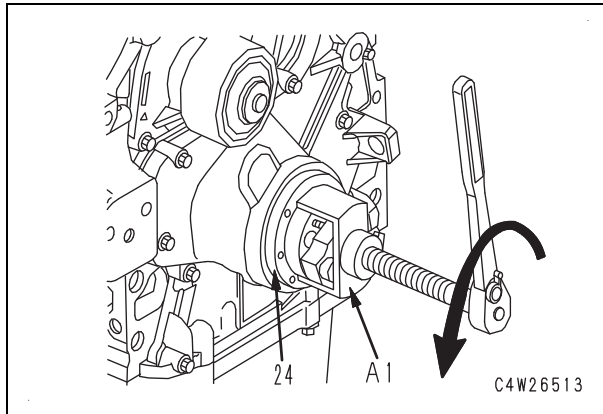
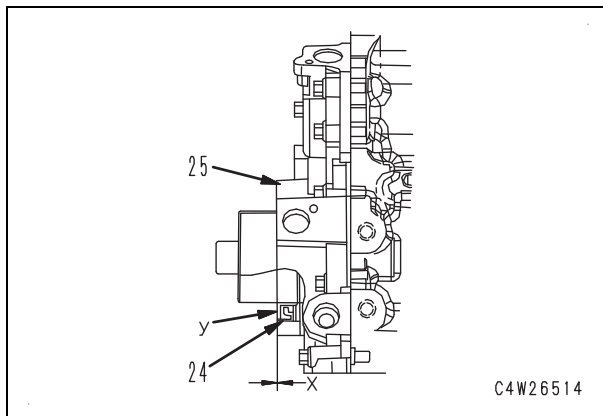


Installation

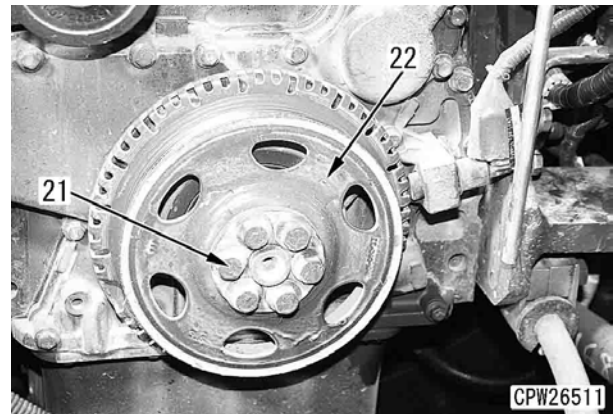
1. Install engine front oil seal (24) by using tool A1.
 - ★ Check that end face corners and seal lip sliding surface of the crankshaft and the housing are free from flaw, burr, or rust before installing the engine front oil seal.
 - ★ Degrease, clean and dry the seal contact surface of the crankshaft and the seal lip surface to prevent oil leakage before installing the engine front oil seal.
 - ★ Do not apply oil, grease, etc. to the crankshaft and seal lip surface when installing the engine front oil seal.



- ★ Dimensions of engine front oil seal (24) must be in the following range from cover (25)
 - Protrusion (x): **Max. 0.38 mm**
 - Facial runout (TIR: Total Indicator Reading) (y): **Max. 0.25 mm**

