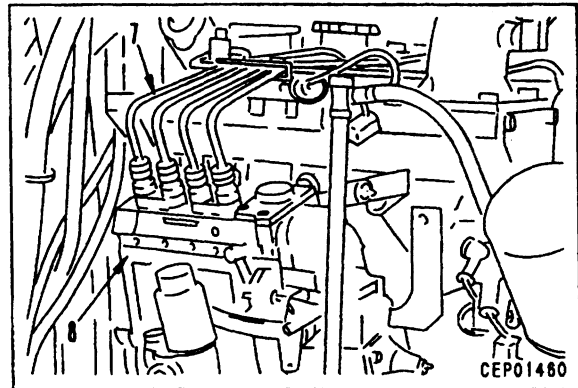
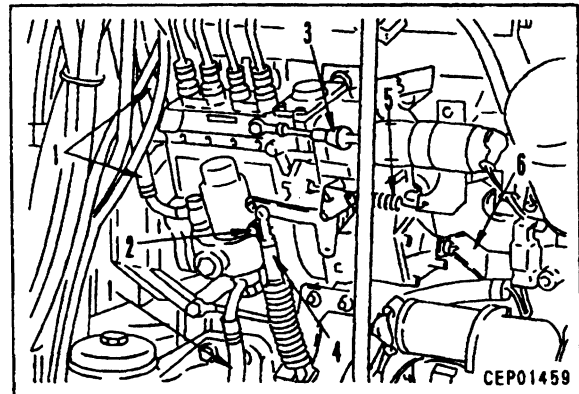


REMOVAL OF FUEL INJECTION PUMP

Serial No.: 7928 and up

⚠ Disconnect the cable from the negative (-) terminal of the battery.

1. Disconnect 3 fuel feed hoses (1).
2. Remove lubrication tube (2).
3. Disconnect engine stop solenoid rod (3). ※ 1
4. Disconnect fuel control cable (4). ※ 2
5. Remove return spring (5).
6. Disconnect bracket (6).
7. Disconnect 4 delivery tubes (7). ※ 3
8. Remove fuel injection pump assembly (8). ※ 4



INSTALLATION OF FUEL INJECTION PUMP ASSEMBLY

Serial No.: 7928 and up

- Carry out installation in the reverse order to removal.


※ 1

- ★ Adjust the engine stop solenoid linkage. For details, see TESTING AND ADJUSTING.

※ 2

- ★ Adjust the fuel control linkage. For details, see TESTING AND ADJUSTING.

※ 3

- ★  Sleeve nut:
 $22.1 \pm 2.5 \text{ Nm } \{2.25 \pm 0.25 \text{ kgm}\}$

※ 4

- ★ Adjust fuel injection timing. For details, see TESTING AND ADJUSTING.

INSTALLATION OF FUEL INJECTION PUMP ASSEMBLY

Serial No.: 7928 and up

- Carry out installation in the reverse order to removal.

※ 1

- ★ Install the cables to the dimensions checked when removed.

※ 2

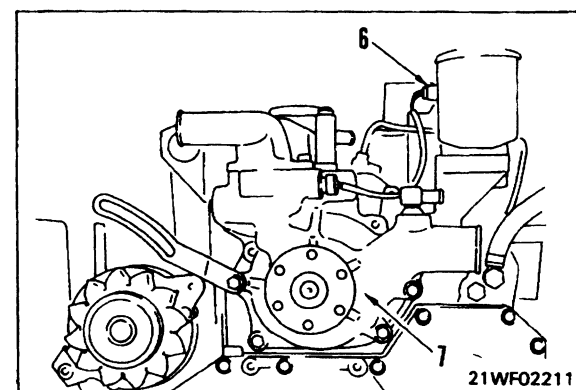
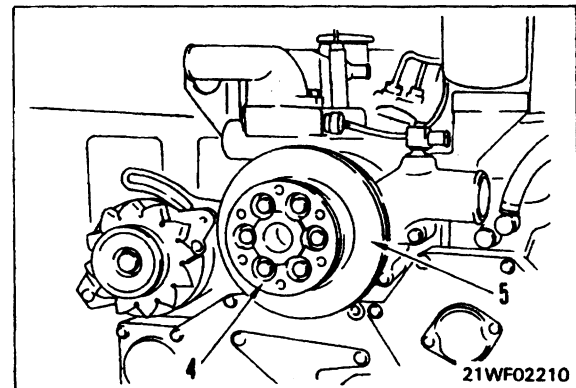
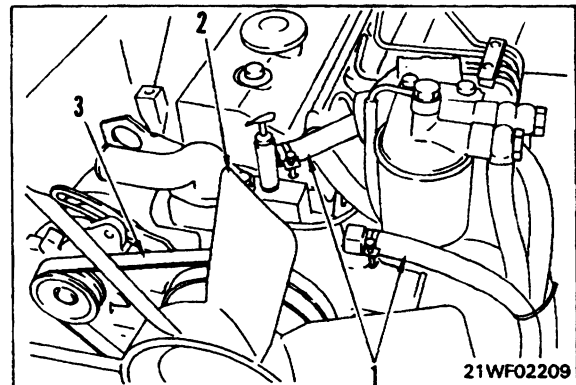
- ★  Sleeve nut:
 $22.1 \pm 2.5 \text{ Nm}$ { $2.25 \pm 0.25 \text{ kgm}$ }

