

CX750D
Crawler Excavator

SERVICE MANUAL

Part number 51408118

English

October 2017

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CASE
CONSTRUCTION



SERVICE MANUAL

**CX750D Crawler excavators RTC Mass excavator version (TIER4 FINAL)
- EU Market**

**CX750D Crawler excavators RTC Mass excavator version (TIER4 FINAL) -
MEA Market**

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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.

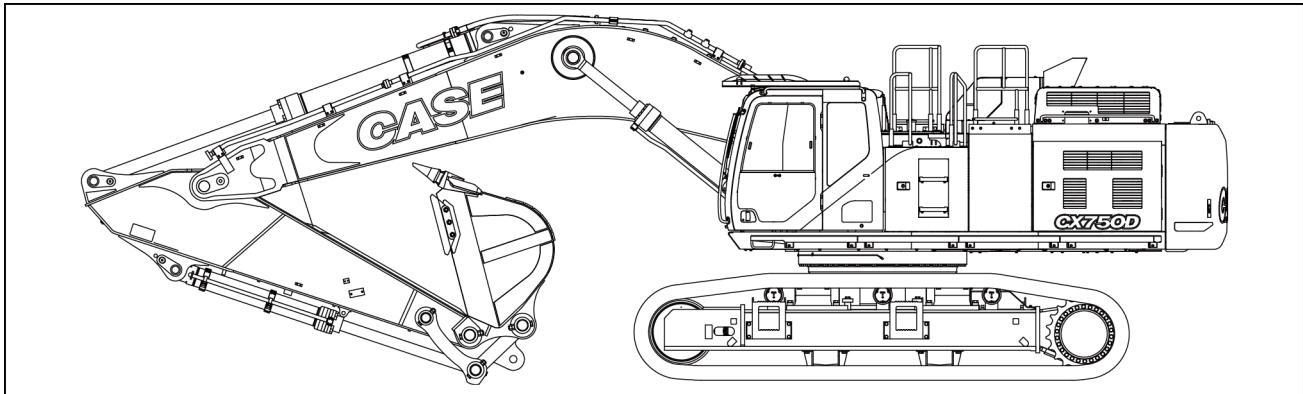
Lubricants (fuel, hydraulic oil)

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

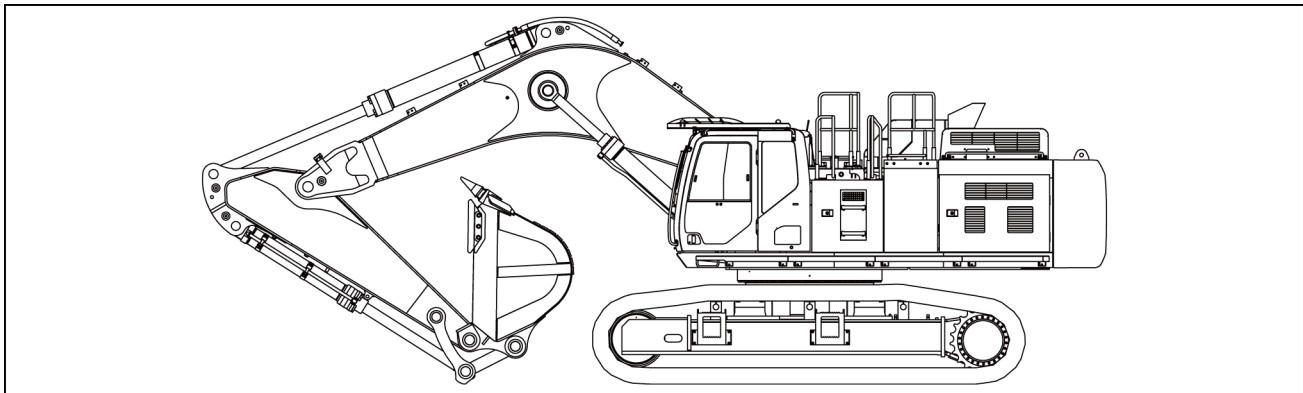
Any breakdowns arising from any fuel or hydraulic oil other than those specified are not covered by the warranty.

Product identification

The CX750D is a totally 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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CX750D

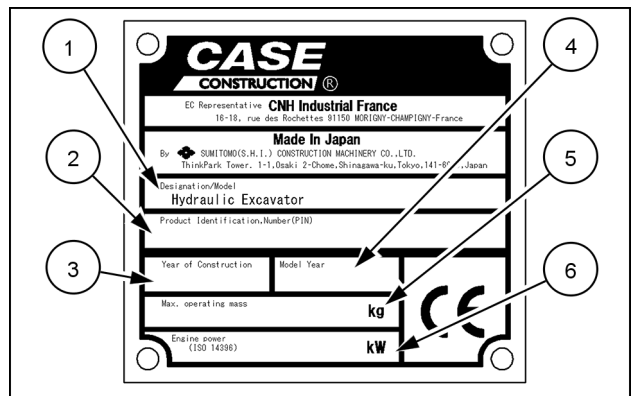


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CX750D ME

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 CX750D
- (2) Product Identification Number (PIN)
- (3) Year of Construction
- (4) Model Year
- (5) Maximum operating mass
(the weight shown on the manufacturer's plate is the value using the heaviest configuration and that it does not always correspond to the transport configuration)
- (6) Engine power ISO 14396



SMIL15CEX3307AA 3



SERVICE MANUAL

Engine

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Engine - General specification

Engine main specifications

Item		Engine model 6UZ1
Type		Diesel/4-cycle/water-cooled, inline 6 cylinder OHC
Cylinder bore x stroke		147 mm (5.79 in) x 154 mm (6.06 in)
Displacement		15.681 L (956.91 in³)
Compression ratio		16.5
Compression pressure		2940 kPa (426.4 psi) / 200 RPM
Shape of combustion chamber		Direct injection type
Rated output		397 kW (540 Hp) / 1800 RPM
Maximum torque		2250 N·m (1659.5 lb ft) / 1500 RPM
Dimensions: length x width x height		1462 mm (57.56 in) x 1071 mm (42.17 in) x 1471 mm (57.91 in)
Dry weight		1150 kg (2535 lb)
Fuel injection order		1, 5, 3, 6, 2, 4
Valve clearance	Intake	0.4 mm (0.016 in) While cool
	Exhaust	0.4 mm (0.016 in) While cool
Opening/closing timing of intake valve	Open	21° BTDC
	Close	27° ABDC
Opening/closing timing of exhaust valve	Open	52.5° ABDC
	Close	17.5° BBDC
Ignition method		Compression ignition
Lubrication system		
Oil pump type		Gear type
Oil filter type		Full-flow bypass integrated type x 2
Engine oil level		42 L (11.1 US gal) to 57 L (15.1 US gal) Reference value
Oil pan capacity		32 L (8.5 US gal) to 52 L (13.7 US gal)
Oil cooling type		Water-cooled multiple-disc type (8 levels)
Cooling system		
Cooling type		Water cooling
Coolant capacity in engine		36 L (9.5 US gal)
Water pump type		Centrifugal gear type
Thermostat type		Wax type
Fuel system		
Injection pump type		Electronic control common rail type
Governor type		Electronic type
Timer type		Electronic type
Injection nozzle type		Porous type 8 holes, inner diameter \varnothing 0.19 mm (0.007 in)
Turbocharger type		RHG8V {IHI}

