VOLVO

Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Engine, description	**210**	**Service Information**	**2014/10/31**
Profile:			

Engine, description

(CUMMINS C8.3–C)

- The engine is a 6-cylinder, 4-stroke, direct injected, turbocharged, water cooled assembly with a cast iron block and cylinder head.
- Gears in the engine gear case are hardened helical type for strength and reduced noise, arranged to provide quiet, smooth transmission of power.
- The cylinder block and head are designed with internal passages formed as sets for lubrication and cooling. The water pump and oil cooler are integrally mounted.
- The fan belt is a poly type V-belt for improved performance and an auto tension adjuster maintains belt tension.

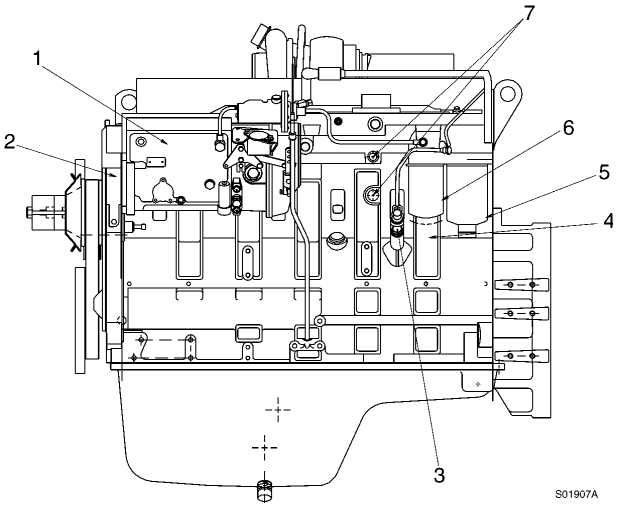

Figure 1
Engine, structure

1. Fuel injection pump
2. Engine data plate
3. Fuel feed pump
4. Engine oil pressure sensor port (1/8″ NPTF)
5. Fuel primary filter/water separator
6. Fuel secondary filter
7. Water inlet/outlet (1/2″ NPTF)

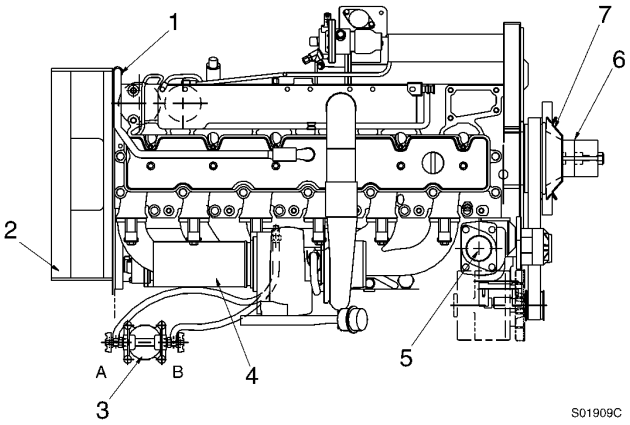

Figure 2
Engine, top view

1. Breather hose
2. Flywheel housing
3. Water filter
4. Exhaust gas pipe
5. Thermostat
6. Fan spacer
7. Fan drive pulley

A. Out
B. In

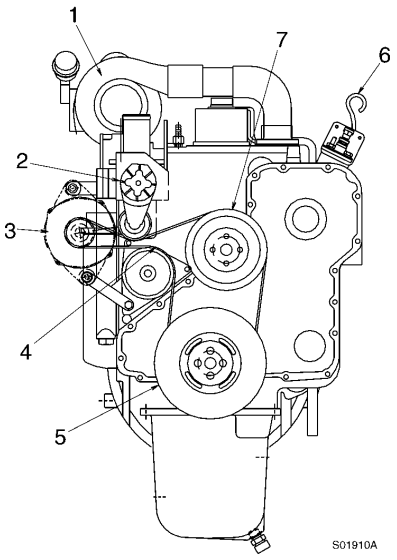

Figure 3
Engine, front view

1. Turbocharger
2. Automatic belt tensioner
3. Alternator
4. Fan belt
5. Vibration damper
6. Dipstick gauge
7. Fan drive pulley

