

General Description

PERIODIC MAINTENANCE SERVICES

1. General Description

A: GENERAL DESCRIPTION

Be sure to perform periodic maintenance in order to maintain vehicle performance and find problems before they occur.

Schedule

PERIODIC MAINTENANCE SERVICES

2. Schedule

A: MAINTENANCE SCHEDULE 1

1. U.S.

		Maintenance interval [Number of months or km (miles), whichever occurs first]																		
	Months	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120	Remarks	
	× 1,000 km	4.8	12	24	36	48	60	72	81.4	96	108	120	132	144	156	168	180	192		
	× 1,000 miles	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120		
1	Engine oil		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R		
2	Engine oil filter		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R		
3	Spark plug									R								R		
4	Drive belt(s)					I				I				I		R				
5	Camshaft drive belt					I				I				I		R				
6	Fuel line					(I)				(I)				(I)				I	Note (1)	
7	Fuel filter									R								R		
8	Air cleaner element					R				R				R				R	Note (2)	
9	Cooling system					I				I				I				I		
10	Engine coolant																		Note (5)	
11	Clutch system			I		I		I		I		I		I		I		I		
12	Transmission gear oil					I				I				I				I		
13	Front and rear differential oil					I				I				I				I		
14	Brake line			I		I		I		I		I		I		I		I		
15	Brake fluid					R				R				R				R		
16	Disc brake pad and disc			I		I		I		I		I		I		I		I		
17	Parking brake			I		I		I		I		I		I		I		I		
18	Suspension			I		I		I		I		I		I		I		I		
19	Wheel bearing									(I)								(I)		
20	Axle boots and joints			I		I		I		I		I		I		I		I		
21	Tire rotation		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	Note (3)	
22	Steering system (power steering)			I		I		I		I		I		I		I		I		
23	A/C filter	Check every 12 months or every 12,000 km (7,500 miles).																		Note (4)

Symbols used:

R: Replace

I: Inspection

P: Perform

(I): Inspections recommended for vehicle safety

NOTE:

1. This inspection is not required to maintain emission warranty eligibility and it does not affect the manufacturer's obligations under EPA's in-use compliance program.

2. When the vehicle is used in extremely dusty conditions, the air cleaner element should be replaced more often.

3. A tire should be replaced when the tread wear indicator appears as a solid band across the tread. The indicators appear when the remaining tread has been worn to 1.6 mm (0.063 in) or less.

4. When the vehicle is used under extremely dusty conditions, the A/C filter should be replaced more often.

5. Replace the first time after 11 years or every 220,000 km (137,500 miles), and thereafter every six years or every 120,000 km (75,000 miles).

Schedule

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B: MAINTENANCE SCHEDULE 2

Item	Maintenance interval	Repeat short distance drive	Repeat rough/muddy road drive	Extremely cold weather area	Salt or other corrosive used or coastal area	High humidity or mountain area	Repeat towing trailer
Engine oil	3.75 months	R		R			R
	6,000 km						
	3,750 miles						
Engine oil filter	3.75 months	R		R			R
	6,000 km						
	3,750 miles						
Fuel line	7.5 months				I		
	12,000 km						
	7,500 miles						
Transmission gear oil	15 months						R
	24,000 km						
	15,000 miles						
Front and rear differential oil	15 months						R
	24,000 km						
	15,000 miles						
Brake line	7.5 months				I		
	12,000 km						
	7,500 miles						
Brake fluid	15 months					R	
	24,000 km						
	15,000 miles						
Disc brake pad and disc	7.5 months	I	I		I		I
	12,000 km						
	7,500 miles						
Parking brake	7.5 months	I	I		I		I
	12,000 km						
	7,500 miles						
Suspension	7.5 months		I	I	I		I
	12,000 km						
	7,500 miles						
Axle boots and joints	7.5 months	I	I	I	I		I
	12,000 km						
	7,500 miles						
Steering system (power steering)	7.5 months	I	I	I	I		
	12,000 km						
	7,500 miles						

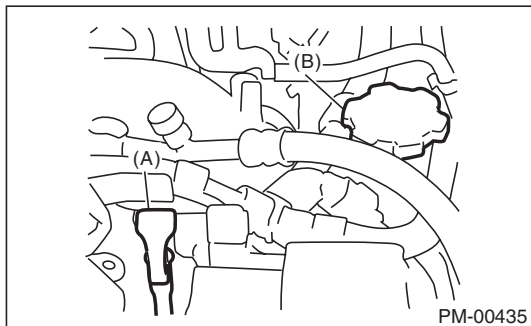
Engine Oil

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3. Engine Oil

A: REPLACEMENT

- 1) Set the vehicle on a lift.
- 2) Open the engine oil filter cap for quick draining of engine oil.

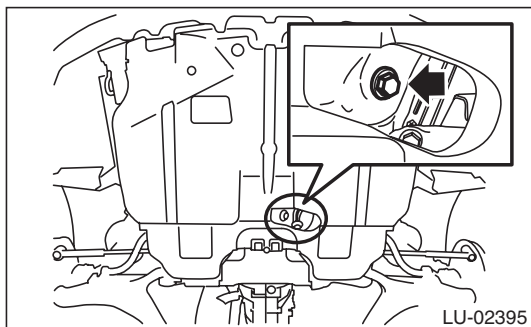


- (A) Oil level gauge
(B) Oil filler cap

CAUTION:

If any engine oil is spilled on the exhaust pipe, under cover, wipe off completely to prevent fires or emission of smoke.

- 3) Lift up the vehicle.
- 4) Drain engine oil by loosening the engine oil drain plug.



NOTE:

Prepare the container for draining of engine oil.

- 5) Replace the drain plug gasket.

NOTE:

Use a new drain plug gasket.

- 6) Tighten the engine oil drain plug after draining engine oil.

Tightening torque:

44 N·m (4.5 kgf-m, 32.5 ft-lb)

- 7) Using engine oil of proper quality and viscosity, fill engine oil through the oil filler duct to the "F" line on oil level gauge. Place the vehicle on a level surface when checking oil level.

Recommended oil:

Refer to "RM" section for the engine oil viscosity. <Ref. to RM-2, LUBRICANT, RECOMMENDED MATERIALS, Recommended Materials.>

Engine oil capacity

Refer to "SPC" section for the engine oil capacity. <Ref. to SPC-4, CAPACITY, Impreza.>

NOTE:

- The proper viscosity helps vehicle get good cold and hot starting by reducing viscous friction and thus increasing cranking speed.
 - 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 standard and SAE viscosity No. designated by SUBARU.
 - If vehicle is used in desert areas with very high temperatures or for other heavy duty applications, the following viscosity oils may be used:
API standard: SN, SM, or SL
ILSAC standard: GF-4 or GF-5
SAE viscosity No.: 30, 40, 20W-40, 20W-50
- 8) Close the engine oil filler cap.
 - 9) Start the engine and warm it up for a time.
 - 10) Stop the engine to inspect the oil level again. <Ref. to PM-5, INSPECTION, Engine Oil.>

B: INSPECTION

CAUTION:

If any engine oil is spilled on the exhaust pipe, under cover, wipe off completely to prevent fires or emission of smoke.

- 1) Park the vehicle on a level surface.
- 2) Remove the oil level gauge and wipe it clean.
- 3) Reinsert the oil level gauge all the way. Be sure that the oil level gauge is correctly inserted and properly orientated.
- 4) Remove the level gauge again and record the oil level. If the engine oil level is below the "L" line, add oil to bring the level up to but not over the "F" line.
- 5) Start the engine and warm it up for a time.

Engine Oil

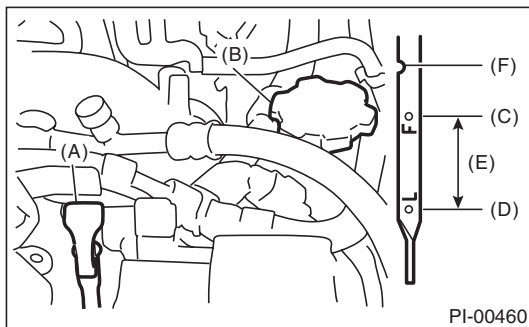
PERIODIC MAINTENANCE SERVICES

6) After turning off the engine, wait a few minutes for the oil to return to the oil pan before checking the level.

NOTE:

- Just after driving or while the engine is warm, engine oil level shows in the range between the “F” line and the notch mark. This is caused by thermal expansion of engine oil.
- As the oil level gauge is used for daily maintenance, the “F” and “L” lines are set assuming that the engine is cold.

7) To prevent overfilling the engine oil, do not add oil above the “F” line when the engine is cold.



- (A) Oil level gauge
- (B) Oil filler cap
- (C) “F” line
- (D) “L” line
- (E) Approx. 1 L (1.1 US qt, 0.9 Imp qt)
- (F) Notch mark

4. Engine Oil Filter

A: REPLACEMENT

- 1) Lift up the vehicle.
- 2) Remove the under cover.
- 3) Remove the oil filter using ST.

- Oil filter (Black)

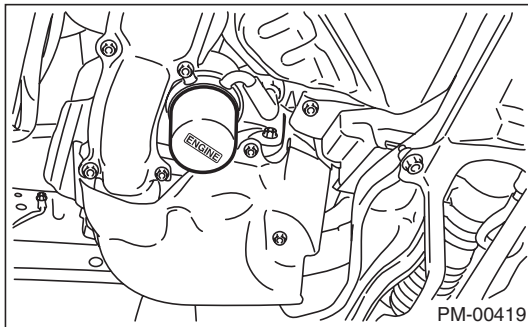
ST 18332AA000 OIL FILTER WRENCH (OUT-
ER DIAMETER: 68 MM (2.68
IN) FOR OIL FILTER)

- Oil filter (Blue)

General tool Oil filter wrench (65/67 mm 14
Flutes)

CAUTION:

If any engine oil is spilled on the exhaust pipe, under cover, wipe off completely to prevent fires or emission of smoke.



- 4) Clean the oil filter installation surface of the oil cooler.

- 5) Obtain a new engine oil filter and apply a thin coat of engine oil to the seal rubber.

- 6) Install the oil filter by turning it by hand, being careful not to damage seal rubber.

- Tighten the oil filter (Black) 68 mm (2.68 in) in diameter (approx. one rotation) after the seal rubber of the oil filter comes in contact with the oil cooler. When using a torque wrench, tighten to 14 N·m (1.4 kgf-m, 10.3 ft-lb).

- Tighten the oil filter (Blue) with an outer diameter of 67.4 mm (2.65 in) (approx. 7/8 rotation) after the seal rubber of the oil filter comes in contact with cylinder block. When using a torque wrench, tighten to 12 N·m (1.2 kgf-m, 8.9 ft-lb).

CAUTION:

Do not tighten excessively. Excessive tightening may cause oil to leak.

- 7) Run the 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.

- 8) Check the engine oil level. <Ref. to PM-5, INSPECTION, Engine Oil.>

Spark Plug

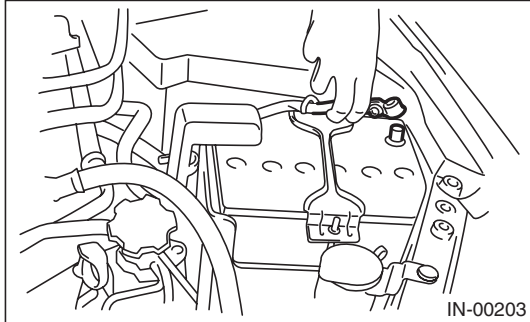
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5. Spark Plug

A: REPLACEMENT

1. RH SIDE

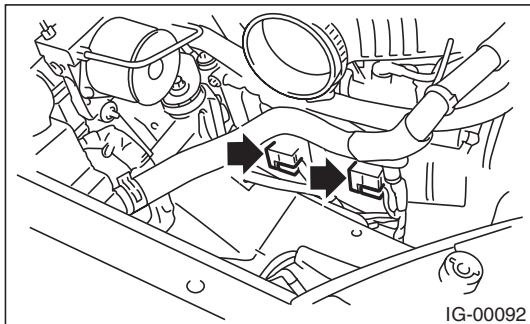
- 1) Disconnect the ground cable from battery.



- 2) Remove the air cleaner case. <Ref. to IN(STI)-8, REMOVAL, Air Cleaner Case.>
- 3) Disconnect the connector from ignition coil.
- 4) Remove the ignition coil.

NOTE:

Turn #3 ignition coil by 180 degrees to remove it.



- 5) Remove the spark plug with a spark plug socket.
- 6) Install in the reverse order of removal.

