# CX18C
## Mini Excavator

# SERVICE MANUAL

**Part number 48139721**
English
June 2017

CASE CONSTRUCTION

# SERVICE MANUAL

## CX18C Cab - Tier IV Engine
## CX18C Canopy - Tier IV Engine

# Contents

# INTRODUCTION

# Foreword - Important notice regarding equipment servicing

All repair and maintenance work listed in this manual must be carried out only by qualified dealership personnel, strictly complying with the instructions given, and using, whenever possible, the special tools.

Anyone who performs repair and maintenance operations without complying with the procedures provided herein shall be responsible for any subsequent damages.

The manufacturer and all the organizations of its distribution chain, including - without limitation - national, regional, or local dealers, reject any responsibility for damages caused by parts and/or components not approved by the manufacturer, including those used for the servicing or repair of the product manufactured or marketed by the manufacturer. In any case, no warranty is given or attributed on the product manufactured or marketed by the manufacturer in case of damages caused by parts and/or components not approved by the manufacturer.

The manufacturer reserves the right to make improvements in design and changes in specifications at any time without notice and without incurring any obligation to install them on units previously sold. Specifications, descriptions, and illustrative material herein are as accurate as known at time of publication but are subject to change without notice.

In case of questions, refer to your CASE CONSTRUCTION Sales and Service Networks.

# Safety rules

## 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 information

## Cleaning

Clean the metal parts with cleaning solution that meets the standard and steam cleaning. (except for bearings)

After cleaning, dry well, and inject oil in all parts.

Also inject oil into the bearings after drying.

## Inspection

When disassembling parts, check all the parts.

If there are any worn or damaged parts, replace them.

Inspect carefully to prevent initial breakdowns.

## Bearing

Replace any loose bearings.

Air dry bearings before installing them.

## Needle bearing

When inserting needle bearings, be very careful not to damage them.

Apply grease to the section where the needle bearing will be inserted.

## Gear

Check that there is no wear and no damage.

## Oil seal, O-ring, gasket

Always install new oil seals, O-rings, and gaskets.

Apply grease to sections where oil seals and O-rings will be inserted.

## Shaft

Check that there is no wear and no damage.

Check the bearings and check for damaged oil seals on the shaft.

## Service parts

Install CASE CONSTRUCTION genuine service parts.

When placing an order, check the parts catalog. It contains the CASE CONSTRUCTION genuine part numbers.

Any breakdowns arising from the installation of non-genuine parts are not covered by the warranty.

## Lubricants (fuel, hydraulic oil)

Use the oil from the specified company or specified in the operator's manual or service Manual.

Any breakdowns arising from any fuel or hydraulic oil other than those specified are not covered by the warranty.

# Safety rules - Personal safety

## Preliminary warnings to maintenance operation

**⚠ WARNING**

**Avoid injury!**
**Shut off the engine, remove the key, and make sure all machine motion stops before you service the machine.**
**Failure to comply could result in death or serious injury.**

W1128B

**⚠ 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

**⚠ CAUTION**

**Pinch hazard!**
**Always use suitable tools to align mating parts. DO NOT use your hand or fingers.**
**Failure to comply could result in minor or moderate injury.**

C0044A

## Personal Protective Equipment (PPE)

**⚠ WARNING**

**Avoid injury!**
**Use Personal Protective Equipment (PPE), including protective goggles, gloves, and safety footwear.**
**Failure to comply could result in death or serious injury.**

W1036A

## Lifting operation

**⚠ 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**

**Heavy objects!**
**Lift and handle all heavy components using lifting equipment with adequate capacity. Always support units or parts with suitable slings or hooks. Make sure the work area is clear of all bystanders.**
**Failure to comply could result in death or serious injury.**

W0398A

**⚠ 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**

**Tip-over hazard!**
**Only raise the track as little as necessary.**
**Failure to comply could result in death or serious injury.**

**W0276A**

## Hydraulic system

**⚠ 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 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**

**⚠ WARNING**

**Pressurized system!**
**Before attempting any service procedure, it is your responsibility to know the number of accumulators on the machine, and the correct procedure for releasing the pressure of each accumulator.**
**Failure to comply could result in death or serious injury.**

**W0136A**

## Battery

**⚠ 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**

## Fluids

**⚠ 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**

**⚠ 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**

**⚠ WARNING**

**Chemical hazard!**
**When handling fuel, lubricants, and other service chemicals, follow the manufacturer's instructions. Wear Personal Protective Equipment (PPE) as instructed. Do not smoke or use open flame. Collect fluids in proper containers. Obey all local and environmental regulations when disposing of chemicals.**
**Failure to comply could result in death or serious injury.**

