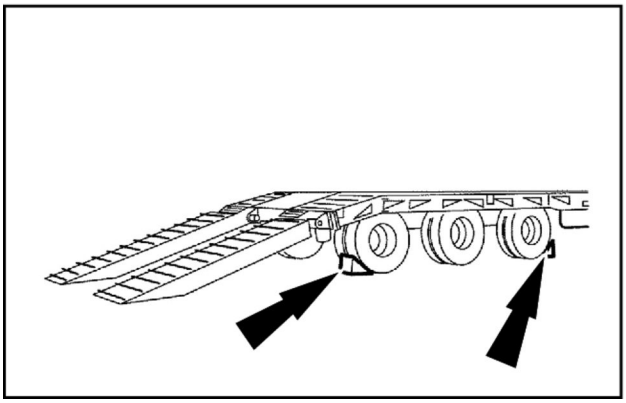
Investigate beforehand the conditions of the road to be traveled, weight and size limits, and special local traffic regulations. Obtain any permits required from proper government agencies for machine transportation.

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.



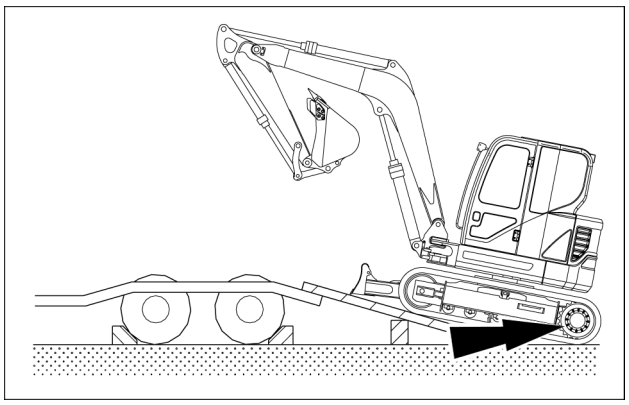
SMIL13CEX2717AB 1

Machine setup

1. Clean the machine undercarriage and tracks to prevent mud or debris from skidding during transport.
2. Select the low travel speed.
3. Lock the boom swing pedal.
4. Fully raise the dozer blade.

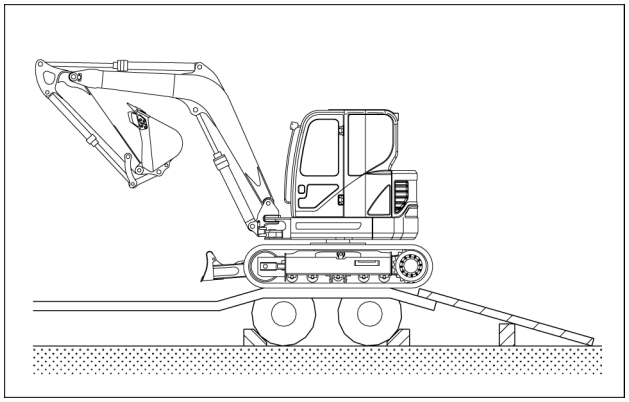
Loading the machine on a rear loading type trailer

1. Align the machine to the trailer, so as the travel motors are in the rear.
2. 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.



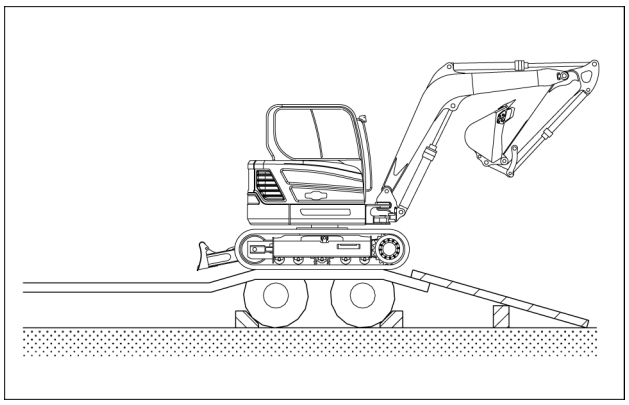
SMIL16MEX1079AA 2

3. Stop loading when the machine is located horizontally in the trailer, within the rear wheel of the trailer.



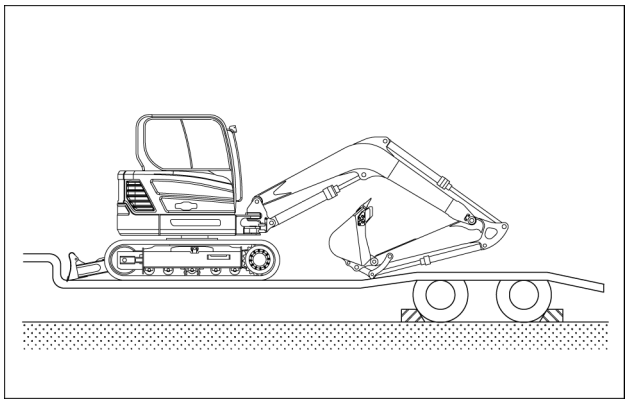
SMIL16MEX1414AA 3

4. Slowly turn the upper structure **180 °**.



SMIL16MEX1080AA 4

5. Lower the working equipment and the dozer blade.

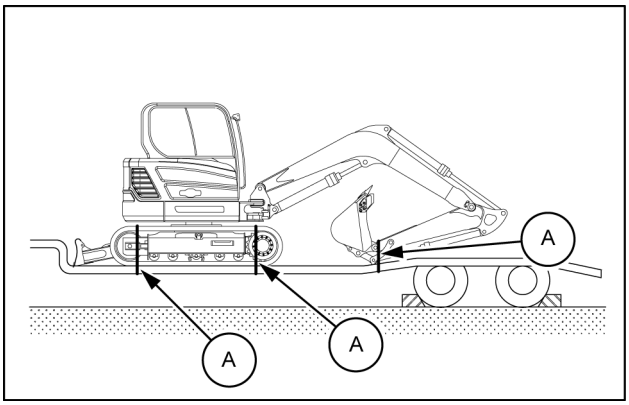


SMIL16MEX1416AA 5

Preparing for road transport

Tie downs for shipping

1. Set the machine in the position for transport: fully retract the arm and curl the bucket slowly.
2. Lower the dozer blade.
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.
4. Set the safety lever to the LOCK position.
5. Turn off the engine and remove the starter key.
6. Get off the machine.
7. Use the starter key to close and secure the cab door, the engine hood, the tool box, and the service door.
8. Check the condition of the tie-down points on the trailer.
9. Secure the machine onto the trailer using chains **(A)** to prevent the machine from swaying (oscillation) during transport.



SMIL16MEX1417AB 1

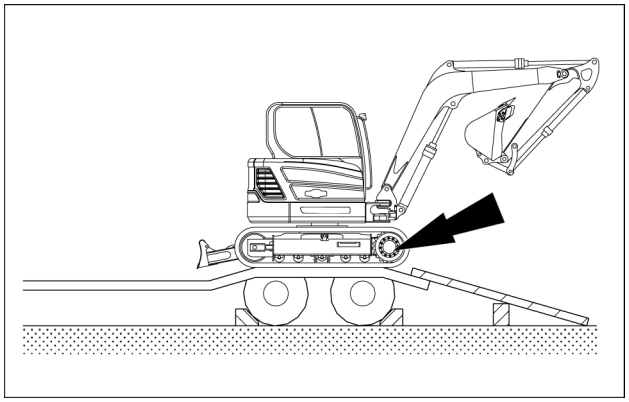
Unloading the machine from a transport trailer

1. Position the trailer on firm and level ground. Put blocks at 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.

   NOTICE: *the ramp slope should be **15 °** or less.*
4. Get on the machine and start the engine.
5. Select the low travel mode.
6. Raise the dozer blade and operate the arm and bucket controls so the bottom of the bucket is about **30 cm** (**11.8 in**) above the trailer bed.

   NOTICE: *in this position, traveling and steering control become opposite to each other.*
7. Travel slowly towards the back of the trailer and stop as you reach the ramps. Operate the boom and the arm softly in order to get the bucket close to the ground ahead of the ramps.

   NOTICE: *avoid fully extending the bucket cylinder to prevent damaging it due to accidental impacts with the ground.*
8. Move down on ramps with extreme care while operating the boom and the arm softly in order to keep the bucket close to the ground and so to grant machine stability.
9. Pass through the ramps completely and stop the machine once it gets on the ground.



SMIL16MEX1415AA 1

Shipping transport

Handling the machine

⚠ 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

1. Retract the boom, bucket and dipper cylinders fully extended.
2. Set the safety lock lever in LOCK position. Stop the engine and leave the operator's compartment.
3. Use wire rope and stay to keep safety distance from the machine, avoiding the touch with the machine.
4. Put a rubber plate where the wire ropes touch the machine, to prevent damage.

   NOTICE: *it is imperative to use the sling points indicated by the machine decals.*

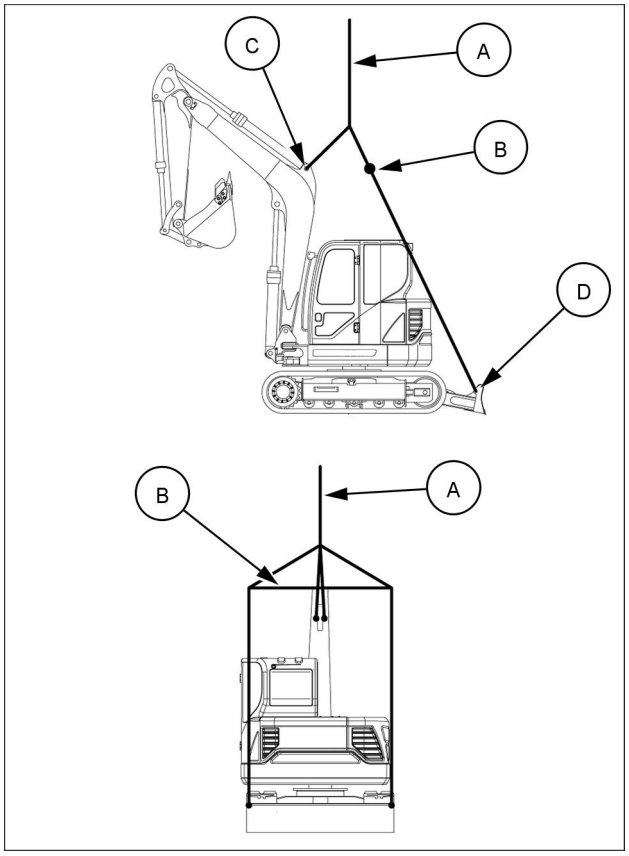
   NOTICE: *the machine must be handled very slowly and horizontally.*

   (A) Wire rope

   (B) Stay

   (C) Boom hoisting point

   (D) Dozer blade hoisting point



SMIL16MEX1418BA 1

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.

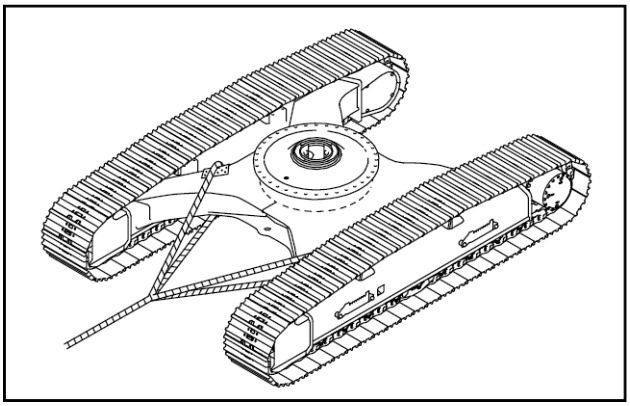
W0259A

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 stuck, 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 under-carriage taking care to protect any protruding angles.
4. Pull the machine without jerking, very slowly and in alignment with the undercarriage.



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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.*

NOTICE: *while any company can perform necessary maintenance or repairs on your equipment, CASE CONSTRUCTION strongly recommends that you use only authorized CASE CONSTRUCTION dealers and products that meet given specifications. Improperly or incorrectly performed maintenance and repair voids the equipment warranty and may affect service intervals.*

- Respect the maintenance intervals by checking the hour meter every day. Before starting maintenance, park the machine on flat, firm ground, away from any obstacles, with the arm retracted and the bucket on the ground. Lower the dozer blade (if equipped) until it rests on the ground. Unless otherwise specified, all maintenance operations must be carried out with the engine stopped and the key removed from the starter switch. Wait for all circuits to cool down before starting 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 a "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.

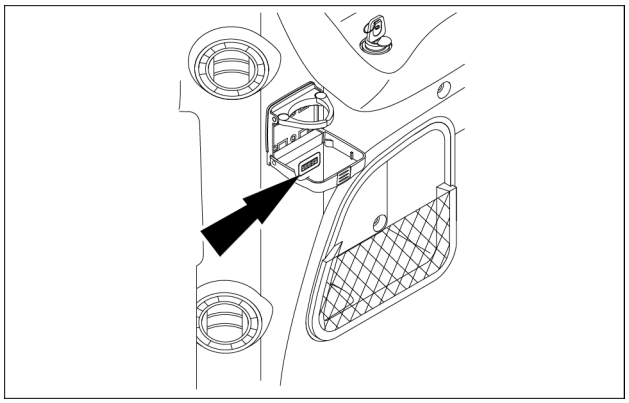
NOTICE: *if you use your machine in particularly harsh conditions (dusty or corrosive atmosphere, etc.), the servicing intervals should be reduced accordingly.*

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.*

Hourmeter

Hourmeter is located in the right-hand side of the cab, under the beverage can holder.



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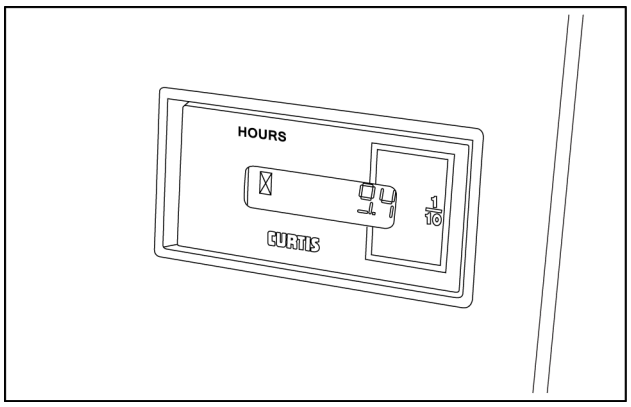
The hourmeter enables service operations to be scheduled. Its hourly indications are the same as those of a clock when the engine is running. Servicing intervals are carefully calculated to ensure safe and efficient machine operation. Be sure to carry out all the servicing operations properly as defined in this manual.



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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 rear-view camera.

Attachment

- Check the cylinders are not leaking oil.
- Check the condition of all lines.
- Check the condition of the bucket teeth.

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.*

General specification - Diesel fuel

Only use diesel fuel that conforms to North American standard **ASTM D975** Grade No. 2-D S15 or equivalent in your engine. Do not use any other low grade diesel fuel.

NOTICE: *Use of other low grade diesel fuels will result in loss of engine power, high fuel consumption, and damage to the exhaust aftertreatment system (if equipped).*

NOTE: *When operating the machine in very cold climates, the use of winter blended fuel is permitted for a short period of time. See your fuel supplier for winter fuel requirements in your area.*

Fuel conditioner

Diesel fuel conditioner is available from your CASE CONSTRUCTION dealer. Instructions for the use of the fuel conditioner is on the container.

The use of diesel fuel conditioner will:

- Clean fuel injectors, valves, and manifolds for increased service life
- Disperse insoluble gummy deposits that form in the fuel system
- Separate moisture from the fuel
- Stabilize fuel in storage

NOTICE: *Use only CASE CONSTRUCTION approved biocide additives to prevent damage to the exhaust aftertreatment system (if equipped).*

General specification - Biodiesel fuels

Biodiesel usage in CASE CONSTRUCTION products

Introduction to Fatty Acid Methyl Ester (FAME) biodiesel

FAME biodiesel, called biodiesel fuel in the following section, consists of a family of fuels derived from vegetable oils treated with methyl esters.

There are two main biodiesel fuel types: Rapeseed Methyl Ester (RME) and Soybean Methyl Ester (SME). RME is a blend of rapeseed and sunflower methyl ester, and is the preferred crop in Europe. SME is the preferred crop in the United States.

Biodiesel fuel is a renewable alternative fuel source. Its use and development is promoted worldwide, especially in Europe and in the United States.

NOTICE: *Your emissions control system is compatible with up to **5 %** biodiesel fuel (B5). Be aware that the use of biodiesel fuel that does not comply with the standards mentioned in this section could lead to severe damage to the engine, fuel system or after treatment system of your machine. The use of non-approved fuels may void CASE CONSTRUCTION Warranty coverage.*

Biodiesel fuel can be used to run diesel engines as pure biodiesel fuel or when blended with standard diesel fuel:

- B5 : indicates the blend of **5 %** biodiesel and **95 %** diesel fuels.

NOTICE: *Never use biodiesel blends higher than B5.*

Biodiesel fuel has several positive features in comparison with diesel fuel:

- Biodiesel fuel adds lubricity to the fuel, which is beneficial in many circumstances, particularly as sulfur and aromatics are removed from the fuel.
- Biodiesel has a greater cetane number and burns cleaner.
- Biodiesel produces less particulate matter and reduces smoke emissions.
- Biodiesel is fully biodegradable and non-toxic.

Diesel and biodiesel fuel specifications

TIER 4 FINAL diesel fuel specifications are covered by the following:

- **ASTM D975**, Standard Specification for Diesel Fuel Oils. (15 ppm sulfur maximum.)

Biodiesel blends are covered by:

- United States Diesel Fuel Specification **ASTM D975** allows up to **5 %** biodiesel since 2009. United States fuel suppliers are allowed to use up to **5 %** biodiesel fuel (B5) to supply the network.
- United States Biodiesel Fuel Specification **ASTM D7467** provides specifications for biodiesel blends from B6 to B20.

Pure biodiesel (B100) specification is covered by the following requirements:

- **ASTM D6751** - Standard specification for biodiesel fuel blend stock (B100) for middle distillate fuels.

Before raw oil can be converted into usable biodiesel fuel, it must undergo transesterification to remove glycerides. During the transesterification process, the oil reacts with an alcohol to separate the glycerine from the fat or vegetable oil. This process leaves behind two products: methyl ester (the chemical name for biodiesel) and glycerine (a byproduct usually sold for use in soaps or other products).

NOTICE: *Biodiesel fuels approved for use in the CASE CONSTRUCTION equipment must be transesterified and comply with the North America Standard **ASTM D6751**.*

NOTICE: *Cold Pressed Biodiesel, Cold Pressed Oil, Straight Vegetable Oil (SVO), or more generally unrefined vegetable oils used as motor fuel, are fuels that are normally made from Rapeseed oil or similar high oil content crops. These kinds of fuel are not transesterified, so they do not fulfil the **ASTM D6751** requirements. There is no recognized quality standard available for these types of fuel. Therefore the use of Cold Pressed Biodiesel, Cold Pressed Oil, Straight Vegetable Oil (SVO), or more generally unrefined vegetable oils used as motor fuel are NOT APPROVED at any blend in any CASE CONSTRUCTION product.*

NOTICE: *Any engine and fuel injection equipment fitted to a CASE CONSTRUCTION vehicle found to have run with any blend of NON-APPROVED fuel (fuel not fulfilling the specification described in the requirement **ASTM D6751**) will no longer be covered for Warranty by CASE CONSTRUCTION.*

Biodiesel fuel usage conditions

You must stringently follow the biodiesel fuel usage conditions. Incorrect application of the biodiesel fuel usage conditions could lead to severe damage to the engine, fuel injection equipment and aftertreatment system.

The main concerns related to operation with biodiesel fuels are:

- Filters and injector blockage caused by poor fuel quality.
- Wear and corrosion of internal components due to water content, which affects lubricity.
- Deterioration of some rubber sealing compounds in the fuel system.
- Biodiesel oxidation, which can lead to the formation of deposits that can harm the fuel injection system.

NOTICE: *Any problem in the engine fuel injection equipment associated with non-compliance to the following conditions for biodiesel fuel handling and maintenance will not be covered for Warranty by CASE CONSTRUCTION.*

Purchase biodiesel fuel from a trusted supplier who understands the product and maintains acceptable fuel quality. It is highly recommended that you use biodiesel from BQ 9000 accredited suppliers to maintain the quality and consistency of the fuel. The BQ 9000 Quality Management Program is accredited by the National Biodiesel Board for producers and marketers of biodiesel fuel. See the National Biodiesel Board website at www.biodiesel.org for more information.

Storage

The machine should not be stored for long periods without changing the diesel fuel in the fuel system.

NOTICE: *Biodiesel is highly hygroscopic and tends to collect water more than diesel fuel. This increases the risk of algae and bacteria growth which can cause severe damage to the fuel injection system. Keep the machine fuel tanks and on-site storage tanks as full as possible to limit the amount of air and water vapors inside the tank. Drain water from the tanks at least once a week.*

If the machine should be stored for long periods, make sure to replace the diesel fuel every three months at most.

Fluids and lubricants

By using appropriate fluids and lubricants the excavator can operate in ambient temperatures ranging from **-15 °C** (**-4 °F**) to **45 °C** (**113 °F**).

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 CONSTRUCTION specification	Reference specification
Fuel tank	**82.0 L** (**21.7 US gal**)	—	—	**ASTM D975**
Engine oil	**11.6 L** (**3.1 US gal**)	**CASE AKCELA UNITEK NO. 1™ SBL CJ-4 SAE 10W-40**	**MAT3521**	**SAE 10W40 API CJ-4**
Travel reduction unit	**1.2 L** (**0.3 US gal**) x2	**CASE AKCELA GEAR 135 H EP 80W-90**	**MAT3511**	**SAE 80W90 API GL-5**
Engine coolant	**11.0 L** (**2.9 US gal**)	**CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT** CONCENTRATE	**MAT3624** Grade OAT-EG1	**ASTM D6210** TYPE I-FF
		CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT 50/50 PREMIXED	**MAT3624** Grade OAT-EG2	**ASTM D6210** TYPE III-FF
Hydraulic oil tank (*)	**60 L** (**18.5 US gal**)	**CASE AKCELA HYDRAULIC LL 46**	—	**ISO 11158** L-HV46
Attachment grease	—	**CASE AKCELA MOLY GREASE**	**MAT3550**	**NLGI 2**
Swing bearing and swing gear grease	—	**CASE AKCELA 251H EP MULTI-PURPOSE GREASE**	**MAT3550** Grade A	**NLGI 2**

(*) The total capacity of the hydraulic system is **110.0 L** (**29.1 US gal**).

Engine coolant

CASE CONSTRUCTION requires the use of a fully formulated Organic Acid Technology (OAT) based coolant. **CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT** is the reference genuine product.

NOTICE: *use of different coolant brands is not recommended.*

NOTICE: *never add Supplemental Coolant Additives (SCA) when using* ***CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT****.*

NOTICE: *never mix* ***CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT*** *coolant with conventional coolant. Mixing OAT based coolant with conventional coolant will reduce the effectiveness of OAT coolant.*

NOTICE: *if only conventional coolant is available, a complete changeover of the fluid into the cooling system shall be carried out.*

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 **CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT**, 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.

CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT 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	**340 ppm**
Chloride (Cl)	**340 ppm**
Sulfate (SO4)	**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 No. 2-D Ultra-Low Sulphur Diesel (S15) that meets **ASTM D975** specifications.

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 fuel other than recommended may cause damage to the fuel injection pump, injector, and other fuel supply system or the engine. CASE CONSTRUCTION may 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.

During cold weather, lower than **-7 °C** (**19.4 °F**), it is temporarily acceptable to use a mixture of No. 1-D (S15) and No. 2-D (S15).

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

(H)	10W-40 CJ-4 UNITEK to CNH MAT3521								
(H)	API CJ–4 10W-40								
-40 °C -40 °F	-30 °C -22 °F	-20 °C -4 °F	-10 °C 14 °F	0 °C 32 °F	10 °C 50 °F	20 °C 68 °F	30 °C 86 °F	40 °C 104 °F	50 °C 122 °F

(H) Engine oil pan or coolant block heater recommended in this range

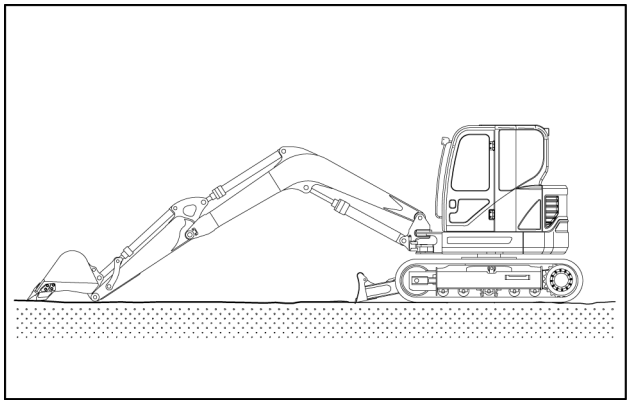
Releasing pressure in the hydraulic system

⚠ WARNING

Pressurized hydraulic fluid can penetrate the skin and cause severe injuries.
Hydraulic fluid is under extreme pressure. Rest the bucket or attachment on the ground. Shut the engine off, turn the key on, and move the hydraulic control lever through all movements several times to relieve residual pressure in the system.
Failure to comply could result in death or serious injury.

W0161A

1. Place the machine on flat, level ground, lower the attachment to the ground, and stop the engine.
2. Put the safety lock lever in UNLOCK position.



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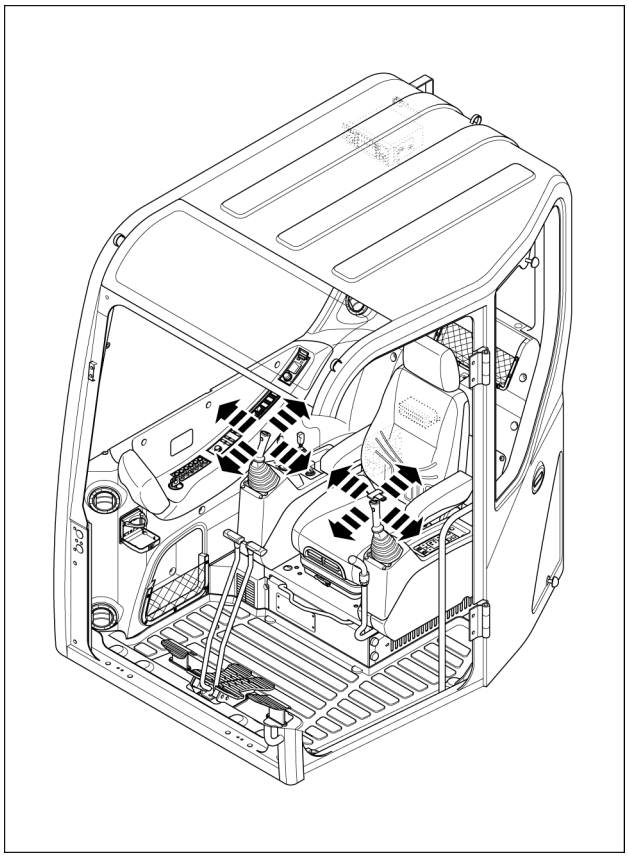
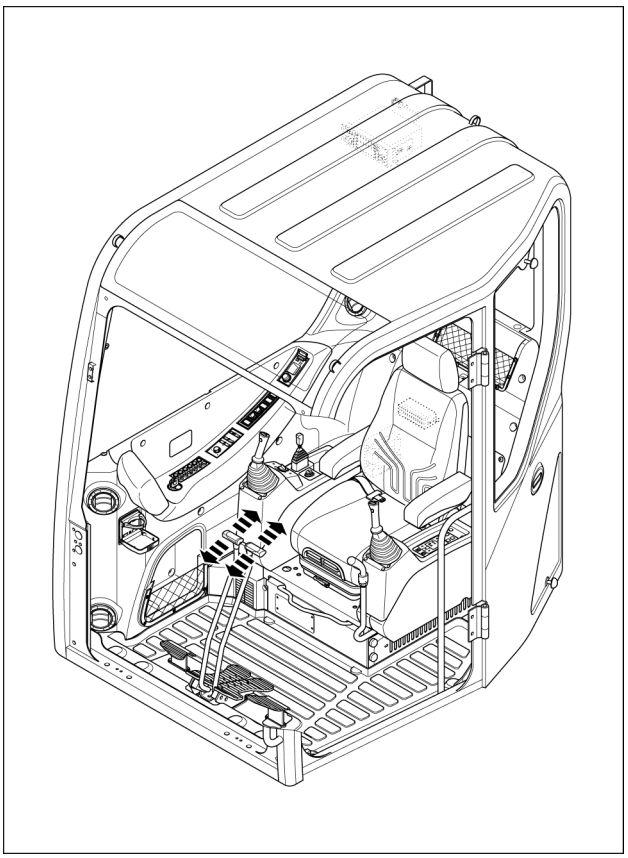
3. Operate the control levers from right–hand to left-hand and front to rear a dozen times approximately.



