ORIGINAL INSTRUCTIONS

CX145D SR
Crawler 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 all kinds of earthmoving and rehandling operations. If you want to use this machine to handle a load (pipes, culverts, formwork, etc.), make sure that it is designed to carry out this kind of work. For this type of application, the machine must be equipped with safety valves, a load handling chart corresponding to the type of machine and its attachment and a load fixing point. All legal requirements must also be strictly observed.

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

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

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

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

Your CASE CONSTRUCTION Dealer is at your disposal for any further information. He will also provide any after-sales service you may require, and genuine CASE CONSTRUCTION spare parts, your guarantee of quality and match. CASE CONSTRUCTION customer assistance is also available. Call 1-866-54-CASE6 (1-866-542-2736) or email casecustomerassistance.na@cnhind.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.

Your CASE CONSTRUCTION Dealer can provide after-sales service and genuine CASE CONSTRUCTION spare parts, your guarantee of quality and match.

CNH Industrial America LLC. Company 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.

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Intended use

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

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

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

Electro-Magnetic Compatibility (EMC)

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

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 is equipped with a telematics system. This is an asset-monitoring system that combines Internet, cellular, and GPS technologies. A transponder unit is mounted on the equipment that wirelessly communicates with the user interface CASE 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 (e.g., installation of dual wheels). Conversion activities must be done:

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

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

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

Before you operate

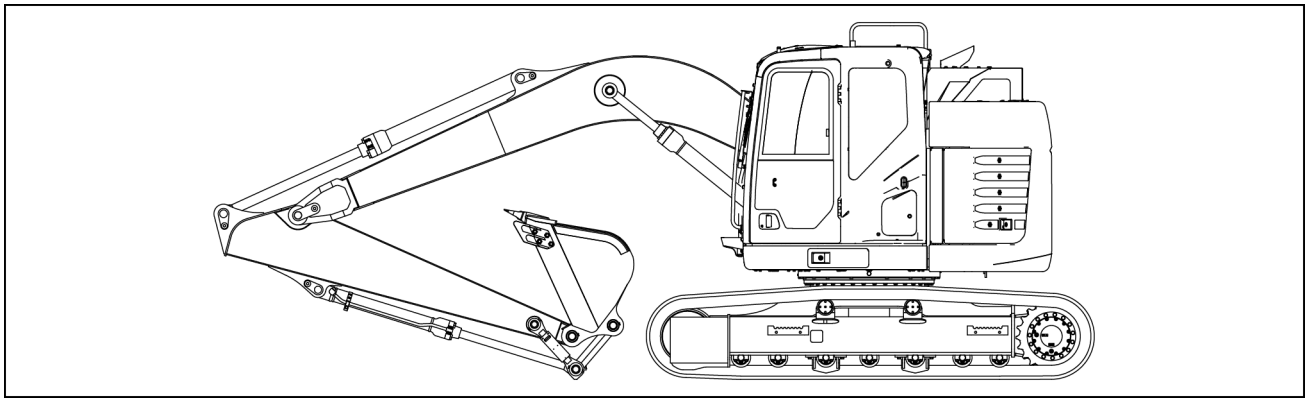
Read this manual before you start the engine or operate this CASE CONSTRUCTION machine. Contact your CASE CONSTRUCTION dealer if:

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

All persons training to operate, or who will operate this CASE CONSTRUCTION machine should be old enough to possess a valid local vehicle operating permit (or meet other applicable local age requirements). These persons must demonstrate the ability to operate and service the CASE CONSTRUCTION machine in a correct and safe manner.

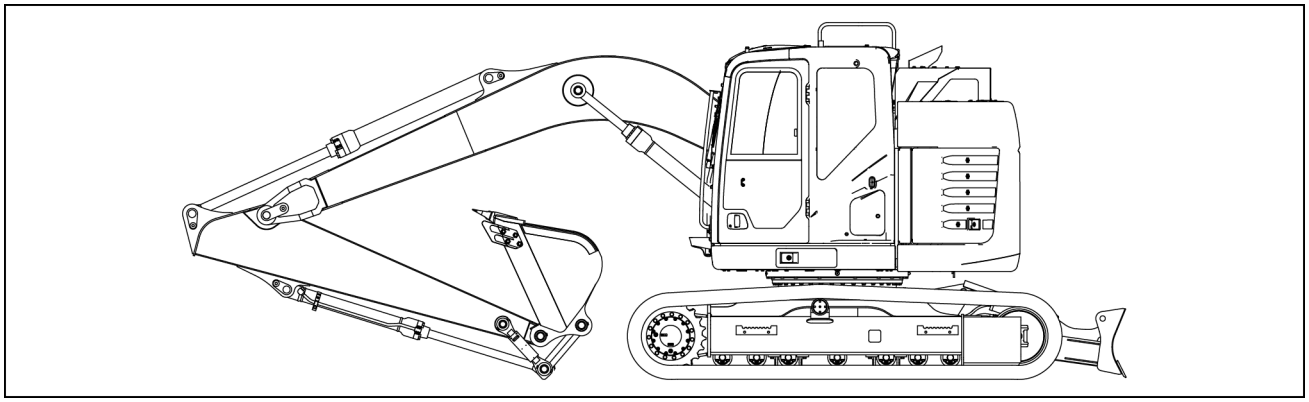
Product identification

The CX145D SR is a crawler hydraulic excavator. It consists of an undercarriage fitted with tracks and a turntable bearing which supports the upperstructure frame. The upperstructure frame supports the attachment, at the front end of the machine, plus the engine, hydraulics and cab. When the operator works the controls, the engine-driven pump delivers hydraulic fluid to the control valves. The control valves distribute the hydraulic fluid to the various cylinders and hydraulic motors employed. A cooling system maintains the hydraulic fluid at normal operating temperature.



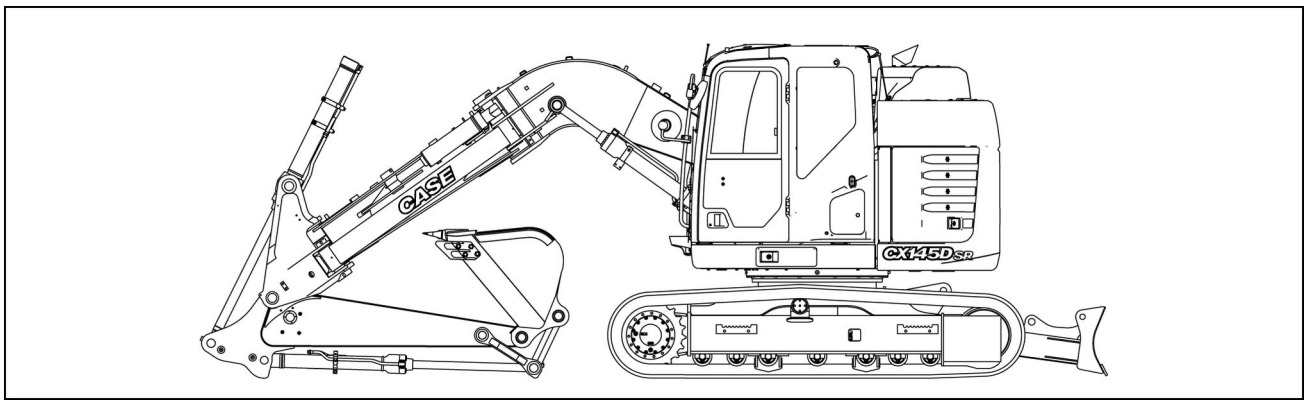
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CX145D SR LC



SMIL17CEX2823EA 2

CX145D SR with blade



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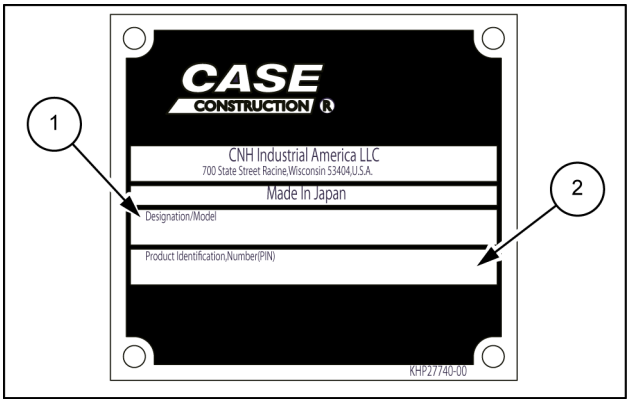
CX145D SR Offset Boom with blade

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

Machine

(1) Designation / Model:
Hydraulic Excavator CX145D SR

(2) Product identification number (PIN):

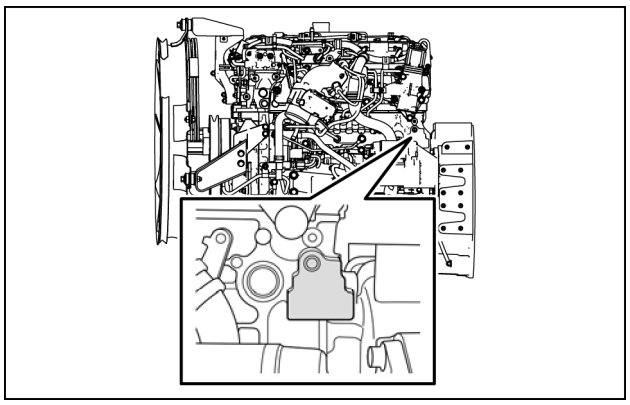


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Engine

Manufacturer and model: ISUZU AR-4JJ1X

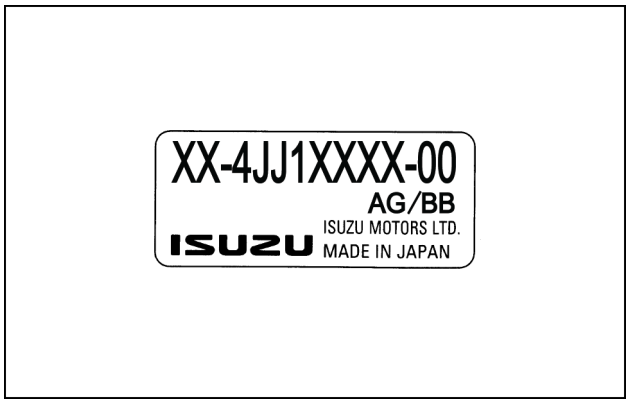
Serial number:



SMIL15CEX8433AA 5

ID label

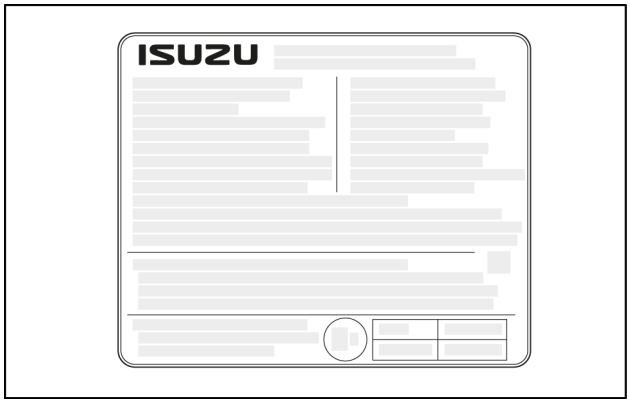
The engine ID label is located on the cylinder head cover.



SMIL15CEX8434AA 6

Emission decal

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.

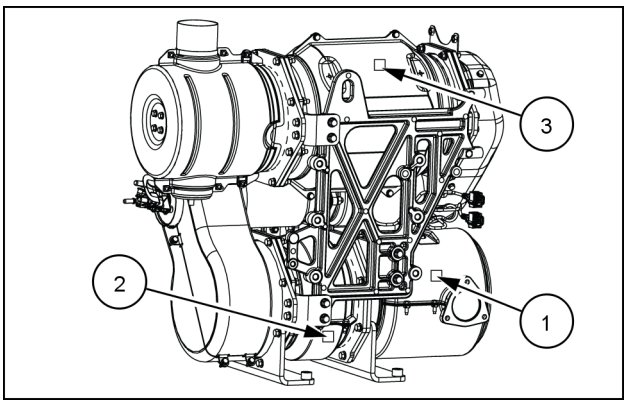


SMIL14CEX1607AA 7

SCR (Selective Catalytic Reduction) serial number

The number is stamped on top of the SCR block.

1. Front DOC (Diesel Oxidation Catalyst) serial:
2. Center DOC serial:
3. SCR serial:

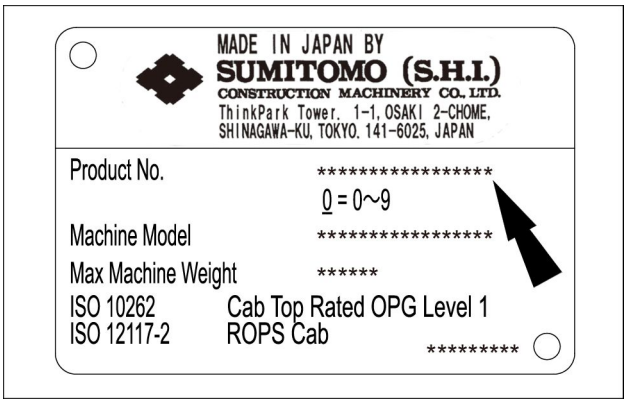


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Cab protection ROPS (Roll Over Protective Structure)

Complies with ISO 12117-2.

Product identification number:



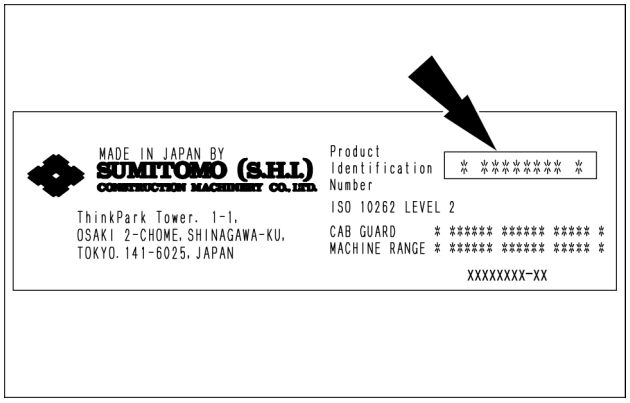
SMIL17CEX5115AA 9

Cab protection FOPS (Falling Objects Protective Structure)

Complies with ISO 10262 level 1 (cab roof).

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

Product identification number:

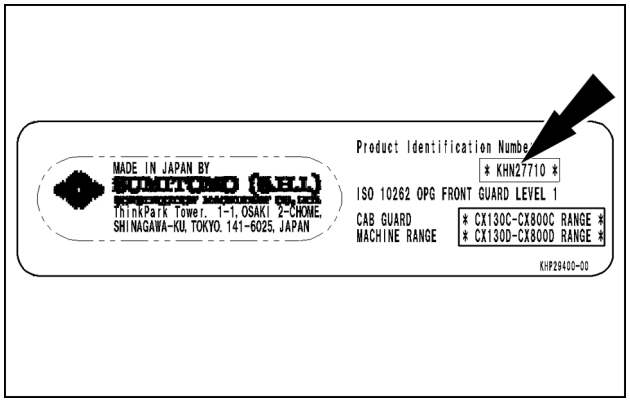


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Cab protection FGPS (Front Guard Protective Structure)

Complies with ISO 10262 level 1 (with optional double frame bolt-on front grid).

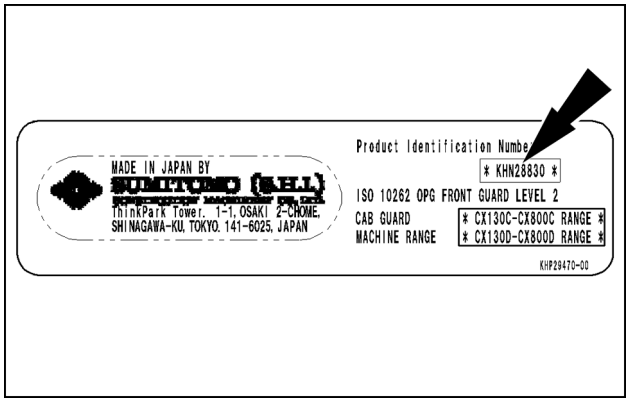
Product identification number:



SMIL15CEX3852AA 11

Complies with ISO 10262 level 2 (with optional single frame bolt-on front grid).

Product identification number:



SMIL15CEX3853AA 12

Component serial numbers

Hydraulic pump:

Swing reduction gear:

Travel reduction gears:

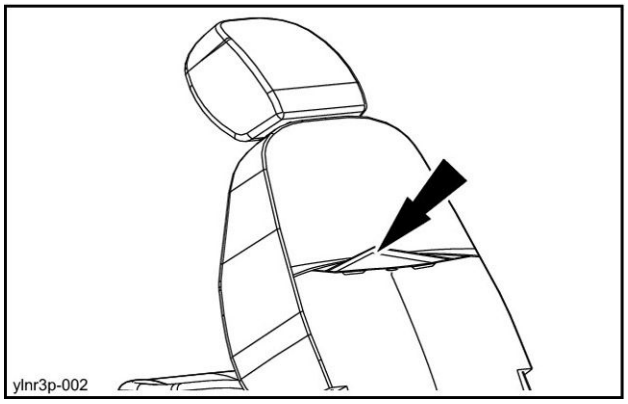
Travel control valve:

Attachment control valve:

Swing control valve:

Operator's manual storage on the machine

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



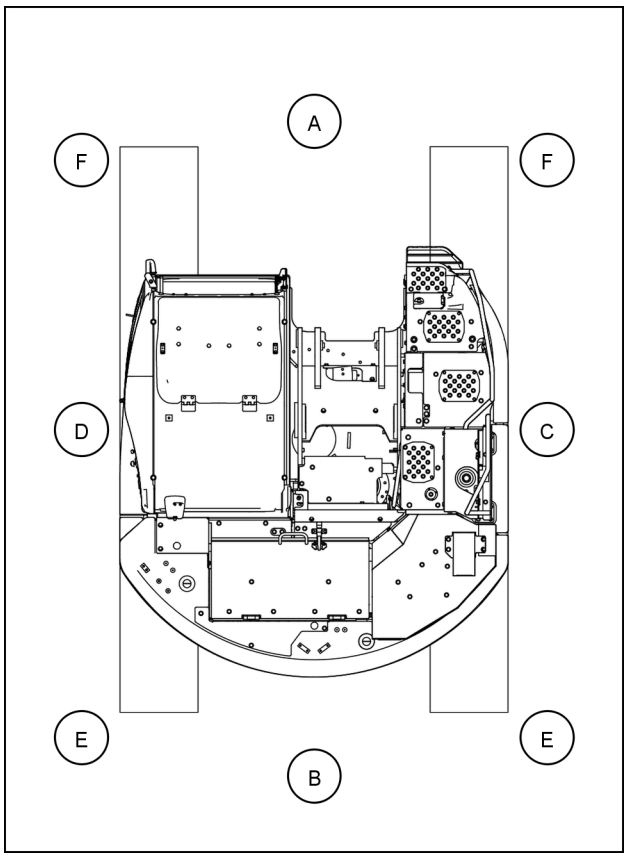
YLNR3P-002 1

Machine orientation

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

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

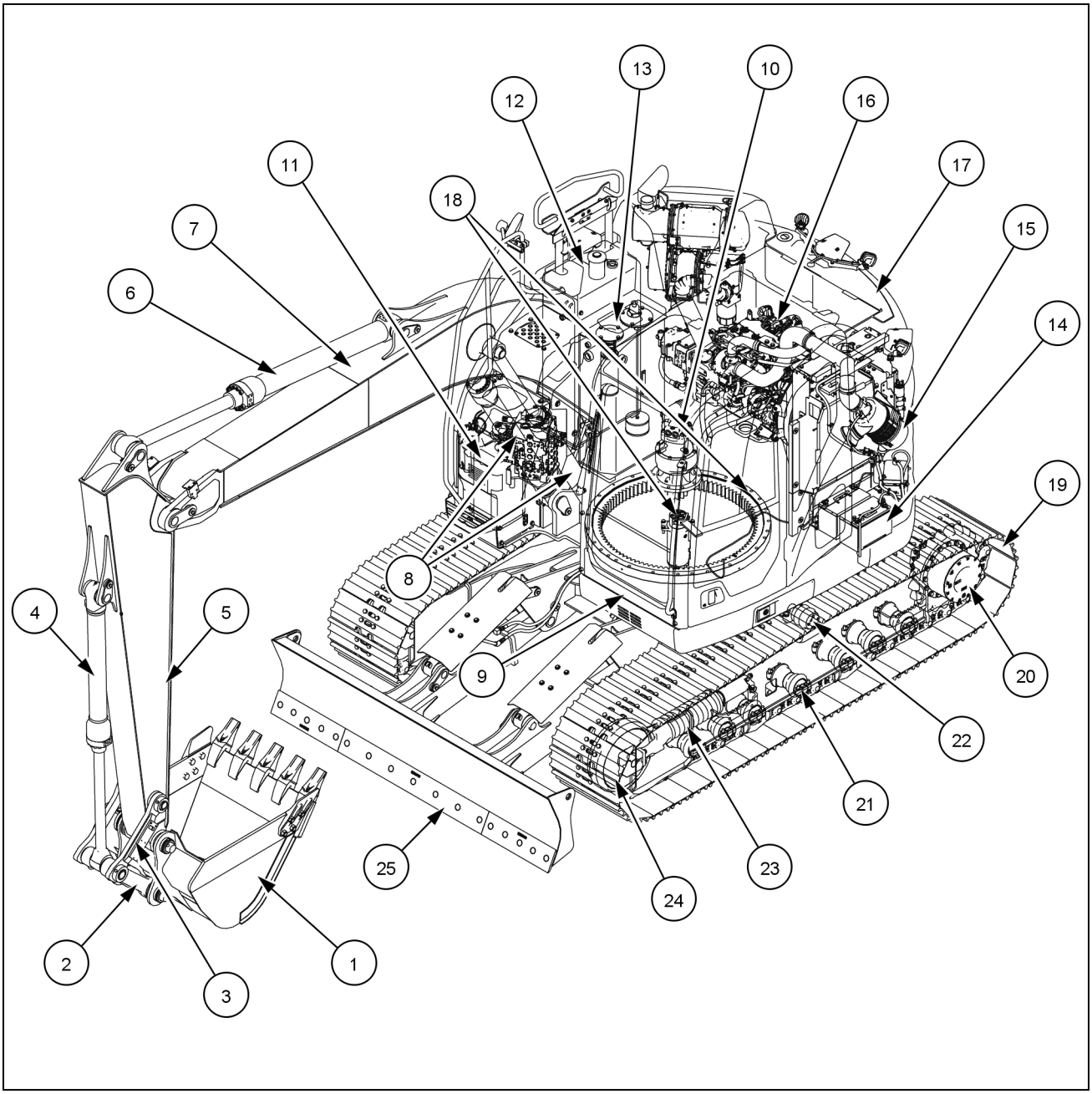
A. Front
B. Rear
C. Right-hand side
D. Left-hand side
E. Travel motor
F. Idler wheel



SMIL17CEX3553BA 1

Machine components

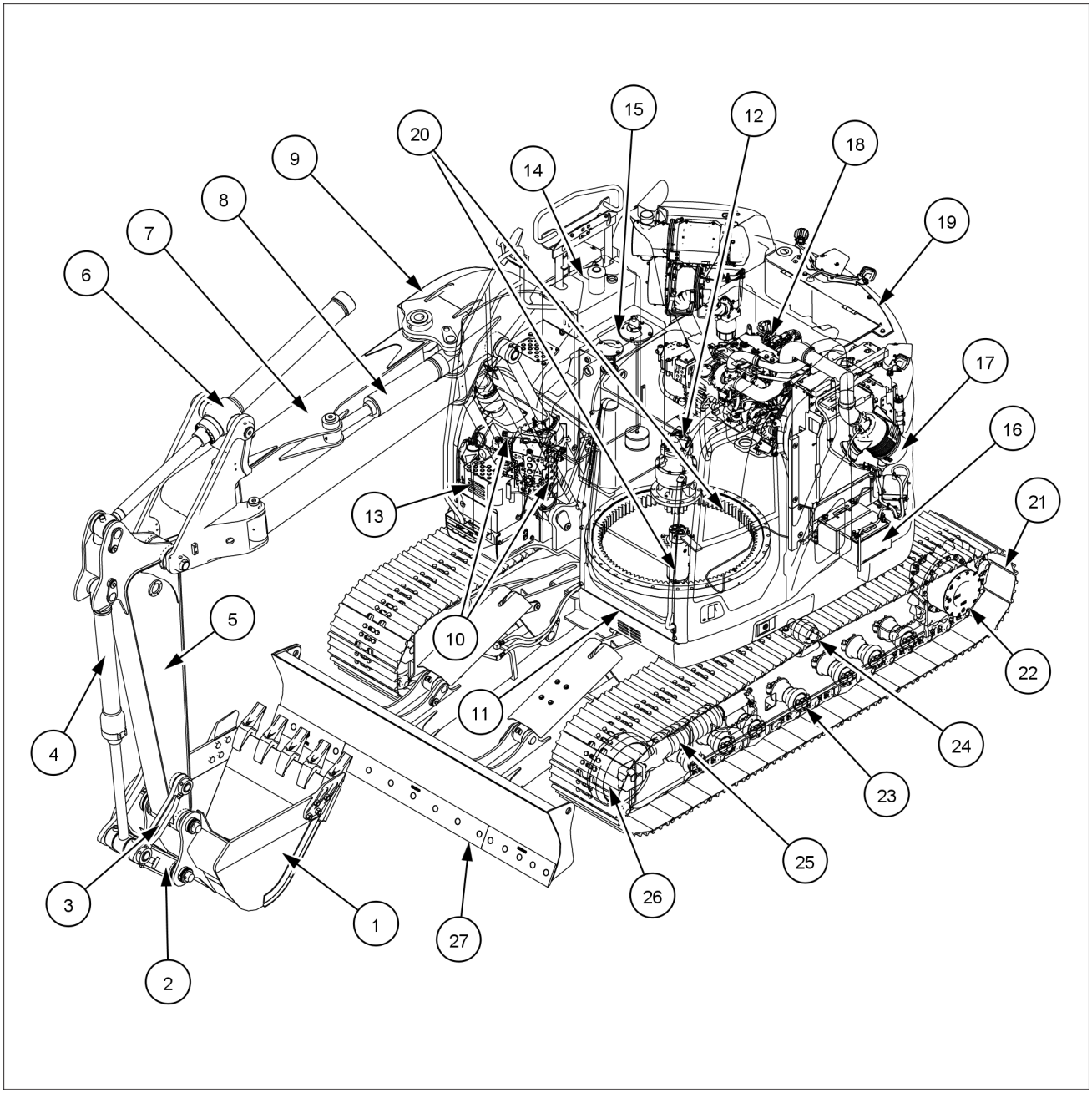
CX145D SR LC — CX145D SR with blade



SMIL17CEX3828GA 1

1. Bucket
2. Bucket link
3. Arm link
4. Bucket cylinder
5. Arm
6. Arm cylinder
7. Boom
8. Boom cylinder
9. Cab / Operation compartment
10. Swing motor assembly
11. **DEF/ADBLUE®** tank
12. Fuel tank
13. Hydraulic tank
14. Battery
15. Air filter
16. Engine compartment
17. Counterweight
18. Swing component
19. Shoes
20. Travel reduction gear
21. Lower roller
22. Upper roller
23. Recoil spring
24. Idler wheel
25. Blade (CX145D SR with blade)

CX145D SR Offset Boom with blade



SMIL17CEX7205G 2

1. Bucket
2. Bucket link
3. Arm link
4. Bucket cylinder
5. Arm
6. Arm cylinder
7. Positioner
8. Positioning cylinder
9. Boom
10. Boom cylinder
11. Cab / Operation compartment
12. Swing motor assembly
13. **DEF/ADBLUE®** tank
14. Fuel tank
15. Hydraulic tank
16. Battery
17. Air filter
18. Engine compartment
19. Counterweight
20. Swing component
21. Shoes
22. Travel reduction gear
23. Lower roller
24. Upper roller
25. Recoil spring
26. Idler wheel
27. Blade

Selective Catalytic Reduction (SCR) system

What is Selective Catalytic Reduction (SCR)?

Your CASE CONSTRUCTION machine is equipped with an SCR after treatment system to comply with the requirements for exhaust emissions set by the US Environmental Protection Agency (EPA). The main components of the SCR system include the SCR catalyst, the **DEF/ADBLUE®** dosing control unit, the **DEF/ADBLUE®** injection system, and the **DEF/ADBLUE®** tank.

How does Selective Catalytic Reduction (SCR) work?

During combustion, harmful Nitrogen Oxide (NO_X) molecules are formed in the exhaust. By injecting a **DEF/ADBLUE®** solution into the exhaust prior to a catalyst, the NO_X can be converted to harmless elemental Nitrogen and water. This happens when the NO_X molecules react inside the catalyst with the heat generated by the engine and the ammonia in the **DEF/ADBLUE®** solution.

NOTICE: *Prolonged idling of the machine with no load for more than **6 h** will cause damage to the SCR catalyst.*

During cold engine operation at low engine coolant and ambient air temperatures, water vapor will be visible from the exhaust. This water vapor will resemble steam or light white smoke, and will dissipate as the engine and machine components warm. This water vapor is considered normal.

NOTE: *The SCR system continues to operate for approximately **3 min** after the starter key is turned off in order to suck **DEF/ADBLUE®** back into the tank. **DEF/ADBLUE®** expands when freezing, and it will thus damage the lines of the SCR system. This is considered normal, and requires no action from the operator.*

What is Diesel Exhaust Fluid (DEF)/AdBlue®?

DEF/ADBLUE® is a clear, colorless, non-toxic, aqueous urea solution (**32.5%**) with a slight ammonia odor. It is used to chemically reduce NO_X emissions from heavy-duty diesel-powered vehicles. **DEF/ADBLUE®** is neither explosive nor harmful to the environment. **DEF/ADBLUE®** is classified under the minimum-risk category of transportable fluids.

International standard **ISO 22241-1** defines **DEF/ADBLUE®** quality. The American Petroleum Institute (API®) has a voluntary certification program for **DEF/ADBLUE®**. To ensure that **DEF/ADBLUE®** satisfies the requirements of ISO 22241, look for the **API® DEF Certification Mark™** whenever you purchase **DEF/ADBLUE®**. API Diesel Exhaust Fluid Certification Mark is a registered trademark of API in the United States and or other countries.



Finding Diesel Exhaust Fluid (DEF)/AdBlue®

Your CASE CONSTRUCTION dealer is fully equipped to accommodate all your **DEF/ADBLUE®** needs.

Case Customer Assistance: 1-866-542-2736
casecustomerassistance.na@cnh.com

Storage, handling, and transport

NOTICE: *storage temperatures above **30 °C (86 °F)** greatly reduce the shelf life of **DEF/ADBLUE®**.*

DEF/ADBLUE® has a typical shelf life of 6-12 months. Refer to the SHELF LIFE table below. In order for **DEF/ADBLUE®** to remain in a useable condition, storage requirements must be met.

- Store between **-11 °C** (**12 °F**) and **30 °C** (**86 °F**).
- Use only an approved **DEF/ADBLUE®** container. Contact your dealer to obtain proper storage container(s).
- Keep container tightly closed.
- Keep container in a cool, well-ventilated area.
- Keep away from heat and direct sunlight.

If the machine will exceed a four month shut down period:

1. Perform a complete after-run procedure.
2. Drain the **DEF/ADBLUE®** tank.
3. Flush the tank with deionized water.
4. Drain the deionized water

NOTICE: *do not disconnect any electrical connections from the SCR system.*

Machine start-up after extended shutdown:

1. Fill the **DEF/ADBLUE®** tank.
2. Replace the main filter in the supply module.
3. Start the machine.

Thawing

- Your CASE CONSTRUCTION machine is equipped with an internal tank heater to thaw frozen **DEF/ADBLUE®**. Your machine will still function until the **DEF/ADBLUE®** begins to flow. The SCR system will then function normally.

  NOTE: *you may notice a slight reduction in engine torque in high demand situations until the* ***DEF/ADBLUE®*** *is fully thawed.*

- Do not heat **DEF/ADBLUE®** for long periods of time at temperatures above **30 °C** (**86 °F**). This causes the solution to decompose, which very slowly decreases the expected shelf life.

NOTICE: *do not use an anti-gelling or freeze point improver in your* ***DEF/ADBLUE®****. The* ***32.5%*** *solution is specifically designed to provide the optimum NO_X reduction properties. Any further blending or adjusting of the* ***DEF/ADBLUE®*** *mixture will lessen its ability to perform correctly and may cause damage to the components of the SCR system.*

Handling and supply of additives, if any.

- Personal Protective Equipment (PPE) is not required under normal conditions. If splashing is likely, wear eye protection. For prolonged or repeated contact, impervious gloves are recommended. Follow the precautions listed in the SAFETY INFORMATION chapter when handling any service fluid.
- No additives are required.

NOTICE: *contaminated* ***DEF/ADBLUE®*** *can affect the performance of your machine. Follow all instructions in this manual when handling* ***DEF/ADBLUE®****.*

Shelf life

Constant ambient storage temperature	Minimum shelf life
Less than or equal to **10 °C** (**50 °F**)	36 months
Less than or equal to **25 °C** (**77 °F**) [1]	18 months
Less than or equal to **30 °C** (**86 °F**)	12 months
Less than or equal to **35 °C** (**95 °F**)	6 months
Greater than **35 °C** (**95 °F**)	-[2]
[1] To prevent decomposition of **DEF/ADBLUE®**, prolonged transportation or storage above **25 °C** (**77 °F**) should be avoided.	
[2] Significant loss of shelf life: check every batch before use. See your CASE CONSTRUCTION dealer for more information on testing.	

NOTE: *the main factors taken into account to define the shelf life in the table above are the ambient storage temperature and the initial alkalinity of* ***DEF/ADBLUE®****. The difference in evaporation between vented and non-vented storage containers is an additional factor.*

NOTE: *the information in this table is for reference only and has been provided by the International Organization for Standardization, Document number* ***ISO 22241-3*** *Diesel engines - NO_X reduction agent AUS 32 - Part 3: Handling, transportation and storage.*

NOTE: DEF/ADBLUE® *that remains in the tank of the machine after the season does not require any special precautions unless storage exceeds the shelf life table above.*

Disposal

- Dispose of **DEF/ADBLUE®** and any filter accumulations in accordance with all applicable Federal, State, and local laws governing waste disposal.

US Environmental Protection Agency (EPA) Warranty Statement

CASE CONSTRUCTION warrants to the ultimate purchaser and each subsequent purchaser that the engine is designed, built and equipped so as to conform with US Environmental Protection Agency (EPA) regulations applicable at the time of manufacture and that it is free from defects in workmanship or material which would cause it not to meet these regulations for a period of:

- 2 years or 1,500 hours of operation, whichever occurs first, for engines less than **19 kW** (**25 Hp**)
- 5 years or 3,000 hours of operation, whichever occurs first, for engines greater than or equal to **19 kW** (**25 Hp**)

NOTE: *this warranty applies to all units operated in the United States or Canada.*

Coverage

The model year, class of diesel engine, and emission application determination for your engine are identified on the Emission Control Information Label. This label is affixed to one of the following areas of the engine: the top of engine's rocker arm cover, the right-hand side of the oil pan, and the right-hand side of the engine front gear cover. The warranty period begins on the date the new equipment is sold to the first retail purchaser. The presence of the emission control label is the indication that the engine conforms to the applicable standards. Any emission control system parts which are proven defective during normal use will be repaired or replaced during the warranty period.

The engine owner has responsibility to perform all the required maintenance listed in the Owner's Manual. CASE CONSTRUCTION will not deny an emission warranty claim solely because no record of maintenance exists; however, a claim may be denied if failure to perform maintenance resulted in the failure of a warranted part

It is recommended that replacement parts used for maintenance or repairs be CASE CONSTRUCTION Service Parts to maintain the quality originally designed into your emission certified engine. The use of non- CASE CONSTRUCTION parts does not invalidate the warranty on other components unless the use of such parts causes damage to warranted parts.

The manufacturer is liable for damages to other engine components caused by the failure of any warranted emission control system part. CASE CONSTRUCTION is not responsible for failures resulting from improper repair or the use of parts that are not genuine CASE CONSTRUCTION or CASE CONSTRUCTION approved parts.

Component coverage

New engines certified for sale and registered will have the following items covered by the emission warranty, depending on the emission level of the engine, if the items were first installed on the new engine as original equipment:

Fuel injection system

- Fuel injection pump
- Fuel injectors
- Fuel injection lines

Air induction system

- Intake manifold
- Turbocharger system (includes exhaust manifold)
- Charge air cooler

Positive Crankcase Ventilation (PCV) system (if applicable)

- PCV valve
- Oil fill cap

Exhaust after treatment Devices (if applicable)

- Diesel Oxidation Catalyst (DOC)
- Diesel Particulate Filter (DPF)
- Selective Catalytic Reduction (SCR)
- Diesel Exhaust Fluid (DEF) tank and dispensing systems

Exhaust Gas Recirculation Systems (EGR)

- EGR valve assembly
- EGR cooler

Cold Start Enrichment Systems

Electronic Control Units, Sensors, Solenoids, and Wiring harnesses used in above systems

Emissions warranty does not cover

- Repairs arising from storage deterioration, failure to maintain the equipment, negligence, alteration, improper use of the equipment, collision or other accident, vandalism, or other casualty, or operation beyond rated capacity or specification.
- Repairs arising from abuse or neglect, including but not limited to: operation without adequate coolant or lubricants, adjustments to the fuel system outside equipment specifications, over-speeding, improper storage, starting, warm-up, or shutdown practices, incorrect fuel or contaminated fuel, oil or other fluids.
- Normal maintenance services, such as engine tune-ups, engine fuel system cleaning, checks, adjustments, shimming, etc.
- Items replaced due to customer demand.
- Labor charges performed by anyone except a dealer authorized by contract to repair the equipment, unless they qualify under special provisions (i.e. outside labor).
- Any and all travel costs for items such as towing, service calls, or transporting a unit to and from the place where the warranty service is performed.
- Normal maintenance costs, including but not limited to: lubricants, coolants, fluids, fuel, filters, and associated labor. Lubricants, filters, and coolants may qualify for warranty reimbursement if they require replacement as a DIRECT RESULT of a defect in material or workmanship.
- Claims involving the inspection or reconditioning of units after storage or prior use.
- Repairs arising from service performed by agents not approved by CASE CONSTRUCTION.
- Repairs arising from any unauthorized modification to the product or the use of non- CASE CONSTRUCTION parts, implements or attachments.
- Removal, replacement, or installation of non- CASE CONSTRUCTION optional equipment, attachments or components.
- Premiums charged for overtime labor costs or out of shop expenses.
- Economic loss including lost profits, crop loss, equipment rental, or other expense.
- Unauthorized modification or updating machines without a warrantable failure.
- Any and all costs of dealer shop supplies incurred with repairs, including but not limited to: solvents, cleaners, anti-seize lubricants, loctite, sealant, adhesive, oil-dry, shop towels, etc.
- Failure of the machine, its implements or attachments caused by improper field application or loading.
- Any and all costs for coolant, fuel, or lube (oil) analysis including supplies and lab recommendations.
- Cost associated with cleaning of machine in preparation for servicing.

2 - SAFETY INFORMATION

Signal word definitions

Personal safety



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

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

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

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

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

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

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

Machine safety

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

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

Information

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

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

Safety rules

⚠ General safety rules ⚠

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

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

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

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

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

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

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

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

Wear protective equipment when appropriate.

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

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. This is a California Proposition 65 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.

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

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

Quick coupler (optional)

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

⚠ Operating the machine⚠

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

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

⚠ Preventing risks caused by vibrations⚠

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

1. Make sure that the machine, the equipment and the tool are suitable for the work to be carried out.
2. Make sure that the machine is in good condition and that servicing intervals are complied with.
3. Check the track tension adjustment and the play in equipment linkages.
4. Make sure that the operator's seat and is adjustment controls are in good condition and then adjust the seat to suit the operator's size and weight. The operator's seat complies with the ISO 7096, 2000 standard, EM 6 class.

During work:

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

⚠ Quick coupler (optional)⚠

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

⚠ Parking the machine⚠

When parking the machine, proceed as follows:

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

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

⚠ Maintenance and adjustments⚠

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

⚠ Using an Implement other than a bucket⚠

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

⚠ Implement operation and maintenance ⚠

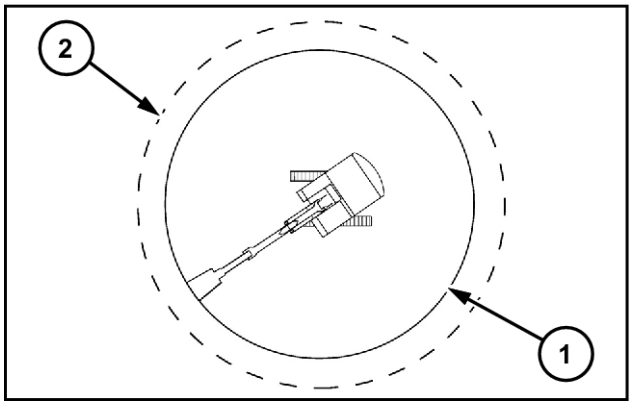
- For the implement operation and maintenance, refer to the operator's manual provided with the implement.

⚠ Safety area ⚠

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

(1) Working area.

(2) Safety area.



SMIL13CEX2517AB 1

Ecology and the environment

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

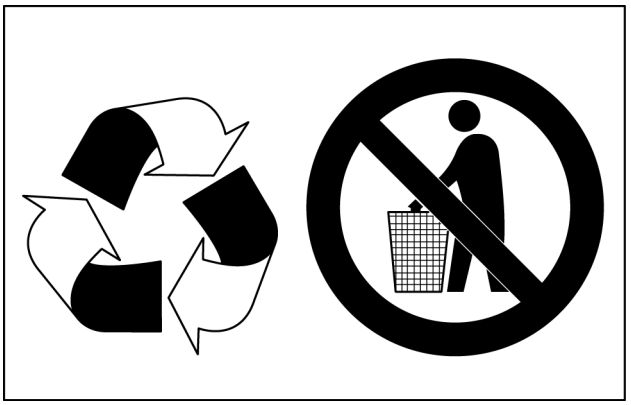
Familiarize yourself with the relative legislation applicable to your country, and make sure that you understand this legislation. Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, anti-freeze, cleaning agents, etc., with regard to the effect of these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

Helpful hints

- Avoid the use of cans or other inappropriate pressurized fuel delivery systems to fill tanks. Such delivery systems may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of these products contain substances that may be harmful to your health.
- Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
- Avoid spillage when you drain fluids such as used engine coolant mixtures, engine oil, hydraulic fluid, brake fluid, etc. Do not mix drained brake fluids or fuels with lubricants. Store all drained fluids safely until you can dispose of the fluids in a proper way that complies with all local legislation and available resources.
- Do not allow coolant mixtures to get into the soil. Collect and dispose of coolant mixtures properly.
- Do not open the air-conditioning system yourself. It contains gases that should not be released into the atmosphere. Your CASE CONSTRUCTION dealer or air-conditioning specialist has a special extractor for this purpose and can recharge the system properly.
- Repair any leaks or defects in the engine cooling system or hydraulic system immediately.
- Do not increase the pressure in a pressurized circuit as this may lead to a component failure.
- Protect hoses during welding. Penetrating weld splatter may burn a hole or weaken hoses, allowing the loss of oils, coolant, etc.

Battery recycling

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



NHIL14GEN0038AA 1

Hand signals

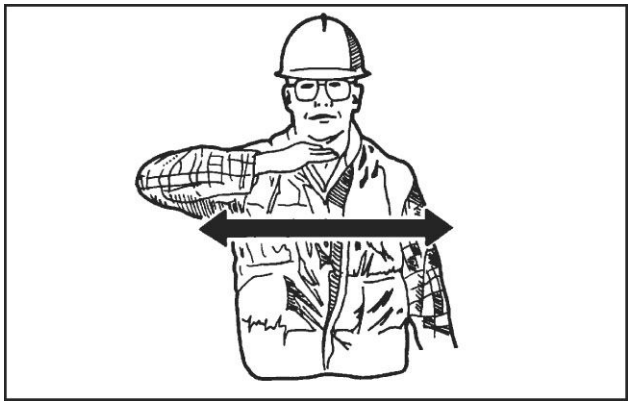
When operating the machine, never attempt to carry out tasks calling for fine control or working in areas where visibility is poor or impaired without seeking the assistance of a signalman. Make perfectly sure that you and the signalman understand the signals to be used.

Start the engine



PDE0002ATBP1 1

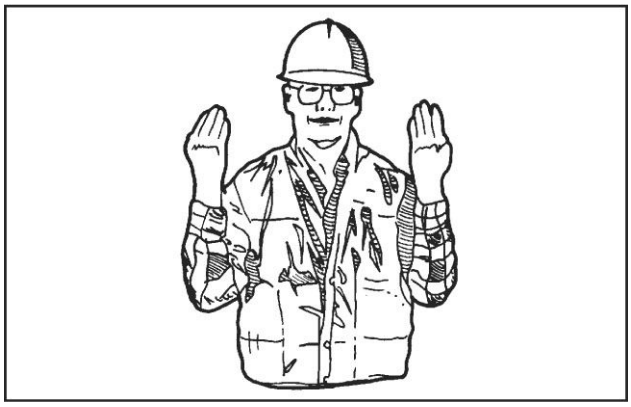
Shut down the engine



PDE0002TBP1 2

Come to me

Wave hands back and forth (palms inwards).



PDE0003ATBP1 3

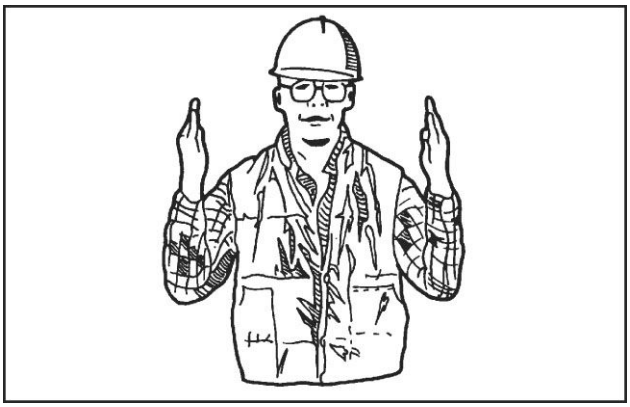
Move away from me

Wave hands back and forth (palms outwards).



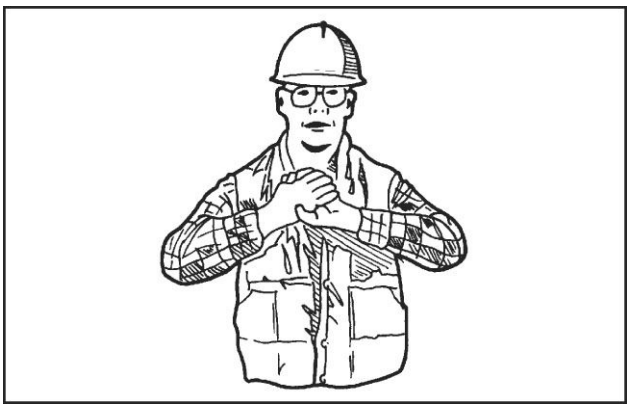
PDE0003TBP1 4

Go this far



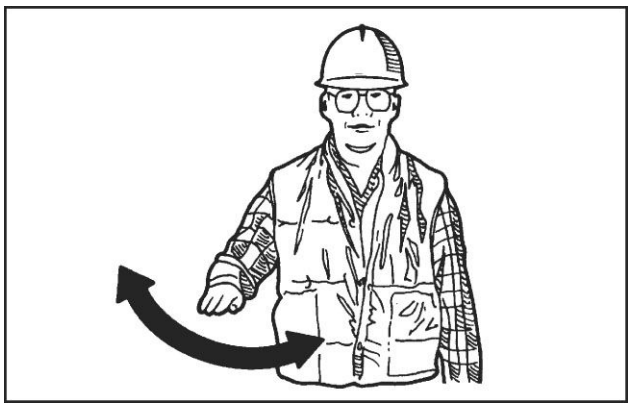
PDE0004ATBP1 5

All stop and hold



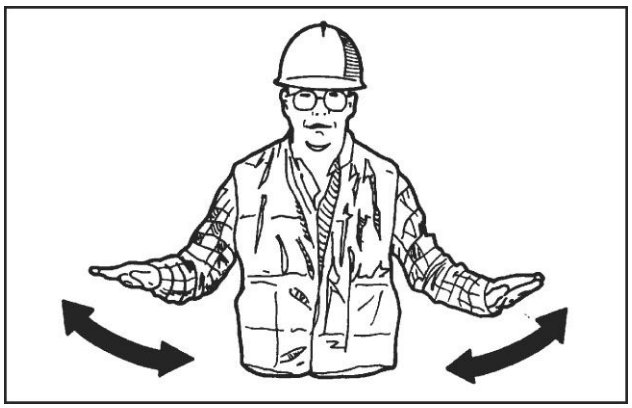
PDE0004TBP1 6

Stop
Wave one hand back and forth.



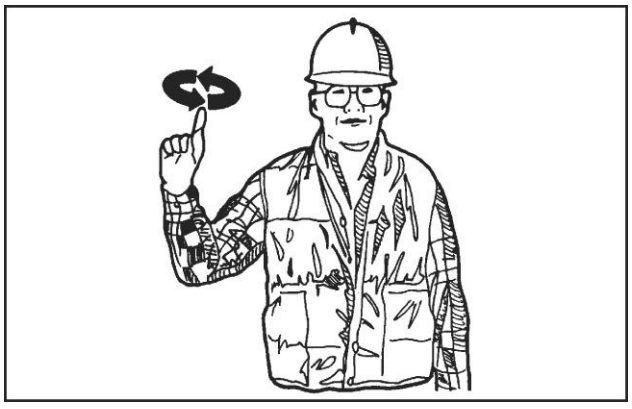
PDE0005ATBP1 7

Emergency stop
Wave hands back and forth.



PDE0005TBP1 8

Raise load or tool



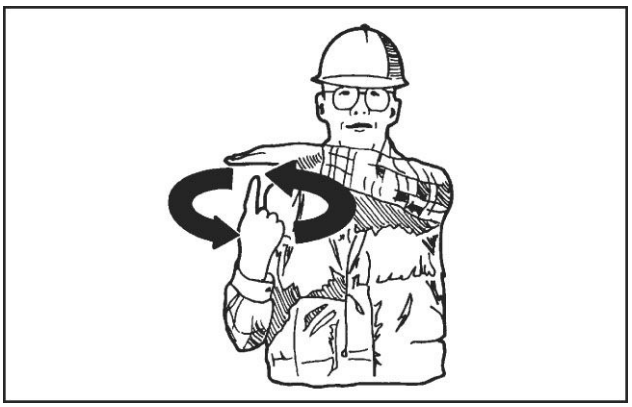
PDE0006ATBP1 9

Lower load or tool



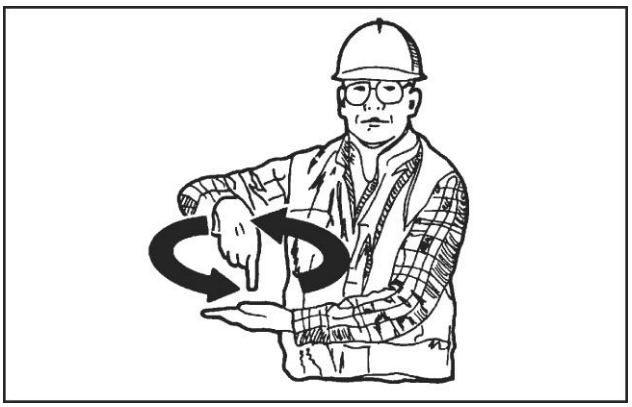
PDE0006TBP1 10

Slowly raise the load or tool



PDE0007ATBP1 11

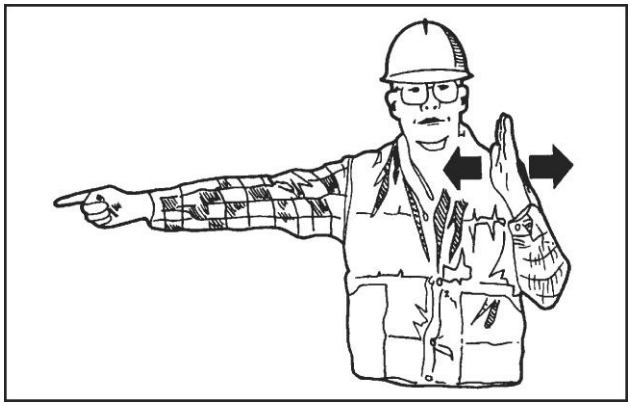
Slowly lower the load or tool



PDE0007TBP1 12

Turn machine left (swing load left)

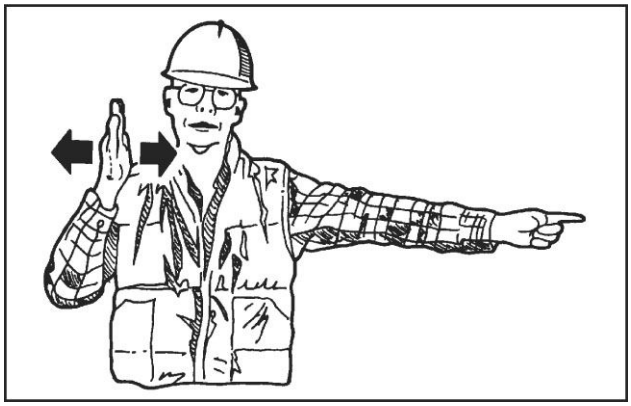
To stop movement, stop moving hand and clench fist.



PDE0008ATBP1 13

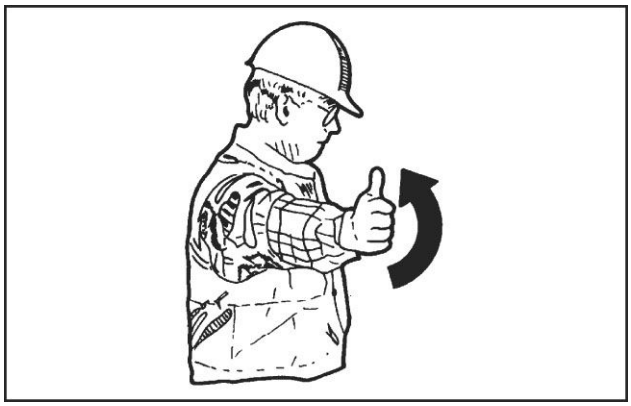
Turn machine right (swing load right)

To stop movement, stop moving hand and clench fist.



PDE0008TBP1 14

Raise tool



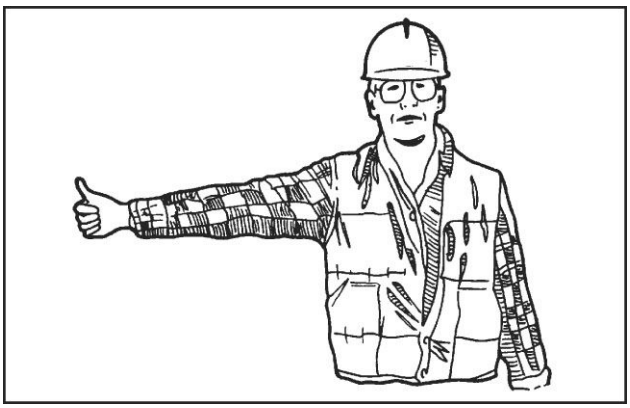
PDE0009ATBP1 15

Lower tool



PDE0009TBP1 16

Lift boom



PDE0010ATBP1 17

Lower boom



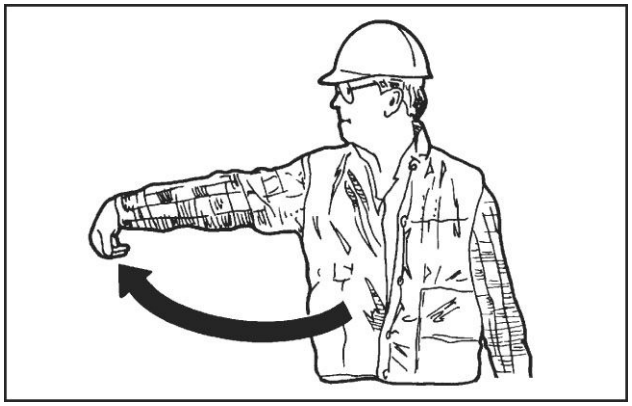
PDE0010TBP1 18

Retract dipper



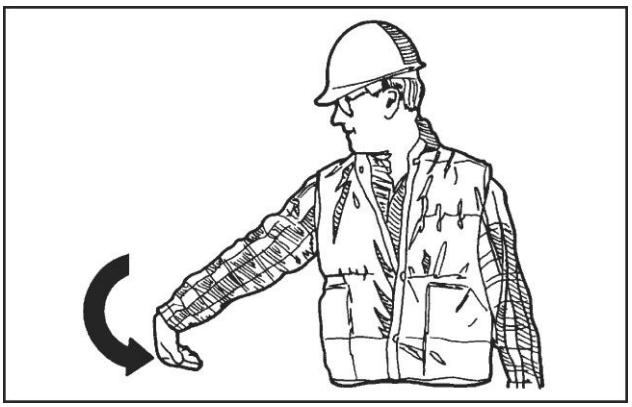
PDE0011ATBP1 19

Extend dipper



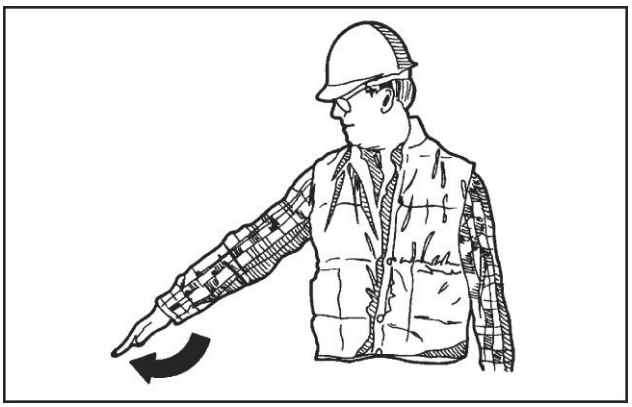
PDE0011TBP1 20

Fill tool



PDE0012ATBP1 21

Empty tool



PDE0012TBP1 22

Safety signs

⚠ WARNING

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

W0228A

⚠ WARNING

Avoid injury!
Make sure decals are perfectly legible. Clean decals regularly. Replace all damaged, missing, painted over, or illegible decals. See your dealer for replacement decals. When replacing parts bearing decals, be sure to put new decals on each new part.
Failure to comply could result in death or serious injury.

W0229A

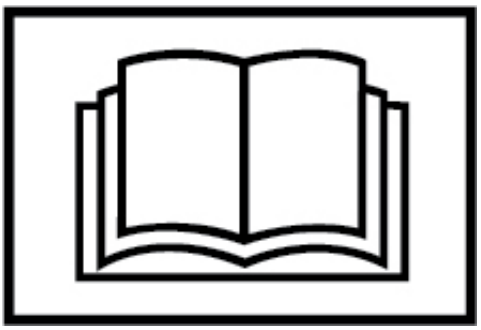
The following safety signs are on your machine as a guide for your safety and for the safety of those working with you. Walk around the machine and note the content and the location of all safety signs before you operate your machine.

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

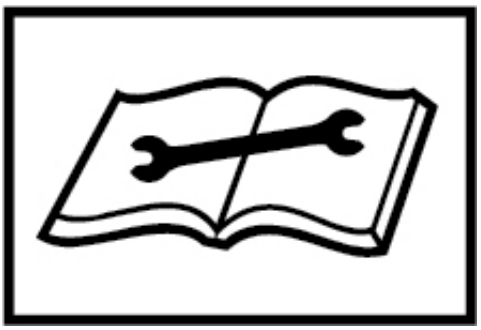
NOTICE: *do not use solvent, gasoline, or other harsh chemicals. Solvents, gasoline, and other harsh chemicals may damage or remove safety signs.*

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

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

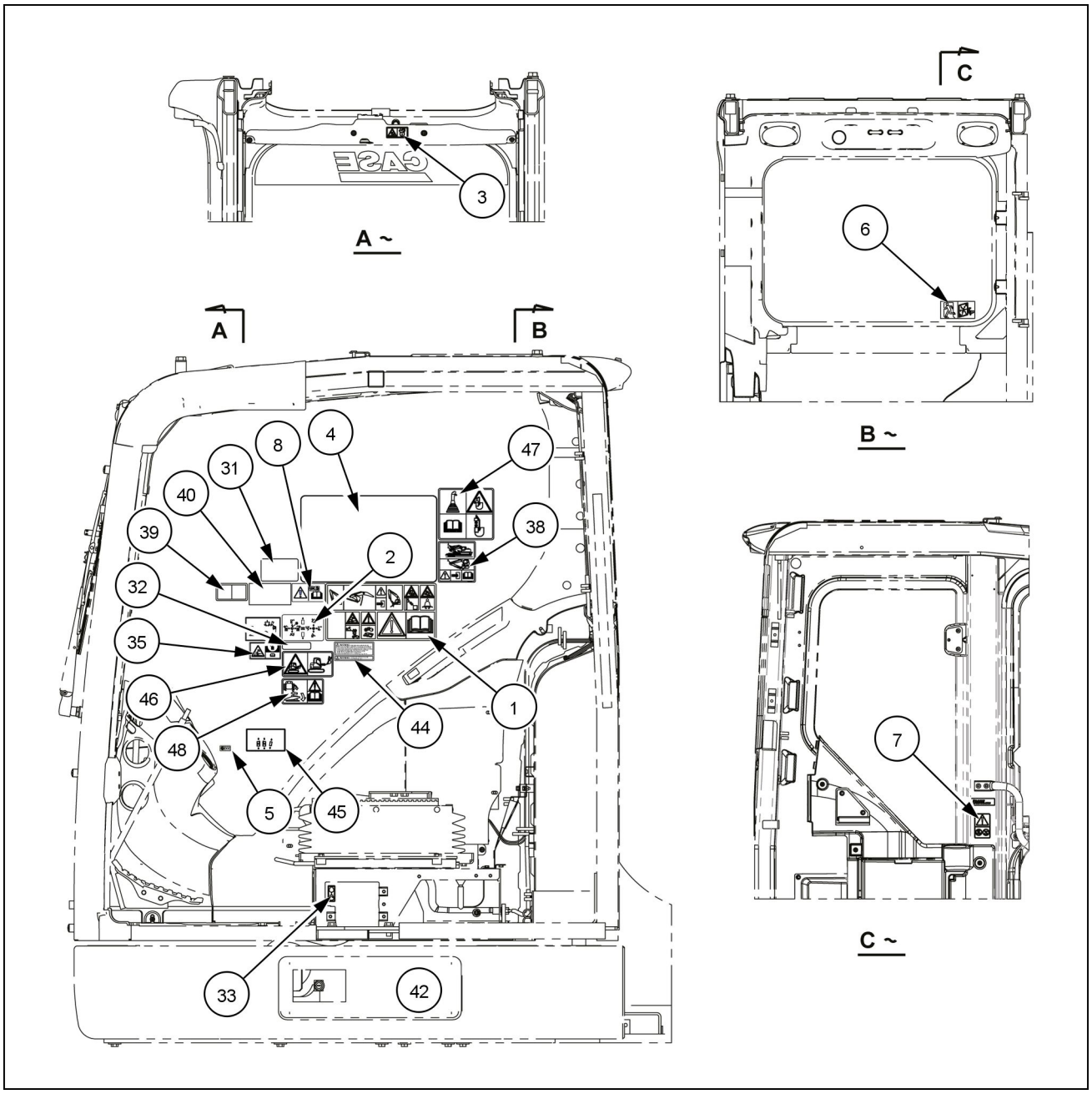


Safety signs that display the "Read service manual" symbol direct you to the service manual. If you doubt your ability to perform service operations, contact your CASE CONSTRUCTION dealer.

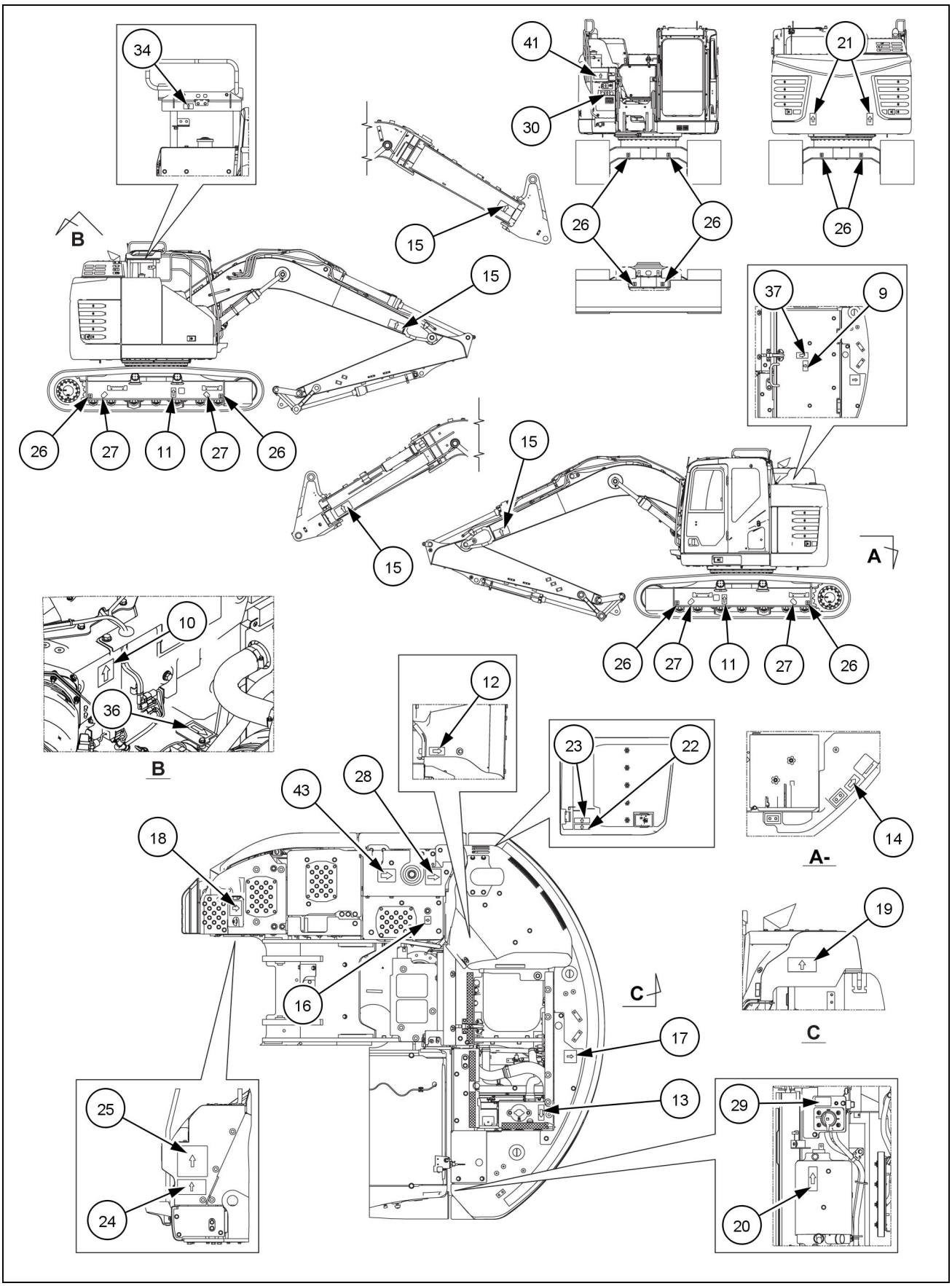


Decal positions

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



SMIL20CEX1306GA 1

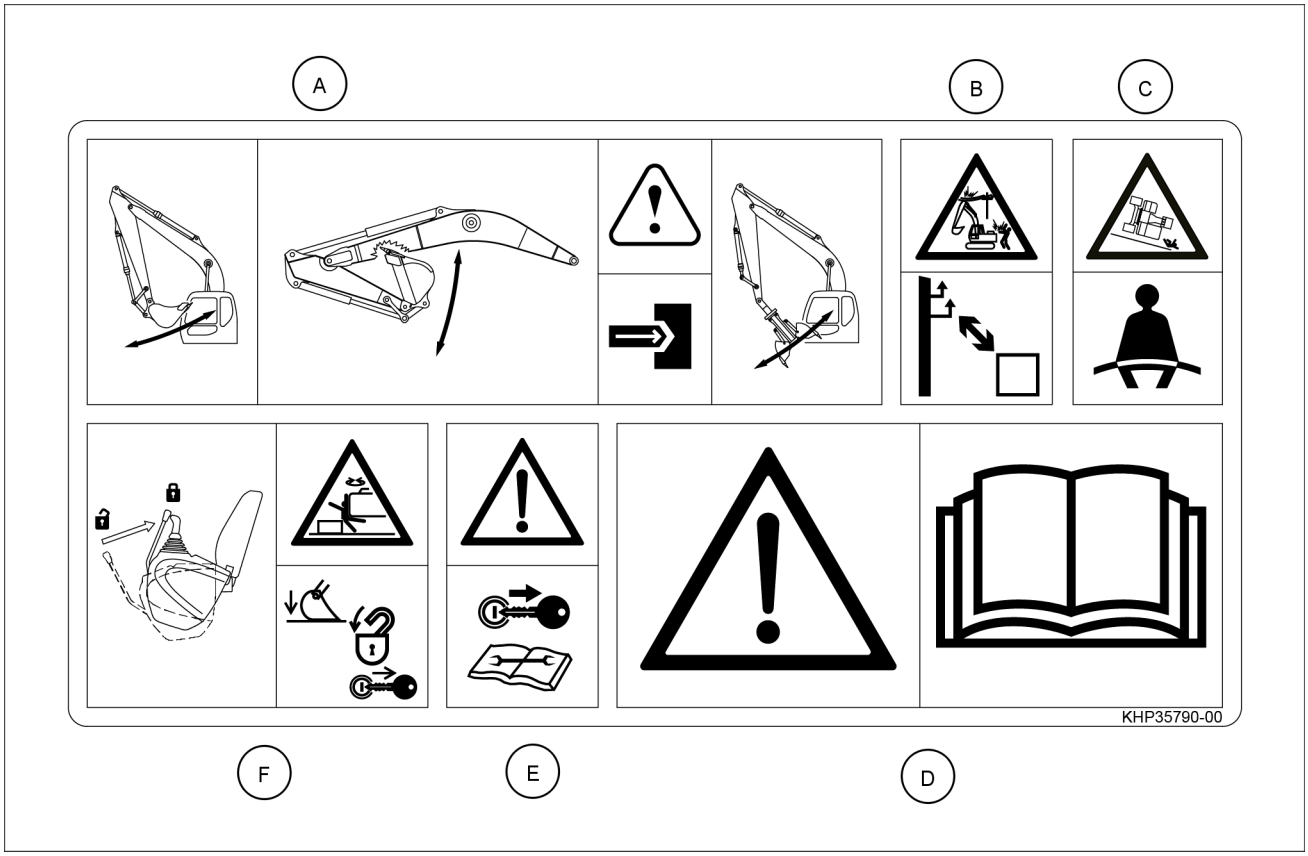


SMIL20CEX1350HB 2

Decal placement diagrams

(1) Table of safety precautions

Part number: KHP35790



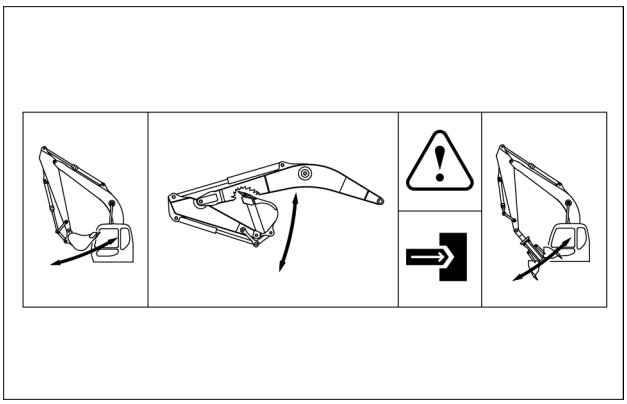
KHP35790 3

(1A) Interference with attachments

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

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

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

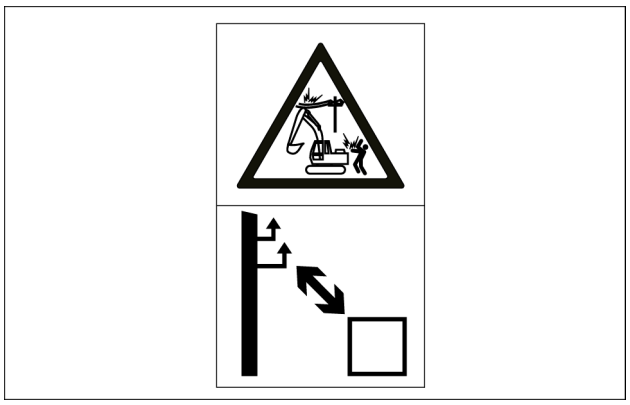


KHP35790_A 4

(1B) Danger electric line

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

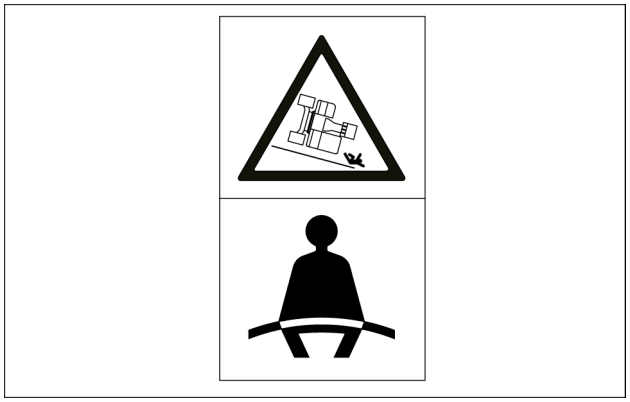
Always keep minimum distances to the electric lines in order to avoid serious damages to the machine, and to avoid serious injuries to the bystanders.



KHP35790_B 5

(1C) Seat belt

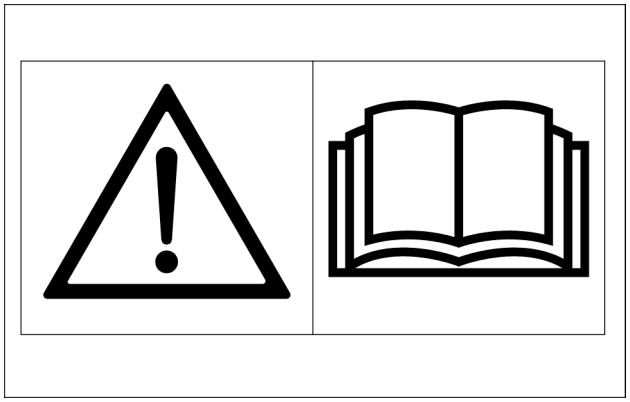
Always fasten the seat belt before starting machine operation.



KHP35790_C 6

(1D) Operator’s manual

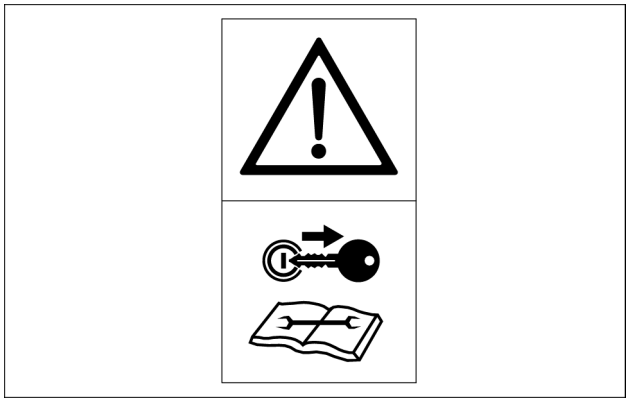
Make sure to read the operator's manual to understand how operate the machine properly and safely.



KHP35790_D 7

(1E) Maintenance or inspection

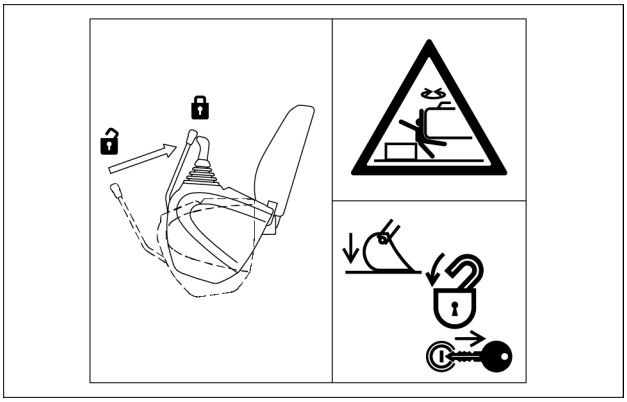
Always stop the engine and remove the starter key before any maintenance operation or inspection of the machine.



KHP35790_E 8

(1F) Parking the machine

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



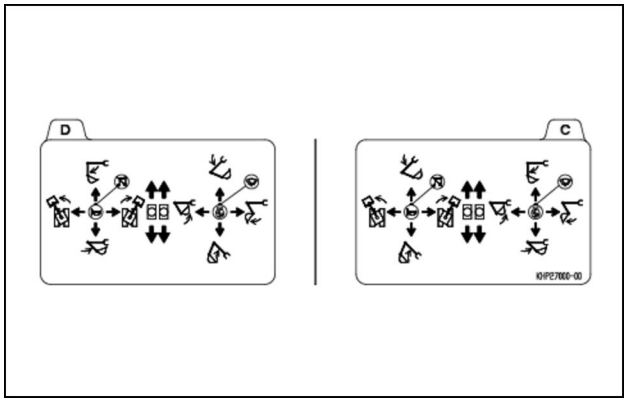
KHP35790_F 9

(2) Functions of operation levers

Part number: KHP27000

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

Always make sure to place the sheet that maps the operating controls to the side corresponding to the selected control pattern.



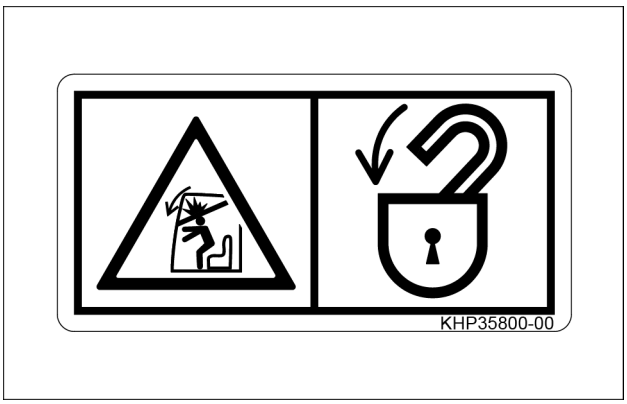
KHP27000 10

(3) Windshield locking

Part number: KHP35800

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

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



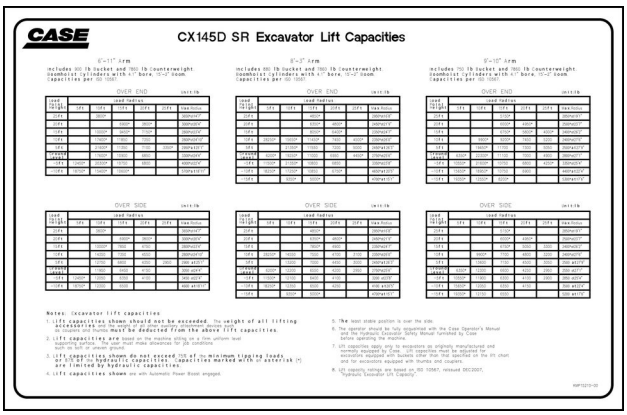
KHP35800 11

(4) Loads handling chart

Part number: KMP15210 (CX145D SR LC)

Part number: KMP15160 (CX145D SR with blade)

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



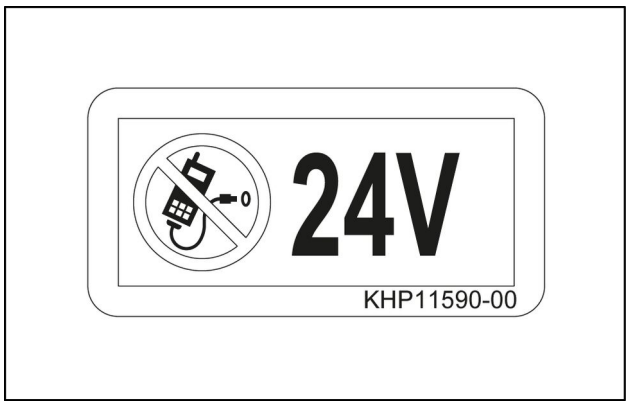
KMP15210 12

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

Part number: KHP11590

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

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

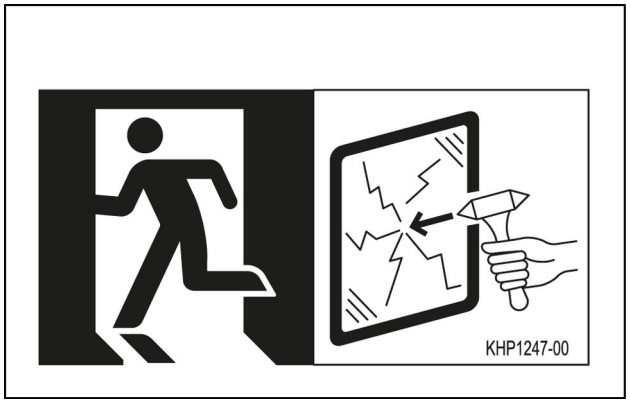


SMIL14CEX1620AB 13

(6) Emergency exit

Part number: KHP1247

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



SMIL14CEX1621AB 14

(7) Handling precautions in operation compartment

Part number: KHP35810

Welding or modification to the cab structure is strictly forbidden.

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

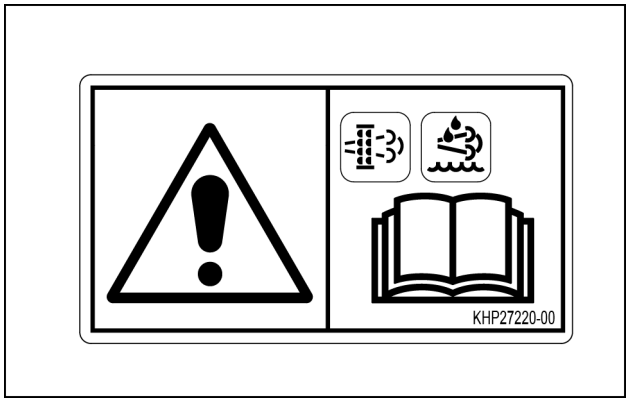


KHP35810 15

(8) Display of **DEF/ADBLUE®** icon and SCR icon

Part number: KHP27220

Make sure to read the operator's manual to understand warning signs and icons related to the functioning of the engine exhaust gas after-treatment system.

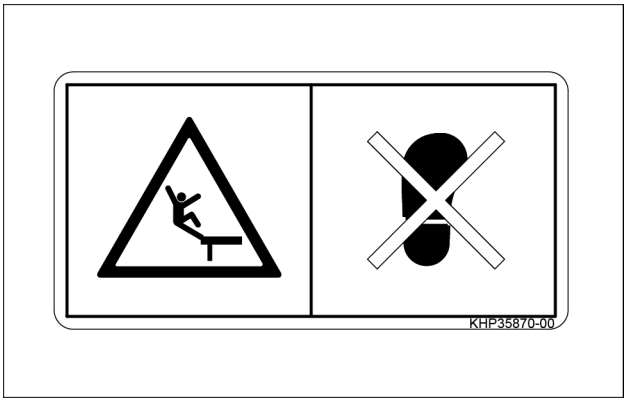


SMIL15CEX0448AA 16

(9) Engine hood

Part number: KHP35870

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



KHP35870 17

(10) Warning decal of high pressure common rail and engine start-up

Part number: KHP25860

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

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



SMIL14CEX1636AB 18

(11) Check valve

Part number: KHP35930

Track tensioning cylinder contains pressurized fluid.

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

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



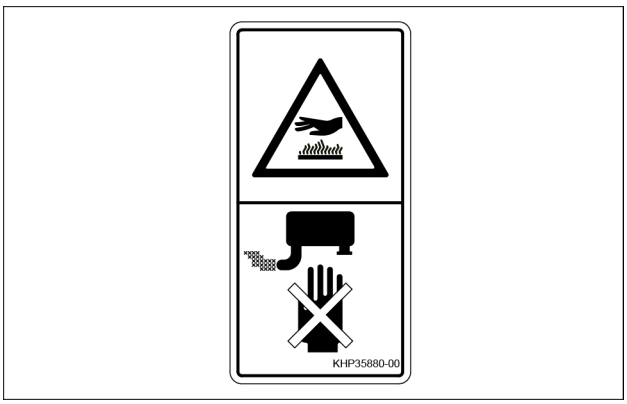
KHP35930 19

(12) Muffler

Part number: KHP35880

Do not touch the muffler right after engine stop.

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



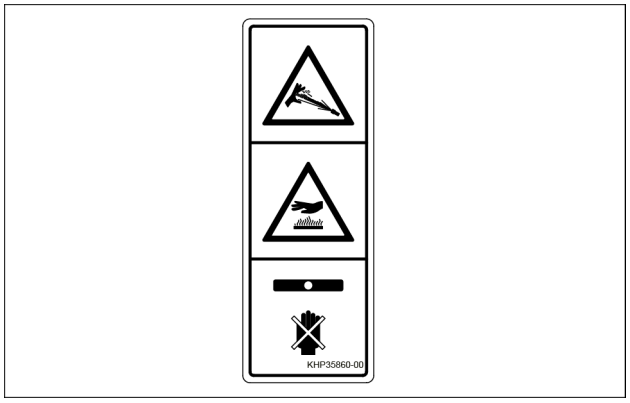
KHP35880 20

(13) Radiator

Part number: KHP35860

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

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



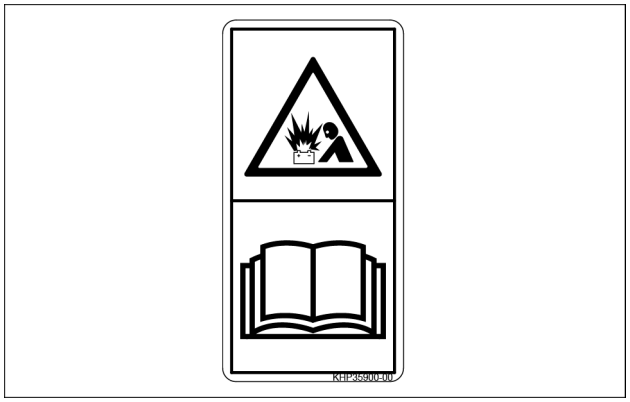
KHP35860 21

(14) Batteries

Part number: KHP35900

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

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



KHP35900 22

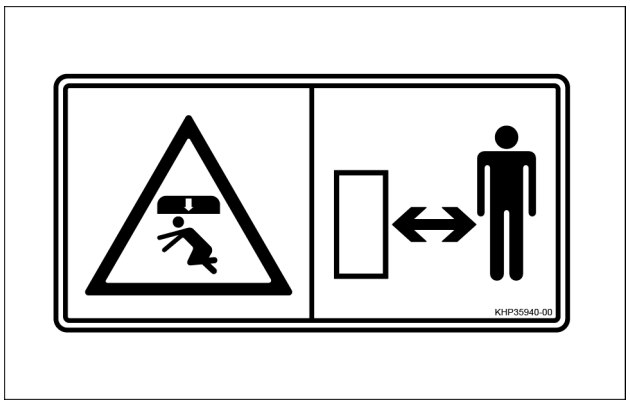
(15) Keep out of work range of attachment

Part number: KHP35940

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

Always sound the horn before start operating the machine.

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



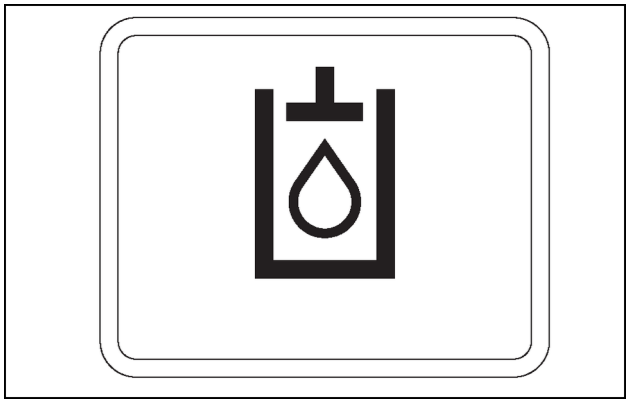
KHP35940 23

(16) Hydraulic tank

Part number: KHP1330

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

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



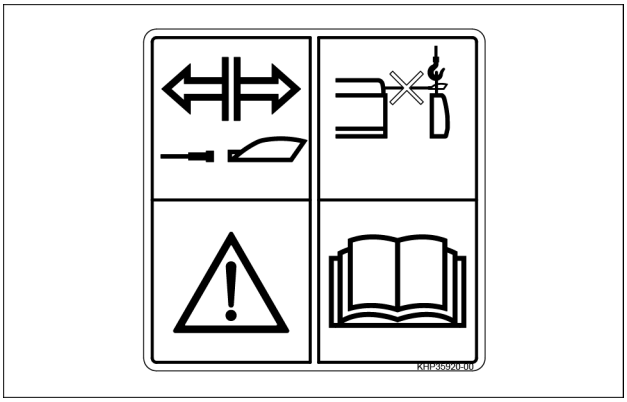
SMIL14CEX1639AB 24

(17) Camera wiring precautions

Part number: KHP35920

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

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



KHP35920 25

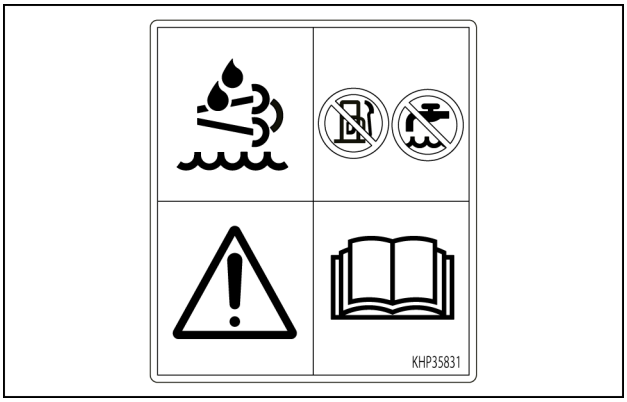
(18) DEF/ADBLUE® tank

Part number: KHP35831

Do not fill the **DEF/ADBLUE®** tank with diesel fuel, water or any fluid other than **DEF/ADBLUE®**.

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

Make sure to read operator's manual to understand proper procedures to be used for storage and usage of **DEF/ADBLUE®**.



KHP35831 26

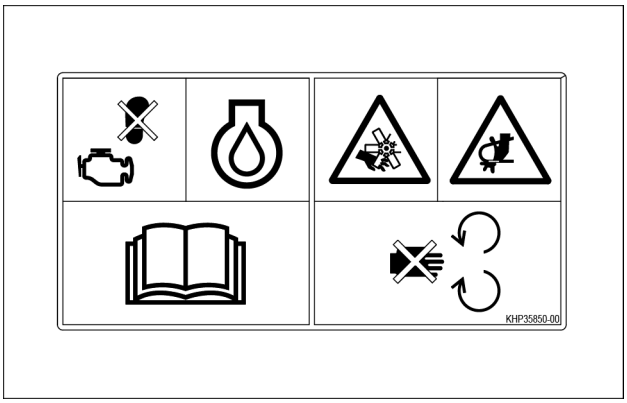
(19) Engine operation general decal

Part number: KHP35850

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

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

Engine fan and other rotating parts can cause serious injuries.

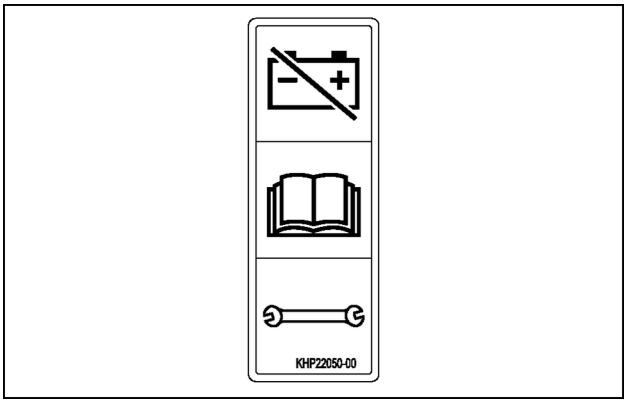


KHP35850 27

(20) Handling precautions for battery disconnect switch

Part number: KHP22050

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



SMIL14CEX1645AB 28

(21) Keep out of work range of upper structure

Part number: KHP35820

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

Always sound the horn before start operating the machine.

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

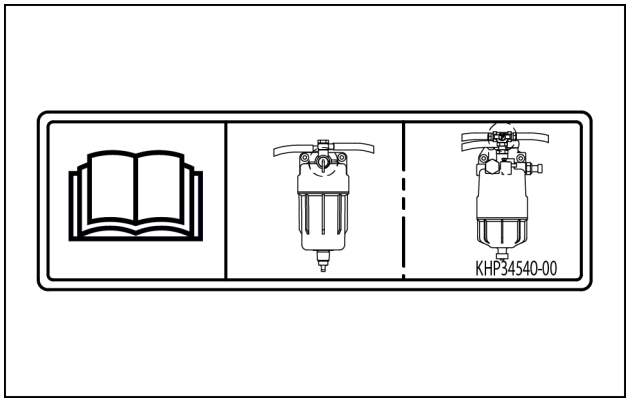


KHP35820 29

(22) Maintenance on fuel line and filter

Part number: KHP34540

Make sure to read Operator's manual to understand proper procedures and tools to be used for maintenance of the fuel system.

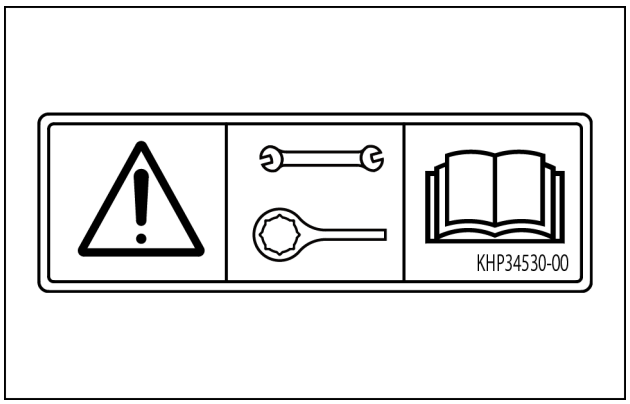


KHP34540 30

(23) Maintenance on fuel line and filter

Part number: KHP34530

Make sure to read Operator's manual to understand proper procedures and tools to be used for maintenance of the fuel system.



KHP34530 31

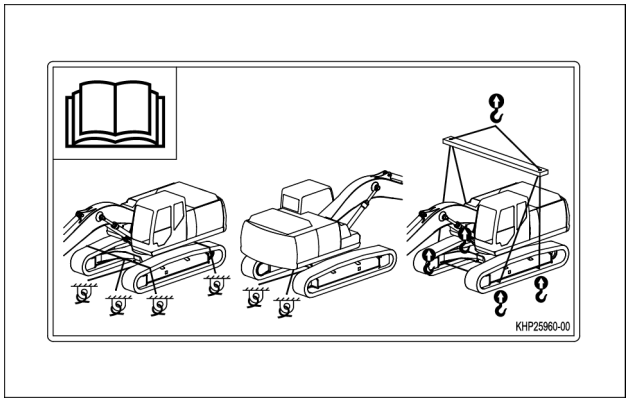
(24) Instruction decal for restraint and lifting

Part number: KHP25960 (CX145D SR LC)

Part number: KHP38650 (CX145D SR with blade)

Reference sketches mapping the layout of devices for transport and lifting of the machine.

Make sure to read operator's manual to understand proper procedures for transport and lifting of the machine.



KHP25960 32

(25) Service table

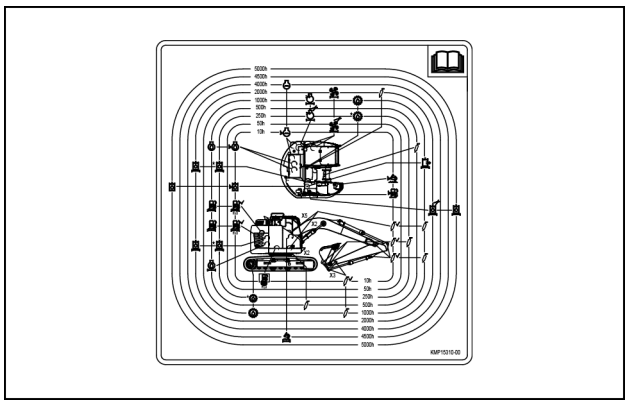
Part number: KMP15311 (CX145D SR LC)

Part number: KMP15151 (CX145D SR with blade)

Part number: KMP16211 (CX145D SR Offset Boom with blade)

Reference chart indicating proper timing for machine maintenance.

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

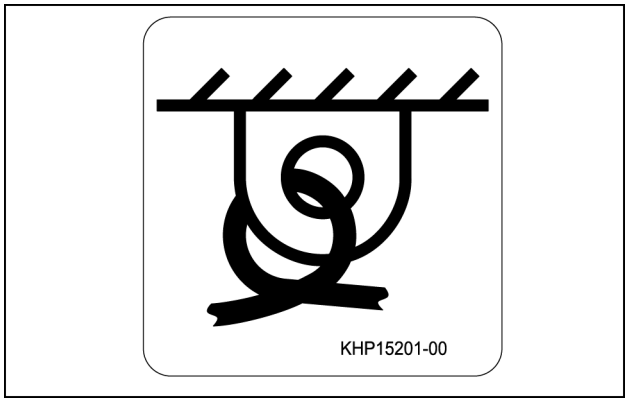


KMP15310 33

(26) Lashing point decal

Part number: KHP15201

Point on machine structure for securing the machine during transport.

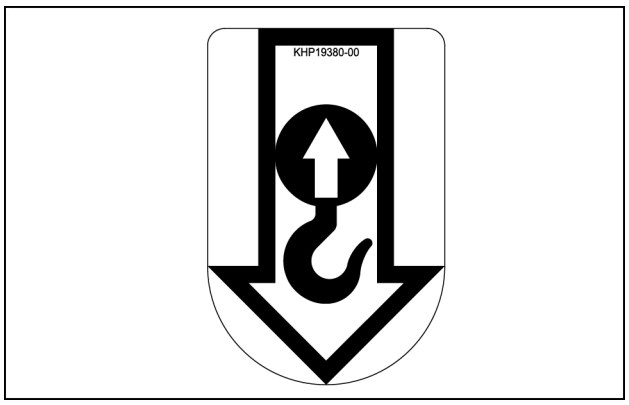


SMIL15CEX0447AA 34

(27) Lifting location

Part number: KHP19380

Machine area where the lifting devices shall be routed.



SMIL15CEX0450AA 35

(28) Fuel tank

Part number: KHP35840

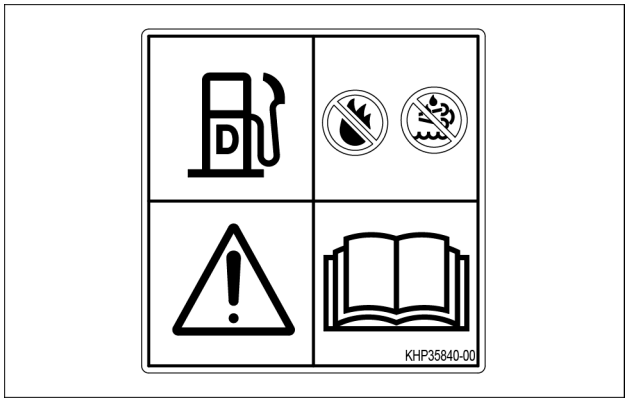
Do not perform welding and avoid any operation generating sparks close to the fuel tank.

Fuel is flammable and flames can cause serious injuries.

Do not fill the fuel tank with water, **DEF/ADBLUE®** or any fluid other than Ultra Low Sulfur diesel fuel.

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

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



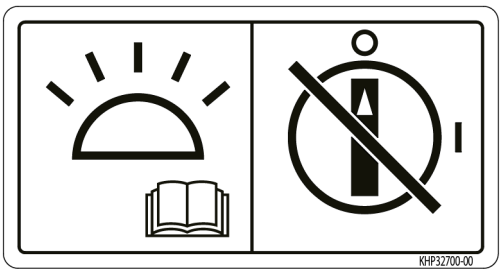
KHP35840 36

(29) Precautions for Battery Disconnect Switch

Part number: KHP32700

Never turn the battery disconnect switch to OFF position when the indicator lamp is lit.

Make sure to read the Operator's manual to understand warning signs and icons related to the functioning of the battery disconnect switch.

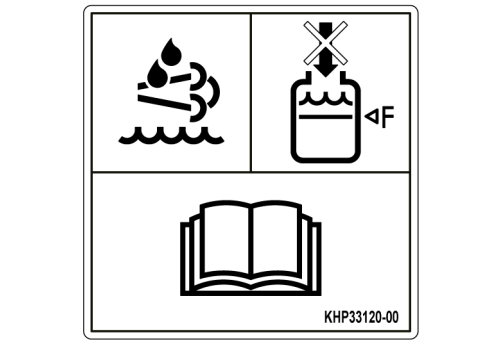


KHP32700 37

(30) DEF/ADBLUE® tank level

Part number: KHP33120

Never refill **DEF/ADBLUE®** over the F (upper limit) mark on the level gauge. Adequate air volume must be present in the top of the tank for proper functionality of the after treatment system.



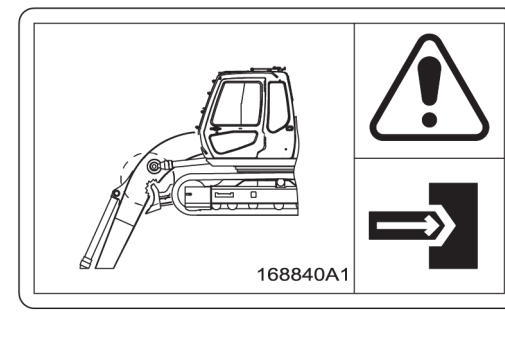
KHP33120 38

(31) Caution for Blade (CX145D SR with blade)

Part number: KHP1384

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

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

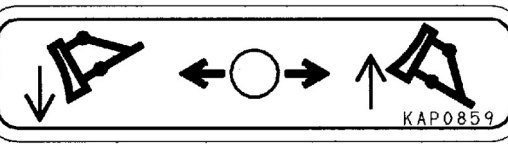


KHP1384 39

(32) Blade Operation (CX145D SR with blade)

Part number: KAP0859

Functions of the blade control lever.

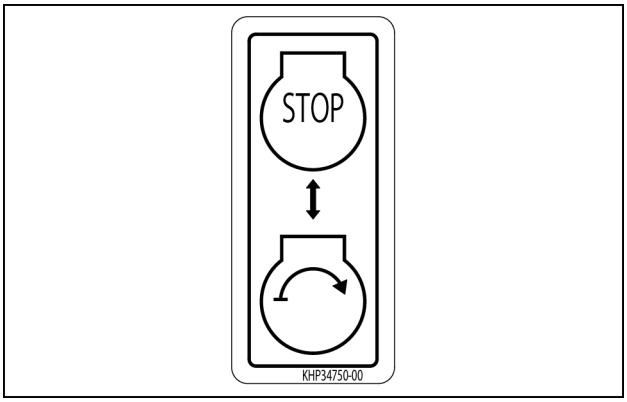


KHP0859 40

(33) Emergency Stop Switch operation

Part number: KHP34750

Press the top side of the switch only if an emergency stop of the engine is necessary.



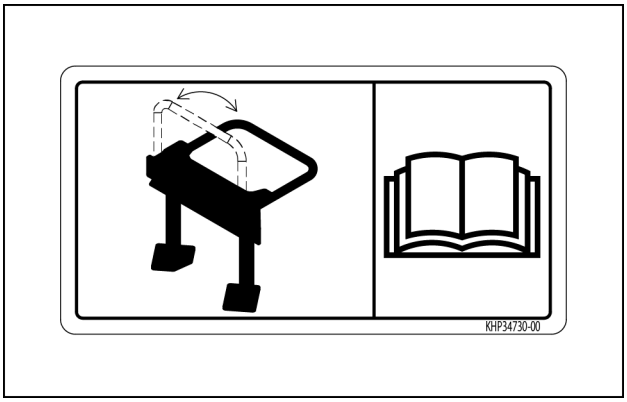
KHP34750 41

(34) Foldable handrail

Part number: KHP34730

The handrail on the top of the fuel tank shall be set and fixed in the horizontal position before a transport operation.

Make sure to read the Operator's manual to understand how to set the handrail according to the operating condition of the machine.



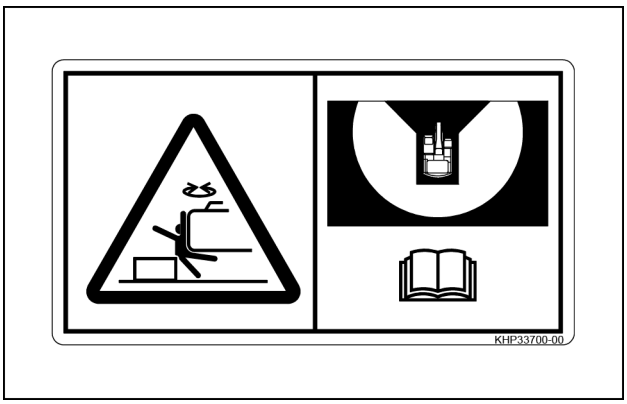
KHP34730 42

(35) Blind spot of Field View Monitior (Optional)

Part number: KHP33700

The Field View Monitor system does not ensure visibility on the closest area around the machine.

Make sure to read the Operator's manual to understand proper practices and precautions to be tackled for machine operation with the Field View Monitor system (Optional).



KHP33700 43

(36) Global Warming Potential decal

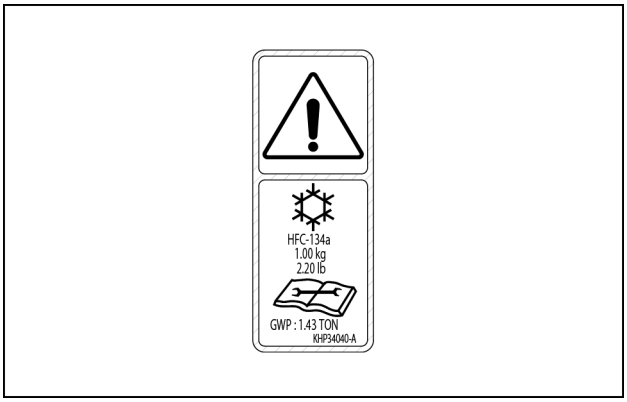
Part number: KHP34040

Greenhouse gas: HFC-134a

Quantity (A/C system charge): **1 kg** (**2.2 lb**)

Global Warming Potential (GWP): 1.43 Ton

Service, repair, or recharging must be performed only by trained service technician. Always contact your local authorized dealer. Failure to comply could result in death or serious injury.



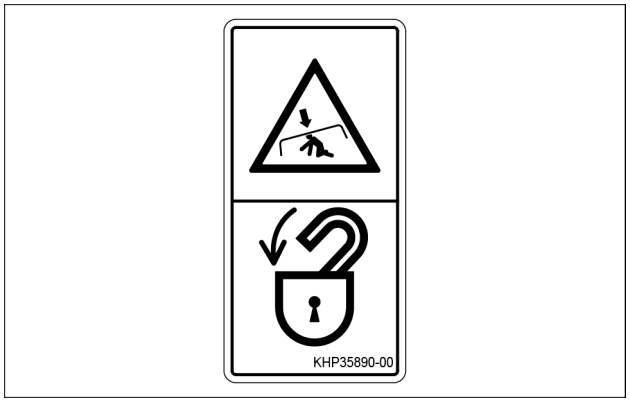
KHP34040 44

(37) Engine Hood

Part number: KHP35890

Always lock the engine hood when it is set in open position for maintenance operations.

Engine hood not locked may fall down causing serious injuries.

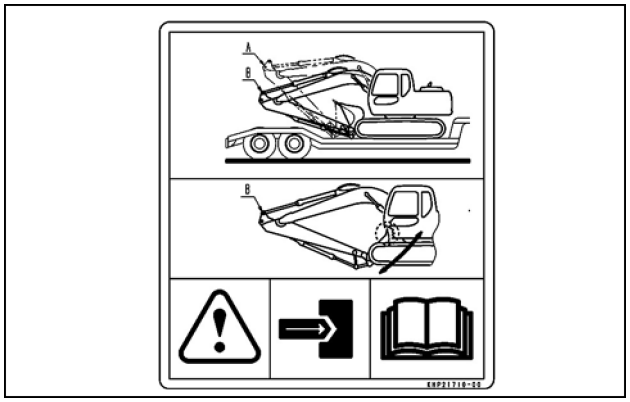


KHP35890 45

(38) Caution for transport with **3.01 m** (**118.5 in**) arm

Part number: KHP21710

When transporting the excavator, ensure that the arm cylinder pin is fixed in the transport position. Do not dig with the arm cylinder pin in the transportation location.



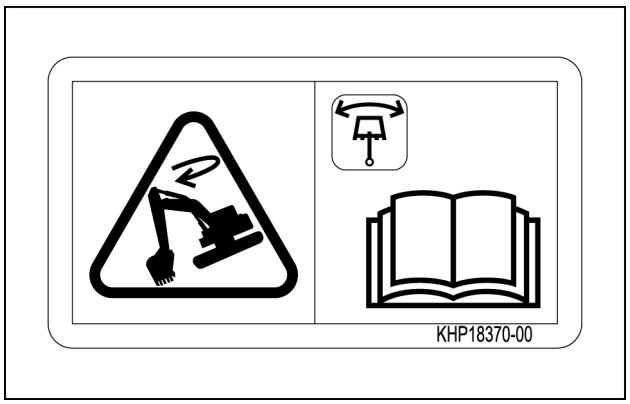
KHP21710 46

(39) Cautions for operation during free swing

Part number: KHP18370

The free swing function delays the swing stop.

Operating on a slope with the free swing function active is dangerous. Make sure to read the Operator's manual to understand how operate the free swing function properly and safely.

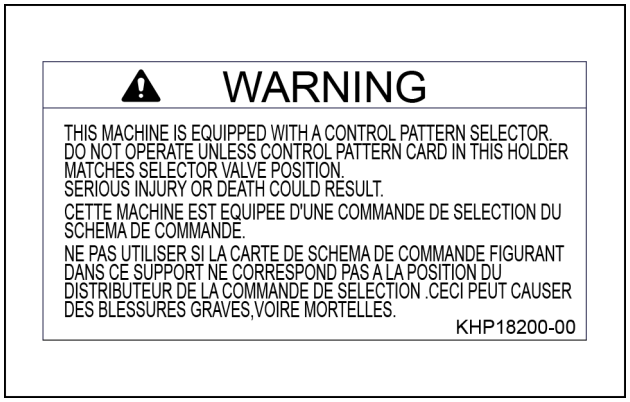


KHP18370 47

(40) Precautions for Operation Pattern

Part number: KHP18200

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



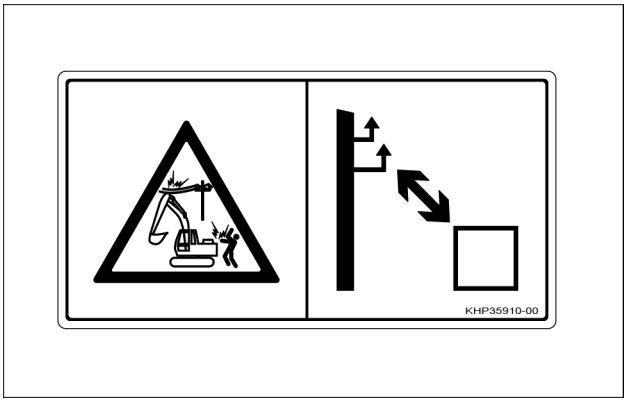
KHP18200 48

(41) Electric shock

Part number: KHP35910

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

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

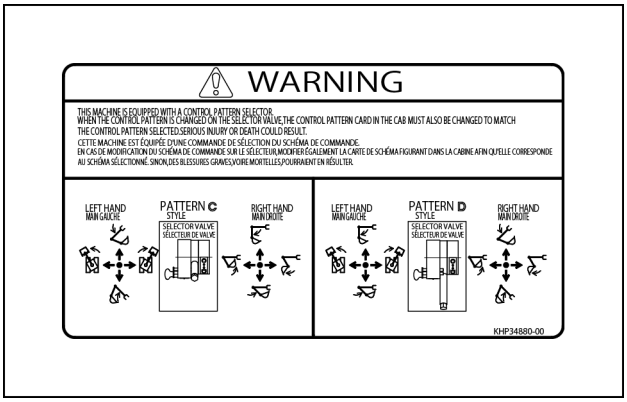


KHP35910 49

(42) Precautions for Operation Pattern

Part number: KHP34880

Before starting machine operation, set the control pattern selector valve to the desired position, and then check that the operating pattern of control levers is consistent with the position selected on the valve.

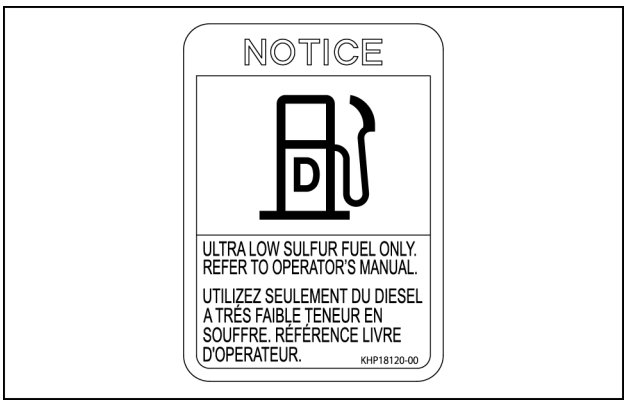


KHP34880 50

(43) Fuel used

Part number: KHP18120

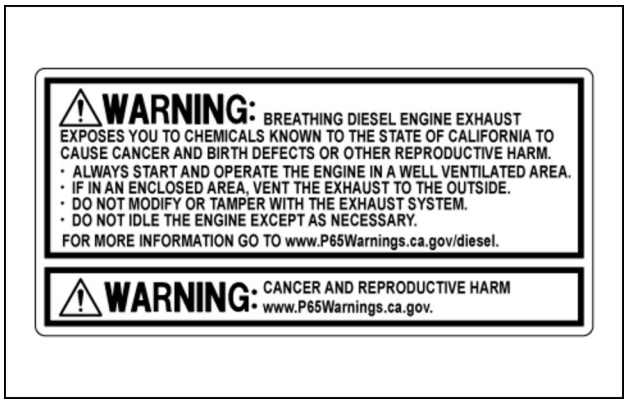
Use only Ultra Low Sulfur diesel fuel. Usage of different kinds of fuel will cause serious damages to the machine.



KHP18120 51

(44) CALIFORNIA PROPOSITION 65 warning

Part number: KHP38510

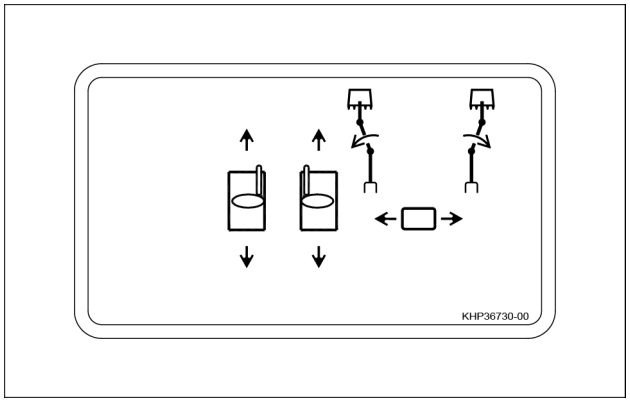


KHP38510 52

(45) Positioner pedal (CX145D SR Offset Boom with blade)

Part number: KHP36730

Functions of the control pedal for the positioner.



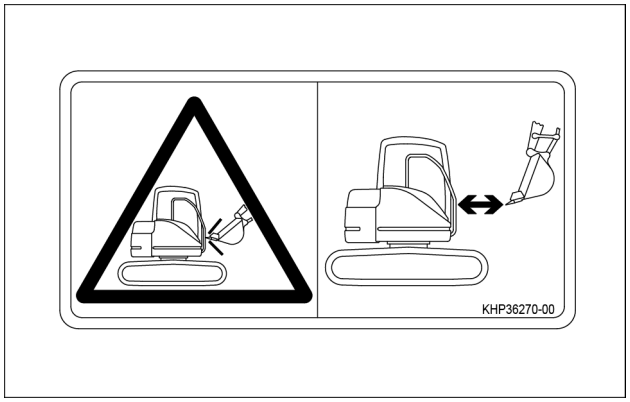
KHP36730 53

(46) Operation of Offset Boom front equipment (CX145D SR Offset Boom with blade)

Part number: KHP36270

When the arm is offset rightward from the boom, the attachment may hit the right front handrail.

Before start working, always make sure to check the operating range on the right side of the machine with the specific attachment in use, in order to keep proper clearance between the attachment and the right front handrail.



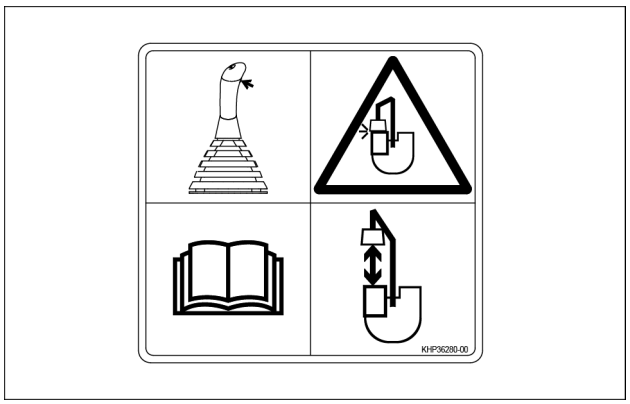
KHP36270 54

(47) Operation of temporary cancellation button (CX145D SR Offset Boom with blade)

Part number: KHP36280

The temporary cancellation button allows to override the cab interference prevention system, and to move the attachment inside of the protection envelope of the cab.

The attachment may hit the cab causing serious damages to the machine and serious injuries to the operator. Make sure to read the operator's manual to understand how operate the machine properly and safely in this condition. Make sure not to get the attachment too close to the cab if not strictly necessary.



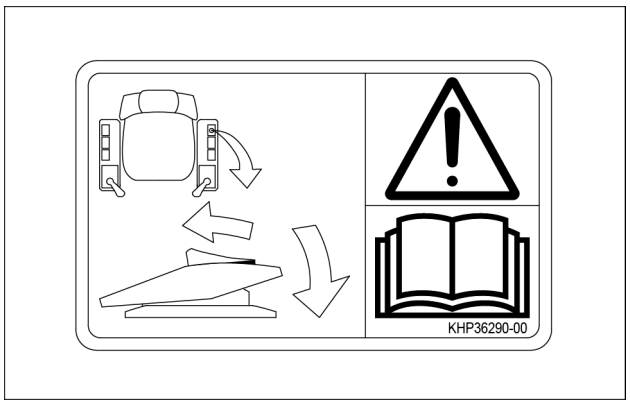
KHP36280 55

(48) Operation of emergency release switch (CX145D SR Offset Boom with blade)

Part number: KHP36290

The emergency release switch allows to unlock the controls of the front equipment as they have been blocked after a failure of the Cab interference prevention system. The controls shall thus be used strictly to move the attachment to a safe position away from the cab.

The attachment may hit the cab causing serious damages to the machine and serious injuries to the operator. Make sure to read the operator's manual to understand how operate the machine properly and safely in this condition.



KHP36290 56

3 - CONTROLS AND INSTRUMENTS

Access to operator's platform

Door and steps

⚠ CAUTION

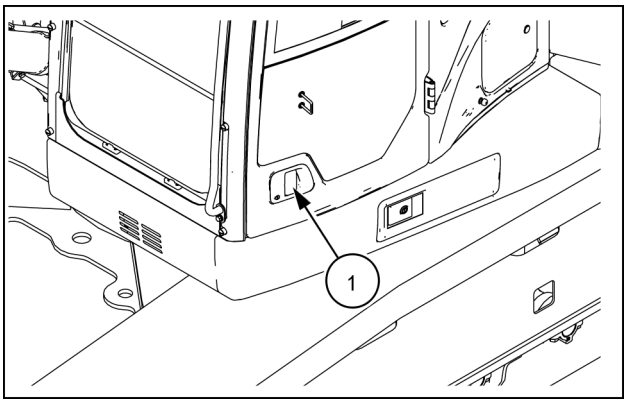
Pinch hazard!
Be careful not to get your hand, clothes, etc. caught in the door when closing it.
Failure to comply could result in minor or moderate injury.

C0046A

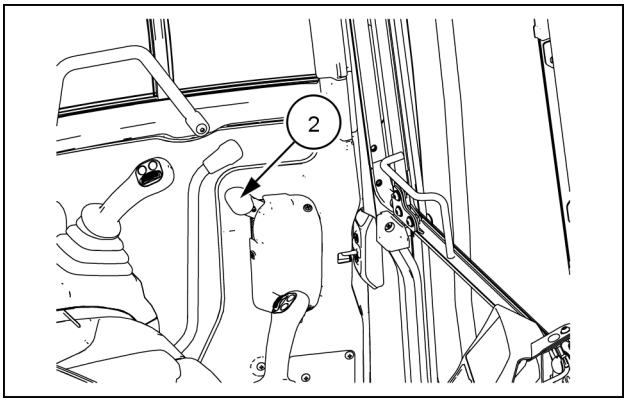
Cab door

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

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



SMIL17CEX0080AA 1

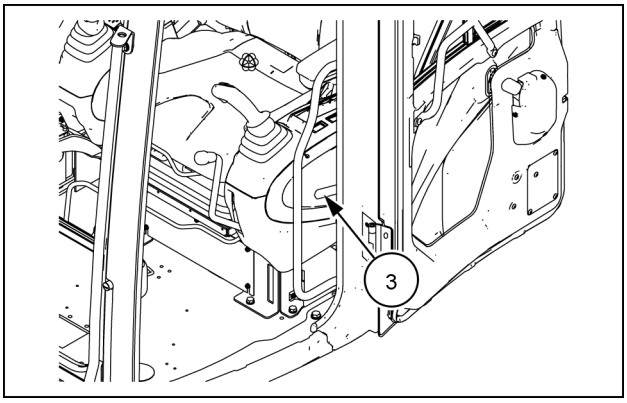


SMIL17CEX0081AA 2

The door can be latched in completely open position.

