

LUBRICATION

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GENERAL DESCRIPTION

LUBRICATION

1. General Description

A: SPECIFICATIONS

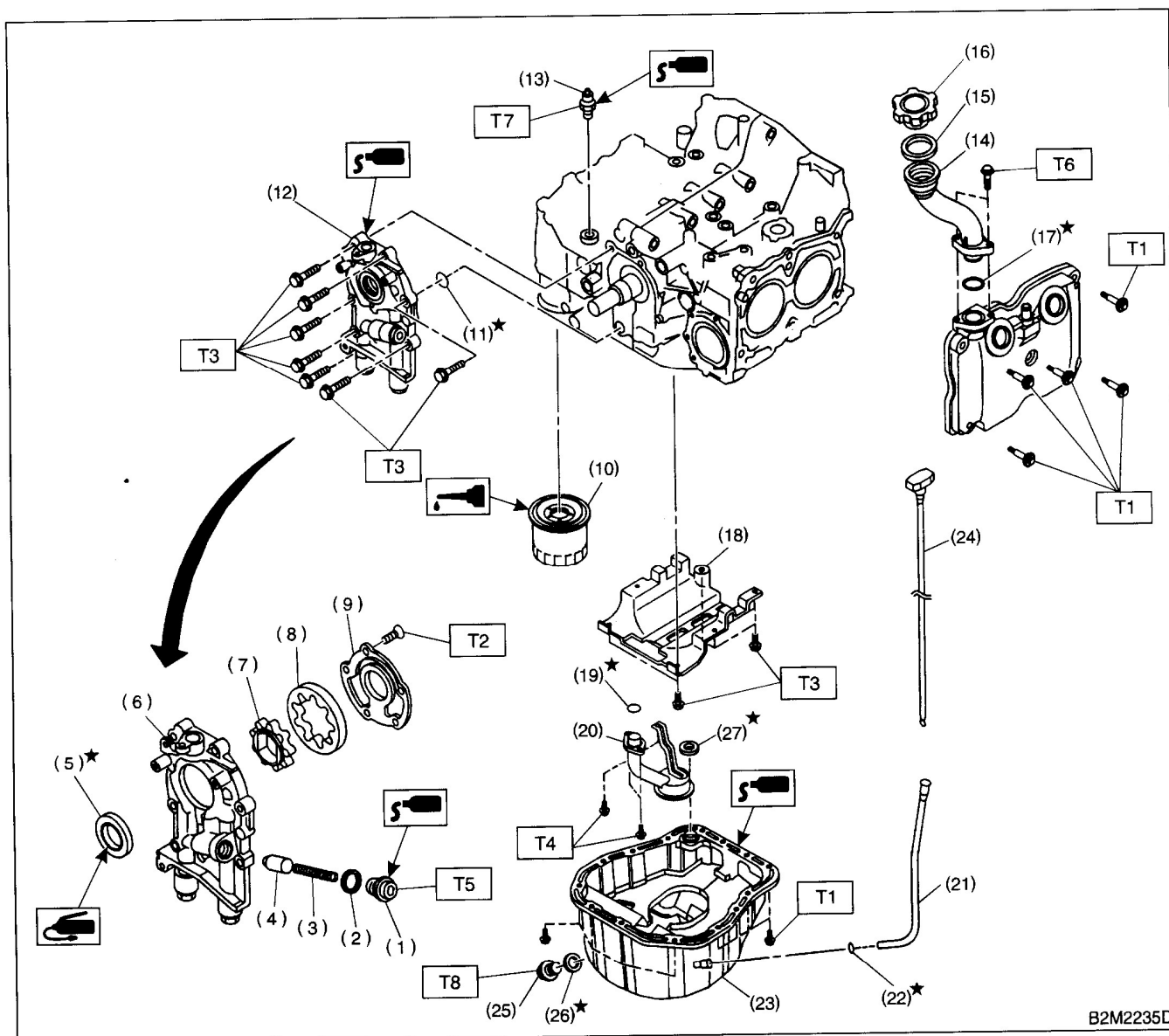
Model					Non-Turbo		Turbo	
Lubrication method					Forced lubrication			
Oil pump	Pump type				Trochoid type			
	Number of teeth		Inner rotor		9			
			Outer rotor		10			
	Outer rotor diameter × thickness				78 × 9 mm (3.07 × 0.35 in)		78 × 10 mm (3.07 × 0.39 in)	
	Tip clearance between inner and outer rotor			STANDARD	0.04 — 0.14 mm (0.0016 — 0.0055 in)			
				LIMIT	0.18 mm (0.0071 in)			
	Side clearance between inner rotor and pump case			STANDARD	0.02 — 0.07 mm (0.0008 — 0.0028 in)			
				LIMIT	0.12 mm (0.0047 in)			
	Case clearance between outer rotor and pump case			STANDARD	0.10 — 0.175 mm (0.0039 — 0.0069 in)			
				LIMIT	0.20 mm (0.0079 in)			
	Capacity at 80°C (176°F)	700 rpm	Discharge	- pressure	98 kPa (1.0 kg/cm ² , 14 psi)			
				- quantity	4.2 ℓ (4.4 US qt, 3.7 lmp qt)/min.		4.6 ℓ (4.9 US qt, 4.0 lmp qt)/min.	
		5,000 rpm	Discharge	- pressure	294 kPa (3.0 kg/cm ² , 43 psi)			
				- quantity	42.0 ℓ (11.10 US gal, 9.24 lmp gal)/min.		47.0 ℓ (12.41 US gal, 10.33 lmp gal)/min.	
	Relief valve operation pressure				490 kPa (5.0 kg/cm ² , 71 psi)		588 kPa (6.0 kg/cm ² , 85 psi)	
Oil filter	Type				Full-flow filter type			
	Filtration area				1,000 cm ² (155 sq in)			
	By-pass valve opening pressure				157 kPa (1.6 kg/cm ² , 23 psi)			
	Outer diameter × width				80 × 70 mm (3.15 × 2.76 in)			
	Oil filter to engine thread size				M 20 × 1.5			
Relief valve (on rocker shaft) operation pressure					69 kPa (0.7kg/cm ² , 10 psi)			
Oil pressure switch	Type				Immersed contact point type			
	Working voltage — wattage				12 V — 3.4 W or less			
	Warning light activation pressure				14.7 kPa (0.15 kg/cm ² , 2.1 psi)			
	Proof pressure				More than 981 kPa (10 kg/cm ² , 142 psi)			
Oil capacity (at replacement)					4.0 ℓ (4.2 US qt, 3.5 lmp qt)		4.5 ℓ (4.8 US qt, 4.0 lmp qt)	

GENERAL DESCRIPTION

LUBRICATION

B: COMPONENT

1. NON-TURBO MODEL



B2M2235D

- (1) Plug
- (2) Washer
- (3) Relief valve spring
- (4) Relief valve
- (5) Oil seal
- (6) Oil pump case
- (7) Inner rotor
- (8) Outer rotor
- (9) Oil pump cover
- (10) Oil filter
- (11) O-ring
- (12) Oil pump ASSY
- (13) Oil pressure switch

- (14) Oil filler duct
- (15) O-ring
- (16) Oil filler cap
- (17) O-ring
- (18) Baffle plate
- (19) O-ring
- (20) Oil strainer
- (21) Oil level gauge guide
- (22) O-ring
- (23) Oil pan
- (24) Oil level gauge
- (25) Drain plug
- (26) Metal gasket

- (27) Gasket

Tightening torque: N-m (kgf-m, ft-lb)

- T1: 5 (0.5, 3.6)**
- T2: 5 (0.5, 3.6)**
- T3: 6.4 (0.65, 4.7)**
- T4: 10 (1.0, 7.2)**
- T5: 44.1 (4.5, 32.5)**
- T6: 6.4 (0.65, 4.7)**
- T7: 25 (2.5, 18.1)**
- T8: 44 (4.5, 33)**

1. **Introduction**

2. TURBO MODEL



- (29) O-ring

Tightening torque: N·m (kgf-m, ft-lb)

T1: 5 (0.5, 3.6)

T2: 5 (0.5, 3.6)

T3: 6.4 (0.65, 4.7)

T4: 10 (1.0, 7.0)

T5: 44.1 (4.5, 32.5)

T6: 69 (7.0, 4.7)

T7: 6.4 (0.65, 50.6)

T8: 25 (2.5, 18.1)

T9: 44 (4.5, 33)

T10: 54 (5.5, 40)

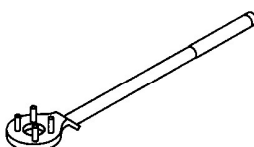
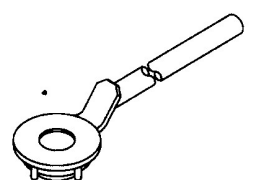
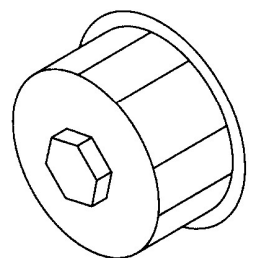
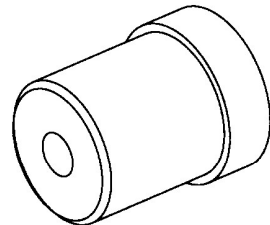
C: CAUTION

- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly, and replacement.
- Be careful not to burn your hands, because each part in the vehicle is hot after running.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or safety stands at the specified points.
- Before disconnecting electrical connectors of sensors or units, be sure to disconnect negative terminal from battery.

GENERAL DESCRIPTION

LUBRICATION

D: PREPARATION TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B2M3870	499977100	CRANK PULLEY WRENCH	Used for stopping rotation of crankshaft pulley when loosening and tightening crankshaft pulley bolt. (Non-Turbo model)
 B2M4157	499977300	CRANK PULLEY WRENCH	Used for stopping rotation of crankshaft pulley when loosening and tightening crankshaft pulley bolt. (Turbo model)
 B2M3872	498547000	OIL FILTER WRENCH	Used for removing and installing oil filter.
 B2M3875	499587100	OIL SEAL INSTALLER	Used for installing oil pump oil seal.