Cooling system main specifications

Item	Specifications
Thermostat	Wax pellet type
Open valve temperature	76.5 °C (170 °F)
Full open temperature	90 °C (194 °F) / 11.0 mm (0.4 in)

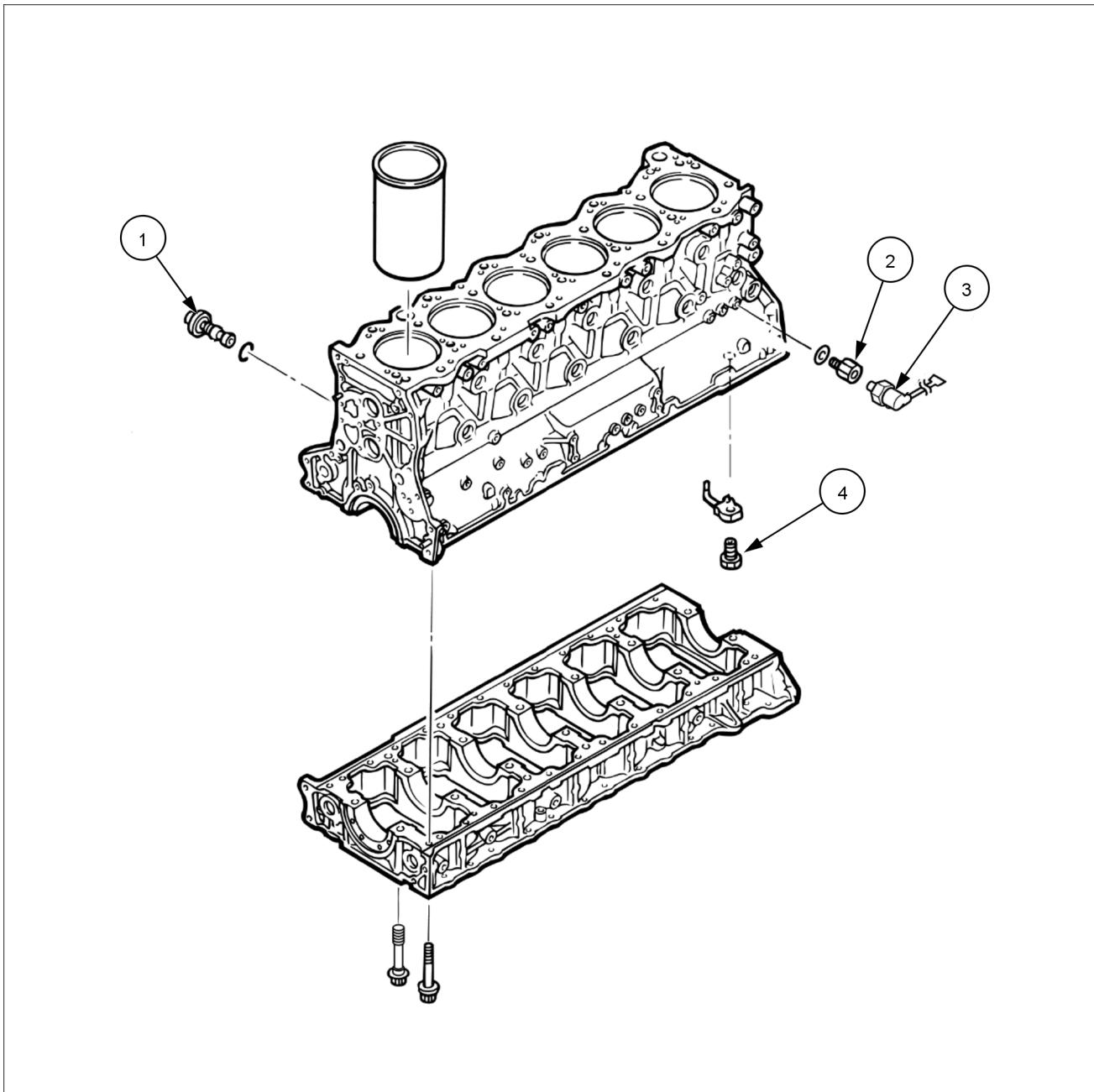
Electrical system main specifications

Generator			
Item	Specification		
Manufacturer name	Mitsubishi Electric Corporation		
Isuzu parts number	1-81200-530-8	1-8120-0603-7	1-8120-0628-1
Nominal output	24 V — 50 A		24 V — 110 A
Rated speed	5000 RPM		
Regulator type	IC type		
Regulated voltage	28 V to 29 V / 5000 RPM with a load 5 A or less, measured between L and E		
Output characteristics (Voltage: 27 V)	more than 42 A 2500 RPM		more than 125 A 2500 RPM
	more than 50 A 5000 RPM 9.6 kg (21.2 lb)		more than 143 A 5000 RPM 9.6 kg (21.2 lb)
	9.7 kg (21.4 lb)	9.6 kg (21.2 lb)	19.4 kg (42.8 lb)

Starter		
Item	Specification	
Manufacturer	Mitsubishi Electric Corporation	
Output	24 V	
Rating	30 s	
York outer diameter	85.0 mm (3.35 in)	
Rotational direction	Right	
Protection type	Dust proof, drip proof	
Deceleration mechanism	Internal gear	
Weight	12.7 kg (28 lb)	
Pinion	Module	3.5
	Pressure angle	14.5°
	Number of teeth	11
No load	Voltage	23.5 V
	Current	less than 125 A
	Rotational speed	more than 3000 RPM
Load	Voltage, current	15.8 V
	Torque	more than 51.5 N·m (38 lb ft)
	Rotational speed	more than 900 RPM
Restraint	Voltage	5 V
	Current	less than 1600 A
	Torque	more than 117 N·m (86 lb ft)
Pinion engaged voltage	less than 16.0 V	