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

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



SMIL17CEX0082AA 3

Steps and access handles

⚠ WARNING

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

W0225A

⚠ WARNING

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

W0139A

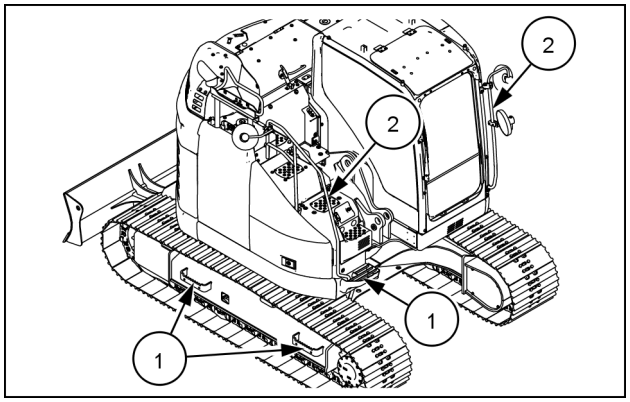
⚠ WARNING

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

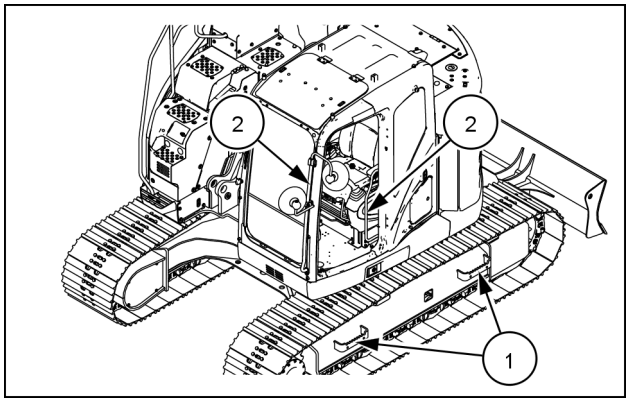
W0141A

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

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



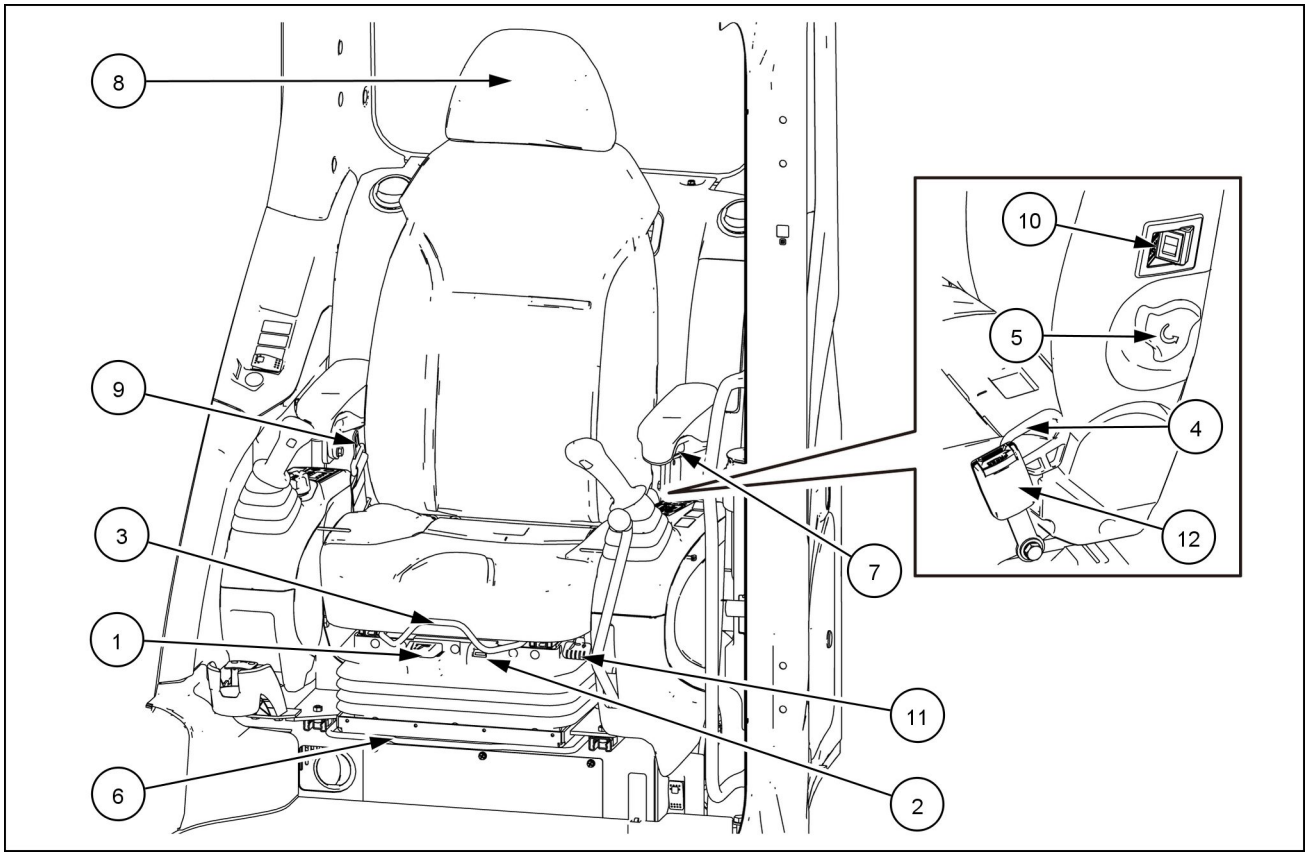
SMIL17CEX3555AA 4



SMIL17CEX3556AA 5

Operator's seat

Operator's seat



SMIL19CEX2699FA 1

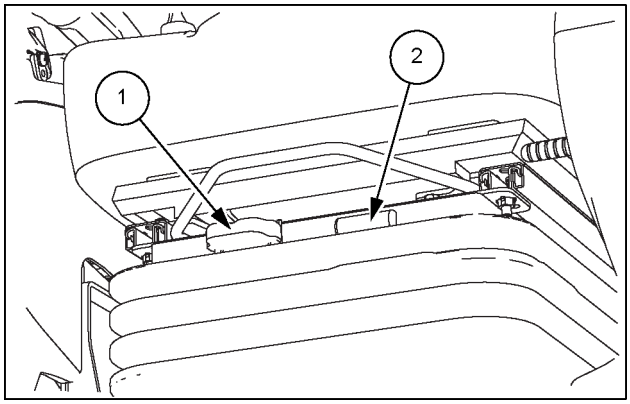
1. Combined height and weight adjustment
2. Weight adjustment indicator
3. Fore and aft adjustment
4. Seat back angle adjustment
5. Lumbar support adjustment
6. Seat and control arm assembly fore and aft adjustment
7. Armrest angle adjustment
8. Headrest adjustment
9. Seat belt
10. Seat heater
11. Seat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

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

Combined height and weight adjustment

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

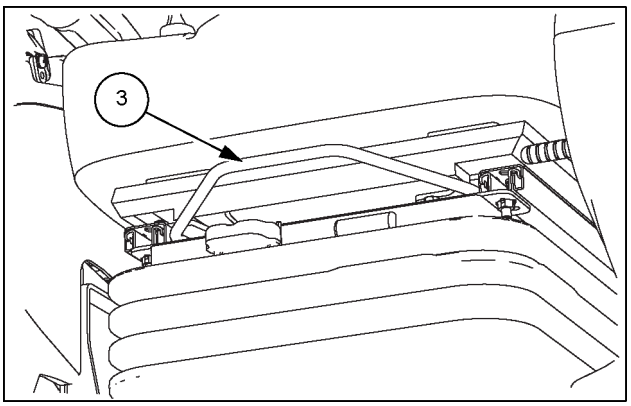
NOTICE: *the indicator* ***(2)*** *must be green when the operator is sitting on the seat.*



SMIL14CEX1655AB 2

Fore and aft adjustment

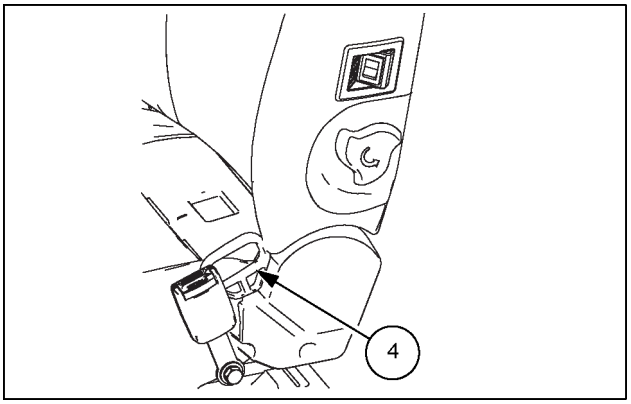
- Hold the control **(3)** in the raised position.
- Slide the seat to the required position.
- Release the control **(3)**.



SMIL14CEX1656AB 3

Seat back angle adjustment

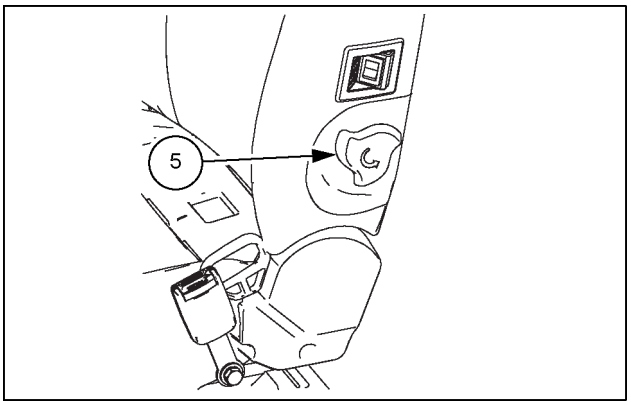
- Hold the lever **(4)** in the raised position.
- Move with the seat-back to the desired position.
- Release the lever **(4)**.



SMIL14CEX1657AB 4

Lumbar support adjustment

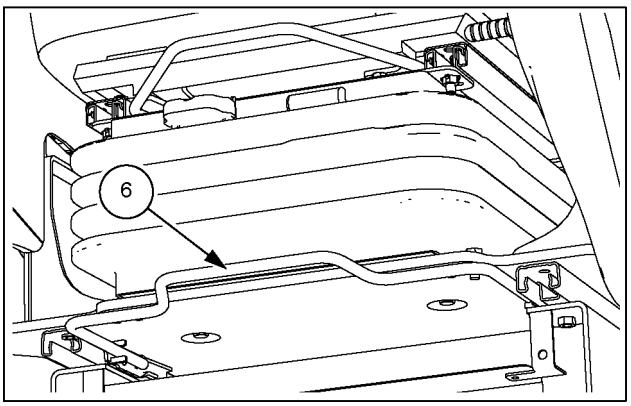
- Turn the dial **(5)** to adjust the bulge of the lumbar area in four levels.



SMIL14CEX1658AB 5

Seat and control arm assembly fore and aft adjustment

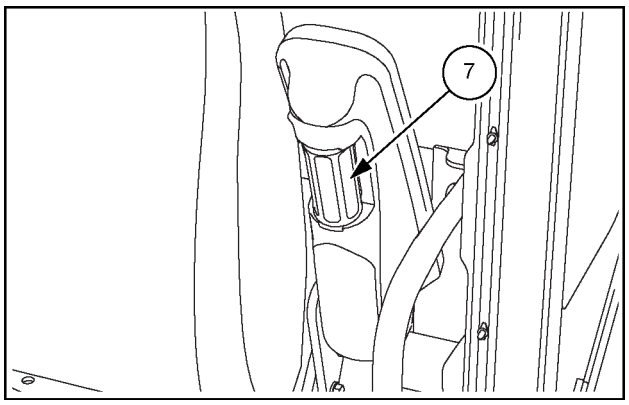
- Pull the control **(6)** upwards.
- Slide the seat and control arm assembly to the desired position.
- Release the control **(6)**.



SMIL14CEX1659AB 6

Armrest angle adjustment

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

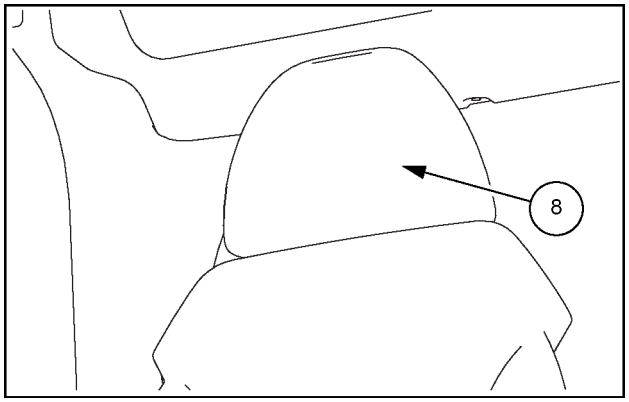


SMIL14CEX1660AB 7

Headrest adjustment

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

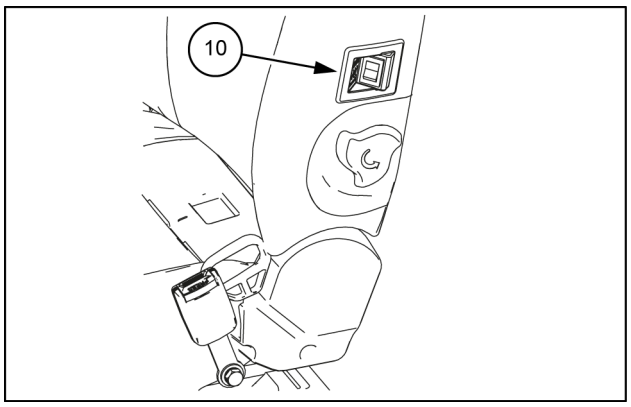
NOTE: *to make the headrest return to its initial position (to the rear), tilt it completely forwards and then release it.*



SMIL14CEX1661AB 8

Seat heater

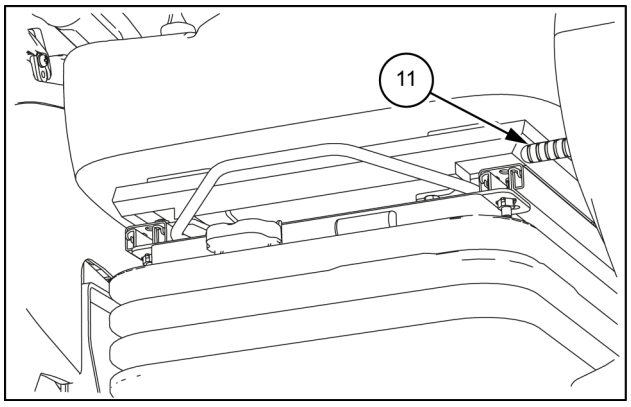
- When the switch **(10)** is turned on, both the backrest and the seat area will be warmed.



SMIL14CEX1662AB 9

Seat angle adjustment section

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



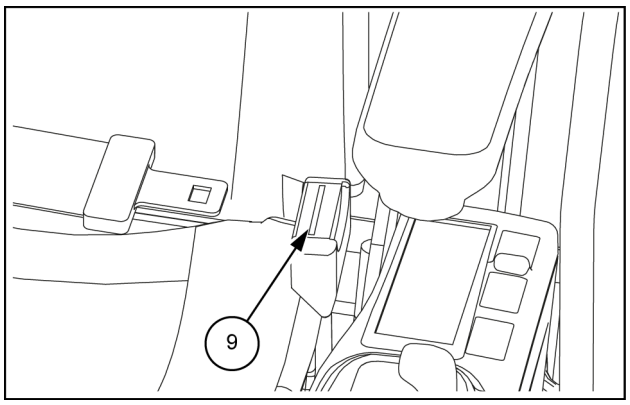
SMIL14CEX1663AB 10

Seat belt

⚠ WARNING

Equipment failure could cause accident or injury!
Always fasten the seat belt securely before you operate the machine. Inspect seat belt parts for wear and damage. Replace any and all worn or damaged parts of the seat belt prior to operation.
Failure to comply could result in death or serious injury.

W0046C



SMIL14CEX1664AB 11

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

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

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

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

Forward controls

⚠ WARNING

Avoid injury!
Inspect the work area or job site to make sure that machine operation can be done safely. Confirm that the lever operation is the same as indicated on the control pattern labels. If not, immediately change the machine control pattern or the label displayed to match the machine control pattern.
Failure to comply could result in death or serious injury.

W1339A

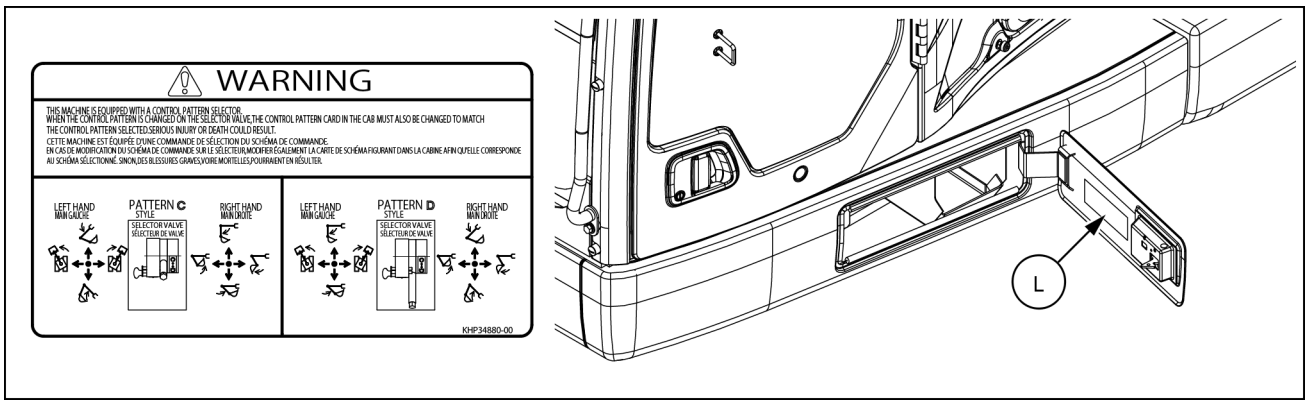
Selection of control pattern

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

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

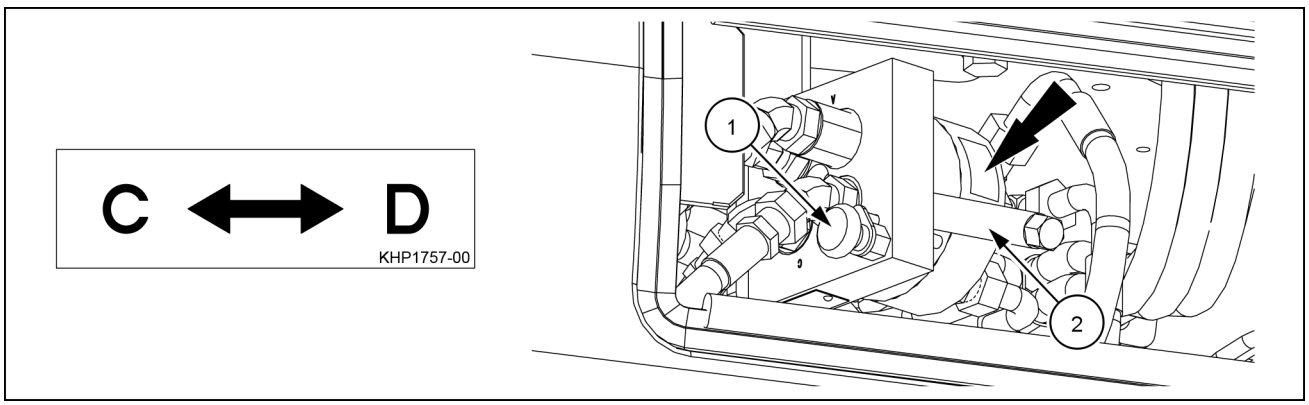
To select the desired control pattern proceed as follows:

1. Lower the attachment to the ground, and stop the engine.
2. Open the storage compartment located under the cab.
3. Read and understand the warning label (L) located on the inside of the compartment cover.



SMIL17CEX0587EA 1

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



SMIL17CEX0588EA 2

5. Close the storage compartment.

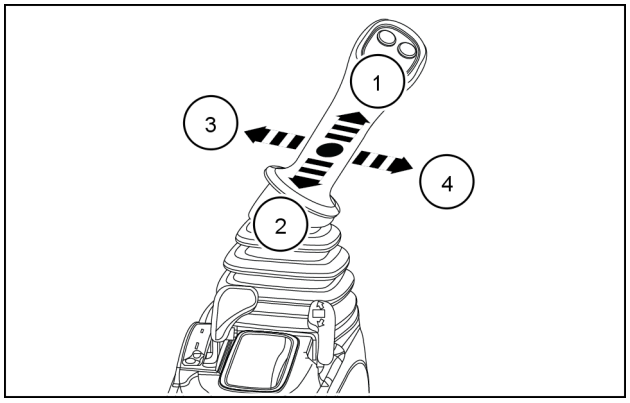
D position: ISO control pattern

Left-hand control lever:

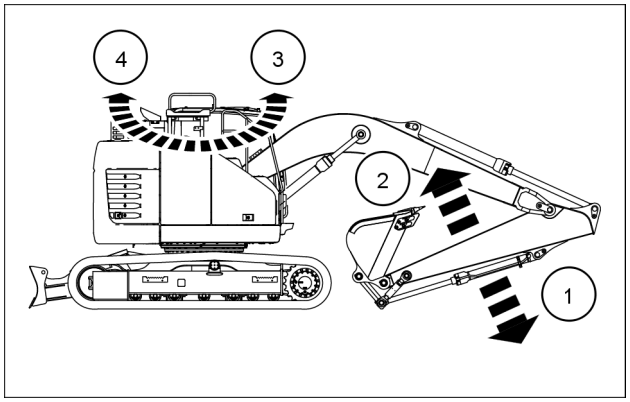
1. The arm extends.
2. The arm retracts.
3. The upper structure swings to the left.
4. The upper structure swings to the right.

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

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



SMIL15CEXY854AA 3

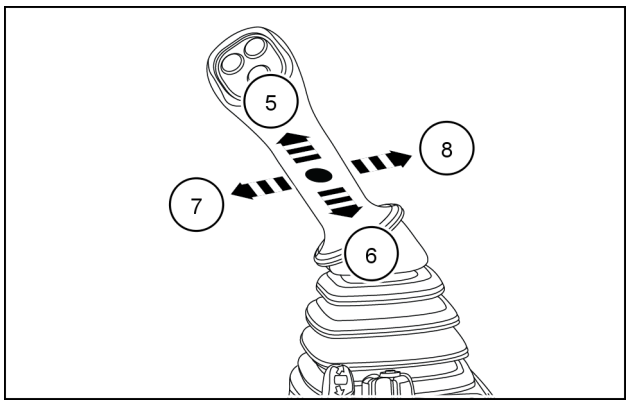


SMIL18CEX0304AA 4

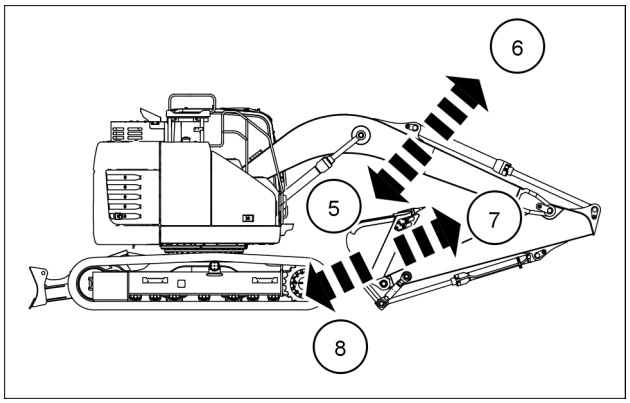
Right-hand control lever:

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

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



SMIL15CEXY853AA 5



SMIL18CEX0305AA 6

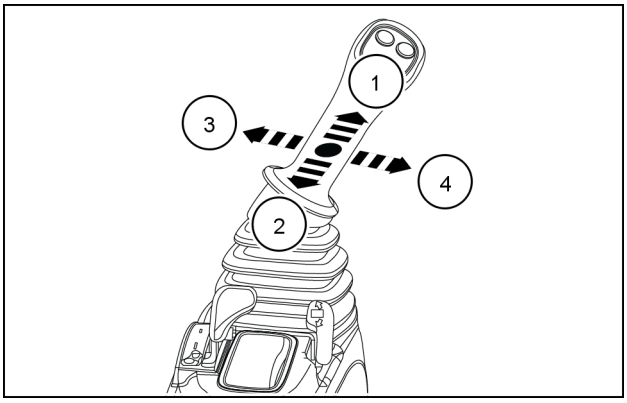
C position: BHL control pattern

Left-hand control lever:

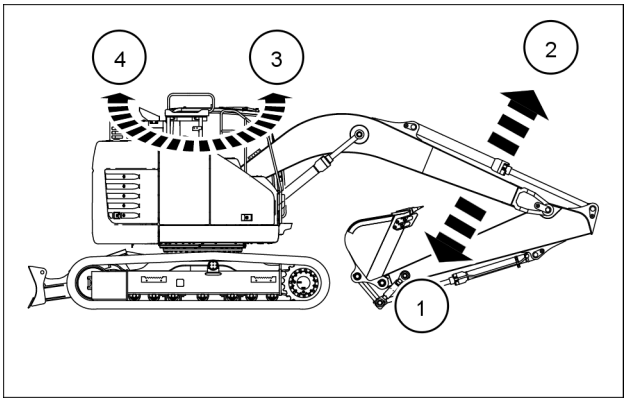
1. The boom lowers.
2. The boom raises.
3. The upper structure swings to the left.
4. The upper structure swings to the right.

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

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



SMIL15CEXY854AA 7

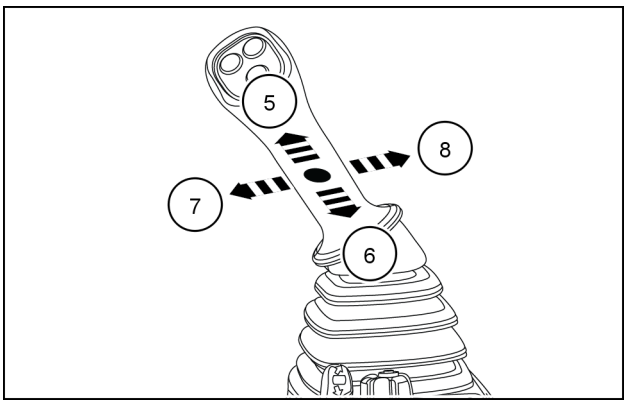


SMIL18CEX0304AA 8

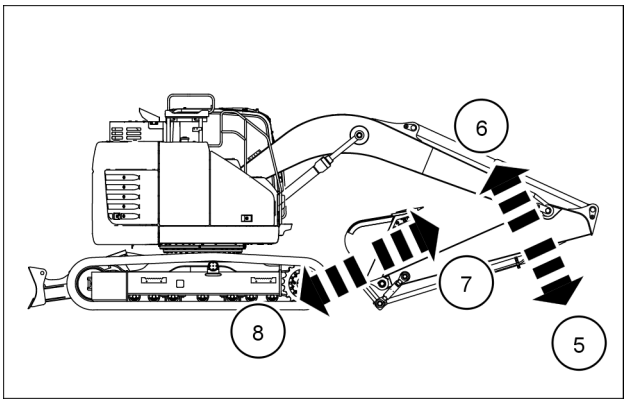
Right-hand control lever:

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

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



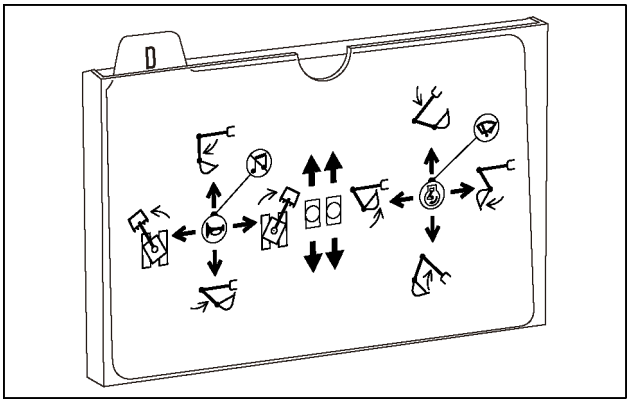
SMIL15CEXY853AA 9



SMIL18CEX0305AA 10

Confirmation of the control pattern selection

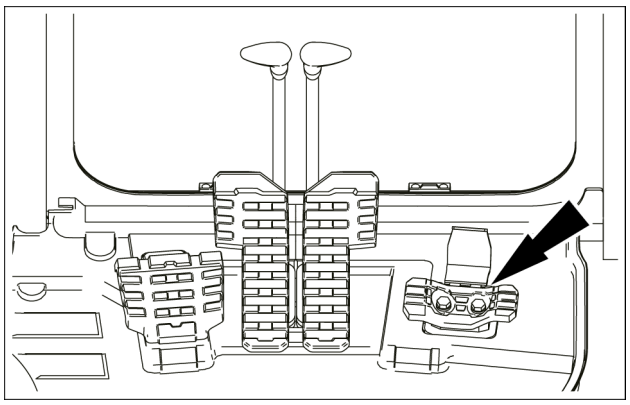
1. Get onto the cab and make sure to place the sheet that maps the operating controls to the side corresponding to the selected control pattern (C or D).
2. Start the engine and check that the operating pattern of control levers is consistent with the position selected on the valve and shown by the mapping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



SMIL14CEX1671AA 11

Positioner pedal (Offset Boom version)

In the Offset Boom front equipment, a positioner arm is linked to a short primary boom by a vertical pivoting pin. The positioner arm can swing horizontally, and is linked at the other end to a front bracket that supports the digging arm and the arm cylinder. The linkage between boom, positioner, and front bracket allows to offset the axis of the digging arm from the axis of the boom, keeping them parallel to each other.



SMIL17CEX7668AA 12

The offset between the boom and the arm can be thus set before starting the digging or leveling application in order to adapt the operating range of the whole front equipment.

NOTICE: *Never change the offset between the boom and the arm during digging or leveling application. Failing to comply will cause severe damages to the machine frames and to the machine systems.*

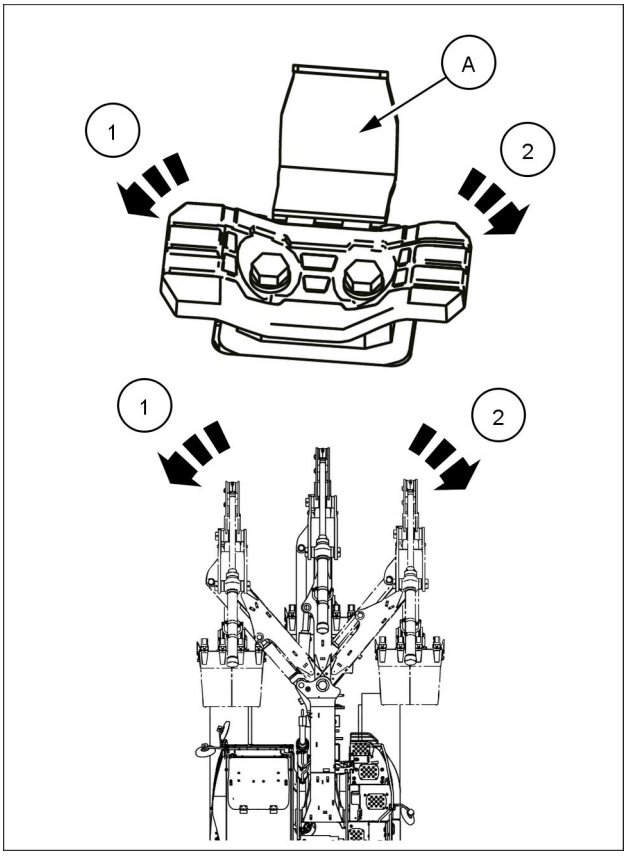
The offset between the boom and the arm is set by a positioning cylinder. The movement of the positioning cylinder is controlled by the positioner pedal.

To operate the positioner pedal, tilt the locking plate **(A)** in outward position.

1. The arm is offset leftward from the boom.
2. The arm is offset rightward from the boom.

NOTE: *The speed of movement of the positioner depends on the tilt angle of the pedal.*

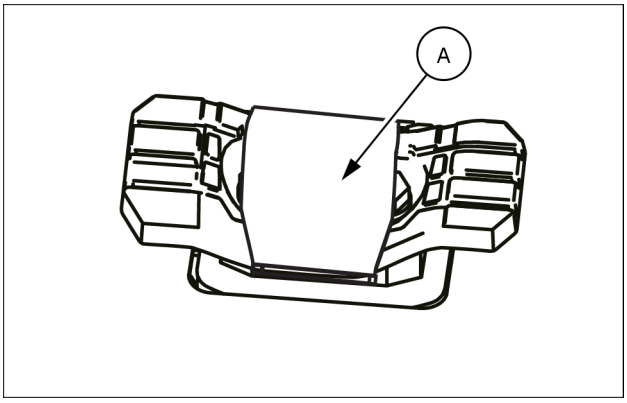
As the pedal is released, it returns automatically into the neutral position. The positioner stops moving and the offset between the boom and the arm is defined.



SMIL17CEX7669BA 13

NOTICE: *The positioner pedal shall always be locked when not in use. Unintended pedal operation can get the attachment hitting the cab causing serious damages to the machine and serious injuries to the operator.*

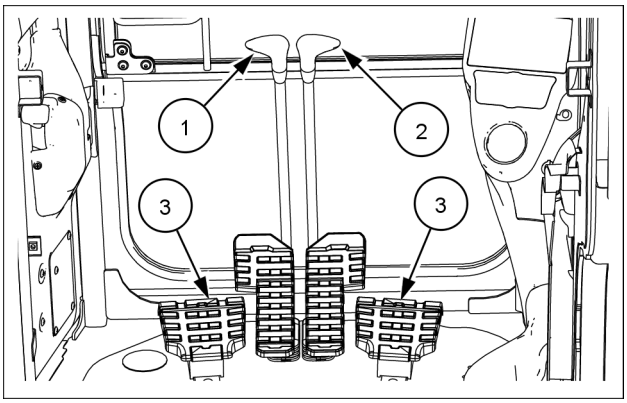
To lock the positioner pedal, fully lower the locking plate **(A)**.



SMIL17CEX7670AA 14

Travel controls

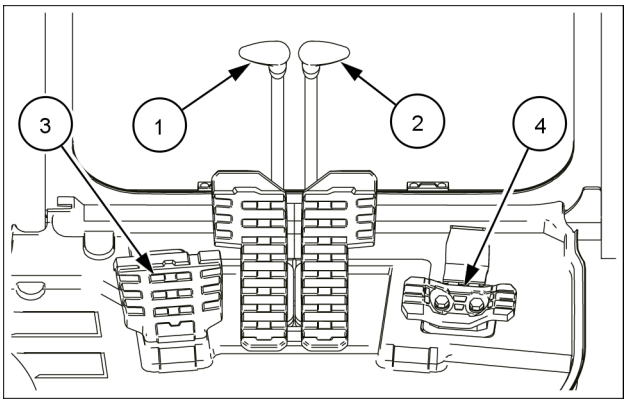
1. Left-hand travel control lever and pedal
2. Right-hand travel control lever and pedal
3. Footrest



SMIL17CEX5210AA 15

1. Left-hand travel control lever and pedal
2. Right-hand travel control lever and pedal
3. Footrest
4. Positioner pedal (CX145D SR Offset Boom with blade)

NOTICE: *The pedal **(4)** shall always be locked when not in use. Unintended pedal operation can get the attachment hitting the cab causing serious damages to the machine and serious injuries to the operator.*



SMIL17CEX7668AA 16

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

(N): neutral

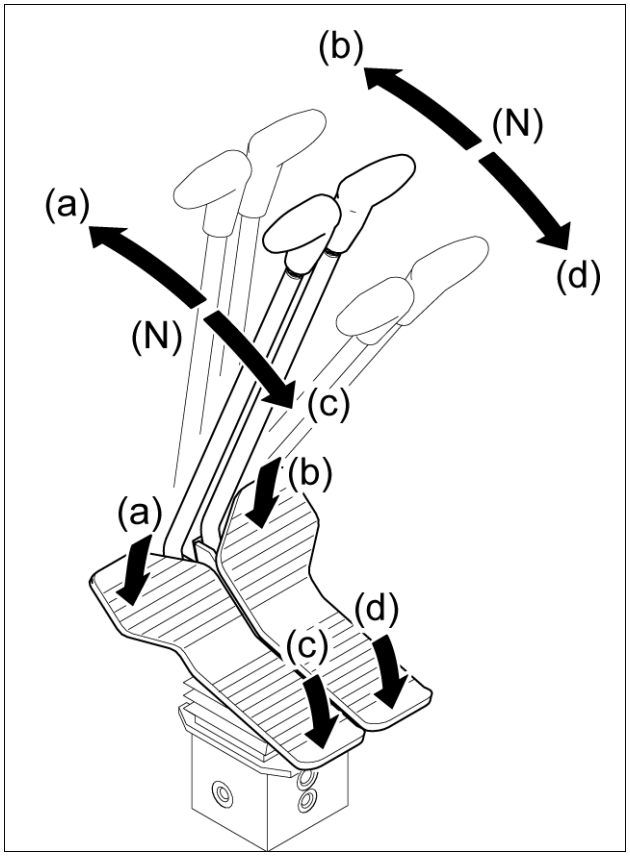
(a) + **(b)**: machine moves forward.

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

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

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

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



NH0159 17

Windshield

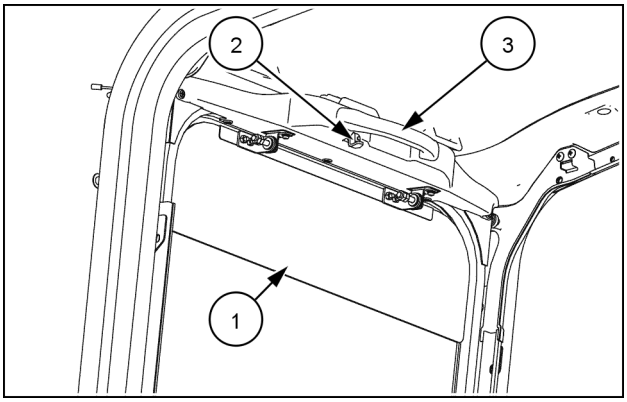
⚠ CAUTION

Pinch hazard!
Make sure you correctly follow the instructions in this manual when handling the windshield. If you do not handle the windshield correctly, it could slip and injure your fingers or hands.
Failure to comply could result in minor or moderate injury.

C0045A

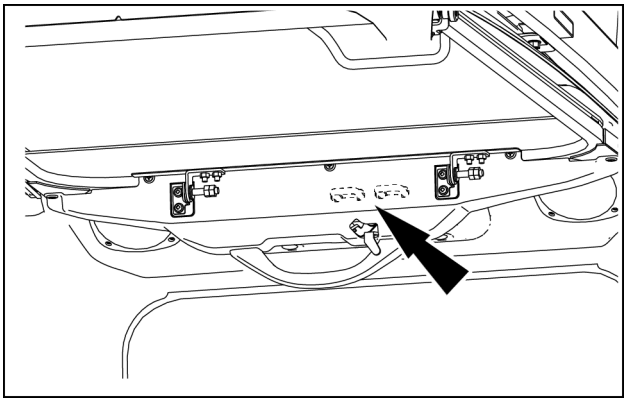
Opening

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



SMIL17CEX0900AA 1

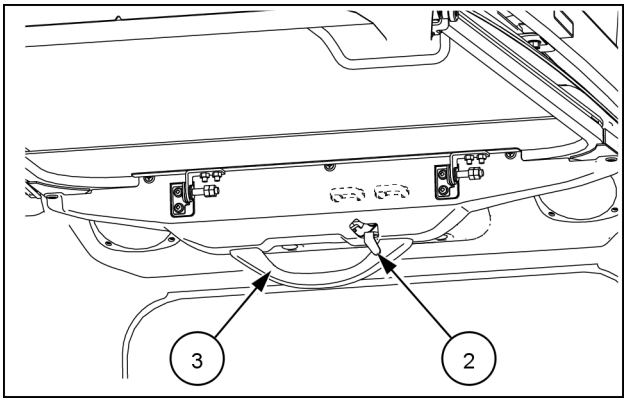
3. Pull the windshield to the rear until it engages perfectly behind the cab.



SMIL17CEX0899AA 2

Closing

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

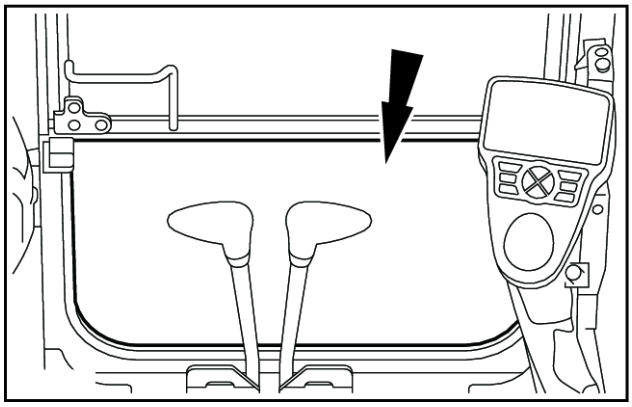


SMIL17CEX0899AA 3

Front lower window

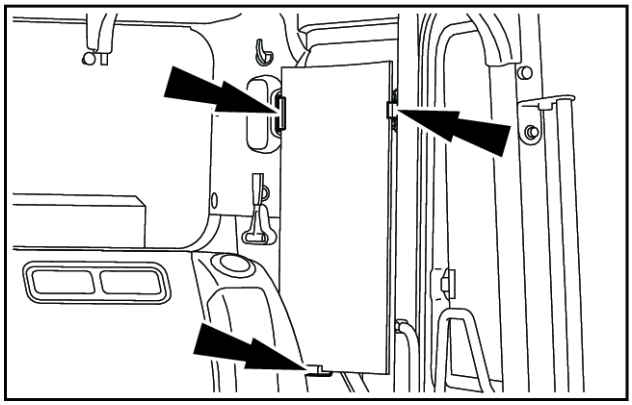
The front lower window may only be removed when the windshield is open.

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



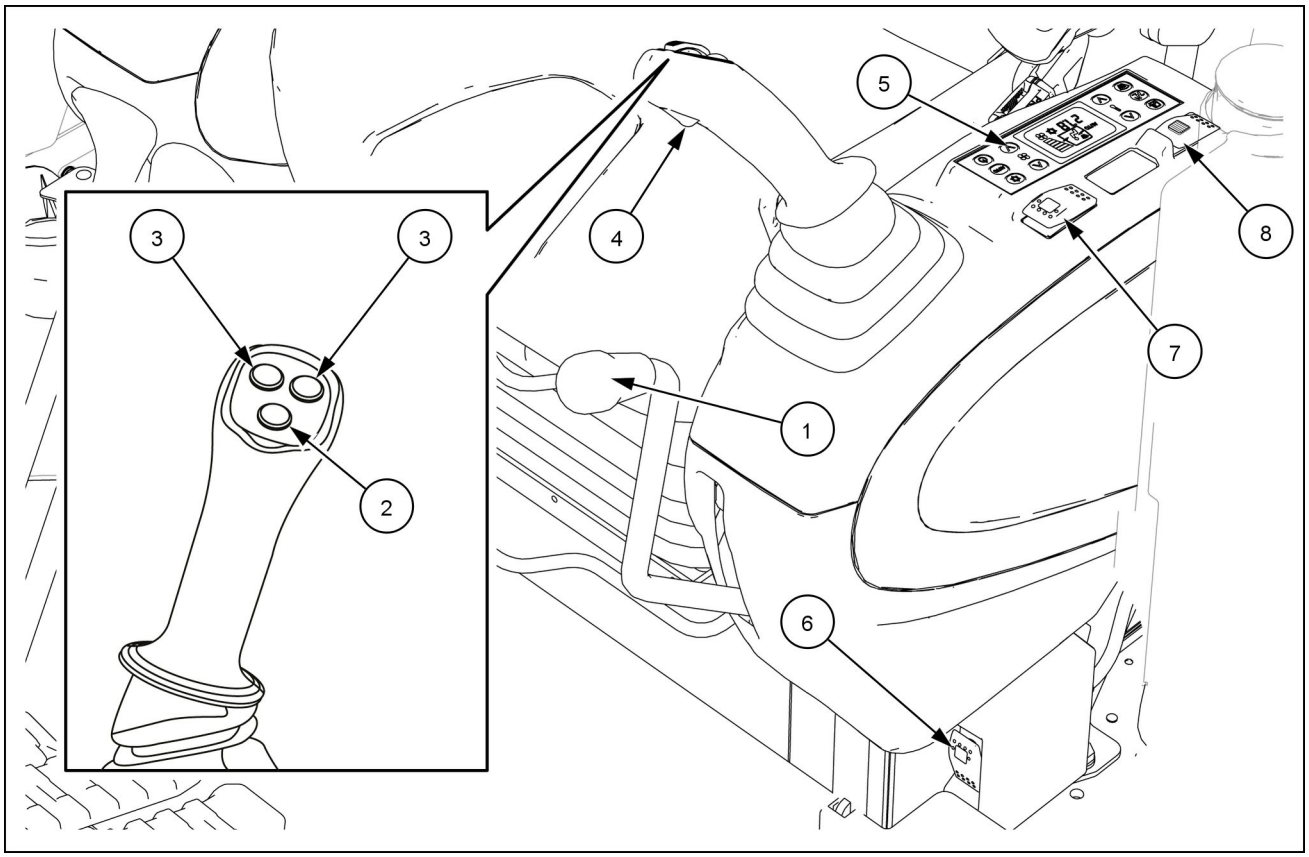
SMIL13CEX2594AB 1

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



SMIL13CEX2595AB 2

Left-hand side controls



SMIL19CEX2682FA 1

(1) Gate lock lever.

(2) Horn button.

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

(3) Not active.

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

(4) Temporary cancellation button (Offset Boom version): the temporary cancellation button is located underneath the control lever. Keep the button pressed to temporary override the cab interference prevention system. Refer to page **4-10**.

NOTICE: *The temporary cancellation button is intended for seldom usage in special operating conditions. Make sure not to get the attachment too close to the cab if not strictly necessary.*

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

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

(7) Free swing button: the button sets the condition of swing stop. If the free swing is activated the swing stop is delayed. Press the button to activate the free swing function. The free swing icon appears on the monitor. Press the button again to deactivate the function.

The free swing function is intended to be used especially for load handling application to avoid loads from slinging.

The free swing function is automatically deactivated when stopping the engine.

NOTICE: *avoid working on a slope with the free swing function active. The swing becomes hard to stop.*

NOTICE: *when parking on a slope, never activate the free swing function from the machine parking position. The machine may start to swing because the swing parking brake is released.*

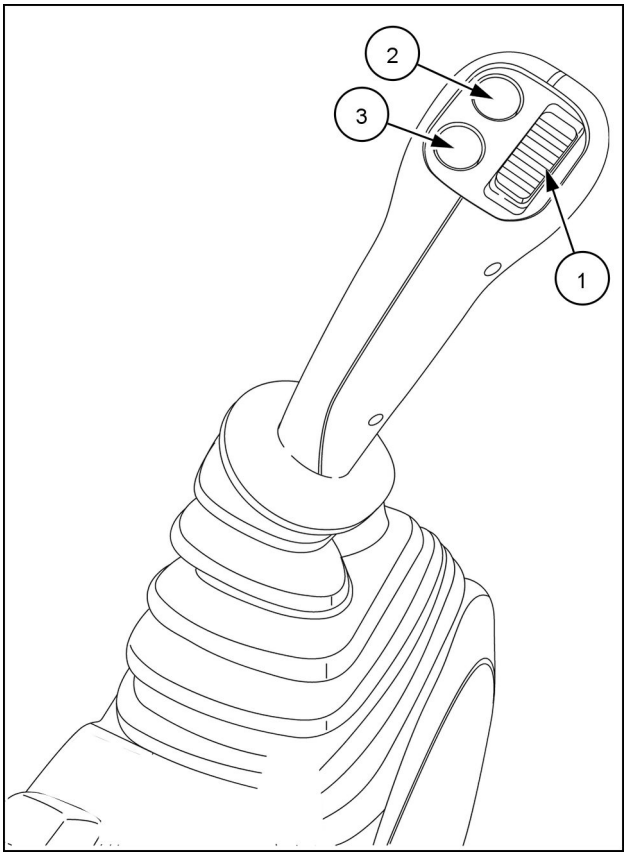
(8) Emergency release switch (Offset Boom version): Slide the lock device and press the front side of the switch to set the emergency release status of the interference prevention system. Refer to page **4-10**.

NOTICE: *The emergency release switch is intended for exceptional usage when the interference prevention system has a failure and needs to be serviced. Never use the switch during regular machine operation.*

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

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

NOTE: *The auxiliary low-flow hydraulic circuit is not available on CX145D SR Offset Boom with blade.*



SMIL15CEXY839BA 2

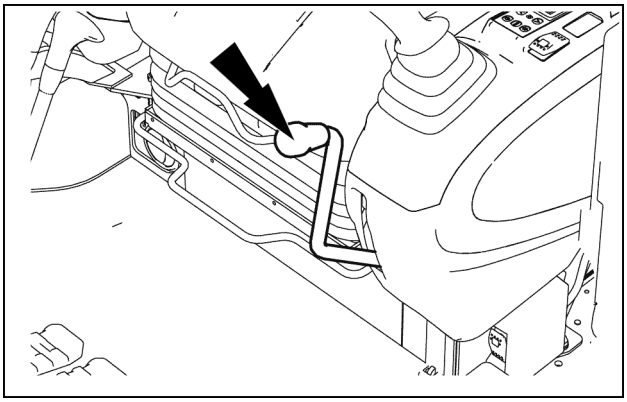
Gate lock lever

⚠ WARNING

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

W1487A

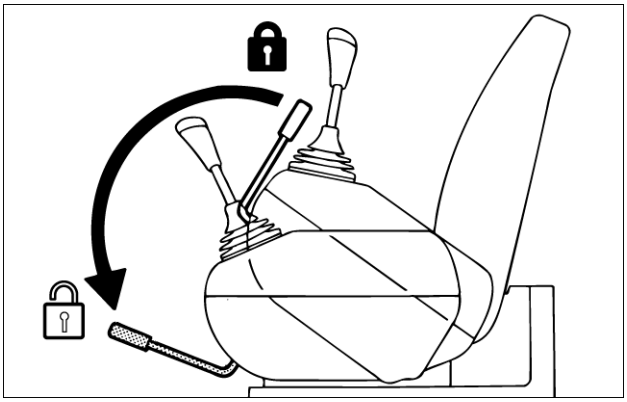
The gate lock lever allows to cancel the functioning of the control levers and pedals.



SMIL17CEX0199AA 1

The gate lock lever has two positions:

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

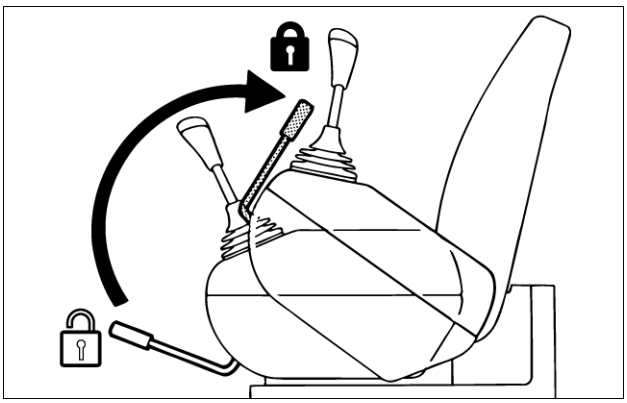


NH0003 2

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

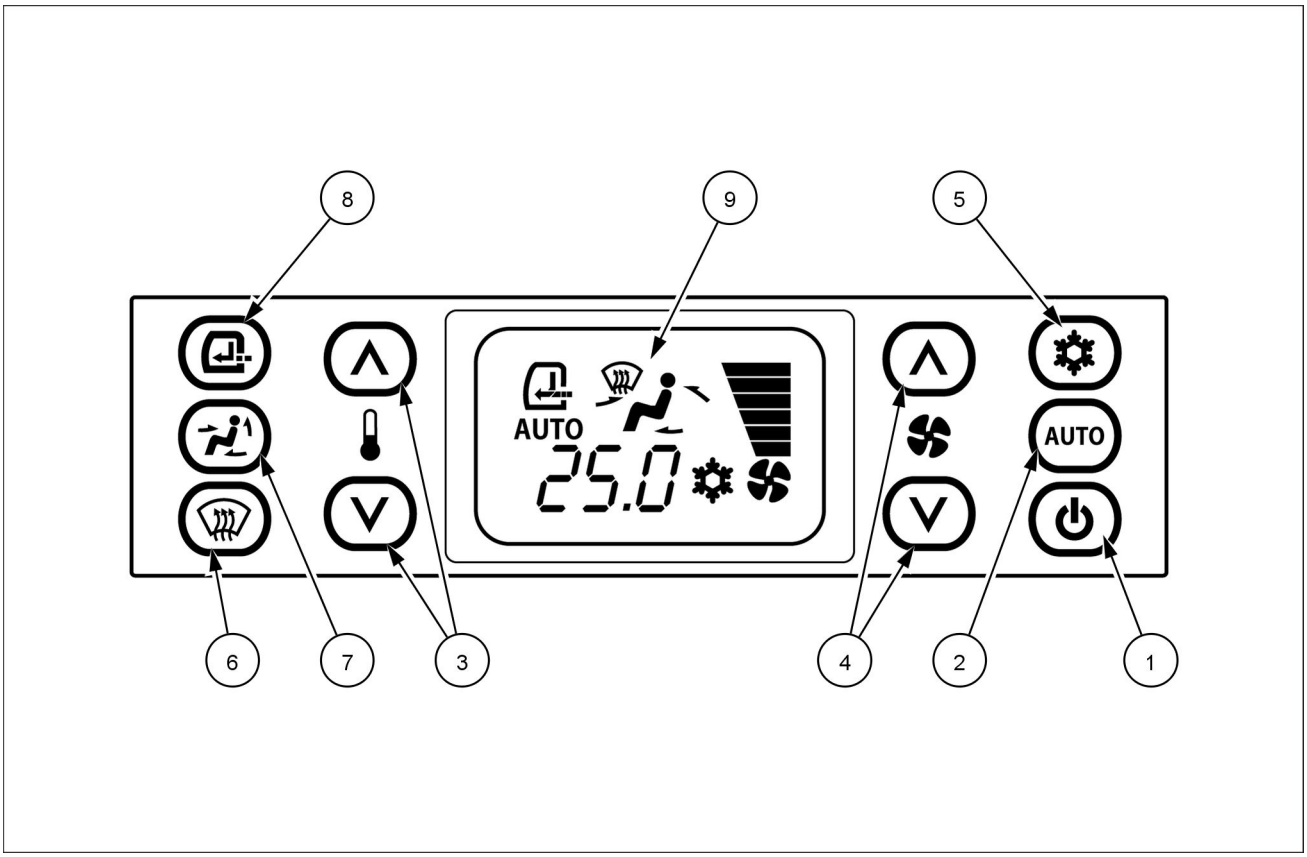
NOTE: *Set the gate lock lever to lock position when ending machine operation and leaving the machine.*

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



NH0002 3

Heating, ventilation or air-conditioning control



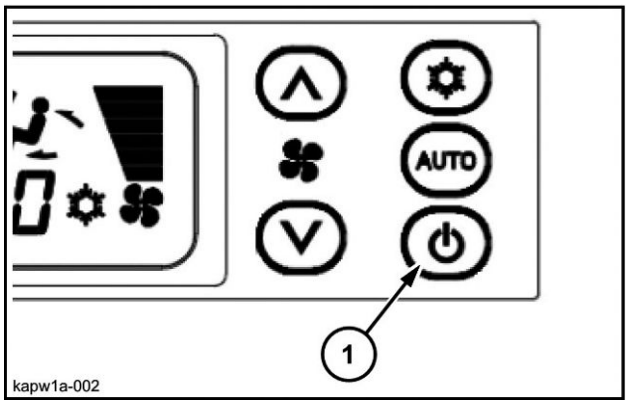
SMIL18CEX0530FB 1

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

On/Off

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

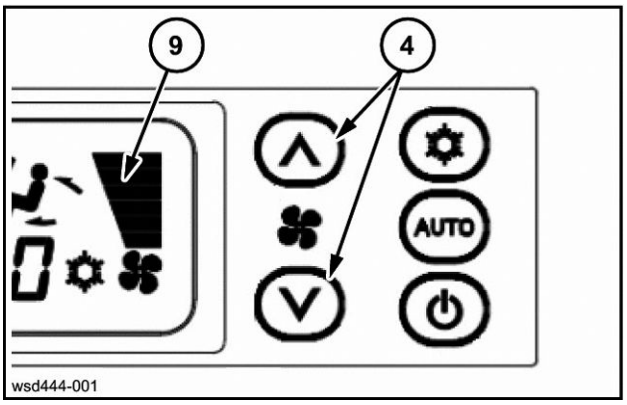
NOTICE: *When the system is turned On it will operate at the same setting as the one selected previously.*



KAPW1A-002 2

Ventilation

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

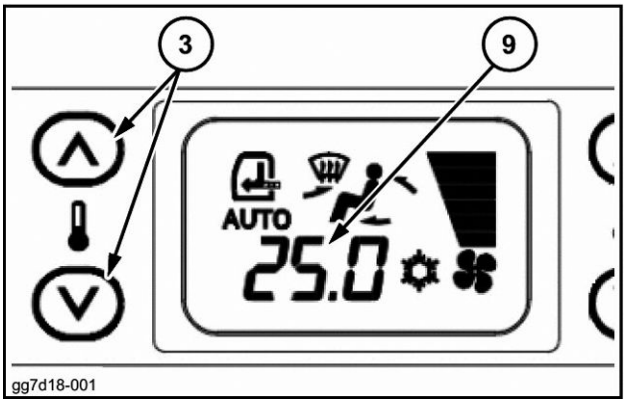


WSD444-001 3

Temperature

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

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



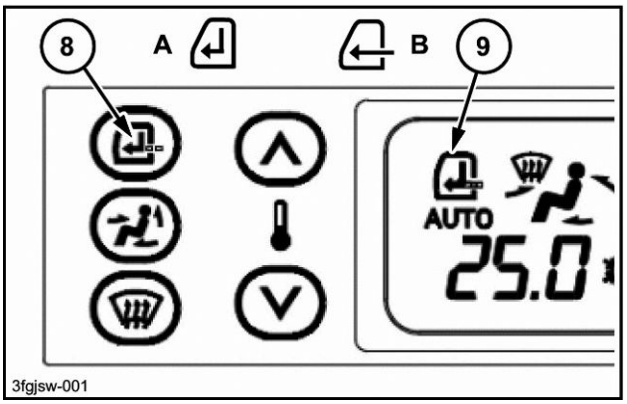
GG7D18-001 4

Air recycling

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

(A) Internal air circulated

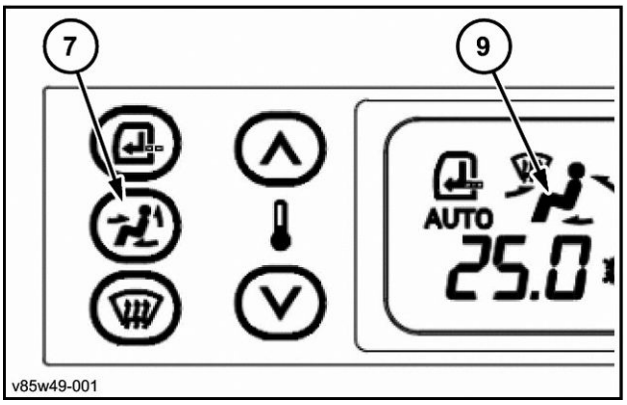
(B) External air enters



3FGJSW-001 5

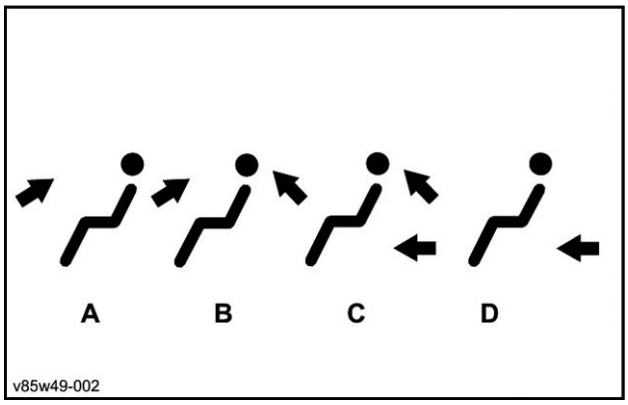
Air flow direction

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



V85W49-001 6

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

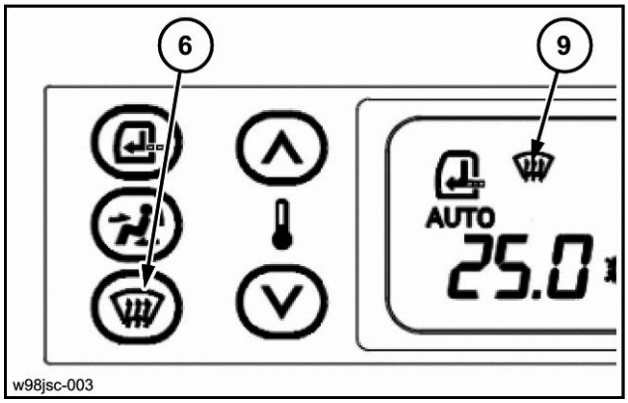


V85W49-002 7

Windshield defroster

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

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



W98JSC-003 8

Air conditioning

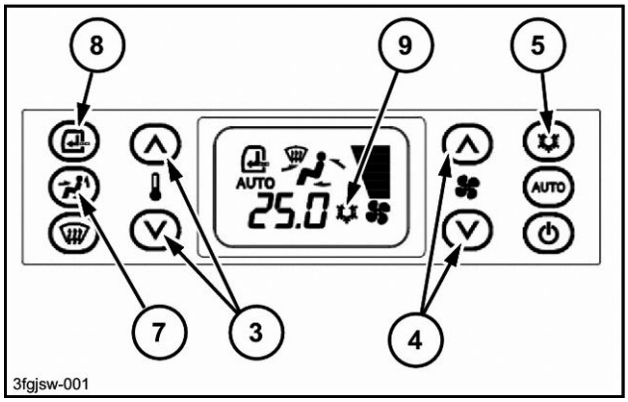
NOTE: *Operate the air conditioning system at least once a week, if only for a short time.*

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

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

Manual:

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

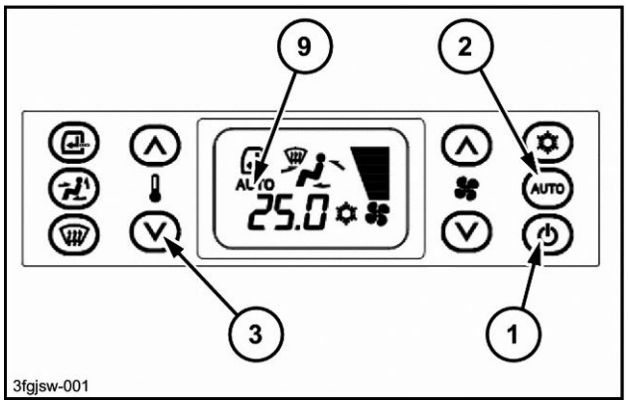


6CSC9W-001 9

Automatic:

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

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



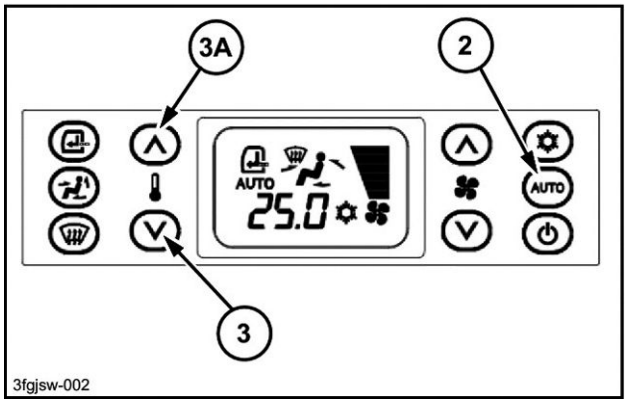
8TWEZ7-001 10

To obtain hot or cold air quickly:

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

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

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



8TWEZ7-002 11

Cab internal lighting

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

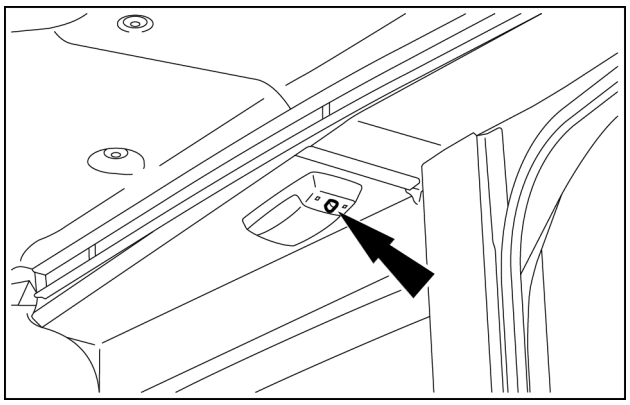
- OFF
- DOOR
- ON

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

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

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

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



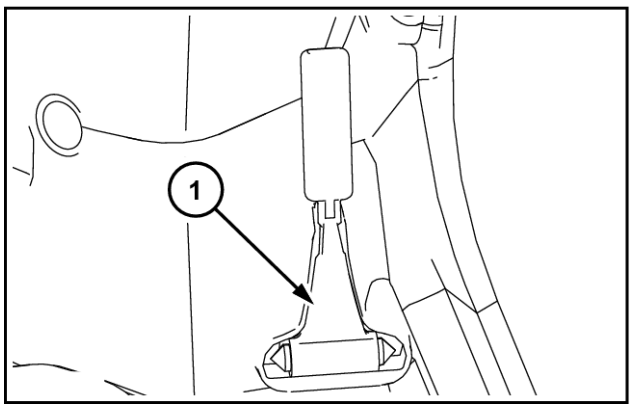
SMIL17CEX0904AA 1

Emergency exit hammer

Located on the left-hand cab, use the hammer **(1)** to break the rear window, and then push the window strongly and escape outside.
Consult your CASE CONSTRUCTION dealer for window installation.

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

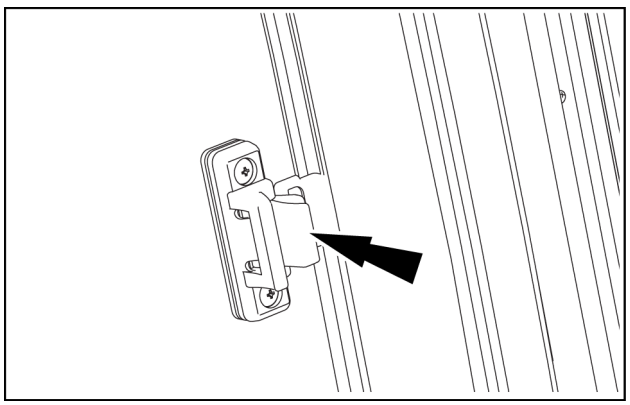
NOTICE: *Do not place anything in front of the window. Doing so may obstruct an emergency escape.*



SMIL13CEX2621AB 1

Sliding windows on door

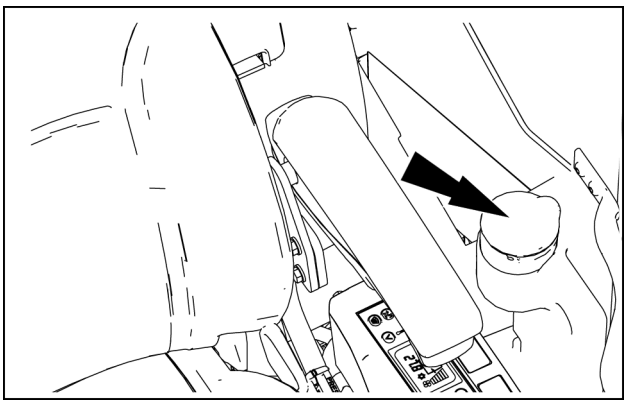
The two windows on the cab door can be opened singularly or simultaneously. Release the lock and slide each window in order to open it.



SMIL14CEX2569AA 1

Ash tray

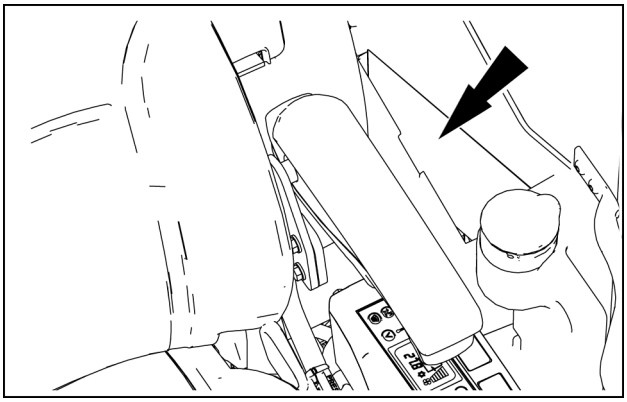
Located leftward the operator’s seat.



SMIL17CEX0200AA 1

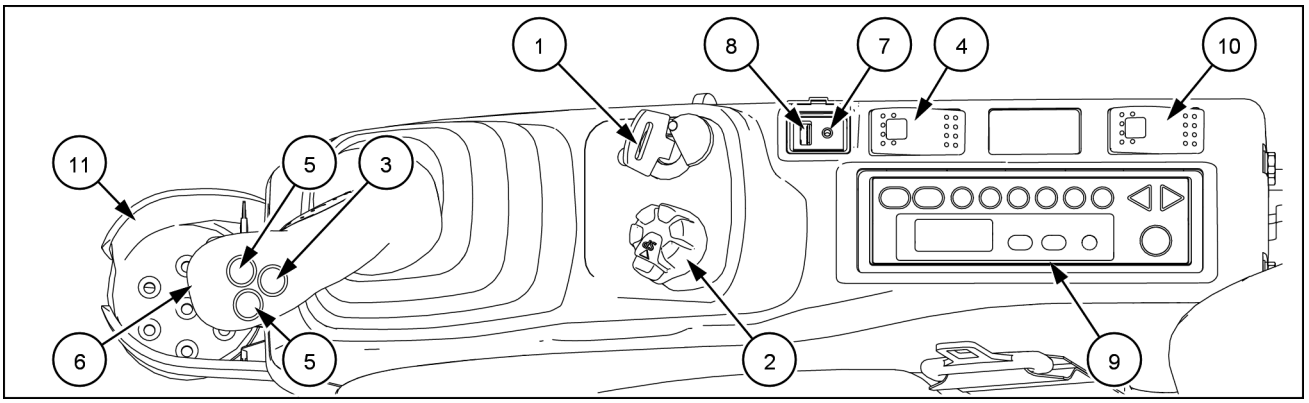
Magazine rack

Located leftward the operator’s seat.



SMIL17CEX0200AA 1

Right-hand side controls



SMIL17CEX0140EA 1

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

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

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

(2) Engine speed throttle and work mode selector.

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

(4) Travel alarm switch.

(5) Not active.

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

(7) Auxiliary port.

(8) USB port.

(9) Radio.

(10) Overload warning switch (optional, refer to Chapter 9).

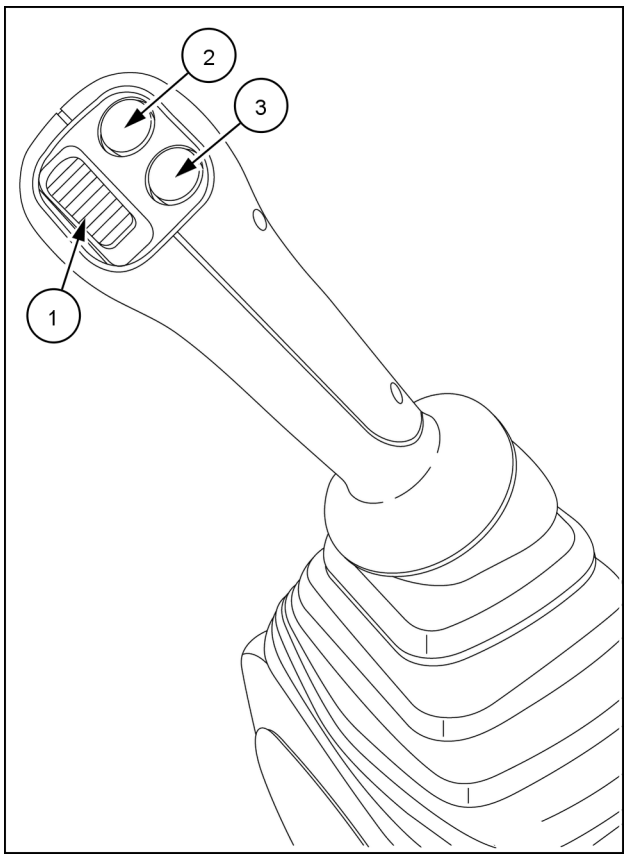
NOTE: *the overload warning alarm is mainly intended for safe operation in loads handling application. Do not activate it during digging or truck loading application.*

(11) Beverage can holder.

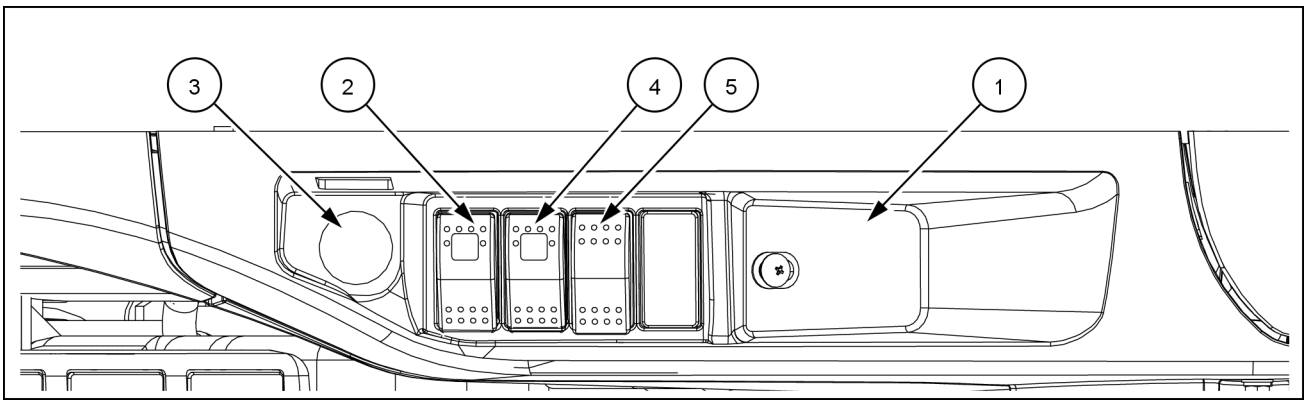
When the machine is equipped with an auxiliary high-flow hydraulic circuit, the right-hand control lever includes:

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

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



SMIL15CEXY838BA 2



SMIL17CEX0141EA 3

(1) Storage tray.

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

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

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

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

(5) Around lighting switch (optional): the around lighting switch allows to activate the around lighting system installed on the cameras. Press the back side of the switch to activate the lighting. Press the front side of the switch to deactivate the lighting.

NOTE: *the around lighting system activates as the working lights are turned on.*

Dozer blade control lever

⚠ WARNING

Hazard to bystanders!
ALWAYS make sure the work area is clear of bystanders and domestic animals before starting this procedure. Know the full area of movement of the machine. Do not permit anyone to enter the area of movement during this procedure.
Failure to comply could result in death or serious injury.

W0245A

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

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

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

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

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

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

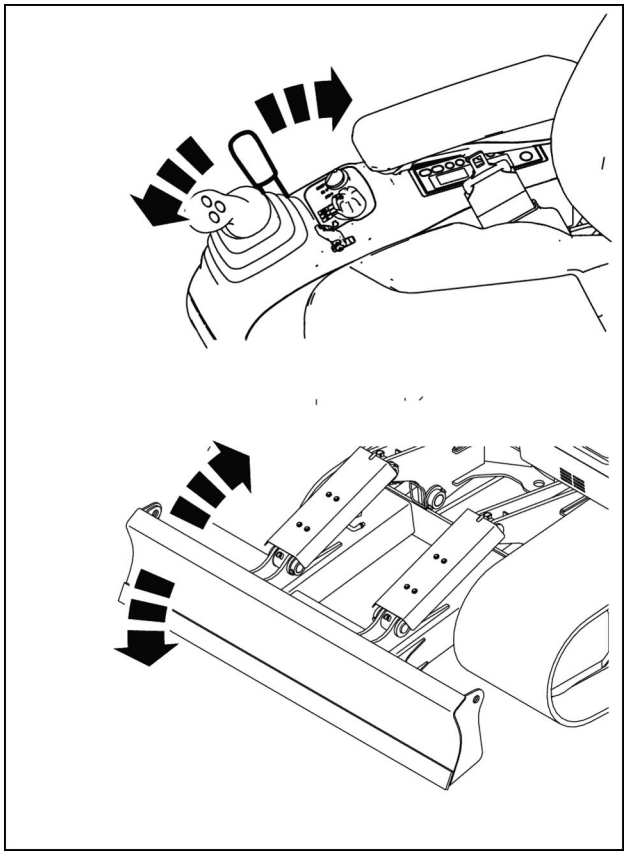
During blade operations, avoid application of concentrated or lateral load to the blade. Severe damages may be caused to the blade structure.

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

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

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

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



SMIL17CEX0197BA 1

Instrument cluster

(1) Ambient sensor

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

(2) Display

(3) Control buttons

(4) Air vents

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

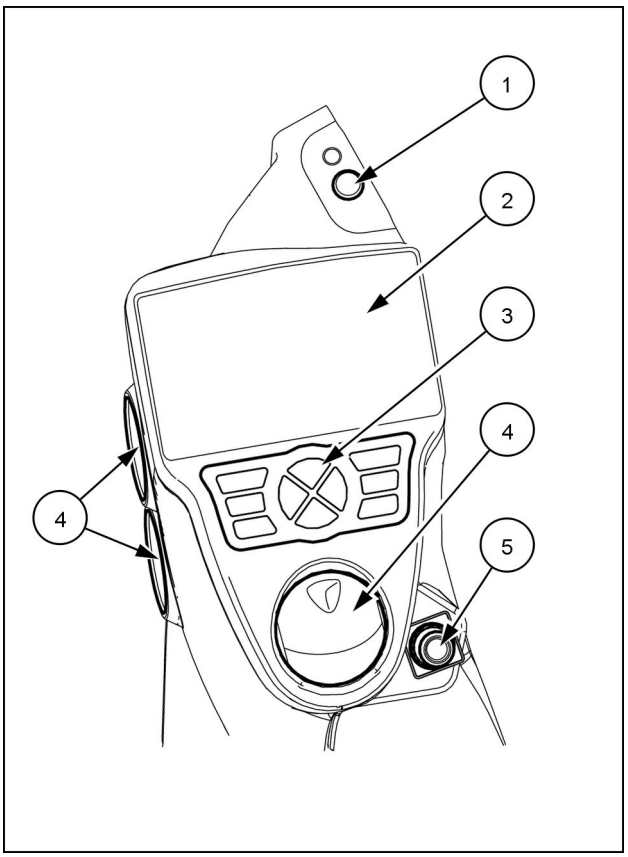
NOTICE: *If water gets inside the instrument cluster, it can be seriously damaged. Make sure to keep the instrument cluster protected from water and from any kind of fluid. Use only a soft, dry cloth to clean the instrument cluster.*

(5) Cigarette lighter and **24 V** power supply socket: the device is active with the starter key in ON position, or while the engine is running. To operate the cigarette lighter, push it down to engage its heating position.

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

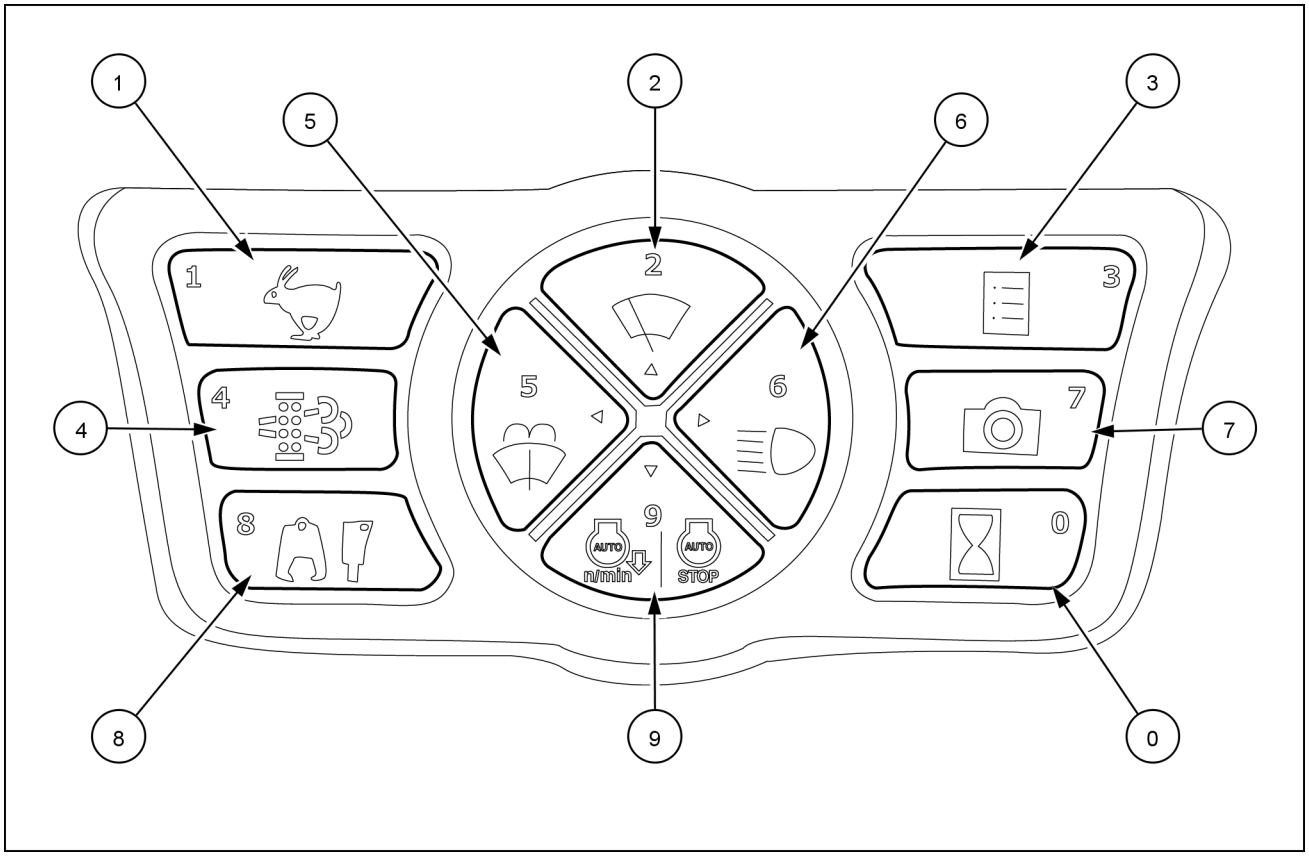
NOTICE: *the electrical system may be damaged if the cigarette lighter does not return to its original position after **30 s**. Pull it out manually and consult the CASE CONSTRUCTION dealer.*

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



SMIL19CEX2698BA 1

Control buttons



SMIL15CEXY842FA 2

1. Travel mode selector button
2. Wiper button
3. Display mode selector button
4. SCR CLEANING button
5. Windshield washer button
6. Working lights button
7. Camera view selector button (*)
8. Attachment selector button
9. Idle mode button
0. Hour meter button

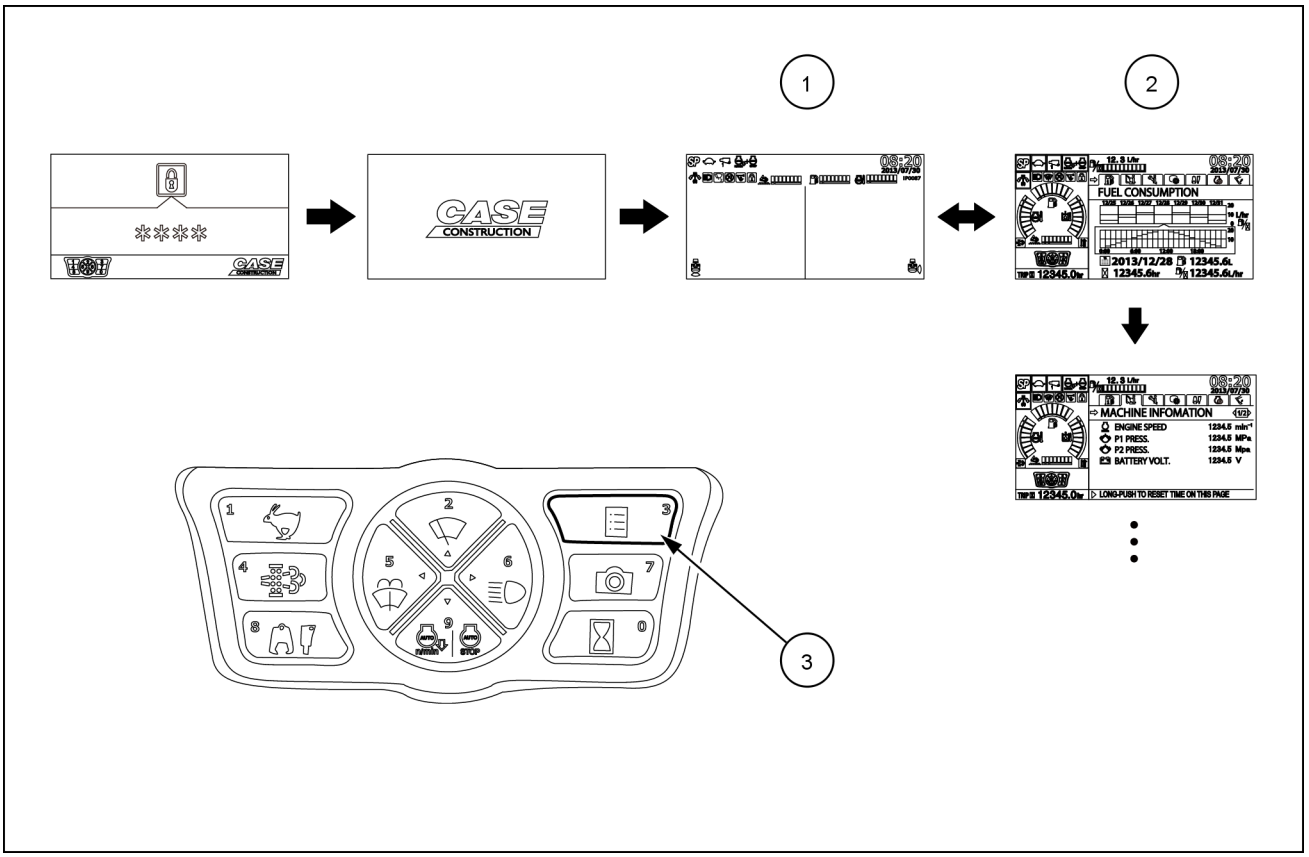
(*) The camera view selector button is active only if the Field View Monitor system is equipped. Refer to Chapter 9.

Display

The display has two visualization modes:

- The operating mode **(1)** shows the images of the external cameras, along with the icons, warning and messages related to the functioning of the machine.
- The user information mode **(2)** shows the information tabs related to the machine operation history, and provides access to the configuration tabs for the set up of the main functionalities of the machine.

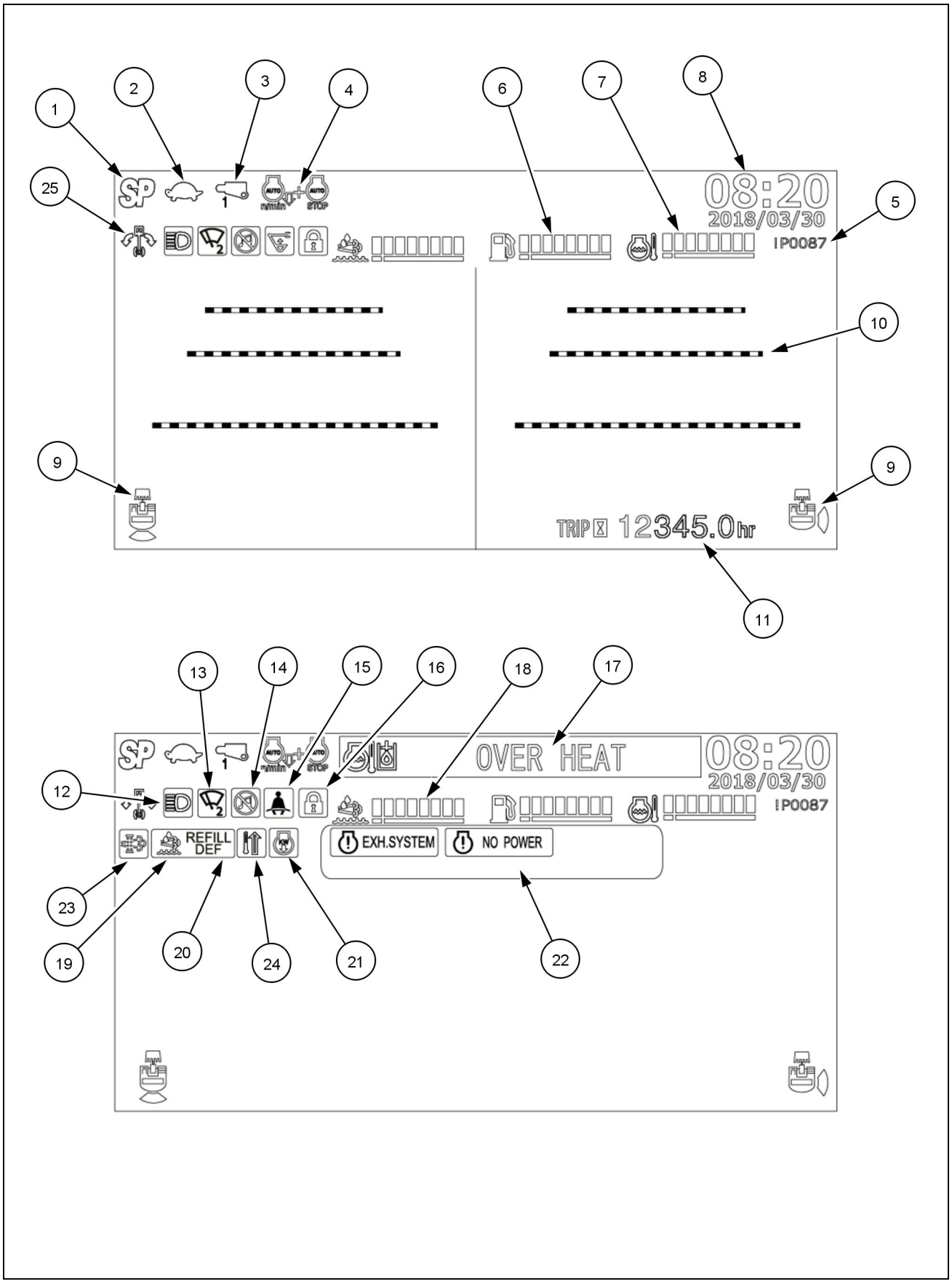
Press the display mode selector button **(3)** to switch the mode. The mode toggles every time the button is pressed.



SMIL16CEX0713FA 3

NOTICE: *During machine operation, make sure to select the operating mode of the display in order to ensure proper visibility around the machine. If the display is switched to the user information mode during machine operation, the warning message SELECT CAMERA SCREEN DURING OPERATION will appear on the top of the display.*

Operating mode



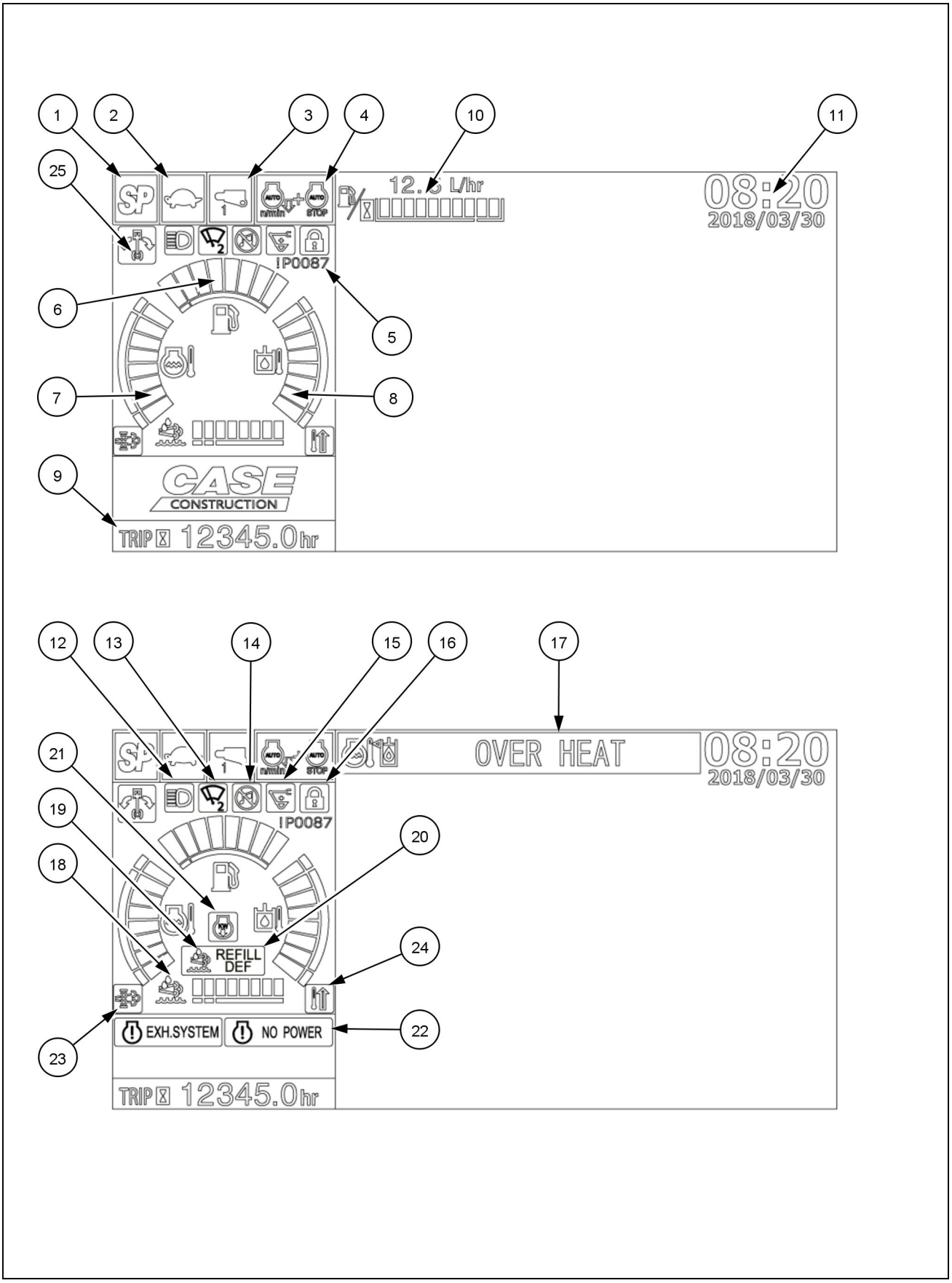
SMIL19CEX0529HA 4

1. Work mode icon
2. Travel mode icon
3. Attachment selection icon
4. Idle mode icon
5. Diagnostic Trouble Code
6. Fuel gauge
7. Engine coolant temperature gauge
8. Date and time
9. Camera view icon
10. Camera view guidelines
11. Hour meter and trip meter
12. Working lights icon
13. Wiper icon
14. Radio mute icon
15. Power boost icon, or Seat belt icon
16. Security function icon
17. Messages
18. **DEF/AdBlue®** level gauge
19. SCR detection icon
20. **DEF/AdBlue®** refill warning
21. Engine derate icon
22. Auxiliary hydraulics settings, or SCR failure warnings
23. SCR CLEANING icon
24. Engine preheating icon, or **DEF/AdBlue®** thawing icon, or cooling down icon.
25. Free swing icon

NOTICE: *if a Diagnostic Trouble Code is displayed, contact the CASE CONSTRUCTION dealer.*

NOTE: *If the machine is equipped with the Field View Monitor system, an alternative operating mode of the display can be selected. The layout of the FVM mode is based on the one of the user information mode. Refer to the next page and to Chapter 9.*

User information mode



SMIL19CEX0533HB 5

1. Work mode icon
2. Travel mode icon
3. Attachment selection icon
4. Idle mode icon
5. Diagnostic Trouble Code
6. Fuel gauge
7. Engine coolant temperature gauge
8. Hydraulic oil temperature gauge
9. Hour meter and trip meter
10. Fuel consumption meter and fuel economy gauge
11. Date and time
12. Working lights icon
13. Wiper icon
14. Radio mute icon
15. Power boost icon, or Seat belt icon
16. Security function icon
17. Messages
18. **DEF/AdBlue®** level gauge
19. SCR detection icon
20. **DEF/AdBlue®** refill warning
21. Engine derate icon
22. Auxiliary hydraulics settings, or SCR failure warnings
23. SCR CLEANING icon
24. Engine preheating icon, or **DEF/AdBlue®** thawing icon, or cooling down icon.
25. Free swing icon

NOTICE: *if a Diagnostic Trouble Code is displayed, contact the CASE CONSTRUCTION dealer.*

NOTE: *the messages overlap the fuel economy gauge.*

Engine speed throttle and work mode selection

The engine speed throttle allows to increase or decrease the engine speed.

Three work modes are selectable:

Select the A mode for loads handling and high precision operations.

Select the H mode for general digging and truck loading operations.

Select the SP mode for heavy digging operations.

NOTE: *to select the SP mode, turn the work mode selector clockwise while holding down the pin.*

The work mode currently selected is indicated by a specific icon on the display:



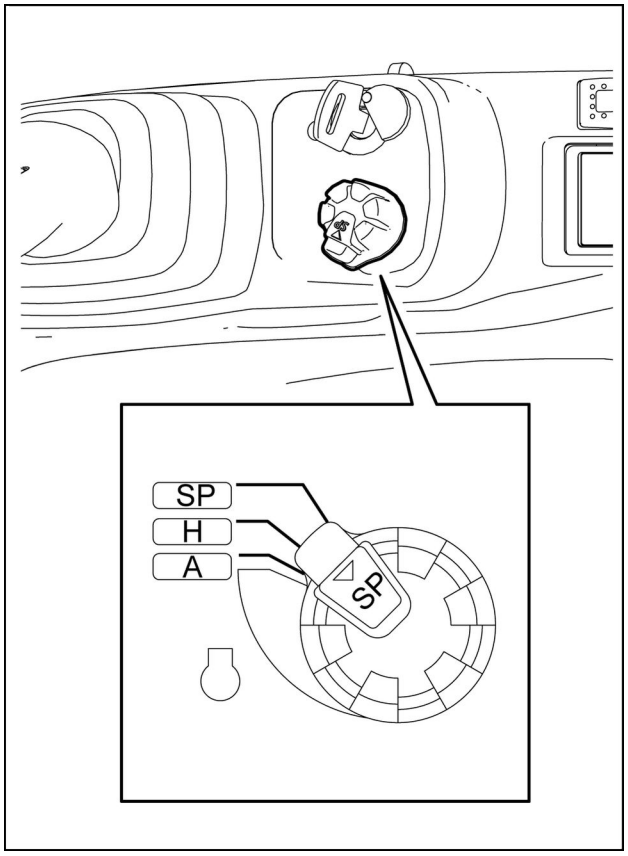
The A work mode is selected.



The H work mode is selected.



The SP work mode is selected.



SMIL19CEX2704BA 6

Power boost

The machine control system automatically manages a boost of the hydraulic power in order to optimize the machine performance.

The activation of the Power boost is related to each work mode:

The Power boost is always active in the A work mode.

The Power boost is activated for **8 s** in the H work mode.

The Power boost is activated for **8 s** in the SP work mode.

The activation of the Power boost in the H or SP work mode is indicated by a specific icon on the display:



Power boost is active

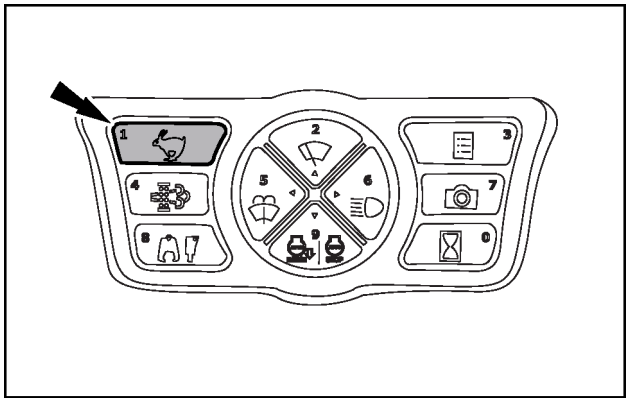
NOTE: *The power boost is not active on CX145D SR Offset Boom with blade.*

Travel mode selector button

⚠ 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



SMIL14CEX1701AA 7

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

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

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

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

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

The travel mode currently selected is indicated by a specific icon on the display:



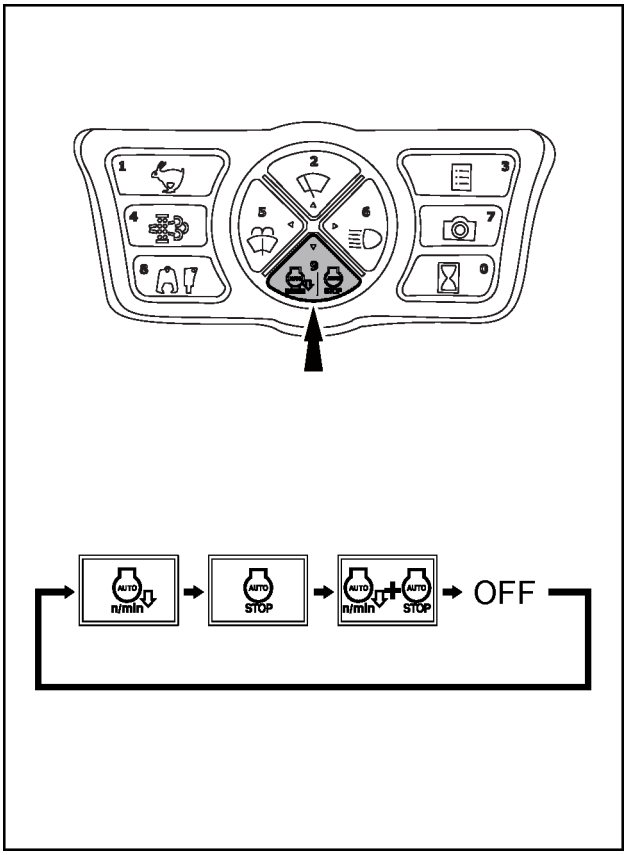
The slow speed travel mode is selected.



The fast speed travel mode is selected.

Idle mode button

The idle setting cycles as follows every time the idle mode button is pressed.



SMIL14CEX1713BA 8

Auto idle

- If any lever or pedal is not operated for **5 s**, the engine speed drops automatically to low idle. To restore the engine speed, operate any control levers, or turn the engine speed throttle.

Idle shutdown

- If the engine speed is kept at **1200 RPM** or below and the gate lock lever is kept in lock position for **3 min**, the message IDLE SHUT DOWN is displayed, an alarm sounds, and the engine stops automatically **10 s** thereafter.

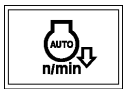
Auto idle and Idle shutdown

- Auto idle activates as described before, and if the gate lock lever is also set to the lock position, idle shutdown eventually activates after **3 min**.

NOTICE: *to protect the engine, let idle continue for at least* ***3 min****.*

NOTE: *to restart the engine that has stopped by idle shutdown, turn the starter key to OFF position and then start the engine.*

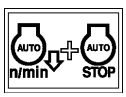
The idle mode currently selected is indicated by a specific icon on the display:



Only auto idle is selected.



Only idle shutdown is selected.

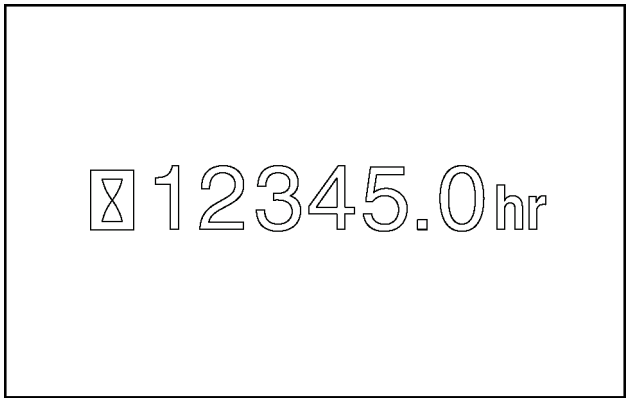


Sequence of auto idle and idle shutdown is selected

Hour meter button

Hour meter

- The hour meter indicates the total engine operating hours in units of **0.1 h** (**6 min**). The hour meter cannot be reset.

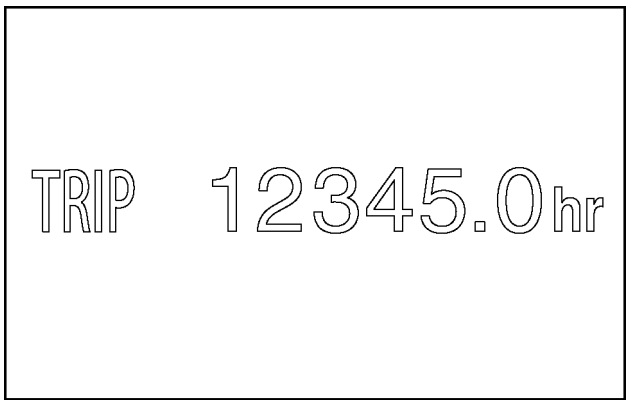


SMIL14CEX1717AA 9

Trip meter

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

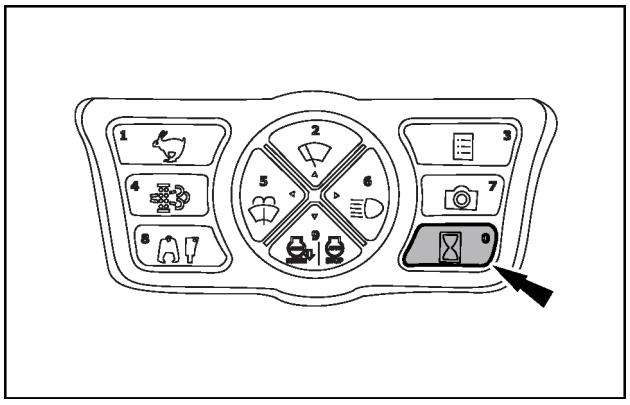
To reset the trip meter press and hold the hour meter button while the trip meter is displayed. The displayed engine operating hours will be reset to **0 h**.



SMIL14CEX1718AA 10

The hour meter is displayed by default. To display the trip meter, press the hour meter button: the trip meter will be thus displayed for approximately **1 min**, after which the hour meter will be displayed again.

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



SMIL14CEX1719AA 11

Wiper button

The wiper operation cycles as follows every time the wiper button is pressed.

Slow speed

- from inactive wiper, the wiper is activated and moves at slow speed

Fast speed

- from wiper moving at slow speed, the wiper goes moving at fast speed

Stop

- from wiper moving at fast speed, the wiper is stopped.

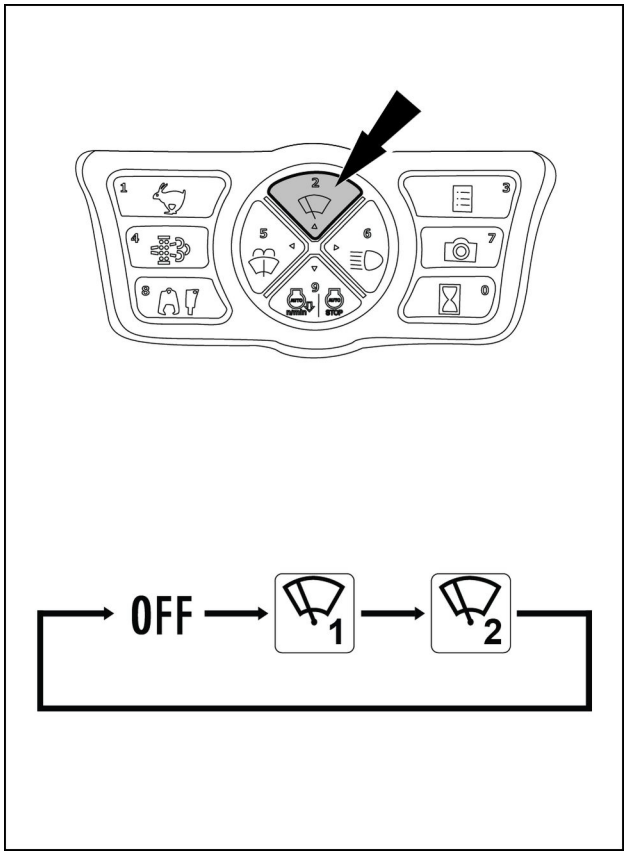
The wiper speed is indicated by a specific icon on the display:



The wiper is active at slow speed.



The wiper is active at fast speed.

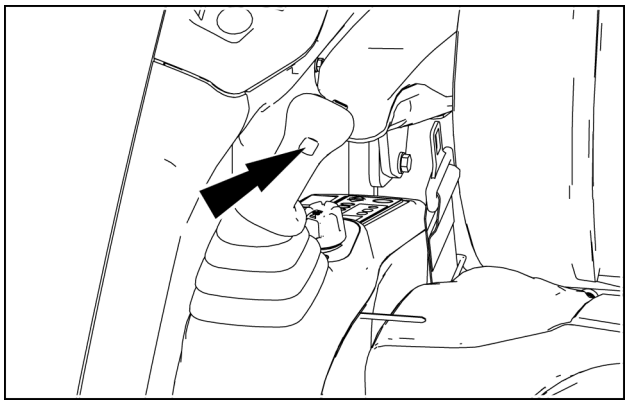


SMIL15CEXY886BB 12

The wiper can be intermittently operated by pressing and holding down the one-touch wiper button on the back of the right control lever.

NOTICE: *do not operate the wiper when the windshield is dry. The wiper may crack.*

NOTICE: *if the wiper is operated when the glass is covered with mud or snow, the wiper may be damaged.*



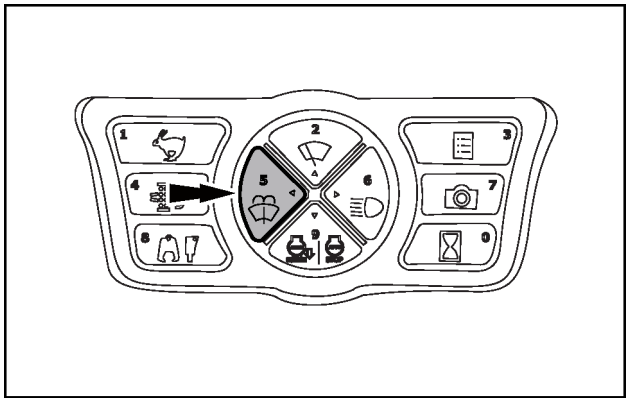
SMIL20CEX0009AA 13

Windshield washer button

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

NOTICE: *Do not press the washer button and the wiper button simultaneously. Also, do not turn off the starter key while the washer button is pushed. It may cause failure.*

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



SMIL14CEX1737AA 14

Working lights button

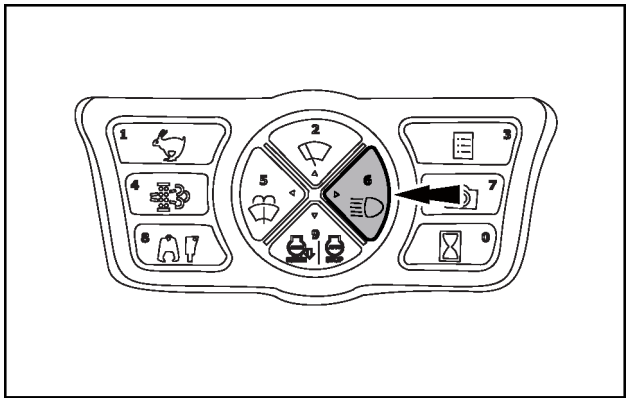
Press the working lights button to turn on the working lights on the front of the machine. Press the button again to turn the working lights off.

The activation of the working lights is indicated by a specific icon on the display:

The working lights are on.

NOTE: *The working lights can be activated only when the engine is running.*

NOTE: *When the working lights are turned on, the brightness of the monitor is automatically adjusted.*



SMIL14CEX1732AA 15

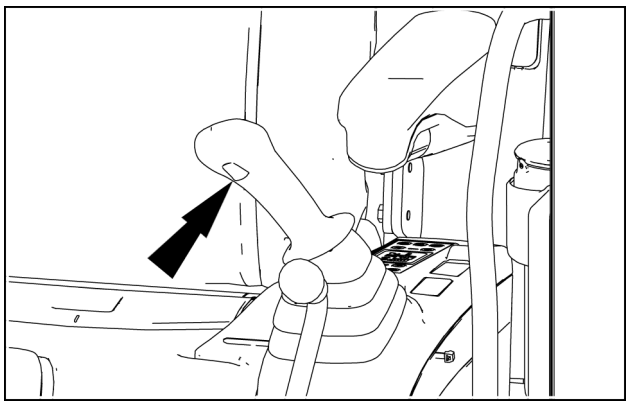
Radio mute

Push the radio mute button on the back of the left control lever to mute the volume. Push the radio mute button again to resume the volume.

The radio muting is indicated by a specific icon on the display:

Radio is muted

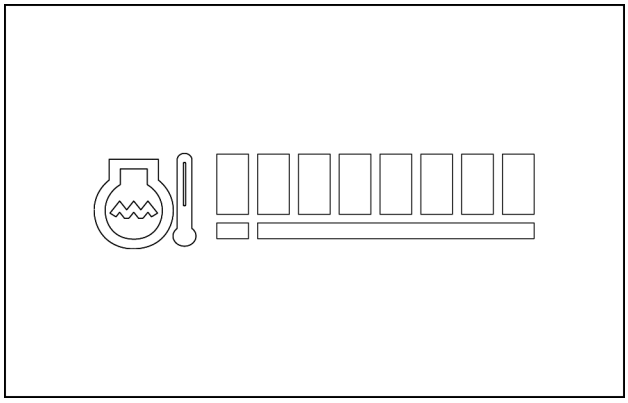
NOTE: *The function to mute the radio with this button is not provided on CX145D SR Offset Boom with blade.*



SMIL20CEX0010AA 16

Engine coolant temperature gauge

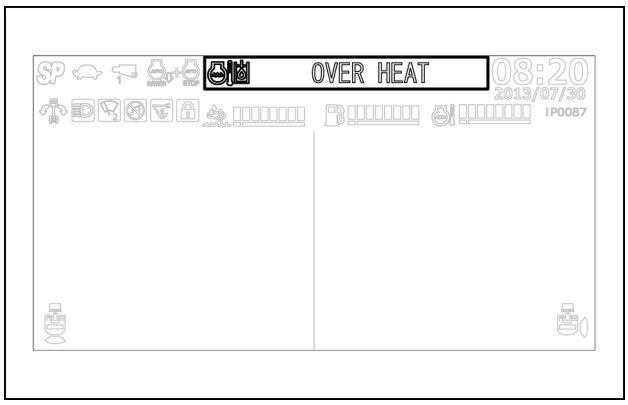
The number of lit segments indicates the temperature of the engine coolant. The greater the number of lit segments, the higher the coolant temperature is.



SMIL16CEX0714AA 17

If all segments are lit, an alarm sounds and the OVER HEAT message is displayed.

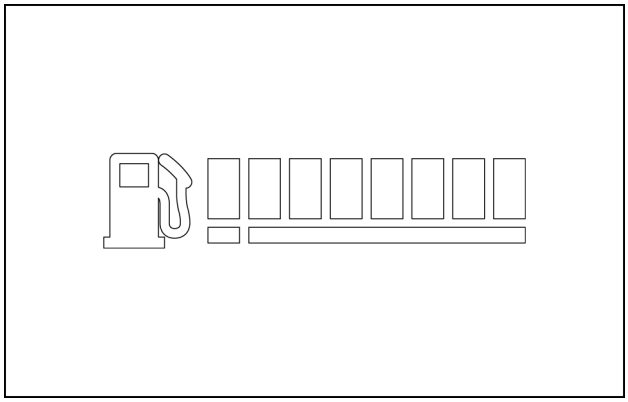
If the OVER HEAT message appears, lower the engine speed. If the temperature does not drop, stop the engine, remove the starter key, and call the CASE CONSTRUCTION dealer for machine inspection.



SMIL16CEX0716AA 18

Fuel gauge

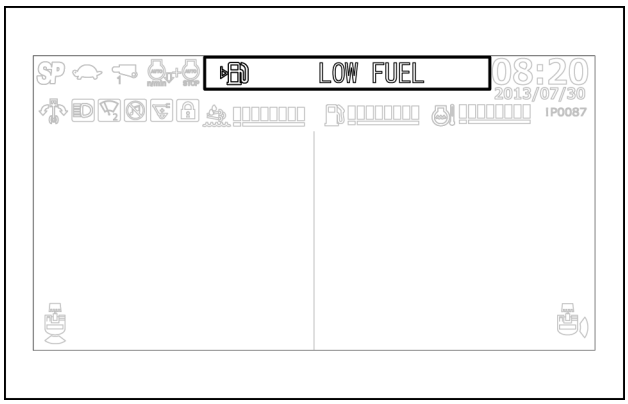
The number of lit segments indicates the remaining level of fuel. If all segments are lit, the fuel tank is full.



SMIL16CEX0715AA 19

If only one segment is lit, an alarm sounds and the LOW FUEL message is displayed.

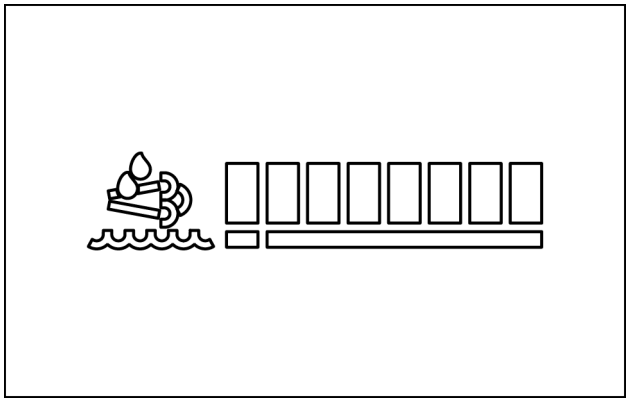
If the LOW FUEL message appears, stop machine operation, stop the engine, and add fuel to the fuel tank.



SMIL16CEX0717AA 20

DEF/ADBLUE® gauge

The number of lit segments indicates the remaining level of **DEF/ADBLUE®**. If all segments are lit, the **DEF/ADBLUE®** tank is full.

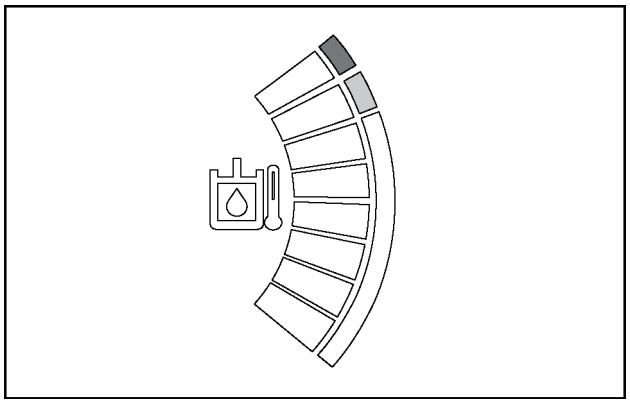


SMIL16CEX1213AA 21

Hydraulic oil temperature gauge

NOTE: *The hydraulic oil temperature gauge is visible only in the user information mode of the display. If the machine is equipped with the Field View Monitor system, the hydraulic oil temperature gauge is visible in the FVM operating mode of the display.*

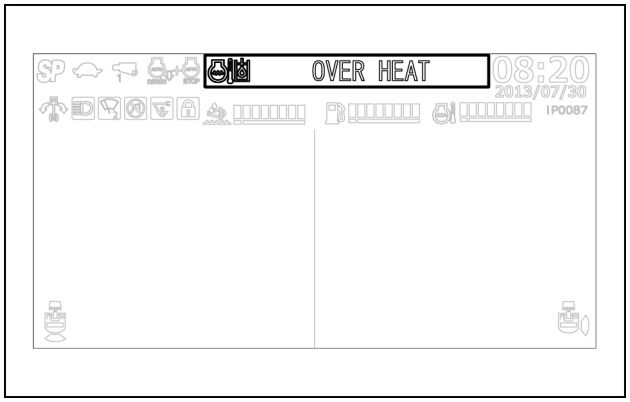
The number of lit segments indicates the temperature of the hydraulic oil. The greater the number of lit segments, the higher the hydraulic oil temperature is.



SMIL14CEX1716AA 22

If all segments are lit, an alarm sounds and the OVER HEAT message is displayed.

If the OVER HEAT message appears, lower the engine speed. If the temperature does not drop, stop the engine, remove the starter key, and call the CASE CONSTRUCTION dealer for machine inspection.

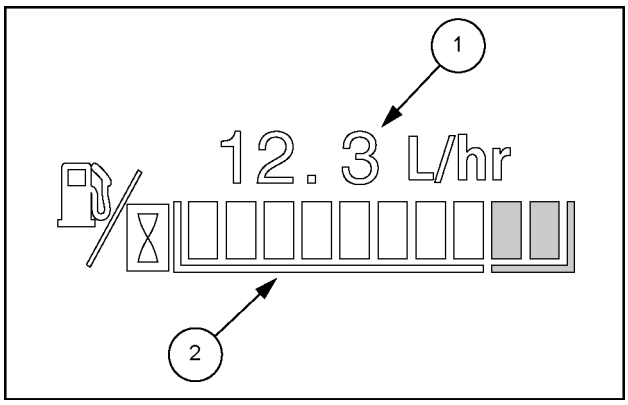


SMIL16CEX0716AA 23

Average fuel consumption meter and fuel economy gauge

NOTE: *The average fuel consumption meter and the fuel economy gauge are visible only in the user information mode of the display. If the machine is equipped with the Field View Monitor system, the average fuel consumption meter and the fuel economy gauge are visible in the FVM operating mode of the display.*

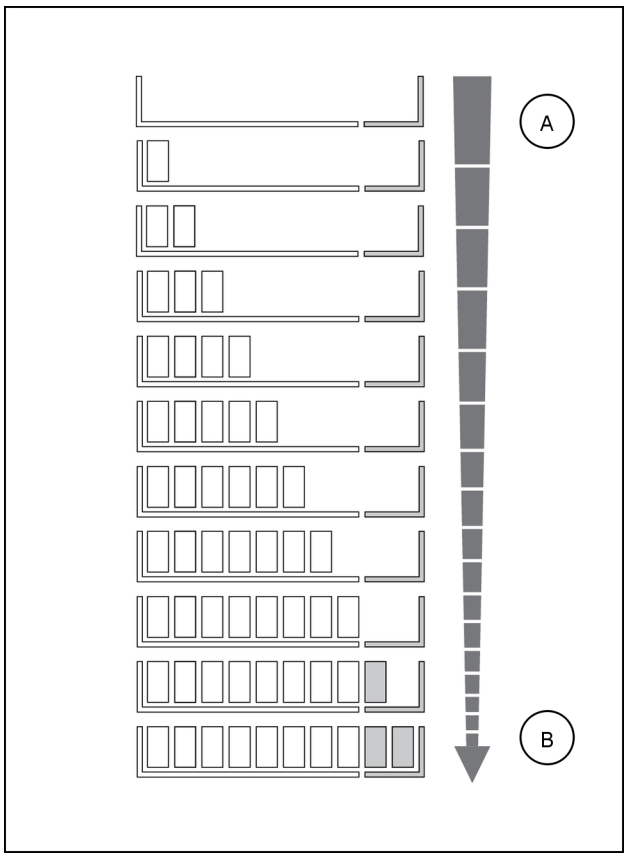
1. Average fuel consumption meter: the average fuel consumption over the total engine operating hours of the machine is displayed by default. Press the hour meter button to select the trip meter, and thus to display the average fuel consumption over the trip hours.
2. Fuel economy gauge: the number of lit segments indicates the energy usage of the current machine application. The greater the number of lit segments, the higher the fuel consumption is.



SMIL14CEX1722AB 24

(A): Low fuel consumption.

(B): High fuel consumption.



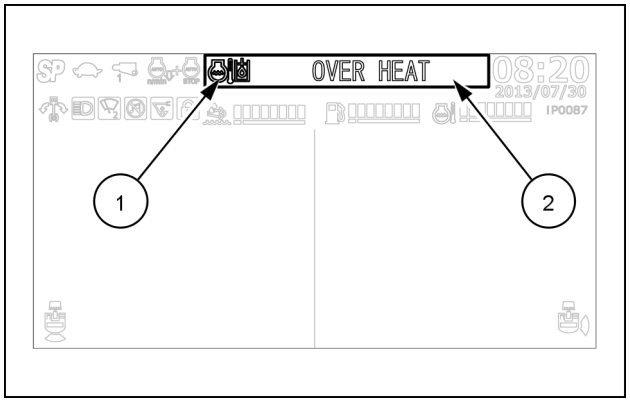
SMIL15CEXY889BB 25

Messages

The messages on the top of the display are intended to provide significant information related to the machine operation.

A message combines an icon **(1)** and a text **(2)**. Some messages are accompanied by an alarm as they are displayed. If there are concurrent messages, they are alternatively displayed.

A message can have a red, orange or green background depending upon the type of message, according to its level of urgency and importance.



SMIL16CEX0716AA 26

Red	Warning	Warning for a failure or for a dangerous condition.
Orange	Caution	Caution for an operation.
Green	Check	Confirmation for an operation.

If a message with red or orange background appears, take an appropriate action by referring to the explanations below. If the message persists, consult the CASE CONSTRUCTION dealer.

NOTE: *The language of the messages can be changed. To change the message language, consult the CASE CONSTRUCTION dealer.*

Messages with red background

Icon and text	Explanation	Action
LOW OIL PRESSURE	LOW OIL PRESSURE: The engine oil pressure is low. The engine goes automatically to low idle.	Stop the engine, and check for oil leaks. If any leak is found, a failure in the hydraulic system can be suspected. Stop the engine, and contact the CASE CONSTRUCTION dealer immediately.
OVER HEAT	OVER HEAT: The temperature of the engine coolant or of the hydraulic oil is too high. The engine goes automatically to low idle. If the high-temperature condition is not promptly addressed, the engine automatically stops.	Let the engine run at low idle to decrease the temperature of coolant and hydraulic fluid. If the coolant level is found low, stop the engine and check for coolant leaks. If any leak is found, start the engine, and if the message persists, contact the CASE CONSTRUCTION dealer immediately.
BOOST TEMP. HIGH	BOOST TEMP HIGH: The temperature of the air flowing into the engine is abnormally high. The engine goes automatically to low idle. If the high-temperature condition is not promptly addressed, the engine automatically stops.	Let the engine run at low idle to decrease the temperature of the turbocharger. If the message persists, contact the CASE CONSTRUCTION dealer immediately.
ALTERNATOR	ALTERNATOR: The battery or the alternator have a problem.	Stop the engine, and contact the CASE CONSTRUCTION dealer immediately.
CHECK ENGINE	CHECK ENGINE: An electric part related to the engine has a problem.	Stop the engine, and contact the CASE CONSTRUCTION dealer immediately.
ELEC. PROBLEM	ELEC. PROBLEM: The electrical system has a problem.	Stop the engine, and contact the CASE CONSTRUCTION dealer immediately.

Icon and text	Explanation	Action
	CHECK CAMERA: The cameras or the camera wirings have a failure.	Stop the engine, and contact the CASE CONSTRUCTION dealer immediately.
	LOW COOLANT: The level of the coolant in the engine cooling system is low.	Stop the engine, and refill the reserve tank with coolant. Start the engine, and check for coolant leaks. If any leak is found, or if the message persists, contact the CASE CONSTRUCTION dealer immediately.
	AIR FILTER: The air cleaner element is clogged.	Stop the engine, and clean or replace the air cleaner element.
	HYD. OIL FILTER: The hydraulic return filter is clogged. The message is active if the machine is equipped with Single-acting or Multi-function auxiliary high-flow hydraulic circuit.	Stop the engine and check the hydraulic return filter. Replace it if any clogging is found.
	FUEL FILTER: The fuel pre-filter or the fuel main filter is clogged. The engine goes automatically to low idle.	Stop the engine, and replace the filter element. Start the engine, and if the message persists, contact the CASE CONSTRUCTION dealer immediately.
	CHECK SCR SYSTEM: The SCR system has a failure and does not function properly.	Stop the engine, and contact the CASE CONSTRUCTION dealer immediately.
	CHECK CAB INTERFERENCE: The attachment gets beyond the interference prevention area, and may hit the cab.	Press the temporary cancellation button, and operate the control levers to move the attachment away from the cab. If the attachment doesn't move, refer to the emergency procedure described on page **4-10**.