Tightening torque (Spark plug):

21 N·m (2.1 kgf-m, 15.5 ft-lb)

Tightening torque (Ignition coil):

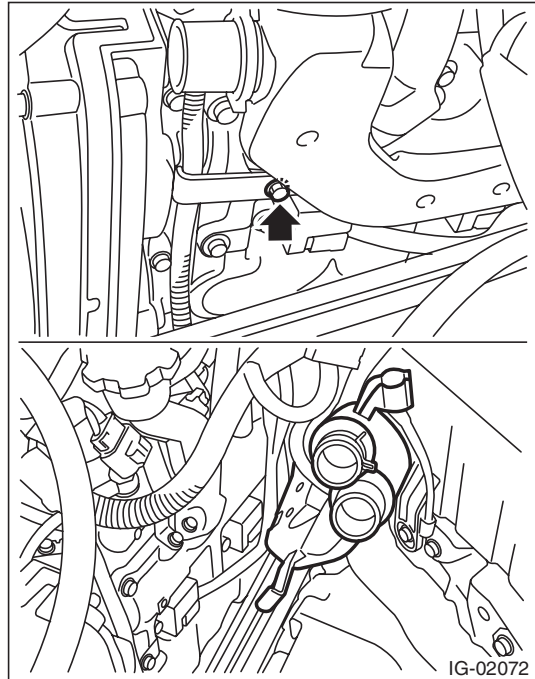
16 N·m (1.6 kgf-m, 11.8 ft-lb)

2. LH SIDE

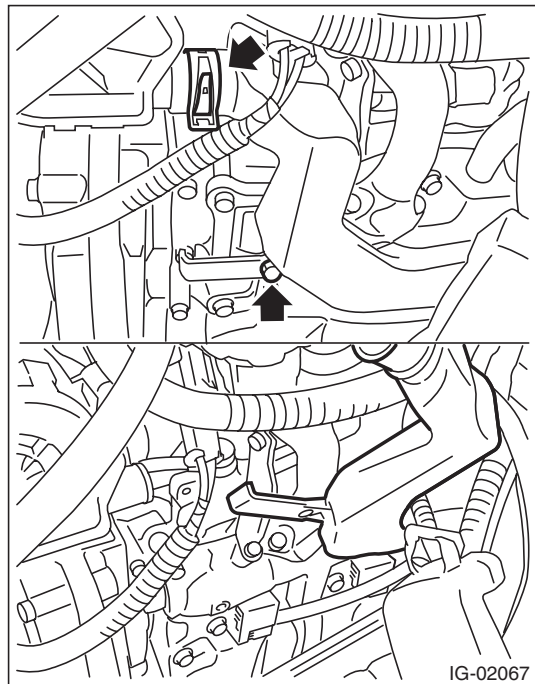
- 1) Remove the battery. <Ref. to SC(STI)-27, REMOVAL, Battery.>
- 2) Remove the secondary air pump. <Ref. to EC(STI)-27, REMOVAL, Secondary Air Pump.> <Ref. to EC(w/o STI)-29, REMOVAL, Secondary Air Pump.>

- 3) Remove the bolts that secure the air duct to the rocker cover (LH), and lift the air duct.

- STI model



- Except for STI model



- 4) Disconnect the connector from ignition coil.

Spark Plug

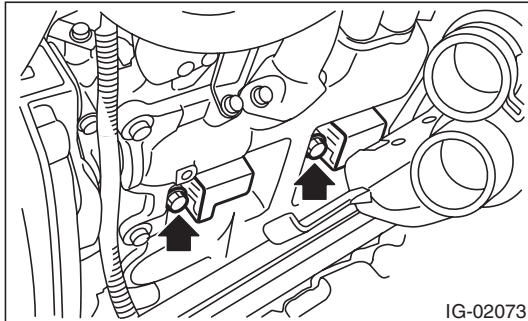
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5) Remove the ignition coil.

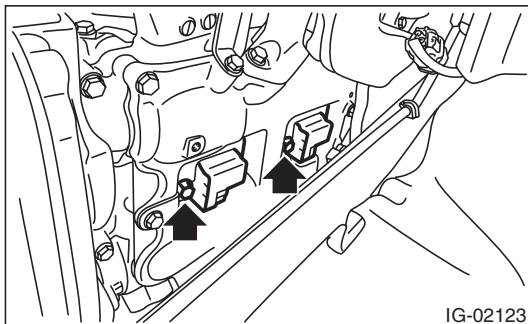
NOTE:

Turn #4 ignition coil by 180 degrees to remove it.

- STI model



- Except for STI model



6) Remove the spark plug with a spark plug socket.

7) Install in the reverse order of removal.

Tightening torque (Spark plug):

21 N·m (2.1 kgf-m, 15.5 ft-lb)

Tightening torque (Ignition coil):

16 N·m (1.6 kgf-m, 11.8 ft-lb)

Tightening torque (Air duct):

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

V-belt

PERIODIC MAINTENANCE SERVICES

6. V-belt

A: INSPECTION

CAUTION:

Check and adjust the front side belt tension so that it is within the specified range. Using the belt with a tension out of the specified range may result in a fault such as the following:

- If the front side belt tension is higher, unexpected force is generated at the power steering oil pump, generator and crankshaft bearing, causing abnormal noise due to abnormal wear of the bearing.
- If the front side belt tension is lower, the front side belt and crank pulley slip, causing abnormally high temperature on the crank pulley due to frictional heat. If this condition repeatedly occurs, the front side belt may abnormally wear, causing abnormal noise, front side belt damage or crank pulley damage.

NOTE:

Since the rear belt is a stretch type belt, it does not require tension check and adjustment.

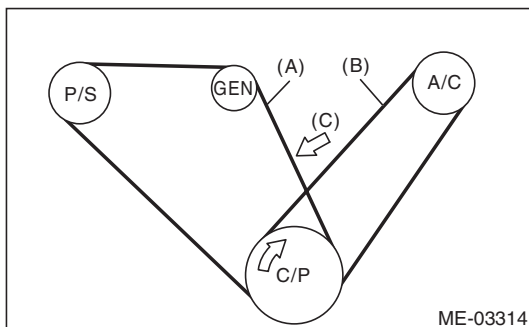
1. PROCEDURE (WITHOUT BELT TENSION GAUGE)

- 1) Replace the belts if cracks, fraying or wear are found.
- 2) Check the V-belt tension and adjust it if necessary by changing the generator installing position or idler pulley installing position. <Ref. to PM-10, REPLACEMENT, V-belt.>

When pressing with belt tension 98 N (10 kgf, 22 lbf)

When replacing: 7 — 9 mm (0.276 — 0.354 in)

When reusing: 9 — 11 mm (0.354 — 0.433 in)



- (A) Front side belt
- (B) Rear side belt
- (C) 98 N (10 kgf, 22 lbf)
- C/P Crank pulley
- GEN Generator pulley
- P/S Power steering oil pump pulley
- A/C A/C compressor pulley

2. PROCEDURE (WITH BELT TENSION GAUGE)

- 1) Replace the belts if cracks, fraying or wear are found.
- 2) Remove the V-belt covers and radiator reservoir tank.
- 3) Check the belt tension, using the belt tension gauge. Adjust the tension, if necessary by changing the generator installing position or idler pulley installing position.

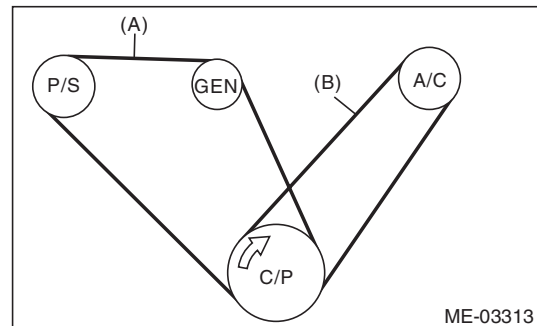
Belt tension

When installing new parts:

640 — 780 N (65 — 80 kgf, 144 — 175 lbf)

At inspection:

490 — 640 N (50 — 65 kgf, 110 — 144 lbf)



- (A) Front side belt
- (B) Rear side belt
- C/P Crank pulley
- GEN Generator pulley
- P/S Power steering oil pump pulley
- A/C A/C compressor pulley

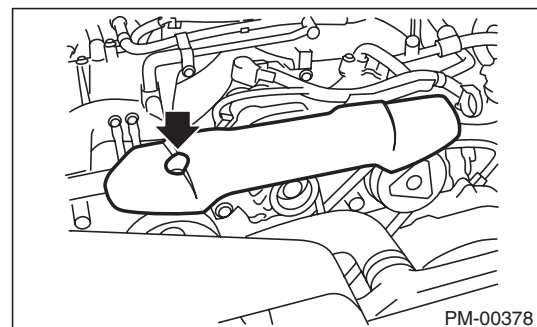
B: REPLACEMENT

1. FRONT SIDE BELT (FOR POWER STEERING OIL PUMP AND GENERATOR)

NOTE:

Wipe off any oil or water on the belt and pulley.

- 1) Remove the V-belt covers.



- 2) Loosen the lock bolt (A).
- 3) Loosen the slider bolt (B).
- 4) Remove the front side belt (C).

- 5) Install a new belt, and tighten the slider bolt so as to obtain the specified belt tension.
- 6) Tighten the lock bolt (A).
- 7) Tighten the slider bolt (B).

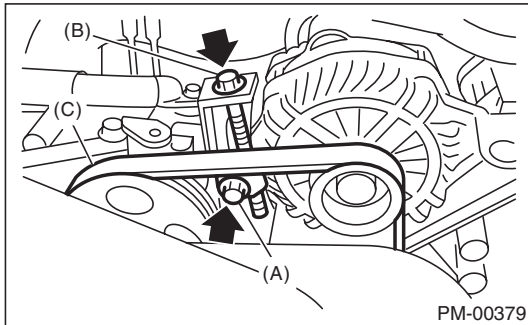
Tightening torque:

Lock bolt

25 N·m (2.5 kgf-m, 18.4 ft-lb)

Slider bolt

8 N·m (0.8 kgf-m, 5.9 ft-lb)



- 8) Start and run the engine for approximately five minutes to allow the V-belt to become fitted. (When using the gauge)
- 9) Stop the engine, check the belt tension and adjust as necessary. (When using the gauge)
- 10) Start and run the engine for approximately one minute to allow the V-belt to become fitted. (When using the gauge)
- 11) Stop the engine and check that the belt tension is within the specification. (When using the gauge)
- 12) Adjust until the specified belt tension is obtained. (When using the gauge)

2. REAR SIDE BELT (FOR A/C)

CAUTION:

Always use new rear side belt.

- 1) Remove the front side belts.
- 2) Cut the rear side belt.
- 3) Install a new belt using an installation jig. <Ref. to ME(STI)-40, REAR SIDE BELT, INSTALLATION, V-belt.> <Ref. to ME(w/o STI)-39, REAR SIDE BELT, INSTALLATION, V-belt.>
- 4) Install the front side belt. <Ref. to ME(STI)-39, INSTALLATION, V-belt.> <Ref. to ME(w/o STI)-38, INSTALLATION, V-belt.>

Timing Belt

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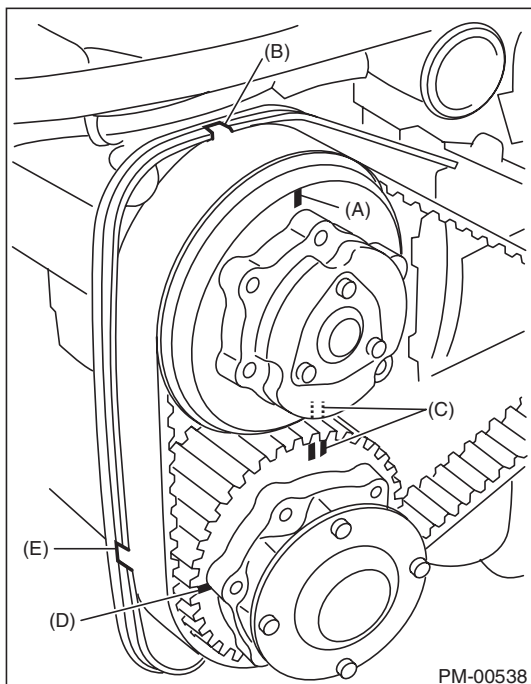
7. Timing Belt

A: INSPECTION

1. CHECK TIMING BELT POSITION

- 1) Remove the timing belt cover (LH) and (RH).
- 2) Turn the crank pulley and align single line mark (A) on the intake cam sprocket (RH) with notch (B) on timing belt cover and check the following.

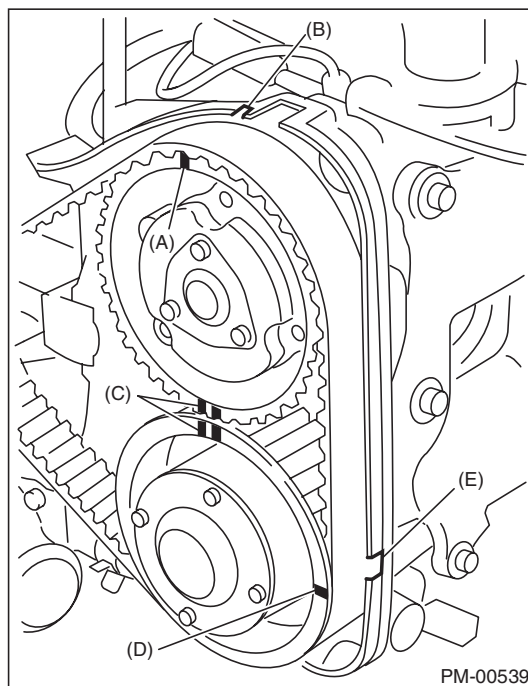
- (1) Make sure double lines (C) on intake and exhaust cam sprocket (RH side) are aligned.
- (2) Make sure single line (D) on exhaust cam sprocket (RH side) is aligned to timing belt cover notch (E).



