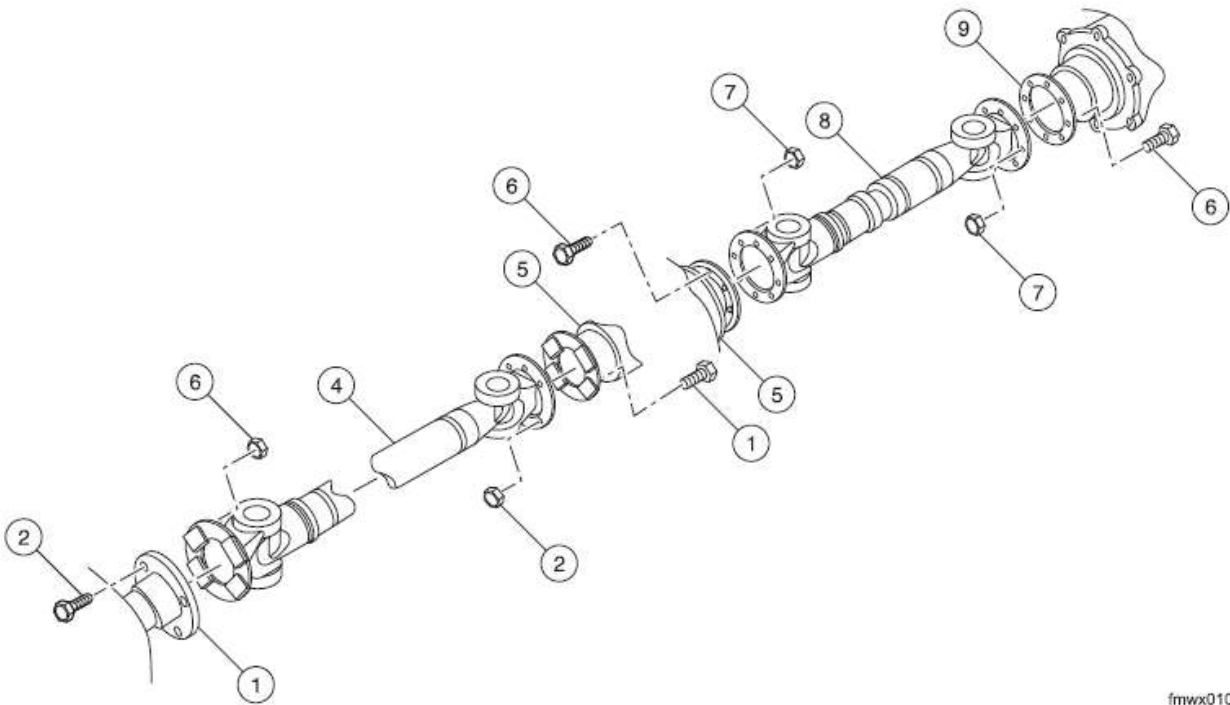


## Example:



fmwx010032

- (a). If the installation procedure and dismantling procedure is just the opposite, only the key parts are described.
- (b). The manual uses illustrations to key parts and operating parts of working procedures, and gives detailed description to them, and lists method of operation, standard value and attentions.
- (c). The manual exists the situation that the same illustration is used for familiar model of vehicle. In such case, there maybe have some variations between the supplied data and practical situation.
- (d). Description of working procedures is made according to the following sequences:
- The operating steps explain "What to do" and "Where to do".
  - The title of operating steps explains: "What to do".
  - The operating steps explain how to "fulfill a task", and supply help and operating information, such as "hints" and "attentions".

# SEATS

## REQUIRED TIGHTENING TORQUE

Fastener	N.m
Driver seat fixing bolt and nut	40
Secondary driver seat fixing bolt and nut	40
Middle seat fixing bolt and nut	20
Angle adjuster assembly fixing bolt	63
Driver seat slideway assembly fixing nut	63
High top sleeper and sleeper air spring fixing nut	20
Fixing bolt between upper sleeper hinge and driver cab	20
Fixing nuts between sleeper air spring and driver cab	40
Fixing bolt of driver cab top sleeper hook	40
Fixing bolt of driver cab wall sleeper hook	20

## ONE SIDE LOW BEAM ALWAYS ON

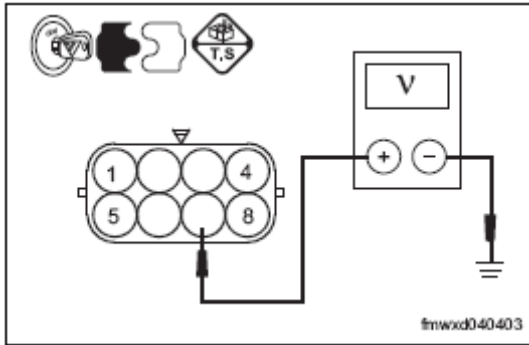
### Circuit Diagram

Please refer to "Both Side Low Beams Not Lit - Circuit Diagram" in this chapter.

### Diagnostic Procedures

#### 1. Check power circuit of low beam bulb.

(a). Shut off main power.