※ 3

- ★ Adjust fuel injection timing. For details, see TESTING AND ADJUSTING.

REMOVAL OF WATER PUMP ASSEMBLY

1. Drain coolant.
2. Remove radiator assembly. For details, see REMOVAL OF RADIATOR ASSEMBLY.
3. Disconnect 2 heater hoses (1). (Only machine of cabin specification)
4. Remove fan (2).
5. Remove belt (3). ※ 1
 ★ Loosen the mounting nut and adjustment bolt of the alternator and move the alternator toward the cylinder block, then remove the fan belt.
6. Remove spacer (4).
7. Remove pulley (5).
8. Disconnect connector (6).
9. Remove water pump assembly (7).



INSTALLATION OF WATER PUMP ASSEMBLY

- Carry out installation in the reverse order to removal.



- ★ Adjust the fan belt tension. For details, see ENGINE STANDARD VALUES TABLE.

- **Refilling with water**
Add water through the water filler to the specified level. Run the engine to circulate the water through the system. Then, check the water level again.
- **Refilling with oil**
★ Add oil through the oil filler to the specified level. Run the engine to circulate the oil through the system. Then, check the oil level again.

REMOVAL OF NOZZLE HOLDER ASSEMBLY

1. Disconnect air intake hose (1) from the connector.
(Only No. 4)

※ 1

2. Remove fuel injection tube (2).

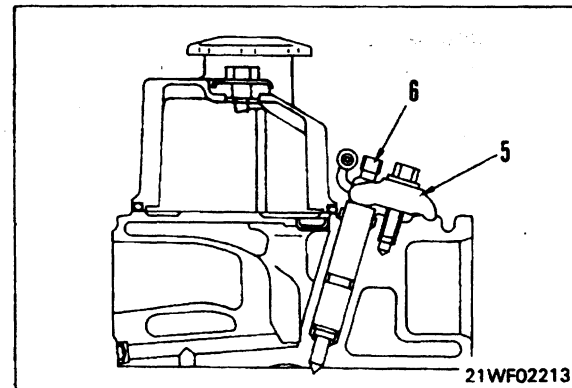
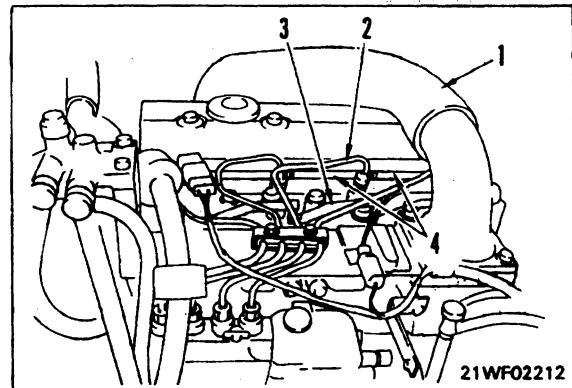
※ 2

3. Remove heater wire (3).

4. Disconnect spill hose (4).

5. Remove holder (5), then remove nozzle holder assembly (6).


※ 3




INSTALLATION OF NOZZLE HOLDER ASSEMBLY

- Carry out installation in the reverse order to removal.


