TRANSMISSION 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.

FUJI HEAVY INDUSTRIES LTD.

G8050GE4

AUTOMATIC TRANSMISSION

AT

1. General Description S502001

A: SPECIFICATIONS S502001E49

1. TORQUE CONVERTER CLUTCH S502001E4901

Model	Non-turbo model	Turbo model
Type	Symmetric, 3 element, single stage, 2 phase torque converter	
Stall torque ratio	2.0 — 2.2	1.9 — 2.1
Nominal diameter	236 mm (9.29 in)	246 mm (9.69 in)
Stall speed (at sea level)	2,100 — 2,600 rpm	2,150 — 2,950 rpm
One-way clutch	Sprague type one-way clutch	

2. OIL PUMP S502001E4902

Type	Pracoid constant-displacement pump	
Driving method	Driven by engine	
Number of teeth	Inner rotor	9
	Outer rotor	10

3. TRANSMISSION CONTROL ELEMENT S502001E4903

Type	4-forward, 1-reverse, double-row planetary gears
Multi-plate clutch	3 sets
Multi-plate brake	2 sets
One-way clutch (sprague type)	1 sets

4. TRANSMISSION GEAR RATIO S502001E4904

	Gear ratio
1st	2.785
2nd	1.545
3rd	1.000
4th	0.694
Rev	2.272

5. PLANETARY GEAR AND PLATE S502001E4905

	Non-turbo model	Turbo model
Tooth number of front sun gear	33	
Tooth number of front pinion	21	
Tooth number of front internal gear	75	
Tooth number of rear sun gear	42	
Tooth number of rear pinion	17	
Tooth number of rear internal gear	75	
Drive & driven plate number of high clutch	4	5
Drive & driven plate number of low clutch	4	7
Drive & driven plate number of reverse clutch	2	
Drive & driven plate number of 2-4 brake	3	4
Drive & driven plate number of low & reverse brake	4	7

6. SELECTOR POSITION S502001E4906

P (Park)	Transmission in neutral, output member immovable, and engine start possible
R (Reverse)	Transmission in reverse for backing
N (Neutral)	Transmission in neutral and engine start possible
D (Drive)	Automatic gear change 1st ← → 2nd ← → 3rd ← → 4th
3 (3rd)	Automatic gear change 1st ← → 2nd ← → 3rd ← 4th
2 (2nd)	Automatic gear change 1st ← → 2nd ← 3rd ← 4th
1 (1st)	1st gear locked (Deceleration possible 1st ← 2nd ← 3rd ← 4th)
Control method	Hydraulic remote control

7. HYDRAULIC CONTROL AND LUBRICATION S502001E4907

Type		Electronic/hydraulic control [Four forward speed changes by electrical signals of vehicle speed and accelerator (throttle) opening]
Fluid		Dexron III type Automatic transmission fluid
Fluid capacity	Non-turbo model	8.4 — 8.7 ℓ (8.9 — 9.2 US qt, 7.4 — 7.7 Imp qt)
	Turbo model	9.3 — 9.6 ℓ (9.8 — 10.1 US qt, 8.2 — 8.4 Imp qt)
Lubrication system		Forced feed lubrication with oil pump
Oil		Automatic transmission fluid (above mentioned)

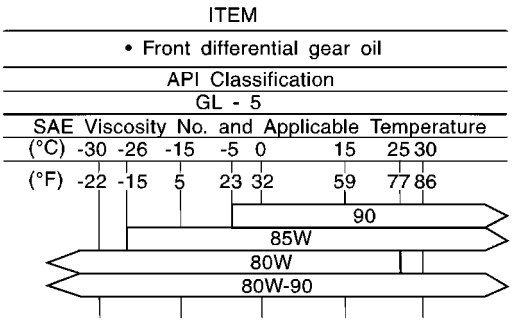
8. COOLING AND HARNESS S502001E4908

Cooling system	Liquid-cooled cooler incorporated in radiator
ATF cooling system (Radiation capacity)	4.630 kW (3,981 kcal/h, 15,797 BTU/h)
Inhibitor switch	12 poles
Transmission harness	20 poles

9. TRANSFER S502001E4909

Model	Non-turbo model	Turbo model
Transfer clutch	Hydraulic multi-plate clutch	
Drive & driven plate number of transfer clutch	4	6
Control method	Electronic, hydraulic type	
Lubricant	The same Automatic transmission fluid used in automatic transmission	
1st reduction gear ratio	1.000 (53/53)	

10. FINAL REDUCTION S502001E4910

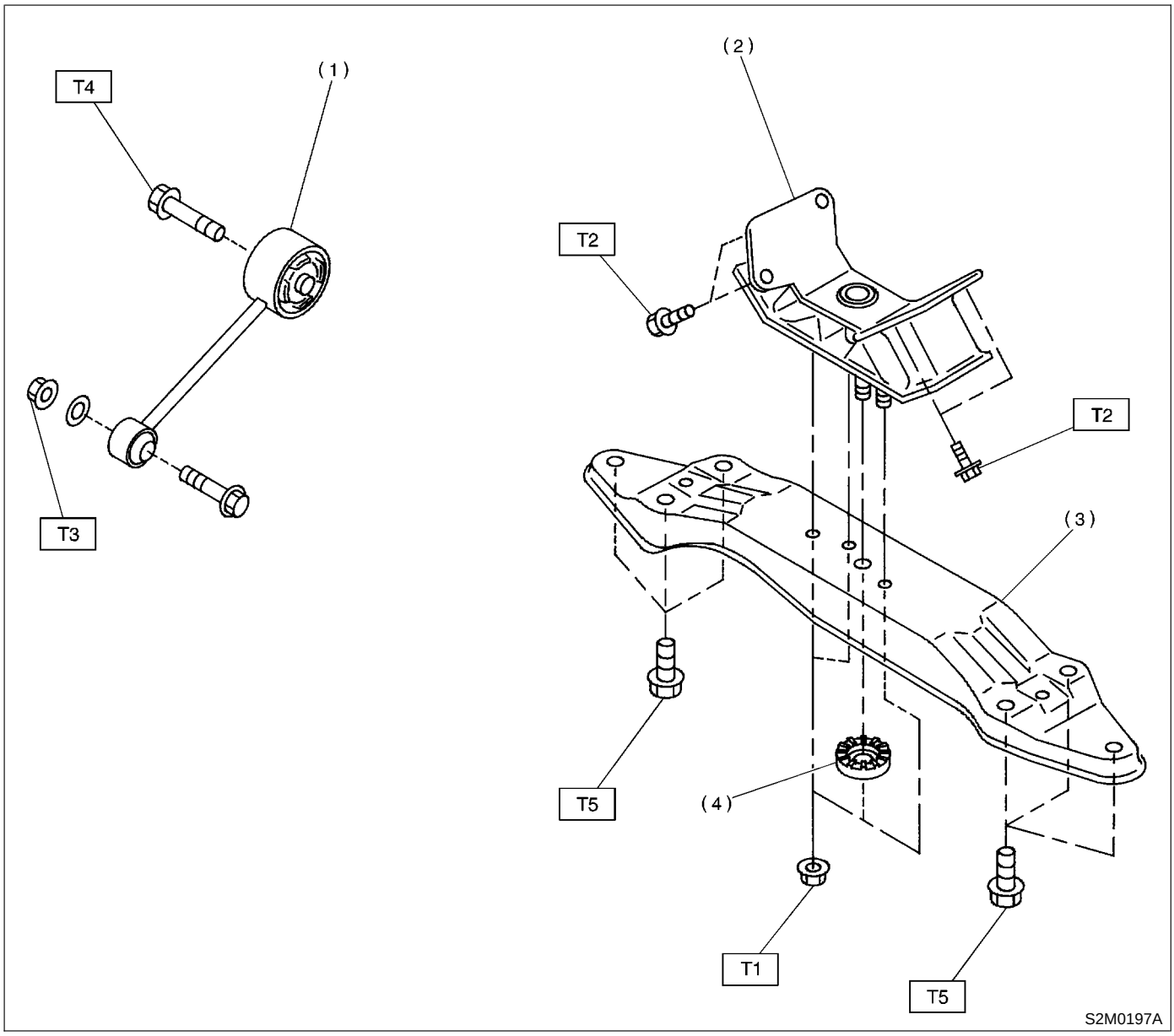
Model	Turbo model	Non-turbo model
Front final gear ratio	4.111 (37/9)	4.444 (40/9)
Lubrication oil		
Front differential oil capacity	1.2 ℓ (1.3 US qt, 1.1 Imp qt)	

H3M1235A

B: COMPONENT S502001A05

NOTE:
For information about other transmission mounting components, refer to “AUTOMATIC TRANSMISSION” <Pub. No. G0853ZE> a separate publication.

1. TRANSMISSION MOUNTING S502001A0501



(1) Pitching stopper
(2) Rear cushion rubber
(3) Crossmember
(4) Stopper

Tightening torque: N·m (kgf-m, ft-lb)
T1: 35 (3.6, 26)
T2: 39 (4.0, 29)
T3: 50 (5.1, 37)
T4: 58 (5.9, 43)
T5: 70 (7.1, 51)

C: CAUTION S502001A03

- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation, and disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt.
- Until the oil pan is removed, do not place with the oil pan side facing up to prevent foreign matter from entering the valve body.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- When disassembling the case and other light alloy parts, use a plastic hammer to force it apart. Do not pry it apart with a screwdriver or other tool.
- Be careful not to burn your hands, because each part on the vehicle is hot after running.
- Use SUBARU genuine gear oil, grease etc. or the equivalent. Do not mix gear oil, grease etc. with that of another grade or from other manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or safety stands at the specified points.
- Apply gear oil onto sliding or revolution surfaces before installation.
- Replace deformed or otherwise damaged snap rings with new ones.
- Before installing O-rings or oil seals, apply sufficient amount of ATF fluid to avoid damage and deformation.
- Be careful not to incorrectly install or fail to install O-rings, snap rings and other such parts.
- Before securing a part on a vise, place cushioning material such as wood blocks, aluminum plate, or shop cloth between the part and the vise.
- Avoid damaging the mating surface of the case.
- Before applying sealant, completely remove the old seal.

D: PREPARATION TOOL S502001A17

1. SPECIAL TOOLS S502001A1701

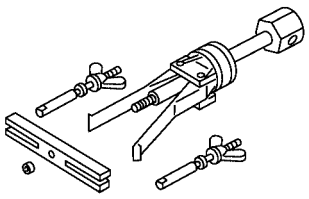
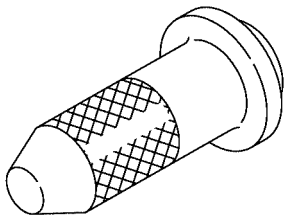
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B3M1977	398527700	PULLER ASSY	Used for removing extension case oil seal.
 B3M1972	498057300	INSTALLER	Used for installing extension oil seal.

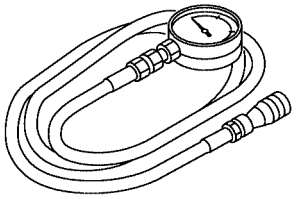
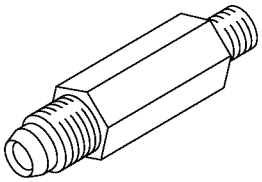
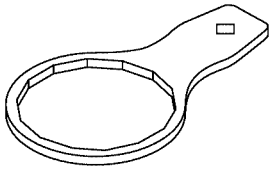
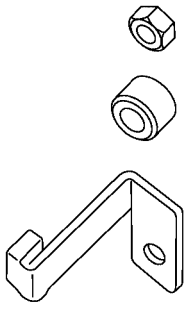
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B3M2040	498575400	OIL PRESSURE GAUGE ASSY	Used for measuring oil pressure.
 B3M2041	498897200	ADAPTER	Used oil pump housing when measuring reverse clutch pressure and line pressure.
 B3M2042	498545400	FILTER WRENCH	Used for removing and installing ATF filter.
 B3M2043	498277200	STOPPER SET	Used for removing and installing automatic transmission assembly to engine.