- (b). Remove fuse in cab fuse box: F22 or F23.  
 (c). Remove left front combination lamp connector B017 or right front combination lamp connector B041, and turn on main power and ignition switch.  
 (d). Use multimeter to measure the voltage of the circuit between Pin 7 of connector B017 or B041 and the effective ground point of body.

Is the voltage equal to Zero?

Yes > Replace cab fuse box.

No > Repair or replace harness relevant to short circuit to power supply.

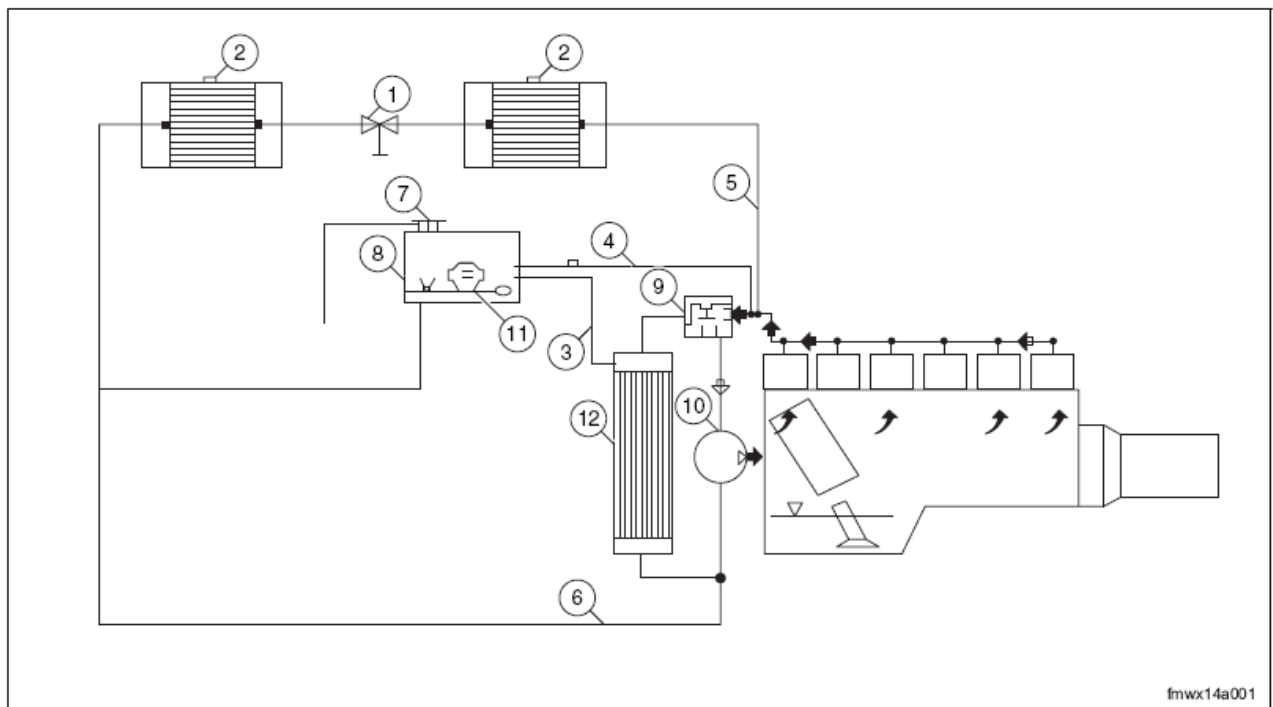
# COOLING SYSTEM

## OVERVIEW

The cooling system of the diesel engine is used to transfer the heat absorbed by the engine members being heated in good time by utilizing the cooling medium, namely, the cooling liquid, ensuring that such members can work normally under the permitted temperature conditions. As for the cooling of diesel engine, the proper cooling level other than the maximum cooling level is required, for the overcooling may exert adverse influences on the operation of the diesel engine as follows: firstly, the cylinder temperature may be too low thus to increase the ignition delay of the fuel, resulting in the reduction of combustion rate and increase of the heat loss; secondly, the engine may work in a rough manner to increase the fuel consumption; thirdly, the viscosity of lubricating oil will be increased to increase the friction power loss of moving parts, thus reducing the engine power. Therefore, only the proper cooling can ensure the correct and economic operation of the engine.

It is not allowed to use the ordinary water as cooling liquid, for the scale generated in the heating process of the water has a heat conduction rate 40 times lower than that of the cast iron, and the scaling on the water jacket wall will degrade the performance of engine cooling system. In particular, if the throttling hole on the cylinder liner is clogged by the scale, the rational water flow may be damaged to give rise to various failures and damages.

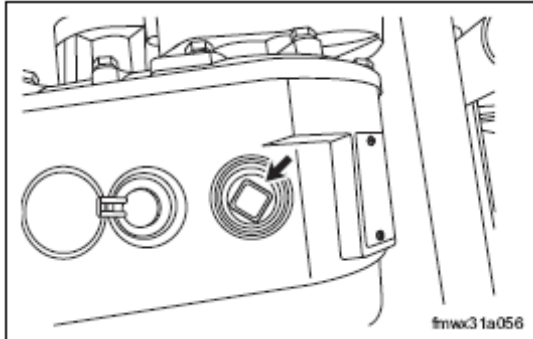
The engine cooling system is composed of the water pump, radiator, fan, thermostat, secondary water tank, cooling pipe and water pipe in the cylinder, and cooling water chamber of the crankcase.



