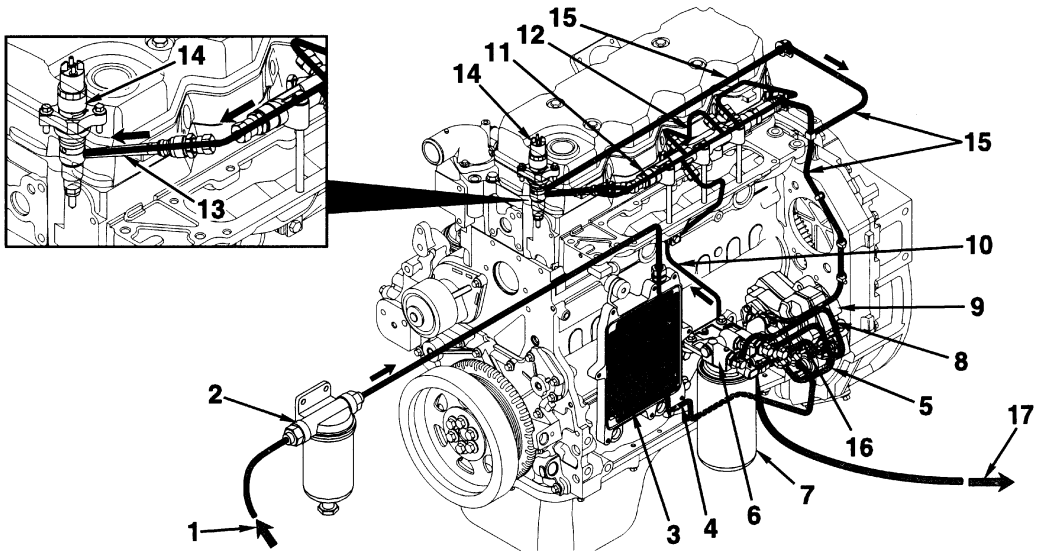
SECTION 2 ENGINE

GROUP 1 STRUCTURE AND FUNCTION

1. SYSTEM DIAGRAMS

The following drawings show the flow through the engine systems.

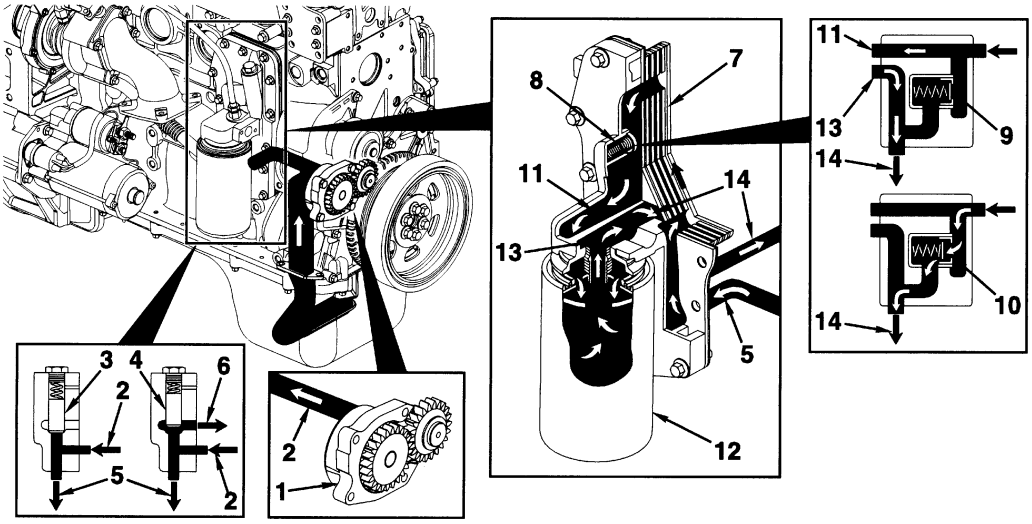
1) FUEL SYSTEM



7607AEG02

1 From fuel tank
2 Water/fuel separator (not mounted on engine)
3 ECM cooling plate
4 To fuel gear pump
5 To fuel filter
6 Fuel filter head
7 Fuel filter
8 To high-pressure pump
9 High-pressure pump
10 To fuel rail
11 Fuel rail
12 To injectors
13 High-pressure connector
14 Injector
15 Fuel return from injectors and fuel rail to fuel filter head
16 Fuel return from high-pressure pump to fuel filter head
17 To fuel tank

