CX260C
Crawler Excavator

SERVICE MANUAL

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English
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CASE
CONSTRUCTION

Contents

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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.

SERVICE MANUAL

Engine

CX260C Crawler excavator LC version (TIER 3) - CHINA Market

Engine - General specification

Engine main data

Item		Engine model 4HK1
Type		Diesel / 4-cycle / water cooling, inline 4 cylinder OHC
Shape of combustion chamber		Direct injection type
Cylinder liner type		Dry type
Cylinder bore x stroke		**115 mm** (**4.528 in**) x **125 mm** (**4.921 in**)
Displacement		**5.193 L** (**316.89 in³**)
Compression ratio		17.5
Compression pressure		**3.04 MPa** (**440.95 psi**) **200 RPM**
Idling rotation speed		**900 RPM**
Valve clearance	In	**0.4 mm** (**0.016 in**) (while engine is cool)
	Out	**0.4 mm** (**0.016 in**) (while engine is cool)
Ignition type		Compression ignition
Injection order		1, 3, 4, 2
Lubricant system		
Lubricating type		Pressure type
Oil pump type		Gear type
Lubrication oil amount		**15.6 - 23.1 L** (**4.121 - 6.102 US gal**)
Oil filter type		Full-flow paper filter/bypass combined type (spin-on type, w/o drain plug)
Oil cooled type		Built-in, water cooled
Cooling system		
Cooling type		Water cooled
Radiator type		Corrugated fin (pressure type)
Water pump type		Spiral, belt type
Thermostat type		2 wax type unit
Thermostat valve opening temperature		**82.0 °C** (**180 °F**)
Coolant capacity		**14 L** (**3.70 US gal**)
Fuel system		
Injection pump type		Common rail type; HP3 model
Governor type		Electronic control type
Injection nozzle type		Electric multi-hole injector (G3AM type)
Battery system		
Generator type		AC type
Output		**24 V**/ **50 A**
Regulator type		IC
Start system		
Starter type		Electromagnetic pinion shift type
Output		**24 V** / **5.0 kW**
Preheat system type		Glow plug
Glow plug standard voltage/current		**23 V**/ **3.5 A**

Cooling system main data

Item	Data
Water pump	Spiral type
Thermostat	Wax pellet type
Valve opening temperature	**82.0 °C** (**180 °F**)
Full-open temperature	**95.0 °C** (**203 °F**)

Electrical system main data

Generator	
Item	**Data**
Isuzu parts number	8980921161
Nominal output	**24 V**/ **50 A**
Rated speed	**5000 RPM**
Regulator type	IC type
Regulated voltage	**28.5 V** ± 1
Weight	**9.5 kg** (**20.9 lb**)

Starter		
Type (Manufacturer)		Nikko
Rated	Voltage	**24 V**
	Output	**5 kW** (**6.8 Hp**)
	Time	**30 s**
No. of pinion gears		13
Direction of rotation (toward pinion)		Clockwise
Weight (approx.)		**8.0 kg** (**17.6 lb**)
No-load characteristics	Current/voltage	**85 A** or less/ **24 V**
	Speed	**3300 RPM** or more
Load characteristics	Current/voltage	**400 A**/ **18.5 V**
	Torque	**28.4 N·m** (**20.95 lb ft**) or more
	Speed	**1250 RPM** or more
Locking characteristics	Current/voltage	**1400 A** or less/ **9 V**
	Torque	**88.2 N·m** (**65.05 lb ft**) or more

Glow plug	
Item	**Type**
Preheat unit model	Glow plug
Glow plug rated voltage/current	**23 V**/ **3.5 A**

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.*

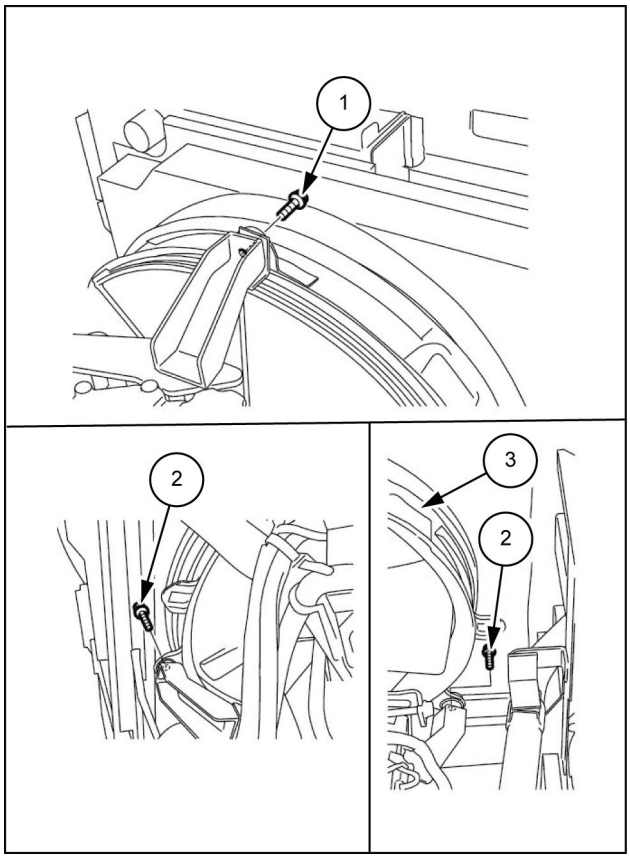
NOTICE: *The air conditioner circuit is filled with high pressure gas, gas may spray out dangerously when loosening lines.*

Items to prepare:

- Wrenches [**7 mm**, **8 mm**, **10 mm**, **13 mm**, **17 mm**, **36 mm**]
- Box wrench [**24 mm**]
- Shackle (with the required lifting capacity) x 2
- Wire rope (with the required breaking load)
- Lifting equipment (with the required lifting capacity)
- Marking pen
- Caps
- Plugs
- Waste oil can
- Rag
- Cleaning fluid
- Wood plank

Engine - Remove

1. Remove the counterweight. (For details, See " **Counterweight - Remove (39.140)** and **Counterweight - Install (39.140)**").
2. Remove the pump. (For details, See " **Pump - Remove (35.106)** and **Pump - Install (35.106)**").
3. Use a wrench to remove the bolts **(1)** and **(2)**, and then remove the fan shroud **(3)**.