SMIL16MEX1089BB 2

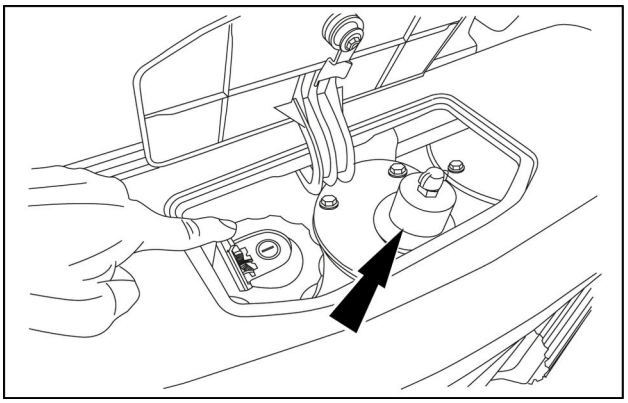
4. Operate the travel levers from front to rear a dozen times approximately.



SMIL16MEX1090BB 3

5. Open the refueling door located on the top of the rear door to access the hydraulic oil tank breather.
6. Loosen the cap **(1)** of the hydraulic oil tank and push the top of the air breather **(2)** to relieve the pressure.

   NOTE: *this procedure does not completely release the pressure, so when operate on the hydraulic system, loosen the connections slowly and do not stand in the direction where the oil drains out.*



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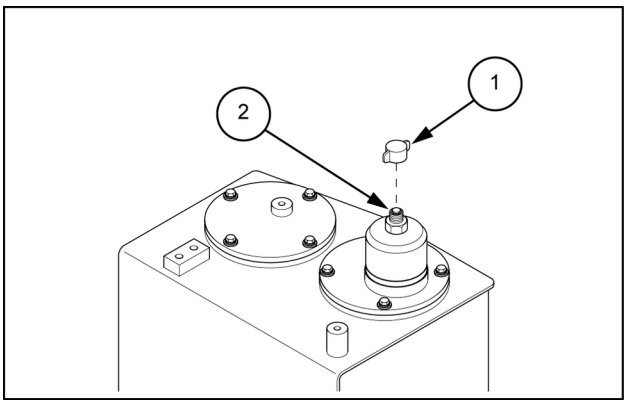

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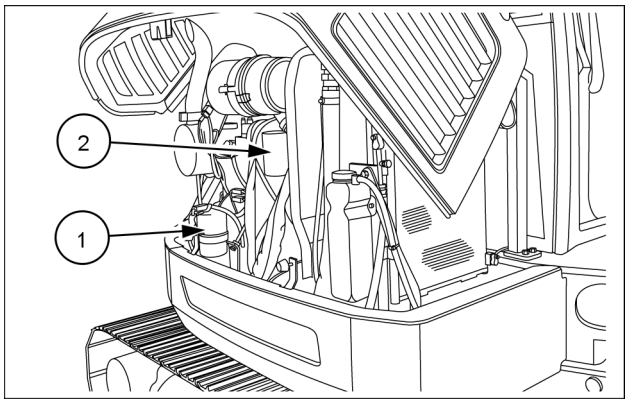
Fuel system bleeding

In the following cases, drainage from the fuel system is required:

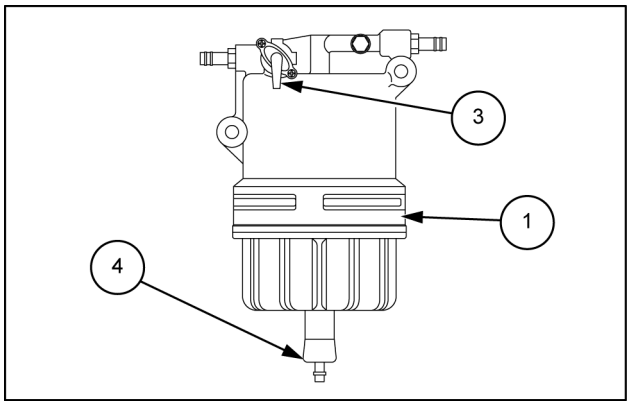
- The tank has become empty completely.
- The fuel filter is replaced.
- The components of the fuel system are removed for service or repair.
- The machine has been stored for longer than one month.

1. Locate the water separator **(1)** and the fuel filter **(2)** inside the engine compartment.
2. Fill the fuel tank with suitable fuel.



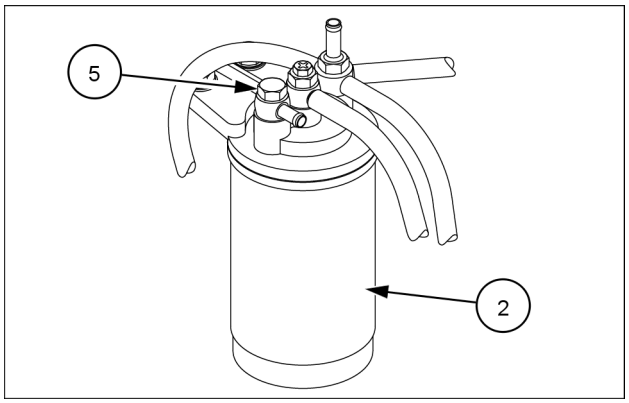
SMIL16MEX1372AA 1

3. Open the cock **(3)** located on the water separator **(1)**.
4. Loosen the air vent plug **(4)** located on the water separator **(1)**.



SMIL16MEX3172AB 2

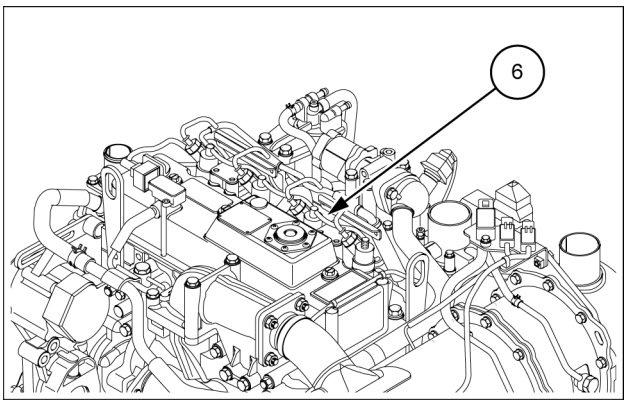
5. Loosen the air vent plug **(5)** located on the fuel filter **(2)**.
6. Tighten the air vent plugs **(4)** and **(5)** when bubbles do not come up any more.



SMIL16MEX0625AA 3

7. Open the air vent cock located on top of the fuel injection pump **(6)**.
8. Turn the starter switch to ON position and hold it in the position for **10 – 15 s** to operate the fuel injection pump **(6)**.
9. Turn the starter switch to OFF position.
10. Close the air vent cock located on top of the fuel injection pump **(6)**.
11. Close the air vent cock **(3)** located on the water separator **(1)** after air bleeding.

NOTICE: *always keep the air vent cock located on the fuel injection pump **(6)** closed except during fuel system bleeding, or it may cause the engine stop.*



SMIL16MEX3180AB 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

⚠ 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

Whenever carrying out a welding operation on the undercarriage or upper-structure carriage as authorized by CASE CONSTRUCTION and in accordance with their instructions, disconnect the batteries, disconnect the alternator B+, D+ terminal wires, and the instrument cluster connector and connect the welding apparatus ground 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 upper-structure (or vice-versa). Never connect the welding apparatus ground 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 O position (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	Replace	Grease	Check	Drain fluid	Adjust	Cleaning		Page no.
Break-in period									
Engine oil and filter	x								**6-19**
Fuel filter		x							**6-19**
Hydraulic oil return filter		x							**6-19**
Pilot line filter		x							**6-19**
Travel reduction gears	x								**6-19**
Grease points			x						**6-19**
Every 10 hours									
Engine oil level				x					**6-20**
Engine coolant level				x					**6-21**
Hydraulic oil level				x					**6-22**
Fuel filter water separator					x				**6-23**
Fan and alternator drive belt						x			**6-25**
Every 50 hours									
Grease points (Bucket)			x						**6-27**
Grease points (Blade)			x						**6-28**
Swing ring gear			x						**6-29**
Track tension				x					**6-30**
Fuel filter water separator							x		**6-31**
Every 250 hours									
Grease points (Boom and arm)			x						**6-32**
Swing bearing			x						**6-33**
Grease points (Boom swing cylinder)			x						**6-34**
Battery				x					**6-35**
Tightening torques				x					**6-38**
Air conditioner filters							x		**6-39**
Every 500 hours									
Engine oil and filter	x								**6-41**
Fuel filter water separator		x							**6-42**
Air cleaner							x		**6-43**
Fuel filter		x							**6-45**
Radiator and coolers							x		**6-46**
Radiator fan				x					**6-47**
Travel reduction gears				x					**6-48**
Every 1000 hours									
Hydraulic oil return filter		x							**6-49**
Oil reservoir breather		x							**6-50**
Pilot line filter		x							**6-51**
Travel reduction gears	x								**6-52**
Every 1500 hours									
Crankcase breather				x					**6-53**
Every 2000 hours									
Hydraulic oil suction filter							x		**6-54**
Hydraulic hoses				x					**6-55**
Engine coolant	x								**6-56**
Every 5000 hours									
Hydraulic oil	x								**6-58**

Maintenance action	Check	Grease	Replace	Change fluid		Drain fluid	Adjust	Cleaning	Page no.
Every 6000 hours									
Diesel Particulate Filter (DPF) - SF filter							x		**6-60**
Every 9000 hours									
Diesel Particulate Filter (DPF) - SF and DOC filters		x							**6-60**
When necessary									
Bulb replacement		x							**6-61**
Diesel Particulate Filter (DPF) regeneration							x		**6-63**
Air-conditioning system filters		x							**6-64**
Control levers			x						**6-64**
Plastic and resin parts							x		**6-64**

Break-in period

Engine oil and filter

Replace the engine oil and the engine oil filter after the first **250 h** of service, then replace the engine oil and the engine oil filter every **500 h**.

To replace the engine oil and the engine oil filter perform the operations described on page **6-41**.

Fuel filter

Replace the fuel filter after the first **250 h** of service, then replace the fuel filter every **500 h**.

To replace the fuel filter perform the operations described on page **6-45**.

Hydraulic oil return filter

Replace the hydraulic oil return filter after the first **250 h** of service, then replace the hydraulic oil return filter every **1000 h**.

To replace the hydraulic oil return filter perform the operations described on page **6-49**.

Pilot line filter

Replace the pilot line filter after the first **250 h** of service, then replace the pilot line filter every **1000 h**.

To replace the pilot line filter perform the operations described on page **6-51**.

NOTE: *replace the pilot line filter every **100 h** of service if hydraulic breaker is used continuously.*

Travel reduction gears

Replace the travel reduction gears oil after the first **250 h** of service, then replace the travel reduction gears oil every **1000 h**.

To replace the travel reduction gears oil perform the operations described on page **6-52**.

Grease points

Lubricate the boom swing cylinder after the first **50 h** of service, then lubricate the boom swing cylinder every **250 h**.

To lubricate the boom swing cylinder perform the operations described on page **6-34**.

Every 10 hours

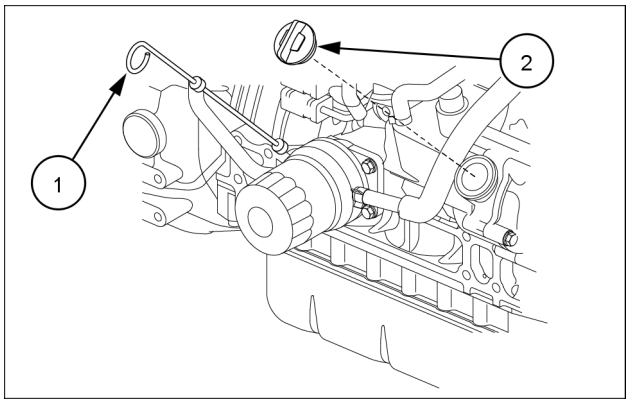
Engine oil level

Check the engine oil level every **10 h** or every day
Lubricant: **CASE AKCELA UNITEK NO. 1™ SBL CJ-4 SAE 10W-40**

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key.
2. After stopping the engine for **15 min** or more, open the engine hood.

   Remove the dipstick **(1)**, and wipe oil off the dipstick with a clean cloth.

   Reinsert the dipstick **(1)** into the guide tube as far as it will go, and then take it out.

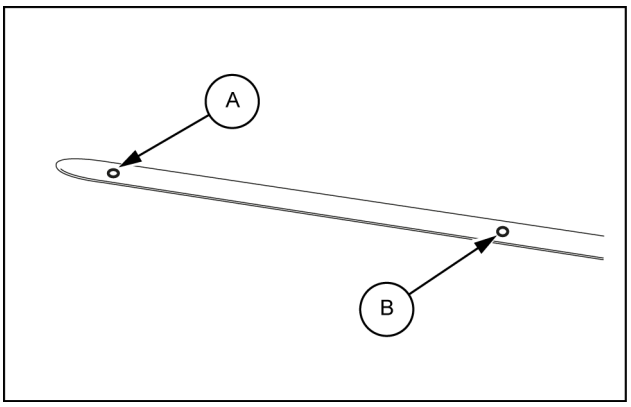


SMIL16MEX0596AA 1

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 dipstick **(1)**, 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 dipstick* ***(1)****. 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

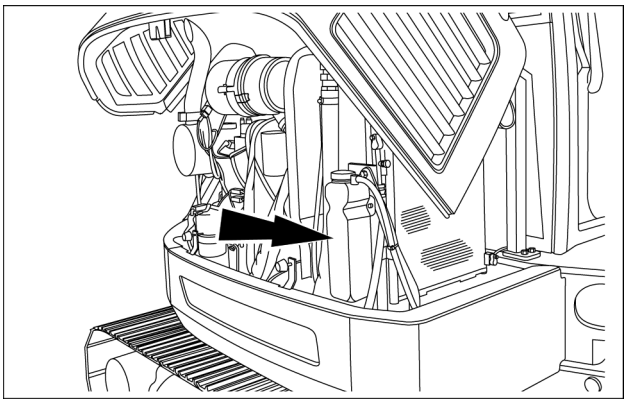
Hazardous chemicals!
Coolant can be toxic. Avoid contact with skin, eyes, and clothing. Antidotes:
EXTERNAL - Rinse thoroughly with water. Remove soiled clothing.
INTERNAL - Rinse the mouth with water. DO NOT induce vomiting. Seek immediate medical attention.
EYES - Flush with water. Seek immediate medical attention.
Failure to comply could result in death or serious injury.

W0282A

Check the coolant level in the coolant tank every **10 h** or every day
Fluid: **CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT**

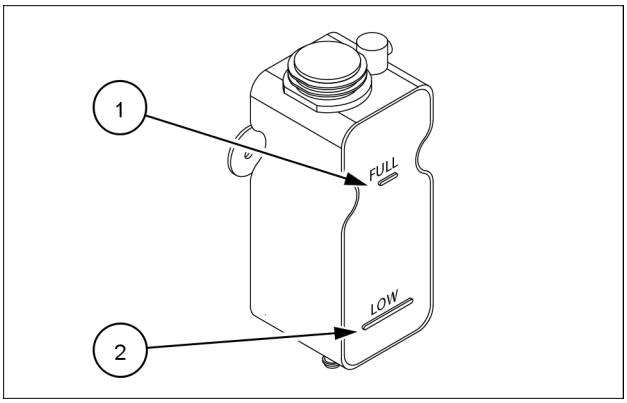
NOTE: *make sure that the coolant level is checked while the engine is cold.*

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key. Open the engine hood and locate the coolant tank



SMIL16MEX1372AA 1

2. Check that the level of the coolant tank is between the FULL **(1)** mark and the LOW **(2)** mark.



SMIL16MEX0597AA 2

Hydraulic oil level

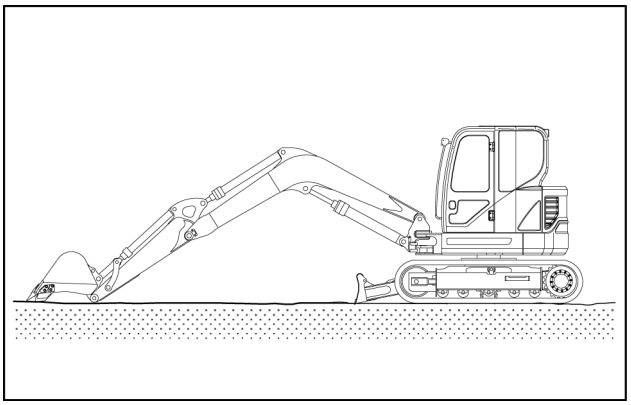
⚠ WARNING

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: **CASE AKCELA HYDRAULIC LL 46**

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.

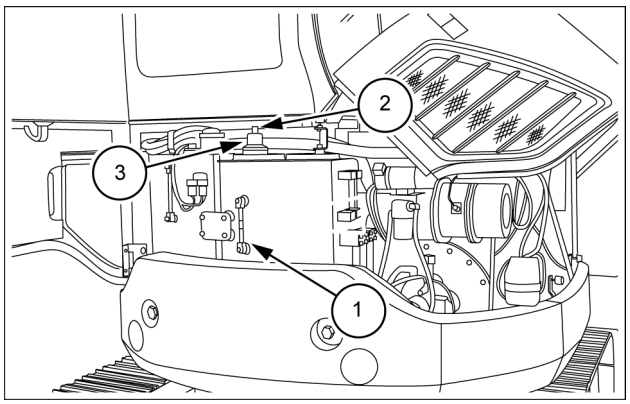


SMIL16MEX1358AA 1

2. Open the engine hood and then the rear door to access the level gauge of the hydraulic oil tank.
   The oil level is normal if it is between the lines of the level gauge **(1)**.
3. If the hydraulic oil level is not in the correct range proceed as follows:
   - Release all pressure in the hydraulic tank. Refer to page **6-12**.
   - Clean the cap **(2)** and the area around the cap.
   - Loosen the cap **(2)** and relieve the pressure in the tank by pushing the top of the air breather.
   - Remove the breather **(3)** on the top of the hydraulic oil tank and fill the oil to the specified level.
   - Install the breather **(3)**. Tighten the breather **(3)** to **11.3 – 16.9 N·m** (**8.3 – 12.5 lb ft**)
   - Tighten the cap **(2)**.

NOTICE: *make sure that no contaminant (water, sand etc.) enters the reservoir during filling.*

4. Start the engine after filling and operate the work equipment several times.
5. Check the oil level after engine stops. Close the rear door.



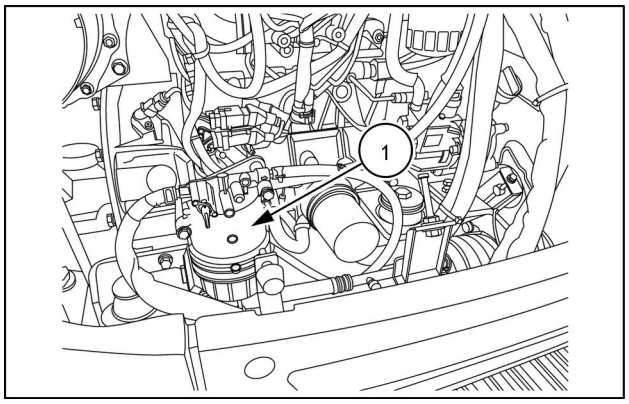
SMIL16MEX1376AB 2

Fuel filter water separator

Drain water and sediment from the fuel filter water separator every **10 h** or every day.
Clean the filter element of the fuel filter water separator every **50 h** or every week.
Replace the filter element of the fuel filter separator every **400 h**

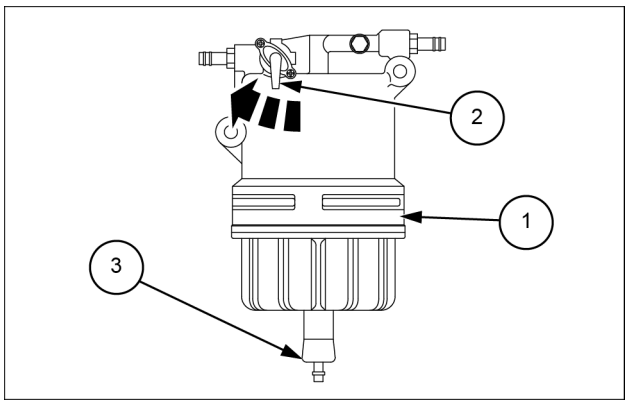
Drain water

1. Open the engine hood to access to the fuel filter water separator and place a container with an appropriate capacity under the fuel filter water separator **(1)**.



SMIL16MEX1373AA 1

2. Rotate clockwise the fuel cock **(2)** located on the fuel filter water separator **(1)** to close the fuel flow.
3. Loloosen the drain plug **(3)** located at the bottom of the fuel filter water separator.
4. Drain the water collected inside.
5. Tighten the drain plug **(3)** to **1 – 2 N·m** (**0.7 – 1.5 lb ft**)
6. Open the fuel cock **(2)**.
7. Prime the fuel system.
8. Check for leaks.

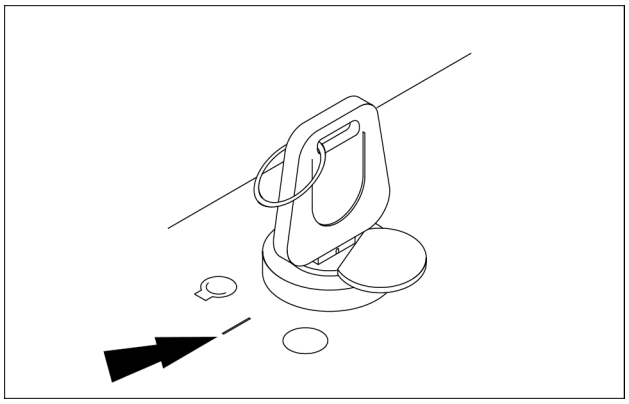


SMIL16MEX0600AB 2

Priming the fuel system

1. Turn the starter switch to ON position for **10 – 15 s**. The electric fuel pump prime the fuel system.

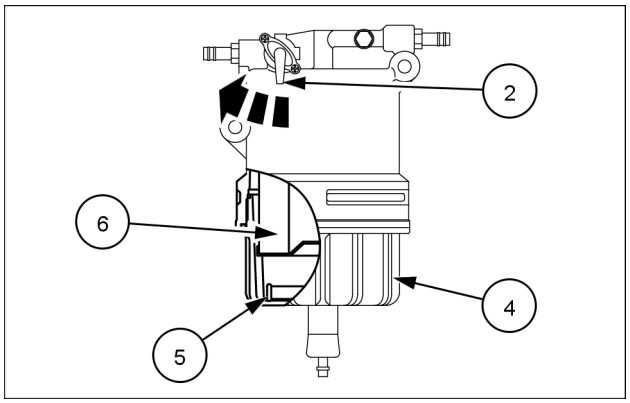
NOTE: *never use the starter motor to crank the engine in order to prime the fuel system. This may cause the starter motor to overheat and damage the coils, the pinion and/or the ring gear.*



SMIL16MEX0507AA 3

Replace element

1. Rotate clockwise the fuel cock **(2)** located on the fuel filter water separator **(1)** to close the fuel flow.
2. Remove the cup **(4)** from the fuel filter water separator.
3. Carefully hold the cup **(4)** to prevent fuel spilling. Clean spilled fuel.
4. Remove the floating ring **(5)** from the cup.
5. Remove the filter element **(6)**, clean and replace if necessary
6. Empty the cup **(4)** and rinse the inside with kerosene.
7. Install a new floating ring **(5)** in the cup **(4)**.
8. Tighten the cup **(4)** to **27.5 – 33.4 N·m** (**20.3 – 24.6 lb ft**).
9. Close the drain cock.
10. Rotate counterclockwise the fuel cock **(2)** to open the fuel flow.
11. Prime the fuel system.
12. Check for leaks.



SMIL16MEX0601AA 4

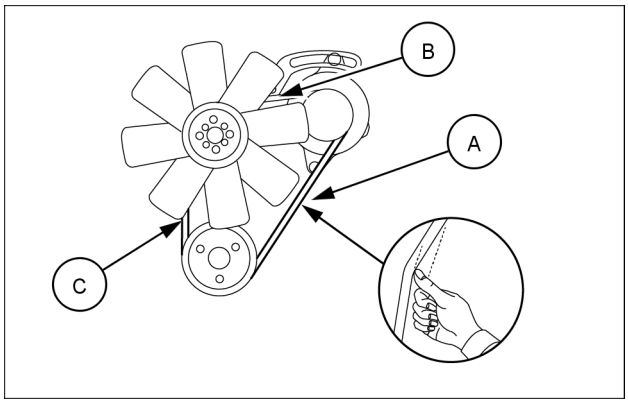
Fan and alternator drive belt

Check the belt tension every **10 h** or every day.