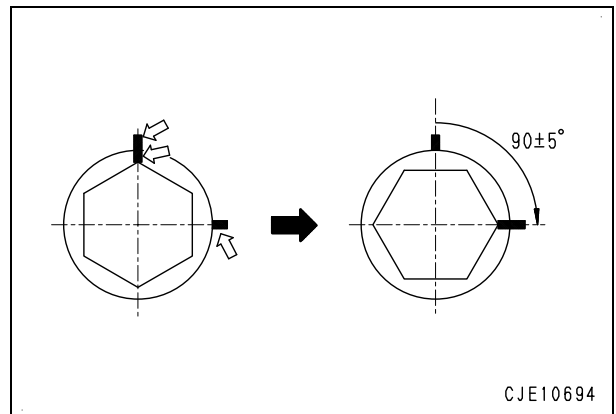


2. Crankshaft pulley
 - 1) Install crankshaft pulley (22) while aligning its dowel hole to the dowel pin of the crankshaft.
 - 2) Tighten mounting bolts (21) according to the following procedure.
 - 1] Tighten the bolts to 55 ± 5 Nm { 5.6 ± 0.5 kgm} in diagonal order.
 - 2] Tighten 180 degrees.
 - 3] Tighten the bolts to 55 ± 5 Nm { 5.6 ± 0.5 kgm} in diagonal order.
 - 4] Retighten the bolts by 90 ± 5 degrees.
 - ★ Tool A6 (wrench) is available for angle tightening. (See the tool table.)



- ★ **When an angle tightening tool is not used**

- 5] After above steps 1] to 3] are finished, put a paint mark on the crankshaft pulley and mounting bolts.
- 6] Retighten the bolts by 90 ± 5 degrees.



- Perform subsequent installation in the reverse order to removal.

Removal and installation of engine rear oil seal assembly

Special tools

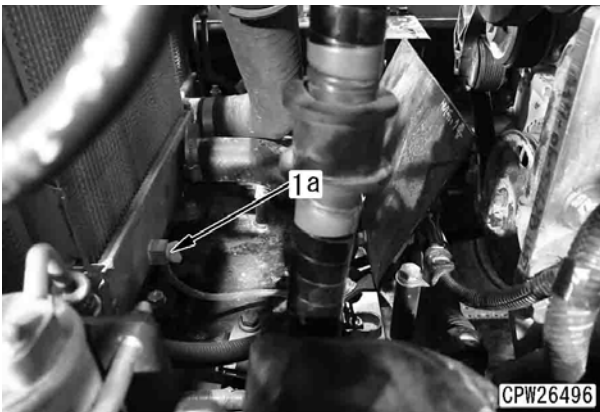
Symbol	Part No.	Part Name	Necessity	Q'ty	New/Redesign	Sketch
A	2	795-799-6500	■	1		
	4	795-799-1131	■	1		

Removal

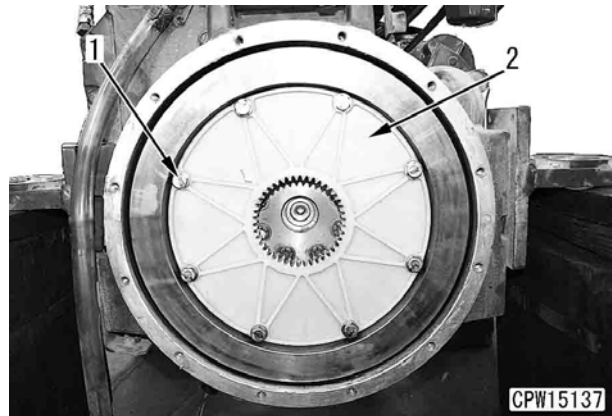
- ▲ Place the machine on a level surface, and set the lock bar to frames to lock front and rear frames.
- ▲ Lower the work equipment to the ground completely and stop the engine. Apply the parking brake and put the blocks under the wheels.
- ▲ Turn the battery disconnect switch to OFF position, and remove the key. (For details, see Testing and adjusting, "Handling battery disconnect switch".)
- ▲ If you drain the coolant when it is still hot, you may be scalded. Wait until the coolant temperature drops before starting the work.

- Loosen radiator drain plug (1a), and drain the coolant.