※ 1

 Hose clamp:
 $5.9 \pm 0.49 \text{ Nm} \{0.60 \pm 0.05 \text{ kgm}\}$

※ 2

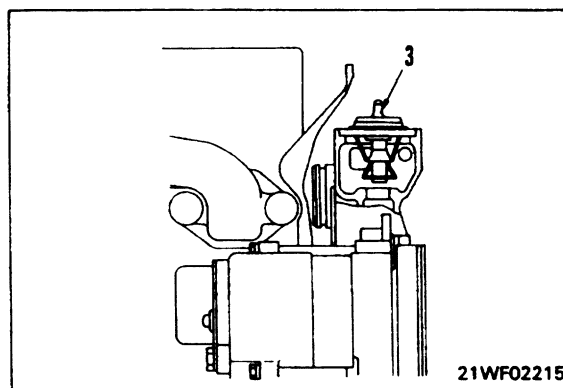
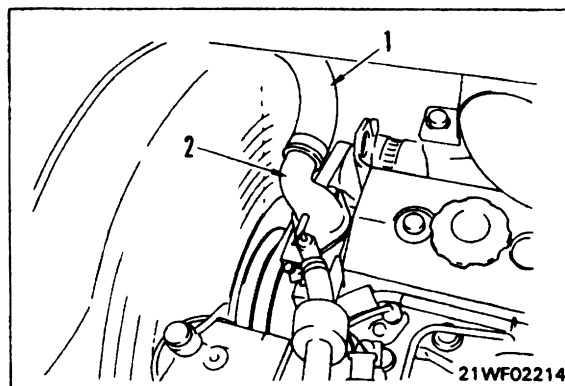
 Sleeve nut:
 $22.1 \pm 2.5 \text{ Nm} \{2.25 \pm 0.25 \text{ kgm}\}$

※ 3

 Nozzle holder mounting bolt:
 $44.1 \pm 4.5 \text{ Nm} \{4.5 \pm 0.5 \text{ kgm}\}$

REMOVAL OF THERMOSTAT ASSEMBLY

1. Drain coolant.
2. Disconnect hose (1).
3. Remove connector (2).
4. Remove thermostat assembly (3).

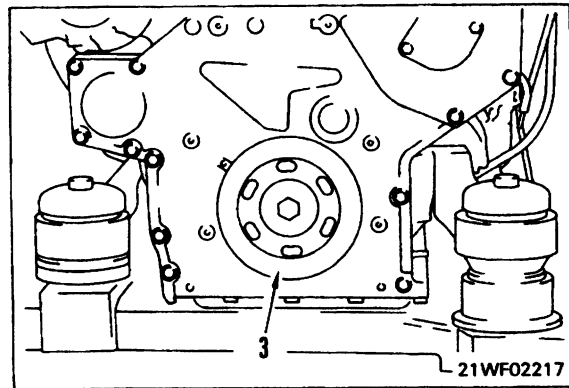
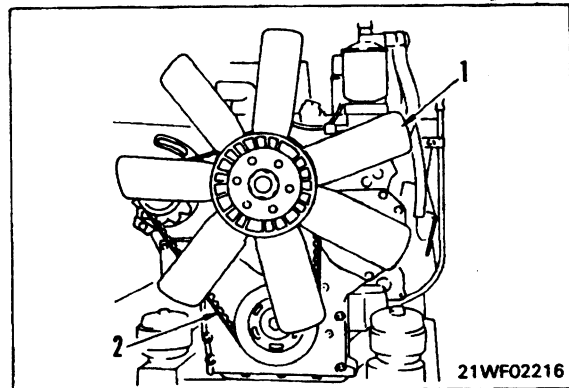


INSTALLATION OF THERMOSTAT

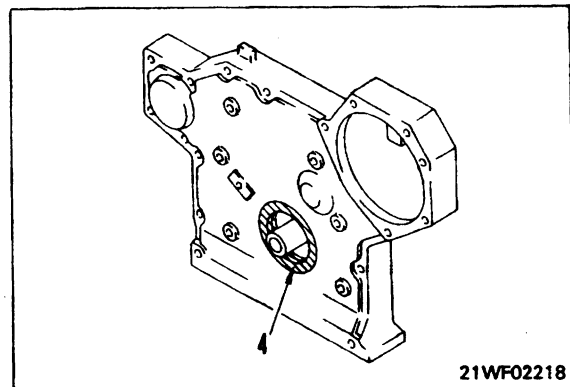
- Carry out installation in the reverse order to removal.
- **Refilling with water**
Add water through the water filler to the specified level. Run the engine to circulate the water through the system. Then, check the water level again.

