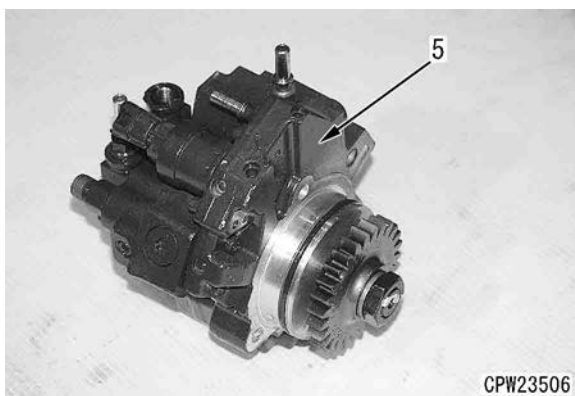
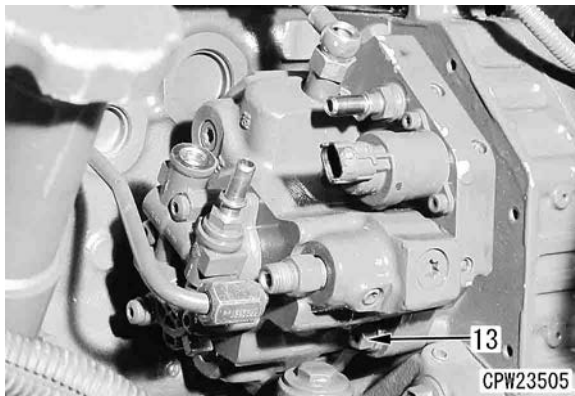


12. Remove nuts (13) (3 places), and remove supply pump (5). [*3]

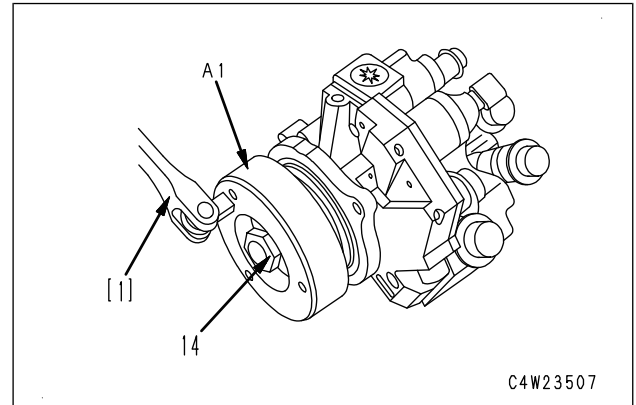
★ Supply pump can be removed together with the gear.



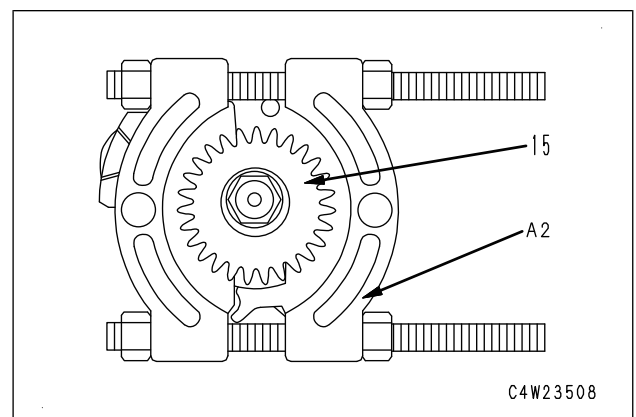
13. Remove the gear from the supply pump in accordance with the following procedure. [*4]

1) Fix the gear by using support A1 and 1/2-inch spin handle (1), and loosen nut (14).

★ Do not remove nut (14) from the shaft.



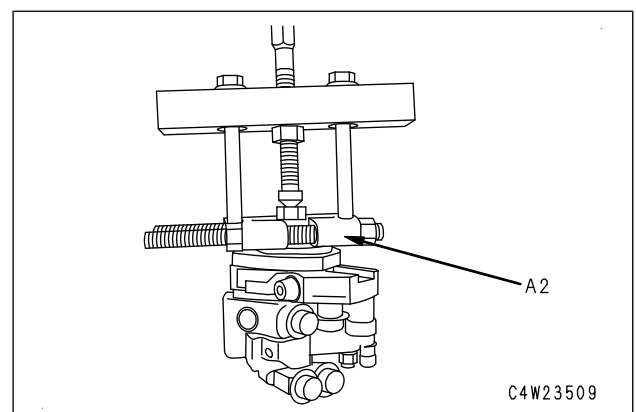
2) Install tool A2 between the flange and gear (15).