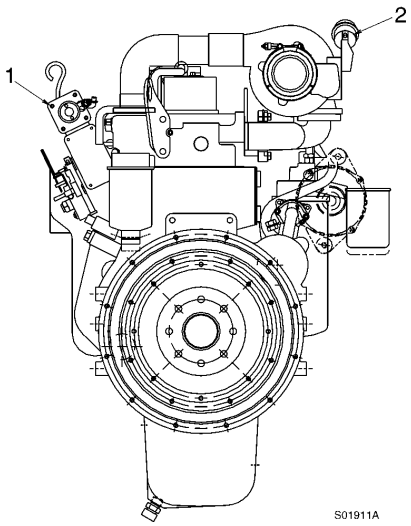

Figure 4
Engine, rear view

1. Fuel shut–off solenoid
2. Turbocharger wastegate

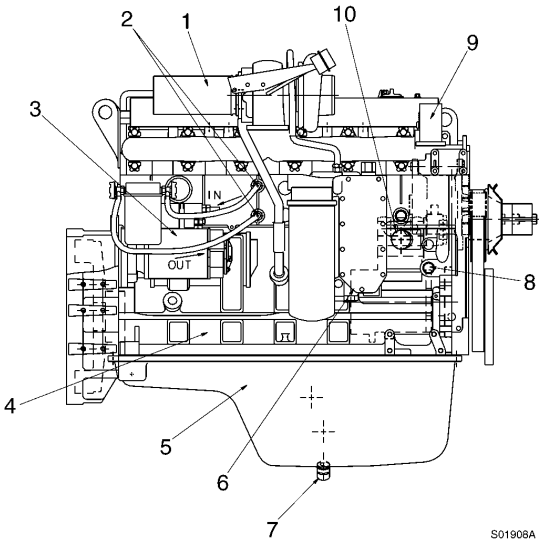

Figure 5
Engine turbocharger, side view

1. Exhaust gas discharge port
2. Water filter connecting port (1/2″ NPTF)
3. Starter
4. Engine block
5. Oil pan
6. Engine oil cooler
7. Engine oil drain valve (M18 × 1.5P)
8. Temperature switch (for auto warm - up)
9. Water outlet
10. Water inlet

Engine characteristic curve

Engine characteristics

Item	Specification

Rated output	200 PS / 1900 rpm
Max. torque (Net)	87 kgf·m / 1300 rpm (629 lbf·ft / 1300 rpm)
Min. fuel consumption	155 g / ps·h
Rated fuel consumption	170 g / ps·h