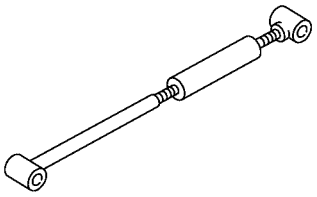
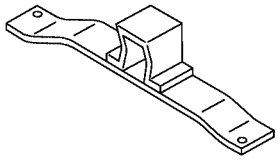
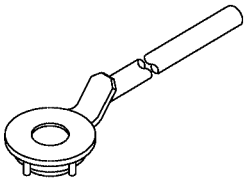
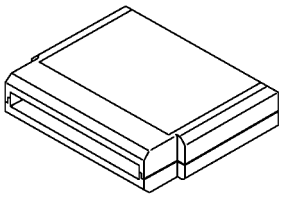
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B3M1976	41099AA020	ENGINE SUPPORT	Used for supporting engine.
 B3M1975	41099AA010	ENGINE SUPPORT BRACKET	Used for supporting engine.
 B2M4157	499977300	CRANK PULLEY WRENCH	Used for removing and installing bolts which secure torque converter to the drive plate.
 B2M3876	24082AA150 (Newly adopted tool)	CARTRIDGE	Troubleshooting for electrical systems.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B2M3877	22771AA030	SELECT MONITOR KIT	Troubleshooting for electrical systems. ● English: 22771AA030 (Without printer) ● German: 22771AA070 (Without printer) ● French: 22771AA080 (Without printer) ● Spanish: 22771AA090 (Without printer)

2. GENERAL PURPOSE TOOLS S502001A1702

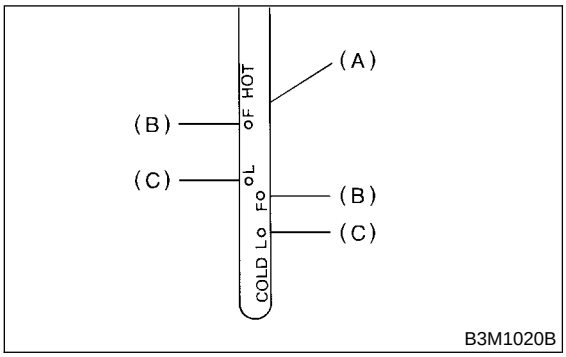
TOOL NAME	REMARKS
Circuit Tester	Used for measuring resistance, voltage and ampere.

2. Automatic Transmission Fluid S502248

A: INSPECTION S502248A10

1) Check the level of the ATF.
   (1) Raise ATF temperature to 60 to 80°C (140 to 176°F) from 40 to 60°C (104 to 140°F) (when cold) by driving a distance of 5 to 10 km (3 to 6 miles).

NOTE:
The level of ATF varies with fluid temperature. Pay attention to the fluid temperature when checking oil level.



(A) ATF level gauge
(B) Upper level
(C) Lower level

   (2) Make sure the vehicle is level. After selecting all positions (P, R, N, D, 3, 2, 1), set the select leveler in “P” range. Measure fluid level with the engine idling.

NOTE:
After running, idle the engine for one or two minutes before measurement.

   (3) If the fluid level is below the center between upper and lower marks, add the recommended ATF until the fluid level is found within the specified range (above the center between upper and lower marks). When the transmission is hot, the level should be above the center of upper and lower marks, and when it is cold, the level should be found below the center of these two marks.

CAUTION:
● Use care not to exceed the upper limit level.
● ATF level varies with temperature. Remember that the addition of fluid to the upper limit mark when the transmission is cold will result in the overfilling of fluid.

   (4) Fluid temperature rising speed
● By idling the engine
Time for temperature rise to 60°C (140°F) with atmospheric temperature of 0°C (32°F): More than 25 minutes
<Reference>
Time for temperature rise to 30°C (86°F) with atmospheric temperature of 0°C (32°F): Approx. 8 minutes
● By running the vehicle
Time for temperature rise to 60°C (140°F) with atmospheric temperature of 0°C (32°F): More than 10 minutes
   (5) Method for checking fluid level upon delivery or at periodic inspection
   Check fluid level after a warm-up run of approx. 10 minutes. During the warm-up period, the automatic transmission functions can also be checked.
2) Check the fluid for leaks.
Check for leaks in the transmission. If there are leaks, it is necessary to repair or replace gasket, oil seals, plugs or other parts.

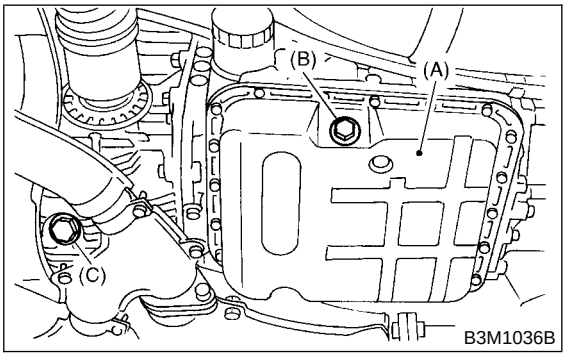
B: REPLACEMENT S502248A20

1) Lift vehicle.
2) Drain ATF completely.

CAUTION:
Directly after the engine has been running, the ATF is hot. Be careful not to burn yourself.

NOTE:
Tighten ATF drain plug after draining ATF.

Tightening torque:
25 N·m (2.5 kgf-m, 18.1 ft-lb)



(A) Oil pan
(B) Drain plug
(C) Differential oil drain plug

3) Lower the vehicle.
4) Pour ATF into the oil charge pipe.

Recommended fluid:
Dexron III type automatic transmission fluid

Capacity:
Fill the same amount of fluid drained from drain plug hole.

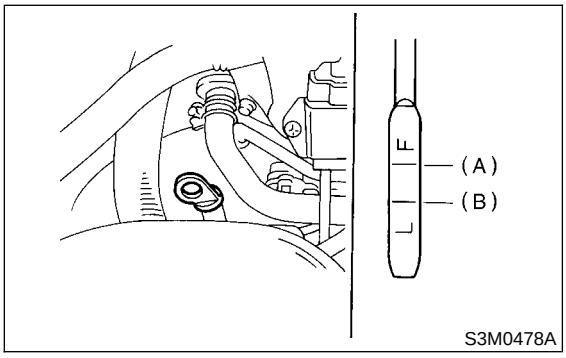
Capacity when transmission is overhauled:
Non-turbo model:
8.4 — 8.7 ℓ (8.9 — 9.2 US qt, 7.4 — 7.71 Imp qt)
Turbo model:
9.3 — 9.6 ℓ (9.8 — 10.1 US qt, 8.2 — 8.4 Imp qt)

5) Check the level and leaks of the ATF.
<Ref. to AT-9 INSPECTION, Automatic Transmission Fluid.>

3. Differential Gear Oil S502150

A: INSPECTION S502150A10

1) Park vehicle on a level surface.
2) Remove 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 in the proper orientation.
4) Remove it again and note the reading. If the differential gear oil level is below the “L” line, add oil to bring the level up to the “F” line.
5) To prevent overfilling the differential gear oil, do not add oil above the “F” line.



(A) Upper level
(B) Lower level

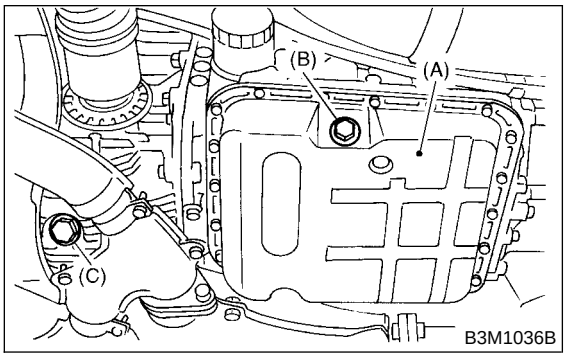
B: REPLACEMENT S502150A20

1) Lift vehicle.
2) Drain differential gear oil completely.

CAUTION:
Directly after the engine has been running, the differential gear oil is hot. Be careful not to burn yourself.

NOTE:
Tighten differential gear oil drain plug after draining differential gear oil.

Tightening torque:
44 N·m (4.5 kgf-m, 32.5 ft-lb)



(A) Oil pan
(B) Drain plug
(C) Differential oil drain plug

3) Lower the vehicle.
4) Pour gear oil into the gauge hole.

Recommended fluid:
Use GL-5 or equivalent.

Gear oil capacity:
1.2 ℓ (1.3 US qt, 1.1 Imp qt)

5) Check the level of the differential gear oil. <Ref. to AT-11 INSPECTION, Differential Gear Oil.>

4. Road Test S502247

A: INSPECTION S502247A10

1. GENERAL PRECAUTION S502247A1001

Road tests should be conducted to properly diagnose the condition of the automatic transmission.

CAUTION:
When performing test, do not exceed posted speed limit.

2. D RANGE SHIFT FUNCTION S502247A1002

Check shifting between 1st ⇔ 2nd ⇔ 3rd ⇔ 4th while driving on normal city streets.

3. D RANGE SHIFT SHOCK S502247A1003

Check the shock level when shifting up during normal driving.

4. KICK-DOWN FUNCTION S502247A1004

Check kick-down for each gear. Also check the kick-down shock level.

5. ENGINE BRAKE OPERATION S502247A1005

- Check the 3rd gear engine brake when shifting between D ⇔ 3rd range while driving in 4th gear of D range [50 to 60 km/h (31 to 37 MPH)].
- Check the 2nd gear engine brake when shifting between 3 ⇔ 2 range while driving in the 3 range 3rd gear [40 to 50 km/h (25 to 31 MPH)].
- Check the 1st gear engine brake when shifting between 2 ⇔1 range while driving in the 2 range 2nd gear [20 to 30 km/h (12 to 19 MPH)].

6. LOCK-UP FUNCTION S502247A1006

Check that rpm does not change sharply when the axle pedal is lightly depressed when driving on flat roads at normal speed in the lock-up range.

7. P RANGE OPERATION S502247A1007

Stop the vehicle on an uphill grade of 5% or more and shift to P range. Check that the vehicle does not move when the parking brake is released.

8. UNUSUAL SOUNDS AND VIBRATION S502247A1008

Check for unusual sounds and vibration while driving and during shifting.

9. CLIMBING CONTROL FUNCTION S502247A1009

- Check that gear remains in 3rd when going up a grade.
- Check that gear remains in 3rd when applying the brakes while going down a grade.

10. OIL LEAKS S502247A1010

After the driving test, inspect for oil leaks.

5. Stall Test S502246

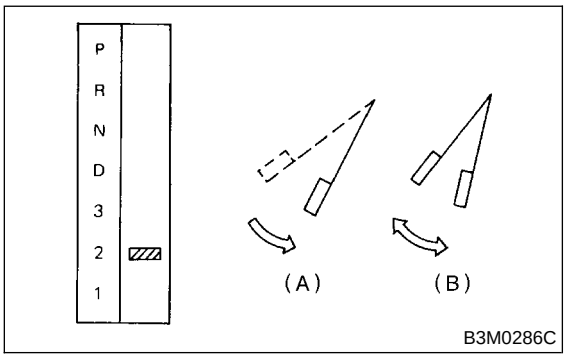
A: INSPECTION S502246A10

1. GENERAL INFORMATION S502246A1001

The stall test is of extreme importance in diagnosing the condition of the automatic transmission and the engine. It should be conducted to measure the engine stall speeds in R and 2 ranges.
Purposes of the stall test:
1) To check the operation of the automatic transmission clutch.
2) To check the operation of the torque converter clutch.
3) To check engine performance.