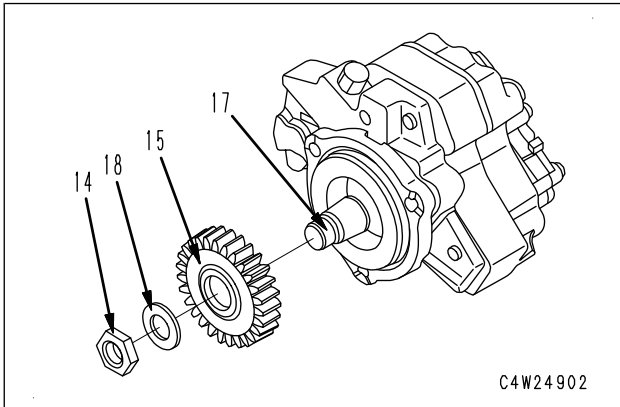
3) Install puller [2] on tool A2 and the shaft.

4) Turn center bolt [3] until the gear is disengaged from the shaft.

5) Remove tool A2 and puller [2].



6) Remove nut (14), lock washer (18) and gear (15) from shaft (17).



Installation (WA320-AD70-720-K-00-A)

- Perform installation in the reverse order to removal.

⚠ Do not reuse a removed hose as a rule since internal parts of its adapter can be damaged in removal. Replace it with a new one for reassembly.

[*1], [*2]

- Procedure for installing high-pressure pipe (10)
 1. Tighten sleeve nuts on supply pump side and common rail side by hand.
 2. Tighten the sleeve nut on supply pump first, and then tighten the sleeve nut on common rail side.

 **Sleeve nut:**

$35 \pm 3.5 \text{ Nm} \{3.57 \pm 0.36 \text{ kgm}\}$

3. Install 2 clamps (12) for high-pressure pipe (10).

 **Rubber clamp fixing bolt:**

$24 \pm 4 \text{ Nm} \{2.45 \pm 0.41 \text{ kgm}\}$

- ★ If rubber is hardened, replace the clamp with a new one.
4. Install boot (11).
 - ★ Install the boot with its slit out and down.
 - ★ The boot is installed for fire prevention and is expected to prevent fuel from flying directly to highly heated portions of the engine if fuel leaks.

[*3]

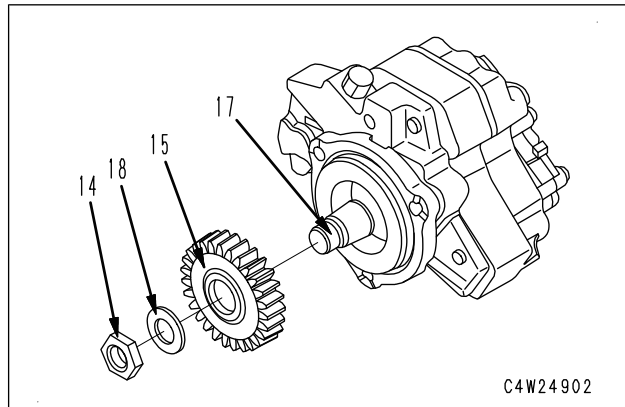
 **Supply pump mounting nut:**

$24 \pm 4 \text{ Nm} \{2.45 \pm 0.41 \text{ kgm}\}$


[*4]

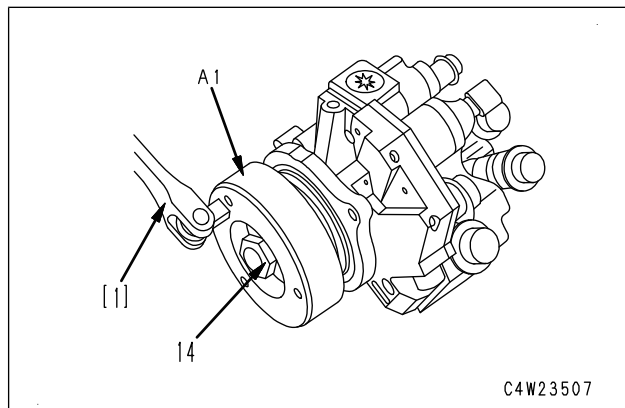
- Procedure for installing gear (15)
 - ★ Before installation, clean dusts and foreign substances on the mating surfaces of shaft (17) and gear (15), and keep the mating surfaces dry.
 1. Install gear (15) to shaft (17).