- (3) Make sure single line (A) on intake cam sprocket (LH side) is aligned to timing belt cover notch (B).

- (4) Make sure double lines (C) on intake and exhaust cam sprocket (LH side) are aligned.

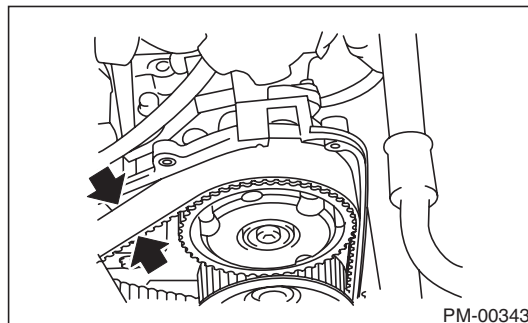
- (5) Check that the single line mark (D) on the exhaust cam sprocket (LH side) and notch (E) on the timing belt cover are aligned.



- 3) When cam sprocket position is offset, check for any defect, and repair or replace as required.

2. OTHER INSPECTIONS

- 1) Remove the timing belt cover (LH).
- 2) While cranking engine at least four rotations, check the timing belt back surface for cracks or damage. Replace faulty timing belts with new parts as required.
- 3) When the side part of timing belt (arrow direction shown in the figure) is abnormally worn (fluff or jumping out of core) or damaged, check the idlers, tensioner, water pump pulley and cam sprocket to determine idler alignment (squareness). Replace the worn timing belt with new part.



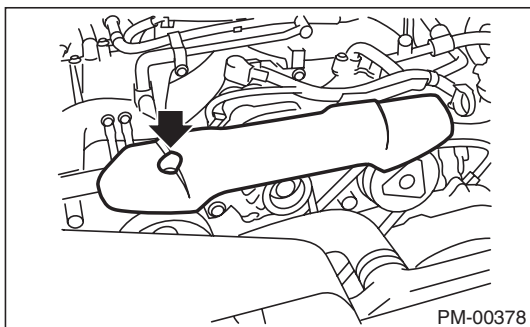
- 4) Install the timing belt cover (LH).

Timing Belt

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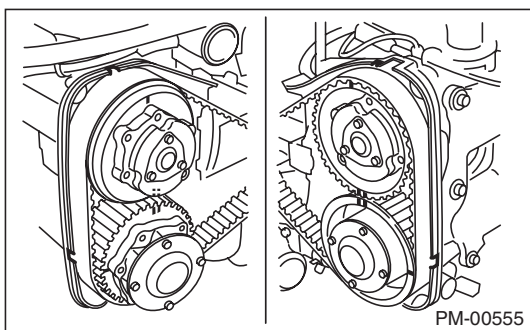
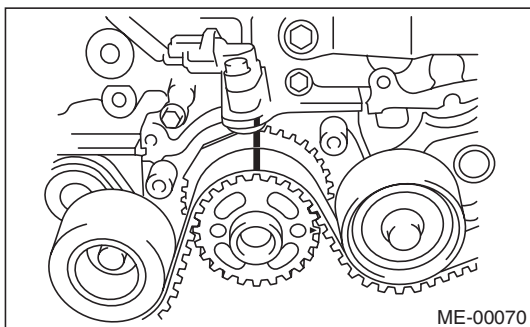
B: REPLACEMENT

- 1) Remove the radiator fan and air conditioner fan. <Ref. to CO(STI)-23, Radiator Main Fan and Fan Motor.> <Ref. to CO(STI)-25, Radiator Sub Fan and Fan Motor.> <Ref. to CO(w/o STI)-23, Radiator Main Fan and Fan Motor.> <Ref. to CO(w/o STI)-25, Radiator Sub Fan and Fan Motor.>
- 2) Protect the radiator with cardboard and blanket.
- 3) Remove the V-belt covers.

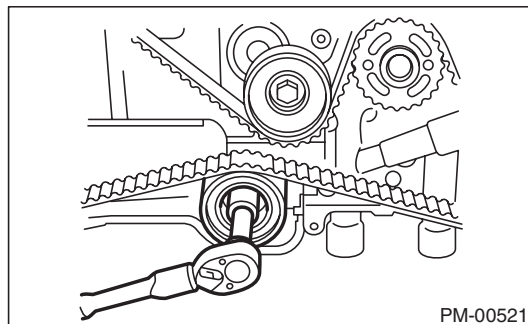


- 4) Remove the V-belts. <Ref. to ME(STI)-39, V-belt.> <Ref. to ME(w/o STI)-38, V-belt.>
- 5) Remove the crank pulley. <Ref. to ME(STI)-46, REMOVAL, Crank Pulley.> <Ref. to ME(w/o STI)-45, REMOVAL, Crank Pulley.>
- 6) Remove the timing belt cover. <Ref. to ME(STI)-48, REMOVAL, Timing Belt Cover.> <Ref. to ME(w/o STI)-47, REMOVAL, Timing Belt Cover.>
- 7) Using ST, turn the crankshaft and align the alignment marks on crankshaft and left and right cam sprockets with alignment marks of belt cover and oil pump.

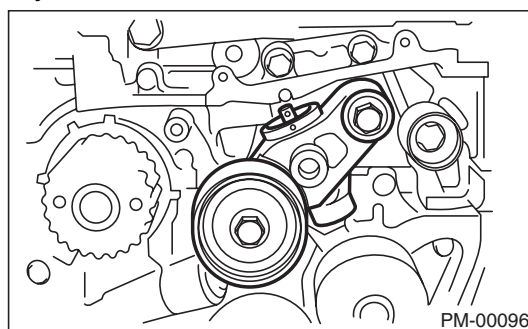
ST 499987500 CRANKSHAFT SOCKET



- 8) Remove the belt idler.



- 9) Remove the timing belt.
- 10) Remove the automatic belt tension adjuster assembly.



- 11) Install in the reverse order of removal. <Ref. to ME(STI)-51, INSTALLATION, Timing Belt.> <Ref. to ME(w/o STI)-50, INSTALLATION, Timing Belt.>

CAUTION:

When installing the timing belt, be sure to align all alignment marks on the belt with corresponding marks on the sprockets. If incorrectly installed, interference between pistons and valves may occur.

Fuel Line

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8. Fuel Line

A: INSPECTION

For fuel line, check pipes, areas near pipes, and engine compartment piping for rust, hose damage, loose band, etc. If faulty parts are found, repair or replace them. <Ref. to FU(STI)-93, Fuel Delivery, Return and Evaporation Lines.>

9. Fuel Filter

A: REPLACEMENT

For fuel filter replacement procedure, refer to FU section. <Ref. to FU(STI)-85, Fuel Filter.>

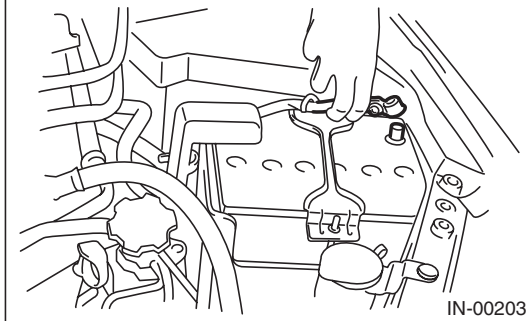
Air Cleaner Element

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10. Air Cleaner Element

A: REPLACEMENT

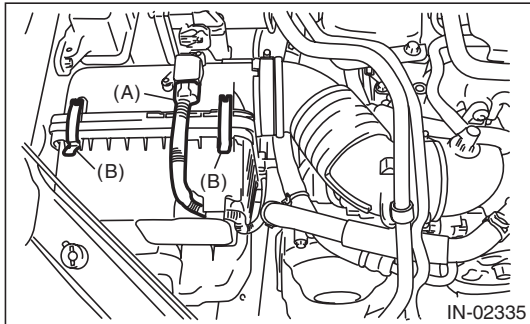
1) Disconnect the ground cable from battery.



2) Remove the air intake duct. <Ref. to IN(STI)-10, REMOVAL, Air Intake Duct.>

3) Disconnect the connector (A) from mass air flow and intake air temperature sensor.

4) Remove the clip (B) from the air cleaner case.



5) Open the air cleaner case, and remove the air cleaner element.

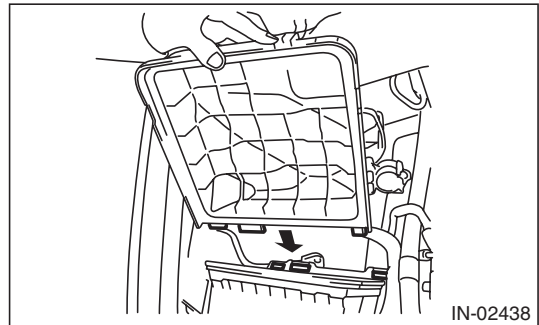
6) Install in the reverse order of removal.

CAUTION:

Be sure to use SUBARU genuine air cleaner element depending on the engine type when replacing the air cleaner elements. Using other air cleaner element may affect the engine performance.

NOTE:

- Check that there are no foreign objects in the air cleaner case.
- When installing the air cleaner case (rear), align the protrusion of the air cleaner case (rear) to the hole on the air cleaner case (front) to install.



11. Cooling System

A: INSPECTION

1) To check the radiator for leakage, fill it with engine coolant, and attach the radiator cap tester to the filler neck, and apply pressure. Check the following points:

Pressure:

122 kPa (1.2 kgf/cm², 18 psi)

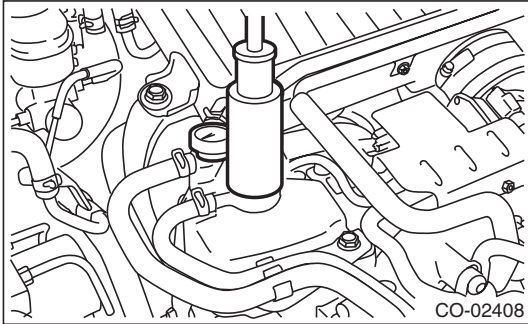
- Each portion of radiator for leakage
- Hose joints and other connections for leakage

CAUTION:

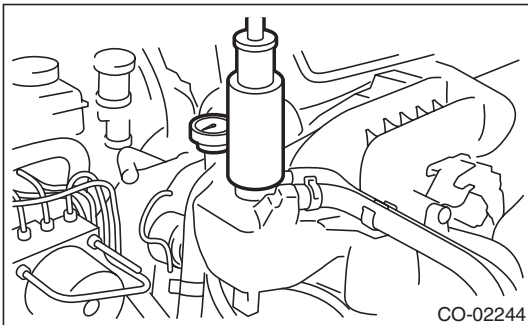
- If any engine coolant is spilled on the exhaust pipe or under cover, wipe off completely to prevent fires or emission of smoke.
- Be careful not to deform the filler neck of filler tank when installing and removing the tester, and while operating the tester.

NOTE:

- Be sure to install the tester to filler tank side.
 - STI model



- Except for STI model



- When performing this check, be sure to keep the engine stationary and fill radiator with coolant.
- Wipe off check points before applying pressure.
- Use care not to spill coolant when detaching tester from filler tank.
- Do not remove the radiator side cap.

2) Check the radiator cap valve open pressure using radiator cap tester.

NOTE:

Rust or dirt on the cap may prevent valve from functioning normally. be sure to clean the cap before testing.

Raise the pressure until the needle of gauge stops and see if the pressure can be retained for five to six seconds. The radiator cap is normal if a pressure above the limit value has been maintained for this period. Replace the radiator cap if the pressure is below the limit.

Radiator cap valve open pressure

Filler tank side

Specification:

93 — 123 kPa (0.95 — 1.25 kgf/cm², 14 — 18 psi)

Service limit:

83 kPa (0.85 kgf/cm², 12 psi)

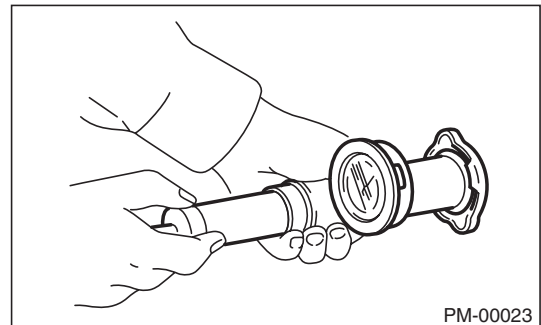
Radiator side

Specification:

122 — 152 kPa (1.24 — 1.55 kgf/cm², 18 — 22 psi)

Service limit:

112 kPa (1.14 kgf/cm², 16 psi)



3) Start the engine, and then inspect that it does not overheat or it is not cooled excessively. If it overheats or it is cooled excessively, check the cooling system.