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.*

Inspection of tension

1. Apply finger pressure of about **10 kg** (**22.0 lb**) at the midpoint of the belt, in the point **(A)**, **(B)**, and **(C)**, while the engine is shut down and the starter key is removed.
2. Loose of tension in the points **(A)**, **(B)**, and **(C)** should be about:



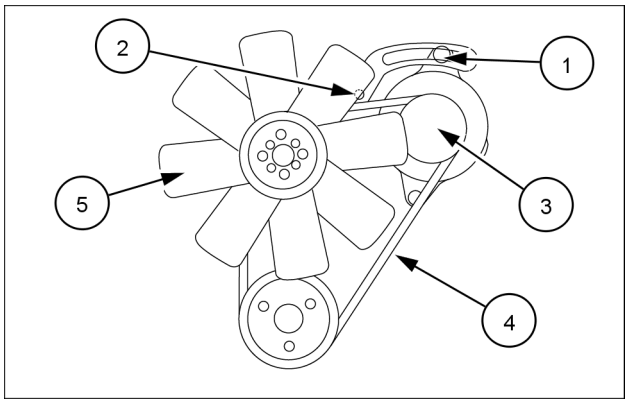
SMIL16MEX0418AA 1

	(A)	(B)	(C)
Used belt	**10 – 14 mm** (**0.4 – 0.6 in**)	**7 – 10 mm** (**0.3 – 0.4 in**)	**9 – 13 mm** (**0.4 – 0.5 in**)
New belt	**8 – 12 mm** (**0.3 – 0.5 in**)	**5 – 8 mm** (**0.2 – 0.3 in**)	**7 – 11 mm** (**0.3 – 0.4 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.*

Adjustment of tension

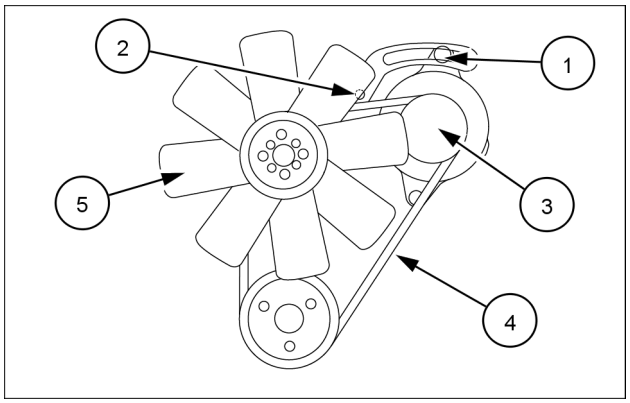
1. Loosen the adjusting bolt **(1)** and the mounting bolt **(2)**.
2. Rotate the alternator **(3)** to obtain the correct value of tension.
3. Tighten the mounting bolt **(2)** and the adjusting bolt **(1)**.



SMIL16MEX0419AA 2

Replacement of belt

1. Loosen the adjusting bolt **(1)** and the mounting bolt **(2)**.
2. Lightly tighten the adjusting bolt **(1)** until its seating face touches.
3. Remove the belt **(4)** from the pulleys to pull it out from the radiator fan **(5)**.
4. Insert the new belt from the radiator fan **(5)** to mount it by aligning it to groove of each pulley. Rotate the alternator **(3)** to obtain the correct value of tension.
5. Tighten the adjusting bolt **(1)** and the mounting bolt **(2)**.
6. After adjustment, run the engine in idling speed for approximately **5 min**, and then stop the engine to re-check tension of the belt.

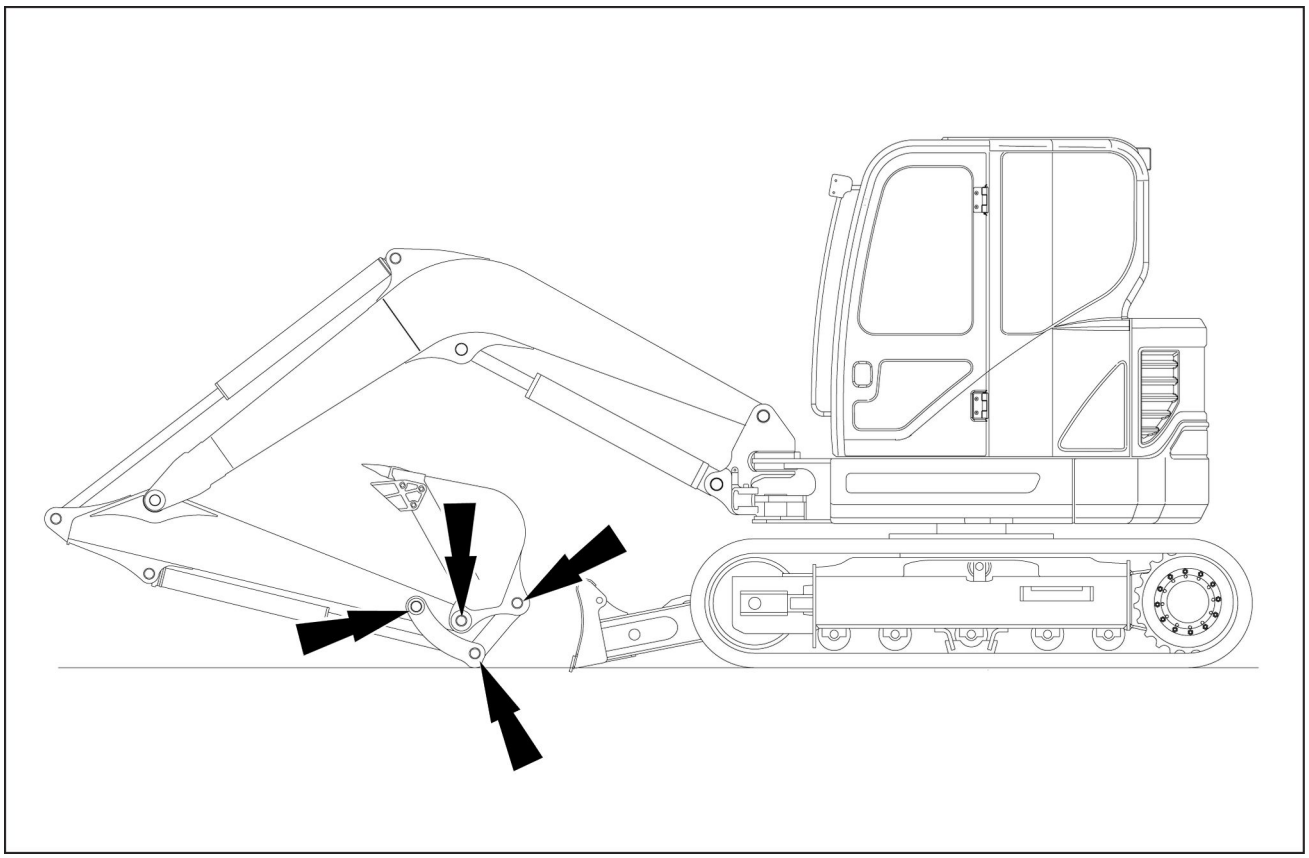


SMIL16MEX0419AA 3

Every 50 hours

Grease points (Bucket)

Grease the bucket linkage every **50 h**.
Lubricant: **CASE AKCELA MOLY GREASE**



SMIL16MEX1076FA 1

Bucket cylinder pin (head): one grease fitting

Bucket cylinder pin (rod): one grease fitting

Bucket link (control rod): one grease fitting

Arm and bucket connection pin: one grease fitting

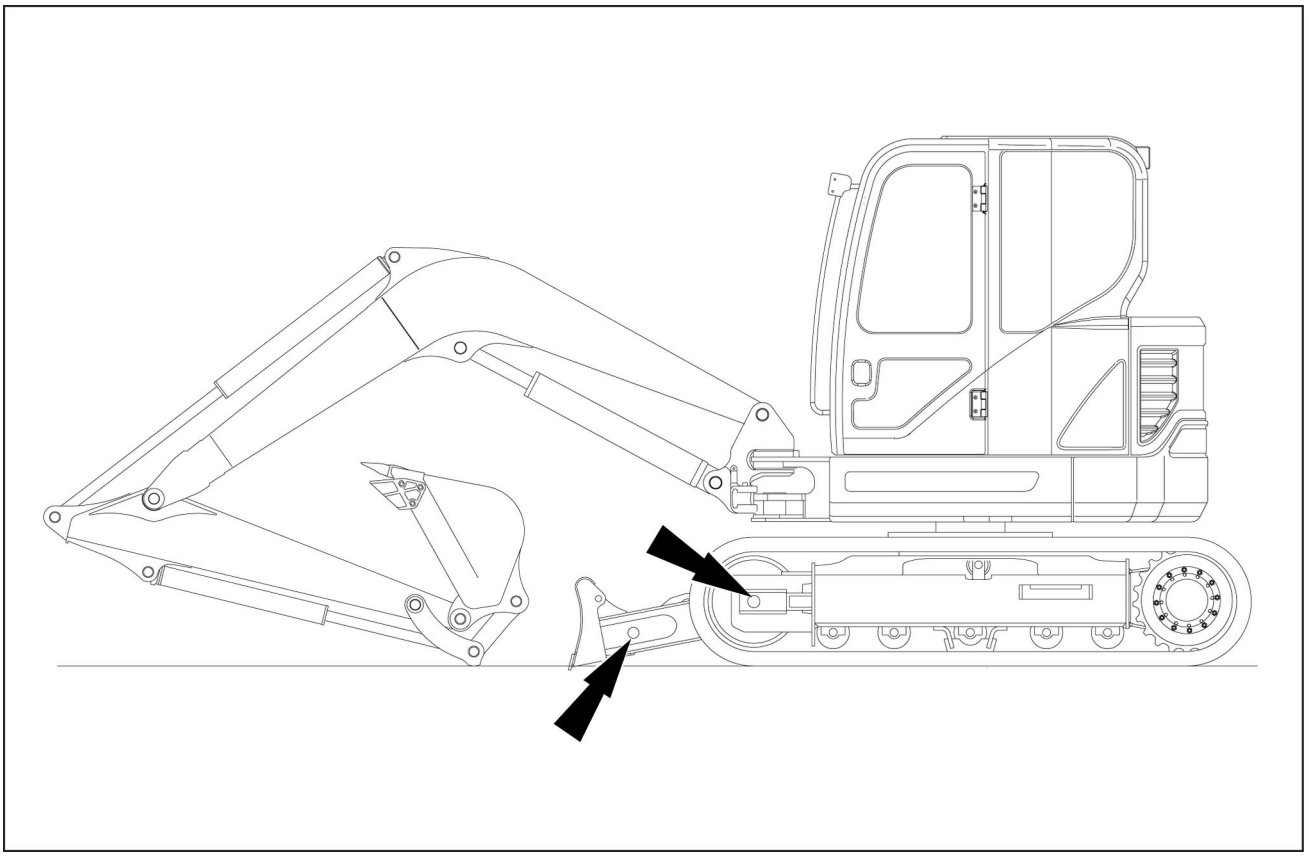
Arm and control link connection pin: one grease fitting

NOTICE: *if you operate the machine in water or mud, you must lubricate the bucket linkage every* ***10 h****.*

NOTICE: *if you operate the machine with any attachment other than a bucket, you must lubricate the bucket linkage every* ***10 h****.*

Grease points (Blade)

Grease the blade every **50 h**.
Lubricant: **CASE AKCELA MOLY GREASE**



SMIL16MEX1076FA 1

Dozer blade connection pin: two grease fittings

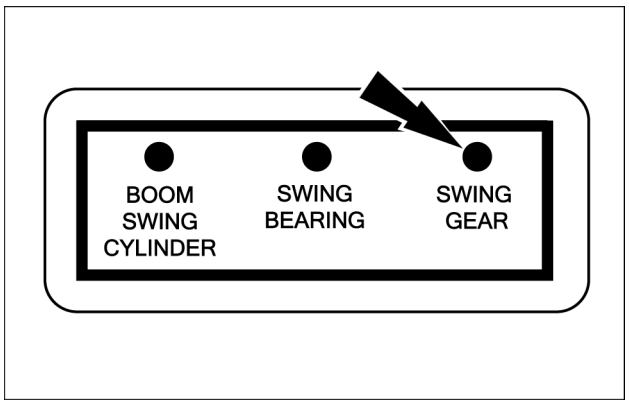
Dozer blade cylinder pin: two grease fittings

NOTICE: *if you operate the machine in water or mud, you must lubricate the dozer blade connection pin and the dozer blade cylinder pin every* ***10 h****.*

Swing ring gear

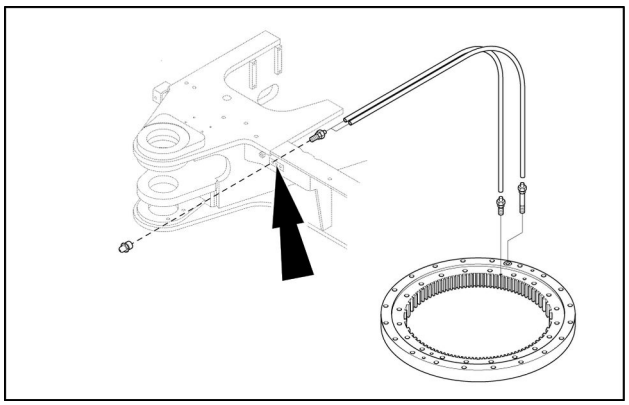
Grease the swing ring gear every **50 h**.
Lubricant: **CASE AKCELA 251H EP MULTI-PURPOSE GREASE**

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key.



SMIL16MEX1424AA 1

2. Using a grease gun, inject grease of the specified type in the grease points shown in figure.



SMIL16MEX1367AA 2

Track tension

⚠ WARNING

Tip-over hazard!
Only raise the track as little as necessary.
Failure to comply could result in death or serious injury.

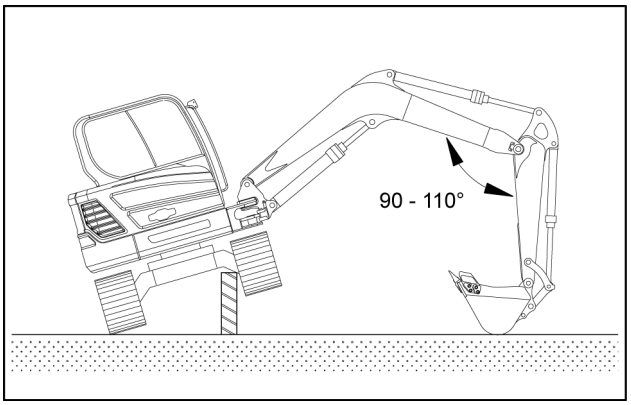
W0276A

Check the track tension every **50 h**.

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:

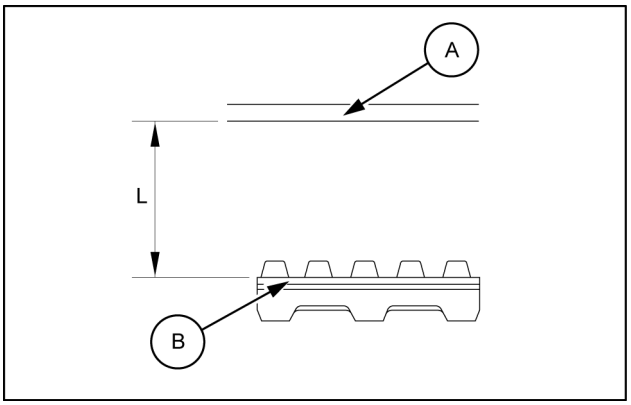
1. Swing the upper structure perpendicular to the undercarriage. Lower the attachment to the ground, then lower the boom until the track is raised off the ground. Place a block under the undercarriage and raise the attachment off the ground.
2. Set the engine speed knob to the maximum speed position.
3. Operate the travel control lever to move the raised track forward and backward and shake off the mud.
4. Repeat the same operations for the other track.



SMIL16MEX1368AA 1

Checking the tension

1. Stop the engine, then remove the key from the starter switch.
2. At the center of the track, measure the slack **(L)** between the bottom of the lower roller **(A)** and the rubber track shoe **(B)**.
   The value must be within:
   130 – 150 mm (**5.1 – 5.9 in**) for steel track;
   39 – 44 mm (**1.5 – 1.7 in**) for rubber track.
3. Adjust the tension as necessary, then lower the track to the ground.
4. Repeat the same operations for the other track.



SMIL16MEX1369AB 2

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.

⚠ 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. Loosen the grease fitting adapter and drain grease from the cylinder.
2. When the track tension is correct, tighten the grease fitting adapter.
3. Clean the grease fitting adapter, then lower the track to the ground.
4. Repeat the same operations for the other track.

NOTICE: *if the grease fitting adapter is damaged, grease may leak out. Check the condition of the grease fitting adapter regularly and replace it if necessary.*

Fuel filter water separator

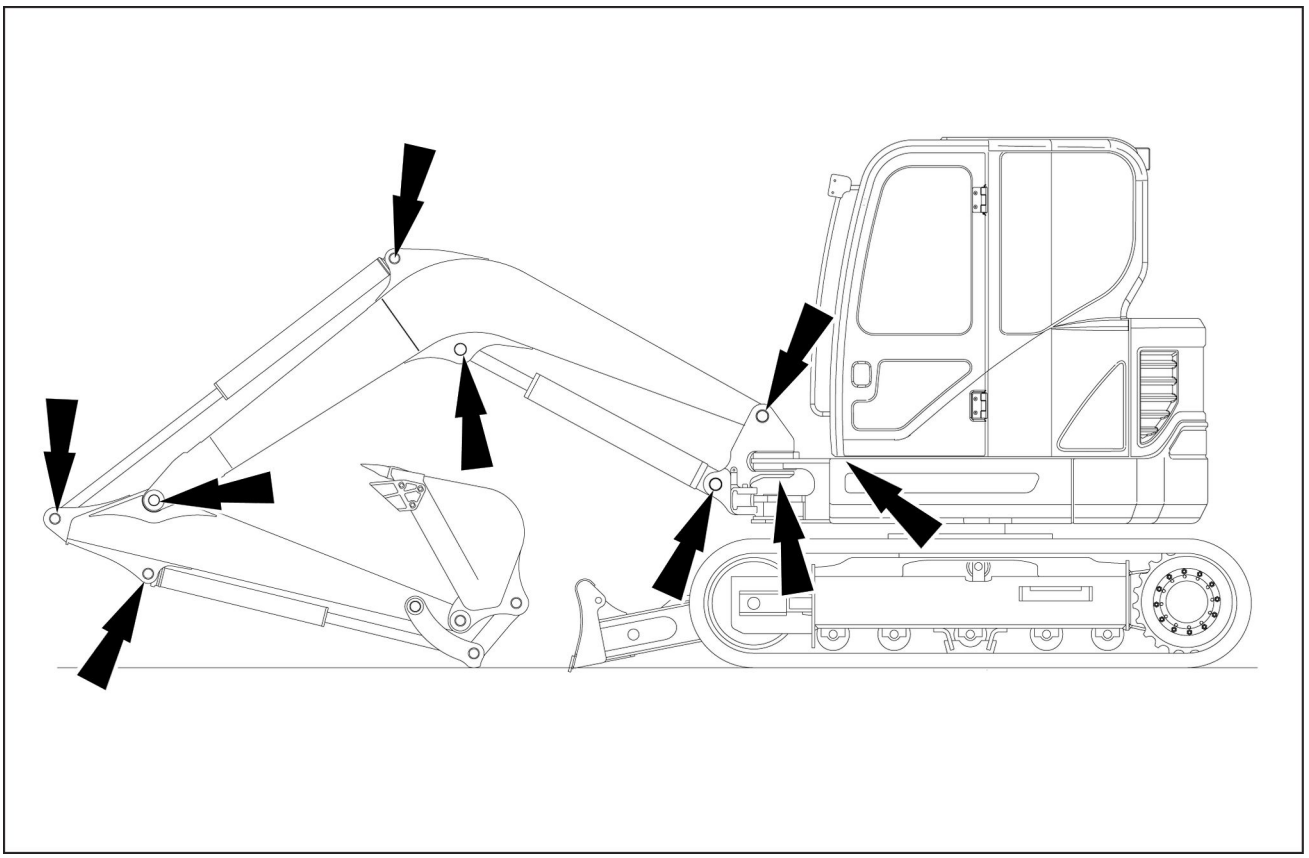
Clean the filter element of the fuel filter water separator every **50 h**.

To clean the filter element of the fuel filter water separator, refer to page **6-42**.

Every 250 hours

Grease points (Boom and arm)

Grease the boom, the arm and the swing system every **250 h**.
Lubricant: **CASE AKCELA MOLY GREASE**



SMIL16MEX1076FA 1

Lubrication manifold at upper frame: four grease fittings

Boom connection pin: two grease fittings

Boom cylinder (head and rod side): two grease fittings

Arm cylinder pin (head and rod side): two grease fittings

Boom and arm connection pin: one grease fitting

Lubrication manifold at upper frame: four grease fittings

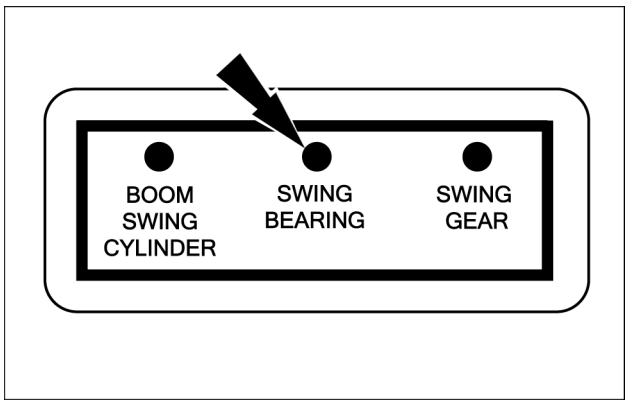
Boom swing post: two grease fittings

NOTICE: *if you operate the machine in water or mud, you must lubricate the boom, the arm and the swing system every* ***10 h****.*

Swing bearing

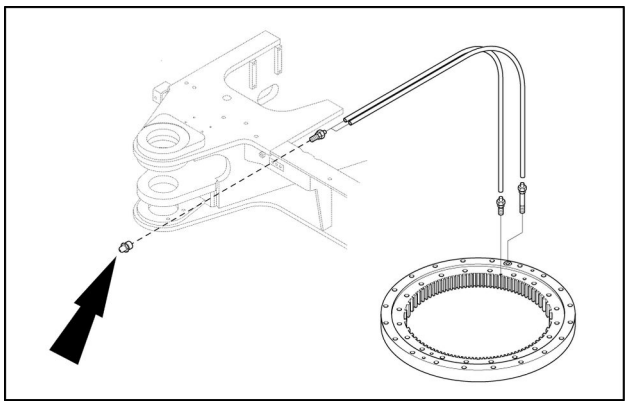
Grease the swing ring gear every **250 h**.
Lubricant: **CASE AKCELA 251H EP MULTI-PURPOSE GREASE**

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key.



SMIL16MEX1424AA 1

2. Using a grease gun, inject grease of the specified type in the grease points shown in figure.

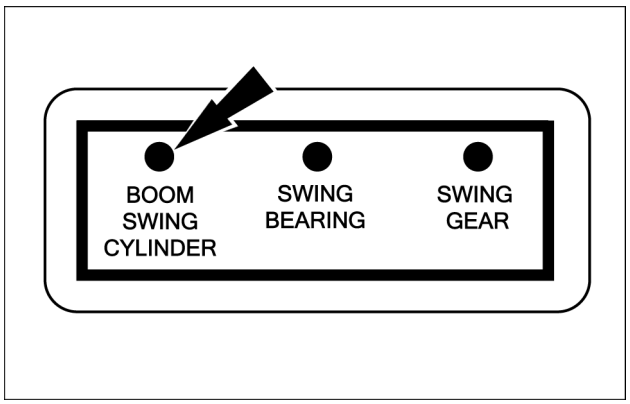


SMIL16MEX1367AA 2

Grease points (Boom swing cylinder)

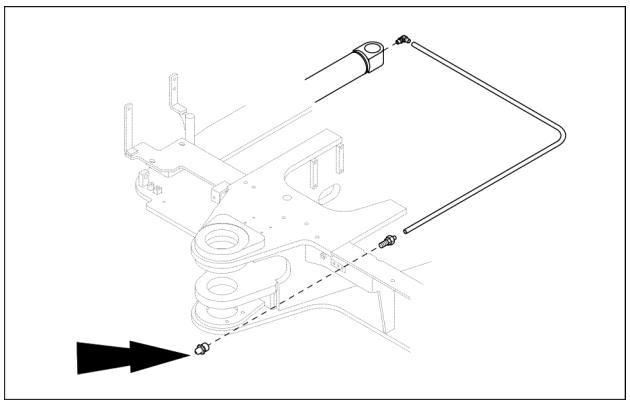
Grease the boom swing cylinder every **250 h** (After **50 h** of operation in run-in period).
Lubricant: **CASE AKCELA MOLY GREASE**

Boom swing cylinder: one grease fitting



SMIL16MEX1424AA 1

Using a grease gun, inject grease of the specified type in the grease points shown in figure.



SMIL16MEX1377AA 2

Battery

⚠ 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

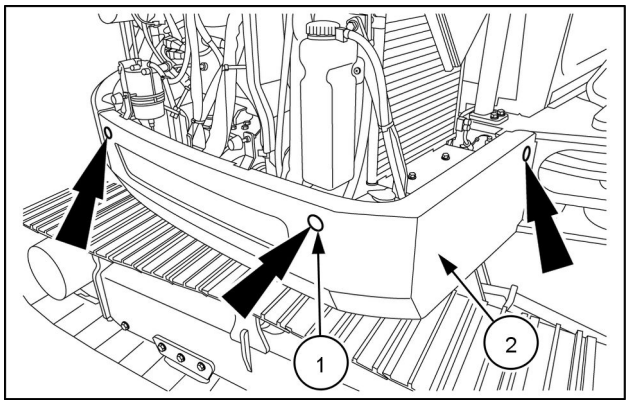
Explosive gas!
Batteries emit explosive hydrogen gas and other fumes while charging. Ventilate the charging area. Keep the battery away from sparks, open flames, and other ignition sources. Never charge a frozen battery.
Failure to comply could result in death or serious injury.

W0005A

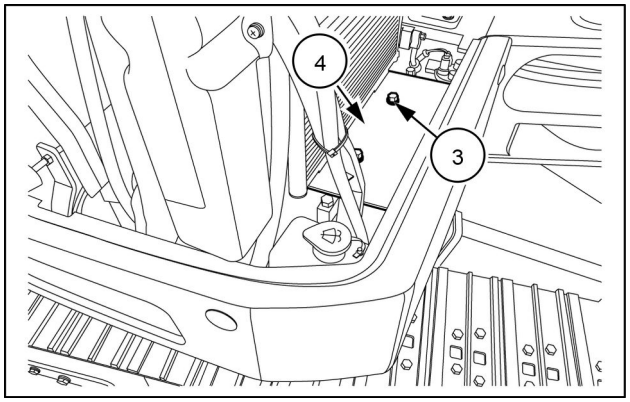
Check the battery voltage every **250 h**.

Replacement of the battery

1. To gain access to the battery, proceed as follows:
    1. Remove the three protection caps (1) of the lower, right-hand cover (2).
    2. Remove the three retaining screws and remove the cover (2) from the frame.
    3. Remove the two screws and washers (3) from the battery protection panel (4), and remove the panel (4).

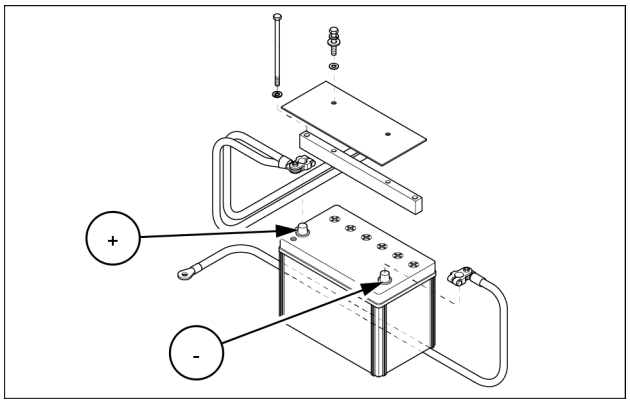


SMIL16MEX1102AB 1



SMIL16MEX1101AB 2

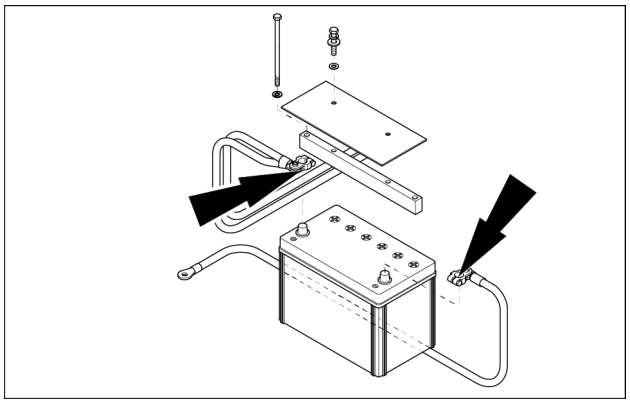
2. To replace the battery proceed as follows:
    1. Set the battery disconnect switch to the OFF position. Cut-off the negative-terminal cable **(-)**. Next, cut-off the positive-terminal cable **(+)**.
    2. Remove the support bracket.
    3. Install a new battery.
    4. Clean the cables and the battery terminals, and apply grease.
    5. Connect the positive **(+)** and the negative **(-)** cable to the positive and the negative terminal of the battery respectively. Set the battery disconnect switch to the ON position.



