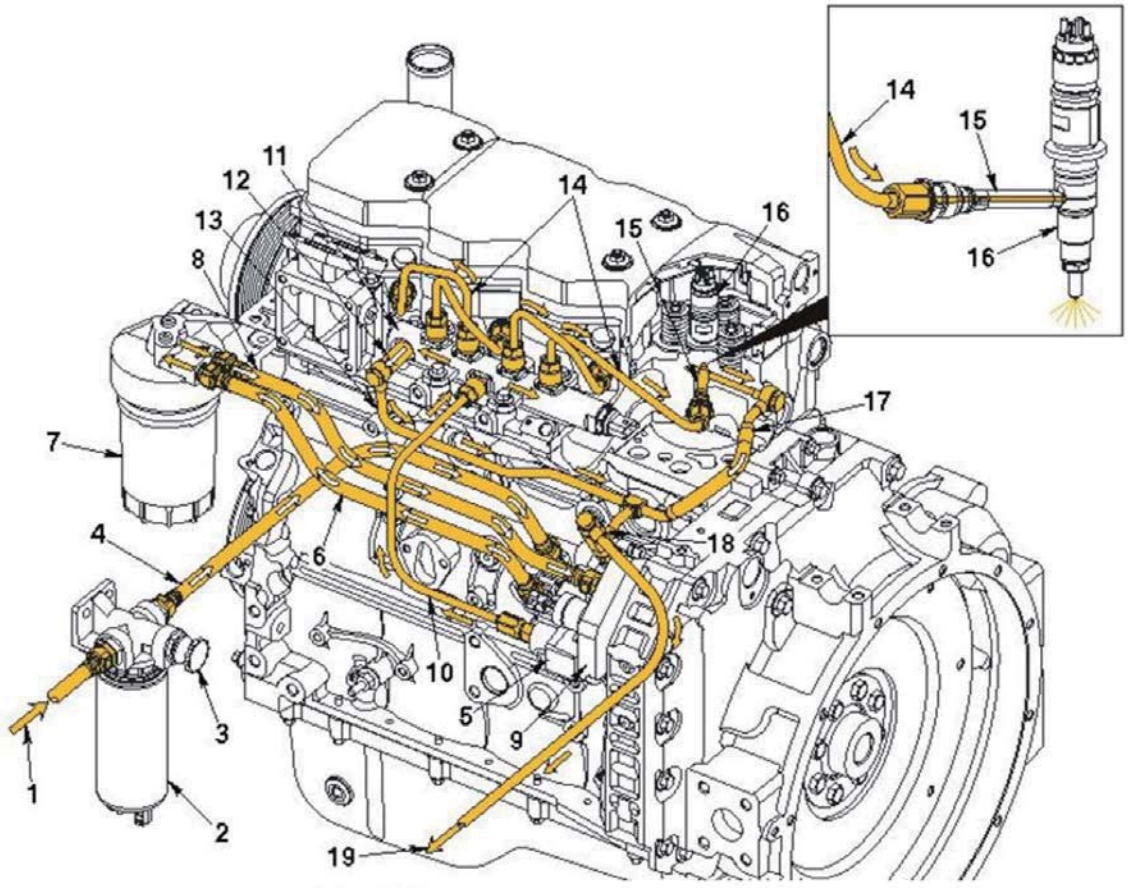
SECTION 2 ENGINE

GROUP 1 STRUCTURE AND FUNCTION

1. SYSTEM DIAGRAMS

The following drawings show the flow through the engine systems.