 Radiator: **Approximately 24.6 l**

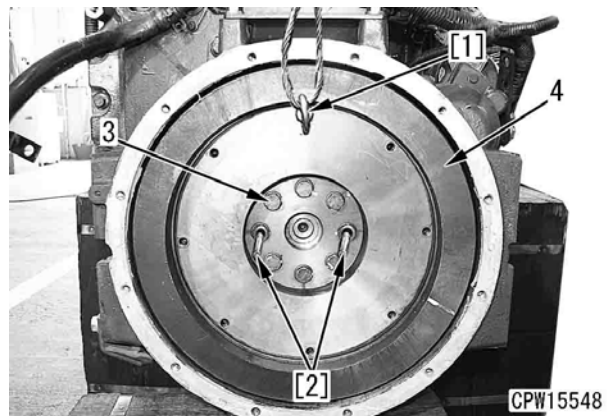


- Remove the engine hood assembly. For details, see "Removal and installation of engine hood assembly".
- Remove the engine assembly. For details, see "Removal and installation of engine assembly".
- Remove 8 mounting bolts (1), and remove damper flange (2). [*1]



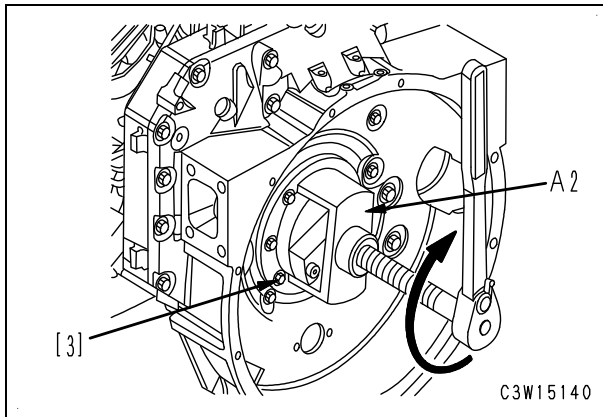
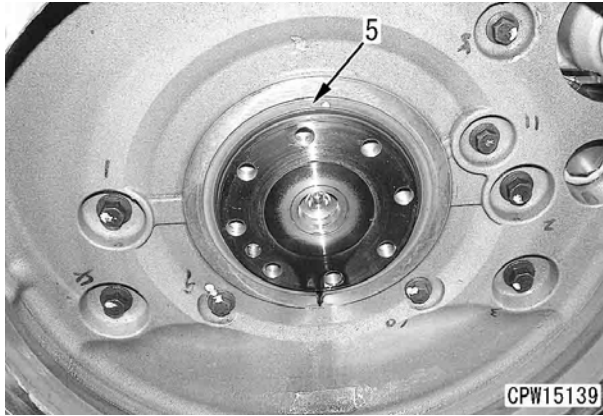
- Install eyebolt [1] in the screw hole of damper mounting bolt, and sling flywheel assembly (4).
- Remove 2 flywheel mounting bolts and install guide bolts [2].
- Remove 6 remaining mounting bolts (3), and hoist and remove flywheel assembly (4). [*2]

 Flywheel assembly: **57 kg**



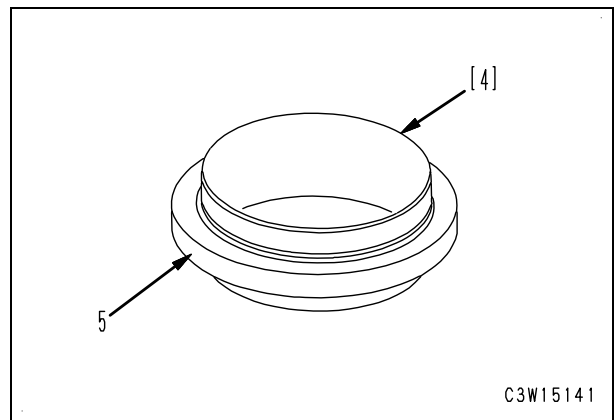
8. Engine rear oil seal

- 1) Install tool A2 to the crankshaft.
- 2) Screw tapping screws [3] of tool A2 into the seal carrier of engine rear oil seal (5).
- 3) Turn the handle clockwise to remove engine rear oil seal (5).