SMIL16MEX0609AA 3

Cleaning of the battery

3. Wash the terminal with hot water and apply grease to the terminals after washing.



SMIL16MEX0609AA 4

Starting the engine with booster cable

⚠ WARNING

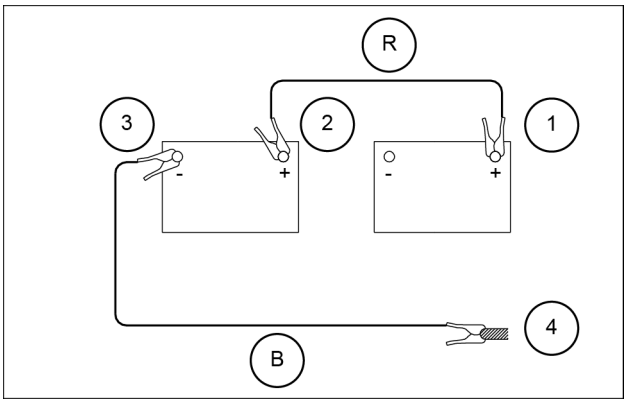
Improper operation or service of this machine can result in an accident.
An error connecting auxiliary starting cables or short-circuiting battery terminals can cause an accident. Connect auxiliary starting cables as instructed in this manual.
Failure to comply could result in death or serious injury.

W0263A

Connection of booster cable

Make sure that the booster battery voltage corresponds to the voltage system of the machine.
Make sure that the starter key is in OFF position and the safety lock lever in LOCK position.
Make sure to use supply cables of appropriate dimensions.
Make sure that the starter key of the machine with the charged battery is in OFF position.

1. Connect the red terminals **(R)** of booster cable to the battery **(+)** terminals between exhausted battery positive terminal **(1)** and new battery positive terminal **(2)**.
2. Connect the black terminal **(B)** of the booster cable to the battery **(-)** terminals between new battery negative terminal **(3)** and chassis **(4)** of the machine with the exhausted battery..
3. Connection order: **(1)**, **(2)**, **(3)**, **(4)**



SMIL16MEX0459AB 5

Starting the engine of the machine

1. Start the engine of the machine with the charged battery and keep it to run at high RPM.
2. Start the engine of the machine with the exhausted battery
3. If the engine does not start, restart after two minutes.

Disconnection of booster cable

1. Disconnection order: **(4)**, **(3)**, **(2)**, **(1)**
2. Remove the black booster cable **(B)**.
3. Remove the red booster cable **(R)**.
4. Run the engine at high RPM.

Tightening torques

Check the tightening torques every **250 h** (after the first **50 h** during the run-in period).

Component		Bolt size	Torque setting
Engine	Engine mounting bolt (engine–bracket)	M10 x 1.5	**58.0 – 78.0 N·m** (**42.8 – 57.5 lb ft**)
	Engine mounting bolt (bracket-frame)	M16 × 2.0	**220.9 – 269.9 N·m** (**162.9 – 199.1 lb ft**)
	Radiator mounting bolt and nut	M12 × 1.75	**96.1 – 155.0 N·m** (**70.9 – 114.3 lb ft**)
	Coupling mounting socket bolt	M14 x 2.0	**127.2 – 146.7 N·m** (**93.8 – 108.2 lb ft**)
	Coupling mounting clamp bolt	M16 × 2.0	**98.2 – 117.7 N·m** (**72.4 – 86.8 lb ft**)
Hydraulic system	Main pump mounting bolt	M12 × 1.75	**107.9 – 127.4 N·m** (**79.6 – 94.0 lb ft**)
	Main control valve mounting bolt	M8 x 1.25	**26.6 – 40.1 N·m** (**19.6 – 29.6 lb ft**)
	Fuel tank mounting bolt	M16 × 2.0	**247.4 – 335.6 N·m** (**182.5 – 247.5 lb ft**)
	Hydraulic oil tank mounting bolt	M16 × 2.0	**247.4 – 335.6 N·m** (**182.5 – 247.5 lb ft**)
	Turning joint mounting bolt and nut	M12 × 1.75	**107.9 – 133.4 N·m** (**79.6 – 98.4 lb ft**)
Power train system	Swing motor mounting bolt	M16 x 2.0	**247.4 – 335.6 N·m** (**182.5 – 247.5 lb ft**)
	Swing bearing upper mounting bolt	M16 x 2.0	**262.1 – 320.9 N·m** (**193.3 – 236.7 lb ft**)
	Swing bearing lower mounting bolt	M16 x 2.0	**262.1 – 320.9 N·m** (**193.3 – 236.7 lb ft**)
	Travel motor mounting bolt	M14 × 2.0	**164.1 – 221.0 N·m** (**121.0 – 163.0 lb ft**)
Under-carriage	Sprocket mounting bolt	M14 × 2.0	**164.1 – 221.0 N·m** (**121.0 – 163.0 lb ft**)
	Carrier roller mounting bolt and nut	M16 × 2.0	**258.8 – 321.5 N·m** (**190.9 – 237.1 lb ft**)
	Track roller mounting bolt	M18 × 2.0	**353.9 – 451.5 N·m** (**261.0 – 333.0 lb ft**)
	Track tension cylinder mounting bolt	M12 x 1.75	**95.3 – 154.2 N·m** (**70.3 – 113.7 lb ft**)
	Track shoe mounting bolt and nut	1/2–20UNF	**171.5 – 210.8 N·m** (**126.5 – 155.5 lb ft**)
	Track guard mounting bolt	M16 x 2.0	**259.0 – 321.3 N·m** (**191.0 – 237.0 lb ft**)
Other systems	Counterweight mounting bolt	M24 x 3.0	**833.8 – 1126.7 N·m** (**615.0 – 831.0 lb ft**)
	Cab mounting bolt and nut	M12 × 1.75	**106.8 – 132.3 N·m** (**78.8 – 97.6 lb ft**)
	Operator’s seat mounting bolt	M8 × 1.25	**6.6 – 16.4 N·m** (**4.9 – 12.1 lb ft**)

Air conditioner filters

⚠ CAUTION

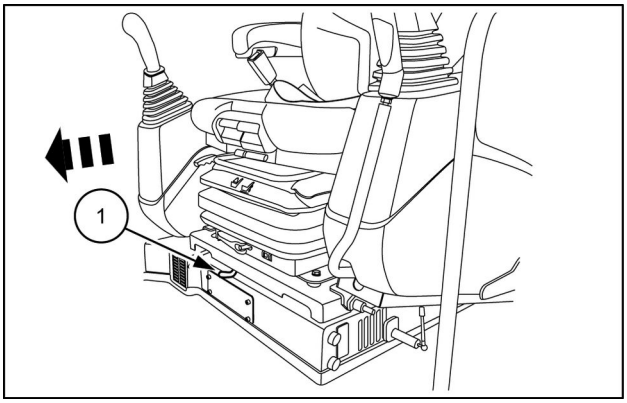
Flying debris!
Compressed air can propel dirt, rust, etc. into the air. Wear eye and face protection when using compressed air.
Failure to comply could result in minor or moderate injury.

C0049A

Clean the air circulation filter every **250 h**
Clean the recirculation filter when necessary

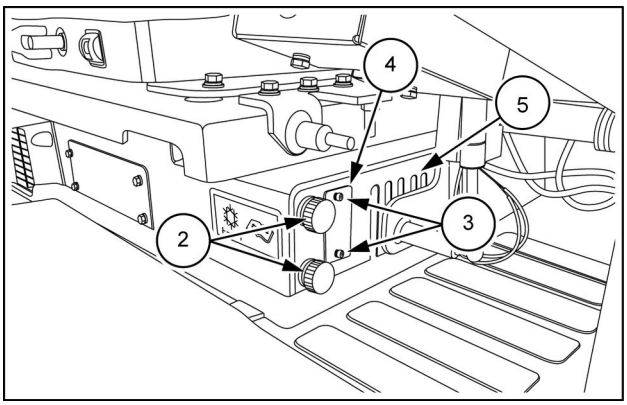
Recirculation filter

1. Remove the floor mat.
2. Use the lever **(1)** to move forward the operator's seat and the console box.



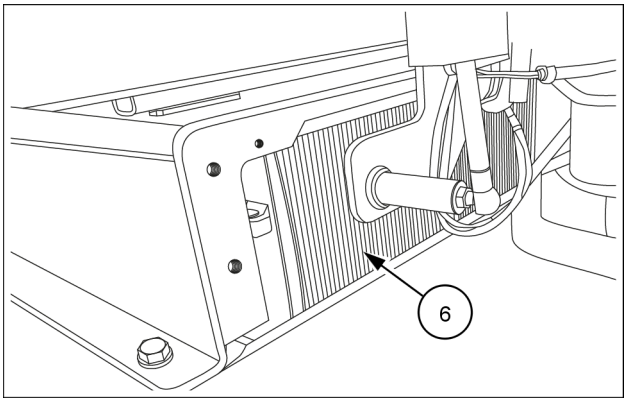
SMIL16MEX1123AB 1

3. Remove the two wing nuts **(2)** and the one located on the back of the operator's seat.
4. Remove the two screws **(3)**, the plate **(4)**, and the protection panel **(5)**.



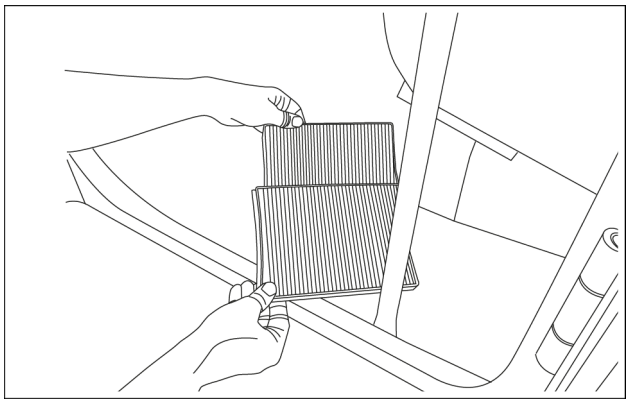
SMIL16MEX1103AB 2

5. Remove the two recirculation filters **(6)** and replace them with new filters.



SMIL16MEX1115AA 3

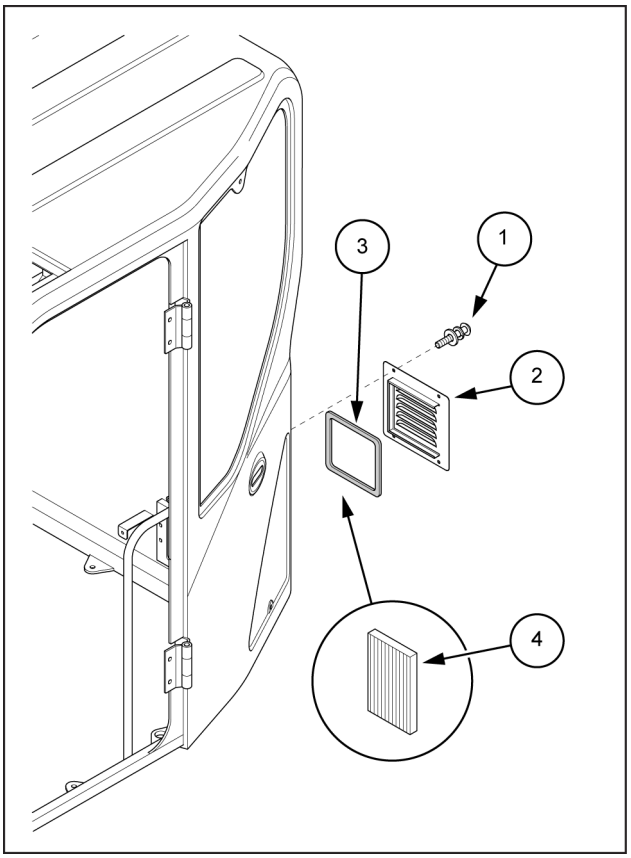
6. Install the protection panel **(5)**, the plate **(4)**, the two screws **(3)** and the wing nuts **(2)**.
7. Adjust the operator's seat and the console box and install the floor mat.



SMIL16MEX1116AA 4

Air circulation filter

1. Tilt the cab forward. Refer to page **3-73**.
2. Remove the screws **(1)**, the cover **(2)**, and the seal **(3)** on the rear side of the cab.
3. Remove the air circulation filter **(4)** and clean it with compressed air. If the filter is damaged, replace it.
4. Install the air circulation filter **(4)**.
5. Install the seal **(3)**, the cover **(2)** and lock with the screws **(1)**.
6. Tilt the cab backward.



SMIL16MEX1378BB 5

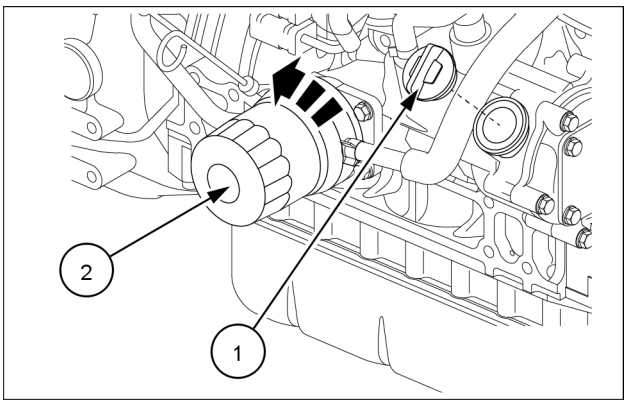
Every 500 hours

Engine oil and filter

Replace the engine oil every **500 h**
Replace the engine oil filter every **500 h**
Lubricant: **CASE AKCELA UNITEK NO. 1™ SBL CJ-4 SAE 10W-40**
Quantity: **11.6 L** (**3.1 US gal**)

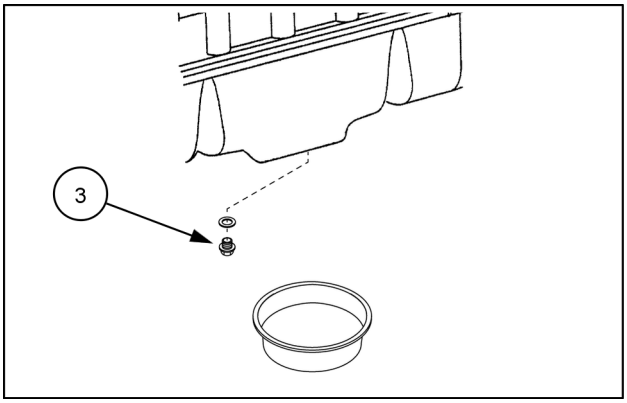
NOTE: *replace the oil while the engine is warm but not hot. Doing so helps the oil in flowing.*

1. Park the machine on a flat and level place. Stop the engine, remove the starter key.
2. Place a container with a capacity of **20 L** (**5.3 US gal**) under the drain plug **(3)**.
3. Open the engine hood and remove the filling plug **(1)**.



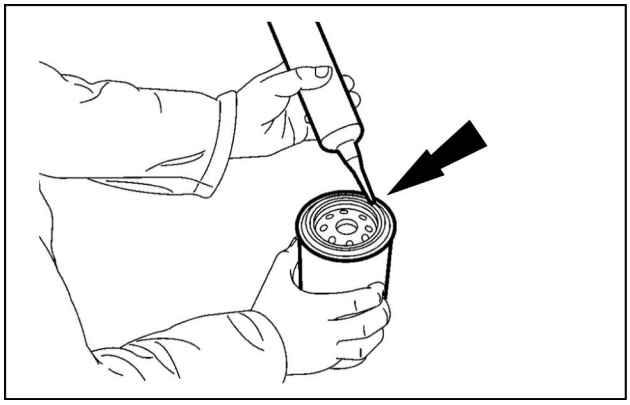
SMIL16MEX0623AA 1

4. Remove the drain plug **(3)** and drain the oil.
5. Clean the area around the engine oil filter **(2)** and remove it with the specific tool provided with the machine.



SMIL16MEX3182AA 2

6. Apply an oil film finely to the seal of a new filter.



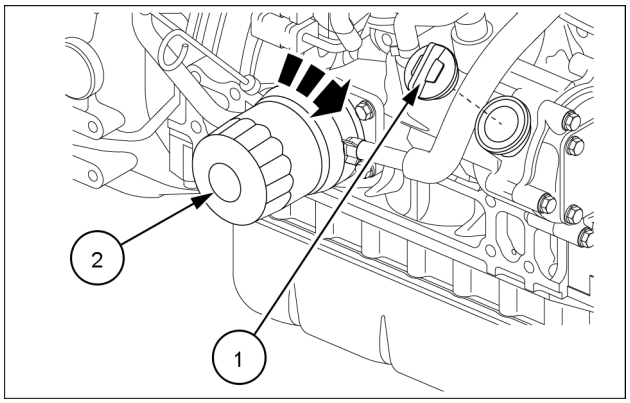
SMIL14CEX2751AA 3

7. Install the new filter. Turn the filter **(2)** until the seal touches the filter head.
   Tighten the filter to **19 – 23 N·m** (**14 – 17 lb ft**)

NOTE: *do not use a filter wrench for tightening the filter. Overtightening can damage the filter and its seal.*

8. Install the drain plug.
9. Add new engine oil to the engine. Install the filling plug **(1)**.
10. Run the engine for several minutes to check that there are no leaks at the filter and at the drain plug.
11. Stop the engine and check the oil level with the dip-stick. Add oil if necessary.

NOTE: *always wait **15 min** to allow the oil to return to the sump before checking the oil level.*



SMIL16MEX0623AA 4

Fuel filter water separator

Replace the element of the fuel filter water separator every **500 h**.

To replace the element of the fuel filter water separator, refer to page **6-23**.

Air cleaner

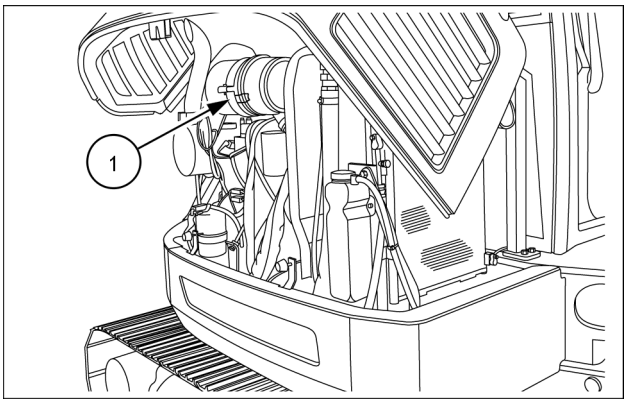
⚠ CAUTION

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.

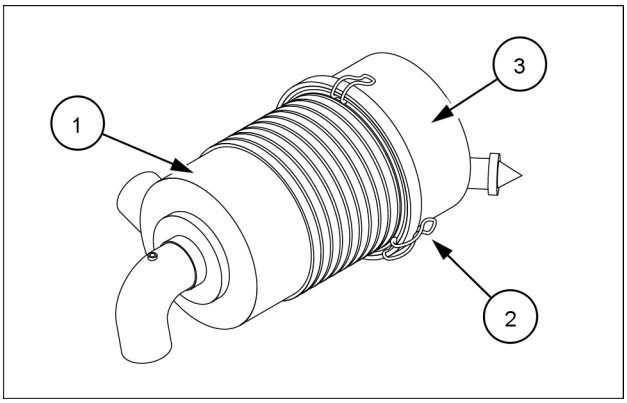
C0049A

Clean the air filter every **500 h** or when the “air cleaner warning light”  appears on the instrument cluster. Replace the primary air filter element after four times cleaning. Replace the secondary air filter element only when the primary element is cleaned for the four times.

1. Open the engine hood to access to the air cleaner **(1)**.
2. Release the fasteners **(2)** and remove the cover **(3)** of the air cleaner.



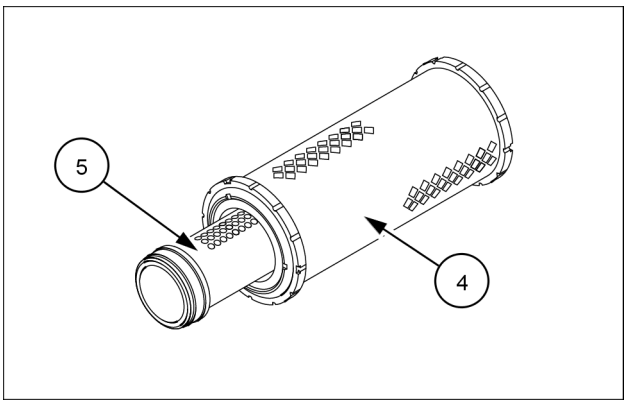
SMIL16MEX1372AA 1



SMIL16MEX0624AA 2

3. Remove the primary element **(4)**.
4. Clean the primary element **(4)**.

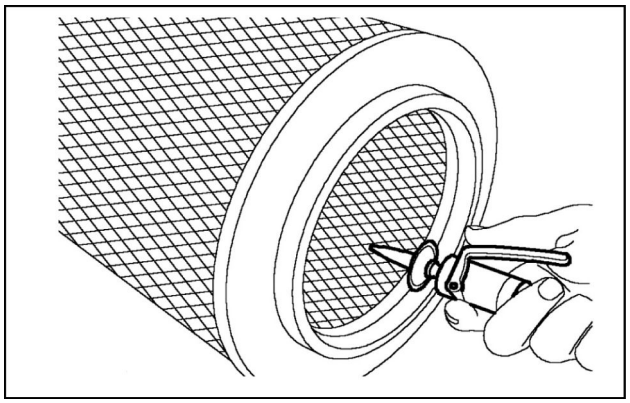
NOTE: *the primary element **(4)** can be cleaned. The secondary element **(5)** cannot be cleaned and must be changed.*



SMIL16MEX0433AA 3

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* ***3 bar****.*

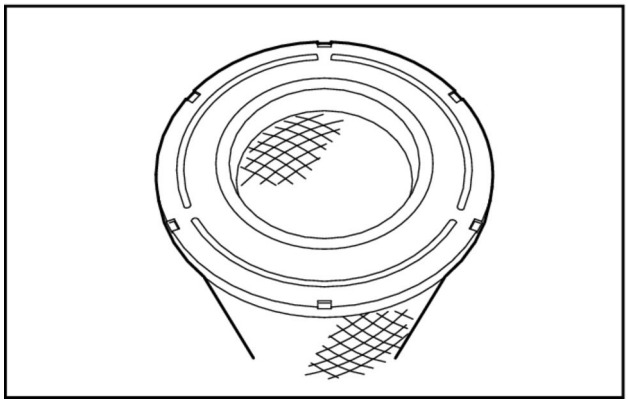


SMIL14CEX2795AA 4

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.*

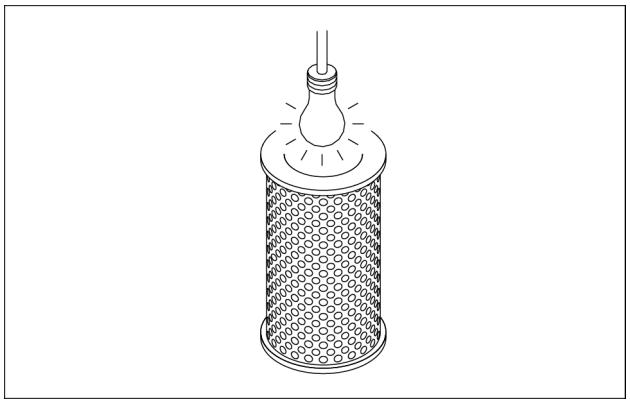


SMIL13CEX2757AA 5

Inspecting the element

Check the element for damage by placing an inspection light inside the element.

NOTE: *change the element if light can be seen through a hole, however small.*

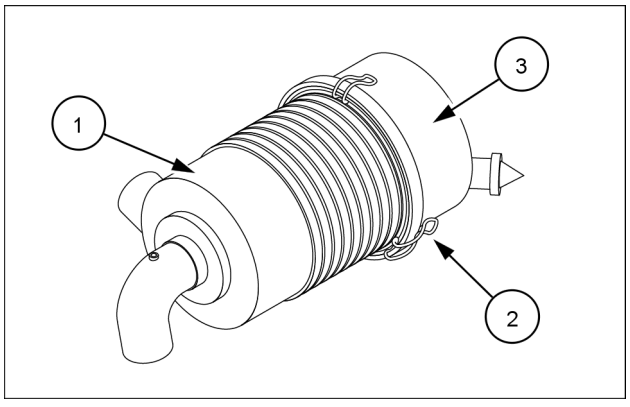


SMIL16MEX0434AA 6

5. Install the secondary element and the primary element into the air cleaner **(1)**.
6. Install the cover **(3)** and lock the fasteners **(2)**.

NOTICE: *the air flow sensor is installed on the inlet duct of the air cleaner. Pay attention not to allow dust to invade the inlet duct when replacing the air cleaner element.*

NOTE: *if, after cleaning, smoke exhaust is abnormal, be sure to replace the primary element of the air cleaner.*



SMIL16MEX0624AA 7

Fuel filter

⚠ WARNING

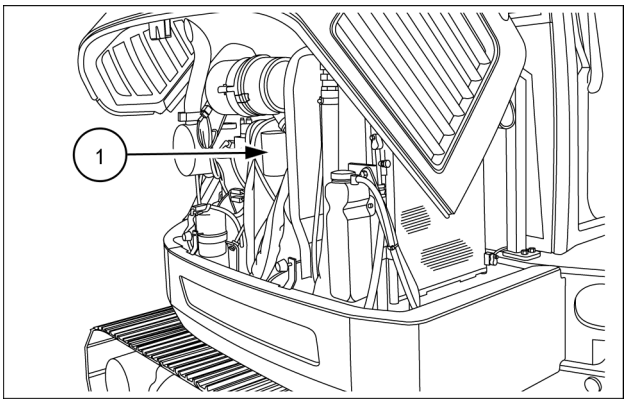
Fire hazard!
When handling diesel fuel, observe the following precautions:
1. Do not smoke.
2. Never fill the tank when the engine is running.
3. Wipe up spilled fuel immediately.
Failure to comply could result in death or serious injury.