2. Install lock nuts (14) with washer (18), and finger-tighten the nut lightly.



3. Use support A1 and 1/2-inch spin handle [1] to fix the gear, and tighten nuts (14).

 **Supply pump gear mounting bolt:**
 $105 \pm 5 \text{ Nm} \{10.7 \pm 0.51 \text{ kgm}\}$



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

Removal and installation of injector assembly (WA320-AE60-924-K-00-A)

★ Special tools

Symbol	Part No.	Part name	Necessity	Qty
A	3	795-799-6700	Puller	1
	4	795-799-1131	Gear	1

⚠ Place the machine on a level ground, and turn the parking brake switch to ON position.

⚠ Set the frame lock bar to LOCK position, and chock the wheels.

⚠ Lower the work equipment to the ground, and set the work equipment lock switch to LOCK.

⚠ Turn the starting switch to OFF position and stop the engine.

⚠ Turn the battery disconnect switch to OFF position, and remove the key. (For details, see Testing and adjusting, "Handling battery disconnect switch".)

★ When removing or installing fuel piping, be careful that foreign matter does not enter. If any dirt or dust sticks the parts of the fuel system, clean it off thoroughly with clean fuel.

Removal (WA320-AE60-520-K-00-A)

1. Remove the engine hood assembly. For details, see "Removal and installation of engine hood assembly".

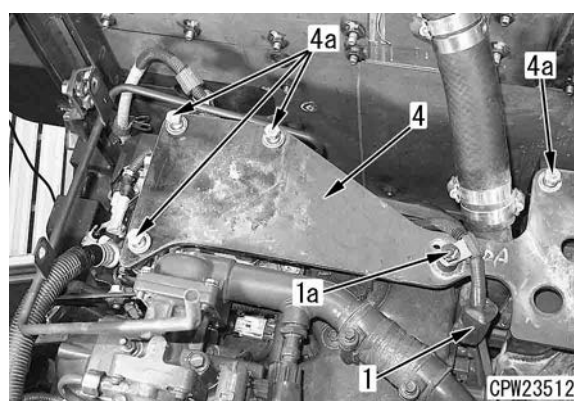
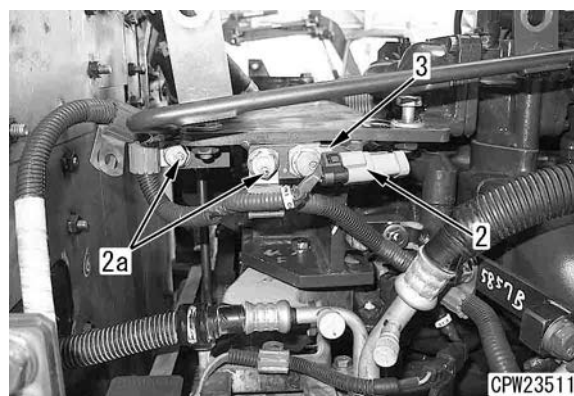
★ Remove it and air cleaner as a unit.

2. Remove KDPF assembly. For details, see "Removal and installation of KDPF assembly".

1) Remove wiring clamp (1a), and disconnect exhaust manifold pressure sensor connector (EXHAUST PRESSURE) (1).

2) Remove wiring clamp (2a), and disconnect connector (2) from clip (3).

3) Remove mounting bolts (4a), and remove bracket (4).



3. Remove KCCV ventilator assembly. For details, see "Removal and installation of KCCV ventilator assembly".

4. Remove hose (5).

5. Remove EGR valve assembly (6). For details, see "Removal and installation of EGR valve assembly".

6. Loosen clamp (7a), and remove hose (7) and flange (8) together as a unit.



7. Remove the intake assembly in accordance with the following procedure.

1) Disconnect clamps (9a) (3 places).