1) FUEL SYSTEM



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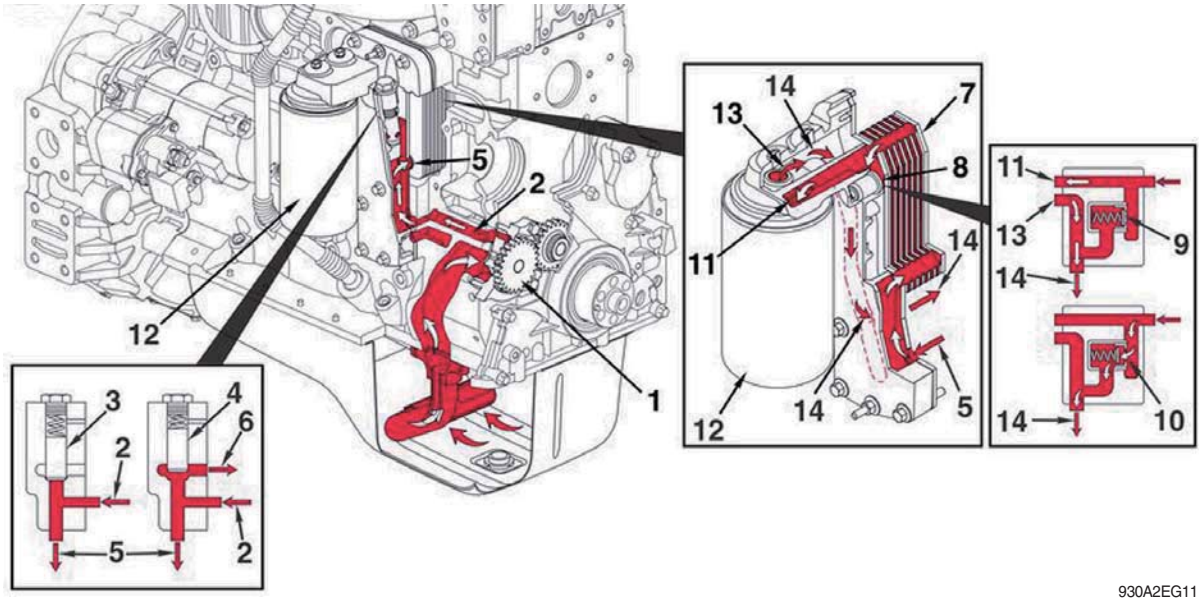
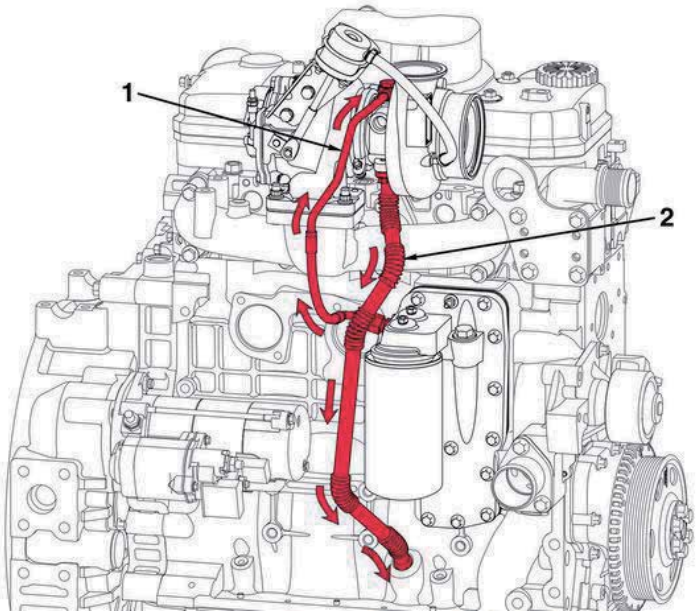
1 Fuel from supply tank
2 Water/fuel separator filter
3 Priming pump
4 Fuel supply to fuel gear pump
5 Fuel gear pump
6 To pressure side fuel filter
7 Pressure side fuel filter
8 To high-pressure fuel pump
9 High-pressure fuel pump
10 To fuel rail
11 Fuel rail
12 Fuel rail pressure relief valve
13 Common rail fuel return
14 High-pressure fuel line to injector
15 High-pressure connector
16 Injector
17 Fuel return from injectors
18 Combined fuel return
19 Fuel return to fuel supply tank