W0099A

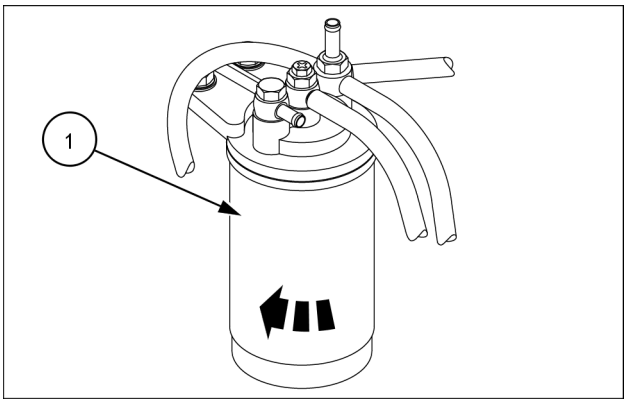
Replace the fuel filter element every **500 h**

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.*

1. Open the engine hood to access the fuel filter **(1)**.
2. Close the fuel cock on the water separator.
3. Clean the area around the fuel filter body and place a container with a capacity of **2 L** (**0.5 US gal**) under the fuel filter.
4. Remove the fuel filter with a filter wrench, turning it to the left. When removing the fuel filter, carefully hold it to prevent spilling of fuel. Wipe up all spilled fuel.
5. Apply a thin film of fuel to the surface of the new fuel filter gasket before tighten it.

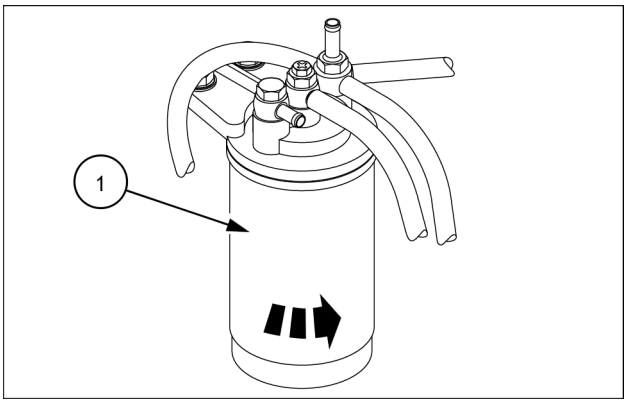


SMIL16MEX1372AA 1



SMIL16MEX0625AA 2

6. Install the new fuel filter **(1)**. Turn to the right and tighten to **19.7 – 23.6 N·m** (**14.5 – 17.4 lb ft**) and one additional turn using the filter wrench.
7. Open the fuel cock on the water separator. Start the engine and check for fuel leakage.
8. Prime the fuel system. Refer to page **6-23**.



SMIL16MEX0625AA 3

Radiator and coolers

⚠ 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.

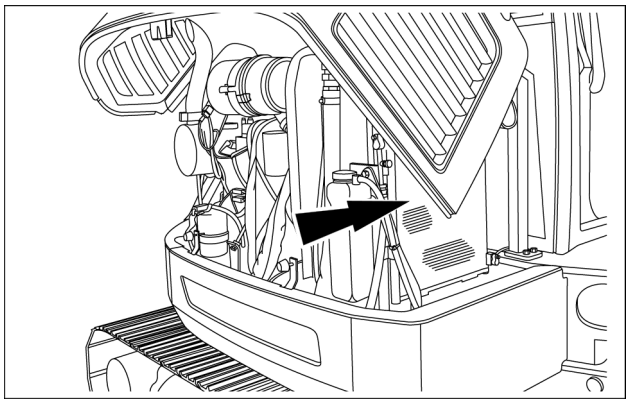
C0049A

Clean the radiator every **500 h**

1. Stop the engine and remove the starter key.
2. Open the engine hood.
3. Visually inspect the radiator for clogged radiator fins.

NOTICE: *overheat may occur if the radiator fin, or the oil cooler fin is clogged.*

NOTE: *after working in a dusty place, clean radiator more frequently.*

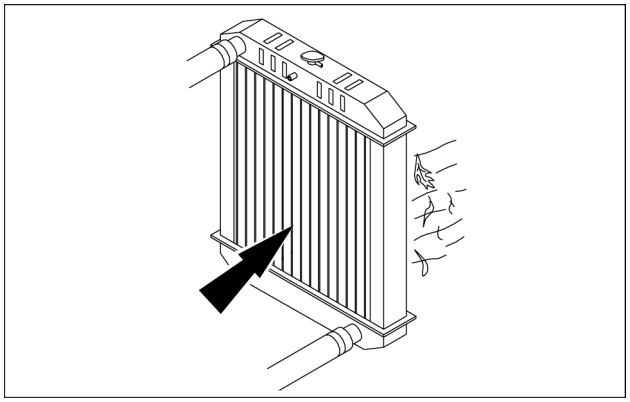


SMIL16MEX1372AA 1

4. Use compressed air to blow away mud or dirt that have clogged the radiator fin. Blow the air in the opposite direction of the fan air flow.

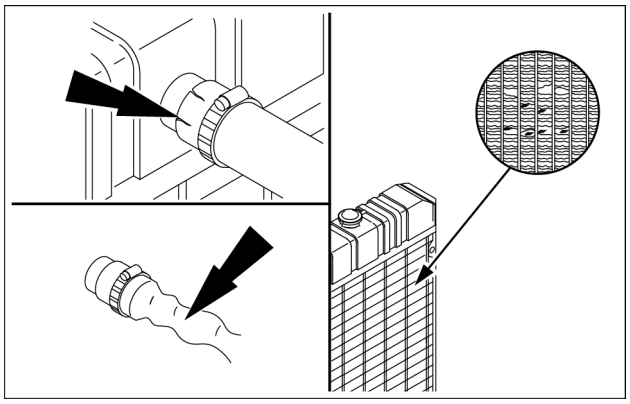
NOTICE: *In presence of greasy or oily dust, consult your CASE CONSTRUCTION dealer in order to carry out a special cleaning operation.*

NOTICE: *use compressed air pressure of maximum* ***550 kPa*** *(****79.8 psi****).*



SMIL16MEX0626AA 2

5. Visually inspect the radiator for bent or broken fins.
6. Visually inspect the radiator for core and gasket leaks.



SMIL16MEX0627AA 3

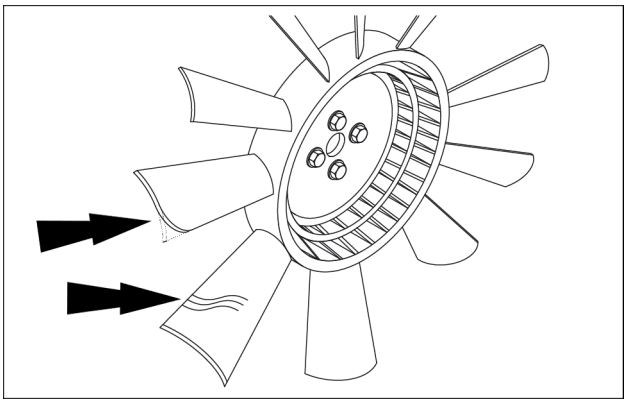
Radiator fan

Visual inspect the radiator fan daily, check every **500 h**

1. Rotate the crankshaft by using the engine barring gear. Check for cracks, loose rivets, and bent or loose blades.

NOTE: *never pull or pry on the fan.*

2. Check the fan to make sure it is securely mounted.
3. Tighten the cap-screws if necessary. If the fan is damaged, consult your CASE CONSTRUCTION dealer to replace the fan.



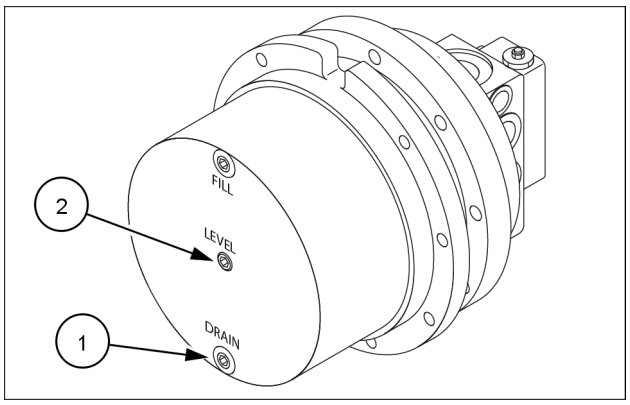
SMIL16MEX0436AA 1

Travel reduction gears

Check the travel reduction gears oil level every **500 h**.
Lubricant: **CASE AKCELA GEAR 135 H EP 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. Remove the level plug **(2)**, and check the oil level. If the level comes up to the bottom edge of port **(2)**, it is sufficient.

   If necessary, add oil through port **(2)** until the oil comes up to the bottom edge of port **(2)**.
5. Check the O-ring seal of the level plug **(2)** for damages, and replace it if necessary.
6. Insert the level plug **(2)** with seal tape wrapped around it.
7. Repeat Steps **2** to **6** for the other travel reduction gear.
8. Run the machine slowly to check that there are no leaks.



SMIL16MEX0442AA 1

Every 1000 hours

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

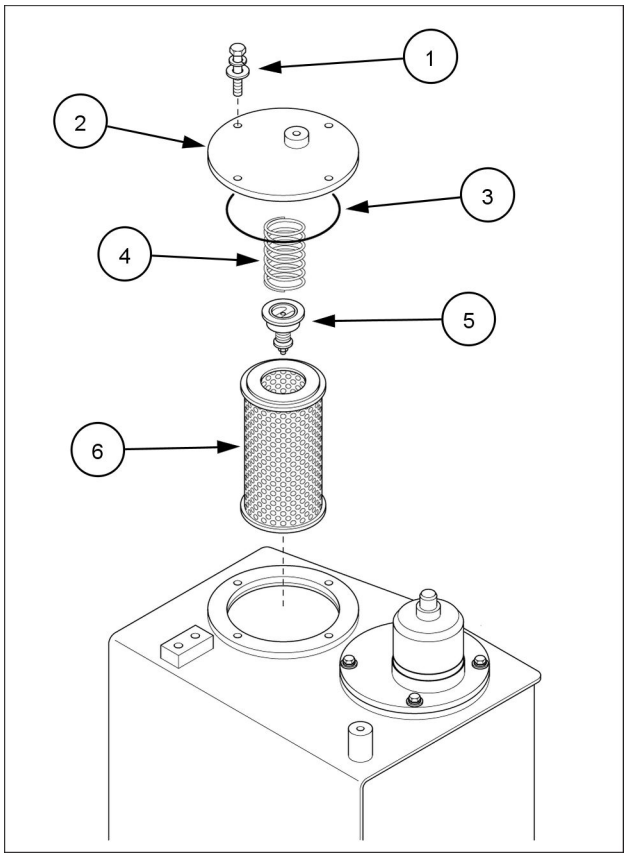
Pressurized system!
Never attempt to drain fluids or remove filters when the engine is running. Turn off the engine and relieve all pressure from pressurized systems before servicing the machine.
Failure to comply could result in death or serious injury.

W0905A

Replace the hydraulic oil return filter every **1000 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.*

1. Release all the pressure in the hydraulic tank. Refer to page **6-12**.
2. Clean the top of the hydraulic oil tank, and clean the cover of the return filter.
3. Remove the bolts **(1)**, the cover **(2)** and the O-ring **(3)**.
4. Take out the spring **(4)**, the by-pass valve **(5)**, and the return filter **(6)**.
5. Install a new filter **(6)**.
6. Clean and install the spring **(4)** and the by-pass valve **(5)**. Check the O-ring **(3)**, and replace it if any wear or damage is found.
7. Install the cover **(2)** and lock with the bolts **(1)**. Tighten the bolts **(1)** to **54.2 – 81.3 N·m** (**40 – 60 lb ft**).
8. Check the hydraulic fluid level, and supply it if necessary.



SMIL16MEX1395BA 1

Oil reservoir breather

⚠ 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

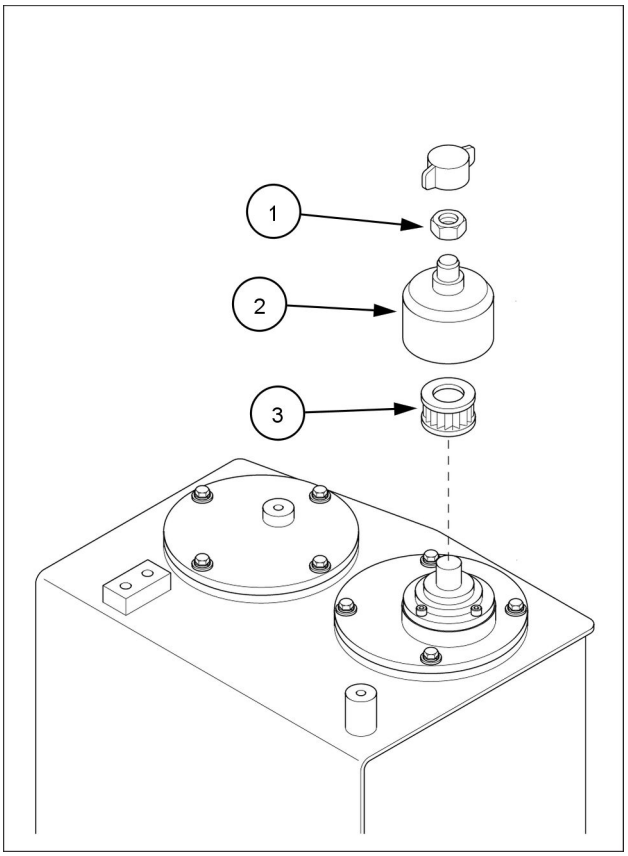
⚠ WARNING

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 oil reservoir breather filter every **1000 h**.

1. Release all the pressure in the hydraulic tank. Refer to page **6-12**.
2. Clean the top of the hydraulic oil tank, and clean the cover of the oil reservoir breather filter.
3. Loosen the lock nut **(1)** and remove the cover **(2)**.
4. Pull out the filter element **(3)**.
5. Install a new filter element.
6. Install the cover **(2)** and lock with the lock nut **(1)**. Tighten the lock nut **(1)** to **1.9 – 2.8 N·m** (**1.4 – 2.1 lb ft**).



SMIL16MEX1396BA 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

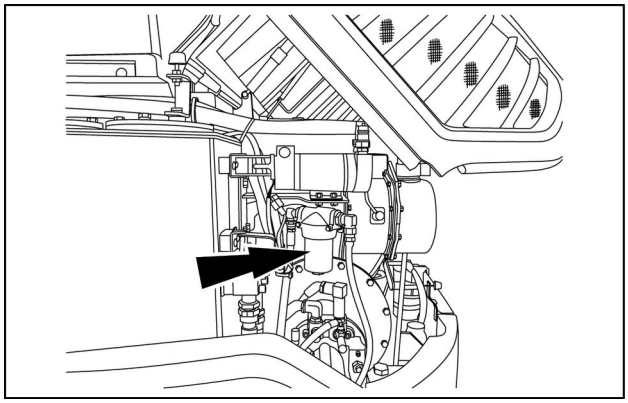
Pressurized system!
Never attempt to drain fluids or remove filters when the engine is running. Turn off the engine and relieve all pressure from pressurized systems before servicing the machine.
Failure to comply could result in death or serious injury.

W0905A

Replace the pilot line filter every **1000 h** (After **250 h** of operation in run-in period).

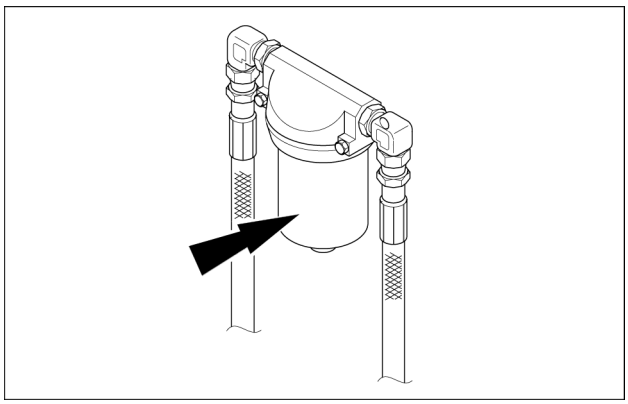
NOTICE: *when the machine is a new vehicle, or when the main components of the hydraulic system are already overhauled or replaced, replace the pilot line filter after **250 h** of operation. After that, replace the filter at specified intervals.*

1. Release all the pressure in the hydraulic tank. Refer to page **6-12**.
2. Open the engine hood and loosen the nut positioned on the filter body.



SMIL16MEX1383AA 1

3. Pull out the pilot line filter element and clean the filter housing.
4. Install the new filter and tighten.



SMIL16MEX1382AA 2

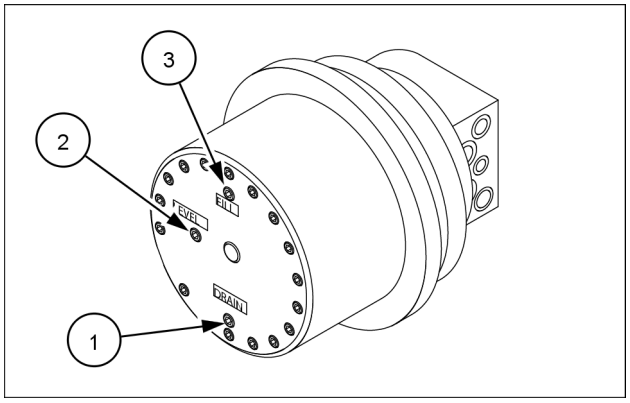
Travel reduction gears

Replace the travel reduction gears oil every **1000 h** (After **250 h** of operation in run-in period)
Lubricant: **CASE AKCELA GEAR 135 H EP 80W-90**
Quantity: **1.2 L** (**0.3 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. Place a container with an appropriate capacity under the travel reduction gear.
5. Remove the level plug **(2)**.
6. Remove the drain plug **(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.*

7. Replace the O-ring seal of the drain plug **(1)**.
8. Insert the drain plug **(1)** with seal tape wrapped around it.
9. Add oil through fill port **(3)** until the oil comes up to the bottom edge of the port **(2)**.
10. Replace the O-ring seal of the level plug **(2)** and the O-ring seal of the fill plug **(3)**. Insert the level plug **(2)** with seal tape wrapped around it, then do the same for the fill plug **(3)**.
11. Repeat steps **2** to **10** for the other travel reduction gear.
12. Run the machine slowly to check that there are no leaks.



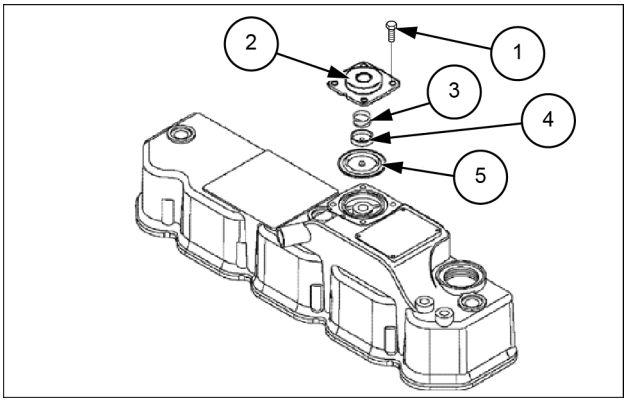
SMIL16MEX0637AA 1

Every 1500 hours

Crankcase breather

Check the crankcase breather every **1500 h**.

1. Remove the bolts **(1)** fixing the diaphragm cover **(2)**.
2. Remove the diaphragm cover **(2)**, the spring **(3)**, the diaphragm plate **(4)**, and the diaphragm **(5)**.
3. Inspect the diaphragm **(5)** for tears.
4. Inspect the spring **(3)** for distortion.
5. Replace components if necessary.
6. Reinstall the diaphragm **(5)**, the diaphragm plate **(4)**, the spring **(3)**, and the diaphragm cover **(2)**. Tighten the bolts **(1)**.



SMIL16MEX0638AB 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

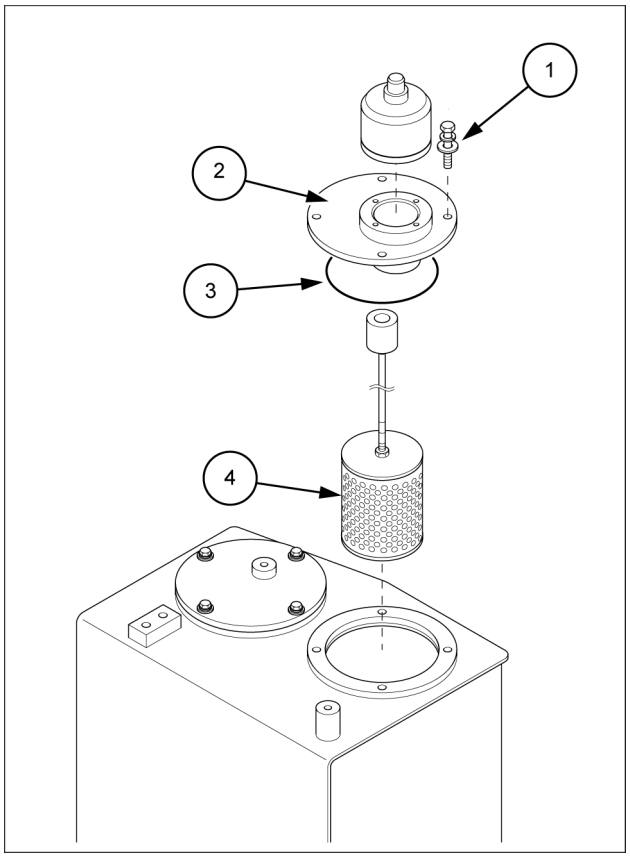
Pressurized system!
Never attempt to drain fluids or remove filters when the engine is running. Turn off the engine and relieve all pressure from pressurized systems before servicing the machine.
Failure to comply could result in death or serious injury.

W0905A

Clean the hydraulic oil suction filter every **2000 h**

NOTICE: *do not remove the hydraulic oil suction filter from the hydraulic tank before the hydraulic tank was empty.*

1. Release all the pressure in the hydraulic tank. Refer to page **6-12**.
2. Clean the top of the hydraulic oil tank, and clean the cover of the suction filter.
3. Remove the bolts **(1)**, the cover **(2)** and the O-ring **(3)**.
4. Take out the suction filter **(4)**.
5. Clean suction filter **(4)** with gasoline or clean oil.
6. Let the suction filter dry completely, and check for damage. If any damage is found on its surface, replace it with a new component.
7. Check the O-ring **(3)**, and replace it if any wear or damage is found.
8. Install the cover **(2)** and lock with the bolts **(1)**. Tighten the bolts **(1)** to **54.2 – 81.3 N·m** (**40 – 60 lb ft**).
9. Check the hydraulic fluid level, and supply it if necessary.



SMIL16MEX1398BB 1

Hydraulic hoses

⚠ WARNING

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 death or serious injury.

W0178A

Check the boom, arm, and bucket cylinder hose: Every 2 years or every **2000 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.

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

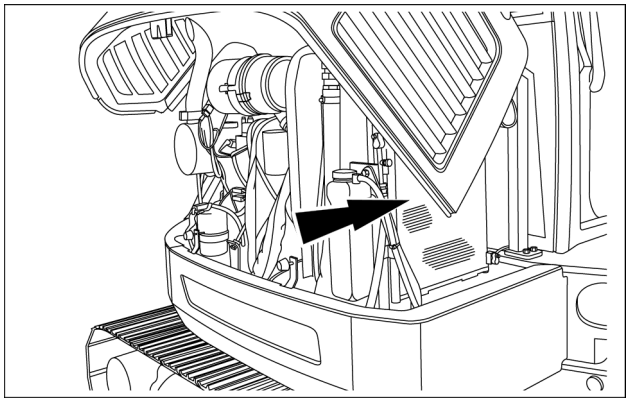
Burn hazard!
Hot coolant can spray out if you remove the filler cap while the system is hot. After the system has cooled, turn the filler cap to the first notch and wait for all pressure to release before proceeding.
Failure to comply could result in death or serious injury.

W1469A

Replace the engine coolant every **2000 h**
Fluid: **CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT**
Quantity (antifreeze/water mixture): **11 L** (**2.9 US gal**)

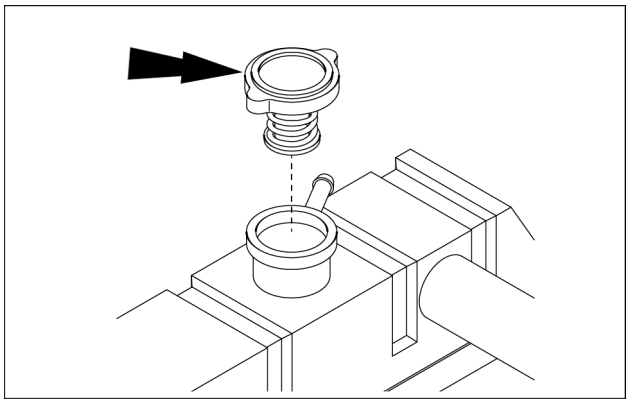
Draining the radiator

1. Open the engine hood to access to the radiator.



SMIL16MEX1372AA 1

2. Remove the radiator cap.

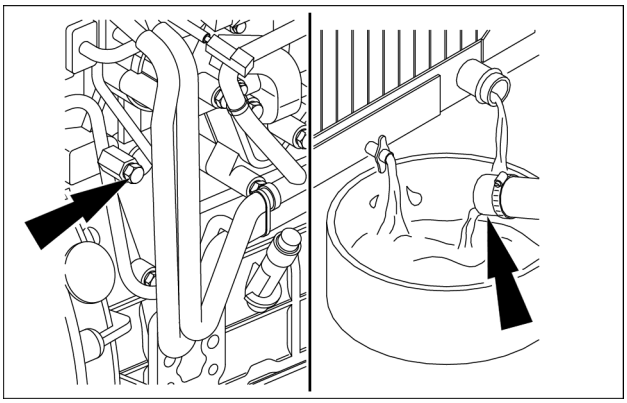


SMIL16MEX0639AA 2

3. Place a container with a capacity of **20 L** (**5.3 US gal**) under the plug located on the bottom of the water inlet.
4. Drain the engine coolant by opening the drain valve on the radiator and the plug on the bottom of the water inlet.
5. Close the drain valve on the radiator and the plug on the bottom of the water inlet.

NOTICE: *after draining coolant, do not start the engine with no water in the radiator. Failure to observe this causes the engine to seize up.*

NOTE: *dispose of the drained coolant according to the instructions on the container label.*



SMIL16MEX0640AA 3

Flushing the radiator

6. Fill the system with a mixture of sodium carbonate and water (or a commercially available equivalent).

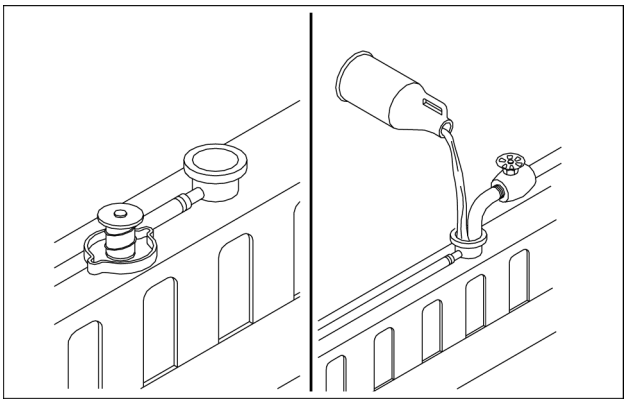
NOTE: *use **0.5 kg** (**1.1 lb**) of sodium carbonate for every **23 L** (**6.1 US gal**) of water.*

7. Do not install the radiator cap. The engine is to be operated without the cap for this process.
8. Operate the engine for **5 min** and let the coolant temperature arrives above **80 °C** (**176 °F**).
9. Stop the engine and drain the cleaning mixture.
10. Fill the cooling system with clean water.