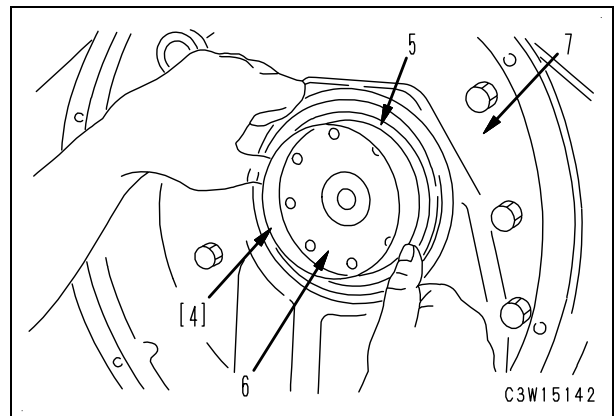


Installation

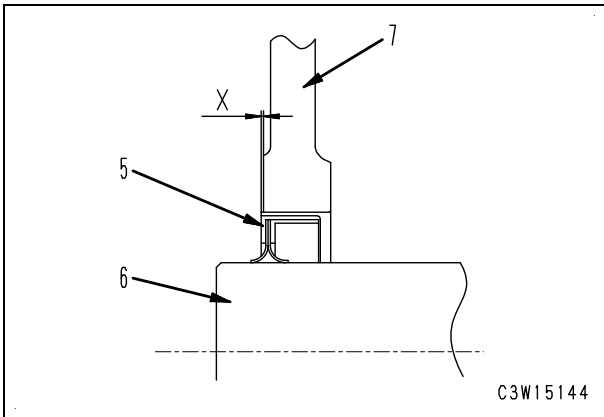
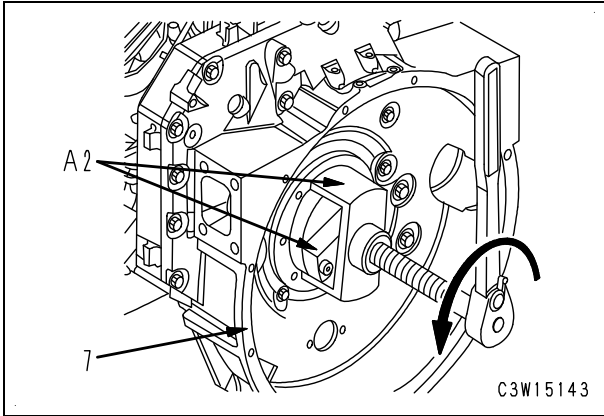
1. Be sure to keep pilot [4] attached to engine rear oil seal (5) until the seal is installed to the crankshaft.
 - ★ Check that end face corners and seal lip sliding surface of the crankshaft and the housing are free from flaw, burr, or rust before installing the engine rear oil seal.
 - ★ Degrease, clean and dry the seal contact surface of the crankshaft and the seal lip surface to prevent oil leakage before installing the engine rear oil seal.
 - ★ Do not apply oil, grease, etc. to the crankshaft and seal lip surface when installing the engine rear oil seal.



2. Install pilot [4] to crankshaft (6), and insert engine rear oil seal (5) into flywheel housing (7).
3. Push in engine rear oil seal (5) further, and then remove pilot [4].



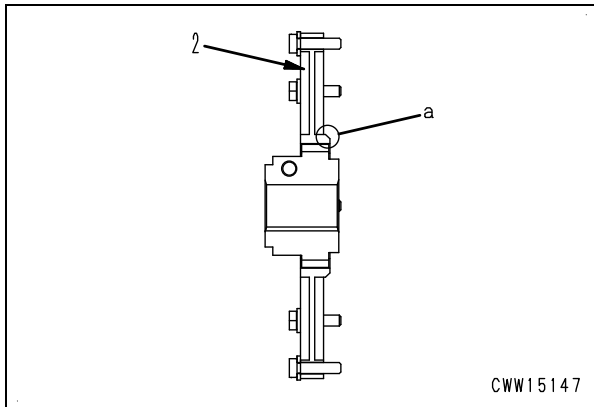
4. By using tool A2, install engine rear oil seal (5) to flywheel housing (7).
- ★ Push in engine rear oil seal (5) taking care not to bend the seal.
 - ★ Protrusion (x) of engine rear oil seal (5): Max. 0.38 mm



- Perform the subsequent installation in the reverse order to removal.