2) LUBRICATING OIL SYSTEM



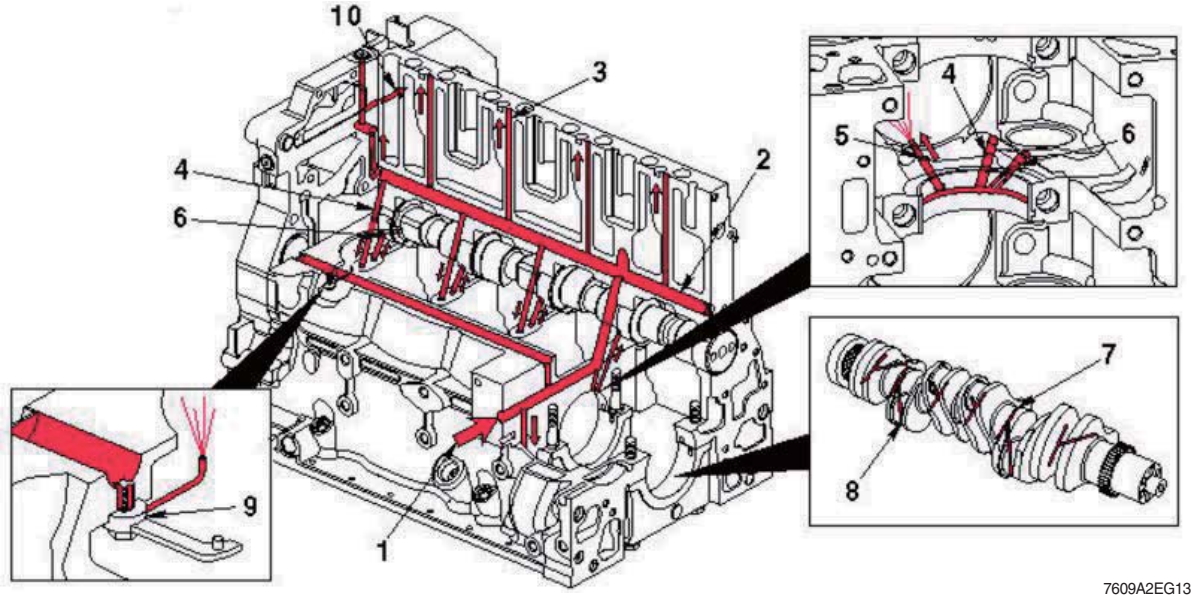
1 Lubricating oil pump
2 From lubricating oil pump
3 Pressure regulating valve closed
4 Pressure regulating valve open
5 To lubricating oil cooler
6 To lubricating oil pump supply
7 Lubricating oil cooler
8 Filter bypass valve
9 Filter bypass valve closed
10 Filter bypass valve open
11 To lubricating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

(1) Lubrication for the turbocharger



1 Turbocharger lubricating oil supply
2 Turbocharger lubricating oil drain

(2) Lubrication for the power components



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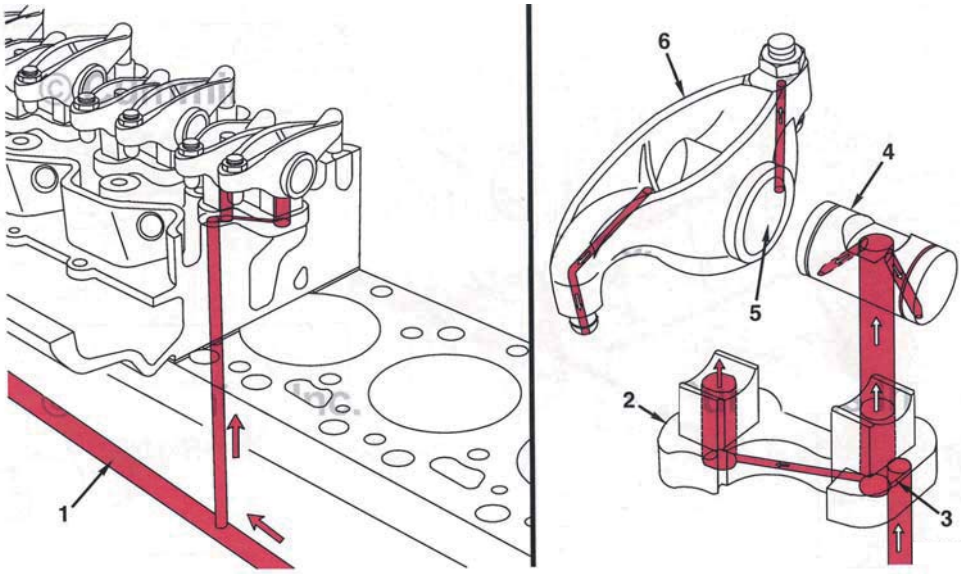
1 From lubricating oil cooler
2 Main lubricating oil rifle
3 To valve train
4 From main lubricating oil rifle
5 To piston-cooling nozzle
6 To camshaft
7 Crankshaft main journal
8 Oil supply to rod bearings
9 Directed piston-cooling nozzle
10 To internal lubrication of air compressor