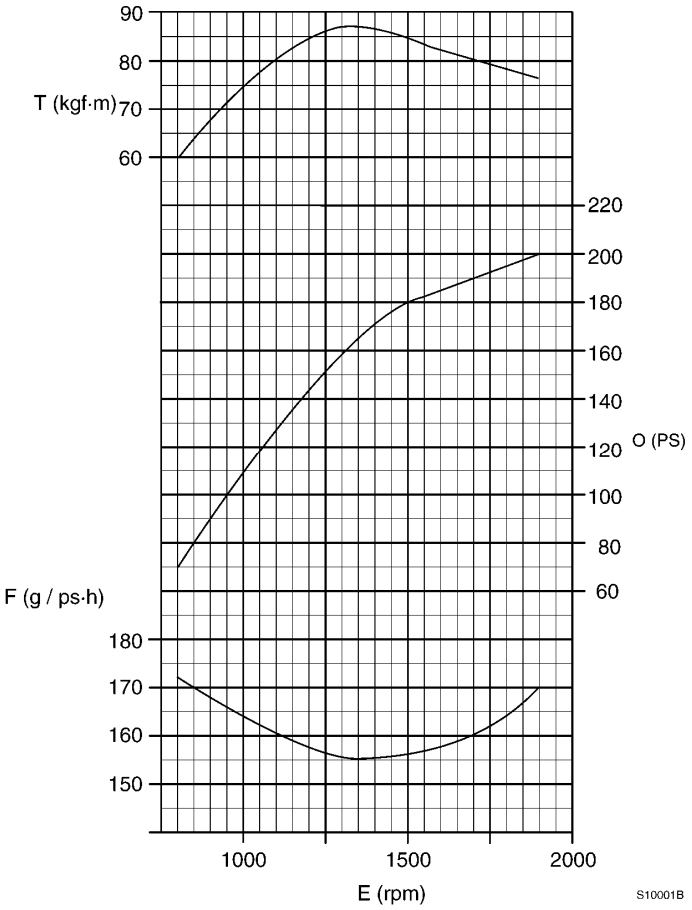

Figure 6
Engine, characteristic curve

T. Torque
F. Fuel consumption
O. Output
E. Engine speed

NOTE!
For detailed information on the engine, consult the separate engine service manual.

Document Title: **Engine, specifications**	Function Group: **210**	Information Type: **Service Information**	Date: **2014/10/31**
Profile:			

Engine, specifications

Specifications

Item		**Unit**	**Specification**
Make		–	Cummins diesel
Model		–	C 8.3–C
Type		–	4–stroke, 6–cylinder, water cooling, upright series, direct injection, diesel engine, turbocharged
Rated output		PS / rpm	200 / 1900
Maximum torque (Net)		kgf·m / rpm (lbf·ft / rpm)	87/ 1300 (629 / 1300)
Number of cylinder Bore × Stroke		mm	6 – 114 × 135
Total displacement		cc(cu·in)	8270 (505)
Compression ratio		–	17.5 : 1
Low idle (No–load)		rpm	810 ~ 890
High idle (No–load)			2030 ~ 2110
Firing order		–	1 – 5 – 3 – 6 – 2 – 4
Nozzle pressure		kgf / cm2 (psi)	260 ~ 268 (3698 ~3812)
Valve clearance	Inlet	mm (inch)	0.30 (0.012)
	Exhaust		0.61 (0.024)
Turbocharger		–	Installed
Fan		–	Suction
Drive			V–rib belt
Weight of engine (wet)		kg	685
		lb	1510

Document Title:	Function Group:	Information Type:	Date:
Valve clearance adjustment	**214**	**Service Information**	**2014/10/31**
Profile:			

Valve clearance adjustment

Cummins C8.3–C

Valve clearance adjustment

Valves must be correctly adjusted for the engine to operate efficiently. Valve adjustment must be performed using the specified values.
Adjust the valves at each 1000 hours or 1 year maintenance interval.
All the valve adjustments must be made when the engine is cold, and stabilized coolant temperature is 60 °C or below.

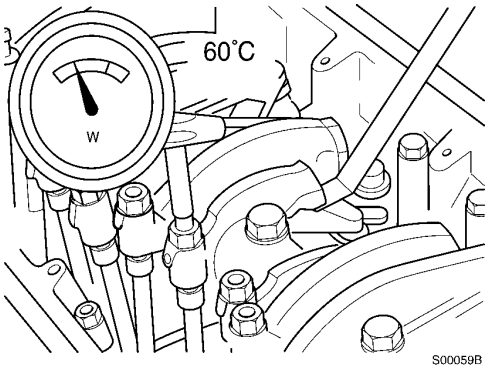

Figure 1
Adjustment condition

W. Water temperature

Valve clearance

Inlet valve	0.30 mm	0.012 in
Exhaust valve	0.61 mm	0.024 in

- Remove the air inlet hose.

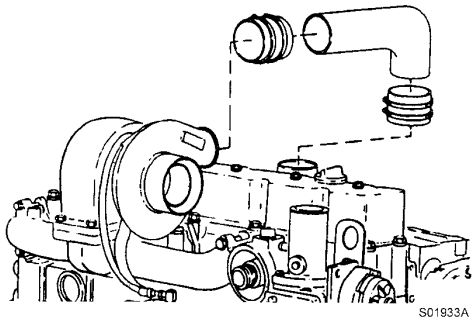

Figure 2
Removal, inlet hose

- Remove the wastegate sensing line, support clamps and crankcase vent tube.