NOTE: *be sure to vent the engine and radiator for complete filling. Do not install the radiator cap or new coolant filter.*

11. Operate the engine for **5 min** and let the coolant temperature arrives above **80 °C** (**176 °F**).
12. Stop the engine, and drain the cooling system.

NOTE: *if the water being drained is still dirty, the system must be flushed again until the water is clean.*



SMIL16MEX0641AA 4

Filling the radiator

13. Fill the cooling system with coolant.

NOTE: *the system has a maximum fill rate of **14 L/min** (**3.7 US gpm**). Do not exceed this fill rate.*

14. The system must be filled slowly to prevent air locks. Supply coolant up to the FULL mark of the reserve tank.
15. During filling, air must be vented from the engine coolant passage.
16. Install the radiator cap.
17. Start the engine until it reaches a temperature of **80 °C** (**176 °F**), and check for coolant leaks.
18. Check the coolant level again to make sure the system is full of coolant.

Every 5000 hours

Hydraulic oil

⚠ 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

⚠ WARNING

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 death or serious injury.

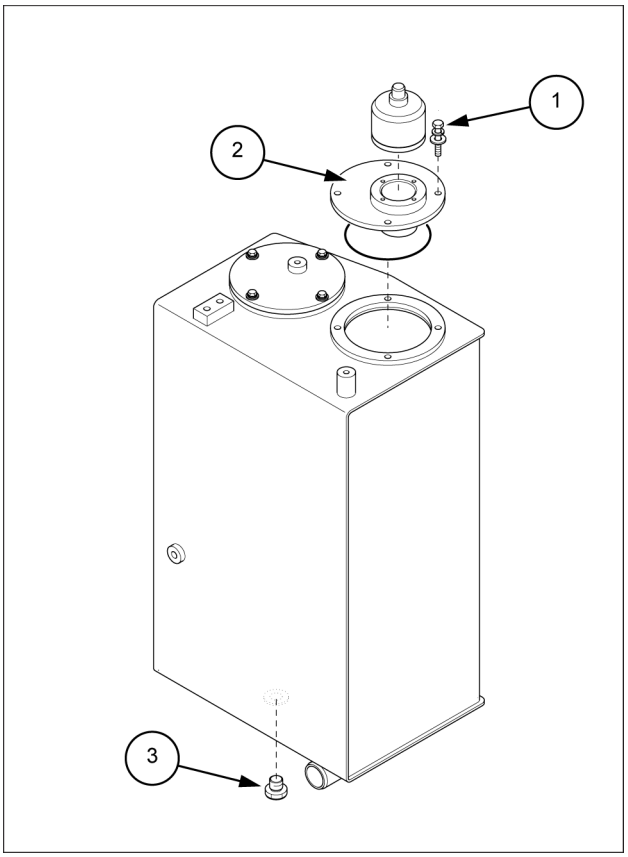
W0178A

Replace the hydraulic oil every **5000 h**
Fluid: **CASE AKCELA HYDRAULIC LL 46**
Quantity: **60 L** (**15.9 US gal**)

NOTICE: *when using the hydraulic breaker, reduce the interval of the hydraulic oil replacement. Replace the hydraulic oil every* ***600 h****.*

1. Release all the pressure in the hydraulic tank. Refer to page **6-12**.
2. Lower the bucket to the ground, pulling the arm and bucket cylinder to the maximum cylinder extension.

3. Remove the bolts **(1)** to remove the cover **(2)**.
4. Place a container with a capacity of minimum **70 L** (**18.5 US gal**) under the drain plug. Loosen the drain plug **(3)** at the bottom of the hydraulic oil tank.
5. When the hydraulic oil is drained, clean the hydraulic oil suction filter, refer to page **6-54**.
6. Tighten the drain plug **(3)** on the hydraulic oil tank.
7. Add new hydraulic oil to the tank.
8. Install the cover **(2)** and tighten the bolts **(1)** to **54.2 – 81.3 N·m** (**40 – 60 lb ft**).
9. Using a solvent, clean the periphery of the air bleed plug at top of the hydraulic pump. Loosen the air bleed plug. If any fluid comes out, remove the plug, and fill the pump with new clean hydraulic fluid.
10. Tighten the air bleed plug on the hydraulic pump.
11. Start the engine, and run it with no load for about **5 min**.
12. Move each control several times to remove all air from the system.
13. Park the machine at the specified position, and then stop the engine.
14. Check the oil level of the hydraulic tank, refill it with oil as necessary. Check that there are no bubbles in the hydraulic tank.
15. Loosen the air bleed plug on the pump, and check that air free fluid comes out from the bleed port.



SMIL16MEX1397BB 1

Every 6000 hours

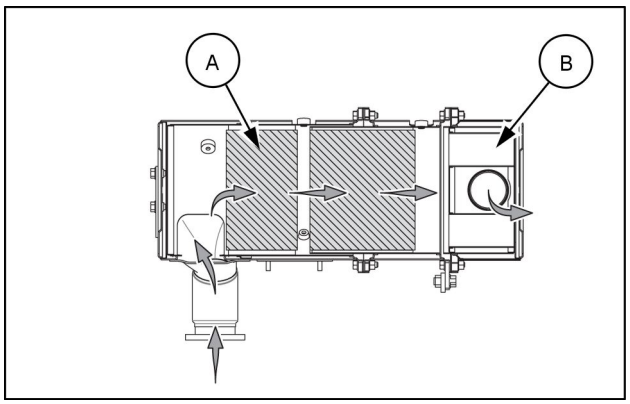
Diesel Particulate Filter (DPF) - SF filter

Clean the SF filter of the Diesel Particulate Filter (DPF) every **6000 h**

NOTICE: *you cannot use conventional tools to clean the SF filter **(A)** of the DPF.*

Contact your CASE CONSTRUCTION dealer. An authorized dealer must clean the SF filter **(A)** of the DPF with an approved cleaning machine.

(B) Silencer.



SMIL16MEX2605AA 1

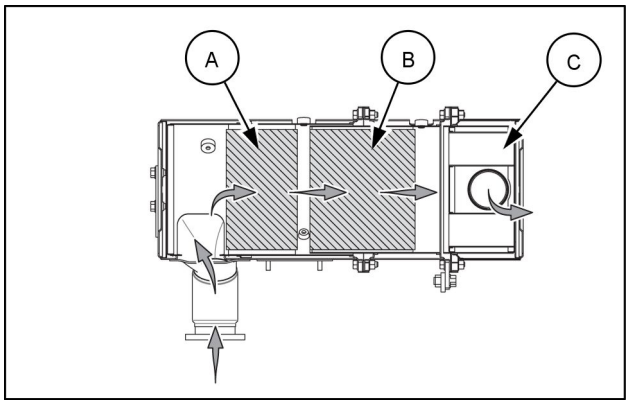
Every 9000 hours

Diesel Particulate Filter (DPF) - SF and DOC filters

Replace the SF and DOC filters of the Diesel Particulate Filter (DPF) every **9000 h**

Contact your CASE CONSTRUCTION dealer to replace the SF filter **(A)** and the DOC filter **(B)** of the DPF.

(C) Silencer.



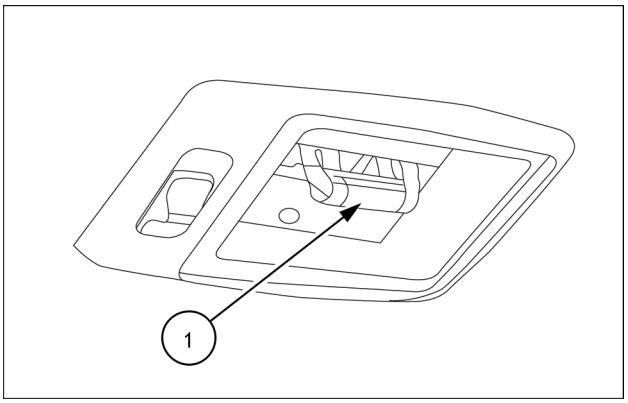
SMIL16MEX2605AA 1

When necessary

Bulb replacement

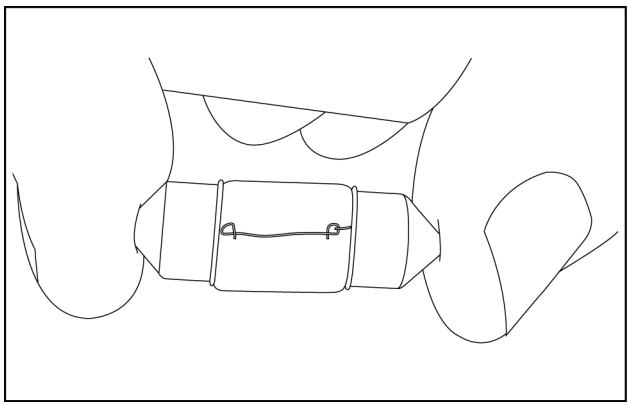
Lighting in the operator compartment

1. Use a flat screwdriver to remove the protective glass of the ceiling light in order to access the bulb **(1)**.



SMIL16MEX1117AA 1

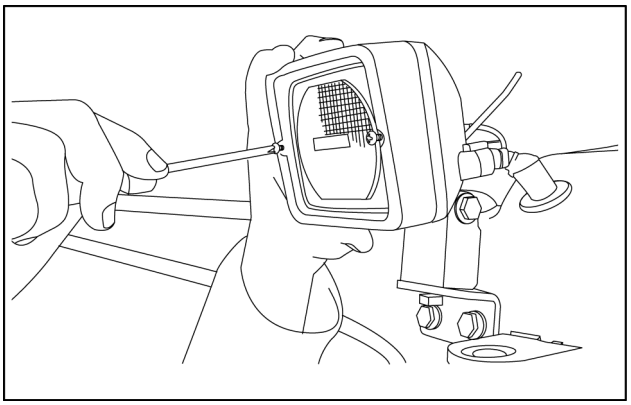
2. Remove the bulb and install a new one of the same wattage in the ceiling light.
3. Put the protective glass on the ceiling light and push it to lock.



SMIL16MEX0934AA 2

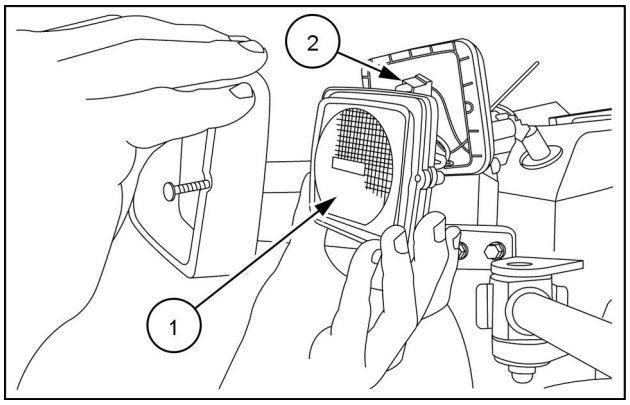
Working lights

1. Remove the two retaining screws.



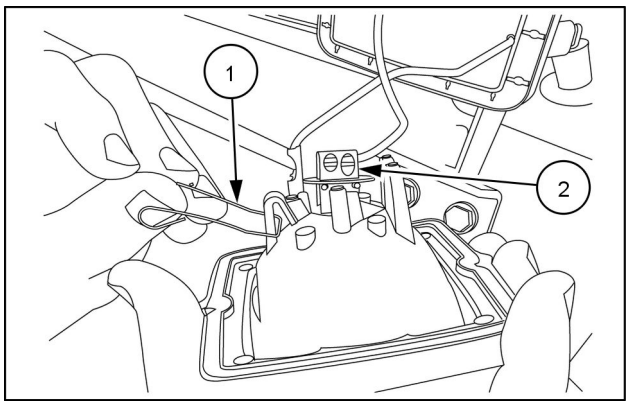
SMIL16MEX0939AA 3

2. Extract the working light **(1)** and disconnect the bulb plug **(2)**.



SMIL16MEX0935AA 4

3. Pull the clip outwards **(1)** and remove the bulb **(2)**.

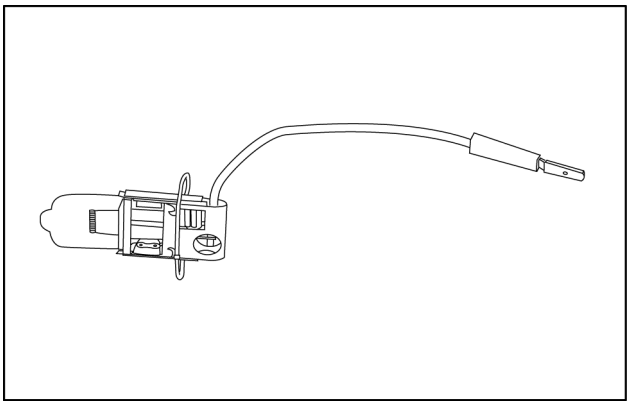


SMIL16MEX0937AA 5

4. Install a new bulb with the same wattage in the working light.

NOTE: *make sure of the correct position of the bulb.*

5. Push the clip inwards in order to lock the bulb.
6. Connect the bulb plug.
7. Put the working light back into position and tighten by means of the two retaining screws.

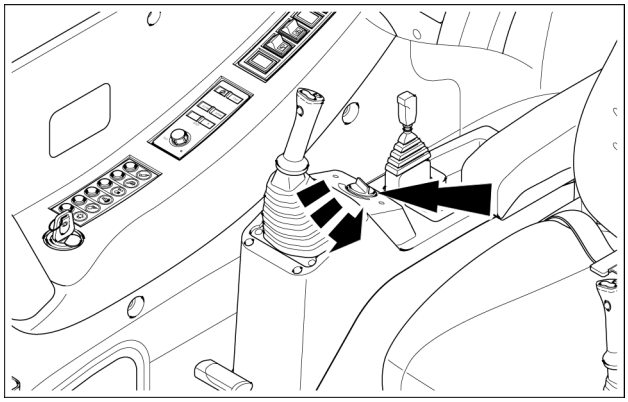


SMIL16MEX0938AA 6

Diesel Particulate Filter (DPF) regeneration

Manual regeneration of the Diesel Particulate Filter (DPF)

1. Perform the manual regeneration of the Diesel Particulate Filter (DPF) only if the machine is in an area away from any combustible materials.
2. Do not stop the machine during the manual regeneration.
3. Park the machine and set the accelerator knob to the low position.
4. Keep engine in low idle.

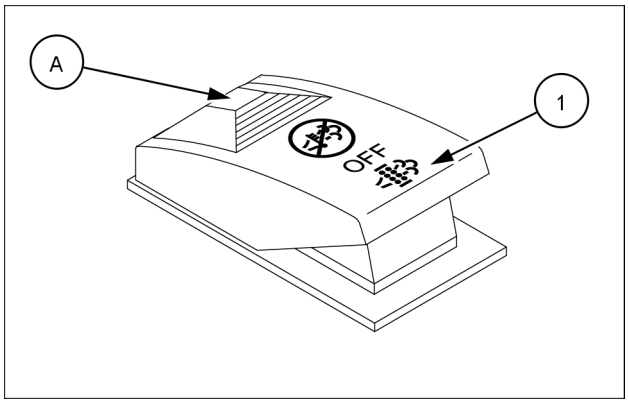


SMIL16MEX1399AA 1

5. Pull the safety button **(A)** and push the switch to the position **(1)**.

NOTE: *for more information about DPF switch, refer to page **3-21**.*

6. The engine speed increases gradually to high RPM and the DPF regeneration starts. The regeneration will take **25 – 30 min**



SMIL16MEX0509AA 2

7. When the manual regeneration starts, the DPF warning light turns OFF and the regeneration acknowledge light and the HEST warning light appear ON. The regeneration acknowledge light and the HEST warning light will turn OFF when the regeneration function is completed.

NOTE: *for more information about DPF warning lights, refer to page **3-27**.*

Regeneration	Warning lights		
	DPF	HEST	ACK
Start	Off	On	On
Complete	Off	Off	Off

Air-conditioning system filters

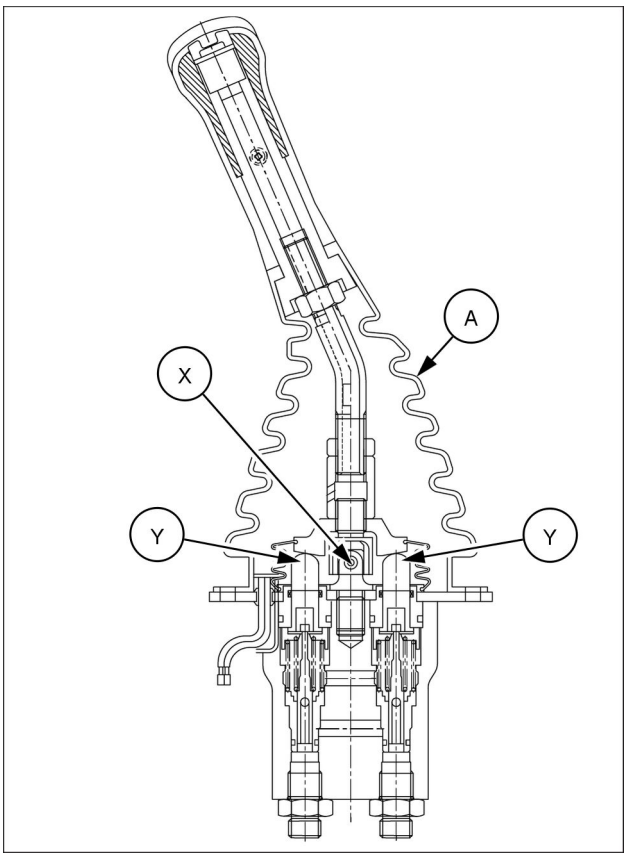
Clean and replace the air circulation filter and the inner filter of the air conditioning system when necessary.

To replace the air circulation filter and the inner filter of the air conditioning system perform the operations described on page **6-39**.

Control levers

Grease the hydraulic control levers when necessary
Fluid: **CASE AKCELA MOLY GREASE**

1. Remove the bellow **(A)** from the control lever.
2. Use a grease gun and grease the joint part **(X)** and the sliding parts **(Y)**.
3. Repeat the same operation for the other hydraulic control lever.



SMIL16MEX0443BA 1

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.*

Fuse and relay locations

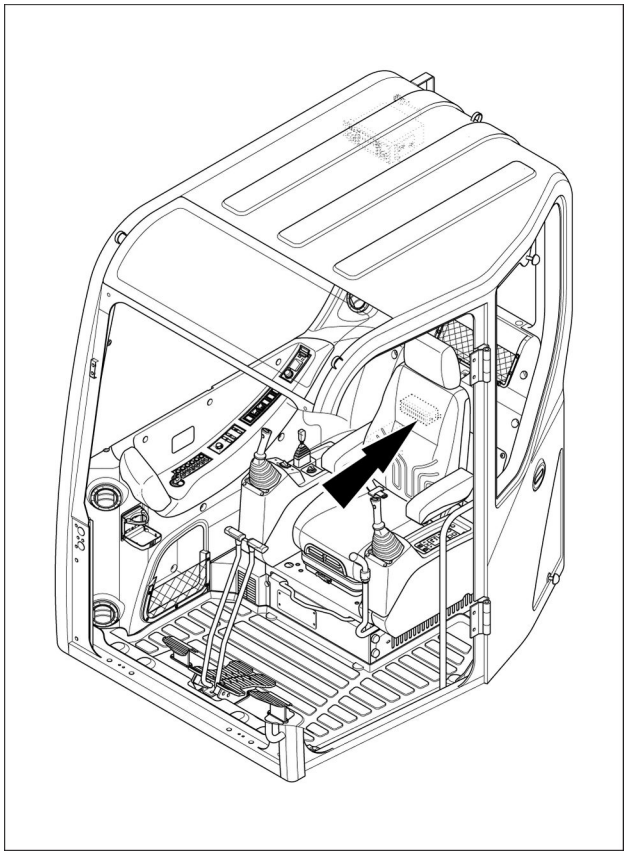
Fuses

The fuse box is located in the rear side panel of the cab, behind the operator’s seat, near the battery disconnect switch.
The fuse box cover indicates the function and amperage of each fuse.

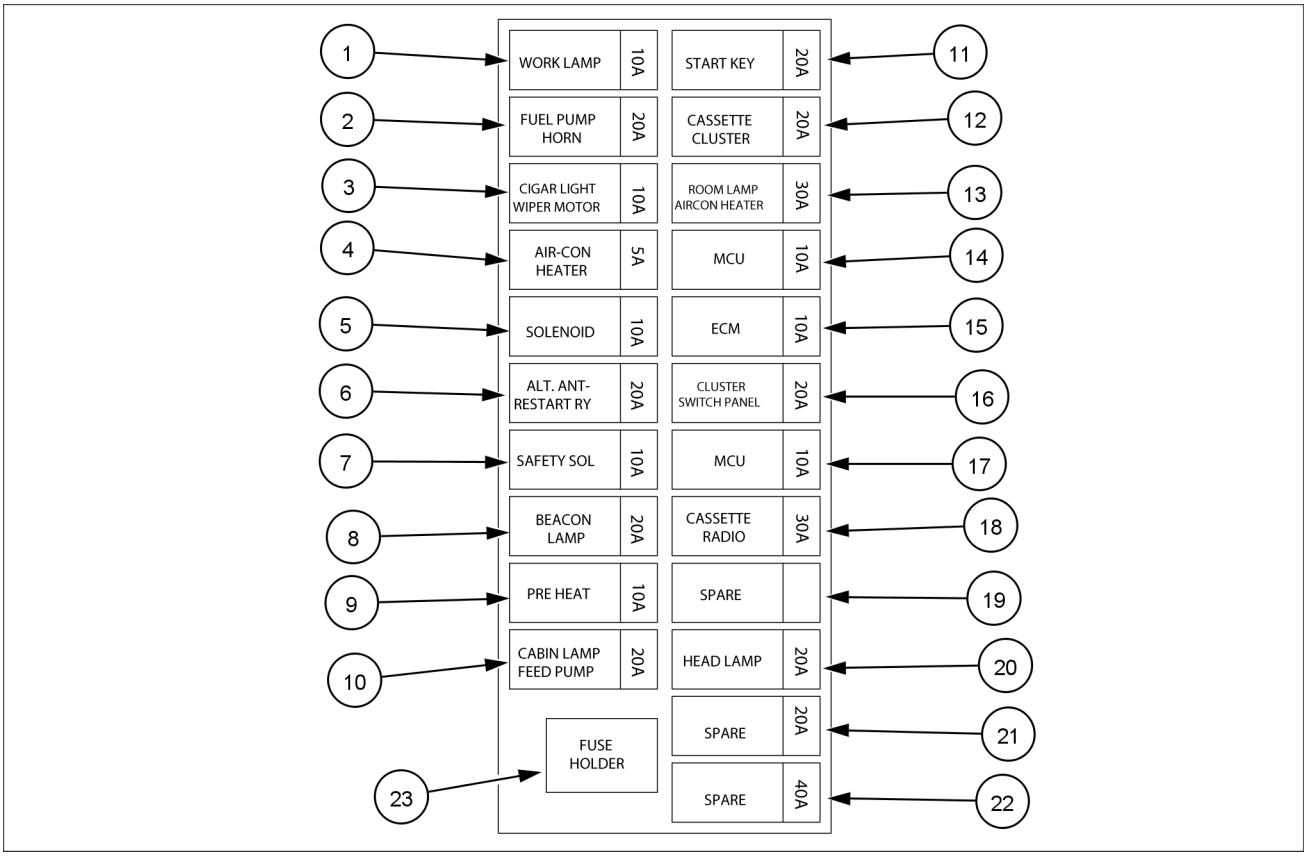
NOTICE: *before changing fuses or relays, turn the starter key to the OFF position.*

NOTICE: *never replace a fuse with a fuse of a different amperage.*

NOTE: *use the provided fuse puller to remove and install the fuses.*



SMIL16MEX1400BA 1



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(1) Work light **10 A**	**(13)** Air-conditioning / Heater / Room light **30 A**
(2) Fuel pump / Horn **20 A**	**(14)** MCU **10 A**
(3) Cigar light / Wiper motor **10 A**	**(15)** ECM **10 A**
(4) Air-conditioning / Heater **5 A**	**(16)** Cluster / Switch panel **20 A**
(5) Solenoid **10 A**	**(17)** MCU **10 A**
(6) Alternator / Start **20 A**	**(18)** Cassette / Radio **30 A**
(7) Safety solenoid **10 A**	**(19)** Spare
(8) Beacon light **20 A**	**(20)** Head light **20 A**
(9) Pre-heating **10 A**	**(21)**Spare **20 A**
(10) Cabin light / Feed P/P **20 A**	**(22)** Spare **40 A**
(11) Starter key **20 A**	**(23)** Fuse holder
(12) Cassette / Cluster **20 A**	

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 for as possible and lower the boom until the attachment is resting on the ground. Lower the dozer blade 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. Plug the air cleaner inlet and the exhaust pipe.
10. Remove the starter key, put the decal "NO OPERATION" on the console, and set the safety lock lever to rearward position (LOCK position).
11. Lock the engine 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 fluid levels and top up if necessary.
3. The condition of all lines, connectors and clamps (check for 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 controls and travel controls.
7. The grease on the cylinder rods.
8. Plug the air filter inlet and the exhaust pipe.

Starting up the machine after storage

⚠ 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 and clean the fuel filter. Replace the filter element as required.
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 (if equipped).
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" label, and start the engine following the engine starting procedure.
14. Check all the indicators and lights 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 oil pressure indicator light appears when the engine speed is raised after completion of warm up	Low oil level	Add the oil to the specified level
	Clogging in oil filter	Replace the oil filter cartridge
	Oil leaks	Check the correct tightening torque of pipes and joints
	Defect in cluster	See your authorized dealer
Steam is emitted from the top part of the radiator (the pressure valve). Coolant level warning light appears.	Low coolant level	Supply the coolant and check leakage
	Incorrect tension of fan belt	Adjust fan belt tension
	Dirty cooling system	Wash out inside of cooling system
	Dirty or damage on radiator fin	Clean the radiator fin or see your authorized dealer.
	Defect on thermostat	See your authorized dealer
	Incorrect tightening torque of radiator cap	Tighten the radiator cap firmly or replace the packing of it
	Defect in cluster	See your authorized dealer
The engine does not start when the starting motor is turned over	Low fuel level	Add fuel
	Air leaking in the fuel system	See your authorized dealer
	Defect or damage in the fuel injection pump or in the nozzle	See your authorized dealer
	Incorrect valve clearance	See your authorized dealer
	Incorrect engine compression pressure	See your authorized dealer
Exhaust gas is white or blue	Wrong oil quantity	Adjust to specified oil quantity
	Wrong fuel	Replace with specified fuel
Exhaust gas occasionally turns black	Air cleaner element dirty or damaged	Clean or replace the air cleaner element
	Defect in nozzle	See your authorized dealer
	Wrong engine compression pressure	See your authorized dealer
	Defect in turbocharger	See your authorized dealer
Combustion noise occasionally changes to breathing sound	Defect in nozzle	See your authorized dealer
Unusual combustion noise or mechanical noise	Wrong fuel	Check with specified fuel
	Over-heating	Check over-heating
	Defect in muffler	See your authorized dealer
	Incorrect valve clearance	See your authorized dealer

Electrical systems - Troubleshooting

NOTE: *this chapter describes the easy diagnostic methods for electrical system-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
Instrument cluster lights does not glow brightly even when engine runs at high speed. Lights flicker while engine runs	Terminals loosened or open circuit	See your authorized dealer
	Incorrect belt tension	Adjust belt tension
Battery charging light does not go out even when engine runs at high speed	Damaged alternator	See your authorized dealer
	Damaged wiring	See your authorized dealer
Unusual noise is emitted from the alternator	Damaged alternator	See your authorized dealer
Starter motor does not turn when starter switch is turned to START	Damaged wiring	See your authorized dealer
	Battery not charged	Charge the battery
	Damaged starter motor	See your authorized dealer
	Damaged safety relay	See your authorized dealer
The pinion of the starter motor keeps going in and out	Battery not charged	Charge the battery
	Damaged safety relay	See your authorized dealer
Starter motor turns the engine sluggishly	Battery not charged	Charge the battery
	Damaged starter motor	See your authorized dealer
The starter motor disengages before the engine starts up	Damaged wiring	See your authorized dealer
	Battery not charged	Charge the battery
The engine oil pressure light does not appear when engine is stationary (when the starter switch is in ON position)	Damaged engine oil pressure switch	See your authorized dealer
	Damaged instrument cluster	See your authorized dealer
Battery charging light does not appear when the engine is stationary. (when the starter switch is in ON position)	Damaged instrument cluster	See your authorized dealer
	Damaged wiring	See your authorized dealer

Machine Control Unit (MCU) - Troubleshooting

NOTE: *to match the pump absorption torque with the engine torque, MCU varies the electroproportional pressure reducing valve output pressure, which control pump discharge amount whenever feedbacked engine speed drops under the reference rpm of each mode set. Three LED lamps on the MCU display.*

Problem	Possible Cause	Correction
G (green) and R (red) are turned ON	Trouble on MCU	See your authorized dealer.
G (green) and Y (yellow) are turned ON	Trouble on serial communication line	See your authorized dealer.
Three LED are turned OFF	Trouble on MCU power	Check the fuse. See your authorized dealer.