[*1]

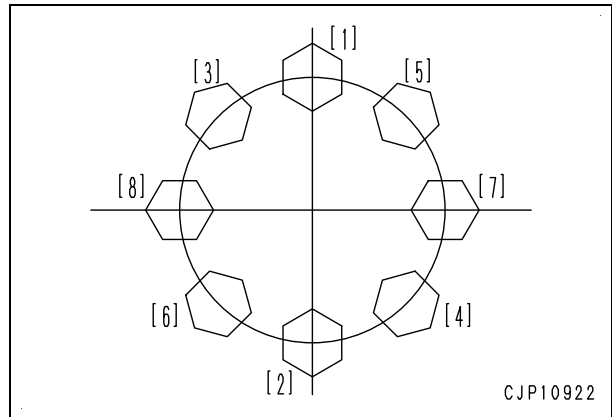
- ★ Install damper flange (2) so that the direction of (a) part is as shown in the following figure.



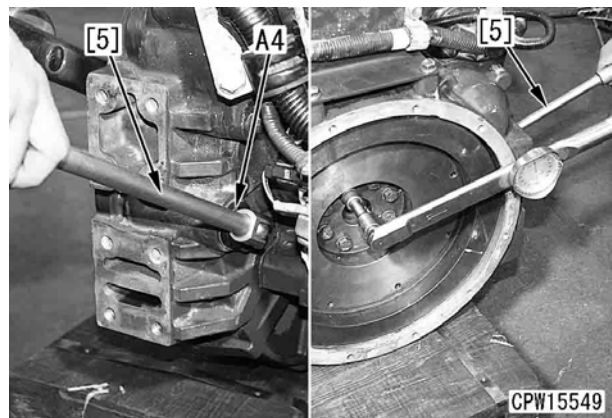
- 🔧 Damper flange mounting bolt (1):
Adhesive (LT-2)
- 🔧 Damper flange mounting bolt (1):
44.1 to 53.9 Nm {4.5 to 5.5 kgm}

[*2]

- ★ Tighten 8 flywheel assembly mounting bolts in the order shown in the figure below.
- 🔧 Flywheel mounting bolt:
137 ± 7 Nm {13.97 ± 0.71 kgm}



- ★ Set tool A4, use wrench [5] to prevent the flywheel from rotating, and tighten flywheel mounting bolts.



- **Measurement of radial runout**

- ★ Radial runout: Max. 0.13 mm

- 1) Install dial gauge [6] on the stand, and set it to flywheel housing (7).
- 2) Apply the probe of dial gauge perpendicular to spigot joint part (b) or outer circumference of the flywheel.
- 3) Rotate the flywheel by 1 turn, and measure the difference between the lowest and the highest values the pointer of dial gauge points.

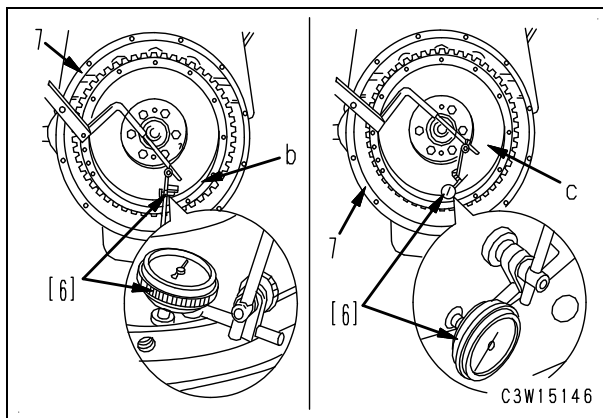
- ★ Rotate the flywheel 1 turn and check that the dial gauge pointer is at the same position as it was located before the revolution.

- **Measurement of facial runout**

- ★ Facial runout: Max. 0.20 mm

- 1) Install dial gauge [6] on the stand, and set it to flywheel housing (7).
- 2) Apply the probe of dial gauge perpendicular to end face (c) of the flywheel at a point near the outer circumference.
- 3) Rotate the flywheel by 1 turn, and measure the difference between the lowest and the highest values the pointer of dial gauge points.