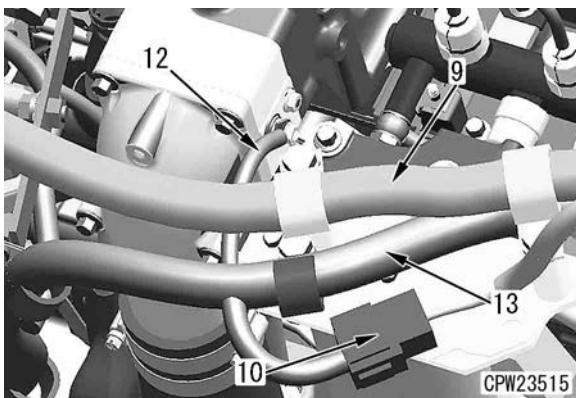
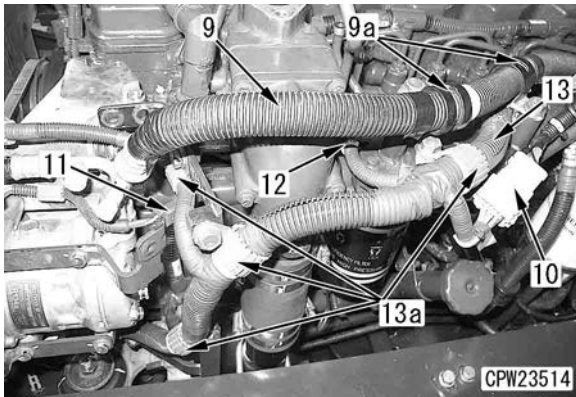
★ Move hose (9) to the outside of the machine.

2) Disconnect connectors (10) and (11).

3) Disconnect heater wiring terminal (12). [*1]

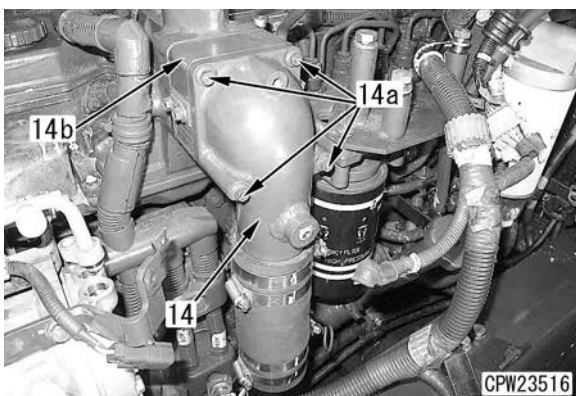
4) Disconnect clamp (13a).

- ★ Move wiring (13) to the outside of the machine.



- 5) Remove mounting bolts (14a) (4 pieces), and remove flange (14). [*2]

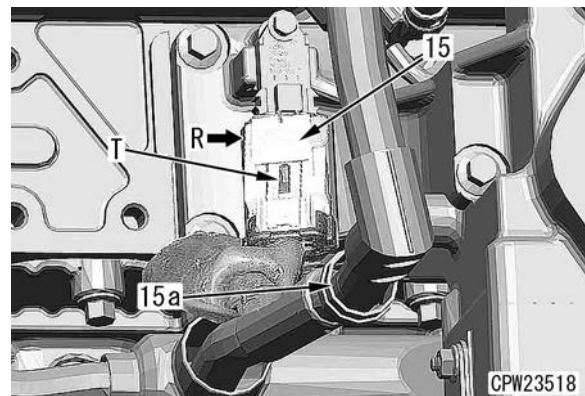
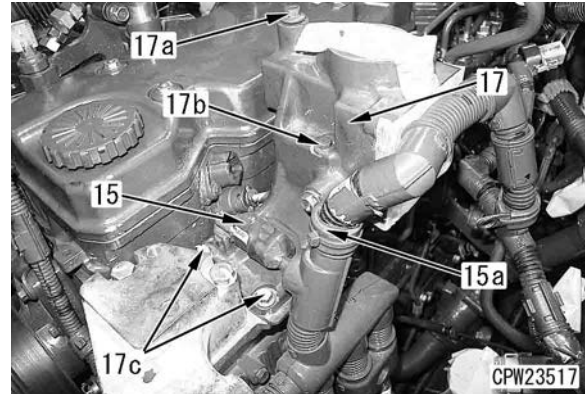
- ★ Ribbon heater (14b) is tightened together. Remove it simultaneously.



- 6) Remove clamp (15a), and disconnect ambient pressure sensor connector (15).

- ★ When disconnecting the ambient pressure sensor connector (15), move lock toward the right side (R) and pull the connector out while pressing stopper (T).