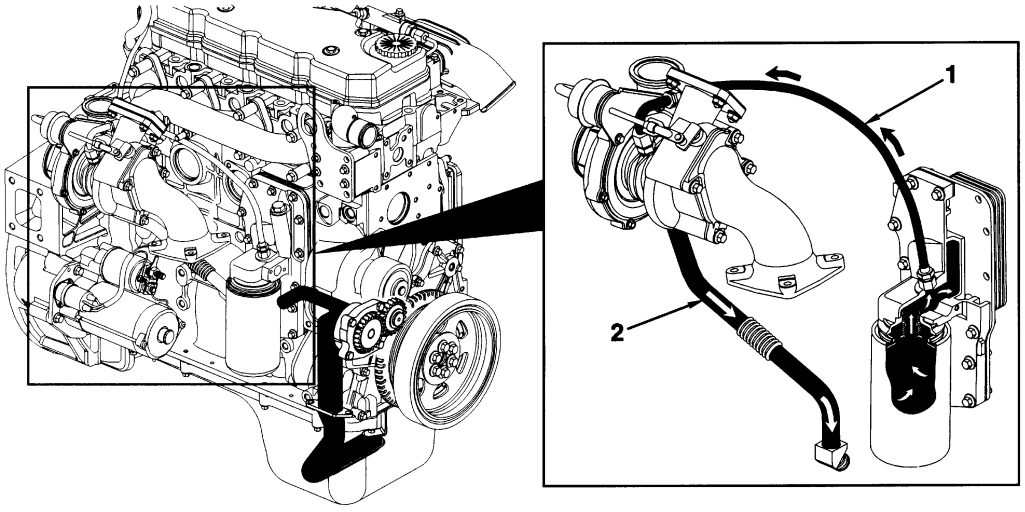
2) LUBRICATING OIL SYSTEM



7607AEG03

1 Gerotor lubricating oil pump
2 From lubricating oil pump
3 Pressure regulating valve closed
4 Pressure regulating valve open
5 To lubricating oil cooler
6 To lubricating oil pump supply
7 Lubricating oil cooler
8 Filter bypass valve
9 Filter bypass valve closed
10 Filter bypass valve open
11 To lubricating oil filter
12 Full-flow lubricating oil filter
13 From lubricating oil filter
14 Main lubricating oil rifle