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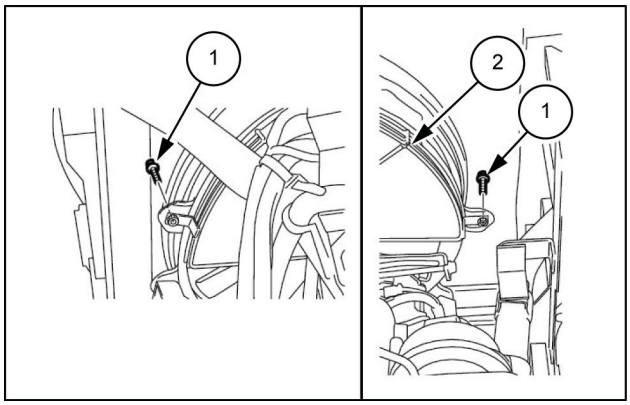
4. Use a wrench to remove the bolts **(1)**, and then remove the fan guard **(2)**.



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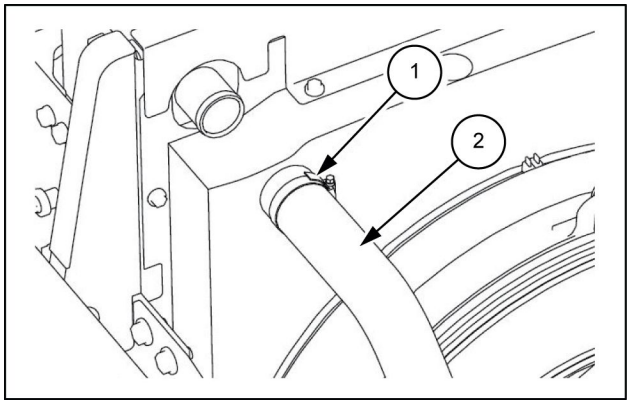
5. Use a wrench [**7 mm**] to loosen the hose band **(1)** on the radiator, and then remove the upper hose **(2)**.



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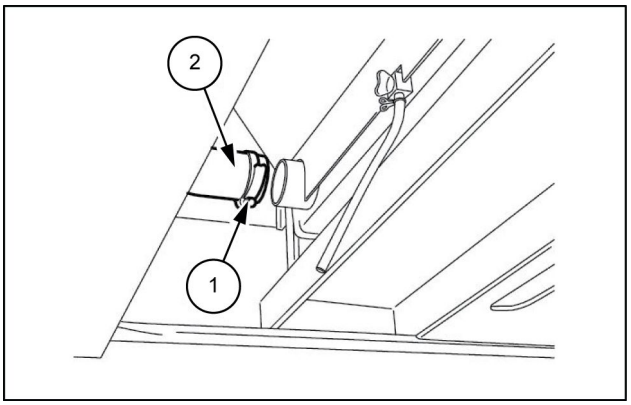
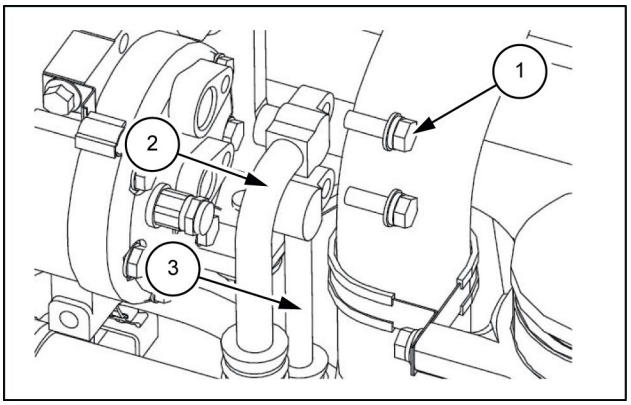
6. Use a wrench [**7 mm**] to loosen the hose band **(1)** on the radiator, and then remove the lower hose **(2)**.
   - Use caps to cover the radiator and hoses to prevent the entry of water, dust or dirt.
   - Before removing the radiator hoses, completely drain the coolant.



SMIL13CEX1231AB 4

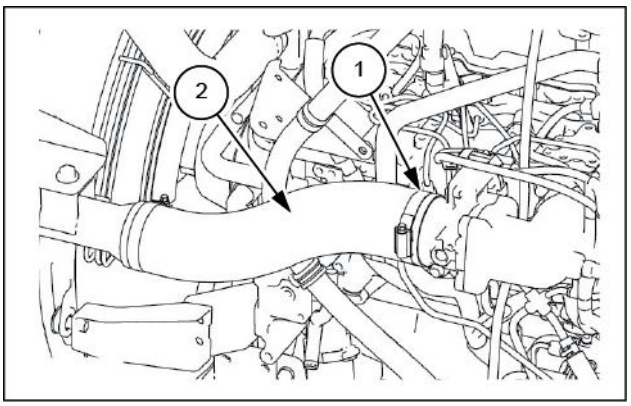
7. Use a wrench [**13 mm**] to loosen the line bolts **(1)** in 2 locations, and then remove the 2 lines **(2)** and **(3)** from the compressor.
   - Always remove the low-pressure (suction side) line **(2)** first.
   - Install caps or plugs to the compressor and lines to prevent any entry of water, dust or dirt.

     3. Line (discharge side)



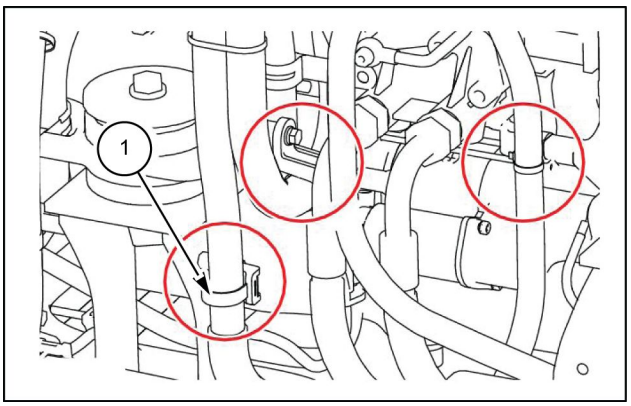
SMIL13CEX1232AB 5

8. Use a wrench [**8 mm**] to loosen the hose band **(1)** on the intercooler, and then remove the hose **(2)**.
   - Use caps to cover the line and hose to prevent the entry of water, dust or dirt.