# TRANSMISSION ASSEMBLY

## REPLACEMENT

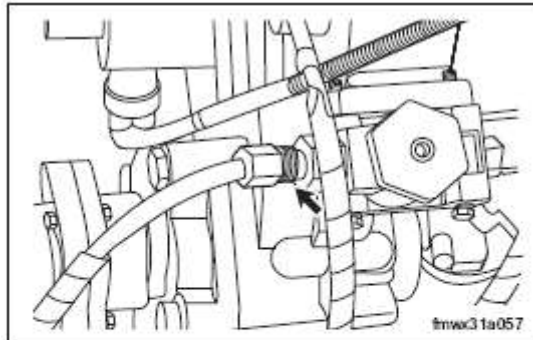
1. Disconnect the battery negative cable.



2. Remove the drain plug at the bottom of transmission to discharge all transmission oil, and then fasten the drain bolt.

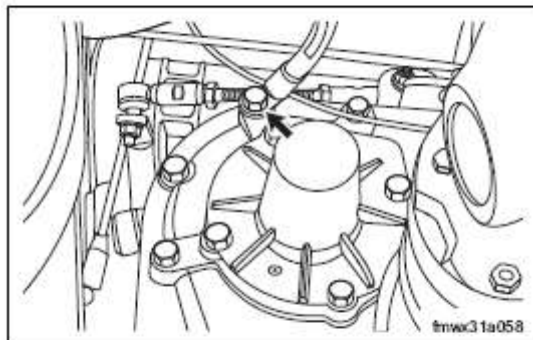
Torque:  $68 \pm 7 \text{N.m}$

3. Remove the intermediate drive shaft. Refer to Chapter 33 Service, Drive Shaft-Intermediate Drive shaft.

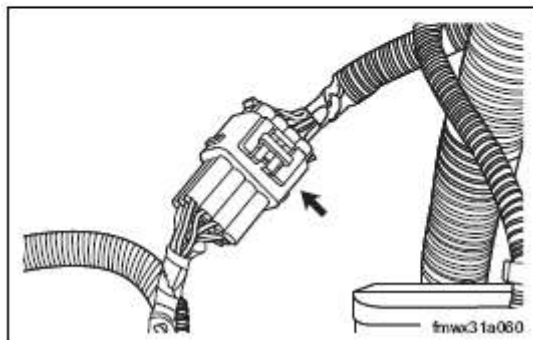


4. Disconnect the transmission from other components.

- (a) Remove the air filter regulator air pipe assembly.



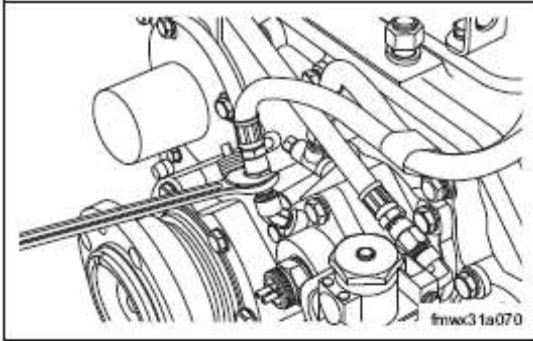
- (b) Remove the transmission earthing cable.



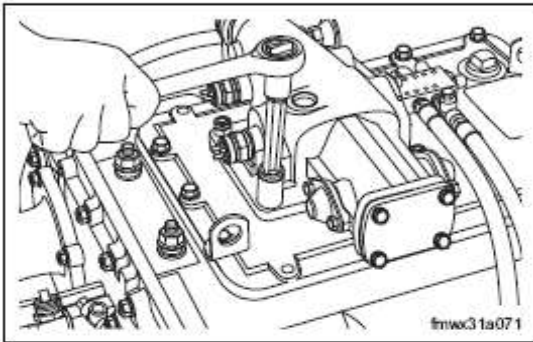
- (c) Disconnect the transmission grouped plug.

## REMOVAL AND INSTALLATION

### 1. Remove the double-H control mechanism

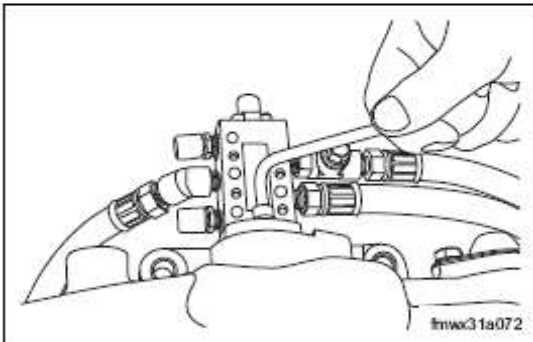


- (a) Remove these three air pipes and two air filter bolts.