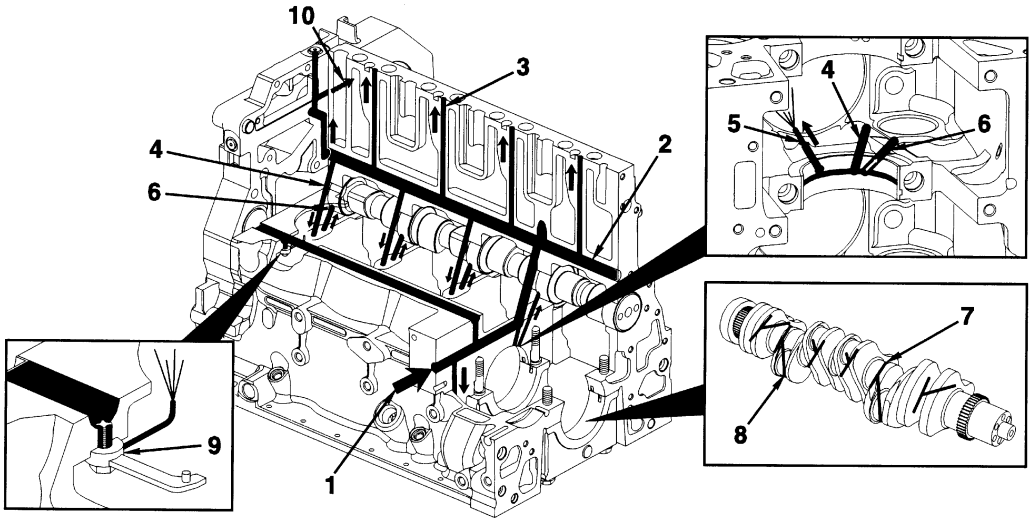
(1) Lubrication for the turbocharger



7607AEG04

1 Turbocharger lubricating oil supply
2 Turbocharger lubricating oil drain

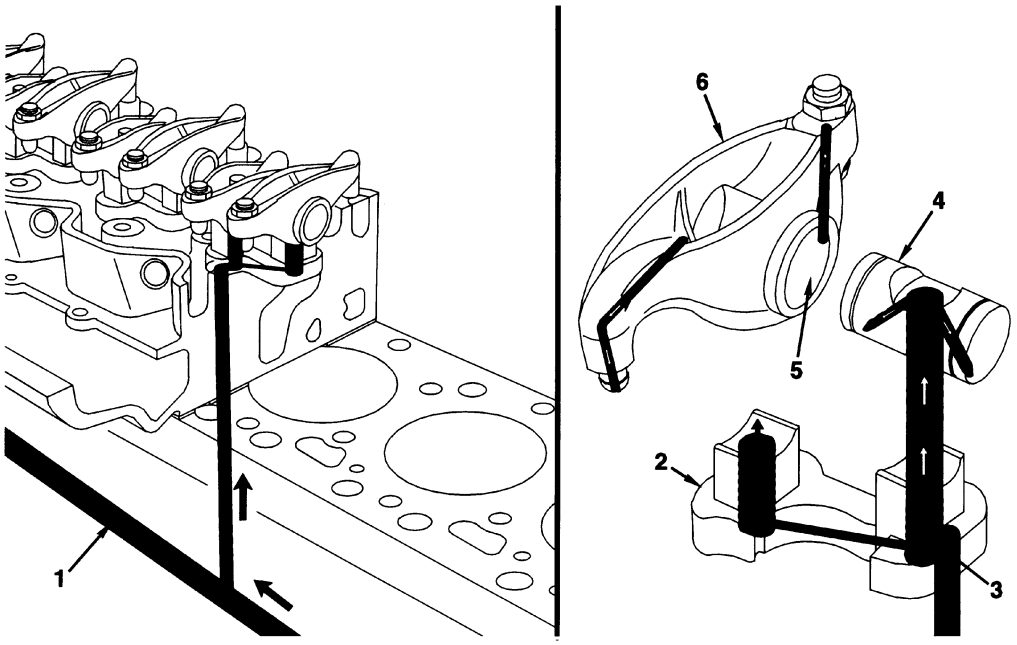
(2) Lubrication for the power components



7607AEG05

1 From lubricating oil cooler
2 Main lubricating oil rifle
3 To valve train
4 From main lubricating oil rifle
5 To piston-cooling nozzle
6 To camshaft
7 Crankshaft main journal
8 Oil supply to rod bearings
9 Directed piston-cooling nozzle
10 To internal lubrication of air compressor