Other systems - Troubleshooting

NOTE: *this chapter describes the easy diagnostic methods for generic 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
Track slip out of place. Excessive wear of the sprocket	Incorrect tension of track	Adjust tension of track
Bucket either rises slowly or not at all	Low oil level	Add oil to specified level
Slow speed of travel, swing, boom, arm and bucket	Low oil level	Add oil to specified level
Unusual noise emitted from pump	Hydraulic tank strainer clogged or dirty	Clean the hydraulic tank strainer
Excessive oil temperature rise of hydraulic oil	Dirty oil cooler	Clean the oil cooler
	Incorrect fan belt tension	Adjust fan belt tension
	Low oil level	Add oil to specified level

8 - SPECIFICATIONS

Machine specifications

Engine

Model	Yanmar 4TNV98C
Type	4-cycle diesel engine, low emission
Cooling method	Water cooling
Number of cylinders and arrangement	4 cylinders, in-line
Firing order	1 - 3 - 4 - 2
Combustion chamber type	Direct injection type
Cylinder bore x stroke	**98 mm** (**3.86 in**) x **110 mm** (**4.33 in**)
Piston displacement	**3319 cm³** (**203 in³**)
Compression ratio	18 : 1
Rated gross horse power (SAE J1995)	**48.3 kW** (**65.7 Hp**) at **2200 RPM**
Maximum torque at **1560 RPM**	**235.4 N·m** (**173.6 lb ft**)
Engine oil quantity	**11.6 L** (**3.1 US gal**)
Dry weight	**270 kg** (**595 lb**)
High idling speed	**2500 – 2600 RPM**
Low idling speed	**950 – 1050 RPM**
Rated fuel consumption	170 g/Hp·hr at **2400 RPM**
Starting motor	**12 V**, **3.0 kW**
Alternator	**12 V**, **100 A**
Battery	1 x **12 V** x **100 A·h**

Main pump

Type	Variable displacement axis piston pumps
Capacity	2 x **27.5 cm³/rev** (**1.7 in³/rev**)
Maximum pressure	**21581 kPa** (**3130 psi**)
Rated oil flow	2 x **55 L/min** (**14.5 US gpm**)
Rated speed	**2000 RPM**

Gear pump

Type	Fixed displacement gear pump single stage
Capacity	**18.3 – 22.8 cm³/rev** (**1.1 – 0.3 in³/rev**)
Maximum pressure	**21581 – 2965 kPa** (**3130 – 430 psi**)
Rated oil flow	**36.6 – 9 L/min** (**9.7 – 2.4 US gpm**)

Main control valve

Type	Sectional, 9 spools
Operating method	Hydraulic pilot system
Main relief valve pressure	**21581 kPa** (**3130 psi**)
Overload relief valve pressure	**23511 kPa** (**3410 psi**)

Swing motor

Type	Fixed displacement axial piston motor	
	Type 1	Type 2
Capacity	**28 cm³/rev** (**1.7 in³/rev**)	**31.5 cm³/rev** (**1.9 in³/rev**)
Gear ratio	23.2	19.46
Relief pressure	**21581 kPa** (**3130 psi**)	**21581 kPa** (**3130 psi**)
Braking torque	**115.2 N·m** (**85.0 lb ft**)	**142.4 N·m** (**105.0 lb ft**)
Brake release pressure	**2944 – 4902 kPa** (**427 – 711 psi**)	**1179 – 1958 kPa** (**171 – 284 psi**)
Reduction gear type	2 - stage planetary	2 - stage planetary
Braking system	Automatic, spring applied hydraulic released	

Travel motor

Type	Variable displacement axial piston motor
Relief pressure	**21581 kPa** (**3130 psi**)
Reduction gear type	2-stage planetary
Braking system	Automatic, spring applied hydraulic released
Brake release pressure	**883 kPa** (**128 psi**)
Braking torque	**82.7 N·m** (**61.0 lb ft**)
Capacity (first speed / second speed)	**43.7 – 22.7 cm³/rev** (**2.7 – 1.4 in³/rev**)
Gear ratio	53.706

Cylinder

Boom cylinder	Bore diameter x Rod diameter x Stroke	Ø **110 mm** (**4.3 in**) x Ø **60 mm** (**2.4 in**) x **715 mm** (**28.1 in**)
	Cushion	Extend only
Arm cylinder	Bore diameter x Rod diameter x Stroke	Ø **85 mm** (**3.3 in**) x Ø **55 mm** (**2.2 in**) x **840 mm** (**33.1 in**)
	Cushion	Extend and retract
Bucket cylinder	Bore diameter x Rod diameter x Stroke	Ø **80 mm** (**3.1 in**) x Ø **50 mm** (**2.0 in**) x **660 mm** (**26.0 in**)
	Cushion	—
Boom swing cylinder	Bore diameter x Rod diameter x Stroke	Ø **95 mm** (**3.7 in**) x Ø **50 mm** (**2.0 in**) x **519 mm** (**20.4 in**)
	Cushion	—
Dozer blade	Bore diameter x Rod diameter x Stroke	Ø **110 mm** (**4.3 in**) x Ø **60 mm** (**2.4 in**) x **224 mm** (**8.8 in**)
	Cushion	—

NOTE: *discoloration of cylinder rod can occur when the friction reduction additive of lubrication oil spreads on the rod surface.*
Discoloration does not cause any harmful effect on the cylinder performance.

Shoe

Shoe width	Steel	**380 mm** (**15.0 in**)
	Rubber	**450 mm** (**17.7 in**)
Ground pressure	Steel	**35.2 kPa** (**5.1 psi**)
	Rubber	**35.2 kPa** (**5.1 psi**)
Overall width	Steel	**1980 mm** (**78.0 in**)
	Rubber	**2050 mm** (**80.7 in**)

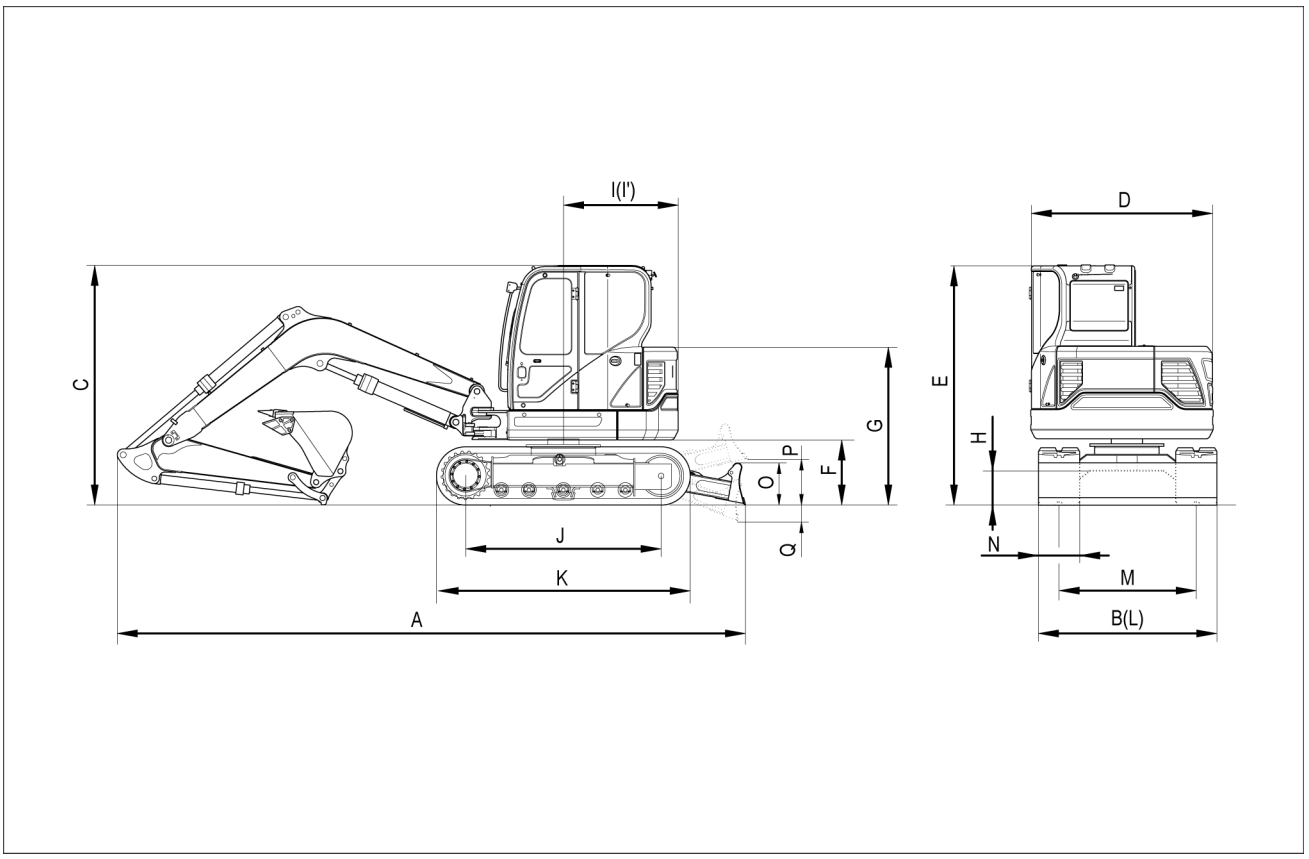
Number of rollers and shoe on each side

Carrier rollers: 1

Track rollers: 5

Track shoes (steel): 40

Dimensions



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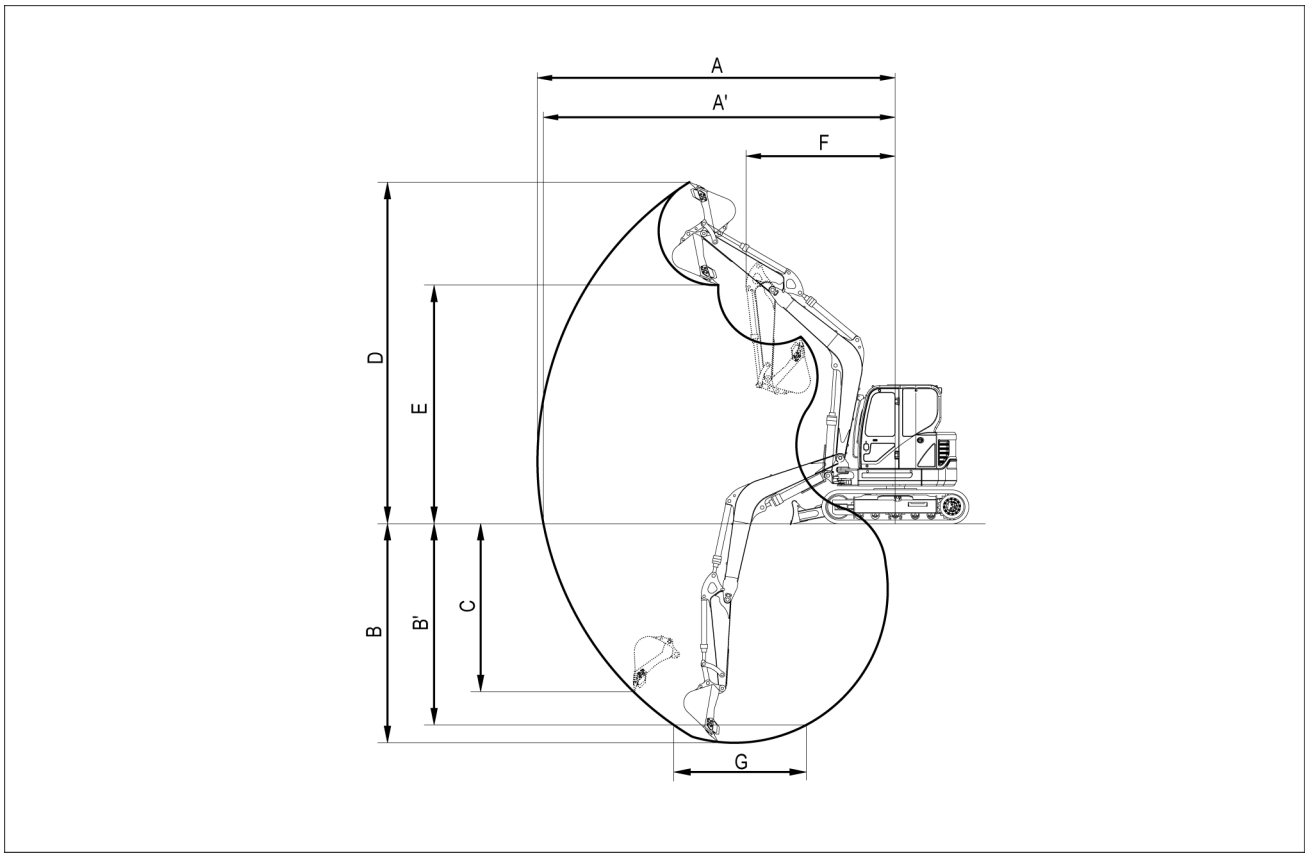
(A) Overall length	**5600 mm** (**220.5 in**)
(B) Overall width, with **380 mm** (**15.0 in**) shoe	**1980 mm** (**78.0 in**)
(C) Overall height	**2550 mm** (**100.4 in**)
(D) Superstructure width	**1950 mm** (**76.8 in**)
(E) Overall height of cab	**2550 mm** (**100.4 in**)
(F) Ground clearance of counterweight	**660 mm** (**26.0 in**)
(G) Engine cover height	**1670 mm** (**65.7 in**)
(H) Minimum ground clearance	**380 mm** (**15.0 in**)
(I) Rear-end distance	**1080 mm** (**42.5 in**)
(I') Rear-end swing radius	**1080 mm** (**42.5 in**)
(J) Distance between tumblers	**1990 mm** (**78.3 in**)
(K) Undercarriage length	**2530 mm** (**99.6 in**)
(L) Undercarriage width	**1980 mm** (**78.0 in**)
(M) Track gauge	**1600 mm** (**63.0 in**)
(N) Track shoe width, standard	**380 mm** (**15.0 in**)
(O) Height of blade	**350 mm** (**13.8 in**)
(P) Ground clearance of blade up	**200 mm** (**7.9 in**)
(Q) Depth of blade down	**700 mm** (**27.6 in**)

Boom length: **2.9 m** (**114.173 in**)
Arm length: **1.48 m** (**58.268 in**)
With boom swing system

Working range



SMIL16MEX1412FB 2

(A) Maximum digging reach		**6150 mm** (**242.1 in**)
(A') Maximum digging reach on ground		**6010 mm** (**236.6 in**)
(B) Maximum digging depth		**3570 mm** (**140.6 in**)
(B') Maximum digging depth (8ft level)		**3160 mm** (**124.4 in**)
(C) Maximum vertical wall digging depth		**3040 mm** (**119.7 in**)
(D) Maximum digging height		**5680 mm** (**223.6 in**)
(E) Maximum dumping height		**3930 mm** (**154.7 in**)
(F) Minimum swing radius		**2420 mm** (**95.3 in**)
Boom swing radius (left-hand/right-hand) G = **2.4 m** (**8.0 ft**)		**70 °** / **50 °**
Bucket digging force	SAE	**36.6 kN** (**8228.0 lb**)
	ISO	**40.9 kN** (**9194.7 lb**)
Arm crowd force	SAE	**25.6 kN** (**5755.1 lb**)
	ISO	**26.5 kN** (**5957.4 lb**)

Mono boom with boom swing system: **2.9 m** (**114.173 in**)

Weights

Components

Operating weight	**5900 kg** (**13007 lb**)
Upperstructure assembly	**2895 kg** (**6382 lb**)
Main frame weld assembly	**570 kg** (**1257 lb**)
Engine assembly	**280 kg** (**617 lb**)
Main pump assembly	**30 kg** (**66 lb**)
Main control valve assembly	**40 kg** (**88 lb**)
Swing motor assembly	**50 kg** (**110 lb**)
Hydraulic oil tank assembly	**60 kg** (**132 lb**)
Fuel tank assembly	**55 kg** (**121 lb**)
Boom swing post	**135 kg** (**298 lb**)
Counterweight	**470 kg** (**1036 lb**)
Cab assembly	**350 kg** (**772 lb**)
Lower chassis assembly	**2275 kg** (**5016 lb**)
Track frame weld assembly	**790 kg** (**1742 lb**)
Swing bearing	**94 kg** (**207 lb**)
Travel motor assembly	**80 kg** (**176 lb**) x 2
Turning joint	**30 kg** (**66 lb**)
Track recoil spring	**20 kg** (**44 lb**)
Idler & tension body	**73 kg** (**161 lb**) x 2
Carrier roller	**12 kg** (**26 lb**) x 2
Track roller	**12 kg** (**26 lb**) x 10
Sprocket	**17 kg** (**37 lb**) x 2
Track-chain assembly (**380 mm** (**15.0 in**) standard triple grouser shoe)	**325 kg** (**717 lb**) x 2
Dozer blade assembly	**210 kg** (**463 lb**)
Front attachment assembly (**2.9 m** (**114.2 in**) boom, **1.48 m** (**58.3 in**) arm, **0.18 m³** (**0.24 yd³**) SAE heaped bucket)	**730 kg** (**1609 lb**)
2.9 m (**114.2 in**) boom assembly	**240 kg** (**529 lb**)
1.48 m (**58.3 in**) arm assembly	**120 kg** (**265 lb**)
0.18 m³ (**6.36 ft³**) SAE heaped bucket	**170 kg** (**375 lb**)
Boom cylinder assembly	**78 kg** (**172 lb**)
Arm cylinder assembly	**53 kg** (**117 lb**)
Bucket cylinder assembly	**33 kg** (**73 lb**)
Bucket control link assembly	**40 kg** (**88 lb**)
Dozer cylinder assembly	**35 kg** (**77 lb**)
Boom swing cylinder assembly	**40 kg** (**88 lb**)

9 - ACCESSORIES

Direct fit buckets

The data shown below are referred to working operation with the dozer blade up, the **470 kg** (**1036 lb**) counterweight, and **400 mm** (**15.75 in**) shoe rubber.

Minimum lift value as function of the arm:

- **1.48 m** (**58.27 in**) arm, minimum lift value: **530 kg** (**1168 lb**).
- **1.90 m** (**74.80 in**) arm, minimum lift value: **450 kg** (**992 lb**).

Direct fit buckets application as function of the arm

General purpose buckets			Arm	
Capacity **ISO 7451** (Heaped)	Width	Mass	**1.48 m** (**58.27 in**)	**1.90 m** (**74.80 in**)
0.08 m³ (**0.11 yd³**)	**305 mm** (**12.01 in**)	**86 kg** (**189.60 lb**)	●	●
0.13 m³ (**0.17 yd³**)	**457 mm** (**17.99 in**)	**109 kg** (**240.30 lb**)	●	●
0.18 m³ (**0.24 yd³**)	**610 mm** (**24.02 in**)	**132 kg** (**291.01 lb**)	●	●

● Density of material up to 1.6 t/m^3

NOTICE: *make particular attention when swing the boom to the left-hand side: the attachment may collide with the cab.*

Auxiliary hydraulic circuits

Circuit configuration

As for breaker oil pressure line, use extra spool of main control valve.

Set proper breaker pressure on load relief valve.

The pressure of the system is **21580 kPa** (**3130 psi**).

The accumulator should be used to the breaker charging and return line. If the accumulator is not used, it will be damage as the input wave is delivered.
Keep the pressure pulsation of pump below **5881.2 kPa** (**853.0 psi**) by installing the accumulator.

Do not connect the breaker return line to the main control, but connect to the return line front of the cooler.

Do not connect the breaker return line to drain lines, such as of swing motor, travel motor or pump, otherwise they should be damaged.

One of spool of the main control valve should be connected to the tank.

Select the size of pipe laying considering the back pressure.

Shim-less tube should be used for the piping.

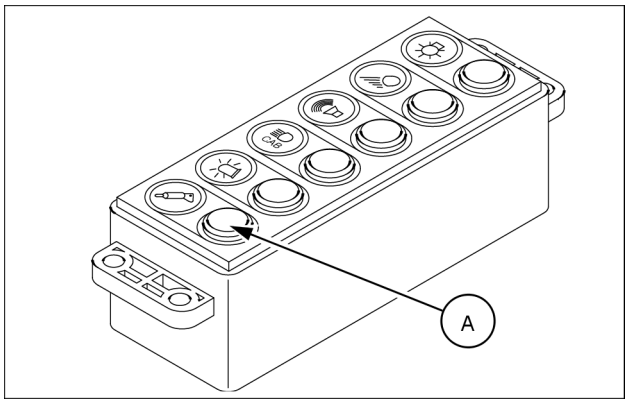
Weld the bracket for pipe clamp to prevent damage caused by vibration.

Operating controls

The flow rate/pressure characteristic of the auxiliary circuit can be set according to the type and to the specifications of the attachment used.

NOTICE: *before operating any hydraulic attachment be sure to set the proper attachment mode (breaker or crusher) and the proper hydraulic flow rate/pressure characteristic. If the attachment mode or the hydraulic flow rate/pressure characteristic are not properly set, malfunction or failure may occur to the machine or damage may occur to the hydraulic attachment.*

To activate the breaker, press the breaker selection button **(A)**.



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Breaker trigger switch (Optional)

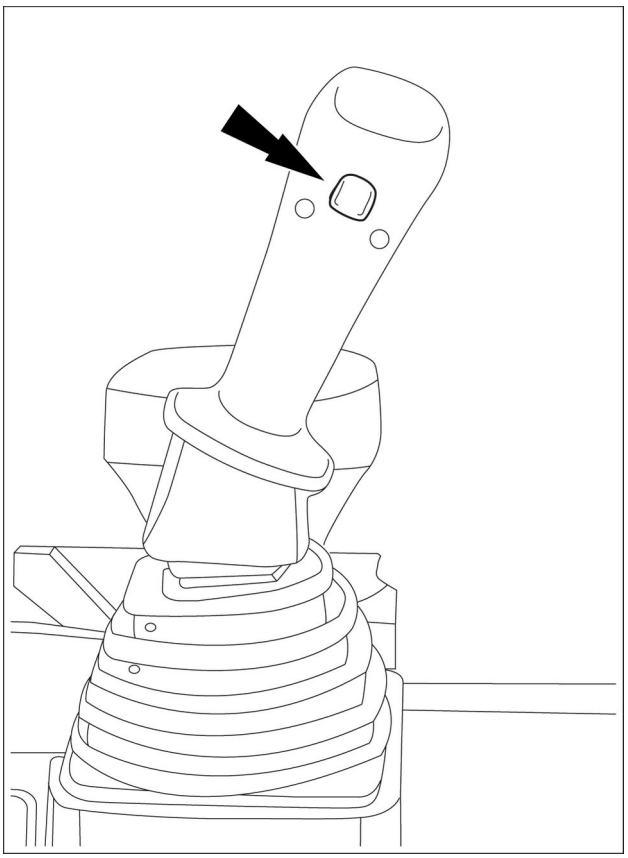
The breaker can be operated by means of the trigger switch located on the right-hand control lever.

NOTE: *the breaker operates only when the breaker selection switch on the switch panel is selected.*

This function applies to single action hydraulic attachment circuit.

When breaker operating is finished, stop the engine and push the trigger switch to release pressure in the breaker circuit.

Consult your CASE CONSTRUCTION dealer to select the optional accessory compatible with your machine and to correctly adjust the flow required for its use.



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2-way selection proportional switch (Optional)

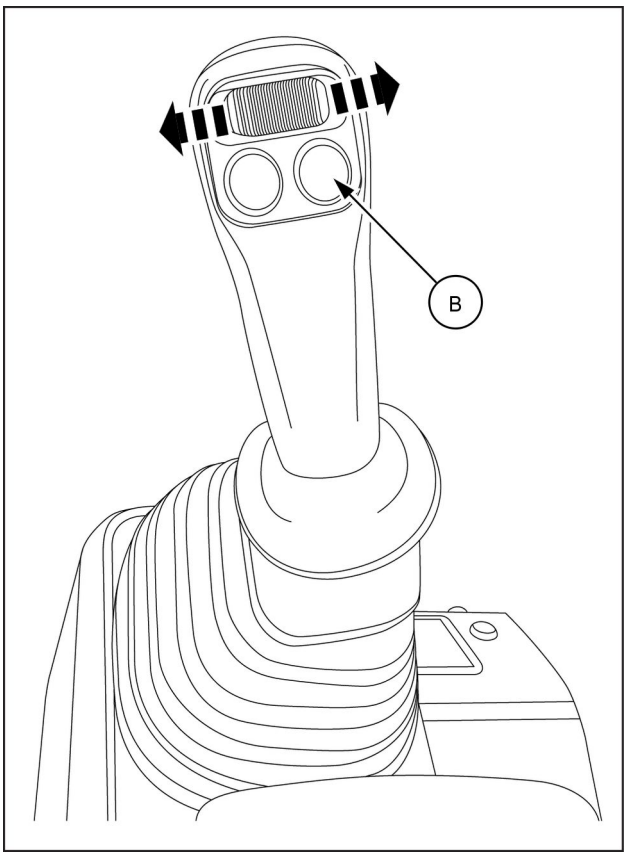
Clamshell or shear can be operated by means of the proportional switch on the right-hand control lever. This function applies to double action hydraulic attachment circuit.

The basic operation of the 2-way selection proportional switch are the following:

- Operate the proportional switch to the left to open the clamshell or shear.
- Operate the proportional switch to the right to close the clamshell or shear.

Consult your CASE CONSTRUCTION dealer to select the optional accessory compatible with your machine and to correctly adjust the flow required for its use.

(B) Horn switch.