SMIL13CEX1233AB 6

9. Remove the hose bands **(1)** in the 3 locations.



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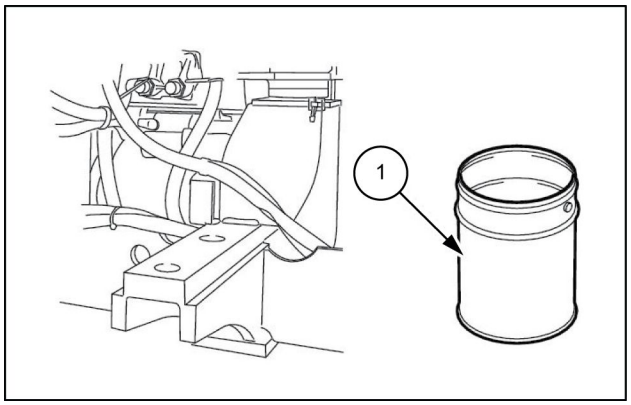
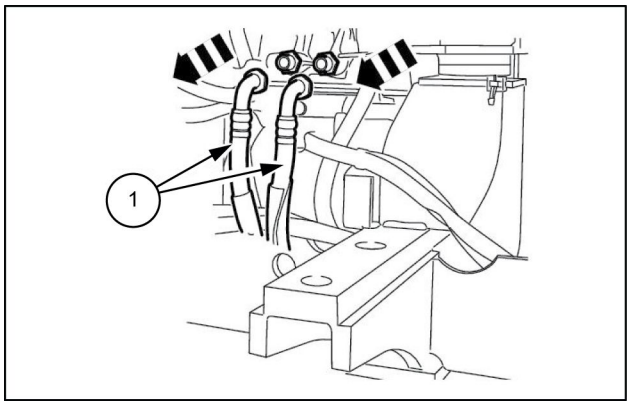
10. Prepare a waste oil can **(1)**.
    - Drain the engine oil before removing the engine oil hose.



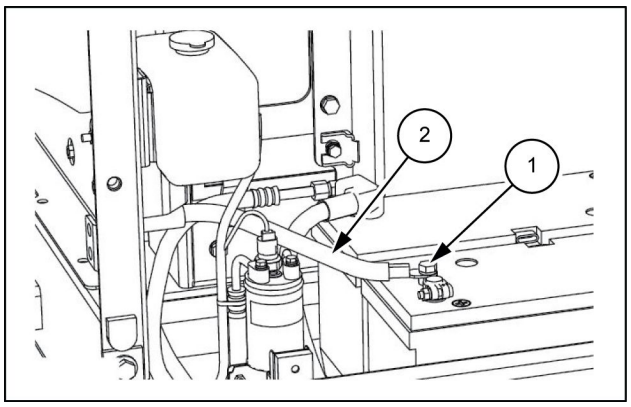
SMIL13CEX1235AB 8

11. Use a wrench [**36 mm**] to remove the 2 engine oil remote hoses **(1)**.
    - Mark the engine and hoses so that the connectors match at the time of assembly.
    - Install caps or plugs to the engine and hoses to prevent any entry of water, dust or dirt.
    - Clean the engine and hoses by spraying them with a parts cleaner to prevent scratches and prevent dirt from accumulating on the connectors.



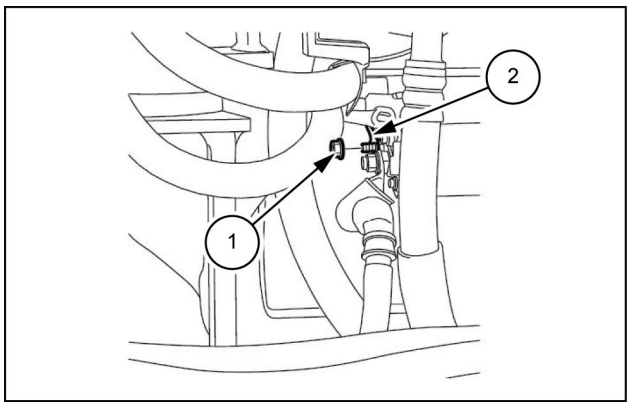
SMIL13CEX1236AB 9

12. Use a wrench [**17 mm**] to remove the bolt **(1)**, and then remove the negative-side battery cable **(2)**.
    - After removing terminals or harnesses, fix them to the frame or a similar location so they do not interfere with the frame. Also, be sure to protect them with a rubber cap or other protective device, to prevent sparks.



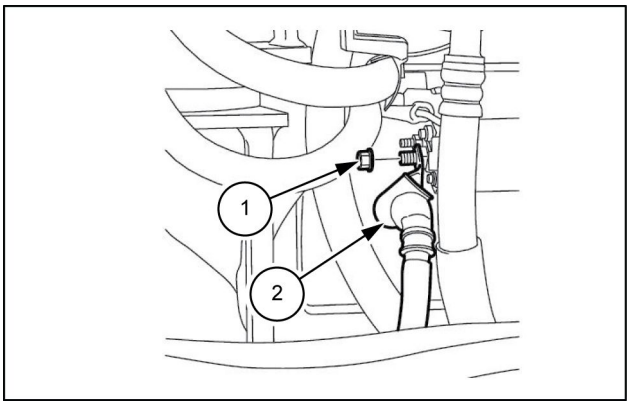
SMIL13CEX1237AB 10

13. Use a wrench [**8 mm**] to remove the 1 nut **(1)**, and then remove the wiring **(2)** from the starter motor.



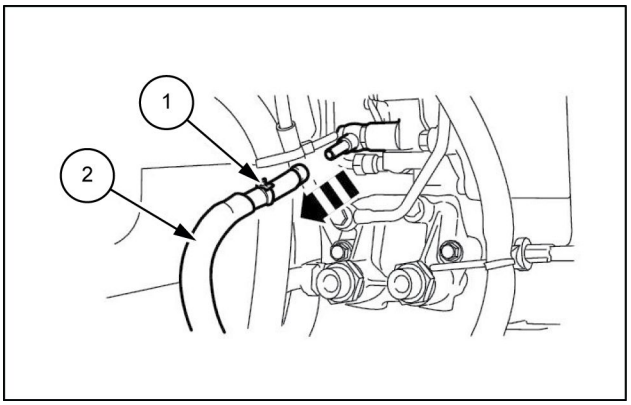
SMIL13CEX1238AB 11

14. Use a wrench to remove the 1 nut **(1)**, and then remove the wiring **(2)** from the starter motor.



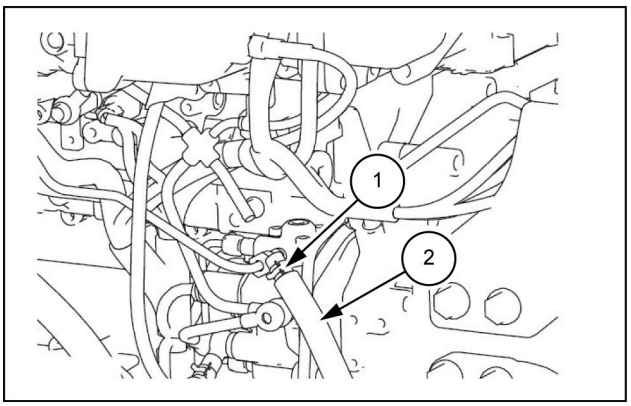
SMIL13CEX1239AB 12

15. Remove the hose band **(1)**, and then remove the fuel hose **(2)**.
    - Install caps or plugs to the engine and hose to prevent any entry of water, dust or dirt.