Glow plug	
Item	Type
Preheat device model	Glow plug QOSII
Glow plug rated voltage/current	23 V

Crankcase - Torque



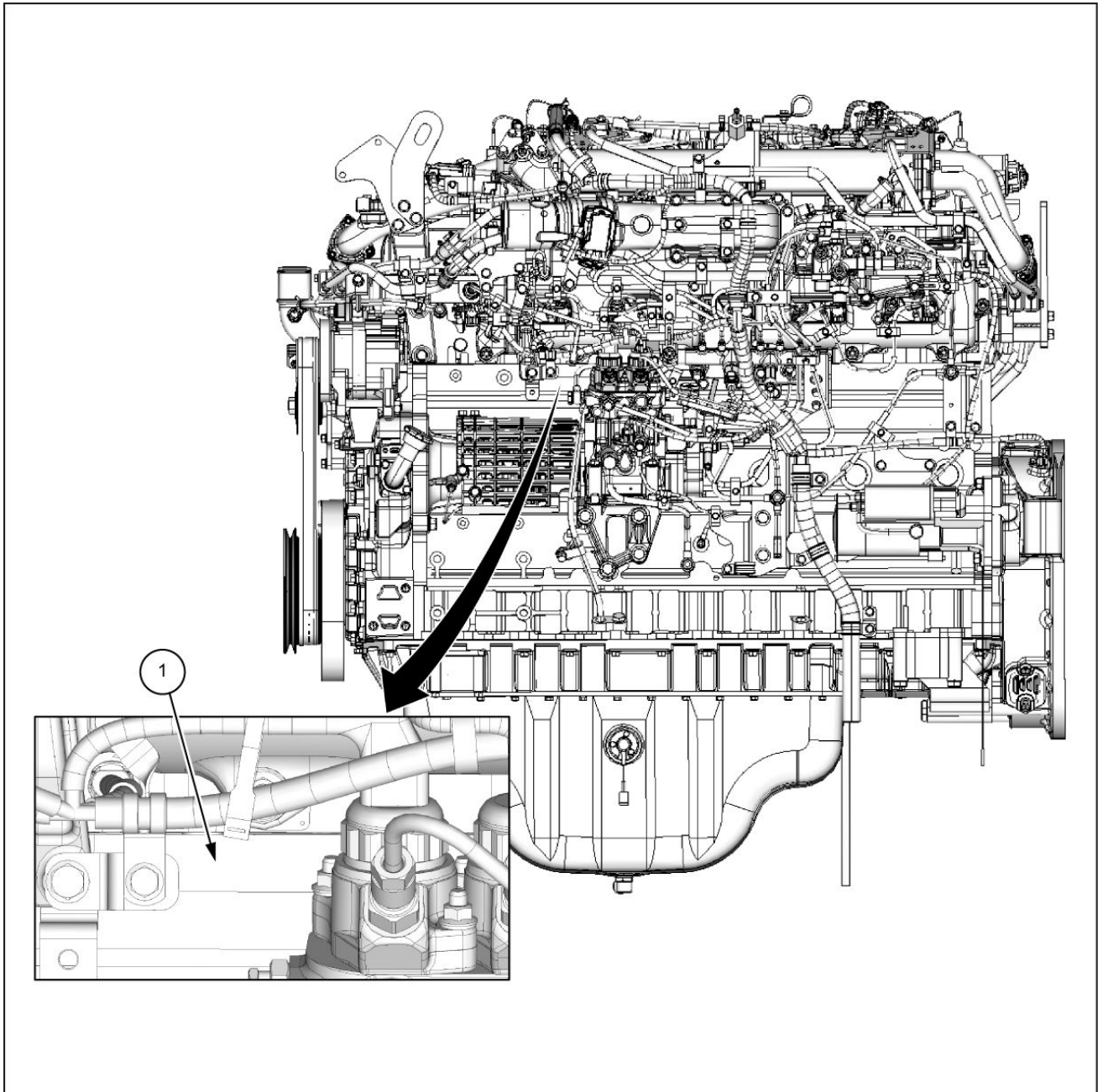
SMIL16CEX2205GA 1

- 1. **20 N·m (15 lb ft)**
- 2. **41 N·m (30 lb ft)**

- 3. **18 N·m (13 lb ft)**
- 4. **69 N·m (51 lb ft)**

Engine - Identification

Engine number

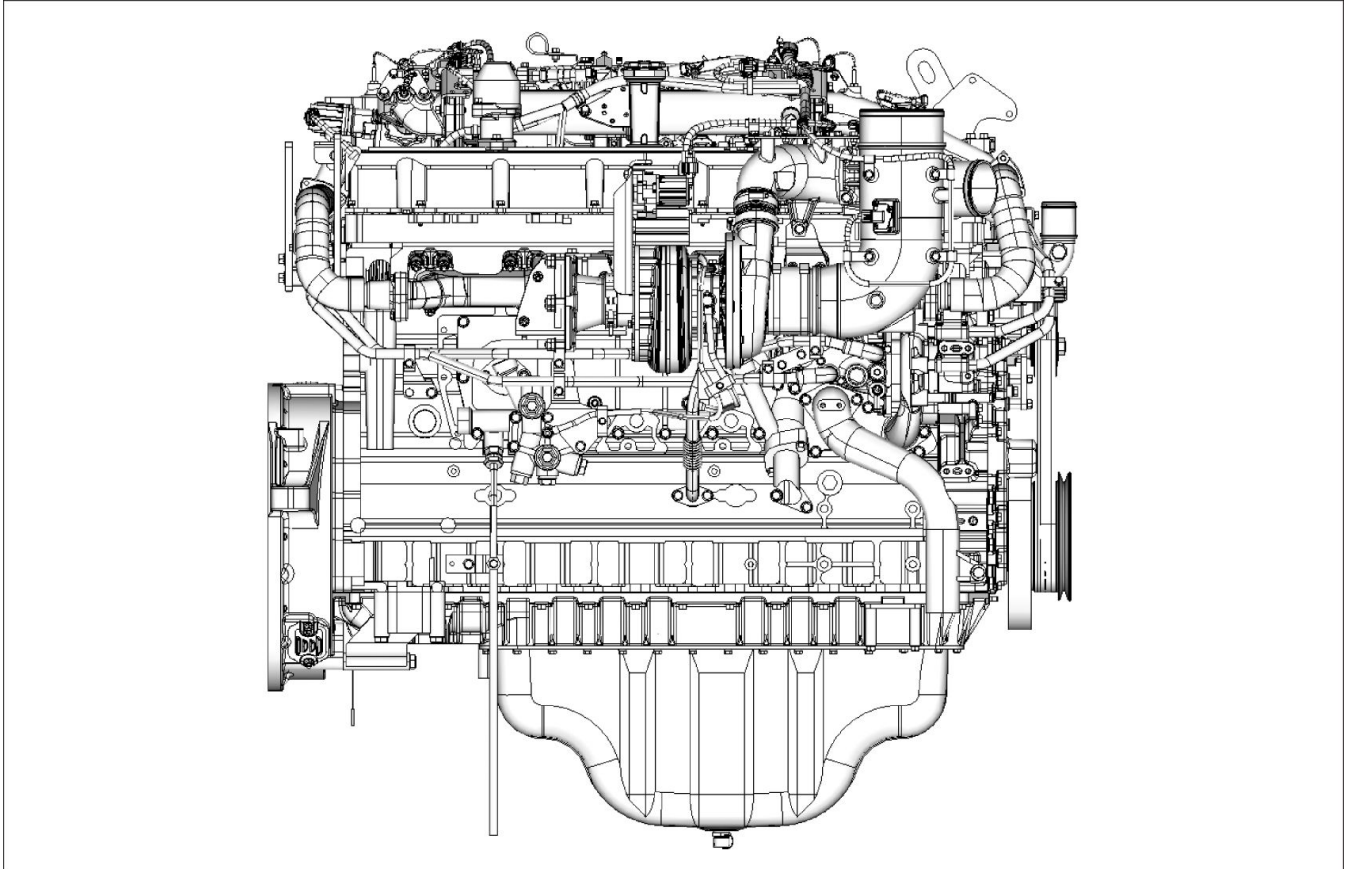


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1. Engine number stamping