REMOVAL OF ENGINE FRONT SEAL

1. Remove radiator assembly. For details, see REMOVAL OF RADIATOR ASSEMBLY.
2. Remove fan (1).
3. Remove belt (2). ※ 1
 - ★ Loosen the mounting nut and adjustment bolt of the alternator and move the alternator toward the cylinder block, then remove the fan belt.
4. Remove crank pulley (3). ※ 2



5. Remove front seal (4). ※ 3



INSTALLATION OF ENGINE FRONT SEAL

- Carry out installation in the reverse order to removal.

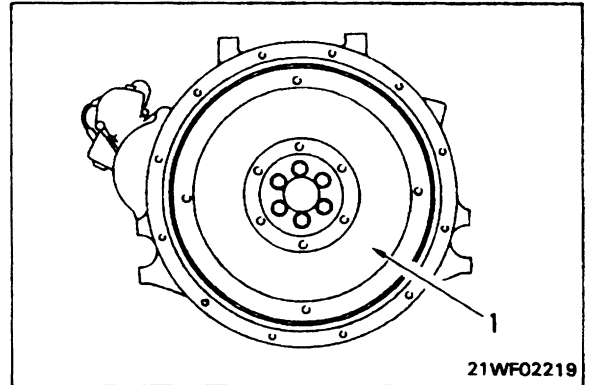
- ※ 1
- ★ Adjust the fan belt tension. For details, see ENGINE STANDARD VALUES TABLE.

- ※ 2
- Pulley mounting bolt:
 $93.2 \pm 4.9 \text{ Nm}$ ($9.5 \pm 0.5 \text{ kgm}$)

- ※ 3
- Oil seal lip: **Grease (G2-LI)**
- ★ Press fit the front seal until it is flush with the front cover.

REMOVAL OF ENGINE REAR SEAL

1. Remove damper assembly. For details, see REMOVAL OF DAMPER ASSEMBLY.
2. Remove flywheel assembly (1). ※ 1
3. Remove rear seal (2). ※ 2



INSTALLATION OF ENGINE REAR SEAL

- Carry out installation in the reverse order to removal.

※ 1

- ★ Tighten the flywheel mounting bolts in the following order.

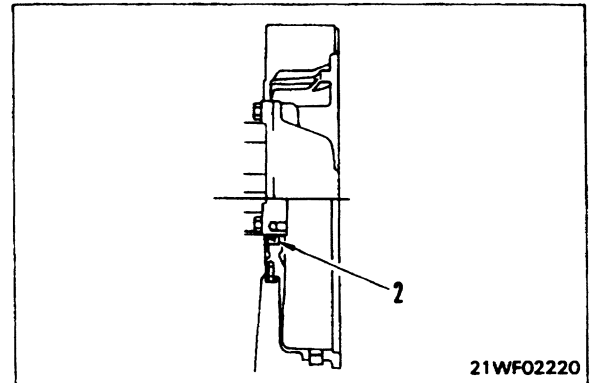
 Engine oil: (EO30)

 Flywheel mounting bolt:

1st time: 88.3 ± 29.4 Nm { 9.0 ± 3.0 kgm}

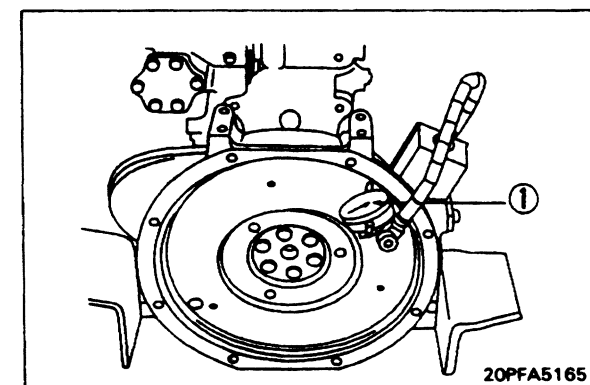
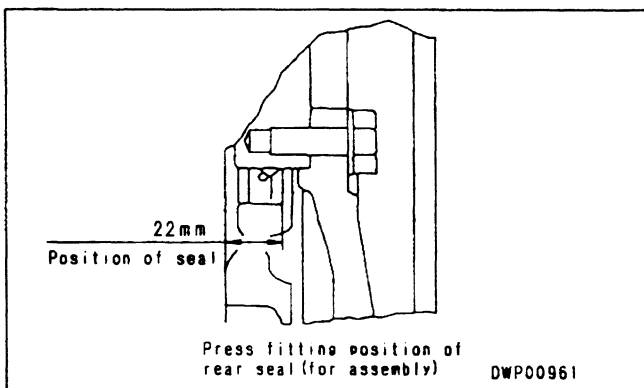
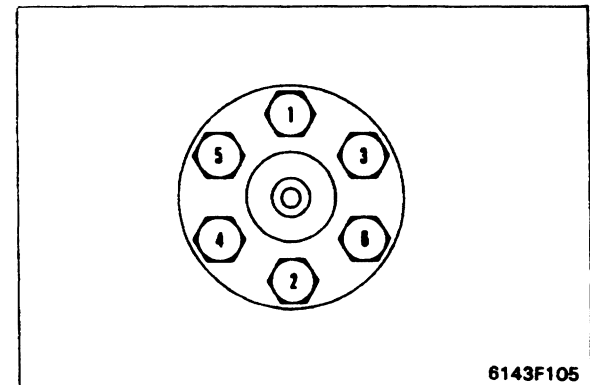
2nd time: 191.2 ± 29.4 Nm { 19.5 ± 0.5 kgm}

- ★ Using dial gauge ①, measure the facial runout and radial runout of the flywheel.
 - Facial runout: max. 0.35 mm
 - Radial runout: max. 0.3 mm



※ 2

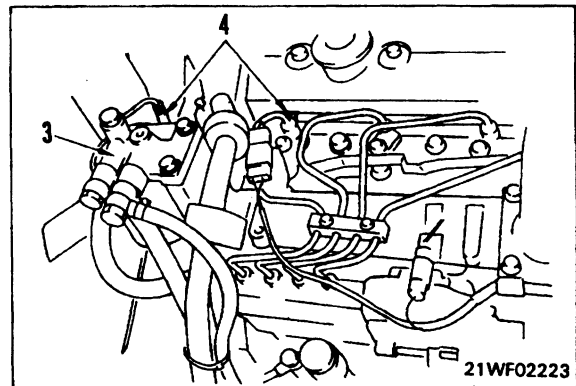
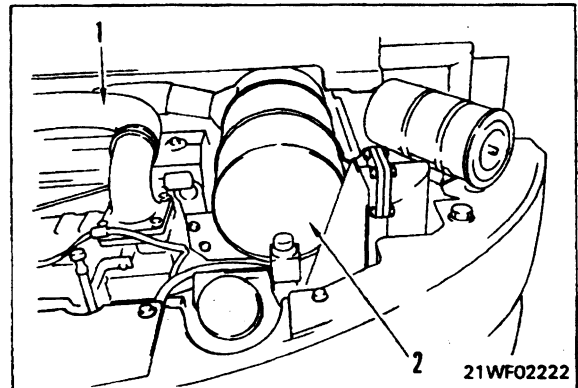
 Oil seal lip: **Grease (G2-LI)**