- ★ Rotate the flywheel 1 turn and check that the dial gauge pointer is at the same position as it was located before the revolution.




- **Air bleeding**

Bleed air from the fuel circuit. For details, see Testing and adjusting, "Bleeding air from fuel circuit".

- **Refilling with coolant**

Refill with coolant to the specified level through the coolant filler port. Run the engine to circulate the coolant through the system. Then check the coolant level again.

 Total of coolant: **Approximately 24.6 l (For details, see "Table of fuel, coolant and lubricants".)**

Removal and installation of cooling fan and fan motor assembly

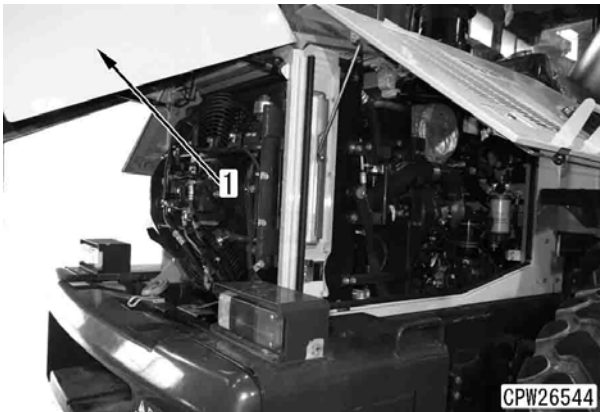
Special tools

Symbol	Part No.	Part Name	Necessity	Qty	New/Redesign	Sketch
A 8	791-415-2002	Remover	■	1		

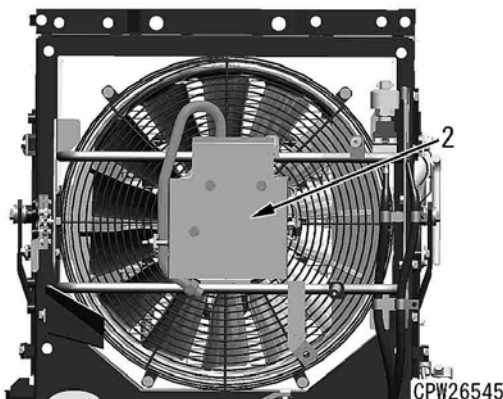
Removal

- ▲ Place the machine on a level surface, and set the lock bar to frames to lock front and rear frames.
- ▲ Lower the work equipment to the ground completely and stop the engine. Apply the parking brake and put the blocks under the wheels.
- ▲ Turn the battery disconnect switch to OFF position, and remove the key. (For details, see Testing and adjusting, "Handling battery disconnect switch".)

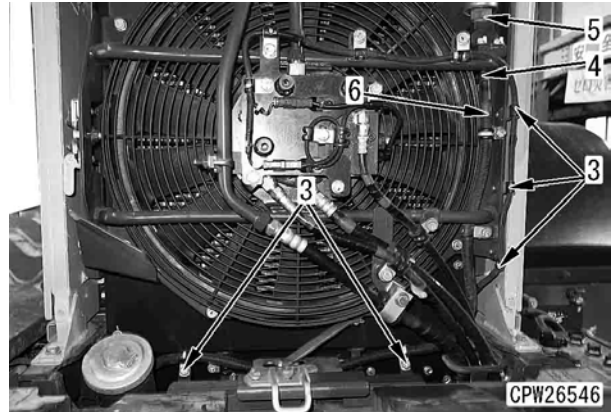
1. Open radiator grille (1).



2. Remove cover (2).



3. Remove 4 clamps (3) of the fuel tank breather hose.
4. Remove clip (4), and disconnect hose (5) from breather (6).
5. Remove breather (6).



6. Remove 2 wiring harness clamps (7).
7. Disconnect wiring harness connectors R19 (8) and R29 (9).
8. Disconnect P port hose (10), TC port hose (11), T port hose (12), and PP port hose (13).
 - ★ Plug the disconnected hoses and ports to prevent oil from flowing out.
9. Remove 4 shroud mounting bolts (14). [*1]