**W0371A**

# SERVICE MANUAL

## Engine

### CX18C Cab - Tier IV Engine
### CX18C Canopy - Tier IV Engine

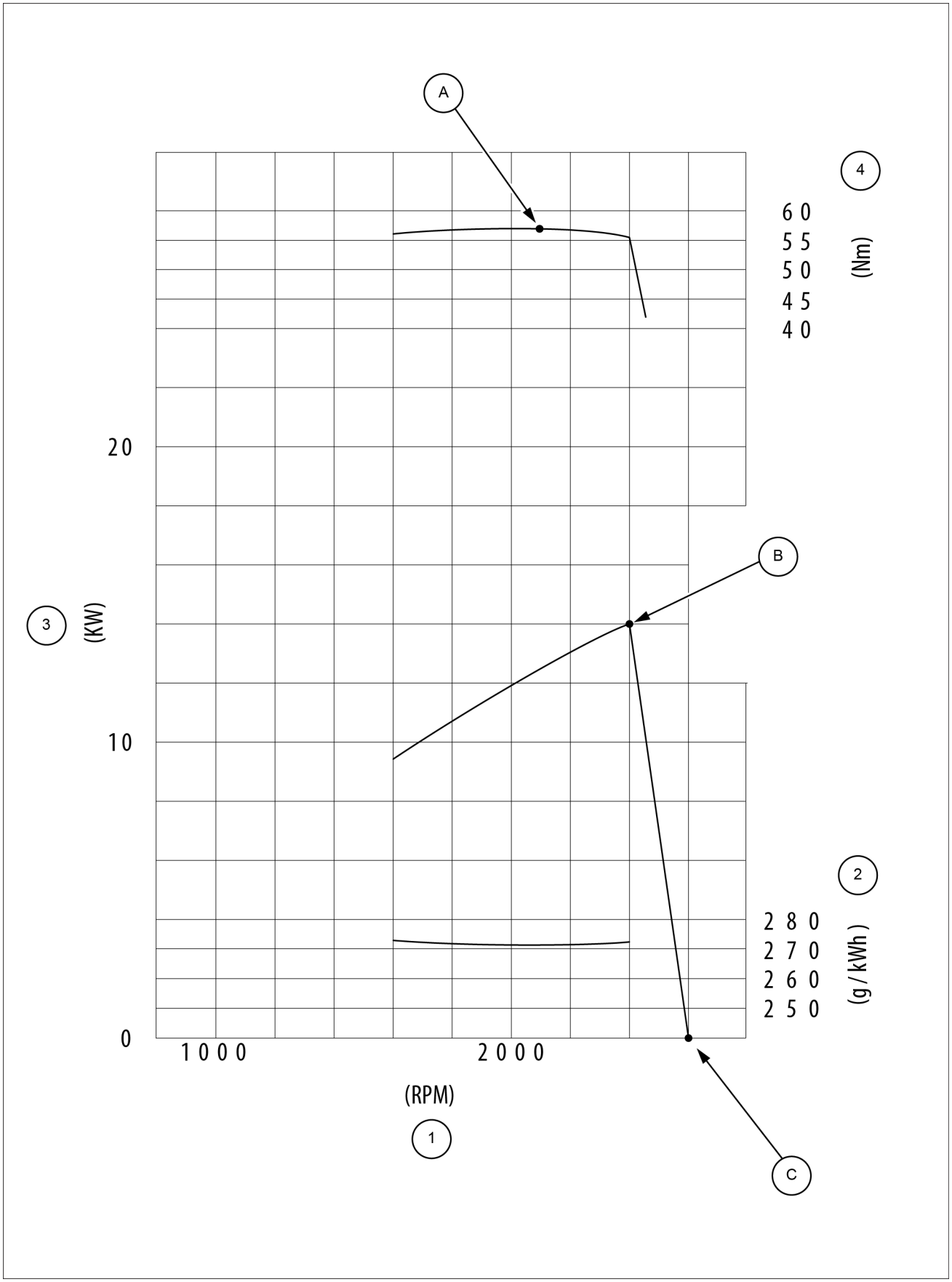
# Engine - General specification

| Engine model | | | | Mitsubishi L3E |
|---|---|---|---|---|
| Main specifications | Type | | | Vertical type, water-cooled, 4 cycle diesel |
| | Number of cylinders | | | 3 |
| | Combustion type | | | Swirl chamber type |
| | Valve mechanism | | | Overhead valve type |
| | Cylinder bore x stroke | | | **76 mm** (**3.0 in**) x **70 mm** (**2.8 in**) |
| | Total displacement | | | **0.952 L** (**0.251 US gal**) |
| | Compression ratio | | | 23 : 1 |
| | Order of ignition | | | 1 – 3 – 2 |
| | Direction of rotation | | | Counterclockwise as viewed from flywheel side |
| | Dry mass | | | **75 kg** (**165 lb**) |
| Basic engine | Piston ring | Number | | Compression ring: 2<br>Oil rings (with expander): 1 |
| | Valve timing (when warm) | Inlet valve | Open | BTDC 18° |
| | | | Close | ABDC 46° |
| | | Exhaust valve | Open | BBDC 46° |
| | | | Close | ATDC 18° |
| | Starting system | | | Electric starting |
| Fuel system | Fuel injection pump | Type | | ND-PFR type |
| | | Plunger diameter | | **5.5 mm** (**0.22 in**), **6.0 mm** (**0.24 in**) |
| | | MS retard (crank angle) | | 4°, 8° |
| | | Cam lift | | **6.0 mm** (**0.24 in**) |
| | Governor | Speed governing type | | Centrifugal weight system |
| | Fuel injection nozzle | Type | | Throttle type |
| | | Spray angle | | 15° |
| | | Valve opening pressure | | **12.73 – 14.73 MPa**<br>(**1846.49 – 2136.59 psi**) |
| | Fuel filter | Type | | Paper-element cartridge or paper-element switch cock |
| | Fuel pump | Type | | Electromagnetic plunger type |
| | | Discharge rate | | **1 L/min** (**0.26 US gpm**) or more<br>(at **12 V** - **1.5 A** ) |
| | Fuel pump (option) | Type | | Electromagnetic plunger type (compact type |
| | | Discharge rate | | **0.4 L/min** (**0.11 US gpm**) or more<br>(at **12 V** - **1.5 A** ) |
| Lubrication system | Lubrication system | | | Pressure feed, full flow filter system |
| | Engine oil | Capacity (engine total) | | Upper limit: **4.2 L** (**1.11 US gal**)<br>Lower limit: **3.0 L** (**0.79 US gal**) |
| | | | | (Upper limit: **4.7 L** (**1.24 US gal**)<br>Lower limit: **3.5 L** (**0.92 US gal**)) |
| | Oil pump | Type | | Gear type (internal and external teeth engagement), built into gear case |
| | | Discharge rate | | **3 L/min** (**0.79 US gpm**) or more<br>(at **1000 RPM**) |
| | Relief valve | Type | | Plunger valve type |
| | | Valve opening pressure | | **0.261 – 0.319 MPa** (**37.858 – 46.271 psi**)<br>( **1000 RPM**) |
| | Oil filter | Type | | Paper-element cartridge |

| Engine model | | | Mitsubishi L3E |
|---|---|---|---|
| Cooling system | Cooling system | | Forced-feed circulation type |
| | Coolant capacity (main unit of engine) | | **1.8 L** (**0.48 US gal**) |
| | Water pump | Type | Centrifugal volute type |
| | | Discharge rate | **50 L/min** (**13.21 US gpm**) at pump rotation of **4500 RPM** |
| | Thermostat | Type | Wax pellet |
| | | Valve opening pressure | **75 – 78 °C** (**167 – 172 °F**) |
| | Cooling fan | Type | Suction (PP fan) |
| | | Outside diameter | **320 mm** (**12.6 in**) |
| Inlet system | Air cleaner | Type | Paper element |
| Electrical system | Engine starter | Type | M001T68381 |
| | | Pinion engagement type | Pinion shift (reduction type) |
| | | Output | **12 V** - **1.7 kW** |
| | | Number | 1 |
| | | Pinion/ring gear ratio | 14 / 106 |
| | Alternator | Type | A007TA0171B |
| | | Type | Three-phase current generator, integral with IC regulator |
| | | Output | **12 V** - **40 A** |
| | | Rated voltage generating speed | **5000 RPM** at **13.5 V**, **37 A**, when hot |
| | | Regulator adjusting voltage | **14.4 – 15 V** |
| | Glow plug | Type | Sheathed |
| | | Rated voltage - current | **10.5 V**, **8.7 – 10.7 A** (30 seconds duration) |
| | Stop solenoid | Working voltage | **12 V** |
| | | Insulation resistance | **100 MΩ** or more at DC **500 V** megger (normal temperature, normal relative humidity) |
| | | Stroke | **9.5 – 10.5 mm** (**0.374 – 0.413 in**) |
| | | Ambient temperature for use | **-30 – 120 °C** (**-22 – 248 °F**) |

# Engine - Engine horse power

## Performance curve

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1. Engine speed (RPM)
2. Fuel consumption (g/kWh)
3. Output (kW)
4. Torque (Nm)

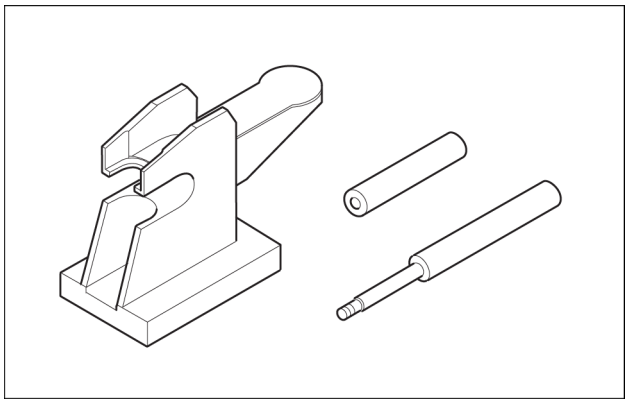
A. **57.1 N·m** / **2100 RPM**
B. **14 kW** / **2400 RPM**
C. NL / **2570 – 2630 RPM**

# Engine - Special tools

Piston pin setting tool

Part number: 30L91–10010

For pulling out and press fitting the piston pins



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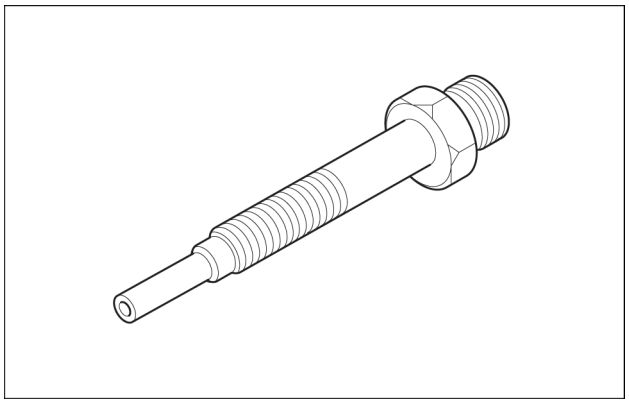
Compression gauge adapter