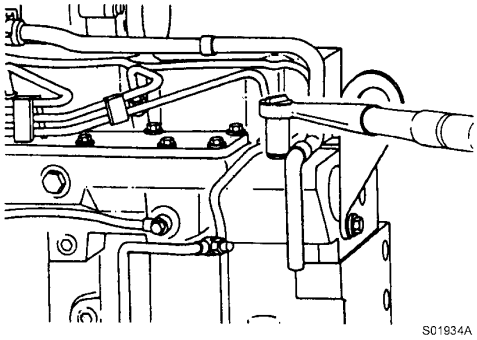

Figure 3
Removal. crankcase vent tube

Tools : 13, 18 mm Socket

- Remove the valve cover.

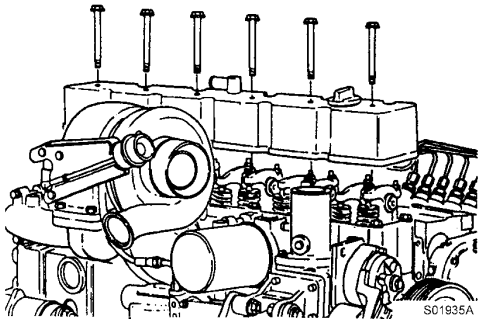

Figure 4
Removal, valve cover

Tools : 15 mm Wrench

- Locate top dead center for cylinder No.1 by rotating the crankshaft slowly while pressing on the engine timing pin.

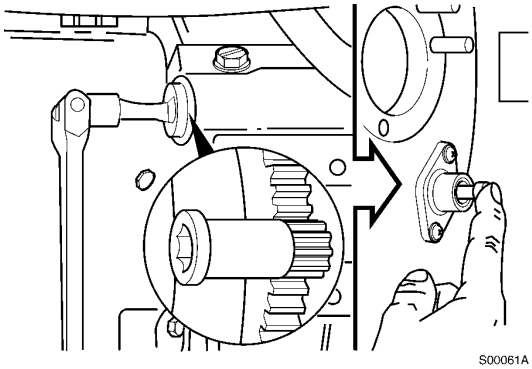

Figure 5
Rotation, camshaft gear

Tools : 1/2″ driver, Part No. 3377371 Engine Barring tool.

- When the pin engages the hole in the camshaft gear, cylinder No. 1 is at top dead center on the compression stroke.

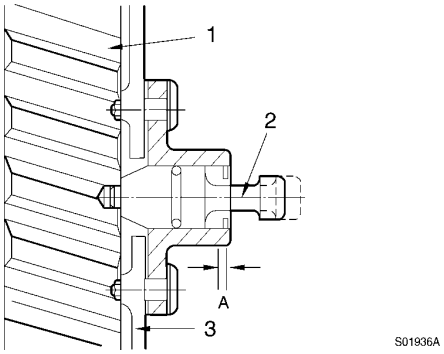

Figure 6
Position, cylinder No.1

1. Camshaft gear
2. Engine timing pin
3. Gear housing

A. Compression stroke

CAUTION

Disengage the timing pin. Engine components may be damaged if the engine is rotated with the timing pin engaged.

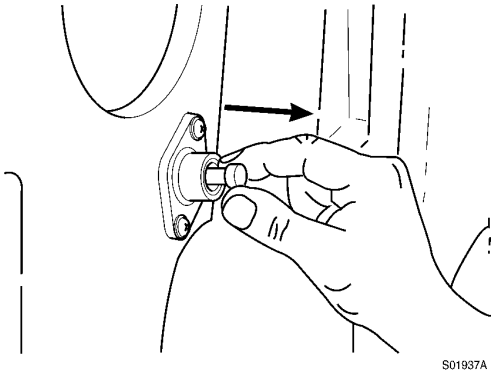

Figure 7
Removal, timing pin

CAUTION

To prevent damage of push rod, make sure the adjusting screw ball is positioned in the socket of the push rod when tightening.