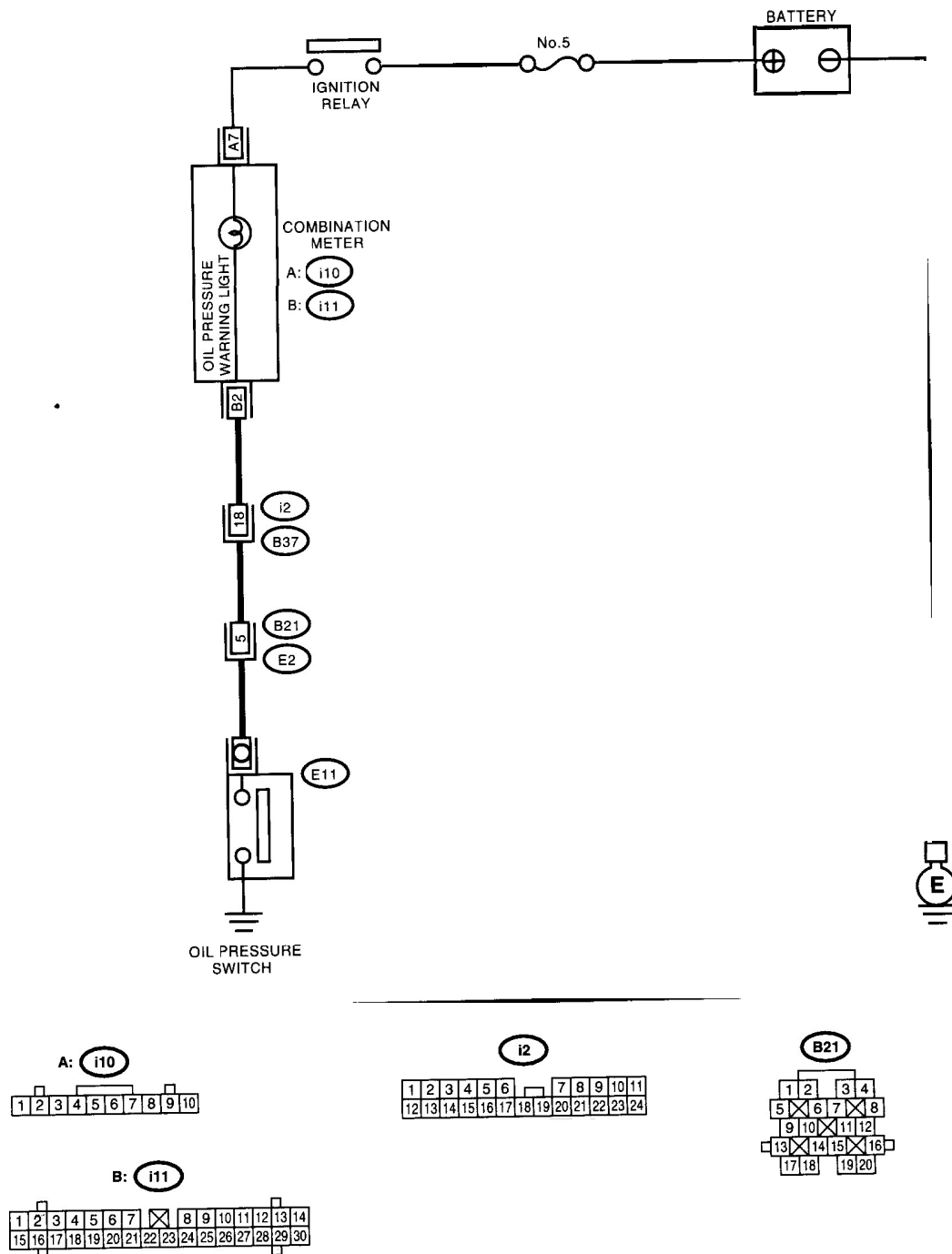
OIL PRESSURE SYSTEM

LUBRICATION

2. Oil Pressure System

A: SCHEMATIC

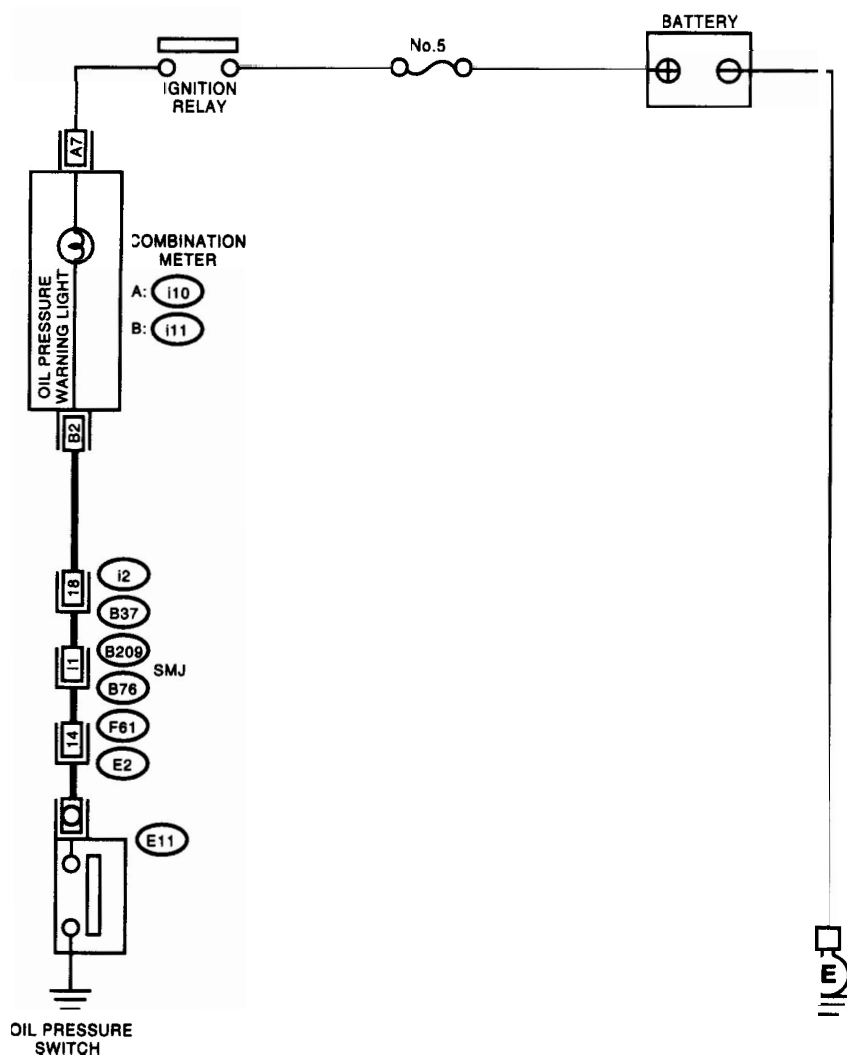
1. NON-TURBO MODEL



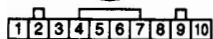
EN1046

OIL PRESSURE SYSTEM

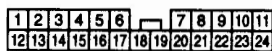
2. TURBO MODEL



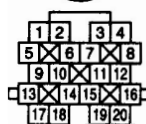
A: i10



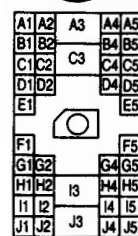
i2



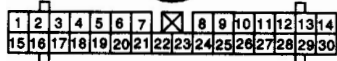
F61



B209



B: i11



EN1047

OIL PRESSURE SYSTEM

LUBRICATION

B: INSPECTION

Step	Check	Yes	No
1 CHECK COMBINATION METER. 1) Turn the ignition switch to ON. (engine OFF) 2) Check other warning lights.	Does the warning lights go on?	Go to step 2.	Repair or replace the combination meter. <Ref. to IDI-4, INSPECTION, Combination Meter System.>
2 CHECK HARNESS CONNECTOR BETWEEN COMBINATION METER AND OIL PRESSURE SWITCH. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the oil pressure switch. 3) Turn the ignition switch ON. 4) Measure the voltage of harness between the combination meter connector and chassis ground. <i>Connector & terminal (E11) No. 1 — Chassis ground:</i>	Is the voltage more than 10 V?	Replace the oil pressure switch.	Go to step 3.
3 CHECK COMBINATION METER. 1) Turn the ignition switch to OFF. 2) Remove the combination meter. 3) Measure the resistance of the combination meter. <i>Terminal No. A7 — No. B2:</i>	Is the resistance less than 10 Ω ?	Replace the harness connector between combination meter and oil pressure switch.	Repair or replace the combination meter and the oil pressure switch warning light bulb.

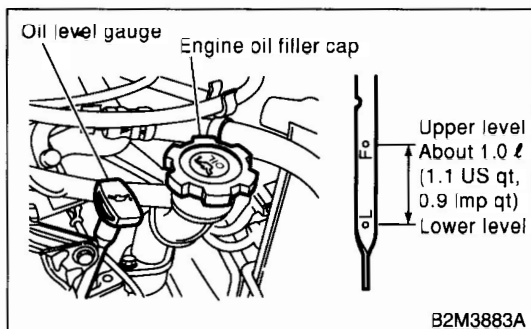
ENGINE OIL

LUBRICATION

3. Engine Oil

A: INSPECTION

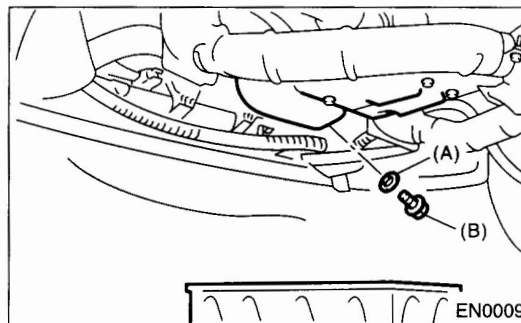
- 1) Park the vehicle on a level surface.
- 2) Remove the oil level gauge and wipe it clean.
- 3) Reinsert the level gauge all the way. Be sure that the level gauge is correctly inserted and properly orientated.
- 4) Remove it again and note the reading. If the engine oil level is below the "L" line, add oil to bring the level up to the "F" line.
- 5) After turning off the engine, wait a few minutes for the oil to drain back into the oil pan before checking the level.
- 6) Just after driving or while the engine is warm, engine oil level may show in the range between the "F" line and the notch mark. This is caused by thermal expansion of the engine oil.
- 7) To prevent overfilling the engine oil, do not add oil above the "F" line when the engine is cold.