Part number: ST332270

For measuring compression

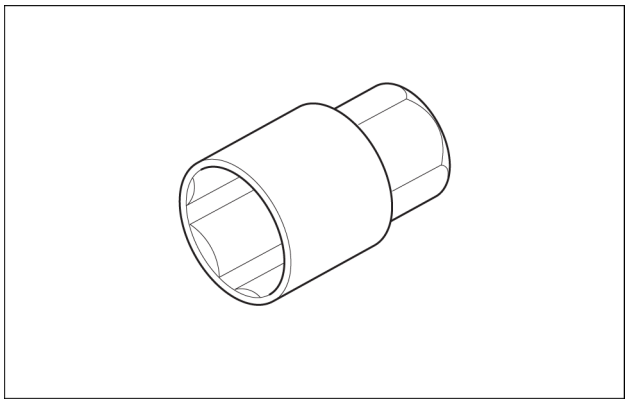


SMIL17MEX1278AA 2

Oil pressure switch socket wrench

Part number: MD998054

For removal and installation of oil pressure switch



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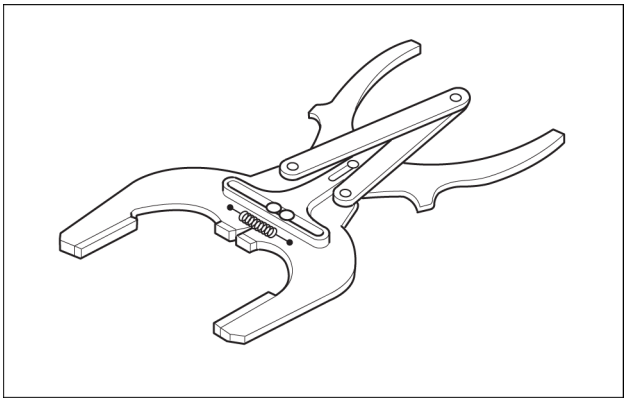
Piston ring pliers

Part number: 31391–12900

Range applicable for removal and installation of the piston rings: **60 – 95 mm** (**2.36 – 3.74 in**)



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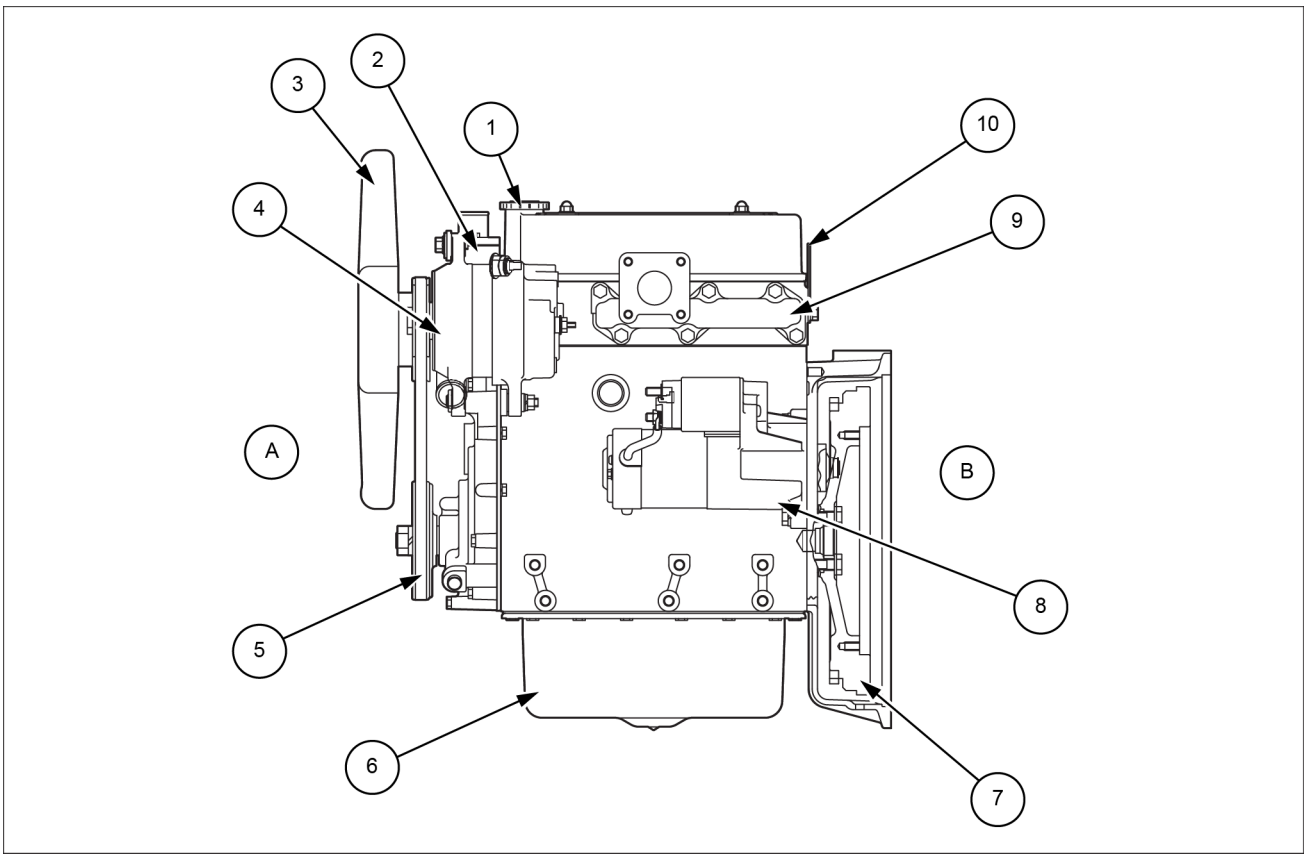
# Engine - Service limits

| Item | | Standard | Limit | Remark |
|---|---|---|---|---|
| Compression pressure at **280 RPM** | | **2.7 MPa** (**391.6 psi**) | Not acceptable at or below **2.2 MPa** (**319.1 psi**) | When oil and water temperatures at **20 – 30 °C** (**68 – 86 °F**) |
| Lubricating oil pressure | Rotating speed | **0.29 – 0.39 MPa** (**42.06 – 56.57 psi**) | | Oil temperature at **60 – 70 °C** (**140 – 158 °F**) |
| | Low idling | **0.1 MPa** (**14.5 psi**) | | |
| Valve timing | Inlet open | BTDC **18°** | | Values for checking valve timing Different from actual valve opening and closing timing |
| | Inlet open | ABDC **46°** | | |
| | Exhaust open | BBDC **46°** | | |
| | Exhaust open | ATDC **18°** | | |
| Valve clearance | Inlet | **0.25 mm** (**0.01 in**) | | When engine is cold |
| | Exhaust | **0.25 mm** (**0.01 in**) | | |
| Fuel injection timing (before TDC) | | (Varies depending on specification) | | |

ABCD – After Bottom Dead Center
BBDC – Before Bottom Dead Center
ATDC – After Top Dead Center
BTDC – Before Top Dead Center