- 7) Remove mounting bolts (17a), (17b), and (17c) (4 pieces), and remove intake assembly (17). [*3]



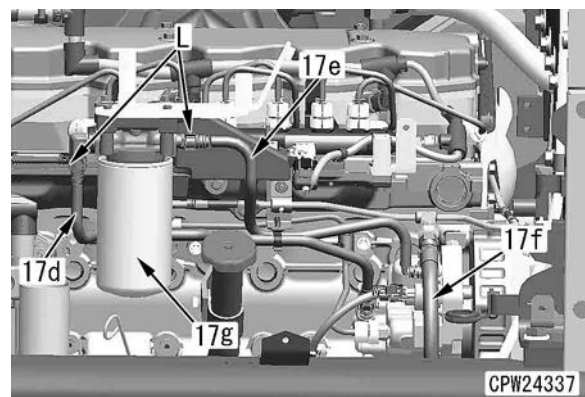
8. Remove fuel filter hoses (17d) and (17e).

- ★ Remove mud on hose connection beforehand. (Sometimes lock (L) is hard to unlock due to mud.)

- ★ Pull out the hose while pressing lock (L) at the hose connection from both sides.

9. Disconnect fuel return hose (17f).

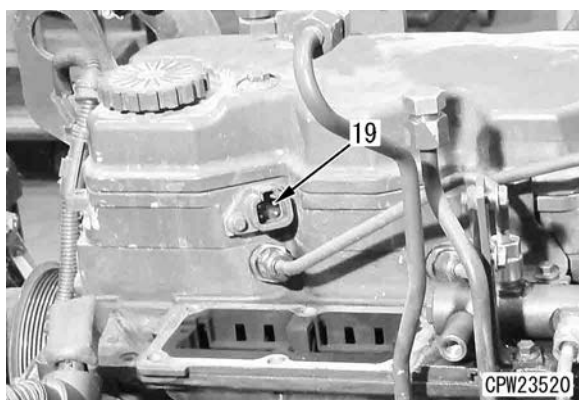
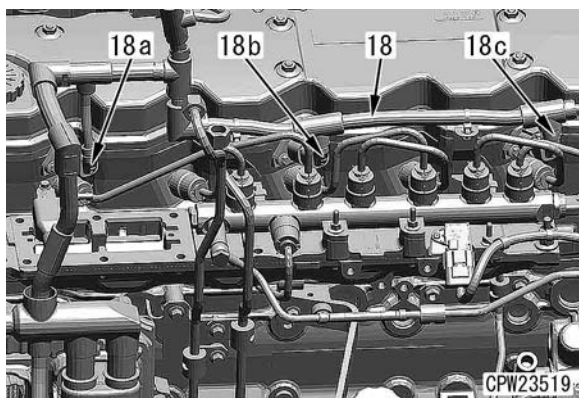
10. Remove fuel filter (17g) together with the bracket.



11. Remove harness (18) clamps (2 places), and disconnect connector (18a), (18b), and (18c) from the cylinder head.

- ★ While pressing the lock of the connector with a flat-head screwdriver, insert another screwdriver in the clearance of the connector, and pry off the connector gradually.

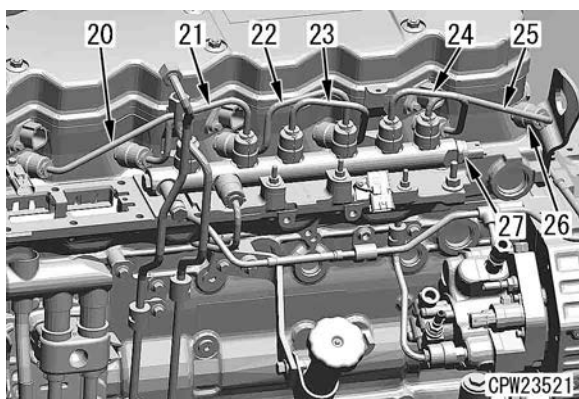
- ★ Do not remove injector harness connector (19) from the rocker housing other than it is required.



12. Remove the high-pressure pipes in accordance with the following procedure. [*4]

- 1) Remove fuel spray prevention caps (26) (6 places) of high-pressure pipes (20) to (25).
- 2) Disconnect high-pressure pipes (20) to (25) from the cylinder head.