(3) Lubrication for the overhead components



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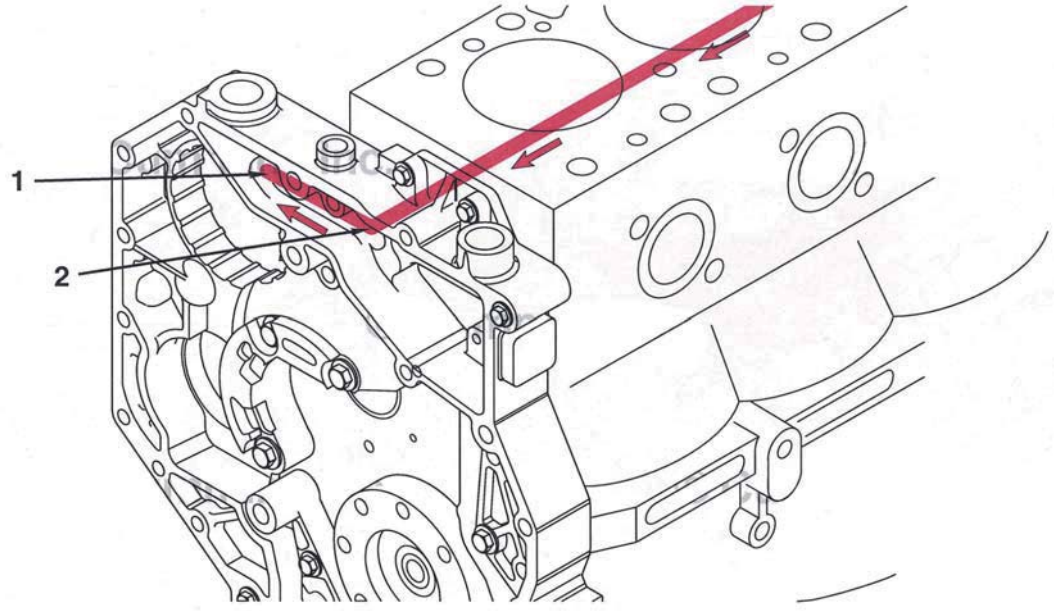
1 Main lubricating oil rifle
2 Rocker lever support
3 Transfer slot
4 Rocker lever shaft
5 Rocker lever bore
6 Rocker lever