Messages with orange background

Icon and text	Explanation	Action
	ENGINE STOP: the engine has been stopped by the emergency stop switch.	To start the engine again, press on the back of the emergency stop switch, turn the starter key to OFF position, and then restart the engine.
	IMPROPER SHUT DOWN: The engine has been stopped without cooling it down.	Restart the engine, and keep it at a low idle for at least **5 min**.
	OVER LOAD: an overload condition is detected during the handling of an object.	Place the load onto the ground and check the load conditions making reference to the chart located inside the cab.
	LOW FUEL: The fuel level in the tank is low.	Stop the engine, and add fuel to the fuel tank.
	CHECK FLOW RATE: The set up of the auxiliary hydraulics is not proper.	Check the specifications of the attachment currently in use, and set appropriate flow.
	AUXILIARY SET-UP REQUIRED: The operation with the hydraulic attachment is attempted without any set up of the auxiliary hydraulics.	Check the specifications of the attachment currently in use, and set up the auxiliary hydraulics accordingly.
	SERVICE DUE: One or more periodical maintenance operations are due.	Check the maintenance chart, and carry out the required maintenance operations.

Icon and text	Explanation	Action
	IDLE SHUT DOWN: The engine is going to stop automatically within **10 s**.	If needed, set the gate lock lever to unlock position to restart normal operation.
	REFILL DEF: The level of **DEF/AdBlue®** in the tank is low.	Stop the engine, and add **DEF/AdBlue®** to the **DEF/AdBlue®** tank.
	PUSH CLEANING SWITCH TO ACTIVATE: The SCR cleaning has to be activated manually.	Press the SCR cleaning button to activate the SCR cleaning.
 	MANUAL SCR CLEANING: The manual SCR cleaning is in progress.	Do not operate the machine.
	SELECT CAMERA SCREEN DURING OPERATION: the operating mode of the display has to be set in order to ensure proper visibility around the machine.	Press the display mode selector button to switch the display to the operating mode.
	OUTPUT REDUCTION CANCEL: the engine derating is temporarily overridden.	Do not operate the machine for more than **30 min**.
	ANTI-INTERFERENCE CANCELED: The interference prevention function is overridden by the temporary cancellation button, and the attachment may get too close to the cab.	Operate the controls of the front equipment slowly, and avoid end-stroke movements.

Messages with green background

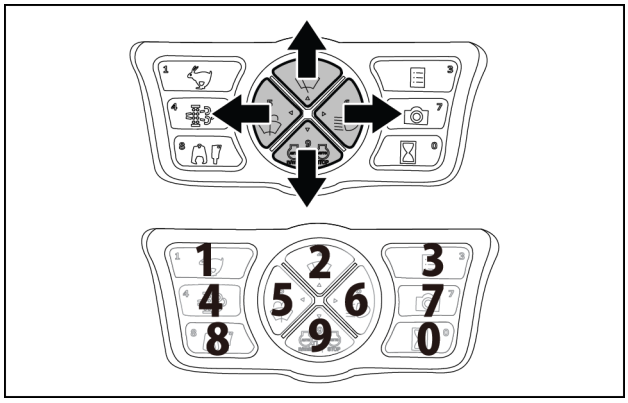
	AUTO WARM UP: The auto warm-up of the machine systems is in progress.	
	SCR AUTO WARM UP: The automatic thawing of **DEF/ADBLUE®** is in progress.	
	AUTO SCR CLEANING: The auto SCR cleaning is in progress.	

User information mode

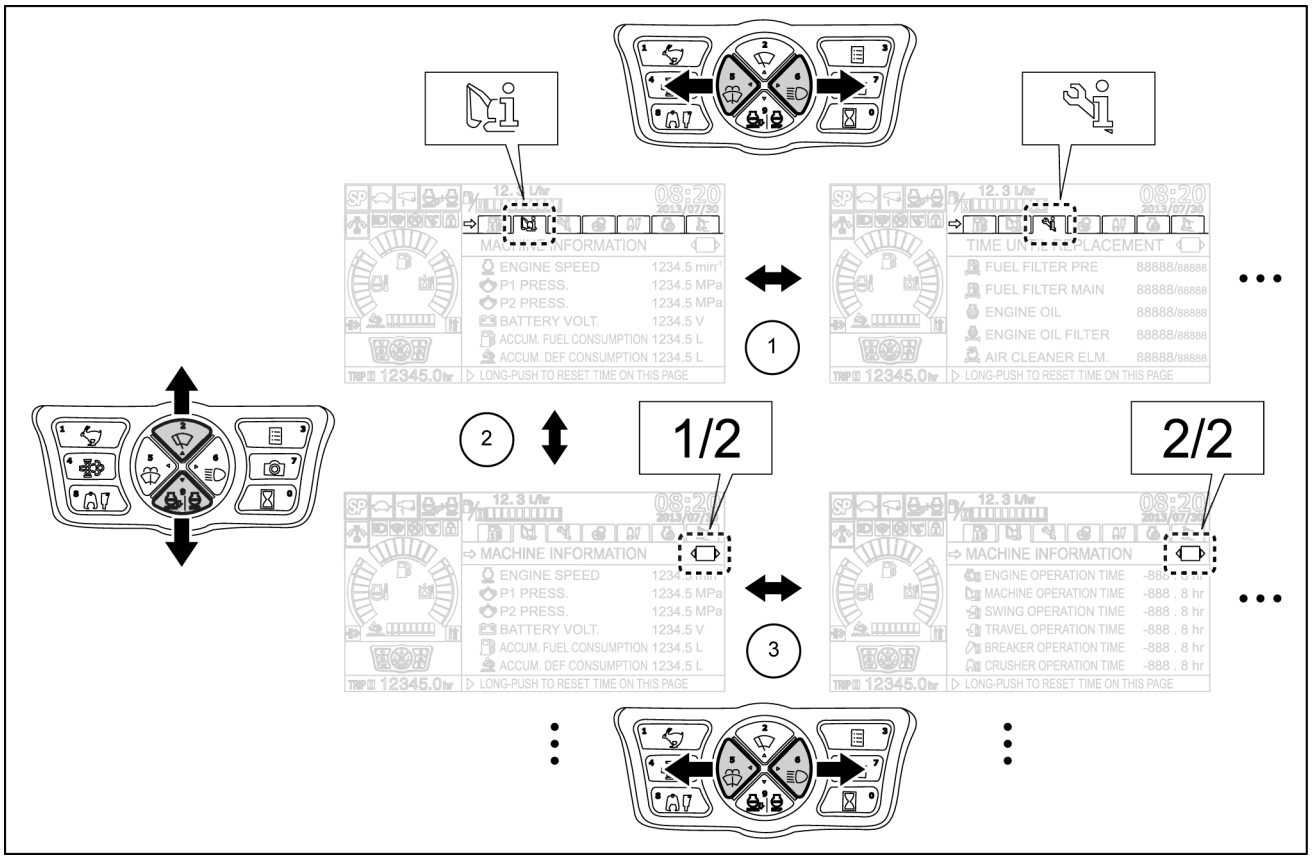
The user information mode includes the following tabs:

- Fuel consumption history
- Machine status
- Maintenance information
- Display configuration
- Auxiliary hydraulics configuration (See Chapter 9)
- SCR configuration

Use the up, down, left, right control buttons to move through the tabs and the pages. Use the control buttons as a numeric keypad to enter the values in the configuration tabs.



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1. Moving through the tabs.
2. Getting to the pages inside each tab.
3. Moving through the pages.

NOTICE: *During machine operation, make sure to select the operating mode of the display in order to ensure proper visibility around the machine. If the display is switched to the user information mode during machine operation, the warning message SELECT CAMERA SCREEN DURING OPERATION will appear on the top of the display.*

Fuel consumption history



Fuel consumption (fuel economy) over the past 7 days can be checked.

Select the Fuel consumption history tab from **(1)**.

Daily average fuel consumption over the past 7 days can be checked in a simple graph in **(2)**.

By selecting a day in **(2)**, the fuel consumption, the operating hours, and the average fuel consumption of the specified day is displayed in **(3)**.

Explanation of the icons in the fuel consumption history screen:



Year/month/day of cursor specified date is displayed.



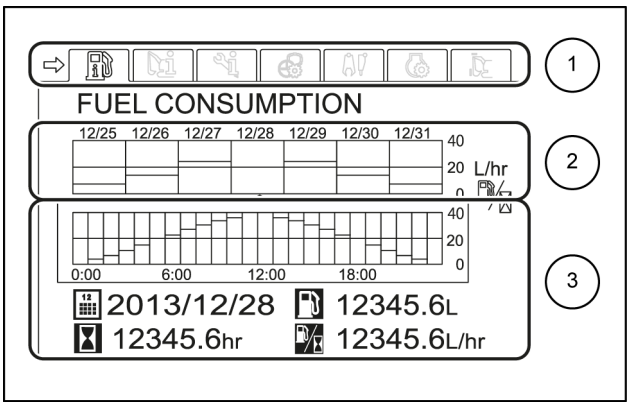
Fuel consumption of cursor specified date is displayed.



Operating hour of cursor specified date is displayed.



Fuel cost (fuel consumption / operating hour) of cursor specified date is displayed.



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Machine status



Detailed machine conditions can be checked.

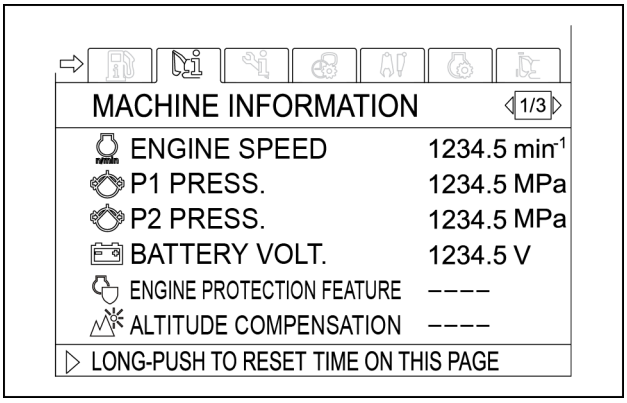
The following items can be checked:

page	Machine information
1/3	ENGINE SPEED (min-1)
	P1 PRESS. (MPa)
	P2 PRESS. (MPa)
	BATTERY VOLT. (V)
	ENGINE PROTECTION FEATURE
	ALTITUDE COMPENSATION
2/3	ACCUMULATED FUEL CONSUMPTION (L)
	ACCUMULATED DEF CONSUMPTION (L)
	COOLING DOWN REMAINING TIME (sec)
3/3	ENGINE OPERATION TIME (hr)
	MACHINE OPERATION TIME (hr)
	SWING OPERATION TIME (hr)
	TRAVEL OPERATION TIME (hr)
	BREAKER OPERATION TIME (hr)
	CRUSHER OPERATION TIME (hr)

***NOTE:** press and hold the left and right buttons together for **10 s**, and the entire fuel history will be reset.*

Engine protection feature: the machine monitors its engine operation and, in case excessive load is applied, controls the engine output for protection. "++++" indicates that this function has been activated, "----", not activated.

Altitude compensation: the machine is equipped with barometric sensor and, under the condition of extremely low atmospheric pressure (ex. high altitude area), optimize the engine operation. "++++" indicates that this function has been activated, "----", not activated.



SMIL15CEX0456AA 30

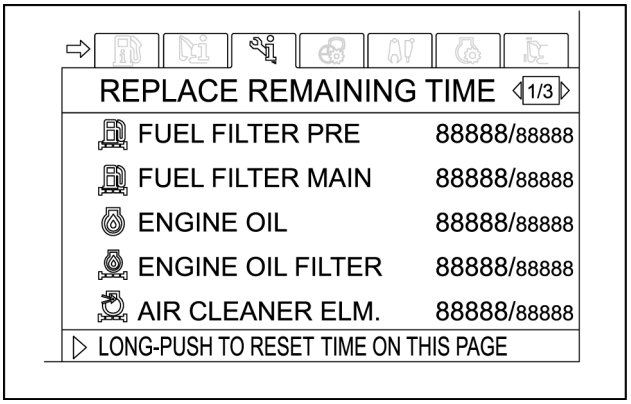
Maintenance information



Information regarding the replacement intervals of periodic-replacement parts can be checked.

page	Replace maintenance time
1/3	FUEL-FILTER PRE
	FUEL-FILTER MAIN
	ENGINE-OIL
	ENGINE-OIL FILTER
	AIR-CLEANER ELEMENT
2/3	AIR-BREATHER ELEMENT
	PILOT-OIL FILTER
	RETURN FILTER
	SUCTION FILTER
	HYDRAULIC OIL
3/3	SWING REDUCTION GEAR-OIL
	TRAVEL REDUCTION GEAR-OIL
	AIR CONDITIONER FILTER
	SUPPLY MODULE FILTER

NOTICE: *If any inspection and/or maintenance (service) is due shortly, the remaining time is shown in yellow and the buzzer is sounded to give warning. If the due date has passed, the remaining time field changes to red. In that case, perform maintenance immediately.*
To reset the remaining time after replacement (change) of components, grease, etc., select the applicable item and then press and hold the right button for ***3 s****. An alarm will sound and the time will be reset.*
To reset the remaining time for all the items displayed on the page, select the title on the applicable page and then press and hold the right button for ***3 s****. An alarm will sound and the time will be reset.*



SMIL14CEX2505AA 31

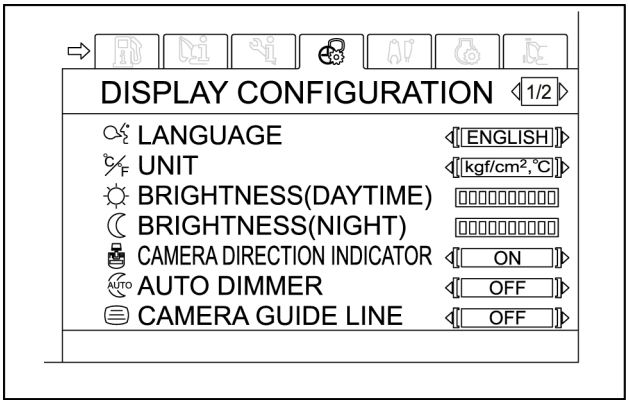
Display configuration



The brightness of the display, the camera settings and date/time can be changed.

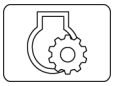
page	Display configuration
1/2	LANGUAGE
	UNIT (MPa , °C/psi , °F/kgf/cm2 , °C)
	BRIGHTNESS(DAYTIME) (10 levels)
	BRIGHTNESS(NIGHT) (10 levels)
	CAMERA DIRECTION INDICATOR (ON/OFF)
	AUTO DIMMER (ON/OFF)
	CAMERA GUIDE LINE (ON/ OFF)
2/2	AUTO TIME ADJUST (ON/ OFF)
	DATE - YEAR
	DATE - MONTH / DAY
	TIME - HOUR / MIN. (Hr/Min)
	DATE FORMAT (Y/M/D , M/D/Y , D/M/Y , or no display)
	TIME FORMAT (12h / 24h)
	DAYLIGHT SAVING TIME (ON/OFF)

Use the up/down buttons to select an item and the left/ right buttons to specify the setting.



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SCR configuration



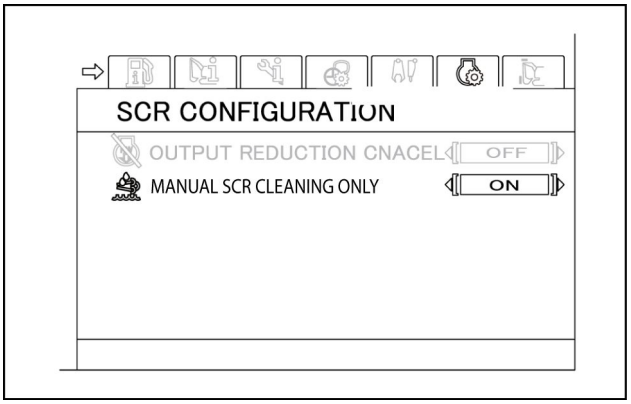
Some settings of the SCR system can be changed.

OUTPUT REDUCTION CANCEL (ON/OFF)

MANUAL SCR CLEANING ONLY (ON/OFF)

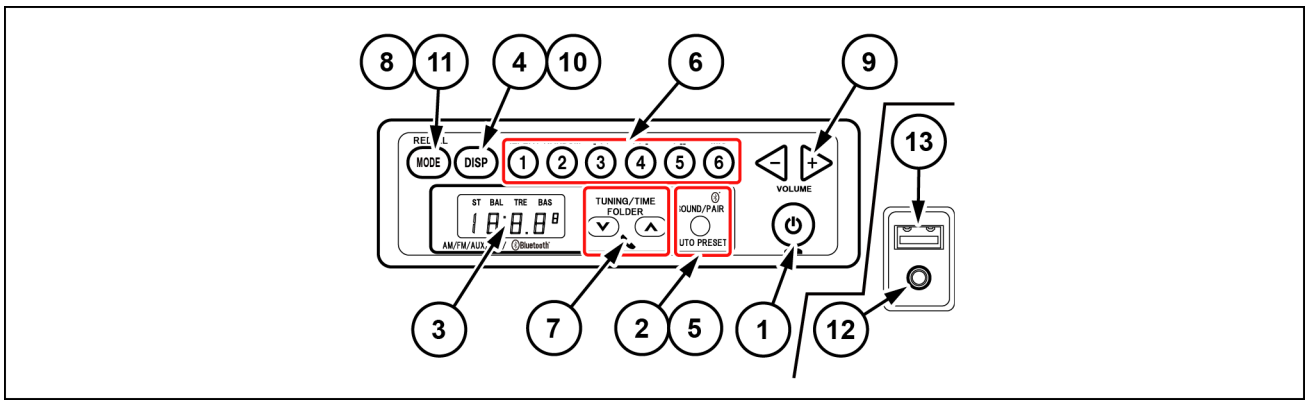
Use the up/down buttons to select an item and the left/ right buttons or numeric keypad to change the setting.

NOTE: *The OUTPUT REDUCTION CANCEL setting can be changed only in specific conditions with operational limitations.*



SMIL14CEX4935AA 33

Radio



SMIL15CEX0753EA 1

NOTICE: *If water gets into a speaker case or the radio, it can cause an unexpected breakdown. Do not let water get on or in them. In particular, keep the window closed when it rains and when washing the machine. Do not use benzene, paint thinner, or any other solvent to clean the display. Use a dry and soft cloth for wiping. Do not disassemble the radio.*

1. Power button: press POWER to turn on the radio. The band name is displayed followed by the frequency. Press POWER again to turn off the radio. The clock is displayed.
2. Sound adjustment: press SOUND to switch between BAL, TRE. and BAS.

- Pressing the tuning buttons with BAL (balance) selected allows you to make adjustments. Press the up button **(7)** to raise the output level of the right speaker. Press the down button **(7)** to lower the output level of the left speaker. (Output levels of both speakers go up to 7).
- Pressing the tuning buttons with TRE (treble) selected allows you to make adjustments. Press the up button **(7)** to raise the level by one step. Press the down button **(7)** to lower the level by one step. (The levels go up and down up to 7).
- Pressing the tuning buttons with BAS (bass) selected allows you to make adjustments. Press the up button **(7)** to raise the level by one step. Press the down button **(7)** to lower the level by one step.

3. Display: the clock, the radio frequency, and the operation mode are displayed.
4. Clock/Frequency button DISP: Pressing this button switches the display to the clock. Pressing it again displays the band. If you leave the display alone, it returns to the frequency display after **1 s**.
5. Auto preset (SOUND/AUTO PRESET): When this button is held down for at least **2 s**, receivable broadcast stations can be memorized for preset buttons 1 through 6.
6. Preset buttons 1 through 6: One FM1, one FM2, and one AM station can be preset for each button. If you long push the desired number of the preset keys (1 to 6) with the radio ON, the receiving frequency is registered with the number selected. The preset display flashes 3 times and then the frequency display lights up.
7. Tuning button (TUNE)
   When TUNE button is held down for at least **1 s**, the radio begins to search automatically for a receivable station and stops when it finds a station. To stop this search midway, press this button again.
   Pressing the up button increases the frequency. Pressing the down button lowers the frequency.
   Holding down either button changes the frequency continuously.
8. Mode selector button (MODE)
   Pressing this button switches the band between AM , FM1, FM2, AUX, USB, BT. The reception band is displayed on the display.
9. Volume adjustment buttons (VOLUME-, VOLUME+)
   Pressing VOLUME- button lower the volume. Pressing VOLUME+ button raises the volume.
   Holding down either button changes the volume continuously.
10. Clock adjustment (DISP)
    Pressing DISP button for at least one second with the clock display selected allows you to adjust the clock. Pressing the DISP button switches between hours and minutes adjustments.
    Pressing this button again cancels the clock adjustment.

- Hours adjustment
  Pressing the tuning buttons while hours section is flashing allows you to make adjustments.
  Pressing the up button **(7)** moves the time forwards. Pressing down button **(7)** moves the time backwards.

- Minutes adjustment
  Pressing the tuning buttons while minutes section is flashing allows you to make adjustments.
  Pressing the up button **(7)** moves the time forwards. Pressing down button **(7)** moves the time backwards.

11. REDIAL
    Regardless of the current band, if you hold down the MODE button, RE is displayed for **3 s** and redialing is performed. After redialing, DL flashes and ring sounds are output from the speaker. Even when the radio unit power is off, if you hold down the MODE button, the power is automatically turned on and redialing is started.
12. External input port (AUX IN): To use this, connect it to the headphone port on your portable audio player through a commercially-available stereo mini plug cord.
13. External input terminal (USB): connect a commercially-available USB memory.

To listen to the radio

1. Turn the starter key to ACC or ON, then press the power button to turn the radio power on.
2. With the band button, select either MW (AM) or FM .
3. Select a station with a preset buttons or with the tuning buttons.
4. Adjust the volume with the volume adjustment buttons.
5. To switch off the radio, press the power button.

Manual tuning

Pressing the "TUNE" **(7)** button once raises the reception frequency one step. Pressing the "TUNE " **(7)** button once lowers the reception frequency one step.

Automatic station selection (Seek)

Holding down the "TUNE" **(7)** button increases frequency automatically. Holding down the "TUNE **(7)**" button decreases frequency automatically. When a receivable broadcasting station is found, searching stops at that frequency and it is received.

Setting the preset buttons

1. Press the MODE button to select MW (AM) or FM and press the tuning buttons to select a broadcasting station.
2. Hold down the desired numbered preset button until the preset button number flashes three times on the display. The preset button is now set to the selected station.
3. Repeat steps 1 and 2 to preset other broadcasting stations.

Auto preset

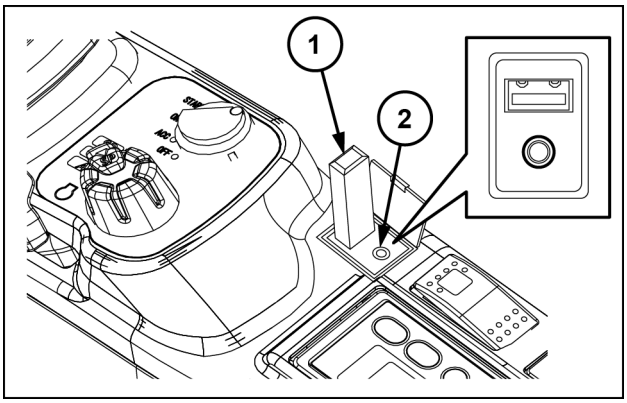
- By holding down the auto preset button, frequencies with good reception are detected and registered on the preset memories 1 to 6 automatically.

NOTE: *When the auto preset function is used, the registered broadcasting stations will be eliminated. To register them on the desired buttons, use the preset function.*

External input

- Audio can be output from the speakers on the machine by connecting a commercially-available portable audio device.
- Always keep appropriate volume for the portable audio device.

1 USB memory
2 AUX input terminal



SMIL15CEX0754AA 2

AUX

- Press the MODE button to switch the audio source and check that AUX is shown on the display.
- Connect from the headphone terminal of your portable audio device using a commercially-available cord (without resistance).
- Use any commercially-available stereo mini-plug cord (D3.5) for external input terminal side. Do not use a connection cord with the wrong size or wrong shape jack.
- The volume also can be adjusted with the volume buttons on the radio unit.

USB

- Files in MP3/WMA/AAC formats are supported.
- Press the MODE button to switch the audio source and check that USB is shown on the display.
- Connect a USB memory to the USB input terminal. Playable data stored in the memory is played automatically.

Button operations when USB is selected as an audio source

Button operations		Function
UP/DOWN		Folder up/down
PRESET1		REPEAT
PRESET2		RANDOM
PRESET3	Short press	Track down
	Long press	Fast forward (while being pressed)
PRESET4	Short press	Track up
	Long press	Rewind (while being pressed)
PRESET5		PLAY/PAUSE
Volume adjustment button +		Volume up
Volume adjustment button -		Volume down

BLUETOOTH

- Can be used when a Bluetooth unit is connected.
- Press the MODE button to switch the audio source and check that BT is shown on the display.
- To use the Bluetooth function, perform pairing of the devices to be connected with a wireless connection.

Button operations when Bluetooth is selected as an audio source

Button operations		—
UP/DOWN		—
PRESET1		—
PRESET2		RANDOM
PRESET3	Short press	Track down
	Long press	—
PRESET4	Short press	Track up
	Long press	—
PRESET5		PLAY/PAUSE
Volume adjustment button +		Volume up
Volume adjustment button -		Volume down

Bluetooth Pairing

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

1. When you hold down the auto preset button with BT displayed, WA will appear on the display, and this system will start preparations for pairing.
2. On completion of the preparations for pairing, PA appears on the display and the system goes on standby for pairing. Then, search for and pair the device, such as a cellular phone and a portable audio player, to connect wirelessly.
3. When the pairing is completed successfully, PO appears on the display. If the pairing is not completed within the time limit **180 s** or if any abnormality occurs, PX appears on the display. If the pairing fails, retry the pairing procedure from step 1.

Use of cellular phone connected via bluetooth

- When the paired cellular phone gets a call, CL will blink on the display and the speaker will output the ringtone. Even if power to this system is off, its power will turn on automatically and CL will appear when it gets a call.
- You can start talking by pressing any button other than the power and the volume adjustment button when it gets a call.
- To reject a call, press the power button. The call will be interrupted, and the band will be restored to its original state.
- While talking, you can adjust the speaker volume by using the volume adjustment button. The preset button 6 allows you to turn on and off the microphone function. With the microphone off, the audio input from here will be stopped.
- To finish talking, press the power button. The band will be restored to its original state.
- By holding down the mode selector button, RE will appear on the display for **3 s**. After redialing, DL will appear, and the speaker will output the ringing tone.

Clearing memory preset selections

When the battery disconnect switch is set to the OFF position, or when connection with the battery is lost by service of the machine, removal of the radio, etc., memories of the preset buttons will be lost in several days. In this case, preset the stations again.

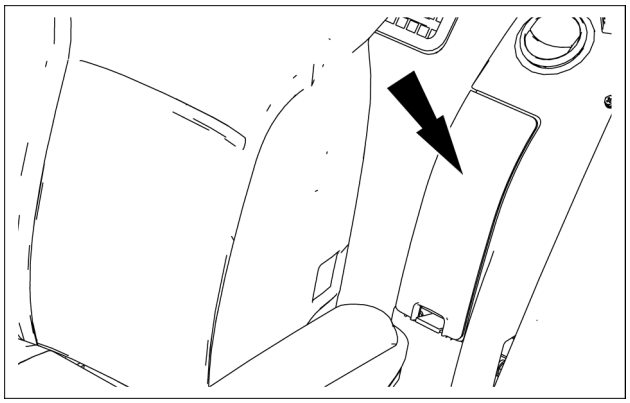
Time adjustment

1. Clock adjustment mode is established by holding down the clock/frequency selector button when a clock is displayed.
2. By pressing the clock/frequency selector button after step 1, the adjustment target can be changed: hour -> minute.
3. With the adjustment target blinking, press the tuning buttons to adjust time.
4. When the clock/frequency selector button is pressed in minute adjustment mode, clock adjustment will be quit.

Rearward controls

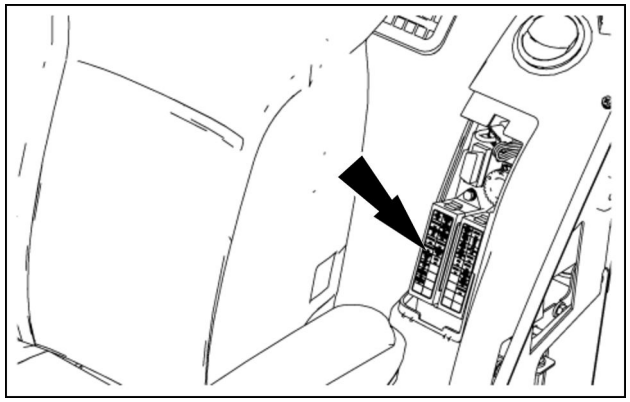
Fuse box

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



SMIL17CEX5125AA 1

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

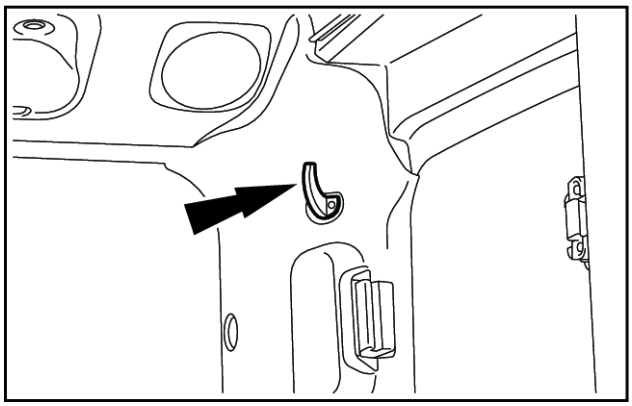


SMIL19CEX0607AA 2

Coat hanger hook

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

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

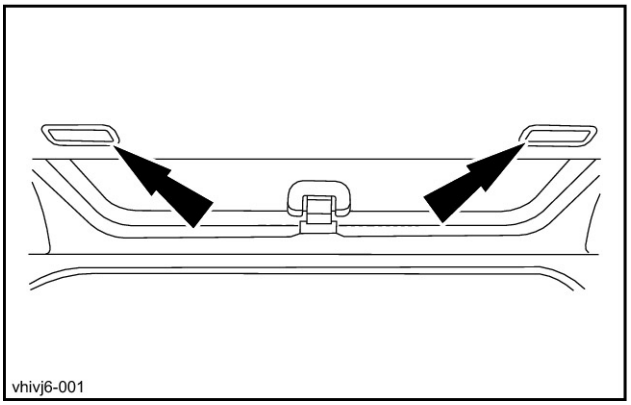


SMIL13CEX2626AB 1

Overhead controls

Roof curtain

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



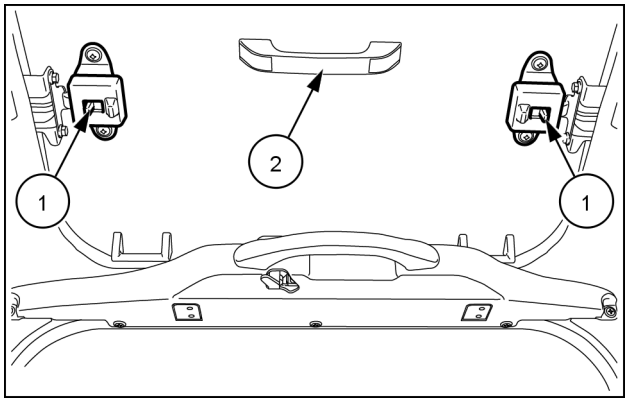
VHIVJ6-001A 1

Roof hatch

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

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

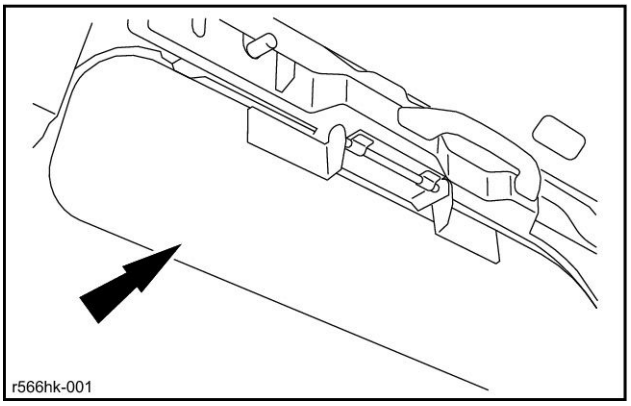
To close the roof hatch, pull it down until the two locking levers **(1)** are engaged.



SMIL17CEX0898AA 1

Sun shield (optional)

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



R566HK-001A 1

Exterior controls

Cab protection (ROPS and FOPS)

⚠ DANGER

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

D0037A

⚠ WARNING

Roll-over hazard!
After an accident, fire, tip over, or roll over, a qualified technician MUST replace the Roll-Over Protective Structure (ROPS) before returning the machine to the field or job site operation.
Failure to comply could result in death or serious injury.

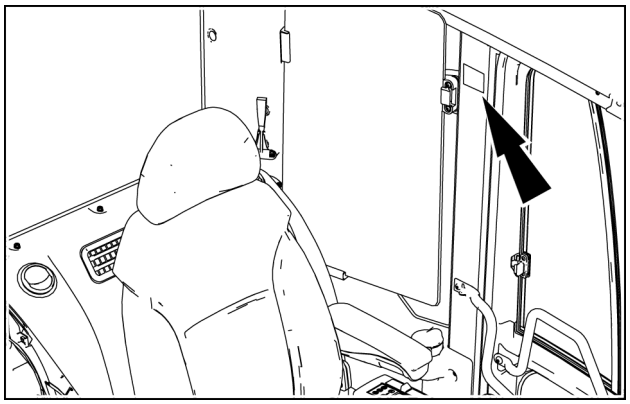
W0134A

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

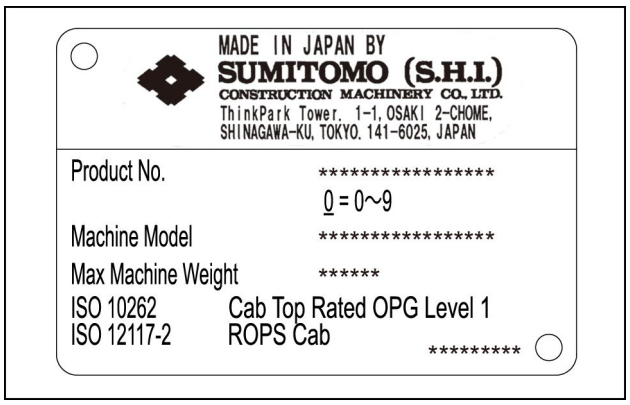
NOTICE: *If the cab's ROPS (guaranteed high-strength member) is damaged, replace the cab. When replacing the cab, check the parts list for the part number of the cab appropriate for the model. If the wrong cab is mounted, the cab could be damaged when the machine rolls over, which could result in the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

This machine is equipped with a Cab Falling Object Protective Structure (FOPS) compliant to Level 1 as defined by ISO 10262.

Level 1 is intended for protection from small objects, e.g. small rocks, small debris and other small objects encountered in operations such as highway maintenance, landscaping and other construction site services.



SMIL19CEX2701AA 1



SMIL17CEX5115AA 2

In case of operations where protection from large objects, e.g. large rocks, large debris and other large objects encountered in applications such as construction and demolition a FOPS Level 2 is required and available as option.

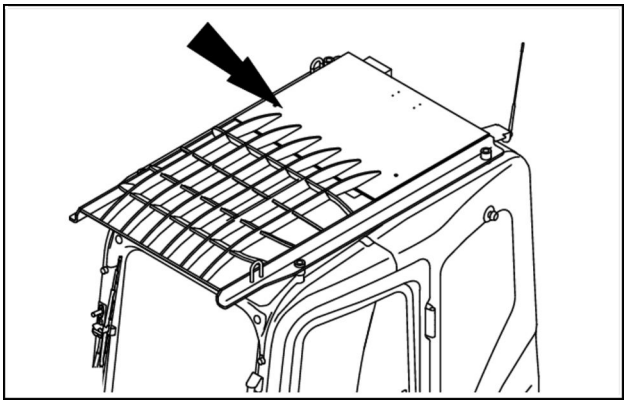
The protective structure, the fitting supports and fastening elements on the machine are an integral part of the structure.

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

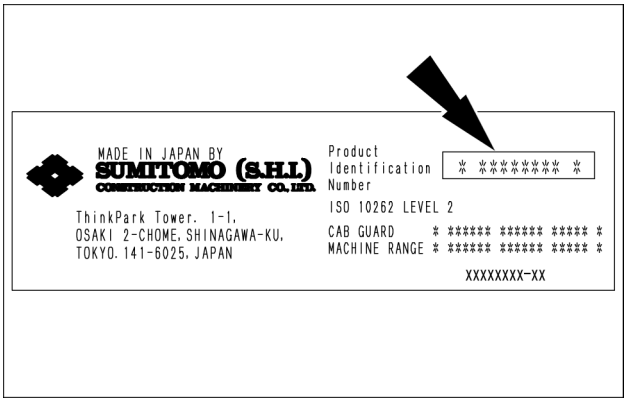
In any case, all damaged parts must be replaced with genuine spare parts, in order to return the machine to its original conditions.

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

Match the part number. Do not perform modifications.

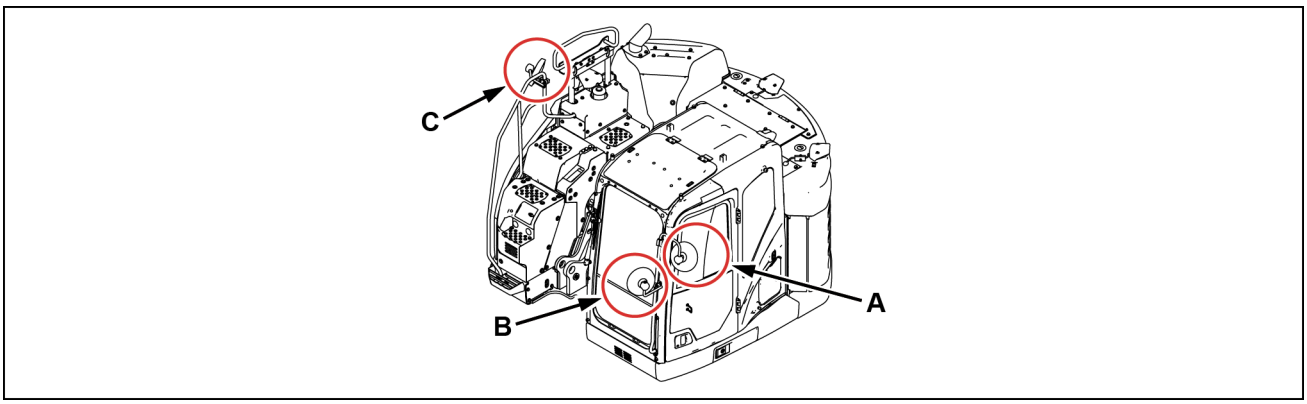


SMIL13CEX2661AB 3



SMIL17CEX5116AA 4

Mirrors



SMIL17CEX3552EA 1

(A) Top-left mirror — (B) Bottom-left mirror — (C) Right-side mirror

Installation and positioning of the mirrors

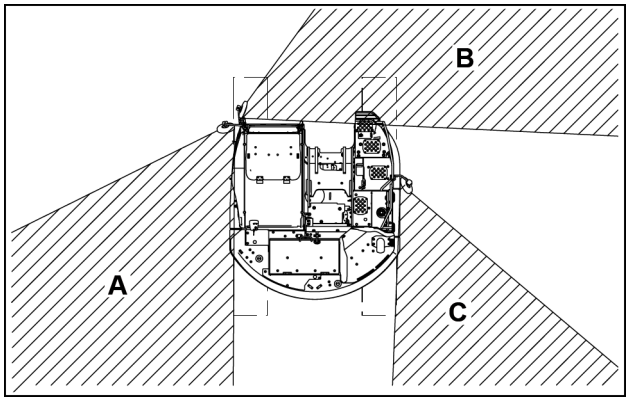
⚠ WARNING

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

W1078A

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

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



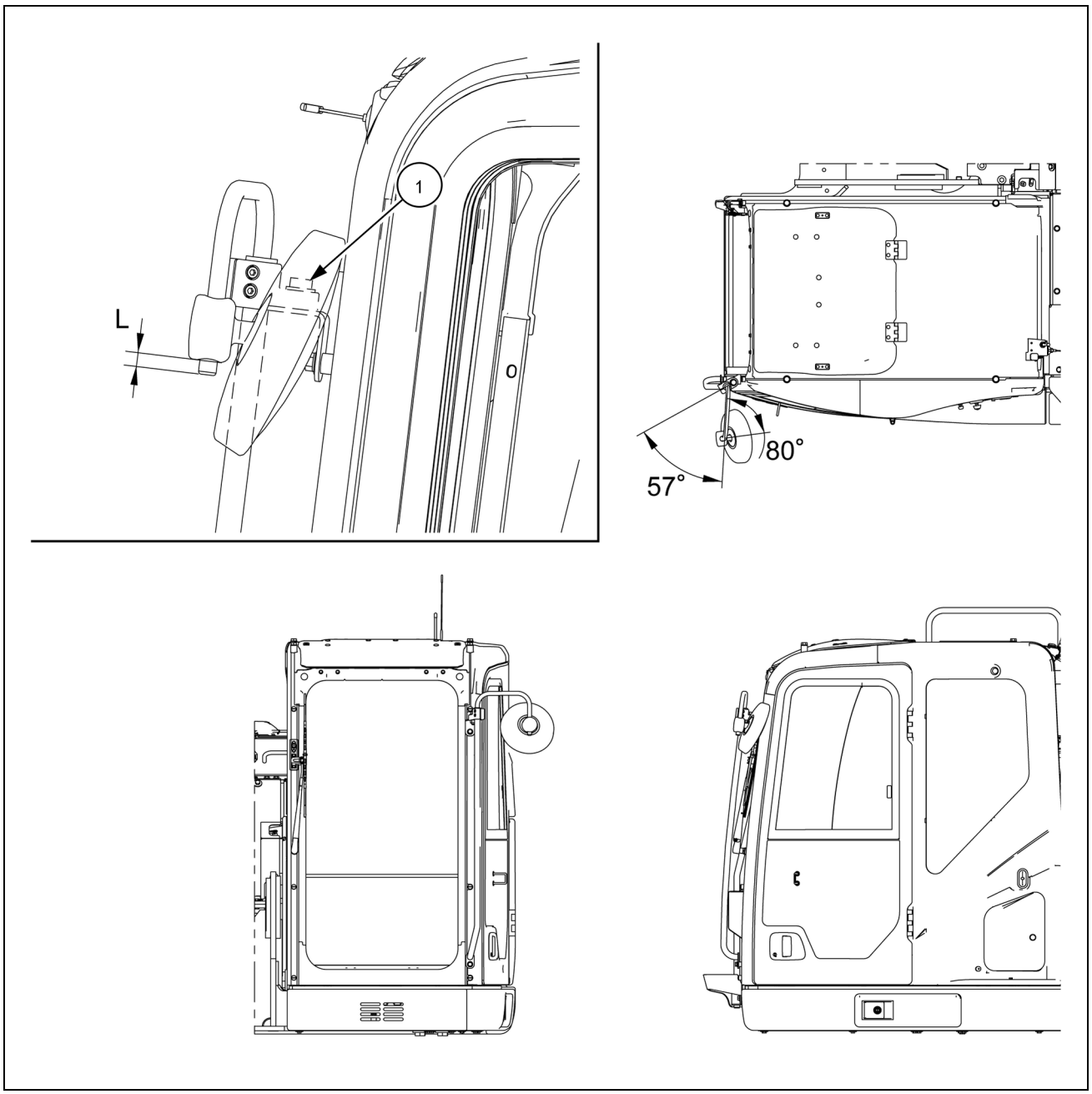
SMIL17CEX3249AA 2

Top-left mirror (A)

The mirror shall be installed as shown in the picture.

The dimension **(L)** is **16 mm** (**0.6 in**).

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

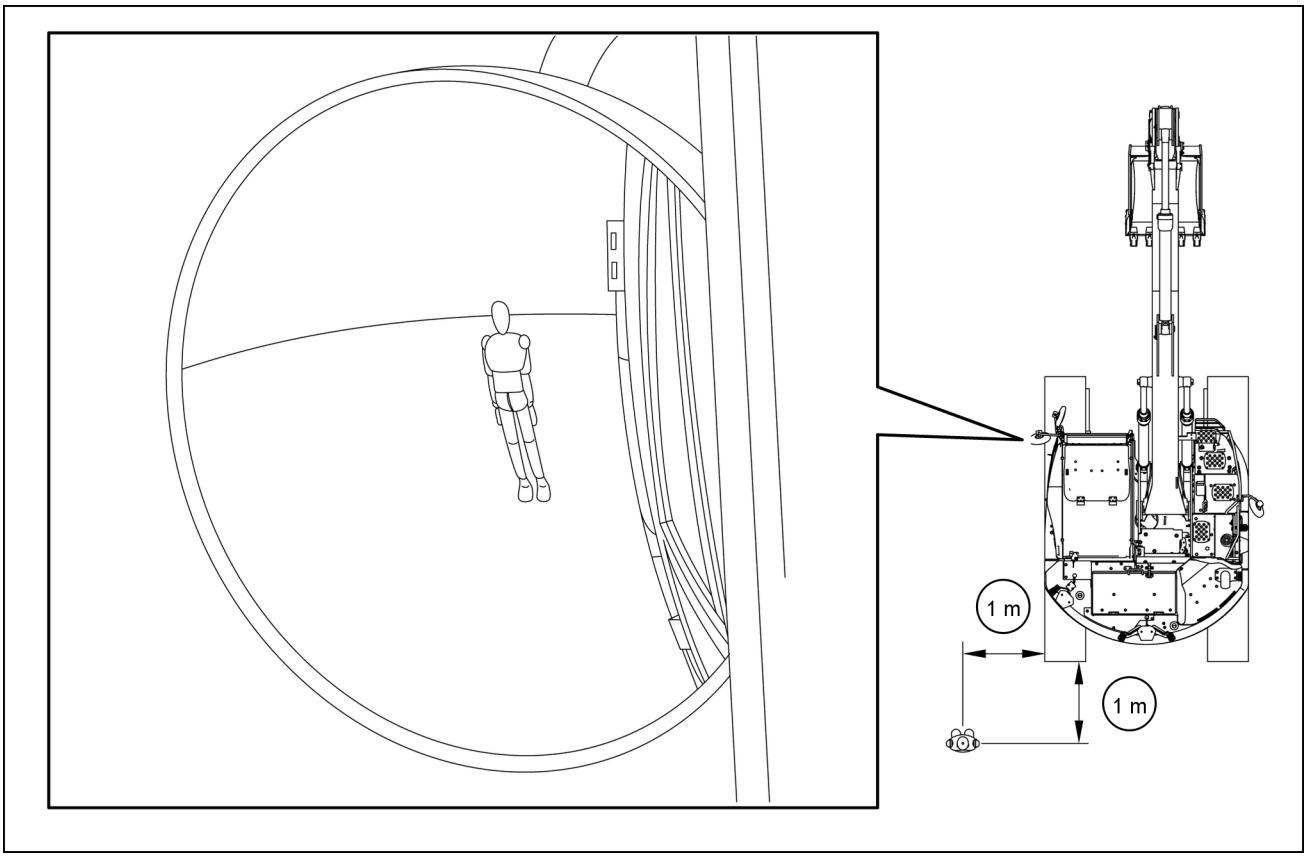


SMIL20CEX1317GA 3

The mirror shall be positioned according to the references shown in picture:

The side on the rear left of the machine shall be visible.

The area around a reference body positioned **1 m** (**39.4 in**) back from the edge of the left track and **1 m** (**39.4 in**) leftward the machine shall be visible.



SMIL20CEX1349GA 4

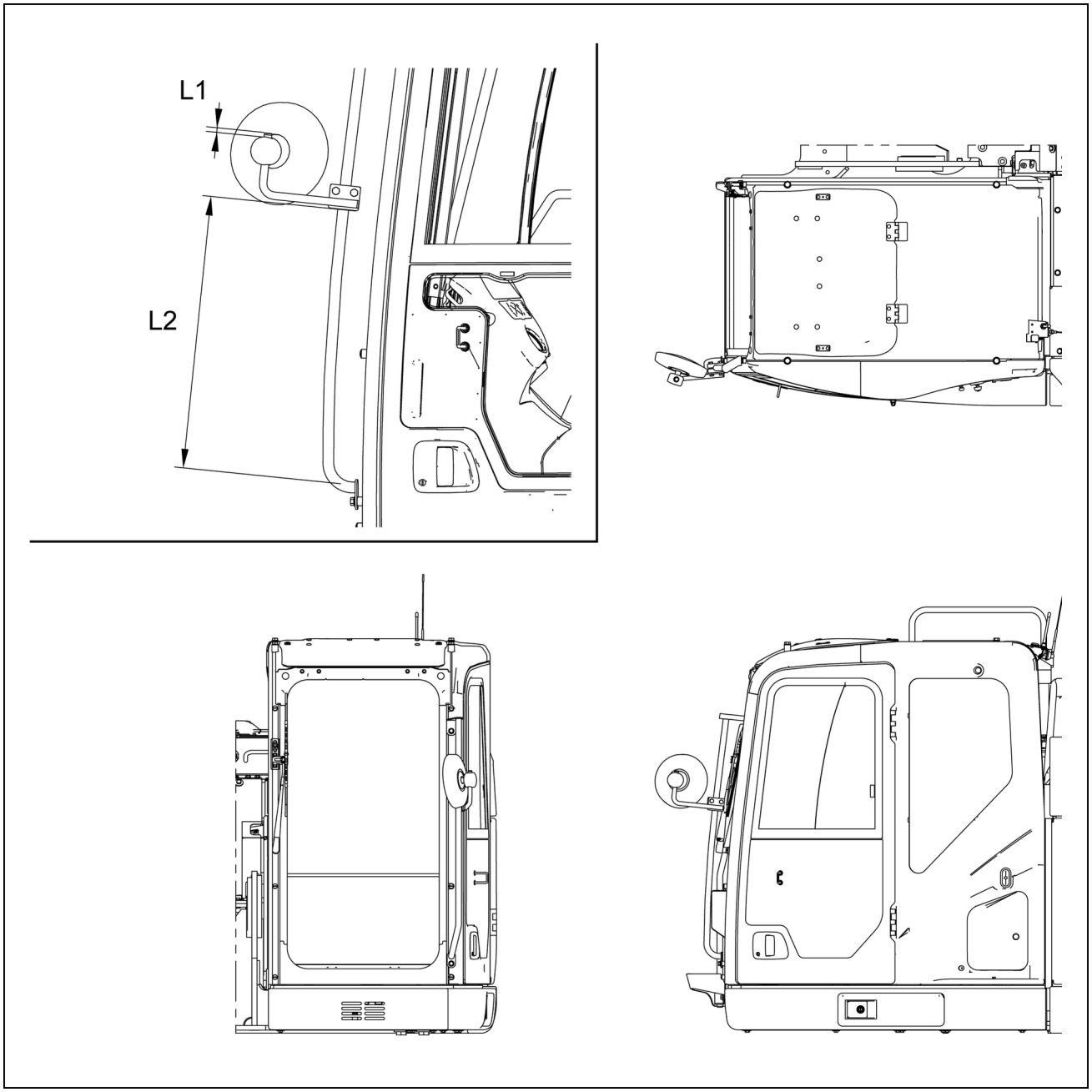
NOTICE: *After installing and positioning all the mirrors, the visibility around the machine shall be checked from the operator's seat. Set the seat into the desired position, and make sure to confirm all the reference views in the mirrors. If necessary, fine tune the positioning of the mirrors in order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

Bottom-left mirror (B)

The mirror shall be installed as shown in the picture.

The dimension **(L1)** is **10 mm** (**0.4 in**).

The dimension **(L2)** is **658 mm** (**25.9 in**).

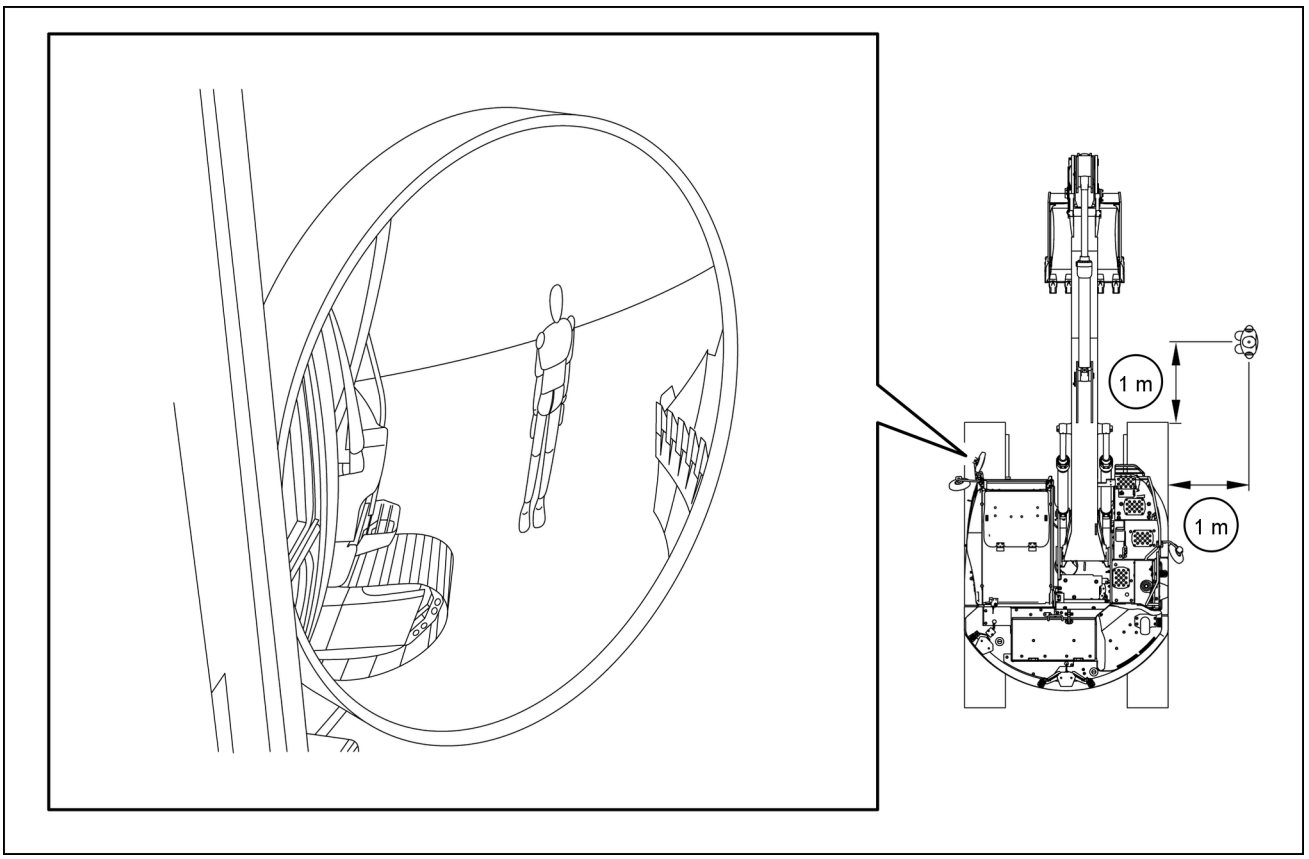


SMIL20CEX1318GA 5

The mirror shall be positioned according to the references shown in picture:

The side on the front right of the machine shall be visible.

The area around a reference body positioned **1 m** (**39.4 in**) ahead from the edge of the right track and **1 m** (**39.4 in**) rightward the machine shall be visible.



SMIL20CEX1347GA 6

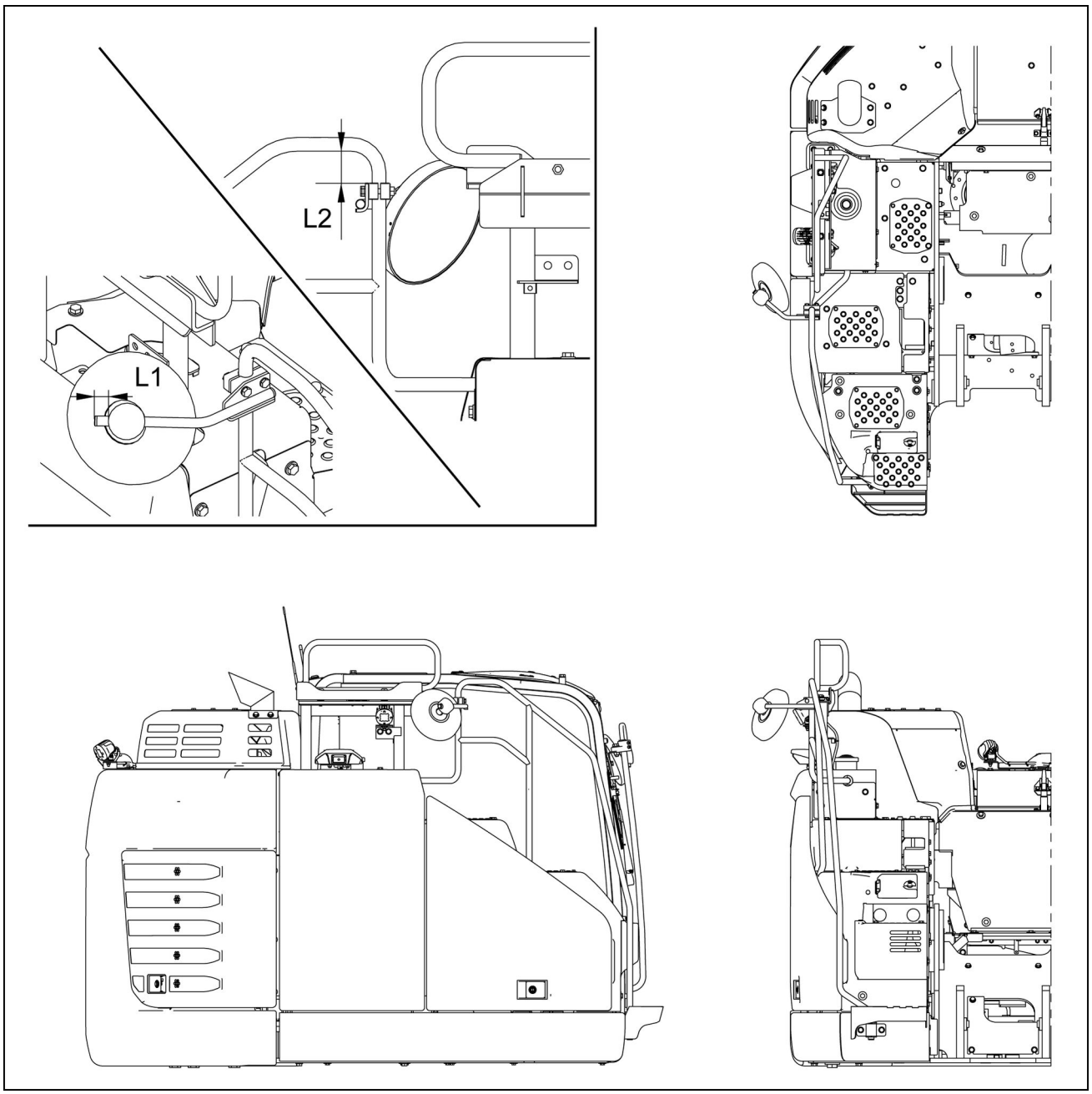
NOTICE: *After installing and positioning all the mirrors, the visibility around the machine shall be checked from the operator's seat. Set the seat into the desired position, and make sure to confirm all the reference views in the mirrors. If necessary, fine tune the positioning of the mirrors in order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

Right-side mirror (C)

The mirror shall be installed as shown in the picture.

The dimension **(L1)** is **23 mm** (**0.9 in**).

The dimension **(L2)** is **63 mm** (**2.5 in**).

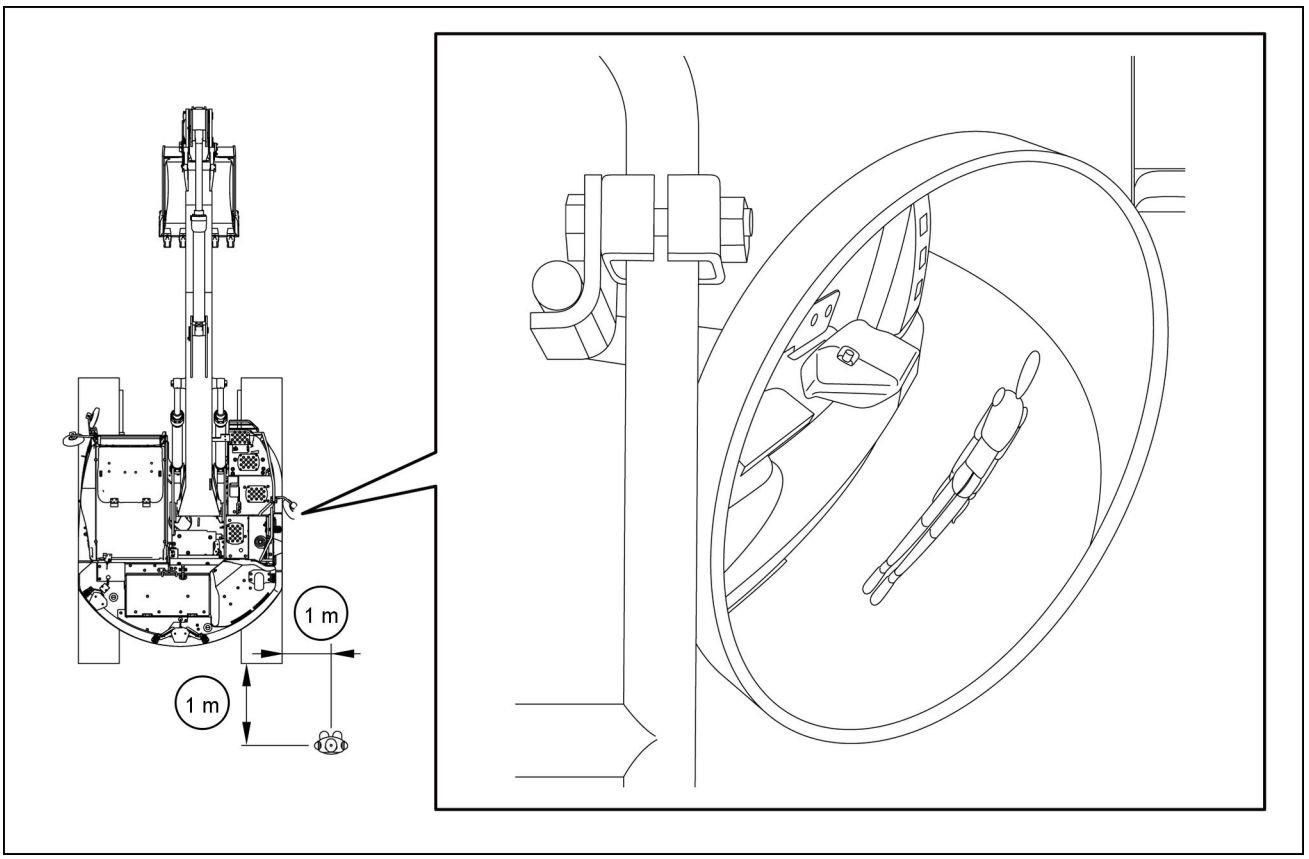


SMIL20CEX1319GA 7

The mirror shall be positioned according to the references shown in picture:

The side on the rear right of the machine shall be visible.

The area around a reference body positioned **1 m** (**39.4 in**) back from the edge of the right track and **1 m** (**39.4 in**) rightward the machine shall be visible.



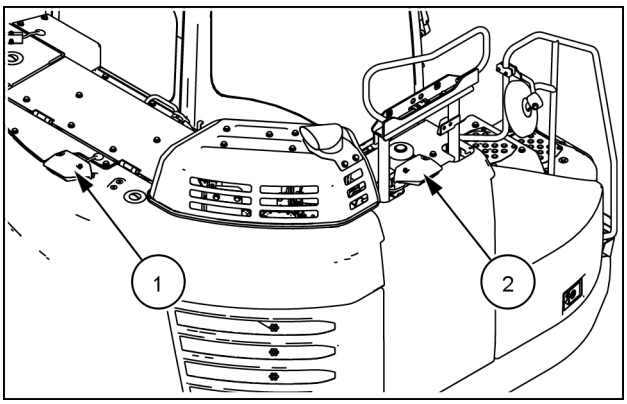
SMIL20CEX1348GA 8

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

Cameras

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

A rear camera **(1)** is installed on the counterweight. A right-side camera **(2)** is installed on the fuel tank.

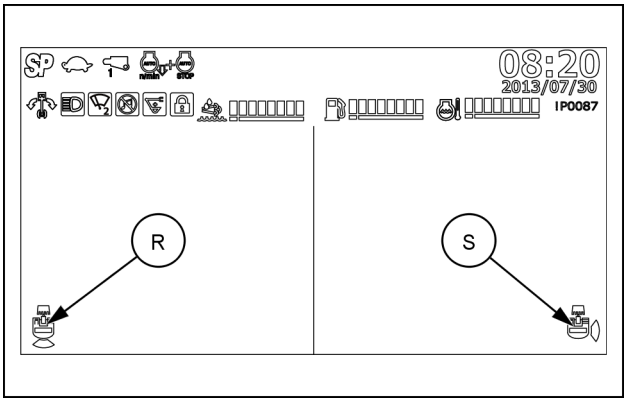


SMIL17CEX3236AA 1

The view of the rear camera **(R)** is shown on the left side of the display. The view of the right side camera **(S)** is shown on the right side of the display.

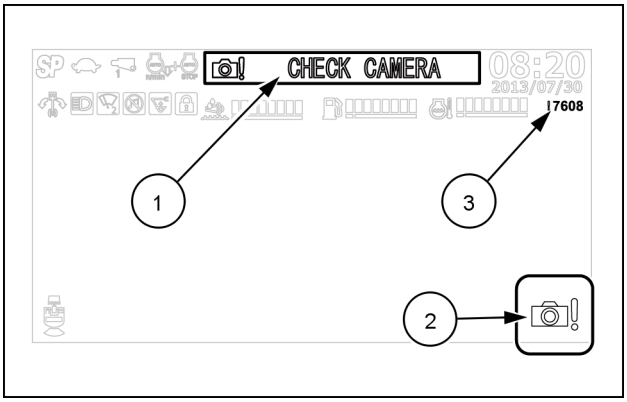
NOTICE: *Never operate the machine while only looking at the images on the display. Make sure to check the area around the machine by the direct view or through the mirrors.*

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



SMIL16CEX1248AA 2

If the cameras or the camera wirings have a failure, a warning buzzer sounds for about **5 s**, the CHECK CAMERA message **(1)** and a DTC **(3)** appear, and the camera failure icon **(2)** is displayed. Moreover, the image of the failed camera is replaced by a grey background.



SMIL16CEX1075AA 3

Camera guidelines

Guidelines can be set up on the camera views in order to support a primary check of the area around the machine.

(1) Guideline indicating a distance of about **1 m** (**39.37 in**) from the rear of the machine.

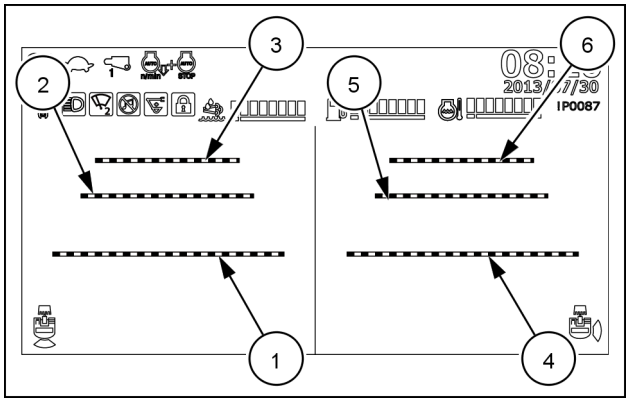
(2) Guideline indicating a distance of about **2 m** (**78.74 in**) from the rear of the machine.

(3) Guideline indicating a distance of about **3 m** (**118.11 in**) from the rear of the machine.

(4) Guideline indicating a distance of about **1 m** (**39.37 in**) from the right-side of the machine.

(5) Guideline indicating a distance of about **2 m** (**78.74 in**) from the right-side of the machine.

(6) Guideline indicating a distance of about **3 m** (**118.11 in**) from the right-side of the machine.

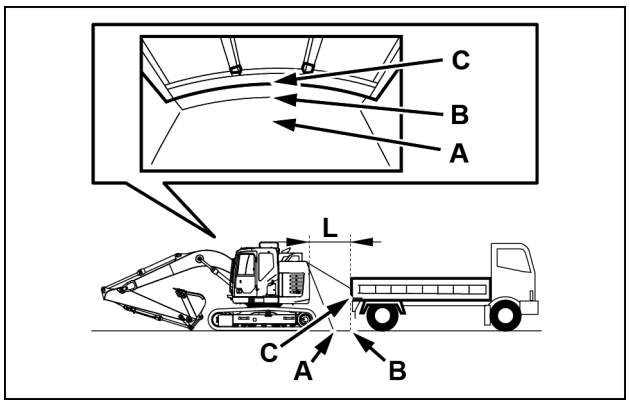


SMIL16CEX1248AA 4

Cautions for the rear view

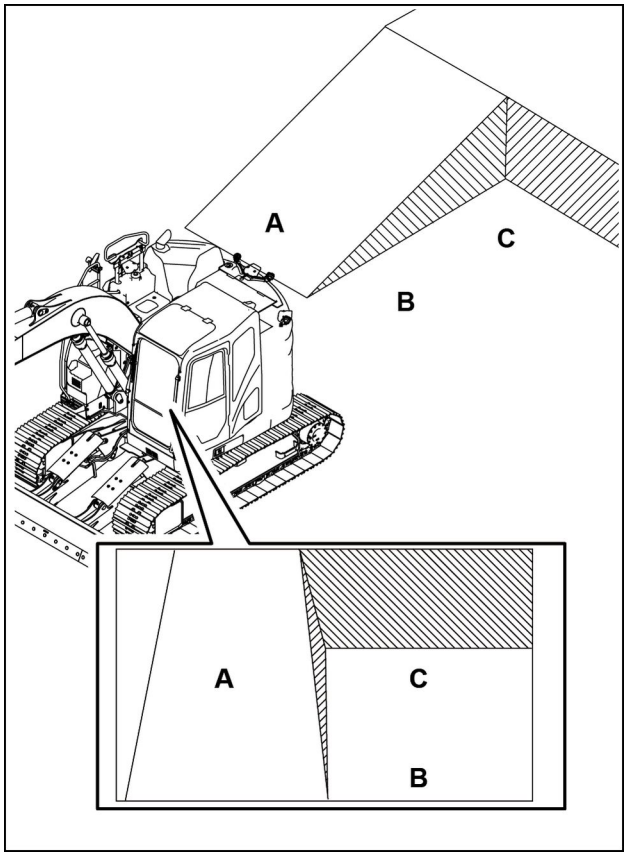
A distance guideline targets a planar object (e.g. the ground). Therefore, if a three-dimensional object with an overhang is approaching, in particular at low distance, the distance of the overhang is not displayed properly.

The picture provides an example. The machine gets rearward, and approaches an object at a distance **(L)** of about **1 m** (**3.3 ft**): on the display, the overhang **(C)** of the object appears aligned to the position **(B)** on the ground. Actually, the position **(B)** on the ground is beyond the overhang **(C)** of the object: the overhang **(C)** is rather aligned to the position **(A)** on the ground. Therefore, there is a risk of collision between the machine and the object if the machine is backed referring to the position **(B)**.



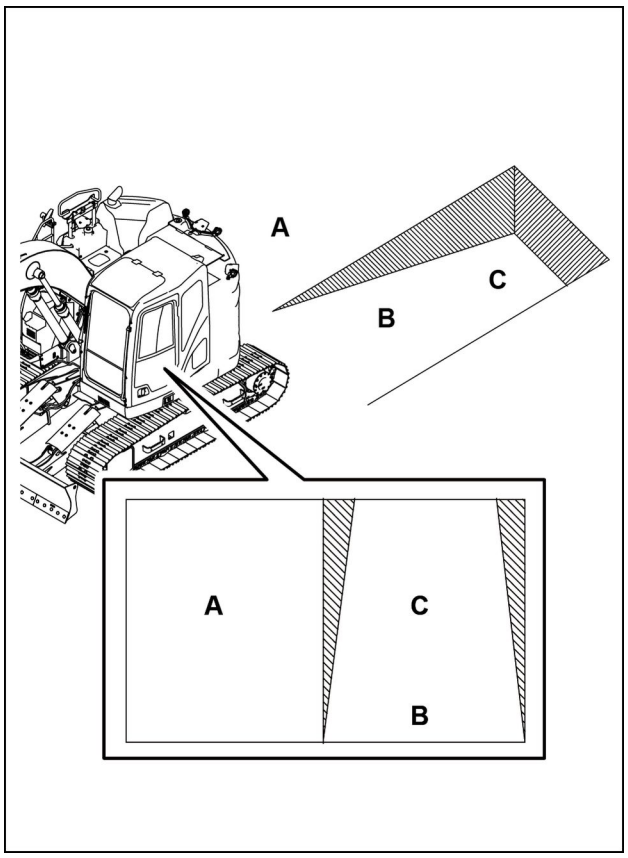
SMIL17CEX3247AA 5

Moreover, if the machine gets rearward and approaches an uphill road, an object in the position **(A)** appears aligned to the position **(C)** on the ground. Actually, the position **(C)** on the ground is beyond the position **(A)**: the position **(A)** is rather aligned to the position **(B)** on the ground. Therefore, there is a risk of collision between the machine and the object if the machine is backed referring to the position **(A)**.



SMIL17CEX3563BA 6

Similarly, if the machine gets rearward and approaches a downhill road, an object in the position **(A)** appears aligned to the position **(C)** on the ground. Actually, the position **(C)** on the ground is beyond the position **(A)**: the position **(A)** is rather aligned to the position **(B)** on the ground. Therefore, there is a risk of collision between the machine and the object if the machine is backed referring to the position **(A)**.

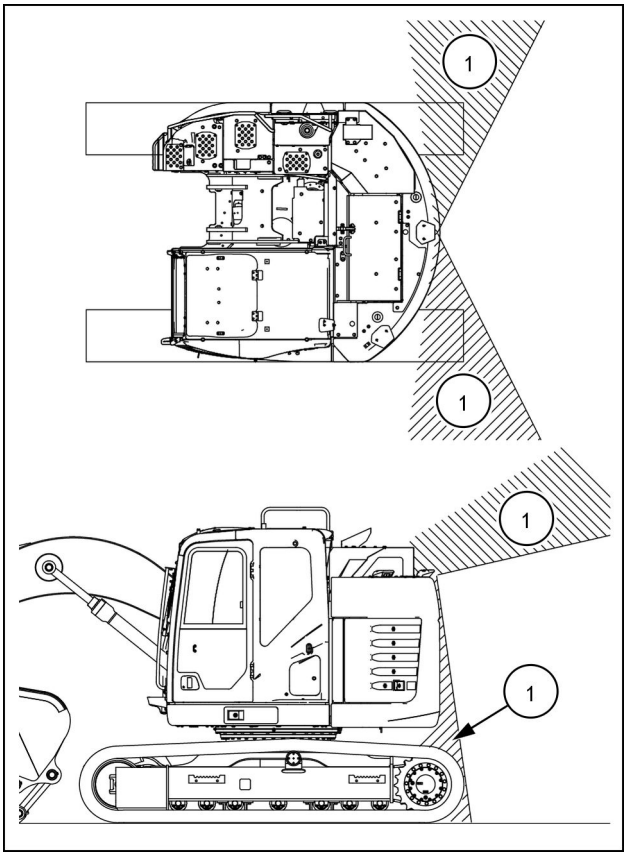


SMIL17CEX3564BA 7

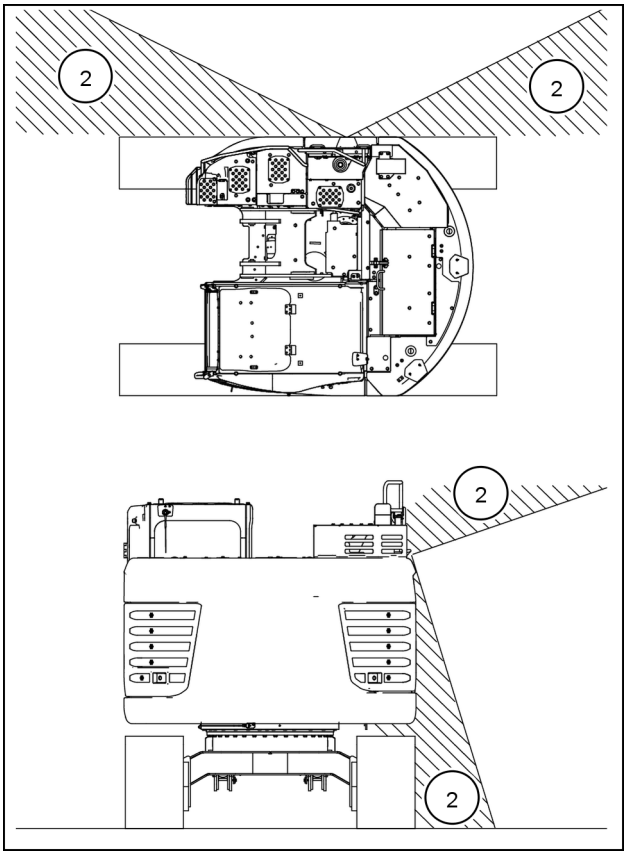
The camera system has a range where no image is displayed (blind spots):

(1) Range where no image from the rear camera is displayed.

(2) Range where no image from the right-side camera is displayed.



SMIL17CEX3565BA 8



SMIL17CEX3566BA 9

Side doors

⚠ WARNING

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

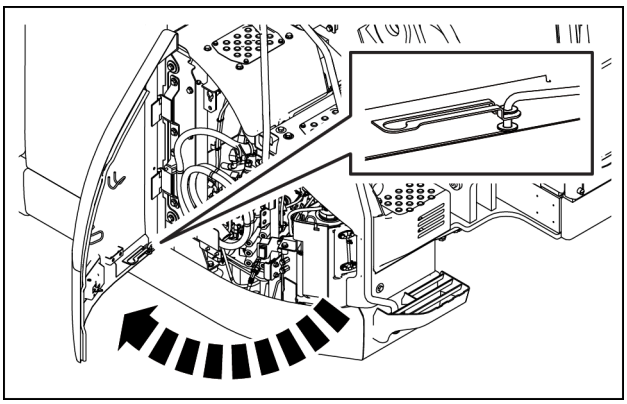
W0238A

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

Front right-hand door

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

NOTE: *Never leave tools inside the compartment.*

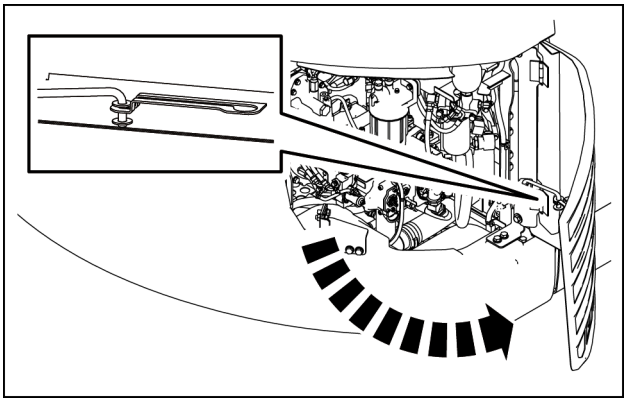


SMIL17CEX3246AA 1

Rear right-hand door

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

NOTE: *Never leave tools inside the compartment.*

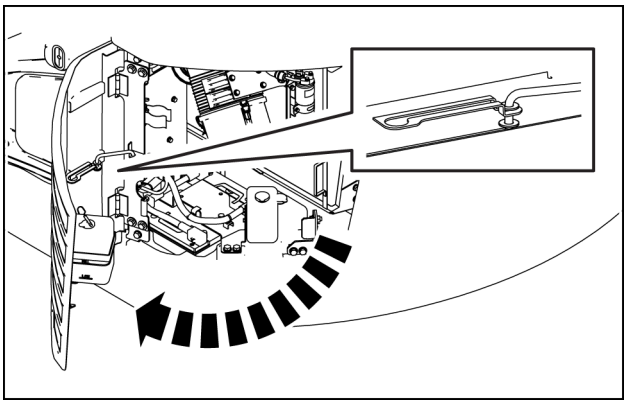


SMIL17CEX3245AA 2

Left-hand door

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

NOTE: *Never leave tools inside the compartment.*



SMIL20CEX1302AA 3

Battery disconnect switch

⚠ WARNING

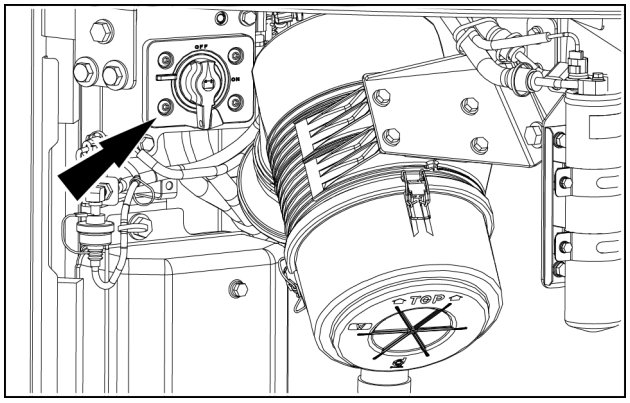
Electrical shock hazard!
Before you work on any part of the electrical system, disconnect the battery ground cable or turn the battery disconnect switch off (if equipped).
Complete all electrical work before you reconnect the cable.
Failure to comply could result in death or serious injury.

W1393A

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

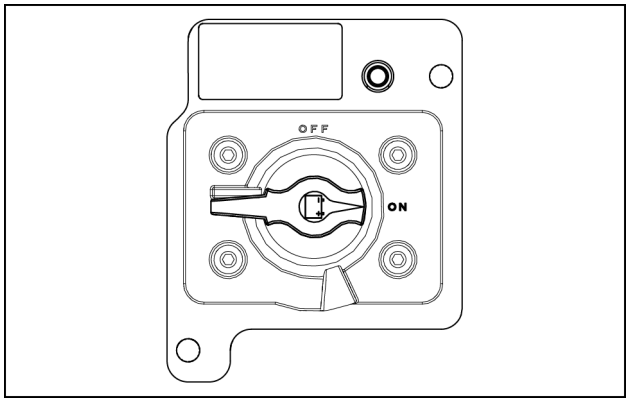
The battery disconnect switch allows to cut off any power supply in the electrical system of the machine.

NOTE: *When the switch is turned to OFF position, the stations stored on the radio presets and the time set for the clock will be cleared.*



SMIL17CEX3541AA 1

The battery disconnect switch should be in ON position for normal operation.



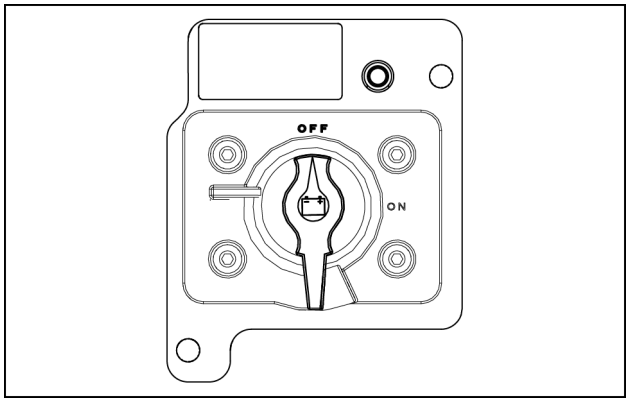
SMIL16CEX1757AA 2

The battery disconnect switch should be turned to OFF position only when the actions below must be done:

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

Before turning the battery disconnect switch to OFF position, make sure to park the machine and to stop the engine.

NOTICE: *If the battery disconnect switch is turned to OFF position when the engine is running, the machine electrical system, the machine control system and the engine control system will be severely damaged.*



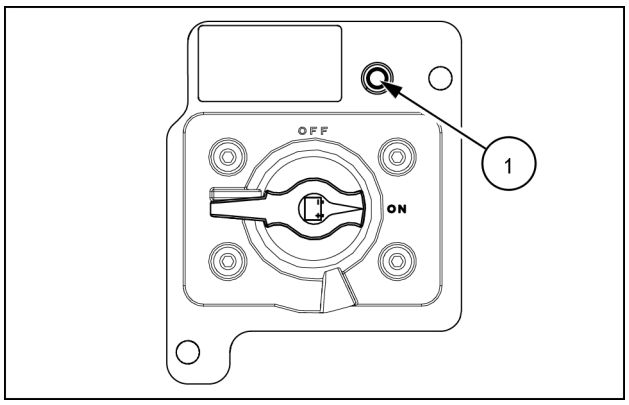
SMIL16CEX1758AA 3

The LED indicator **(1)** close to the battery disconnect switch is lit up in yellow as the main control systems are operating.

After the engine stop, the LED indicator will be active for some minutes. If the battery disconnect switch has to be turned to OFF position, wait the LED indicator **(1)** to turn off.

NOTICE: *Never turn the battery disconnect switch to OFF position when the LED indicator **(1)** is lit up in yellow. The machine control system and the engine control system will be severely damaged.*

NOTICE: *The SCR system continues to operate for approximately **3 min** after the starter key is turned off in order to suck **DEF/ADBLUE®** back into the tank. **DEF/ADBLUE®** expands when freezing, and it will thus damage the lines of the SCR system.*



SMIL16CEX1757AA 4

Engine hood

⚠ WARNING

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

W1059A

⚠ WARNING

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

W1090B

⚠ WARNING

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

W1486A

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

Opening

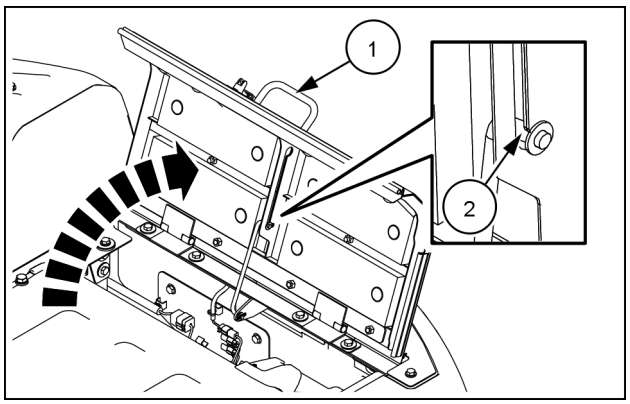
Stand on the service platform. Unlock the latches with the starter key.

Disengage the latches, grab the hood handle **(1)**, and raise the engine hood.

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

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

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



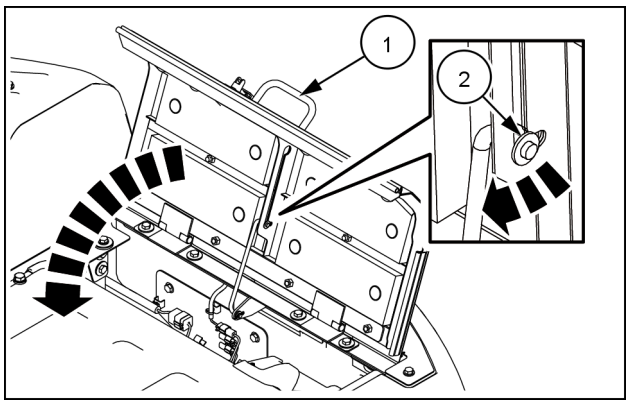
SMIL17CEX3243AA 1

Closing

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

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

Engage the latches firmly, and lock them with the starter key.



SMIL17CEX3242AA 2

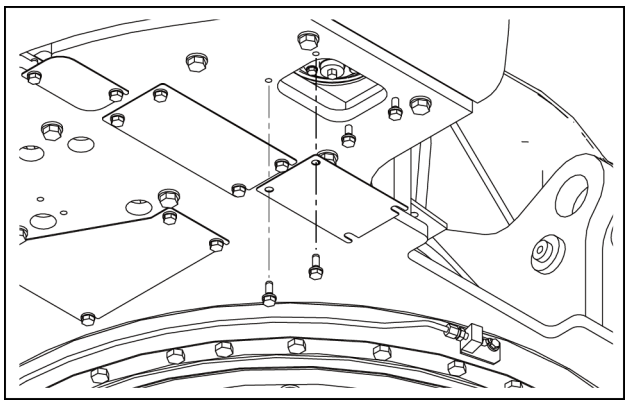
Lower panels

⚠ WARNING

Moving parts!
Make sure the lower panels are properly closed before driving the machine.
Failure to comply could result in death or serious injury.

W0910A

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



SMIL17CEX3241AA 1

Windshield washer reservoir

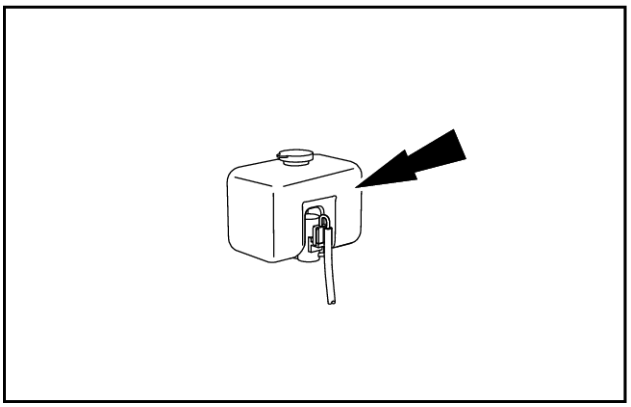
The windshield washer reservoir is located inside one of the left-hand compartments behind the cab.

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

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

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

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



SMIL13CEX2650AB 1

Towing holes

⚠ WARNING

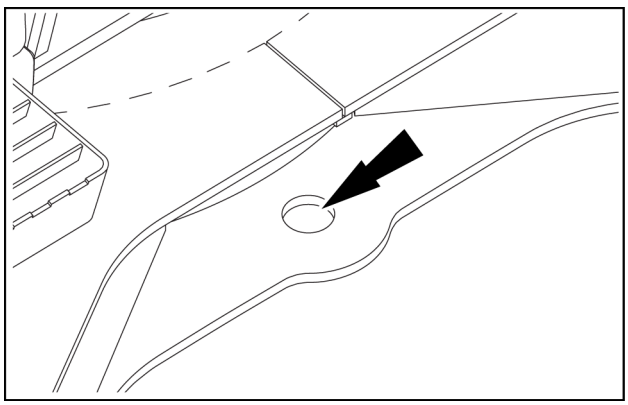
Misuse hazard!
Towing is a delicate maneuver that is always carried out at the risk of the user. The manufacturer's warranty does not apply to incidents or accidents that occur during towing. Where possible, carry out the repairs at the site.
Failure to comply could result in death or serious injury.

W0286A

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

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

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



SMIL14CEX2589AA 1

Storage compartment

⚠ WARNING

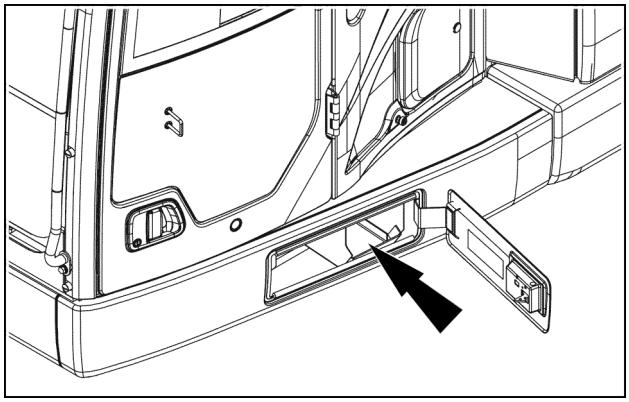
Moving parts!
Make sure the storage box cover is closed properly before driving the machine.
Failure to comply could result in death or serious injury.

W0288A

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

Open the compartment cover with the starter key.

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



SMIL17CEX0897AA 1

Fire extinguisher

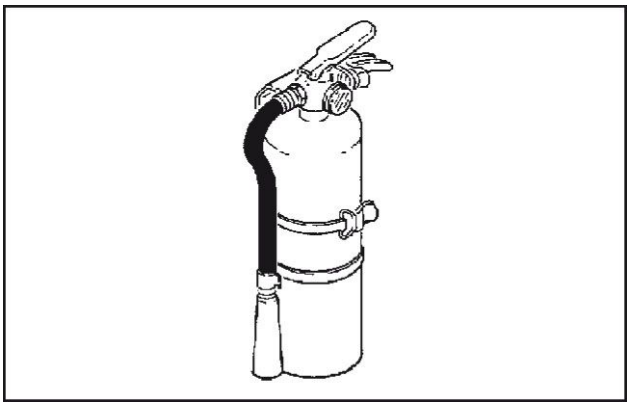
It is strongly recommended to have a fire extinguisher available and to keep it inside the front storage box.

Service specifications:

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

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

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



CS98M573TBP1 1

Fuel tank

⚠ WARNING

Fire hazard!
When handling diesel fuel, observe the following precautions:
1. Do not smoke.
2. Never fill the tank when the engine is running.
3. Wipe up spilled fuel immediately.
Failure to comply could result in death or serious injury.

W0099A

Fill the fuel tank with Ultra-Low Sulfur diesel fuel only. Refer to Chapter 6 for the detailed specifications and prescriptions about the fuel to be used.

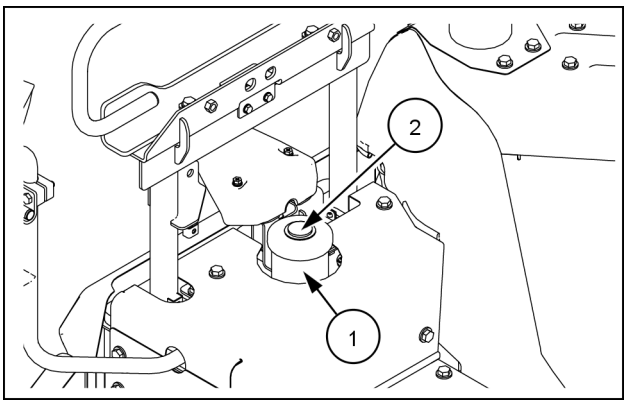
NOTICE: *Never put any moisture elimination product (water draining agent) in the fuel tank. Doing so may damage the fuel system, and thus the engine.*

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

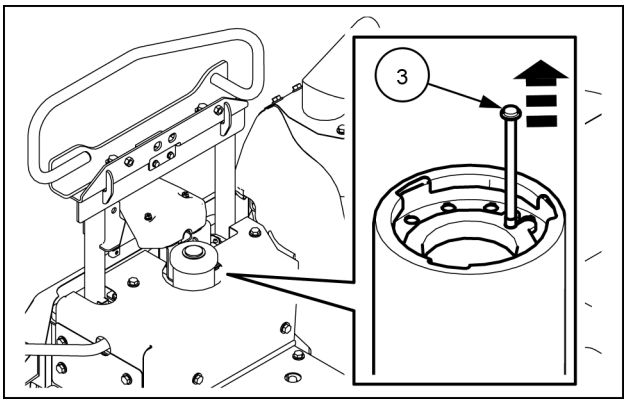
To refill the fuel tank proceed as follows:

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

   NOTICE: *Never remove the mesh filter inside the fuel filler neck. Doing so may damage the fuel system, and thus the engine.*
5. Refill until the needle indicator **(3)** gets up from the filler neck.
6. Put the cap **(2)** on the filler neck. Turn the cap clockwise until it engages the stopper on the filler neck.
7. Lock the cap **(2)** with the starter key.



SMIL17CEX3250AA 1



SMIL19CEX2661AA 2

Fuel tank filler pump (if equipped)

⚠ WARNING

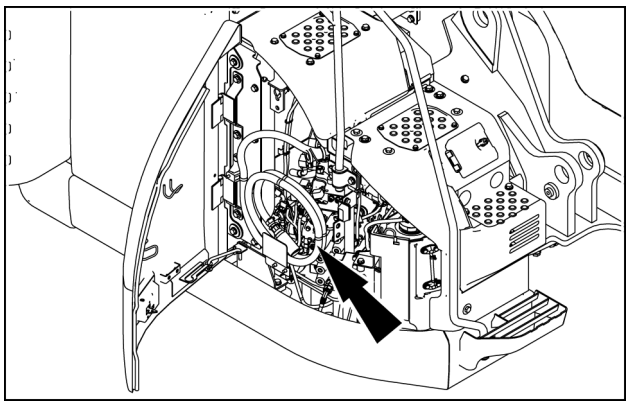
Fire hazard!
When handling diesel fuel, observe the following precautions:
1. Do not smoke.
2. Never fill the tank when the engine is running.
3. Wipe up spilled fuel immediately.
Failure to comply could result in death or serious injury.

W0099A

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

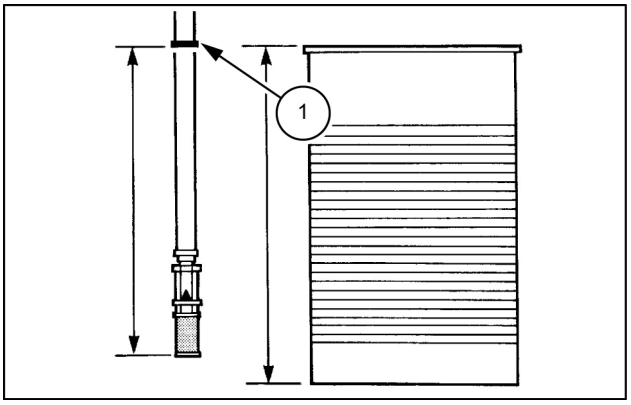
NOTICE: *The fuel tank filler pump is located inside the compartment on the right front of the upperstructure. Use only for suitable fuel.*

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



SMIL20CEX1301AA 1

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



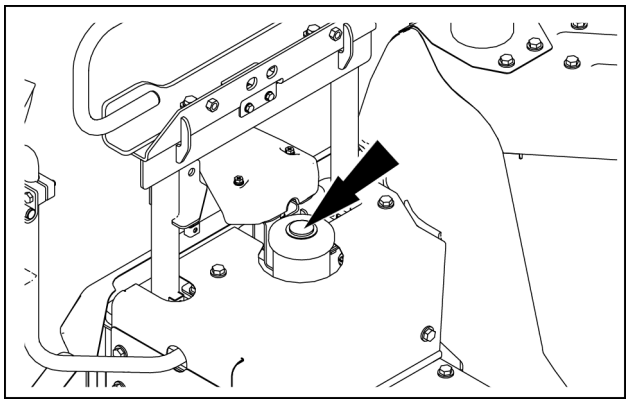
SMIL14CEX2515AB 2

5. Remove the fuel tank filler cap.

⚠ WARNING

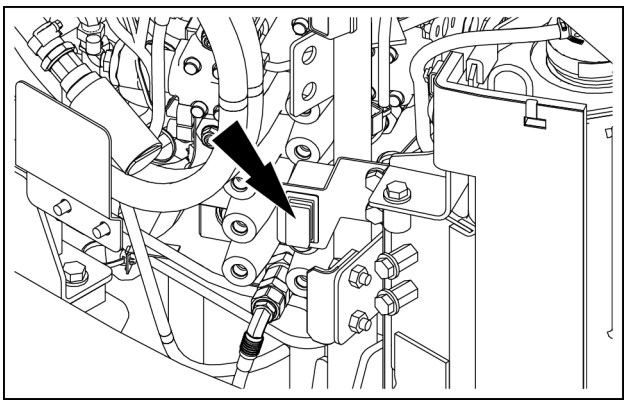
Burn hazard!
If the filler cap remains on during the refueling process, removing the cap after refueling could cause an accident. To reduce this risk, ALWAYS remove the fuel tank filler cap before refueling with the fuel tank filling pump.
Failure to comply could result in death or serious injury.

W0247A



SMIL17CEX3250AA 3

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

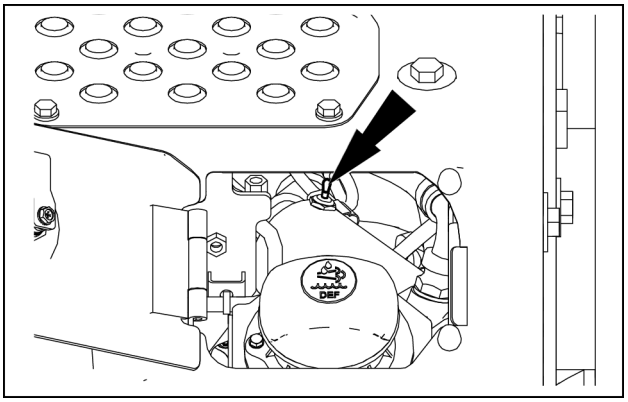


SMIL17CEX3239AA 4

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

   NOTE: *It is possible to stop filling at any time by turning the main switch of the pump to OFF position.*
9. Run the pump for a few moments to empty the pipe outside the drum. Clean and replace the inlet pipe in the front right-hand compartment.
10. Refit the fuel tank filler cap.
11. Turn the starter key to OFF position.

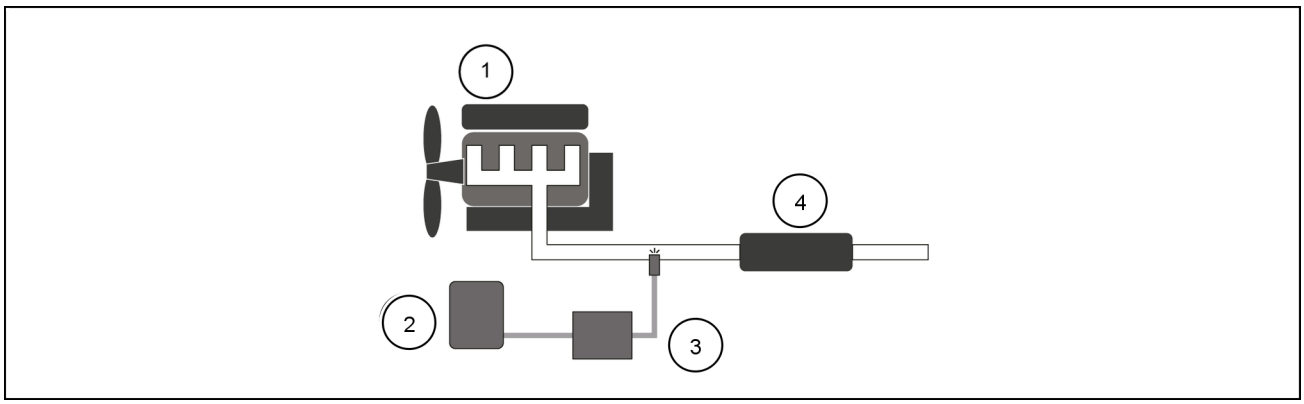
    NOTE: *The pump is equipped with a **10 A** fuse.*



SMIL17CEX3238AA 5

Selective Catalytic Reduction (SCR) system

The SCR after treatment system is intended to abate the emissions of NOx into the engine exhaust gases.



SMIL14CEX2523EB 1

1. Engine
2. **DEF/AdBlue®** tank
3. **DEF/AdBlue®** dosing control unit
4. SCR catalyst block

By spraying **DEF/AdBlue®** fluid into the exhaust gases prior to a catalyst block, the NOx molecules react inside the catalyst with the ammonia contained in the **DEF/AdBlue®**, thanks to the high temperatures generated by the exhaust gases. The NOx are thus converted to harmless elemental Nitrogen and water.

Make sure not to damage, modify or remove any component related to the SCR after treatment system.

NOTICE: *Do not kick or hit the SCR catalyst block in order not to severely damage it.*

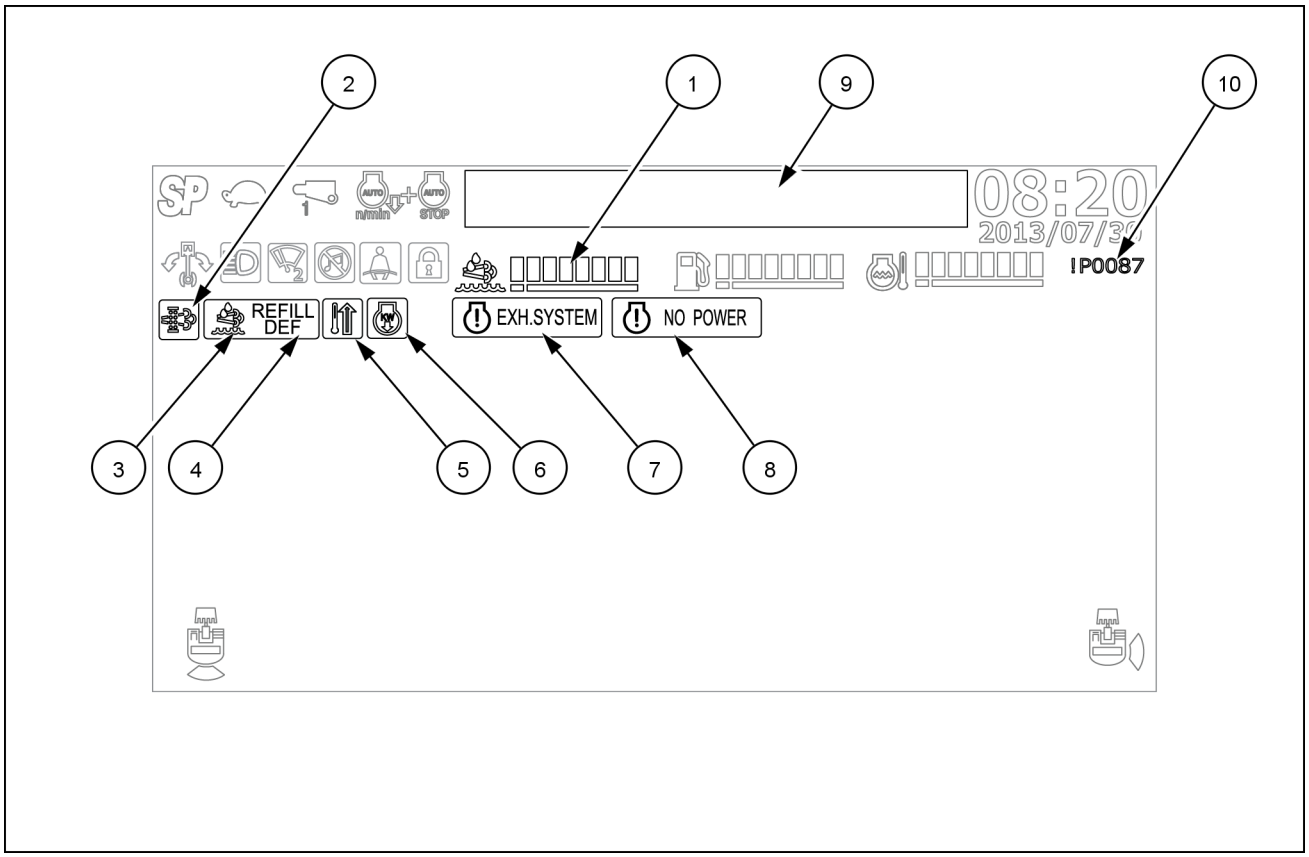
NOTICE: *Depending on machine usage, rust may form on the exhaust pipe and/or fasteners earlier than expected, even on new machines. If any visible abnormality is found, contact the CASE CONSTRUCTION dealer immediately.*

NOTICE: *Do not change the length or orientation of the air intake line to the engine, or of the exhaust line from the engine. The function of the SCR system may be negatively affected. Do not remove or modify components of equipment related to the exhaust emission control system.*

NOTICE: *Do not touch the water released from the muffler. This water is slightly acidic due to the action of the oxidation catalyst built into the muffler. If the water from the muffler has come in contact with your skin, etc., rinse the affected area with ample water.*

Icons and messages related to SCR system

The machine control system monitors the functioning of the SCR after treatment system, displaying specific icons, warnings and messages in order either to inform about a condition, or to warn about an action to be taken.



SMIL17CEX0593FA 2

1. **DEF/AdBlue®** level gauge
2. SCR CLEANING icon
3. SCR detection icon
4. **DEF/AdBlue®** refill warning
5. **DEF/AdBlue®** thawing icon
6. Engine derate icon
7. SCR failure warning
8. Engine no power warning
9. Messages
10. DTC (Diagnostic Trouble Code)

DEF/AdBlue® refilling

The SCR after treatment system requires the usage of **DEF/AdBlue®** fluid. The fluid is stored into a specific tank installed on the machine.

Refill **DEF/AdBlue®** only after the related gauge on the display decreases.

NOTICE: *If the tank is always filled to the FULL level, the **DEF/AdBlue®** level sensor may be diagnosed as malfunctioning.*

NOTICE: *The **DEF/AdBlue®** actual consumption is highly dependent on engine loads, engine speed, ambient conditions and **DEF/AdBlue®** concentration.*

The recommended operating practice is to check **DEF/AdBlue®** level every time the fuel tank is being refilled, and to refill **DEF/AdBlue®** when four segments of the **DEF/AdBlue®** level gauge are lit.

Use only **DEF/AdBlue®** that complies with **ISO 22241-1**. **DEF/AdBlue®** is available from CASE CONSTRUCTION dealers, authorized **DEF/AdBlue®** dealers or truck stations.

NOTICE: ***DEF/AdBlue®*** *is a transparent liquid with no color. Never use **DEF/AdBlue®** featuring any color as this indicates poor quality of the fluid.*

NOTICE: *Do not put any fluid other than **DEF/AdBlue®** in the **DEF/AdBlue®** tank. If anything other than **DEF/AdBlue®** is put in the tank, it will be detected leading to a protective action by the machine control system. Never put diesel fuel or gasoline in the **DEF/AdBlue®** tank. Fire may occur, and the SCR system will be damaged.*

It is recommended to use a **DEF/AdBlue®** filling equipment having a fill nozzle/pump with the proper length and diameter, triggered by the magnet in the tank filler neck and with overfill flow cut out. This will ensure that:

- The screen in the filler neck will not be damaged.
- Impurities are not entering the **DEF/AdBlue®** tank. The standardized **DEF/AdBlue®** nozzle matches the filler neck diameter.
- The **DEF/AdBlue®** tank is not overfilled, as the **DEF/AdBlue®** pump will stop when the **DEF/AdBlue®** tank is full.

NOTICE: *Refilling with a funnel is not recommended as this may lead to damage of the screen in the filler neck.*

Follow the steps below to add **DEF/AdBlue®**:

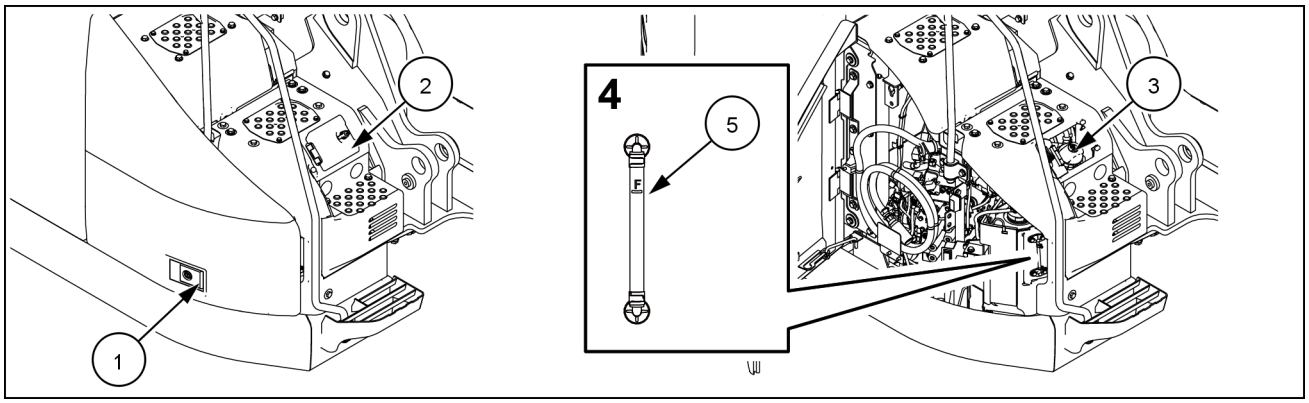
1. Turn the starter key to OFF position. Wait **3 min** for SCR system to completely suck **DEF/AdBlue®** back into the tank.
2. Unlock the front right-hand door **(1)** with the starter key. Open the door until it is fixed by the stay.
3. Unlock the **DEF/AdBlue®** tank cover **(2)** with the starter key. Turn the cover handle, and draw open the cover leftward.
4. Wipe the inlet on the **DEF/AdBlue®** tank clean of dirt, mud, and foreign objects.

   NOTICE: *some white powder deposits may form when **DEF/AdBlue®** adheres and dries in places such as the supply inlet. Wipe off these deposits to prevent them from entering the **DEF/AdBlue®** tank.*
5. Turn the cap **(3)** counterclockwise and open the filler neck.

   NOTICE: DEF/AdBlue® *may emit an odor when the tank cap is opened. Do not attempt to smell inside the tank from the supply inlet.*
6. Refill up to the F (upper limit) mark **(5)** on the level gauge **(4)**.

   NOTICE: *never refill **DEF/AdBlue®** over the F (upper limit) mark on the level gauge. Adequate air volume must be present in the top of the tank for proper functionality of the after treatment system. Moreover, **DEF/AdBlue®** may leaks from the breather hose during use, and sensors may be damaged when it becomes frozen.*

   NOTICE: *if **DEF/AdBlue®** spills while adding, wipe off the spillage with a cloth and then rinse the area with fresh water. **DEF/AdBlue®** will cause corrosion on painted and unpainted metallic surfaces, and may distort some plastic and rubber components.*
7. Put the cap **(3)** on the filler neck. Turn the cap clockwise to close the filler neck.



SMIL17CEX3252EA 3

1. Front right-hand door
2. **DEF/AdBlue®** tank cover
3. Tank cap
4. Level gauge
5. Upper limit level of **DEF/AdBlue®** to be refilled.

SCR CLEANING

The SCR system requires a periodical cleaning process in order to grant the proper functionality.

During the SCR CLEANING process, make sure that the excavator is in a well ventilated area. During the SCR cleaning process, never stop the engine in order to avoid severe damages to the SCR system and to the engine itself.

NOTICE: *During the SCR CLEANING process, the operating characteristics of the engine and of the hydraulic system may change, and some white smoke may get out from the tail pipe.*

NOTICE: *Be sure to close the engine hood properly. The exhaust gas generated during SCR CLEANING could melt the insulation and other material inside the engine hood, causing damage to the excavator.*

NOTICE: *Never touch the SCR block and the exhaust pipings as the SCR CLEANING process is running. The temperatures of these components may get high enough to burn people, and to ignite or melt materials. During SCR CLEANING, make sure that the machine is far away from any flammable and explosive material, such as dried grass or paper scraps.*

The machine control system defines two different cleaning processes for the SCR system:

1. AUTO SCR CLEANING
2. MANUAL SCR CLEANING

The type and the condition of the cleaning process is indicated by a specific icon:



Green: AUTO SCR CLEANING is running.
Green (blinking): AUTO SCR CLEANING is suspended and has to be resumed.
Orange: MANUAL SCR CLEANING is running.
Orange (blinking): MANUAL SCR CLEANING is requested, or is suspended and has to be resumed.



Green slashed: MANUAL SCR CLEANING ONLY function is active.



Red: SCR CLEANING is disabled.

AUTO SCR CLEANING

The AUTO SCR CLEANING occurs automatically about every **30 h** and does not require any operator interaction.

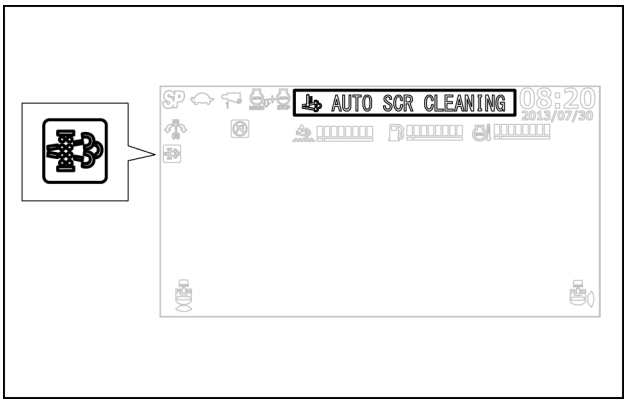
During the AUTO SCR CLEANING, the excavator can and should be operated. By applying a working load, the duration of the AUTO SCR CLEANING is reduced.

The AUTO SCR CLEANING process should take around **10 – 15 min** if the machine is working.

However, the duration of the AUTO SCR CLEANING depends on the outside temperature, engine coolant temperature and engine load. For example, colder outside temperature will increase the amount of time to complete the AUTO SCR CLEANING.

When the AUTO SCR CLEANING starts, the SCR CLEANING icon appears in green, an alarm sounds for approximately **2 s** and the message AUTO SCR CLEANING is displayed. When the AUTO SCR CLEANING completes, the green SCR CLEANING icon and the message AUTO SCR CLEANING disappear.

NOTE: *If the engine is left running at low idle speed for some time during AUTO SCR CLEANING, the machine control system will raise the engine speed automatically to support the completion of the process.*



SMIL16CEX0708AA 4

The AUTO SCR CLEANING is suspended if any of the following occurs:

- The SCR cleaning button is pressed by the operator. The SCR CLEANING icon disappears and the message PUSH SCR SWITCH TO ACTIVATE is displayed. Pressing the SCR cleaning button again will resume the process.
- The coolant temperature drops below **65 °C** (**149 °F**). The SCR CLEANING icon starts to flash in green and a warning alarm sounds for approximately **2 s**. When the engine coolant temperature is above the **70 °C** (**158 °F**), AUTO SCR CLEANING will be resumed.
- The coolant temperature rises above **100 °C** (**212 °F**). The SCR CLEANING icon starts to flash in green and a warning alarm sounds for approximately **2 s**. Lower the engine speed throttle to idle and check the coolant temperature. If the engine coolant temperature drops below **90 °C** (**194 °F**), the AUTO SCR CLEANING will be resumed.

NOTE: *Never keep normal machine operation with the AUTO SCR CLEANING process being suspended. The SCR system will be damaged. Resume the AUTO SCR CLEANING process immediately.*

NOTICE: *If the AUTO SCR CLEANING is not completed after **8 h**, the SCR CLEANING icon will flash in orange and the MANUAL SCR CLEANING will be requested. If normal machine operation is kept when the SCR CLEANING icon is flashing in orange, serious damages to the engine and to the after treatment system will occur. Immediately move the excavator to a well ventilated area and activate the MANUAL SCR CLEANING.*

MANUAL SCR CLEANING

MANUAL SCR CLEANING is requested by the machine control system and shall be activated by the operator.

During the MANUAL SCR CLEANING, the excavator cannot be operated.

The MANUAL SCR CLEANING process should take around **20 – 25 min**.

When the MANUAL SCR CLEANING is requested, the SCR CLEANING icon flashes in orange, a warning alarm sounds for approximately **2 s** and the message PUSH SCR SWITCH TO ACTIVATE is displayed.

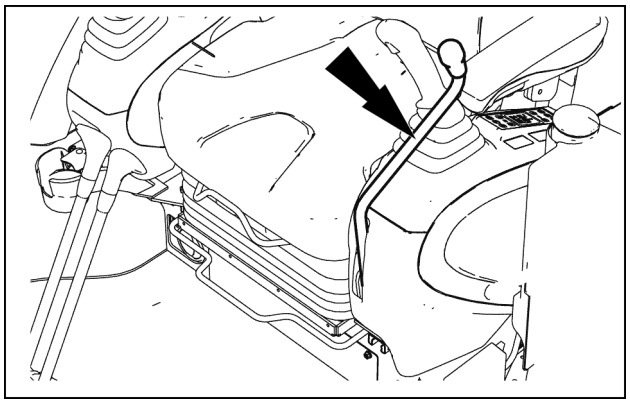
To activate the MANUAL SCR CLEANING:

1. Move the machine to a well ventilated area.
2. Set the gate lock lever in lock position.
3. Lower the engine speed to low idle.
4. Press the SCR CLEANING button to start MANUAL SCR CLEANING process.

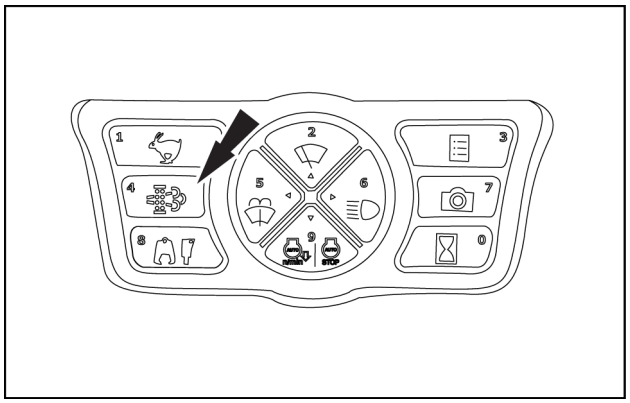
The SCR CLEANING icon is lit up in orange and an alarm sounds for **2 s**. The message MANUAL SCR CLEANING and the message DO NOT OPERATE are alternately displayed.

NOTE: *the engine sets automatically to an intermediate speed during the MANUAL SCR CLEANING process.*

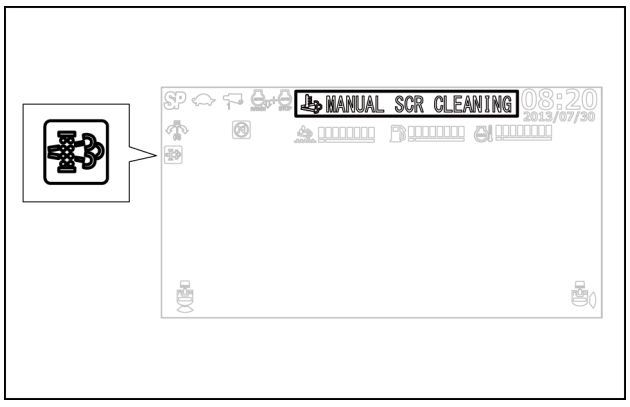
When the MANUAL SCR CLEANING completes, the SCR CLEANING icon and the messages MANUAL SCR CLEANING and DO NOT OPERATE disappear.



SMIL17CEX0198AA 5



SMIL14CEX2534AA 6



SMIL16CEX0707AA 7

The MANUAL SCR CLEANING is stopped if any of the following is done:

- The operator sets the gate lock lever to unlock position.
- The operator changes the engine speed throttle position.
- The operator presses the SCR CLEANING button.

The SCR CLEANING icon starts to flash in orange and the message PUSH SCR SWITCH TO ACTIVATE is displayed.

NOTICE: *Never restart normal machine operation with the MANUAL SCR CLEANING process being suspended. The SCR system will be damaged. Resume the MANUAL SCR CLEANING process immediately.*

The MANUAL SCR CLEANING is disabled if any of the following occurs:

- The MANUAL SCR CLEANING process is not completed within **40 min** after it is started.
- The MANUAL SCR CLEANING is not started within **10 h** after the message to request MANUAL SCR CLEANING (PUSH SCR SWITCH TO ACTIVATE) is displayed.

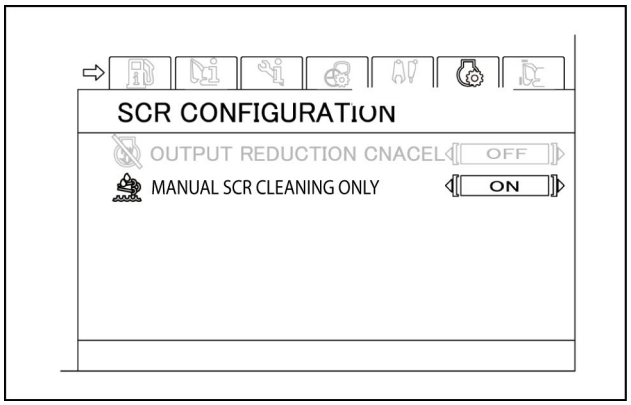
A warning alarm sounds for approximately **2 s** and the SCR CLEANING icon turns red. The message CHECK ENGINE and a DTC (Diagnostic Trouble Code) appear on the display. Immediately stop machine operation, and contact the CASE CONSTRUCTION dealer for machine repair.

MANUAL SCR CLEANING ONLY function

The purpose of this function is to avoid high temperature exhaust in specific operating conditions:

- Operation inside building.
- Operation underground.
- Operation near combustibles or explosives.

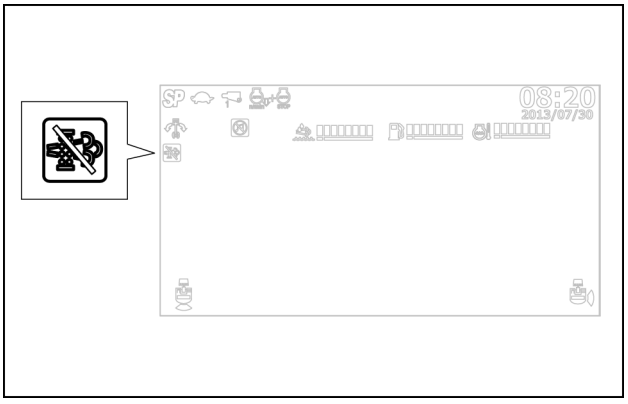
To enable the function, set MANUAL SCR CLEANING ONLY to ON in the SCR CONFIGURATION tab of the user information mode.



SMIL14CEX4935AA 8

Resuming the operating mode of the display, the SCR CLEANING icon appears green and slashed.

NOTE: *This function is just suspending AUTO SCR CLEANING that occurs every **30 h**. The system will request MANUAL SCR CLEANING if AUTO SCR CLEANING is suspended for **8 h**. Use this function only when it is necessary to avoid AUTO SCR CLEANING for safety purpose.*



SMIL16CEX0706AA 9

DEF/AdBlue® thawing

When operating the machine in severe winter climates, and stopping for a while the normal operation (e.g. engine at low idle speed and any control activation) an automatic thawing procedure for **DEF/AdBlue®** is carried out by the machine control system in order to avoid freezing of the fluid. The **DEF/AdBlue®** anti freezing icon is displayed as this procedure is active.



DEF/AdBlue® is being thawed.

Resuming normal operation, the **DEF/AdBlue®** anti freezing procedure and the related icon will quickly disappear.

NOTE: *during the automatic thawing procedure for* ***DEF/AdBlue®****, the engine speed and the engine load are automatically managed by the machine control system.*

SCR system protection

The machine control system detects and warns about improper or even dangerous functioning conditions of the SCR after treatment system:

1. The level of **DEF/AdBlue®** in the tank lowers until the tank is completely empty.
2. The quality of **DEF/AdBlue®** in the tank does not conform to the required specification, or a fluid different than **DEF/AdBlue®** is filled into the **DEF/AdBlue®** tank.
3. One or more components of the SCR system have a failure.