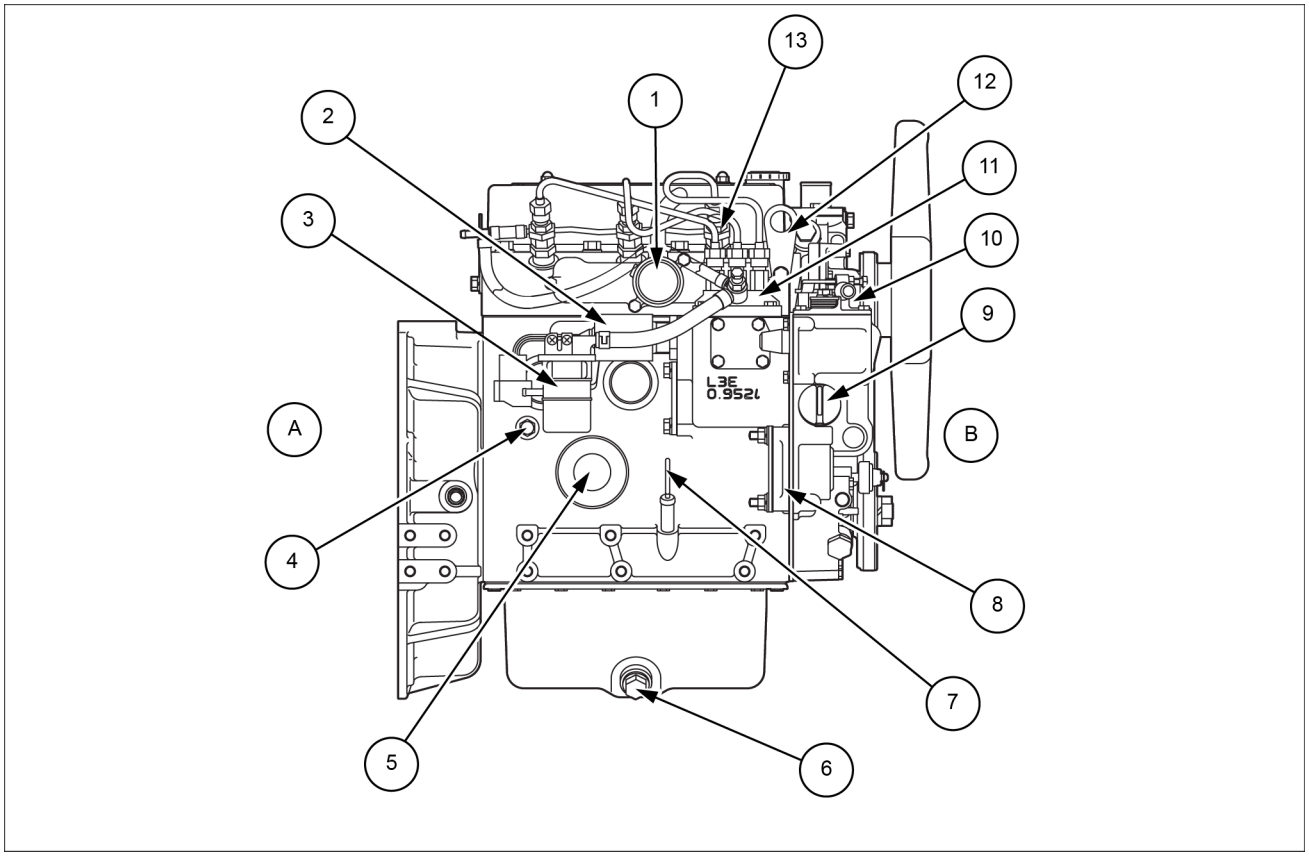
# Engine - Component identification




SMIL17MEX1271FB 1

**Left-hand view**

A. Front
B. Rear
1. Oil filler
2. Thermostat
3. Fan
4. Alternator
5. V-belt
6. Oil pan
7. Flywheel
8. Engine starter
9. Exhaust manifold
10. Rear eye-bolt

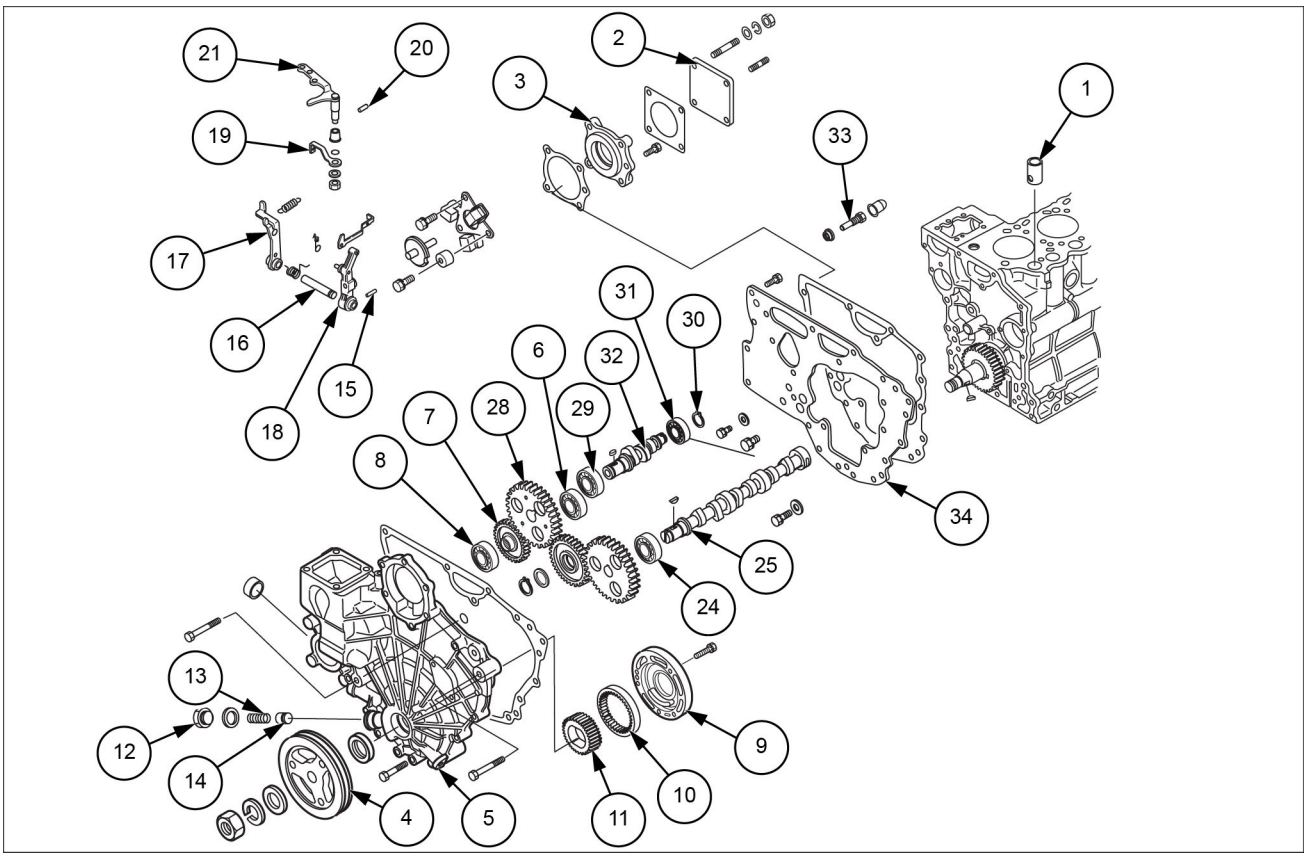



SMIL17MEX1272FB 2

**Right-hand view**

A. Rear
B. Front
1. Inlet manifold
2. Stop solenoid
3. Fuel filter
4. Water drain plug
5. Oil filter
6. Oil drain plug
7. Oil level gauge
8. PTO
9. Oil filler
10. Water pump
11. Fuel injection pump
12. Front eye-bolt
13. Fuel injection nozzle