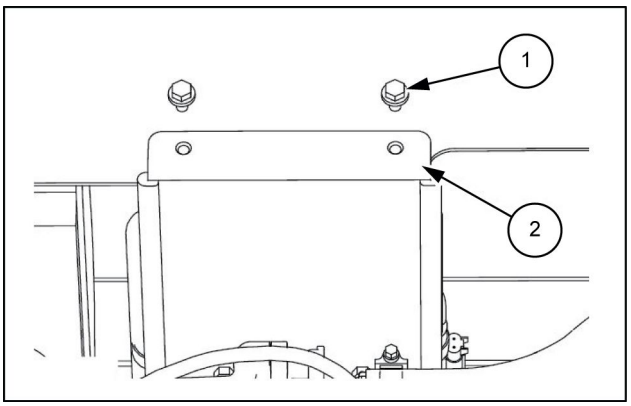
SMIL13CEX1240AB 13

16. Remove the hose band **(1)**, and then remove the fuel hose **(2)**.
    - Install caps or plugs to the engine and hoses to prevent any entry of water, dust or dirt.



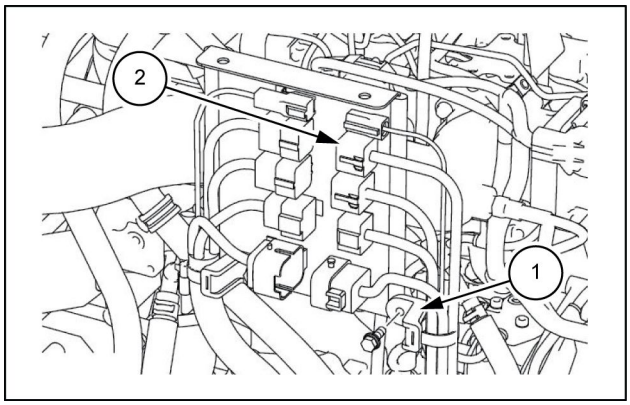
SMIL13CEX1241AB 14

17. Use a wrench [**13 mm**] to remove the 2 bolts **(1)**, and then remove the connector bracket **(2)**.



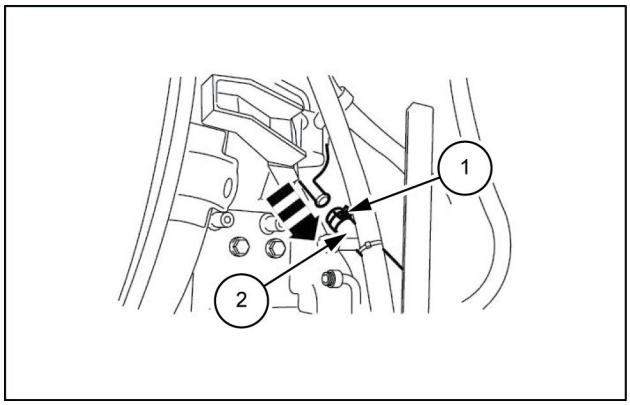
SMIL13CEX1242AB 15

18. Use a wrench [**13 mm**] to remove the hose band **(1)** from the bracket, and then remove the connectors **(2)**.
    - Wrap the removed connectors in plastic after tying them together.



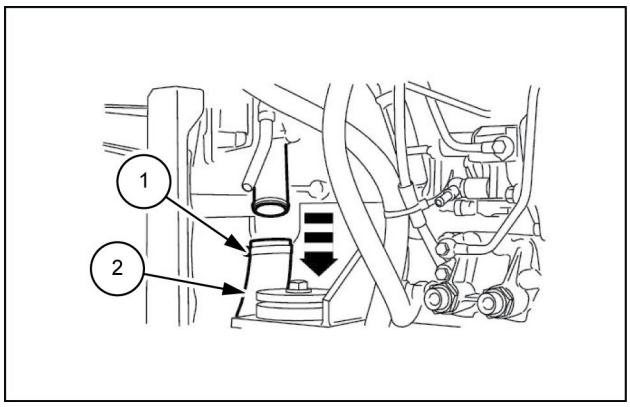
SMIL13CEX1243AB 16

19. Loosen the hose band **(1)**, and then remove the heater hose **(2)**.
    - Install caps or plugs to the engine and hose to prevent any entry of water, dust or dirt.



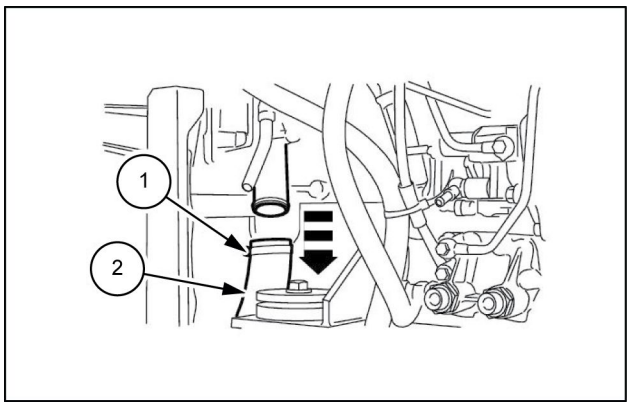
SMIL13CEX1244AB 17

20. Loosen the hose band **(1)**, and then remove the heater hose **(2)**.
    - Install caps or plugs to the engine and hose to prevent any entry of water, dust or dirt.