(4) Lubrication for the accessory drive



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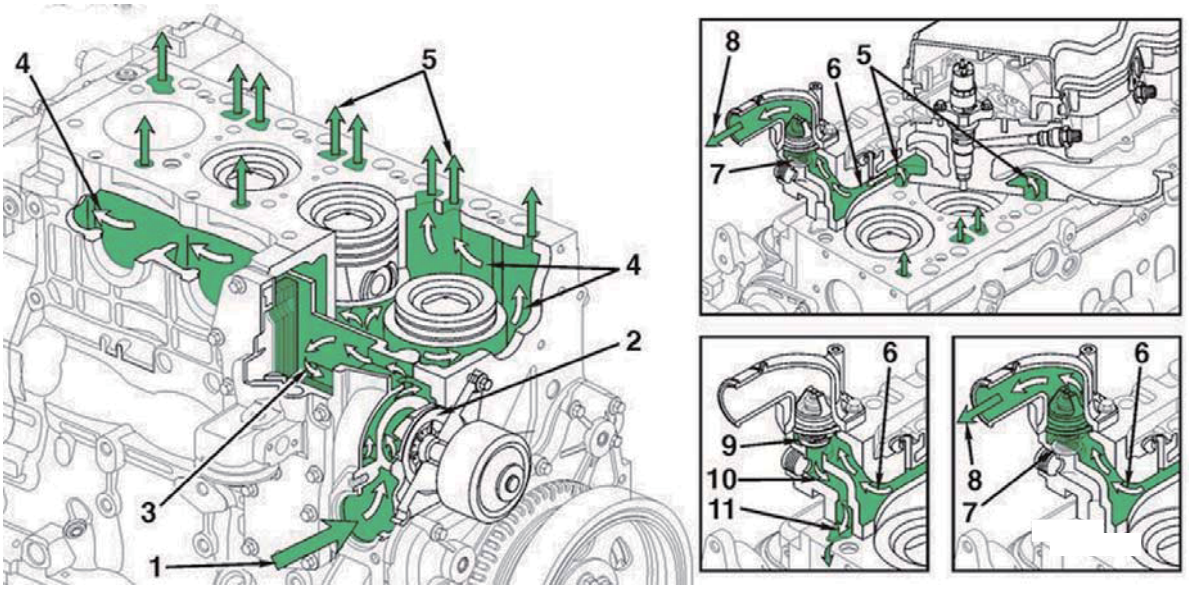
1 Oil supply to accessory drive

2 Oil feed from block

※ Oil returns to pan through the gear housing.

3) COOLING SYSTEM



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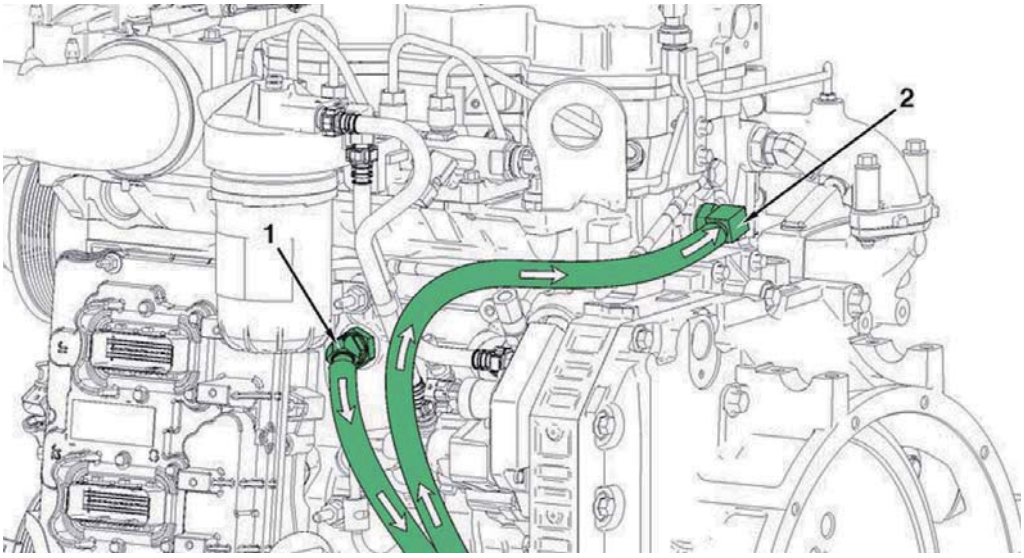
1 Coolant inlet f
2 Pump Impeller
3 Coolant flow past lubricating oil cooler
4 Coolant flow arround cylinders
5 Coolant flow from cylinder block to cylinder head
6 Coolant flow to thermostat housing
7 Thermostat closed
8 Coolant flow back to radiator
9 Thermostat open
10 Coolant bypass passage in cylinder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