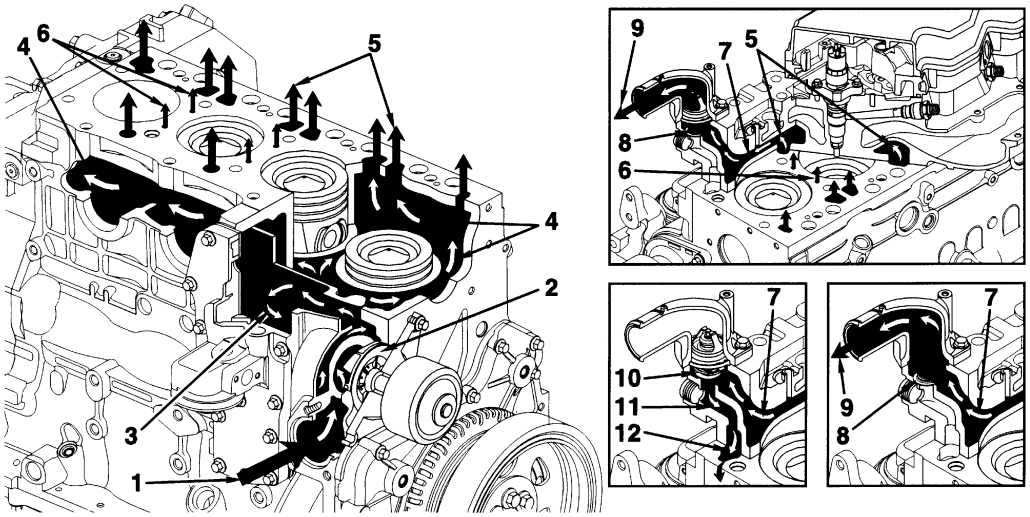
(3) Lubrication for the overhead



7607AEG06

1 Main lubricating oil rifle
2 Rocker lever support
3 Transfer slot
4 Rocker lever shaft
5 Rocker lever bore
6 Rocker lever

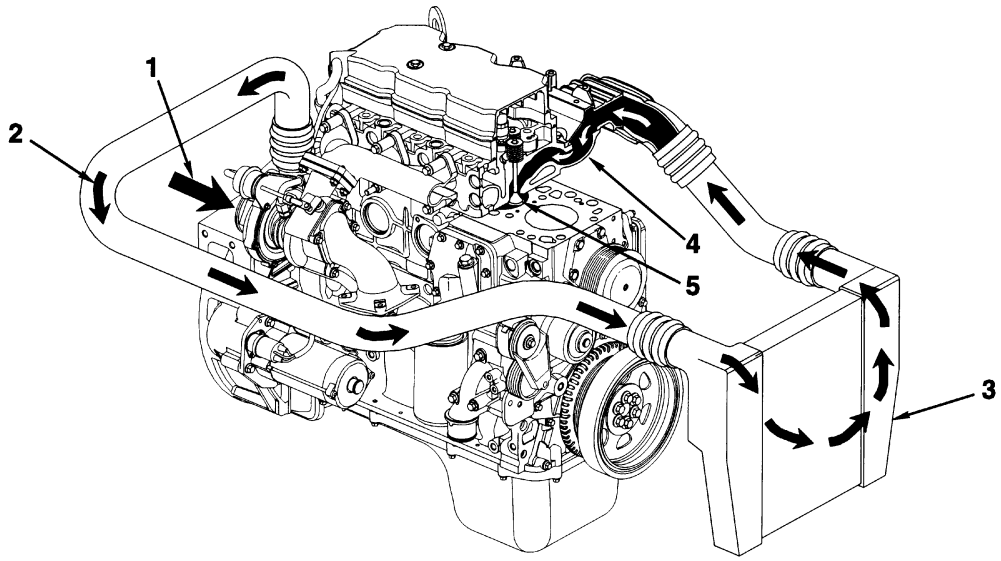
3) COOLING SYSTEM



7607AEG07

1 Coolant inlet
2 Pump Impeller
3 Coolant flow past lubricating oil cooler
4 Coolant flow past cylinders
5 Coolant flow from cylinder block to cylinder head
6 Coolant flow between cylinders
7 Coolant flow to thermostat housing
8 Coolant bypass passage
9 Coolant flow back to radiator
10 Bypass closed
11 Coolant bypass in cylinder head
12 Coolant flow to water pump inlet