2. TEST METHODS S502246A1002

1) Preparations before test:
   (1) Check that throttle valve opens fully.
   (2) Check that engine oil level is correct.
   (3) Check that coolant level is correct.
   (4) Check that ATF level is correct.
   (5) Check that differential gear oil level is correct.
   (6) Increase ATF temperature to 50 to 80°C (122 to 176°F) by idling the engine for approximately 30 minutes (with select lever set to “N” or “P”).
2) Install an engine tachometer at a location visible from the driver’s compartment and mark the stall speed range on the tachometer scale.
3) Place the wheel chocks at the front and rear of all wheels and engage the parking brake.
4) Move the manual linkage to ensure it operates properly, and shift the select lever to the 2 range.
5) While forcibly depressing the foot brake pedal, gradually depress the accelerator pedal until the engine operates at full throttle.



(A) Brake pedal
(B) Accelerator pedal

6) When the engine speed is stabilized, read that speed quickly and release the accelerator pedal.
7) Shift the select lever to Neutral, and cool down the engine by idling it for more than one minute.
8) Record the stall speed.
9) If stall speed in 2 range is higher than specifications, low clutch slipping and 2-4 brake slipping may occur. To identify it, conduct the same test as above in D range.
10) Perform the stall tests with the select lever in the R range.

NOTE:
● Do not continue the stall test for MORE THAN FIVE SECONDS at a time (from closed throttle, fully open throttle to stall speed reading). Failure to follow this instruction causes the engine oil and ATF to deteriorate and the clutch and brake to be adversely affected.
Be sure to cool down the engine for at least one minute after each stall test with the select lever set in the P or N range and with the idle speed lower than 1,200 rpm.
● If the stall speed is higher than the specified range, attempt to finish the stall test in as short a time as possible, in order to prevent the automatic transmission from sustaining damage.

Stall speed (at sea level):
Non-turbo model: 2,100 — 2,600 rpm
Turbo model: 2,150 — 2,950 rpm

3. EVALUATION S502246A1003

Stall speed (at sea level)	Position	Cause
Less than specifications	2, R	● Throttle valve not fully open ● Erroneous engine operation ● Torque converter clutch's one-way clutch slipping
Greater than specifications	D	● Line pressure too low ● Low clutch slipping ● One-way clutch malfunctioning
	R	● Line pressure too low ● Reverse clutch slipping ● Low & reverse brake slipping
	2	● Line pressure too low ● Low clutch slipping ● 2-4 brake slipping

6. Time Lag Test S502245

A: INSPECTION S502245A10

1. GENERAL INFORMATION S502245A1001

If the select lever is shifted while the engine is idling, there will be a certain time elapse or lag before the shock can be felt. This is used for checking the condition of the low clutch, reverse clutch, low & reverse brake and one-way clutch.

CAUTION:
● Perform the test at normal operation fluid temperature 60 to 80°C (140 to 176°F).
● Be sure to allow a one minute interval between tests.
● Make three measurements and take the average value.

2. TEST METHODS S502245A1002

1) Fully apply the parking brake.
2) Start the engine.
Check idling speed (A/C OFF).
3) Shift the select lever from “N” to “D” range.
Using a stop watch, measure the time it takes from shifting the lever until the shock is felt.
Time lag: Less than 1.2 seconds
4) In same manner, measure the time lag for “N” → “R”.
Time lag: Less than 1.5 seconds

3. EVALUATION S502245A1003

1) If “N” → “D” time lag is longer than specified:
- Line pressure too low
- Low clutch worn
- One-way clutch not operating properly

2) If “N” → “R” time lag is longer than specified:
- Line pressure too low
- Reverse clutch worn
- Low & reverse brake worn

7. Line Pressure Test S502244

A: MEASUREMENT S502244A14

1. GENERAL INFORMATION S502244A1401

If the clutch or the brake shows a sign of slippage or shifting sensation is not correct, the line pressure should be checked.

- Excessive shocks during upshifting or shifting takes place at a higher point than under normal circumstances, may be due to the line pressure being too high.
- Slippage or inability to operate the vehicle may, in most cases, be due to loss of oil pressure for the operation of the clutch, brake or control valve.

1) Line pressure measurement (under no load)

CAUTION:

- **Before measuring line pressure, jack-up all wheels.**
- **Maintain temperature of ATF at approximately 50°C (122°F) during measurement. (ATF will reach the above temperature after idling the engine for approximately 30 minutes with select lever in "N" or "P".)**

2) Line pressure measurement (under heavy load)

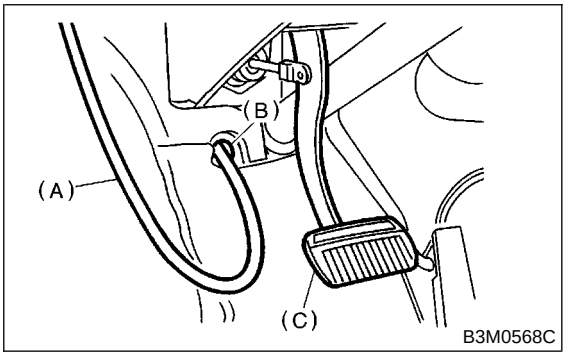
CAUTION:

- **Before measuring line pressure, apply both foot and parking brakes with all wheels chocked (Same as for "stall" test conditions).**
- **Measure line pressure when select lever is in "R", "2" with engine under stall conditions.**
- **Measure line pressure within 5 seconds after shifting the select lever to each position. (If line pressure needs to be measured again, allow the engine to idle and then stop. Wait for at least one minute before measurement.)**
- **Maintain the temperature of ATF at approximately 50°C (122°F) during measurement. (ATF will reach the above temperature after idling the engine for approximately 30 minutes with the select lever in "N" or "P".)**

2. TEST METHODS S502244A1402

1) Temporarily attach the ST to a suitable place in the driver's compartment, remove the blind plug located in front of the toe board and pass the hose of the ST to the engine compartment.

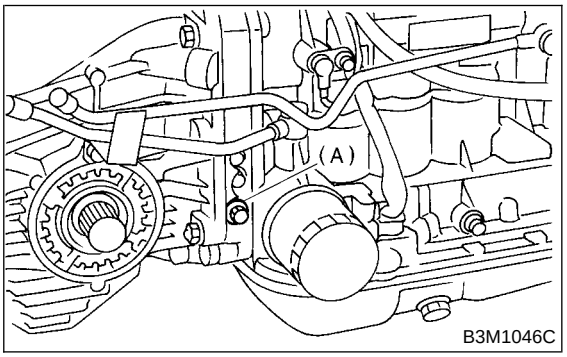
ST 498575400 OIL PRESSURE GAUGE ASSY



(A) Pressure gauge hose
(B) Hole in toe board (blank cap hole)
(C) Brake pedal

2) Remove the test plug and install ST instead.

ST 498897200 OIL PRESSURE GAUGE ADAPTER

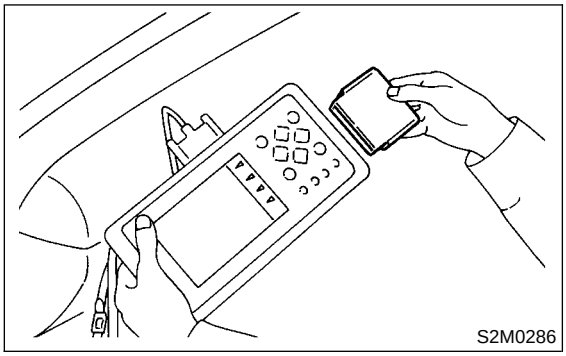


(A) Test plug

3) Connect ST1 with ST2.

ST1 498897200 OIL PRESSURE GAUGE ADAPTER
ST2 498575400 OIL PRESSURE GAUGE ASSY

4) Check for duty ratio changes by opening and closing throttle valve using Subaru Select Monitor.
(1) Insert the cartridge to Subaru Select Monitor. <Ref. to AT-5 PREPARATION TOOL, General Description.>


S2M0286

(2) Connect Subaru Select Monitor to data link connector.

5) Check line pressure in accordance with the following chart.

3. EVALUATION S502244A1403

Standard line pressure			
Range position	Line pressure duty ratio (%)	Throttle position	Line pressure kPa (kg/cm^2, psi)
2	5	Full open	1,128 — 1,304 (11.5 — 13.3, 164 — 189)
R	5	Full open	1,520 — 1,716 (15.5 — 17.5, 220 — 249)
D	100	Full closed	304 — 412 (3.1 — 4.2, 44 — 60)

8. Transfer Clutch Pressure Test S502159

A: INSPECTION S502159A10

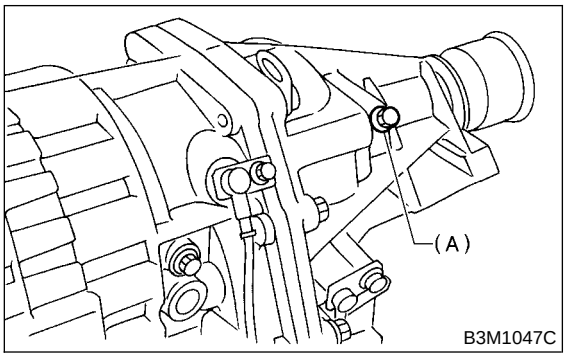
1. TEST METHODS S502159A1001

Check transfer clutch pressure in accordance with the following chart in the same manner as with line pressure test. <Ref. to AT-16, Line Pressure Test.>

ST 498897700 OIL PRESSURE ADAPTER SET
ST 498575400 OIL PRESSURE GAUGE ASSY

AWD mode: “D” range
FWD mode: “P” range, engine speed 2,000 rpm

CAUTION:
Before setting in FWD mode, install spare fuse on FWD mode switch.



(A) Test plug

2. EVALUATION S502159A1002

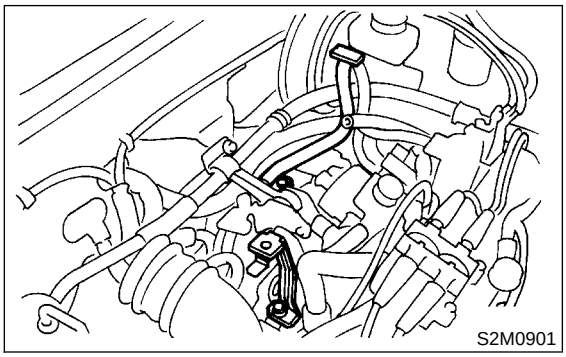
NOTE:
If oil pressure is not produced or if it does not change in the AWD mode, the transfer duty solenoid or transfer valve assembly may be malfunctioning. If oil pressure is produced in the FWD mode, the problem is similar to that in the AWD mode.