These conditions shall be promptly addressed in order not to severely damage the SCR system. Therefore, as one of these conditions comes up, the machine control system displays a specific warning sequence in order to induce the operator to take proper actions.

The inducement sequence has four steps:

A. The SCR system is functioning in proper condition.

B. The SCR system is getting to an improper or dangerous functioning condition, and a warning to the operator is thus given.

C. The SCR system is at risk of damages, and an early inducement is thus given to the operator for stopping operation as soon as possible, and taking proper actions.

D. The SCR system is at risk of serious damages, and a final inducement is thus given to the operator for stopping operation immediately, and taking definitive actions.

From the step B to the step D , the machine functionalities are further limited:

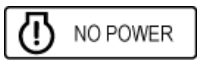
B. The engine is at rated output.

C. The engine is limited to **70%** of the rated output. A derate icon is displayed.



The engine is derated.

D. The engine is limited to **60%** of the rated output, and the engine speed is limited to low idle. A no power warning is displayed



The engine has no power.

In the step D of the inducement sequence, the machine has a minimal operating capacity. This minimal operating capacity is intended to reach a safe condition: as a safe condition is reached, stop the engine, and make sure to take the appropriate action required by the inducement sequence, as for example refilling **DEF/AdBlue®** or repairing the SCR system.

NOTICE: *The recommended practice is to stop operation and take proper actions at the step B of the inducement sequence, in order to avoid severe damages to the after treatment and to the other main systems of the machine.*

The machine control system provides specific combinations of visual and acoustic signals in order to make the operator aware of the starting and the progressing of an inducement sequence.

Inducement sequence for refilling DEF/AdBlue®

(A) Level of **DEF/AdBlue®** around **10%** of tank capacity.

DEF/AdBlue® gauge white.

(B) Level of **DEF/AdBlue®** below **10%** of tank capacity.

DEF/AdBlue® gauge orange.
DEF/AdBlue® refill warning displayed.
REFILL DEF displayed.
One long beep.

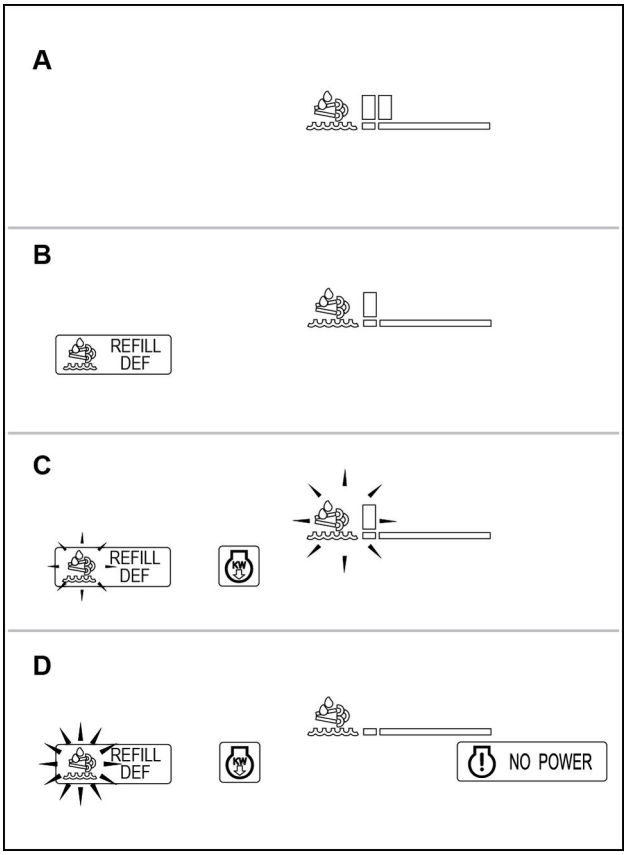
(C) Level of **DEF/AdBlue®** below **5%** of tank capacity.

DEF/AdBlue® gauge orange and flashing.
DEF/AdBlue® refill warning slow flashing.
REFILL DEF displayed.
Three short beeps.

(D)DEF/AdBlue® tank empty

DEF/AdBlue® gauge red.
DEF/AdBlue® refill warning fast flashing.
REFILL DEF displayed.
Continuous beep.

At the step **(D)**, the operation of the machine shall be stopped. Reach a safe condition for the machine, and immediately refill **DEF/AdBlue®** into the tank according to the procedure described in the next page.



SMIL16CEX2783BA 10

To resume normal machine operation as **DEF/AdBlue®** has run out:

1. Turn the starter key to OFF position.
2. Wipe clean any dirt, mud or other foreign objects attached around the filler port on the **DEF/AdBlue®** tank.
3. Turn the tank cap counterclockwise and open the filler neck.
4. Make sure to refill **DEF/AdBlue®** up to **30%** of the tank capacity (see Chapter 6 for capacity of the **DEF/AdBlue®** tank).
5. Put the cap on the filler neck. Turn the cap clockwise to close the filler neck.

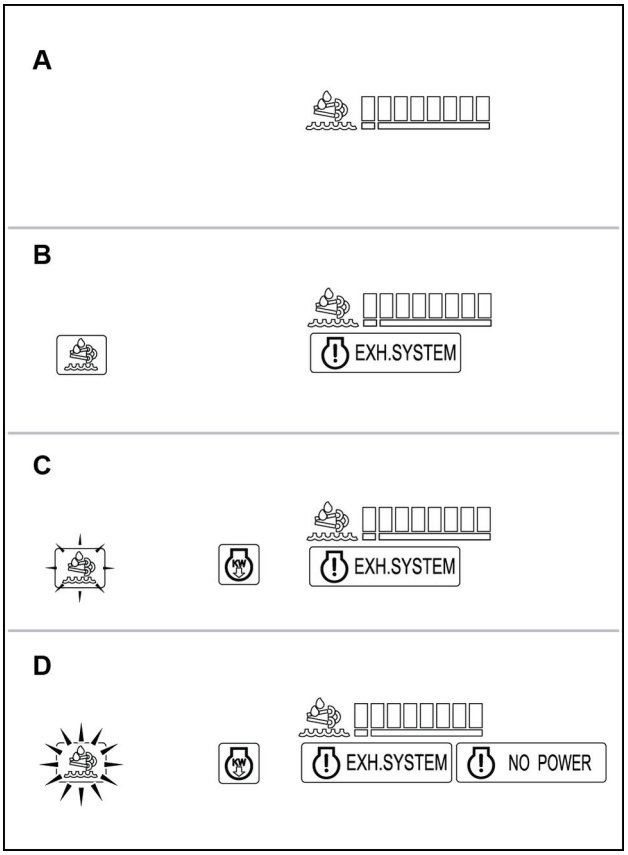
Let the engine run at low idle for **5 min**. The warnings, the messages and the icons remain active for some time as the machine control system has to recognizes that **DEF/AdBlue®** has been added sufficiently.

After the refilling is detected by the machine control system, the segments of the **DEF/AdBlue®** gauge get lit in white and all the warnings, the messages and the icons disappear.

NOTICE: *If the warnings, the messages and the icons do not disappear after **10 min**, turn the starter key to OFF position. Add some more **DEF/AdBlue®** into the tank. Wait **1 min** and then turn the starter key to ON position. If again the warnings, the messages and the icons do not disappear after **15 s**, consult the CASE CONSTRUCTION dealer to check for malfunctioning of the **DEF/AdBlue®** filling detection system.*

Inducement sequence for replacing DEF/AdBlue®, or for repairing the after treatment system

(A) Normal operation.



SMIL16CEX1375BA 11

(B)DEF/AdBlue® bad quality, or SCR problem.

SCR warning signs displayed.
CHECK SCR SYSTEM displayed.
One long beep.

(C) After **3 h** with no action taken.

SCR detection icon slow flashing.
CHECK SCR SYSTEM displayed.
Three short beeps.

(D) After **30 min** with no action taken.

SCR detection icon fast flashing.
CHECK SCR SYSTEM CHECK ENGINE displayed.
Continuous beep.

At the step **(D)**, the operation of the machine shall be stopped. Reach a safe condition for the machine, and immediately call the CASE CONSTRUCTION dealer for inspection and repair of the SCR system, and for replacement of the fluid into the **DEF/AdBlue®** tank with the proper one.

To replace **DEF/AdBlue®** into the tank, refer first to the drain procedure described in Chapter 6, then refer to the procedure described previously in this Section to refill the tank after **DEF/AdBlue®** has run out.

After **DEF/AdBlue®** has been replaced, let the engine run at low idle for about **20 min**. The warnings, the messages and the icons remain active until the machine control system recognizes that the quality of **DEF/AdBlue®** in the tank conforms to the required specification.

NOTICE: *If the warnings, the messages and the icons do not disappear after **25 min**, turn the starter key to OFF position. Wait **1 min** and then turn the starter key to ON position. If again the warnings, the messages and the icons do not disappear after **15 s**, consult the CASE CONSTRUCTION dealer to check for malfunctioning of the **DEF/AdBlue®** quality detection system.*

If any of the following occurs within **40 h** after **DEF/AdBlue®** replacement, or after completion of SCR system repair:

The quality of **DEF/AdBlue®** is abnormal and the detection lasts for **10 s**.

An SCR system abnormality is detected and the detection lasts for **10 s**.

The machine control system immediately resumes the inducement sequence to the step **(C)**.

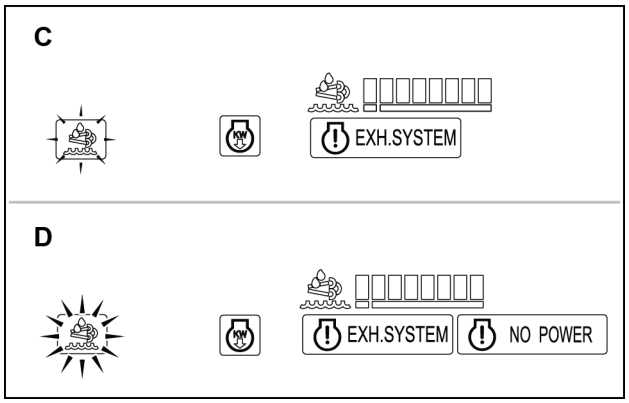
(C)DEF/AdBlue® bad quality, or SCR problem.

SCR detection icon slow flashing.
CHECK SCR SYSTEM displayed.
Three short beeps.

(D) After **30 min** with no action taken.

SCR detection icon fast flashing.
CHECK SCR SYSTEM CHECK ENGINE displayed.
Continuous beep.

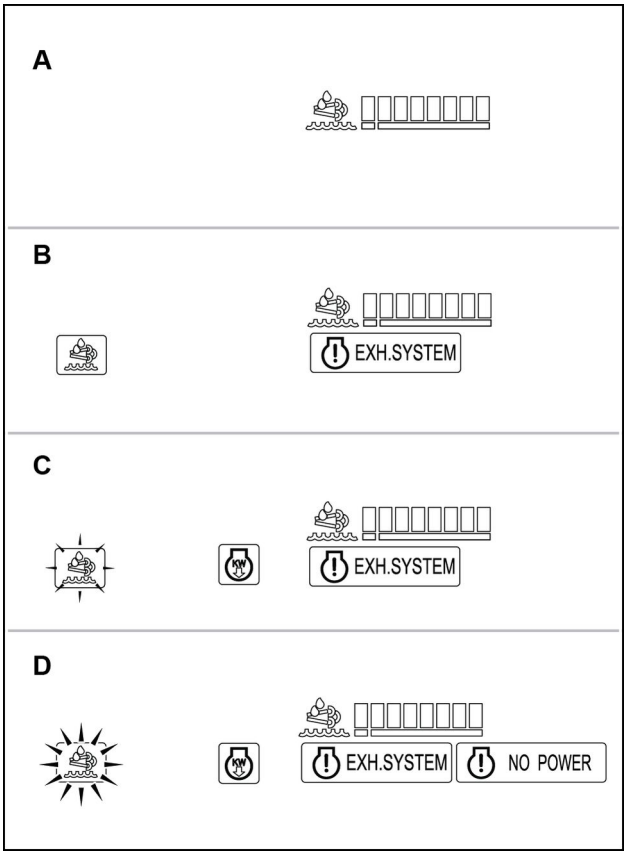
At the step **(D)**, the operation of the machine shall be stopped. Reach a safe condition for the machine, and immediately call the CASE CONSTRUCTION dealer for inspection and repair of the SCR system, and for replacement of the fluid into the **DEF/AdBlue®** tank with the proper one.



SMIL16CEX1376AA 12

Inducement sequence for repairing EGR system

(A) Normal operation.



SMIL16CEX1375BA 13

(B) EGR problem.

SCR warning signs displayed.
CHECK SCR SYSTEM displayed.
One long beep.

(C) After **36 h** with no action taken.

SCR detection icon slow flashing.
CHECK SCR SYSTEM displayed.
Three short beeps.

(D) After **100 h** with no action taken.

SCR detection icon fast flashing.
CHECK SCR SYSTEM CHECK ENGINE displayed.
Continuous beep.

At the step **(D)**, the operation of the machine shall be stopped. Reach a safe condition for the machine, and immediately call the CASE CONSTRUCTION dealer for inspection and repair of the EGR system.

If an EGR system abnormality is detected within **40 h** after completion of EGR system repair, and the detection lasts for **10 s**, the machine control system immediately resumes the inducement sequence to the step **(C)**.

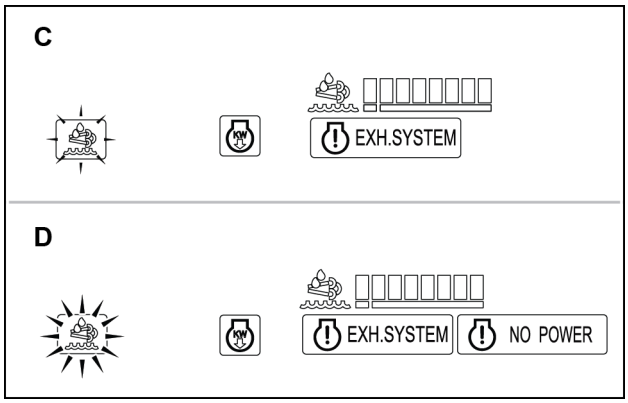
(C) EGR problem.

SCR detection icon slow flashing.
CHECK SCR SYSTEM displayed.
Three short beeps.

(D) After **5 h** with no action taken.

SCR detection icon fast flashing.
CHECK SCR SYSTEM CHECK ENGINE displayed.
Continuous beep.

At the step **(D)**, the operation of the machine shall be stopped. Reach a safe condition for the machine, and immediately call the CASE CONSTRUCTION dealer for inspection and repair of the EGR system.



SMIL16CEX1376AA 14

OUTPUT REDUCTION CANCEL

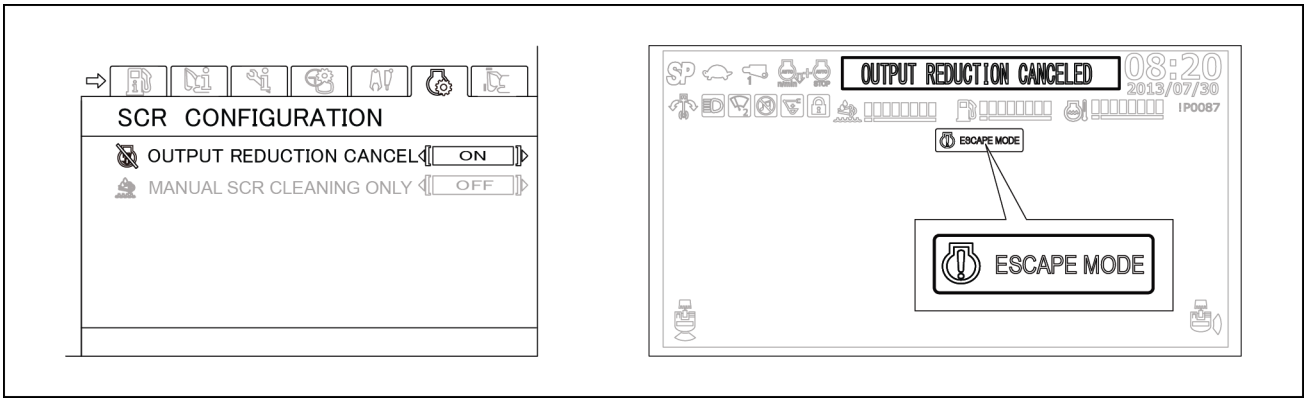
The OUTPUT REDUCTION CANCEL function allows to temporarily override the engine derating condition in the step C of the inducement sequence.

The function overrides the engine derate for **30 min** maximum, and is mainly intended to address dangerous situations.

To activate the OUTPUT REDUCTION CANCEL function, access the user information mode of the display and select the SCR CONFIGURATION tab: set OUTPUT REDUCTION CANCEL to ON.

NOTICE: *The OUTPUT REDUCTION CANCEL function cannot be activated in the step D of the inducement sequence.*

Resuming the operating mode of the display, the ESCAPE MODE warning and the message OUTPUT REDUCTION CANCELED are displayed.



SMIL16CEX1377EA 15

Operate the machine in order to reach a safe condition within **30 min**. Stop the engine, and make sure to take the appropriate action required by the inducement sequence, as for example refilling **DEF/AdBlue®** or repairing the SCR system.

If the operation is continued for more than **30 min**, the engine is derated again, and the step C of the inducement sequence is restored.

4 - OPERATING INSTRUCTIONS

Starting the unit

Anti-theft protection

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

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



The security function is set up.

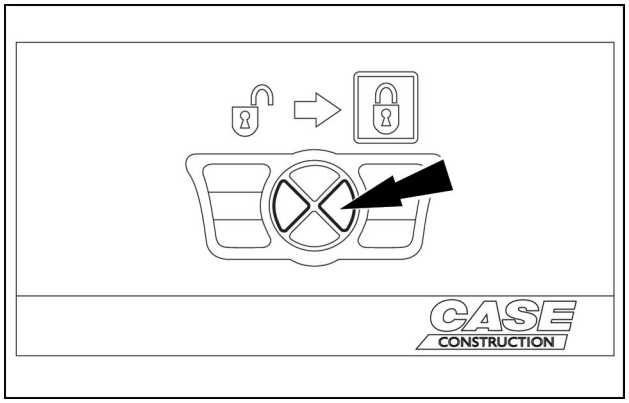
To set up the security function and the password, consult the CASE CONSTRUCTION dealer.

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

Activation of the security function

Turning the starter key to OFF position, the option for activating the security function is displayed. Press the right button to activate the security function.

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



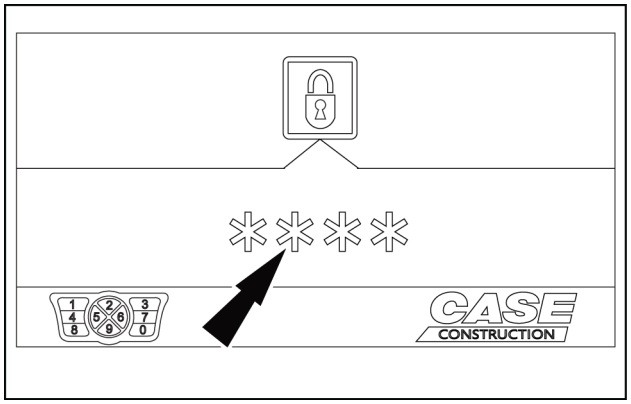
SMIL14CEX2877AA 1

As the key is turned to ON position, the request for entering the password is displayed. Enter the password using the buttons on the cluster as a numeric keypad.

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

If the password is wrongly entered for 3 times, or if the engine is started up without entering the password, the machine goes into an immobilized state:

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



SMIL14CEX2878AA 2

Starting the engine

⚠ WARNING

Avoid injury!
Before starting the engine, securely fasten the seat belt. The seat belt can help ensure your safety if it is properly used and maintained. Never wear a seat belt loosely or with slack in the belt system. Never wear the belt if it is twisted or pinched between the seat structures.
Failure to comply could result in death or serious injury.

W0142A

⚠ WARNING

Hazard to bystanders!
Make sure the area surrounding the machine is clear of all persons before starting the engine.
Failure to comply could result in death or serious injury.

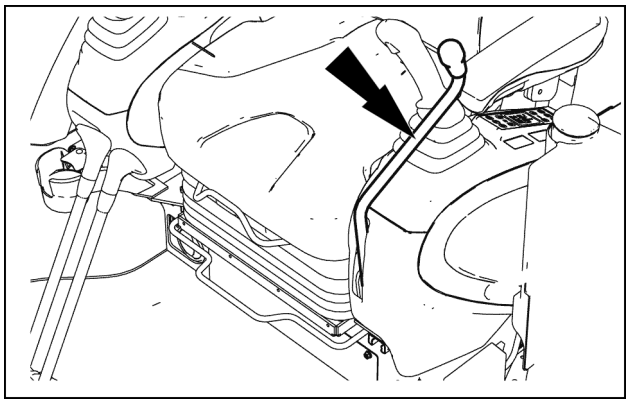
W0090A

⚠ WARNING

Toxic gas and asphyxiation hazard!
Diesel exhaust contains dangerous compounds. Never operate the engine in a closed building or area. Proper ventilation is required under all circumstances.
Failure to comply could result in death or serious injury.

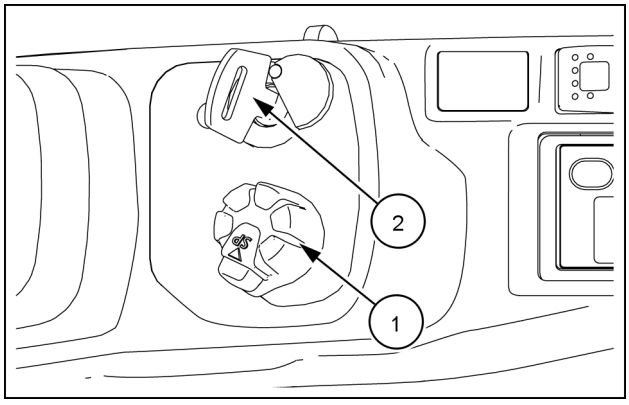
W1302A

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



SMIL17CEX0198AA 1

6. Confirm that the engine speed throttle **(1)** is in low idle position.
7. Turn the starter key **(2)** to ON position. The buzzer of the instrument cluster, the travel alarm (if equipped), and the warning buzzer of the Quick Coupling System (if equipped) will make a check sound.



SMIL19CEX2696AA 2

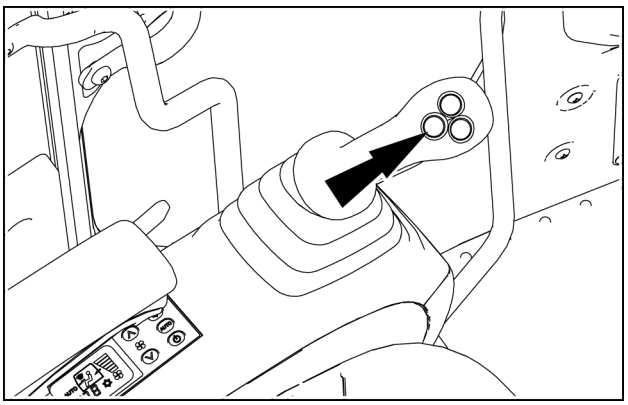
8. Unlock the display if the security function had been activated. When operating the machine in severe winter climates, the engine preheating icon is displayed as the engine is being preheated automatically.

   The engine is preheating.

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

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



SMIL19CEX2697AA 3

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

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

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

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

The seat belt icon turns on after the engine is started in order to remind the operator to securely fasten the seat belt.



Fasten the seat belt.

Bringing the machine up to operating temperature

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

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

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

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

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

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

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

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

Automatic machine warm up

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

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

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

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

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



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

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

Manual machine warm up

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

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

   NOTICE: *Never overload the hydraulic system until the temperature of the hydraulic fluid reaches **25 °C** (**77 °F**). If the hydraulic system is overloaded with the temperature of the hydraulic fluid below **25 °C** (**77 °F**) it will be severely damaged.*
9. Gently operate the controls for travel, front equipment and swing for 3 to 4 times to circulate warmed hydraulic fluid into the whole circuit.

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

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

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

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

Operating the machine in hot or cold weather

In cold weather

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

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

In hot weather

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

Operation under dusty and sandy conditions

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

Operation on seashore

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

Operation on highly humid land or soft land

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

Operating the machine

⚠ WARNING

Misuse hazard!
Follow the operating instructions in this chapter. Any other practice that has not received the prior approval of the manufacturer is considered to be strictly forbidden.
Failure to comply could result in death or serious injury.

W0281A

⚠ WARNING

Hazard to bystanders!
Always know the location of all workers in your area. Warn them before you start working on the machine. Always keep all unauthorized bystanders clear of the area.
Failure to comply could result in death or serious injury.

W0176A

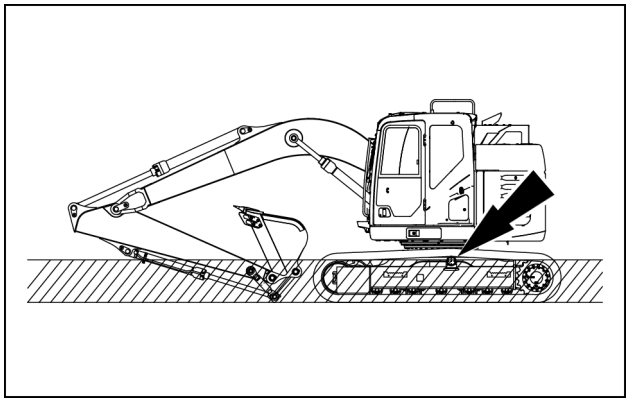
- Pay attention to work condition characteristics of ground and climate condition before operating the machine.
- Inspect every possible risk before operating the machine. Holes on working site, obstructions and hazardous materials such as debris are subject to cause serious accident.
- Pay attention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

The following operation may cause damage to the machine:

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

Operating the machine on soft ground or in water

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



SMIL17CEX3253AA 1

NOTICE: *Do not operate in a fast flowing stream.*

Operating the machine on sloping ground

⚠ WARNING

Driving hazard!
Hillside operations can be dangerous. Rain, snow, ice, loose gravel, or soft ground, etc. can change the ground conditions. You must make a judgment if it is safe to operate your machine on any hillside or ramp.
Failure to comply could result in death or serious injury.

W0144A

⚠ WARNING

Overturning hazard!
Before parking the machine, make sure the ground is stable. Plan the worksite so that the ground is flat, hard, and level.
Failure to comply could result in death or serious injury.

W0258A

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

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

During hillside operations, be extra careful.

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

Digging and loading operations

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

Use the SP work mode for heavy digging operation.

Filling

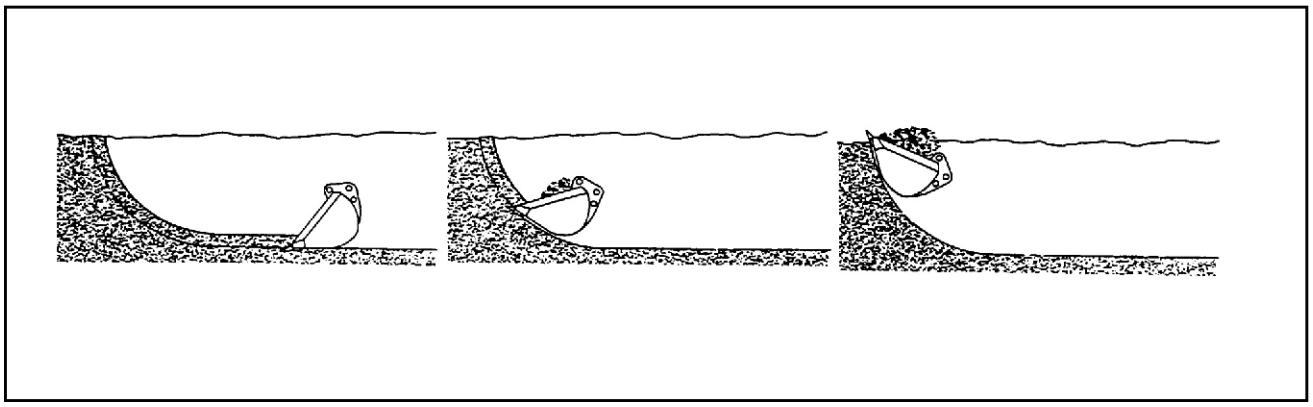
Fill the bucket by manoeuvring the arm.

Keep the bottom of the bucket parallel to the cut.

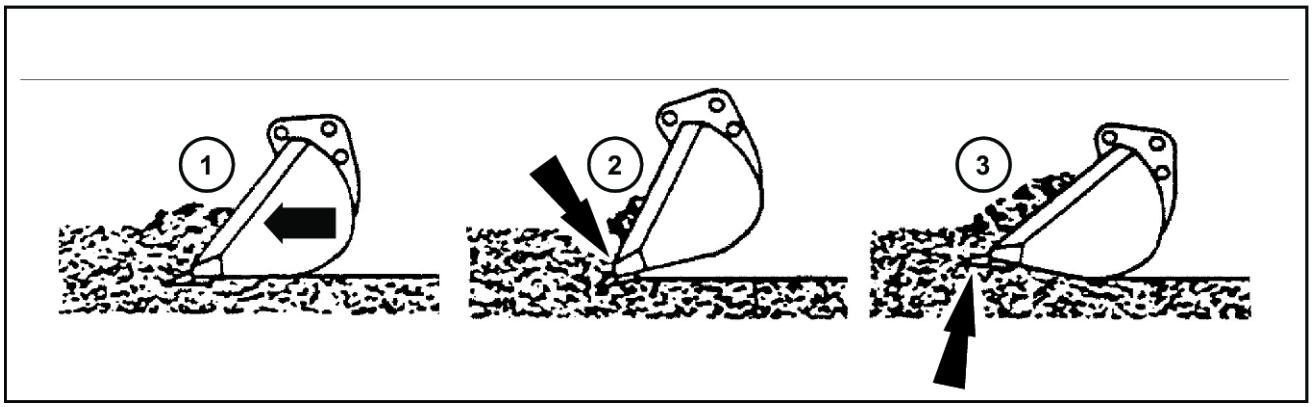
The bucket teeth and blade must cut the ground like the blade of a knife.

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

Excavating method



SMIL13CEX2693EA 2



SMIL13CEX2694EB 3

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

Cab interference prevention system

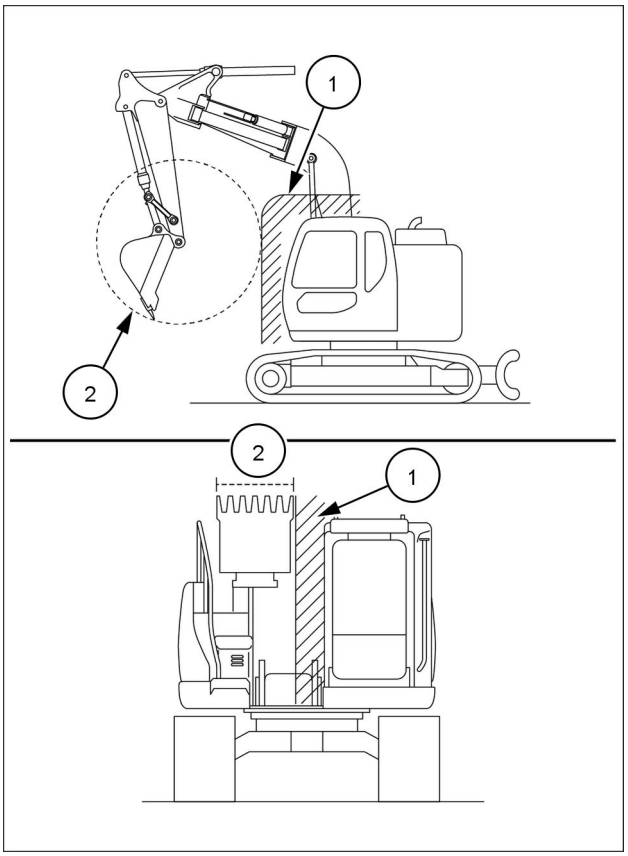
On CX145D SR Offset Boom with blade, the machine control system sets a protection envelope around the cab in order to reduce the risk of collision between the attachment and the cab. This function is defined as cab interference prevention system.

The protection envelope around the cab **(1)** is defined according to the operating envelope of the attachment **(2)**.

The operating envelope of the attachment is defined by a preset bucket radius and a preset bucket width. Therefore, the protection envelope around the cab is independent from the opening or closing of the bucket.

NOTICE: *The operating envelope of the attachment may not cover some types of special attachments. Before start working, always make sure to check the operating range of the machine with the specific attachment in use.*

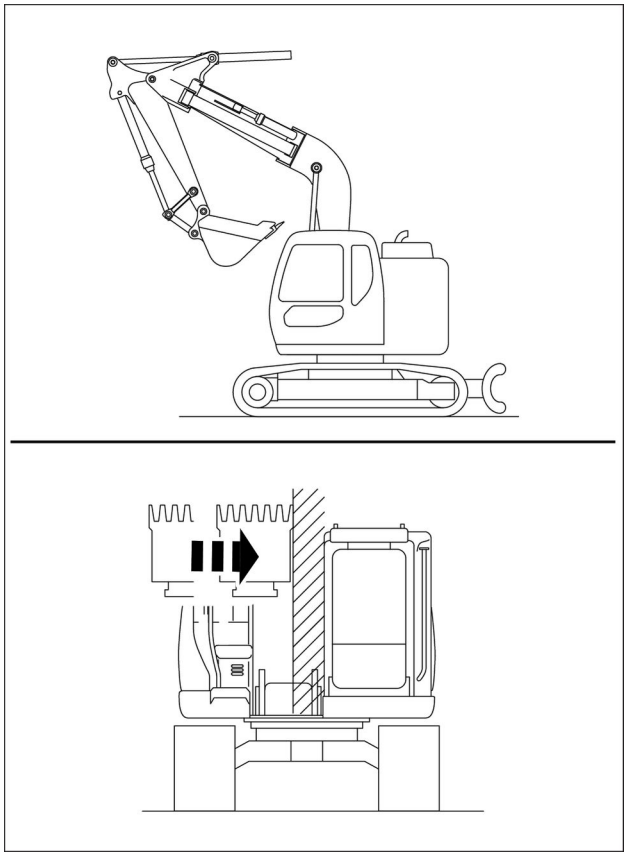
NOTICE: *A different operating envelope of the attachment may be set up for special operating conditions. CASE CONSTRUCTION requires a preventive notice of such special conditions, and reserves the right to evaluate and agree the specific operating framework.*



SMIL18CEX0272BA 1

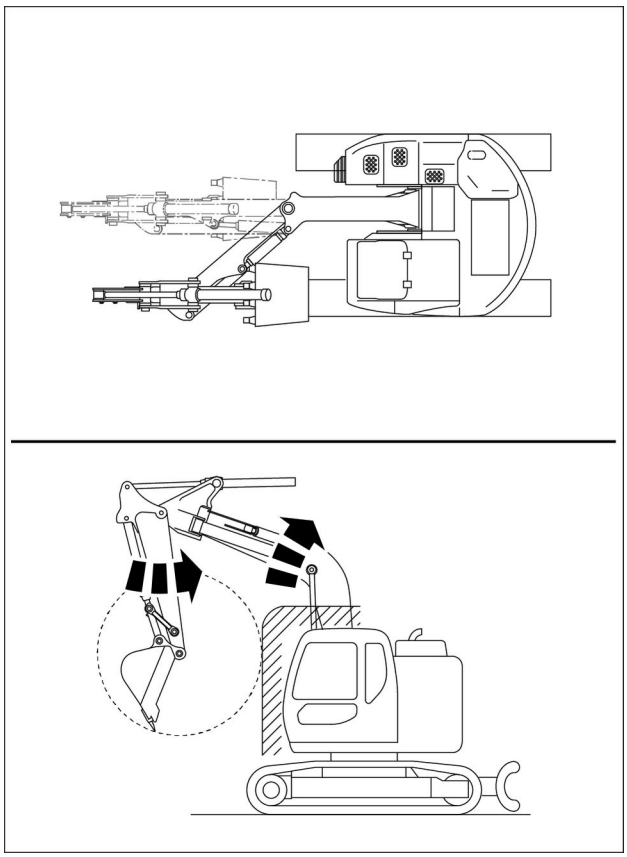
The cab interference prevention system acts against all movements of the front equipment that might cause a collision between the attachment and the cab.

As the boom is raised and straight, and the arm is retracted, the interference prevention system acts against a leftward offset movement that brings the attachment too close to the cab.



SMIL18CEX0297BA 2

As the arm is offset leftward from the boom, the interference prevention system acts against any movement of the boom or of the arm that brings the attachment too close to the cab.



SMIL18CEX0298BA 3

The protection envelope set up by the cab interference prevention system features two layers:

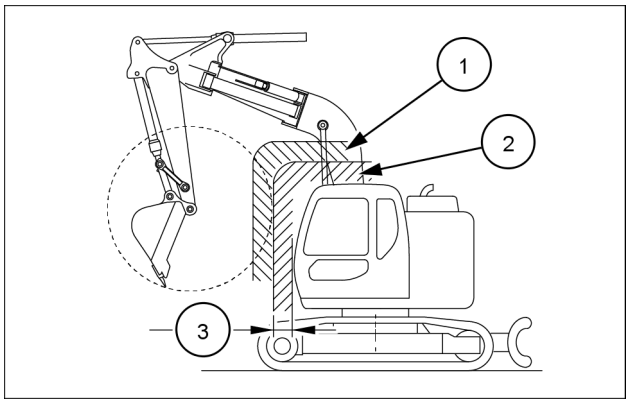
Deceleration Area **(1)**

When the attachment is brought close to the cab and enters the area **(1)**, the speed of the attachment is slowed down. The deceleration area prevents the spreading of material from the attachment due to a sudden stop of the attachment movement.

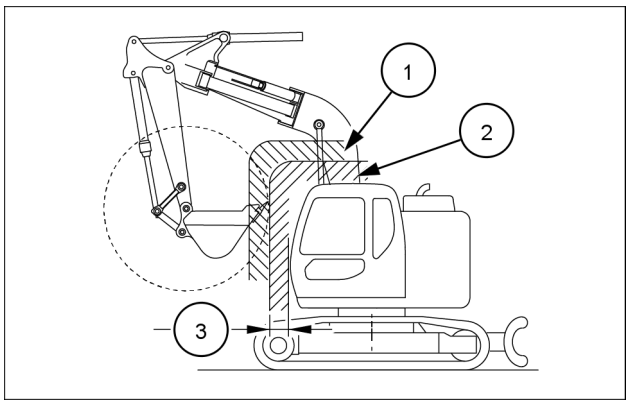
Automatic Stop Area **(2)**

When the attachment is brought further closer to the cab and enters the area **(2)**, the attachment is automatically stopped, and a warning buzzer sounds.

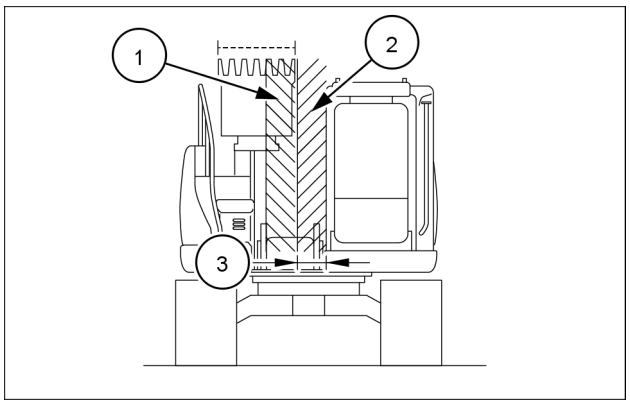
NOTE: *the automatic stop area has a range* ***(3)*** *of* ***10 – 50 cm*** *(****3.9 – 19.7 in****) depending upon the specification of the attachment in use.*



SMIL17CEX7660AA 4



SMIL17CEX7661AA 5



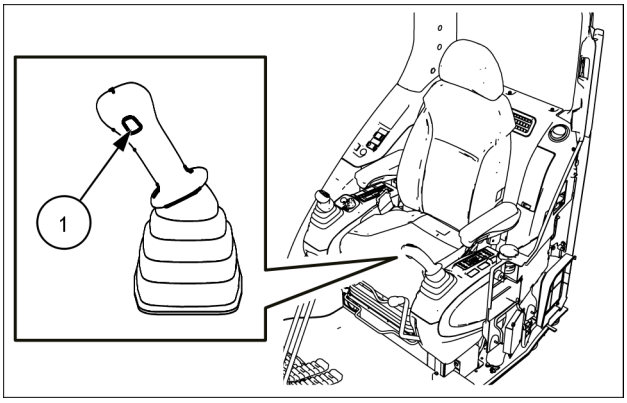
SMIL18CEX0436AA 6

Temporary cancellation button

The temporary cancellation button is located **(1)** on the back side of the left-hand control lever.

As the attachment gets into the automatic stopping area, the temporary cancellation button allows to operate the controls of the front equipment in order to move the attachment closer to the cab.

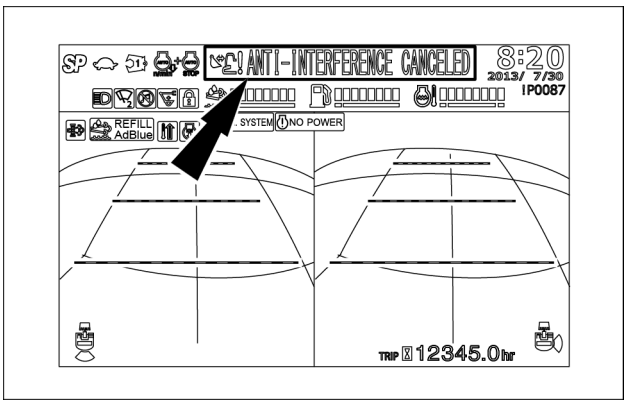
NOTICE: *The temporary cancellation button is intended for seldom usage in special operating conditions. Make sure not to get the attachment too close to the cab if not strictly necessary.*



SMIL17CEX7662AA 7

Keep pressed the temporary cancellation button to move the attachment into the automatic stopping area. An intermittent buzzer sounds, and the message ANTI-INTERFERENCE CANCELED is displayed.

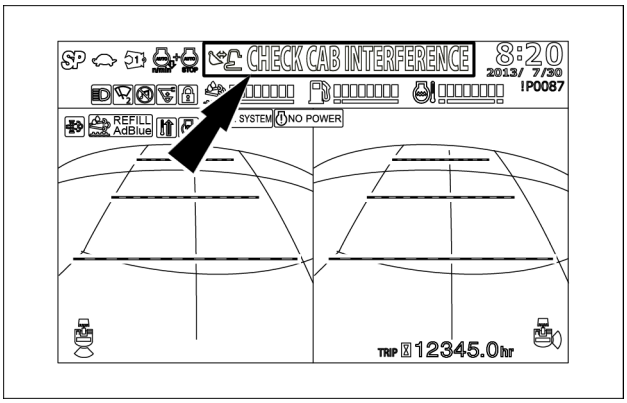
NOTICE: *When the temporary cancellation button is pressed, the attachment may hit the cab: the interference prevention system is disabled, and the end-stroke cushioning of the front equipment movements does not work. Make sure to operate the controls of the front equipment slowly, and avoid end-stroke movements.*



SMIL17CEX7663AA 8

NOTICE: *If the temporary cancellation button is released in the stopping area, the attachment stops moving immediately. A buzzer sounds continuously, and the message CHECK CAB INTERFERENCE is displayed.*

As operation into the automatic stopping area is finished, keep pressed the temporary cancellation button, and operate the controls of the front equipment to move the attachment away from the cab. Release the temporary cancellation button only when the attachment is out of the automatic stopping area: the buzzer stops sounding, and messages disappear form the display.



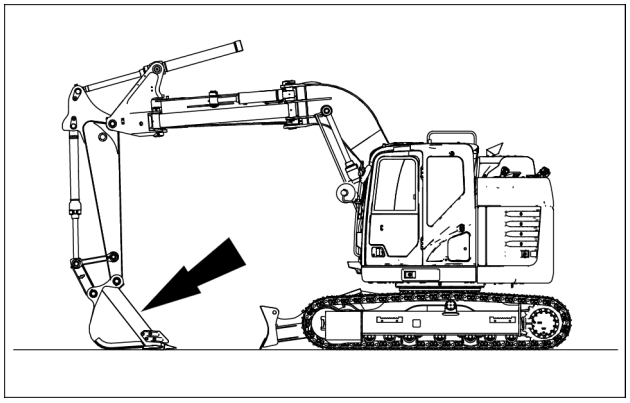
SMIL18CEX0299AA 9

Precautions when stopping and starting the unit

When machine operation has to be stopped, lower the attachment to the ground keeping the arm vertical as shown in picture.

NOTICE: *If the machine is stopped with the front equipment fully raised, it may interfere with the cab due to free-fall. Be sure to lower the attachment to the ground when it is not operated.*

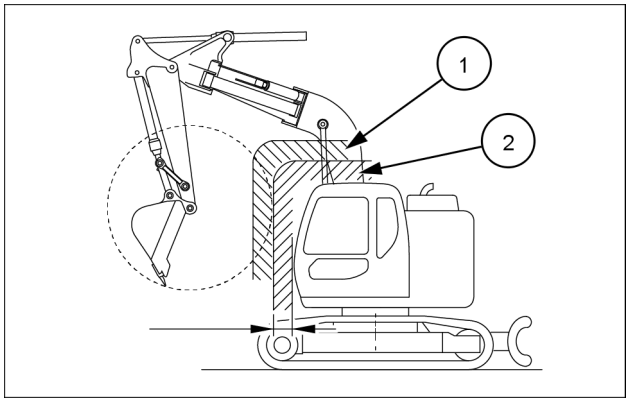
NOTICE: *If the machine is stopped with the attachment into the Automatic Stop Area of the interference prevention system, a temporary override of the system may be needed to move the attachment away from the cab. Refer to the override procedure described on the previous page.*



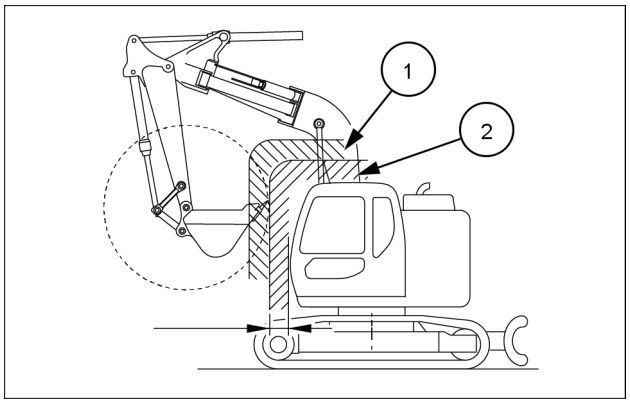
SMIL17CEX7664AA 10

The proper functioning of the interference prevention system shall be confirmed before starting any working operation. Set the gate lock lever in unlock position, and slowly operate the controls of boom, arm, and attachment in order to check the effectiveness of the Deceleration Area **(1)** and of the Automatic Stop Area **(2)**.

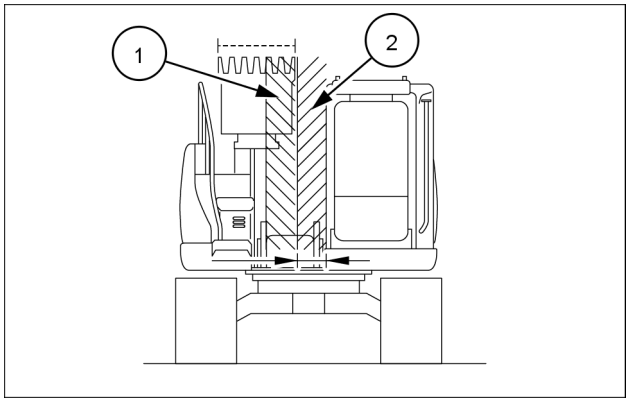
NOTE: *The functioning of the Deceleration Area **(1)** and the Automatic Stop Area **(2)** is described at the beginning of this Chapter.*



SMIL17CEX7660AA 11



SMIL17CEX7661AA 12



SMIL18CEX0436AA 13

Precautions for rightward offset

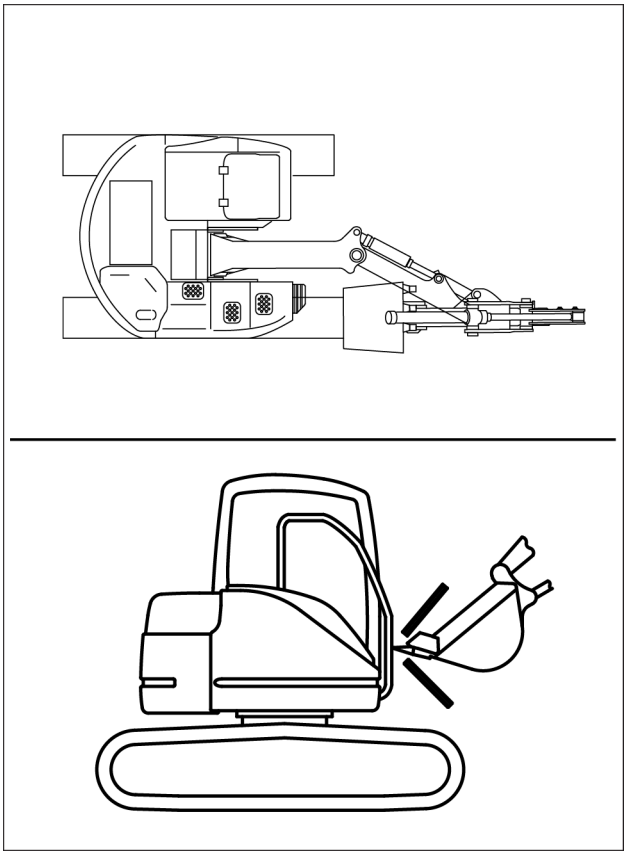
⚠ WARNING

Avoid injury and/or machine damage!
Before you operate an attachment, read and understand the operator's manual and all safety signs for that attachment.
Failure to comply could result in death or serious injury.

W1379A

The interference prevention system does not cover the right side of the machine. Therefore, when the arm is offset rightward from the boom, the attachment may hit the right front of the upperstructure. In particular, the attachment may hit the handrail that allows a safe and ready access to the fuel tank, to the hydraulic tank, and to the engine compartment.

Before start working, always make sure to check the operating range on the right side of the machine with the specific attachment in use, in order to keep proper clearance between the attachment and the upperstructure, and thus not to damage the handrail.



SMIL18CEX0433BA 14

Precautions for system safety

Never disconnect or remove sensors, controller or any other component of the Cab interference prevention system. Doing so will cause serious damages to the system, and will severely affect a proper and safe operation of the machine.

The angle sensors on the front equipment and the controller are located as shown in picture:

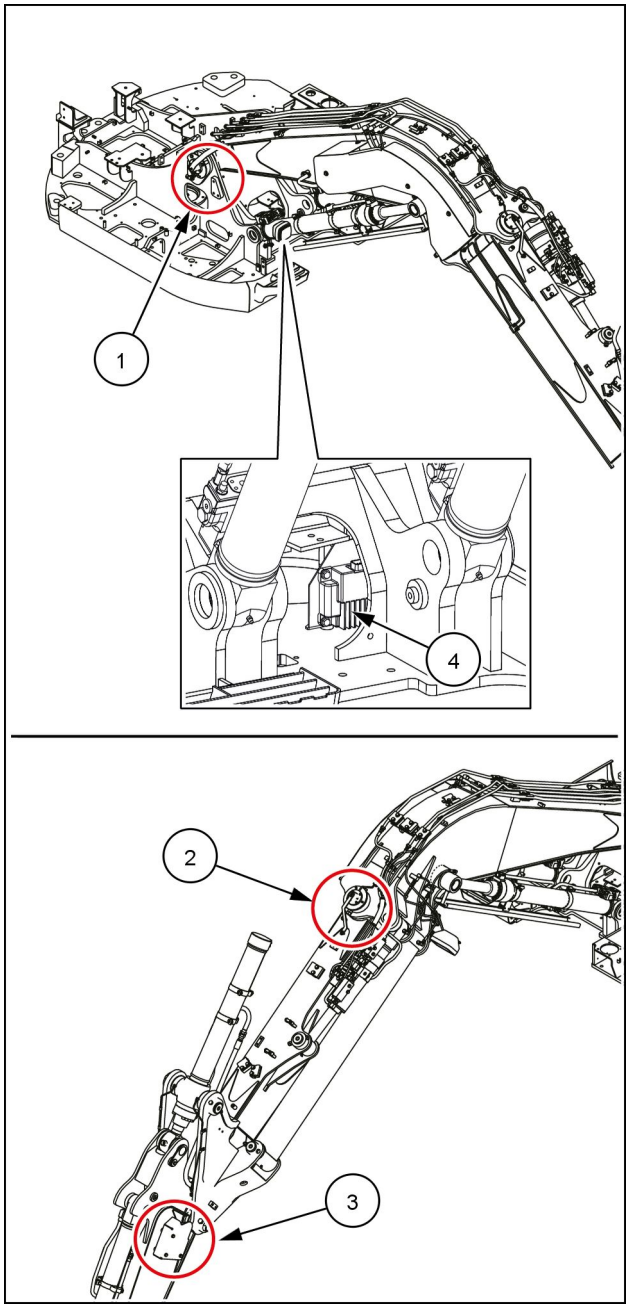
1. Boom angle sensor
2. Offset angle sensor
3. Arm angle sensor
4. Controller

If any damage is found on sensors, controller or any other component of the Cab interference prevention system, stop machine operation immediately, and call the CASE CONSTRUCTION Dealer for inspecting the machine.

NOTICE: *In case of failure of sensors or other components of the interference prevention system, a warning buzzer sounds continuously, and the front equipment is automatically locked. Refer to the emergency procedure described in the next page in order to reach a safe condition for the operator and for the machine.*

Do not perform underwater operations. The sensors of the Cab interference prevention system will be severely damaged. If underwater operation is unavoidable, make sure to check the functioning of the interference prevention system any time the front equipment is raised up from the water. If any damage is found on sensors, stop machine operation immediately, and call the CASE CONSTRUCTION Dealer for inspecting the machine.

Before installing any additional radio-controlled equipment on the machine, consult the CASE CONSTRUCTION Dealer in order to understand the compatibility of such equipment with the machine control system, and in order not to affect a proper and safe operation of the machine.



SMIL18CEX0434CA 15

Emergency release switch

The emergency release switch **(1)** is located on the back of the left-hand console, underneath the armrest.

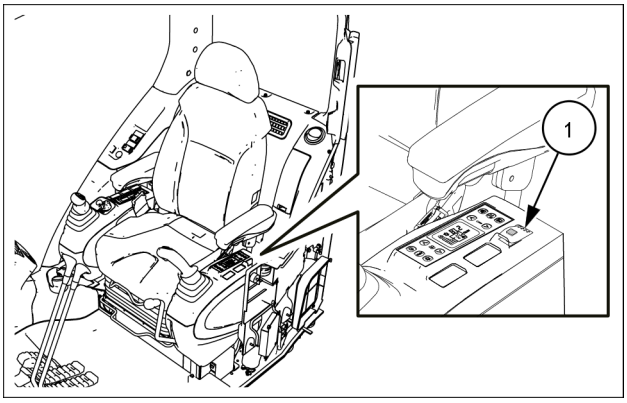
If the interference prevention system has a failure, a warning buzzer sounds, and the front equipment is automatically locked. In this condition, the emergency release switch may be used in order to unlock the controls of the front equipment, and to move the attachment to a safe position away from the cab.

NOTICE: *The emergency release switch is intended for exceptional usage when the interference prevention system has a failure and needs to be serviced. Never use the switch during regular machine operation.*

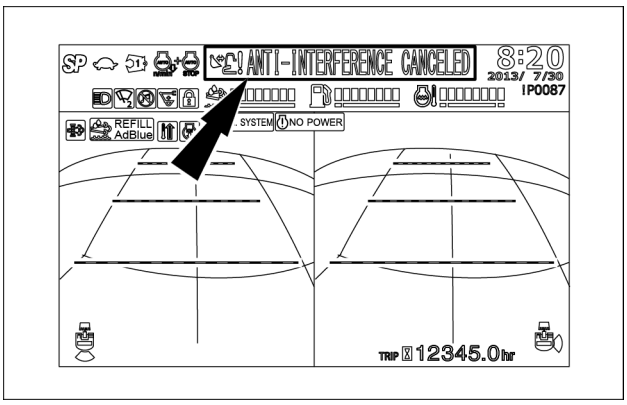
Slide the lock device and press the front side of the switch to set the emergency release status of the interference prevention system. A warning buzzer sounds continuously, and the ANTI-INTERFERENCE CANCELED message is displayed.

NOTICE: *When the emergency release switch is pressed, the attachment may hit the cab: the interference prevention system is disabled, and the end-stroke cushioning of the front equipment movements does not work. Make sure to operate the controls of the front equipment slowly, and avoid end-stroke movements.*

Use the controls of the front equipment strictly to move the attachment away from the cab and to place it on the ground, in order to reach a safe condition for the operator and for the machine. When a safe condition is reached, stop the engine and press the back side of the emergency release switch to reset the readiness of the interference prevention system. Immediately call the CASE CONSTRUCTION Dealer for inspection and repair.



SMIL18CEX0432AA 16



SMIL17CEX7663AA 17

Lowering the attachment in the event of a failure

⚠ WARNING

Unexpected machine movement!
Only use the following procedure in case of machine failure. Always use extreme caution during operations. Keep other persons away from the bucket, attachment, and boom. The bucket or attachment can move unexpectedly during operations due to weight of the bucket, attachment, arm, or boom. Failure to comply could result in death or serious injury.

W1364A

⚠ CAUTION

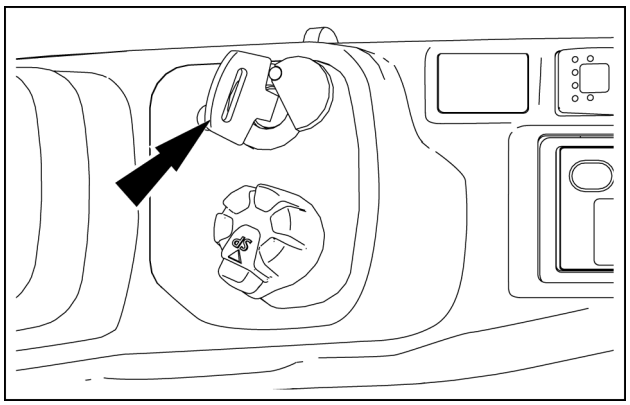
Crushing hazard!
Keep away from the space under the bucket or attachment when lowering the bucket or attachment. In cases where the machine fails and the engine stops, lower the attachment using the procedure described in this manual.
Failure to comply could result in minor or moderate injury.

C0169A

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

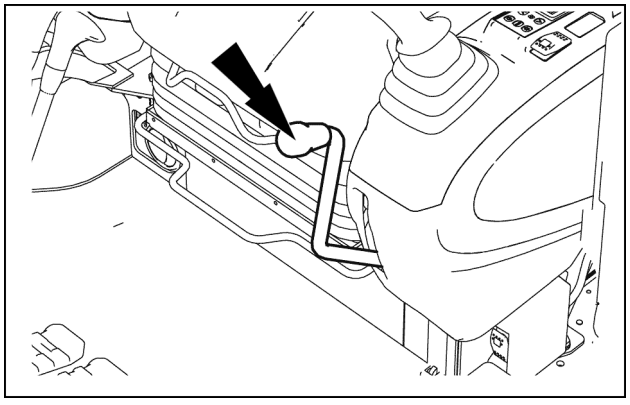
If the engine breaks down, use the following procedure to lower the attachment:

1. Turn the starter key to ON position.



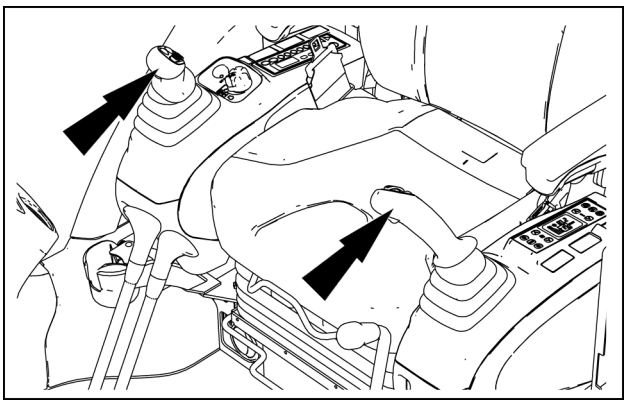
SMIL19CEX2696AA 1

2. Set the gate lock lever to unlock position.



SMIL17CEX0199AA 2

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



SMIL17CEX0109AA 3

Bucket replacement

⚠ CAUTION

Avoid injury!
Handle all parts carefully. Do not place your hands or fingers between parts. Use Personal Protective Equipment (PPE) as indicated in this manual, including protective goggles, gloves, and safety footwear.
Failure to comply could result in minor or moderate injury.

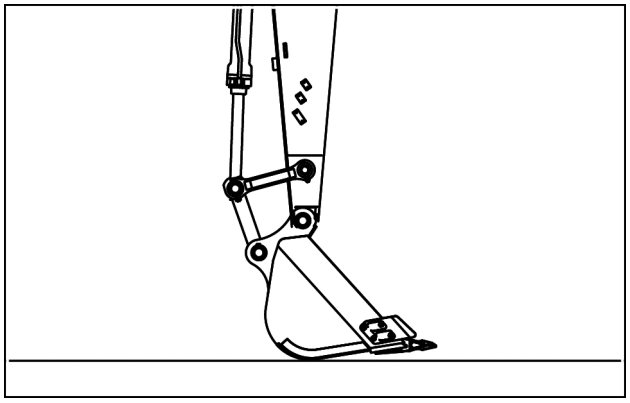
C0145A

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

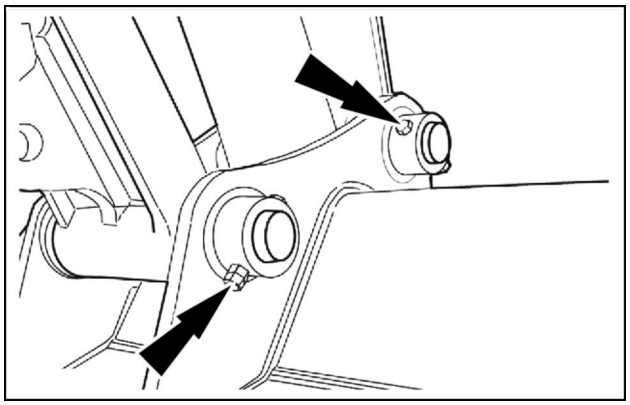
1. Operate the arm and bucket controls so that the arm stands vertical and the bottom side of the bucket leans against a hard and level ground.

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

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



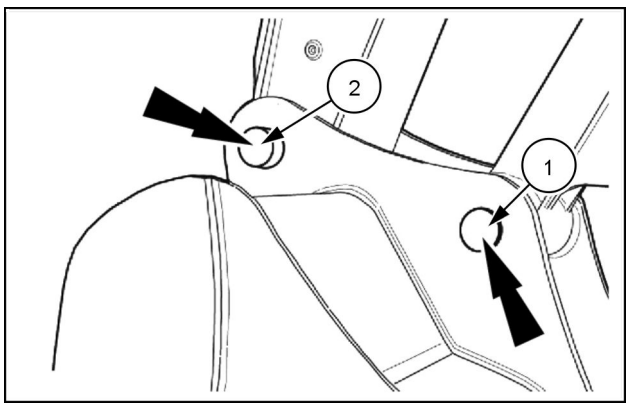
SMIL16CEX0478AA 1



SMIL13CEX2827AB 2

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

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



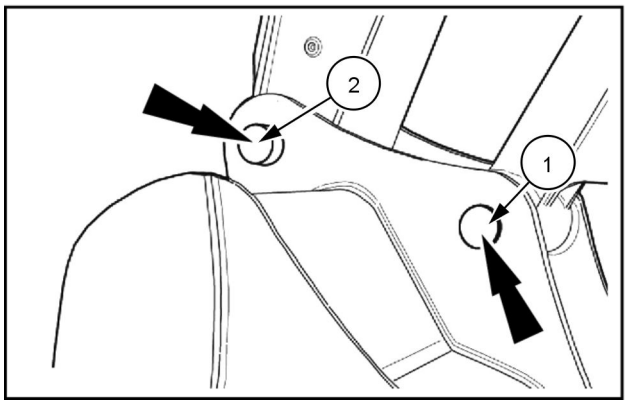
SMIL13CEX2828AB 3

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

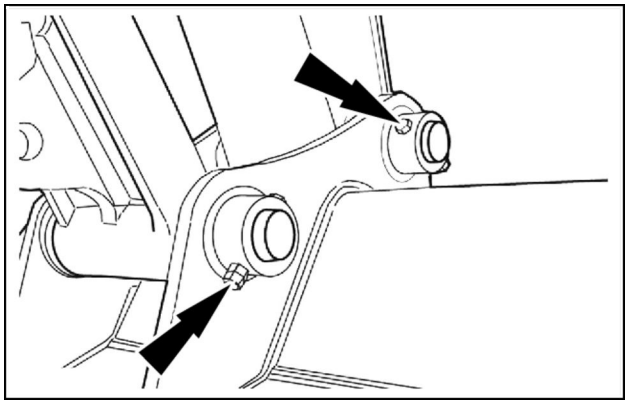
1. Make sure that the machine and the bucket stand both onto a hard and level ground. The bucket should stand on its bottom side.
2. Place the O-ring seals onto the inner bosses of the bucket.
3. Position the machine close to the bucket, and gently operate the boom and arm controls in order to align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

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

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



SMIL13CEX2828AB 4



SMIL13CEX2827AB 5

Stopping the unit

Stopping the engine

1. Lower the attachment until it is resting on the ground.
2. Turn the engine throttle **(1)** to low idle position.
3. Wait for the green cooling down icon to appear.



The engine has cooled down and can be stopped.

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

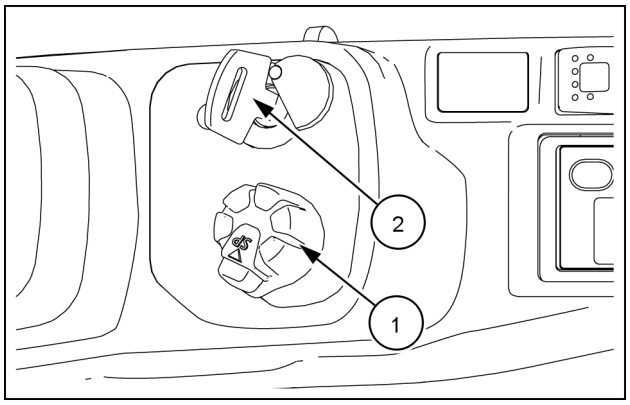
   If the key is turned to OFF position before the green icon appears, the engine stops, but the warning message IMPROPER SHUT DOWN appears on the top of the display, and the audible alarm sounds.



   Do not repeat anymore this early shut down in order to avoid severe damages to the engine and its components.

   NOTICE: *If the engine is stopped before the green icon appears, the lubricated section on the turbocharger gets dried from the high heat, leading to a turbocharger failure.*

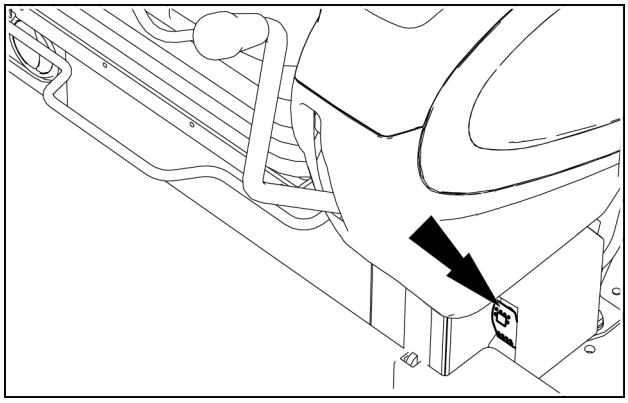
The SCR system continues to operate for approximately **3 min** after the starter key is turned off in order to suck **DEF/ADBLUE®** back into the tank. **DEF/ADBLUE®** expands when freezing, and it will thus damage the lines of the SCR system. This is considered normal, and requires no action from the operator.



SMIL19CEX2696AA 1

Emergency stop switch

The emergency stop switch is located below the left-hand console.



SMIL17CEX0201AA 2

The emergency stop switch enables the engine to be shut down in emergency or when it is not possible to shut it down by means of the starter key.

NOTICE: *The emergency stop switch should be used for emergency purpose only. Do not use it on a day-to-day basis to stop the engine.*

Press on the upper side of the switch to stop the engine. The audible warning device sounds and the message ENGINE STOP is displayed.



To start the engine again, press on the lower side of the emergency stop switch, turn the starter key to OFF position, and then restart the engine

Moving the unit

Machine travel

⚠ WARNING

Controls can be reversed!
In the normal travel position, the operator's compartment is above the idler wheels and the travel reduction gears are to the rear of the upper structure. If the upper structure is turned 180 degrees in relation to the undercarriage, the controls are reversed.
Failure to comply could result in death or serious injury.

W0289A

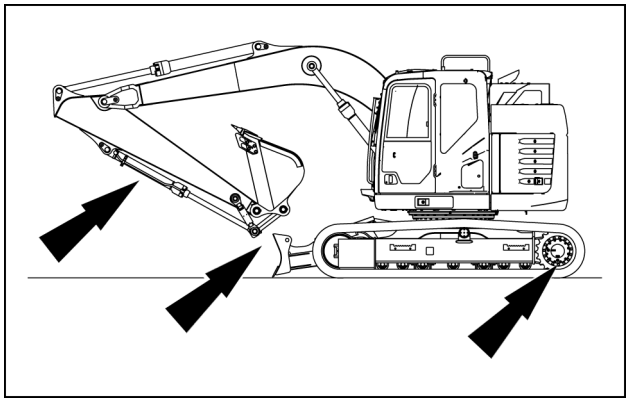
⚠ WARNING

Hazard to bystanders!
Always sound the horn before starting the machine. Make sure the work area is clear of other persons, domestic animals, tools, etc. before you operate the machine. Never allow anyone in the work area during machine operation.
Failure to comply could result in death or serious injury.

W0304A

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

NOTICE: *Before start traveling with CX145D SR with blade, make sure to fully raise the blade in order not to stick on the ground while traveling. Make sure to avoid interference between the blade and the bucket when the front equipment is set in position for traveling or transport.*



SMIL19CEX2695AA 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" and "Rabbit".

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

Travel alarm

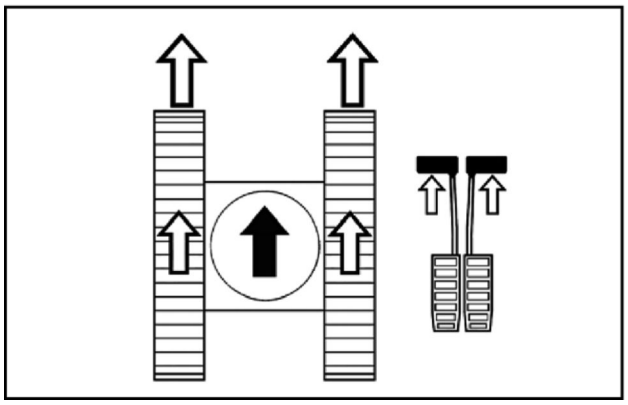
The travel alarm sounds depending on the position of the switch located on the right hand console:

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

CONT position: the alarm sounds continuously each time the travel controls are activated.

Straight line travel (forward travel)

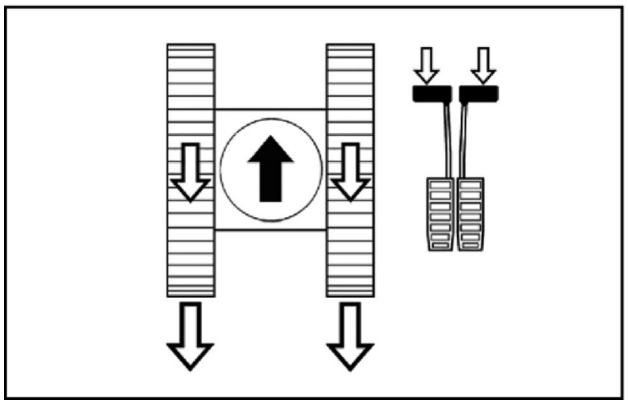
Press the two pedals (or push the two levers) forward at the same time.



SMIL13CEX2679AB 2

Straight line travel (reverse travel)

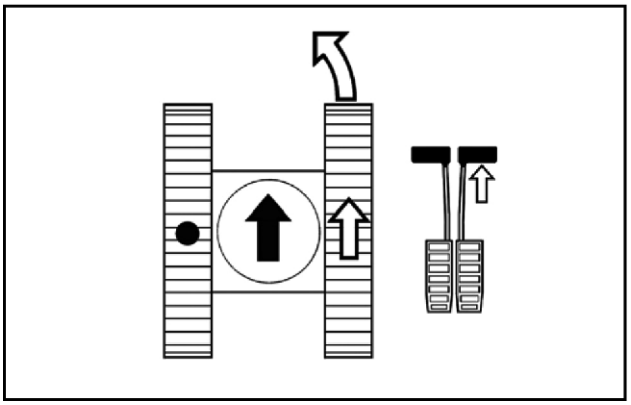
Press the two pedals (or pull the two levers) rearwards at the same time.



SMIL13CEX2680AB 3

Turning to the left (forward travel)

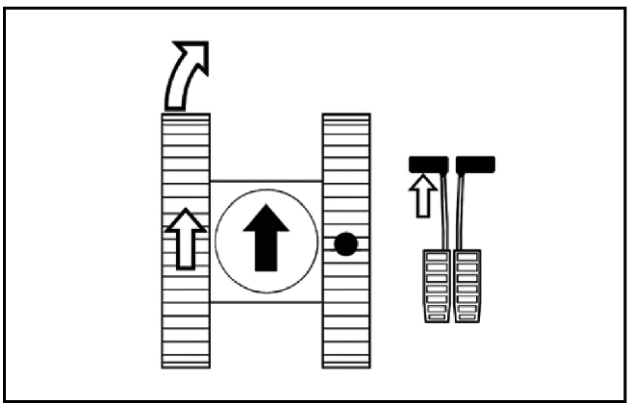
Simply press the right-hand pedal or push the right-hand lever forwards.



SMIL13CEX2681AB 4

Turning to the right (forward travel)

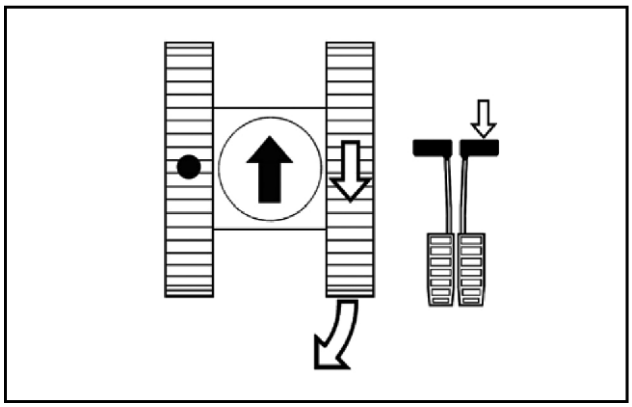
Simply press the left-hand pedal or push the left-hand lever forwards.



SMIL13CEX2682AB 5

Turning to the left (reverse travel)

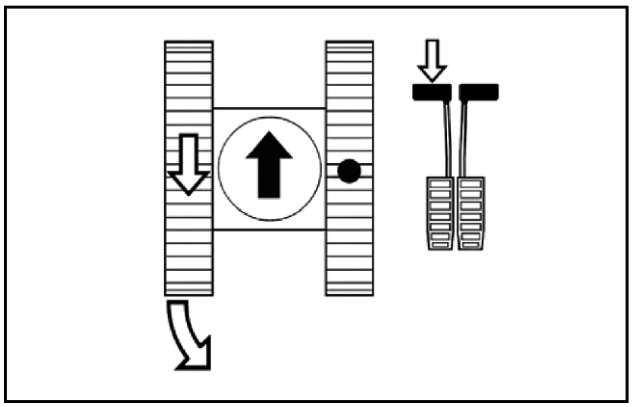
Simply press the right-hand pedal or pull the right-hand lever rearwards.



SMIL13CEX2683AB 6

Turning to the right (reverse travel)

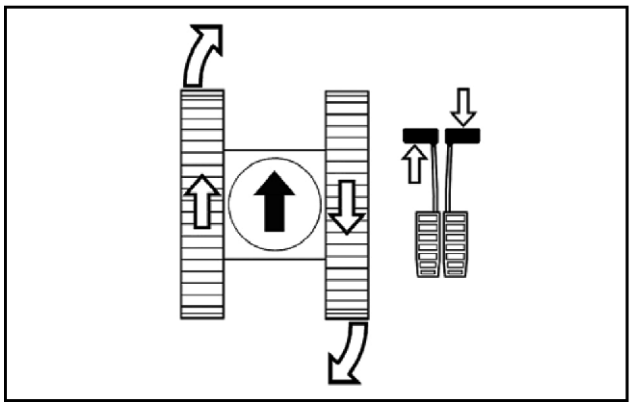
Simply press the left-hand pedal or pull the left-hand lever rearwards.



SMIL13CEX2684AB 7

Turning on the spot, to the right

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

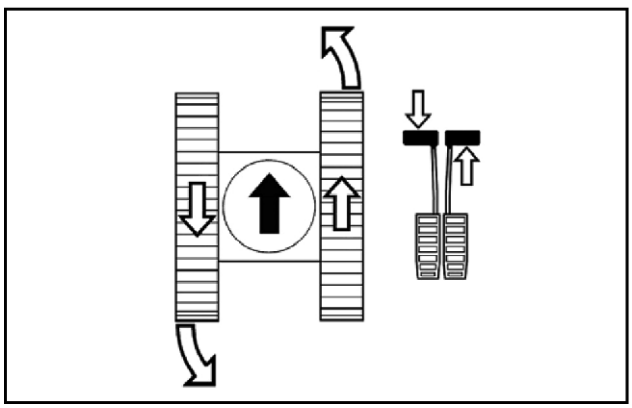


SMIL13CEX2685AB 8

Turning on the spot, to the left

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

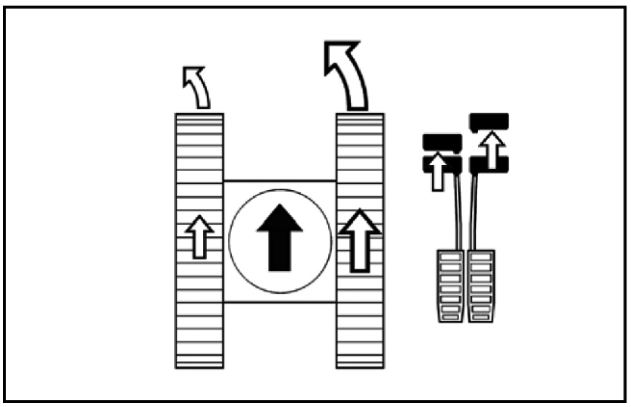
NOTE: *Turning on the spot cannot be done if high speed travel mode is selected.*



SMIL13CEX2686AB 9

Gradual turn on the move

Press one of the pedals or push one of the levers and, at the same time, press the other pedal or push the other lever in the same direction, but slightly harder.



SMIL13CEX2687AB 10

Stopping travel

To come to a complete halt, simply release the levers or pedals and they will return to neutral.

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

NOTICE: *Avoid abrupt stopping as much as practicable.*

NOTICE: *Park or stop the machine on level solid ground in safe area.*

Cautions for traveling

1. Start traveling operation after checking location of the travel unit before commencing travel operation.
2. Select ground as flat and solid as possible for traveling.
3. Travel bypassing obstructions.

NOTICE: *when using wide shoes avoid traveling on rough ground. Wider shoes tend to cause deformation or crack of the shoes.*

4. Travel with decreased traveling speed on rough ground.
5. Encourage a large turn for changing direction and avoid abrupt pivoting turns or spinning turns as much as possible.
6. Check the route to travel in advance.
7. Prepare a personnel to signal operator whenever moving the machine in a location with poor visibility.
   Pay attention to permissible weight of bridge when crossing the bridge.
8. Take necessary measure such as placing plates so as not to damage surface of paved road.
9. Slow down and loosen tension of the track shoes when traveling on place with gravels and cobbles.

Parking the unit

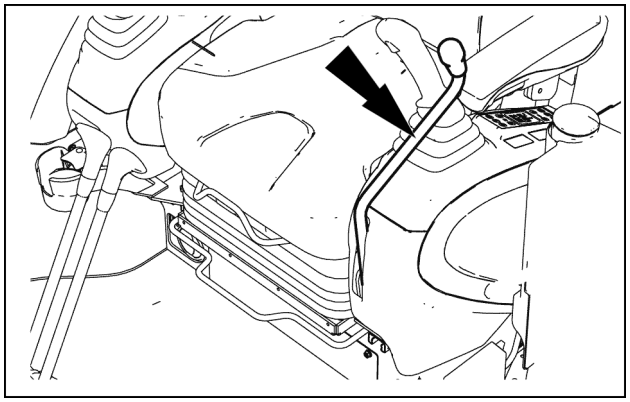
Parking the machine

⚠ WARNING

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

W0141A

1. Park the machine on a hard and level ground, and orient the upper structure frame parallel to the undercarriage.
2. Operate the boom, arm, and attachment controls so that the arm stands vertical and the attachment rests on the ground.
3. Lower the blade to the ground.
4. Set the gate lock lever to lock position.



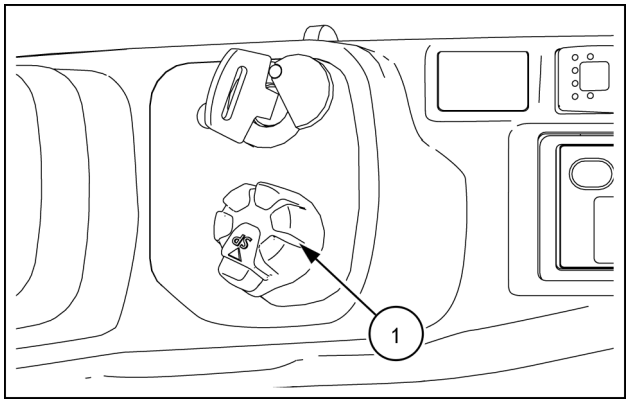
SMIL17CEX0198AA 1

5. Turn the engine throttle **(1)** to low idle position.
6. Wait for the green cooling down icon to appear.



The engine has cooled down and can be stopped.

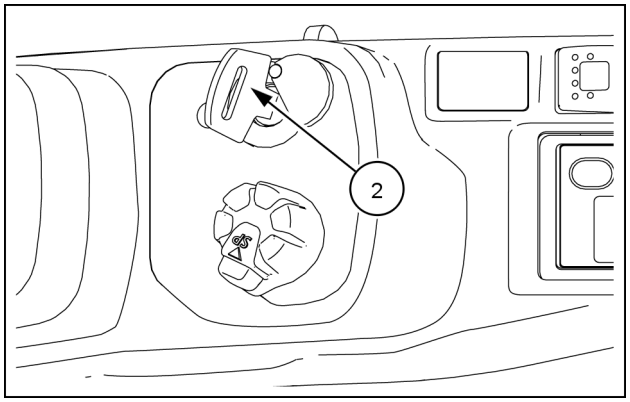
NOTICE: *If the engine is stopped before the icon appears, the lubricated section on the turbocharger gets dried from the high heat, leading to a turbocharger failure.*



SMIL19CEX2696AA 2

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

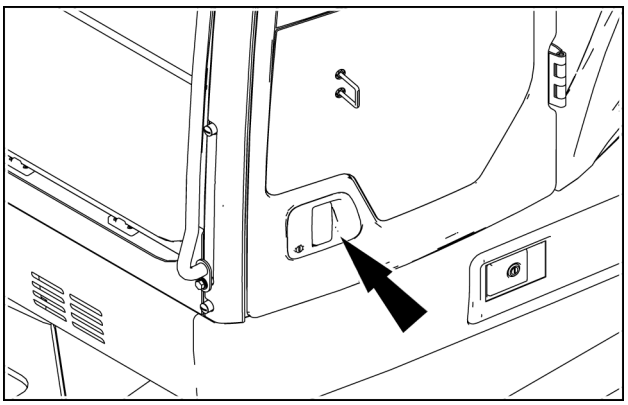
NOTE: *If the security function is set up, the option for activating the security function is displayed.*



SMIL19CEX2696AA 3

8. Remove the starter key, get off the cab and lock the cab door. Check that the hood and the side doors are properly locked, and that the lower panels are properly fixed.

NOTE: *Make sure that any portion of the machine is interfering public road. Install appropriate traffic signs if any portion interferes public road.*



SMIL19CEX2700AA 4

5 - TRANSPORT OPERATIONS

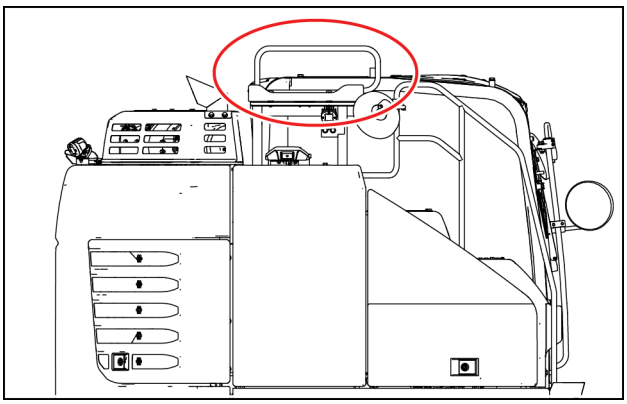
Road transport

Transporting precautions (Folding the handrail before transport)

The handrail on the top of the fuel tank can be folded in order to decrease the overall height of the machine in transport configuration.

The handrail on the top of the fuel tank shall be set and fixed in the horizontal position only before a transport operation. As the transport operation has been completed, the handrail shall be readily set and fixed in the vertical position.

NOTICE: *With the handrail in horizontal position, the fuel tank, the hydraulic tank, and the engine compartment cannot be safely reached. Make sure to set the handrail in vertical position for any machine operation other than transport in order to allow a safe and ready access to the fuel tank, to the hydraulic tank, and to the engine compartment.*

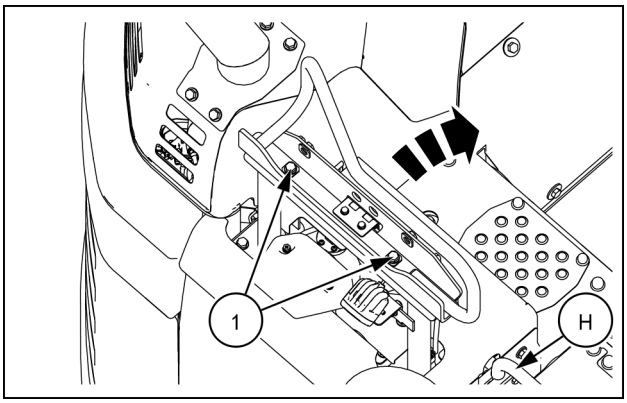


SMIL17CEX3258AA 1

To fold the handrail, proceed as follows:

1. Access the ladder on the right-front of the machine.
2. Remove the bolts **(1)** and fold the handrail in the direction of the arrow.

NOTICE: *Make sure to grab the handrail* ***(H)*** *while performing this operation.*

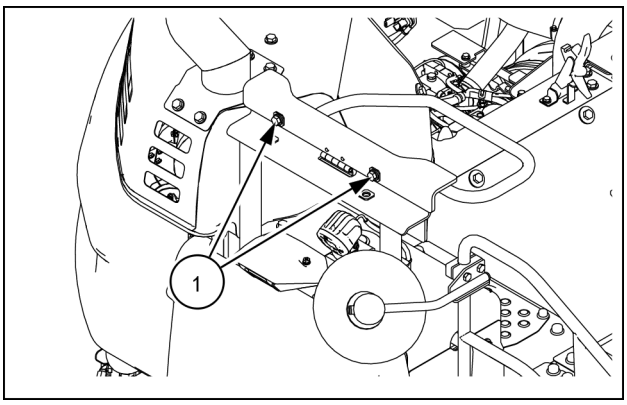


SMIL17CEX3257AA 2

3. Make sure that the handrail is in horizontal position.
4. Fix the handrail by means of the bolts **(1)**.

To set the handrail in vertical position, reverse the folding procedure.

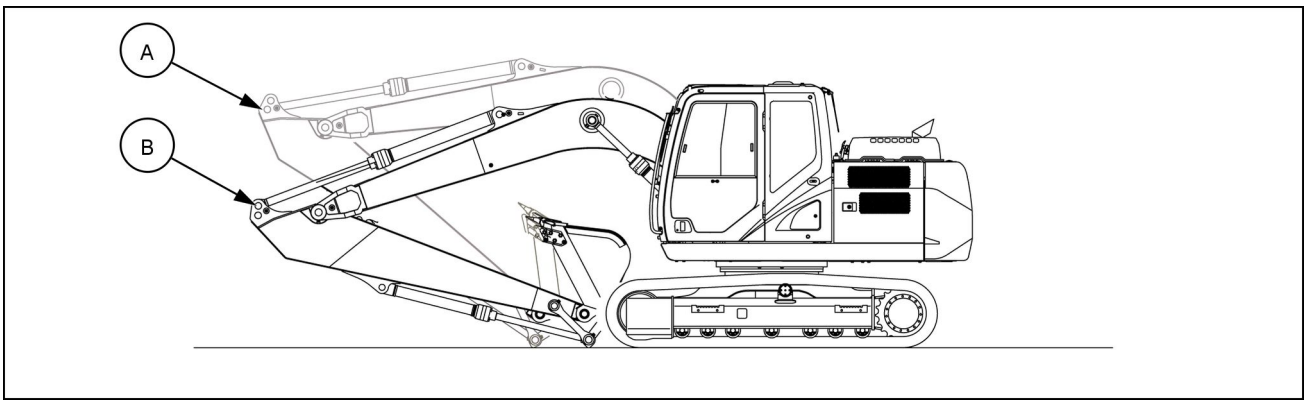
Make sure to tighten the bolts **(1)** to a torque of **53.9 – 63.7 N·m** (**39.8 – 47.0 lb ft**).



SMIL17CEX3256AA 3

Transporting precautions (Machine equipped with long arm)

The **3.01 m** (**118.50 in**) arm has two positions for fixing the arm cylinder pin:



SMIL20CEX0655EA 1

A. Working position; B. Transport position

The position **(A)** must be set for normal operation. The position **(B)** should be set for road transport.

To prepare a machine equipped with the **3.01 m** (**118.50 in**) for road transport proceed as follows:

1. Park the machine on a hard and level surface close to the transport trailer.
2. Fully open the bucket and extend the arm. The arm cylinder shall be not fully retracted.
3. Lower the boom so that the arm touches the ground, and so that the boom-arm cornering area can be reached from the ground.
4. Set the gate lock lever to lock position, stop the engine, and remove the starter key.
5. Place a block between the arm cylinder and the boom top plate to support the arm cylinder.
6. Remove the fixing bolt of the arm cylinder pin, and remove the pin from the working position **(A)**.
7. Get onto the cab, start the engine, and set the gate lock lever to unlock position.
8. Slowly retract the arm cylinder eye out of the working position **(A)** on the arm bracket.
9. Slowly operate the boom and the arm cylinder to align the cylinder eye to the fixing hole of the transport position **(B)** on the arm bracket.
10. Set the gate lock lever to lock position, stop the engine, and remove the starter key.
11. Insert the arm cylinder pin in the transport position **(B)**. Tighten the fixing bolt of the arm cylinder pin.
12. Remove the supporting block between the arm cylinder and the boom top plate.

The machine is now ready for loading on the transport trailer.

NOTICE: *Make sure to fully retract the arm and fully curl the bucket keeping away from the cab. When the arm cylinder pin is set to position* ***(B)*** *, the arm gets closer to the machine and the bucket may hit the cab. Collision between the bucket and the cab can cause serious damages.*

After unloading the machine from a transport trailer, the arm cylinder pin must be set in the working position **(A)**. Follow the procedure above reverting positions **(A)** and **(B)**.

NOTICE: *Never use the machine in normal operation with the arm cylinder pin in the transport position* ***(B)****. This will cause serious damages to the arm.*

Loading the machine onto a transport trailer

⚠ WARNING

Improper operation or service of this machine can result in an accident.
Assign a supervisor to direct worksite operations. Agree on all safety measures, procedures, and suitable hand signals.
Failure to comply could result in death or serious injury.

W0287A

⚠ WARNING

Transport hazard!
The machine can slip or fall from a ramp or trailer. Make sure the ramp and trailer are not slippery. Remove all oil, grease, ice, etc. Move the machine on or off the trailer with machine centered on the trailer or ramp.
Failure to comply could result in death or serious injury.

W0152A

Make sure to check the total weight, length, width and height of the machine to be transported. Refer to Chapter 8.

Make sure to use a trailer with a rated capacity and dimensions sufficient to transport the machine. If a rear loading type trailer is used for road transport, make sure that ramps are available to climb onto the trailer bed. Use ramps which have sufficient width, length, thickness and strength. The ramp slope should be **15°** or less.

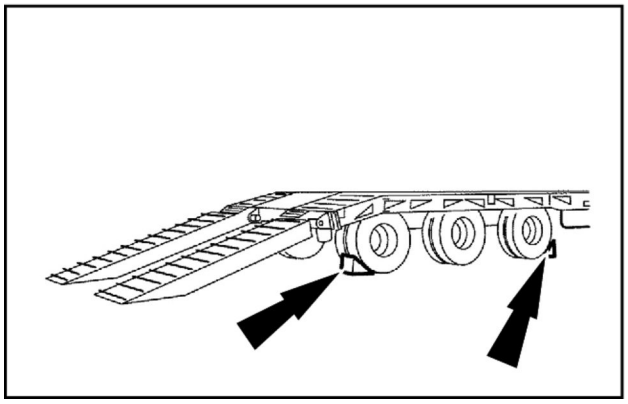
Investigate beforehand the conditions of the road to be traveled, weight and size limits, and special local traffic regulations. Obtain any permits required from proper government agencies for machine transportation.

Trailer setup

Position the trailer on firm and level ground.

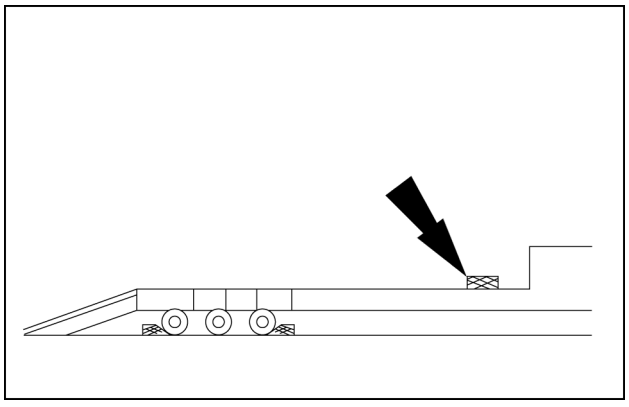
Put blocks to the tires of the trailer to prevent trailer from moving.

If a rear loading type trailer is used for road transport, prepare the loading ramps. If the ramps are included in the trailer frame, lower them to the ground. If the ramps are external to the trailer, match them to the rear edge of the trailer avoiding any bump between trailer bed and external ramps.



SMIL13CEX2717AB 1

If loading a machine with blade, secure a block to the trailer bed at the resting position of the machine. The block must be of a suitable size and strength to keep the blade in lifted position around **40 cm** (**15.7 in**) above the trailed bed. Refer ahead in this Chapter.



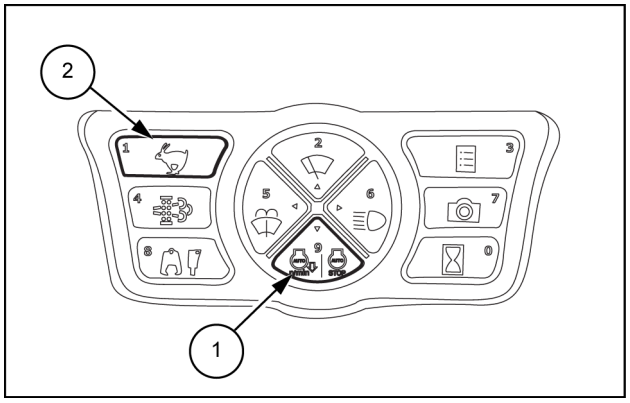
SMIL20CEX0025AA-01 2

Machine setup

Accurately clean the machine undercarriage and tracks to prevent mud or debris from skidding during transport.

Make sure to deactivate the auto idle function and the auto shut-down function. Press the idle mode button **(1)** until any idle icon on the display turns off.

Press the travel mode selector button **(2)** to select the low travel speed. The “Turtle” icon appears on the display.



SMIL14CEX2560AB 3

Loading the machine on a rear loading type trailer (with front equipment installed)

If any heavy attachment is fitted on the machine, such as a hydraulic breaker or a hydraulic crusher, remove the attachment before loading the machine onto the trailer. Refer to the Operator's Manual of the attachment, and strictly follow the specific procedure to remove the attachment from the machine.

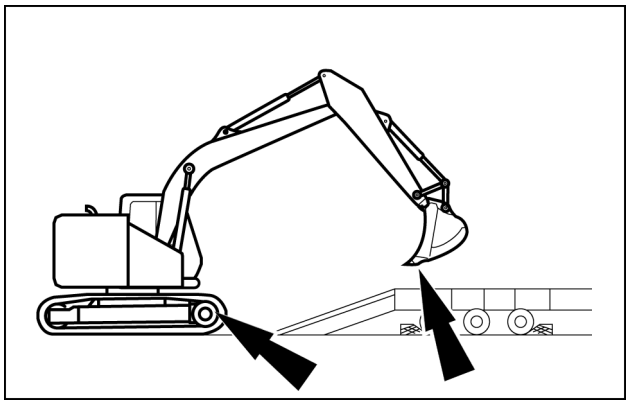
CX145D SR LC

Select the H work mode.

Align the machine to the trailer, so as the travel motors face the trailer ramps.

NOTICE: *Starting from this position, the travel control levers must be pulled backward to move on the ramps and on the trailer bed. Confirm the travel control directions before start moving onto the ramps.*

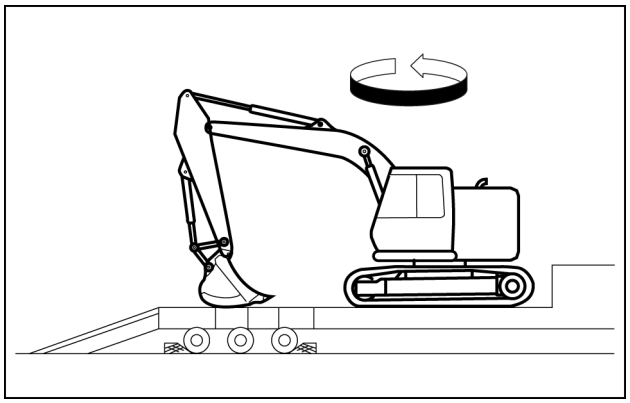
Get close to the ramps and operate the arm and bucket controls so that the arm stands vertical and the bottom side of the bucket is about **20 cm** (**7.9 in**) above the trailer bed.



SMIL20CEX0039AA 4

Slowly climb the trailer ramps keeping the bucket close to the trailer bed. Slowly travel on the trailer bed to reach the resting position, giving particular attention to the attachment so as not to touch the trailer bed.

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



SMIL20CEX0044AA 5

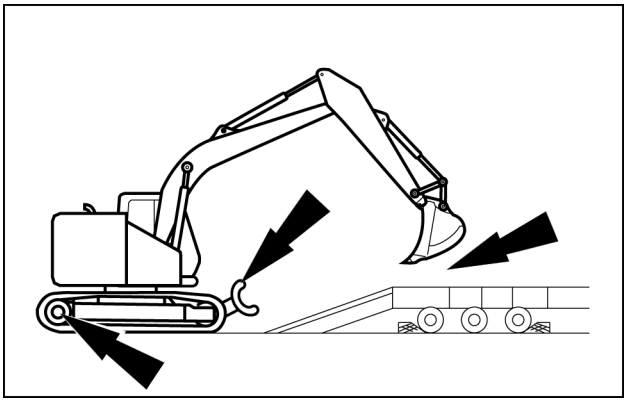
CX145D SR with blade

Select the H work mode.

If loading CX145D SR Offset Boom with blade, set the boom in straight position.

Align the machine to the trailer, so as the blade faces the trailer ramps. Fully raise the blade.

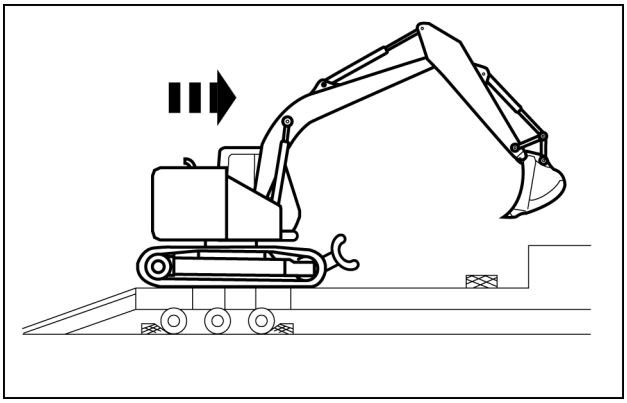
NOTICE: *Starting from this position, the travel control levers must be pushed forward to move on the ramps and on the trailer bed. Confirm the travel control directions before start moving onto the ramps.*



SMIL20CEX0040AA 6

Get close to the ramps and operate the arm and bucket controls so that the arm is slightly extended and the bottom side of the bucket is about **20 cm** (**7.9 in**) above the trailer bed.

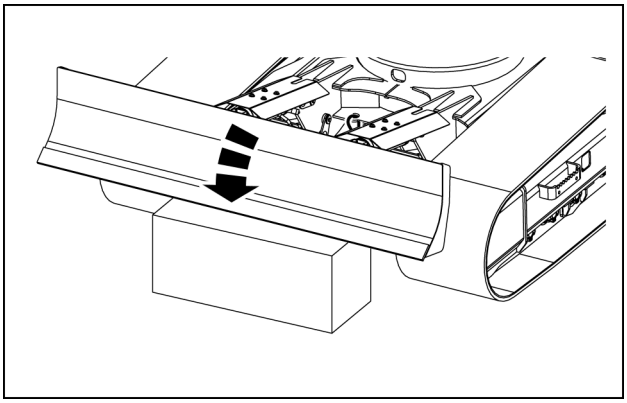
Slowly climb the trailer ramps keeping the bucket close to the trailer bed. Slowly travel on the trailer bed to reach the resting position, giving particular attention to the attachment so as not to touch the trailer bed.



SMIL20CEX0045AA 7

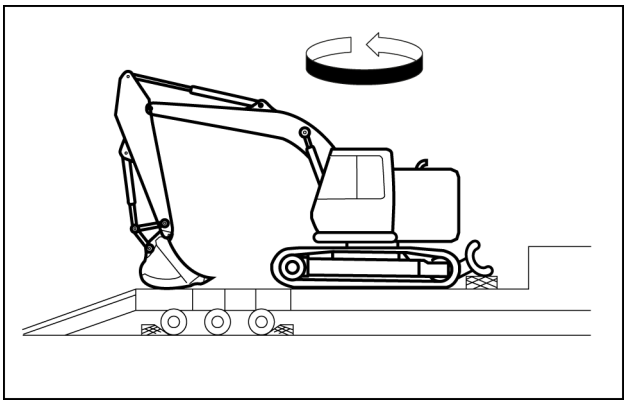
After reaching the resting position, lower the blade on the supporting block.

Make sure that there is enough space between the block and the tracks to route the tie-down chains.



SMIL19CEX2664AA 8

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



SMIL20CEX0047AA 9

Loading the machine on a rear loading type trailer (without front equipment installed)

⚠ WARNING

Tip-over hazard!
The counterweight MUST be removed before transporting the machine without an attachment. Consult you dealer.
Failure to comply could result in death or serious injury.

W0260A

⚠ WARNING

Pressurized system!
Before removing the attachment from the machine, make sure the air pressure and hydraulic oil pressure are at zero.
Failure to comply could result in death or serious injury.

W0284A

If the machine has to be transported without the complete front equipment (boom and arm), the counterweight should be removed from the base machine. Loading the base machine on the trailer with the counterweight installed affects the stability of the base machine itself, and definitely compromises its climbing ability.

NOTICE: *The use of lifting systems is necessary for removal and installation of the machine front attachment and of the counterweight. Refer to your CASE CONSTRUCTION dealer for proper removal and installation procedure.*

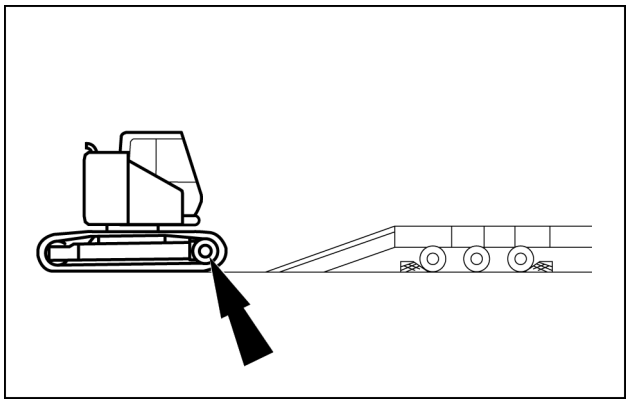
CX145D SR LC

Select the H work mode.

Align the machine to the trailer, so as the travel motors face the trailer ramps.

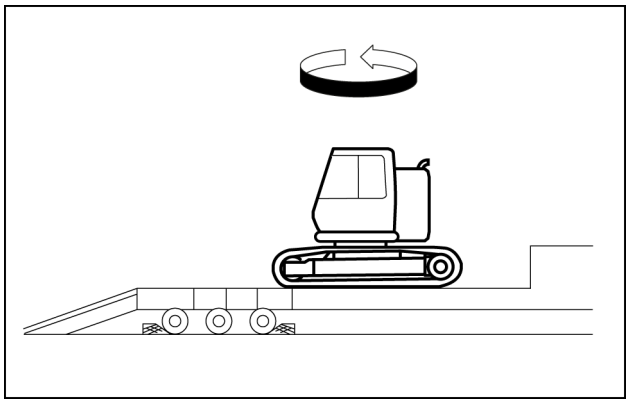
NOTICE: *Starting from this position, the travel control levers must be pulled backward to move on the ramps and on the trailer bed. Confirm the travel control directions before start moving onto the ramps.*

Slowly climb the trailer ramps. Slowly travel on the trailer bed to reach the resting position.



SMIL20CEX0043AB 10

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



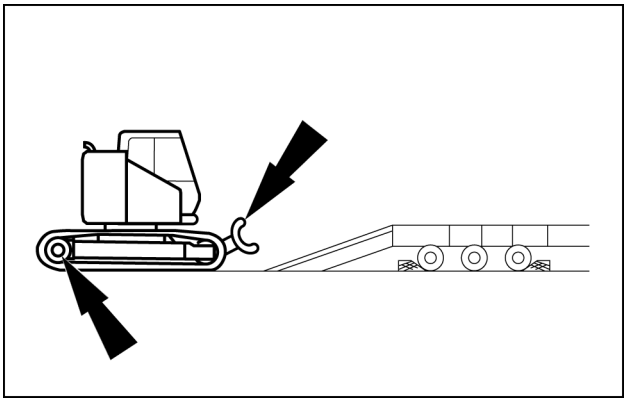
SMIL20CEX0048AB 11

CX145D SR with blade

Select the H work mode.

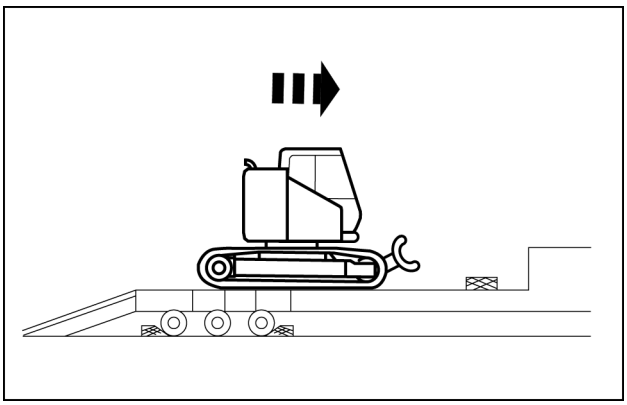
Align the machine to the trailer, so as the blade faces the trailer ramps. Fully raise the blade.

NOTICE: *Starting from this position, the travel control levers must be pushed forward to move on the ramps and on the trailer bed. Confirm the travel control directions before start moving onto the ramps.*



SMIL20CEX0041AB 12

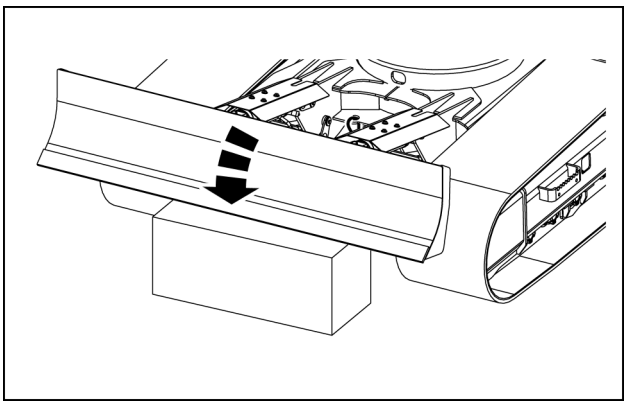
Slowly climb the trailer ramps. Slowly travel on the trailer bed to reach the resting position.



SMIL20CEX0049AB 13

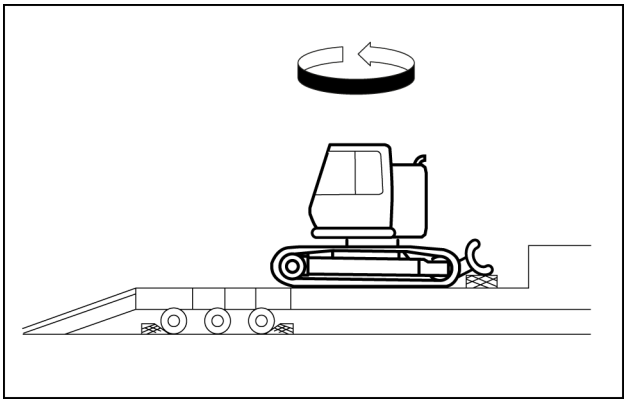
After reaching the resting position, lower the blade on the supporting block.

Make sure that there is enough space between the block and the tracks to route the tie-down chains.



SMIL19CEX2664AA 14

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



SMIL20CEX0050AB 15

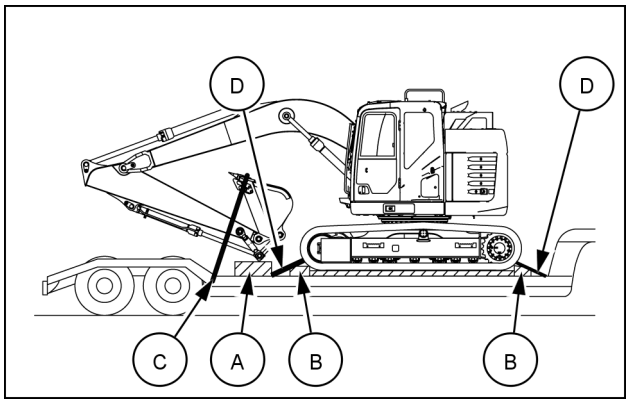
Tie downs for shipping

CX145D SR LC

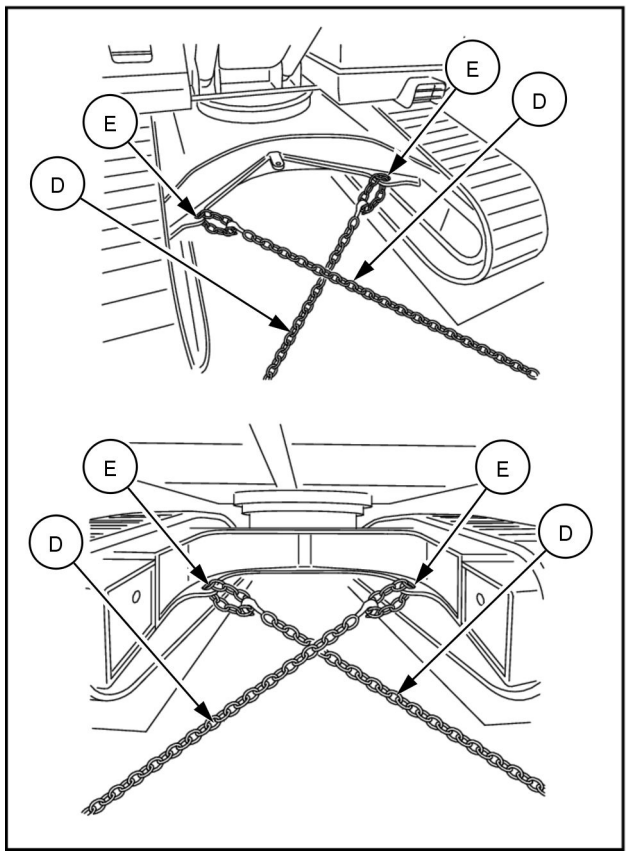
1. Set the machine in the position for transport: fully retract the arm and curl the bucket slowly.

   NOTICE: *The CASE CONSTRUCTION Heavy Duty High Capacity buckets have an extended tip radius. Therefore, the bucket cannot be fully curled after the arm has been fully retracted. Remove the bucket before transport in order not to affect the overall height of the machine, and not to hit the back of the boom.*

2. Place the block **(A)** on the trailer floor as show in the picture, and lower the boom slowly until the bucket linkage lays on the block.
3. Check the overall height between the ground and the highest point of the machine and check the overall width of the machine. Make sure to be within the size limits defined before transport, in order to confirm documents and permissions already got to comply to the local traffic regulations.
4. Place the gate lock lever in lock position. Stop the engine and remove the starter key.
5. Get off the machine. Retract the radio antenna. Fold the rear view mirrors.
6. Lock the cab door and the side panels.
7. Check the condition of the tie-down points on the trailer.
8. Put chocks **(B)** against the edges of the tracks.
9. Pass a wire rope **(C)** around the bucket to secure the front equipment to the trailer.
10. Fix one end of a tie-down chain **(D)** to each of the four lashing points **(E)** identified on the inside of the lower frame.
11. Set the chains in an X shape as shown in the picture, and fix them to the tie-down points on the trailer. Tension the chains evenly to secure the machine to the trailer.
12. Carry out a final check of the tie-down condition.
13. If a rear loading type trailer is used for road transport, lift or remove the loading ramps.
14. Remove blocks from the tires of the trailer.



SMIL19CEX2621AA 1

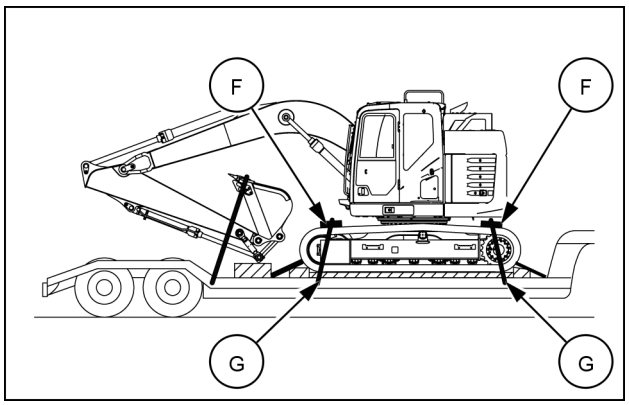


SMIL13CEX2729BA 2

The machine may be further secured onto the trailer bed with a vertical tie-down.

Put pads **(F)** over the tracks in the positions identified along the sides of the lower frame. Route the wire ropes **(G)** across the tracks, and tie-down on the vertical direction.

NOTICE: *Make sure not to tie-down the machine only in the vertical direction: the required tie-down force would be high, and this will cause damages to the tracks and to the other traction components.*



SMIL19CEX2619AA 3

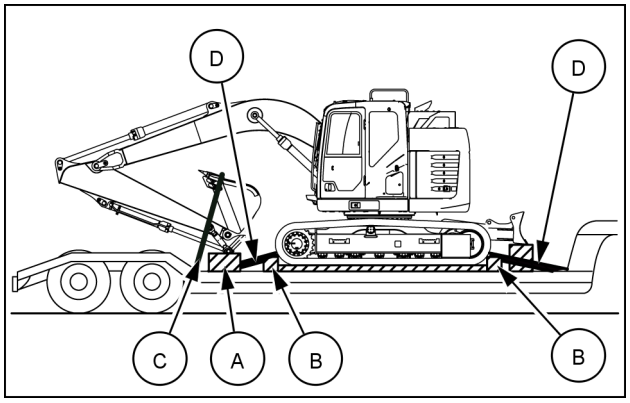
CX145D SR with blade

1. Set the machine in the position for transport: fully retract the arm and curl the bucket slowly.

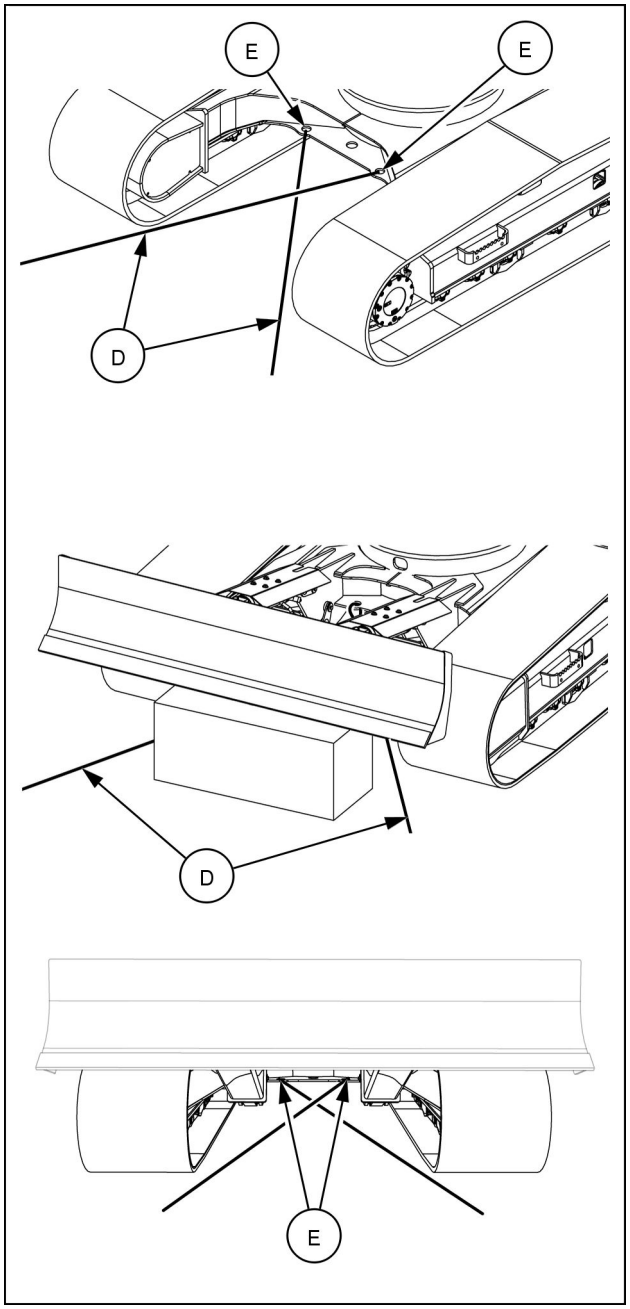
   NOTICE: *The CASE CONSTRUCTION Heavy Duty High Capacity buckets have an extended tip radius. Therefore, the bucket cannot be fully curled after the arm has been fully retracted. Remove the bucket before transport in order not to affect the overall height of the machine, and not to hit the back of the boom.*

   NOTICE: *on CX145D SR Offset Boom with blade, a temporary override of the cab interference prevention system may be needed to reach the transport position. Refer to the override procedure described on page* ***4-10*** *in order to properly and safely tackle this condition.*

2. Place the block **(A)** on the trailer floor as show in the picture, and lower the boom slowly until the bucket linkage lays on the block.
3. Check the overall height between the ground and the highest point of the machine and check the overall width of the machine. Make sure to be within the size limits defined before transport, in order to confirm documents and permissions already got to comply to the local traffic regulations.
4. Place the gate lock lever in lock position. Stop the engine and remove the starter key.
5. Get off the machine. Retract the radio antenna. Fold the rear view mirrors.
6. Lock the cab door and the side panels.
7. Check the condition of the tie-down points on the trailer.
8. Put chocks **(B)** against the edges of the tracks.
9. Pass a wire rope **(C)** around the bucket to secure the front equipment to the trailer.
10. Fix one end of a tie-down chain **(D)** to each of the four lashing points **(E)** identified on the inside of the lower frame.
11. Set the chains in an X shape as shown in the picture, and fix them to the tie-down points on the trailer. Tension the chains evenly to secure the machine to the trailer.
12. Carry out a final check of the tie-down condition.
13. If a rear loading type trailer is used for road transport, lift or remove the loading ramps.
14. Remove blocks from the tires of the trailer.



SMIL20CEX0032AA 4

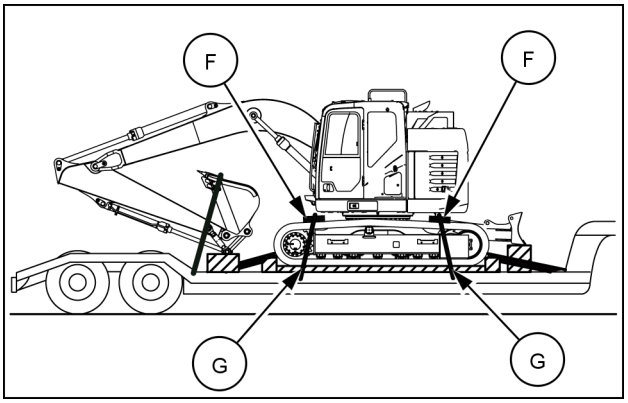


SMIL20CEX0035CA 5

The machine may be further secured onto the trailer bed with a vertical tie-down.

Put pads **(F)** over the tracks in the positions identified along the sides of the lower frame. Route the wire ropes **(G)** across the tracks, and tie-down on the vertical direction.

NOTICE: *Make sure not to tie-down the machine only in the vertical direction: the required tie-down force would be high, and this will cause damages to the tracks and to the other traction components.*



SMIL20CEX0692AA 6

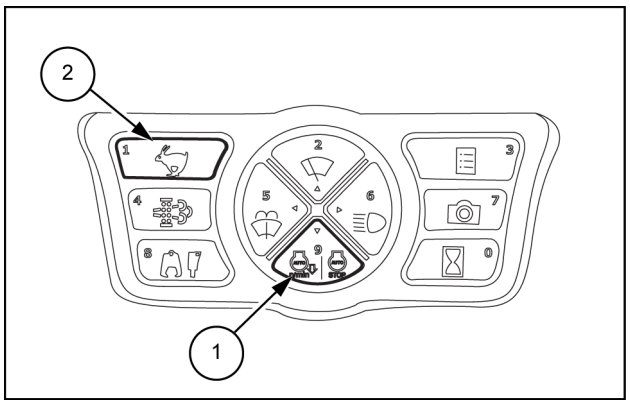
Unloading the machine from a transport trailer

Rear loading type transport trailer

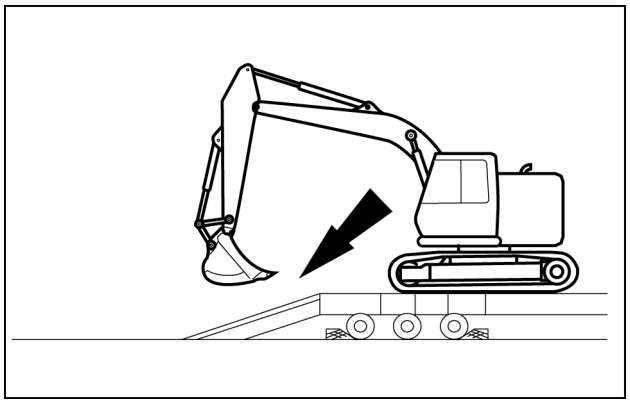
CX145D SR LC

1. Position the trailer on firm and level ground. Put blocks to the tires of trailer to prevent trailer from moving.
2. Remove chains, wire ropes, chocks, blocks and other devices used to secure the machine during road transport.
3. Prepare the loading ramps. If the ramps are included in the trailer frame, lower them to the ground. If the ramps are external to the trailer, match them to the rear edge of the trailer avoiding any bump between trailer bed and external ramps.
4. Get on the machine and start the engine.
5. Make sure to deactivate the auto idle function and the auto shut-down function. Press the idle mode button **(1)** until any idle icon on the display turns off. Press the travel mode selector button **(2)** to select the low travel speed. The “Turtle” icon appears on the display.
6. Select the H work mode and set the gate lock lever to unlock position.
7. If the front equipment is installed, operate the arm and bucket controls so that the arm stands vertical and the bottom of the bucket is about **20 cm** (**7.9 in**) above the trailer bed.

   NOTICE: *Starting from this position, the travel control levers must be pushed forward to move on the trailer bed and on the ramps. Confirm the travel control directions before start moving.*
8. Travel slowly towards the back of the trailer and stop as reaching the ramps. If the front equipment is installed, operate boom and arm softly in order to get the bucket close to the ground ahead of the ramps. Avoid to fully extend the bucket cylinder to prevent damaging it due to accidental impacts with the ground.
9. Move down on ramps with extreme care while operating boom and arm softly in order to keep the bucket close to the ground and so to grant machine stability.
10. Pass through the ramps completely and stop the machine once it gets on the ground.