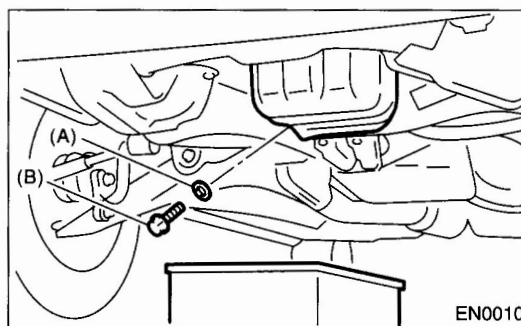
B: REPLACEMENT

- 1) Drain the engine oil by loosening engine oil drain plug.

- Non-Turbo model

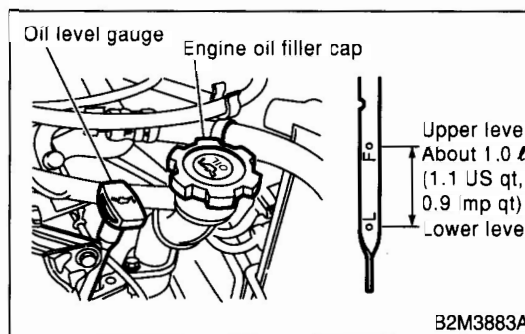


- Turbo model



- (A) Gasket
(B) Drain plug

- 2) Open the engine oil filler cap for quick draining of the engine oil.



- 3) Replace the drain plug gasket.

ENGINE OIL

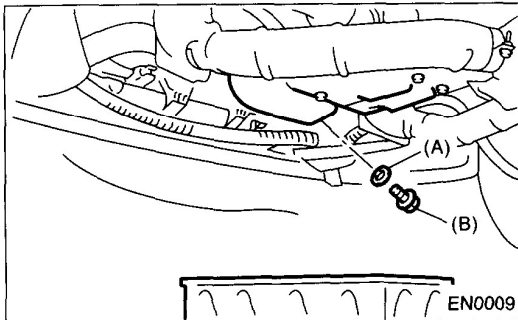
LUBRICATION

4) Tighten the engine oil drain plug after draining engine oil.

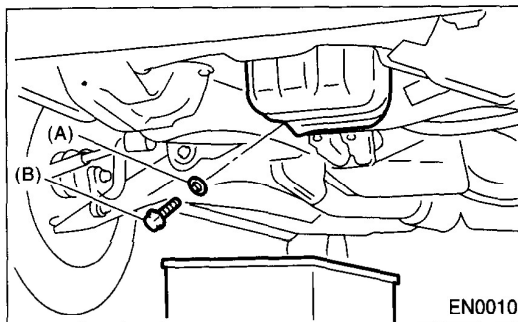
Tightening torque:

44 N·m (4.5 kgf-m, 33 ft-lb)

- Non-Turbo model



- Turbo model



- (A) Gasket
(B) Drain plug

5) Fill the engine oil through filler pipe up to upper point on level gauge. Make sure that the vehicle is placed level when checking oil level. Use engine oil of proper quality and viscosity, selected in accordance with the table in figure.

Recommended oil:

API classification

SJ or SH with the words "Energy Conserving or Energy conserving II", CCMC specification G4 or G5, ACEA specification A1, A2 or A3, or New API mark displayed on the container (If it is impossible to get SJ or SH grade, you may use SG grade.)

Engine oil capacity: (Non-Turbo model)

Upper level

4.0 ℓ (4.2 US qt, 3.5 Imp qt)

Lower level

3.0 ℓ (3.2 US qt, 2.6 Imp qt)

Engine oil capacity: (Turbo model)

Upper level

4.5 ℓ (4.8 US qt, 4.0 Imp qt)

Lower level

3.5 ℓ (3.7 US qt, 3.1 Imp qt)

SAE Viscosity No. and Applicable Temperature							
(°C)	-30	-20	-15	0	15	30	40
(°F)	-22	-4	5	32	59	86	104
B2M3885A							

The proper viscosity helps the vehicle to get good cold and hot starting by reducing viscous friction and thus increasing cranking speed.

CAUTION:

When replenishing oil, it does not matter if the oil to be added is a different brand from that in the engine; however, use oil having the API classification and SAE viscosity No. designated by SUBARU.

NOTE:

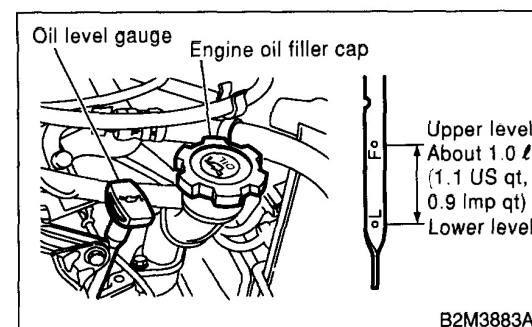
If the vehicle is used in desert areas with very high temperatures or for other heavy duty applications, the following viscosity oils may be used: API classification: SJ or SH

SAE Viscosity No.: 30, 40, 10W-50, 20W-40, 20W-50.

6) Close the engine oil filler cap.

7) Start the engine and warm it up for a time.

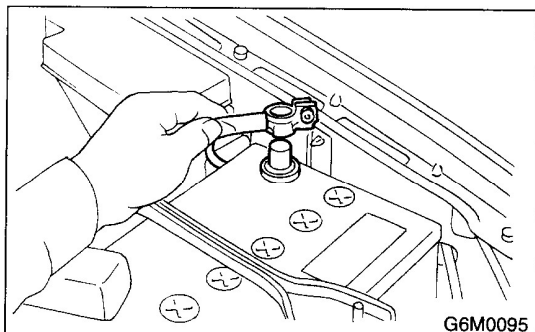
8) After the engine stops, recheck the oil level. If necessary, add engine oil up to upper level on level gauge.



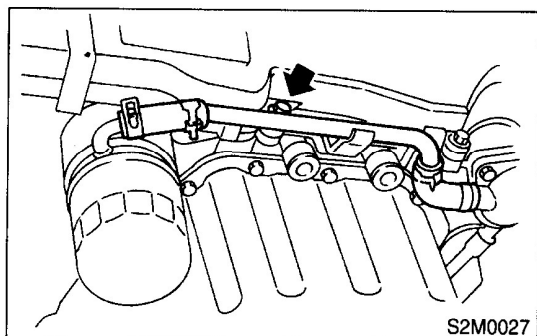
4. Oil Pump

A: REMOVAL

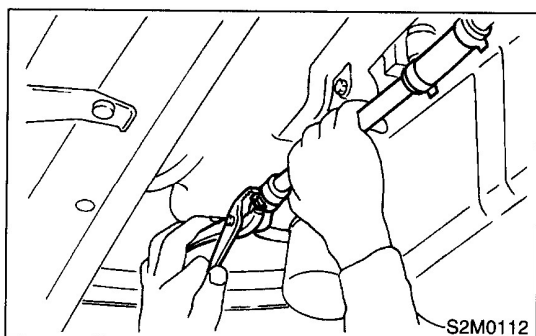
- 1) Disconnect the battery ground cable.



- 2) Lift-up the vehicle.
 3) Remove the under cover.
 4) Remove the bolts which install water pipe of oil cooler to oil pump. (Turbo model)

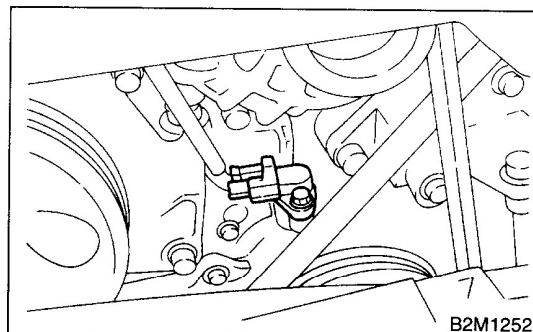


- 5) Remove the water pipe and hoses between oil cooler and water pump. (Turbo model)

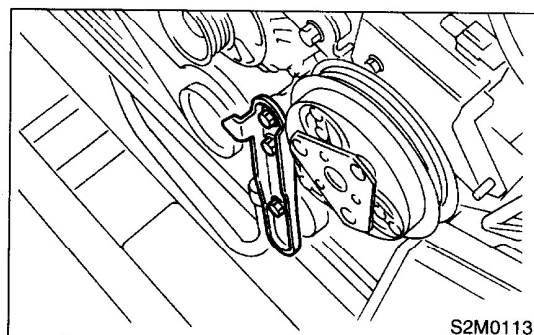


- 6) Remove the radiator. <Ref. to CO-37, REMOVAL, Radiator.>

- 7) Remove the crankshaft position sensor.



- 8) Remove the V-belts. <Ref. to ME(SOHC)-43, REMOVAL, V-belt.> or <Ref. to ME(DOHC TURBO)-44, REMOVAL, V-belt.>
 9) Remove the rear side V-belt tensioner.