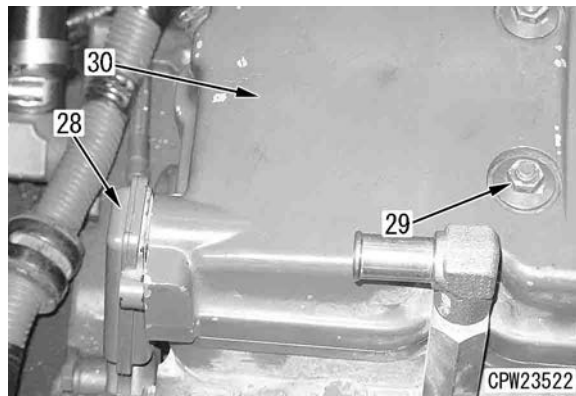
- ★ Also remove boot on the common rail side, and loosen sleeve nut beforehand.
- ★ Do not remove common rail pressure sensor (27) for any purpose other than replacement. [*5]



13. Remove blowby duct (28). [*6]

14. Remove mounting nuts (29) (6 pieces), and remove head cover (30). [*7]

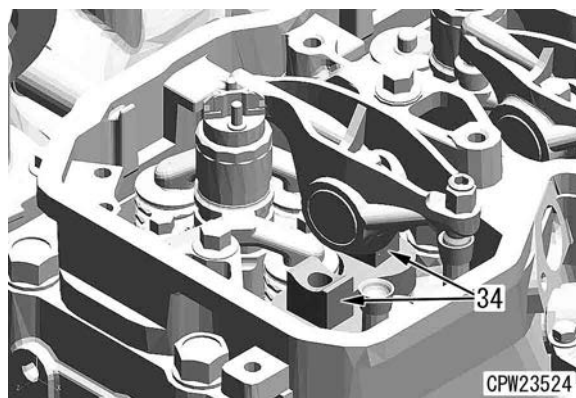
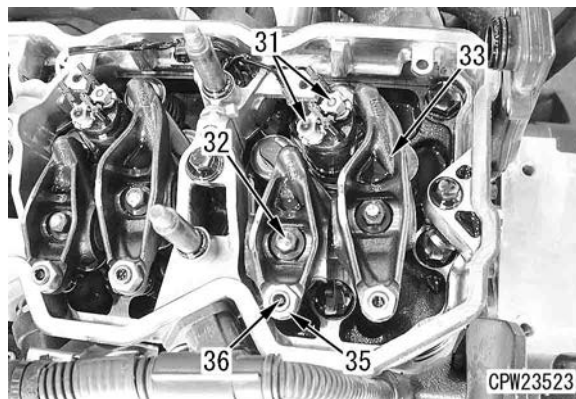
- ★ Clean the surrounding area in advance to prevent intrusion of mud and dirt.



15. Remove harness nut (31) from the injector assembly.

16. Remove mounting bolts (32) of the rocker arm assembly, and remove rocker arm assembly (33) and rocker arm support (34).

- ★ Loosen lock nuts (35), and then loosen adjustment screws (36) a few turns each so that excessive force does not apply to the push rods when the rocker arm assembly is installed.

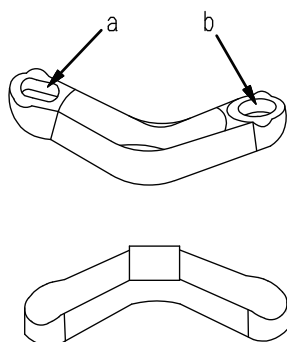


17. Remove crossheads (37).

- ★ Record the locations and directions of the crossheads (hole shapes of parts "a" and "b"). (Install them in the recorded directions when reassembling.)

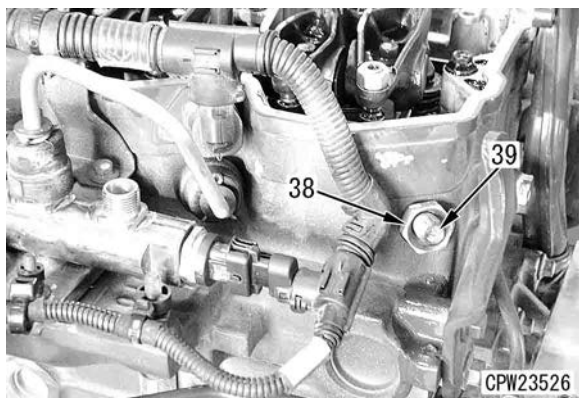
50 Disassembly and assembly

Engine and cooling system

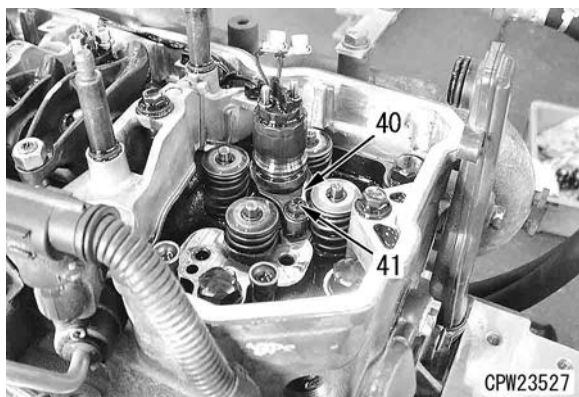


18. Remove retaining nut (38) and remove inlet connector (39).

- ★ Clean the surrounding area in advance to prevent mud and dirt from entering into the hole of inlet connector.