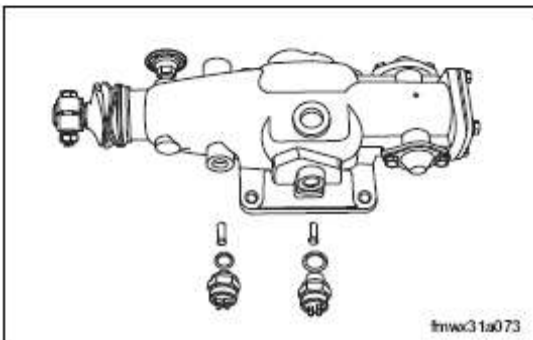


- (b) Remove these four nuts on the double-H assembly.

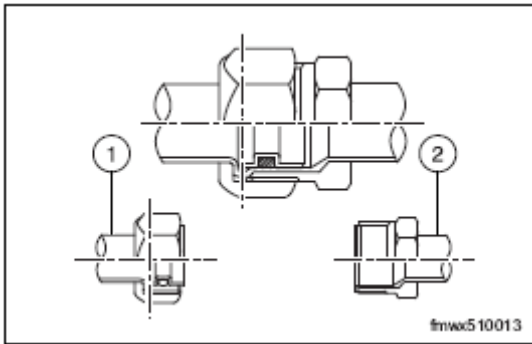
- (c) Loosen the double-H assembly housing by knocking it with a copper rod.



- (d) Remove the double-H control assembly from the transmission, and use the internal hexagon spanner to remove the double-H air valve and air pipe.



- (e) Remove the reverse & neutral gear switch and plunger.



Insert the nut (2) into the union (1). At first, use the hand to fasten the nut as much as possible, and then fasten the nut with the required torque.

#### Leakage of coolant pipeline union

1. Check the torque of coolant pipeline union; if too loose, fasten it to the required torque.

**Notice:**

Use two spanners to avoid twisting or damaging the pipeline.

**Notice:**

Do not fasten the union too tightly.

2. Perform a leakage test at the union of the coolant pipeline.
3. If the leakage remains there, release and collect the coolant in the system.
4. Replace the O-shaped ring.

**Notice:**

Once the O-shaped ring is removed, no further use is allowed.

**Notice:**

Do apply the designated compressor oil onto the new O-shaped ring.

5. Fasten the coolant pipeline union to the required torque.

**Notice:**

Use two spanners to avoid twisting or damaging the pipeline.

6. Discharge, refill and re-test the system.

#### Leakage of hose

If the leakage occurs at the inlet or outlet hose of the compressor, the whole hose must be renewed. It is not allowed to cut or divide the coolant hose for servicing purposes.

1. Find out the leakage position.
2. Discharge and collect the coolant.
3. Remove the hose assembly.

**Notice:**

Immediately cover the union opening.

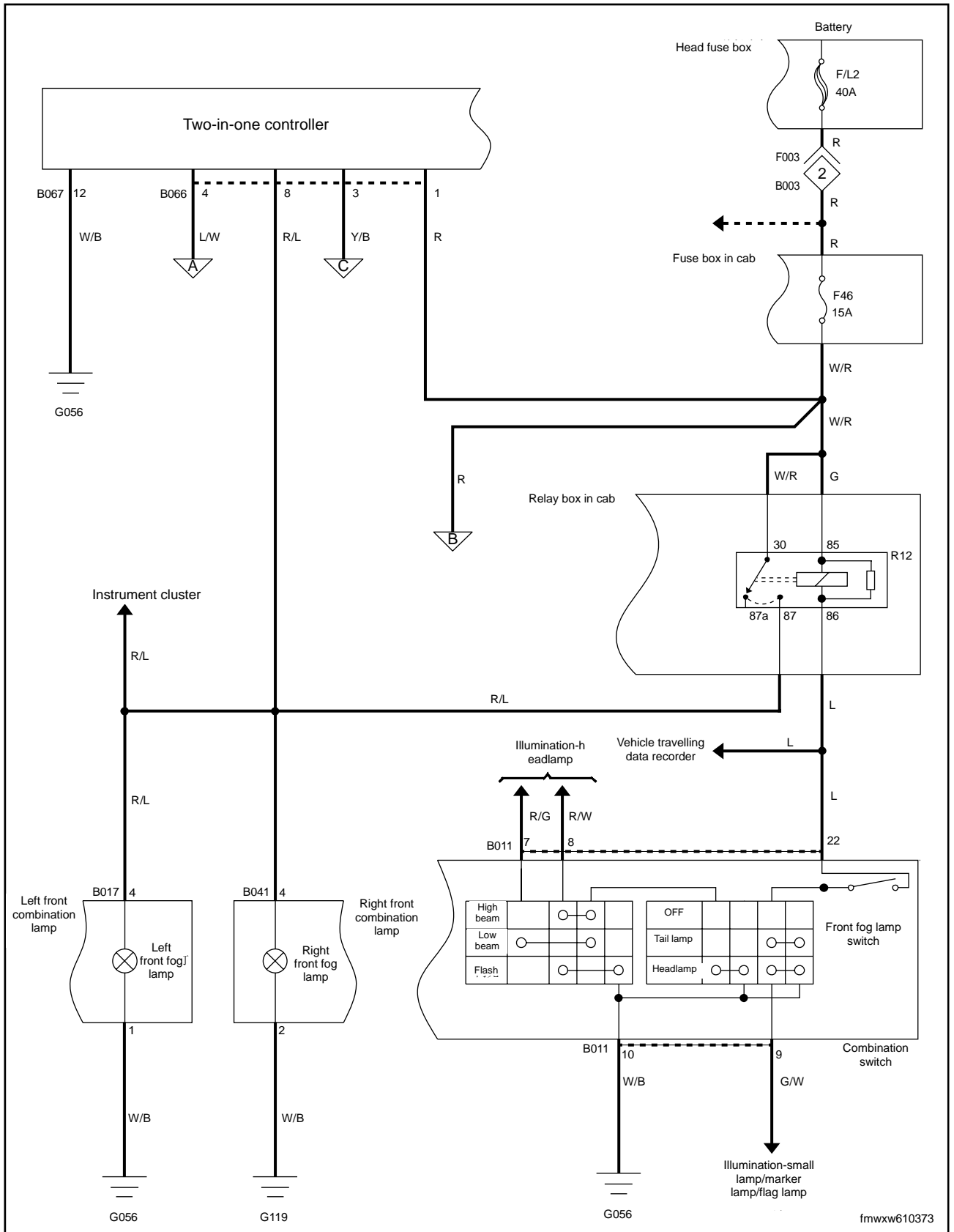
4. Connect the new hose assembly.