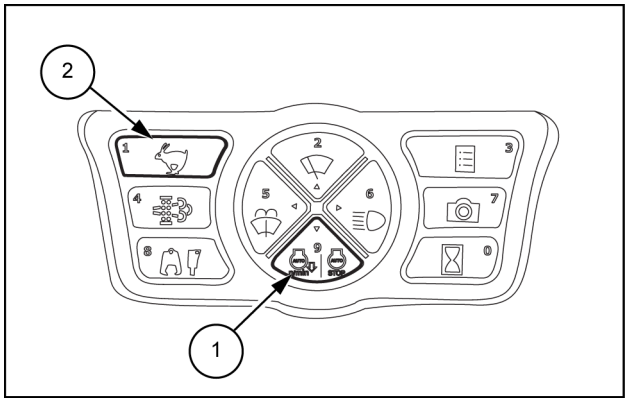
SMIL14CEX2560AB 1



SMIL20CEX0653AA 2

CX145D SR with blade

1. Position the trailer on firm and level ground. Put blocks to the tires of trailer to prevent trailer from moving.
2. Remove chains, wire ropes, chocks, blocks and other devices used to secure the machine during road transport.
3. Prepare the loading ramps. If the ramps are included in the trailer frame, lower them to the ground. If the ramps are external to the trailer, match them to the rear edge of the trailer avoiding any bump between trailer bed and external ramps.
4. Get on the machine and start the engine.
5. Make sure to deactivate the auto idle function and the auto shut-down function. Press the idle mode button **(1)** until any idle icon on the display turns off. Press the travel mode selector button **(2)** to select the low travel speed. The “Turtle” icon appears on the display.
6. Select the H work mode and set the gate lock lever to unlock position.

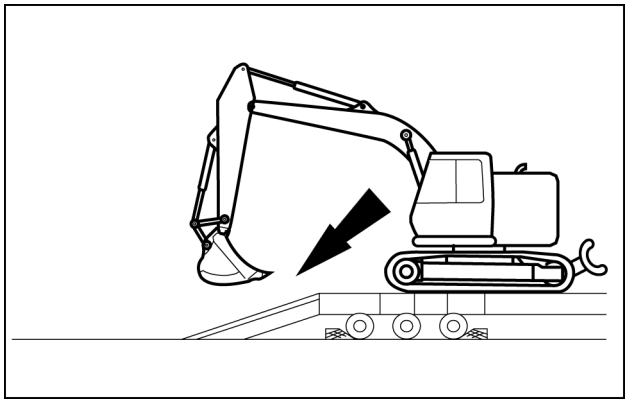


SMIL14CEX2560AB 3

7. Fully raise the blade from the supporting block.
8. If the front equipment is installed, operate the arm and bucket controls so that the arm stands vertical and the bottom of the bucket is about **20 cm** (**7.9 in**) above the trailer bed.

   NOTICE: *Starting from this position, the travel control levers must be pulled backward to move on the trailer bed and on the ramps. Confirm the travel control directions before start moving.*

   NOTICE: *on CX145D SR Offset Boom with blade, a temporary override of the cab interference prevention system may be needed to lift the boom from the transport position. Refer to the override procedure described on page* ***4-10*** *in order to properly and safely tackle this condition.*



SMIL20CEX0652AA 4

9. Travel slowly towards the back of the trailer and stop as reaching the ramps. If the front equipment is installed, operate boom and arm softly in order to get the bucket close to the ground ahead of the ramps. Avoid to fully extend the bucket cylinder to prevent damaging it due to accidental impacts with the ground.
10. Move down on ramps with extreme care while operating boom and arm softly in order to keep the bucket close to the ground and so to grant machine stability.
11. Pass through the ramps completely and stop the machine once it gets on the ground.

Shipping transport

Lifting the machine with a crane

⚠ WARNING

Improper operation or service of this machine can result in an accident.
Assign a supervisor to direct worksite operations. Agree on all safety measures, procedures, and suitable hand signals.
Failure to comply could result in death or serious injury.

W0287A

⚠ WARNING

Crushing hazard!
The lifting systems must be operated by qualified personnel who are aware of the correct procedures to follow. Make sure all lifting equipment is in good condition, and all hooks are equipped with safety latches.
Failure to comply could result in death or serious injury.

W0256A

⚠ WARNING

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

Preparation before lifting the machine

Always lift the machine with the complete front equipment (boom and arm) installed, and fitted with an average size bucket. Never lift the machine fitted with heavy attachments as hydraulic breakers or hydraulic crushers.

NOTICE: *For lifting of CX145D SR Offset Boom with blade, it is recommended to remove also the bucket.*

NOTICE: *if the machine has to be lifted without the complete front equipment (boom and arm), the counterweight shall be removed from the base machine. Lifting up the base machine with the counterweight installed affects the stability of the base machine during lifting operation.*

Make provision for wire ropes and other lifting devices of proper capacity in order to tackle the machine weight. Refer to Chapter 8 for the machine weights, and always consider **120%** of these reference weights for the selection of the lifting devices.

Refer to the picture on the next page for layout and sizing of the wire ropes and of the other lifting devices to be used. Always make sure to check the machine stability before carrying out the lifting operation.

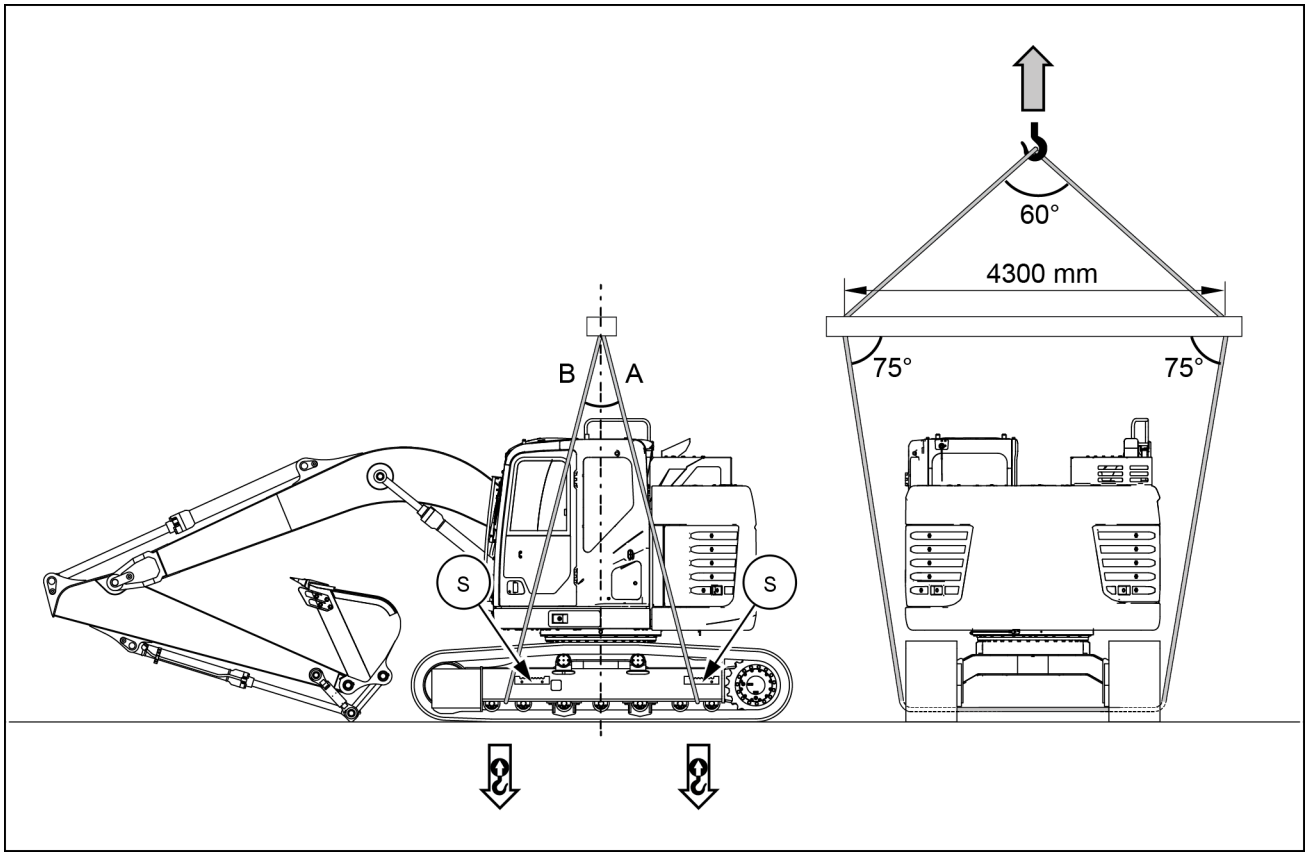
NOTICE: *As reference guideline, each one of the angles A and B between the wire ropes and the middle of the expander should be preliminary assumed at* ***15°*** *. However, these values shall be checked and thus calibrated to tackle the actual machine configuration. The overall angle A+B shall be anyway kept at* ***30 – 35°****.*

NOTICE: *For lifting of CX145D SR with blade, it is recommended to position the machine as for road transport, with the blade and the front equipment opposite to each other.*

Make provision for wire ropes and other lifting devices fitted with selflocking hooks in order to avoid unintended opening during lift operation.

Make provision for wire ropes of sufficient length and expander of proper size to prevent interference with the machine body when lifting up the machine. Cover the wire ropes with paddings where they get in contact with the machine frames in order to protect the machine from damaging.

Position the machine on a firm and level ground, and proceed as follows:



SMIL17CEX3808FA 1

1. Set the machine in the position for transport: align the boom in straight position (CX145D SR Offset Boom with blade), fully retract the arm, curl the bucket and lower the boom.

   NOTICE: *on CX145D SR Offset Boom with blade, a temporary override of the cab interference prevention system may be needed to reach the transport position. Refer to the override procedure described on page* ***4-10*** *in order to properly and safely tackle this condition.*

2. Place the gate lock lever in lock position. Stop the engine and remove the starter key. Check the operator's compartment for any loose item, tools, etc. that could fall or cause a problem or injury during the procedure and remove or secure them. Get off the machine. Retract the radio antenna. Fold the rear view mirrors. Lock the cab door and the side panels. Remove the four side steps **(S)**.
3. Check for lifting point decals on the undercarriage of the machine in order to know where the wire ropes shall be routed. Pass-through the first wire rope between the first two lower rollers on the front of the machine undercarriage. Pass-through the second wire rope between the two last lower rollers on the rear of the machine undercarriage.
4. Link the front wire rope and the rear wire rope to the expander. Slowly lift the expander to tension the wire ropes in order to reach the layout of the lifting devices shown in figure.
5. Carry out a final check of the linkages on the expander and then start lifting the machine.
6. Lift the machine slowly and vertically and make sure for its stability. If needed, lower the machine to the ground slowly and calibrate the layout of the wire ropes to tackle the actual machine configuration.

   NOTICE: *The overall angle A+B shall be kept at* ***30 – 35°****.*

7. Complete the vertical lift up to the height of the platform where the machine has to be placed. Slowly move the crane laterally to get the machine right over the platform. Gently lower the machine to the platform.

NOTICE: *always avoid sliding movements of the crane (lift and move laterally at the same time). Sliding movements definitely affect machine stability during lifting operation.*

Recovery transport

Towing the machine

⚠ WARNING

Misuse hazard!
Towing is a delicate maneuver that is always carried out at the risk of the user. The manufacturer's warranty does not apply to incidents or accidents that occur during towing. Where possible, carry out the repairs at the site.
Failure to comply could result in death or serious injury.

W0286A

⚠ WARNING

Hazard to bystanders!
The operator must be the only person on the machine when towing. Make sure that nobody else is on the machine or within its working range.
Failure to comply could result in death or serious injury.

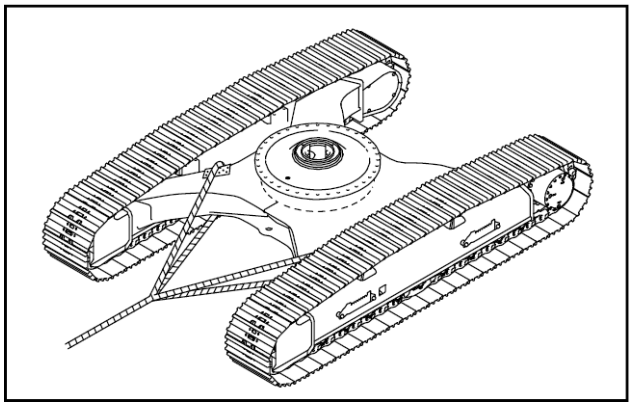
W0259A

As far as possible try to carry out repairs on spot or consult your CASE CONSTRUCTION Dealer.

NOTICE: *the machine must be towed very slowly, over a short distance and only if it is really unavoidable. Always tow the machine in alignment with the undercarriage.*

If the machine is bogged down, it must be towed as follows:

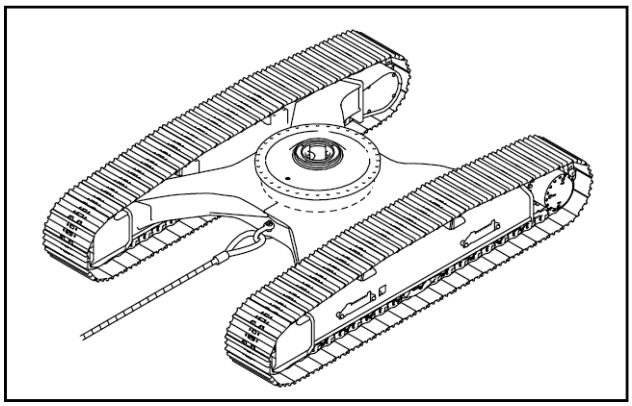
1. Make sure that it can be towed without risk of further damage.
2. Make sure that the shackles, chains and tackle are in perfect condition and strong enough to move the load.
3. Attach the shackles, chains and tackle to the under-carriage taking care to protect any salient angles.
4. Pull the machine without jerking, very slowly and in alignment with the undercarriage.



SMIL13CEX2731AA 1

Towing a load

To tow a load of up to **10 t** (**22046 lb**) , use one of the towing holes provided for this purpose.



SMIL13CEX2732AA 2

6 - MAINTENANCE

General information

Basic instructions

⚠ WARNING

Improper operation or service of this machine can result in an accident.
If you do not understand a maintenance procedure, or doubt your ability to perform a maintenance procedure correctly, see your authorized dealer.
Failure to comply could result in death or serious injury.

W0157A

⚠ WARNING

Improper operation or service of this machine can result in an accident.
Raised equipment or machine movement without an operator can cause serious injury. Always do the following before performing any maintenance:
Park the machine on flat, level ground.
Lower the attachment to the ground.
Shut down the engine and remove the ignition key.
Lock the tracks.
Failure to comply could result in death or serious injury.

W0944D

⚠ WARNING

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

W1090B

NOTICE: *be sure all the service operations in this section are carried out punctually at the intervals given, in order to ensure optimum performance levels and maximum safety when using the machine.*

- Before any maintenance operation, park the machine on a hard and level ground, away from obstacles, and lower the attachment and the dozer blade (if equipped) to the ground.
- Unless otherwise specified, carry out all maintenance operations with the engine stopped and the key removed from the starter switch. Wait for all circuits to cool down before you start work.
- Clean the grease fittings before lubrication. Clean around plugs and filler holes before adding fluid. No dust or dirt must enter the components or the circuits. Wear suitable clothing and remember to use the necessary safety equipment.
- When carrying out service work on the machine, place the "Do not operate" tag on the instrument panel. Never climb down from the operator's compartment leaving the engine running.
- Remove the necessary lower panels during maintenance of certain machine components. Make sure the lower panels are properly closed before operating the machine.

Any modification to the machine without prior authorization could cause serious injury. Do not make any modifications without authorization. Consult your CASE CONSTRUCTION Dealer.

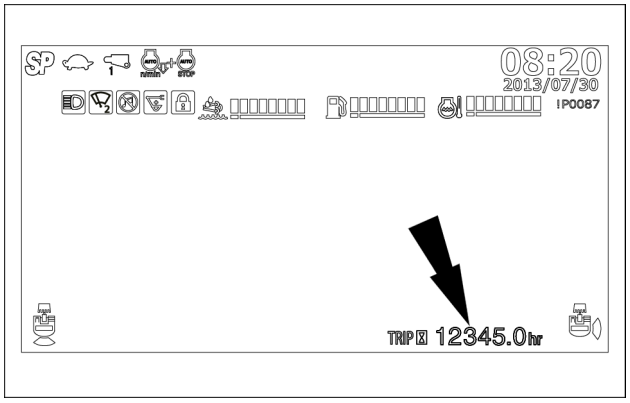
NOTICE: *if you use your machine in particularly harsh conditions (dusty or corrosive atmosphere, etc.), the servicing intervals should be reduced accordingly.*

NOTICE: *take particular care to replace all filters regularly. Clean filters mean longer engine running life.*

NOTE: *oil and fluid should not be thrown on the ground. They must be stored and removed by a company which is responsible for their recycling or their disposal.*

Hour meter

The machine control system is readily warning about the need of specific maintenance operations. However, some other maintenance operations have to be carried out on a regular basis without any specific warning. Make sure to get acquainted with the main time intervals indicated into this Chapter, and make sure to check the hour meter at the beginning of every working day in order to anticipate the need for maintenance operations at a certain time interval.



SMIL17CEX5119AA 1

Daily inspections

Every day, before starting work, it is necessary to inspect the machine and service certain of its components.

General remarks

- Check signs of leaking oil or water.
- Check that all screws and nuts are correctly tightened.
- Wipe off any dust (engine, operator's compartment etc.).
- Check for any signs of damage.

Engine

- Check the oil level and change the oil if necessary.
- Check the coolant level.
- Check the radiator for signs of clogging or deterioration.
- Check the radiator fan belt tension.
- Check the air filter is clean and not restricted.
- Check the components for signs of leaking oil or water.
- Check the condition of all lines.

Undercarriage

- Check the pad hardware.
- Check the condition of the tracks.
- Check that the upper and lower track rollers and the idler wheels are not leaking oil.

Upperstructure

- Check the fuel tank level.
- Check the **DEF/ADBLUE®** tank level.
- Check the hydraulic tank level.
- Check that the hydraulic oil is clean.
- Check the components for signs of leaking oil or water.
- Check the condition of all lines.
- Make sure there are no electrical short circuits.
- Check the battery connections are properly tightened.
- Adjust the rear view mirrors.
- Check the cameras.

Attachment

- Check the cylinders are not leaking oil.
- Check the condition of all lines.
- Check the condition of the bucket and its tools.

After starting the engine

- Did the engine start correctly? Are the exhaust fumes normal? Any strange noises?
- Check for abnormal noise on the hydraulic components.
- Check the components for signs of leaking oil or water.
- Check the audible alarm devices, working lights and windshield wipers.
- Check that all circuits (travel, swing and tool) are functioning correctly.

NOTICE: *if the slightest defect is found, repair it immediately before using the machine or consult your CASE CONSTRUCTION Dealer.*

Service platform

⚠ WARNING

Fall hazard!
Take correct measures to make sure steps, ladders, and platforms remain clean and clear of debris or foreign substances.
Failure to comply could result in death or serious injury.

W1183A

⚠ WARNING

Rotating parts!
It is forbidden to stand on the platform when the engine is running. Turn off the engine and wait at least one minute until all moving parts have completely stopped before accessing the platform.
Failure to comply could result in death or serious injury.

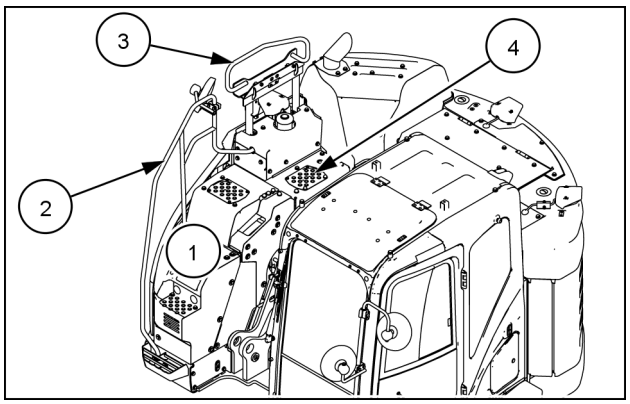
W1200A

The machine is equipped with a platform that allows to carry out regular maintenance operations into the engine compartment and on other components located in the center of the machine, as for example the swing reduction unit and the hydraulic tank.

To access the service platform, proceed as follows:

1. Access the ladder **(1)** on the right-front of the machine. Climb the ladder grabbing the handrail **(2)**.
2. Grab the handrail **(3)**, and step onto the platform **(4)**.

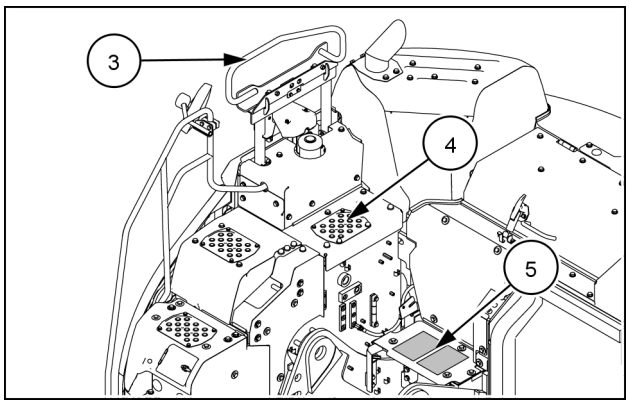
NOTICE: *Make sure that the handrail **(3)** is in vertical position.*



SMIL20CEX0696AA 1

3. Securely grab the handrail **(3)**, and step down from the platform **(4)** onto the service platform **(5)**.

NOTICE: *Make sure to stand on the service platform with the feet laying completely onto the anti-skid surface.*



SMIL20CEX1305AA 2

Biodiesel fuel

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 **-20 °C** (**-4 °F**) to **45 °C** (**113 °F**). Refer to the list of fluids and lubricants contained in this manual.

NOTICE: *When operating the machine in ambient temperatures outside the above mentioned range, consult your CASE CONSTRUCTION Dealer for specific machine provision and for specific fluids and lubricants to be used.*

	Quantity		CASE CON-STRUCTION specification	Reference specification
Fuel tank	**200 L** (**52.8 US gal**)	—	—	**ASTM D975**
DEF/ADBLUE® tank	**43 L** (**11.4 US gal**)	—	—	**ISO 22241-1**
Engine oil	**17 L** (**4.5 US gal**)	**NO.1 ENGINE™ OIL SEMI-SYNTHETIC 10W-40**	**MAT3571**	**SAE 10W40 API CK-4**
Swing reduction unit	**2.2 L** (**0.6 US gal**)	**HYPOID GEAR OIL EXTREME PRESSURE 80W-90**	**MAT3516-A**	**SAE 80W/90 API GL-5**
Travel reduction unit	**2.1 L** (**0.6 US gal**)	**HYPOID GEAR OIL EXTREME PRESSURE 80W-90**	**MAT3516-A**	**SAE 80W/90 API GL-5**
Engine coolant	**16.5 L** (**4.4 US gal**)	**OAT EXTENDED LIFE COOLANT/ANTIFREEZE** CONCENTRATE (*)	**MAT3724** Grade OAT-EG1	**ASTM D6210** TYPE I-FF
		OAT EXTENDED LIFE COOLANT/ANTIFREEZE 50/50 PREMIXED	**MAT3724** Grade OAT-EG2	**ASTM D6210** TYPE III-FF
Hydraulic oil tank (**)	**75 L** (**19.8 US gal**)	**PREMIUM HYDRAULIC OIL HV46 MULTI-GRADE ANTIWEAR**	—	ISO 6743-4 L-HV 46
Grease	—	**MULTI-PURPOSE GREASE EXTREME PRESSURE AND ANTI-WEAR NLGI 2**	**MAT3555-A**	**NLGI 2**

(*) Concentrate antifreeze to be mixed 50/50 with distilled (deionized) water.

(**) The total capacity of the hydraulic system is **158 L** (**41.7 US gal**).

Engine coolant

OAT EXTENDED LIFE COOLANT/ANTIFREEZE is the reference genuine product for machine service.

NOTICE: *Never add Supplemental Coolant Additives (SCA) when using* ***OAT EXTENDED LIFE COOLANT/ANTIFREEZE****.*

OAT EXTENDED LIFE COOLANT/ANTIFREEZE has to be used if refilling of the cooling system is needed. Refer to the dedicated procedure and recommendations described in Chapter 6.

OAT EXTENDED LIFE COOLANT/ANTIFREEZE must be used for the replacement of engine coolant according to the maintenance program of the machine. The replacement shall also be tackled in case of repair or replacement of components of the cooling system. Refer to the dedicated procedure described in Chapter 6.

The engine cooling system should 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 **OAT EXTENDED LIFE COOLANT/ANTIFREEZE**, a 50/50 mixture of antifreeze and distilled (deionized) water grants proper performance of the engine cooling system in the above mentioned operating temperature range of the machine.

OAT EXTENDED LIFE COOLANT/ANTIFREEZE is available as:

- 50/50 PREMIXED coolant solution ready for usage.
- CONCENTRATE antifreeze to be mixed 50/50 with distilled (deionized) water.

NOTICE: *If operating in extreme winter climate, a coolant solution made by 60/40 antifreeze/distilled (deionized) water mixture must be used in order to grant proper performance of the engine cooling system.*

NOTICE: *Never use coolant solution with more than* ***60%*** *of antifreeze. This affects the cooling capacity of the mixture.*

When the coolant solution is prepared starting from the CONCENTRATE product, the antifreeze concentration in the mixture of antifreeze and distilled (deionized) water can be determined with a refractometer designed to measure ethylene glycol content.

If distilled (deionized) water is not available, use water for dilution with the following properties:

Property	Maximum limit
Total Solids	**340 ppm**
Total Hardness	**170 ppm**
Chloride (Cl)	**40 ppm**
Sulfate (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 Sulfur 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 should be invalid if any serious defect is caused by usage of any other fuel. Using any fuel other than the prescribed type will cause damages to the fuel supply system, to the fuel injection system, to the engine block, and to the exhaust after treatment system. CASE CONSTRUCTION will not be responsible to any of such damages.*

If the temperature drops below the fuel cloud point, output deficiency or engine start problems may occur due to wax crystals. 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 should:

- 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 sulfur content.
- have very little residual carbon.

NOTICE: *Never use a mix of diesel fuel and old engine oil. The fuel injection system and the exhaust after treatment system will be severely damaged.*

NOTICE: *consult the fuel supplier or the CASE CONSTRUCTION Dealer regarding appropriate use of fuel additives.*

NOTICE: *in order to prevent condensation during cold weather, fill the fuel tank to full after completing the day's work.*

Fuel storage:

Long storage can lead to the accumulation of impurities and condensation in the fuel. Engine trouble can often be traced to the presence of water in the fuel. The storage tank must be placed outside and the temperature of the fuel should be kept as low as possible. Drain off water and impurities regularly.

Disposal of fluids, lubricants, and spare parts

Fluids, lubricants and spare parts used on the machine are not fully compatible with the environment. Make sure to carry out all maintenance operations using appropriate tools, in order to avoid any risk of damaging the environment.

NOTE: *for example, make sure that the receptacle for collecting oil to be replaced is not leaking.*

Never spread fluids or lubricants on the ground or into water. Consult the CASE CONSTRUCTION Dealer or the Local Environmental Agency in order to obtain information on the correct method of disposing fluids and lubricants used on the machine.

Never throw away spare parts as filters or batteries. Consult the CASE CONSTRUCTION Dealer or the Local Environmental Agency in order to obtain information on the correct method of disposing filters, batteries or other spare parts used on the machine.

Engine oil recommended operating temperature range

CASE CONSTRUCTION prescribes the use of engine oils that meet CNH Industrial standard **MAT3571** in your engine.

You may use other engine oils only if they meet **API CK-4** or **ACEA E9** performance requirements.

CASE CONSTRUCTION engine oils exceed API and ACEA performance requirements.

NOTE: *Do not put performance additives or other oil additive products in the engine crankcase. See your CASE CONSTRUCTION dealer for engine oil analysis test package information.*

RECOMMENDED VISCOSITY GRADES AT VARYING AMBIENT TEMPERATURE LIMITS										
(H) SAE 0W-40										
		(H) SAE 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										

Engine oil and filter service intervals

Always change engine oil and filter at the service intervals prescribed in the maintenance chart, or annually (whichever comes first).

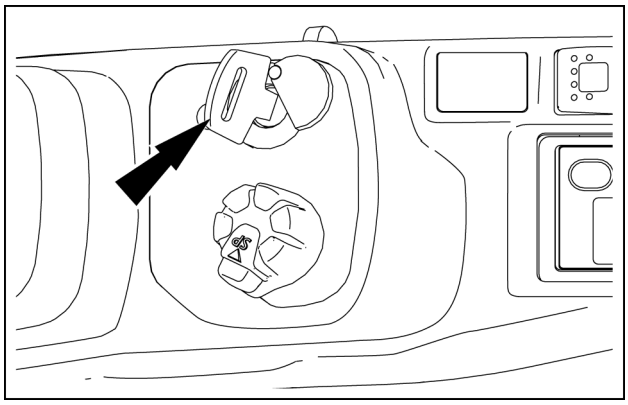
CASE CONSTRUCTION defines the oil/filter change intervals given in this manual from tests with CASE CONSTRUCTION lubricants/filters.

The service intervals for engine oil and filter are based on type of engine oil and oil filter used, and also on sulfur content of diesel fuel. Never use filters other than CASE CONSTRUCTION genuine filters. See the previous page for the approved sulfur content and for other prescriptions for diesel fuel to be used.

Releasing pressure in the hydraulic system

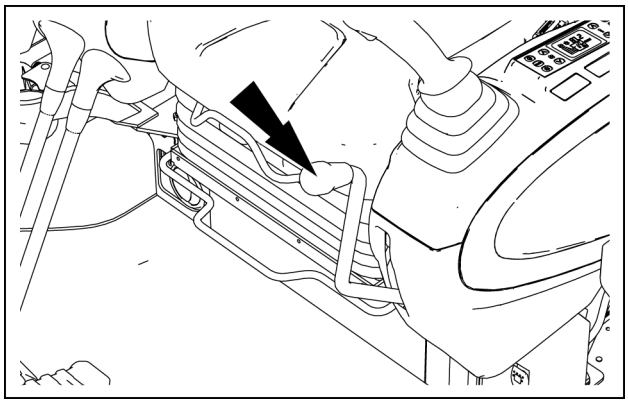
NOTICE: *before carrying out any work on the hydraulic system, there should be no pressure in any of the circuits.*

1. Place the machine on flat, level ground, lower the attachment to the ground and stop the engine.
2. Turn the starter key to ON position.



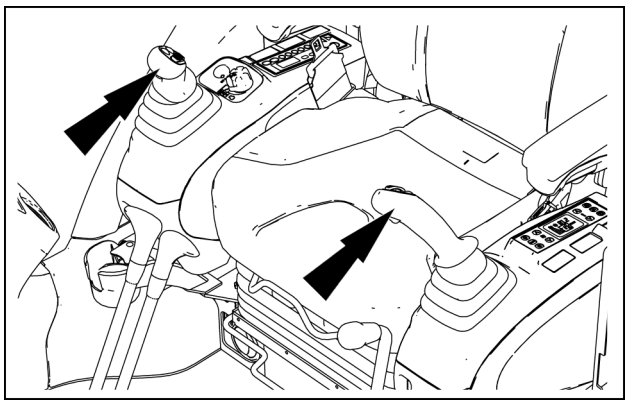
SMIL19CEX2696AA 1

3. Set the gate lock lever to unlock position.



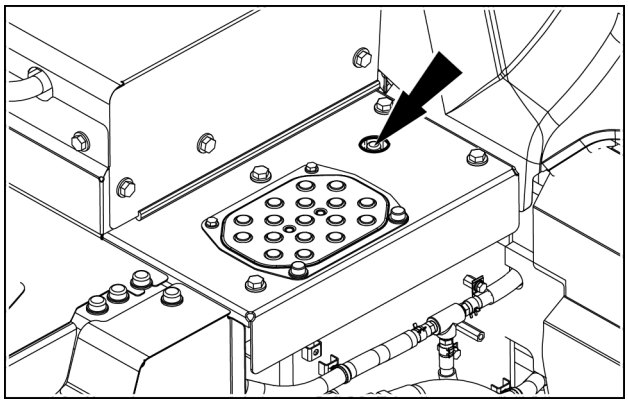
SMIL17CEX0108AA 2

4. Operate the control levers from right to left and front to rear a dozen times approximately.
5. Turn the starter key to OFF position.



SMIL17CEX0109AA 3

6. Keep pressed the button of the hydraulic tank breather to release all the residual pressure.



SMIL17CEX3530AA 4

Fuel system bleeding

⚠ WARNING

Pressurized system!
Only use the bleed screw to bleed air from the fuel system. DO NOT loosen the fuel or injector lines to bleed air. Injury or damage can occur. Fuel or injector lines are under very high pressure.
Failure to comply could result in death or serious injury.

W0285A

⚠ WARNING

Fire hazard!
Leaking fuel could cause a fire. DO NOT perform the bleed procedure while the engine is hot.
Failure to comply could result in death or serious injury.

W1119A

Air gets trapped in the fuel system after maintenance or repair.

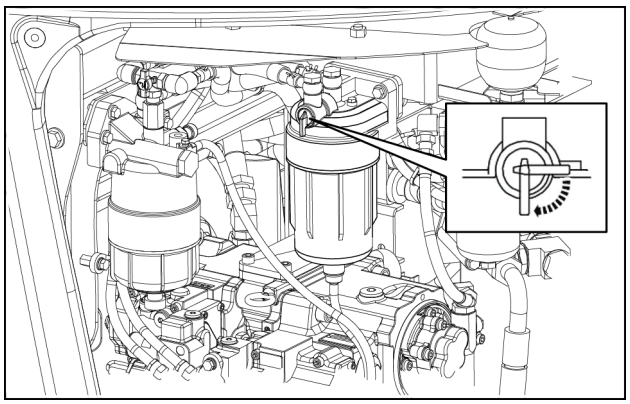
Also, air enters the fuel system when tank has become completely empty.

Moreover, air eventually gets dissolved in the fuel after the machine has been stored for a quite long time.

The air must be thus bled away from the fuel system in order to grant a proper fuel supply, and to avoid severe damages to the high pressure injection components.

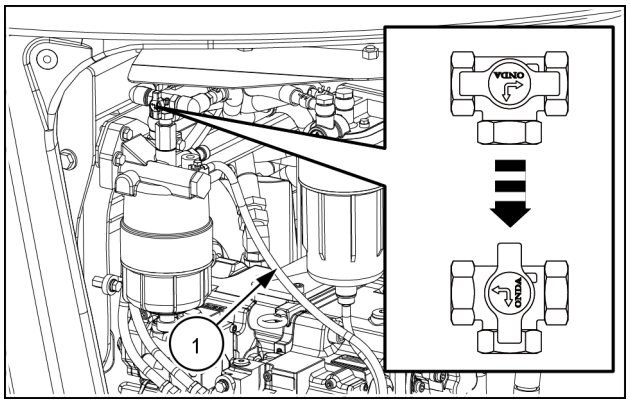
To bleed air from the fuel system proceed as follows:

1. Open the valve of the fuel pre-filter.



SMIL17CEX3817AA 1

2. Switch the valve of the fuel main filter to the tank side.
3. Place a container with an appropriate capacity below the end of the bleeding hose **(1)**.



SMIL17CEX3818AA 2

4. Loosen the air bleed plug **(2)** of the fuel main filter.

5. Turn the starter key to ON position.

   NOTICE: *Do not keep the starter key to ON position for more than **5 min**. Failing to comply will result in serious damages to the fuel feed pump and to the electric system of the machine. If air bleeding is not completed after **5 min**, stop the procedure and turn the starter key to OFF position for **2 min**. Then turn the starter key to ON position again and complete the bleeding procedure.*

6. Turn the head of the priming piston **(3)** to the left. The piston is thus unlocked. Pump against the priming piston to help fuel flow into the filter body.

7. After some seconds, snug tighten the air bleed plug **(2)**, then restart pumping against the priming piston to fill the filter body. As the priming piston becomes hard to pump, loosen the air bleed plug to force fuel with air trapped inside to go out through the bleeding hose **(1)**.

8. Repeat the procedure of point 7 until fuel with no air goes out from the bleeding hose. Tighten the air bleed plug **(2)**.
   The tightening torque of the air bleed plug must be **8 – 12 N·m** (**5.9 – 8.9 lb ft**).

9. Push the priming piston **(3)** fully inward and turn its head to the right. The piston is thus locked.

10. Turn the starter key to OFF position.

11. Switch the valve of the fuel main filter to the engine side.

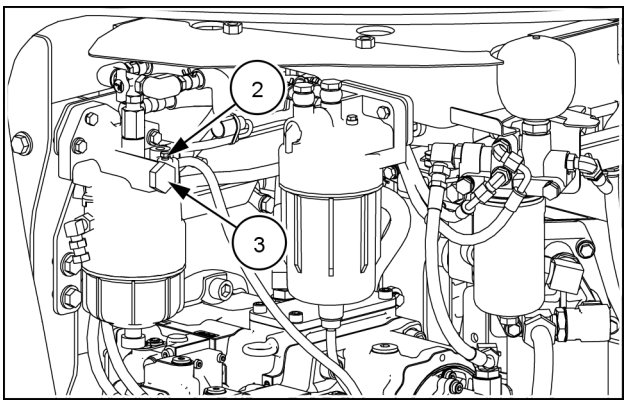
12. Wipe off any spilled fuel around the air bleed plug **(2)** and at the end of the bleeding hose **(1)**.

13. Start the engine, and keep the speed to low idle. If the engine does not start at this stage, repeat the steps from 1 to 12, and then try to start it again.

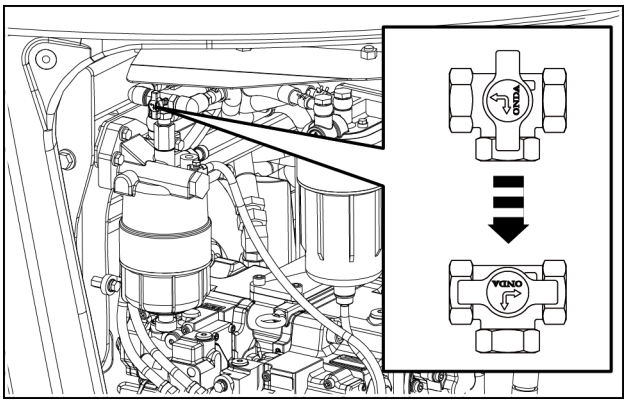
14. Reach the pump compartment, and check for any fuel leak from the components of the fuel supply line.

15. Get onto the cab, and gradually increase the engine speed to the maximum. Keep max speed for **2 min**, then set the engine speed to low idle position.

16. Reach the pump compartment, and check for any fuel leak from the components of the fuel supply line.



SMIL17CEX3272AA 3



SMIL17CEX3819AA 4

Protecting the electronic and electrical systems during battery charging or welding

⚠ DANGER

Improper operation or service of this machine can result in an accident.
Any unauthorized modifications made to this machine can have serious consequences. Consult an authorized dealer on changes, additions, or modifications that may be required for this machine. Do not make any unauthorized modifications.
Failure to comply will result in death or serious injury.

D0030A

⚠ DANGER

Battery acid causes burns. Batteries contain sulfuric acid.
Avoid contact with skin, eyes or clothing. Antidote (external): Flush with water. Antidote (eyes): flush with water for 15 minutes and seek medical attention immediately. Antidote (internal): Drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately.
Failure to comply will result in death or serious injury.

D0117A

Whenever carrying out a welding operation on the undercarriage or upperstructure carriage as authorized by the manufacturer and in accordance with his instructions, disconnect the batteries, disconnect the alternator B+ and D+ terminal wires and connect the welding apparatus earth cable to the component on which the welding operation is to be performed. Never connect the welding apparatus to the undercarriage when welding on the upperstructure (or vice-versa). Never connect the welding apparatus earth to a component of the hydraulic system.

To avoid damage to the electronic/electrical systems, always observe the following:

- Never make or break any of the charging circuit connections, including the battery connections, when the engine is running.
- Never short any of the charging components to ground.
- Make sure to set the battery disconnect switch to OFF position in advance or cut-off the connection of the ground cable when executing arc welding to the machine.
- Always disconnect the negative cable from the battery when charging the battery in the machine with a battery charger.

NOTICE: *position the welder ground clamp as close to the welding area as possible. If welding in close proximity to a computer module, then the module should be removed from the machine. Never allow welding cables to lay on, near or across any electrical wiring or electronic component while welding is in progress.*

NOTICE: *if welding must be performed on the unit, either the machine, the battery ground cable must be disconnected from the machine battery. The electronic monitoring system and charging system will be damaged if this is not done.*

Maintenance planning

Maintenance chart

Maintenance action	Grease	Check	Replace	Change fluid	Cleaning	Adjust	Drain fluid	Page no.
Break-in period								
Grease points (Bucket)	x							**6-17**
Cab protection (ROPS and FOPS)		x						**6-17**
Tightening torques		x						**6-17**
Track shoe bolt torque		x						**6-17**
Hydraulic oil return filter			x					**6-17**
Pilot line filter			x					**6-17**
Swing reduction unit oil				x				**6-17**
Travel reduction units oil				x				**6-17**
Every 10 hours								
Engine oil level		x						**6-18**
Engine coolant level		x						**6-19**
Hydraulic oil level		x						**6-20**
Fan and alternator drive belt		x						**6-21**
Fuel tank				x				**6-21**
Fuel filters				x				**6-22**
Every 50 hours								
Air conditioner filters					x			**6-23**
Grease points (Blade)	x							**6-25**
Every 250 hours								
Grease points (Bucket)	x							**6-26**
Grease points (Bucket, Offset)	x							**6-27**
Swing reduction unit oil		x						**6-28**
Travel reduction units oil		x						**6-29**
Engine primary air filter					x			**6-30**
Battery electrolyte level		x						**6-33**
Fan and alternator drive belt						x		**6-36**
Hydraulic oil tank				x				**6-37**
Tightening torques		x						**6-38**
Track shoe bolt torque		x						**6-39**
Track rollers and idler wheels		x						**6-40**
Cab protection (ROPS and FOPS)		x						**6-40**
Every 500 hours								
Turntable bearing	x							**6-41**
Engine oil and filter				x				**6-43**
Fuel pre-filter			x					**6-45**
Fuel filter			x					**6-46**
Radiator and coolers					x			**6-47**
Every 1000 hours								
Grease points (Boom and arm)	x							**6-48**
Grease points (Boom and arm, Offset)	x							**6-51**
Hydraulic tank breather			x					**6-55**
Engine air filters			x					**6-56**
Hydraulic fluid analysis		x						**6-58**
Engine valve rocker clearance adjustment		x						**6-58**
Swing reduction unit oil				x				**6-59**
Travel reduction units oil				x				**6-61**

Maintenance action	Grease	Check	Replace	Change fluid	Cleaning	Adjust	Drain fluid	Page no.
Alternator		x						**6-62**
Starter motor		x						**6-62**
Every 2000 hours								
Hydraulic oil suction filter					x			**6-63**
Hydraulic oil return filter			x					**6-64**
Pilot line filter			x					**6-65**
Air conditioner filters			x					**6-66**
Swing reduction gear	x							**6-66**
Every 4000 hours								
Engine coolant				x				**6-67**
Pump outlet hoses		x						**6-72**
Hydraulic hoses		x						**6-72**
Every 4500 hours								
DEF/AdBlue® supply module filter			x					**6-73**
Selective Catalytic Reduction (SCR) system		x						**6-74**
Exhaust Gas Recirculation (EGR) system		x						**6-74**
Every 5000 hours								
Hydraulic oil and filters				x				**6-75**
When necessary								
Fuel feed pump					x			**6-78**
Track tension		x						**6-79**
Fuel tank strainer					x			**6-81**
Gas spring inspection		x						**6-82**
Bulb replacement			x					**6-83**
Bucket teeth			x					**6-86**
Cylinders		x						**6-88**
Plastic and resin parts					x			**6-88**
Air-conditioning system		x						**6-89**
DEF/AdBlue® tank drain				x				**6-91**

Break-in period

Grease points (Bucket)

Lubricate the bucket linkage every **10 h** within the first **50 h**: to lubricate the bucket linkage refer to page **6-26**.

Cab protection (ROPS and FOPS)

Check the cab protections after **50 h**: To check the cab protections refer to page **6-40**.

Tightening torques

Check the tightening torques after **50 h**: To check the tightening torques refer to table on page **6-38**.

Track shoe bolt torque

Check the tracks shoes bolts torque after **50 h**: To check the tightening torques refer to table on page **6-39**.

Hydraulic oil return filter

Replace the hydraulic return filter after **250 h**: To replace the hydraulic return filter perform the operations described on page **6-64**.

Pilot line filter

Replace the pilot filter after **250 h**: To replace the pilot filter perform the operations described on page **6-65**.

Swing reduction unit oil

Replace the swing reduction gear oil after **250 h**: To replace the swing reduction gear oil perform the operations described on page **6-59**.

Travel reduction units oil

Replace the travel reduction gear oil after **250 h**: To replace the travel reduction gear oil perform the operations described on page **6-61**.

Every 10 hours

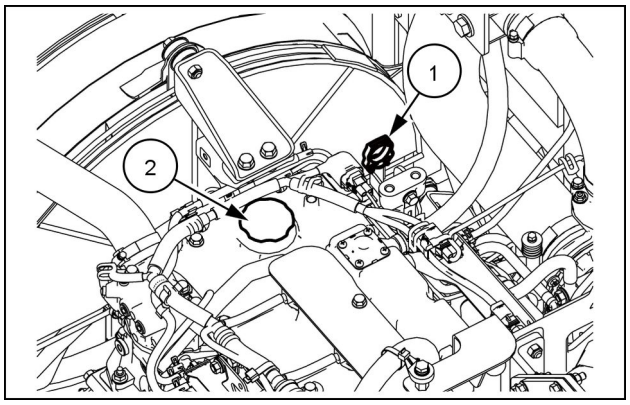
Engine oil level

Check the engine oil level every **10 h** or every day
Lubricant: **NO.1 ENGINE™ OIL SEMI-SYNTHETIC 10W-40**

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key.
2. After **30 min** or more, reach the service platform in the center of the machine. Refer to page **6-4**.
   Raise and fix the engine hood.

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

   Reinsert the oil gauge into the guide tube as far as it will go, and then take it out.

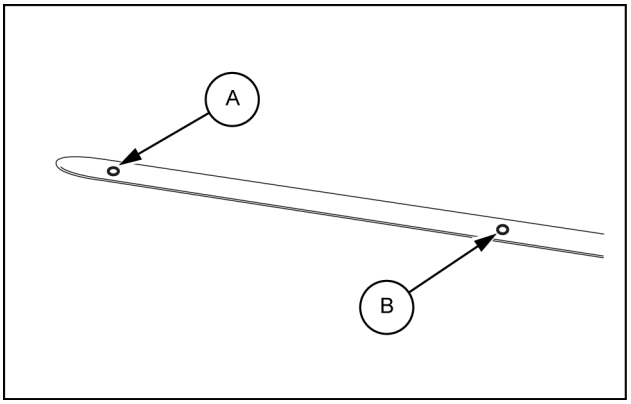


SMIL15CEX9101AB 1

3. The engine oil level is optimal when the oil level is between the mark **(A)** (minimum) and mark **(B)** (maximum).
4. If the oil level is at or below the mark **(A)** (minimum) on the oil gauge, remove the fill plug **(2)** and pour in oil until the level reaches the mark **(B)** (maximum).

NOTE: *Make sure that the oil level is not above the* ***(B)*** *(maximum) on the oil gauge. Doing so will cause such problems as poor fuel economy and an abnormal rise in coolant temperature.*

5. Install the fill plug **(2)**.



SMIL14CEX2746AB 2

Engine coolant level

⚠ WARNING

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

W0282A

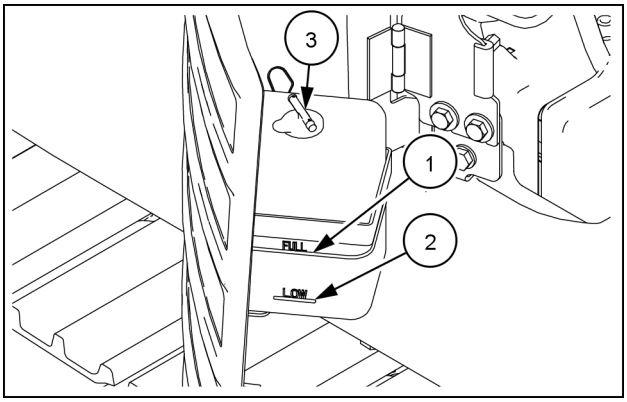
Check the coolant level in the reserve tank every **10 h** or every day
Fluid: **OAT EXTENDED LIFE COOLANT/ANTIFREEZE**

NOTICE: *make sure that the level of the engine coolant is checked after the engine has cooled down.*

NOTICE: *the refilling of the engine coolant should be done only if the level of coolant in the reserve tank is at the LOW mark.*

NOTICE: *If the refilling frequency is higher than **250 h**, CASE CONSTRUCTION recommends not to further refill the system: carefully inspect the cooling circuit for damages, replace any damaged part, and then replace the whole fluid into the cooling system. Refer to the dedicated procedure described ahead in this Chapter.*

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key.
2. Open the left-hand door.
3. Check that the level of the reserve tank is between the FULL **(1)** mark and the LOW **(2)** mark.
4. If the coolant level is at the LOW mark, remove the plug **(3)** and add coolant until the level is right below the FULL mark.
5. Install the plug **(3)**.



SMIL17CEX3277AA 1

Hydraulic oil level

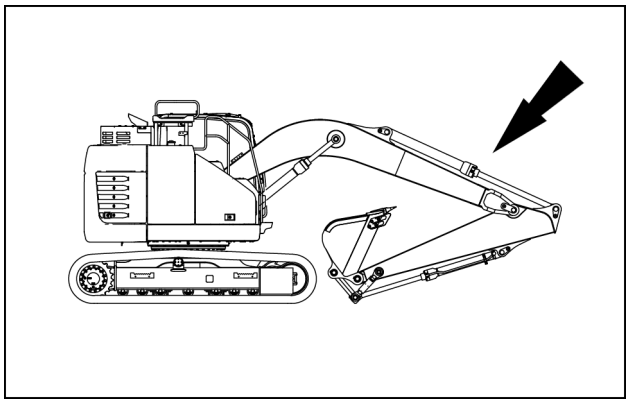
⚠ WARNING

Burn hazard!
Before performing any service on the hydraulic system, you must allow it to cool. Hydraulic fluid temperature should not exceed 40 °C (104 °F).
Failure to comply could result in death or serious injury.

W0241A

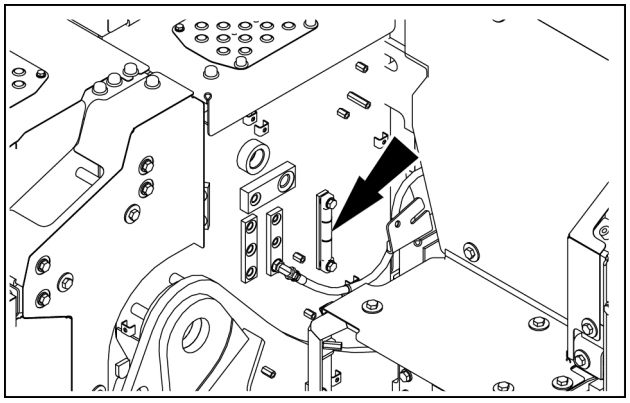
Check the hydraulic oil level every **10 h** or every day
Fluid: **PREMIUM HYDRAULIC OIL HV46 MULTI-GRADE ANTIWEAR**

1. Park the machine on a flat and level place, and arrange the attachment as shown in the figure. Stop the engine, and remove the starter key.



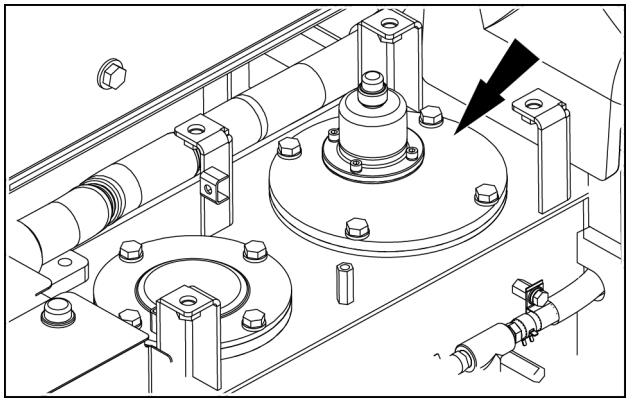
SMIL17CEX3276AA 1

2. Reach the service platform in the center of the machine. Refer to page **6-4**.
   The oil level gauge is located behind the boom foot. The oil level should be in the middle of the band indicated by the two lines.



SMIL17CEX3275AA 2

3. If the hydraulic oil level is not in range proceed as follows:
   - Release all pressure in the hydraulic tank. Refer to page **6-11**.
   - Remove the panel over the hydraulic tank. Clean the top surface of the hydraulic tank.
   - Remove the cover of the suction filter, and supply hydraulic fluid to the tank.
   - If necessary, replace the seal of the cover plate, and attach the cover of the suction filter.
   - Install the panel over the hydraulic tank.



SMIL17CEX3531AA 3

NOTICE: *make sure that no contaminant (water, sand etc.) enters the reservoir during filling.*

Fan and alternator drive belt

Visually check the fan and alternator drive belt every **10 h** or every day

1. Refer to page **6-36**.

NOTICE: *Operating the engine with loosened belt may cause over heat of the engine or insufficient charging of the battery due to slipping belt in its housing.*

Fuel tank

⚠ WARNING

Fire hazard!
When handling diesel fuel, observe the following precautions:
1. Do not smoke.
2. Never fill the tank when the engine is running.
3. Wipe up spilled fuel immediately.
Failure to comply could result in death or serious injury.

W0099A

Drain water and sediment from the fuel tank every **10 h** or every day

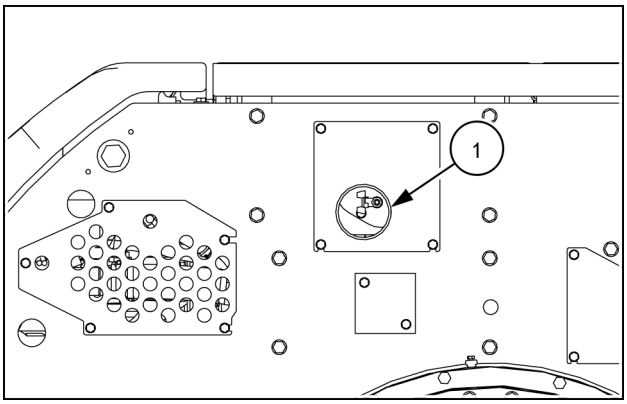
NOTICE: *The fuel tank must be drained taking precautions so that any foreing material may gets inside. Failing to comply will lead to severe damages to the fuel supply system and to the fuel injection system.*

To drain water and sediment from the fuel tank proceed as follows:

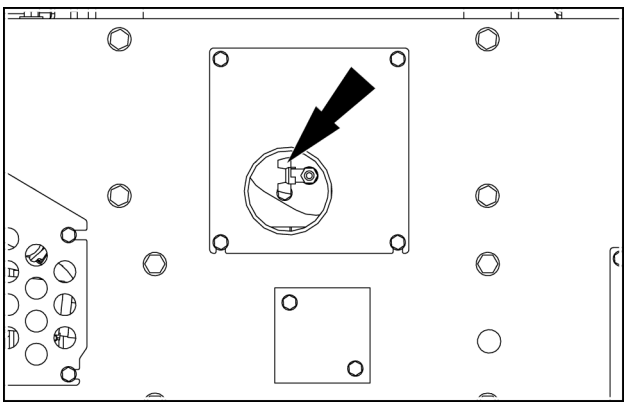
1. Park the machine on a hard and level ground. Orient the upper structure frame so that there is enough free space under the fuel tank to place a barrel of suitable capacity.
2. Stop the engine and remove the starter key.
3. Clean the hole on the lower panel **(1)** below the fuel tank to access the drain valve.
4. Place a container of a suitable capacity under the drain valve.
5. Open the valve and drain the accumulated sediment and water.

NOTICE: *the drained materials shall be disposed according to the local Regulations for special wastes.*

6. Close the drain valve.



SMIL19CEX2665AA 1



SMIL20CEX0693AA 2

Fuel filters

Check the water deposit at the bottom of each filter body every **10 h** or every day.

The separation of water mixed to the fuel should be mainly done in the fuel pre-filter. Nevertheless, water may pass and deposit at the bottom of the fuel filter body. Make sure to regularly drain water from the pre-filter, and from the main filter if needed, in order to keep the overall performance of the filters and to avoid severe damages to the fuel injection system.

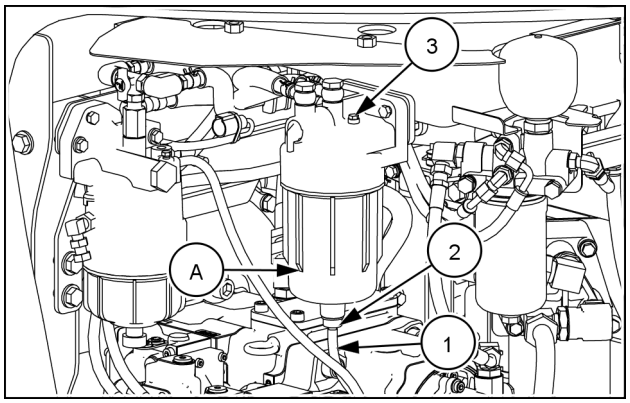
NOTICE: *In cold weather, water may freeze on top of the filter bodies. Wait until ice melts before drainage.*

If the floating ring in the pre-filter reaches the level indicated by the line **(A)** proceed as follows:

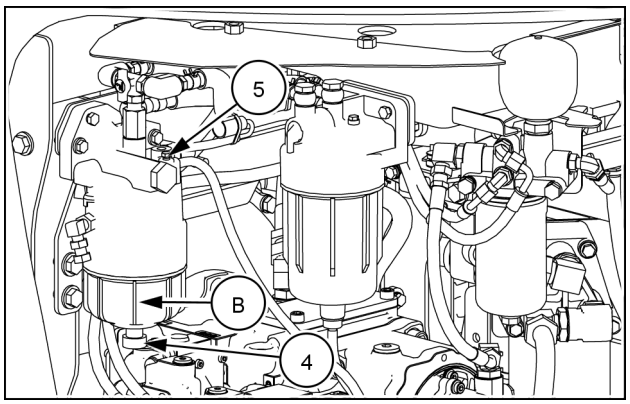
1. Place a container with an appropriate capacity below the end of the drain hose **(1)**.
2. Loosen the drain plug **(2)** and the air bleed plug **(3)**, and drain water from the pre-filter body.
3. When the floating ring reaches the bottom of the filter body, tighten the drain plug **(2)** and the air bleed plug **(3)**. The tightening torque of the drain plug must be **2 – 3 N·m** (**1.48 – 2.21 lb ft**), and the tightening torque of the air bleed plug must be **8 – 12 N·m** (**5.90 – 8.85 lb ft**).

NOTICE: *Overtightening can damage the seal.*

4. Check the main filter body: if the floating ring in the main filter reaches the level indicated by the line **(B)** proceed as for the pre-filter. The positions of the drain plug **(4)** and of the air bleed plug **(5)** of the fuel main filter are shown in the picture.
5. Check for any leak from the filter bodies.



SMIL17CEX3272AA 1



SMIL17CEX3272AA 2

Every 50 hours

Air conditioner filters

⚠ CAUTION

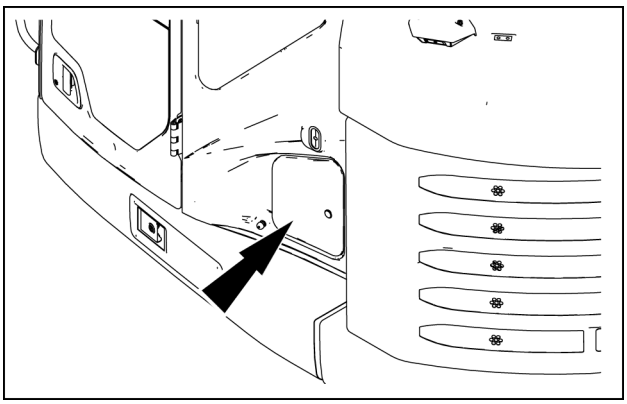
Flying debris!
Compressed air can propel dirt, rust, etc. into the air. Wear eye and face protection when using compressed air.
Failure to comply could result in minor or moderate injury.

C0049A

Clean the air inlet filter every **50 h**
Clean the air circulation filter every **50 h**

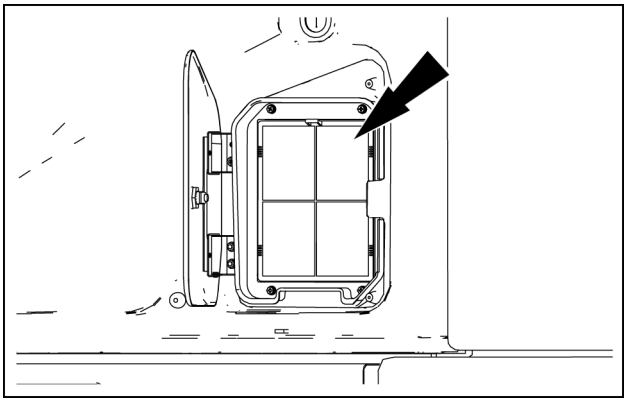
Air inlet filter

1. Open the cover of the air inlet filter with the starter key.



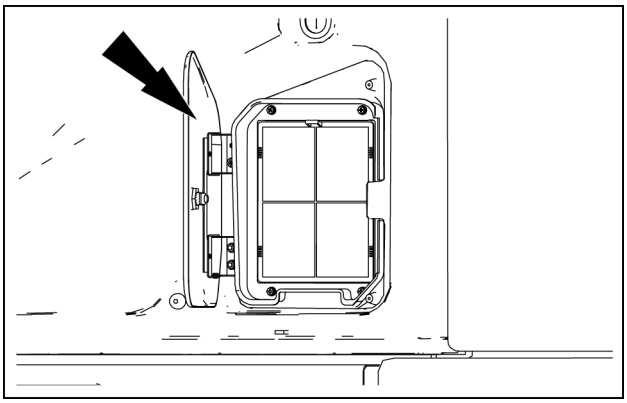
SMIL17CEX0110AA 1

2. Remove the filter and clean it with compressed air. If the filter is damaged, replace it.



SMIL17CEX0111AA 2

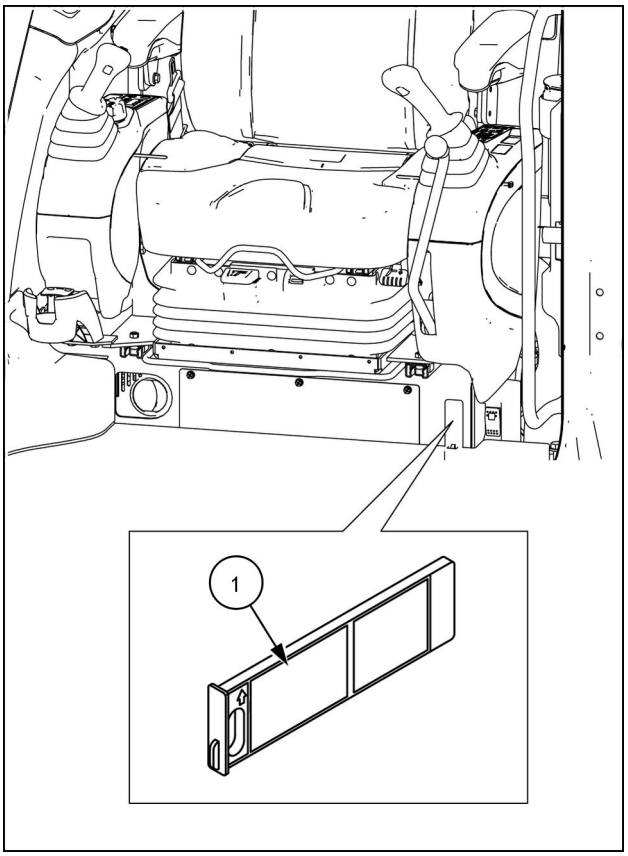
3. Install the air inlet filter.
4. Close the cover and lock it with the starter key.



SMIL17CEX0111AA 3

Air circulation filter

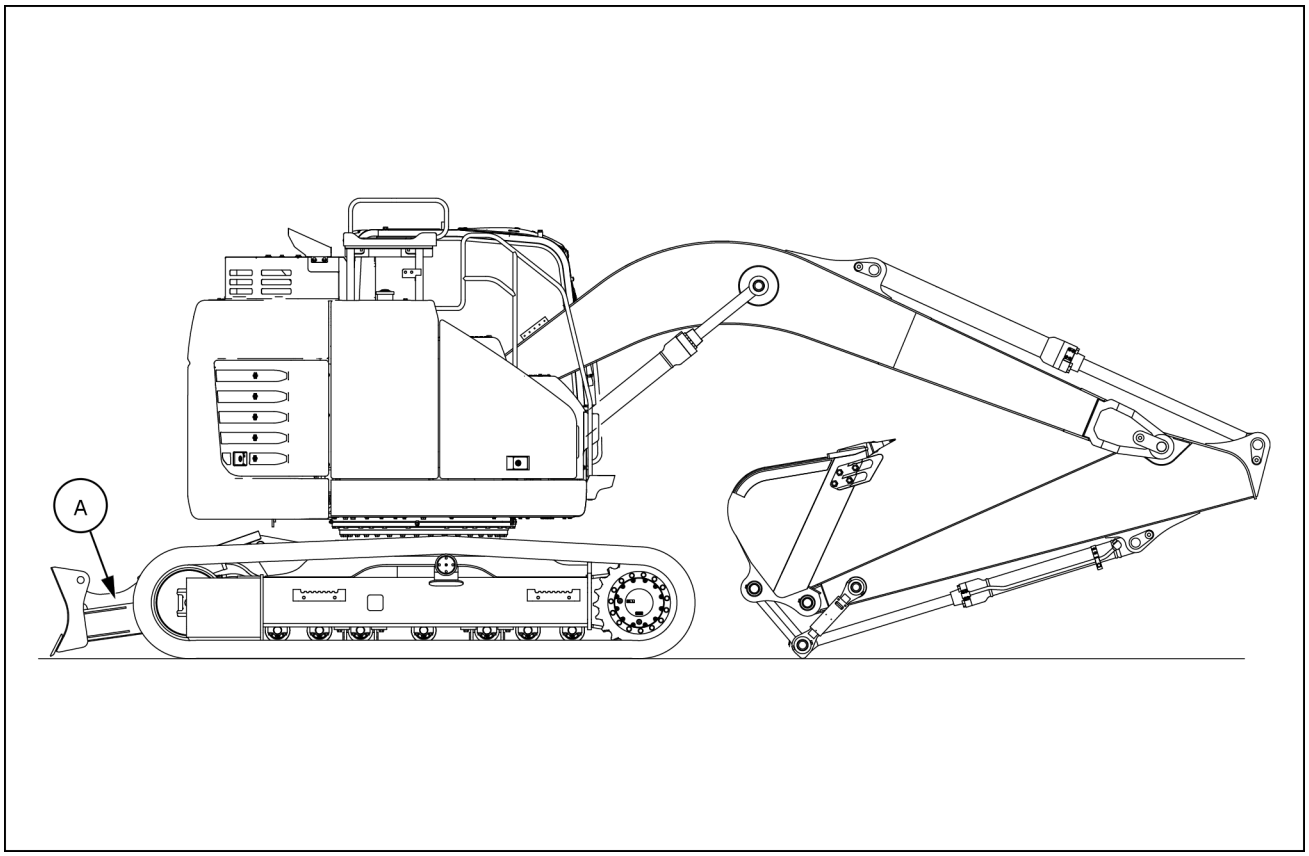
1. Extract the air circulation filter **(1)** and clean it with compressed air. If the filter is damaged, replace it.
2. Insert the air circulation filter **(1)** into its seat.



SMIL17CEX0554BA 4

Grease points (Blade)

Grease the blade every **50 h**.
Lubricant: **MULTI-PURPOSE GREASE EXTREME PRESSURE AND ANTI-WEAR NLGI 2**.



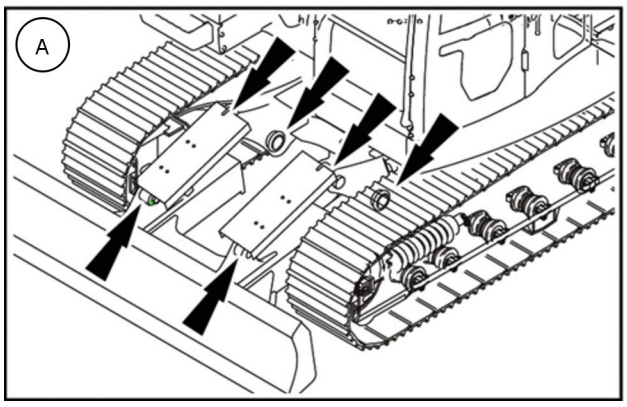
SMIL17CEX3554FA 1

NOTE: *the blade shall be lubricated every* ***10 h*** *if non-genuine grease is used.*

- Blade main pins: two grease fittings.
- Blade cylinders top pins: two grease fittings.
- Blade cylinders bottom pins: two grease fittings.

NOTICE: *the blade shall be lubricated every* ***10 h*** *if the machine is operated in water or mud.*

NOTE: *after lubrication, refit the protective plastic caps to the grease fittings.*

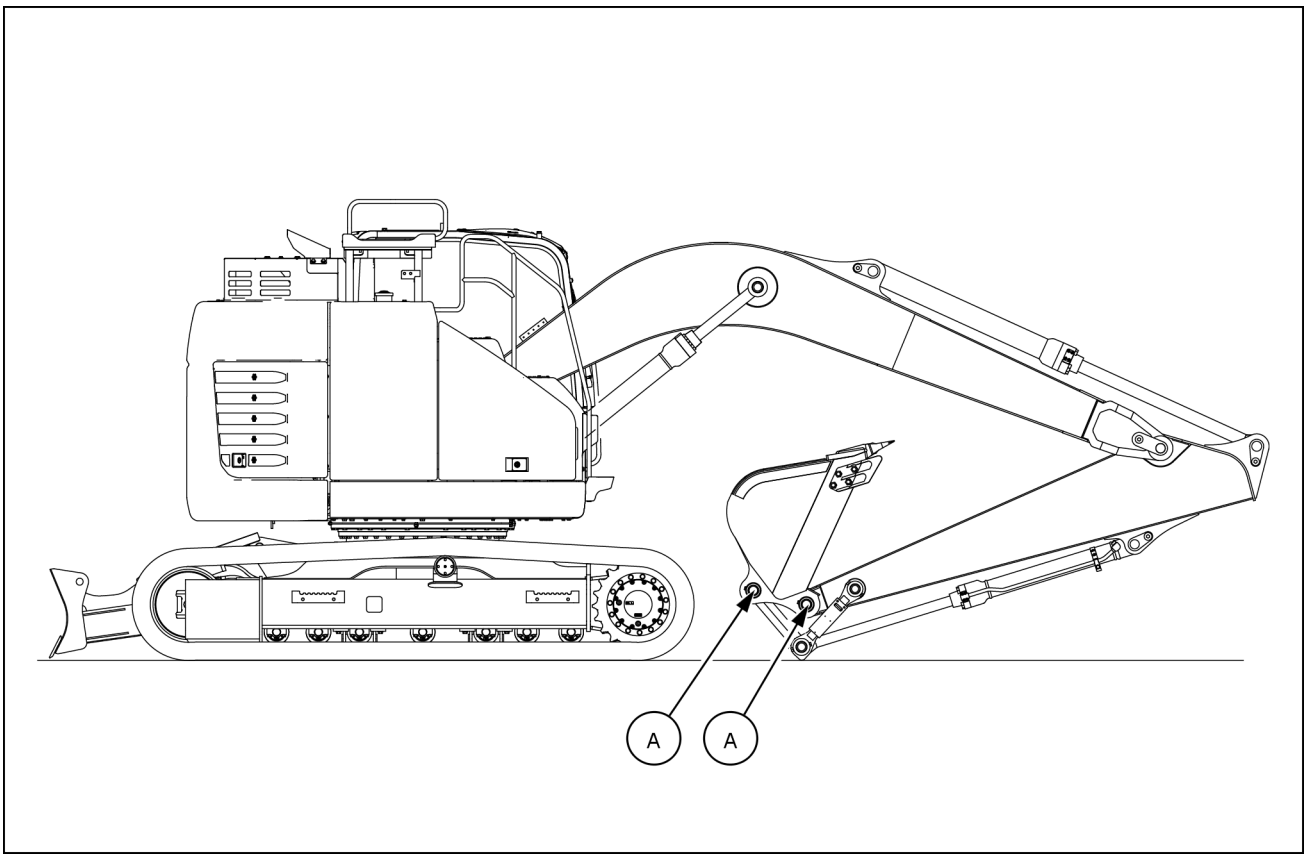


SMIL14CEX0107AA 2

Every 250 hours

Grease points (Bucket)

Grease the bucket linkage every **250 h**.
Lubricant: **MULTI-PURPOSE GREASE EXTREME PRESSURE AND ANTI-WEAR NLGI 2**.



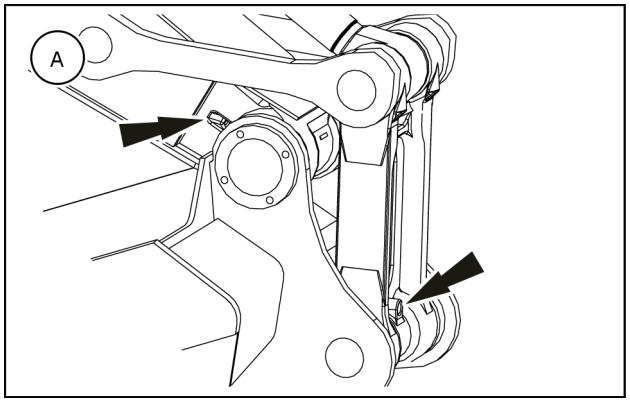
SMIL17CEX3554FA 1

NOTE: *the bucket linkage shall be lubricated every* ***10 h*** *if non-genuine grease is used.*

Bucket linkage: two grease fittings.

NOTICE: *the bucket linkage shall be lubricated every* ***10 h*** *if the machine is operated in water or mud.*

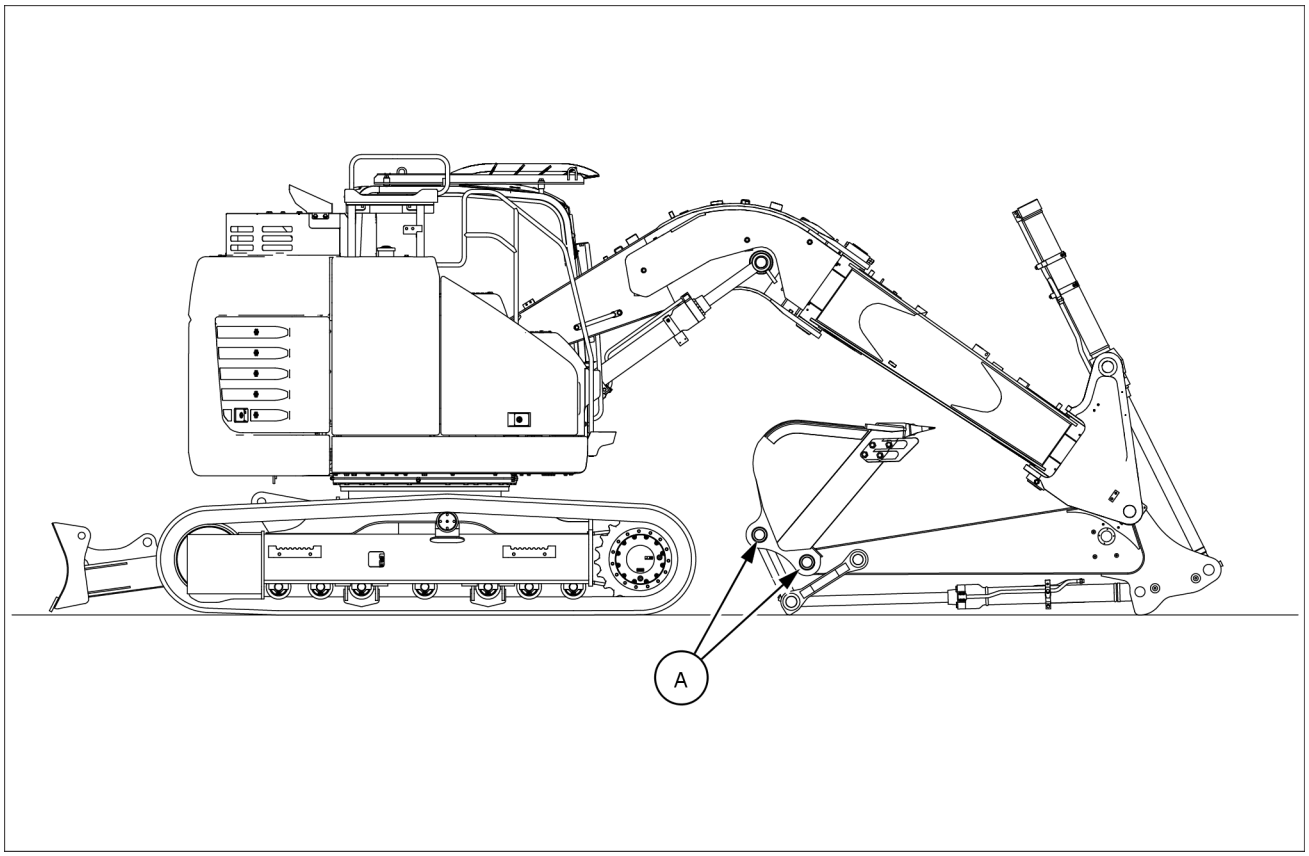
NOTICE: *the bucket linkage shall be lubricated every* ***10 h*** *if any attachment other than a bucket is used.*



SMIL14CEX2731AA 2

Grease points (Bucket, Offset)

Grease the bucket linkage every **250 h**.
Lubricant: **MULTI-PURPOSE GREASE EXTREME PRESSURE AND ANTI-WEAR NLGI 2**.



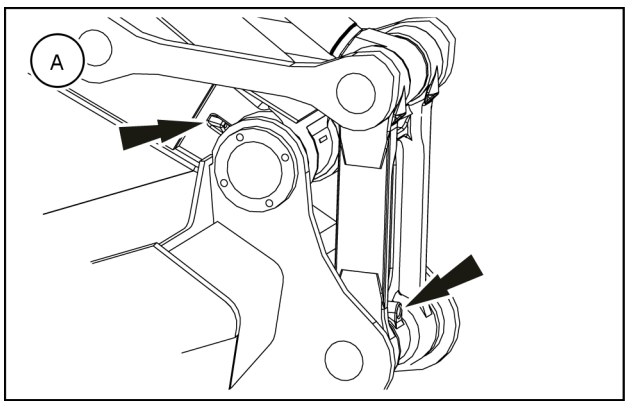
SMIL17CEX7206FA 1

NOTE: *the bucket linkage shall be lubricated every* ***10 h*** *if non-genuine grease is used.*

Bucket linkage: two grease fittings.

NOTICE: *the bucket linkage shall be lubricated every* ***10 h*** *if the machine is operated in water or mud.*

NOTICE: *the bucket linkage shall be lubricated every* ***10 h*** *if any attachment other than a bucket is used.*



SMIL14CEX2731AA 2

Swing reduction unit oil

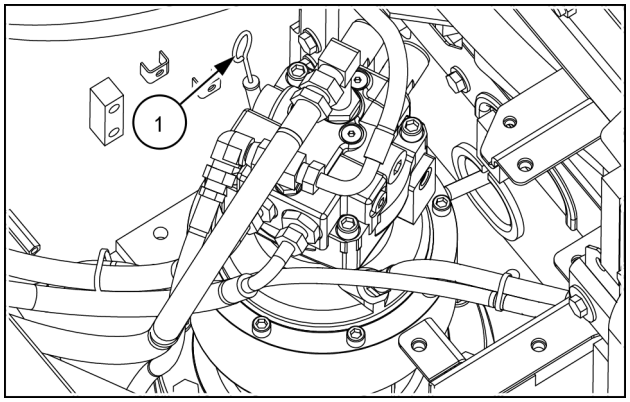
⚠ WARNING

Hot surface possible!
Wait for all components to cool before performing any operation.
Failure to comply could result in death or serious injury.

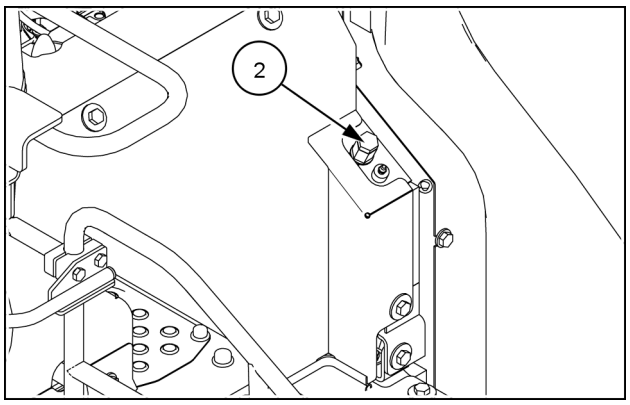
W0251A

Check the swing reduction gear oil level every **250 h**.
Lubricant: **HYPOID GEAR OIL EXTREME PRESSURE 80W-90**

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key.
2. Reach the service platform in the center of the machine. Refer to page **6-4**.
3. Remove the oil gauge **(1)**, clean it with a neat cloth, and check the oil level. Oil needs to reach the hatched area.
   If necessary, supply oil via the fill port **(2)**, and check the oil level again.
4. Attach the oil gauge **(1)**.



SMIL17CEX3821AA 1



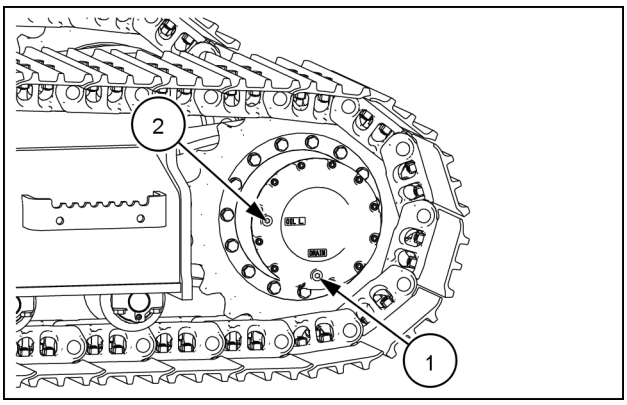
SMIL20CEX1316AA 2

Travel reduction units oil

Check the travel reduction gears oil level every **250 h**.
Lubricant: **HYPOID GEAR OIL EXTREME PRESSURE 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 the port **(2)**, it is sufficient.

   If necessary, add oil through the port **(2)** until the oil comes up to the bottom edge of the port **(2)**.
5. Check the O-ring seal of the level plug **(2)** for damages, and replace it if necessary. Insert the level plug **(2)** with seal tape wrapped around it.
6. Repeat Steps **2** to **5** for the other travel reduction gear.
7. Run the machine slowly to check that there are no leaks.



SMIL15CEX9565AA 1

Engine primary air filter

⚠ CAUTION

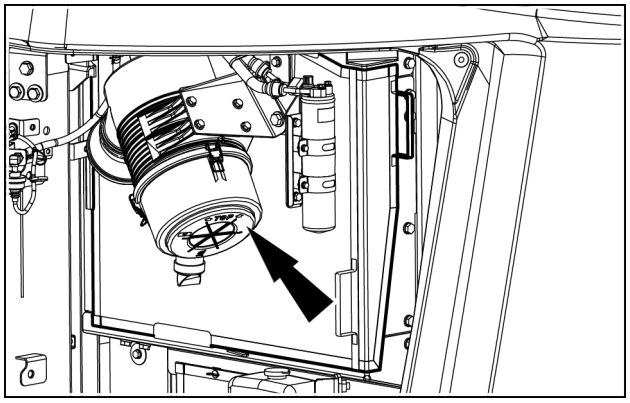
Flying debris!
Compressed air can propel dirt, rust, etc. into the air. Wear eye and face protection when using compressed air.
Failure to comply could result in minor or moderate injury.

C0049A

Clean the engine primary air filter every **250 h** or when the AIR FILTER message is displayed.

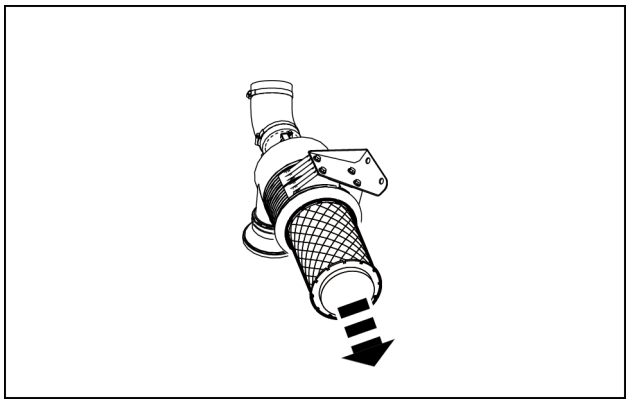
NOTE: *The primary element can be cleaned. The secondary element cannot be cleaned and must be changed.*

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key.
2. Open the left-hand door.
3. Release the fasteners, and remove the cover.



SMIL17CEX3528AA 1

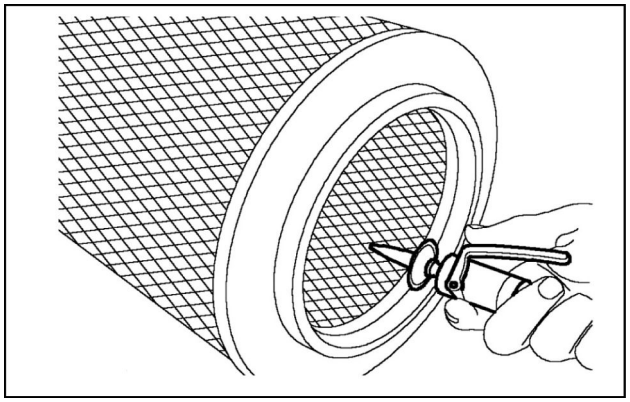
4. Remove the primary element.



SMIL17CEX3269AA 2

When the primary element is dry:
Blow compressed air at very low pressure from the inside to the outside.
Hold the compressed air nozzle at a position at least **3 cm** (**1.181 in**) away from the inside wall of the element. When no more dust comes out of the primary element, cleaning is complete.

NOTE: *Be sure to keep the compressed air pressure below* ***7 bar****.*



SMIL14CEX2795AA 3

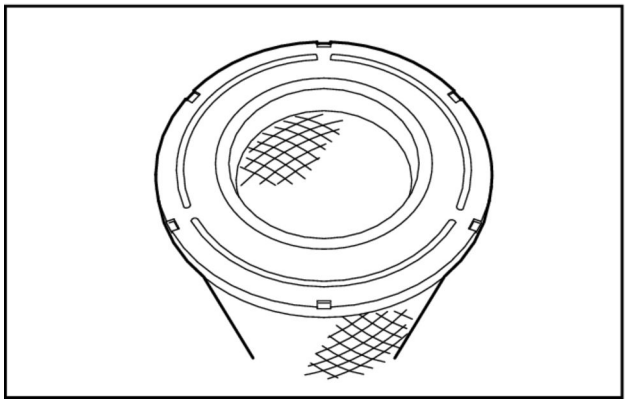
NOTE: *Do not use compressed air if there is oil or soot in the element.*

If the cartridge is greasy:

Clean it in water, with suitable detergent. (Consult your CASE CONSTRUCTION dealer).

Instructions for using the detergent are printed on the package.

NOTE: *Dry the element out completely before installing it. It is advisable to keep a clean spare element ready that can be installed on the air cleaner while the cleaned element is drying.*

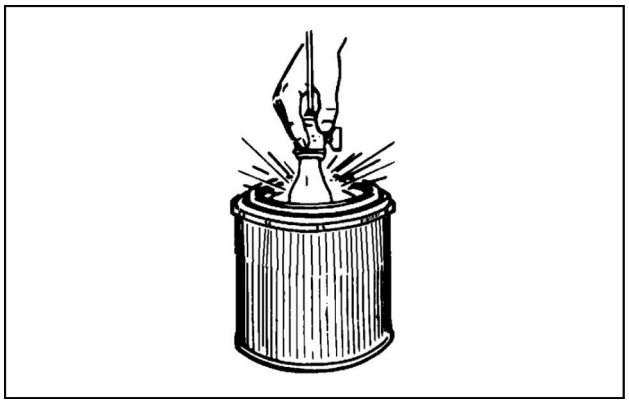


SMIL13CEX2757AA 4

Inspecting the element

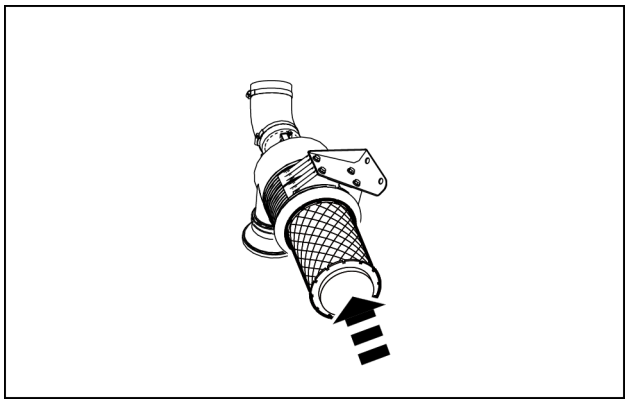
Check the element for damage by placing an inspection lamp inside the element.

NOTE: *Change the element if light can be seen through a hole, however small.*



SMIL14CEX2797AA 5

5. Clean the inside of the air cleaner case, and attach the primary element.
6. Attach the cover (with the "TOP" display facing up), and lock the fasteners.

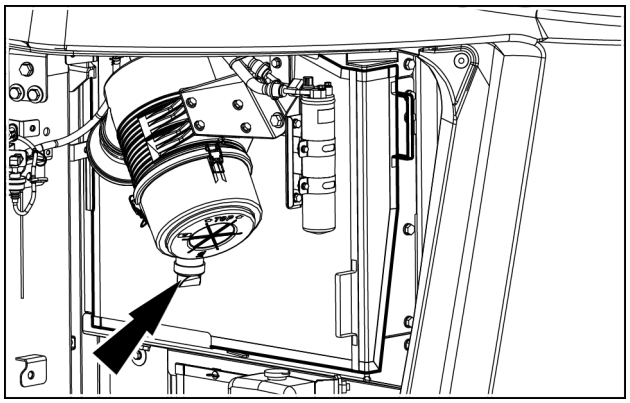


SMIL17CEX3269AA 6

NOTICE: *The mass air flow (MAF) sensor is mounted on the inlet duct of the air cleaner. Output of the engine may be restricted if any dust is attached to the MAF sensor or failure of sensing part of the MAF sensor due to usage of retailed cleaning fluid.*
Pay attention not to allow dust to invade the inlet duct when replacing the air cleaner element. Also, pay attention not to spray retailed cleaning fluids to the MAF sensor when using them.

7. Check that the dust ejector under the filter is operating correctly.

NOTE: *If, after cleaning, smoke exhaust is abnormal, be sure to replace the primary element of the air cleaner.*



SMIL17CEX3528AA 7

Battery electrolyte level

⚠ WARNING

Improper operation or service of this machine can result in an accident.
Before working on any component(s) of the electrical circuit, put the ignition key in the off (shut down) position. When disconnecting batteries, always disconnect the negative (-) cable first. When reconnecting batteries, always connect the negative (-) cable last.
Failure to comply could result in death or serious injury.

W0943A

⚠ WARNING

Battery acid causes burns. Batteries contain sulfuric acid.
Avoid contact with skin, eyes or clothing. Antidote (external): Flush with water. Antidote (eyes): flush with water for 15 minutes and seek medical attention immediately. Antidote (internal): Drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately.
Failure to comply could result in death or serious injury.

W0111A

⚠ WARNING

Battery gas can explode!
To prevent an explosion: 1. Always disconnect the negative (-) battery cable first. 2. Always connect the negative (-) battery cable last. 3. Do not short circuit the battery posts with metal objects. 4. Do not weld, grind, or smoke near a battery.
Failure to comply could result in death or serious injury.

W0011A

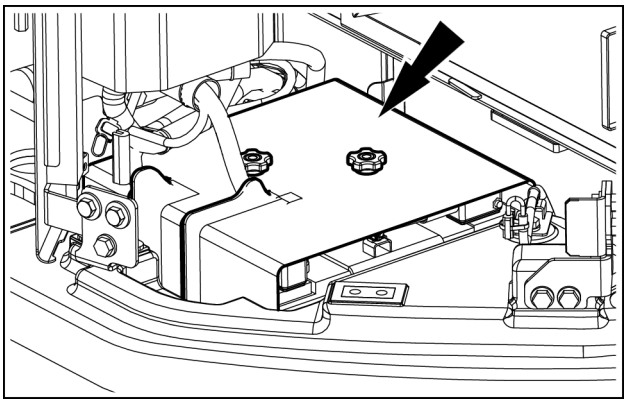
⚠ WARNING

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

W0005A

Check the electric charge of the battery every **250 h**.
Check of electrolyte level of the battery every **250 h**.

To access the batteries, open the left-hand door, and then remove the skid plate.

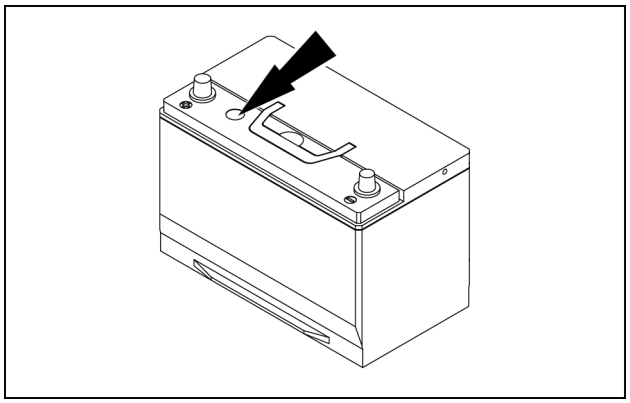


SMIL17CEX3529AA 1

Inspection of maintenance-free battery charge state

The charge indicator on the battery shows the state of charge of the battery:

- If the color is green the charge is correct.
- If the color is black the charge is insufficient. Recharge the battery until the indicator turns green.
- Transparent (colorless): replace the battery as soon as possible.



SMIL15CEX9567AA 2

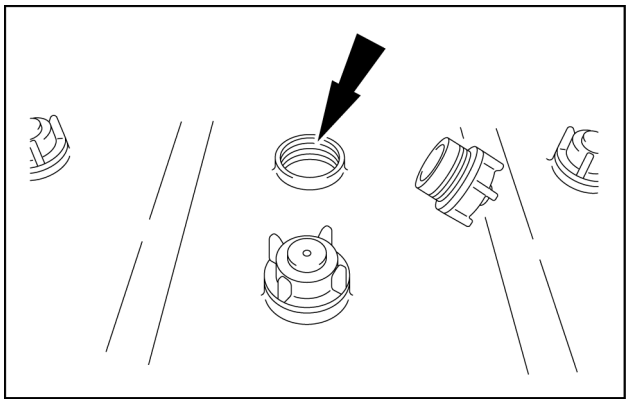
Checking the electrolyte level of a maintenance-free battery

Remove the cell caps and check the level in each batteries cell.

- The level should be between **10 mm** (**0.4 in**) and **15 mm** (**0.6 in**) above the plates.
- Add distilled water if necessary, then install the cell caps.

NOTE: *When adding distilled water at temperatures below* ***0 °C*** *(****32 °F****), the batteries must be charged or the engine run for two hours approximately in order to ensure that the distilled water and the electrolyte are properly mixed.*

NOTE: *Make sure the battery terminals are clean and coated with grease and that the cables are properly tightened.*

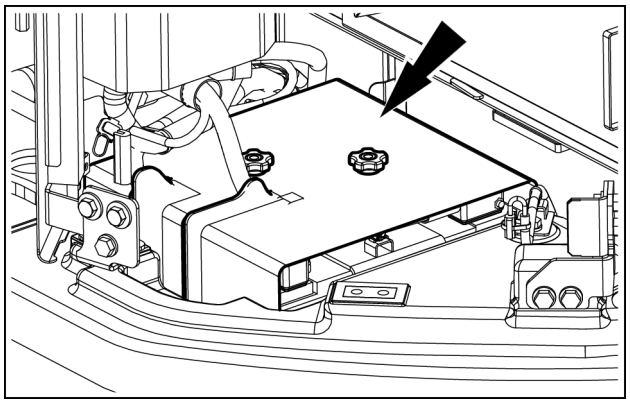


SMIL14CEX2831AA 3

Replacement of the battery

To replace the batteries proceed as follows:

1. Set the battery disconnect switch to the OFF position. Remove the terminal protection caps, and cut-off the negative-terminal cable. Next, cut-off the positive-terminal cable. Remove the anti-sulfuration pellets and the battery clips.
2. Attach a new battery, and return the clips to their original positions.
3. Clean the cables and the battery terminals, and apply grease.
4. Attach new anti-sulfuration pellets, and connect the positive and the negative cable to the positive and the negative terminal of the battery respectively. Attach the terminal protection caps. Set the battery disconnect switch to the ON position.
5. Attach the skid plate.



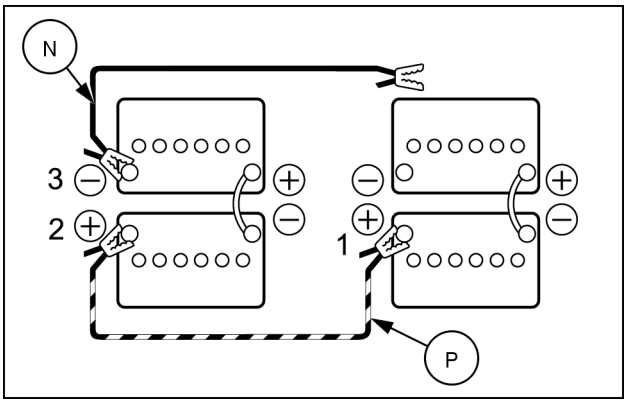
SMIL17CEX3529AA 4

Starting the engine with booster batteries

⚠ WARNING

Improper operation or service of this machine can result in an accident.
An error connecting auxiliary starting cables or short-circuiting battery terminals can cause an accident. Connect auxiliary starting cables as instructed in this manual.
Failure to comply could result in death or serious injury.

W0263A



SMIL15CEX5131AA 5

Make sure that the booster battery voltage corresponds to the voltage system of the machine **24 V**.
Make sure that the starter key is in OFF position and the gate lock lever in inward position.
Make sure to use supply cables of appropriate dimensions (at least **50 mm²** (**0.1 in²**).

1. Connect one terminal of the positive jumper cable **(P)** to the positive (+) pole of the machine batteries.
2. Connect the other terminal of the positive jumper cable **(P)** to the positive (+) pole of the booster batteries.
3. Connect one terminal of the negative jumper cable **(N)** to the negative (-) pole of the booster batteries.
4. Connect the other terminal of negative jumper cable **(N)** to the upper frame of the machine (ground).

Turn the starter key to ON position and start the engine.
After the engine has started proceed as follows:

1. Disconnect the terminal of negative jumper cable **(N)** from the upper frame of the machine (ground).
2. Disconnect the other terminal of the negative jumper cable **(N)** from the negative (-) pole of the booster batteries.
3. Disconnect the terminal of the positive jumper cable **(P)** from the positive (+) pole of the booster batteries.
4. Disconnect the other terminal of the positive jumper cable **(P)** from the positive (+) pole of machine batteries.

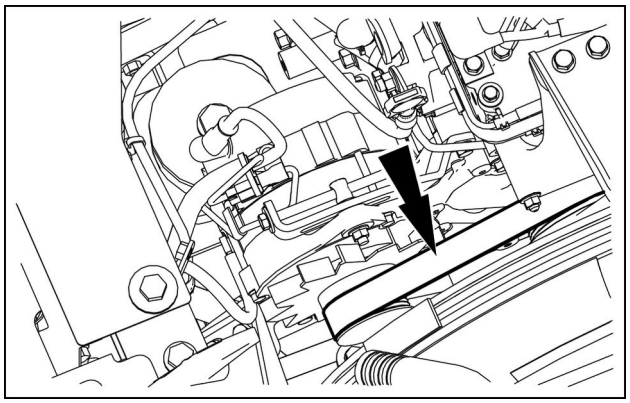
Fan and alternator drive belt

Check the belt tension every **250 h**.

NOTICE: *Operating the engine with loosened belt may cause over heat of the engine or insufficient charging of the battery due to slipping belt in its housing.*

Apply finger pressure of about **10 kg** (**22.0 lb**) center of the belt while the engine is shut down and the starter key is removed.
Loose of tension should be about **6.6 – 7.4 mm** (**0.260 – 0.291 in**).

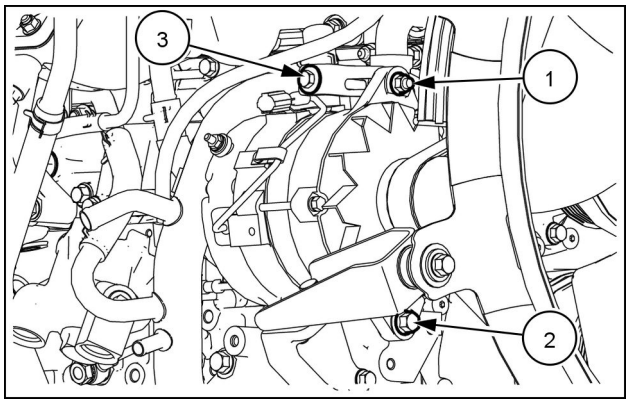
NOTE: *Check any indication of damage on the pulley or belt due to wear. Check thoroughly to make sure that the belt is correctly engaged to groove of the pulley. The belt must be replaced if it is elongated, it has cracks or it is worn out.*



SMIL15CEX9108AA 1

Adjustment of tension

1. Slightly loosen the lock nut **(1)** and the bolt **(2)** of the generator.
2. Turn the adjust bolt **(3)** of the generator so that the belt tension is within the specified range.
3. Tighten the lock nut **(1)** and the bolt **(2)** to the specified torque.
   Lock nut **(1)** tightening torque: **20 – 30 N·m** (**15 – 22 lb ft**)
   Bolt **(2)** tightening torque: **44 – 58 N·m** (**32 – 43 lb ft**)

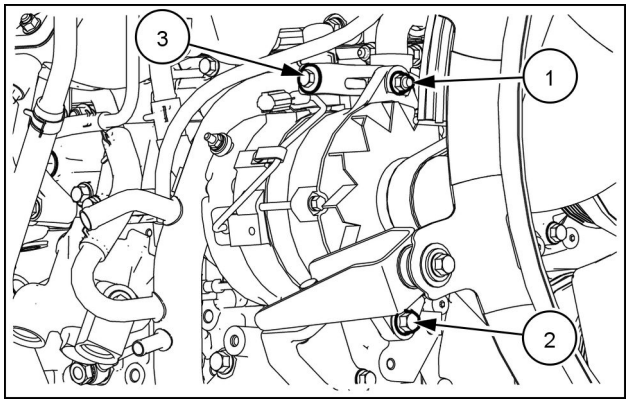


SMIL15CEX9109AB 2

Replacement of belt

NOTICE: *If the belt breaks, the message ALTERNATOR is displayed. Stop the engine, remove the starter key, and then replace the belt.*

1. Loosen the lock nut **(1)** and the bolt **(2)**.
2. Remove the belt.
3. Install a new belt, and adjust the belt tension.
4. After the adjustment, run the engine at the idling speed for approximately **5 min**, and then stop the engine to recheck the belt tension.



SMIL15CEX9109AB 3

Hydraulic oil tank

⚠ WARNING

Burn hazard!
Before performing any service on the hydraulic system, you must allow it to cool. Hydraulic fluid temperature should not exceed 40 °C (104 °F).
Failure to comply could result in death or serious injury.

W0241A

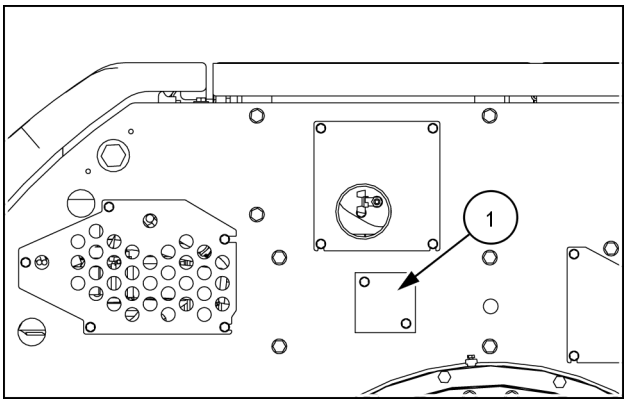
Drain water and sediment from the hydraulic oil tank every **250 h**

NOTICE: *The hydraulic tank must be drained taking precautions so that any foreing material may gets inside. Failing to comply will lead to severe damages to the hydraulic system.*

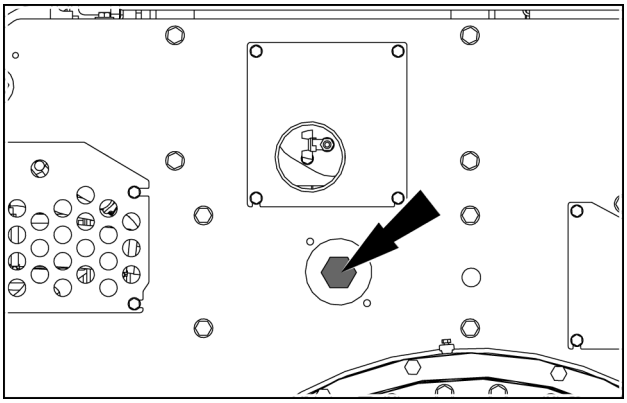
To drain water and sediment from the hydraulic oil tank proceed as follows:

1. Park the machine on a hard and level ground. Orient the upper structure frame so that there is enough free space under the hydraulic tank to place a barrel of suitable capacity.
2. Stop the engine and remove the starter key.
3. Release all the pressure in the hydraulic tank. Refer to page **6-11**.
4. Remove the lower panel **(1)** below the hydraulic tank to access the drain plug.
5. Place a container of a suitable capacity under the drain plug.
6. Open the plug and drain the accumulated sediment and water.

   NOTICE: *the drained materials shall be disposed according to the local Regulations for special wastes.*
7. Close the drain plug, and install the lower panel below the hydraulic tank.
8. Check the level of the hydraulic fluid in the system, and refill if needed.



SMIL19CEX2665AA 1



SMIL20CEX1303AA 2

Tightening torques

Check the tightening torques every **250 h** (after the first **50 h** during the run-in period).

NOTICE: *At the end of each working day, check all mounting nuts and screws for tightness and tighten if necessary. Make sure no hardware items are missing. Replace them, if necessary.*

Component	Screw	Wrench	Torque setting
Travel reduction gears (*)	M16	**24 mm**	**267 – 312 N·m** (**197 – 230 lb ft**)
Drive sprocket (*)	M16	**24 mm**	**267 – 312 N·m** (**197 – 230 lb ft**)
Idler wheel (*)	M16	**24 mm**	**267 – 312 N·m** (**197 – 230 lb ft**)
Upper roller (*)	M16	**24 mm**	**267 – 312 N·m** (**197 – 230 lb ft**)
Lower roller (*)	M16	**24 mm**	**267 – 312 N·m** (**197 – 230 lb ft**)
Chain guide (*)	M16	**24 mm**	**267 – 312 N·m** (**197 – 230 lb ft**)
Counterweight	M30	**46 mm**	**1435 – 1650 N·m** (**1058 – 1217 lb ft**)
Turntable (lower frame)	M16	**24 mm**	**280 – 312 N·m** (**207 – 230 lb ft**)
Turntable (swing frame)	M16	**24 mm**	**280 – 312 N·m** (**207 – 230 lb ft**)
Swing reduction gear (*)	M16	**24 mm**	**280 – 312 N·m** (**207 – 230 lb ft**)
Front engine mount (*)	M16	**24 mm**	**265 – 314 N·m** (**195 – 232 lb ft**)
Rear engine mount (*)	M16	**24 mm**	**265 – 314 N·m** (**195 – 232 lb ft**)
Engine rear bracket (*)	M12	**19 mm**	**109 – 127 N·m** (**80 – 94 lb ft**)
Radiator	M12	**19 mm**	**63 – 74 N·m** (**46 – 55 lb ft**)
Hydraulic pump flange (*)	M10	**17 mm**	**63 – 73 N·m** (**46 – 54 lb ft**)
Hydraulic pump (*)	M16	Hexagon wrench	**223 – 247 N·m** (**164 – 182 lb ft**)
Hydraulic tank (*)	M16	**24 mm**	**232 – 276 N·m** (**171 – 204 lb ft**)
Fuel tank (*)	M16	**24 mm**	**232 – 276 N·m** (**171 – 204 lb ft**)
DEF/ADBLUE® tank (*)	M16	**24 mm**	**226 – 265 N·m** (**167 – 195 lb ft**)
Center joint (*) (lower frame)	M12	**19 mm**	**109 – 127 N·m** (**80 – 94 lb ft**)
Center joint (*) (swing frame)	M12	**19 mm**	**88 – 107 N·m** (**65 – 79 lb ft**)
Control valve (*)	M16	**24 mm**	**267 – 312 N·m** (**197 – 230 lb ft**)
Cab	M16	**24 mm**	**149 – 173 N·m** (**110 – 128 lb ft**)
Battery	M10	**17 mm**	**19 – 29 N·m** (**14 – 21 lb ft**)

NOTE: *On the screws with mark (*), use **LOCTITE® 262™** or its equivalent.*

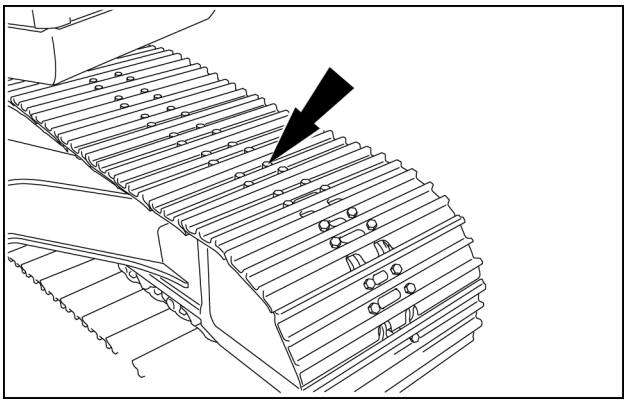
Track shoe bolt torque

Check the torque of the track shoe every **250 h** (after the first **50 h** during the run-in period)

NOTE: *If the tracks are too tight, they wear quickly. If tracks are not tight enough, they wear quickly and the links can catch on the sprocket wheel or slide off the idler wheel or the sprocket wheel. Clean the tracks after work.*

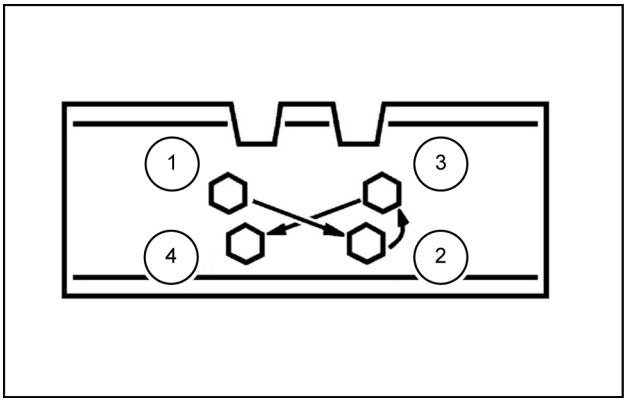
NOTE: *Check the screws for tightness periodically. Do not use the machine with track pad screws loose. Otherwise, the screws may come out to cause damage to tracks.*

The screws tightening torque must be **373 – 451 N·m** (**275 – 333 lb ft**).



SMIL17CEX3811AA 1

NOTE: *Follow the specified order when tightening the screws.*

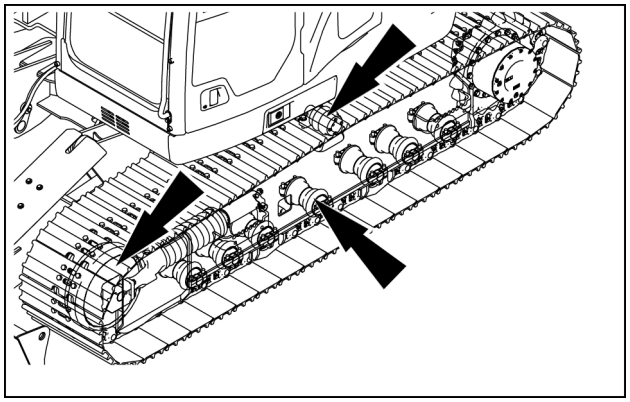


SMIL14CEX2859AA 2

Track rollers and idler wheels

Visually check the track rollers and the idler wheels every **250 h**

Floating seals are used on the upper/lower roller and the idler wheel. Although they endure enough until the average overhaul timing, visually check for oil leaks before work. If there is any oil leak, the components need to be replaced. Consult the CASE CONSTRUCTION dealer.



SMIL17CEX3266AA 1

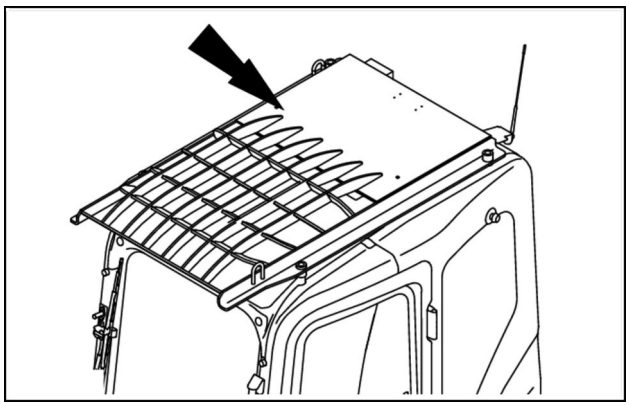
Cab protection (ROPS and FOPS)

Check the cab protection every **250 h** (after the first **50 h** during the run-in period)

Check the retaining hardware, if necessary retighten the screws.

Check the absence of cracks, rust or holes in the protective structure and the components that constitute it. Ageing, bad weather and accidents can cause damage. If you have even the slightest doubt regarding the condition of the structure, consult your CASE CONSTRUCTION Dealer.

If the protective structure has suffered any accident, it is necessary to replace the damaged components of the structure in order to restore the initial protection, consult your CASE CONSTRUCTION Dealer.



SMIL13CEX2661AB 1

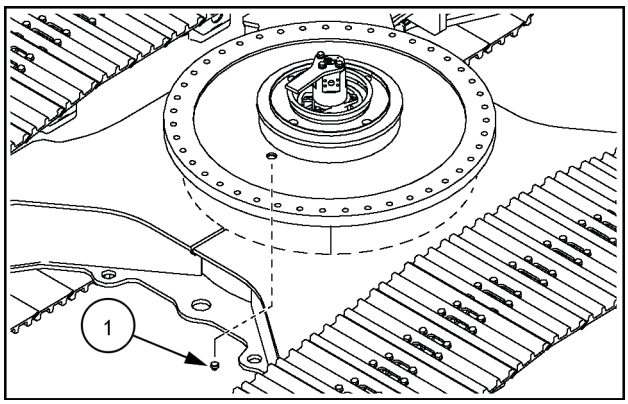
Every 500 hours

Turntable bearing

Check the greasing of the swing gears, and grease the turntable bearing every **500 h**.
Lubricant: **MULTI-PURPOSE GREASE EXTREME PRESSURE AND ANTI-WEAR NLGI 2**

Prepare a can of loose and clean grease for checking the greasing of the swing gears. Prepare a gun and cartridges of clean grease for greasing the turntable bearing.

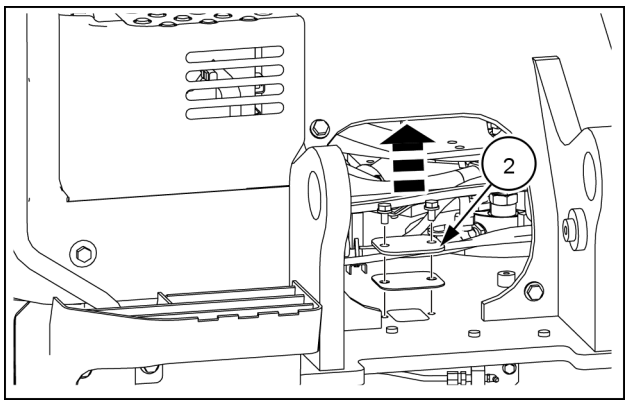
1. Park the machine on a hard and level ground. Orient the upper structure frame parallel to the undercarriage.
2. Operate the boom, arm, and attachment controls so that the arm stands vertical and the attachment rests on the ground.
3. Set the gate lock lever to lock position, stop the engine, and remove the starter key.
4. Remove the cover in the bottom of the lower frame. Remove the plug **(1)** so to drain water, and greasy mud. Snug tighten the plug **(1)**.



SMIL14CEX4312AB 1

5. Check the greasing of the swing gears. Remove the inspection cover **(2)** on the front of the upper frame.
6. Remove all dirty grease.
7. Check the surfaces of the swing gears for excessive wearing or damages. If any excessive wearing or damage is found, immediately call the CASE CONSTRUCTION Dealer for inspection and repair.
8. Taking clean grease from the can, restore proper greasing of the surface of the teeth of the swing ring.

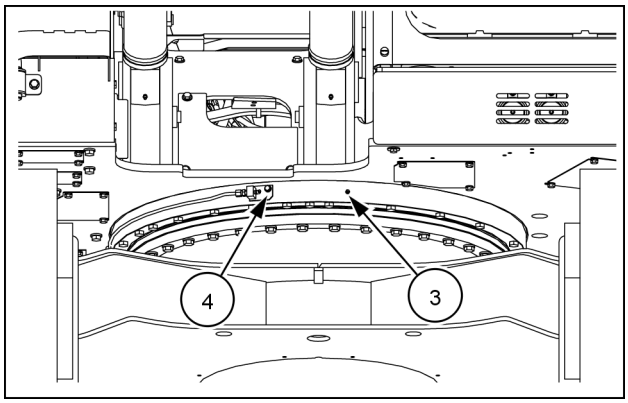
NOTICE: *do not grease the teeth at full height in order not to have too much grease spread beyond the swing ring.*



SMIL17CEX3539AA 2

9. Grease the turntable bearing. Remove the protective caps from the fittings **(3)** and **(4)** on the bearing.
10. Using the grease gun, inject clean grease into the fitting **(3)** so to push the old grease out from the lower sealing lip of the turntable bearing. Stop injecting as clean grease comes out from the lip.
11. Clean up the grease that exceeded the sealing lip, and reset the lip to its seating position.

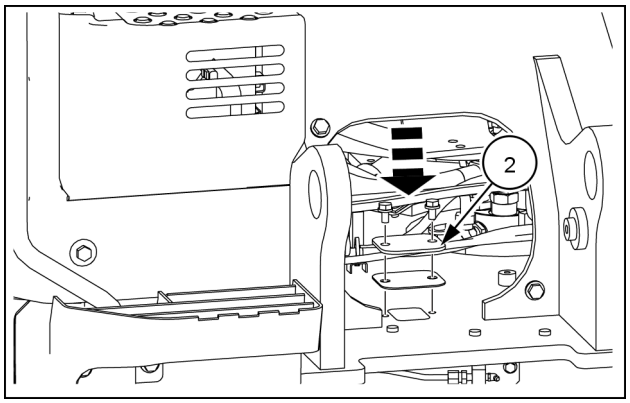
NOTICE: *Always check the sealing lip for excessive wearing or damages. If any excessive wearing or damage is found, immediately call the CASE CONSTRUCTION Dealer for inspection and repair.*



SMIL17CEX3538AA 3

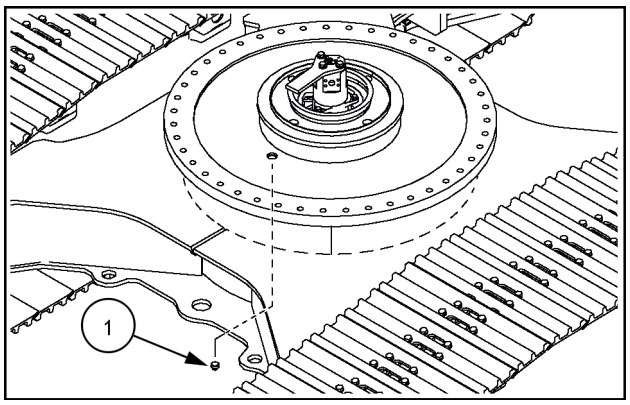
12. Inject the same amount of grease into the fitting **(4)**. Reach the opposite side of the turntable bearing, clean up the grease that exceeded the sealing lip, and reset the lip to its seating position.
13. Get onto the cab, start the engine, and set the gate lock lever to unlock position.

14. Turn the upper frame **45°** clockwise. Set the gate lock lever to lock position, stop the engine, and remove the starter key.
15. Repeat the procedure described in the steps from 6 to 14 for three more times.
16. Complete the check of the greasing on the other half of the swing ring. Make sure to check the greasing every **45°**.
17. Install the inspection cover **(2)** on the front of the upper frame.



SMIL17CEX3539AA 4

18. Get onto the cab, start the engine, and set the gate lock lever to unlock position. Slowly turn the upper structure frame counterclockwise, and complete three **360°** rotations.
19. Stop the rotation. Slowly turn the upper structure frame clockwise and complete two **360°** rotations.
20. Stop the rotation. Set the gate lock lever to lock position, stop the engine, and remove the starter key.
21. Clean up any more grease that has come out from the sealing lip of the turntable bearing. Make sure that the sealing lip is reset to its seating position.
22. Clean the grease fittings on the turntable bearing, and install the protective caps.
23. Remove the plug **(1)** so to drain any more water and greasy mud. Tighten the plug **(1)**. Install the cover in the bottom of the lower frame.



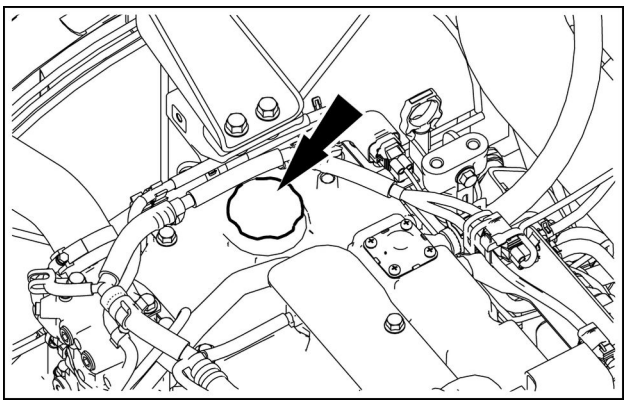
SMIL14CEX4312AB 5

Engine oil and filter

Replace the engine oil every **500 h**
Replace the engine oil filter every **500 h**
Lubricant: **NO.1 ENGINE™ OIL SEMI-SYNTHETIC 10W-40**
Quantity: **17 L** (**4.5 US gal**)

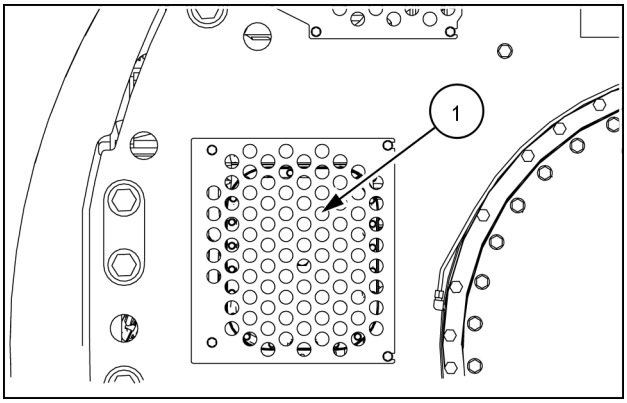
NOTE: *Replace the oil while the engine is warm. Doing so helps the oil in flowing.*

1. Park the machine on a flat and level place. Stop the engine and remove the starter key.
2. Reach the service platform in the center of the machine. Refer to page **6-4**.
3. Raise and lock the engine hood, and remove the filling plug.



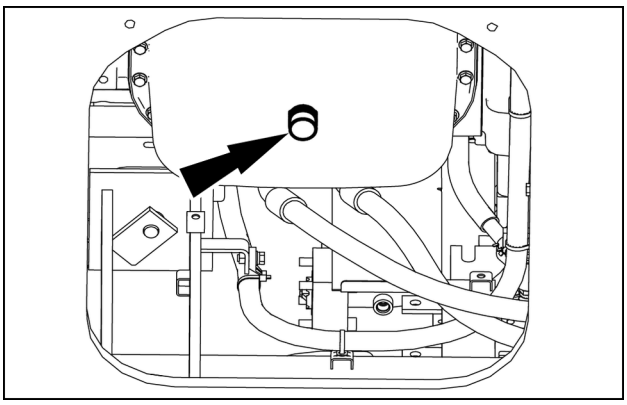
SMIL15CEX9124AA 1

4. Remove the lower panel **(1)** under the engine oil pan.



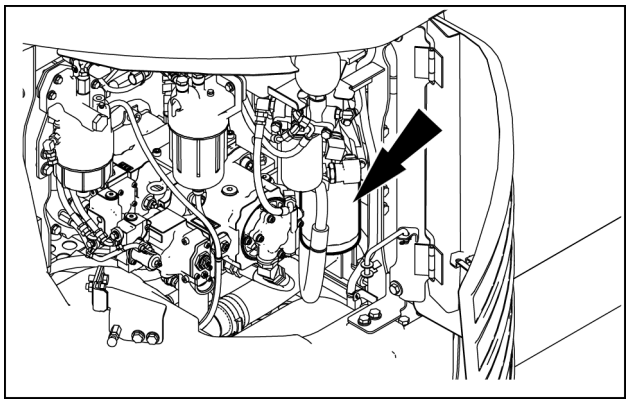
SMIL19CEX2666AA 2

5. Remove the protection cap from the drain valve on the engine oil pan.
6. Take out the extension drain hose provided with the machine from the left front storage compartment. Screw one end of the extension drain hose onto the drain valve on the engine, and put the other end into a container with an appropriate capacity to drain the oil.
7. Remove the extension drain hose, and attach the protection cap to the drain valve on the engine housing. Install the lower panel **(1)**. Stow the extension drain hose in the left front storage compartment.