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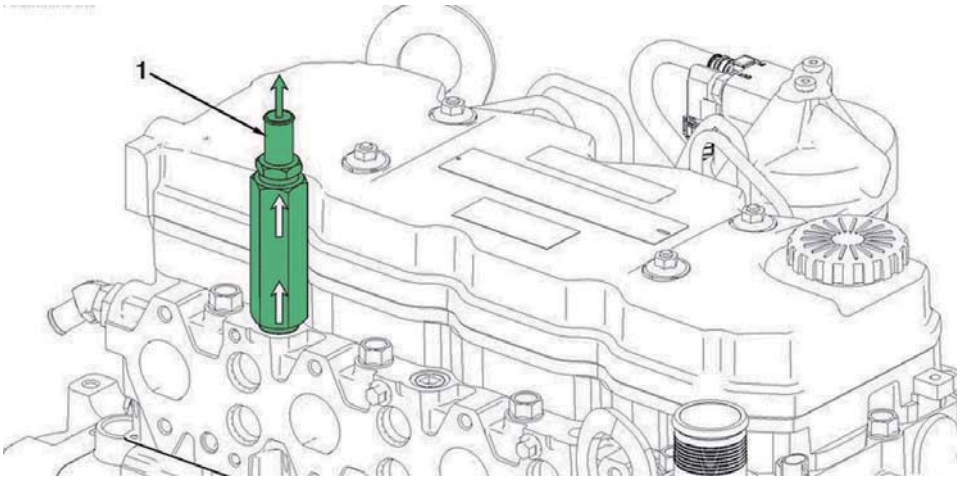
1 Air compressor coolant supply from cylinder block
2 Air compressor coolant return to cylinder head



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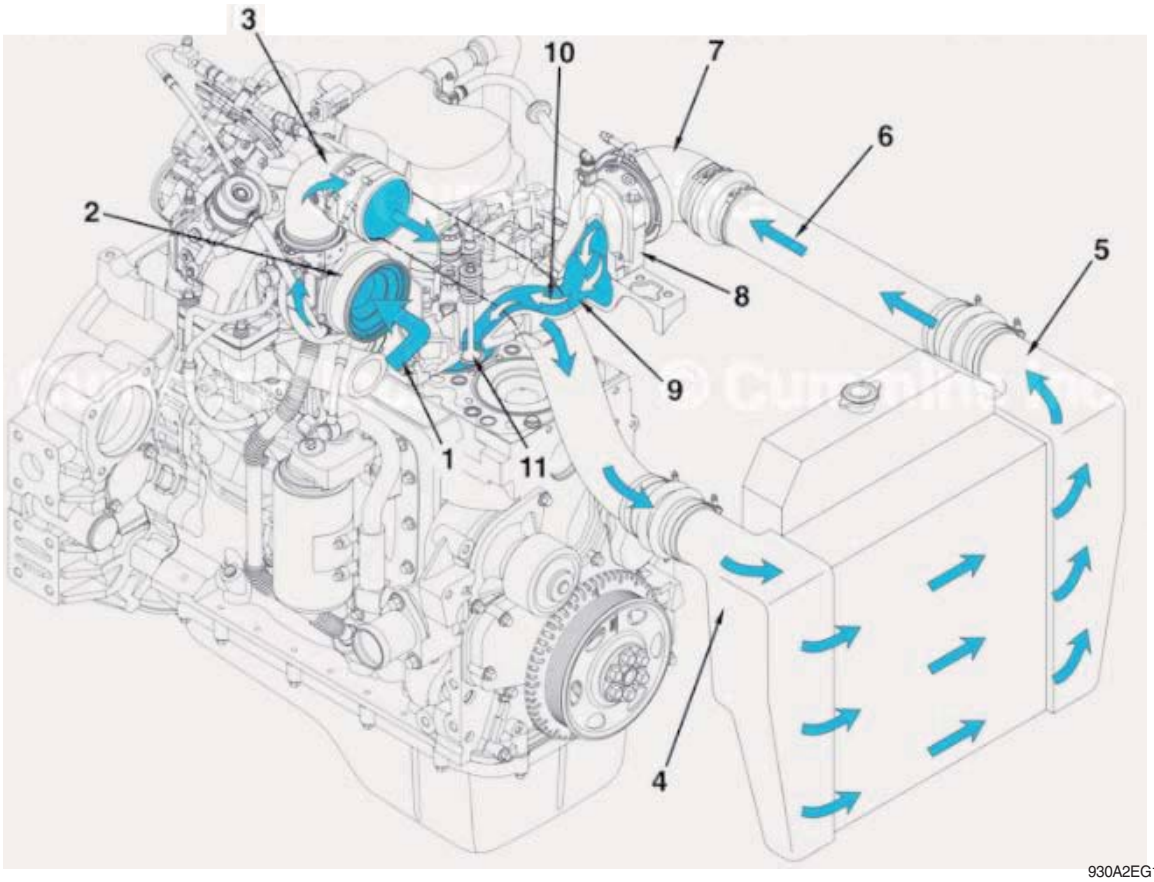
1 For mid-mount rear outlet turbocharger configuration, the coolant port between cylinders 3 and 4 is recommended for coolant supply to the aftertreatment DEF dosing valve and DEF tank.