**Notice:**

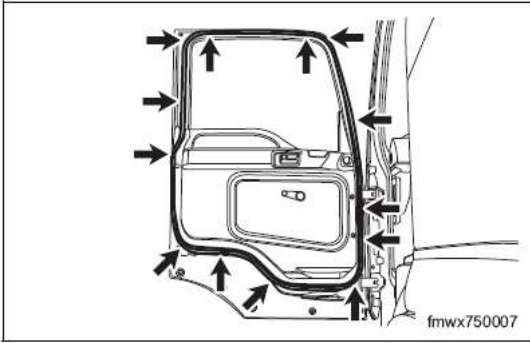
Use two spanners to avoid twisting or damaging the pipeline.

5. Discharge, refill and test the system.

FOG LAMP



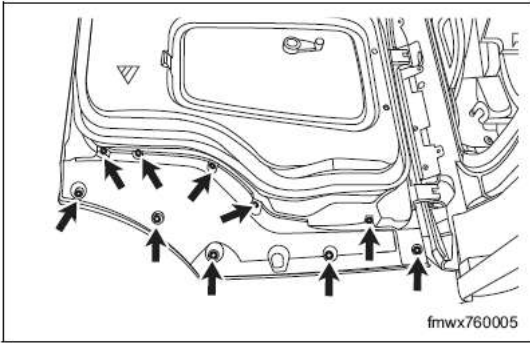




(b) Dismantle inner door guard panel.

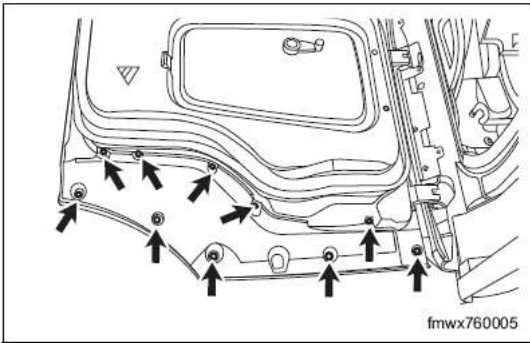
**Note:**

If any damage occurs on buckles of inner guard panel, they must be replaced by new parts.



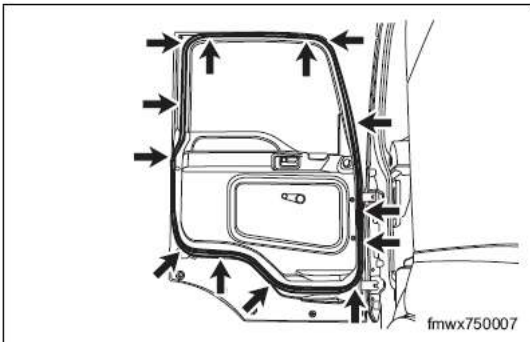
**6. Dismantle lining panel of bottom door trim panel**

- (a) Dismantle plastic buckles.
- (b) Dismantle fixing bolts and nuts on lining panel of bottom door trim panel.



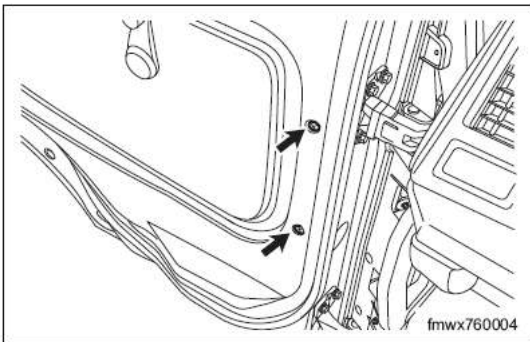
**7. Assemble lining panel of bottom door trim panel**

- (a) install fixing bolts and nuts on lining panel of bottom door trim panel .