SMIL15CEX9125AA 3

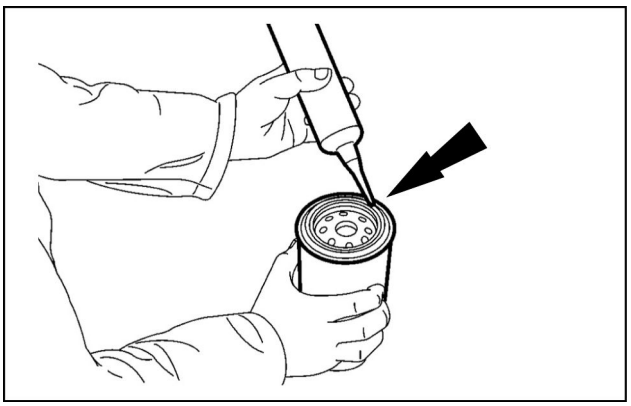
8. Open the rear right-hand door. Clean the area around the engine oil filter and remove it with the specific tool provided with the machine.



SMIL17CEX3536AA 4

9. Apply an oil film finely to the seal of a new filter.
10. Attach a new filter. Turn the filter until the seal touches the filter head, and then tighten it further a half turn by hand.

NOTE: *Do not use a filter wrench for tightening the filter. Overtightening can damage the filter and its seal.*

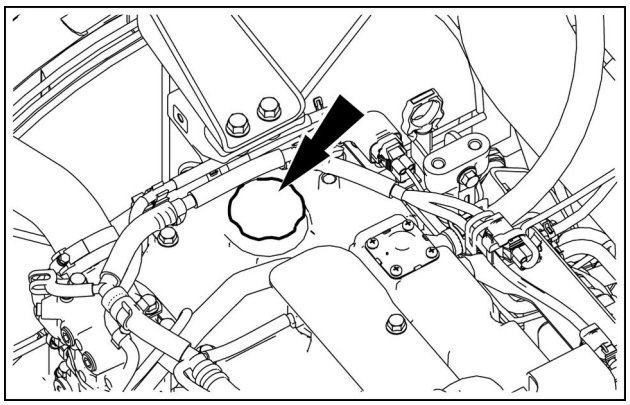


SMIL14CEX2751AA 5

11. Add new engine oil to the engine. Attach the filling plug.
12. Run the engine for several minutes to check that there is no leak.

    Recheck the level, and add oil if necessary.

NOTE: *always wait* ***15 min*** *to allow the oil to return to the sump before checking the oil level.*



SMIL15CEX9124AA 6

Fuel pre-filter

⚠ WARNING

Fire hazard!
When handling diesel fuel, observe the following precautions:
1. Do not smoke.
2. Never fill the tank when the engine is running.
3. Wipe up spilled fuel immediately.
Failure to comply could result in death or serious injury.

W0099A

Replace the fuel pre-filter element every **500 h**

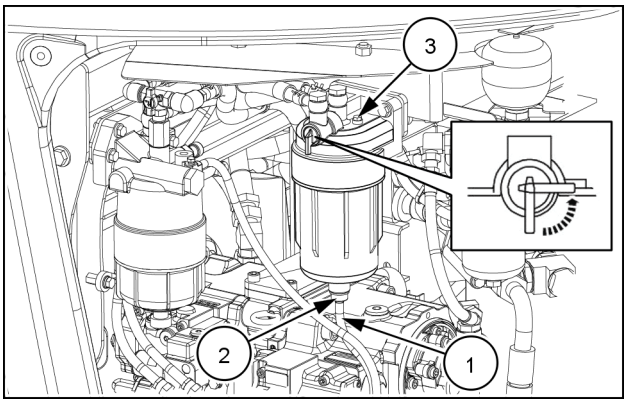
The filter element may get clogged earlier than **500 h** depending upon the quality of fuel, the integrity of filter, the functionality of the supply system, or other not regular conditions. In these cases, the message FUEL FILTER appears on the top of the display. Immediately stop machine operation, and replace the filter element in order to avoid severe damages to the fuel system.

NOTICE: *The filter must be replaced taking precautions so that any foreing material may get into the filter body or the filter element. Failing to comply will lead to severe damages to the fuel supply system and to the fuel injection system.*

NOTICE: *Never reuse fuel that rests into the filter body. To clean the filter body, use clean diesel fuel only.*

NOTICE: *Use of fuel filters other than CASE CONSTRUCTION genuine components, is prohibited.*

1. Place a container with an appropriate capacity below the end of the drain hose **(1)**.
2. Close the valve of the fuel pre-filter.
3. Loosen the drain plug **(2)** and the air bleed plug **(3)**, and drain water from the pre-filter body.
4. Clean the area around the pre-filter body, and then remove it with the specific wrench supplied with the machine.
5. Install a new filter element. Replace the seal on the pre-filter body, and then install the body on the pre-filter head by turning it manually.



SMIL17CEX3535AA 1

NOTICE: *never fill the pre-filter body with fuel before the installation.*

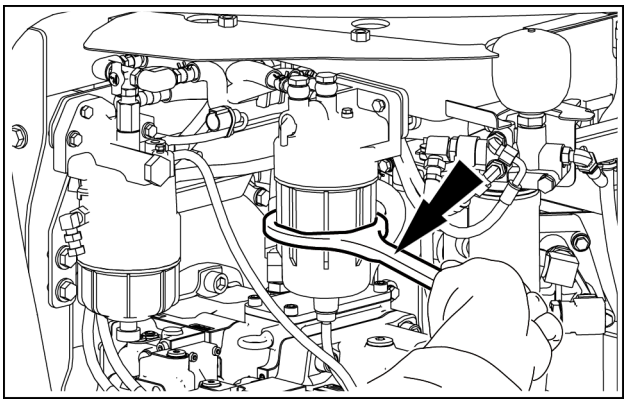
6. Tighten the body with the specific wrench. The tightening torque must be **28 – 32 N·m** (**20.65 – 23.60 lb ft**)
7. Replace the seal of the drain plug **(2)**, and attach the drain plug **(2)**. The tightening torque must be **2 – 3 N·m** (**1.48 – 2.21 lb ft**).

NOTE: *Never reuse the seal of the filter body and the seal of the drain plug **(2)**. They shall always be replaced with new seals.*

8. Tighten the air bleed plug **(3)**. The tightening torque must be **8 – 12 N·m** (**5.9 – 8.9 lb ft**).

NOTICE: *Overtightening can damage the seals.*

9. Bleed the fuel system. Refer to page **6-12**.



SMIL17CEX3540AA 2

Fuel filter

⚠ WARNING

Fire hazard!
When handling diesel fuel, observe the following precautions:
1. Do not smoke.
2. Never fill the tank when the engine is running.
3. Wipe up spilled fuel immediately.
Failure to comply could result in death or serious injury.

W0099A

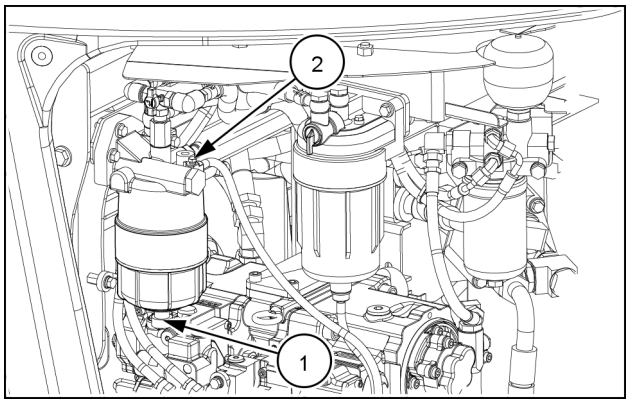
Replace the fuel filter element every **500 h**

NOTICE: *The filter must be replaced taking precautions so that any foreing material may get into the filter body or the filter element. Failing to comply will lead to severe damages to the fuel supply system and to the fuel injection system.*

NOTICE: *Never reuse fuel that rests into the filter body. To clean the filter body, use clean diesel fuel only.*

NOTICE: *Use of fuel filters other than CASE CONSTRUCTION genuine components, is prohibited.*

Take the same procedure as that for the pre-filter. The positions of the drain plug **(1)** and of the air bleed plug **(2)** of the fuel main filter are shown in the picture.



SMIL17CEX3534AA 1

Bleed the fuel system. Refer to page **6-12**

Radiator and coolers

⚠ WARNING

Flying debris!
Compressed air can propel dirt, rust, etc. into the air. Wear eye and face protection when using compressed air.
Failure to comply could result in death or serious injury.

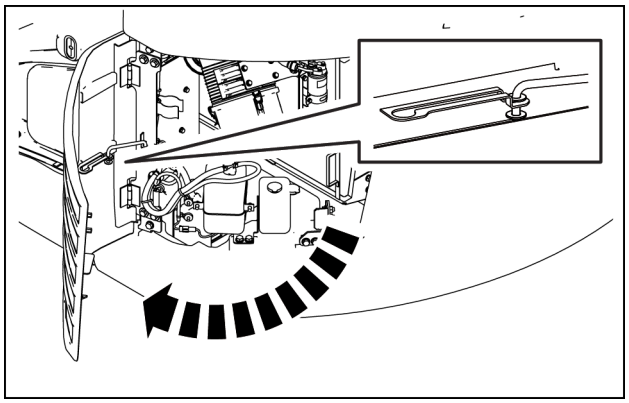
W0307A

Clean the radiator every **500 h**

NOTICE: *overheat may occur if the protection net, the radiator fin, or the oil cooler fin is clogged.*

1. Stop the engine, and remove the starter key.
2. Fully open the rear left-hand door until the door is fixed by the stay.

NOTICE: *always check that the door is fixed firmly.*

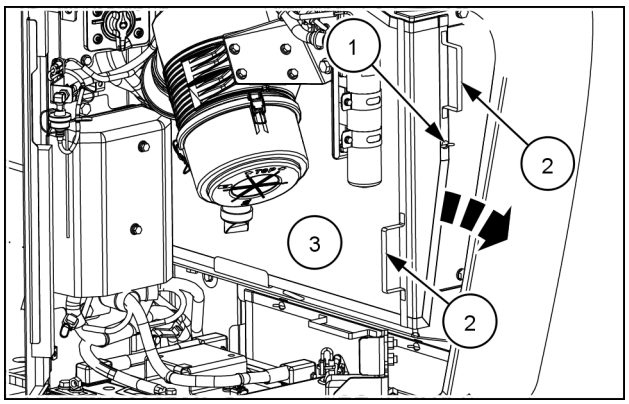


SMIL17CEX3244AA 1

3. Unlock the quick-connect clip **(1)**, hold the handles **(2)** and pull out the upper anti-dust net **(3)**.
4. Unlock the quick-connect clips **(4)**, hold the handle **(5)** and pull out the lower protection net **(6)**.
5. Use compressed air to blow away mud or dirt clogged in the nets and the radiator fin. Steam or compressed water may be used instead of compressed air.

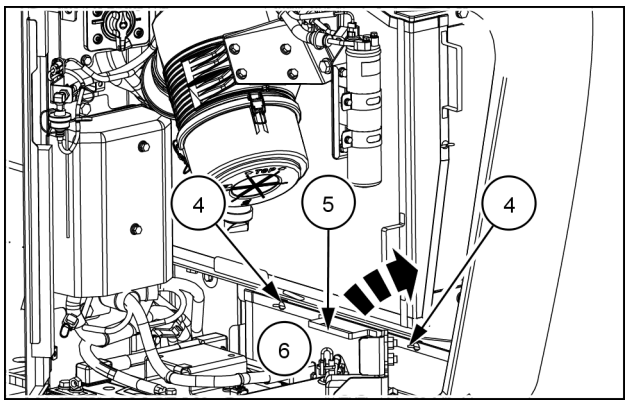
NOTICE: *Apply high-pressure vehicle-wash steam from a sufficient distance away. If the steam outlet is too close, the radiator fin may deform.*

NOTICE: *In presence of greasy or oily dust, use perchlorethylene. Use of trichloroethylene is strictly forbidden.*



SMIL17CEX3812AA 2

6. Insert the lower protection net **(6)** into the guide rails, and lead it to its resting position by holding the handle **(5)**. Lock the quick connect clips **(4)**.
7. Install the anti-dust net **(3)** and lead it into its resting position by holding the handles **(2)**. Lock the quick connect clip **(1)**.
8. Close and lock the rear left-hand door.

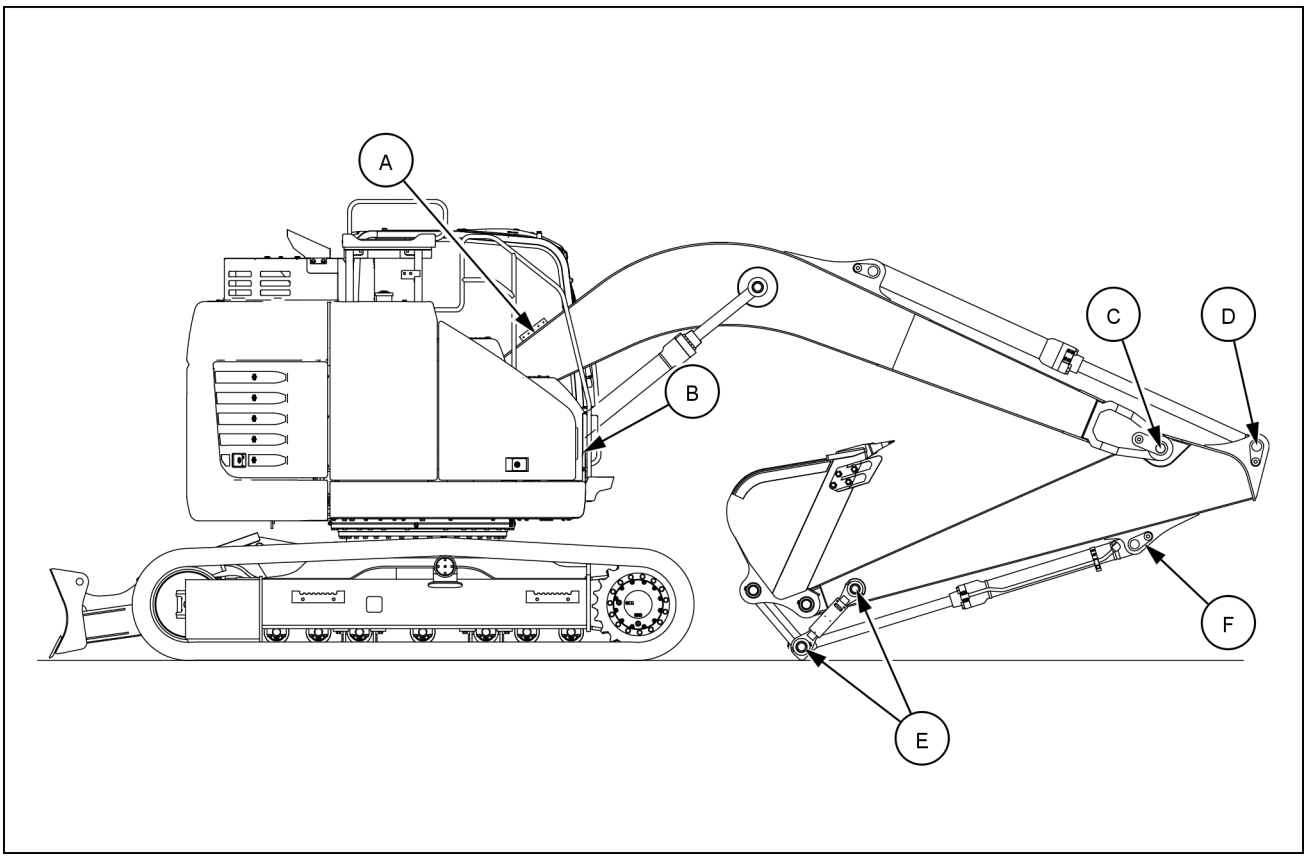


SMIL17CEX3812AA 3

Every 1000 hours

Grease points (Boom and arm)

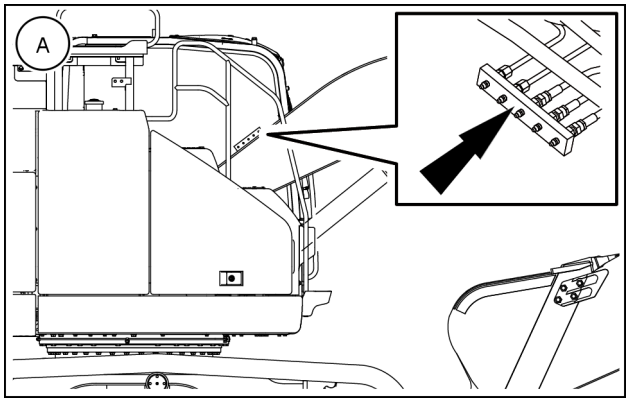
Grease the boom and arm every **1000 h**.
Lubricant: **MULTI-PURPOSE GREASE EXTREME PRESSURE AND ANTI-WEAR NLGI 2**



SMIL17CEX3554FA 1

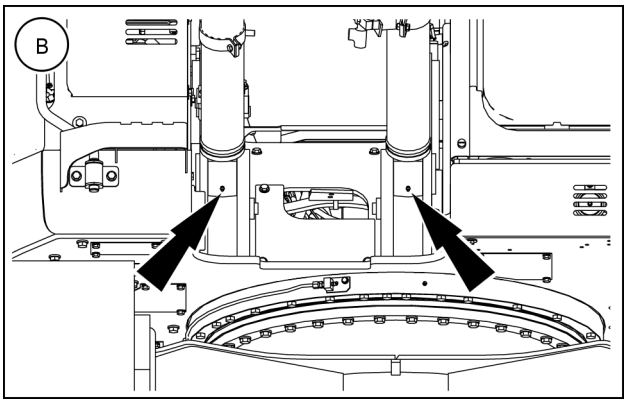
***NOTE:** the boom and the arm shall be lubricated every **50 h** if non-genuine grease is used.*

Boom bottom pin: two grease fittings.
Boom cylinder top pin: two grease fittings.
Arm cylinder bottom pin: one grease fitting.



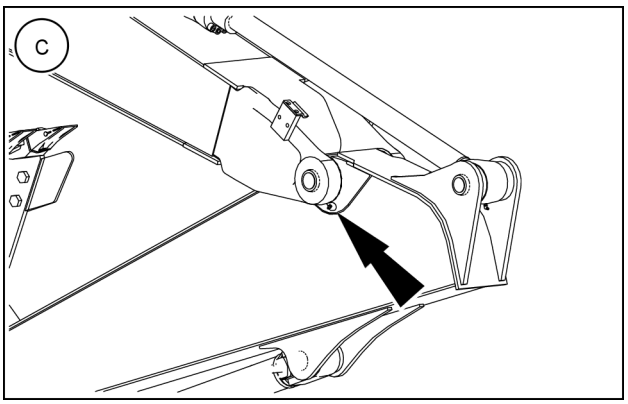
SMIL17CEX3572AA 2

Boom cylinder bottom pin: two grease fittings.



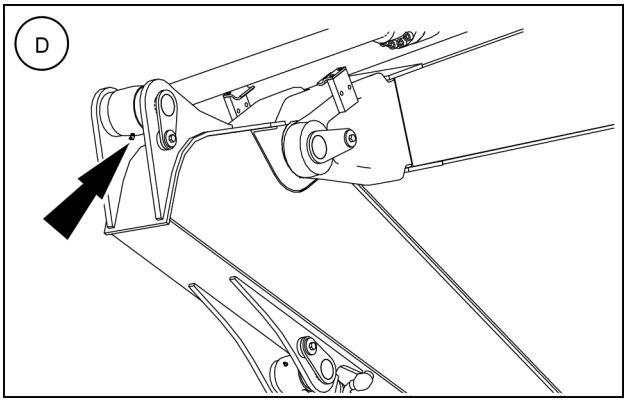
SMIL17CEX3573AA 3

Boom/arm linkage: one grease fitting.



SMIL17CEX3569AA 4

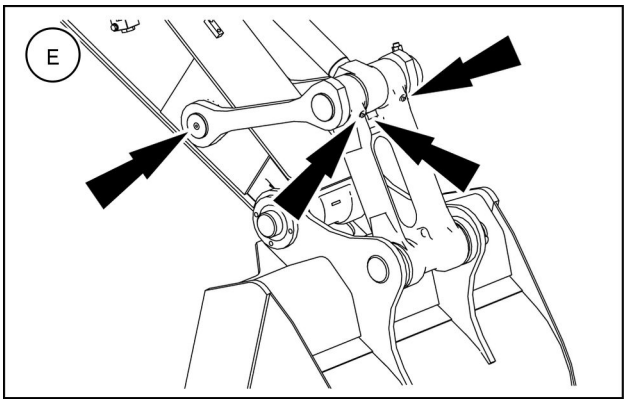
Arm cylinder top pin: one grease fitting.



SMIL17CEX3570AA 5

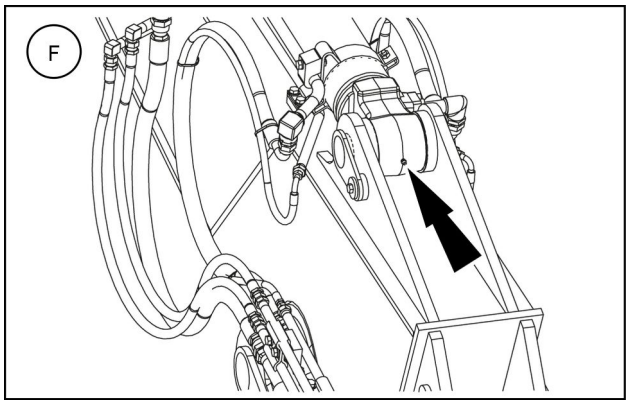
Arm link / Connecting rod: four grease fittings.

NOTICE: *the arm link and the connecting rod shall be lubricated every* ***10 h*** *if any attachment other than a bucket is used.*



SMIL14CEX2732AA 6

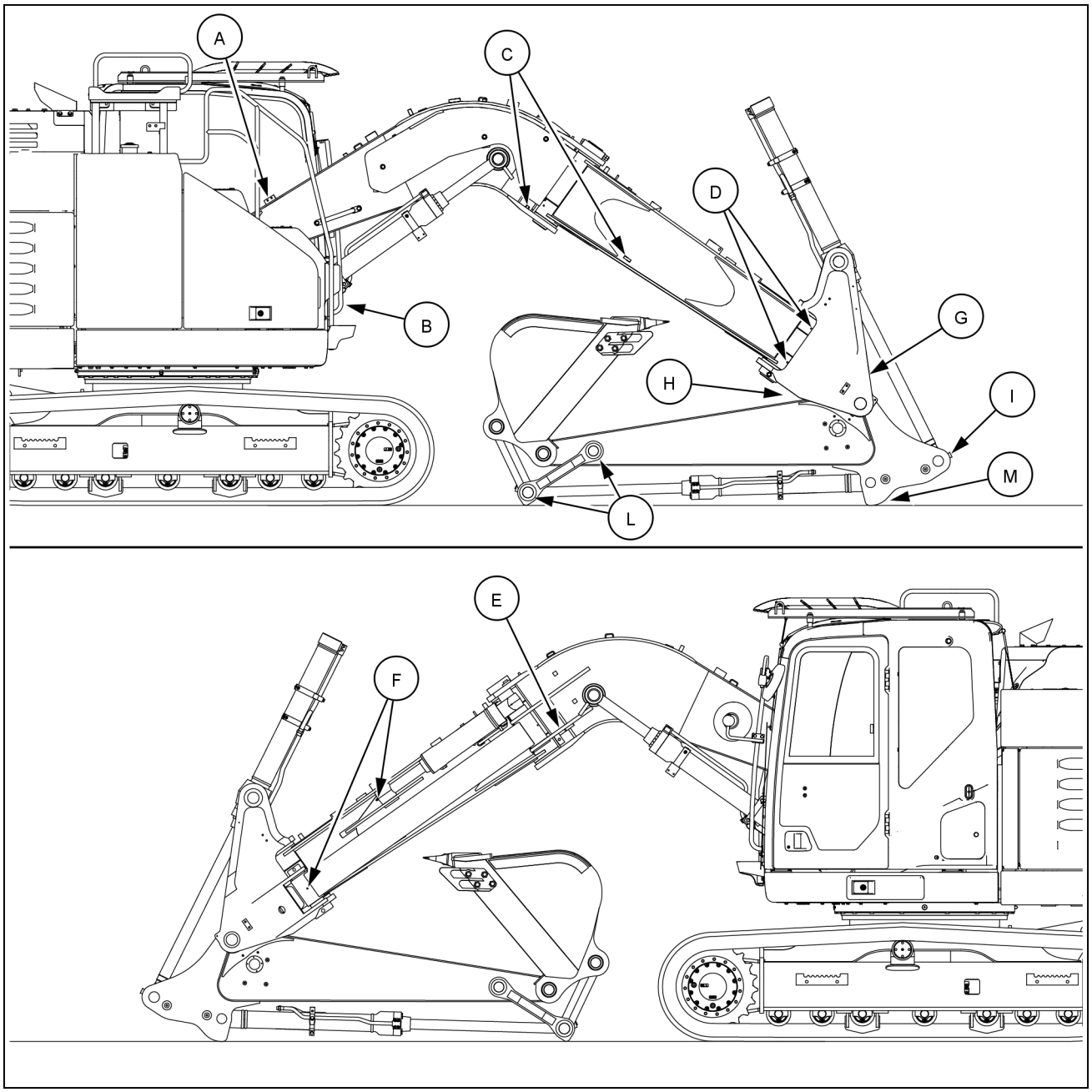
Bucket cylinder bottom pin: one grease fitting.



SMIL14CEX2733AA 7

Grease points (Boom and arm, Offset)

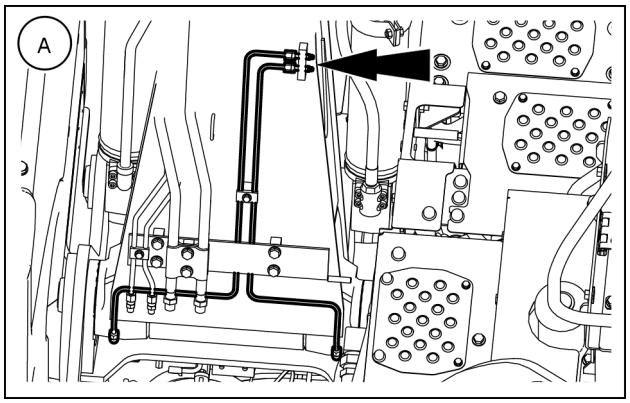
Grease the boom, the positioner, and the arm every **1000 h**.
Lubricant: **MULTI-PURPOSE GREASE EXTREME PRESSURE AND ANTI-WEAR NLGI 2**



SMIL17CEX7637GA 1

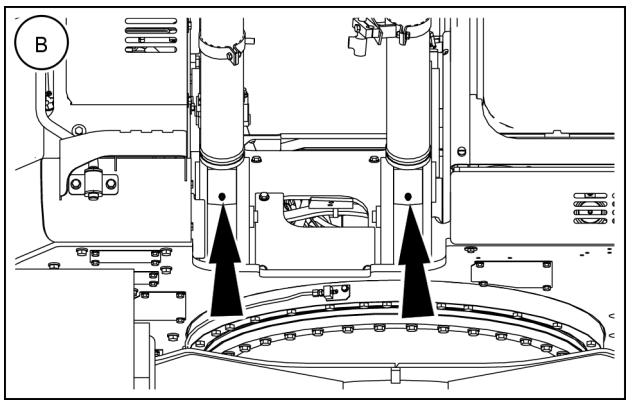
NOTE: *the boom, the positioner, and the arm shall be lubricated every* ***50 h*** *if non-genuine grease is used.*

Boom bottom pin: two grease fittings.



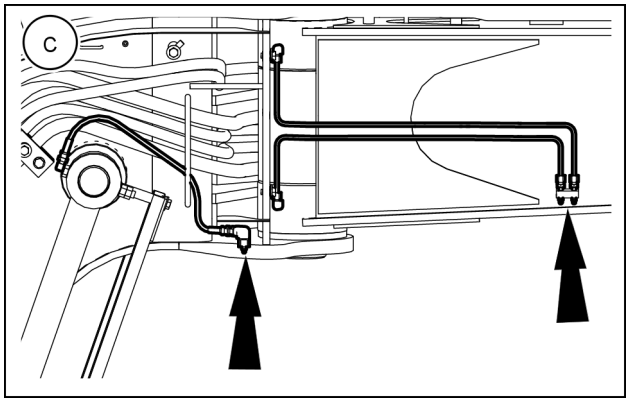
SMIL17CEX7634AA 2

Boom cylinder bottom pin: two grease fittings.



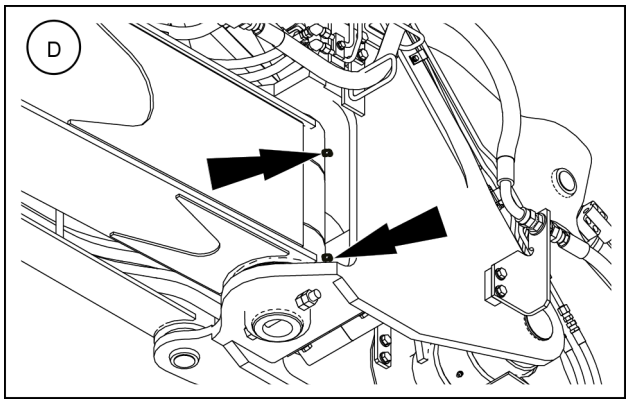
SMIL17CEX7209AA 3

Right boom cylinder top pin: one grease fitting.
Boom top pin: two grease fittings.



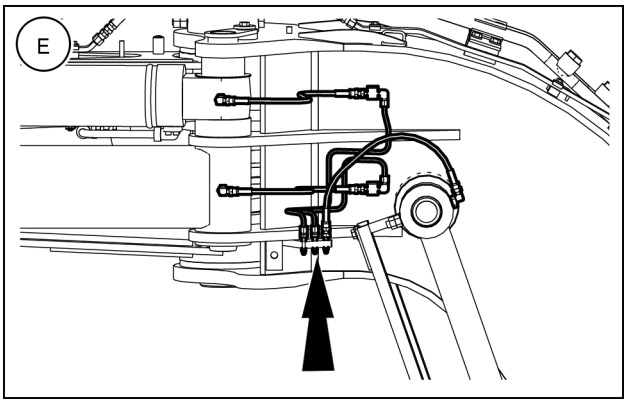
SMIL17CEX7210AA 4

Positioner top pin: two grease fittings.



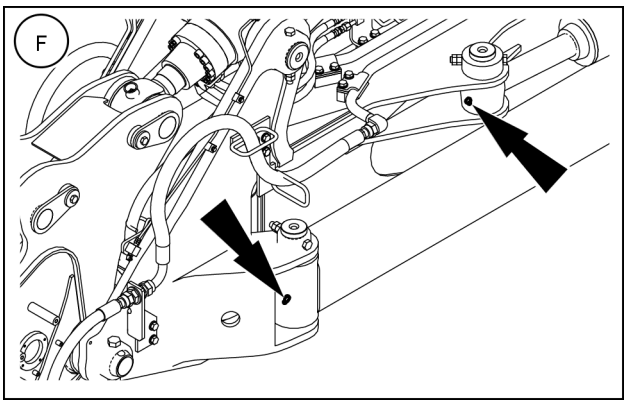
SMIL17CEX7633AA 5

Left boom cylinder top pin: one grease fitting.
Boom / Positioner linkage: one grease fitting.
Positioning cylinder bottom pin: one grease fitting.



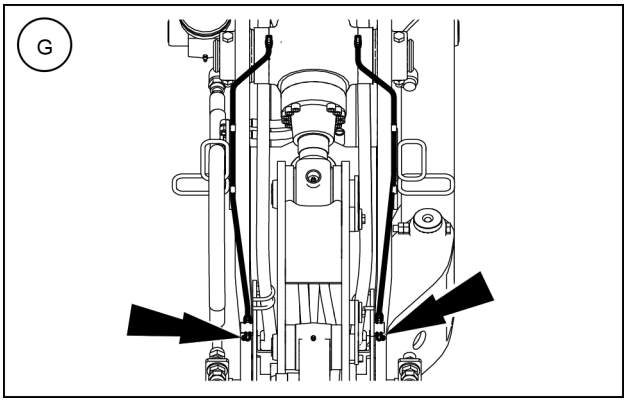
SMIL17CEX7635AA 6

Positioning cylinder top pin: one grease fitting.
Positioner / Front bracket linkage: one grease fitting.



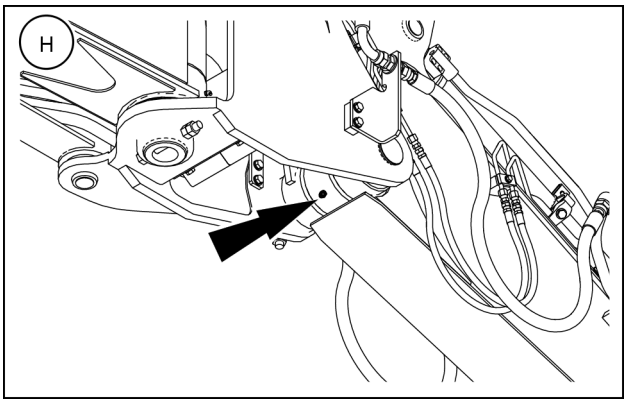
SMIL17CEX7641AA 7

Arm cylinder center pin: two grease fittings.



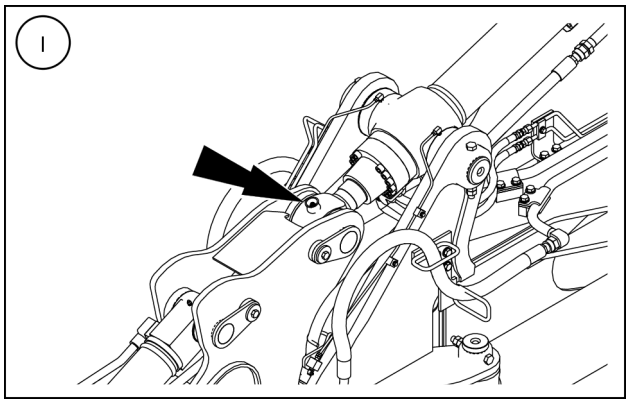
SMIL17CEX7208AA 8

Front bracket / Arm linkage: one grease fitting.



SMIL17CEX7642AA 9

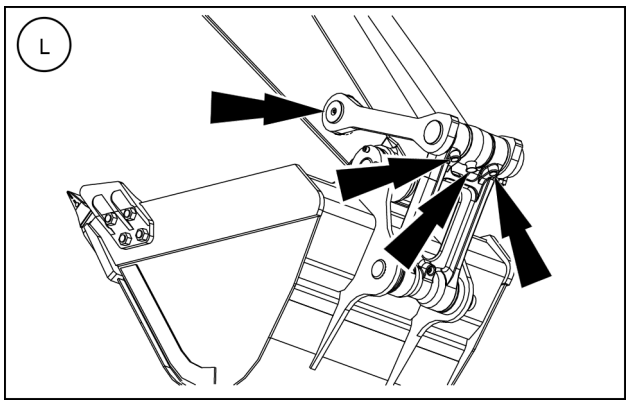
Arm cylinder top pin: one grease fitting.



SMIL17CEX7639AA 10

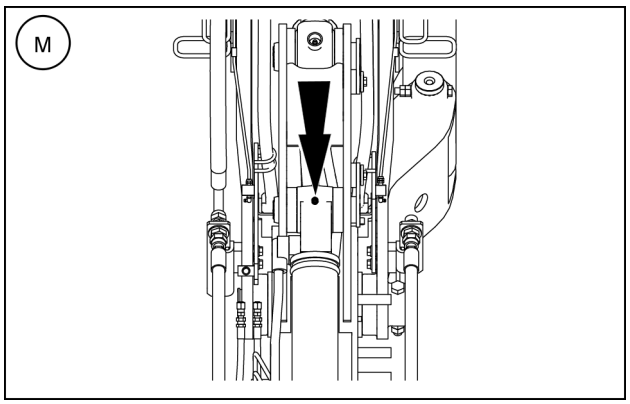
Arm link/Connecting rod: four grease fittings.

NOTICE: *the arm link and the connecting rod shall be lubricated every* ***10 h*** *if any attachment other than a bucket is used.*



SMIL17CEX7632AA 11

Bucket cylinder bottom pin: one grease fitting.

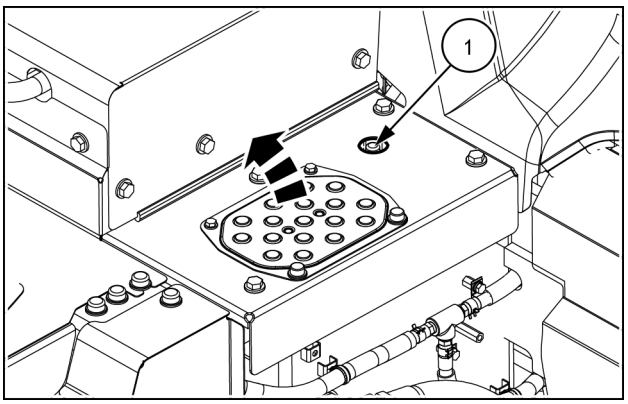


SMIL17CEX7640AA 12

Hydraulic tank breather

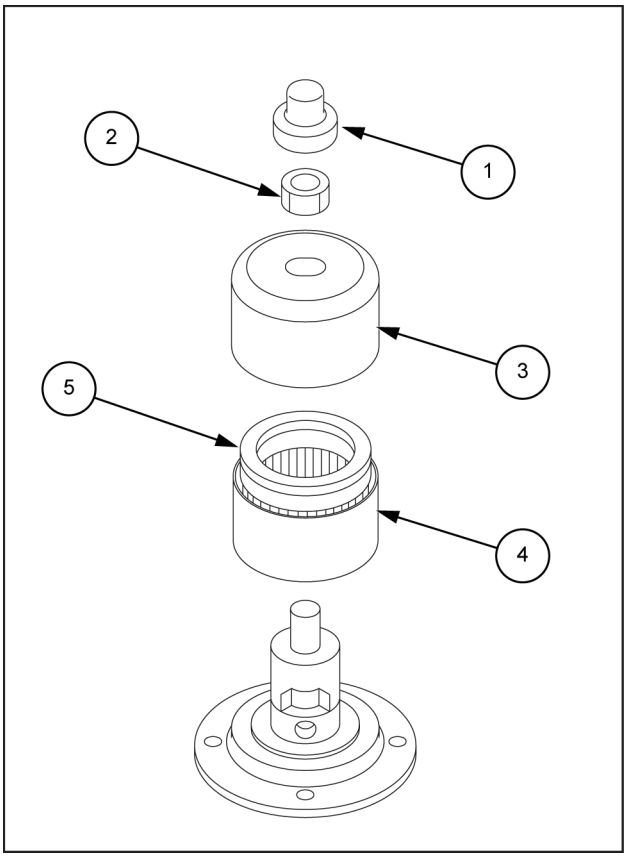
Replace the hydraulic tank breather every **1000 h**

1. Reach the service platform in the center of the machine. Refer to page **6-4**.
2. Keep pressed the button **(1)** on the top of the breather to release all the pressure in the hydraulic tank.
3. Remove the panel over the hydraulic tank. Clean the top surface of the hydraulic tank.



SMIL17CEX3530AA 1

4. Remove the button **(1)** from the breather.
5. Remove the nut **(2)** and the cover **(3)**.
6. Remove and discard the used filter element **(4)**.
7. Attach a new element **(4)** with the seal **(5)** facing up.
8. Attach the cover **(3)** together with the nut **(2)**.
9. Attach the button **(1)**.
10. Install the panel over the hydraulic tank.



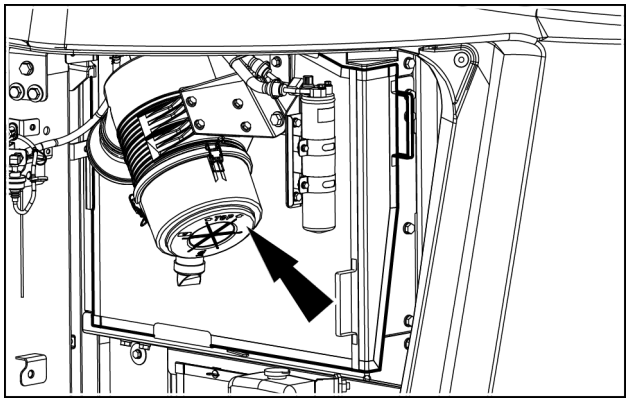
SMIL14CEX2782BB 2

Engine air filters

Change the primary element: every **1000 h** or after cleaning 6 times
Change the secondary element every **1000 h**

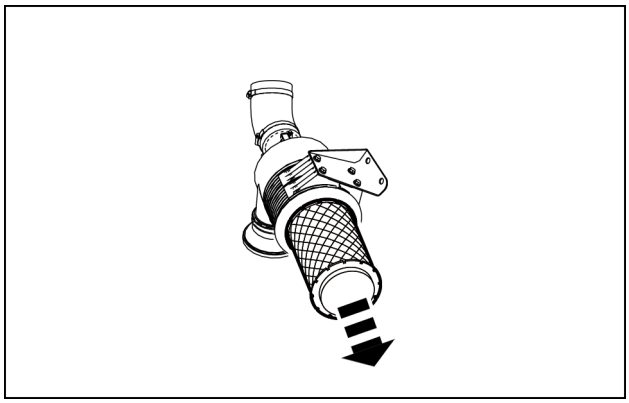
NOTICE: *Be sure to carry out regular checks on the air filter, intake manifold, seals and hoses. At the same time, check the intake manifold screws and hose clamps for tightness. The hoses should be changed before they are worn.*

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key.
2. Open the left-hand door.
3. Release the fasteners, and remove the cover.



SMIL17CEX3528AA 1

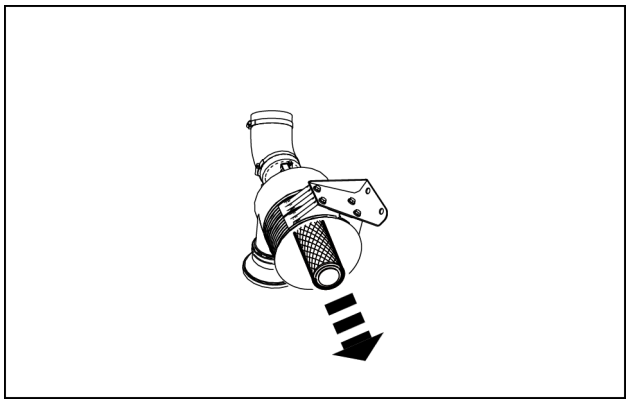
4. Remove the primary element.



SMIL17CEX3269AA 2

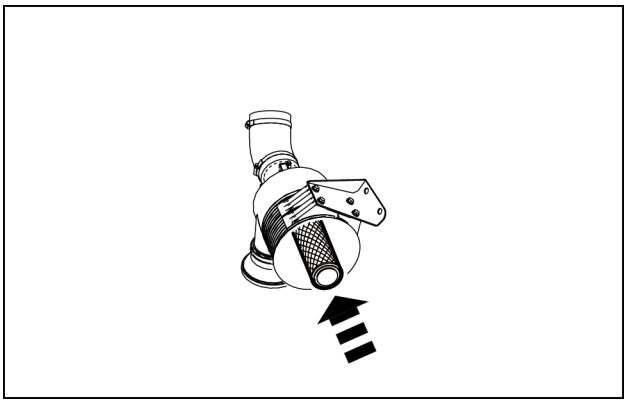
5. Remove the secondary element.

NOTICE: *Make sure that the secondary element is replaced. Do not clean it.*



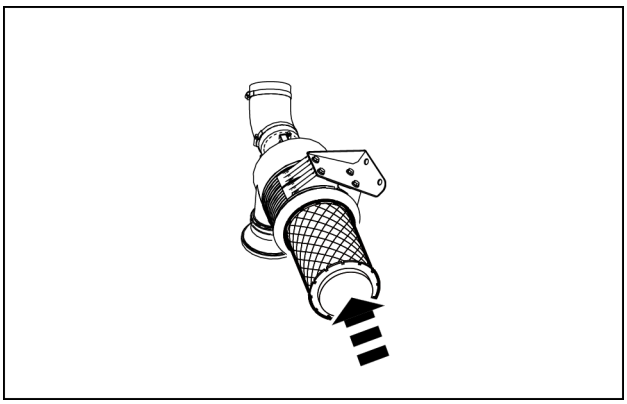
SMIL17CEX3268AA 3

6. Clean the inside of the air cleaner case, and attach the new secondary element.



SMIL17CEX3268AA 4

7. Attach the new primary element.

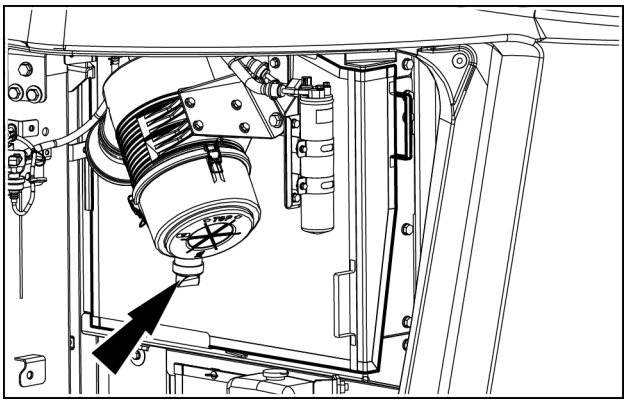


SMIL17CEX3269AA 5

8. Attach the cover (with the "TOP" display facing up), and lock the fasteners.

NOTICE: *The mass air flow (MAF) sensor is mounted on the inlet duct of the air cleaner. Output of the engine may be restricted if any dust is attached to the MAF sensor or failure of sensing part of the MAF sensor due to usage of retailed cleaning fluid.*
Pay attention not to allow dust to invade the inlet duct when replacing the air cleaner element. Also, pay attention not to spray retailed cleaning fluids to the MAF sensor when using them.

9. Check that the dust ejector under the filter is operating correctly.



SMIL17CEX3528AA 6

Hydraulic fluid analysis

Check the hydraulic oil condition every **1000 h**

NOTICE: *If any attachment other than a bucket is used, reduce the interval of the hydraulic oil analysis. Refer to Chapter 9.*

Ask your CASE CONSTRUCTION Dealer to analyze the hydraulic oil condition.

Engine valve rocker clearance adjustment

Check the clearance of the engine valve rocker every **1000 h**

Ask your CASE CONSTRUCTION Dealer to check the engine valve rocker clearance.

Swing reduction unit oil

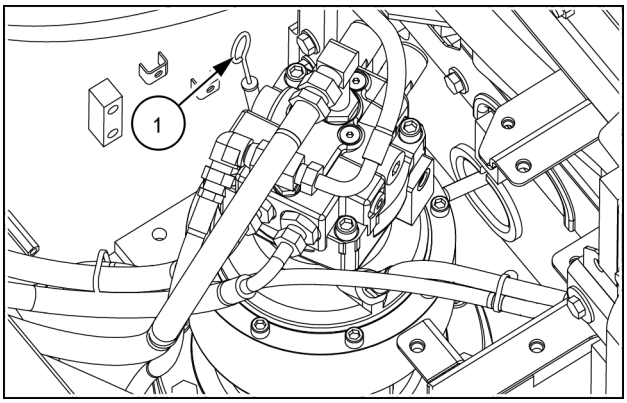
⚠ WARNING

Hot surface possible!
Wait for all components to cool before performing any operation.
Failure to comply could result in death or serious injury.

W0251A

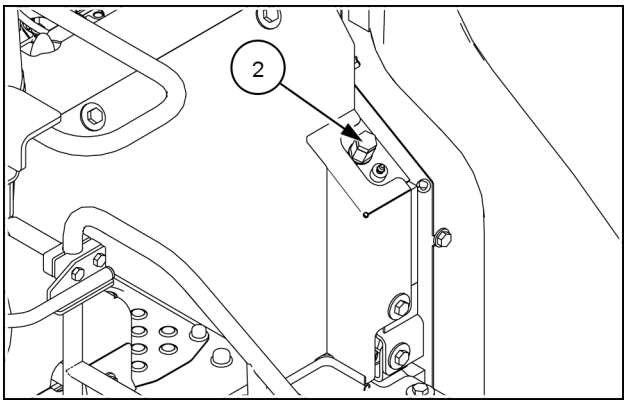
Replace the swing reduction unit oil every **1000 h** (After **250 h** of operation in run-in period).
Lubricant: **HYPOID GEAR OIL EXTREME PRESSURE 80W-90**.
Quantity: **2.2 L** (**0.6 US gal**).

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key.
2. Reach the service platform in the center of the machine. Refer to page **6-4**.
3. Remove the oil gauge **(1)**. Clean the oil gauge with a neat cloth.



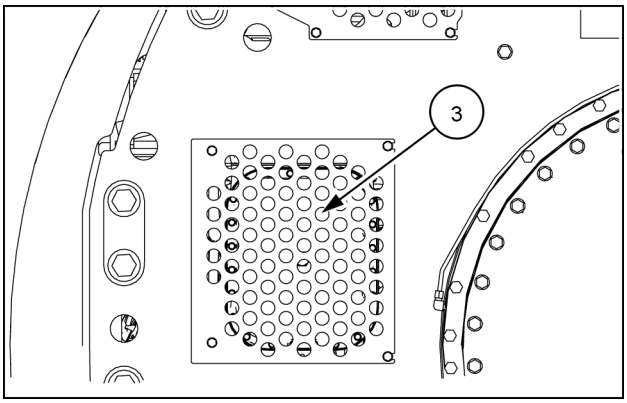
SMIL17CEX3821AA 1

4. Remove the fill plug **(2)**.



SMIL20CEX1316AA 2

5. Remove the lower panel **(3)**.

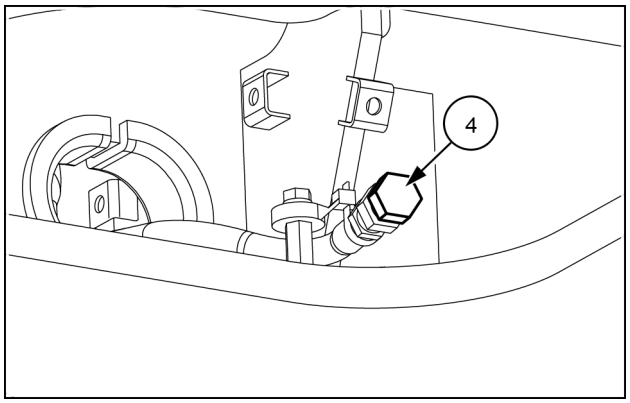


SMIL19CEX2666AA 3

6. Place a container with an appropriate capacity under the upper structure frame. Remove the oil drain plug **(4)** to drain oil.

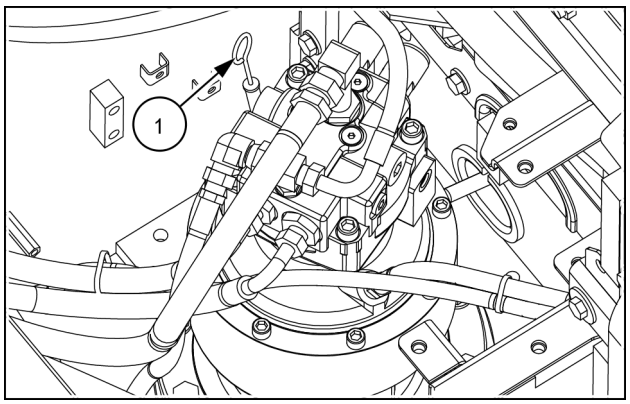
NOTE: *Draining oil requires a comparatively long time.*

NOTE: *Check the condition of the drained oil. If foreign objects, such as metal scrapings, are included, consult the CASE CONSTRUCTION dealer.*



SMIL17CEX3825AA 4

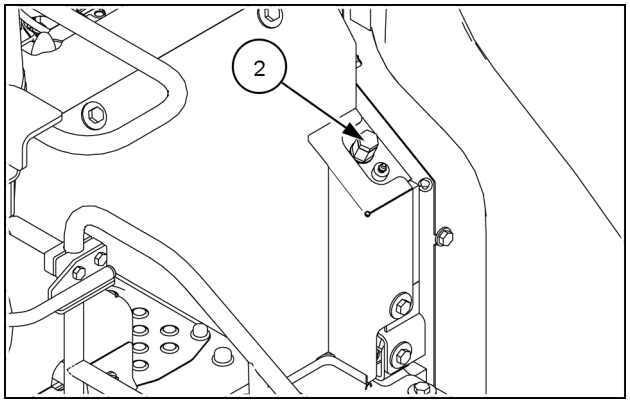
7. Attach the drain plug **(4)**, and install the lower panel **(3)**.
8. Supply oil via the fill port **(2)**.
9. Attach the oil gauge **(1)** and check that the oil level is in the hatched area.



SMIL17CEX3821AA 5

10. Wait for **10 min** and check the oil level again. If necessary, supply additional oil via the fill port **(2)**.

    Attach the fill plug **(2)**.



SMIL20CEX1316AA 6

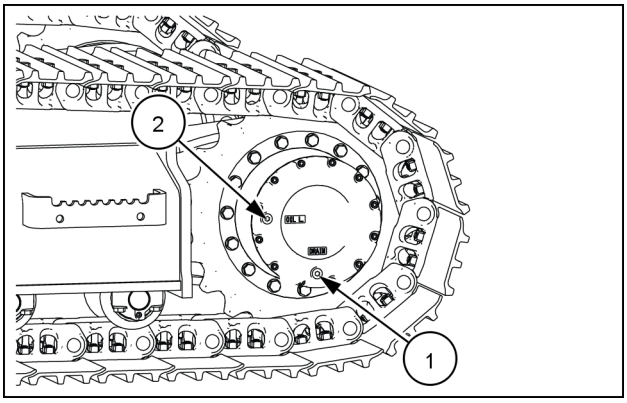
Travel reduction units oil

Replace the travel reduction units oil every **1000 h** (After **250 h** of operation in run-in period)
Lubricant: **HYPOID GEAR OIL EXTREME PRESSURE 80W-90**
Quantity: **2.1 L** (**0.6 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)**. Insert the drain plug **(1)** with seal tape wrapped around it. Add oil through port **(2)** until the oil comes up to the bottom edge of the port.
8. Replace the O-ring seal of the level plug **(2)**. Insert the level plug **(2)** with seal tape wrapped around it.
9. Repeat steps **2** to **8** for the other travel reduction gear.
10. Run the machine slowly to check that there are no leaks.



SMIL15CEX9565AA 1

Alternator

Check the alternator every **1000 h**

⚠ WARNING

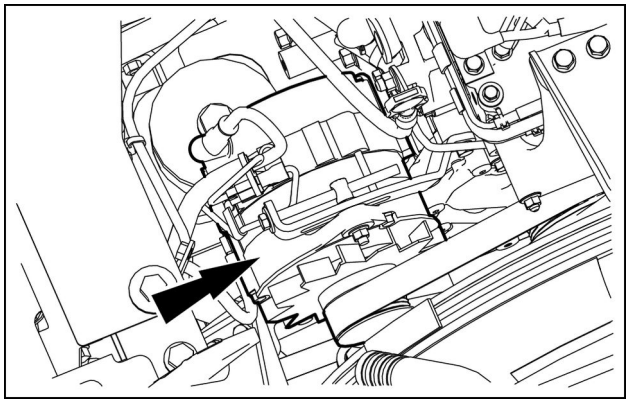
Improper operation or service of this machine can result in an accident.
Welding sparks can cause battery gases to explode. When welding on the machine, always disconnect the B+ and D+ wires from the alternator. Check the wire markings before reconnecting to ensure a correct connection.
Failure to comply could result in death or serious injury.

W0253A

Ask your CASE CONSTRUCTION Dealer to check the alternator.

NOTICE: *check that the terminal protectors are correctly installed.*

NOTICE: *do not use a steam cleaning machine or solvent to clean the alternator.*



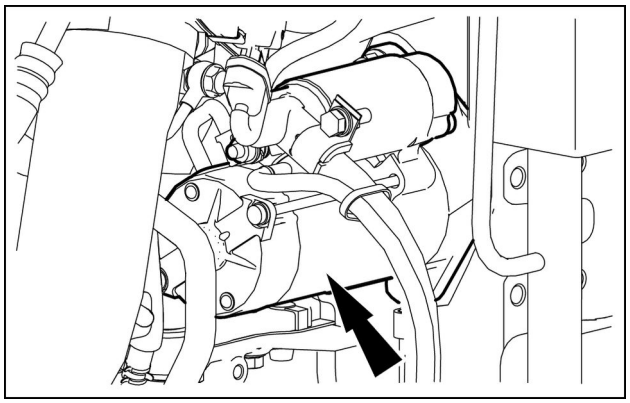
SMIL15CEX9140AA 1

Starter motor

Check the starter motor every **1000 h**

Ask your CASE CONSTRUCTION Dealer to check the starter motor.

NOTICE: *check that the terminal protectors are correctly installed.*



SMIL15CEX9141AA 1

Every 2000 hours

Hydraulic oil suction filter

⚠ WARNING

Burn hazard!
Before performing any service on the hydraulic system, you must allow it to cool. Hydraulic fluid temperature should not exceed 40 °C (104 °F).
Failure to comply could result in death or serious injury.

W0241A

⚠ WARNING

Pressurized system!
Never attempt to drain fluids or remove filters when the engine is running. Turn off the engine and relieve all pressure from pressurized systems before servicing the machine.
Failure to comply could result in death or serious injury.

W0905A

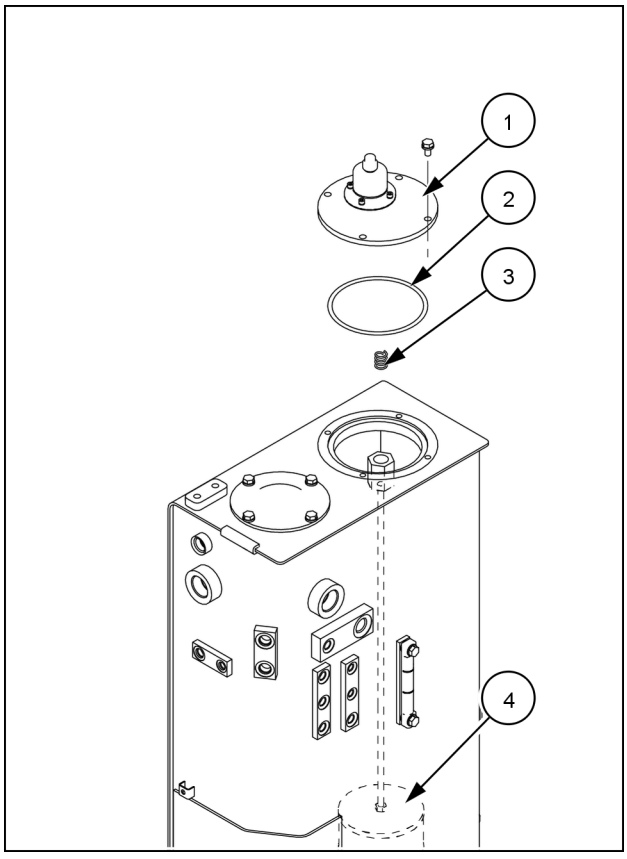
Clean the hydraulic oil suction filter every **2000 h**

NOTICE: *If any attachment other than a bucket is used, reduce the interval of the hydraulic oil suction filter cleaning. Refer to Chapter 9.*

NOTICE: *If you find any metal particles on the old filters, consult the CASE CONSTRUCTION dealer.*

NOTICE: *Replace the hydraulic oil suction filter every **5000 h** of operation or when hydraulic fluid is replaced.*

1. Reach the service platform in the center of the machine. Refer to page **6-4**
2. Release all the pressure in the hydraulic tank. Refer to page **6-11**.
3. Remove the panel over the hydraulic tank. Clean the top surface of the hydraulic tank, and clean the cover of the suction filter.
4. Remove the cover **(1)**, the O-ring **(2)**, and the spring **(3)** located on top of the rod assembly of the suction filter.
5. Remove the oil suction filter **(4)**, and clean it with a solvent.
   Let it dry completely, and check for damage. If any damage is found on its surface, replace it with a new component.
6. Attach the suction filter **(4)** and the rod assembly.
7. Attach the spring **(3)**.
8. Replace the O-ring **(2)**.
9. Attach the cover **(1)**.
10. Check the hydraulic fluid level, and supply it if necessary.
11. Install the panel over the hydraulic tank.



SMIL17CEX3546BA 1

Hydraulic oil return filter

⚠ WARNING

Burn hazard!
Before performing any service on the hydraulic system, you must allow it to cool. Hydraulic fluid temperature should not exceed 40 °C (104 °F).
Failure to comply could result in death or serious injury.

W0241A

⚠ WARNING

Pressurized system!
Never attempt to drain fluids or remove filters when the engine is running. Turn off the engine and relieve all pressure from pressurized systems before servicing the machine.
Failure to comply could result in death or serious injury.

W0905A

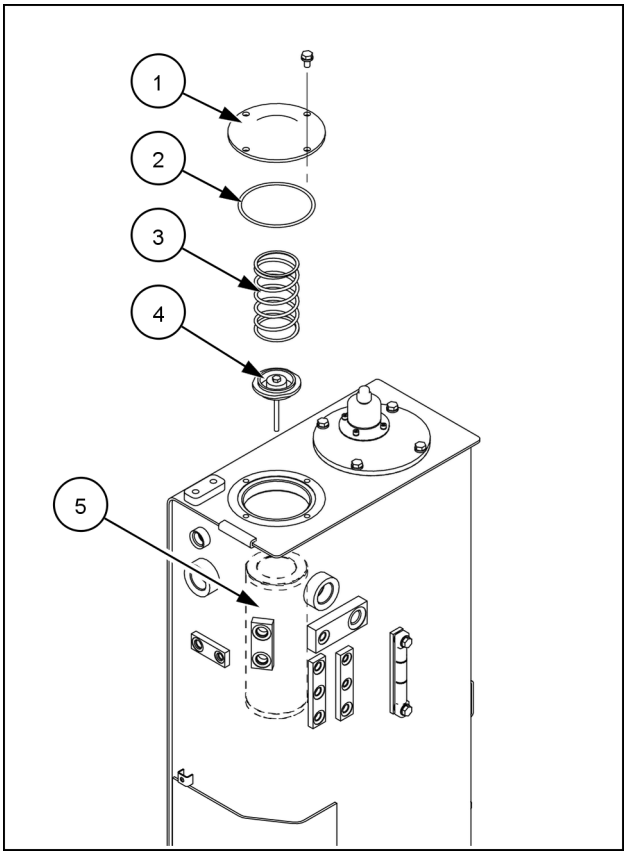
Replace the hydraulic oil return filter every **2000 h** (After **250 h** of operation in run-in period).

NOTICE: *When the machine is a new vehicle, or when the main components of the hydraulic system are already overhauled or replaced, replace the oil return filter after **250 h** of operation. After that, replace the filter at specified intervals.*

NOTICE: *If any attachment other than a bucket is used, reduce the interval of the hydraulic oil return filter replacement. Refer to Chapter 9.*

1. Reach the service platform in the center of the machine. Refer to page **6-4**
2. Release all the pressure in the hydraulic tank. Refer to page **6-11**.
3. Remove the panel over the hydraulic tank. Clean the top surface of the hydraulic tank, and clean the cover of the return filter.
4. Remove the cover **(1)** and the O-ring **(2)**.
5. Take out the spring **(3)**, the valve **(4)**, and the filter **(5)**.
6. Attach a new filter **(5)**.

   Clean and attach the spring **(3)** and the valve **(4)**.
7. Replace the O-ring **(2)**.
8. Attach the cover **(1)**.
9. Check the hydraulic fluid level, and supply it if necessary.
10. Install the panel over the hydraulic tank.



SMIL17CEX3547BA 1

Pilot line filter

⚠ WARNING

Burn hazard!
Before performing any service on the hydraulic system, you must allow it to cool. Hydraulic fluid temperature should not exceed 40 °C (104 °F).
Failure to comply could result in death or serious injury.

W0241A

⚠ WARNING

Pressurized system!
Never attempt to drain fluids or remove filters when the engine is running. Turn off the engine and relieve all pressure from pressurized systems before servicing the machine.
Failure to comply could result in death or serious injury.

W0905A

Replace the pilot line filter every **2000 h** (After **250 h** of operation in run-in period).

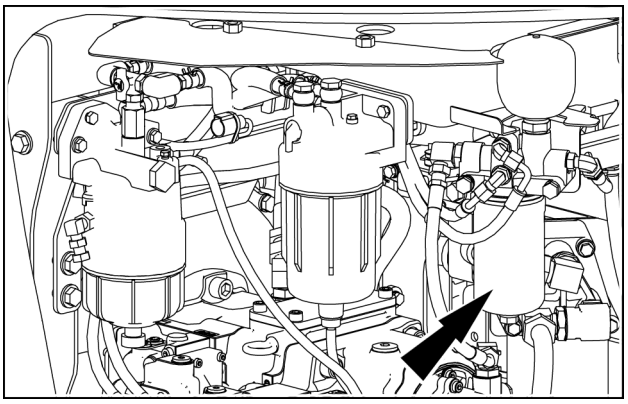
NOTICE: *The accumulator of the pilot circuit contains high pressure gas. Do not perform welding and avoid any operation generating sparks and high temperature close to the accumulator.*

NOTICE: *When the machine is a new vehicle, or when the main components of the hydraulic system are already overhauled or replaced, replace the pilot filter after **250 h** of operation. After that, replace the filter at specified intervals.*

NOTICE: *If any attachment other than a bucket is used, reduce the interval of the pilot line filter replacement. Refer to Chapter 9.*

1. Release all the pressure in the hydraulic tank. Refer to page **6-11**.
2. Open the rear right-hand door.
3. Unscrew and remove the filter using a wrench.
4. Coat the seal of the new filter with a fine film of clean oil.
5. Install the new filter.

   Turn the filter until the seal comes into contact with the filter head then tighten by an extra third of a turn by hand.



SMIL17CEX3272AA 1

Air conditioner filters

Replace the air conditioning filters every **2000 h**
The air conditioning system has to be inspected by a specialist every 6 months.

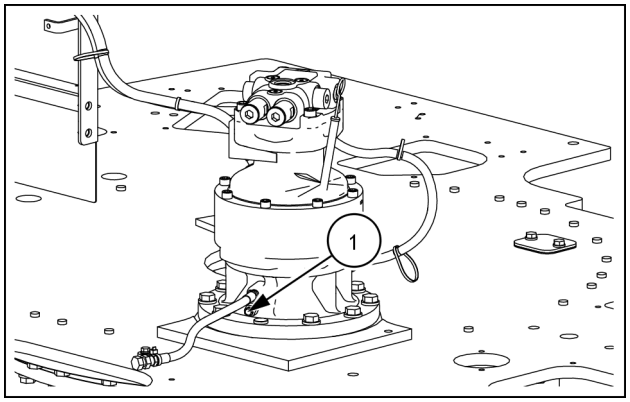
To replace the air conditioning filters, proceed as follows:

1. Remove the air conditioning filters. Refer to page **6-23**.
2. Place the new filters in the housings according to the installation procedure.

Swing reduction gear

Grease the swing reduction gear every **2000 h**
Lubricant: **MULTI-PURPOSE GREASE EXTREME PRESSURE AND ANTI-WEAR NLGI 2**

1. Park the machine on a flat and level place. Stop the engine, and remove the starter key.
2. Remove the air bleed plug **(1)**.

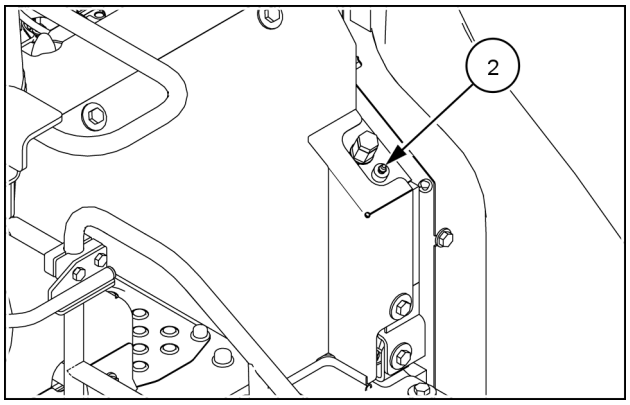


SMIL17CEX3820AA 1

3. Reach the service platform in the center of the machine. Refer to page **6-4**.
4. Supply grease from the greasing point **(2)**.
5. Grease until a certain amount of grease overflows from the air bleed plug **(1)**.

NOTICE: *Greasing with the air bleed plug **(1)** unremoved will damage the inner seal.*

6. Clean the air bleed port and apply the air bleed plug **(1)**.



SMIL20CEX1316AA 2

Every 4000 hours

Engine coolant

⚠ WARNING

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

W0282A

⚠ WARNING

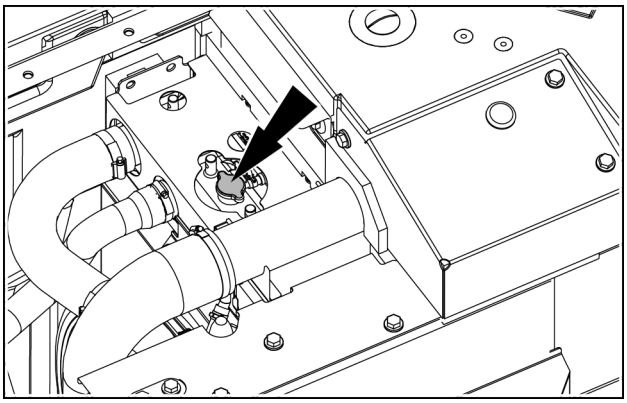
Burn hazard!
Hot coolant can spray and scald if you remove the radiator or deaeration tank cap while the system is hot. To remove the cap: allow the system to cool, turn the cap to the first notch, and wait for all pressure to release. Remove the cap only after all pressure has released.
Failure to comply could result in death or serious injury.

W0367A

Replace the engine coolant every **4000 h** or every 2 years
Fluid: **OAT EXTENDED LIFE COOLANT/ANTIFREEZE**
Quantity (50/50 antifreeze/deionized water mixture): **16.5 L** (**4.4 US gal**)

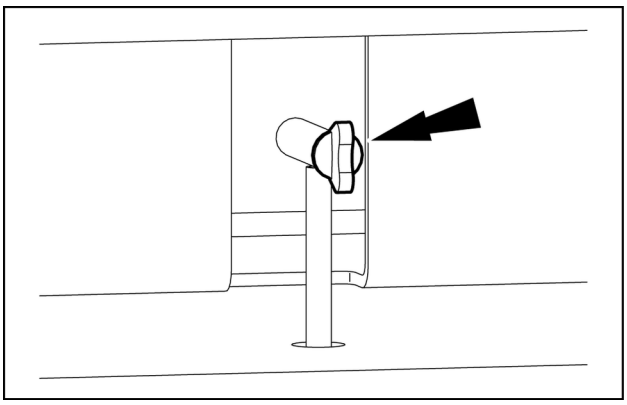
Draining the engine cooling system

1. Stop the engine and let it cool down.
2. Reach the service platform in the center of the machine. Refer to page **6-4**.
3. Disengage the latches and raise the engine hood. Fix the engine hood with the stay.
4. Remove the radiator cap.



SMIL17CEX3574AA 1

5. Open the coolant drain cock of the radiator. Drain coolant from the radiator.



SMIL14CEX2754AA 2

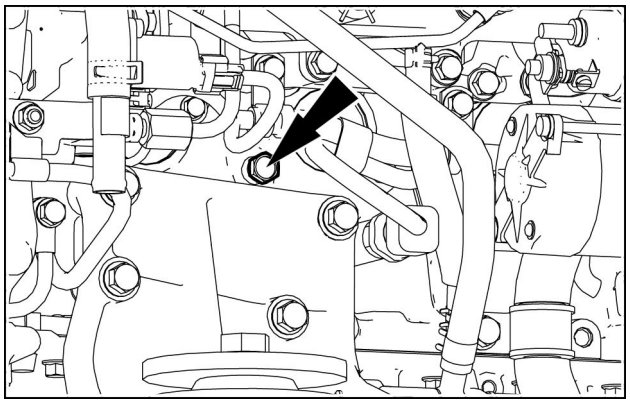
6. Loosen the coolant drain plug on the right side of the engine block. Drain coolant inside the engine.
7. Close the coolant drain cock of the radiator.

NOTICE: *The coolant drain cock of the radiator should be tightened by hand. It may be damaged if being tightened with tools such as pliers.*

8. Close the coolant drain plug on the engine block.

NOTICE: *the engine shall never be started with no water in the radiator. This causes the engine to seize up.*

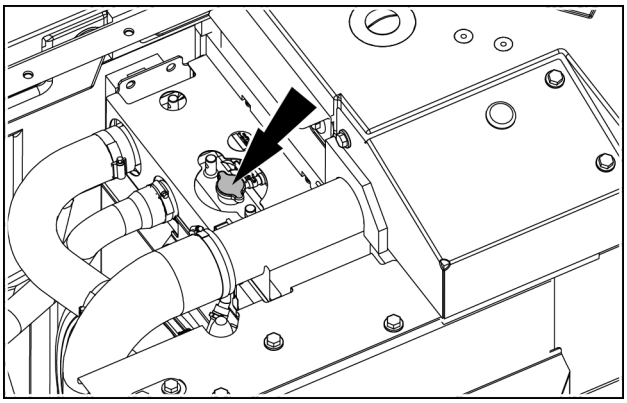
NOTICE: *the drained coolant shall be disposed according to the local Regulations for coolant fluids.*



SMIL17CEX3571AA 3

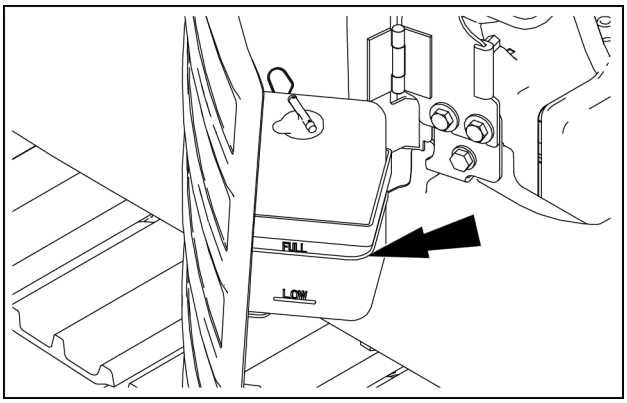
Flushing the engine cooling system

9. Inspect and clean the radiator cap. Inspect hoses and clamps of the engine cooling system. Make sure to replace any damaged parts.
10. Fill the radiator with tap water up to the edge of the coolant inlet.
11. Close the radiator cap.



SMIL17CEX3574AA 4

12. Fill the reserve tank with tap water up to the FULL mark. Close the cap of the reserve tank.
13. Start the engine and let it run at low idle speed for **20 min**. Turn on the cab heating system, and set the temperature and the fan speed to intermediate level.
14. Stop the engine. Wait until the engine has cooled down. Check for leakages from the hoses of the engine cooling system.
15. Drain water completely from the engine cooling system. Repeat the flushing procedure (steps from 10 to 14) for 2 more times. If drained water is still not clean, further repeat the flushing procedure until clean water is drained from the engine.



SMIL17CEX3277AA 5

Filling the engine cooling system

16. Close the coolant drain cock of the radiator and close the coolant drain plug on the engine block.
17. Slowly supply coolant through the radiator coolant inlet. Add coolant up to the edge of the coolant inlet.

NOTICE: *the coolant shall be added slowly in order to prevent the entry of air into the engine cooling system.*

NOTE: *push and release the radiator hoses while supplying coolant into the radiator to ease the flowing of the engine coolant into the cooling system.*

18. Close the radiator cap.
19. Fill the reserve tank with coolant up to the FULL mark. Close the cap of the reserve tank.
20. Start the engine and let it run at low idle speed for **3 – 5 min**, and then stop the engine.
21. Wait until the engine has cooled down. Slowly open the radiator cap and check for coolant level. If needed, add coolant up to the edge of the coolant inlet of the radiator.
22. Close the radiator cap.

23. Start the engine and let it run at low idle speed for **3 min**. Turn on the cab heating system, and set the temperature and the fan speed to the maximum level.

24. Gradually increase the engine speed to H position. Let the engine run until the coolant temperature reaches **90 °C**. Make sure that coolant temperature stays at **90 °C** for some minutes.

NOTICE: *if coolant temperature gets quickly over **90 °C**, lower the engine speed to low idle. Stop the engine and check for leakages from the hoses of the cooling system.*

25. Gradually decrease the engine speed to low idle and let it run for **3 min**. Stop the engine.

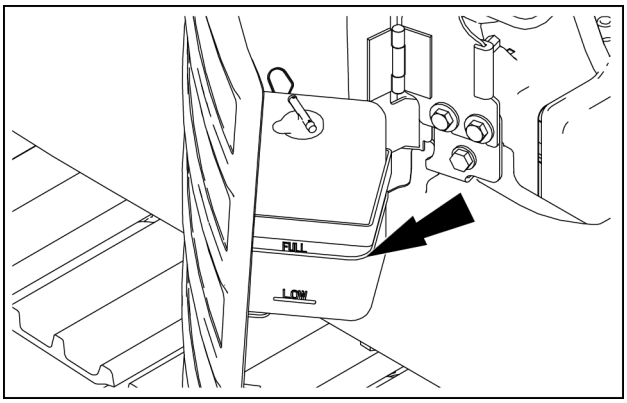
26. Wait until the engine has cooled down. Slowly open the radiator cap and check for coolant level. Add some coolant up to the edge of the coolant inlet of the radiator.

NOTICE: *if too much coolant has to be added at this stage, carefully check for leakages into the engine cooling system.*

27. Close the radiator cap.

28. Carry out final filling of the coolant reserve tank up to the FULL mark. Close the cap of the reserve tank.

NOTICE: *the coolant level in the reserve tank shall be always double checked the morning after. The cooling circuit may take some more time to get stabilized. If needed, fill the reserve tank with coolant up to the FULL mark. Close the cap of the reserve tank.*



SMIL17CEX3277AA 6

Pump outlet hoses

Check the outlet hose of main pump: Every 2 years or every **4000 h** (whichever comes first)

Checking the hydraulic system piping

Make sure there are no leaks from the hydraulic system hoses, pipes, plugs, connections and fittings and check that all nuts and screws are correctly tightened. In the event of problems, repair, change or tighten the component (s) concerned.

Hydraulic hoses

Check the boom, arm, and bucket cylinder hose: Every 2 years or every **4000 h** (whichever comes first)

Checking the hydraulic system piping

Make sure there are no leaks from the hydraulic system hoses, pipes, plugs, connections and fittings and check that all nuts and screws are correctly tightened. In the event of problems, repair, change or tighten the component (s) concerned.

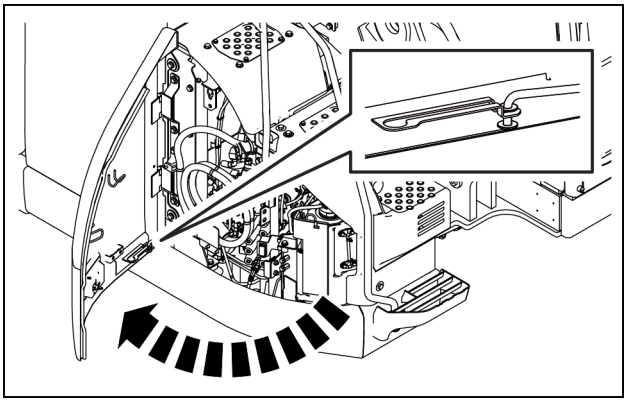
Every 4500 hours

DEF/AdBlue® supply module filter

Replace the supply module filter every **4500 h**

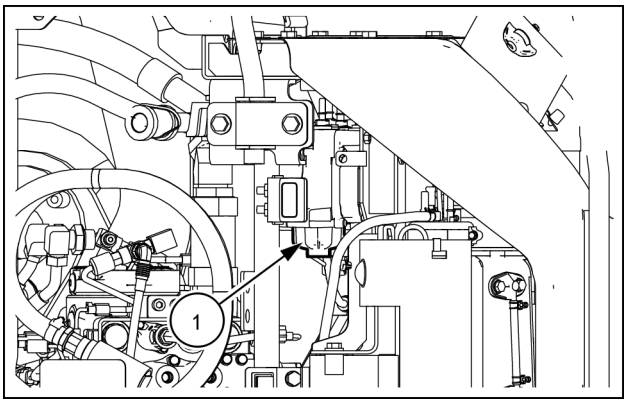
1. Turn the starter key to OFF position. Wait **3 min** for SCR system to completely suck **DEF/ADBLUE®** back into the tank.

   Open the front right-hand door until it is fixed by the stay.



SMIL17CEX3246AA 1

2. Prepare a container with an appropriate capacity, and loosen the supply module filter cap **(1)**.

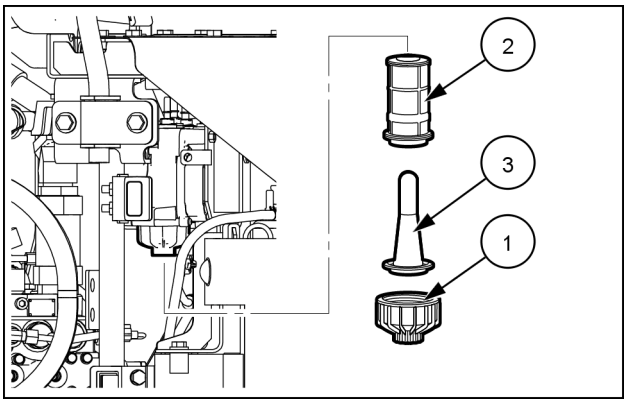


SMIL17CEX3813AA 2

3. Remove the filter element **(2)** and the equalizing element **(3)**.
4. Assemble the new filter element **(2)** and the equalizing element **(3)**.

   The cap should be tightened at **20 – 25 N·m** (**14.75 – 18.44 lb ft**).

5. Wipe off the spilled **DEF/ADBLUE®** with a cloth, and then rinse the area with fresh water. Finally, blow compressed air at very low pressure to clean the compartment of the **DEF/ADBLUE®** tank.
6. Idle the engine for several minutes to check that there is no leak.



SMIL17CEX3814AA 3

Selective Catalytic Reduction (SCR) system

1. Ask your CASE CONSTRUCTION Dealer to check the SCR system and the dosing control unit.

Exhaust Gas Recirculation (EGR) system

1. Ask your CASE CONSTRUCTION Dealer to check the engine related equipment (EGR valve, EGR cooler, turbocharger).

Every 5000 hours

Hydraulic oil and filters

⚠ WARNING

Burn hazard!
Before performing any service on the hydraulic system, you must allow it to cool. Hydraulic fluid temperature should not exceed 40 °C (104 °F).
Failure to comply could result in death or serious injury.

W0241A

⚠ WARNING

Pressurized system!
Never attempt to drain fluids or remove filters when the engine is running. Turn off the engine and relieve all pressure from pressurized systems before servicing the machine.
Failure to comply could result in death or serious injury.

W0905A

⚠ CAUTION

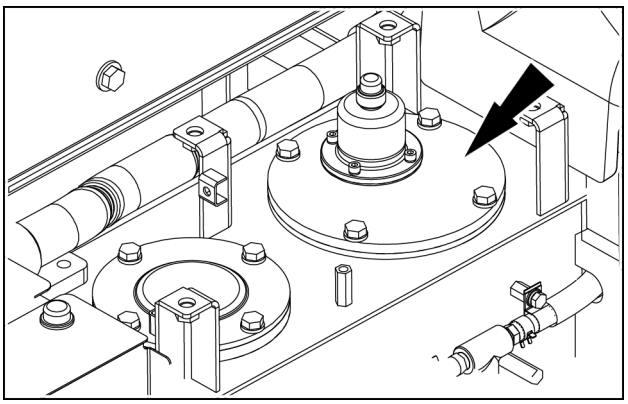
Escaping fluid!
Hydraulic fluid or diesel fuel leaking under pressure can penetrate the skin and cause infection or other injury. To prevent personal injury: Relieve all pressure before disconnecting fluid lines or performing work on the hydraulic system. Before applying pressure, make sure all connections are tight and all components are in good condition. Never use your hand to check for suspected leaks under pressure. Use a piece of cardboard or wood for this purpose. If injured by leaking fluid, see your doctor immediately.
Failure to comply could result in minor or moderate injury.

C0104A

Replace the hydraulic oil and filters every **5000 h**
Fluid: **PREMIUM HYDRAULIC OIL HV46 MULTI-GRADE ANTIWEAR**
Quantity: **75 L** (**19.8 US gal**)

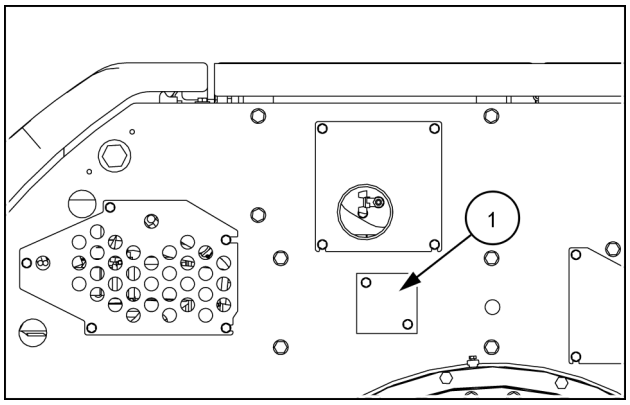
NOTICE: *If any attachment other than a bucket is used, reduce the interval of the hydraulic oil and filters replacement. Refer to Chapter 9.*

1. Park the machine on a hard and level ground. Orient the upper structure frame so that there is enough free space under the hydraulic tank to place a barrel of suitable capacity.
2. Stop the engine and remove the starter key.
3. Reach the service platform in the center of the machine. Refer to page **6-4** .
4. Release all the pressure in the hydraulic tank. Refer to page **6-11**.
5. Remove the panel over the hydraulic tank. Clean the top surface of the hydraulic tank, and clean the cover of the suction filter.
6. Remove the cover of the hydraulic oil suction filter.
7. With a pump, remove the hydraulic oil from the hydraulic tank.

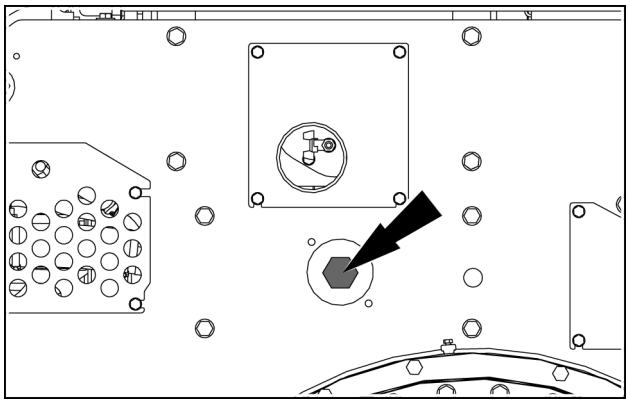


SMIL17CEX3531AA 1

8. Remove the lower panel **(1)** below the hydraulic tank to access the drain plug.
9. Place a container of a suitable capacity under the drain plug.
10. Open the plug to drain the remaining hydraulic fluid.
11. Replace the suction filter as described on page **6-63**.
12. Replace the return filter as described on page **6-64**.
13. Replace the O-ring and close the drain plug. Install the lower panel below the hydraulic tank.
14. Add new hydraulic oil to the tank.
15. Replace the O-ring, and attach the cover of the hydraulic oil suction filter.
16. Start the engine, and run it with no load for about **5 min**.
17. Move each control several times to remove all air from the system.
18. Swing the upper structure all the way from left to right equally twice or more.
19. Park the machine at the specified position, and then stop the engine.
20. Check the oil level of the hydraulic tank, refill it with oil as necessary. Check that there are no bubbles in the hydraulic tank.
21. Install the panel over the hydraulic tank.



SMIL19CEX2665AA 2



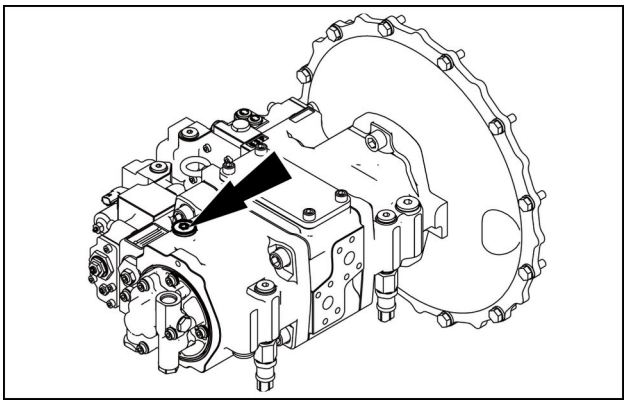
SMIL20CEX1303AA 3

Bleeding air from the hydraulic components

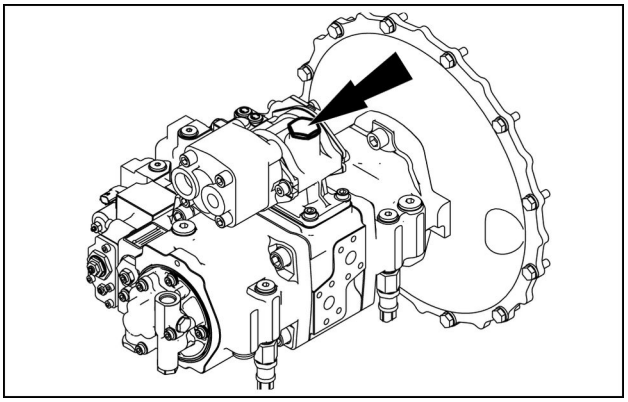
NOTE: *After bleeding air from the components, stop the engine for five minutes and check there are no bubbles at the surface of the hydraulic fluid in the reservoir.*

Hydraulic pump

Using a solvent, clean the periphery of the air bleed plug.
Loosen the air bleed plug, remove the plug if the fluid does not flow.
Fill the pump with new clean hydraulic fluid. Install and tighten the air bleed plug.
Start the engine and run it at low idle speed. Loosen the air bleed plug on the pump.
Tighten the plug when air free fluid comes out of the bleed plug hole.
Clean the area completely.



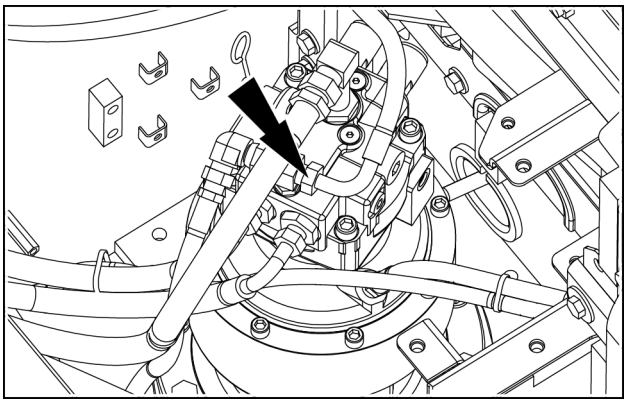
SMIL15CEX9148AA 4



SMIL15CEX9149AA 5

Swing reduction gear

Set the engine at a low idle, and loosen the hose connected with the joint of the drain port. Check that oil oozes from there. At this time, do not perform swing operation.
If oil does not ooze, stop the engine, remove the joint connected with the drain port, and fill the motor case with hydraulic fluid via the drain port.
Attach the joint of the drain port, and temporarily tighten the hose.
Set the engine at a low idle, and run it until oil oozes from the drain port.
After checking that oil has oozed, fully tighten the joint and the hose.
With the engine at a low idle, perform swing operation slowly right and left at two or more revolutions.



SMIL17CEX3821AA 6

Attachment cylinders

Start the engine and run it at low idle speed. Extend and retract the attachment cylinder rods four or five times without bringing them to end of stroke. Then repeat the operation three or four times, this time bringing the cylinder rods to end of stroke.

When necessary

Fuel feed pump

⚠ WARNING

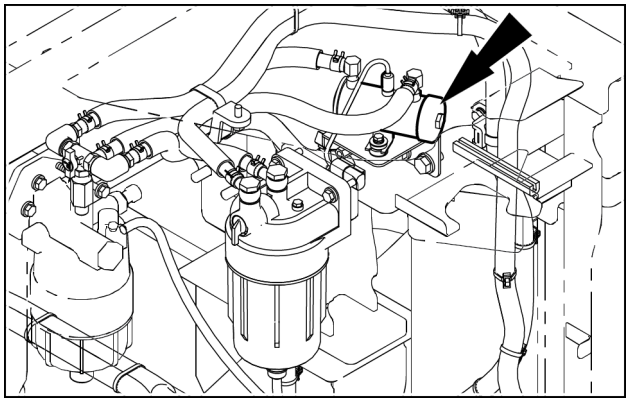
Flying debris!
Compressed air can propel dirt, rust, etc. into the air. Wear eye and face protection when using compressed air.
Failure to comply could result in death or serious injury.

W0307A

Clean the electromagnetic fuel feed pump periodically

The fuel feed pump is located behind the fuel pre-filter. To clean the feed pump proceed as follows:

1. Place a container with an appropriate capacity under the feed pump.
2. Close the valve of the fuel pre-filter.
3. Disconnect the electric cable from the feed pump. Carefully disconnect the fuel lines from the feed pump.
4. Remove the mounting screws and take out the feed pump for cleaning.

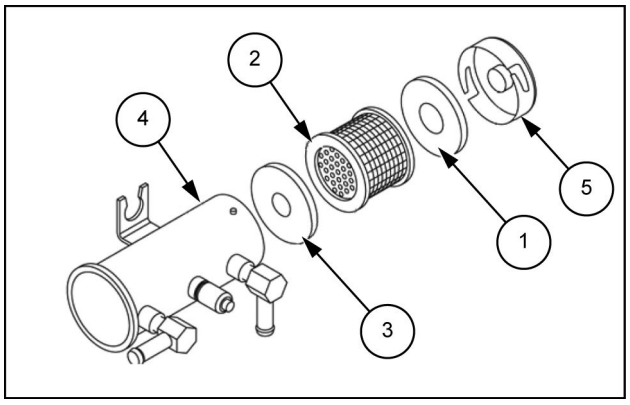


SMIL17CEX3824AA 1

5. Open the pump body, and pull out the filter **(2)** and the seals **(1)** and **(3)**.
6. Clean the filter by compressed air. Check the filter, and replace it if necessary.
7. Replace the seals **(1)** and **(3)**.
8. Clean the body **(4)** and the cover **(5)** carefully.

   Make sure that the feed pump is free from the accumulation of dirt.

9. Attach the seals **(1)** and **(3)** to the filter **(2)** in the correct order, then carefully insert the seals and the filter into the pump body. Close the cover **(5)** onto the pump body **(4)**.
10. Install the feed pump with the mounting screws.
11. Connect the fuel lines to the feed pump. Connect the electric cable to the feed pump.
12. Bleed the fuel system. Refer to page **6-12**.



SMIL14CEX2767AB 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.

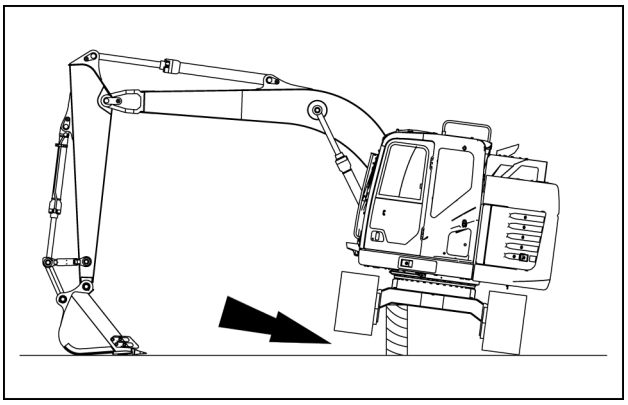
W0276A

Check the track tension periodically

NOTICE: *if the tracks are too tight, they wear quickly. If tracks are not tight enough, they wear quickly and the links can catch on the sprocket wheel or slide off the idler wheel or the sprocket wheel. Clean the tracks after work.*

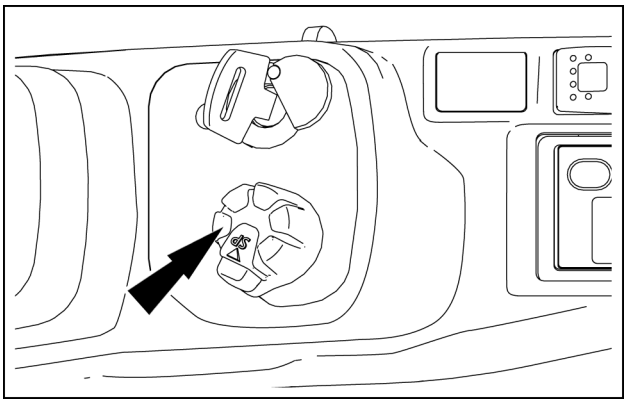
To check the tracks tension, proceed as follows:

1. Swing the upper structure perpendicular to the undercarriage. Lower the attachment to the ground, then lower the boom until the track is raised off the ground. Place a block under the undercarriage and raise the attachment off the ground.



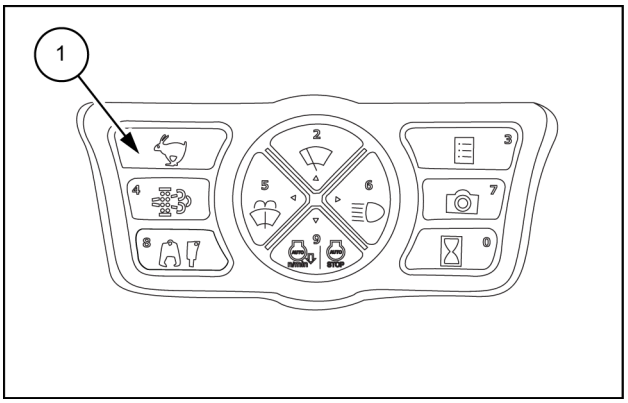
SMIL17CEX0132AB 1

2. Turn the engine speed throttle to the maximum speed position.



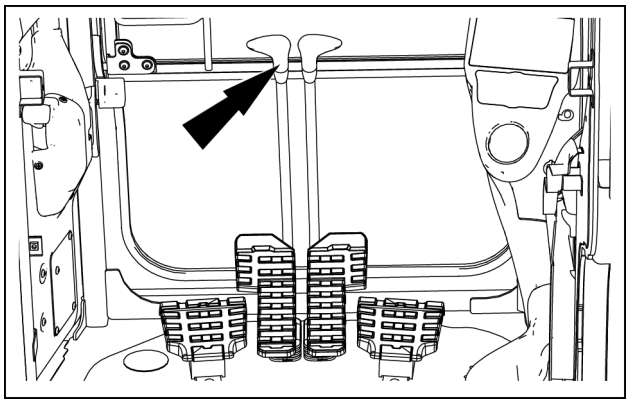
SMIL19CEX2696AA 2

3. Press the travel mode selector button **(1)** to set the "Rabbit" mode.



SMIL14CEX2853AB 3

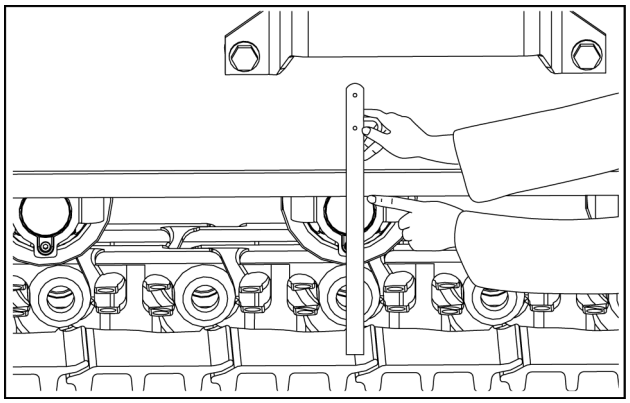
4. Operate the travel control lever to move the raised track forward and backward and shake off the mud.
5. Repeat the same operations for the other track.



SMIL17CEX5210AA 4

Checking the tension

1. If the track is not yet raised, perform the same procedure as for cleaning to put the machine into the required position.
2. Operate the travel control lever to move the raised track rearward for a while.
3. Stop the engine, and remove the starter key.
4. At the center of the track, measure the slack between the base of the undercarriage and the pad. The value must be within:
   CX145D SR LC: **260 – 280 mm** (**10.2 – 11.0 in**)
   CX145D SR with blade: **220 – 240 mm** (**8.7 – 9.4 in**)
5. Adjust the tension as necessary, then lower the track to the ground.
6. Repeat the same operations for the other track.

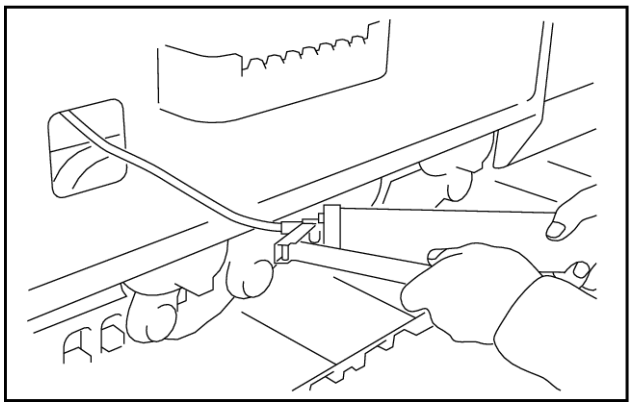


SMIL14CEX2855AA 5

Adjusting the tension

To increase the tension:

1. Clean the grease fitting adapter and the grease fitting.
2. Connect the grease pump. Inject the grease to obtain the right amount of track tension.
3. Remove the grease pump and clean the grease fitting.
4. Repeat the same operations for the other track.

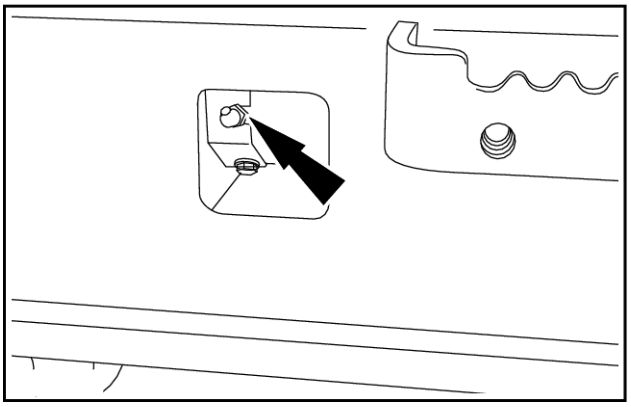


SMIL13CEX2749AA 6

⚠ WARNING

Pressurized fluid can penetrate the skin and cause severe injuries.
The grease in the cylinder is under high pressure. Never loosen the grease fitting adaptor completely in order to speed up the flow of grease.
Failure to comply could result in death or serious injury.

W0261A



SMIL13CEX2750AB 7

To reduce the tension:

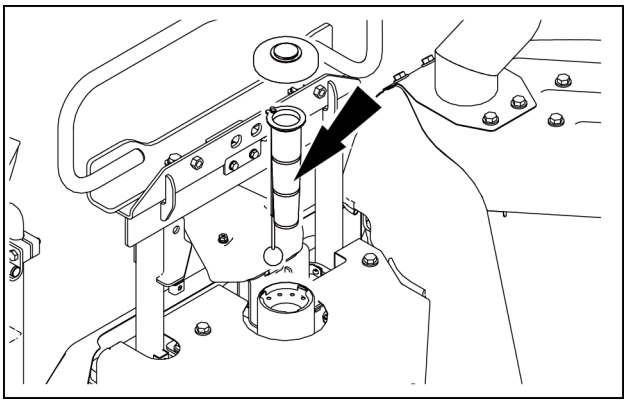
1. Turn the grease fitting adapter about 3 times to loosen it and drain grease from the cylinder.
2. When the track tension is correct, tighten the adapter.
3. Clean the grease adapter and fitting, then lower the track to the ground.
4. Repeat the same operations for the other track.

NOTICE: *if the grease fitting adaptor is damaged, grease may leak out. Check the condition of the grease fitting adaptor regularly and replace it if necessary.*

Fuel tank strainer

Clean the fuel tank strainer periodically

Remove the fuel tank strainer, inspect it for damage. If damaged, discard and replace. If in good condition, clean it in an environmentally safe manner. Diesel fuel is a preferred cleaning agent. Fuel must not be added to the tank unless the strainer is in place and in good working condition.



SMIL17CEX3815AA 1

Gas spring inspection

⚠ WARNING

Explosive gas!
Gas struts contain high-pressure nitrogen gas. If handled improperly, they could explode.
- Do not disassemble.
- Do not expose to flame or fire.
- Do not puncture, weld, or melt.
- Do not expose to shock by striking or turning.
- The fill gas must be removed before disposal. Consult your dealer.
Failure to comply could result in death or serious injury.

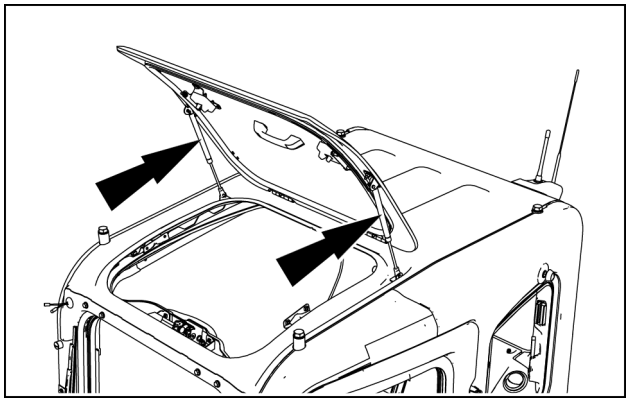
W0914A

Check the gas springs periodically

The cab sunroof is supported by gas springs.

In the following cases, request inspection, service, and replacement from the CASE CONSTRUCTION dealer:

- The cab sunroof does not open without force.
- The cab sunroof does not remain open.
- Oil or gas leak is found in the gas spring.

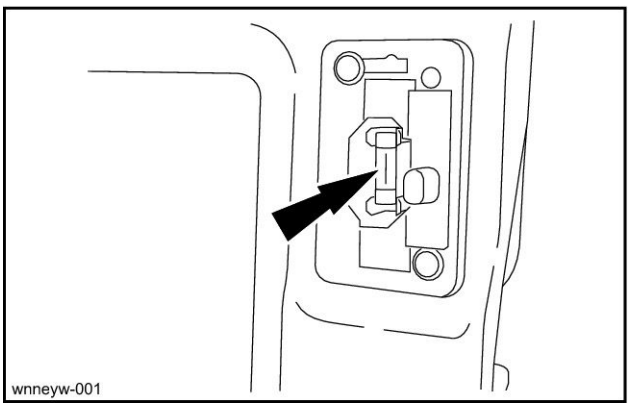


SMIL17CEX0127AA 1

Bulb replacement

Lighting in the operator compartment:

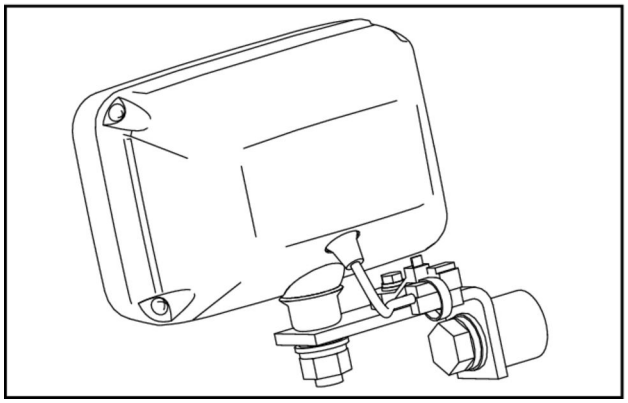
1. Remove the cover.
2. Remove the light bulb, then install a new light bulb of the same wattage (**10 W**).
3. Install the cover.



8YHY9K-001A 1

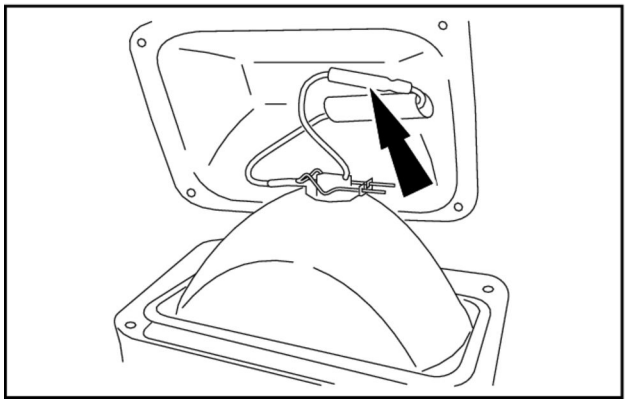
Attachment working lights:

1. Remove the 4 retaining screws.



SMIL13CEX2830AB 2

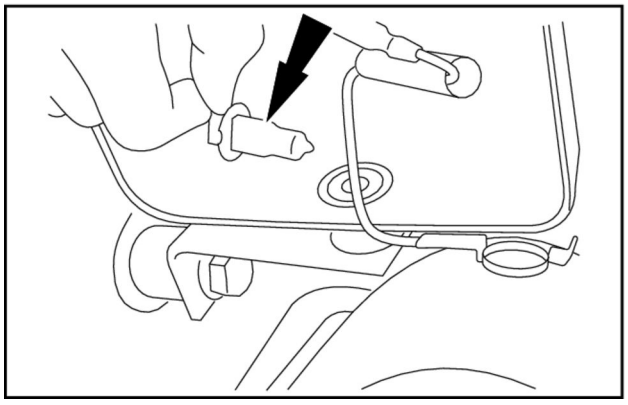
2. Tilt the working light and disconnect the plug.



SMIL13CEX2831AB 3

3. Pull the clip outwards, remove the bulb and install a bulb of the same wattage (**70 W**).
4. Install the clip and reconnect the plug.
5. Put the working light back into position and install the mounting screws.

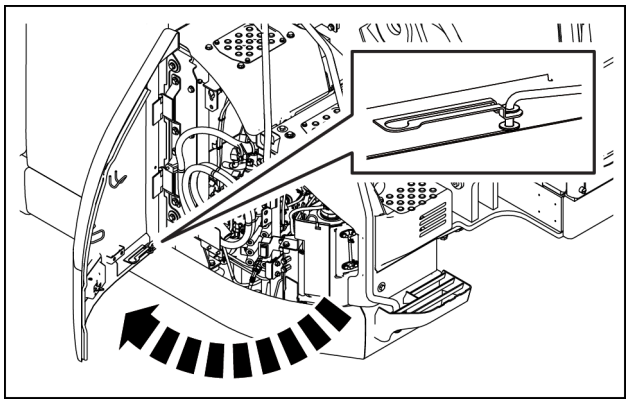
NOTICE: *never put your fingers on a tungsten iodide bulb.*



SMIL13CEX2832AB 4

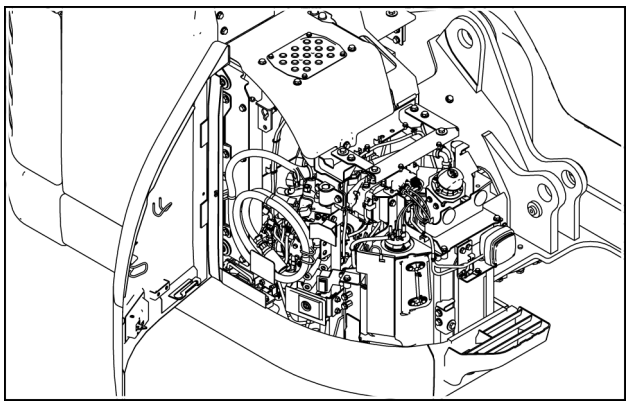
Upper structure and cab headlight:

1. Open the front right-hand door until it is fixed by the stay.



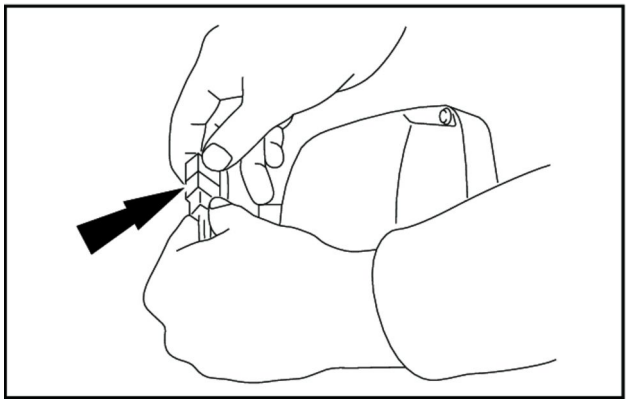
SMIL17CEX3246AA 5

2. Remove the right front cover.



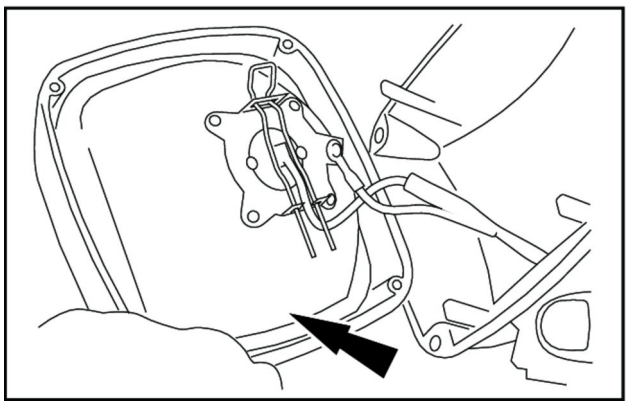
SMIL20CEX1331AA 6

3. Disconnect the plug.



SMIL13CEX2833AB 7

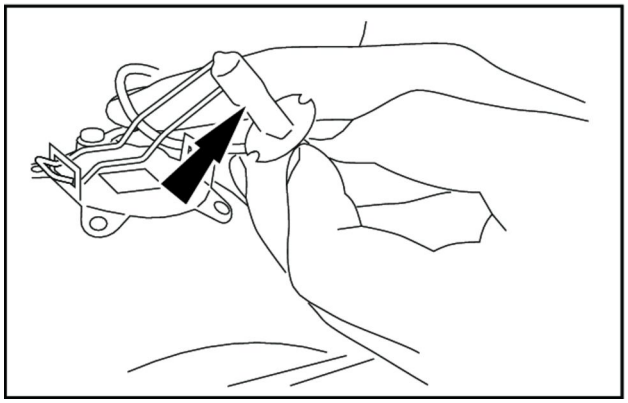
4. Remove the four screws and tilt the headlight.



SMIL13CEX2834AB 8

5. Pull the clip outward and remove the light bulb. Install a new light bulb of the same wattage (**70 W**).
6. Install the clip, put the headlight back in position.
7. Install the screws and the plug.
8. Install the switch bracket.

NOTICE: *never put your fingers on a tungsten iodide bulb.*



SMIL13CEX2835AB 9

Bucket teeth

The bucket teeth might be replaced because of either wearing or different operating needs.

NOTE: *The wear of the bucket teeth depends upon several application factors. Examples of these factors are the materials mainly handled on the jobsite and the operator's digging style.*

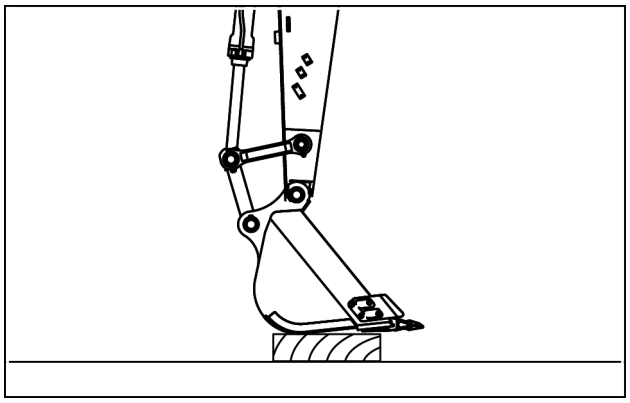
NOTICE: *some types of teeth have a symmetrical design that allows to flip them in case of uneven wear. Consult the CASE CONSTRUCTION DEALER or the bucket supplier and make sure to understand the proper practices to increase the service life of the teeth, as for example flipping and swapping.*

NOTICE: *Never work with a tooth that is completely worn: the adapter on the bucket will be seriously damaged.*

The CASE CONSTRUCTION buckets are equipped with the SMARTFIT teeth system that allows either to easily replace a worn tooth, or to easily switch between several types of teeth.

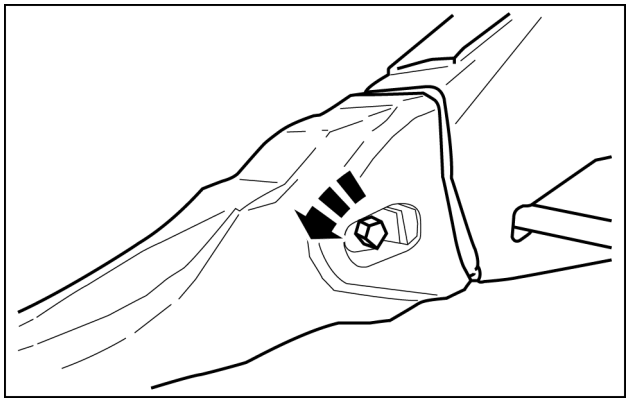
To replace a SMARTFIT bucket tooth proceed as follows:

1. Position the machine on a hard and level ground. Place the bottom side of the bucket on a block so that the bucket teeth are ahead of the block.



SMIL16CEX0479AA 1

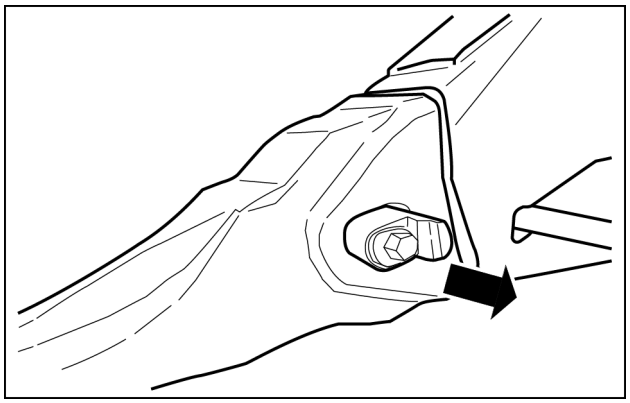
2. Place the gate lock lever in lock position, stop the engine and remove the starter key.
3. Turn the locking stud of the mounting pin **90°** counterclockwise using an hexagonal wrench.



SMIL16CEX0461AA 2

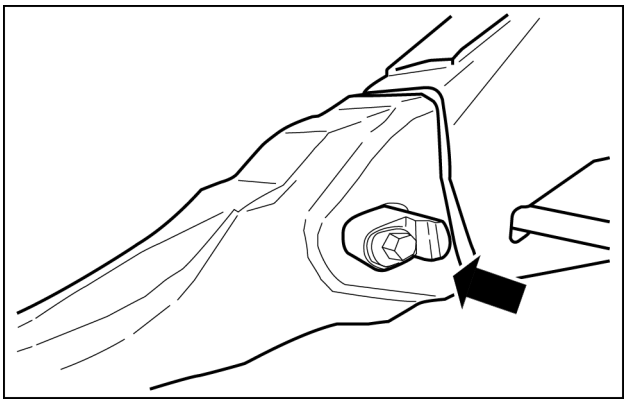
4. Extract the mounting pin.
5. Check the mounting pin for wear or damages.
6. Extract the tooth from the adapter on the bucket.

NOTICE: *If the tooth does not easily come out from the adapter, hit on its sides with a hammer as the mating surfaces come unstuck.*



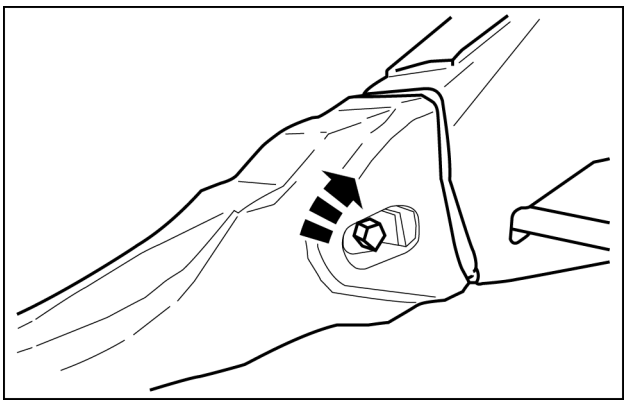
SMIL16CEX0462AA 3

7. Clean the mating surfaces on the adapter. Check the adapter for wear and damages.
8. Insert a new tooth as it completely mate the adapter.
9. Insert the mounting pin. Push until the locking stud touches the aligning surface on the adapter.



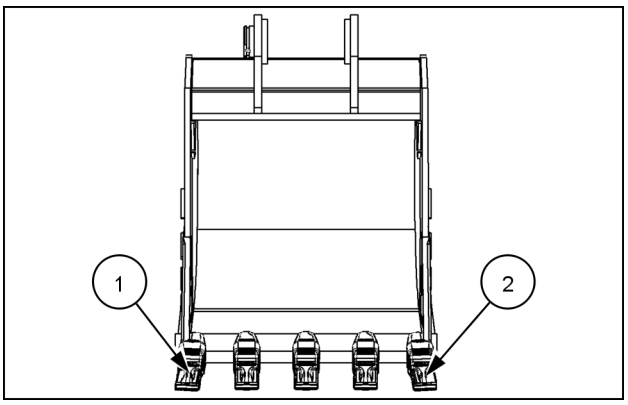
SMIL16CEX0462AA 4

10. Turn the locking stud **90°** clockwise using an hexagonal wrench in order to lock the mounting pin in position.
11. Make sure that the tooth is aligned with the adapter, and that it has no backlash.



SMIL16CEX0461AA 5

NOTE: *if all teeth have to be replaced, it is recommended to remove them starting from tooth* ***(1)*** *up to tooth* ***(2)****. It is also recommended to follow the same order from* ***(1)*** *to* ***(2)*** *to install the new teeth.*



SMIL16CEX0477AA 6

Cylinders

A cylinder rod should be slightly oily. Check that there are no leaks after a period of work, when the whole hydraulic system is at normal operating temperature.

1. Wipe clean the rod and bearing on the cylinder to be cleaned.
2. Operate normally for **5 – 10 min**.
3. Extend the cylinder rod.
4. Carry out the leak test.

ROD APPEARANCE	TEST	CONCLUSION
Dry	Slight traces of oil when a piece of paper is wiped over **20 cm** (**7.9 in**) of the rod.	Normal
Slightly greasy	Paper remains stuck to rod when run over rod.	Normal
Oily	Paper remains stuck when placed on rod.	Normal
Very oily or weeping	Each time the cylinder rod is extended, a ring of oil can be seen on the rod.	Consult your CASE CONSTRUCTION Dealer
Leakage	Each time the rod retracts, the excess oil drips from the gland.	

Plastic and resin parts

Use a soft, slightly humid, cloth to clean the panels, the consoles, and the switches. Use a soft, dry cloth to clean the instrument cluster.

NOTICE: *do not use gasoline, kerosene, paint solvents. The use of gasoline, kerosene, paint solvents, etc. will cause discoloration, cracks or deformation of the parts.*

Air-conditioning system

⚠ WARNING

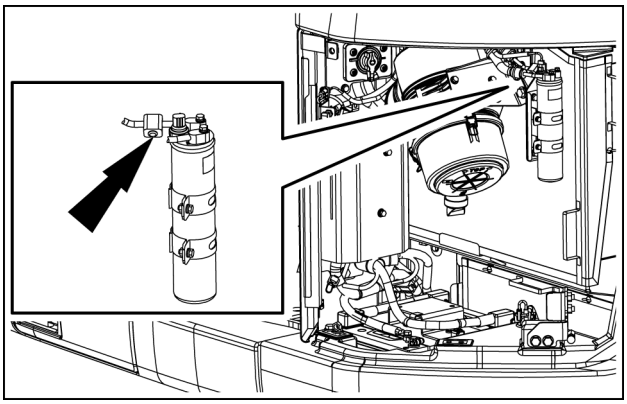
Escaping refrigerant may cause frostbite!
Always wear protective goggles when handling refrigerant. If you get refrigerant in your eye, immediately flush your eyes with water for 15 minutes. Seek medical assistance immediately.
Failure to comply could result in death or serious injury.

W0339A

System charge check

To check the charge of the air conditioning system, proceed as follows:

1. Start the engine and turn on the air-conditioning system. Set the engine speed to **1400 – 1600 RPM**.
2. Open the left-hand door to access the air-conditioning dryer.
3. Let the system operate for about **5 min**, then check the inspection gauge of the dryer.



SMIL20CEX1330AA 1

Refer to the following conditions:

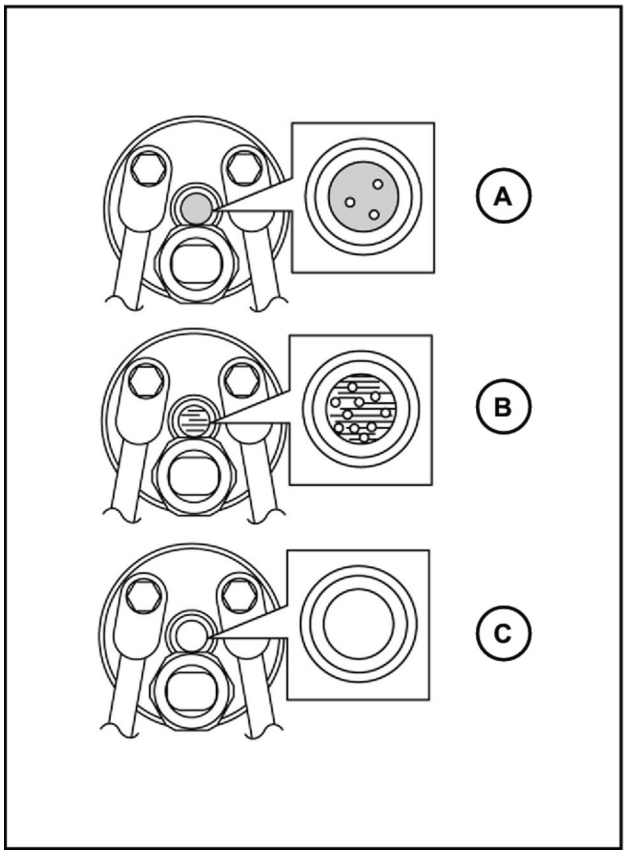
A. The fluid in the gauge is at first transparent, then it quickly turns whitish with few small air bubbles, and stays in this condition. The charge status is correct.