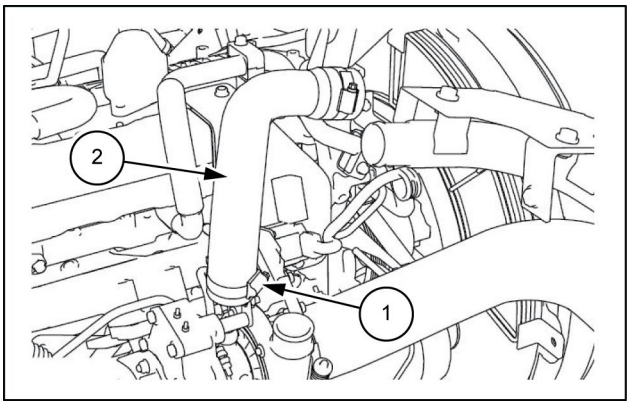
SMIL13CEX1245AB 18

21. Use a wrench [**7 mm**] to loosen the hose band **(1)**, and then remove the radiator hose **(2)**.
    - Use caps to cover the lines and hoses to prevent any entry of water, dust or dirt.



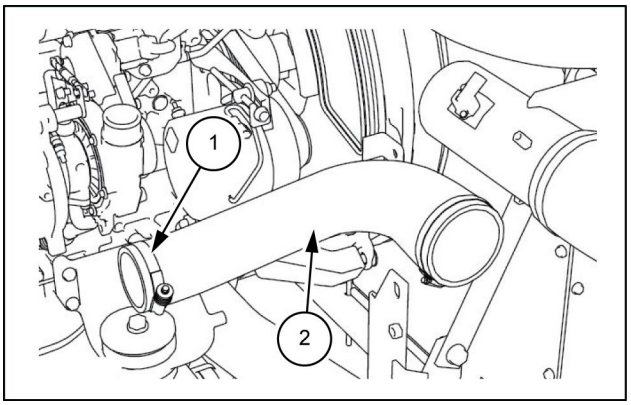
SMIL13CEX1246AB 19

22. Use a wrench [**8 mm**] to loosen the hose band **(1)**, and then remove the air hose **(2)**.
    - Use caps to cover the lines and hoses to prevent any entry of water, dust or dirt.



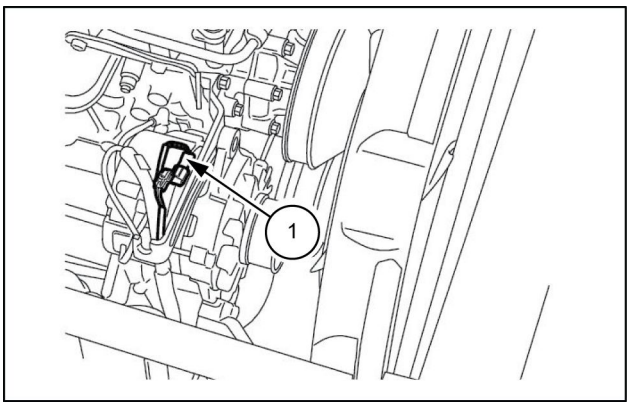
SMIL13CEX1247AB 20

23. Use a wrench [**7 mm**] to loosen the hose band **(1)**, and then remove the air hose **(2)**.
    - Use caps to cover the line and hose to prevent any entry of water, dust or dirt.



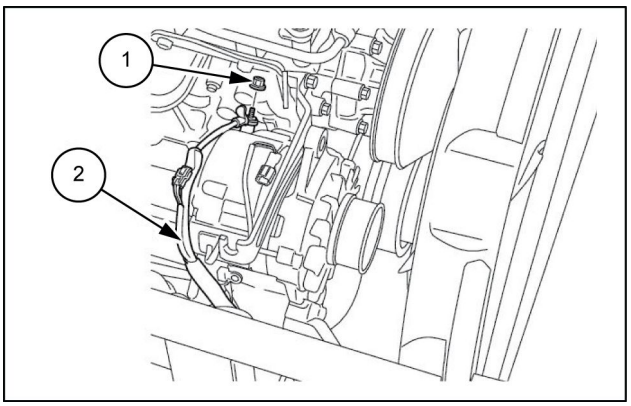
SMIL13CEX1248AB 21

24. Remove the connectors **(1)** from the alternator.



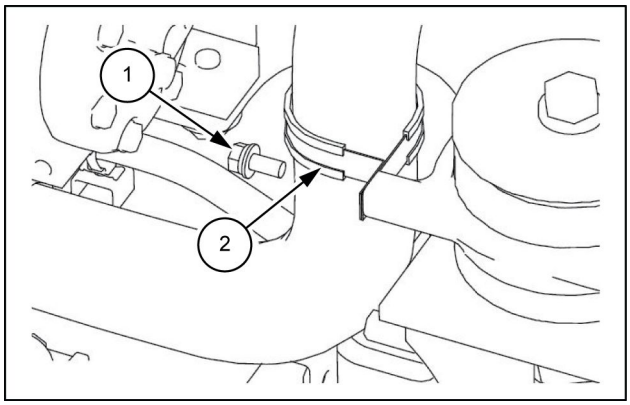
SMIL13CEX1249AB 22

25. Use a wrench [**10 mm**] to remove the nut **(1)**, and then remove the wiring from the alternator **(2)**.



SMIL13CEX1250AB 23

26. Use a wrench [**13 mm**] to remove the bolt **(1)**, and then remove the radiator hose clamp **(2)**.



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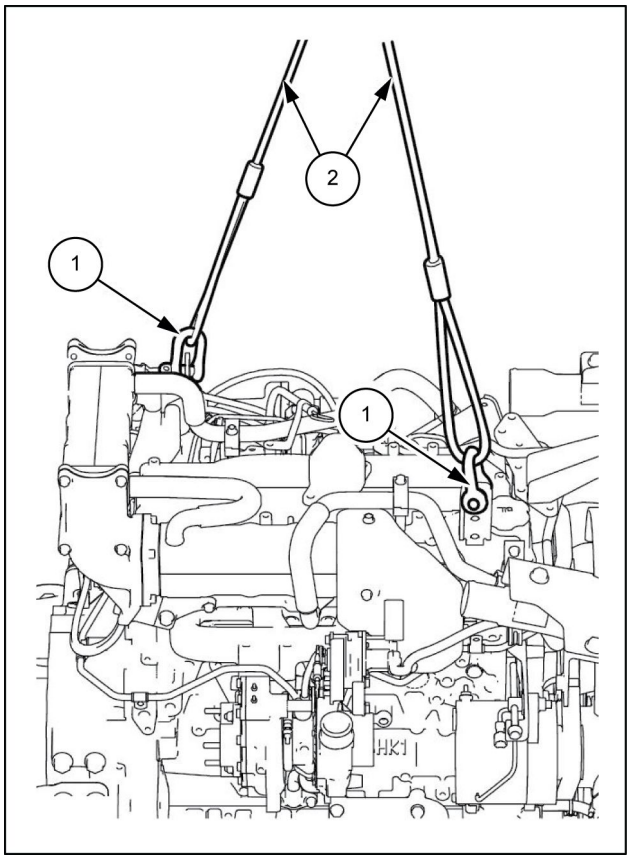
27. Install the 2 shackles **(1)**, and then use the wire rope **(2)** and liftcrane to secure the engine.