**8. Install inner door guard panel assembly**

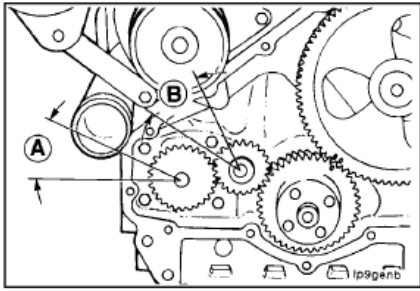
- (a). Assemble inner door guard panel.



- (b). install front door spikes.

**Lubricating Oil Pressure – Low (continued)**

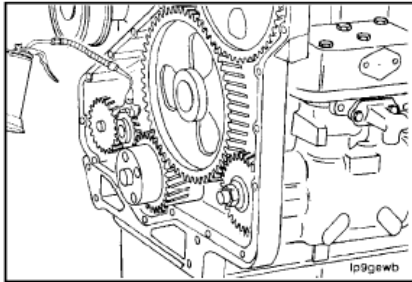
Cause	Correction
Pipe plug loose or missing	Check for external leak at rear of cylinder head, along fuel pump side of block, oil cooler cover and gear housing.
Oil filter plugged	Change lubricating oil and filters.
Lubricating oil cooler is plugged	Check and replace oil cooler.
Cup plug internal leak	Check oil rifle cup plugs, cup plug in front and rear face of block.
Suction tube loose or gasket leaking	Replace gasket and tighten suction tube.
Lubricating oil pump worn	Check / replace oil pump.
Main bearing cap loose	Check / install new bearing(s). Tighten cap.
Connecting rod or main bearings worn	Check / replace bearings. Also, check / replace piston cooling nozzles.



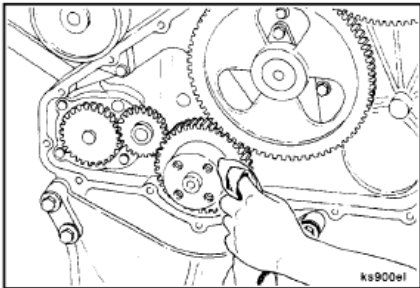
Use a dial indication with a magnetic base to measure the idler gear backlash.

**NOTE:** Do not allow the mating gears to rotate while measuring the backlash.

Oil Pump Idler Gear Backlash ( A & B)		
mm		in
0.08	min.	0.003
0.33	max	0.013



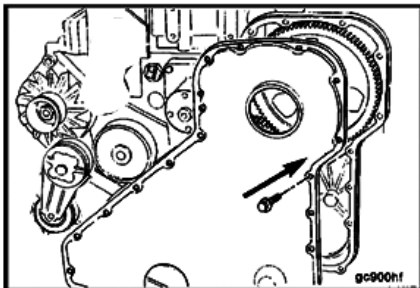
Lubricate the front gear train with clean 15w-40 engine oil.



Thoroughly clean the front seal area of the crankshaft.

If the contact area has a groove worn deep enough to feel with a fingernail or sharp object, it will be necessary to install a wear sleeve over the sealing surface.

**NOTE:** The seal lip and the sealing surface on the crankshaft must be free from all oil residue to prevent seal leaks.



Use sealant, Part No. 3823494, on both sides of the front cover gasket.

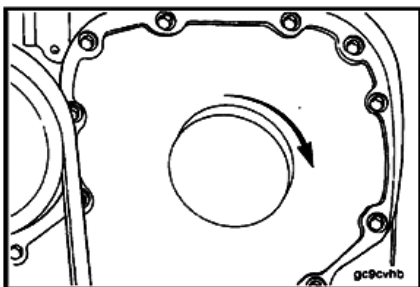


Install the front cover and gasket.

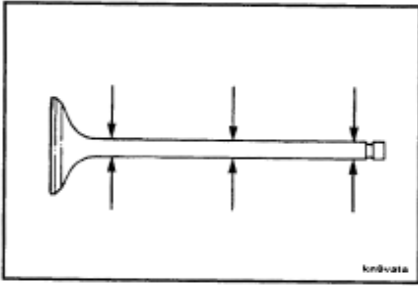
Install the capscrews.

Torque Value: 24N • m[18 ft-lb]

**NOTE:** Torque the capscrews within 15 minutes after applying the sealant.



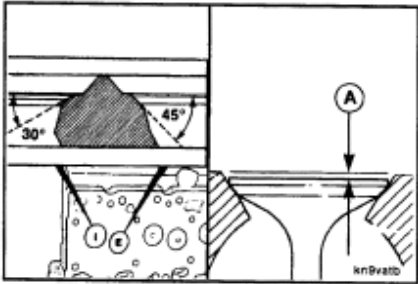
Install the gear cover/tachometer drive adapter assembly.



Measure the valve stem diameter.

Valve stem diameter	
mm	
7.96	min
8.00	max

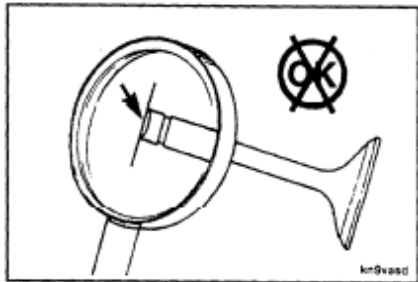
**NOTE:** If the valve stem diameter is out of specification, the valve stems must be replaced.