<Ref. to CO(STI)-15, Water Pump.> <Ref. to CO(STI)-17, Thermostat.> <Ref. to CO(STI)-19, Radiator.> <Ref. to CO(STI)-22, Radiator Cap.> <Ref. to CO(w/o STI)-15, Water Pump.> <Ref. to CO(w/o STI)-17, Thermostat.> <Ref. to CO(w/o STI)-19, Radiator.>

Cooling System

PERIODIC MAINTENANCE SERVICES

4) Check the radiator fan operates using Subaru Select Monitor, when the coolant temperature exceeds the specified value. If it does not operate, check the radiator fan system. <Ref. to CO(STI)-7, Radiator Fan System.> <Ref. to CO(w/o STI)-7, Radiator Fan System.>

Engine coolant temperature:

Except for STI model

<Ref. to CO(w/o STI)-8, INSPECTION, Radiator Fan System.>

STI model

<Ref. to CO(STI)-8, INSPECTION, Radiator Fan System.>

12.Engine Coolant

A: INSPECTION

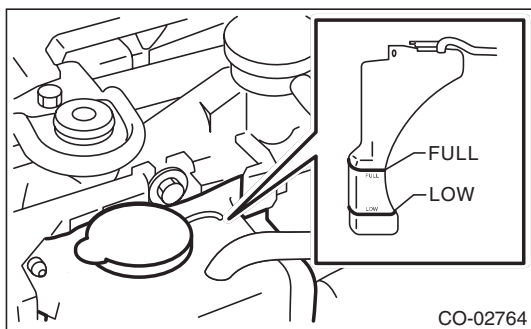
CAUTION:

- Do not use water instead of coolant.
- Refer to "RM" section for the recommended engine coolant. <Ref. to RM-4, COOLANT, RECOMMENDED MATERIALS, Recommended Materials.>

- 1) Park the vehicle on a level surface.
- 2) Make sure the engine coolant level in the reservoir tank is between "FULL" and "LOW" when the engine is cold.

NOTE:

If the engine coolant level drops, make sure that there are no engine coolant leakage, and add engine coolant to the "FULL" line.



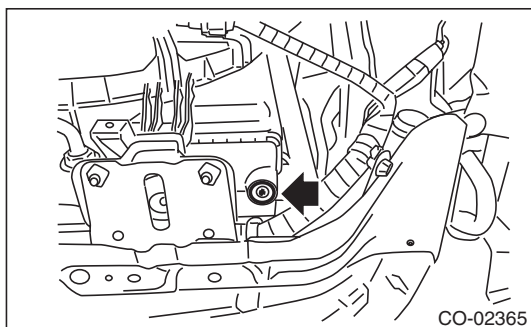
- 3) Remove the radiator cap and make sure that the radiator is filled with engine coolant up to the filler neck position.

B: REPLACEMENT

WARNING:

The radiator is of the pressurized type. Do not attempt to open the radiator cap immediately after the engine has been stopped.

- 1) Lift up the vehicle.
- 2) Remove the under cover.
- 3) Place a container under drain pipe.
- 4) Loosen and remove the drain cock to drain engine coolant into container.



- 5) For quick draining, open the radiator cap.

CAUTION:

If any engine coolant is spilled on the exhaust pipe, wipe off completely to prevent fires or emission of smoke.

NOTE:

- Be sure to open the radiator cap on the filler tank side.
 - Be careful not to spill coolant on the floor.
- 6) Drain the coolant from reservoir tank.
 - 7) Tighten the radiator drain cock securely after draining coolant.
 - 8) Pour cooling system conditioner through the filler neck.

Cooling system protective agent:

Cooling system conditioner (SOA345001)

- 9) Fill the engine coolant into coolant filler tank up to the filler neck position.
- 10) Fill engine coolant into the reservoir tank up to "FULL" level.

Recommended engine coolant:

Refer to "RM" section. <Ref. to RM-4, COOLANT, RECOMMENDED MATERIALS, Recommended Materials.>

Coolant capacity (fill up to "FULL" level):

Refer to "SPC" section. <Ref. to SPC-4, CAPACITY, Impreza.>

NOTE:

The SUBARU Super Coolant contains anti-freeze and anti-rust agents, and is especially made for Subaru engines with an aluminum cylinder block. Always use SUBARU Super Coolant since other engine coolant may cause corrosion.

- 11) Close the coolant filler tank cap, and start the engine. Race 5 to 6 times at 3,000 rpm or less, then stop the engine. (Complete this operation within 40 seconds.)
- 12) Wait for one minute after the engine stops, then open the coolant filler tank cap. If the engine coolant level drops, add engine coolant into the coolant filler tank up to the filler neck position.
- 13) Perform the procedures 11) and 12) again.
- 14) Install the coolant filler tank cap and reservoir tank cap properly.
- 15) Start the engine and operate the heater at maximum hot position and the blower speed setting to "LO".

Engine Coolant

PERIODIC MAINTENANCE SERVICES

16) Run the engine at 2,000 rpm or less until radiator fan starts and stops.

NOTE:

- Be careful with the engine coolant temperature gauge to prevent overheating.
- If the radiator hose becomes hardened with the pressure of engine coolant, air bleeding operation seems to be almost completed.

17) Stop the engine and wait until the engine coolant temperature lowers to 30°C (86°F) or less.

18) Open the coolant filler tank cap. If the engine coolant level drops, add engine coolant into the coolant filler tank up to the filler neck position and the reservoir tank to "FULL" level.

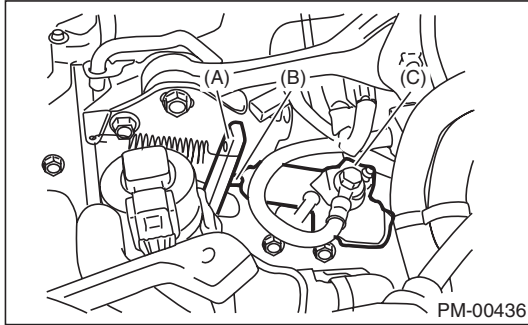
19) Install the coolant filler tank cap and reservoir tank cap properly.

20) Set the heater setting to maximum hot position and the blower speed setting to "LO" and start the engine. Perform racing at 3,000 rpm or less. If the flowing sound is heard from heater core, repeat the procedures from step 16).

13. Clutch System

A: INSPECTION AND ADJUSTMENT

1) Push the release lever to retract the push rod of the operating cylinder and check if the fluid level in the clutch reservoir tank rises or not.



- (A) Release lever
- (B) Push rod
- (C) Operating cylinder

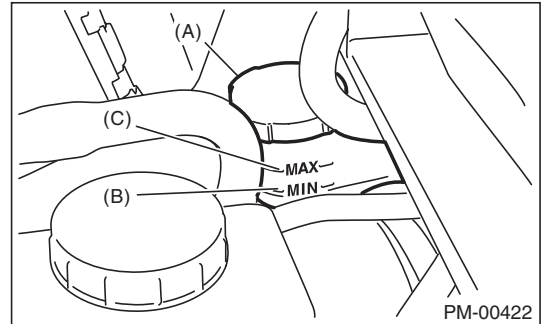
2) If the fluid level rises, pedal free play is correct.
3) If the fluid level does not rise, or the push rod cannot be retracted, adjust the clutch pedal. <Ref. to CL-28, Clutch Pedal.>
4) Check the fluid level using the scale on the outside of the clutch reservoir tank (A). If the level is below "MIN" (B), inspect the clutch master cylinder, operating cylinder and hydraulic line for fluid leaks. If fluid leaks are found, repair or replace. If fluid leaks are not found, add clutch fluid to bring it up to "MAX" (C) of clutch reservoir tank.

Recommended clutch fluid:

Refer to "RM" section. <Ref. to RM-4, FLUID, RECOMMENDED MATERIALS, Recommended Materials.>

CAUTION:

- Prevent the clutch fluid from being splashed over vehicle body. If clutch fluid is splashed over vehicle body, flush it, and then wipe it up.
- If any clutch fluid is spilled on the exhaust pipe, wipe off completely to prevent fires or emission of smoke.
- Avoid mixing brake fluid of different brands to prevent fluid performance from degrading.
- Be careful not to allow dirt or dust to get into the reservoir tank.



- (A) Reservoir tank
- (B) MIN. level
- (C) MAX. level

Transmission Gear Oil

PERIODIC MAINTENANCE SERVICES

14. Transmission Gear Oil

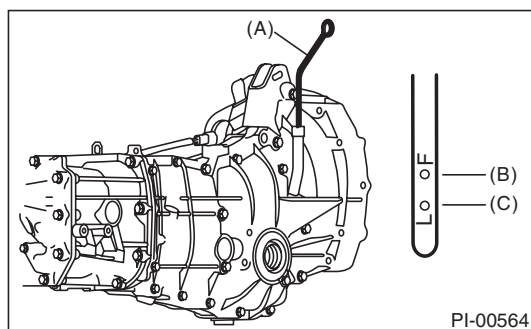
A: INSPECTION

1. 6MT MODEL

Check the gear oil for leaks.

2. 5MT MODEL

Check the transmission gear oil amount. If the amount of gear oil is insufficient, check for leaks. Then, add the necessary amount of the specified gear oil.



- (A) Oil level gauge
- (B) Upper level
- (C) Lower level

B: REPLACEMENT

1. 6MT MODEL

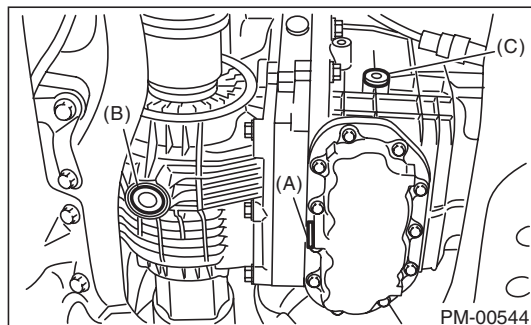
CAUTION:

If transmission gear oil is spilt over the exhaust pipe, wipe it off with a cloth to avoid emitting smoke or causing a fire.

NOTE:

Before starting work, cool off the transmission gear oil well.

- 1) Drain the gear oil by removing drain plug (A) and (B).



- (A) Drain plug (oil pan side)
- (B) Drain plug (clutch housing side)
- (C) Filler plug

- 2) Replace the gasket with new part, and then tighten the drain plug (A) and (B) to specified torque.

Tightening torque:

Oil pan side

50 N·m (5.1 kgf-m, 36.9 ft-lb)

Clutch housing side

70 N·m (7.1 kgf-m, 51.6 ft-lb)

- 3) Remove the filler plug and add transmission gear oil up to the lower edge of the filler plug hole.

CAUTION:

- Carefully refill oil while watching the level. Excessive or insufficient oil must be avoided.
- Make sure to check the fluid level with the vehicle parked at a flat horizontal position.

Recommended gear oil:

Refer to "RM" section. <Ref. to RM-2, LUBRICANT, RECOMMENDED MATERIALS, Recommended Materials.>

NOTE:

Each oil manufacturer has its base oil and additives. Thus, do not mix two or more brands.

Gear oil capacity:

<Ref. to SPC-4, CAPACITY, Impreza.>

- 4) Replace the gasket with new part, and then tighten the filler plug to specified torque.

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

2. 5MT MODEL

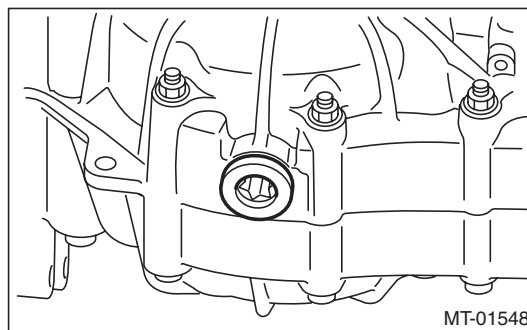
CAUTION:

If transmission gear oil is spilt over the exhaust pipe, wipe it off with a cloth to avoid emitting smoke or causing a fire.

NOTE:

Before starting work, cool off the transmission gear oil well.

- 1) Drain the gear oil by removing drain plug.
- 2) Remove the drain plug using TORX® bit T70, and then drain gear oil.



Transmission Gear Oil

PERIODIC MAINTENANCE SERVICES

3) Replace the gasket with new part, and then tighten the drain plug to specified torque.

Tightening torque:

44 N·m (4.5 kgf-m, 32.5 ft-lb) (Aluminum gasket silver)

70 N·m (7.1 kgf-m, 51.6 ft-lb) (Copper gasket brown)

70 N·m (7.1 kgf-m, 51.6 ft-lb) (Metal gasket black)

4) Fill the transmission gear oil through the oil level gauge hole up to the upper point of level gauge.

Recommended gear oil:

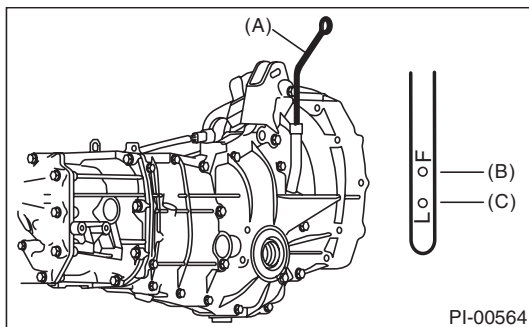
Refer to “RM” section. <Ref. to RM-2, LUBRICANT, RECOMMENDED MATERIALS, Recommended Materials.>

NOTE:

Each oil manufacturer has its base oil and additives. Thus, do not mix two or more brands.