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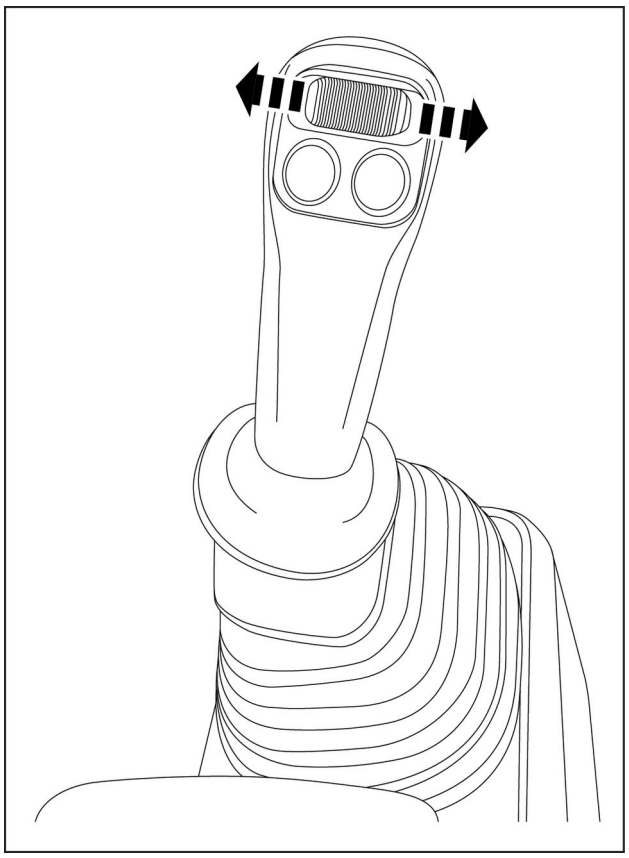
4-way selection proportional switch (Optional)

The attachment can be rotated by means of the proportional switch on the left-hand control lever. This function applies to double action hydraulic attachment circuit.

The basic operation of the 4-way selection proportional switch are the following:

- Operate the proportional switch to the left-hand to rotate counterclockwise the attachment.
- Operate the proportional switch to the right-hand to rotate clockwise the attachment.

Consult your CASE CONSTRUCTION dealer to select the optional accessory compatible with your machine and to correctly adjust the flow required for its use.



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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 damage 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.*

Make sure to read and understand the Operator's Manual of the hydraulic attachment.

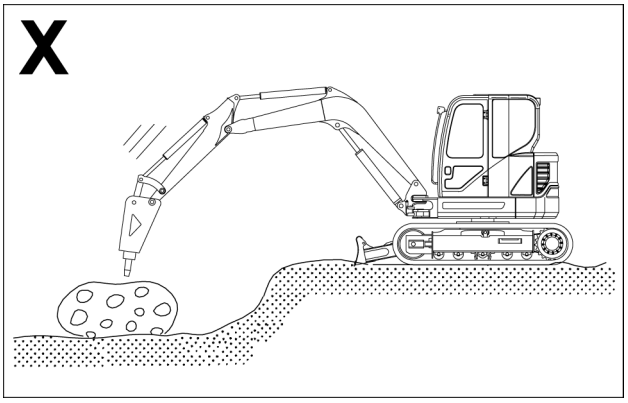
Always refer to the Operator's Manual of the hydraulic attachment for proper and safe installation of the attachment to the machine.

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 specific attachments (e.g. replacement of the hydraulic filters and of the hydraulic fluid, greasing of the pins of the bucket linkage).

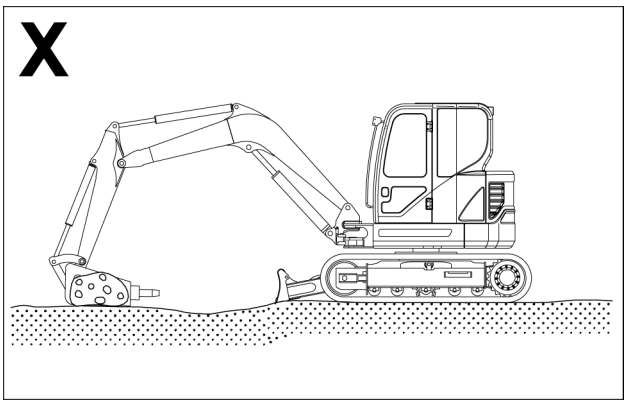
Precautions while operating the hydraulic breaker

Avoid hitting objects with breaker. The breaker is heavier than the bucket and lowers faster. This may cause damages to the breaker, attachment, and upperstructure. Always lower the breaker slowly until the chisel point touches the object to be broken before starting breaker operation.



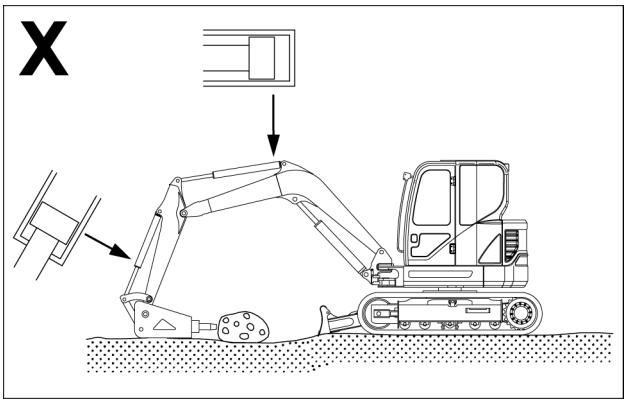
SMIL16MEX1402AA 5

Do not use the hydraulic breaker and/or swing function to push objects as damages to the attachment may result.



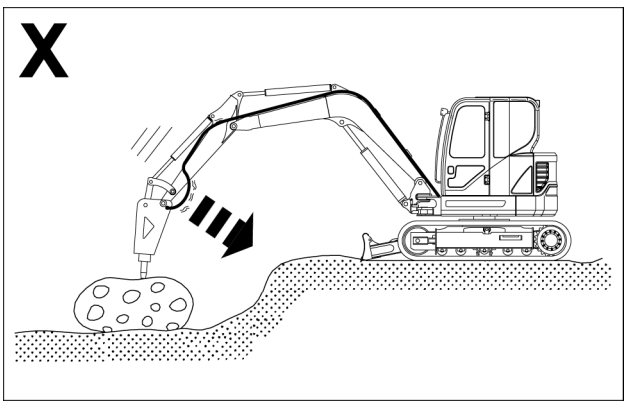
SMIL16MEX1403AA 6

Do not operate the breaker with the excavator cylinders fully extended or retracted to avoid attachment and/or cylinder damage.



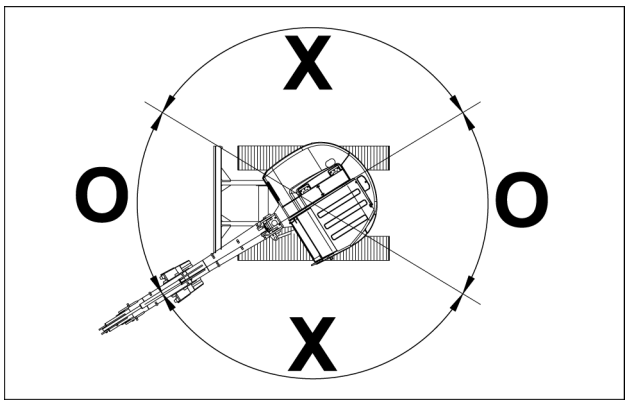
SMIL16MEX1404AA 7

Stop working if hydraulic hoses look abnormally bent. Contact your authorized Dealer.



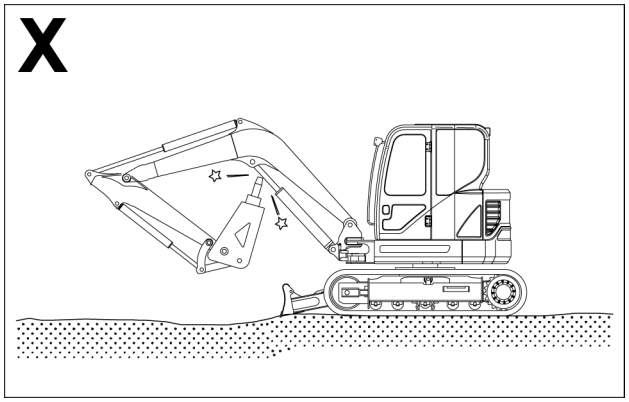
SMIL16MEX1078AA 8

Do not operate the breaker to the side of the machine. The machine may become unstable and undercarriage components life may be reduced.



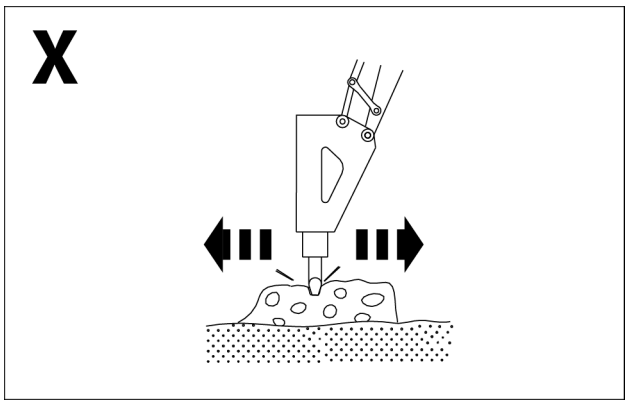
SMIL16MEX1406AA 9

Operate the excavator carefully to avoid hitting the boom with the hydraulic breaker.



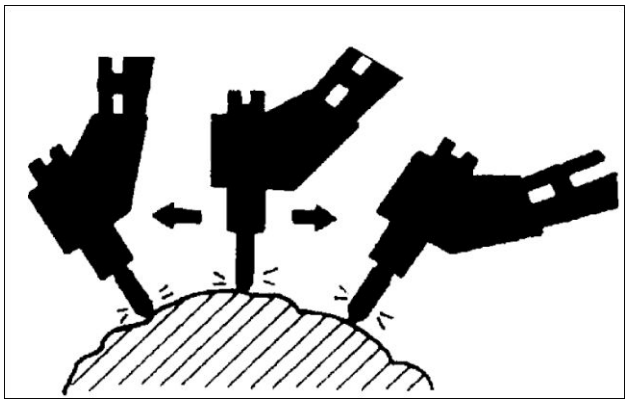
SMIL16MEX1407AA 10

Do not operate the breaker while striking. This can cause damage to the working device and to the swing system.



SMIL16MEX0467AA 11

Do not operate the hydraulic breaker continuously longer than **60 s**. Excessive chisel wear will result. If an object could not be broken within **60 s**, apply chisel to other locations, less than **60 s** for each location.



NH0205 12

Hydraulic oil - breaker/nibbler

When using the hydraulic breaker, hydraulic fluid deteriorates more quickly than during ordinary digging. Check the hydraulic fluid level more frequently. In addition, when changing the filters, also check the condition of the hydraulic fluid.

Use the following table to determine the interval for changing the hydraulic fluid and filters when using the hydraulic breaker.

Maintenance action	Operating the breaker (rate 100%)	Normal use
Hydraulic oil replacement	Every **600 h**	Every **5000 h**
Hydraulic oil return filter replacement	Every **100 h**	Every **250 h**
Pilot line filter replacement	Every **100 h**	Every **250 h**

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 handling eye, 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 self-locking 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.*

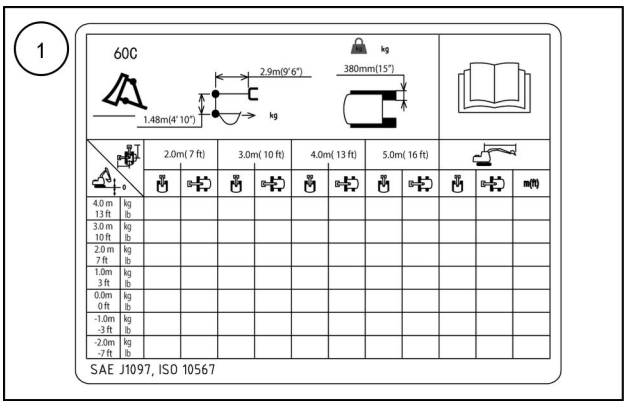
NOTICE: *a suspended load can swing freely, and it can thus hit persons or the cab of the machine. Make sure that all bystanders are moved away from the field of action of the machine, and make sure to handle the load slowly. If the load starts to swing during the handling, lower it slowly to the ground and sling it in a way that avoid unintended swinging as much as possible.*

NOTICE: *load handling eye rated lifting load RLL:* ***3000 kg*** *(****6614 lb****).*

To handle suspended loads proceed as described below:

- Evaluate (if not known) 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.
- Press the overload switch **(2)** to activate the overload warning alarm. The overload warning alarm is intended to avoid lifting of excessive loads.

  NOTICE: *if an overload condition is detected during the handling of the load, When the machine is overloaded, a buzzer sounds and the overload warning light in the instrument cluster is ON. Place the load onto the ground and check the load conditions making reference to the chart located inside the cab.*
- Secure the load with the load handling eye **(3)** located on the bucket linkage rod, 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.
- Extend the bucket cylinder to end stroke.
- Check the surrounding working area and make sure that the path to be travelled with the load is free from obstacles.
- 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.
- Position and place the load where desired, making sure that it is resting on a solid base appropriate for its mass.
- Remove the chains.



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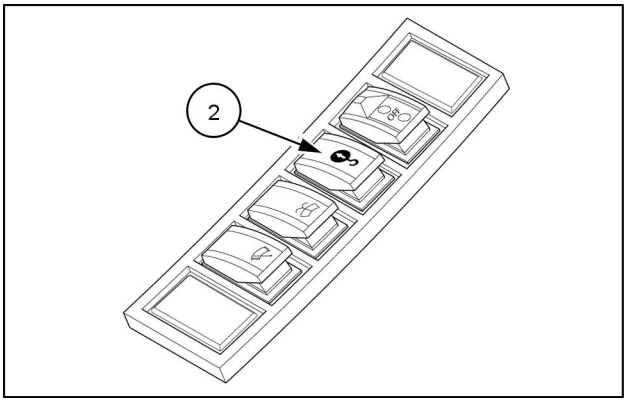
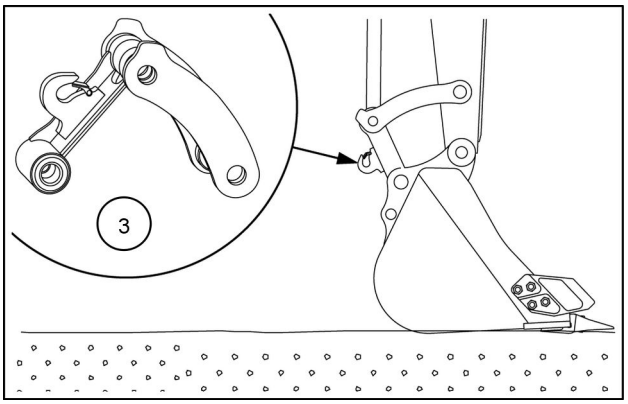


SMIL16MEX3229AA 2

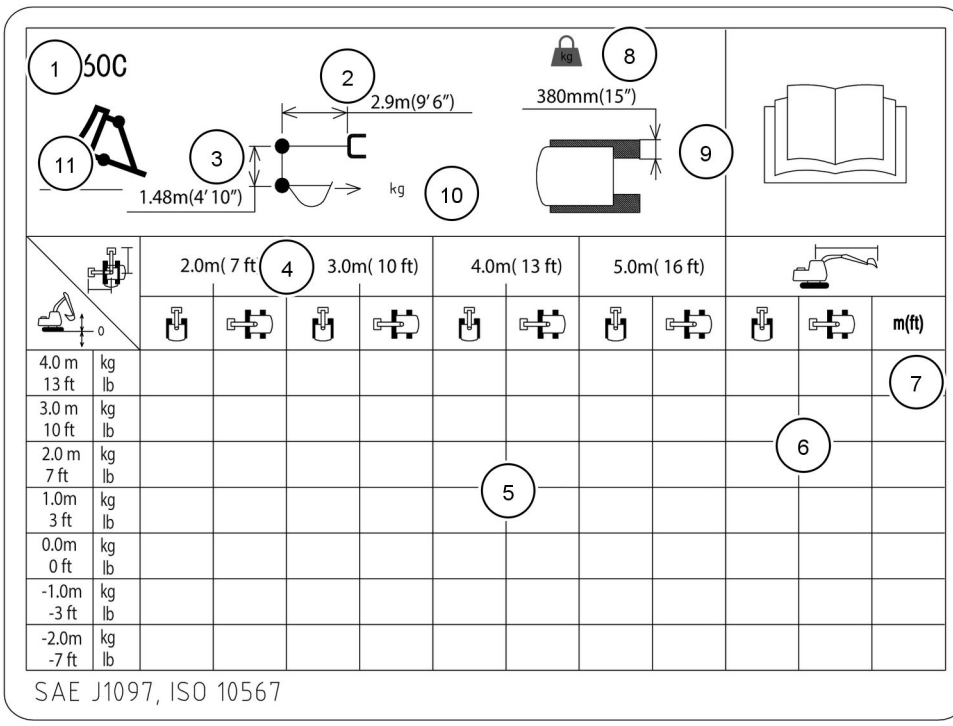


SMIL16MEX1105AA 3

Loads handling chart

The loads handling chart indicates the rated lift capacities that shall be considered at different distances from the swing axis.

The rated lift capacity is defined according to SAE J1097 and ISO 10567 as the smaller value of either the rated tipping load (**75 %** of the tipping load) or the rated hydraulic lift capacity (**87 %** of the hydraulic lift capacity).



SMIL16MEX3241FA 4

1. Model name
2. Boom length
3. Arm length
4. Load radius
5. Rated lift capacity
6. Rated lift capacity at maximum reach.
7. Maximum reach
8. Counterweight mass (in case of an additional counterweight, two weight icons are shown).
9. Track shoe width
10. Bucket weight
11. Dozer blade position

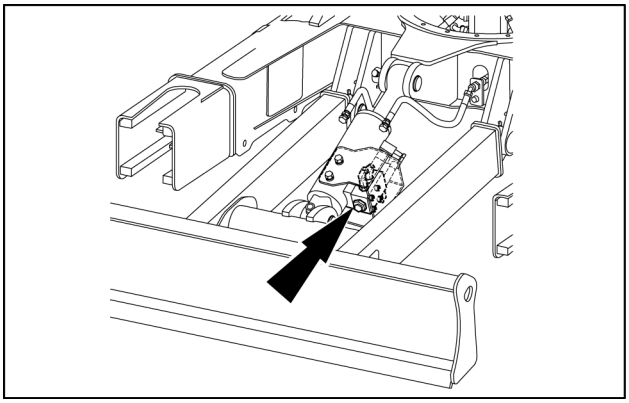
Safety valves

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.

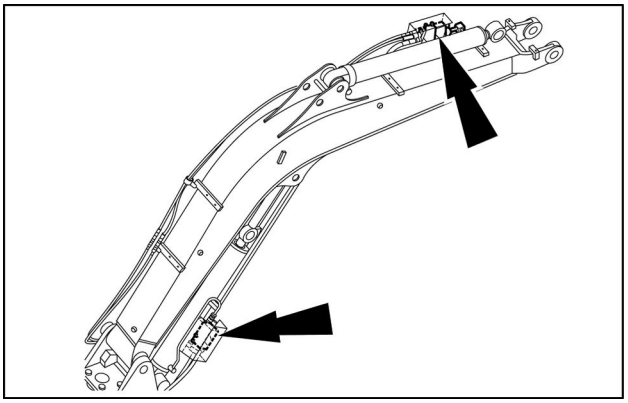
Moreover, the safety valves allow to keep the front equipment in the selected operating position reducing the leakages that occur in the neutral position of the boom spool and the arm spool in the main control valve.

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.*



SMIL16MEX1104AB 5

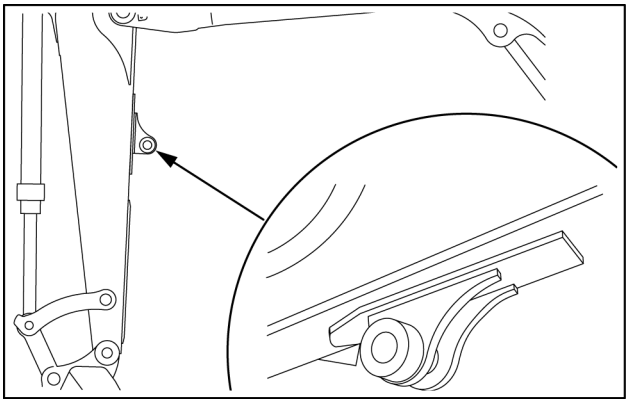


SMIL16MEX1125AA 6

Thumb bracket

The arm can be equipped with the bracket in order to install a hydraulic thumb.

NOTE: *consult your CASE CONSTRUCTION dealer to select the hydraulic thumb compatible with your machine and to install it correctly.*



SMIL16MEX1106AA 1

Fuel tank filler pump

If the machine is refuelled often or regularly with fuel from cans or barrels, there is an increased risk of foreign matter and water getting into the fuel system.

In this case:

- always refuel through a fine mesh filter;
- use only intake hoses with a fine mesh filter;
- drain off water from the fuel filter more often than specified in the maintenance schedule.

NOTICE: *refuel only with decanted fuel. We suggest to refuel at the end of each working day, condensation will so be avoided during overnight down-time. Do not let the tank run out of fuel because air could penetrate inside of the supply circuit and would require the air bleeding.*

By means of the refueling system, fuel can be pumped from a large spare container into the machine tank.

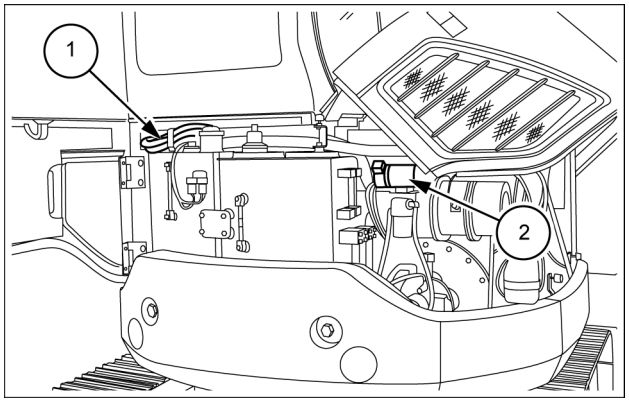
NOTICE: *before refueling, the tank cap must be opened to avoid overpressure in the tank and risks of dangerous fuel leaks.*

NOTICE: *read and observe: refueling with the refueling system, safety instructions.*

The refueling system is installed on the rear side of the machine.

The refueling system consists of:

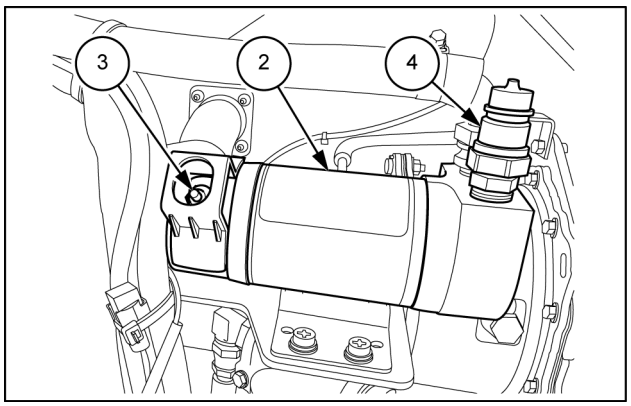
- a plastic filling hose **(1)**;
- an electric refuel pump **(2)**.



SMIL16MEX1506AB 1

Refueling tank operation

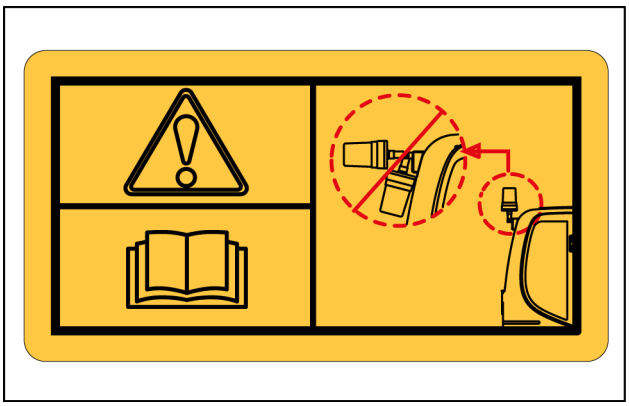
1. Open the engine hood and the rear door, then remove the fuel tank cap.
2. Connect the filling hose to the electric refuel pump **(2)** by means the pipe union **(4)**.
3. Plunge the end of the filling hose into the container/ collection tank.
4. Set the switch **(3)** in “ON” position and fill the fuel tank.
5. When the fuel tank is full, set the switch **(3)** in “OFF” position.
6. Remove the end of the filling hose from the fuel container/collection tank and disconnect it from the pipe union **(4)** of the electric refuel pump **(2)**. Thoroughly clean filling hose from any fuel residues, roll up again and put it back into the rear side of the machine.
7. Reinstall the cap on the fuel tank.



SMIL16MEX1118AB 2

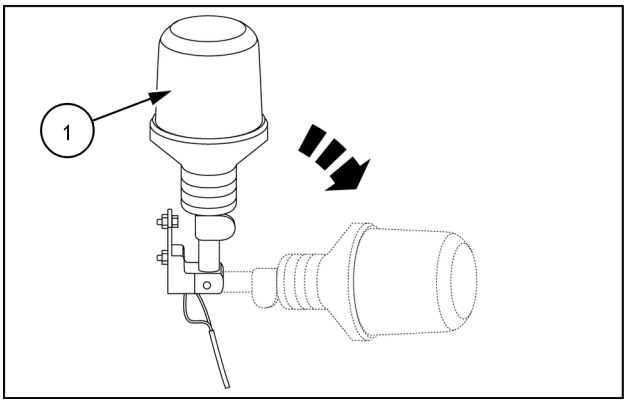
Rotating beacon

When you operate a machine on a road or beside a road, a rotating beacon is required to avoid any traffic accident. Please contact your CASE CONSTRUCTION dealer to install it.



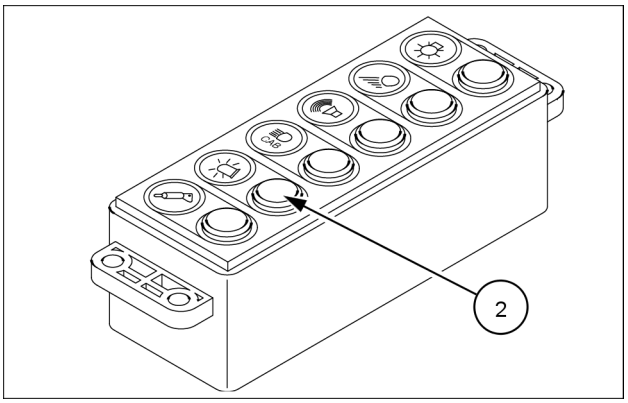
SMIL16MEX0021AA 1

During the machine transfer, change the position of the light to the horizontal position.
Before starting the machine operations, make sure that the beacon **(1)** light maintains a vertical position.
A horizontal position can result in a decrease in life time of the light due to the infiltration of foreign substances such as dust or water.



SMIL16MEX1108AA 2

Press the beacon switch **(2)** located on the right–hand side of the cab to activate the beacon light on the cab and the indicator light on the switch.



SMIL16MEX0506AA 3

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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.

CASE CONSTRUCTION