B. The fluid in the gauge features at first many air bubbles, and stays in this condition. The system is underfilled. Call the CASE CONSTRUCTION dealer in order to inspect the system lines for leaks and to restore the correct charge status.

C. The fluid in the gauge is at first transparent with no air bubbles appearing, and stays in this condition. The system is overfilled. Call the CASE CONSTRUCTION dealer in order to restore the correct charge status.

4. Clean the lines and the connections of the air-conditioning system. Clean the radiator of the air-conditioning system in the radiators compartment.

***NOTICE:** Operate the air conditioning at least once every **50 h** in order to keep the compressor's seals lubricated. The recommended practice is to set the cab temperature to the lowest level, to set the cab ventilation fan to the maximum speed and thus to let the system run for **15 – 20 min**.*



SMIL13CEX2895BB 2

Compressor belt check

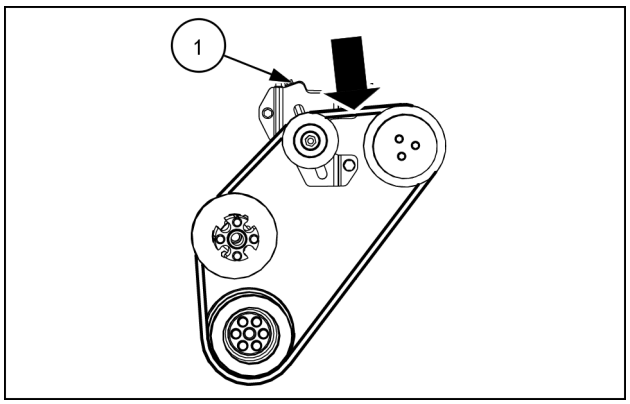
The drive belt of the air-conditioning compressor shall be periodically checked in order to grant the proper operation of the air-conditioning system.

To check the drive belt of the air-conditioning compressor, proceed as follows:

1. Stop the engine, and remove the starter key.
2. Inspect the pulleys and the drive belt for excessive wear or damages. Make sure that the drive belt is correctly engaged to the grooves of the pulleys.

   NOTICE: *The drive belt shall be replaced if it is stretched or cracked in order not to let it worn out.*
3. Check the tension of the drive belt by applying finger pressure of about **10 kg** (**22.0 lb**) on the point indicated by the black arrow. Loose of tension should be about **5 – 7 mm** (**0.2 – 0.3 in**).

If needed, restore the proper tension by acting on the tensioning screw **(1)**.



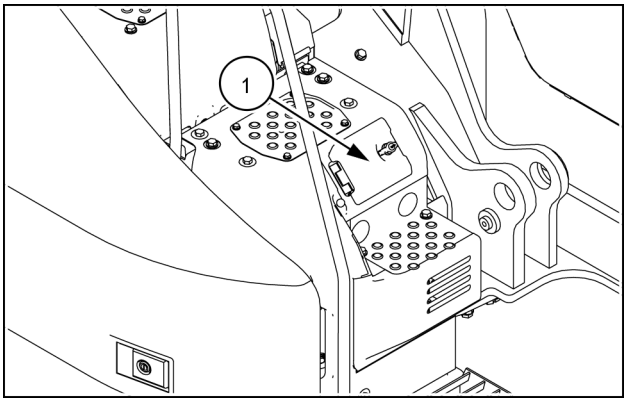
SMIL16CEX0621AA 3

DEF/AdBlue® tank drain

Drainage may be required if the machine control system detects that the quality of **DEF/ADBLUE®** in the tank does not conform to the required specification. Refer to Chapter 3.

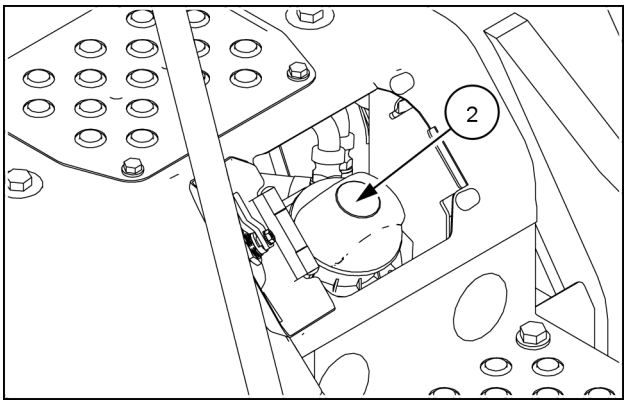
To drain **DEF/ADBLUE®** from the tank proceed as follows:

1. Park the machine on a hard and level ground. Orient the upper structure frame so that there is enough free space under the **DEF/ADBLUE®** tank to place a barrel of suitable capacity.
2. Stop the engine and remove the starter key. Wait 5 min to allow the SCR system to suck **DEF/ADBLUE®** back into the tank.
3. Unlock the **DEF/ADBLUE®** tank cover **(1)** with the starter key. Turn the cover handle, and draw open the cover leftward.



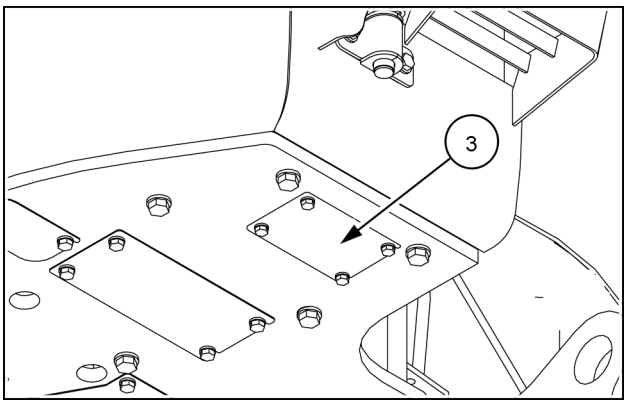
SMIL20CEX1309AA 1

4. Turn the cap **(2)** counterclockwise and open the filler neck.



SMIL20CEX1308AA 2

5. Remove the lower panel **(3)** below the **DEF/ADBLUE®** tank to access the drain plug.

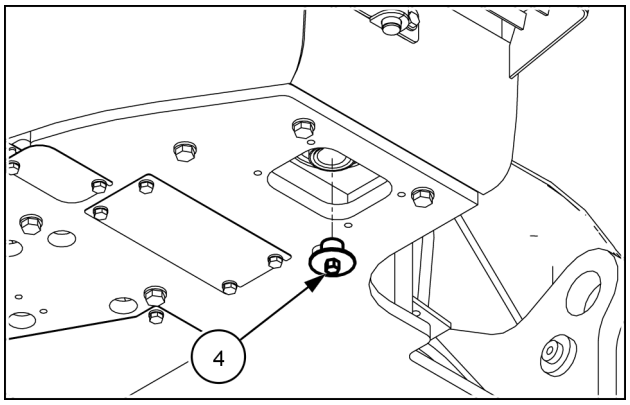


SMIL20CEX1312AA 3

6. Open the drain plug **(4)** to drain **DEF/ADBLUE®**.

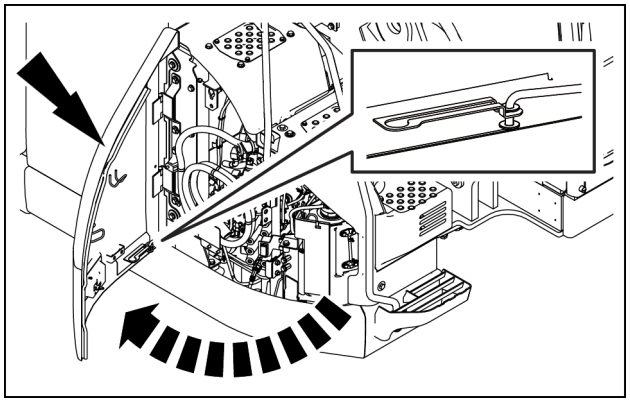
NOTICE: *the drained **DEF/ADBLUE®** must be disposed according to the local Regulations for **DEF/ADBLUE®**.*

7. Close the drain plug **(4)**, and install the lower panel **(3)** below the **DEF/ADBLUE®** tank.



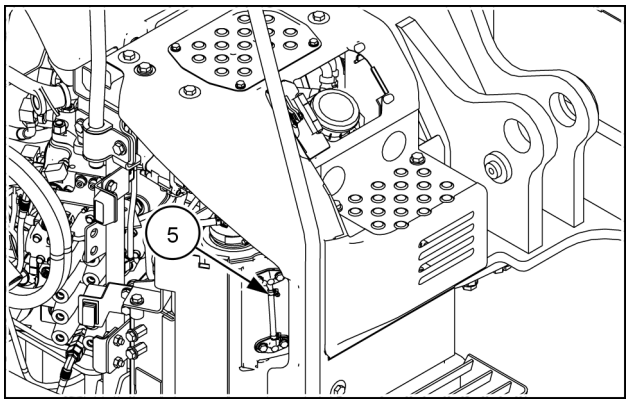
SMIL20CEX1311AA 4

8. Open the front right-hand door until it is fixed by the stay.



SMIL17CEX3246AA 5

9. Fill the tank with **DEF/ADBLUE®** that conforms to the required specification. Never refill **DEF/ADBLUE®** over the F (upper limit) mark on the level gauge **(5)**.
10. Close the front right-hand door.
11. Put the cap **(2)** on the filler neck. Turn the cap clockwise to close the filler neck.
12. Wipe off the spilled **DEF/ADBLUE®** with a cloth, and then rinse the area with fresh water.
13. Close the tank cover **(1)**.



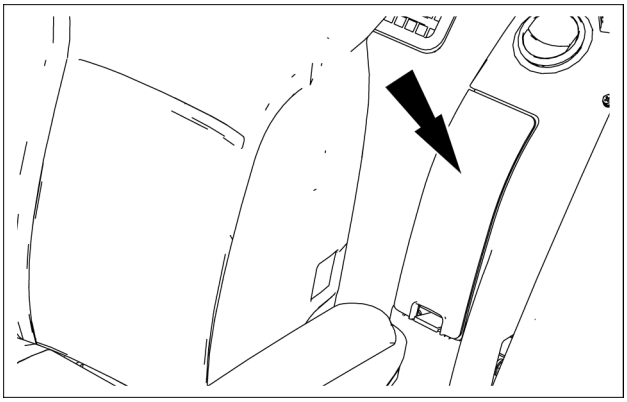
SMIL20CEX1310AA 6

Fuse and relay locations

Fuses

To replace a fuse proceed as follows:

1. Turn the starter key to OFF position.
2. Remove the protective cover of the fuse box located behind the operator's seat.

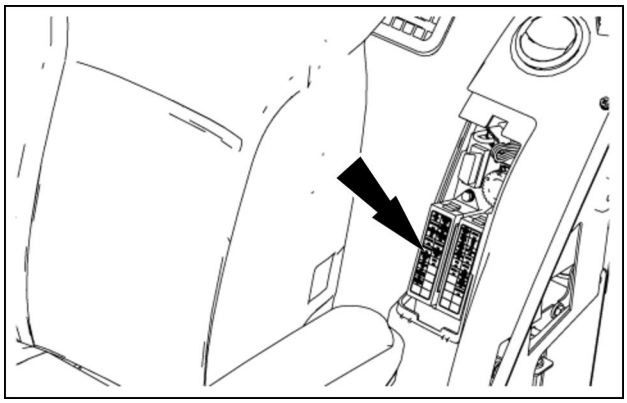


SMIL17CEX5125AA 1

3. Identify the fuse to be replaced. Refer to the fuse map on the following page.

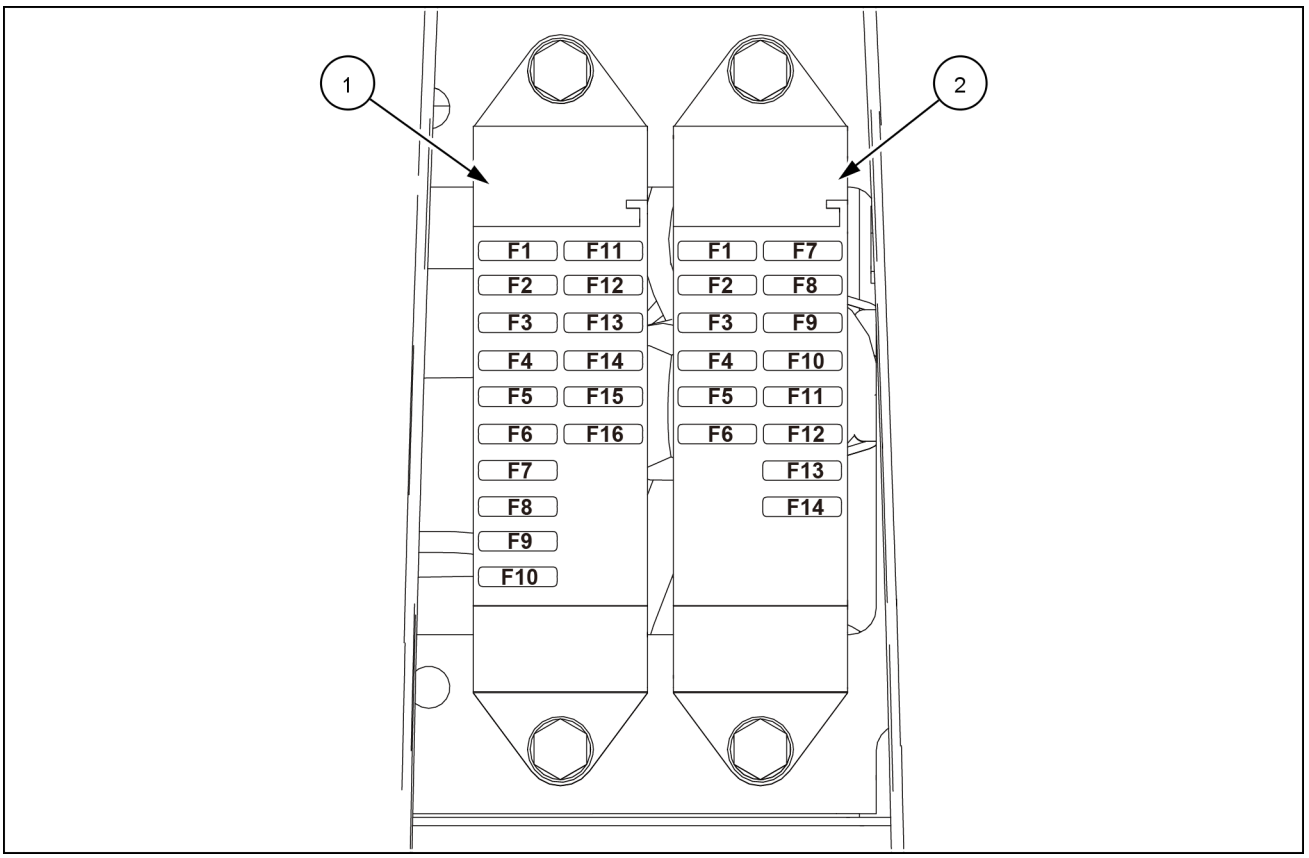
NOTE: *The fuse map is also reported on labels applied on the fuse box.*

NOTICE: *Make sure to replace the failed fuse with one of the same amperage. Failing to comply will result in serious damages to the electric system of the machine.*



SMIL19CEX0607AA 2

4. Open the fuse box that contains the fuse to be replaced.
5. Use the provided jigs to remove the failed fuse, and to install the new fuse.
6. Close the fuse box and install the protective cover.

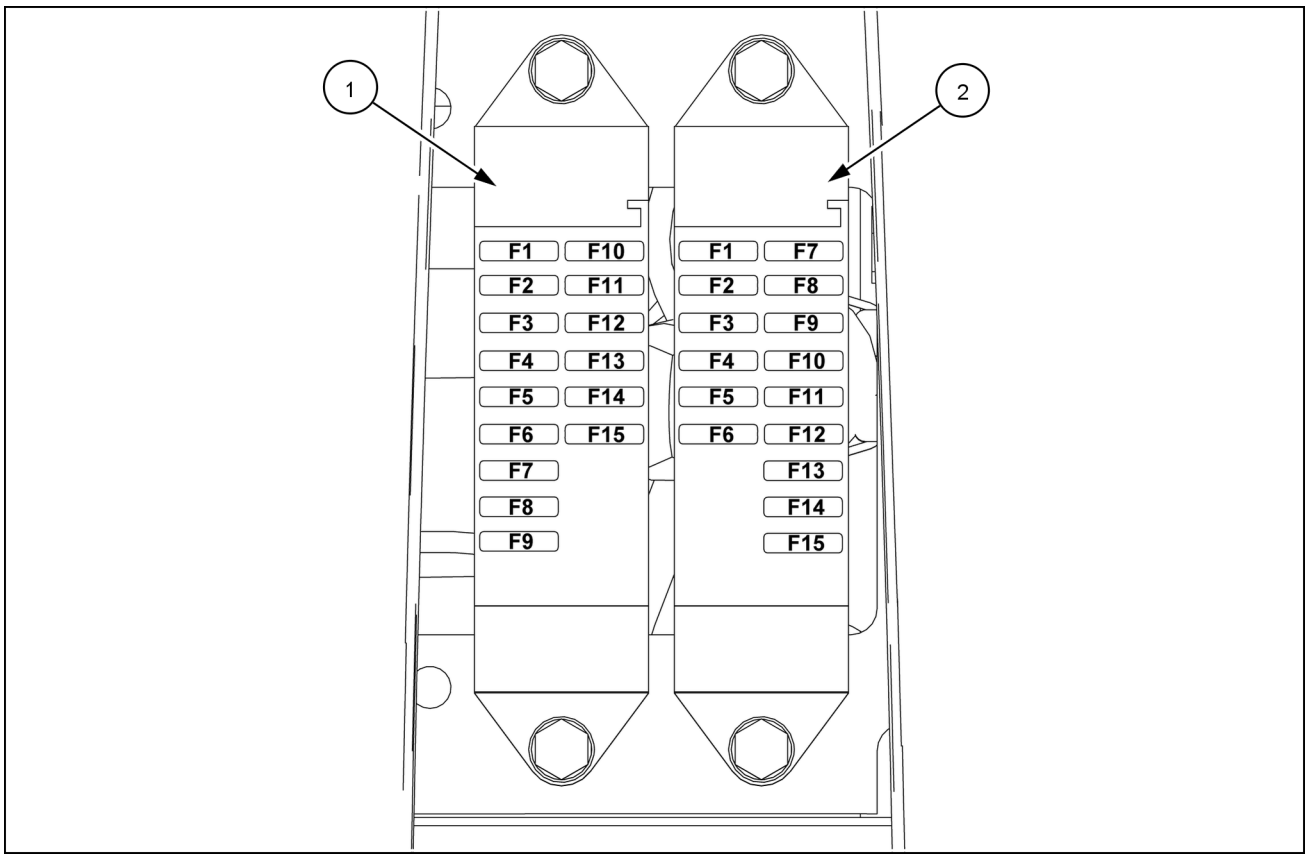


SMIL17CEX0556FA 3

Fuse functions

Fuse box **(1)**	Fuse box **(2)**
(F1) Key switch **10 A**	**(F1)** Seat suspension heater **10 A**
(F2) Accessory **10 A**	**(F2)** Wiper and washer **15 A**
(F3) Controller GPS **10 A**	**(F3)** Cigar lighter **10 A**
(F4) ICT controller **15 A**	**(F4)** DC converter **10 A**
(F5) Monitor **10 A**	**(F5)** Field View Monitor **10 A**
(F6) Controller **10 A**	**(F6)** Spare 1 **10 A**
(F7) Gate lock lever **10 A**	**(F7)** Beacon **10 A**
(F8) Air conditioner unit **5 A**	**(F8)** Lamp (cab) **15 A**
(F9) Air conditioner blower motor **15 A**	**(F9)** Lamp (boom, housing) **15 A**
(F10) Air conditioner compressor **5 A**	**(F10)** Option line **10 A**
(F11) Engine controller **20 A**	**(F11)** Spare 2 **10 A**
(F12) Monitor (backup) **10 A**	**(F12)** Indicator **10 A**
(F13) Backup (radio) **10 A**	**(F13)** Optional controller **10 A**
(F14) Solenoid **15 A**	**(F14)** Optional controller **15 A**
(F15) Proportional solenoid **15 A**	
(F16) Horn **10 A**	

NOTE: *if CASE CONSTRUCTION**SiteWatch**™ Telematics system is equipped, a dedicated **5 A** fuse is added outside of the main fuse box. The fuse connector is located underneath the panels behind the operator's seat.*



SMIL20CEX1363FA 4

Fuse functions (CX145D SR Offset Boom with blade)

Fuse box **(1)**	Fuse box **(2)**
(F1) Key switch **10 A**	**(F1)** Seat suspension heater **10 A**
(F2) Accessory **10 A**	**(F2)** Wiper and washer **15 A**
(F3) Controller GPS **10 A**	**(F3)** Cigar lighter **10 A**
(F4) Monitor **10 A**	**(F4)** DC converter **10 A**
(F5) Controller **10 A**	**(F5)** Field View Monitor **10 A**
(F6) Gate lock lever **10 A**	**(F6)** Spare 1 **10 A**
(F7) Air conditioner unit **5 A**	**(F7)** Beacon **10 A**
(F8) Air conditioner blower motor **15 A**	**(F8)** Lamp (cab) **15 A**
(F9) Air conditioner compressor **5 A**	**(F9)** Lamp (boom, housing) **15 A**
(F10) Engine controller **20 A**	**(F10)** Option line **10 A**
(F11) Monitor (backup) **10 A**	**(F11)** Spare 2 **10 A**
(F12) Backup (radio) **10 A**	**(F12)** Indicator **10 A**
(F13) Solenoid **15 A**	**(F13)** Optional controller **10 A**
(F14) Proportional solenoid **15 A**	**(F14)** Optional controller **15 A**
(F15) Horn **10 A**	**(F15)** Backup switch **5 A**

NOTE: *if CASE CONSTRUCTION**SiteWatch**™ Telematics system is equipped, a dedicated **5 A** fuse is added outside of the main fuse box. The fuse connector is located underneath the panels behind the operator's seat.*

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 (if equipped) to the ground.
4. Grease the machine thoroughly. The exposed surfaces of the cylinder rods should be greased or covered with a protective film. Consult your CASE CONSTRUCTION Dealer.

NOTE: *When the machine resumes service, the film will disappear automatically.*

5. While the engine is still warm, drain the oil sump, replace the oil filter and fill with specified oil. Check the oil level and add more if necessary.
6. Clean or replace the air filter element.
7. Check the level of coolant solution. If the machine is within **100 h** of the next scheduled coolant change, change the coolant now.
8. **DEF/ADBLUE®** needs to be drained from the tank if the machine is subject to long-term storage.
9. Turn the battery disconnect switch to OFF position. Remove the batteries, clean the battery housing, and check that there is no adhesion of battery fluid. Store the batteries safely in a cool and dry place where temperature is **0 °C** (**32 °F**) or more.

NOTICE: *Never turn the battery disconnect switch to OFF position when the LED indicator above the switch is lit up in yellow. The machine control system and the engine control system will be severely damaged.*

10. Apply a coating if it has any flaws or peelings.
11. Plug the air cleaner inlet and the exhaust pipe.
12. Remove the starter key, put the "Do not operate" tag on the right console, and set the gate lock lever to lock position.
13. Lock the hood, the side door, and the cab door.

Periodic checks

⚠ WARNING

Inhalation hazard! Risk to operators and bystanders.
Avoid running the engine in confined areas. Make sure there is adequate ventilation at all times.
Failure to comply could result in death or serious injury.

W0156A

Every month, check:

1. The battery charge and recharge the batteries if required.
2. The levels and top up if necessary.
3. The condition of all lines, connectors and clamps (rust). Grease if necessary.
4. The condition of the paintwork. Apply a coat of anti-rust treatment where necessary.
5. Unplug the air filter inlet and the exhaust pipe.
6. Run the engine at low speed following the starting up procedure and operate the attachment, swing and travel controls.
7. The grease on the cylinder rods.
8. Plug the air filter inlet and the exhaust pipe.

Starting up the machine

⚠ WARNING

Unexpected machine movement!
Before starting the engine, make sure all controls are in the neutral position.
Failure to comply could result in death or serious injury.

W0311A

⚠ WARNING

Inhalation hazard! Risk to operators and bystanders.
Avoid running the engine in confined areas. Make sure there is adequate ventilation at all times.
Failure to comply could result in death or serious injury.

W0156A

1. Drain the fuel tank, the pre-filter and the fuel filter, replace the filter elements if necessary.
2. Fill the fuel tank with suitable fuel.
3. Install the batteries or reconnect the cable to the negative (-) terminal.
4. Grease the machine thoroughly.
5. Check the condition of the fan drive belt and replace it if necessary.
6. Check the condition of the air conditioning drive belt and replace it if necessary.
7. Check the cooling system level and add more coolant if necessary.
8. Check the hydraulic fluid level, and supply it as necessary.
9. Check the **DEF/ADBLUE®** level, and supply it as necessary.
10. Check the gear oil level of the travel reduction gear and that of the swing reduction gear, and supply it as necessary.
11. Clean the cylinder rod.
12. Remove the lid of the air cleaner inlet and that of the exhaust pipe.
13. 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.
14. Remove the "Do not operate" tag, and start the engine following the engine starting procedure.
15. Check all the indicators and lamps carefully.

NOTICE: *check the machine and the engine for leaks or for any parts that are broken, defective or missing.*

7 - TROUBLESHOOTING

Fault code resolution

Engine - Troubleshooting

NOTE: *This chapter describes the easy diagnostic methods for engine-related problems and the remedies for them. If you cannot find the cause of a problem or solve a problem, consult the CASE CONSTRUCTION dealer.*

Problem	Possible Cause	Correction
The engine does not start	Defect in starter switch (Deactivation of starter)	Check the starter switch
	Poor running of starter (Starter running slowly)	Discharged battery, defect in starter, dirt or looseness of connectors
	Poor viscosity of engine oil	Inspect and, as necessary, replace
	Poor air bleeding for fuel system	Bleed it of air completely
	Cold engine (in cold weather)	Preheat suction air, or warm coolant
	No fuel in fuel tank	Add
	Low-quality fuel	Inspect and, as necessary, replace
	Clogging in fuel filter	Clean or replace
	Engine stuck	Consult the CASE CONSTRUCTION dealer
	Low compression	Consult the CASE CONSTRUCTION dealer
	Defect in fuel injection pump	Consult the CASE CONSTRUCTION dealer
	Battery disconnect switch is OFF	Set to ON
	No urea solution remaining in urea solution tank	Add
	Other urea solution than that of specified concentration added	Consult the CASE CONSTRUCTION dealer
The engine stops during operation	No fuel in fuel tank	Add
	Clogging in fuel filter	Clean or replace
	Air entry in fuel system	Retighten the connections of fuel lines
Abnormal oil pressure	Low oil level	Add
	Clogging in oil filter	Replace the oil filter
	Low oil viscosity	Replace with the oil of suitable viscosity for temperature
	Oil leaks from connections	Tighten the connections
	Defect in oil pressure switch	Consult the CASE CONSTRUCTION dealer
	Malfunction in oil pump	Consult the CASE CONSTRUCTION dealer
Exhaust gas from the engine is white or blue	Excess oil	Give an overhaul or replace components
	Very low oil viscosity	Replace with the oil of correct viscosity
	Overcooling by radiator	Adjust
	Incorrect fuel injection timing	Consult the CASE CONSTRUCTION dealer
	Low compression	Consult the CASE CONSTRUCTION dealer
Exhaust gas from the engine is black or deep gray	Wrong fuel	Replace with the correct fuel
	Incorrect valve clearance	Adjust
	Poor suction (Clogging in air cleaner)	Clean or replace the air cleaner
	Defect in fuel injection pump	Consult the CASE CONSTRUCTION dealer
	Low compression	Consult the CASE CONSTRUCTION dealer

Problem	Possible Cause	Correction
Excessive consumption of fuel	Wrong fuel	Replace with the correct fuel
	Poor suction	Clean or replace the element
	Defect in fuel injection pump	Consult the CASE CONSTRUCTION dealer
	Poor injection of fuel injection nozzle	Consult the CASE CONSTRUCTION dealer
	Incorrect fuel injection timing	Consult the CASE CONSTRUCTION dealer
	Low compression	Consult the CASE CONSTRUCTION dealer
Excessive consumption of engine oil	Excess oil	Drain the oil down to the correct level
	Low oil viscosity	Replace with the oil of suitable viscosity for temperature
	Oil leaks	Retighten and, as necessary, replace
	Wear on cylinder piston ring	Consult the CASE CONSTRUCTION dealer
Abnormal noise (from fuel or mechanical system)	Low-quality fuel	Replace
	Damage inside muffler	Replace
Engine overheat (Too high coolant temperature)	Low coolant level	Add
	Coolant leaks	Repair
	Wear or damage on belt	Replace
	Wrong mixing ratio of anti-freeze	Replace
	Problems with radiator	Consult the CASE CONSTRUCTION dealer
	Damaged fan	Consult the CASE CONSTRUCTION dealer
	Problems with thermostat	Consult the CASE CONSTRUCTION dealer
	Problems with water pump	Consult the CASE CONSTRUCTION dealer
	Problems with coolant temperature gauge	Consult the CASE CONSTRUCTION dealer
Problems with battery charge	Incorrect belt tension	Adjust
	Problems with electric wires	Repair
	Problems with battery	Replace
	Problems with regulator	Consult the CASE CONSTRUCTION dealer
	Defect in alternator	Consult the CASE CONSTRUCTION dealer

8 - SPECIFICATIONS

Machine specifications

Engine

Manufacturer and model	ISUZU AR-4JJ1X
Injection	Electronic-controlled High-pressure common rail
Number of cylinders	4
Bore x stroke	**95.4 mm** (**3.8 in**) x **104.9 mm** (**4.1 in**)
Displacement	**2999 cm³/rev** (**183 in³/rev**)
Rated speed	**2000 RPM**
Rated power (**ISO 9249**)	**76.4 kW** (**103.9 Hp**)
Cooling	Water-cooled
Battery start	2 x **12 V 72 A·h**
Voltage	**24 V**
Alternator	**50 A**
Starter	**24 V**, **4.0 kW**

Hydraulic system

Maximum flow of the main pump (at **2000 RPM**)	2 x **129 L/min** (**34.1 US gpm**)
Rated working pressure	**34.3 MPa** (**4975.2 psi**)
Maximum working pressure (Power boost) (*)	**36.3 MPa** (**5265.3 psi**)
Maximum flow of the blade pump (at **2000 RPM**)	**65 L/min** (**17.2 US gpm**)
Rated working pressure	**20.6 MPa** (**2988.0 psi**)
Maximum flow of the pilot pump (at **2000 RPM**)	**20 L/min** (**5.3 US gpm**)
Rated pilot pressure	**3.9 MPa** (**565.7 psi**)

NOTE: *(*) The hydraulic Power boost is not active on CX145D SR Offset Boom with blade.*

Swing performance

Swing speed	**12.5 RPM**
Swing torque	**37000 N·m** (**27290 lb ft**)

Travel performance

Low speed	**0 – 3.4 km/h** (**0 – 2.1 mph**)
High speed	**0 – 5.6 km/h** (**0 – 3.5 mph**)
Drawbar pull	**116000 N** (**26078 lb**)
Grade ability	**70%** (**35°**)

Digging performance (Power boost engaged)

CX145D SR LC — CX145D SR with blade

Bucket digging force	**9500 daN** (**21357 lbf**)
Arm digging force **2.11 m** (**83.07 in**)	**7400 daN** (**16636 lbf**)
Arm digging force **2.50 m** (**98.43 in**)	**6600 daN** (**14837 lbf**)
Arm digging force **3.01 m** (**118.50 in**)	**6000 daN** (**13489 lbf**)

CX145D SR Offset Boom with blade (No Power boost)

Bucket digging force	**8930 daN** (**20075 lbf**)
Arm digging force **2.11 m** (**83.07 in**)	**5950 daN** (**13376 lbf**)

Tracks

Steel track	**600 mm** (**23.62 in**)
	700 mm (**27.56 in**)
Rubber pads (*)	**500 mm** (**19.69 in**)

NOTICE: *(*) for operation on concrete surfaces or paved roads.*

Working lights

One on upper structure	**24 V**, **70 W**
One on attachment	**24 V**, **70 W**
Two on cab	**24 V**, **70 W**

Fluids and lubricants

By using appropriate fluids and lubricants the excavator can operate in ambient temperatures ranging from **-20 °C** (**-4 °F**) to **45 °C** (**113 °F**). Refer to the list of fluids and lubricants contained in this manual.

NOTICE: *When operating the machine in ambient temperatures outside the above mentioned range, consult your CASE CONSTRUCTION Dealer for specific machine provision and for specific fluids and lubricants to be used.*

	Quantity		CASE CON-STRUCTION specification	Reference specification
Fuel tank	**200 L** (**52.8 US gal**)	—	—	**ASTM D975**
DEF/ADBLUE® tank	**43 L** (**11.4 US gal**)	—	—	**ISO 22241-1**
Engine oil	**17 L** (**4.5 US gal**)	**NO.1 ENGINE™ OIL SEMI-SYNTHETIC 10W-40**	**MAT3571**	**SAE 10W40 API CK-4**
Swing reduction unit	**2.2 L** (**0.6 US gal**)	**HYPOID GEAR OIL EXTREME PRESSURE 80W-90**	**MAT3516-A**	**SAE 80W/90 API GL-5**
Travel reduction unit	**2.1 L** (**0.6 US gal**)	**HYPOID GEAR OIL EXTREME PRESSURE 80W-90**	**MAT3516-A**	**SAE 80W/90 API GL-5**
Engine coolant	**16.5 L** (**4.4 US gal**)	**OAT EXTENDED LIFE COOLANT/ANTIFREEZE** CONCENTRATE (*)	**MAT3724** Grade OAT-EG1	**ASTM D6210** TYPE I-FF
		OAT EXTENDED LIFE COOLANT/ANTIFREEZE 50/50 PREMIXED	**MAT3724** Grade OAT-EG2	**ASTM D6210** TYPE III-FF
Hydraulic oil tank (**)	**75 L** (**19.8 US gal**)	**PREMIUM HYDRAULIC OIL HV46 MULTI-GRADE ANTIWEAR**	—	ISO 6743-4 L-HV 46
Grease	—	**MULTI-PURPOSE GREASE EXTREME PRESSURE AND ANTI-WEAR NLGI 2**	**MAT3555-A**	**NLGI 2**

(*) Concentrate antifreeze to be mixed 50/50 with distilled (deionized) water.

(**) The total capacity of the hydraulic system is **158 L** (**41.7 US gal**).

Engine coolant

OAT EXTENDED LIFE COOLANT/ANTIFREEZE is the reference genuine product for machine service.

NOTICE: *Never add Supplemental Coolant Additives (SCA) when using* ***OAT EXTENDED LIFE COOLANT/ANTIFREEZE****.*

OAT EXTENDED LIFE COOLANT/ANTIFREEZE has to be used if refilling of the cooling system is needed. Refer to the dedicated procedure and recommendations described in Chapter 6.

OAT EXTENDED LIFE COOLANT/ANTIFREEZE must be used for the replacement of engine coolant according to the maintenance program of the machine. The replacement shall also be tackled in case of repair or replacement of components of the cooling system. Refer to the dedicated procedure described in Chapter 6.

The engine cooling system should 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 **OAT EXTENDED LIFE COOLANT/ANTIFREEZE**, a 50/50 mixture of antifreeze and distilled (deionized) water grants proper performance of the engine cooling system in the above mentioned operating temperature range of the machine.

OAT EXTENDED LIFE COOLANT/ANTIFREEZE is available as:

- 50/50 PREMIXED coolant solution ready for usage.
- CONCENTRATE antifreeze to be mixed 50/50 with distilled (deionized) water.

NOTICE: *If operating in extreme winter climate, a coolant solution made by 60/40 antifreeze/distilled (deionized) water mixture must be used in order to grant proper performance of the engine cooling system.*

NOTICE: *Never use coolant solution with more than* ***60%*** *of antifreeze. This affects the cooling capacity of the mixture.*

When the coolant solution is prepared starting from the CONCENTRATE product, the antifreeze concentration in the mixture of antifreeze and distilled (deionized) water can be determined with a refractometer designed to measure ethylene glycol content.

If distilled (deionized) water is not available, use water for dilution with the following properties:

Property	Maximum limit
Total Solids	**340 ppm**
Total Hardness	**170 ppm**
Chloride (Cl)	**40 ppm**
Sulfate (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 Sulfur 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 should be invalid if any serious defect is caused by usage of any other fuel. Using any fuel other than the prescribed type will cause damages to the fuel supply system, to the fuel injection system, to the engine block, and to the exhaust after treatment system. CASE CONSTRUCTION will not be responsible to any of such damages.*

If the temperature drops below the fuel cloud point, output deficiency or engine start problems may occur due to wax crystals. 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 should:

- 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 sulfur content.
- have very little residual carbon.

NOTICE: *Never use a mix of diesel fuel and old engine oil. The fuel injection system and the exhaust after treatment system will be severely damaged.*

NOTICE: *consult the fuel supplier or the CASE CONSTRUCTION Dealer regarding appropriate use of fuel additives.*

NOTICE: *in order to prevent condensation during cold weather, fill the fuel tank to full after completing the day's work.*

Fuel storage:

Long storage can lead to the accumulation of impurities and condensation in the fuel. Engine trouble can often be traced to the presence of water in the fuel. The storage tank must be placed outside and the temperature of the fuel should be kept as low as possible. Drain off water and impurities regularly.

Disposal of fluids, lubricants, and spare parts

Fluids, lubricants and spare parts used on the machine are not fully compatible with the environment. Make sure to carry out all maintenance operations using appropriate tools, in order to avoid any risk of damaging the environment.

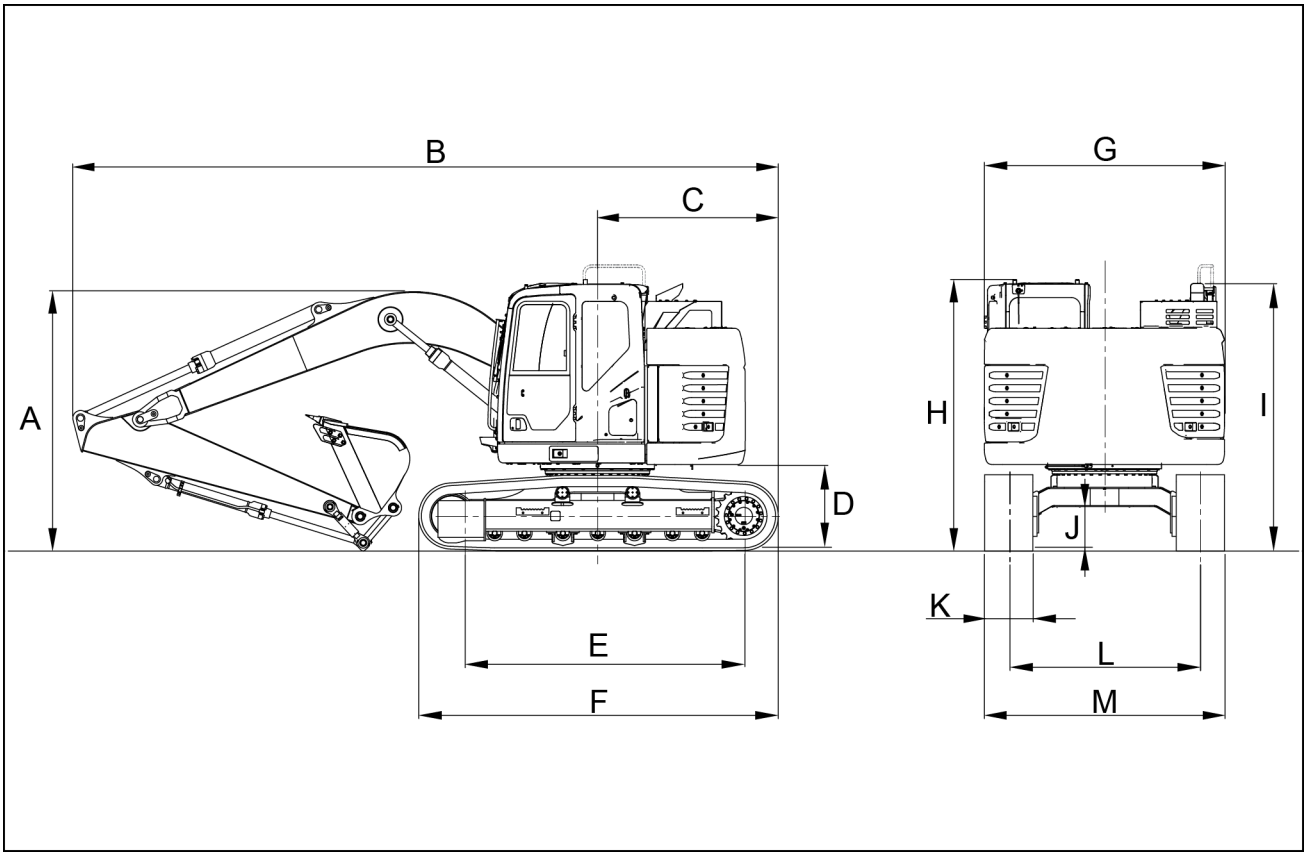
NOTE: *for example, make sure that the receptacle for collecting oil to be replaced is not leaking.*

Never spread fluids or lubricants on the ground or into water. Consult the CASE CONSTRUCTION Dealer or the Local Environmental Agency in order to obtain information on the correct method of disposing fluids and lubricants used on the machine.

Never throw away spare parts as filters or batteries. Consult the CASE CONSTRUCTION Dealer or the Local Environmental Agency in order to obtain information on the correct method of disposing filters, batteries or other spare parts used on the machine.

Dimensions

CX145D SR LC



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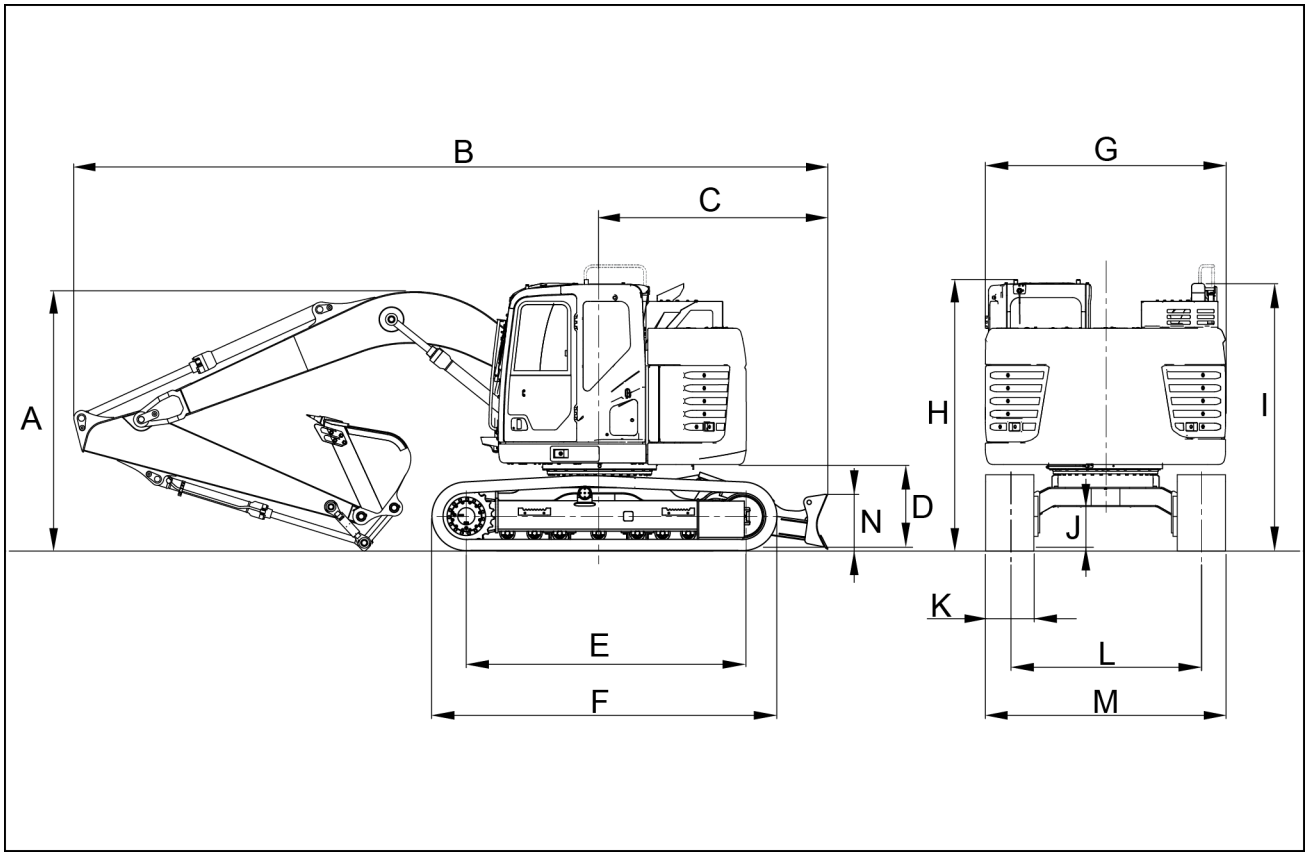
Arm	**2.11 m** (**83.07 in**)	**2.50 m** (**98.43 in**)	**3.01 m** (**118.50 in**)
(A)	**2.75 m** (**108.27 in**)	**2.84 m** (**111.81 in**)	**2.68 m** (**105.51 in**)
(B)	**7.34 m** (**288.98 in**)	**7.35 m** (**289.37 in**)	**7.34 m** (**288.98 in**)
(C)	**1.88 m** (**74.02 in**)		
(D) (without grousers)	**0.88 m** (**34.65 in**)		
(E)	**3.04 m** (**119.69 in**)		
(F)	**3.76 m** (**148.03 in**)[**3.85 m** (**151.57 in**) with rubber pads]		
(G)	**2.49 m** (**98.03 in**)		
(H) (*)	**2.82 m** (**111.02 in**)[**2.87 m** (**112.99 in**) with rubber pads]		
(I) (with folded handrail)	**2.78 m** (**109.45 in**)[**2.83 m** (**111.42 in**) with rubber pads]		
(J) (without grousers)	**0.42 m** (**16.54 in**)[**0.48 m** (**18.90 in**) with rubber pads]		
(K) (standard track)	**0.60 m** (**23.62 in**)		
(L)	**1.99 m** (**78.35 in**)		
(M) 500 mm (**19.7 in**) pad	**2.49 m** (**98.03 in**)		
(M) 600 mm (**23.6 in**) track	**2.59 m** (**101.97 in**)		
(M) 700 mm (**27.6 in**) track	**2.69 m** (**105.91 in**)		

Boom length: **4.63 m** (**182.28 in**)

NOTE: *(*) **2.92 m** (**114.96 in**) if FOPS level 2 is installed [**2.97 m** (**116.93 in**) with rubber pads]*

NOTICE: *For the **3.01 m** (**118.50 in**) arm, the dimension **(A)** and the dimension **(B)** of the reference position shown in figure are measured with the arm cylinder pin in transport position.*

CX145D SR with blade



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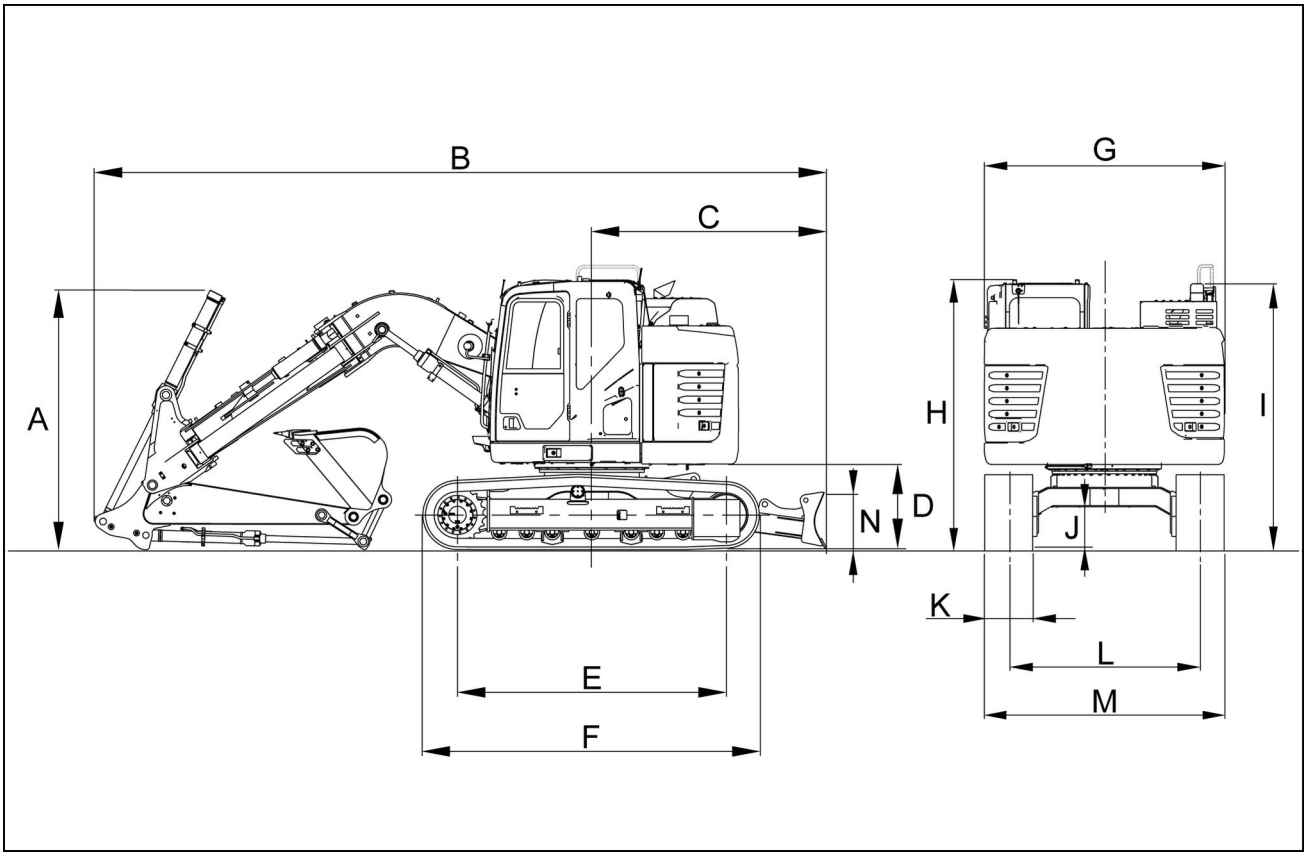
Arm	**2.11 m** (**83.07 in**)	**2.50 m** (**98.43 in**)	**3.01 m** (**118.50 in**)
(A)	**2.75 m** (**108.27 in**)	**2.84 m** (**111.81 in**)	**2.68 m** (**105.51 in**)
(B)	**7.87 m** (**309.84 in**)	**7.88 m** (**310.24 in**)	**7.87 m** (**309.84 in**)
(C)	**2.41 m** (**94.88 in**)		
(D) (without grousers)	**0.88 m** (**34.65 in**)		
(E)	**2.79 m** (**109.84 in**)		
(F)	**3.50 m** (**137.80 in**)[**3.59 m** (**141.34 in**) with rubber pads]		
(G)	**2.49 m** (**98.03 in**)		
(H) (*)	**2.82 m** (**111.02 in**)[**2.87 m** (**112.99 in**) with rubber pads]		
(I) (with folded handrail)	**2.78 m** (**109.45 in**)[**2.83 m** (**111.42 in**) with rubber pads]		
(J) (without grousers)	**0.42 m** (**16.54 in**)[**0.48 m** (**18.90 in**) with rubber pads]		
(K) (standard track)	**0.60 m** (**23.62 in**)		
(L)	**1.99 m** (**78.35 in**)		
(M) 500 mm (**19.7 in**) pad	**2.49 m** (**98.03 in**)		
(M) 600 mm (**23.6 in**) track	**2.59 m** (**101.97 in**)		
(M) 700 mm (**27.6 in**) track	**2.69 m** (**105.91 in**)		
(N)	**0.57 m** (**22.44 in**)		

Boom length: **4.63 m** (**182.28 in**)

NOTE: *(*) **2.92 m** (**114.96 in**) if FOPS level 2 is installed [**2.97 m** (**116.93 in**) with rubber pads]*

NOTICE: *For the **3.01 m** (**118.50 in**) arm, the dimension **(A)** and the dimension **(B)** of the reference position shown in figure are measured with the arm cylinder pin in transport position.*

CX145D SR Offset Boom with blade



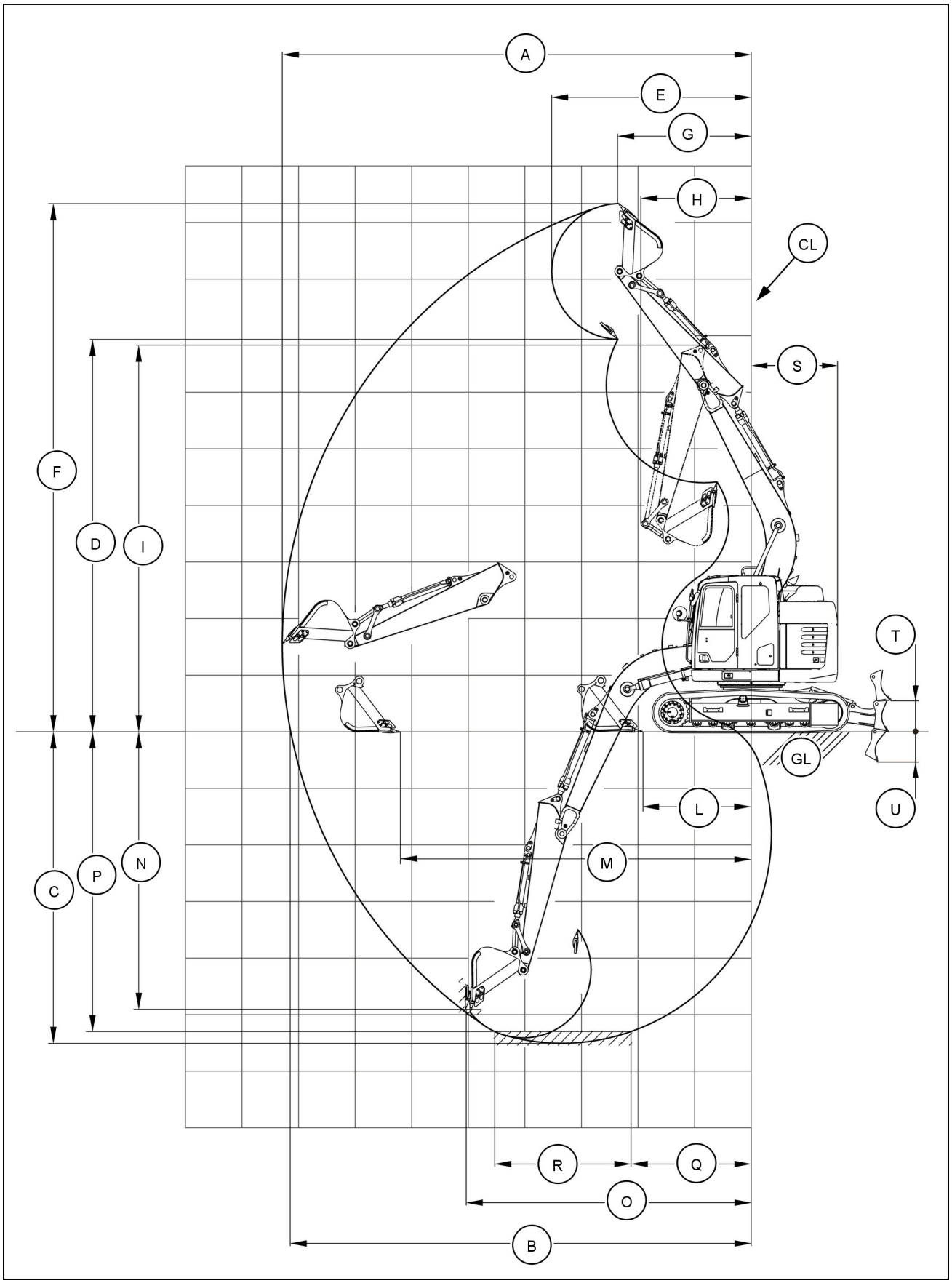
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Arm	**2.11 m** (**83.07 in**)
(A)	**2.69 m** (**105.91 in**)
(B)	**7.57 m** (**298.03 in**)
(C)	**2.41 m** (**94.88 in**)
(D) (without grousers)	**0.88 m** (**34.65 in**)
(E)	**2.79 m** (**109.84 in**)
(F)	**3.50 m** (**137.80 in**)[**3.59 m** (**141.34 in**) with rubber pads]
(G)	**2.49 m** (**98.03 in**)
(H) (*)	**2.82 m** (**111.02 in**)[**2.87 m** (**112.99 in**) with rubber pads]
(I) (with folded handrail)	**2.78 m** (**109.45 in**)[**2.83 m** (**111.42 in**) with rubber pads]
(J) (without grousers)	**0.42 m** (**16.54 in**)[**0.48 m** (**18.90 in**) with rubber pads]
(K) (standard track)	**0.60 m** (**23.62 in**)
(L)	**1.99 m** (**78.35 in**)
(M) 500 mm (**19.7 in**) pad	**2.49 m** (**98.03 in**)
(M) 600 mm (**23.6 in**) track	**2.59 m** (**101.97 in**)
(M) 700 mm (**27.6 in**) track	**2.69 m** (**105.91 in**)
(N)	**0.57 m** (**22.44 in**)

Boom length: **4.50 m** (**177.17 in**)

***NOTE:** (*) **2.92 m** (**114.96 in**) if FOPS level 2 is installed [**2.97 m** (**116.93 in**) with rubber pads]*

Working ranges CX145D SR LC — CX145D SR with blade

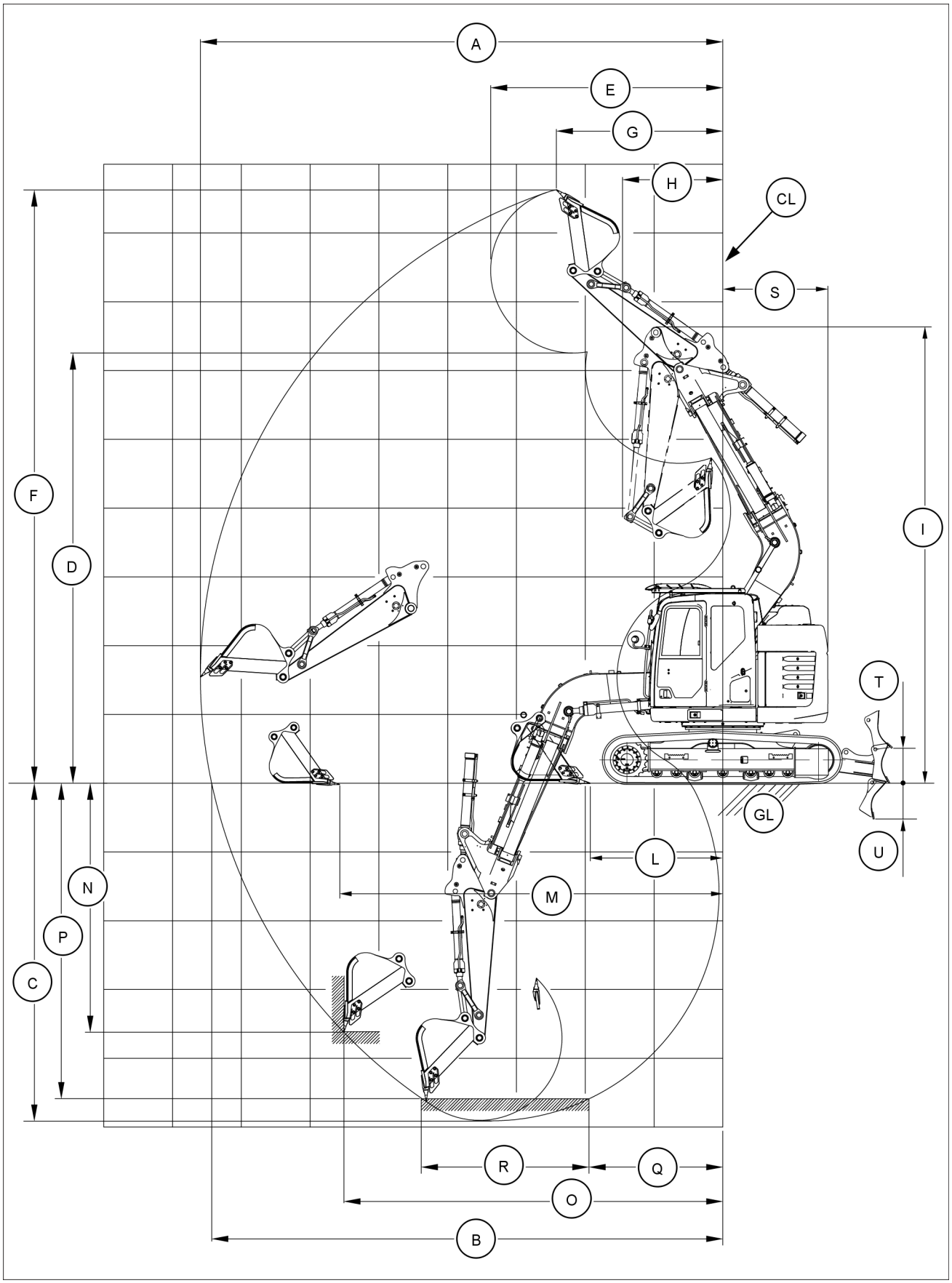


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Arm	**2.11 m** (**83.07 in**)	**2.50 m** (**98.43 in**)	**3.01 m** (**118.50 in**)
(A) Max digging reach	**7.94 m** (**312.60 in**)	**8.29 m** (**326.38 in**)	**8.74 m** (**344.09 in**)
(B) Max digging reach at ground level **(GL)**	**7.78 m** (**306.30 in**)	**8.14 m** (**320.47 in**)	**8.60 m** (**338.58 in**)
(C) Max digging depth	**5.11 m** (**201.18 in**)	**5.51 m** (**216.93 in**)	**6.01 m** (**236.61 in**)
(D) Max dump height	**6.66 m** (**262.20 in**)	**6.94 m** (**273.23 in**)	**7.29 m** (**287.01 in**)
(E) Max dump distance	**3.24 m** (**127.56 in**)	**3.53 m** (**138.98 in**)	**3.90 m** (**153.54 in**)
(F) Max working height	**9.06 m** (**356.69 in**)	**9.34 m** (**367.72 in**)	**9.69 m** (**381.50 in**)
(G) Reach at max working height	**2.03 m** (**79.92 in**)	**2.34 m** (**92.13 in**)	**2.75 m** (**108.27 in**)
(H) Min equipment swing radius	**1.89 m** (**74.41 in**)	**1.95 m** (**76.77 in**)	**2.33 m** (**91.73 in**)
(I) Height at min equipment swing radius	**6.82 m** (**268.50 in**)	**6.82 m** (**268.50 in**)	**6.84 m** (**269.29 in**)
(L) Min clean up distance	**2.28 m** (**89.76 in**)	**1.97 m** (**77.56 in**)	**1.90 m** (**74.80 in**)
(M) Max clean up distance	**5.93 m** (**233.46 in**)	**6.32 m** (**248.82 in**)	**6.78 m** (**266.93 in**)
(N) Max digging depth on a vertical face	**4.56 m** (**179.53 in**)	**4.90 m** (**192.91 in**)	**5.28 m** (**207.87 in**)
(O) Reach at max digging depth on a vertical face	**4.90 m** (**192.91 in**)	**5.05 m** (**198.82 in**)	**5.29 m** (**208.27 in**)
(P) Max flat-bottomed trenching depth	**4.87 m** (**191.73 in**)	**5.29 m** (**208.27 in**)	**5.83 m** (**229.53 in**)
(Q) Distance of flat-bottomed trench	**2.11 m** (**83.07 in**)	**2.11 m** (**83.07 in**)	**2.11 m** (**83.07 in**)
(R) Flat-bottomed trench reference lenght	**2.44 m** (**96.06 in**)		
(S) Swing tail radius	**1.53 m** (**60.24 in**)		
(T) Maximum blade lift	**0.51 m** (**20.08 in**)		
(U) Maximum blade depth	**0.52 m** (**20.47 in**)		

NOTE: *The dimensions of the working range are defined basing on the two reference lines* ***(GL)*** *(ground level) and* ***(CL)*** *(center line, i.e. rotation axis of the machine). All the dimensions related to the* ***(GL)*** *are defined with the grousers indented into the ground.*

Working ranges CX145D SR Offset Boom with blade (Offset 0)

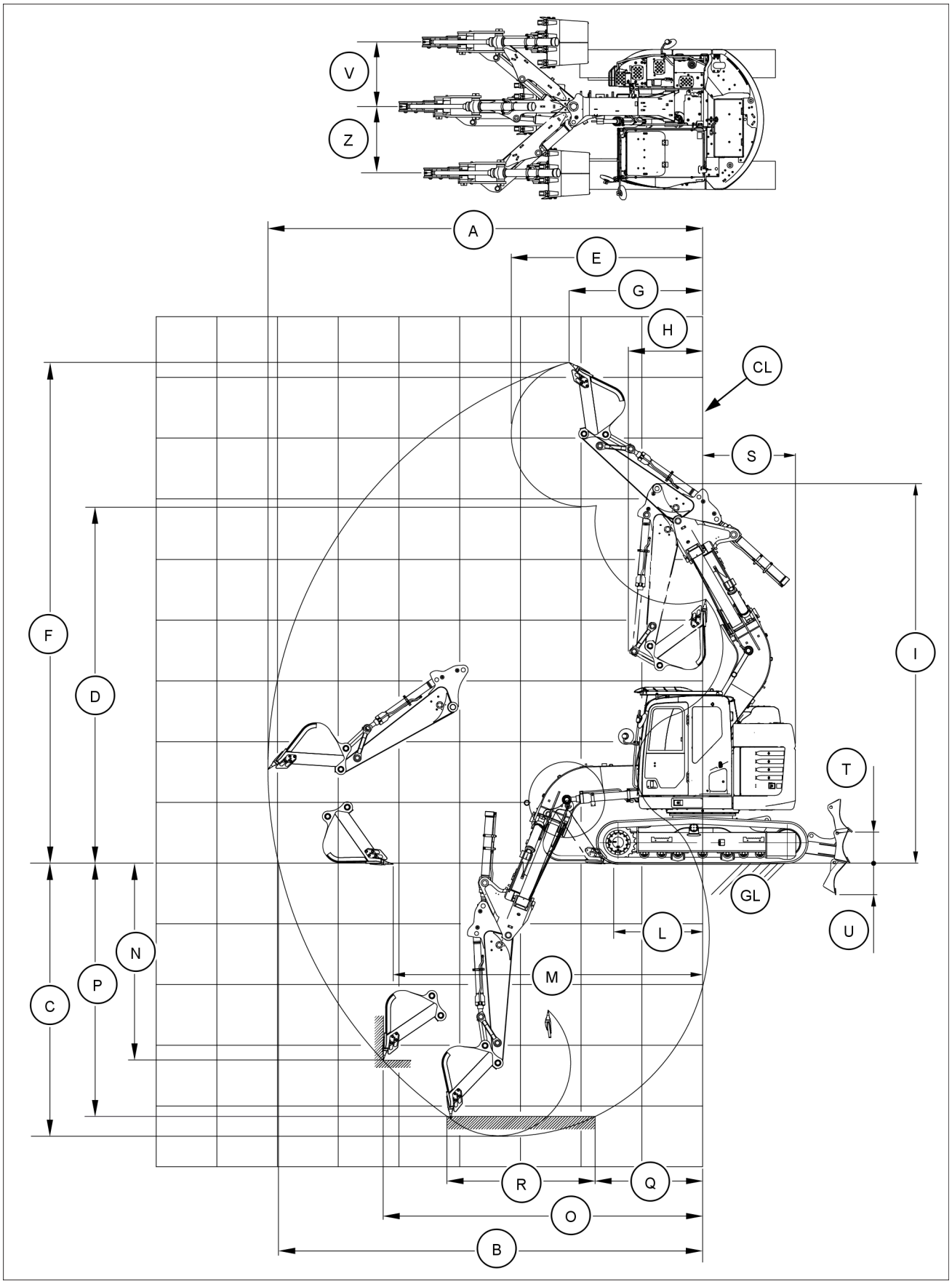


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Arm	**2.11 m** (**83.07 in**)
(A) Max digging reach	**7.59 m** (**298.82 in**)
(B) Max digging reach at ground level **(GL)**	**7.43 m** (**292.52 in**)
(C) Max digging depth	**4.91 m** (**193.31 in**)
(D) Max dump height	**6.25 m** (**246.06 in**)
(E) Max dump distance	**3.38 m** (**133.07 in**)
(F) Max working height	**8.63 m** (**339.76 in**)
(G) Reach at max working height	**2.42 m** (**95.28 in**)
(H) Min equipment swing radius	**1.43 m** (**56.30 in**)
(I) Height at min equipment swing radius	**6.63 m** (**261.02 in**)
(L) Min clean up distance	**1.93 m** (**75.98 in**)
(M) Max clean up distance	**5.75 m** (**226.38 in**)
(N) Max digging depth on a vertical face	**3.61 m** (**142.13 in**)
(O) Reach at max digging depth on a vertical face	**5.51 m** (**216.93 in**)
(P) Max flat-bottomed trenching depth	**4.59 m** (**180.71 in**)
(Q) Distance of flat-bottomed trench	**1.94 m** (**76.38 in**)
(R) Flat-bottomed trench reference lenght	**2.44 m** (**96.06 in**)
(S) Swing tail radius	**1.49 m** (**58.66 in**)
(T) Maximum blade lift	**0.51 m** (**20.08 in**)
(U) Maximum blade depth	**0.52 m** (**20.47 in**)

NOTE: *The dimensions of the working range are defined basing on the two reference lines* ***(GL)*** *(ground level) and* ***(CL)*** *(center line, i.e. rotation axis of the machine). All the dimensions related to the* ***(GL)*** *are defined with the grousers indented into the ground.*

Working ranges CX145D SR Offset Boom with blade (Max offset left)



SMIL17CEX7678HA 6

Arm	**2.11 m** (**83.07 in**)
(A) Max digging reach	**7.16 m** (**281.89 in**)
(B) Max digging reach at ground level **(GL)**	**6.99 m** (**307.48 in**)
(C) Max digging depth	**4.50 m** (**177.17 in**)
(D) Max dump height	**5.87 m** (**231.10 in**)
(E) Max dump distance	**3.15 m** (**124.02 in**)
(F) Max working height	**8.25 m** (**357.48 in**)
(G) Reach at max working height	**2.20 m** (**86.61 in**)
(H) Min equipment swing radius	**1.21 m** (**47.64 in**)
(I) Height at min equipment swing radius	**6.25 m** (**246.06 in**)
(L) Min clean up distance	**1.55 m** (**61.02 in**)
(M) Max clean up distance	**5.22 m** (**205.51 in**)
(N) Max digging depth on a vertical face	**3.25 m** (**127.95 in**)
(O) Reach at max digging depth on a vertical face	**5.26 m** (**207.09 in**)
(P) Max flat-bottomed trenching depth	**4.17 m** (**164.17 in**)
(Q) Distance of flat-bottomed trench	**1.77 m** (**69.69 in**)
(R) Flat-bottomed trench reference lenght	**2.44 m** (**96.06 in**)
(S) Swing tail radius	**1.49 m** (**58.66 in**)
(T) Maximum blade lift	**0.51 m** (**20.08 in**)
(U) Maximum blade depth	**0.52 m** (**20.47 in**)
(V) Max offset right	**1.15 m** (**45.28 in**)
(Z) Max offset left	**1.18 m** (**46.46 in**)

NOTE: *The dimensions of the working range are defined basing on the two reference lines* ***(GL)*** *(ground level) and* ***(CL)*** *(center line, i.e. rotation axis of the machine). All the dimensions related to the* ***(GL)*** *are defined with the grousers indented into the ground.*

Operating weights

CX145D SR LC

With mono-block boom, **2.50 m** (**98.43 in**) arm, **0.60 m³** (**0.78 yd³**) Heavy Duty bucket, **600 mm** (**24 in**) track, operator, fluids, and full fuel tank.	**14800 kg** (**32628 lb**)
Average ground contact pressure	**37 kPa** (**5.4 psi**)

CX145D SR with blade

With mono-block boom, **2.50 m** (**98.43 in**) arm, **0.60 m³** (**0.78 yd³**) Heavy Duty bucket, **600 mm** (**24 in**) track, operator, fluids, and full fuel tank.	**15400 kg** (**33951 lb**)
Average ground contact pressure	**42 kPa** (**6.1 psi**)

CX145D SR Offset Boom with blade

With Offset Boom, **2.11 m** (**83.07 in**) arm, **0.50 m³** (**0.65 yd³**) Heavy Duty bucket, **600 mm** (**23.6 in**) track, operator, fluids, and full fuel tank.	**15400 kg** (**33951 lb**)
Average ground contact pressure	**42 kPa** (**6.1 psi**)

9 - ACCESSORIES

Direct fit buckets

CASE CONSTRUCTION direct fit buckets are designed to optimize the operating performance of the CASE CONSTRUCTION excavators in main construction works and in special jobsites.

NOTICE: *CASE CONSTRUCTION direct fit buckets are designed for best performance when they are installed directly to the excavator arm. If the excavator is equipped with a quick coupler, specific CASE CONSTRUCTION Coupler buckets are available and should be used. Refer ahead in this Chapter.*

CASE CONSTRUCTION Heavy Duty direct fit buckets ensure excavating performance and payload for most of construction works. They are recommended for digging and trenching in compacted and slightly abrasive soil. They are also suitable for scoop loading of sand and gravel.

CASE CONSTRUCTION Heavy Duty High Capacity direct fit buckets feature a higher capacity/width ratio for special construction works that do not require top excavating performance. They are recommended for productive trenching in uncompacted soil. They are also suitable for scoop loading of topsoil, coal, and other loose light materials.

NOTE: *All the CASE CONSTRUCTION direct fit buckets may be equipped with bolt-on side cutters in order to enhance the penetration effect and to reduce the wearing of the base frames of the bucket.*

CASE CONSTRUCTION Ditch Cleaning direct fit buckets feature a compact shell, a wide front and a bolt-on straight cutting edge. They are suitable for light digging and dredging, and for leveling or fine grading of slopes or beds.

CASE CONSTRUCTION defines application rules in order to match each bucket type and size with the most suitable configuration of the machine, and to refer bucket application to specific working conditions.

NOTICE: *CASE CONSTRUCTION Heavy Duty High Capacity direct fit buckets must not be installed on CX145D SR Offset Boom with blade. These buckets have a longer teeth radius, and they may hit the cab causing serious damages to the machine and serious injuries to the operator.*

Direct fit buckets application as function of the arm (CX145D SR LC – CX145D SR with blade)

Heavy Duty buckets			Arm		
Capacity **ISO 7451** (Heaped)	Width	Mass	**2.11 m** (**83.07 in**)	**2.50 m** (**98.43 in**)	**3.01 m** (**118.50 in**)
0.27 m³ (**0.35 yd³**)	**455 mm** (**18 in**)	**390 kg** (**860 lb**)	○	○	○
0.38 m³ (**0.50 yd³**)	**610 mm** (**24 in**)	**460 kg** (**1014 lb**)	○	○	○
0.50 m³ (**0.65 yd³**)	**760 mm** (**30 in**)	**520 kg** (**1146 lb**)	○	○	●
0.60 m³ (**0.78 yd³**)	**915 mm** (**36 in**)	**590 kg** (**1301 lb**)	○	●	■
0.71 m³ (**0.93 yd³**)	**1065 mm** (**42 in**)	**650 kg** (**1433 lb**)	●	■	x
0.83 m³ (**1.09 yd³**)	**1220 mm** (**48 in**)	**730 kg** (**1609 lb**)	■	x	x

Heavy Duty, High Capacity buckets			Arm		
Capacity **ISO 7451** (Heaped)	Width	Mass	**2.11 m** (**83.07 in**)	**2.50 m** (**98.43 in**)	**3.01 m** (**118.50 in**)
0.32 m³ (**0.42 yd³**)	**455 mm** (**18 in**)	**430 kg** (**948 lb**)	○	○	○
0.44 m³ (**0.58 yd³**)	**610 mm** (**24 in**)	**510 kg** (**1124 lb**)	○	○	●
0.56 m³ (**0.73 yd³**)	**760 mm** (**30 in**)	**580 kg** (**1279 lb**)	○	●	■
0.70 m³ (**0.92 yd³**)	**915 mm** (**36 in**)	**650 kg** (**1433 lb**)	●	■	x
0.83 m³ (**1.09 yd³**)	**1065 mm** (**42 in**)	**690 kg** (**1521 lb**)	■	x	x

Ditch cleaning buckets			Arm		
Capacity **ISO 7451** (Heaped)	Width	Mass	**2.11 m** (**83.07 in**)	**2.50 m** (**98.43 in**)	**3.01 m** (**118.50 in**)
0.61 m³ (**0.80 yd³**)	**1220 mm** (**48 in**)	**390 kg** (**860 lb**)	○	●	■
		450 kg (**992 lb**) (*)	○	●	■
0.78 m³ (**1.02 yd³**)	**1525 mm** (**60 in**)	**460 kg** (**1014 lb**)	●	■	x
		530 kg (**1168 lb**) (*)	■	■	x

(*) with bolt-on cutting edge

○ Density of material up to 2 t/m^3
● Density of material up to 1.6 t/m^3
■ Density of material up to 1.2 t/m^3
x Not applicable

Direct fit buckets application (CX145D SR Offset Boom with blade)

Heavy Duty buckets			Arm
Capacity **ISO 7451** (Heaped)	Width	Mass	**2.11 m** (**83.07 in**)
0.27 m³ (**0.35 yd³**)	**455 mm** (**18 in**)	**390 kg** (**860 lb**)	○
0.38 m³ (**0.50 yd³**)	**610 mm** (**24 in**)	**460 kg** (**1014 lb**)	○
0.50 m³ (**0.65 yd³**)	**760 mm** (**30 in**)	**520 kg** (**1146 lb**)	●
0.60 m³ (**0.78 yd³**)	**915 mm** (**36 in**)	**590 kg** (**1301 lb**)	■
0.71 m³ (**0.93 yd³**)	**1065 mm** (**42 in**)	**650 kg** (**1433 lb**)	■

Ditch cleaning buckets			Arm
Capacity **ISO 7451** (Heaped)	Width	Mass	**2.11 m** (**83.07 in**)
0.61 m³ (**0.80 yd³**)	**1220 mm** (**48 in**)	**390 kg** (**860 lb**)	●
		450 kg (**992 lb**) (*)	●
0.78 m³ (**1.02 yd³**)	**1525 mm** (**60 in**)	**460 kg** (**1014 lb**)	■
		530 kg (**1168 lb**) (*)	■

(*) with bolt-on cutting edge

○ Density of material up to 2 t/m^3
● Density of material up to 1.6 t/m^3
■ Density of material up to 1.2 t/m^3

Auxiliary hydraulic circuits (CX145D SR LC – CX145D SR with blade)

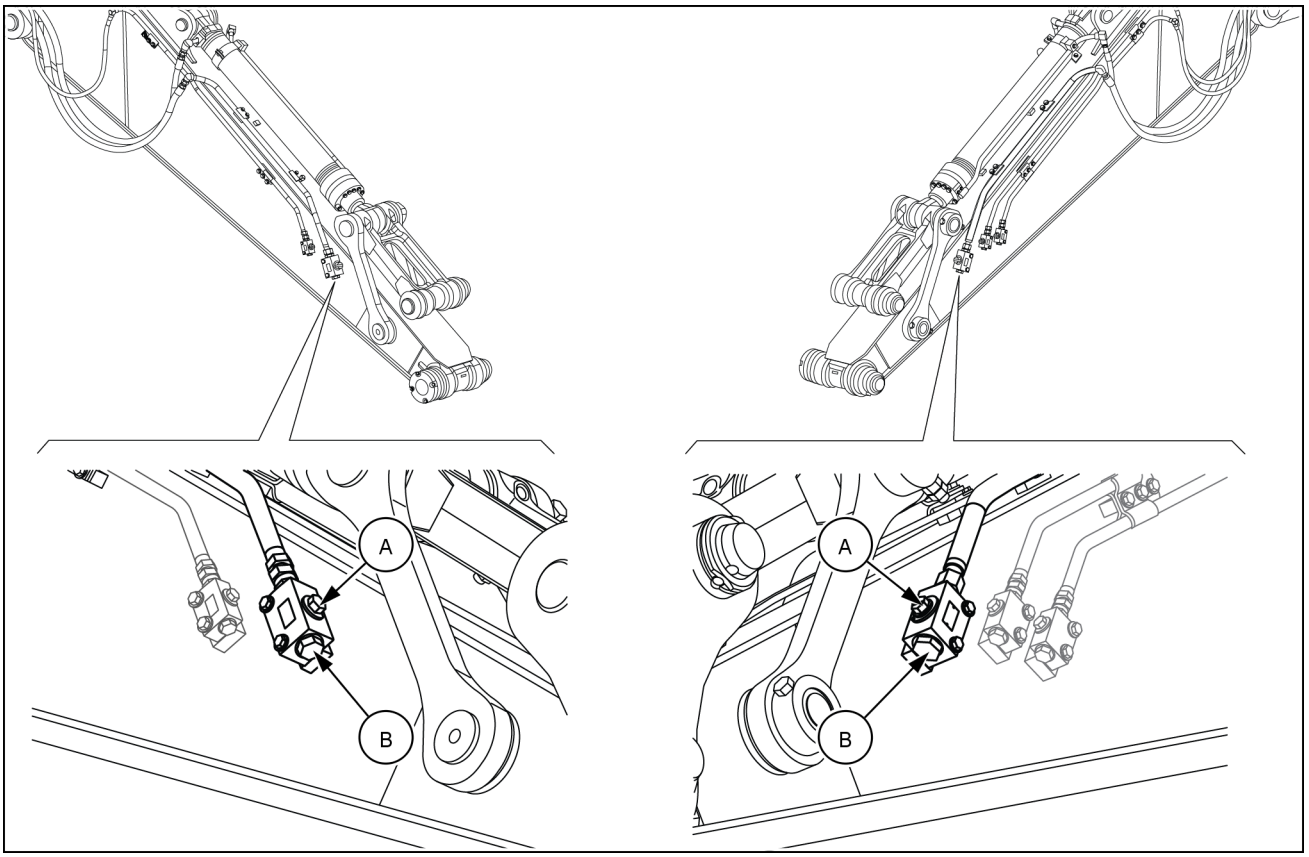
Auxiliary high-flow hydraulic circuit

The machine can be equipped with one of the following auxiliary high-flow hydraulic circuits:

- Single-acting auxiliary high-flow hydraulic circuit intended for usage of attachments such as a hydraulic breaker.
- Double-acting auxiliary high-flow hydraulic circuit intended for usage of attachments such as a hydraulic thumb, as a sorting grab or as a hydraulic demolition crusher.
- Multi-function auxiliary high-flow hydraulic circuit which can be alternatively set as a single-acting circuit or a double-acting circuit.

Hydraulic connections

The feed valves at the top of the arm allow to install properly and safely the hoses to connect the hydraulic attachment to the lines of the auxiliary high-flow hydraulic circuit.



SMIL15CEXY959FB 1

Open/Close tool **(A)**	**24 mm** wrench
Hydraulic connection **(B)**	G 3/4” female port with O-Ring seat

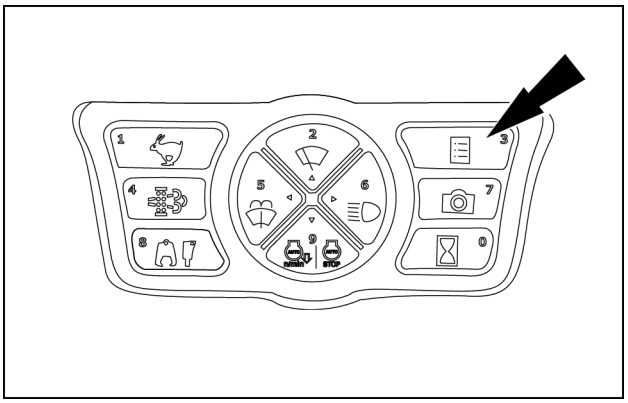
NOTICE: *Always keep each connecting hose on the same side of the arm. Never cross-over the connecting hoses between the two sides of the arm.*

Operational settings

The flow rate/pressure characteristic of the auxiliary high-flow hydraulic circuit can be set according to the type and to the specifications of the attachment used.

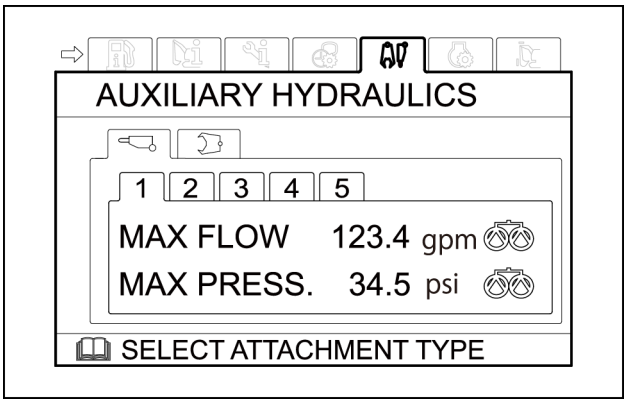
NOTICE: *before operating any hydraulic attachment be sure to set the proper attachment mode (breaker or crusher) and the proper hydraulic flow rate/pressure characteristic. If the attachment mode or the hydraulic flow rate/pressure characteristic are not properly set, malfunction or failure may occur to the machine or damage may occur to the hydraulic attachment.*

Before operating any hydraulic attachment, press the display mode selector button to open the User Information Mode.



SMIL15CEX1234AA 2

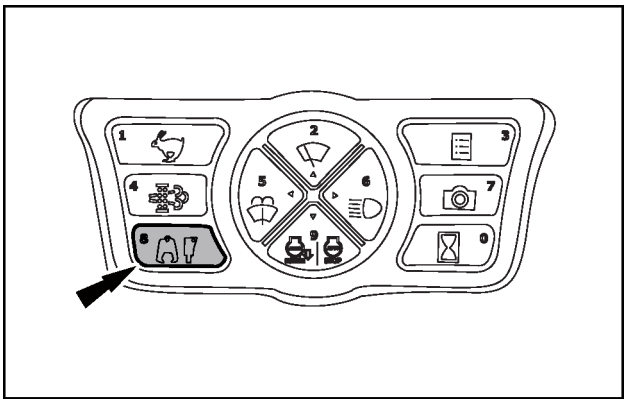
Select the dedicated tab for operational settings of the auxiliary high-flow hydraulic circuit.



SMIL15CEXZ394AA 3

Alternatively, just press and hold the attachment selector button for **1 s** to get directly to the dedicated tab for operational settings of the auxiliary high-flow hydraulic circuit.

NOTE: *the dedicated tab for operational settings of the auxiliary high-flow hydraulic circuit is not active if the machine is not equipped with any auxiliary high-flow hydraulic circuit.*



SMIL14CEX1709AA 4

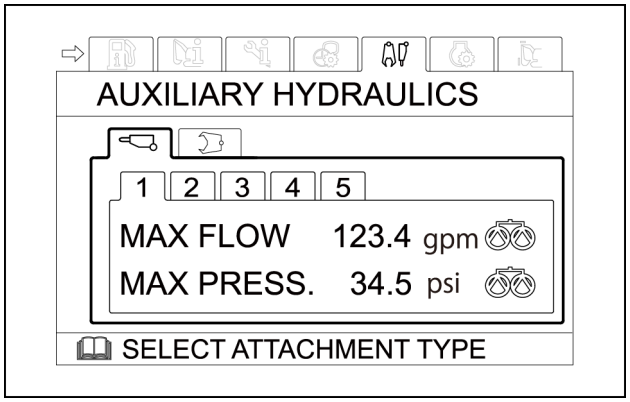
The tab for operational settings of the auxiliary high-flow hydraulic circuit features two pages. These two pages allows to set and store specific flow rate/pressure combinations according to the type and to the specifications of the attachment used.

Once the flow rate/pressure combinations are stored, they can be directly selected pressing the attachment selector button. Refer ahead in this Section.

Before operating a hydraulic breaker or any other single-acting hydraulic attachment, select the first page (breaker icon) to set and store the proper flow rate/pressure combination.

Five flow rate/pressure combinations can be set and stored for usage of single-acting hydraulic attachments. Combination 1 for single-acting circuit is set from factory.

NOTE: *If the machine is equipped with the Double-acting auxiliary high-flow hydraulic circuit, the page for setting the flow rate/pressure combinations for breakers is not active.*

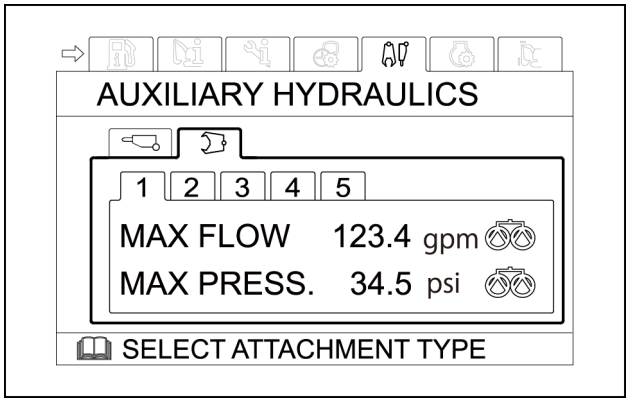


SMIL15CEXZZ48AA 5

Before operating a hydraulic crusher or any other double-acting hydraulic attachment, select the second page (crusher icon) to set and store the proper flow rate/pressure combination.

Five flow rate/pressure combinations can be set and stored for usage of double-acting hydraulic attachments. Combination 1 for double-acting circuit is set from factory.

NOTE: *If the machine is equipped with the Single-acting auxiliary high-flow hydraulic circuit, the page for setting the flow rate/pressure combinations for crushers is not active.*



SMIL15CEXZZ47AA 6

Refer to the next pages for specific information about setting capabilities for each kind of auxiliary high-flow hydraulic circuit.

NOTE: *all the values of the maximum flow rate are related to the SP work mode. If the auxiliary high-flow hydraulic circuit is used with a different work mode the actual flow will be lower.*

Setting ranges for Single-acting auxiliary high-flow hydraulic circuit

The maximum flow rate for the Single-acting auxiliary high-flow hydraulic circuit can be selected within the following range:

Level	1 pump flow
1	**34 L/min** (**9.0 US gpm**)
2	**38 L/min** (**10.0 US gpm**)
3	**51 L/min** (**13.5 US gpm**)
4	**62 L/min** (**16.4 US gpm**)
5	**73 L/min** (**19.3 US gpm**)
6	**85 L/min** (**22.5 US gpm**)
7	**97 L/min** (**25.6 US gpm**)
8	**108 L/min** (**28.5 US gpm**)
9	**117 L/min** (**30.9 US gpm**)
10	**126 L/min** (**33.3 US gpm**)

The maximum flow rate for Breaker 1 combination is set from factory:

Single-acting circuit	Breaker 1: **108 L/min** (**28.5 US gpm**)

The message CHECK FLOW RATE appears at the bottom of the setting tab if a value above Level 10 is selected. If attachment operation is anyway started with this setting, the message CHECK FLOW RATE will appear on the top of the display, and a warning buzzer will sound.



Stop attachment operation, and make sure to select a value of maximum flow rate that does not exceed Level 10.

NOTICE: *the working pressure can be set from the instrument cluster only for the Multi-function auxiliary high-flow hydraulic circuit. For the Single-acting circuit and for the Double-acting circuit the working pressure shall be set manually.*

NOTICE: *The working pressure of the Single-acting auxiliary high-flow hydraulic circuit shall be set manually by the port relief valve on the relevant section of the control valve. The factory setting of the port relief valve on the relevant section of the control valve is* ***36.3 MPa*** *(****5265.31 psi****). The maximum setting of the port relief valve is* ***36.3 MPa*** *(****5265.31 psi****).*

Setting ranges for Double-acting auxiliary high-flow hydraulic circuit

The maximum flow rate for the Double-acting auxiliary high-flow hydraulic circuit can be selected within the following range:

Level	1 pump flow	Level	2 pumps flow
1	**34 L/min** (**9.0 US gpm**)	11	**160 L/min** (**42.3 US gpm**)
2	**38 L/min** (**10.0 US gpm**)	12	**164 L/min** (**43.3 US gpm**)
3	**51 L/min** (**13.5 US gpm**)	13	**176 L/min** (**46.5 US gpm**)
4	**62 L/min** (**16.4 US gpm**)	14	**188 L/min** (**49.7 US gpm**)
5	**73 L/min** (**19.3 US gpm**)	15	**199 L/min** (**52.6 US gpm**)
6	**85 L/min** (**22.5 US gpm**)	16	**210 L/min** (**55.5 US gpm**)
7	**97 L/min** (**25.6 US gpm**)	17	**223 L/min** (**58.9 US gpm**)
8	**108 L/min** (**28.5 US gpm**)	18	**234 L/min** (**61.8 US gpm**)
9	**117 L/min** (**30.9 US gpm**)	19	**242 L/min** (**63.9 US gpm**)
10	**126 L/min** (**33.3 US gpm**)	20	**252 L/min** (**66.6 US gpm**)

The maximum flow rate for Crusher 1 combination is set from factory:

Double-acting circuit	Crusher 1: **234 L/min** (**61.8 US gpm**)

NOTICE: *the working pressure can be set from the instrument cluster only for the Multi-function auxiliary high-flow hydraulic circuit. For the Single-acting circuit and for the Double-acting circuit the working pressure shall be set manually.*

NOTICE: *The working pressure of the Double-acting auxiliary high-flow hydraulic circuit shall be set manually by the port relief valves on the relevant section of the control valve. The factory setting of the port relief valves on the relevant section of the control valve is* ***36.3 MPa*** *(****5265.31 psi****) . The maximum setting of the port relief valves is* ***36.3 MPa*** *(****5265.31 psi****).*

NOTICE: *the Double-acting auxiliary high-flow hydraulic circuit is mainly intended for operation of hydraulic thumbs. Before operating heavy attachments like grabs or demolition crushers, check the specification sheet of the attachment and make sure that the working pressure range of the Double-acting circuit is suitable to operate the attachment properly and effectively.*

Setting ranges for Multi-function auxiliary high-flow hydraulic circuit

The setting ranges of the Multi-function auxiliary high-flow hydraulic circuit are related to the circuit mode selected by the specific page. If breaker page has been selected (Single-acting mode), the maximum flow rate can be selected within Level 1 and Level 10 in the table below. If crusher page has been selected (Double-acting mode), the maximum flow rate can be selected within Level 1 and Level 20 in the table below.

Level	1 pump flow	Level	2 pumps flow
1	**34 L/min** (**9.0 US gpm**)	11	**160 L/min** (**42.3 US gpm**)
2	**38 L/min** (**10.0 US gpm**)	12	**164 L/min** (**43.3 US gpm**)
3	**51 L/min** (**13.5 US gpm**)	13	**176 L/min** (**46.5 US gpm**)
4	**62 L/min** (**16.4 US gpm**)	14	**188 L/min** (**49.7 US gpm**)
5	**73 L/min** (**19.3 US gpm**)	15	**199 L/min** (**52.6 US gpm**)
6	**85 L/min** (**22.5 US gpm**)	16	**210 L/min** (**55.5 US gpm**)
7	**97 L/min** (**25.6 US gpm**)	17	**223 L/min** (**58.9 US gpm**)
8	**108 L/min** (**28.5 US gpm**)	18	**234 L/min** (**61.8 US gpm**)
9	**117 L/min** (**30.9 US gpm**)	19	**242 L/min** (**63.9 US gpm**)
10	**126 L/min** (**33.3 US gpm**)	20	**252 L/min** (**66.6 US gpm**)

The maximum flow rate for Breaker 1 combination and the maximum flow rate for Crusher 1 combination are set from factory:

Multi-function circuit	Breaker 1: **108 L/min** (**28.5 US gpm**)
	Crusher 1: **234 L/min** (**61.8 US gpm**)

If the circuit is set in the Single acting mode, the message CHECK FLOW RATE appears at the bottom of the setting tab if a value above Level 10 is selected. If attachment operation is anyway started with this setting, the message CHECK FLOW RATE will appear on the top of the display, and a warning buzzer will sound.



Stop attachment operation, and make sure to select a value of maximum flow rate that does not exceed Level 10.

The maximum working pressure of the circuit can be set according to the mode selected by the specific page. If breaker page has been selected (Single-acting mode), the maximum working pressure can be set within the following range:

Multi-function circuit (Breaker mode)	**14.0 – 34.5 MPa** (**2030.7 – 5004.2 psi**) (in 0.5 increments)

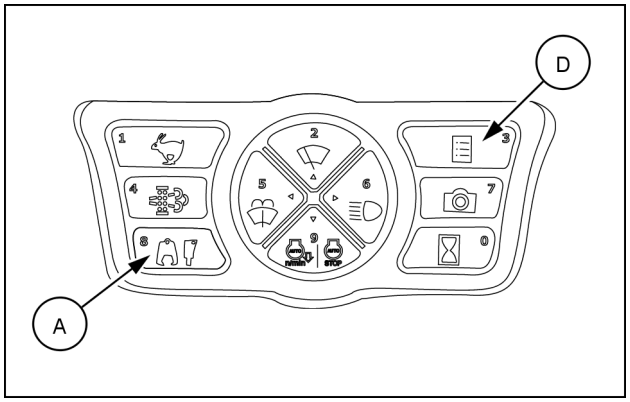
If crusher page has been selected (Double-acting mode), the maximum working pressure can be set within the following range:

Multi-function circuit (Crusher mode)	**16.5 – 34.5 MPa** (**2393.3 – 5004.2 psi**) (in 0.5 increments)

The maximum working pressure for Breaker 1 combination and the maximum working pressure for Crusher 1 combination are set from factory:

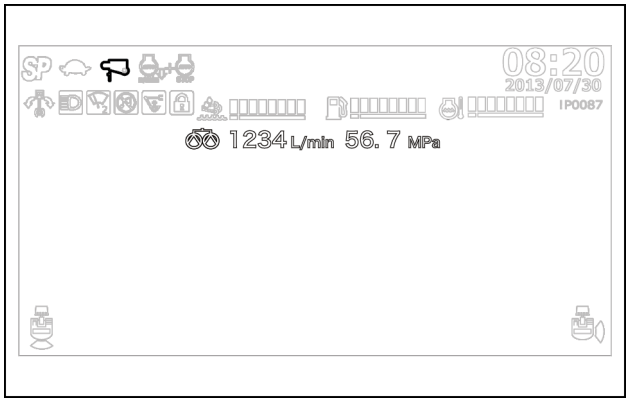
Multi-function circuit	Breaker 1: **14.0 MPa** (**2030.7 psi**)
	Crusher 1: **16.5 MPa** (**2393.3 psi**)

Press the display mode selector button **(D)** to confirm the selected combination. Resume the operating mode of the display, and press the attachment selector button **(A)**.



SMIL15CEX1234AA 7

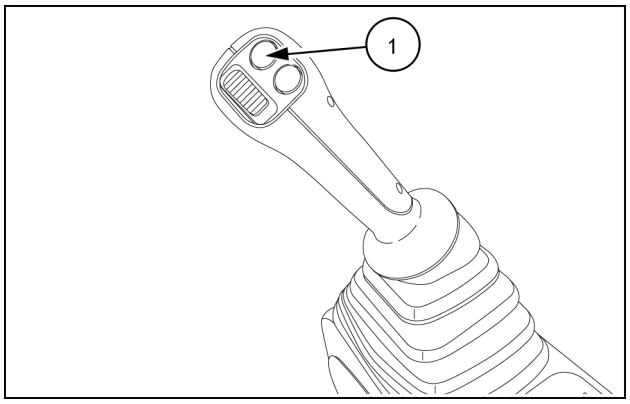
An icon on the top of the display indicates the type of attachment (breaker or crusher) and the storing number (1 to 5) of the flow rate/ pressure combination currently in use. The pump setting (single or twin) and the values of maximum flow rate and working pressure currently in use are displayed below the **DEF/ADBLUE®** and fuel gauges.



SMIL15CEXZ406AB 8

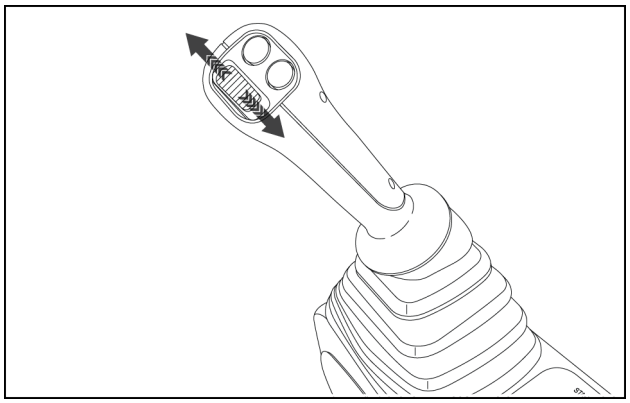
Operating Controls

Use the ON/OFF button **(1)** located on the right-hand control lever to operate a single-acting hydraulic attachment with a continuous flow.



SMIL15CEXZ396AB 9

Use the proportional switch located on the right-hand control lever to operate a double-acting hydraulic attachment with a variable power.



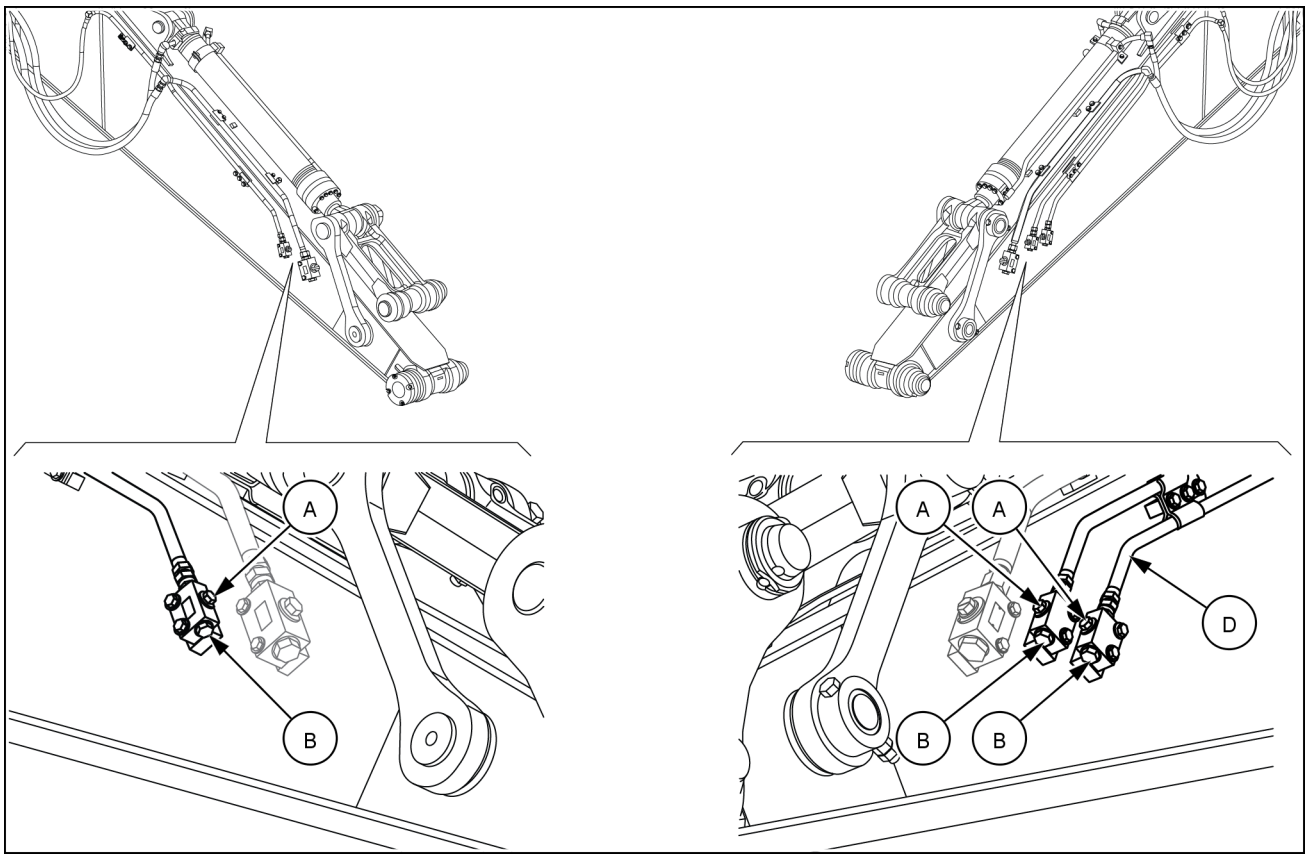
SMIL15CEXY965AB 10

Auxiliary low-flow hydraulic circuit

The machine can be equipped with an additional auxiliary low-flow hydraulic circuit to operate attachments featuring secondary hydraulic actuation for positioning, such as rotating grabs or tiltable buckets.

Hydraulic connections

The feed valves at the top of the arm allow to install properly and safely the hoses to connect the hydraulic attachment to the lines of the auxiliary low-flow hydraulic circuit.



SMIL15CEXY958FB 11

Open/Close tool **(A)**	**19 mm** wrench
Hydraulic connection **(B)**	G 1/2” female port with O-Ring seat

NOTE: *the maximum flow rate of the auxiliary low-flow hydraulic circuit using the SP work mode is* ***62 L/min*** *(****16.4 US gpm****). The maximum working pressure of the auxiliary low-flow hydraulic circuit is* ***20.6 MPa*** *(****2988 psi****).*

NOTE: *an additional drainage line* ***(D)*** *is located on the left side of the arm. The drainage line* ***(D)*** *is intended to allow external drainage from the hydraulic motor which rotates the grab or the crusher.*

NOTICE: *Always keep each connecting hose on the same side of the arm. Never cross-over the connecting hoses between the two sides of the arm.*

Operating controls

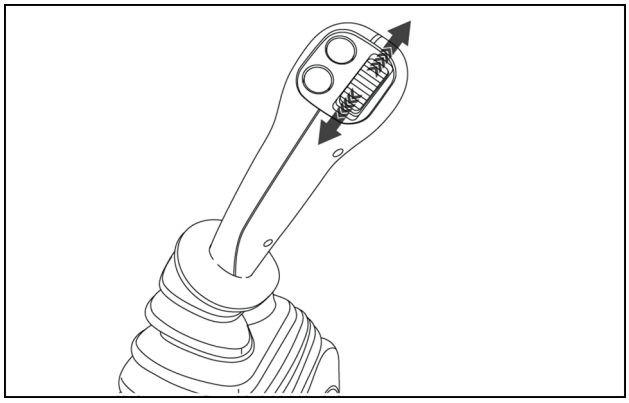
Use the proportional switch located on the left-hand control lever to operate the grab rotation or the bucket tilt with a variable power.

Make sure that the control pattern of the positioning actuation is as intended. Slide up and down the proportional switch and confirm the control directions (e.g. left/right).

NOTICE: *If control directions for the positioning actuation are not as intended, check for an alternative set up of the hydraulic connections between the attachment and the machine.*

NOTICE: *Always keep each connecting hose on the same side of the arm. Never cross-over the connecting hoses between the two sides of the arm.*

NOTICE: *If not using any hydraulic attachment, do not operate controls for auxiliary hydraulic circuits.*



SMIL15CEXY964AB 12

Operating guidelines for usage of hydraulic attachments

Always select the hydraulic attachment which is suitable for installation on the machine, in order to avoid severe damages to the machine frames and to the machine systems. Make sure to select an hydraulic attachment which does not compromise the overall machine stability. Make sure to select the hydraulic attachment which properly matches the capacity of the auxiliary hydraulic circuit of the machine.

NOTICE: *make sure to know the maximum working pressure allowed by the attachment. Look for "Relief pressure range" or "Maximum pressure range" information into the specification sheet of the attachment. Set the maximum working pressure of the auxiliary hydraulic circuit according to this specification. The attachment will operate properly and effectively, and serious damages will be avoided to the attachment and to the machine.*

Contact your CASE CONSTRUCTION dealer for selection and provision of the mounting bracket for the attachment, and for selection and provision of the connecting hoses between the auxiliary hydraulic circuits and the attachment.

Make sure to read and understand the Operator's Manual of the hydraulic attachment.

Always refer to the Operator's Manual of the hydraulic attachment for proper and safe installation of the attachment to the machine.

Always refer to the Operator's Manual of the hydraulic attachment and to the following instructions in this manual for proper and safe usage of the attachment.

Always refer to the Operator's Manual of the hydraulic attachment for proper maintenance of the attachment. Always refer to the Operator's Manual of the machine for specific maintenance schedule related to the usage of any attachment other than a bucket (refer to the next page).

If not using any hydraulic attachment, make sure to apply the blanking plugs on the feed valves and on the connecting hoses to the attachment in order to avoid the penetration of foreign bodies.

Maintenance

A specific maintenance schedule shall be adopted for the machine if any hydraulic attachment is used over a significant period of time. In particular, the maintenance of the hydraulic system shall be more frequent because the usage of hydraulic attachments severely affects the properties of the hydraulic fluid.

The following table prescribes the required intervals for the maintenance operations to be performed on the hydraulic system of the machine depending upon the percentage of the usage of the attachment.

<table>
<tr><th></th><th>10%</th><th>20%</th><th>40%</th><th>100%</th></tr>
<tr><td>Hydraulic oil level check</td><td>10 h</td><td>10 h</td><td>10 h</td><td>10 h</td></tr>
<tr><td>Hydraulic oil suction filter cleaning</td><td rowspan="4">800 h</td><td rowspan="4">600 h</td><td rowspan="4">300 h</td><td rowspan="4">100 h</td></tr>
<tr><td>Hydraulic oil return filter replacement</td></tr>
<tr><td>Pilot filter replacement</td></tr>
<tr><td>Hydraulic oil analysis</td></tr>
<tr><td>Hydraulic oil and filters replacement</td><td>4000 h</td><td>3000 h</td><td>1500 h</td><td>600 h</td></tr>
</table>

Moreover, the following operations shall be performed every **10 h** if any attachment other than a bucket is used:

- lubricate the bucket pins and the whole bucket linkage.
- check the tightening torques, in particular if the machine is used in demolition applications.
- check the frames and the structures for damages or cracks, in particular if the machine is used in demolition applications.
- if the hydraulic attachment is used, check the hydraulic lines and connections towards the attachment.

Auxiliary hydraulic circuits pressure release

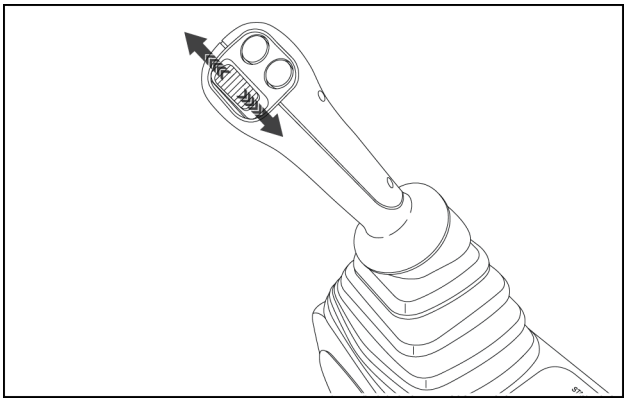
⚠ WARNING

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.

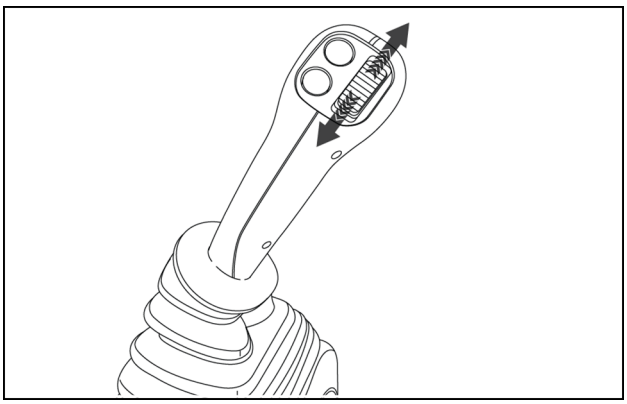
W0178A

Auxiliary hydraulic circuits are high pressure hydraulic systems. Always release the pressure before connecting or disconnecting the hydraulic hoses between the machine and the attachment. Proceed as follows:

1. Place the machine on flat and level ground.
2. Lower the attachment to the ground and stop the engine.
3. Turn the starter key to ON position.
4. Set the gate lock lever to unlock position.
5. Slide the right proportional switch and the left proportional switch up and down three times approximately to release the pressure.
6. Turn the starter key to OFF position.



SMIL15CEXY965AB 13



SMIL15CEXY964AB 14

Operation with the hydraulic breaker

The hydraulic breaker is a single-acting hydraulic attachment, and shall be connected to a high-flow hydraulic circuit.

Therefore, to operate with a hydraulic breaker the machine shall be equipped with the Single-acting auxiliary high-flow hydraulic circuit or with the Multi-function auxiliary high-flow hydraulic circuit.

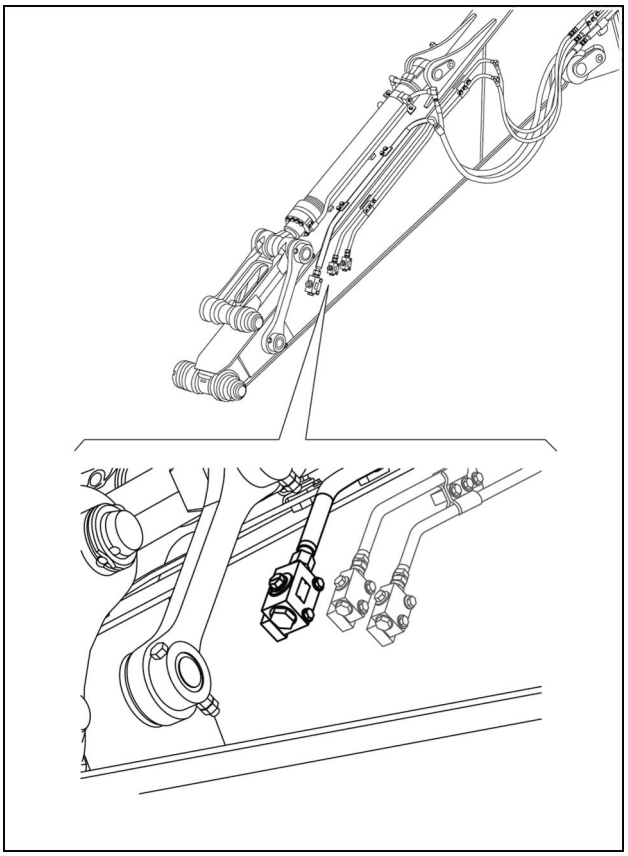
NOTICE: *The working pressure of the Single-acting auxiliary high-flow hydraulic circuit shall be set manually by the port relief valve on the relevant section of the control valve.*

1. Make sure that the machine and the attachment to be installed are on flat and level ground.
2. Make sure to read and understand the installation procedure described in the Operator's Manual of the attachment.

   NOTICE: *The maximum working pressure of the auxiliary high-flow hydraulic circuit shall be set according to the specification of the breaker.*
3. Operate the controls of boom, arm and bucket in order to install the hydraulic breaker to the bucket linkage at the top of the arm.
4. Stop the engine. Release pressure inside the auxiliary high-flow hydraulic circuit.
5. Close the feed valves at the top of the arm. Install the connecting hoses between the attachment and the feed valves.

   NOTICE: *make sure to identify on the breaker the supply port (IN or P) and the return port to tank (OUT or T). The hose for breaker supply shall always be connected to the feed valve on the left side of the arm. If the supply port on the breaker is not aligned to the feed valve on the left side of the arm, check for an alternative set up of the hydraulic ports on the attachment.*

   NOTICE: *Always keep each connecting hose on the same side of the arm. Never cross-over the connecting hoses between the two sides of the arm.*
6. Open the feed valves and check the fixing clamps for looseness, and the tubes and hoses fittings for leakages.

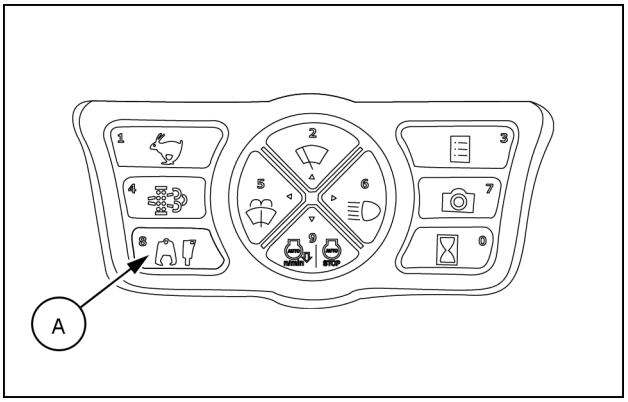


SMIL15CEXZ386BB 15

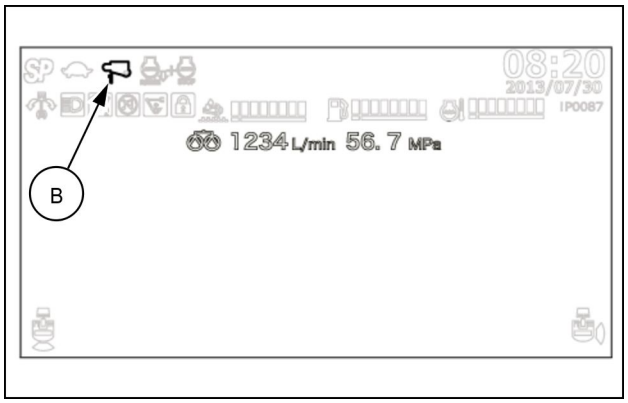
7. Start the engine. Press the attachment selector button **(A)** until the breaker icon **(B)** featuring the required flow rate/pressure combination (1 to 5) appears on the top left of the display. If a different setting is necessary, or in case of forgotten settings, refer to the Operational settings paragraph previously in this Section.

   NOTICE: *If operation with the hydraulic attachment is attempted without making any setting, a warning buzzer sounds and the message AUXILIARY SET UP REQUIRED is displayed.*





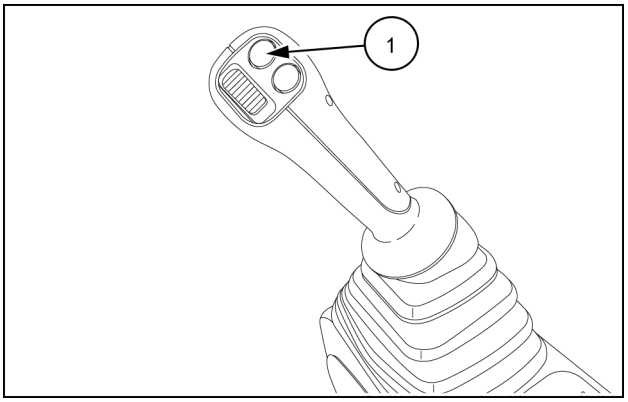
SMIL15CEX1234AA 16



SMIL19CEX0563AA 17

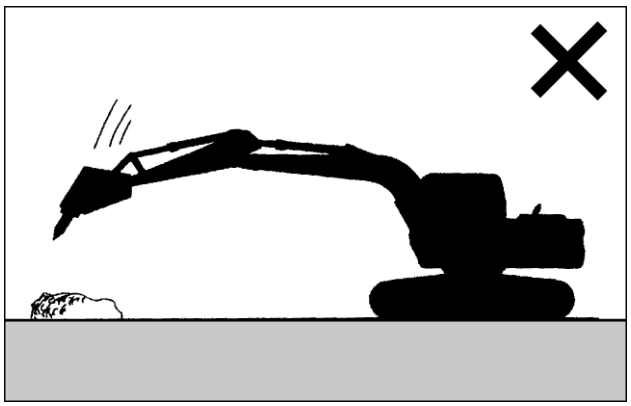
8. Select the SP work mode.
9. Set the gate lock lever to unlock position.
10. Operate the controls of boom, arm and bucket in order to position the breaker right to the structure or to the object to be crushed.
11. Press and hold the ON/OFF button **(1)** located on the right-hand control lever to operate the hydraulic breaker with the continuous selected flow providing a constant blowing frequency. Release the button to stop breaker operation.

    NOTE: *To change the blowing frequency, get back to the dedicated tab for operational settings of the auxiliary high-flow hydraulic circuit, and change the flow rate/pressure combination to be used.*



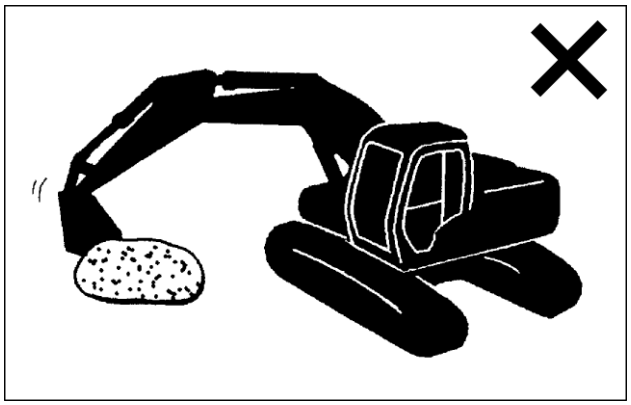
SMIL15CEXZ396AB 18

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.



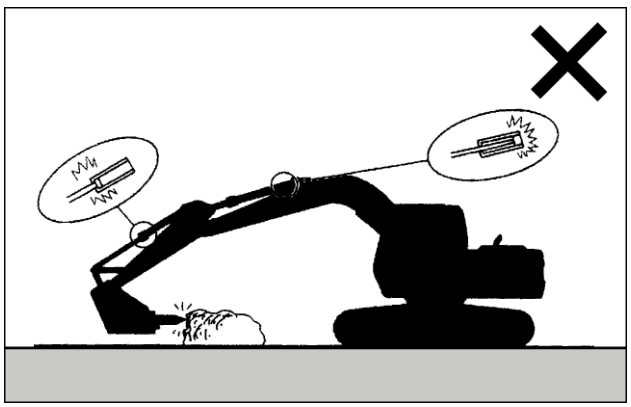
NH0195 19

Do not use the hydraulic breaker and/or swing function to push objects as damages to the attachment may result.



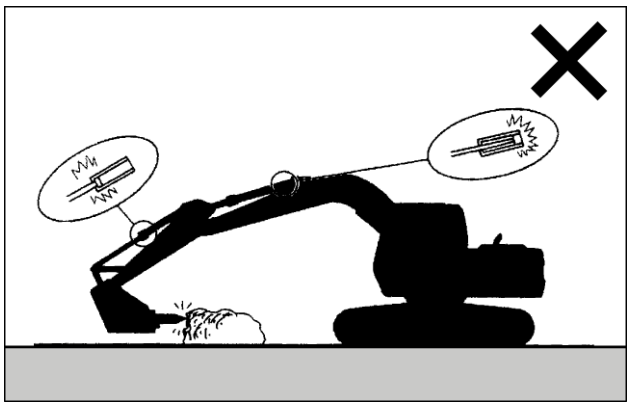
NH0196 20

Do not operate the breaker with the excavator cylinders fully extended or retracted to avoid attachment and/or cylinder damage.



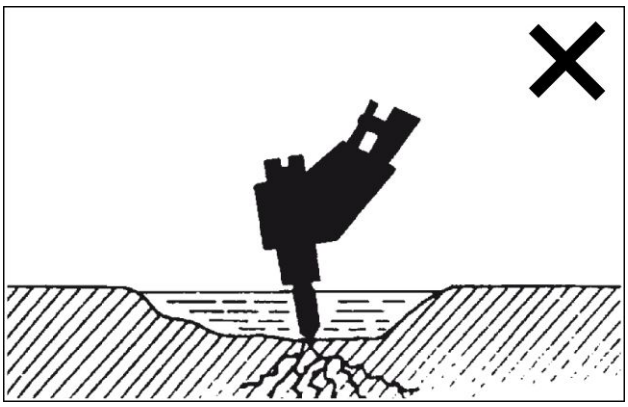
NH0197 21

Stop working if hydraulic hoses look abnormally bent. Contact your authorized Dealer.



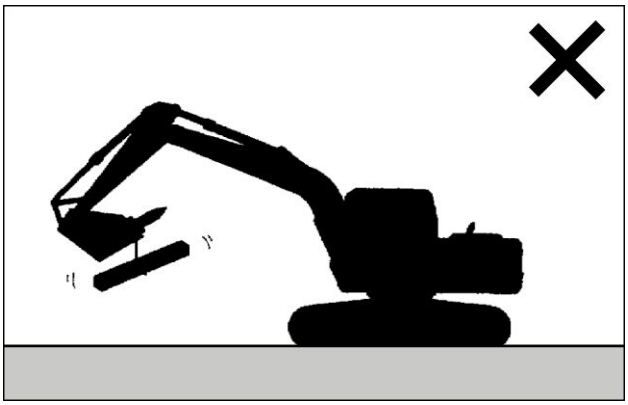
NH0197 22

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



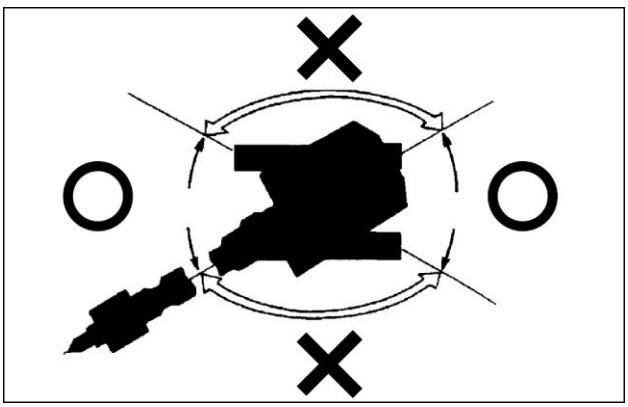
NH0199 23

Do not use the hydraulic breaker to move objects. The excavator might overturn and/or the hydraulic breaker may be damaged.