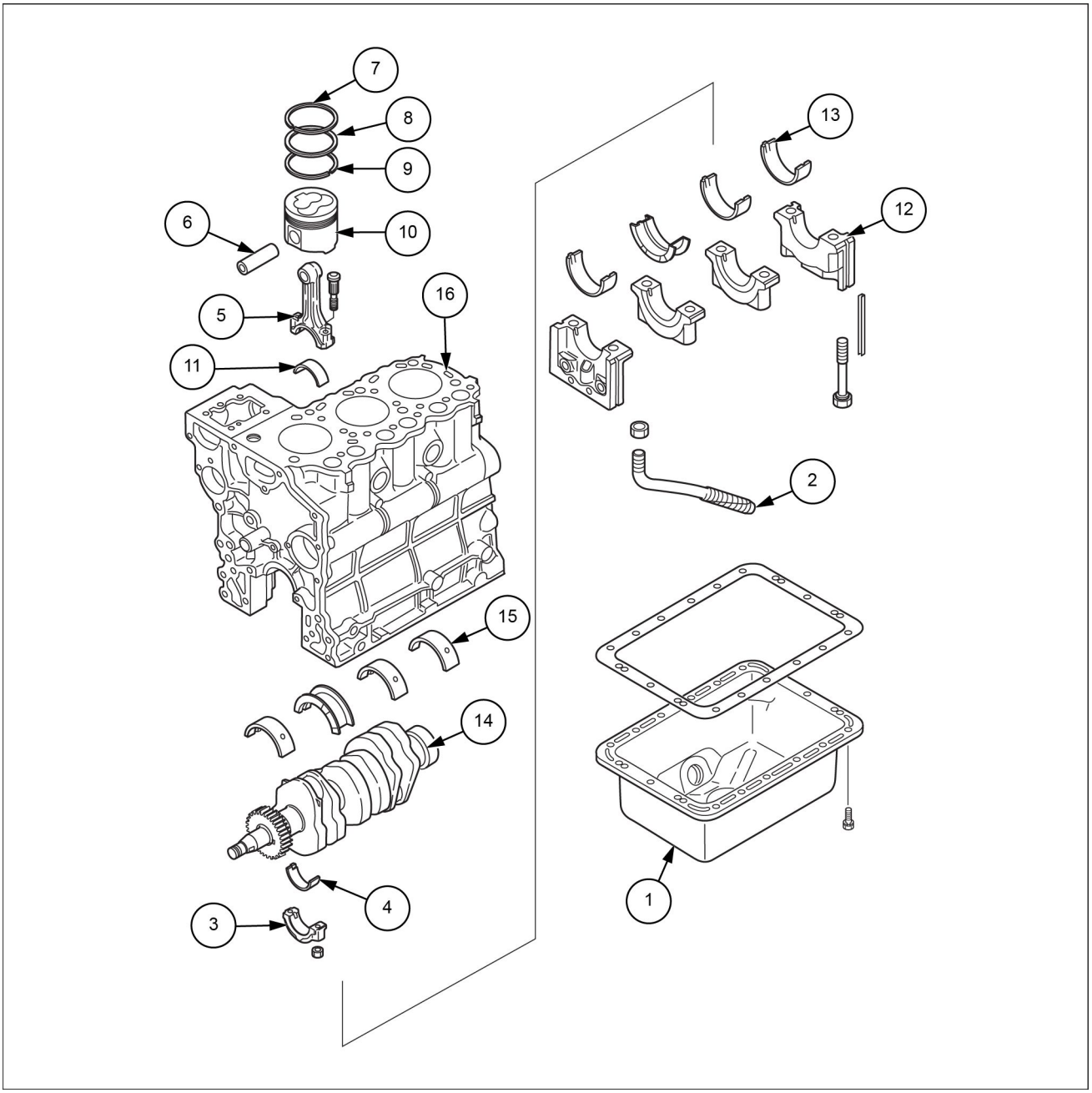
# Engine - Exploded view




SMIL17MEX1295F 1

**Gear case, timing gears, and camshaft**

1. Tappet
2. Oil pump cover
3. Gear pump housing
4. Crankshaft pulley
5. Gear case
6. Ball bearing
7. PTO gear
8. Ball bearing
9. Oil pump housing
10. Oil pump outer gear
11. Oil pump inner gear
12. Plug
13. Relief spring
14. Relief plunger
15. Grooved pin
16. Governor shaft
17. Tension lever
18. Governor lever
19. Governor spring lever
20. Grooved pin
21. Speed control lever
22. Idler gear
23. Camshaft gear
24. Ball bearing
25. Camshaft
26. Sliding shaft
27. Governor weight
28. Fuel injection pump camshaft gears
29. Ball bearing
30. Snap ring
31. Ball bearing
32. Fuel injection pump camshaft
33. Torque spring set
34. Front plate




SMIL17MEX1312GB 2

**Cylinder block, crankshaft, piston, and oil pan**

1. Oil pan
2. Oil screen
3. Connecting rod cap
4. Lower connecting rod bearing
5. Connecting rod
6. Piston pin bearing
7. Compression number 1
8. Compression number 2
9. Oil ring
10. Piston
11. Upper connecting rod
12. Main bearing cap
13. Lower main bearing
14. Crankshaft
15. Upper main bearing
16. Cylinder block

# Engine - Remove

**⚠ WARNING**

**Avoid injury!**
**Shut off the engine, remove the key, and make sure all machine motion stops before you service the machine.**
**Failure to comply could result in death or serious injury.**

W1128B

**⚠ WARNING**

**Chemical hazard!**
**Use caution when opening the quick coupler cap from the load port. There may be product left in the port.**
**Failure to comply could result in death or serious injury.**

W1039A

**⚠ 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.**
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W0256A

**⚠ WARNING**

**Heavy objects!**
**Lift and handle all heavy components using lifting equipment with adequate capacity. Always support units or parts with suitable slings or hooks. Make sure the work area is clear of all bystanders.**
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W0398A

**⚠ 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).**
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W0241A

**⚠ 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.**

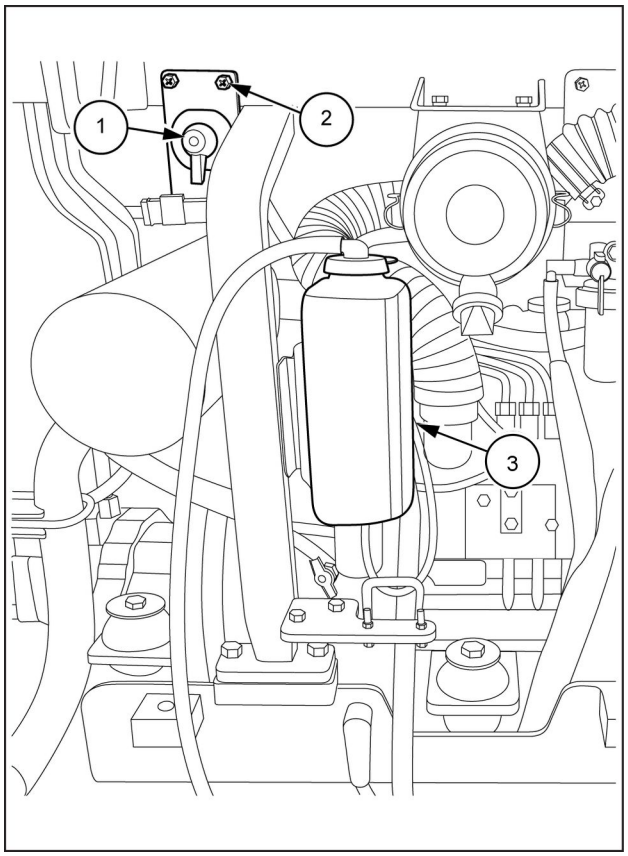
W0178A

**⚠ WARNING**

**Chemical hazard!**
**When handling fuel, lubricants, and other service chemicals, follow the manufacturer's instructions. Wear Personal Protective Equipment (PPE) as instructed. Do not smoke or use open flame. Collect fluids in proper containers. Obey all local and environmental regulations when disposing of chemicals.**
**Failure to comply could result in death or serious injury.**

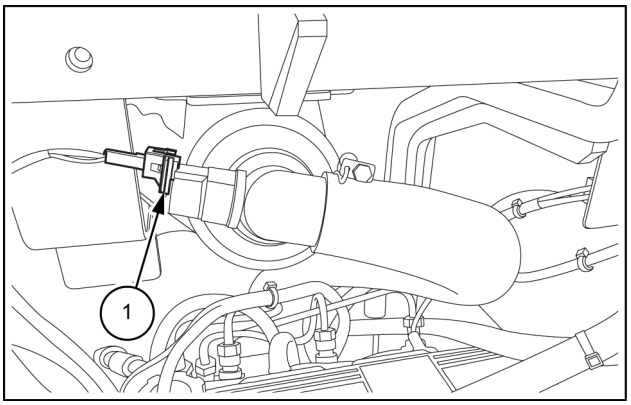
W0371A

1. Set the battery disconnect switch to O position (OFF position) to cut off any power supply in the electrical system of the machine (refer to **Mechanical battery isolator - Dynamic description (55.302)**).
2. Remove the right-hand side shields (refer to **Side shields - Remove (90.105)**).
3. Remove the left-hand side shields (refer to **Side shields - Remove (90.105)**).
4. Remove the engine hood (refer to **Hood - Remove (90.100)**).
5. Remove the cab or the canopy (refer to **Canopy assembly - Remove (90.114)**).
6. Remove the operator seat (refer to **Operator seat - Remove (90.120)**).
7. Remove the operator seat base trim panel (refer to **Operator seat base trim panel - Remove - Platform (90.160)**).
8. Remove the radiator (refer to **Radiator - Remove (10.400)**).
9. Remove the windshield washer reservoir **(3)** from the bracket.
10. Use a wrench [ **13 mm**] to remove the two bolts **(2)**, and then remove the bracket with the battery disconnect switch **(1)**.