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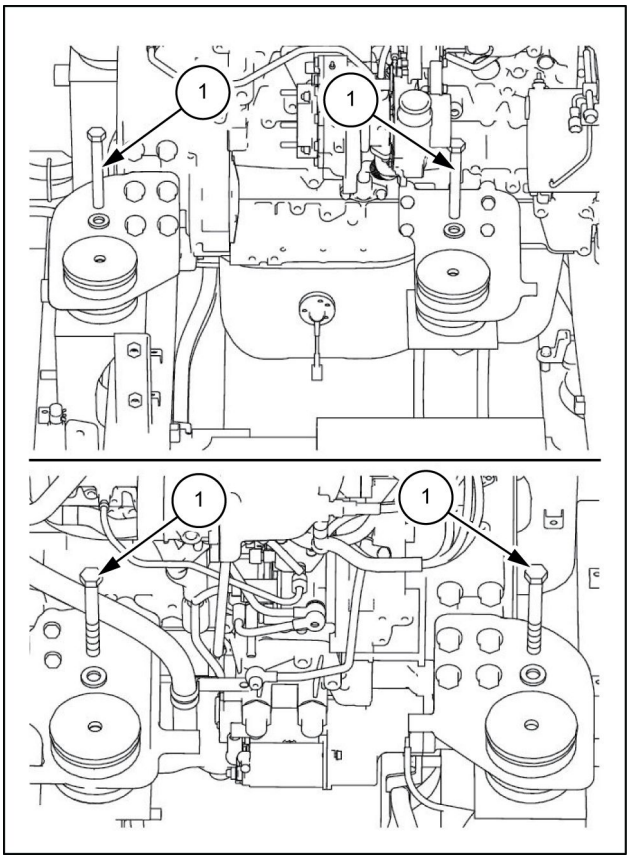
28. Use a box wrench [**24 mm**] to remove the 4 bolts **(1)** from the mount.



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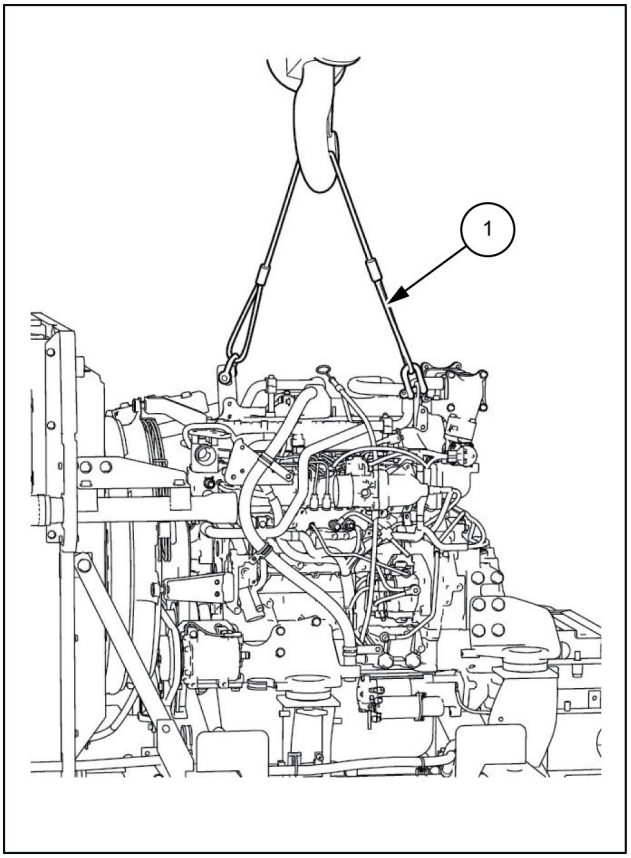
29. Use the wire rope **(1)** and liftcrane to lift the engine. Thoroughly check that the location is safe before lowering the engine on wood planks, etc.



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Engine - Install

1. To install the engine, perform the reverse of the removal procedure.
   When installing each bolt, tighten them to the specified torque.
   For bolts for which the torque is not specified, see **Torque – Bolt and nut ()**.
   After installing the engine, resupply coolant and engine oil, perform fuel line air bleeding, cleaning, and perform filling for the air conditioner gas. For details, see the individual explanations for each procedure.
2. Run the engine at no-load idling and check for any water or oil leaks.
3. Attach the hydraulic pump, covers, and counterweight. For details, see the individual explanations for each procedure.

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.

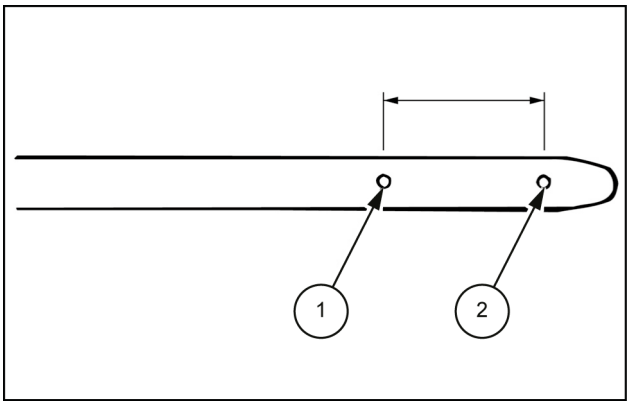
NOTE: *Wipe off the engine oil remaining on the oil level gauge.*

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. Upper limit
2. Lower limit

NOTE: *If the oil level is under the lower limit, add engine oil. Replace the engine oil if engine oil is dirty.*



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Engine - Service instruction

Precautions on maintenance

To prevent the engine from being damaged and to ensure the reliability of engine performance, be careful of the following points when performing maintenance works.

When placing the engine on the ground, make sure that the bearing surface of the oil pan does not directly contact the ground.

Use an appropriate wood frame, etc. to support the engine at the engine foot portion and the flywheel housing portion. There is only a small gap between the oil pan and oil pump strainer, so be careful not to damage the oil pan and oil strainer.