- 10) Remove the crankshaft pulley by using ST.
 ST 499977300 CRANKSHAFT PULLEY WRENCH (Turbo model)
 ST 499977100 CRANKSHAFT PULLEY WRENCH (Non-Turbo model)

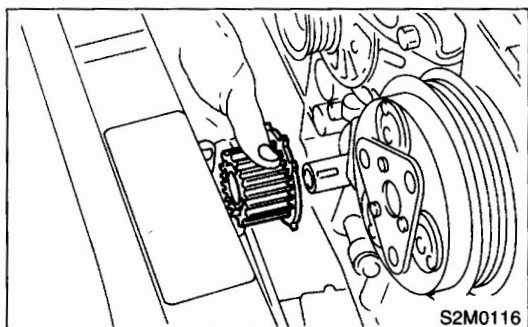


OIL PUMP

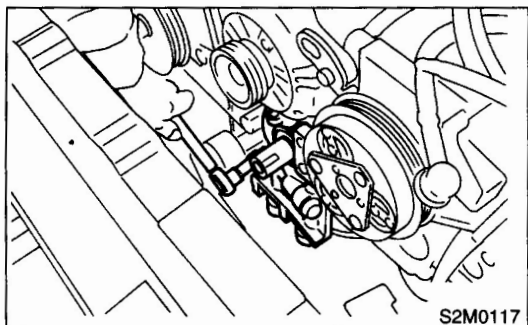
LUBRICATION

11) Remove the water pump. <Ref. to CO-27, REMOVAL, Water Pump.>

12) Remove the crankshaft sprocket.



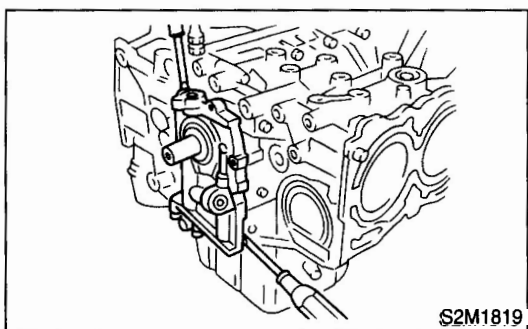
13) Remove the bolts which install oil pump onto cylinder block.



14) Remove the oil pump by using flat bladed screwdriver.

CAUTION:

Be careful not to scratch mating surfaces of cylinder block and oil pump.



B: INSTALLATION

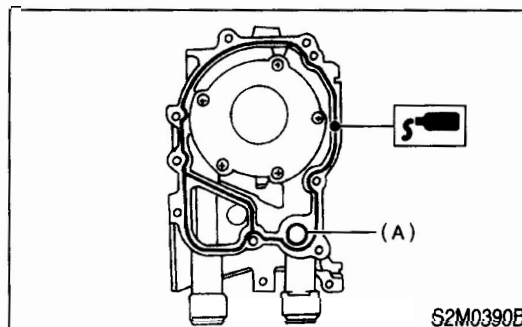
Install in the reverse order of removal.

Do the following:

1) Apply fluid packing to matching surfaces of oil pump.

Fluid packing:

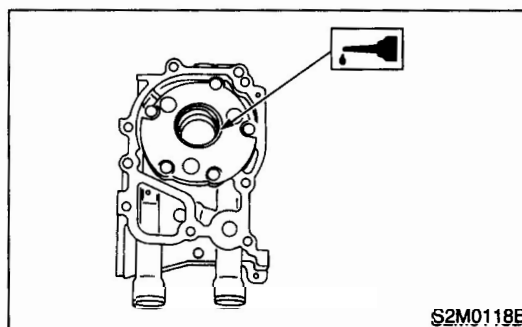
THREE BOND 1215 or equivalent



(A) O-ring

2) Replace the O-ring with a new one.

3) Apply a coat of engine oil to the inside of the oil seal.



4) Be careful not to scratch oil seal when installing oil pump on cylinder block.

5) Position the oil pump, aligning the notched area with the crankshaft, and push the oil pump straight.

CAUTION:

Make sure the oil seal lip is not folded.

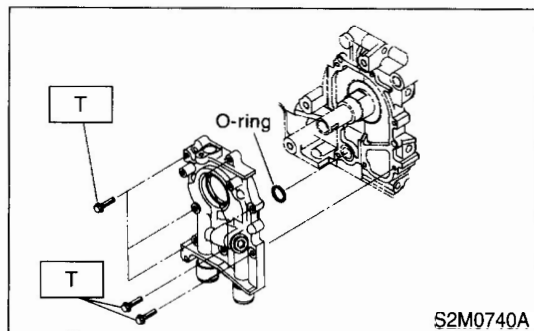
OIL PUMP

LUBRICATION

6) Install the oil pump.

Tightening torque:

6.4 N·m (0.65 kgf-m, 4.7 ft-lb)

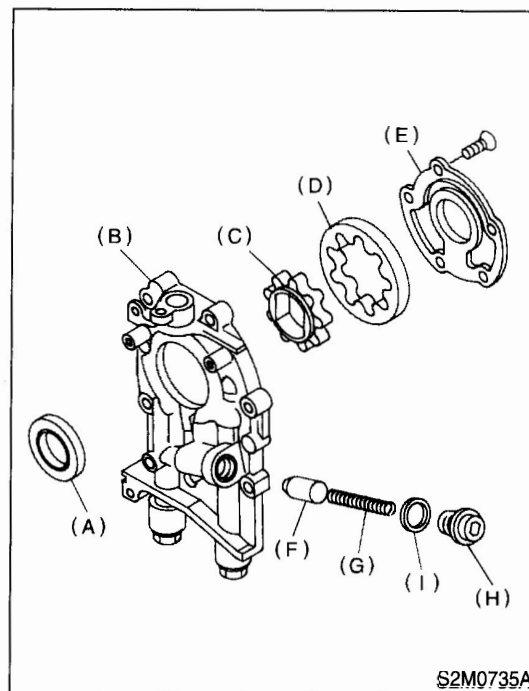


C: DISASSEMBLY

Remove the screws which secure oil pump cover and then disassemble oil pump. Inscribe alignment marks on inner and outer rotors so that they can be replaced in their original positions during reassembly.

CAUTION:

Before removing the relief valve, loosen plug when removing the oil pump from cylinder block.



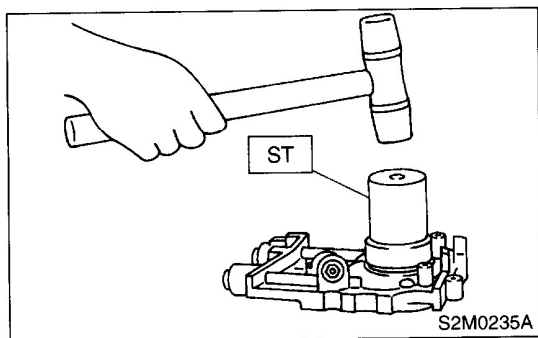
- (A) Oil seal
- (B) Pump case
- (C) Inner rotor
- (D) Outer rotor
- (E) Pump cover
- (F) Relief valve
- (G) Relief valve spring
- (H) Plug
- (I) Washer

D: ASSEMBLY

1) Install the front oil seal by using ST.
ST 499587100 OIL SEAL INSTALLER

CAUTION:

Use a new oil seal.

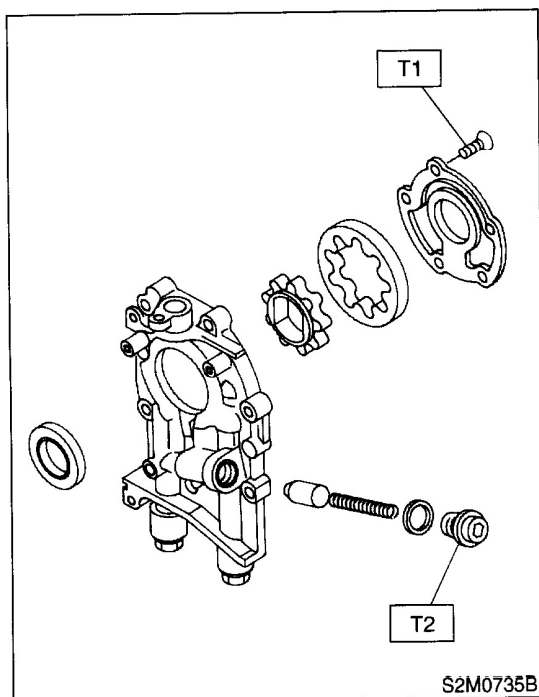


- 2) Apply a coat of engine oil to inner and outer rotors.
- 3) Install the inner and outer rotors in their original positions.
- 4) Install the oil relief valve and relief valve spring.
- 5) Install the oil pump cover.

Tightening torque:

T1: 5 N·m (0.5 kgf-m, 3.6 ft-lb)

T2: 44 N·m (4.5 kgf-m, 32.5 ft-lb)

**E: INSPECTION****1. TIP CLEARANCE**

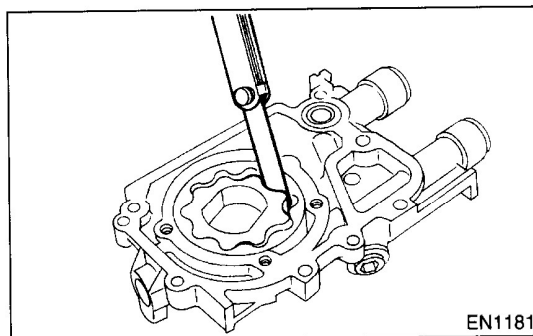
Measure the tip clearance of rotors. If the clearance exceeds the limit, replace rotors as a matched set.

Tip clearance:**Standard**

0.04 — 0.14 mm (0.0016 — 0.0055 in)

Limit

0.18 mm (0.0071 in)

**2. CASE CLEARANCE**

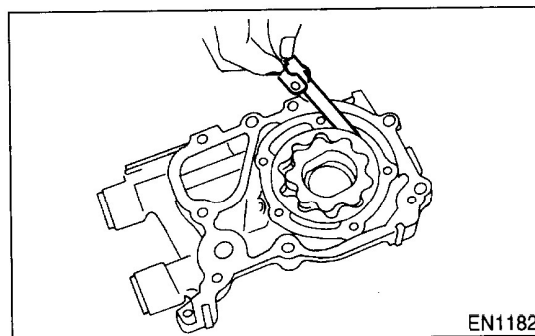
Measure the clearance between the outer rotor and the cylinder block rotor housing. If the clearance exceeds the limit, replace the rotor.

Case clearance:**Standard**

0.10 — 0.175 mm (0.0039 — 0.0069 in)

Limit

0.20 mm (0.0079 in)



OIL PUMP

LUBRICATION

3. SIDE CLEARANCE

Measure the clearance between oil pump inner rotor and pump cover. If the clearance exceeds the limit, replace rotor or pump body.