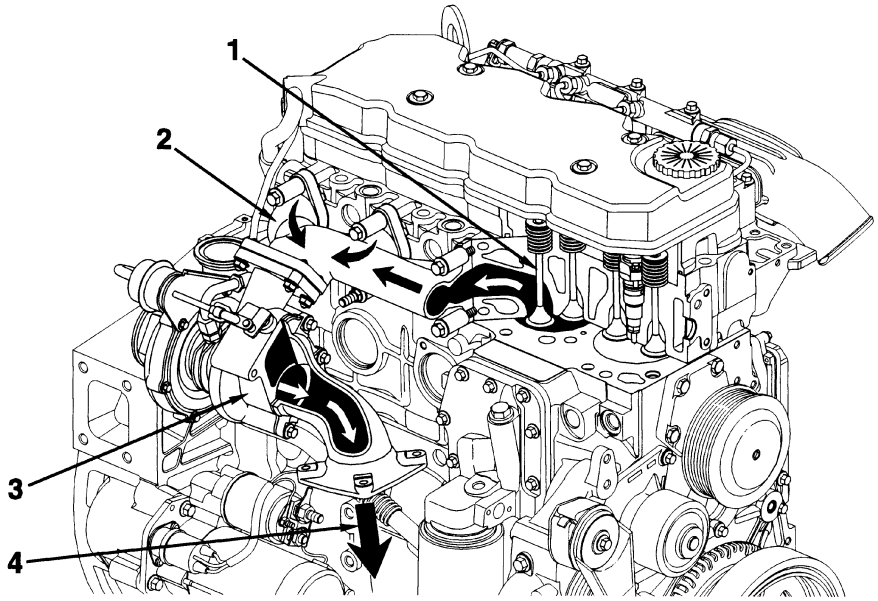
4) AIR INTAKE SYSTEM



7607AEG08

1 Intake air inlet to turbocharger
2 Turbocharger air to charge air cooler
3 Charge air cooler
4 Intake manifold
(Integral part of cylinder head)
5 Intake valve

5) EXHAUST SYSTEM



7607AEG09

1 Exhaust valve
2 Exhaust manifold
3 Turbocharger
4 Turbocharger exhaust outlet

GROUP 2 ENGINE SPEED & STALL RPM

1. TEST CONDITION

1) Normal temperature of the whole system
   - Coolant : Approx 80˚C (176˚F)
   - Hydraulic oil : 45 ± 5˚C (113 ± 10˚F)
   - Transmission oil : 75 ± 5˚C (167 ± 10˚F)

2) Normal operating pressure : See page 6-53.

2. SPECIFICATION

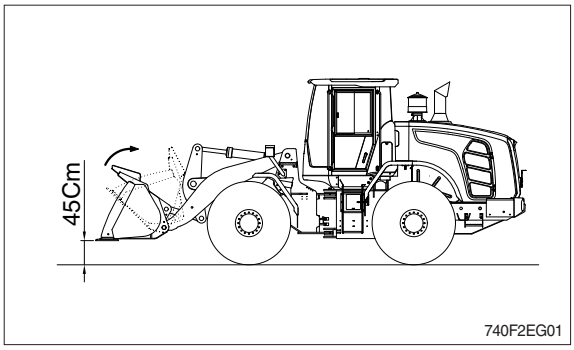
Engine speed, rpm (P mode)						Remark
Low idle	High idle	Pump stall	Converter stall	Full stall	Fan motor	
800±25	2150±50	2150±70	2050±70	1990±100	950±50	

3. ENGINE RPM CHECK

Remark : If the checked data is not normal, it indicates that the related system is not working properly. Therefore, it is required to check the related system pressure : See page 6-51.

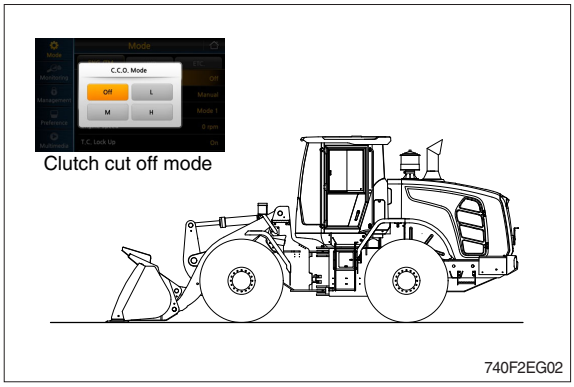
1) Pump stall rpm

- Start the engine and raise the bucket approx 45 cm (1.5 ft) as the figure.
- Press the accelerator pedal fully and operate the bucket control lever to the retract position fully.
- Check the engine rpm at the above condition.



2) Convertor stall rpm

- Start the engine and lower the bucket on the ground as the figure.
- Set the clutch cut off mode at the OFF position.
- Press the brake pedal and accelerator pedal fully.
- Shift the transmission lever to the 4th forward position.
- Check the engine rpm at the above condition.



3) Full stall rpm

- Start the engine and raise the bucket approx 45 cm (1.5 ft) as the figure.
- Set the clutch cut off mode at the OFF position.
- Press the brake pedal and accelerator pedal fully .
- Shift the transmission lever to the 4th forward position and operate the bucket lever to the retract position fully.
- Check the engine rpm at the above condition.