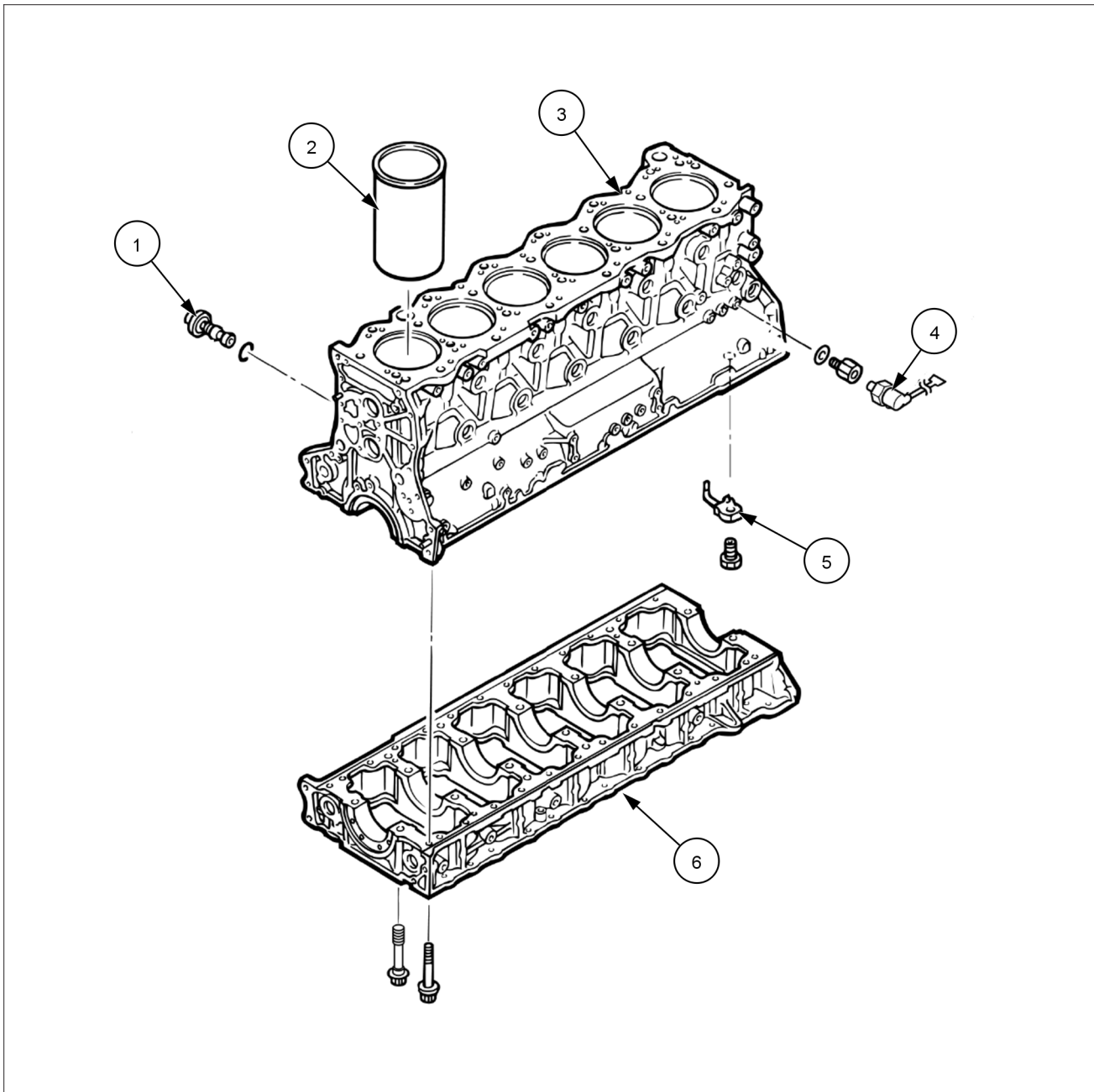
Engine - External view

Engine structural diagram



SMIL16CEX1811FA 1

Crankcase - Exploded view



SMIL16CEX2205GA 1

- | | |
|---------------------|------------------------|
| 1. Oil relief valve | 4. Oil pressure sensor |
| 2. Cylinder liner | 5. Oil jet |
| 3. Cylinder block | 6. Crankcase |

Engine - Prepare

⚠ 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

Avoid injury!