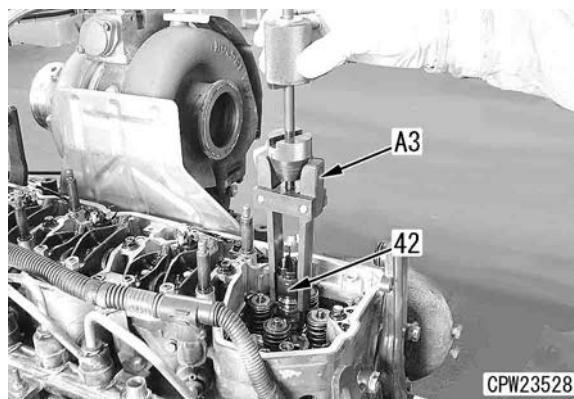


19. Remove mounting bolt (41) of holder (40).



20. Using tool A3, remove injector assembly (42).


- ★ Do not pry the injector assembly head to remove it.
- ★ Be careful not to allow dirt and foreign matter to enter the mounting portion of the injector assembly.



Installation (WA320-AE60-720-K-00-A)

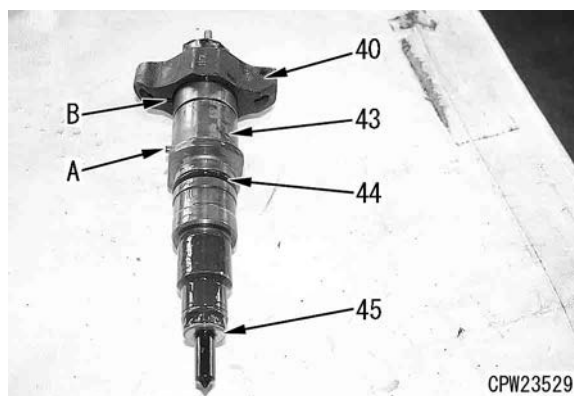
1. Injector assembly

- ★ When replacing an injector assembly with a new one, be sure to replace inlet connector with a new one as well.
 - ★ Check that injector bore on cylinder head is free from damages or dusts.
- 1) Install O-ring (44) and gasket (45) to injector (43).
 - 2) Apply engine oil to O-ring and head side mounting hole of injector.

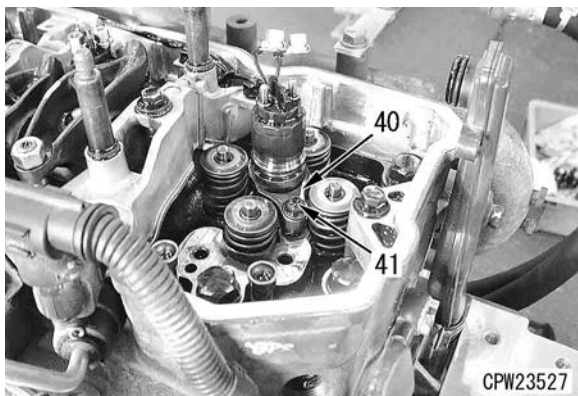
 **O-ring and head side hole of injector:**

Engine oil

- 3) Align concave portion (B) of holder (40) with convex portion (A) of injector to install holder.

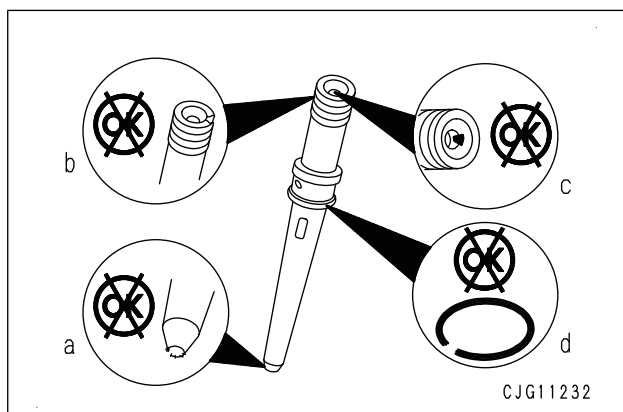


- 4) Install injector assembly (42) to cylinder head directing fuel inlet hole of injector assembly toward air intake manifold.
- 5) Tighten holder mounting bolt (41) 3 to 4 threads.