- While the air duct or air cleaner is removed, cover the open section of the intake to prevent foreign matters from entering the cylinder.
  If a foreign matter enters the cylinder, it may seriously damage the cylinder when the engine starts.
- When maintaining the engine, be sure to disconnect the negative battery cable.
  Failure to do this may cause the harness or electrical components to be damaged.
  If energizing is required for inspection, be careful not to cause a short.
- Before assembly, apply the engine oil to the slide contact surface of the engine.
  This work ensures appropriate lubrication when first starting the engine.
- When the valve train component, piston, piston ring, connecting rod, connecting rod bearing, and/or crankshaft journal bearing are removed, line them up in the correct order so that their original positions are clear.
- When installing, install it in the same position as when it was removed.
- When assembling the engine, replace the gasket, oil seal, and O-ring with new ones.
- For a component with the liquid gasket applied, carefully remove the old liquid gasket and clean the component so that no oil, water, and/or dust remain.
  Thereafter, apply the specified liquid gasket to each component before assembly.
- Assemble components with the liquid gasket applied within 5 minutes of applying the liquid gasket.
  If **5 min** have passed, remove the old liquid gasket and apply liquid gasket again.
- When assembling or installing a component, make sure to tighten them at the specified torque to ensure secure installation.

Important precautions for handling this engine

The holes and gaps in the fuel system including inside the injector where the fuel passes through are manufactured with high precision.

Therefore, these are extremely sensitive to any foreign matter, and may be severely damaged due to foreign matter accidentally intruded. For this reason, extreme care must be taken to prevent any foreign matter from entering.

When performing maintenance on the fuel system, take extreme care to prevent any foreign matter from entering the system.

- Before starting maintenance, clean the fuel line and its surroundings.
- Be sure to wash your hands before starting maintenance.
  Do not put on cotton work gloves.
- When the fuel hose or fuel pipe is removed, cover the opening with a plastic bag and fix it with a piece of tape.

NOTICE: *When the high-pressure piping of the fuel system is removed, be sure to replace it with a new one. If it is reused, the sealing surface may be damaged to cause fuel leakage.*

- When replacing the fuel hose and/or fuel pipe, do not unpack new components before starting installation.
- When the fuel pipe, injection pipe, fuel injector, fuel supply pump, and/or common rail are removed, seal each opening immediately.
- Store the eyebolt and gasket in a clean parts box with a cover so that foreign matter does not attach to them.
- Fuel leakage may cause a fire. Therefore, be sure to wipe spilled fuel after completing the maintenance work and confirm that there is no fuel leakage before starting the engine.

Crankcase - Remove

Removal of cylinder block

Battery ground cable disconnect

1. Disengage the battery ground cable from the battery.

Coolant drain

1. Drain the coolant from the radiator.

   ⚠ CAUTION:

   After the coolant is discharged, make sure to tighten the drain plug.

Engine oil drain

1. Remove the drain plug from the oil pan.
2. Drain the engine oil from the oil pan.
3. Install the drain plug to the oil pan.

   Tightening torque: **70 N·m** (**51.63 lb ft**)

Engine harness disconnect

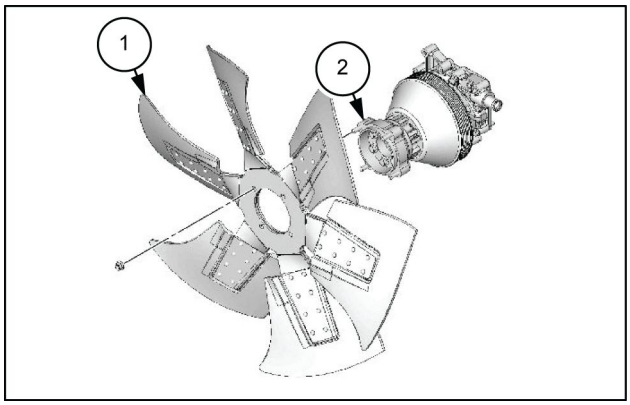
1. Disengage the engine harness from the engine assembly.

   ⚠ CAUTION:

   Disconnect each connector.

Cooling fan removal

1. Remove the cooling fan **(1)** from the adapter **(2)**.



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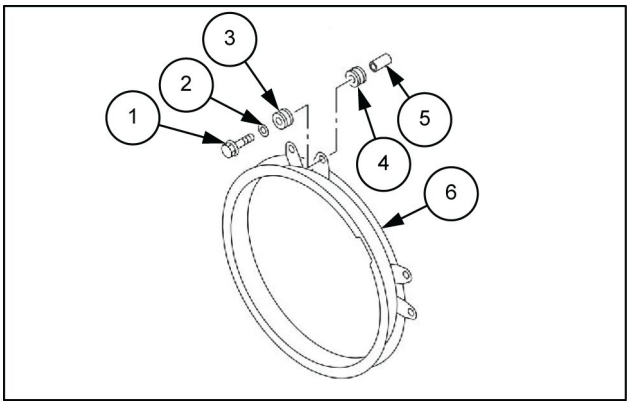
Fan guide removal

1. Remove the fan guide **(6)** from the fan guide bracket.
2. Remove the fan guide bracket from the engine assembly.
    1. Bolt
    2. Washer
    3. Rubber mount
    4. Rubber mount assembly
    5. Guide tube



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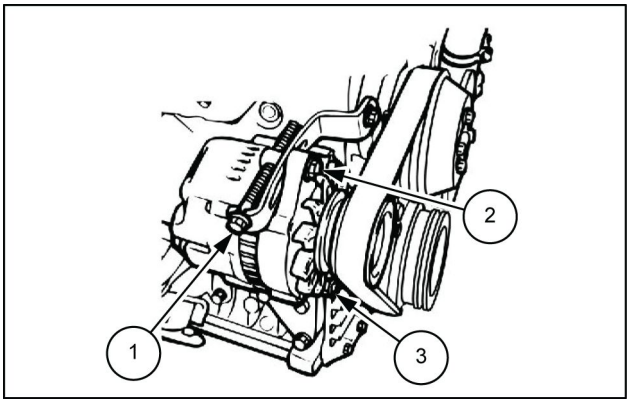
Cooling fan belt removal