Shut off the engine, remove the key, and make sure all motion is stopped before servicing the machine.

Failure to comply could result in death or serious injury.

W1128A

⚠ 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

Explosion hazard!

Batteries emit explosive gases. Always ventilate when using in an enclosed area or when charging. Keep the battery away from sparks, open flames, and other ignition sources.

Failure to comply could result in death or serious injury.

W0369A

NOTICE: Keep away from flames.

NOTICE: The air conditioner circuit is filled with high pressure gas, gas may spray out dangerously when loosening lines.

Items to prepare:

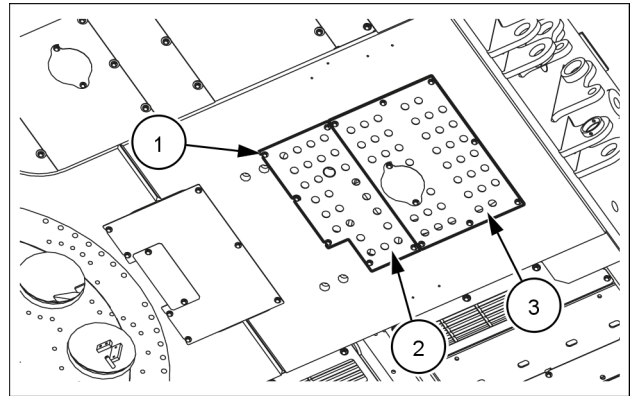
- Wrenches [**7 mm**, **10 mm**, **13 mm**, **19 mm**, **36 mm**, **41 mm**]
- Box wrench [**36 mm**]
- Shackle (that fulfills slinging capacity) x 4
- Wire rope (that fulfills breaking load)
- Lifting equipment (that fulfills slinging capacity)
- Marking pen
- Cap
- Plug
- Waste oil can
- Rag
- Cleaning fluid
- Wood plank, etc.

Engine - Remove

1. Remove the cable connected to minus side of the battery. Or turn OFF the battery disconnect switch.
 - Secure the terminal and harness in order to prevent them from touching the frame or other parts when they have been removed.
 - Or protect them with a rubber cap or other cap to prevent sparks.

NOTICE: While the indicator (LED) of the battery disconnect switch is lit, do not turn OFF the battery disconnect switch nor disconnect its negative cable from the battery. After turning the key OFF, the LED is lit for a maximum duration of **3 min**.

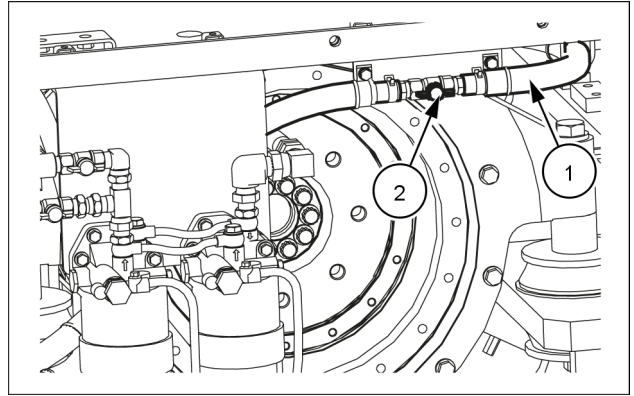
2. Remove the 13 bolts (1) with a wrench [19 mm] to remove the under covers (2) and (3).



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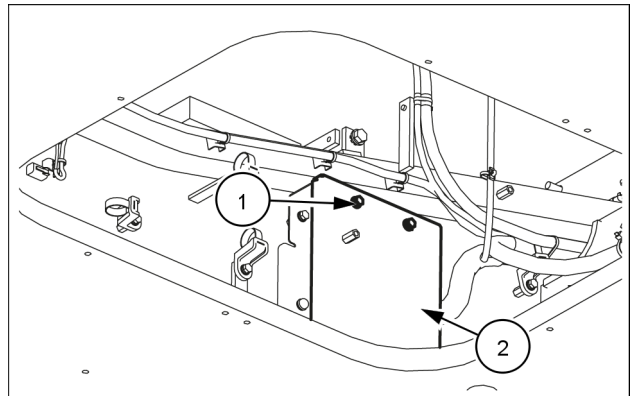
3. Drain engine oil.
4. Drain coolant of the radiator. (See **Radiator - Remove (10.400)** for detail.)
5. Remove the engine hood and step, house frame. (See **Hood - Remove (90.100)** for detail.)
6. Remove the hydraulic pump. (See **Hydraulic pump - Remove (35.820)** for detail.)
7. Remove the radiator hose, the hydraulically-operated fan, and the fan shroud. (See **Radiator - Remove (10.400)** for detail.)
8. Remove the exhaust pipe.
9. Remove lines from the compressor. (See **Air-conditioning compressor - Remove (50.200)** for detail.)
10. Remove the starter. (See **Engine starter - Remove (55.201)** for detail.)
11. Remove wirings from the alternator. (See **Alternator - Remove (55.301)** for detail.)

12. Close the stop valve **(2)** of the fuel line **(1)**.



SMIL16CEX2324AA 2

13. Remove the 2 bolts **(1)** with a wrench [**13 mm**] to remove the box cover **(2)**.

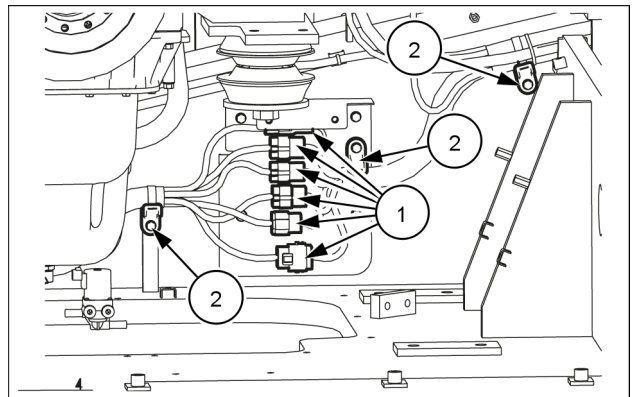


SMIL16CEX2325AA 3

14. Disconnect the 6 connections **(1)** of the engine harness and frame main wire harness in the box.

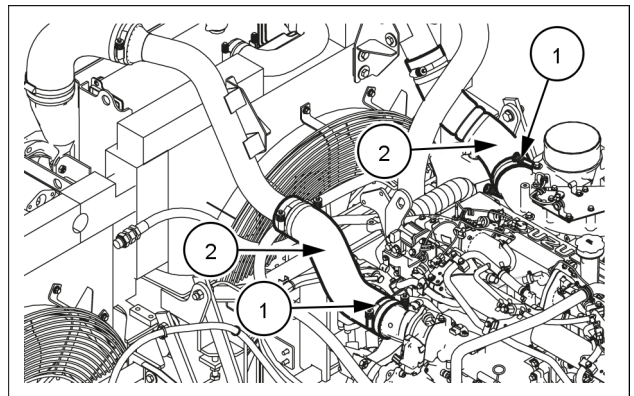
Remove the 3 bolts **(1)** with a wrench [**13 mm**] to disconnect the engine harness from the frame.