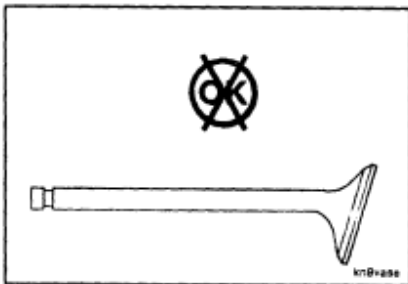
Valve seat angle:

- Intake 30 degrees
- Exhaust 45 degrees

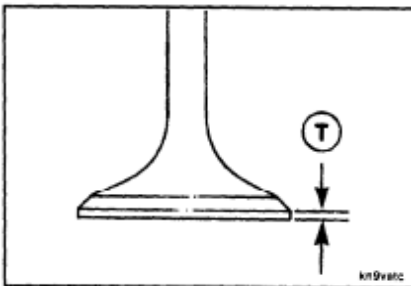
Intake valve depth (installed)	
mm	
0.584	MIN
1.092	MAX
Exhaust valve depth (installed)	
mm	
0.965	MIN
1.473	MAX



**NOTE:** if valve seat angle is out of specifications, Check the valve stem tip for flatness. If it is worn, then replace the valve stems



Inspect for bent valves. If it is bent, then replace the valve stems.

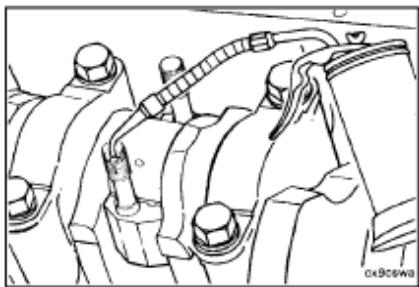


Measure the rim thickness to determine if there is enough stock to grind the valve.

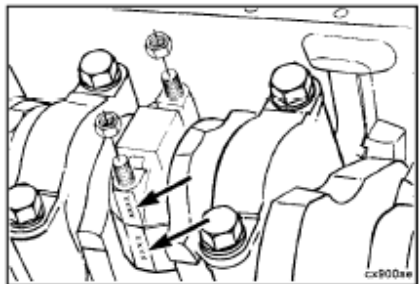


Valve rim thickness limit	
mm	
2.0	MIN

**NITE:** If the valve rim thickness is out of specification, then replace it.



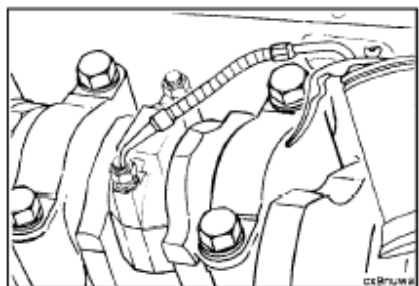
Use clean engine oil to lubricate the threads of the connecting rod capscrews.



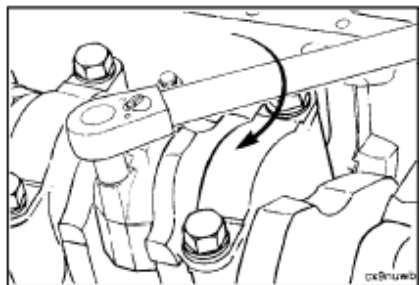
**NOTE:** The numbers marked on the connecting rod and the cap must be the same. The tang slot side of the cap must be on the same side as the tang slot in the connecting rod when the cap is installed.



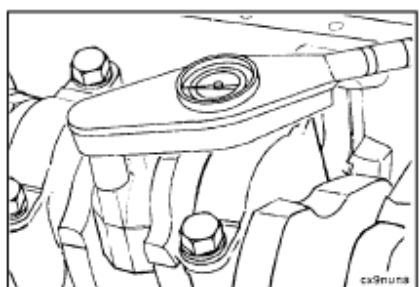
Install the bearing in the connecting rod cap. Install the rod cap and tight the connecting rod nuts. Use lubricate@105, or equivalent, to coat the inside diameter of the bearing shell.



Use clean 15w-40 oil to lubricate the connecting rod nuts.



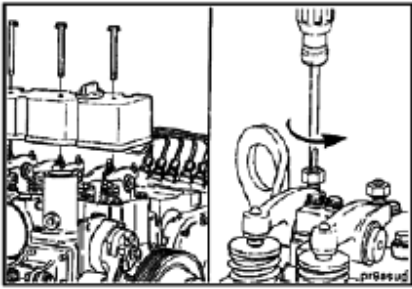
**19 mm**  
Alternately tighten the rod nuts to pull the rod cap into position.



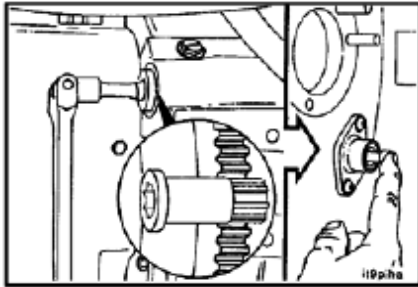
**19 mm Socket, Torque Wrench**  
Tighten the connecting rod cap to the connecting rod evenly.