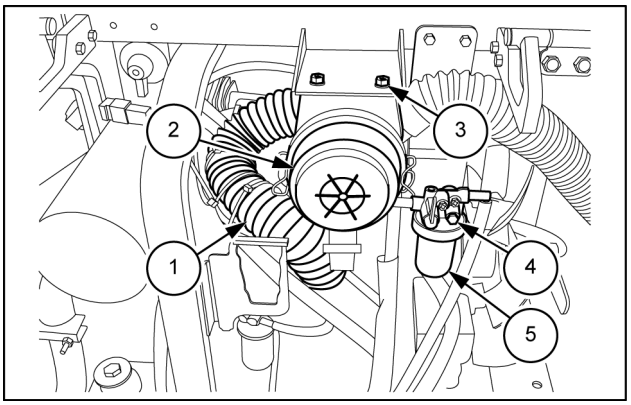

SMIL17MEX1990BB 1

11. Disconnect the electrical connector **CD-10 (1)** from the air cleaner.




SMIL17MEX1991AB 2

12. Loosen the clamp and remove the air hose **(1)** from the engine.
13. Use a wrench [ **13 mm**] to remove the bolts **(3)**, and then remove the air cleaner **(2)**.
14. Use a wrench [ **13 mm**] to remove the bolt **(4)** and then remove the fuel filter **(5)**.

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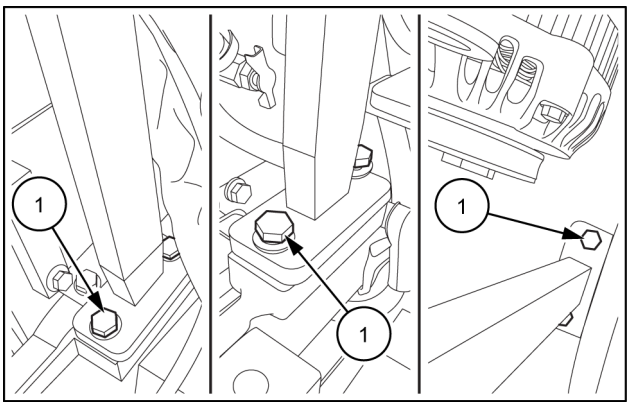
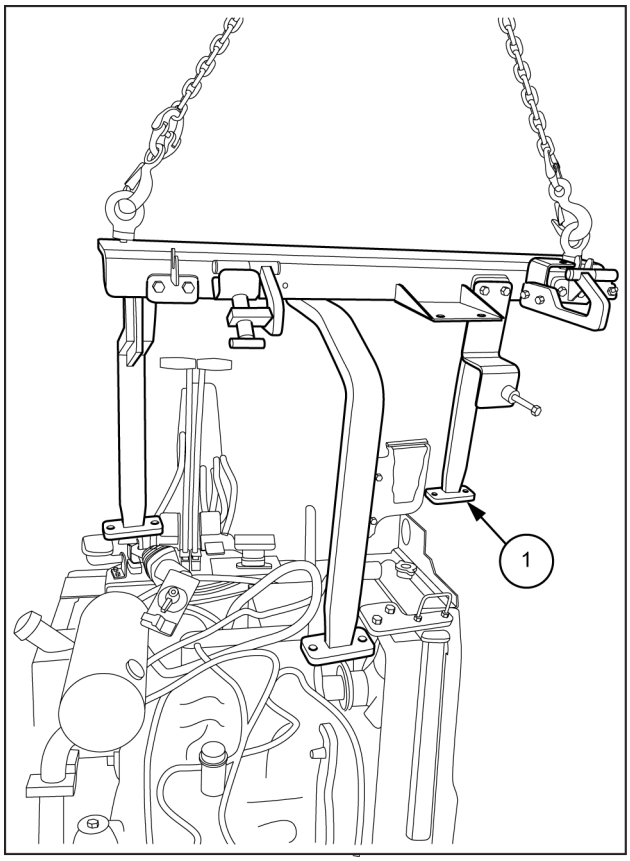
15. Use a wrench [ **17 mm**] to remove the six bolts **(1)** that fix the platform support.



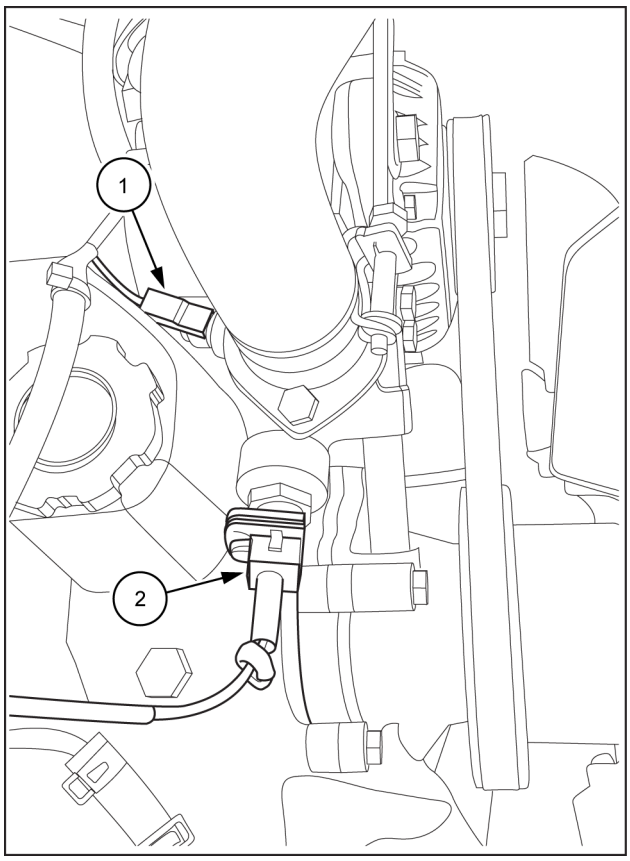

SMIL17MEX1993AB 4

16. Install two eye-bolts into the platform support, and then use the wire rope or chain and lift-crane to secure the platform support.
17. Remove the platform support **(1)**.



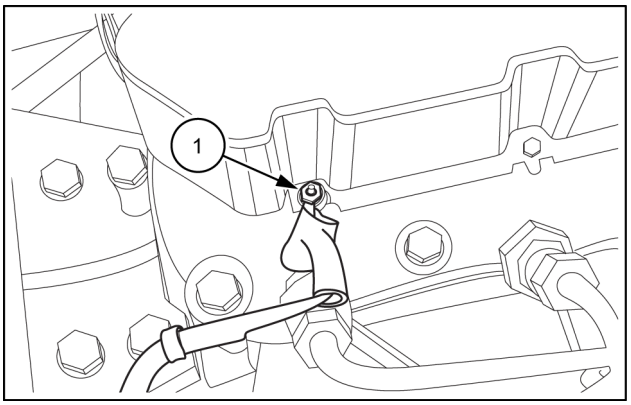

SMIL17MEX1994BB 5

18. Disconnect the electrical connector **CD-8 (2)** of the engine coolant temperature sensor.
19. Disconnect the electrical connector **CD-9 (1)** of the overheat switch.