Standard transfer clutch pressure kPa (kg/cm^2, psi)			
Duty ratio (%)	Throttle position	AWD mode	FWD mode
5	Full closed	932 — 1,089 (9.5 — 11.1, 135 — 158)	—
60	2/3 throttle	216 — 294 (2.2 — 3.0, 31 — 43)	—
95	Full open	—	0 (0, 0)

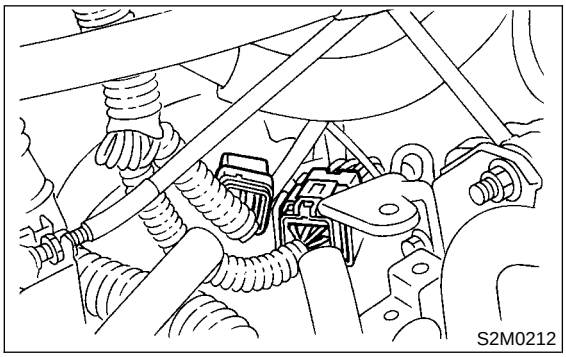
9. Automatic Transmission Assembly S502207

A: REMOVAL S502207A18

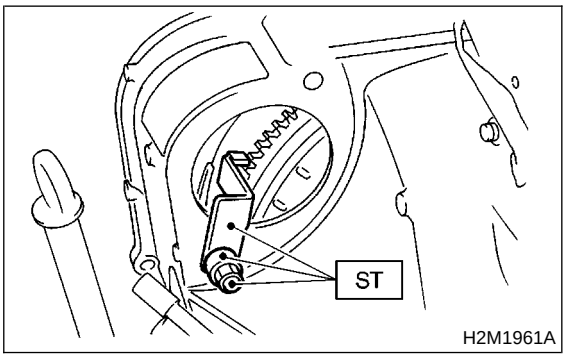
1) Set vehicle on a lift.
2) Open front hood fully, and support with stay.
3) Disconnect battery ground terminal.
4) Remove air intake duct and cleaner case. (Non-turbo model) <Ref. to IN(SOHC)-8, REMOVAL, Air Intake Duct.> and <Ref. to IN(SOHC)-7, REMOVAL, Air Cleaner Case.>
5) Remove air cleaner case stay. (Non-turbo model)


S2M0901

6) Remove intercooler. (Turbo model) <Ref. to IN(DOHC TURBO)-10, REMOVAL, Intercooler.>
7) Disconnect the following connectors.
   (1) Transmission harness connector

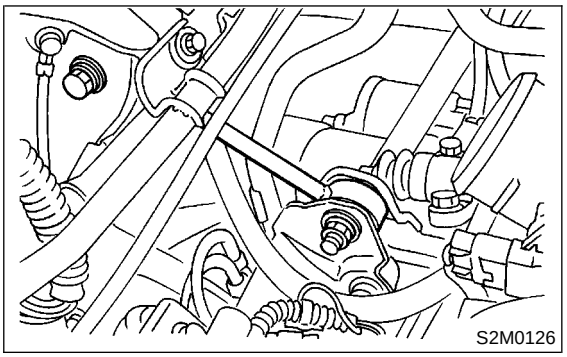

S2M0212

   (2) Transmission ground terminal
8) Remove starter. <Ref. to SC-5, REMOVAL, Starter.>
9) Install ST to torque converter clutch case.
ST 498277200 STOPPER SET



H2M1961A

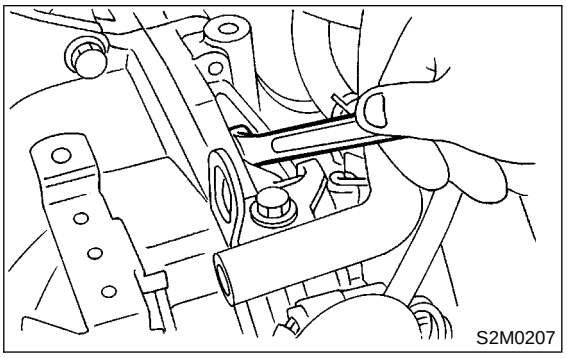
10) Remove pitching stopper.


S2M0126

11) Separate torque converter clutch from drive plate.
   (1) Remove service hole plug.
   (2) Remove bolts which hold torque converter clutch to drive plate.
   (3) While rotating the engine, remove other bolts using ST.

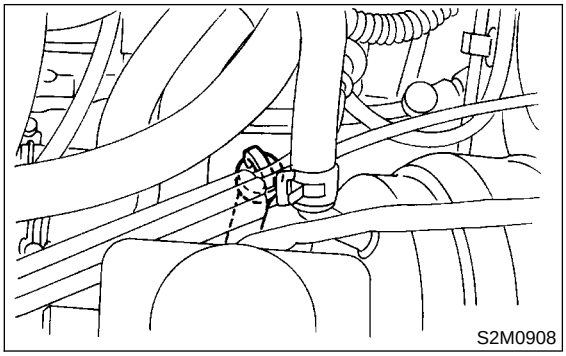
CAUTION:
Be careful not to drop bolts into torque converter clutch housing.

ST 499977300 CRANK PULLEY WRENCH


S2M0207

12) Remove ATF level gauge.

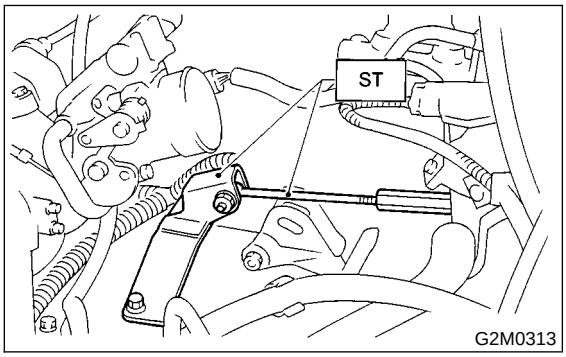
CAUTION:
Plug opening to prevent entry of foreign particles into transmission fluid.


S2M0908

13) Set ST.

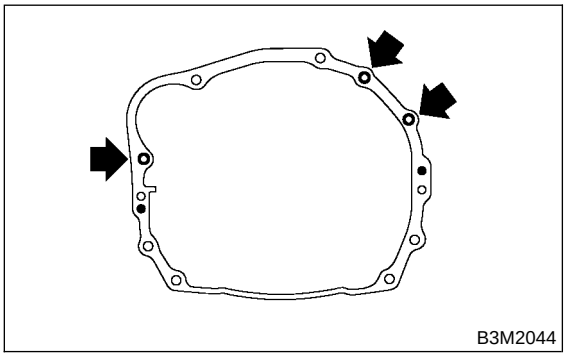
NOTE:
Also is available Part No. 41099AA010.

ST 41099AA020 ENGINE SUPPORT ASSY

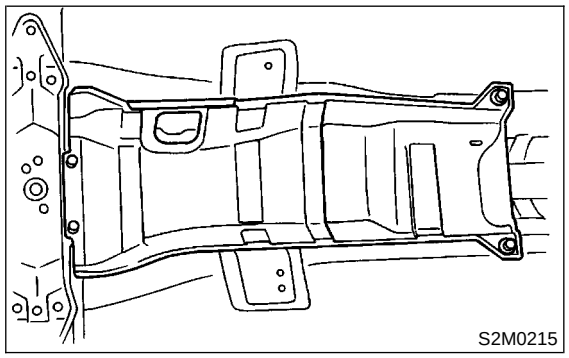


G2M0313

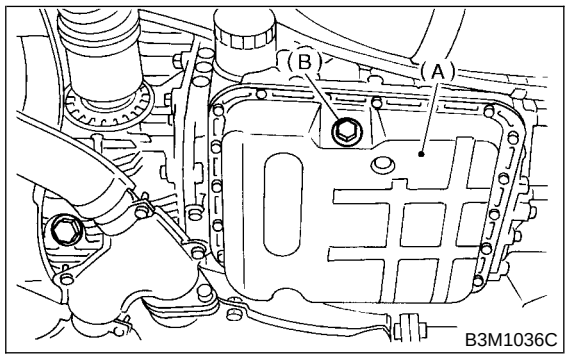
14) Remove bolt which holds right upper side of transmission to engine.


B3M2044

15) Remove front and center exhaust pipe. (Non-turbo model)
With OBD:
<Ref. to EX(SOHC)-5, REMOVAL, Front Exhaust Pipe.>
Without OBD:
<Ref. to EX(SOHCw/oOBD)-6, REMOVAL, Front Exhaust Pipe.>
16) Remove rear exhaust pipe and muffler. (Non-turbo model)
With OBD:
<Ref. to EX(SOHC)-9, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(SOHC)-11, REMOVAL, Muffler.>
Without OBD:
<Ref. to EX(SOHCw/oOBD)-10, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(SOHCw/oOBD)-12, REMOVAL, Muffler.>
17) Remove center, rear exhaust pipe and muffler. (Turbo model)
<Ref. to EX(DOHC TURBO)-9, REMOVAL, Center Exhaust Pipe.>, <Ref. to EX(DOHC TURBO)-14, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(DOHC TURBO)-15, REMOVAL, Muffler.>
18) Remove heat shield cover. (If equipped)


S2M0215

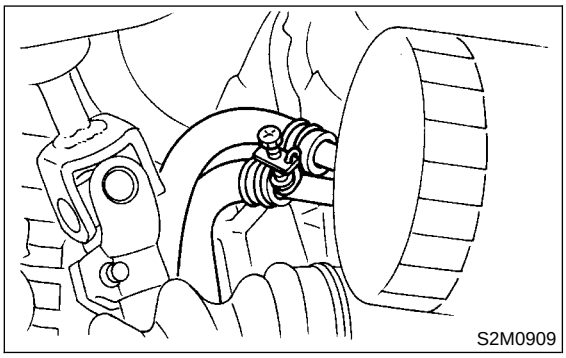
19) Remove hanger bracket from right side of transmission.
20) Remove under cover.
21) Drain ATF to remove ATF drain plug.



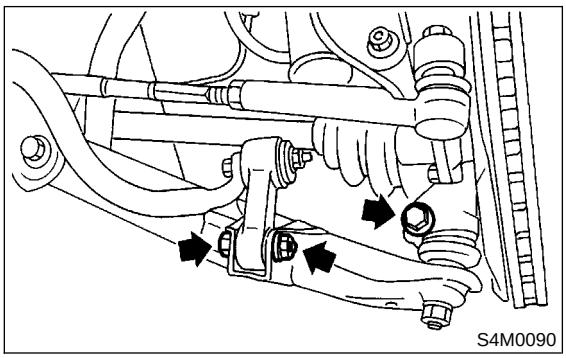
B3M1036C

(A) Oil pan
(B) Drain plug

22) Disconnect ATF cooler hoses from pipes of transmission side, and remove ATF level gauge guide.

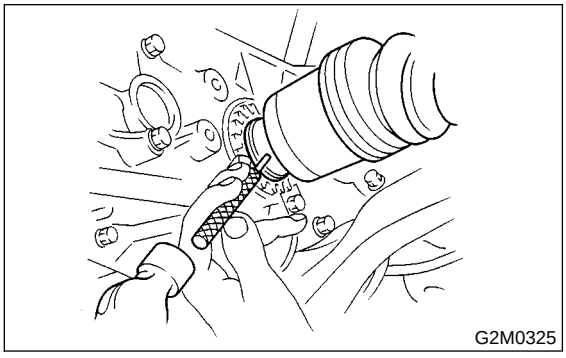

S2M0909

23) Remove propeller shaft.
<Ref. to DS-14 REMOVAL, Propeller Shaft.>
24) Remove shift select cable. <Ref. to CS-10 REMOVAL, Select Cable.>
25) Remove front drive shafts from transmission.
(1) Disconnect stabilizer link from transverse link.
(2) Remove bolt securing ball joint of transverse link to housing.

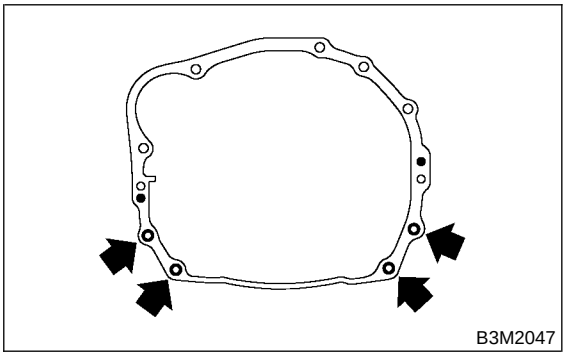

S4M0090

(3) Lower transverse link.
(4) Remove spring pins and separate front drive shafts from each side of the transmission.