- Wrap the disconnected connectors with a vinyl after bundle them so as to prevent invasion of water, dust and dirt.



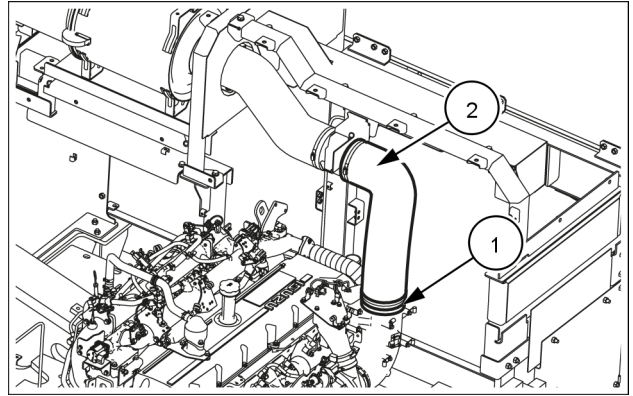
SMIL16CEX2326AA 4

15. Loosen the 2 hose band **(1)** with a wrench [**10 mm**] to disconnect the 2 intercooler hoses **(2)**.



SMIL16CEX2327AA 5

16. Loosen the hose bands (1) with a wrench [7 mm] to disconnect the air cleaner hose (2).

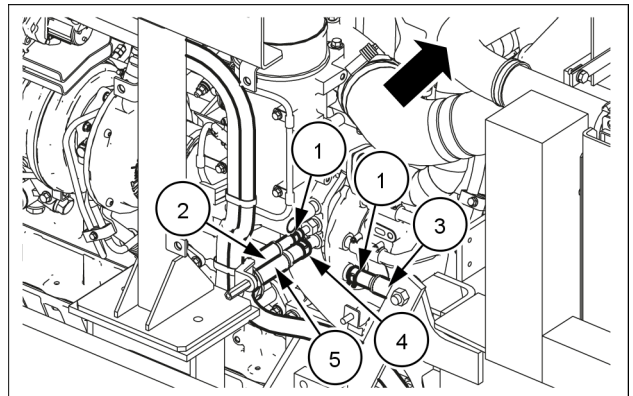


SMIL16CEX2328AA 6

17. Remove the hose band (1) to disconnect the 2 urea coolant hoses (2) and (3).

Remove the hose band (4) to remove the heater hose (5).

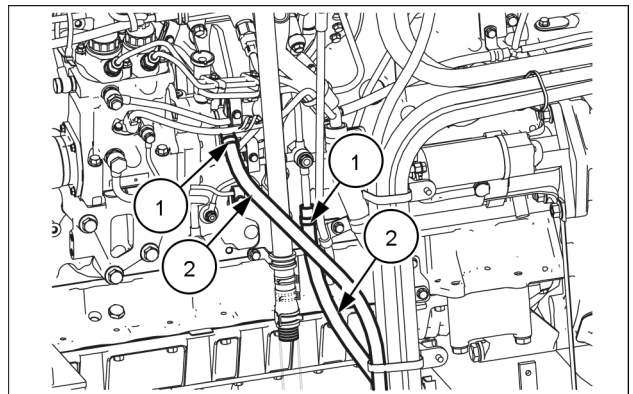
- Hose (3) has blue tape.
- Attach caps and plugs to the engine and the hoses to prevent the entry of water, dust, and dirt.



SMIL16CEX2329AB 7

18. Remove the hose band (1) to remove the 2 fuel hoses (2).

- Attach caps and plugs to the engine and the hoses to prevent the entry of water, dust, and dirt.

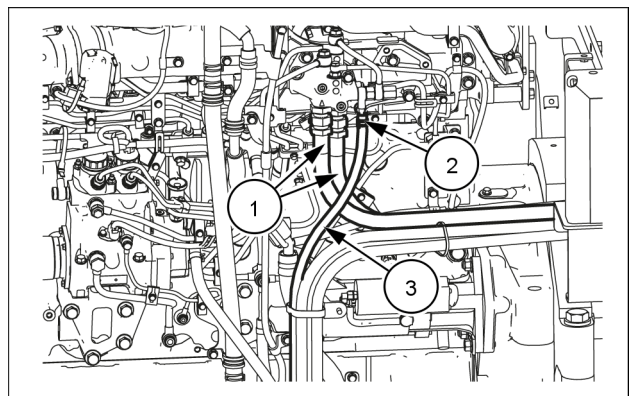


SMIL16CEX2330AA 8

19. Disconnect the 2 fuel hoses (1) with a wrench [36 mm].

Remove the hose band (2) to disconnect the fuel hose (3).

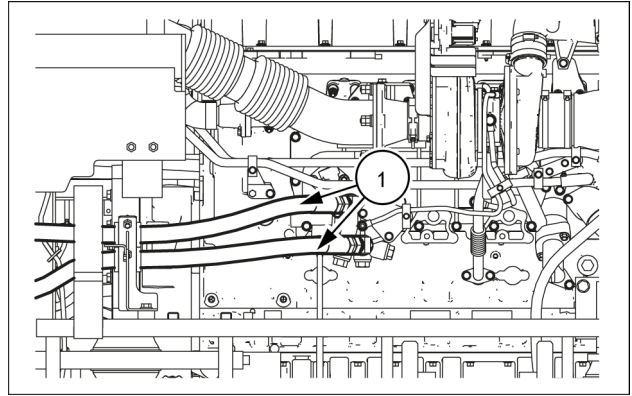
Hose tightening torque: **55 – 66 N·m (40.57 – 48.68 lb ft)**



SMIL16CEX2331AA 9

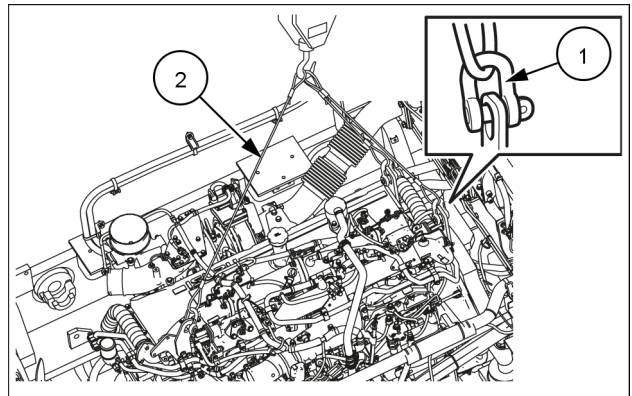
20. Prepare a waste oil can and then remove the 2 engine oil remote hoses (1) with a wrench [41 mm].