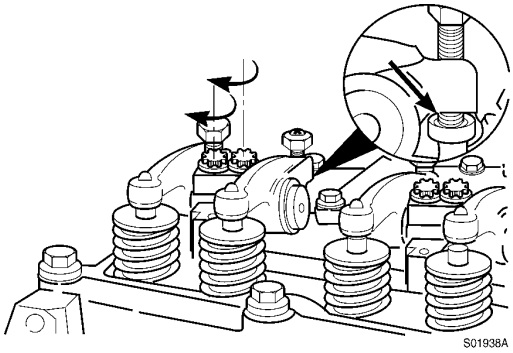

Figure 8
Position, adjusting screw ball

- The clearance is correct when slight resistance is felt as the feeler gauge is moved between the valve stem and rocker lever.
  At that point, tighten the lock nut.

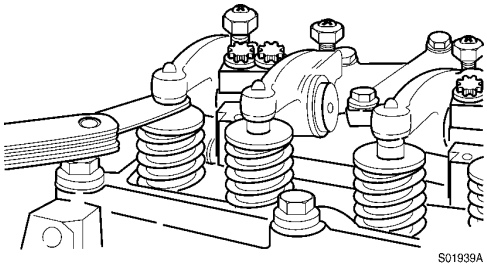

Figure 9
Checking, clearance

Tools : Spanner 14mm, "-" Driver, feeler gauge.

- Adjust the valves indicated (*) in the table below.
  After tightening the lock nut, check the valve clearance again.
  If the clearance is not correct, readjust.

Valves to be adjusted (*)

Cylinder	1	2	3	4	5	6
Inlet (I)	*	*		*		
Exhaust (E)	*		*		*	

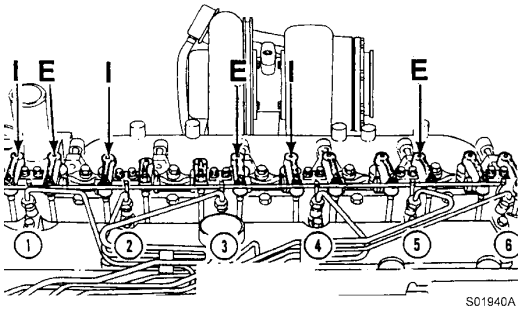

Figure 10
Valves to be adjusted

CAUTION
Be sure the timing pin is disengaged.

- Mark the crankpulley and cover.
- Rotate the crankshaft 360°.

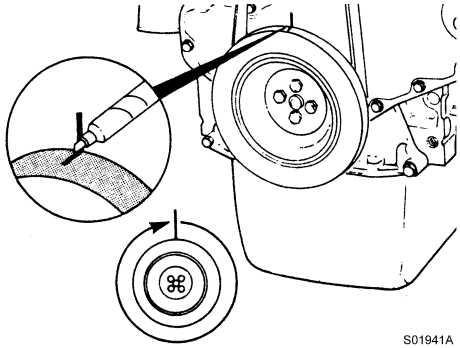

Figure 11
Marking, crankpulley

- Adjust the valves indicated (*) in the table below.
  After tightening the lock nut, check the valve clearance again.
  If the clearance is not correct, readjust.

Valves to be adjusted (*)

Cylinder	1	2	3	4	5	6
Inlet (I)		*		*	*	
Exhaust (E)		*		*		*

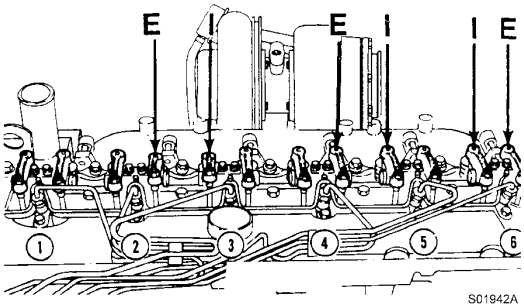

Figure 12
Valves to be adjusted

Valve cover–installation

- Install the rubber seal into the groove in the valve cover. Start the installation at the overlap area shown in the illustration.