CAUTION:
Discard removing spring pin. Replace with a new one.


G2M0325

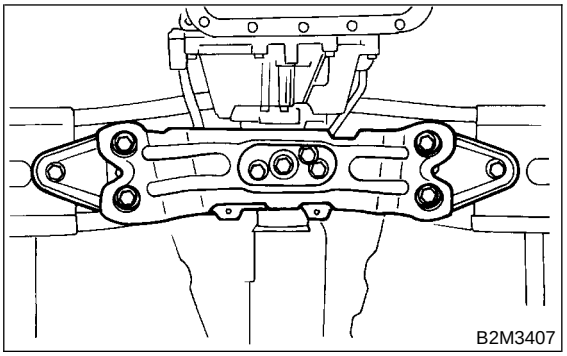
26) Remove nuts which hold lower side of transmission to engine.


B3M2047

27) Place transmission jack under transmission.

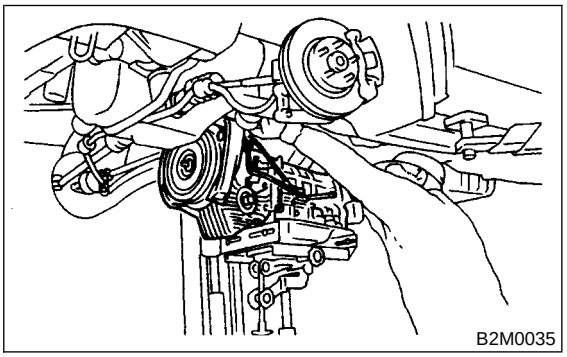
CAUTION:
● Always support transmission case with a transmission jack.
● On AT vehicles, make sure that the support plates of transmission jack don't touch the oil pan.

28) Remove transmission rear crossmember from vehicle.


B2M3407

29) Remove transmission.

CAUTION:
Move transmission and torque converter as a unit away from engine.


B2M0035

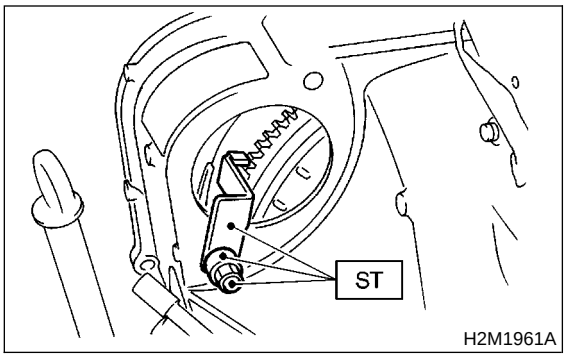
30) Separate transmission assembly and rear cushion rubber.

B: INSTALLATION S502207A11

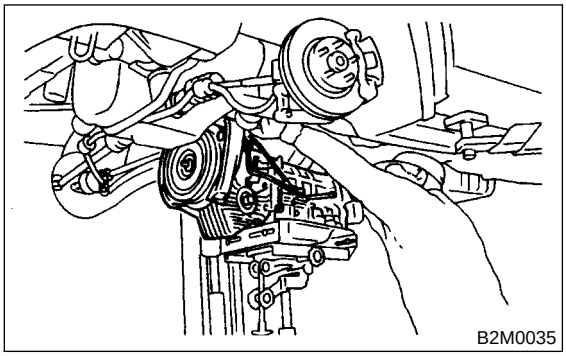
1) Install rear cushion rubber to transmission assembly.

Tightening torque:
38 N·m (3.9 kgf-m, 28 ft-lb)

2) Install ST to torque converter clutch case.
ST 498277200 STOPPER SET

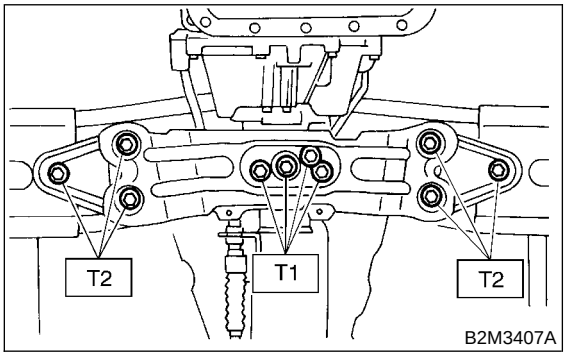


3) Install transmission onto engine.
(1) Gradually raise transmission with transmission jack.



(2) Engage them at splines.
4) Install transmission rear crossmember.

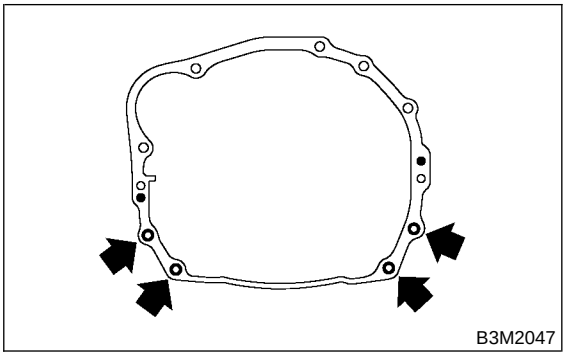
Tightening torque:
T1: 35 N·m (3.6 kgf-m, 26 ft-lb)
T2: 70 N·m (7.1 kgf-m, 51 ft-lb)



5) Take off transmission jack.

6) Tighten nuts and bolts which hold lower side of transmission to engine.

Tightening torque:
50 N·m (5.1 kgf-m, 36.9 ft-lb)

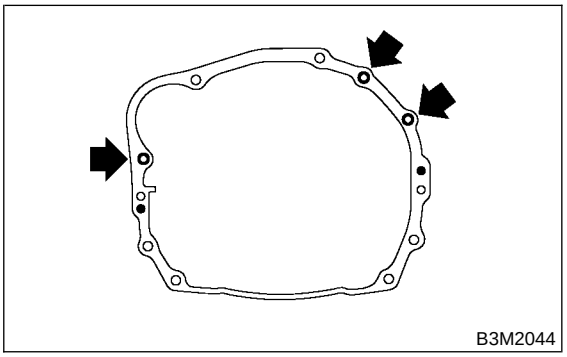


7) Lower the vehicle.
8) Connect engine and transmission.
(1) Remove ST from torque converter clutch case.

NOTE:
Be careful not to drop the ST into the torque converter clutch case when removing ST.

ST 498277200 STOPPER SET
(2) Install starter.
<Ref. to SC-6 INSTALLATION, Starter.>
(3) Tighten bolt which holds right upper side of transmission to engine.

Tightening torque:
50 N·m (5.1 kgf-m, 36.9 ft-lb)

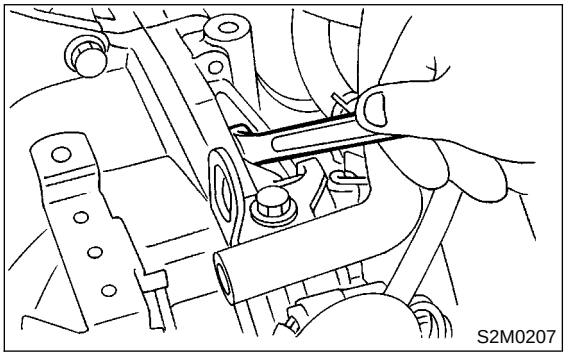


9) Install torque converter clutch to drive plate.
(1) Tighten bolts which hold torque converter clutch to drive plate.
(2) Tighten other bolts while rotating the engine by using ST.

CAUTION:
Be careful not to drop bolts into torque converter clutch housing.

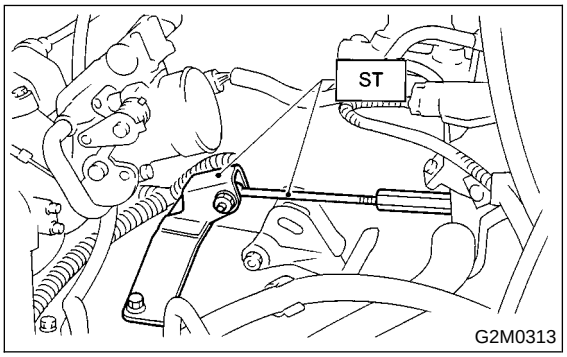
ST 499977300 CRANK PULLEY WRENCH

Tightening torque:
25 N·m (2.5 kgf-m, 18.1 ft-lb)


S2M0207

(3) Clog plug onto service hole.

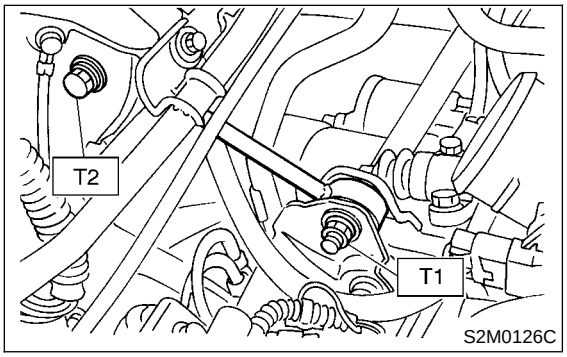
10) Remove ST.



G2M0313

11) Install 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)

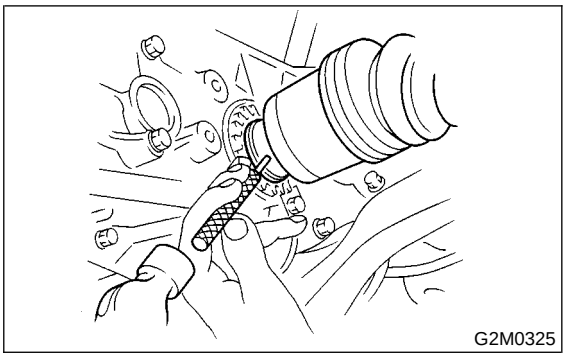


S2M0126C

12) Lift vehicle.

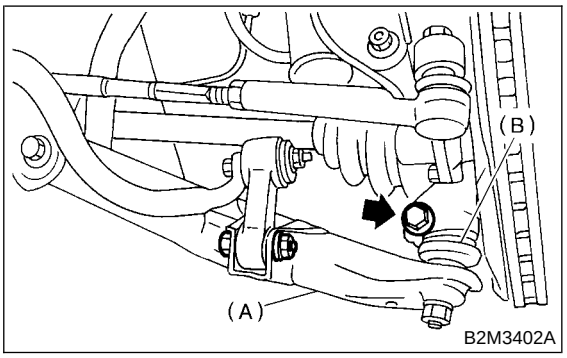
Install front drive shafts into transmission.
(1) Lift vehicle.
(2) Install front drive shaft into transmission.
(3) Drive spring pin into chamfered hole of drive shaft.

CAUTION:
Always use a new spring pin.


G2M0325

(4) Install ball joints of lower arm into knuckle arm of housing, and tighten installing bolts.

Tightening torque:
49 N·m (5.0 kgf-m, 36 ft-lb)

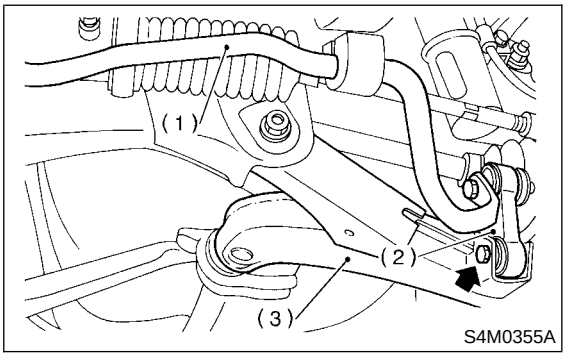


B2M3402A

(A) Transverse link
(B) Ball joint

13) Install stabilizer link to front transverse link.