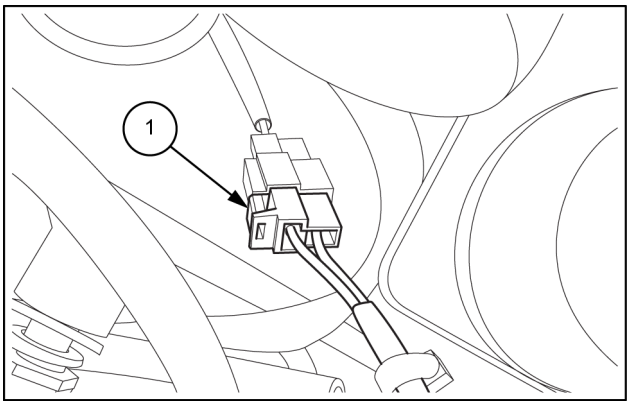

SMIL17MEX1995BB 6

20. Move the protective cap.
21. Remove the nut and disconnect the electrical connector **CN-80 (1)** of the pre-heater.



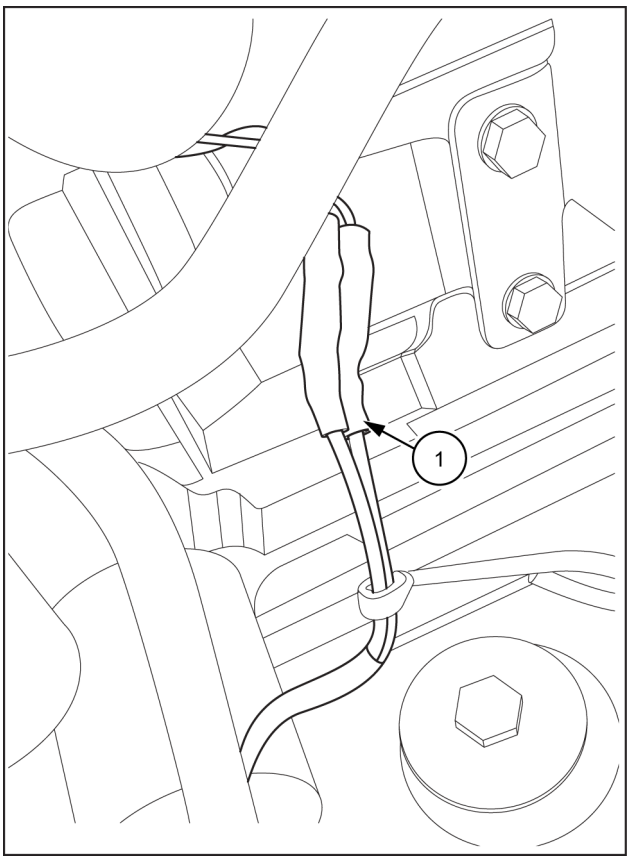

SMIL17MEX1996AB 7

22. Disconnect the electrical connector **CN-145 (1)** of the fuel feed pump.



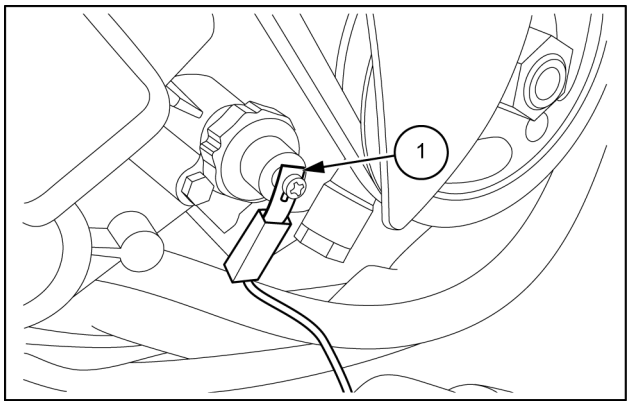

SMIL17MEX1997AB 8

23. Disconnect the electrical connector **CN-79 (1)** of the engine stop solenoid.



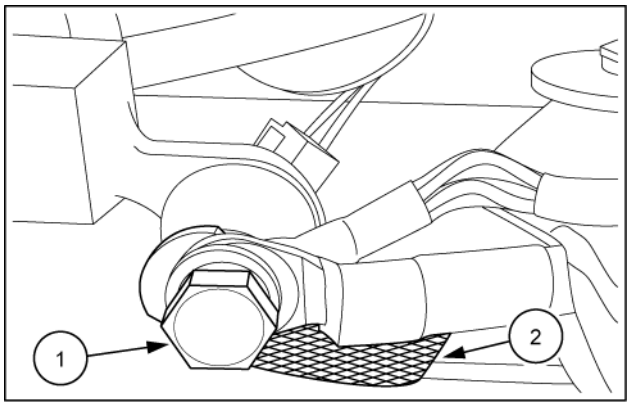

SMIL17MEX1998BB 9

24. Disconnect the electrical connector **CD-18 (1)** of the engine oil pressure switch.



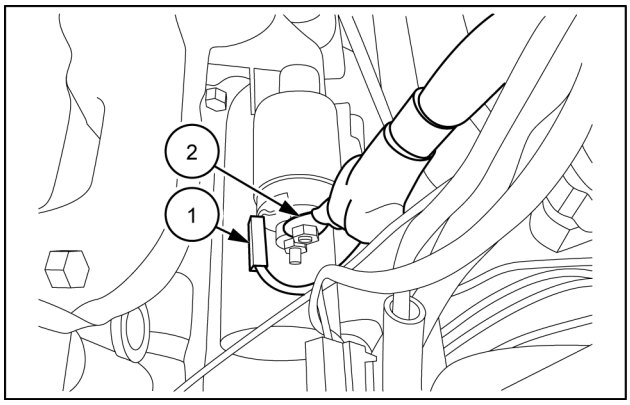

SMIL17MEX1999AB 10

25. Use a wrench [ **17 mm**] to remove the bolt **(1)** and then disconnect the earth strap **(2)** from the upper frame.



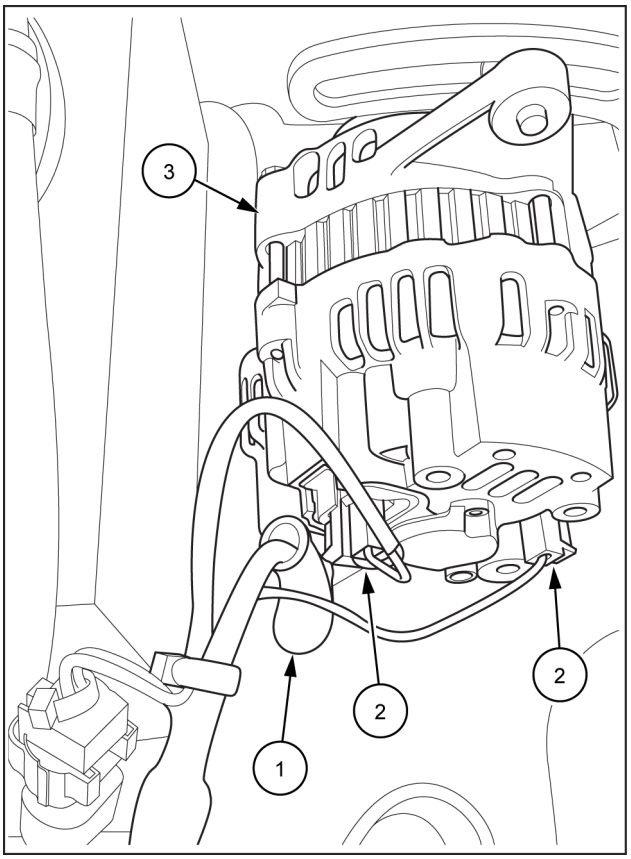

SMIL17MEX2000AB 11

26. Move the protective cap.
27. Use a wrench [ **13 mm**] to remove the nut and then remove the wires **(2)** from the engine starter.
28. Disconnect the electrical connector **CN-45 (1)** from the engine starter.



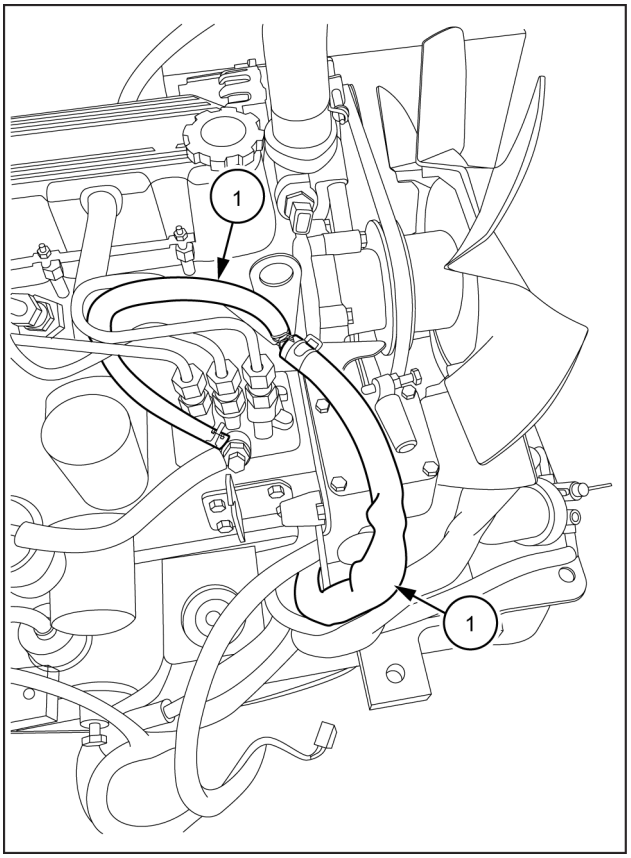

SMIL17MEX2001AB 12

29. Disconnect the electrical connectors **CN-74 (2)** from the alternator **(3)**.
30. Move the protective cap.
31. Use a wrench [ **10 mm**] to remove the nut and disconnect the wire **(1)**.