Gear oil capacity:

<Ref. to SPC-4, CAPACITY, Impreza.>



(A) Oil level gauge

(B) Upper level

(C) Lower level

Front & Rear Differential Gear Oil

PERIODIC MAINTENANCE SERVICES

15. Front & Rear Differential Gear Oil

A: INSPECTION

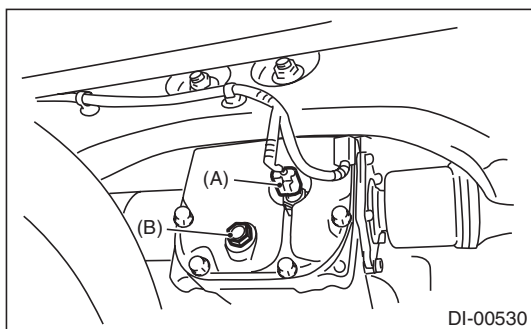
1. FRONT DIFFERENTIAL

As well as transmission oil, differential oil is used to lubricate the differential. Refer to "Transmission Oil". <Ref. to PM-22, Transmission Gear Oil.>

2. REAR DIFFERENTIAL

STI model

1) Disconnect the oil temperature switch connector.



- (A) Connector
(B) Oil drain plug

2) Remove the oil temperature switch and check the gear oil. Replace the gear oil if it is contaminated or deteriorated. <Ref. to PM-25, REPLACEMENT, Front & Rear Differential Gear Oil.>

CAUTION:

- Gear oil is extremely hot just after driving. Be wary of receiving burns.
- If differential oil spills on exhaust pipes, wipe it off with a cloth to avoid generating smoke or causing a fire.

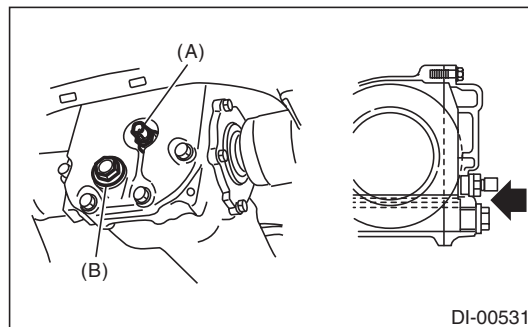
NOTE:

Remove the oil temperature switch and adapter as a unit.

3) Check that the gear oil level is within -5 mm (-0.2 in) from the bottom of the filler plug hole. If the level is low, make sure that there is no leakage, and refill up to the bottom of the filler plug hole.

Recommended gear oil:

<Ref. to RM-2, LUBRICANT, RECOMMENDED MATERIALS, Recommended Materials.>



- (A) Oil temperature switch
(B) Oil drain plug

4) Install the oil temperature switch.

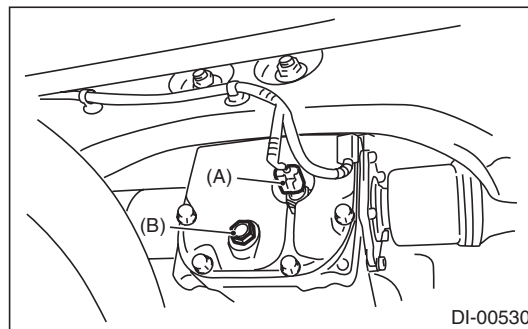
NOTE:

- Install the oil temperature switch and the filler plug as a unit.
- Use a new gasket.

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)

5) Connect the oil temperature switch connector.



- (A) Oil temperature switch
(B) Oil drain plug

Front & Rear Differential Gear Oil

PERIODIC MAINTENANCE SERVICES

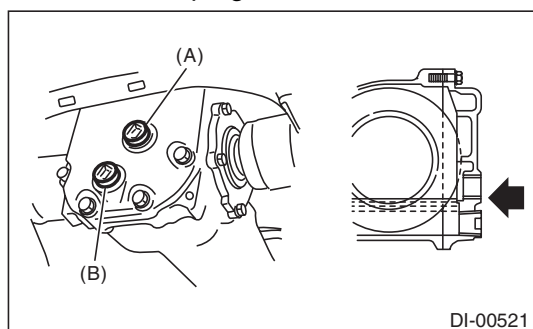
Except for STI model

1) Remove the filler plug, and then check the gear oil. Replace the gear oil if it is contaminated or deteriorated.

CAUTION:

- Gear oil is extremely hot just after driving. Be wary of receiving burns.
- If differential oil spills on exhaust pipes, wipe it off with a cloth to avoid generating smoke or causing a fire.

2) Check that the gear oil level is up to the bottom of the filler plug hole. If the level is low, refill up to the bottom of filler plug.



- (A) Filler plug
(B) Drain plug

B: REPLACEMENT

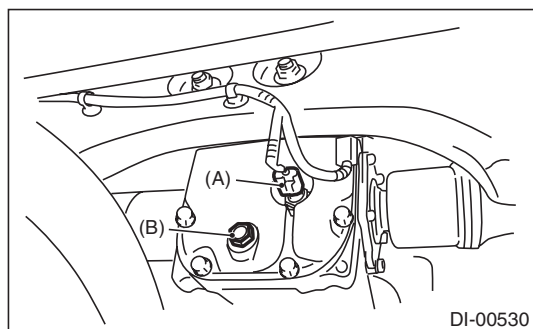
1. FRONT DIFFERENTIAL

As well as transmission oil, differential oil is used to lubricate the differential. Refer to "Transmission Oil". <Ref. to PM-22, Transmission Gear Oil.>

2. REAR DIFFERENTIAL

• STI model

1) Disconnect the oil temperature switch connector.



- (A) Connector
(B) Oil drain plug

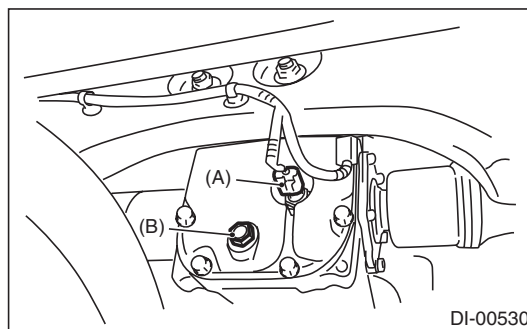
2) Remove the oil drain plug and oil temperature switch, and drain the gear oil.

CAUTION:

Gear oil is extremely hot just after driving. Be wary of receiving burns.

NOTE:

Remove the oil temperature switch and adapter as a unit.



- (A) Oil temperature switch
(B) Oil drain plug

3) Tighten the oil drain plug.

NOTE:

Use a new gasket.

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)

4) Fill the differential carrier with gear oil to the bottom of oil temperature switch hole.

NOTE:

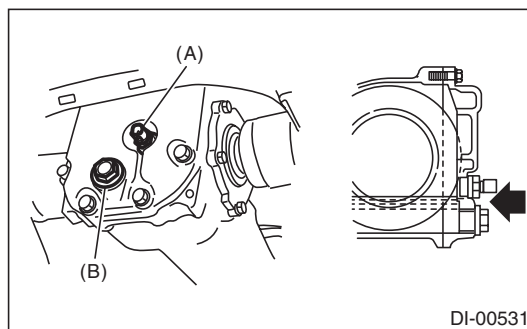
Carefully refill oil while watching the level. Excessive or insufficient oil must be avoided.

Recommended gear oil:

Refer to "RM" section. <Ref. to RM-2, LUBRICANT, RECOMMENDED MATERIALS, Recommended Materials.>

Oil capacity:

<Ref. to SPC-4, CAPACITY, Impreza.>



- (A) Oil temperature switch
(B) Oil drain plug

Front & Rear Differential Gear Oil

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5) Install the oil temperature switch.

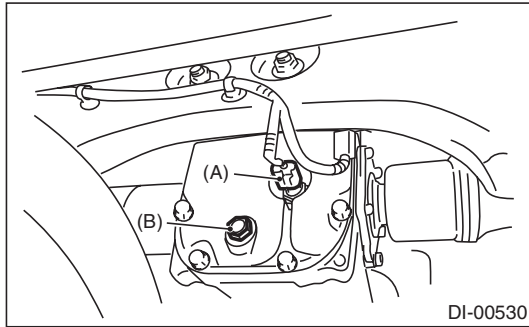
NOTE:

- Use a new gasket.
- Install the oil temperature switch and adapter as a unit.

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)

6) Connect the oil temperature switch connector.



(A) Oil temperature switch

(B) Oil drain plug

Except for STI model

- 1) Drain the oil by removing oil drain plug.
- 2) Remove the filler plug for quick draining oil.
- 3) Install the drain plug after draining oil.

NOTE:

Apply liquid gasket to the drain plug threads.

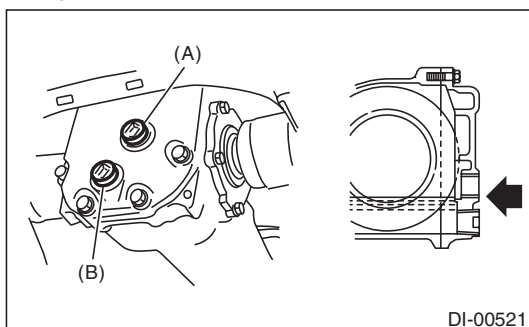
Liquid gasket:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

49 N·m (5.0 kgf-m, 36.1 ft-lb)

4) After installing the drain plug onto rear differential gear case firmly, fill oil up fully to the mouth of filler plug.



(A) Filler plug

(B) Oil drain plug

Recommended gear oil:

<Ref. to RM-2, LUBRICANT, RECOMMENDED MATERIALS, Recommended Materials.>

Oil capacity:

<Ref. to SPC-4, CAPACITY, Impreza.>

NOTE:

Each oil manufacturer has its base oil and additives. Thus, do not mix two or more brands.

5) Attach the filler plug to the rear differential case securely.

NOTE:

Apply liquid gasket to the drain plug threads.

Liquid gasket:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

49 N·m (5.0 kgf-m, 36.1 ft-lb)

16.Brake Line

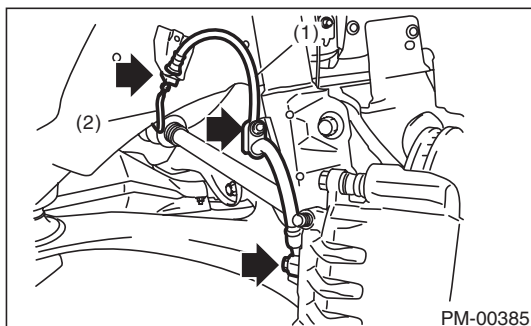
A: INSPECTION

1. BRAKE LINE

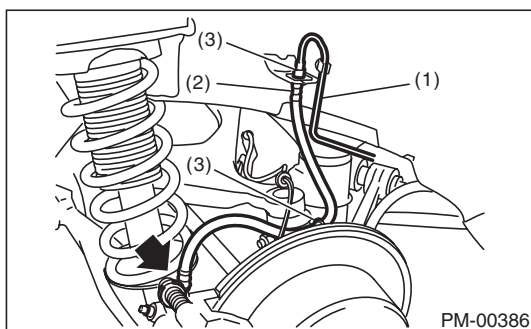
- 1) Check for scratches, swelling, corrosion, traces of fluid leakage on the brake hoses or pipe joints.
- 2) Check the possibility of adjacent parts interfering with brake pipes/hoses during driving, and loose connections/clamps.
- 3) Check any trace of fluid leakage, scratches, etc. on master cylinder and wheel cylinder.

NOTE:

- When the brake fluid level in the reservoir tank is lower than specified limit, the brake warning light on the combination meter will illuminate.
- Visually check the brake hose for damage. (Use a mirror where it is difficult to see)



- (1) Front brake hose
- (2) Front brake pipe



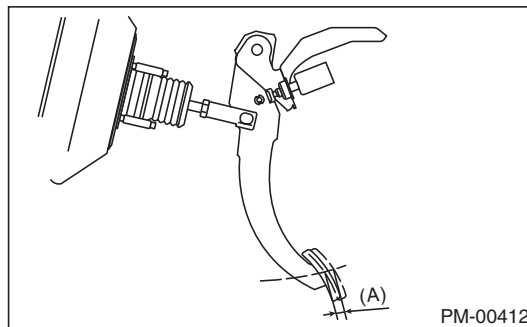
- (1) Rear brake pipe
- (2) Rear brake hose
- (3) Clamp

2. SERVICE BRAKE

- 1) Move to the pull-up direction with the force of less than 10 N (1 kgf, 2 lbf) and check the free play.

Brake pedal play

0.5 — 2.0 mm (0.02 — 0.08 in)



(A) Pedal free play

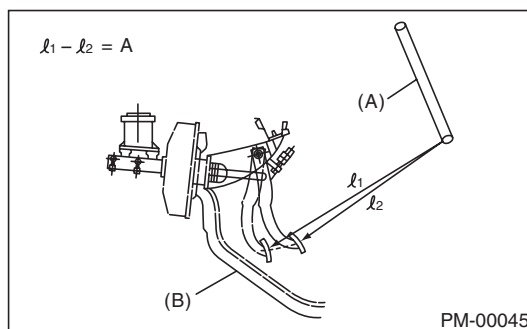
- 2) If the free play is out of specifications above, adjust the brake pedal. <Ref. to BR-46, INSPECTION, Brake Pedal.>

- 3) Check the pedal stroke.