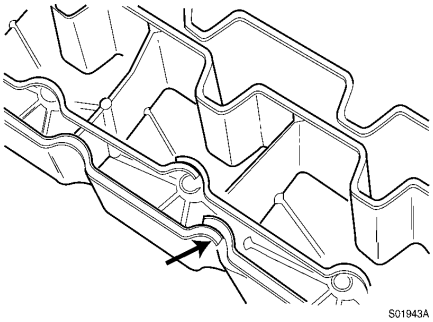

Figure 13
Assembly, rubber seal

- Do not stretch the rubber seal. If the seal has more overlap than shown in this illustration, trim the excess to provide the proper overlap.
- Install new o-rings on the valve cover screws.

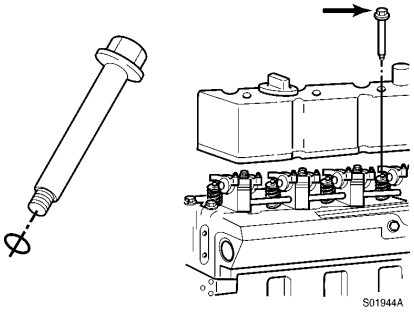

Figure 14
Assembly, o-ring

NOTE!
Engines equipped with wastegate turbochargers must have a studded screw installed in the third hole from the front. This is for the wastegate actuator hose clamp.

- Install the valve cover screws and tighten in the sequence shown.

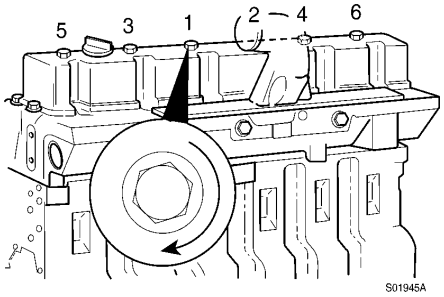

Figure 15
Screw tightening sequence

Tools : 15 mm spanner
Tightening torque : 24 N·m (18 lbf·ft)

Crankcase breather tube–installation

- Install the breather tube and hose clamps.
- Tighten the screws for the breather tube support brackets.

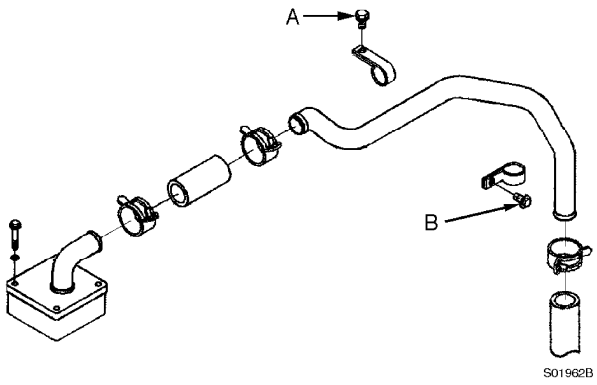

Figure 16
Assembly, breather tube

Tightening torque : A = 24 N·m (18 lbf·ft), B = 43 N·m (32 lbf·ft)
Tools : 13, 18 mm spanner

Injection nozzles–installation

- Lubricate the sealing lips of the sleeve with anti-seize compound. Assemble the injection nozzle, the sealing sleeve, a new copper washer and the hold-down clamp.
- Use only one washer.
- A light coat of clean 15W–40 engine oil between the washer and the injection nozzle will aid in holding the washer in place during installation.

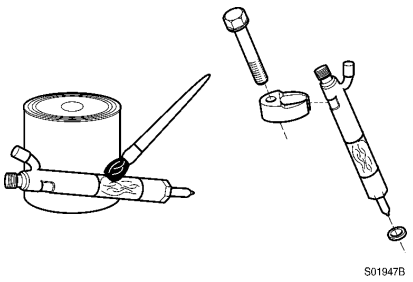

Figure 17
Apply, anti-seize compound

- Install the hold-down injection nozzle assembly into the injection nozzle bore. The injector leak–off connection must be toward the valve cover.