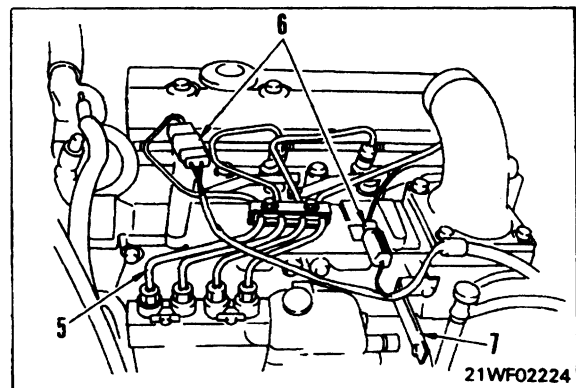
REMOVAL OF CYLINDER HEAD

Serial No.: 5001 – 7927

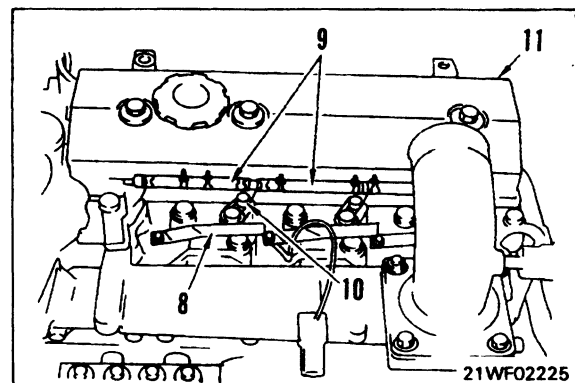
1. Drain coolant.
2. Remove engine hood.
3. Remove air intake hose (1). ※ 1
4. Remove muffler assembly (2).
★ Secure the exhaust pipe to the counterweight with strings, etc. so that it will not be an obstacle to the work.
5. Disconnect fuel filter assembly (3).
6. Disconnect fuel return hose (4).



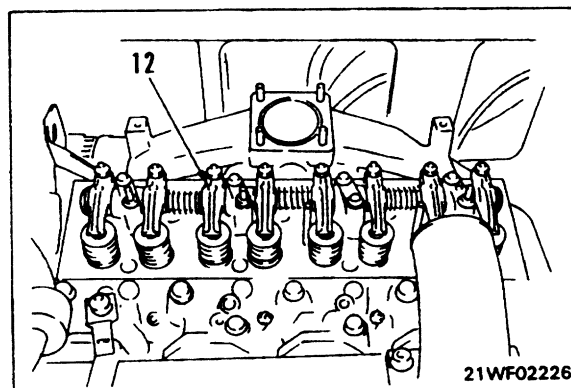
7. Remove 4 fuel injection tubes (5). ※ 2
8. Disconnect wire clamp, then disconnect connector (6).
9. Disconnect oil level gauge bracket (7).



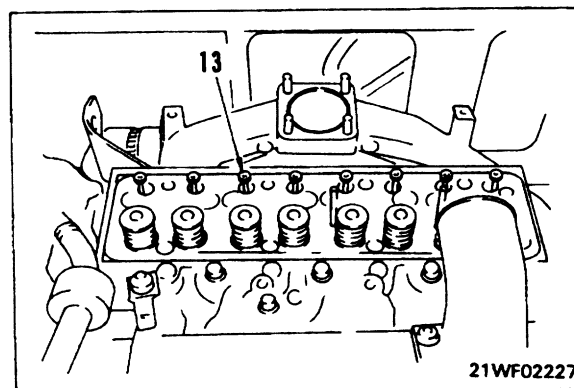
10. Remove 3 heater wires (8).
11. Remove 3 spill hoses (9).
12. Remove 4 nozzle holder assemblies (10). ※ 3
13. Remove head cover (11). ※ 4



14. Remove rocker arm assembly (12). ※ 5
★ Loosen the locknut, then loosen the adjustment screw 2 – 3 turns.



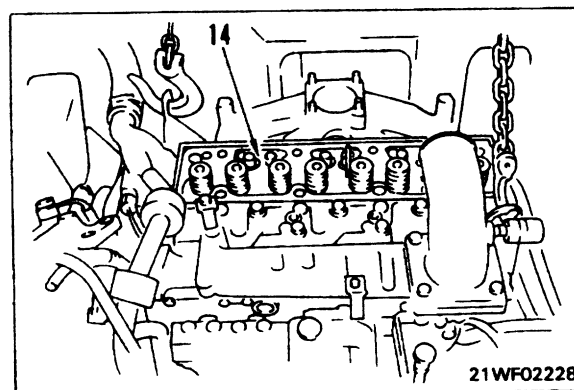
15. Remove 8 push rods (13).