While the engine is idling, depress the brake pedal with a 490 N (50 kgf, 110 lbf) load and measure the distance between the brake pedal and steering wheel. With the brake pedal released, measure the distance between pedal and steering wheel again. The difference between the two measured values must be the specified value or less. If the measured value is greater than or equal to the specification, there is possibility of entering air in hydraulic unit.

Brake pedal stroke A:

110 mm (4.33 in)/ 490 N (50 kgf, 110 lbf) or less



- (A) Steering wheel
- (B) Toe board

- 4) Check to see if air is in the hydraulic brake line by the feel of pedal operation. If air appears to exist in the line, bleed it from the system.

- 5) Check for even operation of all brakes, using a brake tester or by driving the vehicle for a short distance on a straight road.

Brake Line

PERIODIC MAINTENANCE SERVICES

3. BRAKE SERVO SYSTEM

1) With the engine off, depress the brake pedal several times applying the same pedal force. Make sure the travel distance should not change.

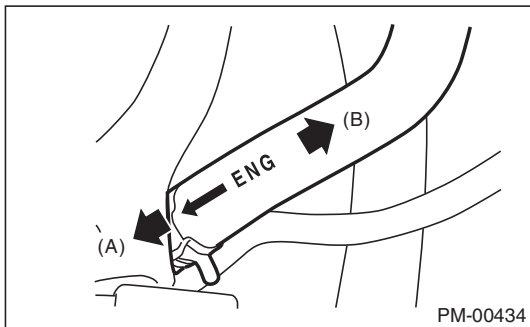
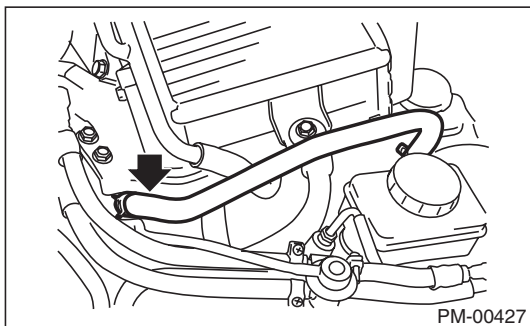
2) With the brake pedal depressed, start the engine. Make sure the pedal should move slightly toward the floor.

3) With the brake pedal depressed, stop the engine and keep the pedal depressed for 30 seconds. Make sure the pedal height should not change.

4) A check valve is built into the vacuum hose. Disconnect the vacuum hose to inspect function of check valve.

Blow compressed air into vacuum hose from the end of brake booster side. Check that the air flows from the air hose on engine side. Next blow air into hose from engine side: Check that the air does not flow from the hose.

Replace the both check valve and vacuum hose if the check valve is faulty. Engine side of vacuum hose is indicated by marking "ENG" as shown.



(A) Engine side

(B) Brake booster side

5) Check the vacuum hose for cracks or other damage.

NOTE:

When installing the vacuum hose on the engine and brake booster, do not use soapy water or lubricating oil on their connections.

6) Check the vacuum hose to make sure it is tightly secured.

17.Brake Fluid

A: INSPECTION

- 1) Check that the amount of brake fluid is between the lines of "MIN" and "MAX". If out of the specified range, refill or drain the fluid. If the fluid level is close to "MIN", check the brake pad for wear and refill the fluid.
- 2) Check the fluid for discoloration. If the fluid is extremely discolored, replace with the new fluid.

B: REPLACEMENT

CAUTION:

- Do not let brake fluid come into contact with the painted surface of the vehicle body. Wash away with water immediately and wipe off if it is spilled by accident.
- Avoid mixing brake fluid of different brands to prevent fluid performance from degrading.
- Be careful not to allow dirt or dust to enter the reservoir tank.
- If the brake fluid is spilt over exhaust pipe, wipe it off with cloth to avoid emitting smoke or causing a fire.

NOTE:

- During the operation, keep the reservoir tank filled with brake fluid to prevent entry of air.
 - Operate the brake pedal slowly.
 - For convenience and safety, perform the work with 2 people.
 - The required amount of brake fluid is approximately 500 mL (16.9 US fl oz, 17.6 Imp fl oz) for the entire brake system.
- 1) Either jack-up the vehicle and place a rigid rack under it, or have the vehicle lifted.
 - 2) Remove all the wheels.
 - 3) Drain brake fluid from the reservoir tank.
 - 4) Refill the reservoir tank with recommended brake fluid.

Recommended brake fluid:

Refer to "RM" section. <Ref. to RM-4, FLUID, RECOMMENDED MATERIALS, Recommended Materials.>

Perform the same procedure as for bleeding the brake line, until new brake fluid comes out from vinyl tube. <Ref. to BR-39, PROCEDURE, Air Bleeding.>

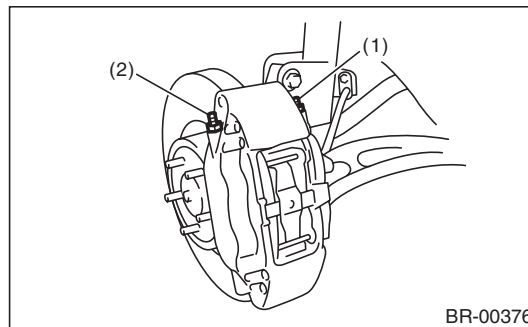
NOTE:

Perform brake fluid replacement starting in the order from the farthest wheel cylinder from the master cylinder.

- 5) Install one end of a vinyl tube onto the air bleeder and insert the other end of the tube into a container to collect the brake fluid.

NOTE:

For calipers with two air bleeder screws, bleed air from the inner side first and then the outer side.



- (1) Inner side air bleeder screw
- (2) Outer side air bleeder screw

- 6) Instruct your co-worker to depress the brake pedal slowly two or three times and then hold it depressed.
- 7) Loosen the bleeder screw approximately 1/4 turn until a small amount of brake fluid drains into the container, and then quickly tighten the screw.
- 8) Repeat steps 6) and 7) until there are no air bubbles in drained brake fluid and new fluid flows through vinyl tube.

NOTE:

Add brake fluid as necessary while performing the air bleed operation, in order to prevent the tank from running short of brake fluid.

- 9) After completing the bleeding operation, hold the brake pedal depressed and tighten the screw and install bleeder cap.

Tightening torque:

20 N·m (2.0 kgf-m, 14.8 ft-lb)

- 10) Bleed air from each wheel cylinder by following steps from 5) to 9).
- 11) Depress the brake pedal with a force of approx. 294 N (30 kgf, 66 lbf) and hold it there for approx. 20 seconds. At this time check the pedal to see if it makes any unusual movement. Visually inspect the bleeder screws and brake pipe joints to confirm there is no fluid leakage.

Disc Brake Pad and Disc

PERIODIC MAINTENANCE SERVICES

18.Disc Brake Pad and Disc

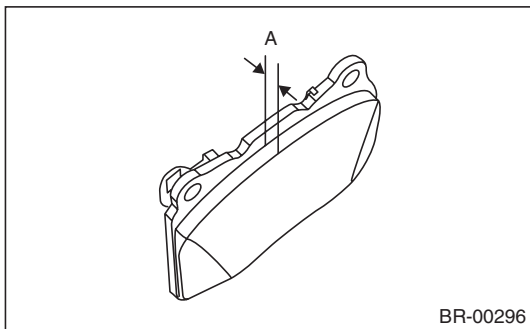
A: INSPECTION

1. DISC BRAKE PAD AND DISC

- 1) Jack-up the vehicle and support it with rigid racks. Remove the wheels.
- 2) Visually check the pad thickness through inspection hole of disc brake assembly. Replace the pad if necessary.

NOTE:

When replacing a pad, always replace the pads for both the left and right wheels at the same time. Also replace the pad clips if they are twisted or worn.



(A) Pad thickness

- Front (back metal not included)
Brembo type

Pad thickness mm (in)	
Standard	8.9 (0.350)
Wear limit	1.2 (0.047)

Except for brembo type

Pad thickness mm (in)	
Standard	11 (0.43)
Wear limit	1.5 (0.059)

- Rear (back metal not included)
Brembo type

Pad thickness mm (in)	
Standard	9.0 (0.354)
Wear limit	1.2 (0.047)

Except for brembo type

Pad thickness mm (in)	
Standard	9.0 (0.354)
Wear limit	1.5 (0.059)

- 3) Check the disc rotor, and correct or replace if it is damaged or worn.

- Front

Brembo type

Disc rotor thickness mm (in)	
Standard	30 (1.18)
Wear limit	28 (1.10)

Except for brembo type

Disc rotor thickness mm (in)	
Standard	24 (0.94)
Wear limit	22 (0.87)

- Rear

Brembo type

Disc rotor thickness mm (in)	
Standard	20 (0.79)
Wear limit	18 (0.71)

Except for brembo type

Disc rotor thickness mm (in)	
Standard	10 (0.39)
Wear limit	8.5 (0.33)

- 4) Remove the caliper body. <Ref. to BR-18, Front Disc Brake Assembly.> <Ref. to BR-28, Rear Disc Brake Assembly.>

- 5) Tighten the wheel nuts to secure disc rotor.

- 6) Set a dial gauge at a point of 10 mm (0.39 in) or less from outer periphery of the rotor, and then measure the disc rotor runout.

Disc rotor runout limit:

Brembo type

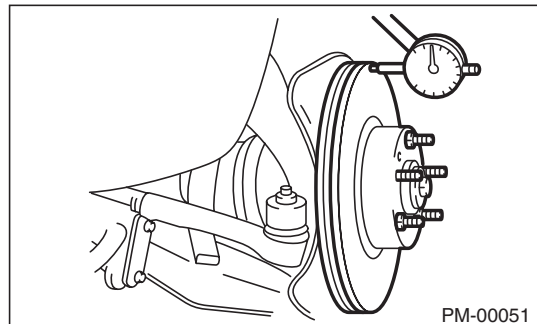
Front: 0.075 mm (0.0030 in)

Rear: 0.070 mm (0.0028 in)

Except for brembo type

Front: 0.050 mm (0.0020 in)

Rear: 0.050 mm (0.0020 in)



19. Parking Brake

A: INSPECTION

1) Measure the inner diameter of the brake disc rotor. If scoring or worn is found on the disk, replace the brake disc rotor.

Disc rotor inner diameter:

Standard

190 mm (7.48 in)

Service limit

191 mm (7.52 in)

2) Measure the lining thickness. If it exceeds the limit, replace the brake shoe.

Lining thickness:

Standard

2.8 mm (0.11 in)

Service limit

1.5 mm (0.059 in)

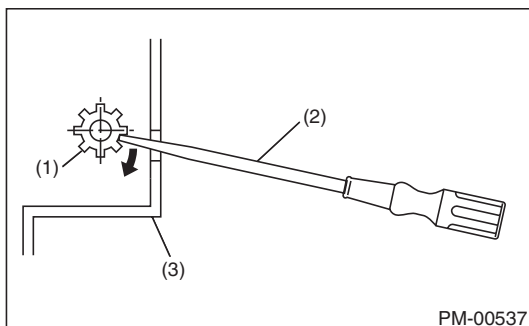
NOTE:

Replace the right and left primary and secondary brake shoes as a set.

B: ADJUSTMENT

For rear disc brake, adjust the parking brake after bleeding air.

- 1) Return the parking brake pedal fully.
- 2) Loosen the adjusting nut, and make the cable free.
- 3) Remove the adjusting hole cover from the disc rotor.
- 4) Using a flat tip screwdriver, turn the adjusting screw in the direction of the arrow (shoe extension direction) as shown in the figure until it is locked slightly (until the disc no longer rotates with both hands).



- (1) Adjusting screw
- (2) Flat tip screwdriver
- (3) Disc rotor

5) Loosen the adjusting screw by 5 notches to opposite direction of arrow.

CAUTION:

- **Check there is no brake drag.**
- **If the amount that the adjusting screw is turned back is little, securely loosen it by 5 notches to avoid dragging.**

6) Install the adjusting hole cover to the disc rotor.

7) Adjust the parking brake lever stroke. <Ref. to PB-8, LEVER STROKE, ADJUSTMENT, Parking Brake Assembly (Rear Disc Brake).>

Suspension

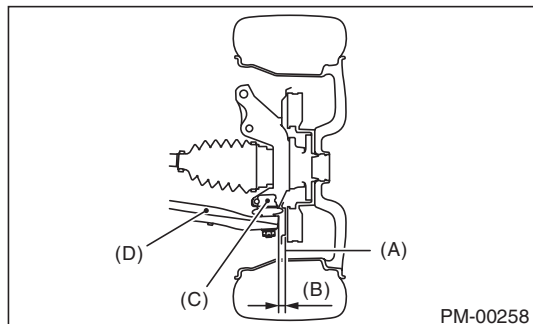
PERIODIC MAINTENANCE SERVICES

20. Suspension

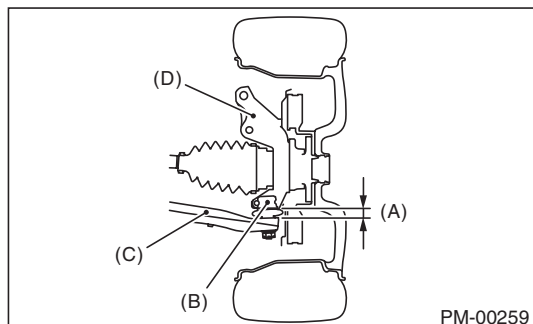
A: INSPECTION

1. SUSPENSION BALL JOINT

- 1) Jack up the vehicle until front tires are off ground.
- 2) Grasp the bottom of tire and move it in and out in axial direction. If relative movement (B) is observed between the brake disc cover (A) and end of front arm (D), ball joint (C) may be excessively worn.