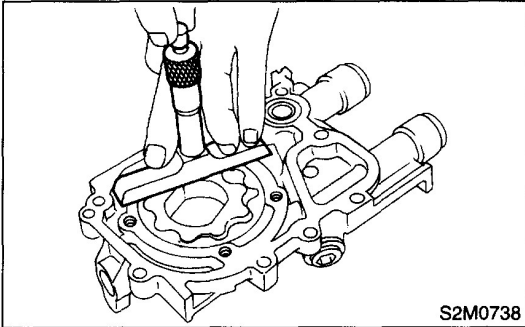
Side clearance:

Standard

0.02 — 0.07 mm (0.0008 — 0.0028 in)

Limit

0.12 mm (0.0047 in)



4. OIL RELIEF VALVE

Check the valve for fitting condition and damage, and the relief valve spring for damage and deterioration. Replace the parts if defective.

Relief valve spring:

Free length

71.8 mm (2.827 in)

Installed length

54.7 mm (2.154 in)

Load when installed

77.08 N (7.86 kg, 17.33 lb)

5. OIL PUMP CASE

Check the oil pump case for worn shaft hole, clogged oil passage, worn rotor chamber, cracks, and other faults.

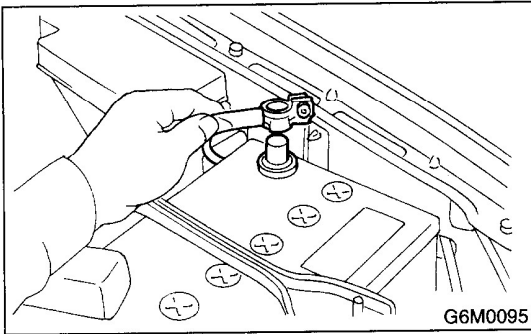
6. OIL SEAL

Check the oil seal lips for deformation, hardening, wear, etc, and replace if defective.

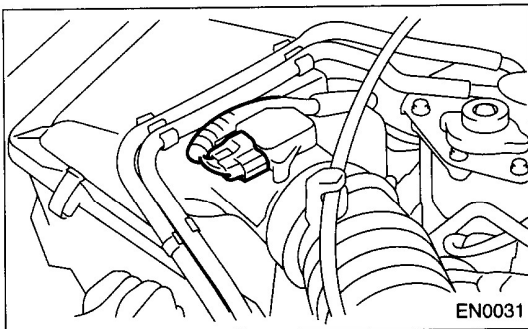
5. Oil Pan and Strainer

A: REMOVAL

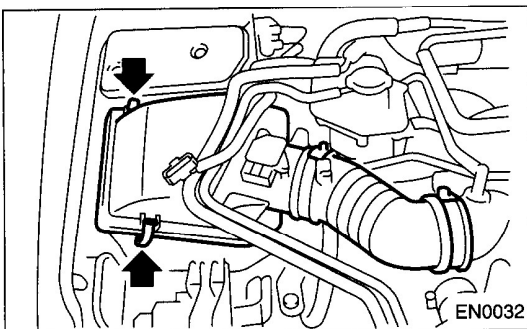
- 1) Set the vehicle on lift arms.
- 2) Remove the front wheels.
- 3) Disconnect the battery ground cable.



- 4) Remove the air intake duct and air cleaner case. (Non-Turbo model)
<Ref. to IN(SOHC)-7, REMOVAL, Air Intake Duct.>
and <Ref. to IN(SOHC)-6, REMOVAL, Air Cleaner Case.>
- 5) Disconnect the connector from mass air flow sensor. (Turbo model)

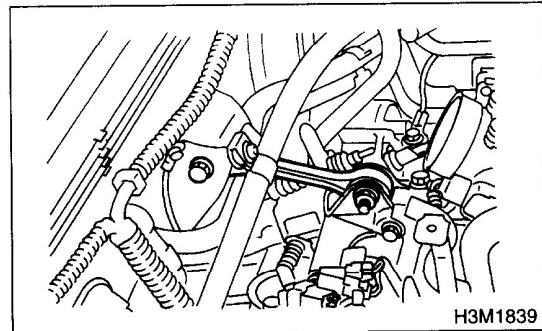


- 6) Remove the air intake boot and air cleaner upper cover. (Turbo model)



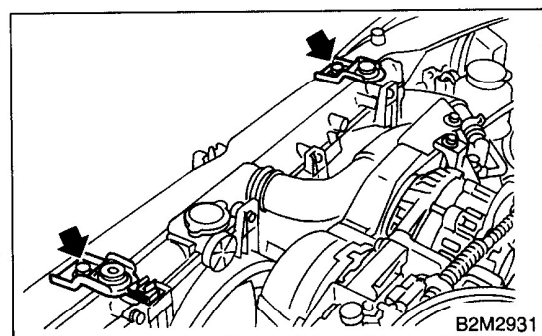
- 7) Remove the intercooler (Turbo model) <Ref. to IN(DOHC TURBO)-10, REMOVAL, Intercooler.>

- 8) Remove the pitching stopper.

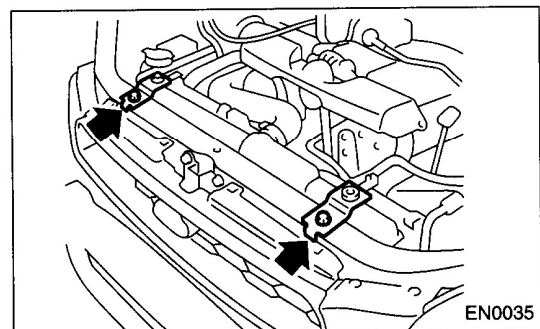


- 9) Remove the radiator upper brackets.

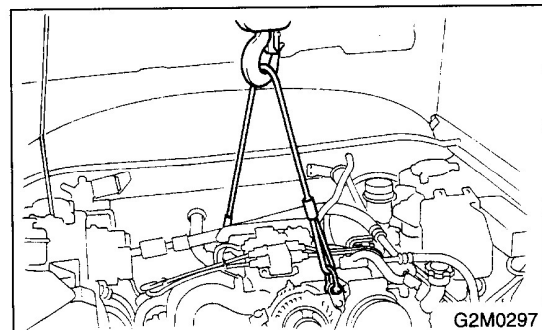
- Non-Turbo model



- Turbo model



- 10) Support the engine with a lifting device and wire ropes.



- 11) Lift-up the vehicle.

CAUTION:
At this time, raise up wire ropes.

OIL PAN AND STRAINER

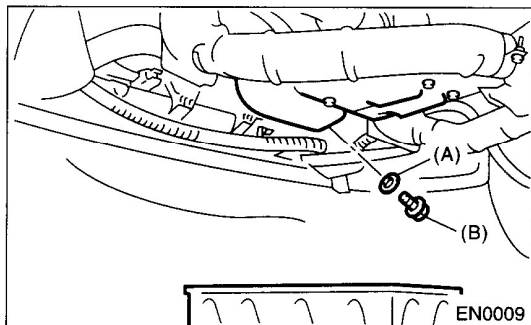
LUBRICATION

12) Remove the under cover.

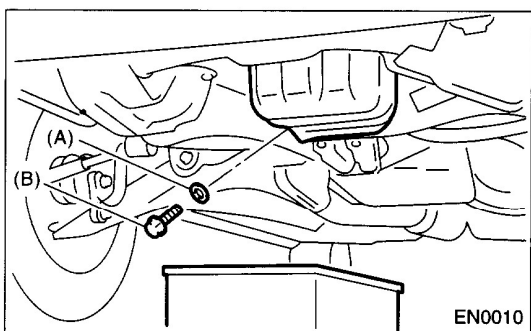
13) Drain the engine oil.

Set a container under the vehicle, and remove drain plug from oil pan.

- Non-Turbo model



- Turbo model

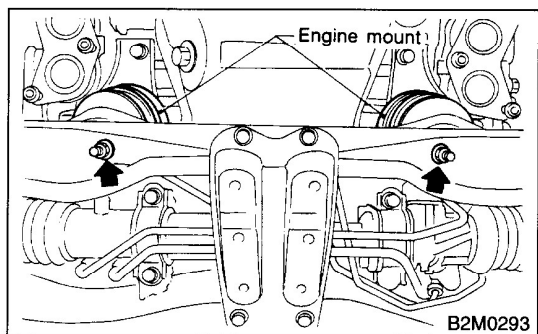


(A) Gasket

(B) Drain plug

14) Remove the front and center exhaust pipes. (Non-Turbo model) <Ref. to EX(SOHC)-5, REMOVAL, Front Exhaust Pipe.>

15) Remove the nuts which install front cushion rubber onto front crossmember.



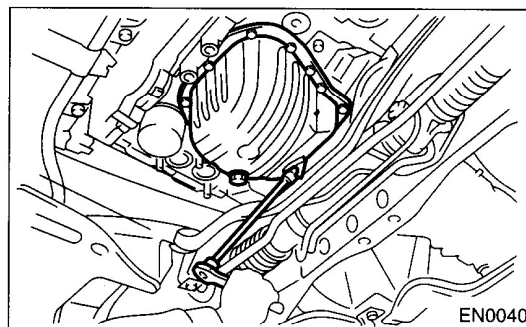
16) Remove the bolts which install oil pan on cylinder block while raising up engine.

17) Insert the oil pan cutter blade between cylinder block-to-oil pan clearance.

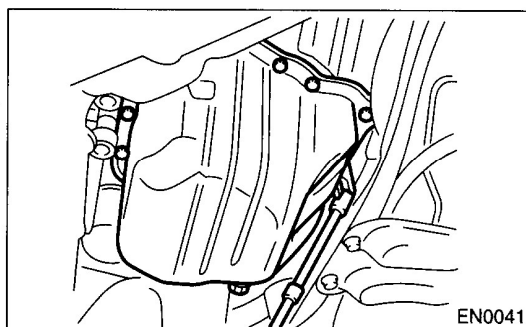
CAUTION:

Do not use a screwdriver or similar tool in place of oil pan cutter.