Tightening torque:
30 N·m (3.1 kgf-m, 22 ft-lb)

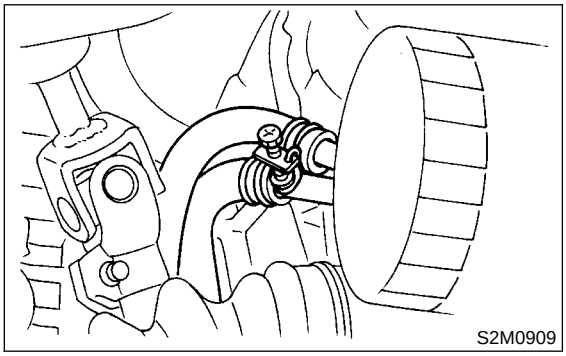


S4M0355A

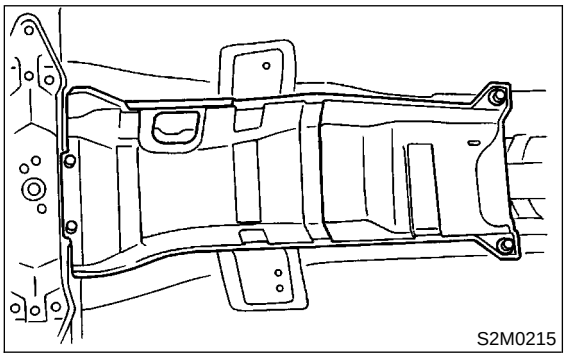
(A) Stabilizer
(B) Stabilizer link
(C) Transverse link

14) Install shift select cable onto select lever.
<Ref. to CS-11 INSTALLATION, Select Cable.>

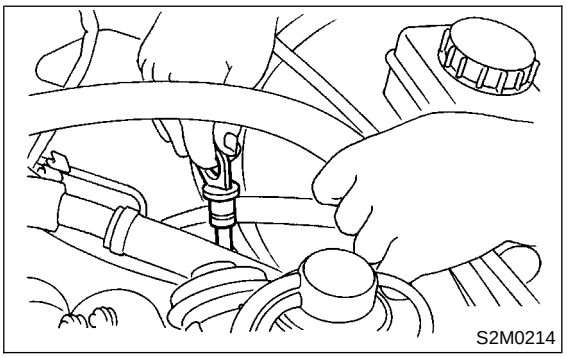
15) Install ATF level gauge guide, and connect ATF cooler hoses to pipe.


S2M0909

16) Install propeller shaft.
<Ref. to DS-15 INSTALLATION, Propeller Shaft.>
17) Install heat shield cover. (If equipped)


S2M0215

18) Install rear exhaust pipe and muffler assembly. (Non-turbo model)
With OBD:
<Ref. to EX(SOHC)-11, INSTALLATION, Muffler.> and <Ref. to EX(SOHC)-9, INSTALLATION, Rear Exhaust Pipe.>
Without OBD:
<Ref. to EX(SOHCw/oOBD)-12, INSTALLATION, Muffler.> and <Ref. to EX(SOHCw/oOBD)-10, INSTALLATION, Rear Exhaust Pipe.>
19) Install front and center exhaust pipe. (Non-turbo model)
With OBD:
<Ref. to EX(SOHC)-6, INSTALLATION, Front Exhaust Pipe.>
Without OBD:
<Ref. to EX(SOHCw/oOBD)-7, INSTALLATION, Front Exhaust Pipe.>
20) Install center, rear exhaust pipe and muffler. (Turbo model) <Ref. to EX(DOHC TURBO)-10, INSTALLATION, Center Exhaust Pipe.>, <Ref. to EX(DOHC TURBO)-14, INSTALLATION, Rear Exhaust Pipe.> and <Ref. to EX(DOHC TURBO)-15, INSTALLATION, Muffler.>
21) Install under cover.
22) Lower the vehicle.
23) Install ATF level gauge.


S2M0214

24) Connect the following connectors.
(1) Transmission harness connectors
(2) Transmission ground terminal
25) Install air cleaner case stay.

Tightening torque:
16 N·m (1.6 kgf-m, 11.6 ft-lb)

26) Install air cleaner case and intake duct. (Non-turbo model) <Ref. to IN(SOHC)-7, INSTALLATION, Air Cleaner Case.> and <Ref. to IN(SOHC)-8, INSTALLATION, Air Intake Duct.>
27) Install intercooler. (Turbo model) <Ref. to IN(DOHC TURBO)-10, INSTALLATION, Intercooler.>
28) Connect battery ground terminal.
29) Fill ATF up to the middle of the “COLD” side on level gauge by using the gauge hole.

Recommended fluid:
Dexron III type automatic transmission fluid

Fluid capacity:
Non-turbo model
8.4 — 8.7 ℓ (8.9 — 9.2 US qt, 7.4 — 8.4 Imp qt)
Turbo model
9.3 — 9.6 ℓ (9.8 — 10.1 US qt, 8.2 — 8.4 Imp qt)

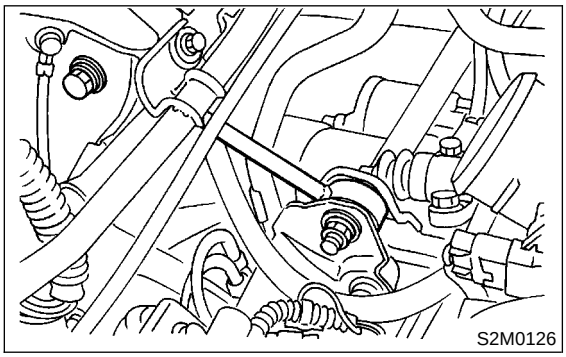
30) Take off vehicle from lift arms.
31) Check select lever operation.
<Ref. to AT-28, INSPECTION, Inhibitor Switch.>
32) Check the ATF level. <Ref. to AT-9, Automatic Transmission Fluid.>
33) Check the vehicle on the road tester.
<Ref. to AT-12, Road Test.>

10. Transmission Mounting System S502233

A: REMOVAL S502233A18

1. PITCHING STOPPER S502233A1801

1) Disconnect battery ground terminal.
2) Remove the air intake duct and cleaner case. (Non-turbo model) <Ref. to IN(SOHC)-8, REMOVAL, Air Intake Duct.> and <Ref. to IN(SOHC)-7, REMOVAL, Air Cleaner Case.>
3) Remove intercooler. (Turbo model) <Ref. to IN(DOHC TURBO)-10, INSTALLATION, Inter-cooler.>
4) Remove the pitching stopper.

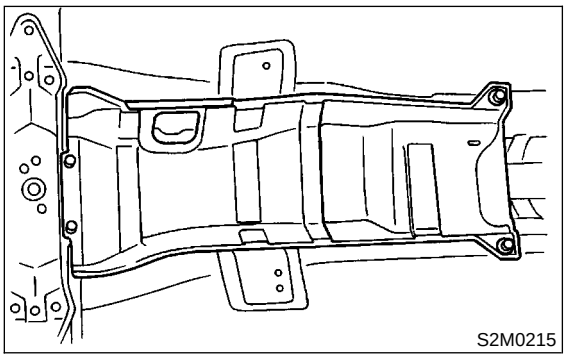

S2M0126

2. CROSSMEMBER AND CUSHION RUBBER S502233A1802

1) Set vehicle on a lift.
2) Disconnect battery ground terminal.
3) Lift vehicle and support it with sturdy racks.
4) Remove the front, center, rear exhaust pipes and muffler.

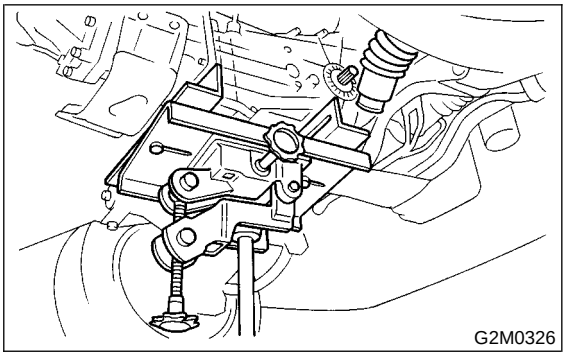
CAUTION:
When removing exhaust pipes, be careful each exhaust pipe does not drop out.

5) Remove the heat shield cover. (If equipped)

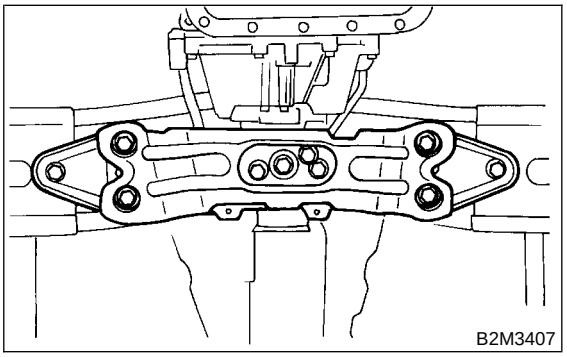

S2M0215

6) Set the transmission jack under the transmission.

CAUTION:
● Always support transmission case with a transmission jack.
● On AT vehicle, make sure that the support plates of transmission jack don't touch the oil pan.


G2M0326

7) Remove the crossmember.


B2M3407

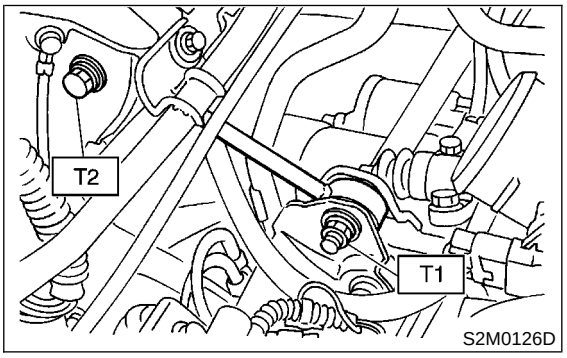
8) Remove the rear cushion rubber.

B: INSTALLATION S502233A11

1. PITCHING STOPPER S502233A1101

1) 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)



S2M0126D

2) Install the air intake duct and cleaner case. (Non-turbo model) <Ref. to IN(SOHC)-7, INSTALLATION, Air Cleaner Case.> and <Ref. to IN(SOHC)-8, INSTALLATION, Air Intake Duct.>

3) Install intercooler. (Turbo model) <Ref. to IN(DOHC TURBO)-10, INSTALLATION, Intercooler.>

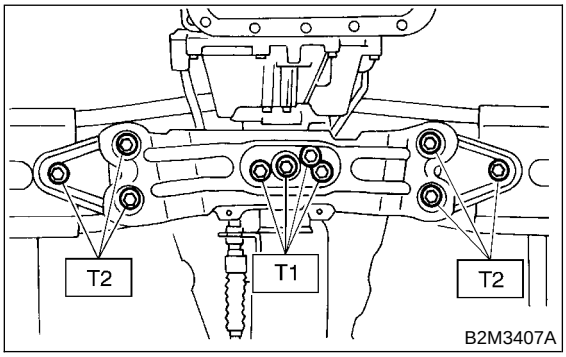
2. CROSSMEMBER AND CUSHION RUBBER S502233A1102

1) Install the rear cushion rubber.

Tightening torque:
38 N·m (3.9 kgf-m, 28 ft-lb)

2) Install the crossmember.