- 3) Grasp the end of front arm and move it up and down. Relative movement (A) between the housing (D) and front arm (C) boss indicates ball joint (B) may be excessively worn.

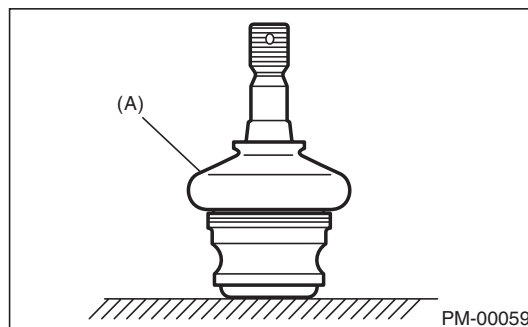


- 4) If the relative movement is observed in the preceding two steps, remove and inspect the ball joint. If the free play exceeds standard value, replace the ball joint. <Ref. to FS-18, Front Ball Joint.>
- 5) Damage of dust cover
Visually inspect the ball joint dust cover. If it is damaged, remove the front arm. <Ref. to FS-20, Front Arm.> Measure the play of the ball joint. <Ref. to FS-18, Front Ball Joint.>
 - (1) If the free play exceeds standard value, replace the ball joint.

- (2) If the dust cover is damaged, replace with a new ball joint.

NOTE:

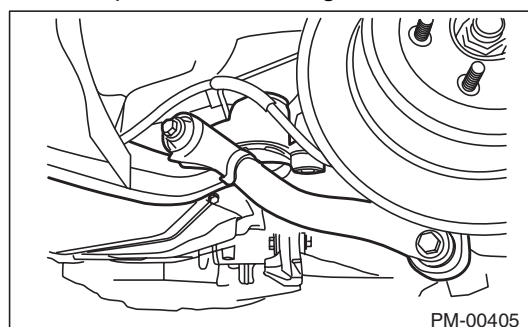
When the front arm ball joint has been removed or replaced, check the toe of front wheel. If the front wheel toe is outside the specified range, <Ref. to FS-8, Wheel Alignment.> adjust toe-in.



(A) Dust cover

2. FRONT, REAR SUSPENSION BUSHING

Apply pressure with tire lever or similar tool to inspect the bushing for fatigue or other damage. If defective, replace the bushing.



3. WHEEL ARCH HEIGHT

- 1) Unload the vehicle, so that it is at curb weight.
- 2) Check the wheel arch height of the front and rear suspensions to ensure that they are within tolerance. <Ref. to FS-8, Wheel Alignment.>
- 3) If the wheel arch height is out of the specification, visually check the following components and replace deformed parts.
 - Suspension components [Front strut assembly and rear shock absorber assembly]
 - Parts connecting suspension and body
- 4) When no components are deformed, adjust the wheel arch height by replacing the suspension for which the wheel arch height is not within tolerance. <Ref. to FS-8, Wheel Alignment.>

4. WHEEL ALIGNMENT OF FRONT SUSPENSION

1) Check the alignment of front suspension to make sure the following items are within tolerance.

- Toe-in
- Camber
- Caster (Referential Value)
- Steering angle

<Ref. to FS-8, Wheel Alignment.>

2) When the caster angle does not conform to the reference value obviously, visually inspect the following components and replace deformed parts.

- Suspension components [Strut assembly, crossmember, front arm, etc.]
- Parts connecting suspension and body

3) When the toe-in and camber are outside of the tolerance value, adjust each one so that they conform to the specified value.

4) When the rotating angles of the right and left tires are not within tolerance, adjust them to standard. <Ref. to FS-8, Wheel Alignment.>

5. WHEEL ALIGNMENT OF REAR SUSPENSION

1) Inspect the alignment of the rear suspension and check the following items are within the specified range.

- Toe-in
- Camber
- Thrust angle

<Ref. to RS-8, Wheel Alignment.>

2) If camber is out of the specification, visually check the items listed below. If the deformation is found, replace the damaged part.

- Suspension component [shock absorber, front lateral link, rear lateral link, upper arm, trailing link, sub frame etc.]
- Parts connecting suspension and body

3) If the toe-in or thrust angle is out of the specification, adjust to the standard value. <Ref. to FS-8, Wheel Alignment.>

6. OIL LEAKAGE OF STRUT AND SHOCK ABSORBER

Visually inspect the front strut and rear shock absorber for oil leakage. Replace the front strut and rear shock absorber if oil leaks excessively.

7. TIGHTNESS OF BOLTS AND NUTS

Check the bolts and nuts for looseness. Retighten the bolts and nuts to specified torque. If the self-locking nuts and bolts are removed, replace them with new parts.

Front suspension: <Ref. to FS-2, General Description.>

Rear suspension: <Ref. to RS-2, General Description.>

8. DAMAGE TO SUSPENSION PARTS

Check the following parts and the fastening portion of the vehicle body for deformation or excessive rusting which impairs the suspension. If necessary, replace the damaged parts with new parts. If minor rust formation, pitting, etc. are noted, remove the rust and take rust prevention measure.

- Front suspension
 - Front arm
 - Crossmember
 - Strut
- Rear suspension
 - Sub frame
 - Front lateral link
 - Rear lateral link
 - Upper arm
 - Trailing link
 - Shock absorber
- In the area where salt is sprayed to melt snow on a road in winter, check suspension parts for damage caused by rust every 12 months after lapse of 60 months. Take rust prevention measures as required.

Wheel Bearing

PERIODIC MAINTENANCE SERVICES

21. Wheel Bearing

A: INSPECTION

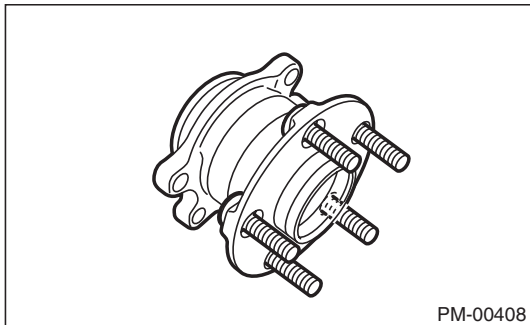
1. FRONT HUB UNIT

- 1) Jack-up the front side of vehicle.
- 2) While holding the front wheel by hand, swing it in and out to check that there is no bearing free play.
- 3) Loosen the wheel nuts, and remove the front wheel.
- 4) If the bearing free play exists in step 2) above, attach a dial gauge to hub and measure the looseness in the axial direction.

Service limit:

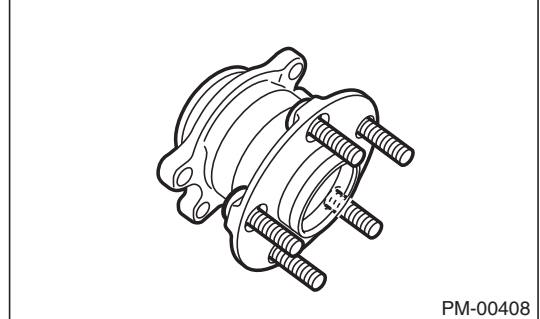
***Straight-ahead position within 0.05 mm
(0.0020 in)***

- 5) Remove the bolts and self-locking nuts, and extract transverse link from the front crossmember.
 - 6) Remove the AAR of front drive shaft from transmission. <Ref. to DS-14, Front Axle.>
 - 7) While supporting the front drive shaft horizontally with one hand, turn the hub with the other hand to check for noise or binding.
- If the hub is noisy or binds, replace the front hub unit.



- 6) While supporting rear drive shaft horizontally with one hand, turn the hub with the other to check for noise or binding.

If the hub is noisy or binds, replace the rear hub unit.



2. REAR HUB UNIT

- 1) Jack-up the rear side of vehicle.
- 2) While holding the rear wheel by hand, swing it in and out to check bearing free play.
- 3) Loosen the wheel nuts, and remove the rear wheel.
- 4) If the bearing free play exists in step 2) above, attach a dial gauge to hub and measure the looseness in the axial direction.

Service limit:

***Straight-ahead position within 0.05 mm
(0.0020 in)***

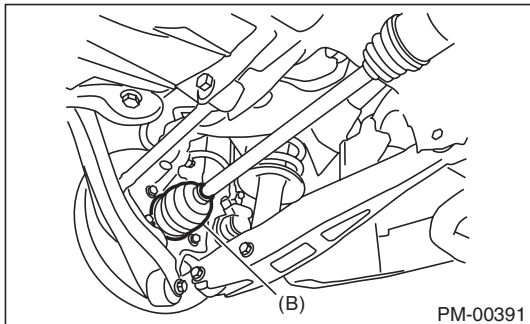
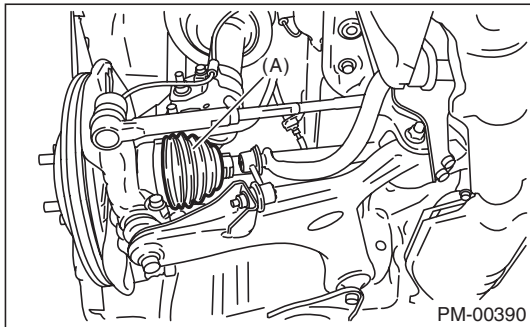
- 5) Remove the EDJ of the rear drive shaft from the rear differential. <Ref. to DS-35, Rear Drive Shaft.>

22. Axle Boots & Joints

A: INSPECTION

1. FRONT AND REAR AXLE BOOTS

Inspect the front axle boots (A) and rear axle boots (B) for deformation, damage or failure. If faulty, replace with new part. <Ref. to DS-27, Front Drive Shaft.> <Ref. to DS-35, Rear Drive Shaft.>



2. PROPELLER SHAFT

Inspect the propeller shaft for damage or failure. If faulty, replace with new part. <Ref. to DS-11, Propeller Shaft.>

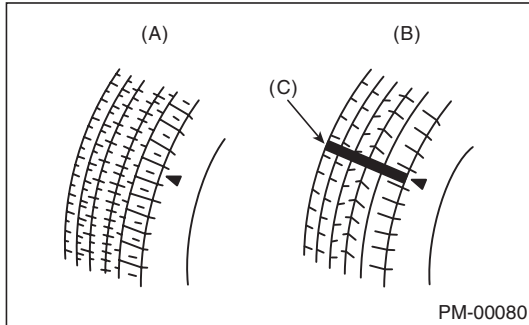
Tire Rotation

PERIODIC MAINTENANCE SERVICES

23. Tire Rotation

A: INSPECTION

1) When the tread has worn down to less than 1.6 mm (0.063 in) or the wear indicator appears across the tread, replace the tire. (Replace the right and left tires as a set.)

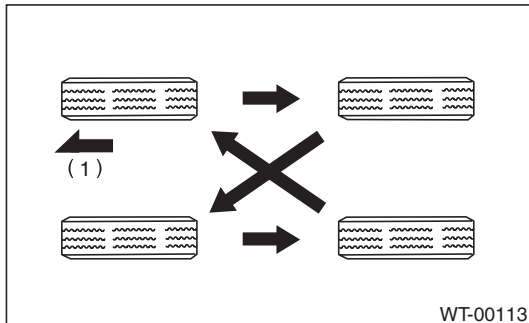


- (A) New tread
- (B) Damaged tread
- (C) Tread wear indicator

2) If the tire appears to be worn unevenly, adjust the wheel alignment.

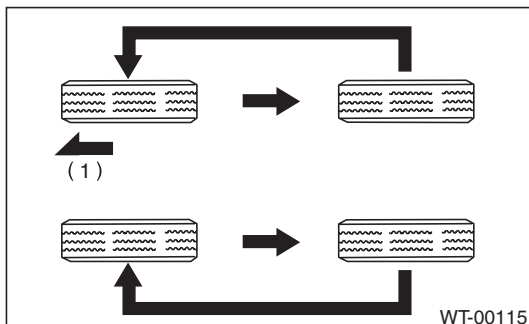
3) Next, make a tire rotation between front and rear as shown in the figure, make sure tires are worn evenly.

- When the direction of tire rotation is not specified



- (1) Front

- When the direction of tire rotation is specified



- (1) Front

Steering System (Power Steering)

PERIODIC MAINTENANCE SERVICES

24. Steering System (Power Steering)

A: INSPECTION

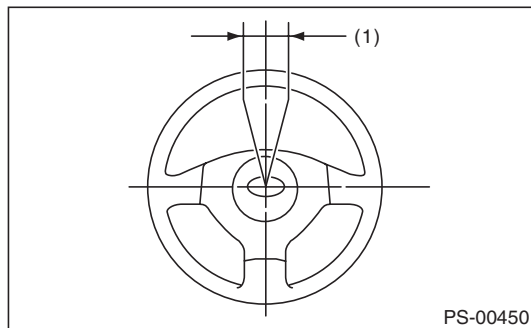
1. STEERING WHEEL

- 1) Set the steering wheel in a straight-ahead position, and check the wheel spokes to make sure they are correctly set in their specified positions.
- 2) Lightly turn the steering wheel to the left and right to determine the point where front wheels start to move.