4) AIR INTAKE SYSTEM



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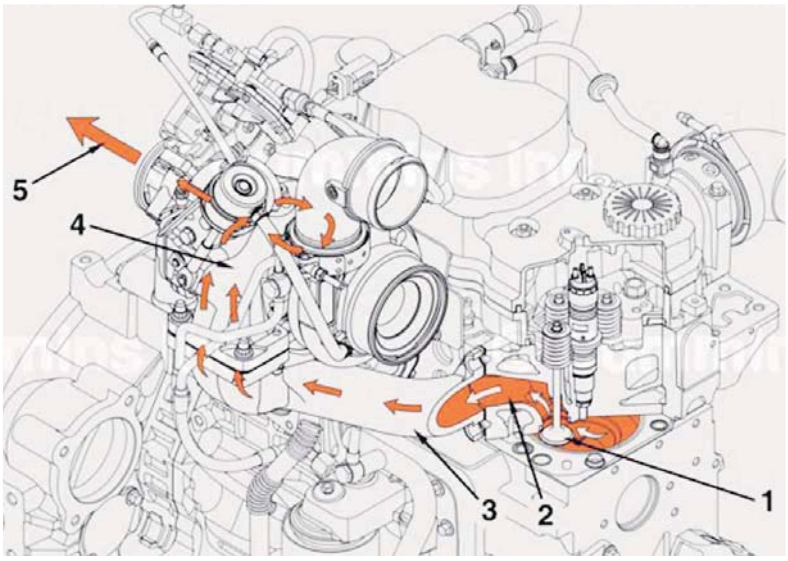
1 Air cleaner
2 Turbocharger compressor inlet
3 Turbocharger compressor outlet
4 Charge air cooler inlet
5 Charge air cooler outlet
6 Charge air cooled intake air
7 Air intake connection adapter
8 Air intake manifold cover
9 Intake port
10 Intake valve
11 Air to combustion cylinder