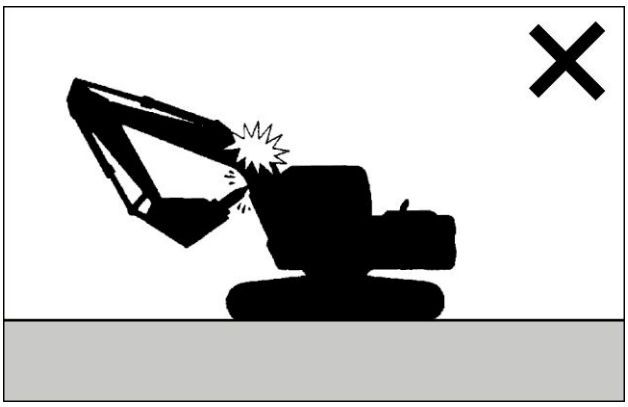
NH0200 24

Do not operate the breaker to the side of the machine. The machine may become unstable and undercarriage components life may be reduced.



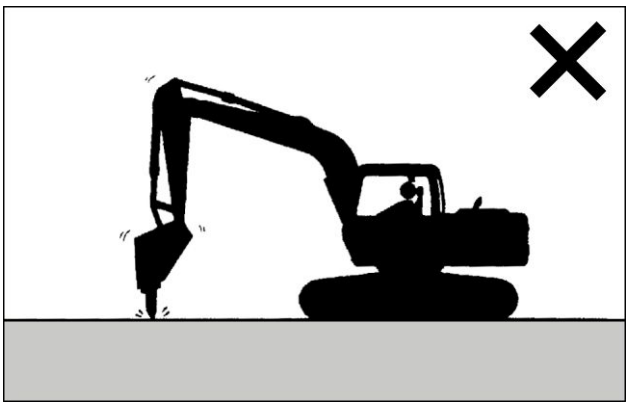
NH0201 25

Operate the excavator carefully to avoid hitting the boom with the hydraulic breaker.



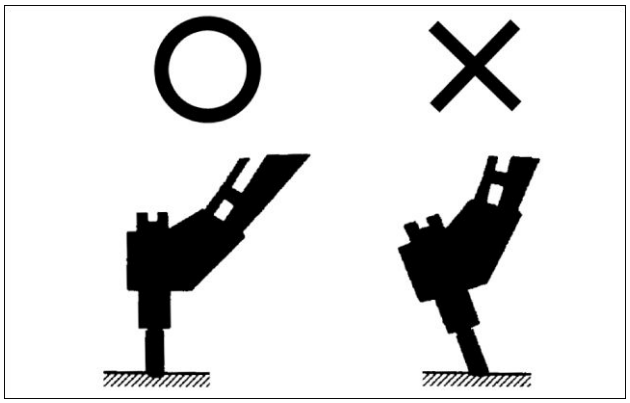
NH0202 26

Do not operate the breaker with the arm positioned vertically. Excessive vibration to the arm cylinder may cause oil leakage.



NH0203 27

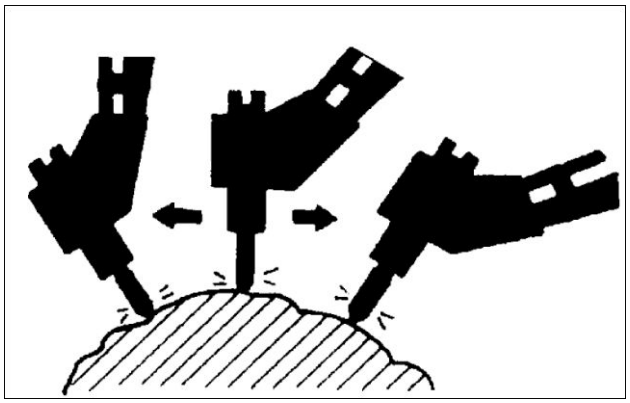
Press the breaker so that the chisel point thrust is square (perpendicular) to the object to be broken.



NH0204 28

Do not operate the hydraulic breaker continuously longer than **15 s**. Excessive chisel wear will result. If an object could not be broken within **15 s**, apply chisel to other locations, less than **15 s** for each location.

If breaker operation is done with ambient temperature above **35 °C**, make sure to take a stand-by time between breaker strikes in order to allow the circulation of the hydraulic fluid.



NH0205 29

CASE CONSTRUCTION hydraulic breakers

CASE CONSTRUCTION CH hydraulic breakers are designed to optimize the operating performance of the CASE CONSTRUCTION excavators in general construction works, as for example residential construction or utilities maintenance.

CASE CONSTRUCTION defines application rules in order to match each breaker model with the most suitable configuration of the machine, and to refer breaker application to specific working conditions.

Direct fit application as function of the arm (CX145D SR LC – CX145D SR with blade)

CH BREAKER						
Model	Install Weight	Reference machine settings		Arm		
		Flow	Relief Pressure	**2.11 m** (**83.07 in**)	**2.50 m** (**98.43 in**)	**3.01 m** (**118.50 in**)
CH-7J	**1090 kg** (**2403 lb**)	**85 L/min** (**22 US gpm**)	**20 – 22 MPa** (**2901 – 3191 psi**)	●	x	x

● Conditional application (only over the front working position)
x Not applicable

NOTICE: *for construction works on uneven ground, the machine must be equipped with* ***600 mm*** *(****24 in****) tracks and double track guards.*

NOTICE: *CASE CONSTRUCTION will not take into account any condition of application that is out of the ones defined in the table above.*

Operation with the hydraulic crusher

The hydraulic demolition crusher is a double-acting hydraulic attachment, and shall be connected to a high-flow hydraulic circuit.

Therefore, to operate with a hydraulic crusher the machine shall be equipped with the Double-acting auxiliary high-flow hydraulic circuit or with the Multi-function auxiliary high-flow hydraulic circuit.

NOTICE: *The working pressure of the Double-acting auxiliary high-flow hydraulic circuit shall be set manually by the port relief valves on the relevant section of the control valve.*

NOTICE: *Make sure that the working pressure range of the Double-acting circuit is suitable to operate the crusher properly and effectively.*

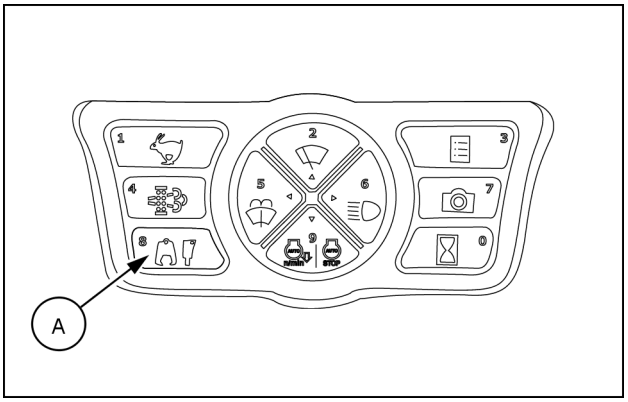
1. Make sure that the machine and the attachment to be installed are on flat and level ground.
2. Make sure to read and understand the installation procedure described in the Operator's Manual of the attachment.

   NOTICE: *The maximum working pressure of the auxiliary high-flow hydraulic circuit shall be set according to the specification of the crusher.*
3. Operate the controls of boom, arm and bucket in order to install the hydraulic crusher to the bucket linkage at the top of the arm.
4. Stop the engine. Release pressure inside the auxiliary high-flow hydraulic circuit.
5. Close the feed valves at the top of the arm. Install the connecting hoses between the attachment and the feed valves.
6. Open the feed valves and check the fixing clamps for looseness, and the tubes and hoses fittings for leakages.

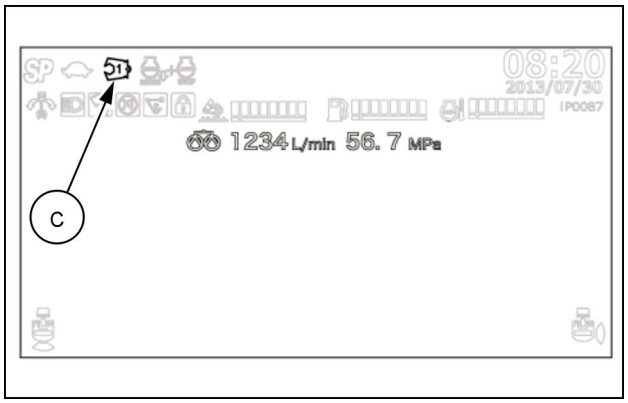
7. Start the engine. Press the attachment selector button **(A)** until the crusher icon **(C)** featuring the required flow rate/pressure combination (1 to 5) appears on the top left of the display. If a different setting is necessary, or in case of forgotten settings, refer to the Operational settings paragraph previously in this Section.

   NOTICE: *If operation with the hydraulic attachment is attempted without making any setting, a warning buzzer sounds and the message AUXILIARY SET UP REQUIRED is displayed.*





SMIL15CEX1234AA 30

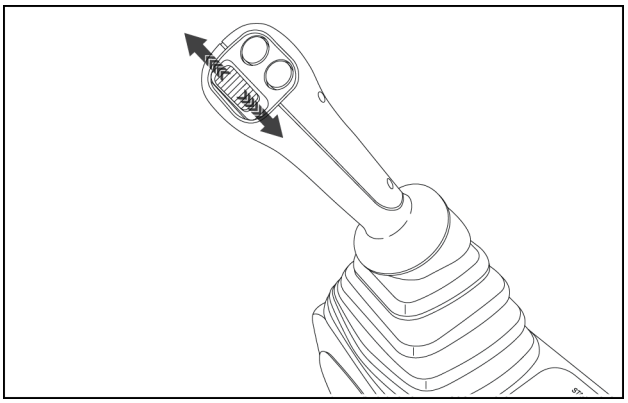


SMIL19CEX0564AA 31

8. Select the SP work mode.
9. Set the gate lock lever to unlock position.
10. Make sure that the control pattern of the hydraulic crusher is as intended. Slide up and down the proportional switch located on the right-hand control lever, and confirm the control direction to open the crusher and the control direction to close the crusher.

    NOTICE: *if control directions for opening and closing are not as intended, check for an alternative set up of the connecting ports on the attachment.*

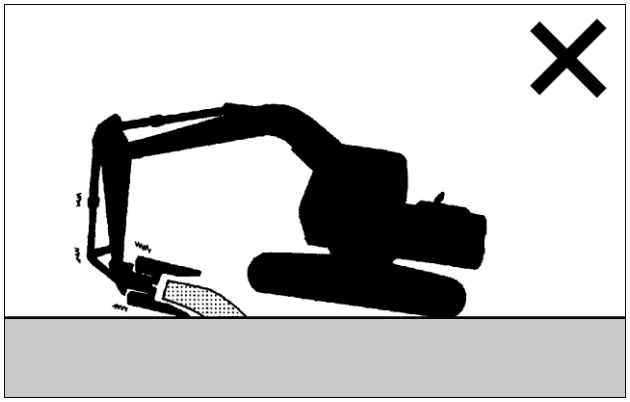
    NOTICE: *Always keep each connecting hose on the same side of the arm. Never cross-over the connecting hoses between the two sides of the arm.*
11. Operate the controls of boom, arm and bucket in order to position the crusher right to the structure or to the object to be crushed.
12. Operate the hydraulic crusher according to the control pattern defined at the step 10. The crushing force increases with the sliding of the proportional switch in the closing direction. Release the switch to hold the crusher jaws in position.



SMIL15CEXY965AB 32

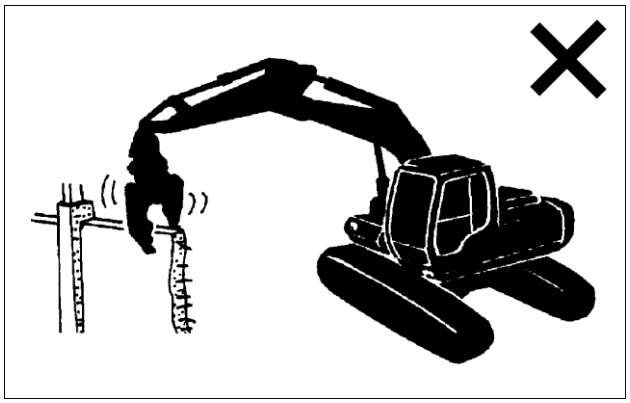
Do not allow the machine weight to be supported by prying with the crusher and cylinders fully extended or retracted. Doing so may damage the front attachment. In particular, avoid doing so with the crusher cylinder fully extended as the front attachment will be more easily damaged.

Do not use the crusher to haul or move crushed scraps.



NH0212A 33

Do not perform crushing on either side of the machine, always do so at front or rear, parallel with tracks. Otherwise, the machine may overturn.



NH0213A 34

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



NH0214 35

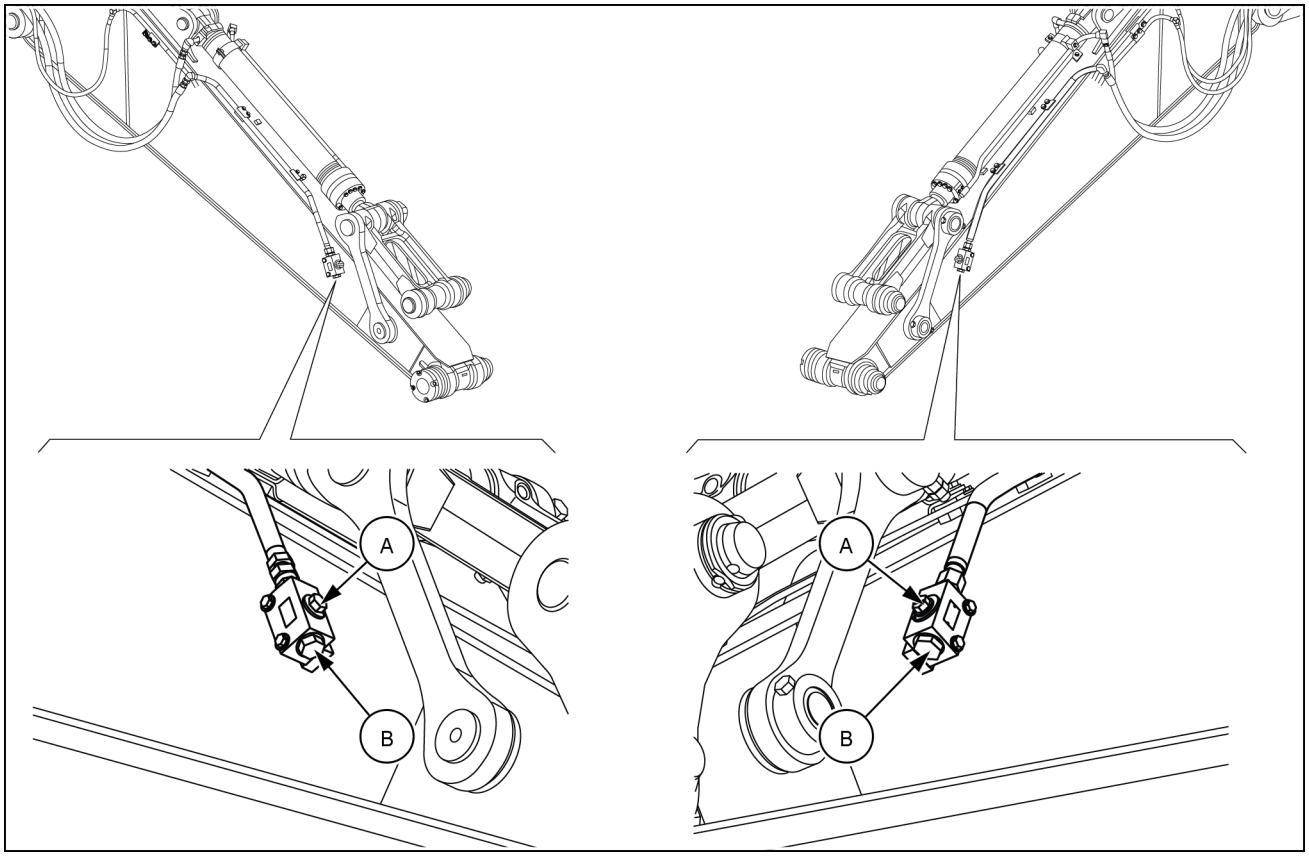
Auxiliary hydraulic circuits (CX145D SR Offset Boom with blade)

The machine can be equipped with one of the following auxiliary high-flow hydraulic circuits:

- Single-acting auxiliary high-flow hydraulic circuit intended for usage of attachments such as a hydraulic breaker.
- Double-acting auxiliary high-flow hydraulic circuit intended for usage of attachments such as a hydraulic sorting grab.

Hydraulic connections

The feed valves at the top of the arm allow to install properly and safely the hoses to connect the hydraulic attachment to the lines of the auxiliary high-flow hydraulic circuit.



SMIL15CEXY959FB 1

Open/Close tool **(A)**	**24 mm** wrench
Hydraulic connection **(B)**	G 3/4” female port with O-Ring seat

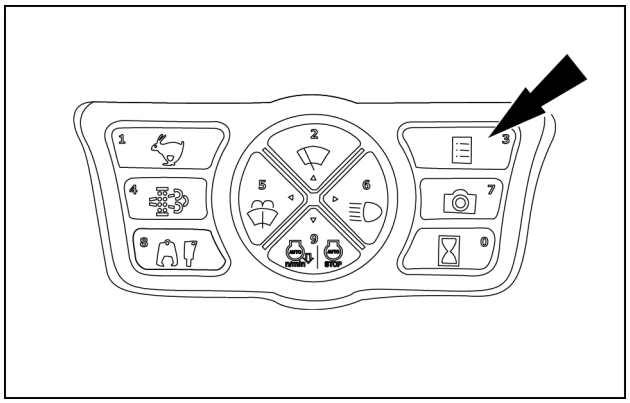
NOTICE: *Always keep each connecting hose on the same side of the arm. Never cross-over the connecting hoses between the two sides of the arm.*

Operational settings

The flow rate of the auxiliary high-flow hydraulic circuit can be set according to the type and to the specifications of the attachment used.

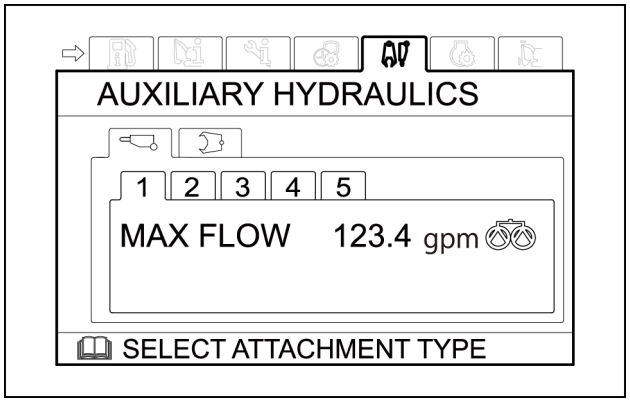
NOTICE: *before operating any hydraulic attachment be sure to set the proper attachment mode (breaker or grab) and the proper hydraulic flow rate. If the attachment mode or the hydraulic flow rate are not properly set, malfunction or failure may occur to the machine or damage may occur to the hydraulic attachment.*

Before operating any hydraulic attachment, press the display mode selector button to open the User Information Mode.



SMIL15CEX1234AA 2

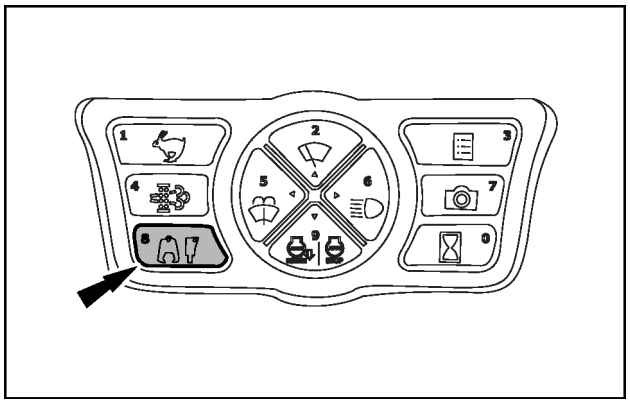
Select the dedicated tab for operational settings of the auxiliary high-flow hydraulic circuit.



SMIL15CEXZ394AA 3

Alternatively, just press and hold the attachment selector button for **1 s** to get directly to the dedicated tab for operational settings of the auxiliary high-flow hydraulic circuit.

NOTE: *the dedicated tab for operational settings of the auxiliary high-flow hydraulic circuit is not active if the machine is not equipped with any auxiliary high-flow hydraulic circuit.*



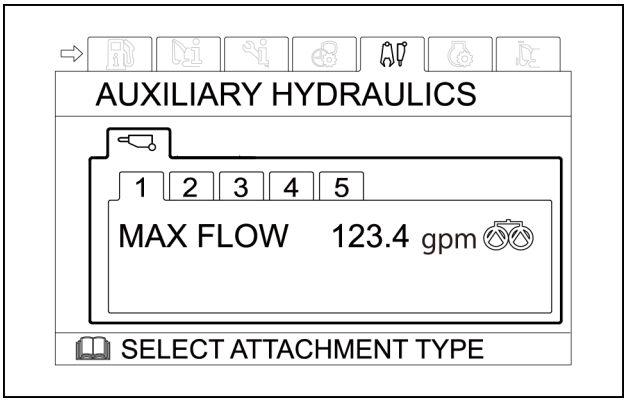
SMIL14CEX1709AA 4

The tab for operational settings of the auxiliary high-flow hydraulic circuit is defined according to the type of circuit installed on the machine.

If the Single-acting circuit is equipped, a page with breaker icon is shown. If the Double-acting circuit is equipped, a page with grab icon is shown. Each page allows to set and store specific flow rate values according to the type and to the specifications of the attachment used.

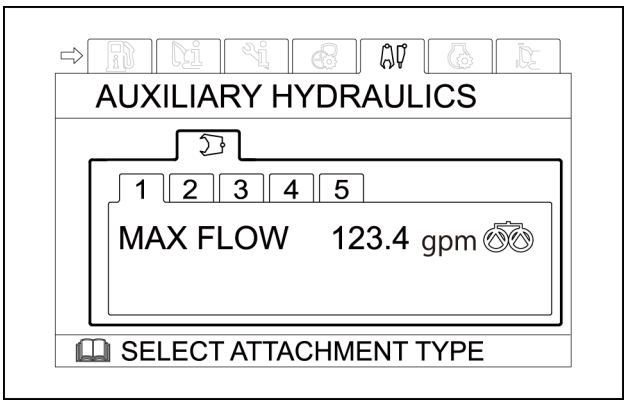
Once the flow rate values are stored, they can be directly selected pressing the attachment selector button. Refer ahead in this Section.

Five flow rate values can be set and stored for usage of single-acting hydraulic attachments. The flow rate 1 for single-acting circuit is set from factory.



SMIL15CEXZZ48AA 5

Five flow rate values can be set and stored for usage of double-acting hydraulic attachments. The flow rate 1 for double-acting circuit is set from factory.



SMIL15CEXZZ47AA 6

Refer to the next pages for specific information about setting capabilities for each kind of auxiliary high-flow hydraulic circuit.

NOTE: *all the values of the maximum flow rate are related to the SP work mode. If the auxiliary high-flow hydraulic circuit is used with a different work mode the actual flow will be lower.*

Setting ranges for Single-acting auxiliary high-flow hydraulic circuit

The maximum flow rate for the Single-acting auxiliary high-flow hydraulic circuit can be selected within the following range:

Level	1 pump flow
1	**34 L/min** (**9.0 US gpm**)
2	**38 L/min** (**10.0 US gpm**)
3	**51 L/min** (**13.5 US gpm**)
4	**62 L/min** (**16.4 US gpm**)
5	**73 L/min** (**19.3 US gpm**)
6	**85 L/min** (**22.5 US gpm**)
7	**97 L/min** (**25.6 US gpm**)
8	**108 L/min** (**28.5 US gpm**)
9	**117 L/min** (**30.9 US gpm**)
10	**126 L/min** (**33.3 US gpm**)

The setting 1 for maximum flow rate is stored from factory:

Single-acting circuit	Flow rate 1: **108 L/min** (**28.5 US gpm**)

The message CHECK FLOW RATE appears at the bottom of the setting tab if a value above Level 10 is selected. If attachment operation is anyway started with this setting, the message CHECK FLOW RATE will appear on the top of the display, and a warning buzzer will sound.



Stop attachment operation, and make sure to select a value of maximum flow rate that does not exceed Level 10.

NOTICE: *the working pressure of the Single-acting auxiliary high-flow hydraulic circuit shall be set manually by the port relief valve on the relevant section of the control valve. The factory setting of the port relief valve is* ***36.3 MPa*** *(****5265.3 psi****). The maximum setting of the port relief valve is* ***36.3 MPa*** *(****5265.3 psi****).*

Setting ranges for Double-acting auxiliary high-flow hydraulic circuit

The maximum flow rate for the Double-acting auxiliary high-flow hydraulic circuit can be selected within the following range:

Level	1 pump flow
1	**34 L/min** (**9.0 US gpm**)
2	**38 L/min** (**10.0 US gpm**)
3	**51 L/min** (**13.5 US gpm**)
4	**62 L/min** (**16.4 US gpm**)
5	**73 L/min** (**19.3 US gpm**)
6	**85 L/min** (**22.5 US gpm**)
7	**97 L/min** (**25.6 US gpm**)
8	**108 L/min** (**28.5 US gpm**)
9	**117 L/min** (**30.9 US gpm**)
10	**126 L/min** (**33.3 US gpm**)

The setting 1 for maximum flow rate is stored from factory:

Double-acting circuit	Flow rate 1: **108 L/min** (**28.5 US gpm**)

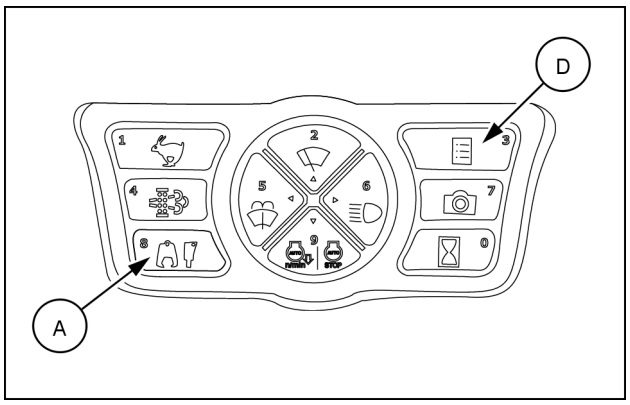
The message CHECK FLOW RATE appears at the bottom of the setting tab if a value above Level 10 is selected. If attachment operation is anyway started with this setting, the message CHECK FLOW RATE will appear on the top of the display, and a warning buzzer will sound.



Stop attachment operation, and make sure to select a value of maximum flow rate that does not exceed Level 10.

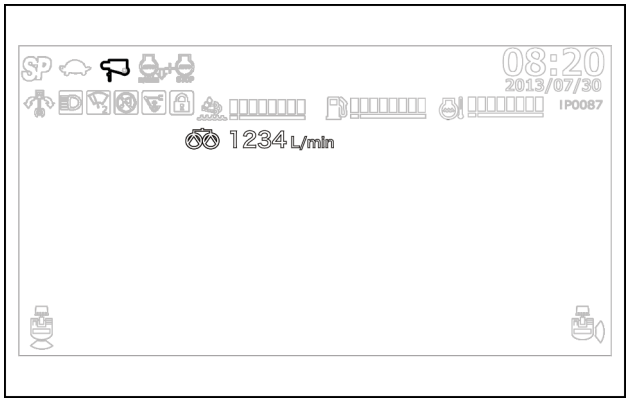
NOTICE: *the working pressure of the Double-acting auxiliary high-flow hydraulic circuit shall be set manually by the port relief valves on the relevant section of the control valve. The factory setting of the port relief valves is* ***36.3 MPa*** *(****5265.3 psi****). The maximum setting of the port relief valves is* ***36.3 MPa*** *(****5265.3 psi****).*

Press the display mode selector button **(D)** to confirm the selected flow rate value. Resume the operating mode of the display, and press the attachment selector button **(A)**.



SMIL15CEX1234AA 7

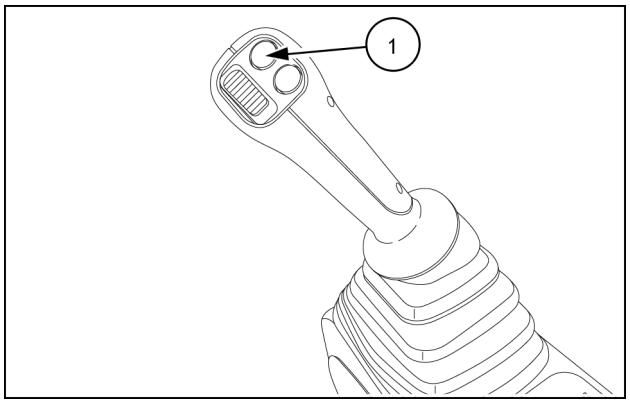
An icon on the top of the display indicates the type of attachment (breaker or grab) and the storing number (1 to 5) of the flow rate value currently in use. The pump setting and the value of maximum flow rate currently in use are displayed below the **DEF/ADBLUE®** and fuel gauges.



SMIL15CEXZ406AB 8

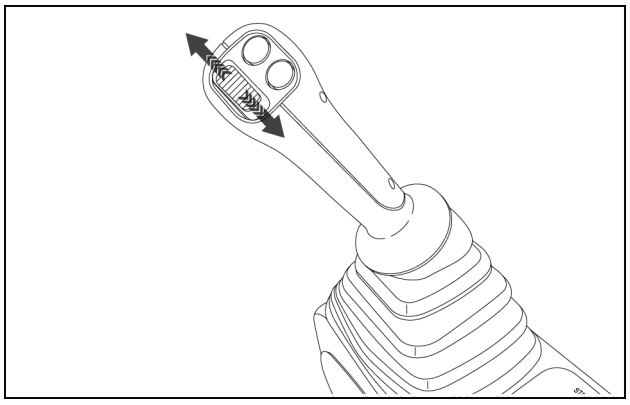
Operating Controls

Use the ON/OFF button **(1)** located on the right-hand control lever to operate a single-acting hydraulic attachment with a continuous flow.



SMIL15CEXZ396AB 9

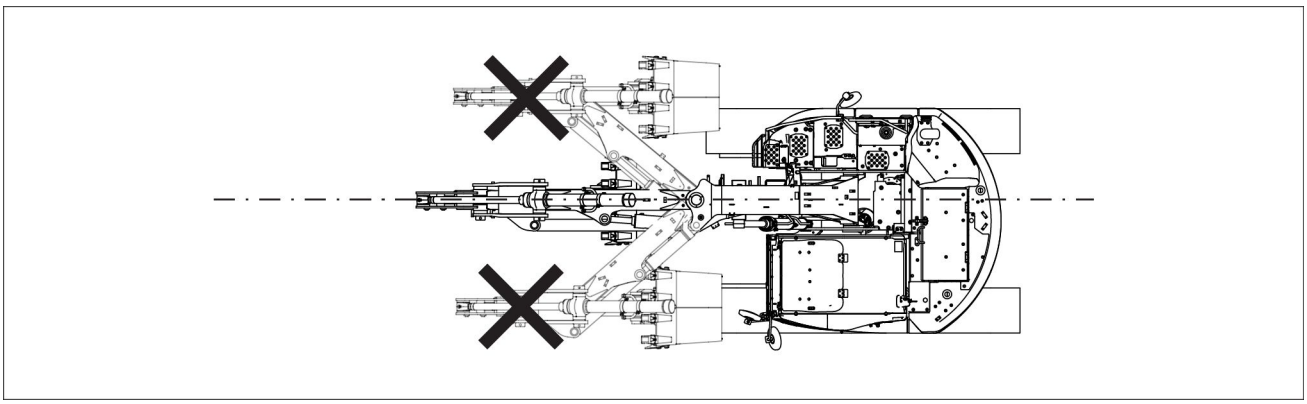
Use the proportional switch located on the right-hand control lever to operate a double-acting hydraulic attachment with a variable power.



SMIL15CEXY965AB 10

Operating guidelines for usage of hydraulic attachments

When using the machine with a hydraulic attachment, the front equipment shall be set in straight position. The arm shall never be offset neither rightward nor leftward from the boom. Failing to comply will cause severe damages to the machine frames and to the machine systems.



SMIL18CEX0435EA 11

Always select an hydraulic attachment which is suitable for installation on the machine, in order to avoid severe damages to the machine frames and to the machine systems. Make sure to select an hydraulic attachment which does not compromise the overall machine stability. Make sure to select an hydraulic attachment which properly matches the capacity of the auxiliary hydraulic circuit of the machine.

NOTICE: *make sure to know the maximum working pressure allowed by the attachment. Look for "Relief pressure range" or "Maximum pressure range" information into the specification sheet of the attachment. Set the maximum working pressure of the auxiliary hydraulic circuit according to this specification. The attachment will operate properly and effectively, and serious damages will be avoided to the attachment and to the machine.*

Contact your CASE CONSTRUCTION dealer for selection and provision of the mounting bracket for the attachment, and for selection and provision of the connecting hoses between the auxiliary hydraulic circuits and the attachment.

Make sure to read and understand the Operator's Manual of the hydraulic attachment.

Always refer to the Operator's Manual of the hydraulic attachment for proper and safe installation of the attachment to the machine.

Always refer to the Operator's Manual of the hydraulic attachment and to the following instructions in this manual for proper and safe usage of the attachment.

Always refer to the Operator's Manual of the hydraulic attachment for proper maintenance of the attachment. Always refer to the Operator's Manual of the machine for specific maintenance schedule related to the usage of any attachment other than a bucket (refer to the next page).

If not using any hydraulic attachment, make sure to apply the blanking plugs on the feed valves and on the connecting hoses to the attachment in order to avoid the penetration of foreign bodies.

Maintenance

A specific maintenance schedule shall be adopted for the machine if any hydraulic attachment is used over a significant period of time. In particular, the maintenance of the hydraulic system shall be more frequent because the usage of hydraulic attachments severely affects the properties of the hydraulic fluid.

The following table prescribes the required intervals for the maintenance operations to be performed on the hydraulic system of the machine depending upon the percentage of the usage of the attachment.

<table>
<tr><th></th><th>10%</th><th>20%</th><th>40%</th><th>100%</th></tr>
<tr><td>Hydraulic oil level check</td><td>10 h</td><td>10 h</td><td>10 h</td><td>10 h</td></tr>
<tr><td>Hydraulic oil suction filter cleaning</td><td rowspan="4">800 h</td><td rowspan="4">600 h</td><td rowspan="4">300 h</td><td rowspan="4">100 h</td></tr>
<tr><td>Hydraulic oil return filter replacement</td></tr>
<tr><td>Pilot filter replacement</td></tr>
<tr><td>Hydraulic oil analysis</td></tr>
<tr><td>Hydraulic oil and filters replacement</td><td>4000 h</td><td>3000 h</td><td>1500 h</td><td>600 h</td></tr>
</table>

Moreover, the following operations shall be performed every **10 h** if any attachment other than a bucket is used:

- lubricate the bucket pins and the whole bucket linkage.
- check the tightening torques, in particular if the machine is used in demolition applications.
- check the frames and the structures for damages or cracks, in particular if the machine is used in demolition applications.
- if the hydraulic attachment is used, check the hydraulic lines and connections towards the attachment.

Auxiliary hydraulic circuits pressure release

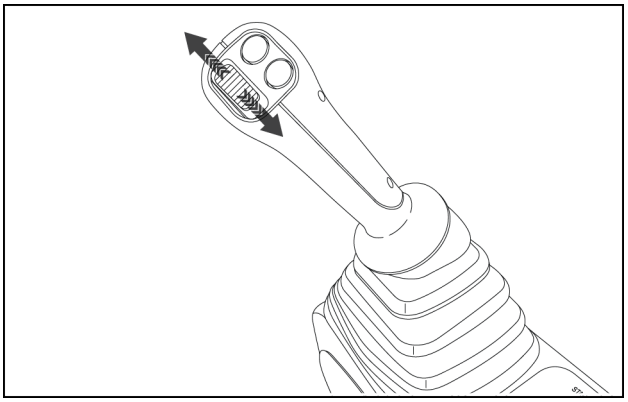
⚠ WARNING

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

Auxiliary hydraulic circuits are high pressure hydraulic systems. Always release the pressure before connecting or disconnecting the hydraulic hoses between the machine and the attachment. Proceed as follows:

1. Place the machine on flat and level ground.
2. Lower the attachment to the ground and stop the engine.
3. Turn the starter key to ON position.
4. Set the gate lock lever to unlock position.
5. Slide the proportional switch up and down three times approximately to release the pressure.
6. Turn the starter key to OFF position.



SMIL15CEXY965AB 12

Operation with the hydraulic breaker

The hydraulic breaker is a single-acting hydraulic attachment, and shall be connected to a high-flow hydraulic circuit.

Therefore, to operate with a hydraulic breaker the machine shall be equipped with the Single-acting auxiliary high-flow hydraulic circuit.

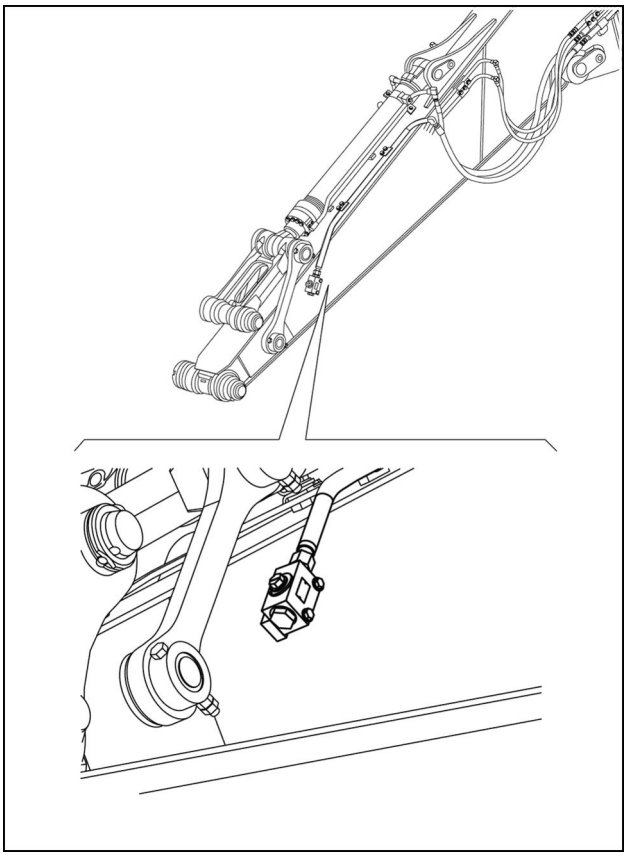
NOTICE: *The working pressure of the Single-acting auxiliary high-flow hydraulic circuit shall be set manually by the port relief valve on the relevant section of the control valve.*

1. Make sure that the machine and the attachment to be installed are on flat and level ground.
2. Make sure to read and understand the installation procedure described in the Operator's Manual of the attachment.

   NOTICE: *The maximum working pressure of the auxiliary high-flow hydraulic circuit shall be set according to the specification of the breaker.*
3. Operate the controls of boom, arm and bucket in order to install the hydraulic breaker to the bucket linkage at the top of the arm.
4. Stop the engine. Release pressure inside the auxiliary high-flow hydraulic circuit.
5. Close the feed valves at the top of the arm. Install the connecting hoses between the attachment and the feed valves.

   NOTICE: *make sure to identify on the breaker the supply port (IN or P) and the return port to tank (OUT or T). The hose for breaker supply shall always be connected to the feed valve on the left side of the arm. If the supply port on the breaker is not aligned to the feed valve on the left side of the arm, check for an alternative set up of the hydraulic ports on the attachment.*

   NOTICE: *Always keep each connecting hose on the same side of the arm. Never cross-over the connecting hoses between the two sides of the arm.*
6. Open the feed valves and check the fixing clamps for looseness, and the tubes and hoses fittings for leakages.

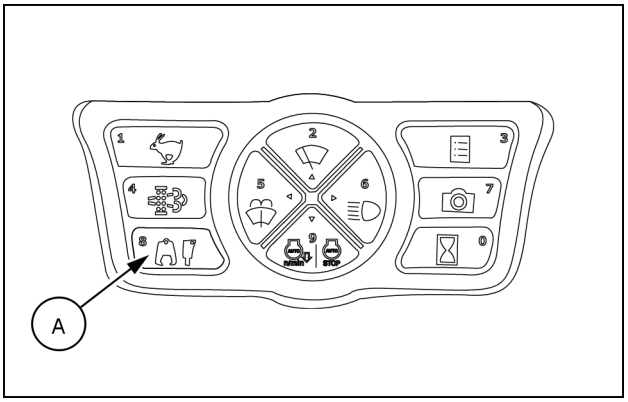


SMIL15CEXZ386BB 13

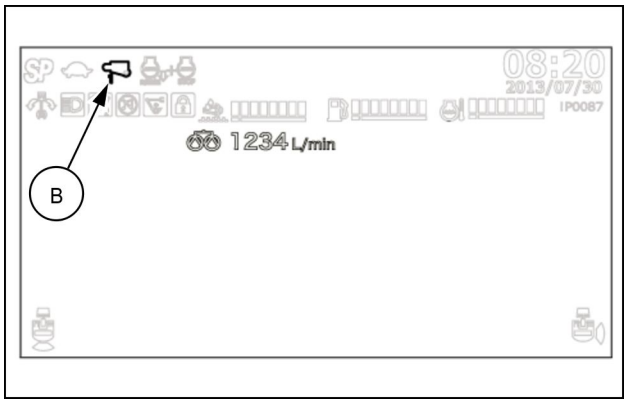
7. Start the engine. Press the attachment selector button **(A)** until the breaker icon **(B)** featuring the required flow rate value (1 to 5) appears on the top left of the display. If a different setting is necessary, or in case of forgotten settings, refer to the Operational settings paragraph previously in this Section.

   NOTICE: *If operation with the hydraulic attachment is attempted without making any setting, a warning buzzer sounds and the message AUXILIARY SET UP REQUIRED is displayed.*





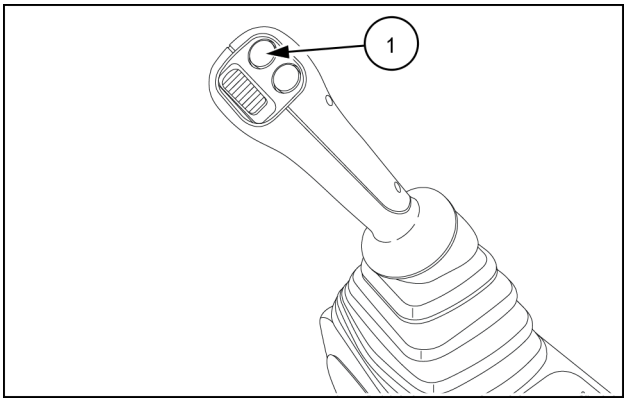
SMIL15CEX1234AA 14



SMIL19CEX0563AA 15

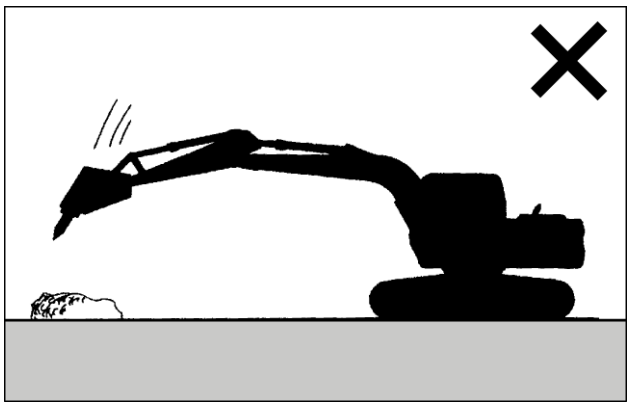
8. Select the SP work mode.
9. Set the gate lock lever to unlock position.
10. Operate the controls of boom, arm and bucket in order to position the breaker right to the structure or to the object to be crushed.
11. Press and hold the ON/OFF button **(1)** located on the right-hand control lever to operate the hydraulic breaker with the continuous selected flow providing a constant blowing frequency. Release the button to stop breaker operation.

    NOTE: *To change the blowing frequency, get back to the dedicated tab for operational settings of the auxiliary high-flow hydraulic circuit, and change the flow rate value to be used.*



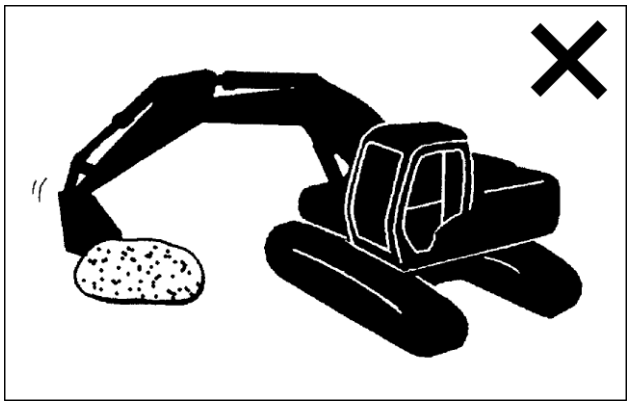
SMIL15CEXZ396AB 16

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.



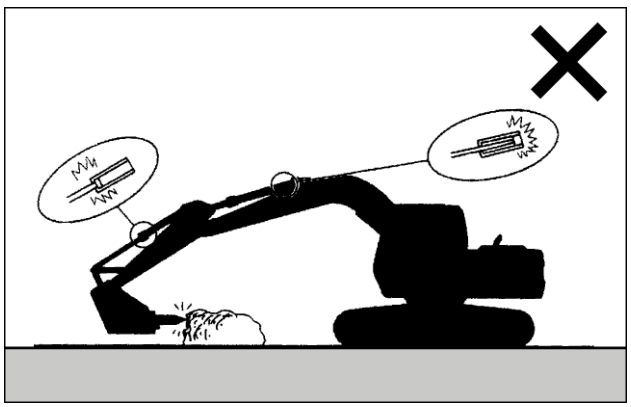
NH0195 17

Do not use the hydraulic breaker and/or swing function to push objects as damages to the attachment may result.



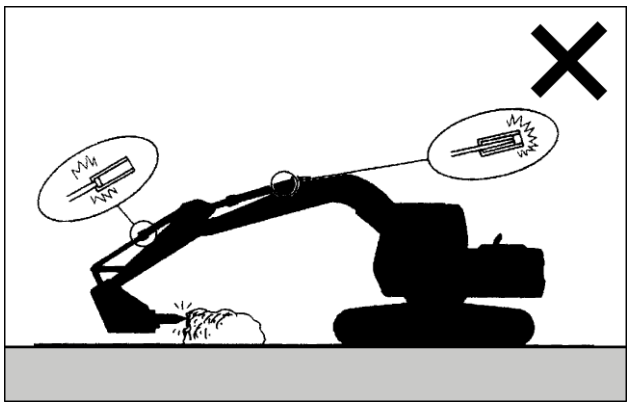
NH0196 18

Do not operate the breaker with the excavator cylinders fully extended or retracted to avoid attachment and/or cylinder damage.



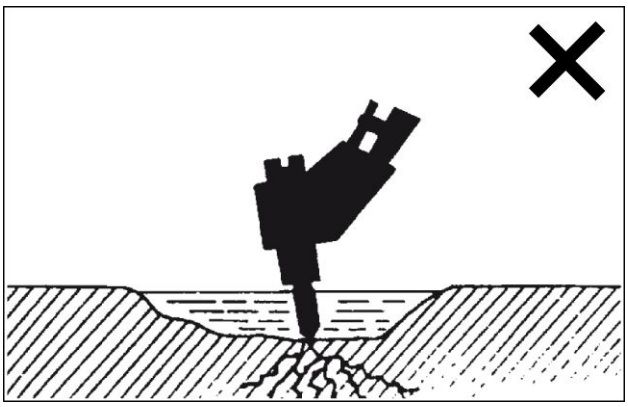
NH0197 19

Stop working if hydraulic hoses look abnormally bent. Contact your authorized Dealer.



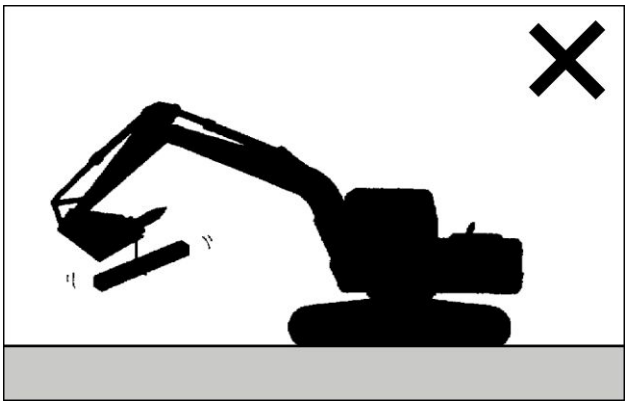
NH0197 20

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



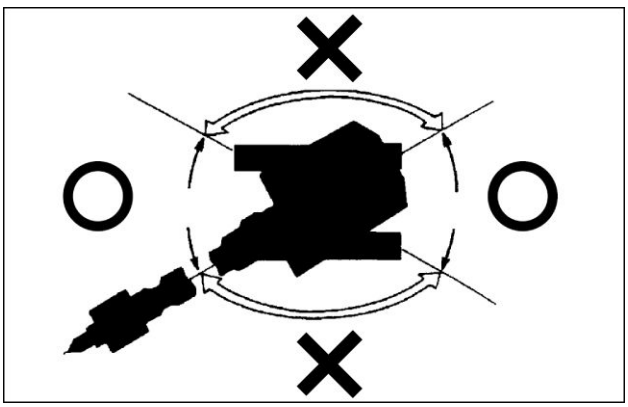
NH0199 21

Do not use the hydraulic breaker to move objects. The excavator might overturn and/or the hydraulic breaker may be damaged.



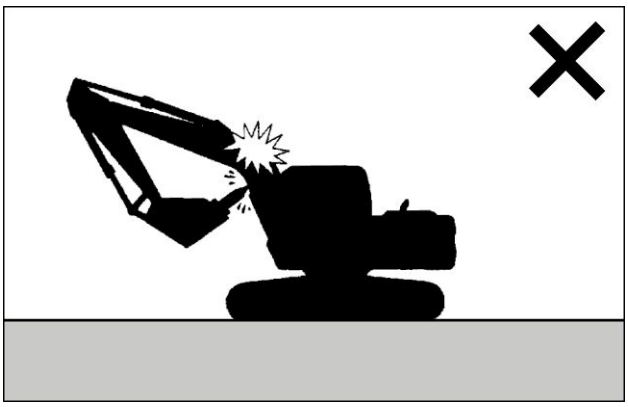
NH0200 22

Do not operate the breaker to the side of the machine. The machine may become unstable and undercarriage components life may be reduced.



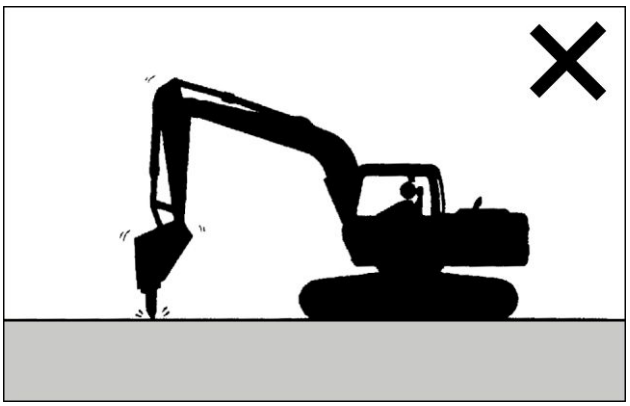
NH0201 23

Operate the excavator carefully to avoid hitting the boom with the hydraulic breaker.



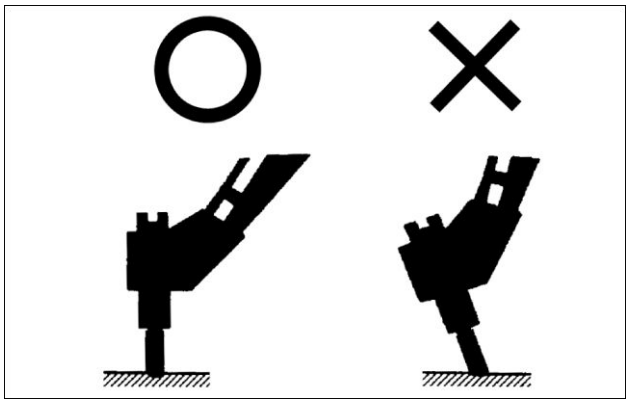
NH0202 24

Do not operate the breaker with the arm positioned vertically. Excessive vibration to the arm cylinder may cause oil leakage.



NH0203 25

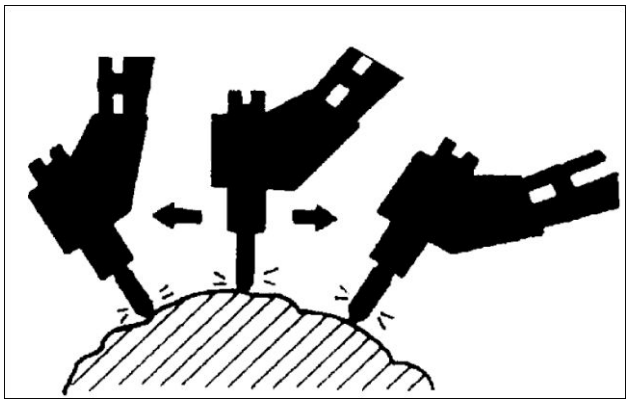
Press the breaker so that the chisel point thrust is square (perpendicular) to the object to be broken.



NH0204 26

Do not operate the hydraulic breaker continuously longer than **15 s**. Excessive chisel wear will result. If an object could not be broken within **15 s**, apply chisel to other locations, less than **15 s** for each location.

If breaker operation is done with ambient temperature above **35 °C**, make sure to take a stand-by time between breaker strikes in order to allow the circulation of the hydraulic fluid.



NH0205 27

Operation with the hydraulic sorting grab

The hydraulic sorting grab is a double-acting hydraulic attachment, and shall be connected to a high-flow hydraulic circuit.

Therefore, to operate with a hydraulic sorting grab the machine shall be equipped with the Double-acting auxiliary high-flow hydraulic circuit.

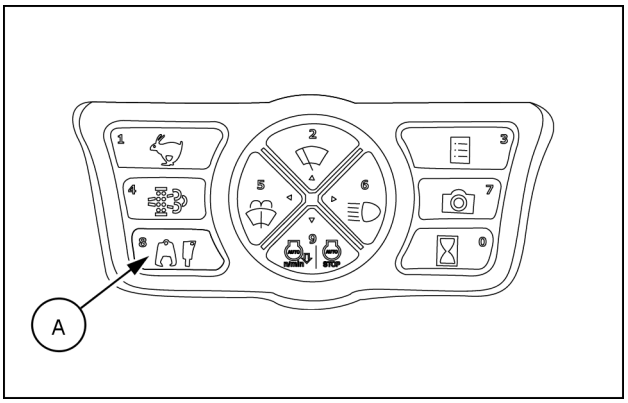
NOTICE: *The working pressure of the Double-acting auxiliary high-flow hydraulic circuit shall be set manually by the port relief valves on the relevant section of the control valve.*

1. Make sure that the machine and the attachment to be installed are on flat and level ground.
2. Make sure to read and understand the installation procedure described in the Operator's Manual of the attachment.

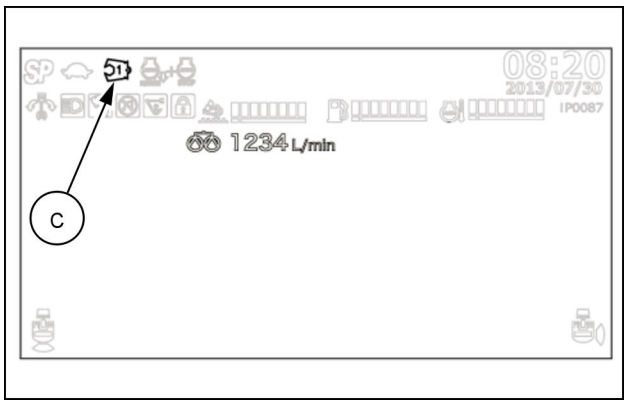
   NOTICE: *The maximum working pressure of the auxiliary high-flow hydraulic circuit shall be set according to the specification of the sorting grab.*
3. Operate the controls of boom, arm and bucket in order to install the hydraulic sorting grab to the bucket linkage at the top of the arm.
4. Stop the engine. Release pressure inside the auxiliary high-flow hydraulic circuit.
5. Close the feed valves at the top of the arm. Install the connecting hoses between the attachment and the feed valves.
6. Open the feed valves and check the fixing clamps for looseness, and the tubes and hoses fittings for leakages.
7. Start the engine. Press the attachment selector button **(A)** until the grab icon **(C)** featuring the required flow rate value (1 to 5) appears on the top left of the display. If a different setting is necessary, or in case of forgotten settings, refer to the Operational settings paragraph previously in this Section.

   NOTICE: *If operation with the hydraulic attachment is attempted without making any setting, a warning buzzer sounds and the message AUXILIARY SET UP REQUIRED is displayed.*





SMIL15CEX1234AA 28

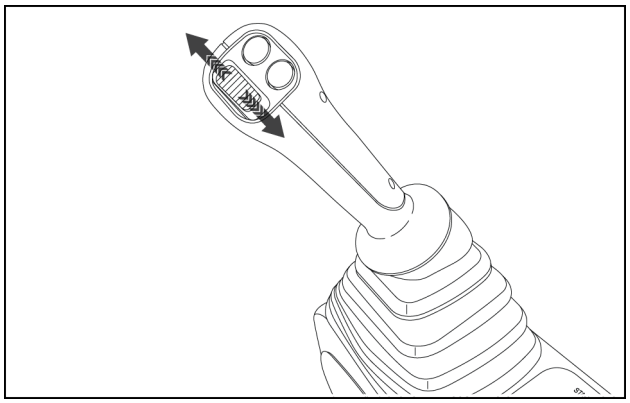


SMIL19CEX0564AA 29

8. Select the SP work mode.
9. Set the gate lock lever to unlock position.
10. Make sure that the control pattern of the hydraulic sorting grab is as intended. Slide up and down the proportional switch located on the right-hand control lever, and confirm the control direction to open the sorting grab and the control direction to close the sorting grab.

    NOTICE: *if control directions for opening and closing are not as intended, check for an alternative set up of the connecting ports on the attachment.*

    NOTICE: *Always keep each connecting hose on the same side of the arm. Never cross-over the connecting hoses between the two sides of the arm.*
11. Operate the controls of boom, arm and bucket in order to position the sorting grab onto the material to be picked up.
12. Operate the hydraulic sorting grab according to the control pattern defined at the step 10. The grabbing force increases with the sliding of the proportional switch in the closing direction. Release the switch to hold the shells of the sorting grab in position.



SMIL15CEXY965AB 30

Do not use swing torque or machine weight as a force to crack blocks or pieces. Do not use traveling force of the machine for picking or grabbing operation. Doing so will cause serious damages to the machine structures and components.

Never operate with cylinders fully extended or fully retracted. Doing so will cause serious damages to the cylinders and to the whole front equipment.

Avoid abrupt change of swing direction when swinging the upper structure. Doing so will severely affect machine stability, and may cause loosening of materials from the attachment.

Never hit or push objects with side of the attachment. Do not sweep ground with the attachment to level rubbles. Doing so will cause serious damages to the machine structures and components.

Hydraulic quick coupling system

⚠ WARNING

Crushing hazard!
Never put your hands inside the quick coupler when the engine is running. Turn off the engine and wait for all movement to stop.
Failure to comply could result in death or serious injury.

W0252A

⚠ WARNING

Hazard to bystanders!
ALWAYS make sure the work area is clear of bystanders and domestic animals before starting this procedure. Know the full area of movement of the machine. Do not permit anyone to enter the area of movement during this procedure.
Failure to comply could result in death or serious injury.

W0245A

NOTICE: *The quick coupler extends the length of the arm. Make sure to check the operating range of the coupled attachment in order to avoid risk of hitting the cab or the machine frame.*

NOTICE: *Never operate with a quick coupled hydraulic breaker over a long period of time, in order to reduce the risk of premature wear, failures or breakage of the quick coupler. Never use the breaker as a lever, as the stress would be borne by the quick coupler cylinder.*

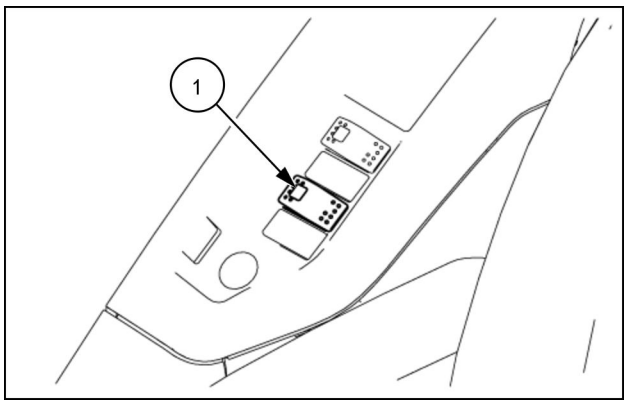
NOTICE: *Make sure to read and understand the Operator's Manual of the hydraulic quick coupler for proper installation, usage and maintenance.*

NOTICE: *The CASE CONSTRUCTION quick coupling system is supplied by the high pressure hydraulic system of the machine. Refer to Chapter 8 for the maximum working pressure of the hydraulic system. Make sure to use a quick coupler that is suitable for proper and safe operation with high pressure hydraulics. For information consult the CASE CONSTRUCTION dealer.*

Attachment engagement

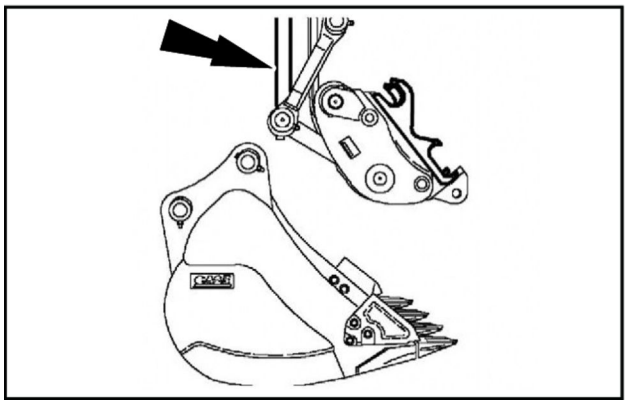
To engage the attachment using CASE CONSTRUCTION quick coupling system proceed as follows:

1. Make sure the attachment to be installed is laying safely on flat and level ground.
2. Select the H work mode.
3. Slide the lock device and press the front side of the quick coupler switch **(1)** to set the unlocking status of the quick coupling system. The audible alarm device starts sounding.



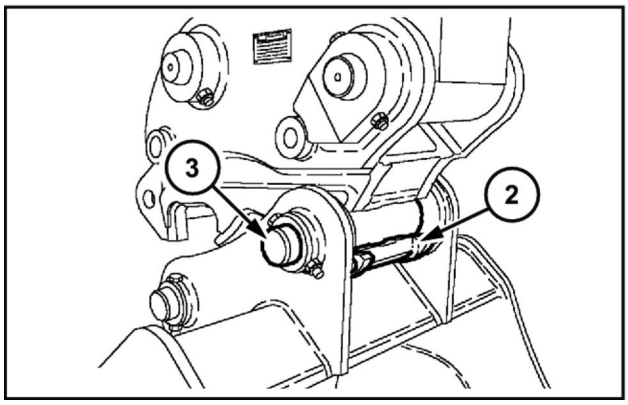
SMIL19CEX1015AA 1

4. Operate the arm and bucket controls so that the arm is practically vertical, sloping slightly towards the cab to release the safety device. Extend the bucket cylinder rod completely and maintain the hydraulic pressure for approximately **5 – 10 s** so that the latching hook retracts.



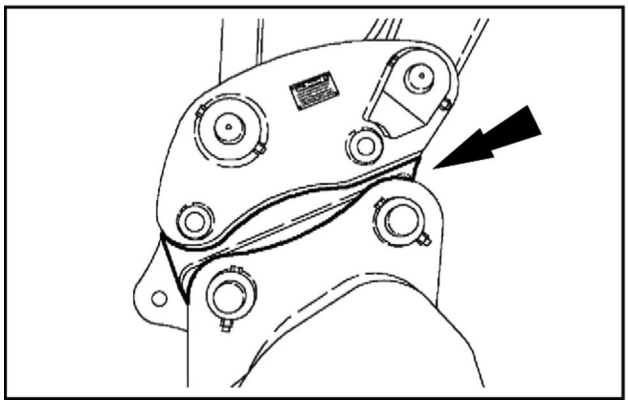
SMIL13CEX2697AB 2

5. Operate the arm and bucket controls so as to bring the quick coupler hook **(2)** around the attachment pin **(3)**.



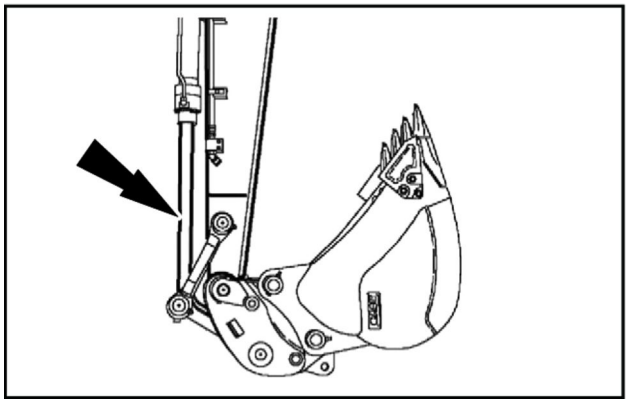
SMIL13CEX2698AB 3

6. Operate the bucket control lever so that the pin is completely engaged in the quick coupler hook.



SMIL13CEX2699AB 4

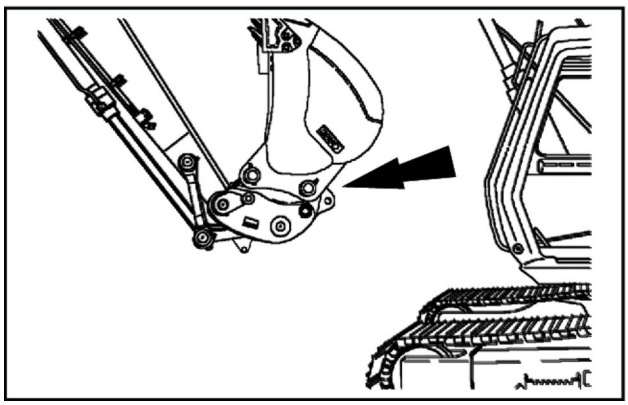
7. Operate the arm control to raise the arm and operate the bucket control to extend the bucket cylinder rod completely.



SMIL13CEX2700AB 5

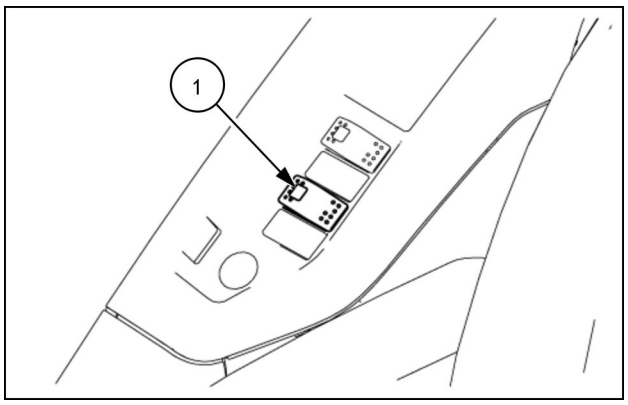
8. Raise the arm until the attachment pin is visible from the operator's seat.

NOTICE: *The quick coupler extends the length of the arm and with certain attachments there is the risk to hit the cab in some operating positions. With this kind of attachments, it may not be possible to raise the arm until the attachment pin is visible from the operator's seat.*



SMIL13CEX2701AB 6

9. Press the rear side of the quick coupler switch **(1)** to set the locking status of the quick coupling system. The audible alarm device stops sounding.

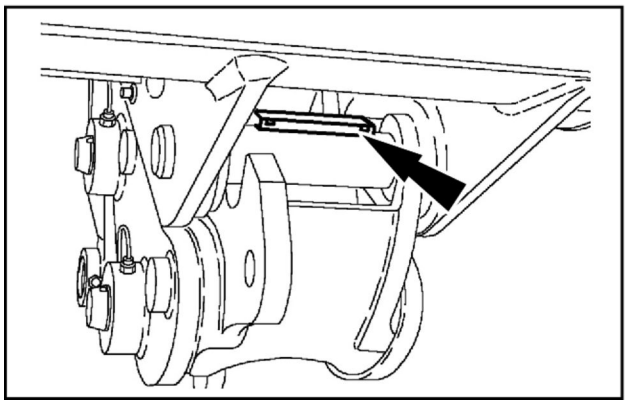


SMIL19CEX1015AA 7

10. Maintain the hydraulic pressure in the bucket cylinder for approximately **5 – 10 s** to allow the latching hook to close.
11. Confirm that the attachment pin is correctly engaged in the latching hook.

NOTE: *the latching hook has a different color to ease the visual confirmation of the engagement of the pin.*

NOTICE: *If visual confirmation is not possible from the operator's seat, get down from the machine and make sure that the attachment pin is correctly engaged in the latching hook.*

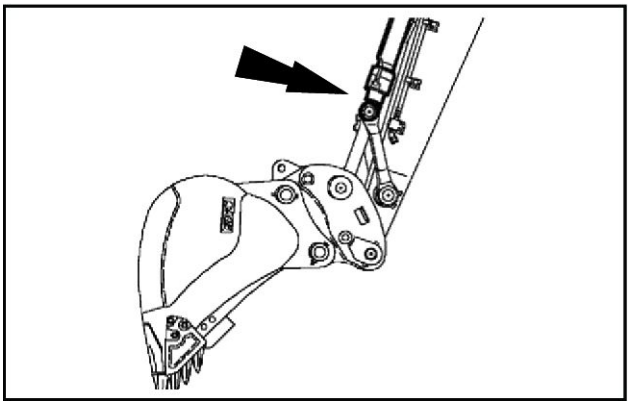


SMIL13CEX2702AB 8

12. Operate the bucket control to retract the cylinder rod and allow the safety device to engage.
13. To ensure that the bucket/attachment pins are securely held by the quick coupler, apply force to the bucket/attachment by pressing it against the ground.

    NOTE: *This operation is commonly known as “Bump Test” or “Ground test”.*

    NOTICE: *If the quick coupler is used in conjunction with an hydraulic breaker, do not apply force with the chisel.*

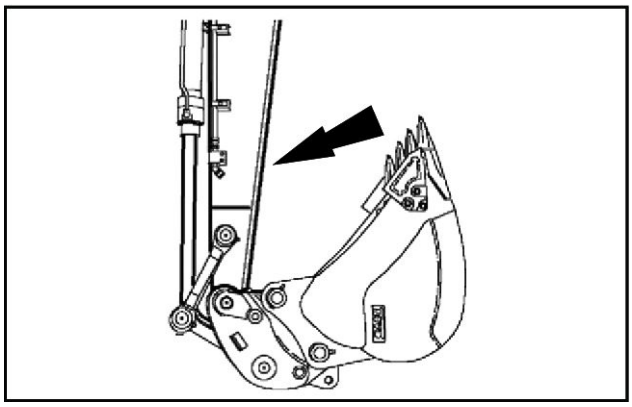


SMIL13CEX2703AB 9

Attachment disengagement

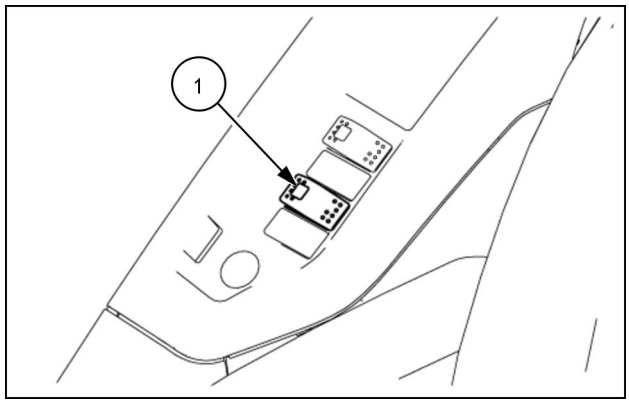
To disengage the attachment using CASE CONSTRUCTION quick coupling system proceed as follows:

1. Operate the arm and bucket controls so that the arm is practically vertical, sloping slightly towards the cab, to release the safety device.



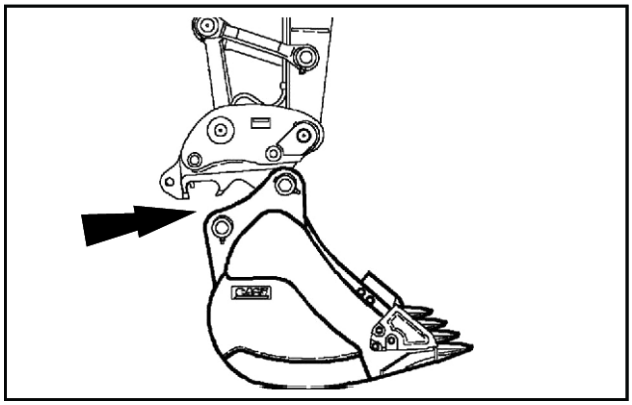
SMIL13CEX2704AB 10

2. Slide the lock device and press the front side of the quick coupler switch **(1)** to set the unlocking status of the quick coupling system. The audible alarm device starts sounding.
3. Extend the bucket cylinder rod completely and maintain the hydraulic pressure for approximately **5 – 10 s** so that the latching hook retracts.



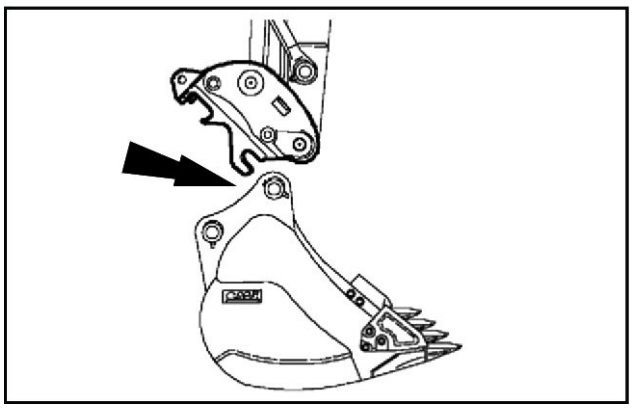
SMIL19CEX1015AA 11

4. Operate the bucket and arm controls to lay the attachment safely on flat, level ground.



SMIL13CEX2705AB 12

5. Operate the arm control to unhook the attachment.
6. Press the rear side of the quick coupler switch **(1)** to set the locking status of the quick coupling system. The audible alarm device stops sounding.



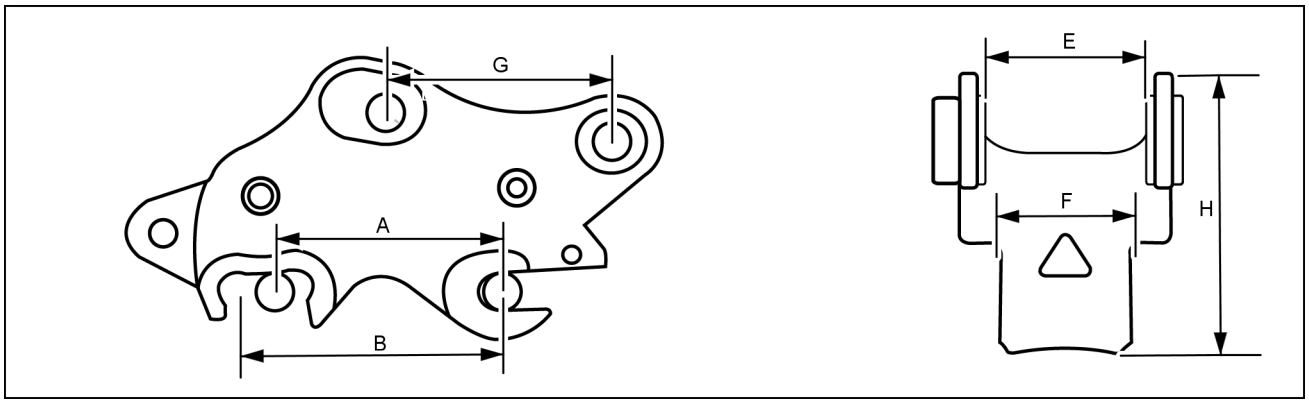
SMIL13CEX2706AB 13

Quick coupler buckets

CASE CONSTRUCTION quick coupler

CASE CONSTRUCTION can provide a hydraulic quick coupler and a dedicated range of Coupler buckets.

The CASE CONSTRUCTION Coupler buckets are designed to optimize the fitting to the CASE CONSTRUCTION quick coupler, and are designed to optimize the operating performance of the CASE CONSTRUCTION excavators in most of construction works.



SMIL15CEX3064EA 1

Main dimensions

(E)	**255 mm** (**10 in**)
(G)	**385 mm** (**15 in**)
(H)	**510.5 mm** (**20.1 in**)
Weight	**180 kg** (**397 lb**)

NOTICE: *usage of buckets other than CASE CONSTRUCTION Coupler buckets is strictly limited to the condition that the bucket hangers match with the dimensions indicated in the table below. Contact your CASE CONSTRUCTION dealer for checking the buckets intended for usage.*

Bucket fitting dimensions

Bucket pin diameter	**60 mm** (**2.4 in**)	**65 mm** (**2.6 in**)
Minimum pin spread **(A)**	**345 mm** (**13.6 in**)	**355 mm** (**14.0 in**)
Maximum pin spread **(B)**	**415 mm** (**16.3 in**)	**420 mm** (**16.5 in**)
Seating width **(F)**	**230 mm** (**9.1 in**)	

Quick coupler identification plate

The identification plate of the CASE CONSTRUCTION quick coupler is located on the inside of the top hangers.

Serial number:

Weight:

Working pressure:

Type/Model:

Part number:

Year of manufacture:

SWL (Safe Working Load):

Quick coupler buckets application as function of the arm (CX145D SR LC – CX145D SR with blade)

Heavy Duty Coupler buckets			Arm		
Capacity **ISO 7451** (Heaped)	Width	Mass	**2.11 m** (**83.07 in**)	**2.50 m** (**98.43 in**)	**3.01 m** (**118.50 in**)
0.24 m³ (**0.31 yd³**)	**455 mm** (**18 in**)	**310 kg** (**683 lb**)	○	○	○
0.33 m³ (**0.43 yd³**)	**610 mm** (**24 in**)	**360 kg** (**794 lb**)	○	○	○
0.43 m³ (**0.56 yd³**)	**760 mm** (**30 in**)	**400 kg** (**882 lb**)	○	○	●
0.54 m³ (**0.71 yd³**)	**915 mm** (**36 in**)	**440 kg** (**970 lb**)	○	●	■
0.63 m³ (**0.82 yd³**)	**1065 mm** (**42 in**)	**480 kg** (**1058 lb**)	●	■	x
0.73 m³ (**0.95 yd³**)	**1220 mm** (**48 in**)	**520 kg** (**1146 lb**)	■	x	x

Ditch cleaning buckets			Arm		
Capacity **ISO 7451** (Heaped)	Width	Mass	**2.11 m** (**83.07 in**)	**2.50 m** (**98.43 in**)	**3.01 m** (**118.50 in**)
0.61 m³ (**0.80 yd³**)	**1220 mm** (**48 in**)	**410 kg** (**904 lb**)	●	●	x
		470 kg (**1036 lb**) (*)	●	■	x
0.78 m³ (**1.02 yd³**)	**1525 mm** (**60 in**)	**480 kg** (**1058 lb**)	■	x	x
		550 kg (**1213 lb**) (*)	■	x	x

(*) with bolt-on cutting edge

○ Density of material up to 2 t/m^3
● Density of material up to 1.6 t/m^3
■ Density of material up to 1.2 t/m^3
x Not applicable

NOTICE: *A bucket mounted on the quick coupler has a longer overall teeth radius. Always check the operating range of the machine with the Coupler bucket. Avoid abrupt operation in order to keep proper clearance between the bucket and the cab or boom or other significant parts of the machine.*

NOTICE: *A bucket mounted on the quick coupler has a longer overall teeth radius. Therefore, the bucket cannot be fully curled after the arm has been fully retracted, and the overall height of the machine in the transport position is increased. The recommended operating practice is to remove the bucket from the coupler before any transport operation in order not to increase the overall height of the machine.*

Quick coupler buckets application (CX145D SR Offset Boom with blade)

Heavy Duty Coupler buckets			Arm
Capacity **ISO 7451** (Heaped)	Width	Mass	**2.11 m** (**83.07 in**)
0.24 m³ (**0.31 yd³**)	**455 mm** (**18 in**)	**310 kg** (**683 lb**)	○
0.33 m³ (**0.43 yd³**)	**610 mm** (**24 in**)	**360 kg** (**794 lb**)	○
0.43 m³ (**0.56 yd³**)	**760 mm** (**30 in**)	**400 kg** (**882 lb**)	●
0.54 m³ (**0.71 yd³**)	**915 mm** (**36 in**)	**440 kg** (**970 lb**)	■
0.63 m³ (**0.82 yd³**)	**1065 mm** (**42 in**)	**480 kg** (**1058 lb**)	■

Ditch cleaning buckets			Arm
Capacity **ISO 7451** (Heaped)	Width	Mass	**2.11 m** (**83.07 in**)
0.61 m³ (**0.80 yd³**)	**1220 mm** (**48 in**)	**410 kg** (**904 lb**)	■
		470 kg (**1036 lb**) (*)	■

(*) with bolt-on cutting edge

○ Density of material up to 2 t/m^3
● Density of material up to 1.6 t/m^3
■ Density of material up to 1.2 t/m^3

NOTICE: *A bucket mounted on the quick coupler has a longer overall teeth radius. Always check the operating range of the machine with the Coupler bucket. Avoid abrupt operation in order to keep proper clearance between the bucket and the cab or boom or other significant parts of the machine.*

NOTICE: *A bucket mounted on the quick coupler has a longer overall teeth radius. Therefore, the bucket cannot be fully curled after the arm has been fully retracted, and the overall height of the machine in the transport position is increased. The recommended operating practice is to remove the bucket from the coupler before any transport operation in order not to increase the overall height of the machine.*

Servicing instructions

⚠ WARNING

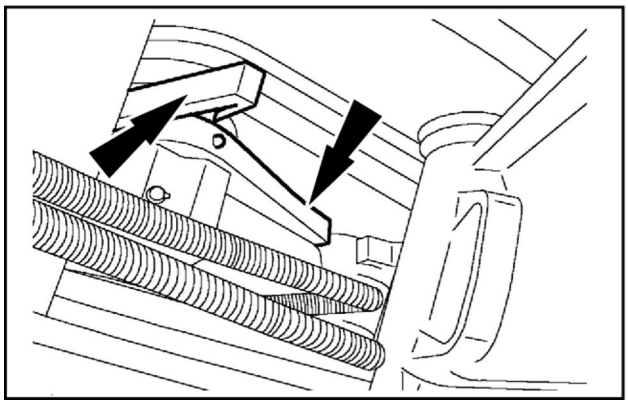
Improper operation or service of this machine can result in an accident.
If you do not understand a maintenance procedure, or doubt your ability to perform a maintenance procedure correctly, see your authorized dealer.
Failure to comply could result in death or serious injury.

W0157A

Modification of the quick coupler without prior authorization can cause serious injury. Do not carry out any modification without authorization. Consult your CASE CONSTRUCTION Dealer.

Daily checks:

- Check that the locking bar functions correctly and that it is not fouled by foreign matter.
- Check the quick coupler cylinder hoses for free movement.
- Check for any signs of cracks.



SMIL13CEX2822AB 2

Incorrect functioning

NOTICE: *make sure that the attachment is in full contact with the ground before carrying out the following checks.*

If the quick coupler does not work correctly, check the following items:

- That no pin is broken, bent or lost.
- That no foreign matter is fouling the safety device.
- That the cylinder is not damaged or bent.
- That there are no leaks from hydraulic hoses, etc.

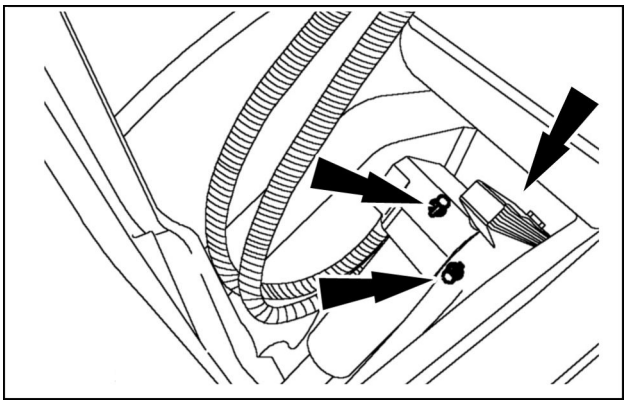
If the problem persists after all these checks, consult your CASE CONSTRUCTION Dealer.

Maintenance

Grease the quick coupler linkage every **50 h**.
Lubricant: **MULTI-PURPOSE GREASE EXTREME PRESSURE AND ANTI-WEAR NLGI 2**.

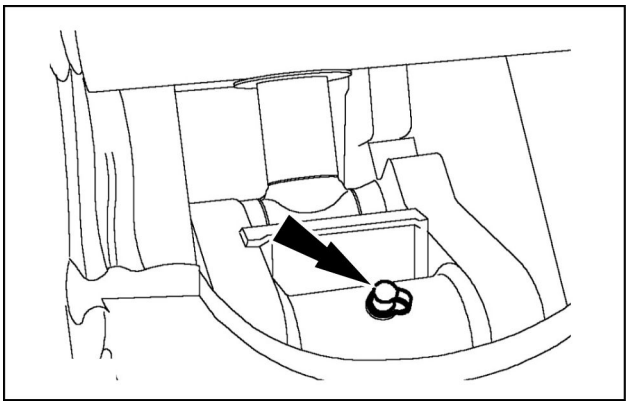
Set the quick coupler cylinder in retracted position. Put grease into the grease points shown in figure.

- Cylinder bottom pin: one lubrication point.
  Locking bar pivot: one lubrication point.
  Latching system pivot: one lubrication point.



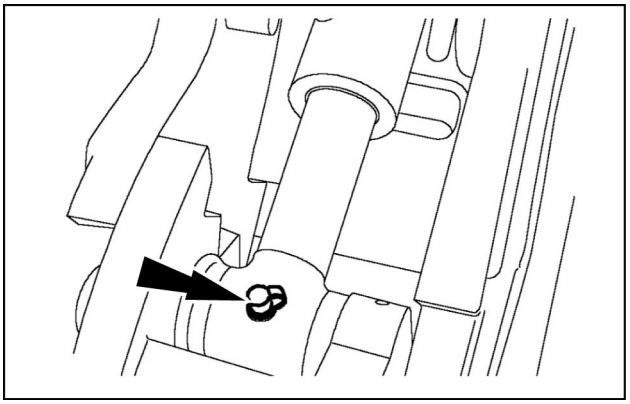
SMIL14CEX2734AA 3

- Hook pivot: one lubrication point.



SMIL14CEX2736AA 4

- Cylinder top pin: one lubrication point.



SMIL14CEX2735AA 5

NOTICE: *the coupler linkage shall be lubricated every* ***10 h*** *if the machine is operated in water or mud.*

Ripper tooth

CASE CONSTRUCTION ripper tooth are designed to optimize the operating performance of the CASE CONSTRUCTION excavators in primary digging of tough soils and frozen grounds, or in primary cutting of road pavement. Ripper tooth can be effectively used also for extraction of stumps and embedded materials.

NOTICE: *never use ripper tooth as a chisel on hard rocks and boulders: it is not productive, and it significantly increases the stress level on the front equipment of the excavator.*

CASE CONSTRUCTION defines application rules in order to match ripper tooth with the most suitable configuration of the machine, and to refer ripper tooth application to specific working conditions.

NOTICE: *CASE CONSTRUCTION ripper tooth must not be installed on CX145D SR Offset Boom with blade. This version of the machine is not intended for heavy digging application, and the operation with ripper tooth may lead to severe damages to the machine structures.*

Direct fit application as function of the arm (CX145D SR LC – CX145D SR with blade)

Tooth radius	Weight	Arm		
		2.11 m (**83.07 in**)	**2.50 m** (**98.43 in**)	**3.01 m** (**118.50 in**)
1020 mm (**40 in**)	**310 kg** (**683 lb**)	○	●	x

Quick coupled application as function of the arm (CX145D SR LC – CX145D SR with blade)

Tooth radius	Weight	Arm		
		2.11 m (**83.07 in**)	**2.50 m** (**98.43 in**)	**3.01 m** (**118.50 in**)
1020 mm (**40 in**)	**310 kg** (**683 lb**)	○	○	x

○ Suitable application
● Conditional application (only with arm reinforcement kit)
x Not applicable

NOTICE: *Direct fit of ripper tooth should be selected for productive applications that require top breakout action.*

NOTICE: *For primary digging of uneven tough soils, the machine must be equipped with **2.11 m** (**83.07 in**) arm, **600 mm** (**24 in**) tracks and double track guards.*

NOTICE: *CASE CONSTRUCTION will not take into account any condition of application that is out of the ones defined in the table above.*

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 selflocking hooks in order to avoid unintended opening during lift operation. The lifting devices can be used exclusively for the lifting of parts not anchored to the ground. Never use them for towing operations, uprooting or tearing apart.*

NOTICE: *a suspended load can swing freely, and it can thus hit persons or the cab of the machine. Make sure that all bystanders are moved away from the field of action of the machine, and make sure to handle the load slowly. If the load starts to swing during the handling, lower it slowly to the ground and sling it in a way that avoid unintended swinging as much as possible.*

To handle suspended loads proceed as follows:

1. Make sure to know the mass of the object to be handled and compare it with the data listed in the liftable loads chart **(1)** located in the cab. Do not lift loads exceeding the maximum values prescribed by the table.

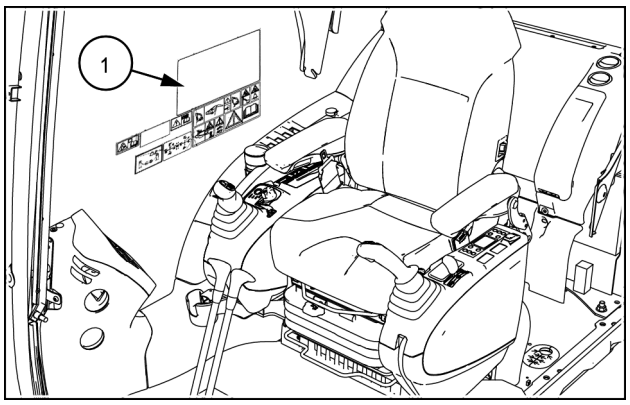
   NOTICE: *The weight of all lifting accessories and the weight of all other working attachment such as buckets and couplers must be deducted from the maximum lifting values prescribed by the table.*

2. Press the ON side of the overload warning switch **(2)** to activate the overload warning alarm. The overload warning alarm is intended to avoid lifting of excessive loads. If an overload condition is detected during the handling of the load, the message OVER LOAD appears on the top of the display and the overload warning alarm sounds.

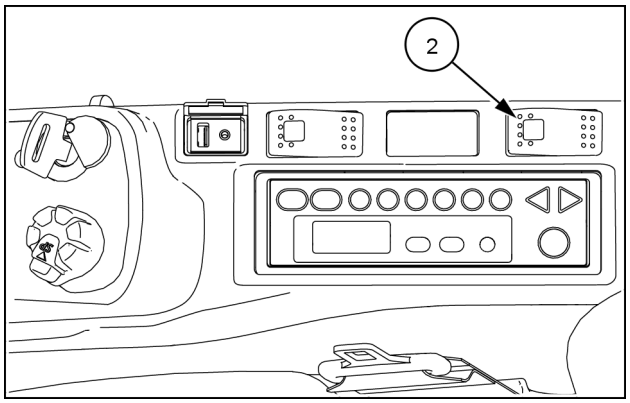
   OVER LOAD

   NOTICE: *if an overload condition is detected during the handling of the load, place the load onto the ground and check the load conditions making reference to the chart located inside the cab.*

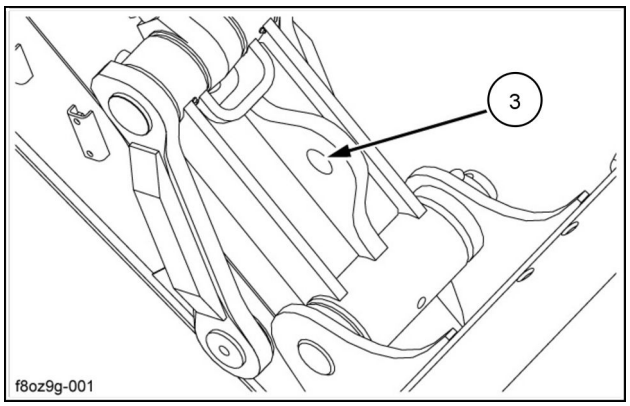
3. Secure the load with the load handling eye **(3)** located on the bucket linkage rod, using slinging devices and chains adequate for the load to be lifted. In order to limit the swinging of the load, avoid slinging it with cables and/or chains too long.
4. Select the A work mode.
5. Extend the bucket cylinder to mid stroke.
6. Check the surrounding working area and make sure that the path that may be travelled with the load is free from obstacles.
7. 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.
8. Position and place the load where desired, making sure that it is resting on a solid base appropriate for its mass.
9. Remove the chains.



SMIL14CEX5596AA 1

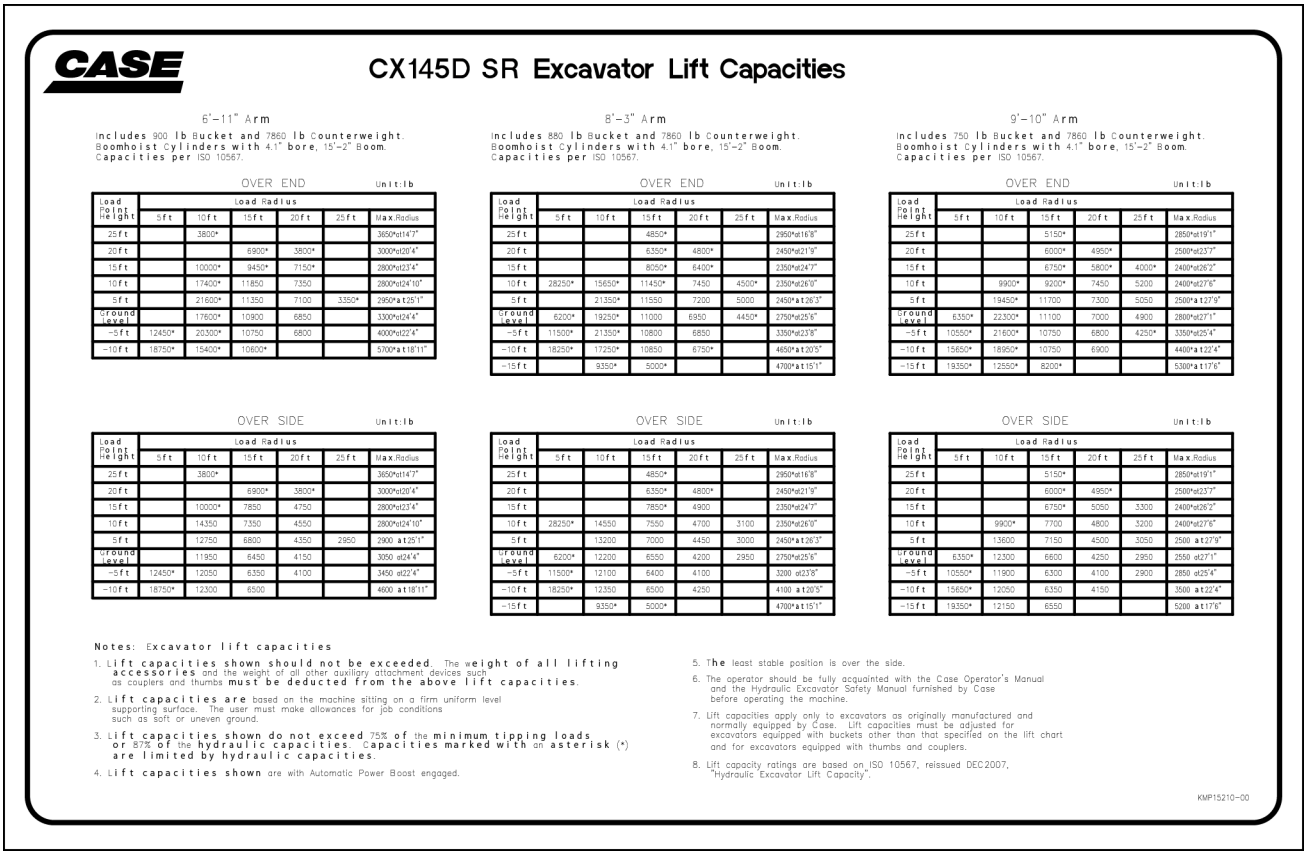


SMIL17CEX0321AA 2



F8OZ9G-001 3

Loads handling chart



CASE

CX145D SR Excavator Lift Capacities

6'–11" Arm

Includes 900 lb Bucket and 7860 lb Counterweight.
Boomhoist Cylinders with 4.1" bore, 15'–2" Boom.
Capacities per ISO 10567.

OVER END — Unit: lb

Load Point Height	Load Radius					
	5 ft	10 ft	15 ft	20 ft	25 ft	Max. Radius
25 ft		3800*				3650* at 14'7"
20 ft			6900*	3800*		3000* at 20'4"
15 ft		10000*	9450*	7150*		2800* at 23'4"
10 ft		17400*	11850	7350		2800* at 24'10"
5 ft		21600*	11350	7100	3350*	2950* at 25'1"
Ground Level		17600*	10900	6850		3300* at 24'4"
–5 ft	12450*	20300*	10750	6800		4000* at 22'4"
–10 ft	18750*	15400*	10600*			5700* at 18'11"

OVER SIDE — Unit: lb

Load Point Height	Load Radius					
	5 ft	10 ft	15 ft	20 ft	25 ft	Max. Radius
25 ft		3800*				3650* at 14'7"
20 ft			6900*	3800*		3000* at 20'4"
15 ft		10000*	7850	4750		2800* at 23'4"
10 ft		14350	7350	4550		2800* at 24'10"
5 ft		12750	6800	4350	2950	2900 at 25'1"
Ground Level		11950	6450	4150		3050 at 24'4"
–5 ft	12450*	12050	6350	4100		3450 at 22'4"
–10 ft	18750*	12300	6500			4600 at 18'11"

8'–3" Arm

Includes 880 lb Bucket and 7860 lb Counterweight.
Boomhoist Cylinders with 4.1" bore, 15'–2" Boom.
Capacities per ISO 10567.

OVER END — Unit: lb

Load Point Height	Load Radius					
	5 ft	10 ft	15 ft	20 ft	25 ft	Max. Radius
25 ft			4850*			2950* at 16'8"
20 ft			6350*	4800*		2450* at 21'9"
15 ft			8050*	6400*		2350* at 24'7"
10 ft	28250*	15650*	11450*	7450	4500*	2350* at 26'9"
5 ft		21350*	11550	7200	5000	2450* at 26'3"
Ground Level	6200*	19250*	11000	6950	4450*	2750* at 25'6"
–5 ft	11500*	21350*	10800	6850		3350* at 23'8"
–10 ft	18250*	17250*	10850	6750*		4650* at 20'5"
–15 ft		9350*	5000*			4700* at 15'1"

OVER SIDE — Unit: lb

Load Point Height	Load Radius					
	5 ft	10 ft	15 ft	20 ft	25 ft	Max. Radius
25 ft			4850*			2950* at 16'8"
20 ft			6350*	4800*		2450* at 21'9"
15 ft			7850*	4900		2350* at 24'7"
10 ft	28250*	14550	7550	4700	3100	2350* at 26'9"
5 ft		13200	7000	4450	3000	2450* at 26'3"
Ground Level	6200*	12200	6550	4200	2950	2750* at 25'6"
–5 ft	11500*	12100	6400	4100		3200 at 23'8"
–10 ft	18250*	12350	6500	4250		4100 at 20'5"
–15 ft		9350*	5000*			4700* at 15'1"

9'–10" Arm

Includes 750 lb Bucket and 7860 lb Counterweight.
Boomhoist Cylinders with 4.1" bore, 15'–2" Boom.
Capacities per ISO 10567.

OVER END — Unit: lb

Load Point Height	Load Radius					
	5 ft	10 ft	15 ft	20 ft	25 ft	Max. Radius
25 ft			5150*			2850* at 19'1"
20 ft			6000*	4950*		2500* at 23'7"
15 ft			6750*	5800*	4000*	2400* at 26'2"
10 ft		9900*	9200*	7450	5200	2400* at 27'6"
5 ft		19450*	11700	7300	5050	2500* at 27'9"
Ground Level	6350*	22300*	11100	7000	4900	2800* at 27'1"
–5 ft	10550*	21600*	10750	6800	4250*	3350* at 25'4"
–10 ft	15650*	18950*	10750	6900		4400* at 22'4"
–15 ft	19350*	12550*	8200*			5300* at 17'6"

OVER SIDE — Unit: lb

Load Point Height	Load Radius					
	5 ft	10 ft	15 ft	20 ft	25 ft	Max. Radius
25 ft			5150*			2850* at 19'1"
20 ft			6000*	4950*		2500* at 23'7"
15 ft			6750*	5050	3300	2400* at 26'2"
10 ft		9900*	7700	4800	3200	2400* at 27'6"
5 ft		13600	7150	4500	3050	2500 at 27'9"
Ground Level	6350*	12300	6900	4250	2950	2550 at 27'1"
–5 ft	10550*	11900	6300	4100	2900	2850 at 25'4"
–10 ft	15650*	12050	6350	4150		3500 at 22'4"
–15 ft	19350*	12150	6550			5200 at 17'6"

Notes: Excavator lift capacities

1. Lift capacities shown should not be exceeded. The weight of all lifting accessories and the weight of all other auxiliary attachment devices such as couplers and thumbs must be deducted from the above lift capacities.
2. Lift capacities are based on the machine sitting on a firm uniform level supporting surface. The user must make allowances for job conditions such as soft or uneven ground.
3. Lift capacities shown do not exceed 75% of the minimum tipping loads or 87% of the hydraulic capacities. Capacities marked with an asterisk (*) are limited by hydraulic capacities.
4. Lift capacities shown are with Automatic Power Boost engaged.
5. The least stable position is over the side.
6. The operator should be fully acquainted with the Case Operator's Manual and the Hydraulic Excavator Safety Manual furnished by Case before operating the machine.
7. Lift capacities apply only to excavators as originally manufactured and normally equipped by Case. Lift capacities must be adjusted for excavators equipped with buckets other than that specified on the lift chart and for excavators equipped with thumbs and couplers.
8. Lift capacity ratings are based on ISO 10567, reissued DEC2007, "Hydraulic Excavator Lift Capacity".

KMP15210–00

KMP15210 4

1. Lift capacities shown should not be exceeded. The weight of all lifting accessories and the weight of all other auxiliary attachment devices such as couplers and thumbs must be deducted from the above lift capacities.
2. Lift capacities are based on the machine sitting on a firm uniform level supporting surface. The user must take allowances for job conditions such as soft or uneven ground.
3. Lift capacities shown do not exceed **75%** of the minimum tipping loads or **87%** of the hydraulic capacities. Capacities marked with an asterisk are limited by hydraulic capacities.
4. Lift capacities shown are with automatic power boost engaged.
5. The least stable position is over the side.
6. The operator should be fully acquainted with the CASE CONSTRUCTION operator's manual before operating the machine.
7. Lift capacities apply only to excavators as originally manufactured and normally equipped by CASE CONSTRUCTION. Lift capacities must be adjusted for excavators equipped with buckets other than that specified on the lift chart and for excavators equipped with thumbs and couplers.
8. Lift capacity ratings are based on **ISO 10567**, reissued 2007 "Hydraulic Excavators Lift Capacity".

Safety valves

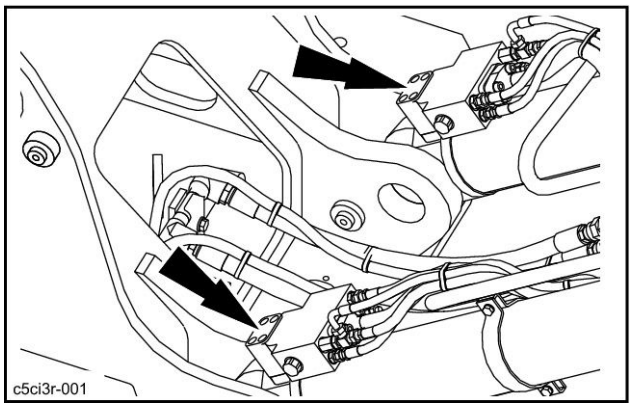
The safety valves are intended to prevent the front equipment from dropping down in the event of a breakage or burst of a hose in the hydraulic lines of boom and arm. The safety valves keep the front equipment in the position at the time of breakage, and thus allow the operator to slowly lower the attachment to the ground using the left and right control levers.

Moreover, the safety valves allow to keep the front equipment in the selected operating position reducing the leakages that occur in the neutral position of the boom spool and the arm spool in the main control valve.

NOTICE: *prior to starting any handling of suspended loads check that the valves do not show clear evidence of damages or abnormal noises. In the event abnormal conditions are found, contact the CASE CONSTRUCTION. dealer.*

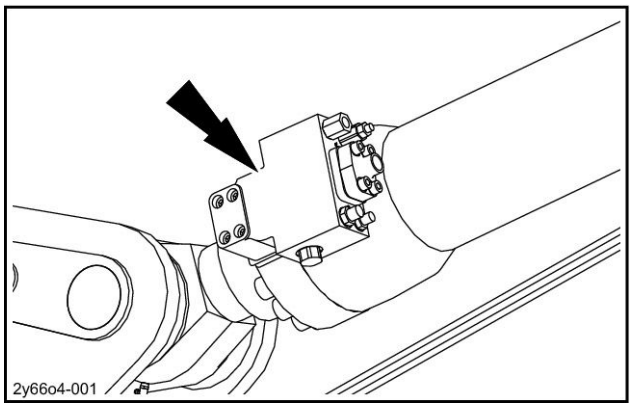
NOTICE: *the pressure setting of the safety valves must be checked every 6 months. Consult the CASE CONSTRUCTION dealer.*

On boom cylinders



C5CI3R-001A 5

On arm cylinder

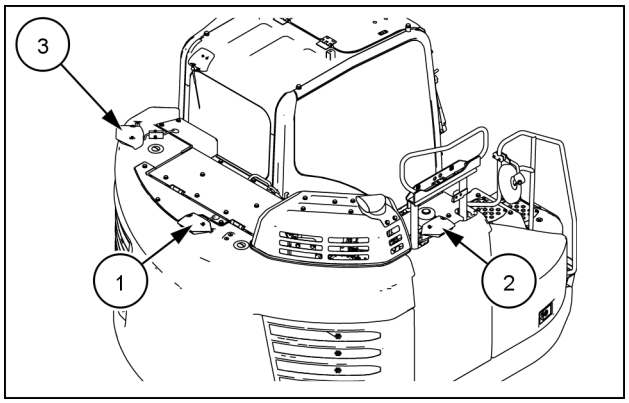


2Y66O4-001A 6

Field view monitor

The CASE CONSTRUCTION Field View Monitor (FVM) is a system that ensure proper visibility during operation by displaying a comprehensive visualization of the area around the machine.

The comprehensive visualization is based on the combination of the views of three external cameras: a rear camera **(1)** installed on the counterweight, a right-side camera **(2)** installed on the fuel tank, a left-side camera **(3)** installed above the left-hand door.



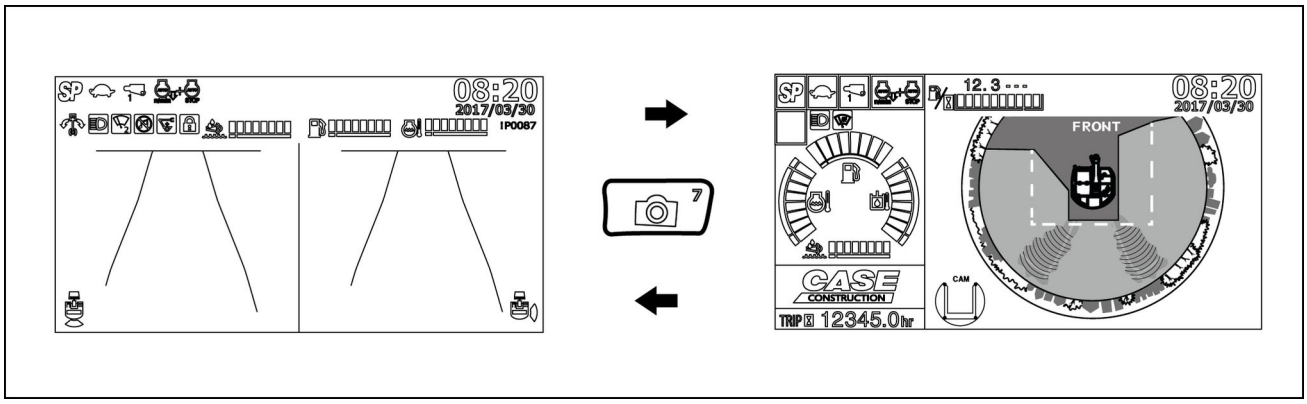
SMIL17CEX3248AA 1

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

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

FVM mode of the display

The FVM mode of the display is alternative to the normal operating mode. Press the camera view selector button on the instrument cluster to select the FVM mode. The operating mode of the display toggles every time the button is pressed.

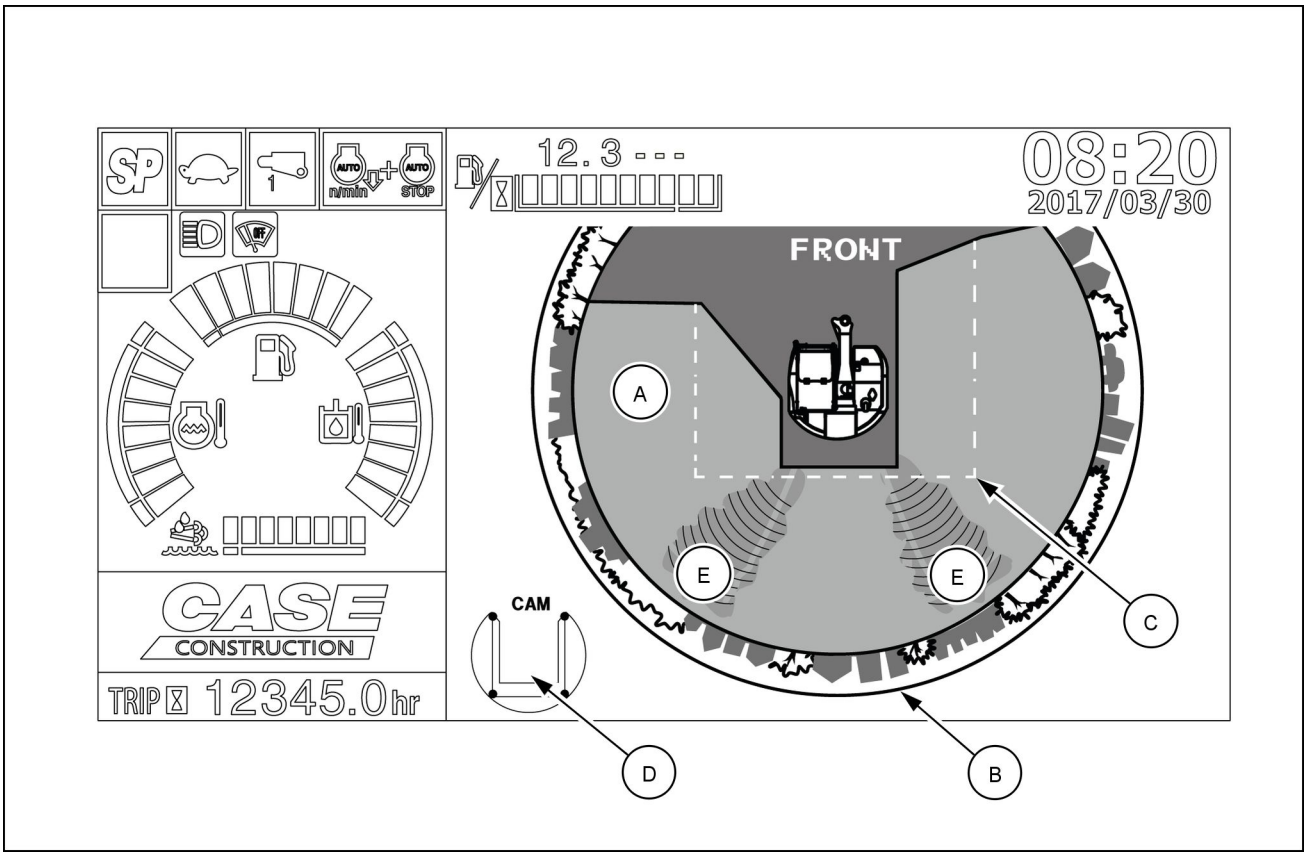


SMIL20CEX0667EA 2

NOTICE: *During machine operation, make sure to select either one operating mode of the display in order to ensure proper visibility around the machine. If the display is switched to the user information mode during machine operation, the warning message SELECT CAMERA SCREEN DURING OPERATION will appear on the top of the display.*

In the FVM mode, the hour meter, the gauges, the icons, and the warnings related to the functioning of the machine are shown on the left side of the display. The fuel economy gauge, the clock, and the messages related to the functioning of the machine are shown on the top of the display.

The FVM visualization is centered right above the machine, and provides a bird's eye type view of the area around the machine along with a panoramic view of the surroundings.



SMIL20CEX0666FA 3

A. Around view area (light gray background)
B. Panoramic view strip
C. Machine Periphery Guideline
D. Camera position monitor

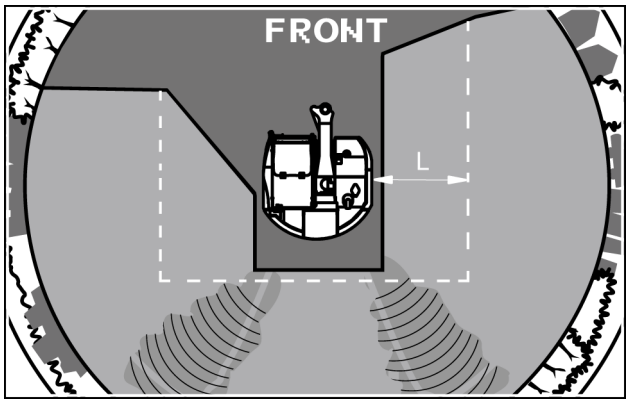
NOTE: *The zones* ***(E)*** *where the view of the rear camera is combined with the views of the side cameras are affected by a slight distortion of the image due to the matching process of the single views.*

A guideline is displayed on the around view area to set a reference for the periphery of the machine.

The distance from the side of the upperframe up to the guideline **(L)** is **1.2 m** (**47.2 in**).

The distance from the rear edge of the tracks up to the guideline is **0.9 m** (**35.4 in**).

NOTICE: *The FVM system does not ensure visibility on the closest area around the machine. Approximately* ***30 cm*** *(****11.8 in****) of the machine periphery is not covered by the cameras (dark grey background). Make sure to check the closest area around the machine by the direct view or through the mirrors.*



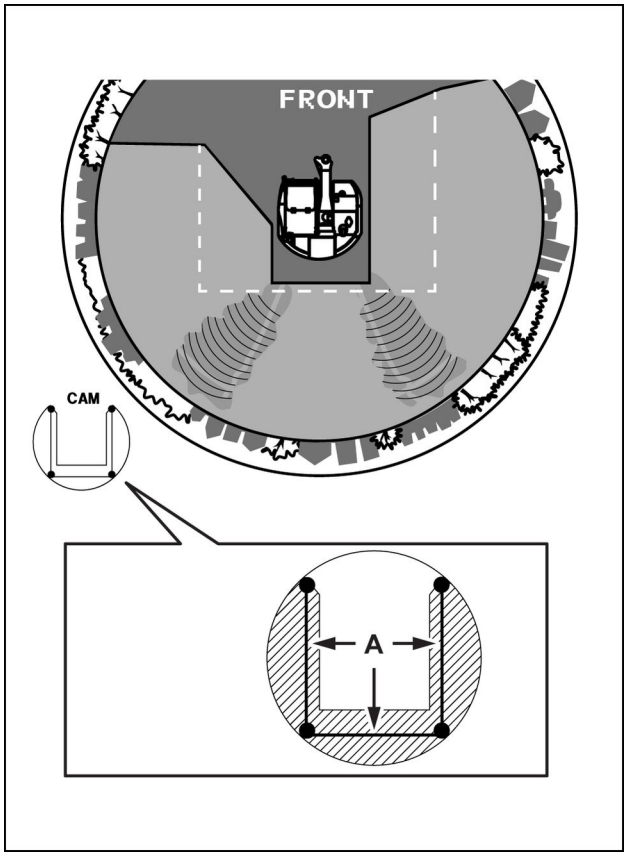
SMIL20CEX0654AB 4

The camera position monitor allows to check if the cameras are properly fixed and oriented to ensure the comprehensive visualization of the area around the machine.

If the lines **(A)** are projected over the hatched area, the cameras are properly fixed and oriented.

If any of the lines **(A)** is not projected over the hatched area, the cameras are not properly fixed and oriented. Stop machine operation, and request the CASE CONSTRUCTION dealer to adjust the cameras.

NOTICE: *Never operate the machine if the cameras are not properly fixed and oriented. Operating in such condition may lead to serious injuries to the bystanders.*



SMIL20CEX0042BB 5

Front Guard Protective System

The Front Guard Protective Structure (FGPS) must be installed if the machine is operated in conditions where there is a risk of projection of rocks or debris towards the front of the cab, or a risk of collision of heavy objects with the front of the cab.

Two types of FGPS are available: a FGPS compliant to Level 1 as defined by ISO 10262, or a FGPS compliant to Level 2 as defined by ISO 10262.

Level 1 FGPS **(1)** is intended for protection from small rocks, light debris, wood chips, and other light objects encountered in applications such as construction site services, secondary sorting of crushed materials, roads maintenance, waste rehandling, landscaping.

NOTICE: *The upper part of the Level 1 FGPS can be opened so to ease cleaning and maintenance of the windshield. Never start machine operation with the upper part of the FGPS opened. Failing to comply may result in death or serious injury.*

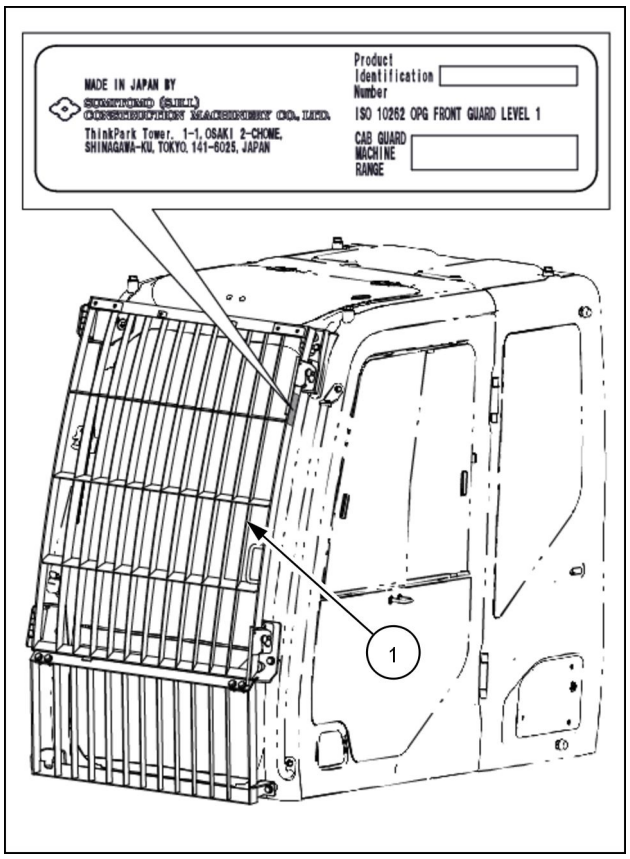
Level 2 FGPS **(2)** is intended for protection from heavy stones, rock or concrete blasts, steel scrap, logs and other heavy objects encountered in applications such as quarry, mining, primary and secondary demolition, scrap loading, log stacking.

The protective structures, the fitting supports and fastening elements on the machine are all parts of an integrated protective system.

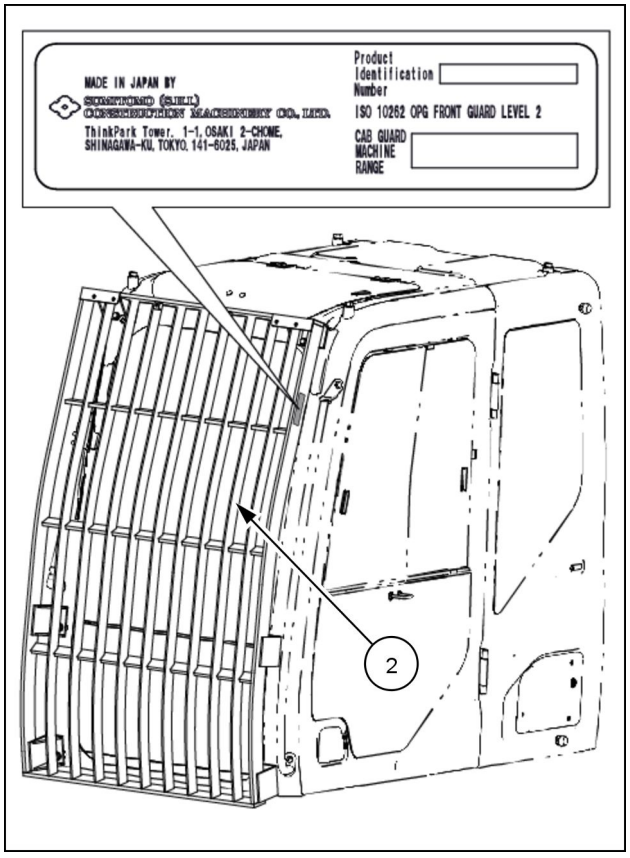
Never make modifications, or drill holes, or weld parts on protective structures. Doing so will result in death or serious injury.

Never attach any device to the protective structures for pulling purposes. Doing so will lead to serious damages to the protective structures.

After a fire, a collision, or a tip-over, or in case of corrosion, the cab protective structures shall be carefully checked for damages by specialised and qualified personnel. Moreover, all damaged parts must be replaced with genuine spare parts, in order to return the protective system to its original condition. Make sure to match the part number of each protective structure. Immediately call the CASE CONSTRUCTION dealer for inspection of the conditions of the cab's protective structures, or to get parts or entire structures replaced.



SMIL17CEX6873BA 1

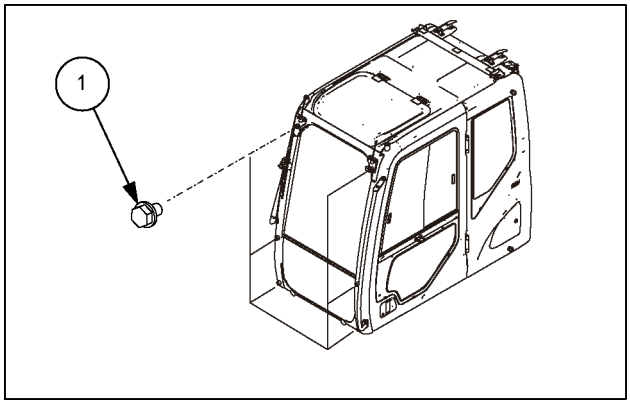


SMIL17CEX6872BA 2

Vandalism guard

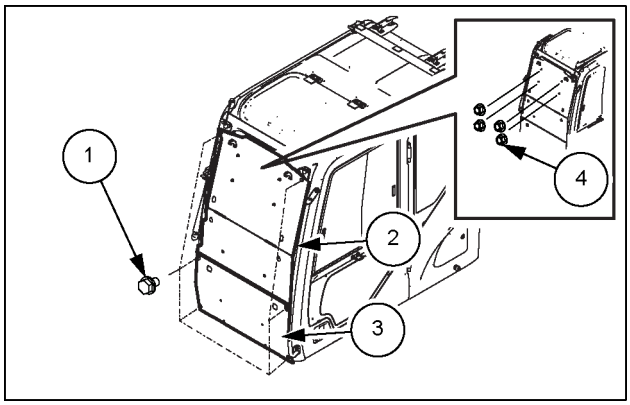
Installation of cover

1. Remove the bolt **(1)** from front of the cab.



SMIL14CEX1674AB 1

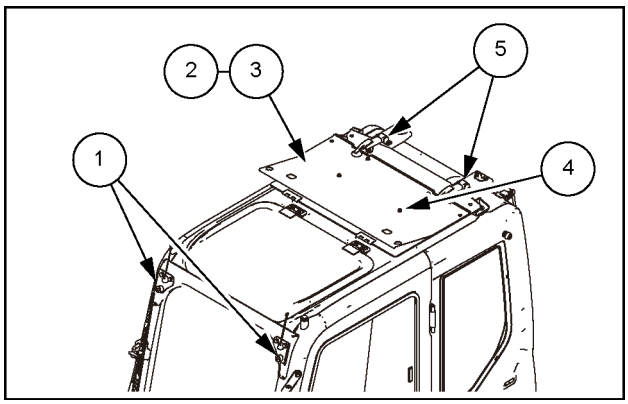
2. Secure the vandal guards **(2)**, **(3)** with the bolt **(1)**.
3. Secure the nut **(4)** for stowing lock in front of the vandal.



SMIL14CEX1675AB 2

Removal and stowing of cover

1. Remove the bolt **(1)** from front of the cab.
2. Remove the nut **(4)** for stowing lock.
3. Remove the vandal guards **(2)**, **(3)**.
4. Fold the vandal guard **(2)** and then secure the vandal guard **(3)** to the vandal guard **(2)** with the nut **(4)** for stowing lock.
5. Secure the vandal guards **(2)**, **(3)** with the catch **(5)** on the cab.



SMIL14CEX1676AB 3

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