Measure the distance of the movement of steering wheel at the outer periphery of wheel.

Steering wheel free play:

0 — 17 mm (0 — 0.67 in)



(1) Steering wheel free play

Move the steering wheel vertically toward the shaft to ascertain if there is play in the direction.

Maximum permissible play:

0.5 mm (0.020 in)

- 3) Drive the vehicle and check the following items during operation.

(1) Steering force:

The effort required for steering should be smooth and even at all points, and should not vary.

(2) Pulled to one side:

Steering wheel should not be pulled to either side while driving on a level surface.

(3) Wheel runout:

Steering wheel should not show any sign of runout.

(4) Return factor:

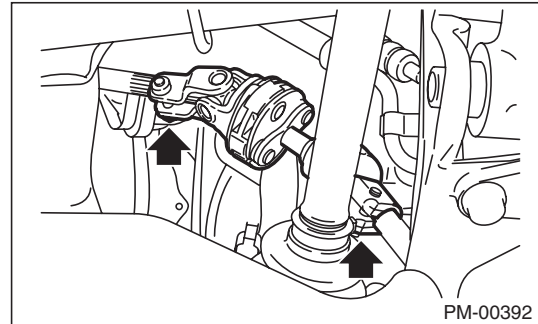
Steering wheel should return to its original position after it has been turned and then released.

2. STEERING SHAFT JOINT

If steering wheel play is excessive, disconnect the universal joint of steering shaft and then check the play where the joints cross and yawing torque. Also, check the seal for damage or serrations for wear. If loose joints, tighten the mounting bolts to specified torque.

Tightening torque:

24 N·m (2.4 kgf-m, 17.7 ft-lb)



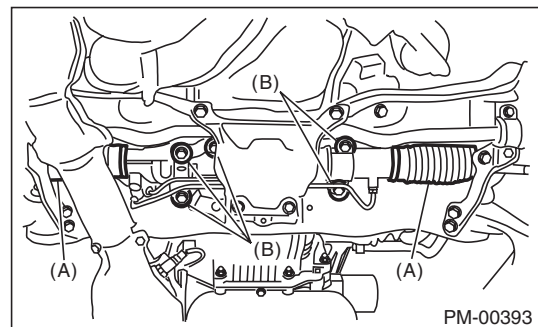
3. GEARBOX

- 1) With the vehicle placed on a level surface, turn the steering wheel 90° in both the left and right directions.

While the wheel is being rotated, reach under the vehicle and check for looseness in gearbox.

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)



(A) Boot

(B) Gearbox mounting bolt

- 2) Check the boot for damage, cracks or deterioration.

Steering System (Power Steering)

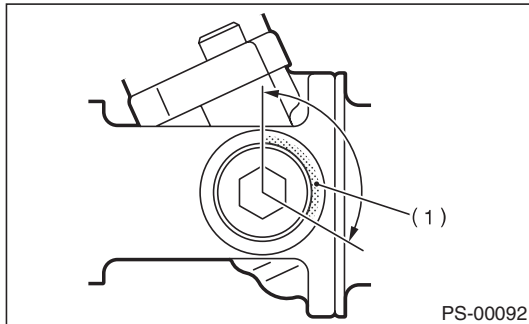
PERIODIC MAINTENANCE SERVICES

3) With the vehicle placed on a level surface, quickly turn the steering wheel to the left and right. While steering wheel is being rotated, check the gear backlash. If any noise is noticed, adjust the gear backlash in the following manner.

- (1) Loosen the adjusting screw, and apply liquid gasket to at least 1/3 of the entire perimeter of adjusting screw thread.

Liquid gasket:

THREE BOND 1102 or 1215



- (1) Apply liquid gasket to 1/3 or more of the entire perimeter.

- (2) Tighten the adjusting screw, then loosen it.

CAUTION:

Adjust the steering rack to the straight forward position.

Tightening torque:

25 N·m (2.5 kgf-m, 18 ft-lb)

- (3) Tighten the adjusting screw, then loosen it.
- (4) Tighten the adjusting screw.

Tightening torque:

5.9 N·m (0.6 kgf-m, 4.2 ft-lb)

- (5) Then, return the adjusting screw by 20° and fix it.
- (6) Install the lock nut. While holding the adjusting screw with wrench, tighten the lock nut using ST.

ST 926230000 SPANNER

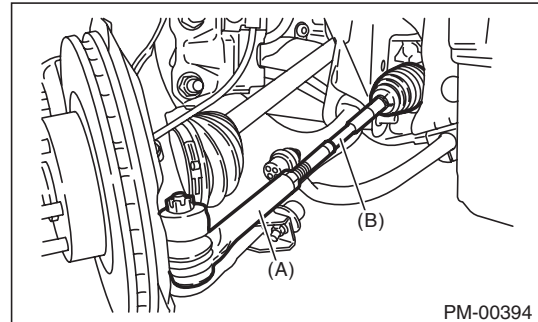
Tightening torque (lock nut):

25 N·m (2.5 kgf-m, 18 ft-lb)

Hold the adjusting screw with wrench to prevent it from turning while tightening the lock nut.

4. TIE-ROD

- 1) Check the tie-rod and tie-rod end for bend, cracks or other damages.



- (A) Tie-rod end
(B) Tie-rod

- 2) Make sure there is free play at the connection of knuckle ball joint and check the dust seal for damage, and the ball stud for play. If loose castle nut, tighten it to the specified tightening torque, and tighten further within 60° until the cotter pin hole is aligned.

Tightening torque:

27 N·m (2.75 kgf-m, 19.9 ft-lb)

- 3) Check the tightening of tie-rod end lock nut. If it is loose, tighten it to the specified torque.

Tightening torque:

85 N·m (8.7 kgf-m, 62.7 ft-lb)

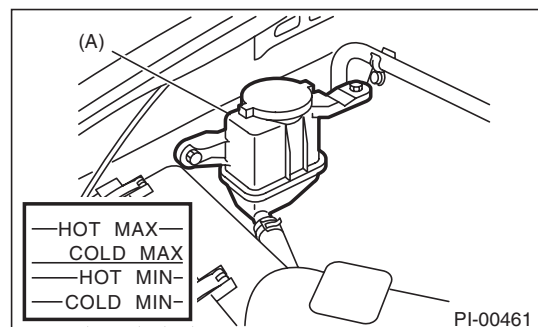
5. POWER STEERING FLUID LEVEL

NOTE:

- At power steering fluid temperature 20°C (68°F); read the fluid level on the "COLD" side.
- At power steering fluid temperature 80°C (176°F); read the fluid level on the "HOT" side.

- 1) Place the vehicle with engine "OFF" on a level surface.

- 2) Check the fluid level using the scale on the outside of the reservoir tank (A). If the level is below "MIN", fill fluid up to "MAX" level.



Steering System (Power Steering)

PERIODIC MAINTENANCE SERVICES

CAUTION:

If the power steering fluid is spilt over exhaust pipe, wipe it off with cloth to avoid emitting smoke or causing a fire.

NOTE:

If fluid level is at MAX level or above, drain fluid to keep the level in the specified range of indicator by using a syringe or the like.

Recommended fluid:

Refer to "RM" section. <Ref. to RM-4, FLUID, RECOMMENDED MATERIALS, Recommended Materials.>

Fluid capacity:

0.7 L (0.7 US qt, 0.6 Imp qt)

6. POWER STEERING FLUID FOR LEAKS

Inspect the underside of oil pump and gearbox of power steering system, hoses, pipes and their couplings for fluid leaks.

If fluid leakage is found, tighten the mounting bolt (or nut) again or replace with a new part.

NOTE:

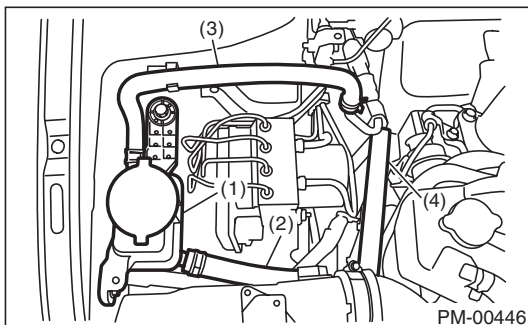
- Wipe the leaked fluid off after correcting fluid leaks.
- When inspecting the fluid leakage, be careful of the clearance between the hose (or piping) and other parts.

7. HOSES OF OIL PUMP FOR DAMAGES

Check the pressure hose and return hose of oil pump for crack, swell or damage. Replace the hose with a new part if necessary.

NOTE:

Prevent hoses from turning and/or bending when installing hoses.



- (1) Reservoir tank
- (2) Suction hose
- (3) Return hose
- (4) Pressure hose

8. POWER STEERING PIPES FOR DAMAGES

Check the power steering pipes for corrosion and damage.

Replace the pipe with a new part if necessary.

9. GEARBOX BOOTS

Inspect both sides of the gearbox boot as follows, and correct the defects if necessary.

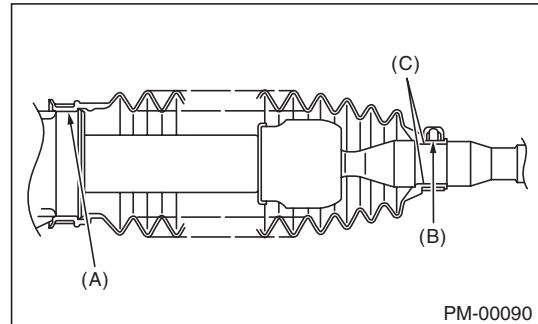
1) Positions (A) and (B) of the gearbox boot are fitted correspondingly in grooves (A) and (B) of the gearbox and rod (C).

2) Clips are fitted outside of positions (A) and (B) of boot.

3) Boot does not have crack or hole.

NOTE:

Rotate (B) position of gearbox boot against the torsion produced by the adjustment of toe-in etc. Apply grease to the groove (C).



10. FITTING BOLTS AND NUTS

Inspect the fitting bolts and nuts of oil pump and bracket for looseness, and retighten them if necessary.

Inspect and/or retighten them when engine is cold.

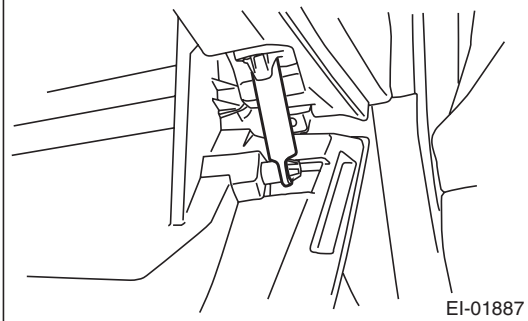
A/C Filter

PERIODIC MAINTENANCE SERVICES

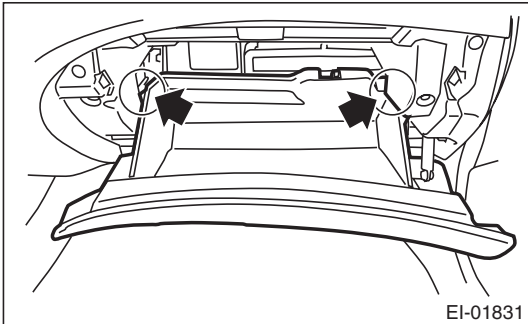
25.A/C Filter

A: REPLACEMENT

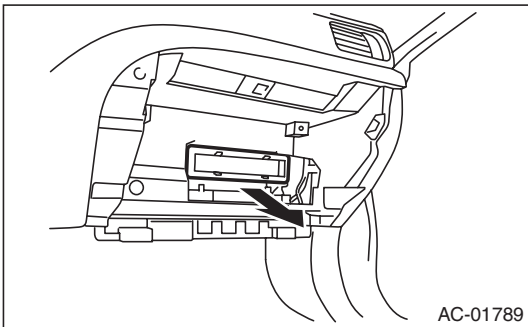
1) Remove the glove box damper.



2) Disengage the stopper section and pull the glove box lid to remove it.



3) Pinch the claw to unlock and remove the A/C filter.



4) Install in the reverse order of removal.

ENGINE 1 SECTION

This service manual has been prepared to provide SUBARU service personnel with the necessary information and data for the correct maintenance and repair of SUBARU vehicles.

This manual includes the procedures for maintenance, disassembling, reassembling, inspection and adjustment of components and diagnostics for guidance of experienced mechanics.

Please peruse and utilize this manual fully to ensure complete repair work for satisfying our customers by keeping their vehicle in optimum condition. When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

All information, illustration and specifications contained in this manual are based on the latest product information available at the time of publication approval.

FUEL INJECTION (FUEL SYSTEMS)	FU(STI)
EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)	EC(STI)
INTAKE (INDUCTION)	IN(STI)
MECHANICAL	ME(STI)
EXHAUST	EX(STI)
COOLING	CO(STI)
LUBRICATION	LU(STI)
SPEED CONTROL SYSTEMS	SP(STI)
IGNITION	IG(STI)
STARTING/CHARGING SYSTEMS	SC(STI)

FUEL INJECTION (FUEL SYSTEMS)

FU(STI)

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