- Apply marking to each location of the engine and hoses so as to match connections at assembling.
- Attach caps and plugs to each location of the engine and hoses to prevent the entry of water, dust, and dirt.
- Wash each location of the engine and hoses by blowing parts cleaner so as to prevent adhering dirt at connections and not to damage them.



SMIL16CEX2332AA 10

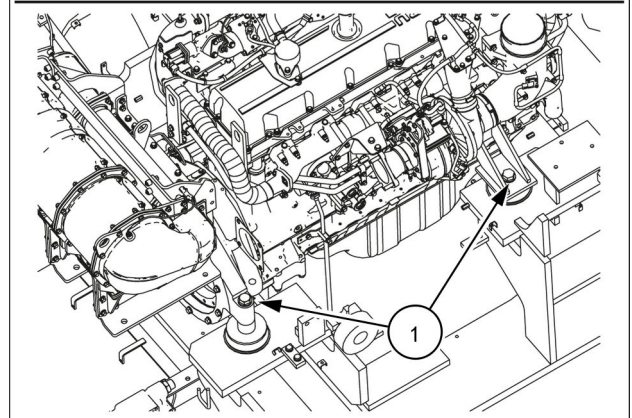
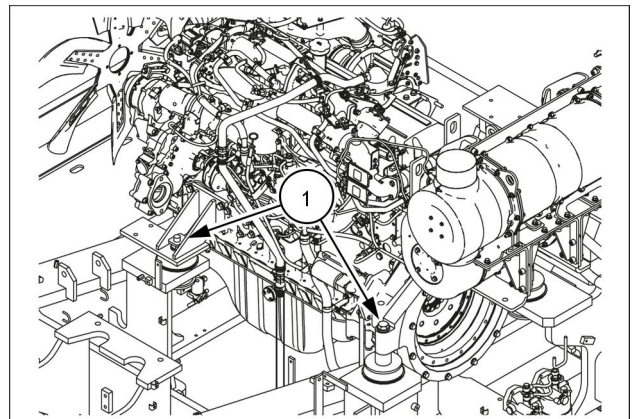
21. Attach the 3 shackles (1), and secure the engine main unit with wire ropes (2) and a lifting equipment.



SMIL16CEX2333AA 11

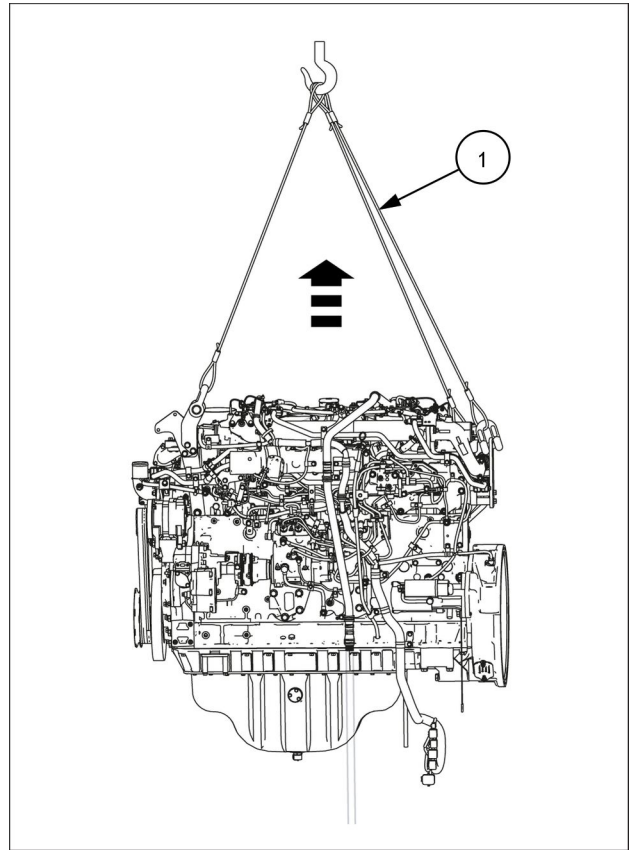
22. Remove the 4 bolts (1) of the mount with a box wrench [36 mm].

Bolt tightening torque: 902 – 1049 N·m (665.28 – 773.70 lb ft)



SMIL16CEX2334B 12

23. Lift the engine main unit with wire ropes **(1)** and a lifting equipment.
Make sure that the area is safe, and then place the engine on wood planks.



SMIL16CEX2335BB 13

Engine - Install

1. Install the engine in the reversed order of the procedure for removal.

Each bolt has to be tightened in the specified torque.

Refer to the **Torque - Bolt and nut ()** for tightening torque for bolts without instruction.

After installation, fill coolant, fill engine oil, bleed air from the fuel line, wash and fill air conditioner gas.

Follow respective procedures and descriptions for detail.

2. Make sure that there is no water leak or oil leak by running the engine in idle speed with no load.

Engine - Check - Engine oil

⚠ WARNING

Burn hazard!

Do not handle any service fluid (engine coolant, engine oil, hydraulic oil, etc.) at temperatures that exceed 49 °C (120 °F). Allow fluids to cool before proceeding.

Failure to comply could result in death or serious injury.

W0330B

NOTICE: The engine should be in a horizontal position.

NOTICE: Wait at least 5 min before starting the engine and after stopping the engine.