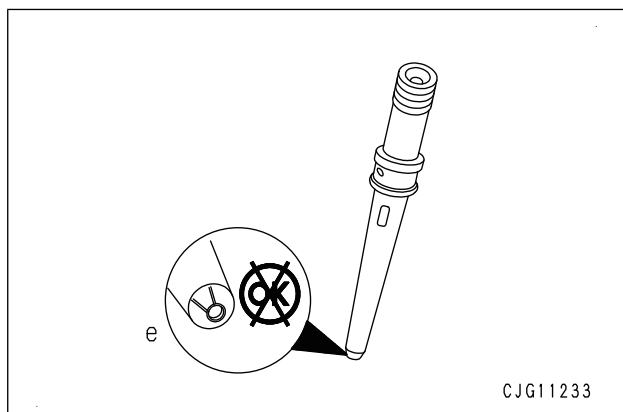


6) Check inlet connector on the following points. If any abnormality is found, replace it.

- When there are burrs or wear on top-end part (a) or rear-end part (b) of inlet connector.
- When there is foreign matter on edge filer at rear-end part (c) of inlet connector.
- Cracks or deterioration are recognizable on the O-ring of the inlet connector upper (d) portion.



- When there is a worn part or an uneven seat contact mark on seat surface (e) at front-end of inlet connector.
- ★ If high-pressure fuel leaks through the inlet connector, seat surface has fine streaks or cracks.



7) Apply engine oil to O-ring (part C) and head side (part D) of inlet connector (39).

 **O-ring and head side of inlet connector:**

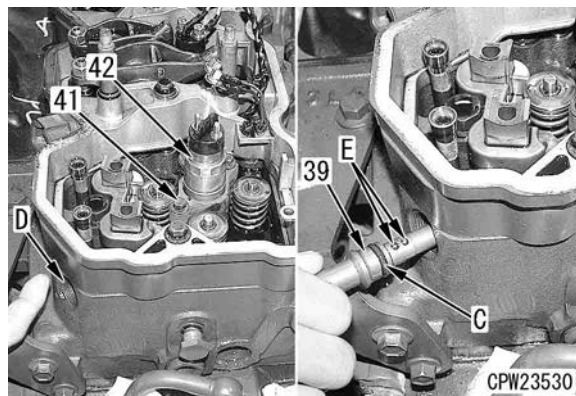
Engine oil

8) Insert inlet connector (39) to injector assembly (42) and tighten it lightly using retaining nut (38).

- ★ After tightening lightly, it is tightened to the specified torque in a succeeding step. Be sure to tighten it to the specified torque in both steps. Insufficient or excessive tightening torque can be the cause for fuel leakage into the engine.
- ★ Install inlet connector so that its positioning ball (part E) becomes as guide groove part on head side.

 **Retaining nut (38) (tightening lightly):**

$15 \pm 5 \text{ Nm}$ { $1.53 \pm 0.51 \text{ kgm}$ }




9) Tighten mounting bolts (41) of holder (40) alternately.

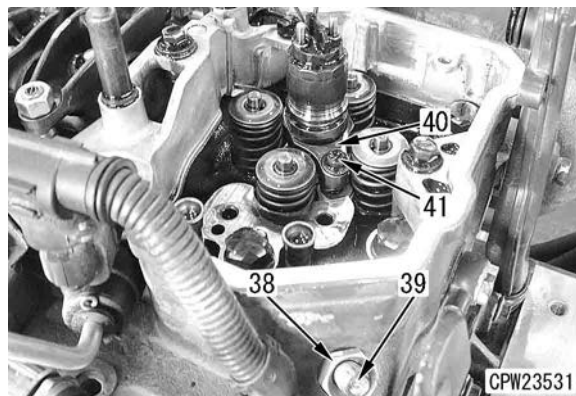
 **Mounting bolt:**

$8 \pm 0.8 \text{ Nm}$ { $0.82 \pm 0.08 \text{ kgm}$ }

10) Tighten retaining nut (38) of inlet connector (39).

 **Retaining nut (38) (tightening to the specified torque):**

$50 \pm 5 \text{ Nm}$ { $5.1 \pm 0.5 \text{ kgm}$ }



2. Rocker arm assembly and crosshead