16. Lift off cylinder head and air intake and exhaust manifolds assembly (14).



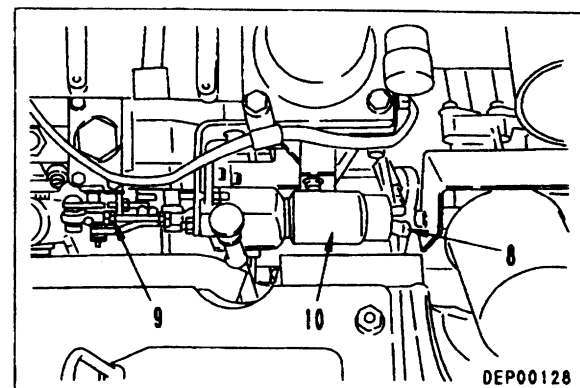
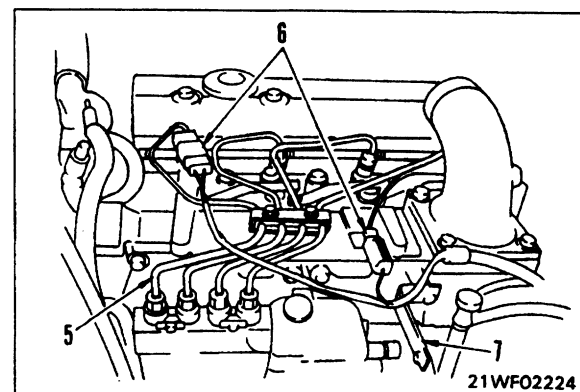
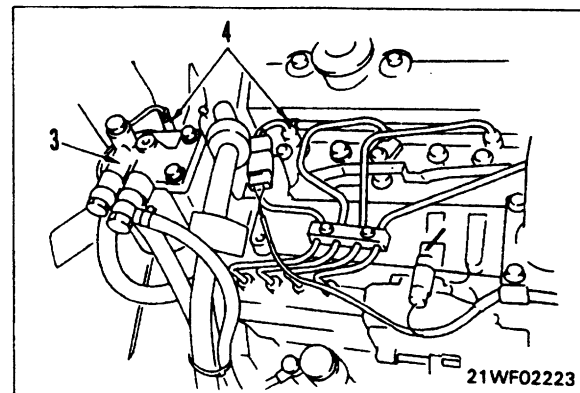
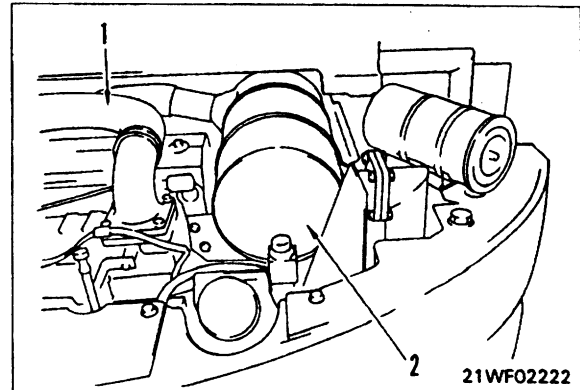
※ 6
Cylinder head and air intake and exhaust manifolds assembly: **30 kg**