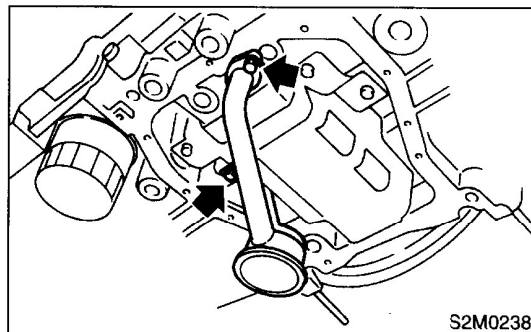
- Non-Turbo model



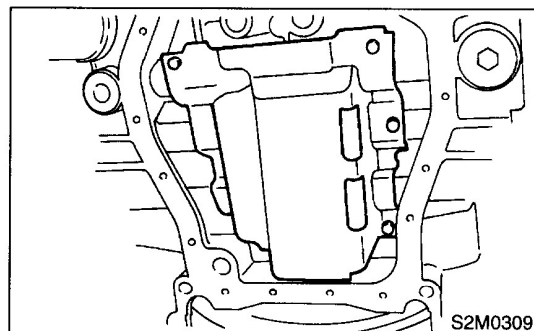
- Turbo model



18) Remove the oil strainer.



19) Remove the baffle plate.



B: INSTALLATION

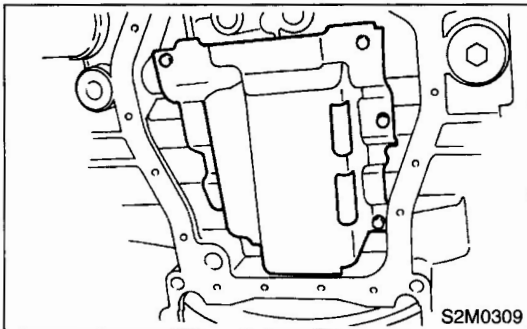
CAUTION:

Before installing the oil pan, clean sealant from oil pan and engine block.

1) Install the baffle plate.

Tightening torque:

6.4 N·m (0.65 kgf-m, 4.7 ft-lb)



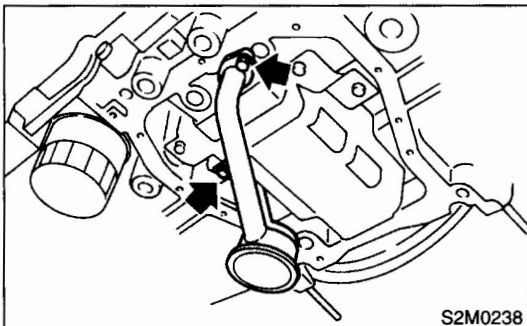
2) Install the oil strainer onto baffle plate.

CAUTION:

Replace the O-ring with a new one.

Tightening torque:

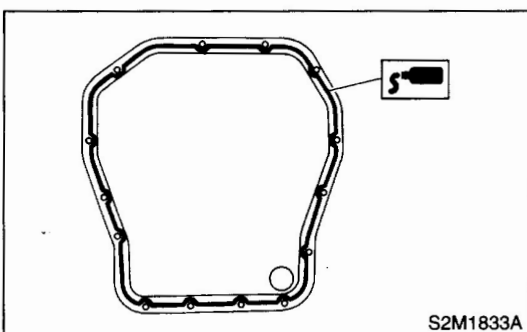
10 N·m (1.0 kgf-m, 7 ft-lb)



3) Apply fluid packing to mating surfaces and install the oil pan.

Fluid packing:

THREE BOND 1215 or equivalent

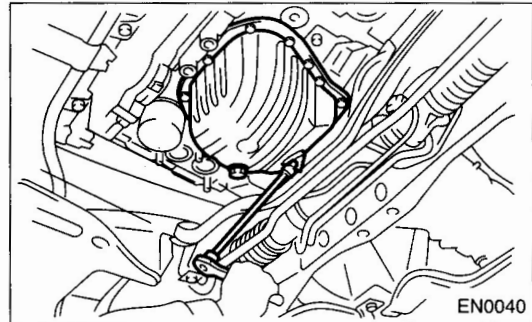


4) Tighten bolts which install the oil pan onto engine block.

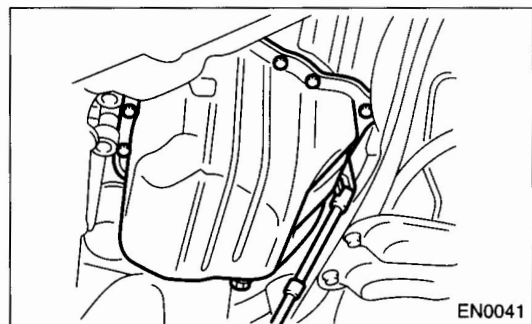
Tightening torque:

5 N·m (0.5 kgf-m, 3.6 ft-lb)

- Non-Turbo model



- Turbo model

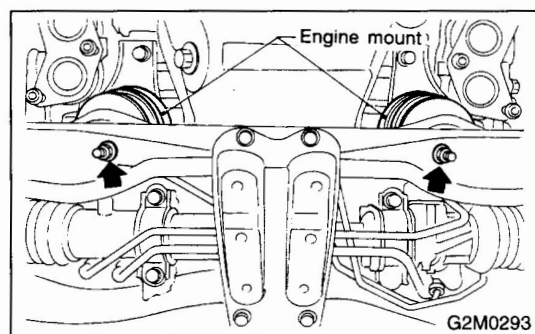


5) Lower the engine onto front crossmember.

6) Tighten the nuts which install front cushion rubber onto front crossmember.

Tightening torque:

69 N·m (7.0 kgf-m, 51 ft-lb)



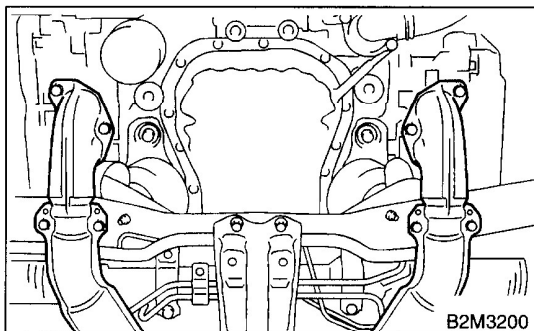
OIL PAN AND STRAINER

LUBRICATION

7) Install the front and center exhaust pipes. (Non-Turbo model)
<Ref. to EX(SOHC)-6, INSTALLATION, Front Exhaust Pipe.>

NOTE:

Always use new gaskets.



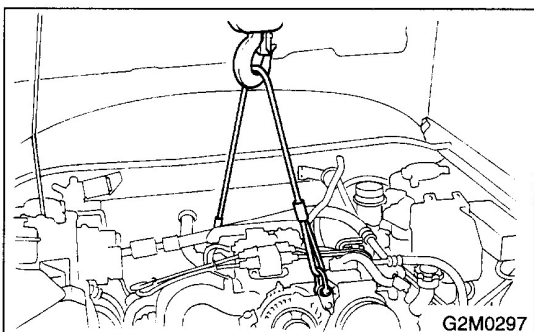
8) Install the under cover.

9) Lower the vehicle.

CAUTION:

At this time, lower the lifting device and release steel cables.

10) Remove the lifting device and steel cables.

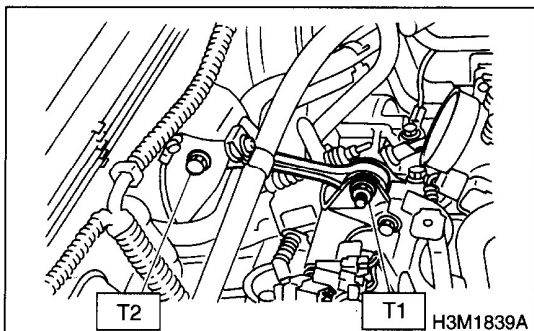


11) Install the pitching stopper.

Tightening torque:

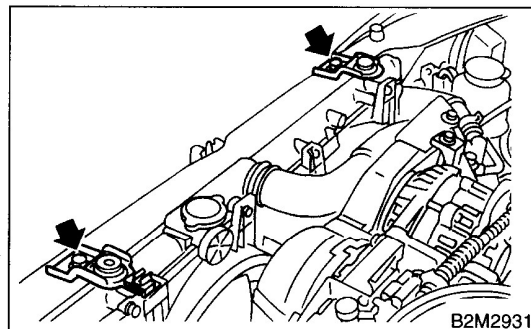
T1: 50 N·m (5.1 kgf-m, 37 ft-lb)

T2: 58 N·m (5.9 kgf-m, 43 ft-lb)

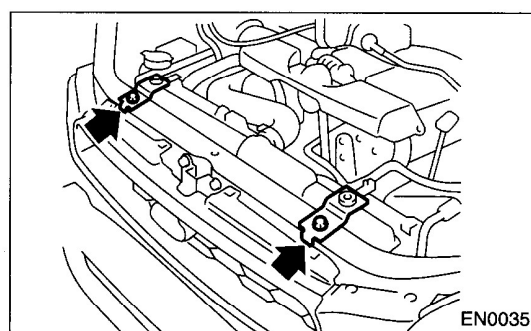


12) Install the radiator upper brackets.