Tightening torque:
T1: 35 N·m (3.6 kgf-m, 26 ft-lb)
T2: 70 N·m (7.1 kgf-m, 51 ft-lb)



3) Remove the transmission jack.
4) Install the heat shield cover. (If equipped)
5) Install the front, center, rear exhaust pipes and the muffler. (Non-turbo model)
With OBD:
<Ref. to EX(SOHC)-6, INSTALLATION, Front Exhaust Pipe.>, <Ref. to EX(SOHC)-9, INSTALLATION, Rear Exhaust Pipe.> and <Ref. to EX(SOHC)-11, INSTALLATION, Muffler.>
Without OBD:
<Ref. to EX(SOHCw/oOBD)-7, INSTALLATION, Front Exhaust Pipe.>, <Ref. to EX(SOHCw/oOBD)-10, INSTALLATION, Rear Exhaust Pipe.> and <Ref. to EX(SOHCw/oOBD)-10, INSTALLATION, Rear Exhaust Pipe.>
6) Install center, rear exhaust pipes and muffler. (Turbo model) <Ref. to EX(DOHC TURBO)-10, INSTALLATION, Center Exhaust Pipe.>, <Ref. to EX(DOHC TURBO)-14, INSTALLATION, Rear Exhaust Pipe.> and <Ref. to EX(DOHC TURBO)-15, INSTALLATION, Muffler.>
7) Install under cover.

C: INSPECTION S502233A10

Repair or replace parts if the results of the inspection below are not satisfactory.

1. PITCHING STOPPER S502233A1001

Make sure that the pitching stopper is not bent or damaged. Make sure that the rubber is not stiff, cracked, or otherwise damaged.

2. CROSSMEMBER AND CUSHION RUBBER S502233A1002

Make sure that the crossmember is not bent or damaged. Make sure that the cushion rubber is not stiff, cracked, or otherwise damaged.

11. Extension Case Oil Seal S502718

A: INSPECTION S502718A10

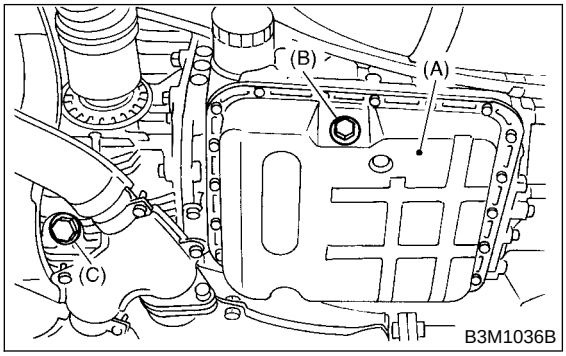
Make sure ATF does not leak from the joint of the transmission and propeller shaft. If so, replace oil seal. <Ref. to AT-27 REPLACEMENT, Extension Case Oil Seal.>

B: REPLACEMENT S502718A20

1) Set vehicle on a lift.
2) Lift vehicle.
3) Clean transmission exterior.
4) Drain ATF completely.

NOTE:
Tighten ATF drain plug after draining ATF.

Tightening torque:
25 N·m (2.5 kgf-m, 18.1 ft-lb)



(G) Oil pan
(H) Drain plug
(I) Differential oil drain plug

5) Remove the rear exhaust pipe and muffler.

Non-turbo model:
With OBD
<Ref. to EX(SOHC)-9, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(SOHC)-11, REMOVAL, Muffler.>
Without OBD
<Ref. to EX(SOHCw/oOBD)-10, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(SOHCw/oOBD)-12, REMOVAL, Muffler.>

Turbo model:
<Ref. to EX(DOHC TURBO)-14, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(DOHC TURBO)-15, REMOVAL, Muffler.>

6) Remove the heat shield cover. (If equipped)
7) Remove the propeller shaft. <Ref. to DS-14 REMOVAL, Propeller Shaft.>
8) Using ST, remove the oil seal.
ST 398527700 PULLER ASSY
9) Using ST, install the oil seal.
ST 498057300 INSTALLER
10) Install the propeller shaft. <Ref. to DS-15 INSTALLATION, Propeller Shaft.>
11) Install the heat shield cover. (If equipped)
12) Install the rear exhaust pipe and muffler.

Non-turbo model:
With OBD
<Ref. to EX(SOHC)-11, INSTALLATION, Muffler.> and <Ref. to EX(SOHC)-9, INSTALLATION, Rear Exhaust Pipe.>
Without OBD
<Ref. to EX(SOHCw/oOBD)-12, INSTALLATION, Muffler.> and <Ref. to EX(SOHCw/oOBD)-10, INSTALLATION, Rear Exhaust Pipe.>

Turbo model:
<Ref. to EX(DOHC TURBO)-14, INSTALLATION, Rear Exhaust Pipe.> and <Ref. to EX(DOHC TURBO)-15, INSTALLATION, Muffler.>

13) Pour ATF and check the ATF level. <Ref. to AT-9 Automatic Transmission Fluid.>

12. Inhibitor Switch S502243

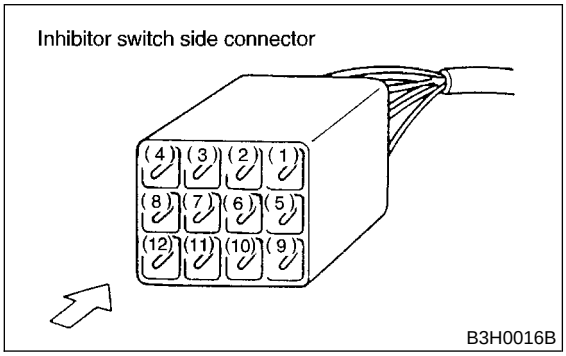
A: INSPECTION S502243A10

When driving condition or starter motor operation is erroneous, first check the shift linkage for improper operation. If the shift linkage is functioning properly, check the inhibitor switch.
1) Disconnect inhibitor switch connector.
2) Check continuity in inhibitor switch circuits with select lever moved to each position.

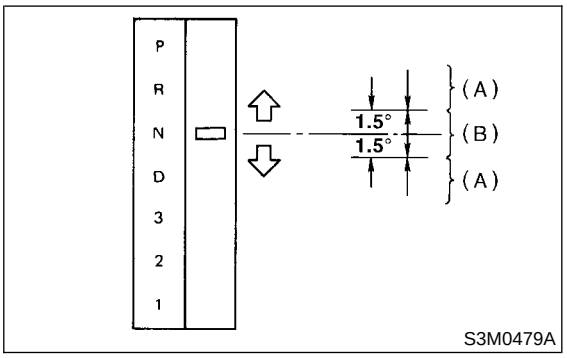
CAUTION:
Also check that continuity in ignition circuit does not exist when select lever is in R, D, 3, 2 and 1 ranges.

NOTE:
If inhibitor switch is inoperative, check for poor contact of connector on transmission side.

	Position	Pin No.
Signal sent to TCM	P	4 — 3
	R	4 — 2
	N	4 — 1
	D	4 — 8
	3	4 — 7
	2	4 — 6
	1	4 — 5
Ignition circuit	P/N	12 — 11
Back-up light circuit	R	10 — 9



3) Check if there is continuity at equal points when the select lever is turned 1.5° in both directions from the N range.
If there is continuity in one direction and the continuity in the other or if there is continuity at unequal points, adjust the inhibitor switch. <Ref. to AT-28 ADJUSTMENT, Inhibitor Switch.>

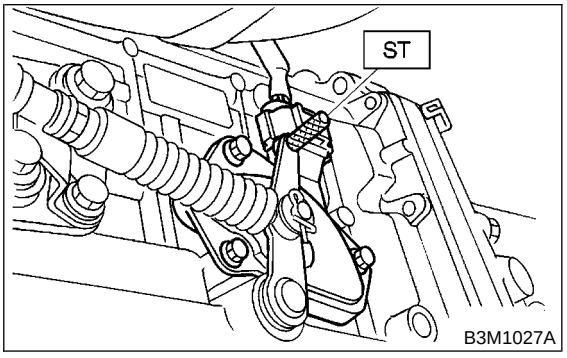


(A) Continuity does not exist.
(B) Continuity exists.

4) Repeat the above checks. If there are abnormalities, adjust the select cable. <Ref. to CS-11 ADJUSTMENT, Select Cable.>

B: ADJUSTMENT S502243A01

1) Shift the select lever to the N range.
2) Loosen the three inhibitor switch securing bolts.
3) Insert ST as vertical as possible into the holes in the inhibitor switch lever and switch body.
ST 499267300 STOPPER PIN



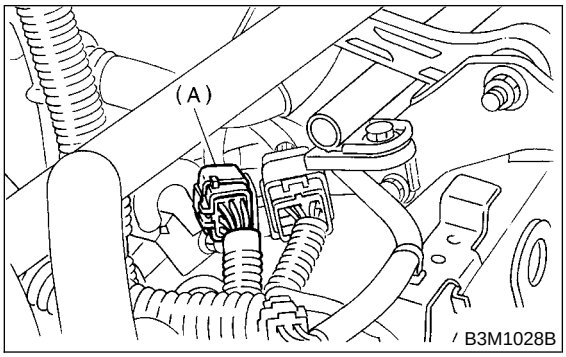
4) Tighten the three inhibitor switch bolts.

Tightening torque:
3.4 N·m (0.35 kgf-m, 2.5 ft-lb)

5) Repeat the above checks. If the inhibitor switch is determined to be “faulty”, replace it.

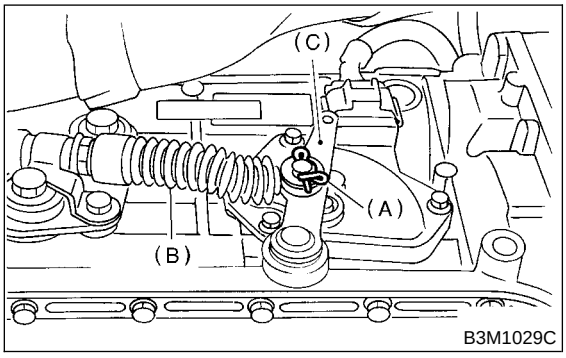
C: REMOVAL S502243A18

1) Set vehicle on a lift.
2) Move select lever to neutral position.
3) Remove air cleaner case. <Ref. to IN(SOHC)-7, REMOVAL, Air Cleaner Case.>
4) Remove intercooler. <Ref. to IN(DOHC TURBO)-10, REMOVAL, Intercooler.>
5) Disconnect inhibitor switch connector.



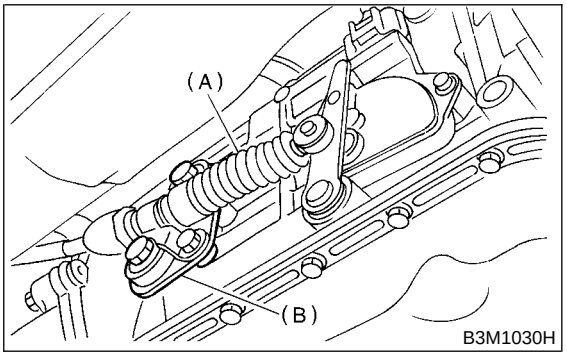
(A) Inhibitor switch

6) Remove inhibitor switch connector from stay.
7) Lift vehicle.
8) Remove under cover.
9) Remove snap pin from range select lever.



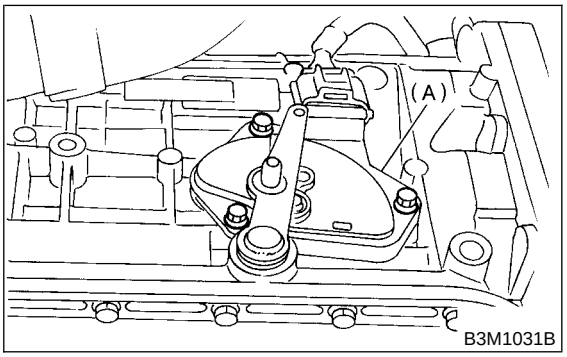
(A) Snap pin
(B) Select cable
(C) Range select lever

10) Remove plate assembly from transmission case.