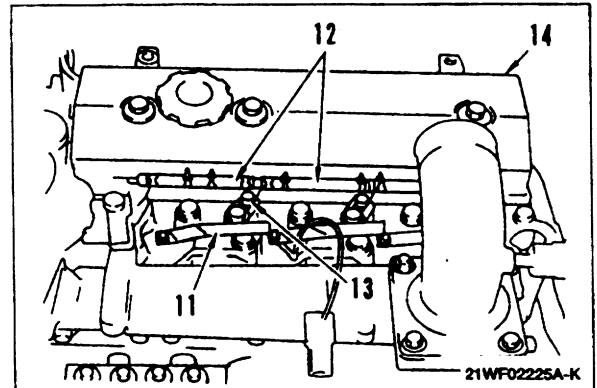
REMOVAL OF CYLINDER HEAD

Serial No.: 7928 and up

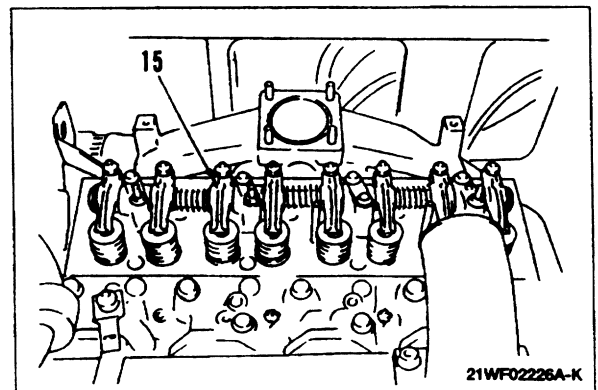
1. Drain coolant.
2. Remove engine hood.
3. Remove air intake hose (1). ※ 1
4. Remove muffler assembly (2).
 - ★ Secure the exhaust pipe to the counterweight with strings, etc. so that it will not be an obstacle to the work.
5. Disconnect fuel filter assembly (3).
6. Disconnect fuel return hose (4).
7. Remove 4 fuel injection tubes (5). ※ 2
8. Disconnect wire clamp, then disconnect connector (6).
9. Disconnect oil level gauge bracket (7).
10. Disconnect 2 wires (8) and rod (9), then remove engine stop solenoid valve (10) together with mounting bracket.



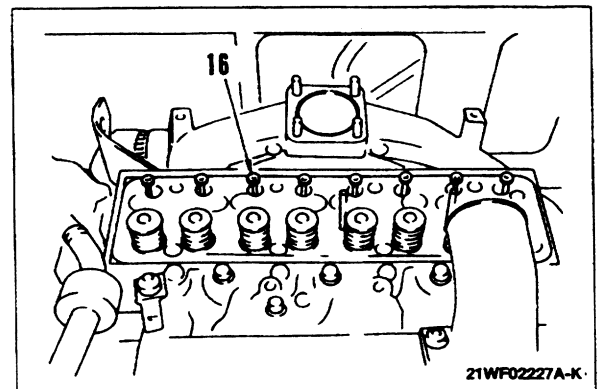
- 11. Remove 3 heater wires (11).
- 12. Remove 3 spill hoses (12).
- 13. Remove 4 nozzle holder assemblies (10). ※ 3
- 14. Remove head cover (14). ※ 4




- 15. Remove rocker arm assembly (15). ※ 5
 - ★ Loosen the locknut, then loosen the adjustment screw 2 - 3 turns.

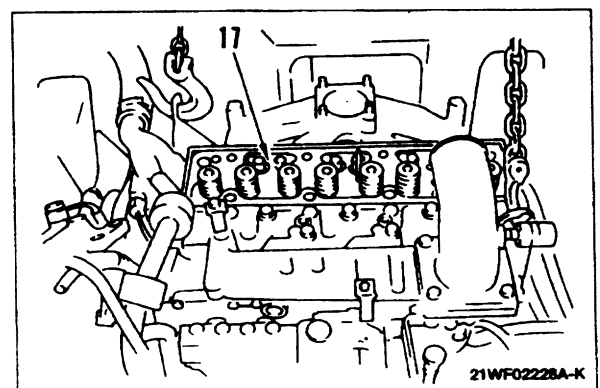


- 16. Remove 8 push rods (16).



- 17. Lift off cylinder head and air intake and exhaust manifolds assembly (17). ※ 6


 Cylinder head and air intake and exhaust manifolds assembly: **30 kg**




INSTALLATION OF CYLINDER HEAD ASSEMBLY

- Carry out installation in the reverse order to removal.


※ 1

 Hose clamp:
 $5.9 \pm 0.49 \text{ Nm}$ { $0.60 \pm 0.05 \text{ kgm}$ }


※ 2

 Sleeve nut:
 $22.1 \pm 2.5 \text{ Nm}$ { $2.25 \pm 0.25 \text{ kgm}$ }

※ 3


 Nozzle holder mounting bolt:
 $44.1 \pm 4.9 \text{ Nm}$ { $4.5 \pm 0.5 \text{ kgm}$ }


※ 4

 Head cover mounting bolt:
 $8.8 \pm 0.98 \text{ Nm}$ { $0.9 \pm 0.1 \text{ kgm}$ }

※ 5

- ★ Before installing the mounting bolts, clean the oil holes.
- ★ Check that the ball of the adjustment screw is fitted to the socket of the push rod securely.
- ★ Adjust the valve clearance. For details, see TESTING AND ADJUSTING, Adjusting valve clearance.

 Rocker arm assembly mounting bolt:
 $24.5 \pm 4.9 \text{ Nm}$ { $2.5 \pm 0.5 \text{ kgm}$ }

 Locknut:
 $44.1 \pm 4.9 \text{ Nm}$ { $4.5 \pm 0.5 \text{ kgm}$ }