- Non-Turbo model



- Turbo model

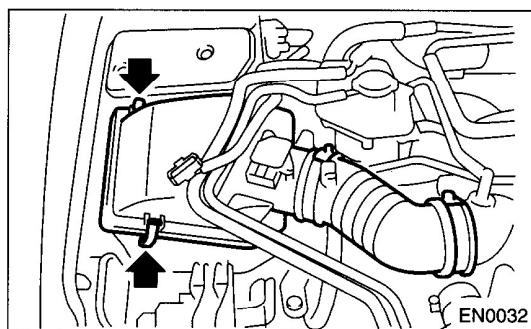


13) Install the air intake duct and air cleaner case. (Non-Turbo model)

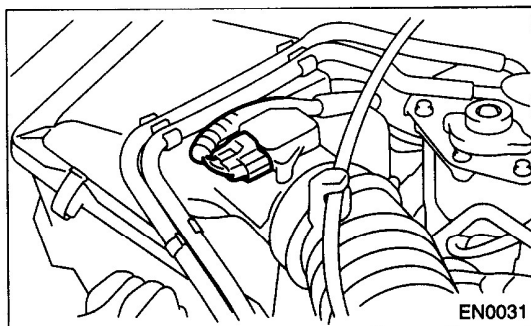
<Ref. to IN(SOHC)-6, INSTALLATION, Air Cleaner Case.> and <Ref. to IN(SOHC)-7, INSTALLATION, Air Intake Duct.>

14) Install the intercooler. (Turbo model) <Ref. to IN(DOHC TURBO)-11, INSTALLATION, Intercooler.>

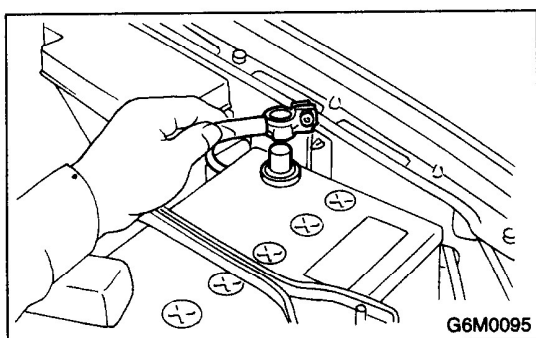
15) Install the air intake boot and air cleaner upper cover. (Turbo model)



- 16) Connect the connector to mass air flow sensor.
(Turbo model)



- 17) Install the front wheels.
18) Connect the battery ground cable.



- 19) Fill the engine oil. <Ref. to LU-10, INSPECTION, Engine Oil.>

C: INSPECTION

By visual check make sure oil pan, oil strainer, oil strainer stay and baffle plate are not damaged.

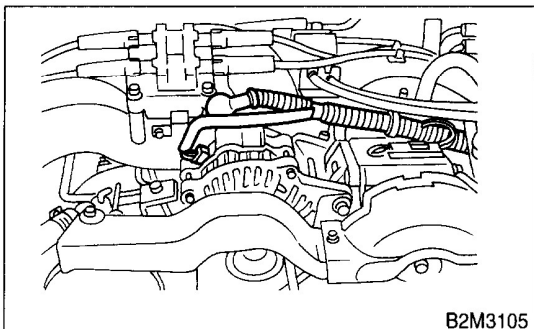
OIL PRESSURE SWITCH

LUBRICATION

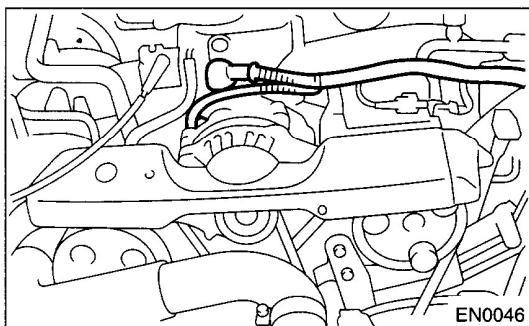
6. Oil Pressure Switch

A: REMOVAL

- 1) Remove the generator from bracket.
 - (1) Disconnect the connector and terminal from generator.
- Non-Turbo model

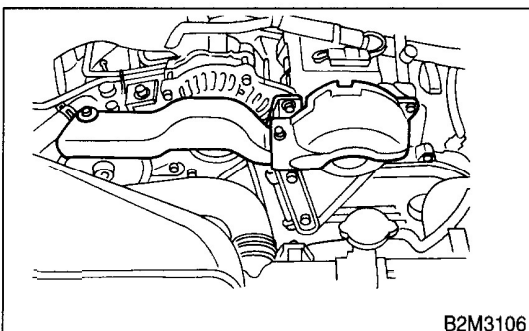


- Turbo model

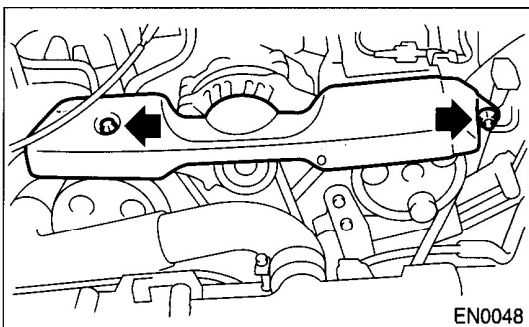


- (2) Remove the V-belt cover.

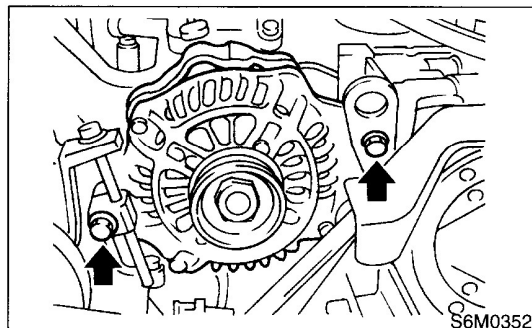
- Non-Turbo model



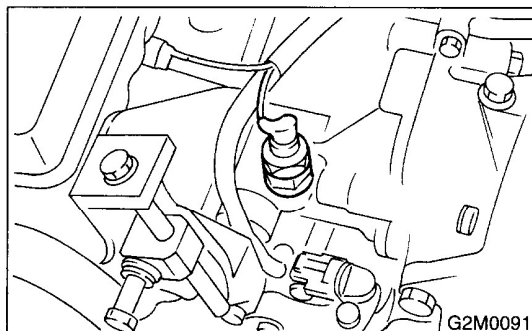
- Turbo model



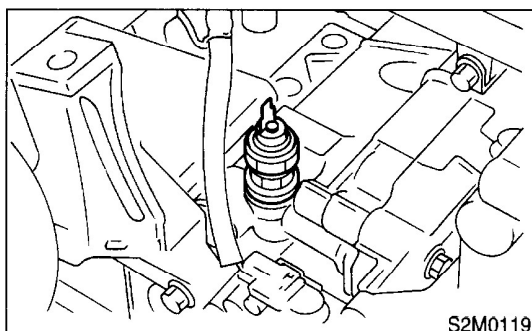
- (3) Remove the front side V-belt. <Ref. to ME(SOHC)-43, REMOVAL, V-belt.> or <Ref. to ME(DOHC TURBO)-44, REMOVAL, V-belt.>
- (4) Remove the bolts which install generator on bracket.



- 2) Disconnect the terminal from oil pressure switch.



- 3) Remove the oil pressure switch.



OIL PRESSURE SWITCH

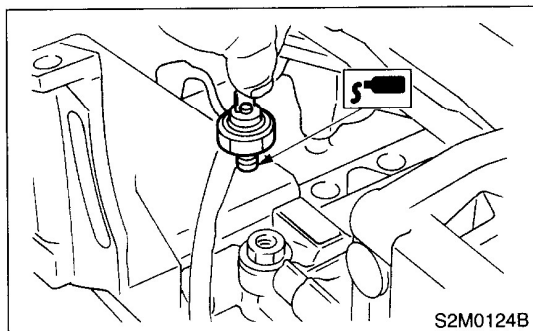
LUBRICATION

B: INSTALLATION

1) Apply fluid packing to oil pressure switch threads.

Fluid packing:

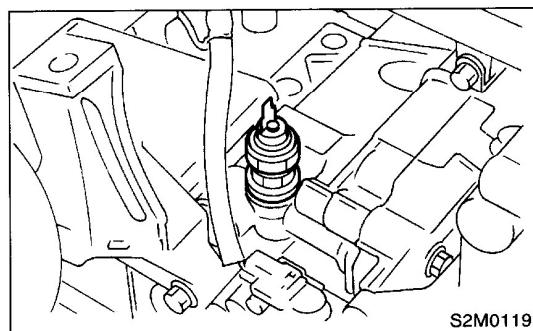
THREE BOND 1215 or equivalent



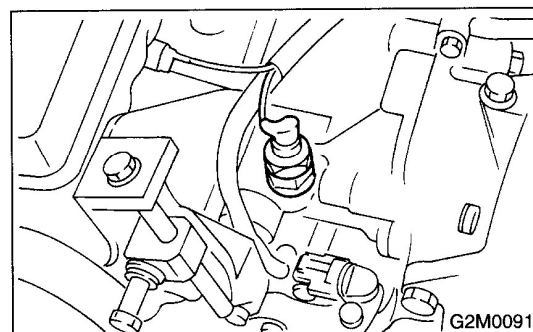
2) Install the oil pressure switch onto engine block.

Tightening torque:

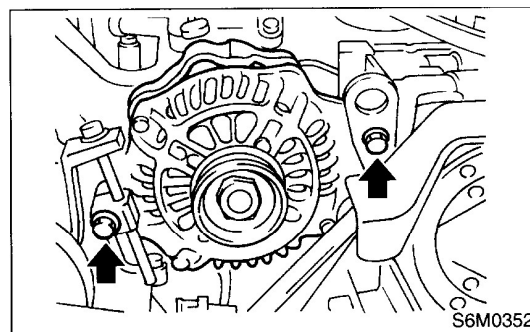
25 N·m (2.5 kgf-m, 18.1 ft-lb)



3) Connect the terminal of oil pressure switch.



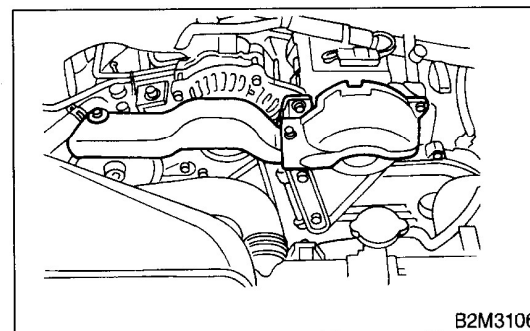
4) Install the generator on bracket and temporarily tighten installing bolts.