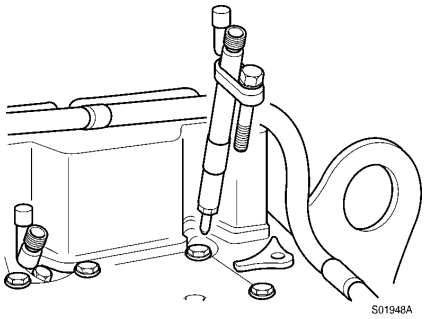

Figure 18
Assembly, injection nozzle

- Install the hold-down screw.

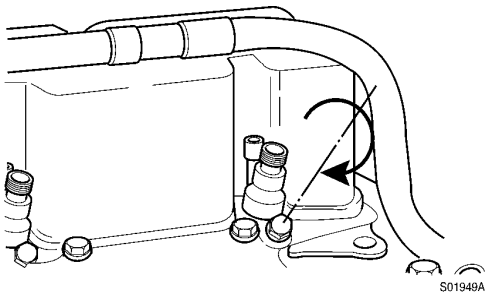

Figure 19
Screw in, hold-down screw

Tightening torque : 24 N·m (18 lbf·ft)
Tools : 13 mm spanner

Document Title:	Function Group:	Information Type:	Date:
Engine mounting	**218**	**Service Information**	**2014/10/31**
Profile:			

Engine mounting

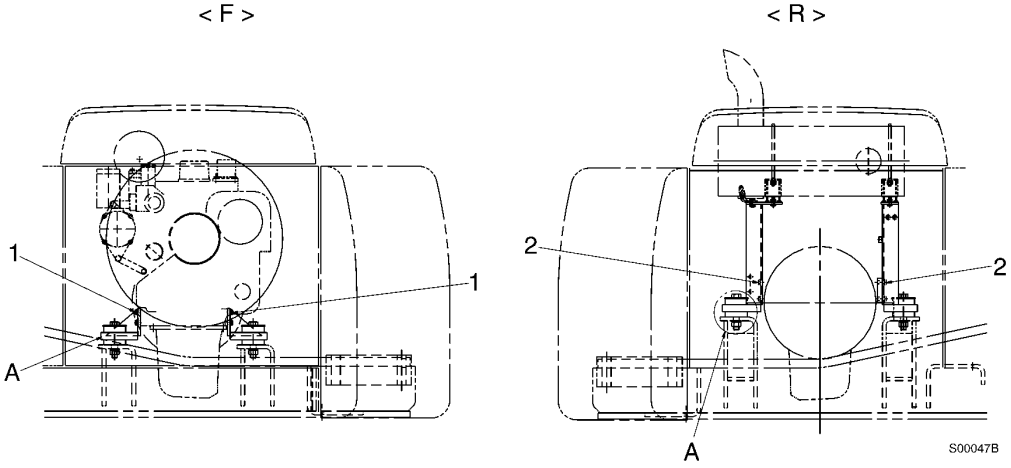

Figure 1
Engine mounting, side view

A : Cushion
F : Front-fan side view
R : Rear- flywheel side view

Tightening torque, unit : kgf·m (lbf·ft)

No.	Mounting position	Tightening torque
1	Engine mounting bracket (front)	M12 x 1.75 x 35L
		11 ~ 12 (79 ~ 87)
2	Engine mounting bracket (rear)	M12 x 1.75 x 50L
		7.2 ~ 8.4 (52 ~ 61)
3	Engine mounting cushion	M22 x 2.5 x 130L
		63 ~ 77 (455 ~ 557)

NOTE!
Check the color markings for cushion installation.

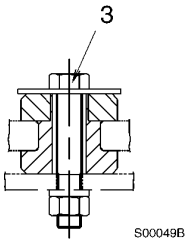

Figure 2
Cushion (A - detail)

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