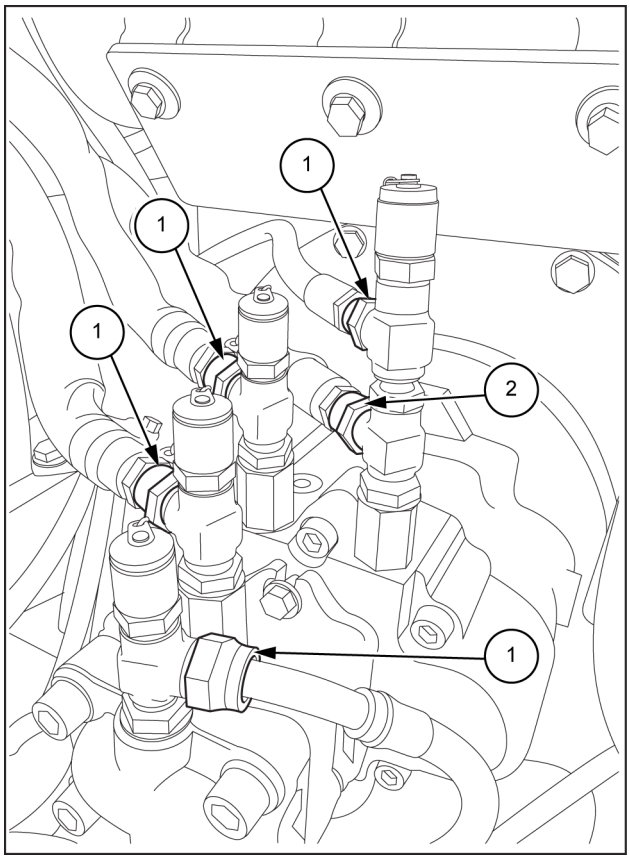

SMIL17MEX2002BB 13

32. Loosen the clamps and remove the fuel hoses **(1)** from the engine.



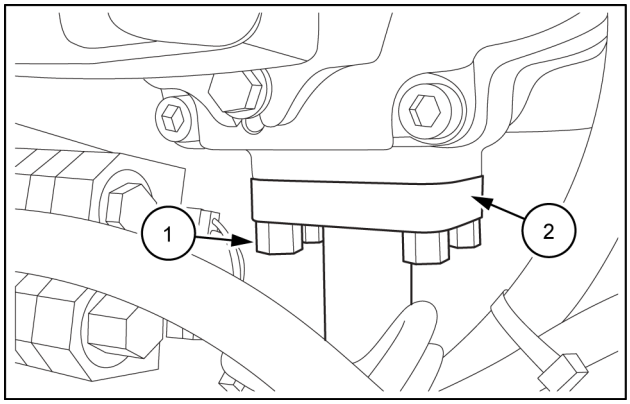

SMIL17MEX2003BB 14

33. Use a wrench [ **22 mm**] to disconnect the hoses **(1)** from the pump.
34. Use a wrench [ **19 mm**] to disconnect the hose **(2)**.
    - Mark the pump and hoses so that the connectors match at the time of assembly.
    - Use protective caps and plugs to cover the pump and hoses to prevent any entry of water, dust or dirt.
    - Clean the pump and hoses by spraying them with a parts cleaner to prevent scratches and prevent accumulation of dirt on the hydraulic connectors.




SMIL17MEX2004BB 15

35. Use a hexagon wrench [ **8 mm**] to remove the four bolts **(1)** and then separate the suction hose **(2)** from the hydraulic pump.




SMIL17MEX2005AB 16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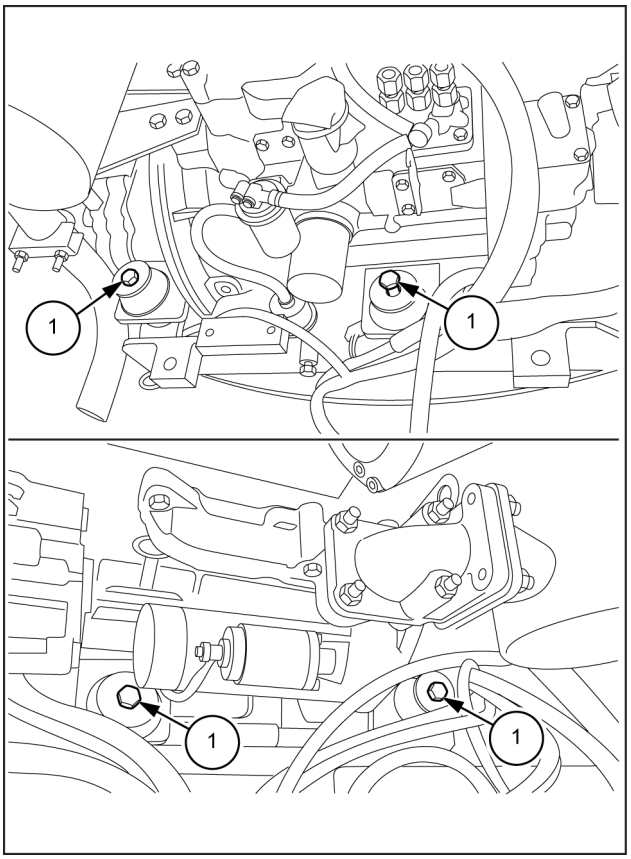
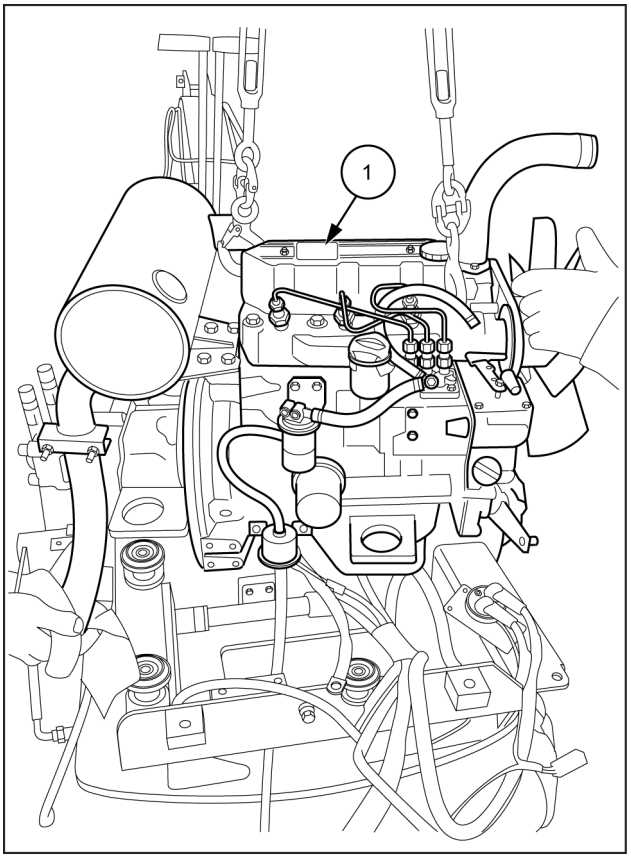
36. Install the two eye-bolts into the engine lift bracket, and then use the wire rope or chain and lift-crane to secure the engine.
37. Use a box wrench [ **19 mm**] to remove the four bolts **(1)**.




SMIL17MEX2006BB 17

38. Remove the engine **(1)**.




SMIL17MEX2007BB 18