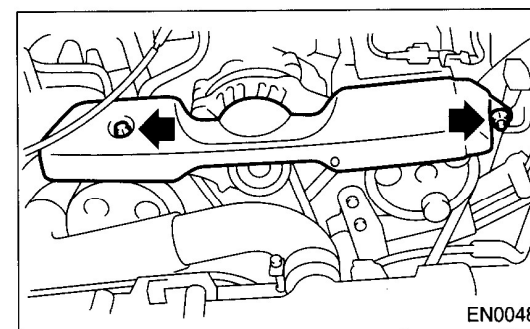
5) Install the front side V-belt and adjust it.
<Ref. to ME(SOHC)-43, INSTALLATION, V-belt.>
or <Ref. to ME(DOHC TURBO)-44, INSTALLATION, V-belt.>

6) Install the V-belt cover.

- Non-Turbo model



- Turbo model

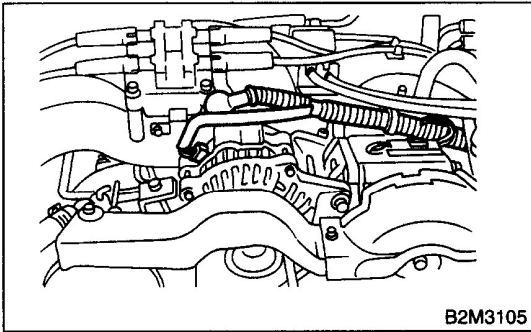


OIL PRESSURE SWITCH

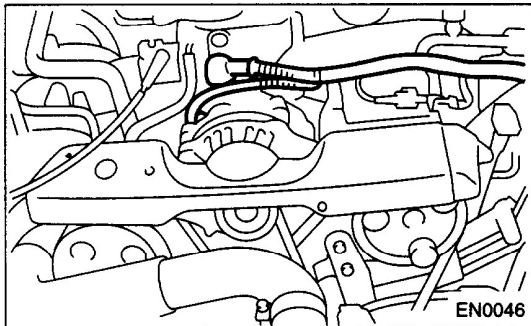
LUBRICATION

7) Connect the connector and terminal to generator.

- Non-Turbo model



- Turbo model



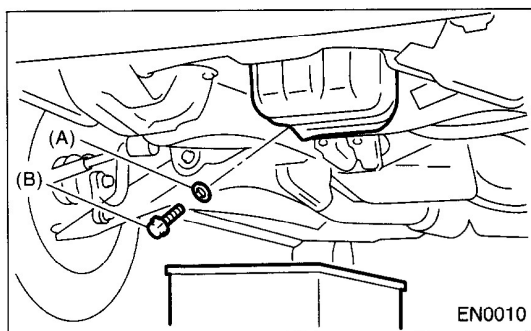
C: INSPECTION

Make sure oil does not leak or seep from where the oil pressure switch is installed.

7. Engine Oil Cooler

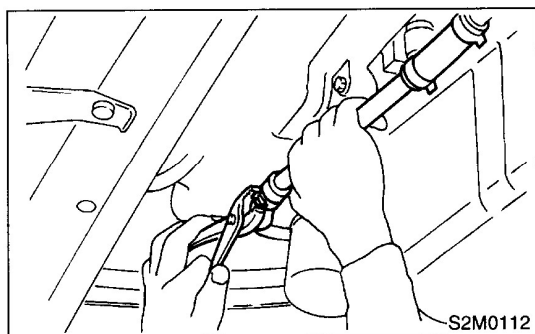
A: REMOVAL

- 1) Lift-up the vehicle.
- 2) Remove the under cover.
- 3) Drain the engine oil.
Set a container under the vehicle, and remove drain plug from oil pan.



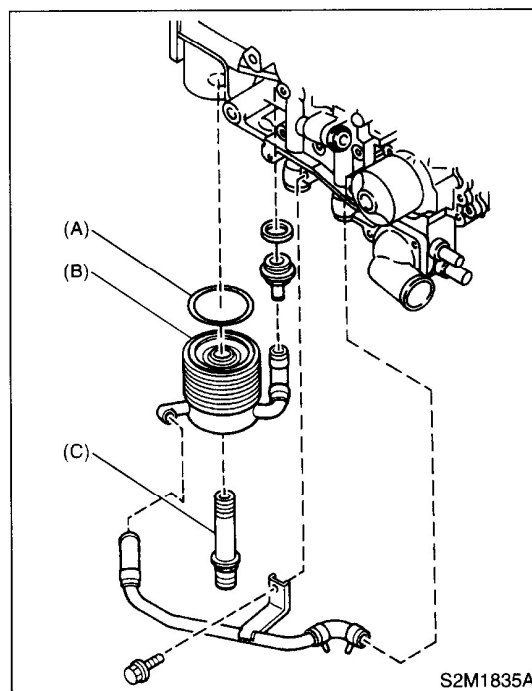
- (A) Metal gasket
(B) Drain plug

- 4) Drain the coolant.
- 5) Remove the water by-pass pipe between oil cooler and water pump.



- 6) Remove the engine oil filter. <Ref. to LU-27, REMOVAL, Engine Oil Filter.>

- 7) Remove the connector and remove oil cooler.



- (A) O-ring
(B) Oil cooler
(C) Connector

ENGINE OIL COOLER

LUBRICATION

B: INSTALLATION

1) Install in the reverse order of removal.

Tightening torque:

T: 54 N·m (5.5 kgf-m, 39.8 ft-lb)

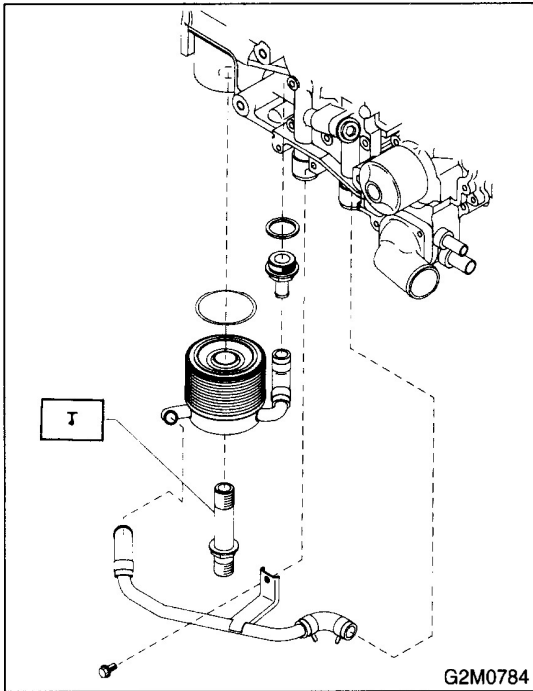
CAUTION:

Always use a new O-ring.

C: INSPECTION

1) Check that coolant passages are not clogged using an air blow method.

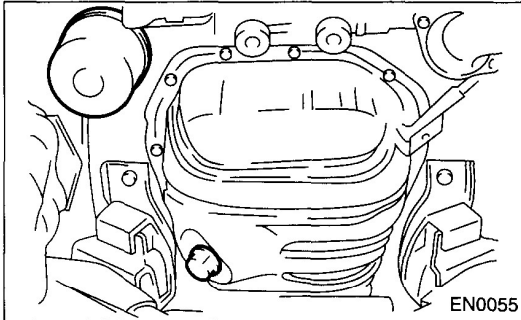
2) Check the mating surfaces of cylinder block, O-ring groove and oil filter for damage.



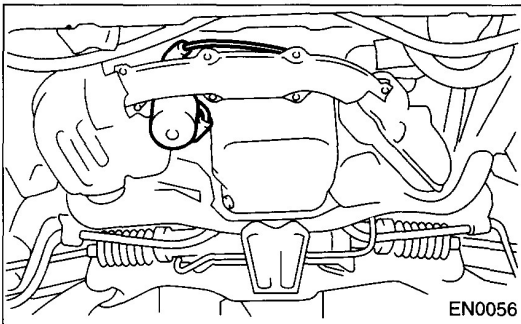
8. Engine Oil Filter

A: REMOVAL

- 1) Remove the under cover.
 - 2) Remove the oil filter with ST.
- ST 498547000 OIL FILTER WRENCH
- Non-Turbo model



- Turbo model



B: INSTALLATION

- 1) Get a new oil filter and apply a thin coat of engine oil to the seal rubber.
- 2) Install the oil filter turning it by hand, being careful not to damage seal rubber.
- 3) Tighten more (approximately 2/3 to 3/4 turn) after the seal rubber contacts the oil pump case. Do not tighten excessively, or oil may leak.

C: INSPECTION

- 1) After installing the oil filter, run engine and make sure that no oil is leaking around seal rubber.

NOTE:

The filter element and filter case are permanently jointed; therefore, interior cleaning is not necessary.

- 2) Check the engine oil level. <Ref. to LU-10, INSPECTION, Engine Oil.>

ENGINE LUBRICATION SYSTEM TROUBLE IN GENERAL

LUBRICATION

9. Engine Lubrication System Trouble in General

A: INSPECTION

Before performing diagnostics, make sure that the engine oil level is correct and no oil leakage exists.

Trouble	Possible cause		Corrective action
1. Warning light remains on.	1) Oil pressure switch failure	Cracked diaphragm or oil leakage within switch	Replace.
		Broken spring or seized contacts	Replace.
	2) Low oil pressure	Clogged oil filter	Replace.
		Malfunction of oil by-pass valve in oil filter	Clean or replace.
		Malfunction of oil relief valve in oil pump	Clean or replace.
		Clogged oil passage	Clean.
		Excessive tip clearance and side clearance of oil pump rotor and gear	Replace.
		Clogged oil strainer or broken pipe	Clean or replace.
	3) No oil pressure	Insufficient engine oil	Replenish.
		Broken pipe of oil strainer	Replace.
		Stuck oil pump rotor	Replace.
2. Warning light does not go on.	1) Burn-out bulb		Replace.
	2) Poor contact of switch contact points		Replace.
	3) Disconnection of wiring		Repair.
3. Warning light flickers momentarily.	1) Poor contact at terminals		Repair.
	2) Defective wiring harness		Repair.
	3) Low oil pressure		Check for the same possible causes as listed in 1.—2).