**Torque Value:**  
Step 1: 40 N•m [30ft- lb]  
Step 2: 80 N•m [60 ft- lb]  
Step 3: 120 N•m [88 ft- lb]

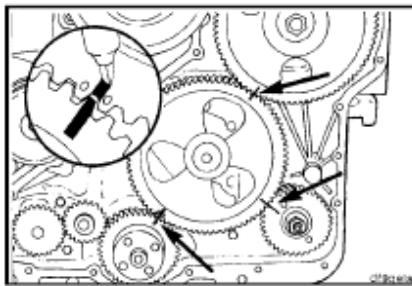


Remove the valve cover and loosen all rocker lever adjusting screws to remove the load on the camshaft.

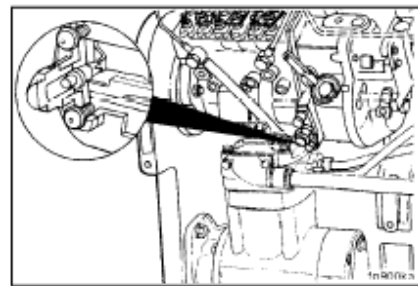


**Part No. 3377371, Engine Barring Gear**

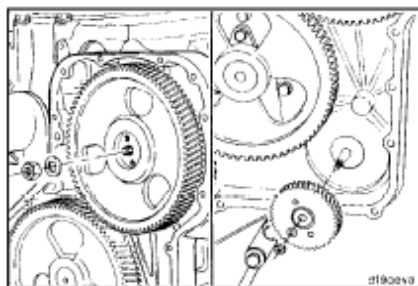
Rotate the crankshaft and align the timing marks of the camshaft and crankshaft gears.



Use a felt marker to blacken the timing marks on the gear train. Use the marker to make alignment mark on the accessory drive gear and shaft.



Lock the fuel injection pump.



**Part No. 3823259, Fuel Pump Gear Puller**

Remove the fuel pump drive gear and the accessory drive gear.

Diagram of Components-Handbrake Valve..... 27-6	Differential Case, Driven Gear and Planetary Pinion Assembly..... 25-33
Diagram of Components-Double-H Control Mechanism .....31B-40	Differential lock..... 61-29
Diagram of Components-4-Circuit Protection Valve ..... 26-43	Removal and Installation-Transmission Control Mechanism..... 31A-30, 31B-30
Diagram of Components-Sunroof ..... 72-20	Removal and Installation-Single-H Control Mechanism.....31A-42
Diagram of Components-Sleeper Device ..... 74-14	Removal and Installation-Driver Seat ..... 74-6
Diagram of Components-Battery Assembly .. 53-12	Removal and Installation-Double-H Control Mechanism .....31B-42
Diagram of Components-input Shaft Assembly ..... 31B-75	Removal and Installation-Hydraulic Circuit... 42-33
Diagram of Components-Instrument Console. 73-4	Removal and Installation-Steering Tank Assembly . ..... 42-37
Diagram of Components-Audio System..... 56-4	Removal and Installation-Steering Column (Right-Hand Drive) ..... 41-15
Diagram of Components-Wiper and Washer .. 55-4	Removal and Installation-Steering Column (Left-Hand Drive) ..... 41-12
Diagram of Components-Lighting System ..... 54-4	Auxiliary High Beam Not Lit -Lighting System ..... 04-111
Diagram of Components-Shading Units..... 76-8	Frame Dimension Drawing – Frame Assembly ..... 28-6
Diagram of Components-Evaporator ..... 51-45	Frame Assembly..... 28-3
Diagram of Components-Evaporator (Right-Hand Drive) ..... 51-49	Position of Jacking and Supporting Vehicle.. 01-15
Diagram of Components-Brake Pedal ..... 26-23	Vehicle Identification Logo ..... 01-7
Diagram of Components-Brake Pedal (Right-Hand Drive) ..... 26-25	Vehicle Identification -Vehicle Identification Logo... 01-7
Diagram of Components-Cooling Pipe..... 51-41	Door Glass ..... 72-14
Diagram of Components-Countershaft Assembly.. .....31B-88	Wheel and Tire Assembly..... 23-3
Diagram of Components-Middle Seat..... 74-12	Door Glass ..... 72-12
Diagram of Components-intermediate Axle Assembly .....29A-8	Inner Door Guard Panel ..... 76-3
Diagram of Components-Basic Transmission Countershaft .....31A-89	Door Assembly ..... 75-3
Diagram of Components-Fuel-Water Separator .... 11A-21, 11b-21	Speedometer Failure -Combination instrument ..... 04-269
Diagram of Components-Master Brake Valve ..... 26-28	Speed Display Lamp - Circuit Diagram ..... 61-52
Diagram of Components-Master Brake Valve (Right-Hand Drive) ..... 26-31	Speed Display Lamp Lighting ..... 54-36
Diagram of Components-Combination instrument..... 73-10	Rearview Mirror ..... 72-22
	Charging Current Unstable ..... 04-28
	Charging System-Diagnostic ..... 04-18
	Charging System-Circuit Diagram ..... 61-28
	Charging Indicator Always On..... 04-24
	Air Reservoir..... 26-37
	Liquid Reservoir ..... 51-65

---

C

---

Side Window Glass ..... 72-10
Differential Valve..... 26-49

---