Engine oil inspection

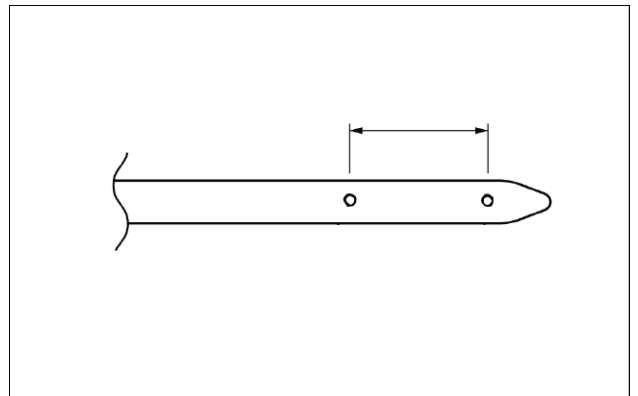
1. Remove the oil level gauge from the oil level gauge guide tube.

NOTE: Wipe off the engine oil remaining on the oil level gauge.

2. Install the oil level gauge to the oil level gauge guide tube.
3. Remove the oil level gauge from the oil level gauge guide tube.
4. Inspect the engine oil.

NOTE: Check the engine oil remaining on the oil level gauge to inspect the engine oil level.

1. MAX
2. MIN
3. Acceptable oil amount

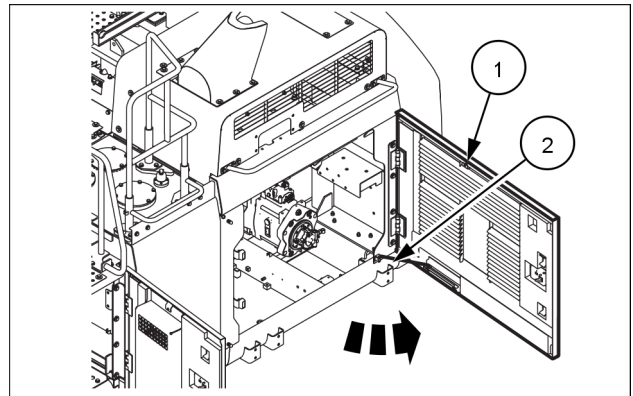


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Engine - Test - Engine oil

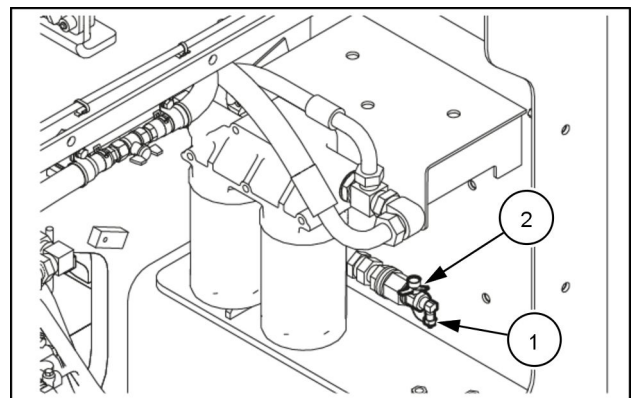
Sampling of engine oil

1. Open the side door **(1)**.
At this time, make sure to apply the lock **(2)**.



SMIL17CEX1974AA 1

2. Place a sampling container under the sampling port **(1)**.
3. Open the valve **(2)** to drain a proper amount of oil.
4. Close the valve **(2)** to check that there is no leakage.
5. If necessary, add the same amount of oil as the drained oil.



SMIL17CEX2830AA 2



Suggest:

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Engine - Compression test

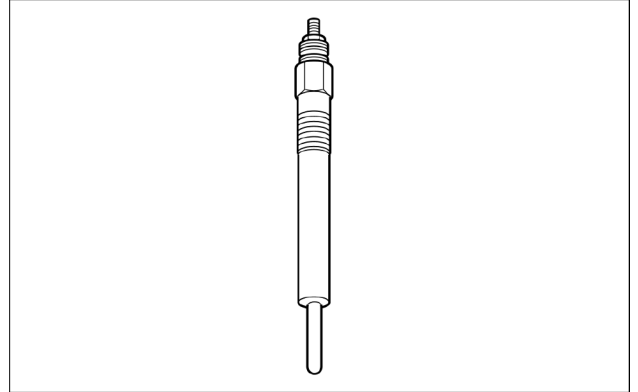
NOTE: Warm up the engine.

1. Confirm that there is no abnormality with the battery and the starter.
2. Disconnect the battery ground cable.

NOTICE: Do not disconnect the battery cable for **3 min** after turning **OFF** the ignition switch.

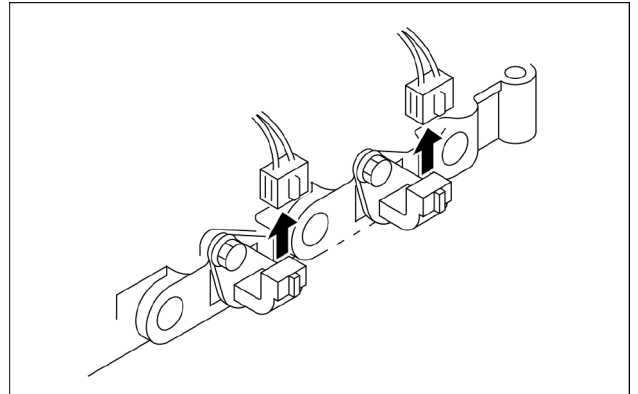
3. Remove the inlet pipe.
4. Remove the EGR cooler.
5. Remove glow plug from cylinder head.

NOTE: Repeat this operation for all the cylinders.



SMIL16CEX1829AA 1

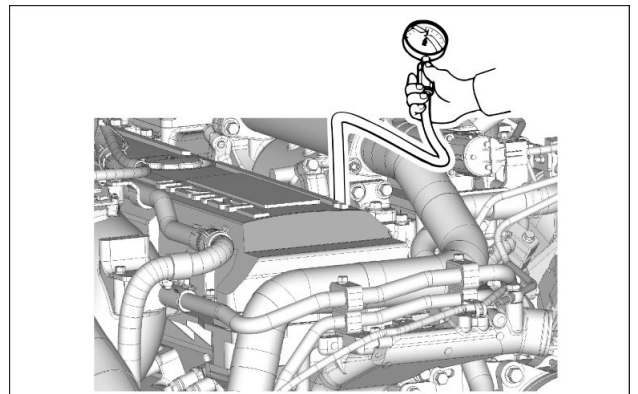
6. Remove the injector harness connector from the lower cover.



SMIL16CEX1830AA 2

7. Install the special tool to the cylinder head assembly.

NOTE: Insert the compression gauge adapter into the installation hole of the glow plug to install the compression gauge.



SMIL16CEX1833AA 3

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