1. Remove the cooling fan belt from the engine assembly.
    1. Adjust bolt
    2. Fixing bolt
    3. Fixing bolt



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Crankshaft pulley removal

1. Remove the crankshaft pulley from the crankshaft.
2. Remove the crankshaft damper from the crankshaft pulley.

Crankshaft front oil seal removal

1. Remove the crankshaft front oil seal **(3)** from the crankshaft using the special tool.

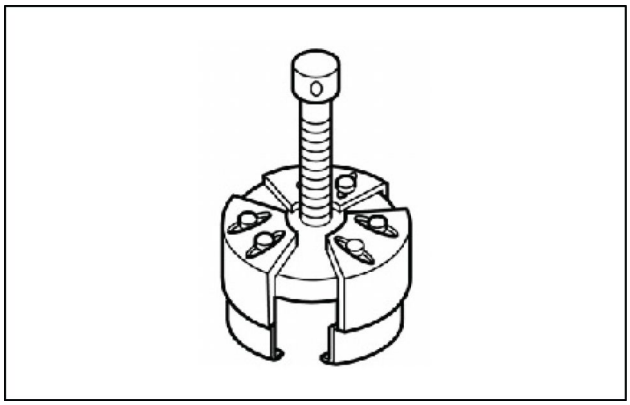
   Special tool: Rear oil seal remover (refer to **Crankshaft - Special tools (10.103)**)

   1. Felt

   - Remove the slinger **(2)** and oil seal together.
   - If the slinger **(2)** of the remover is easy to come off, the outer circumference of the jig can be tightened using a clip band to improve the workability.

   ⚠ CAUTION:

   Be careful not to damage the oil seal press-fitting surface.



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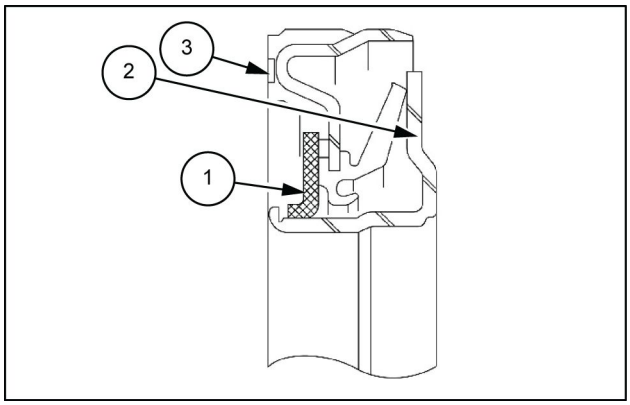

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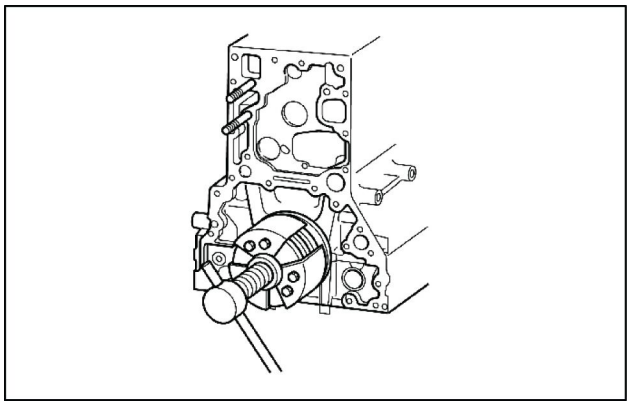

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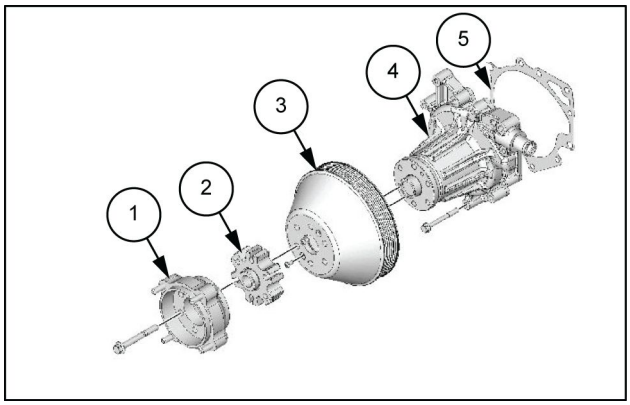
Water pump assembly removal

1. Remove the adapter **(1)** from the water pump assembly **(4)**.
2. Remove the spacer **(2)** from the adapter **(1)**.
3. Remove the fan pulley **(3)** from the water pump assembly **(4)**.
4. Disengage the water hose from the water pump assembly **(4)**.
5. Disengage the water return pipe from the water pump assembly **(4)**.
6. Remove the water pump assembly **(4)** from the front cover.

   5. Gasket



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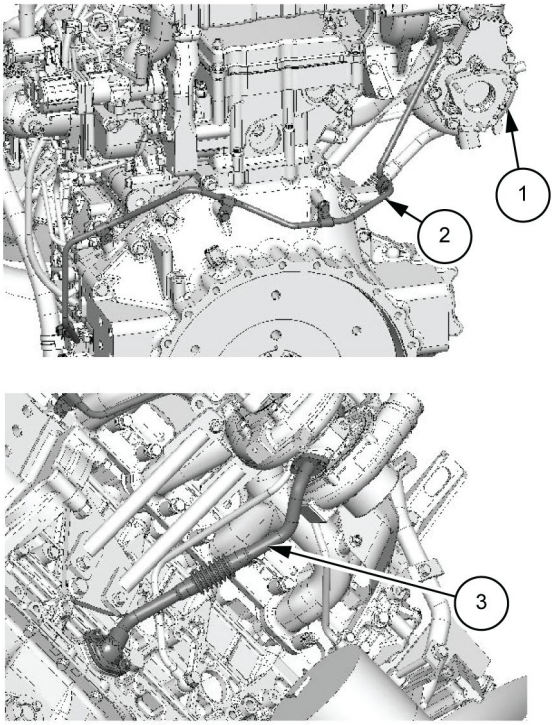
Front cover removal

1. Remove the front cover from the cylinder block.

Turbocharger assembly removal

1. Remove the air cleaner duct from the air cleaner assembly and the turbocharger assembly **(1)**.
2. Remove the air intake hose from the turbocharger assembly **(1)** and the intercooler.
3. Remove the exhaust pipe from the turbocharger assembly **(1)**.
4. Disengage the oil feed pipe **(2)** from the turbocharger assembly **(1)**.
   - Remove the clip.
5. Remove the oil feed pipe **(2)** from the oil port cover.
   - Remove the clip.
6. Disengage the oil return pipe **(3)** from the turbocharger assembly **(1)**.
7. Remove the oil return pipe **(3)** from the cylinder block.



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