5) EXHAUST SYSTEM



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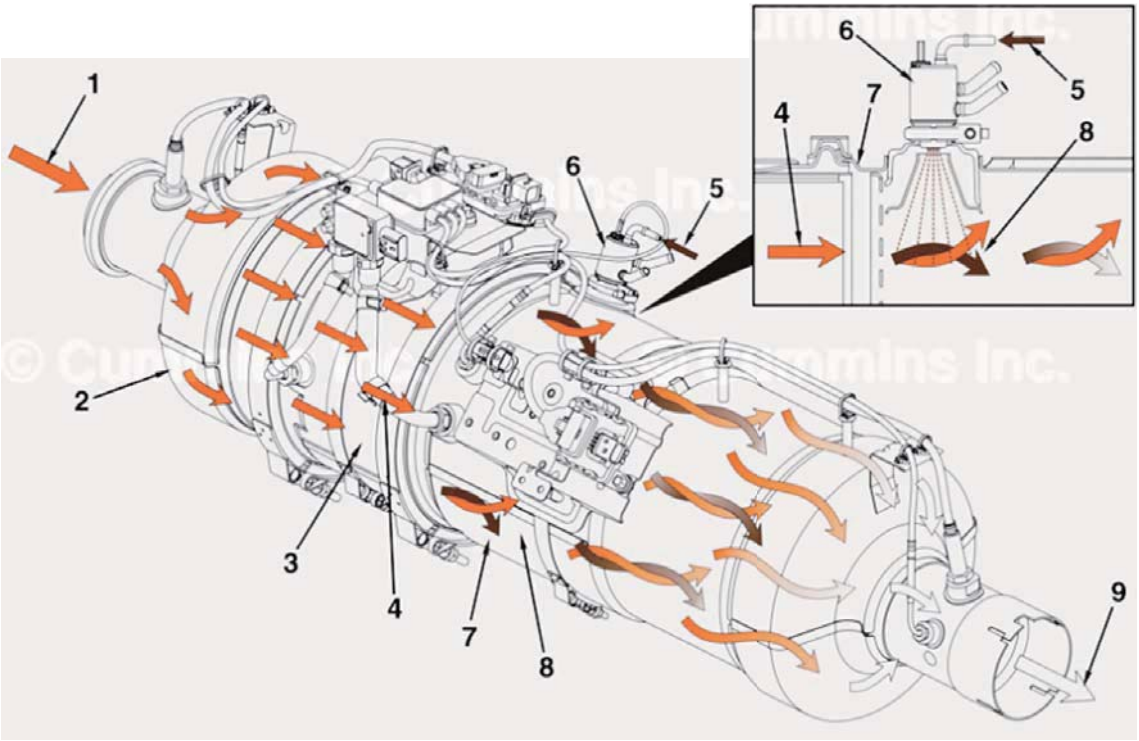
1 Exhaust valve
2 Exhaust port
3 Exhaust manifold
4 Turbocharger
5 Turbocharger exhaust outlet to aftertreatment

EXHAUST SYSTEM



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1 Exhaust flow from turbocharger
2 Aftertreatment DOC
3 Aftertreatment DPF
4 Exhaust gas flow from the DPF
5 DEF supply to the aftertreatment DEF dosing valve
6 Aftertreatment DEF dosing valve
7 Decomposition tube and selective catalytic reduction (SCR) catalyst assembly
8 Exhaust and DEF mixture
9 Exhaust flow exiting aftertreatment system

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

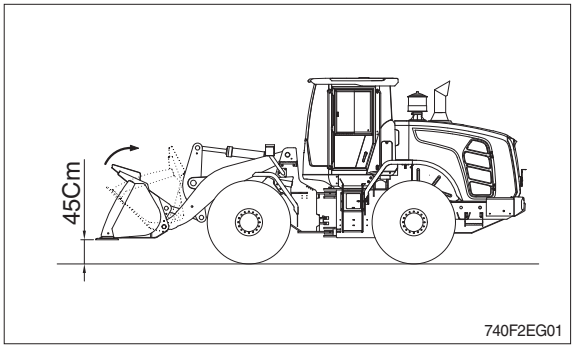
Engine speed, rpm (P mode)						Remark
Low idle	High idle	Pump stall	Converter stall	Full stall	Fan motor	
800±25	2230±50	2230±70	2020±70	1970±100	950±50	

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.

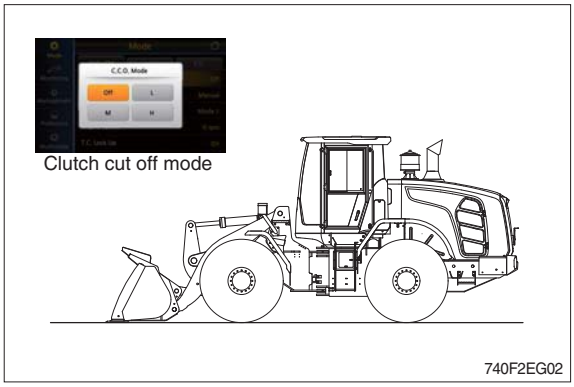
1) Pump stall rpm

- Start the engine and raise the bucket approx 45 ㎝ (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 ㎝ (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.