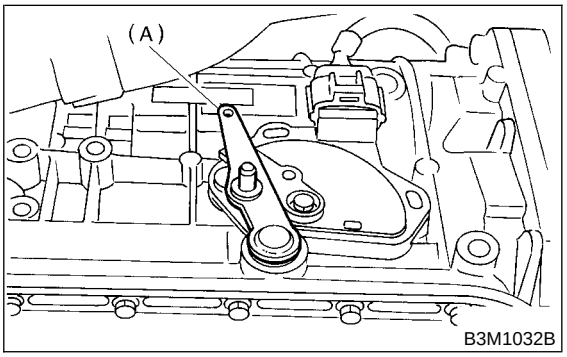
(A) Select cable
(B) Plate ASSY

11) Remove bolts.



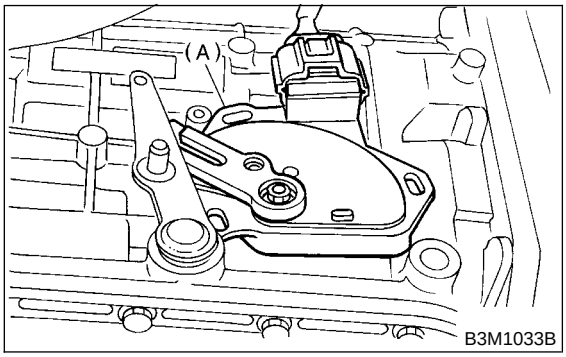
(A) Inhibitor switch

12) Move range select lever to parking position (left side).



(A) Range select lever

13) Remove inhibitor switch from transmission.

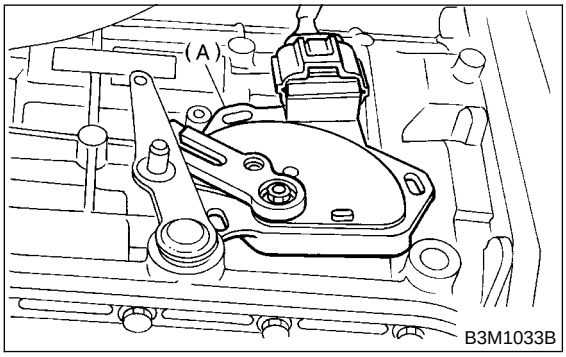


(A) Inhibitor switch

14) Remove inhibitor switch connector from inhibitor switch.

D: INSTALLATION S502243A11

1) Connect inhibitor switch connector.
2) Install inhibitor switch to transmission case.

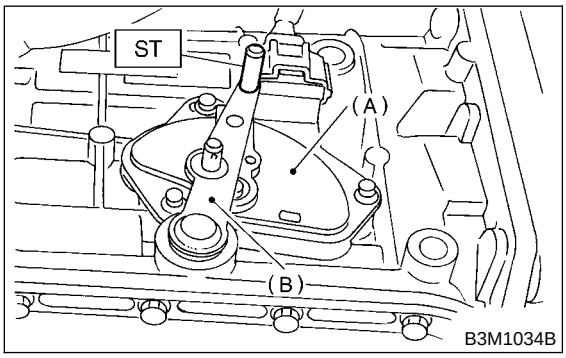


(A) Inhibitor switch

3) Move range select lever to neutral position.
4) Using ST, tighten bolts of inhibitor switch.

ST 499267300 STOPPER PIN

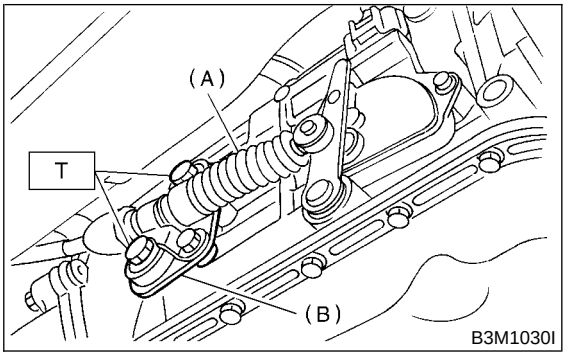
Tightening torque:
3.4 N·m (0.35 kgf-m, 2.5 ft-lb)



(A) Inhibitor switch
(B) Range select lever

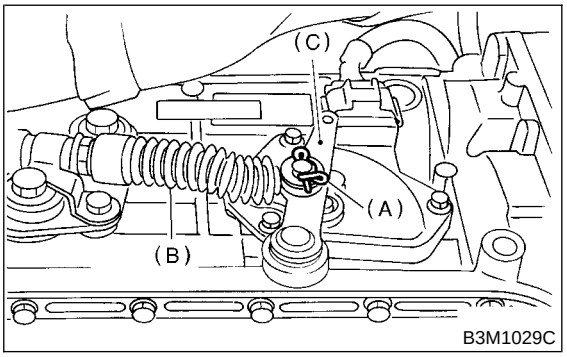
5) Install select cable to range select lever.
6) Install plate assembly to transmission.

Tightening torque:
T: 24.5 N·m (2.50 kgf-m, 18.1 ft-lb)



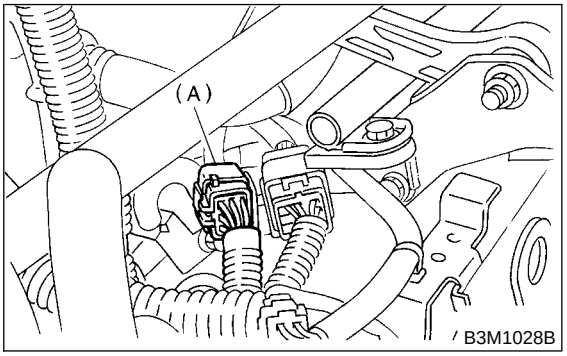
(A) Select cable
(B) Plate ASSY

7) Install snap pin to range select lever.



(A) Snap ring
(B) Select cable
(C) Range select lever

8) Install under cover.
9) Lower the vehicle.
10) Install inhibitor switch connector from stay.
11) Connect inhibitor switch connector.



(A) Inhibitor switch

12) Install air cleaner case. (Non-turbo model) <Ref. to IN(SOHC)-7, INSTALLATION, Air Cleaner Case.>

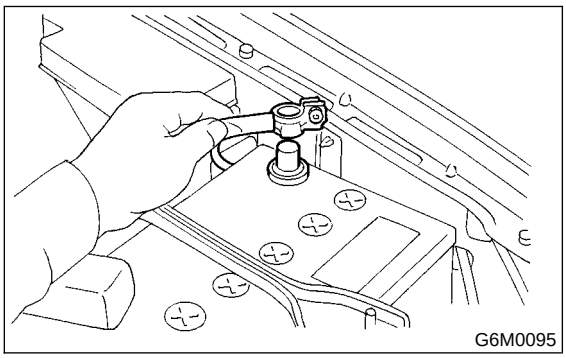
13) Install intercooler. <Ref. to IN(DOHC TURBO)-10, INSTALLATION, Intercooler.>
14) Inspect inhibitor switch. <Ref. to AT-28 INSPECTION, Inhibitor Switch.>

13. Front Vehicle Speed Sensor

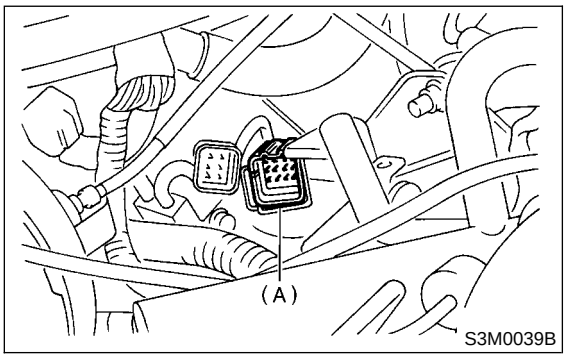
S502709

A: REMOVAL S502709A18

1) Set vehicle on a lift.
2) Disconnect battery ground terminal.



3) Remove air cleaner case. (Non-turbo model) <Ref. to IN(SOHC)-7, REMOVAL, Air Cleaner Case.>
4) Remove intercooler. (Turbo model) <Ref. to IN(DOHC TURBO)-10, REMOVAL, Intercooler.>
5) Disconnect transmission connector.

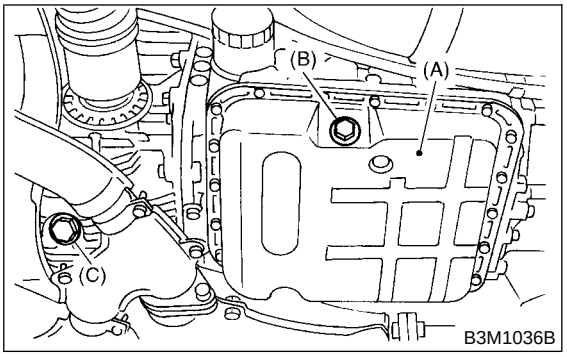


(A) Transmission connector

6) Remove the transmission connector from stay.
7) Lift vehicle.
8) Remove under cover.
9) Clean transmission exterior.
10) Drain ATF completely.

NOTE:
Tighten ATF drain plug after draining ATF.

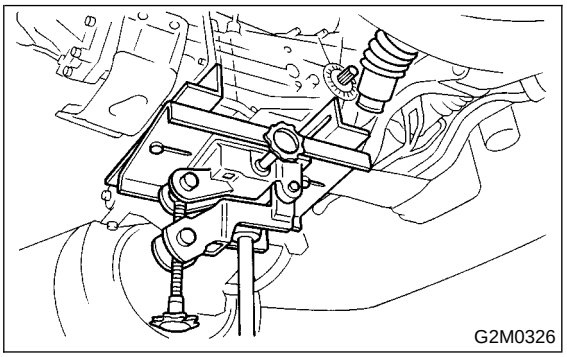
Tightening torque:
25 N·m (2.5 kgf-m, 18.1 ft-lb)



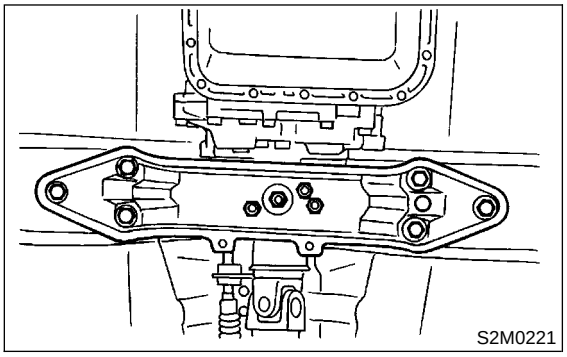
(A) Oil pan
(B) Drain plug
(C) Differential oil drain plug

11) Remove front, center, rear exhaust pipes and muffler. (Non-turbo model)
With OBD:
<Ref. to EX(SOHC)-5, REMOVAL, Front Exhaust Pipe.>, <Ref. to EX(SOHC)-9, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(SOHC)-11, REMOVAL, Muffler.>
Without OBD:
<Ref. to EX(SOHCw/oOBD)-6, REMOVAL, Front Exhaust Pipe.>, <Ref. to EX(SOHCw/oOBD)-10, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(SOHCw/oOBD)-12, REMOVAL, Muffler.>
12) Remove center, rear exhaust pipe and muffler. (Turbo model)
<Ref. to EX(DOHC TURBO)-9, REMOVAL, Center Exhaust Pipe.>, <Ref. to EX(DOHC TURBO)-14, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(DOHC TURBO)-15, REMOVAL, Muffler.>
13) Remove the shield cover. (If equipped)
14) Remove the propeller shaft. <Ref. to DS-14 REMOVAL, Propeller Shaft.>
15) Place transmission jack under transmission.

CAUTION:
● Always support transmission case with a transmission jack.
● On AT vehicle, make sure that the support plates of transmission jack don't touch the oil pan.



16) Remove the transmission rear crossmember bolts.



17) Lower the AT jack.

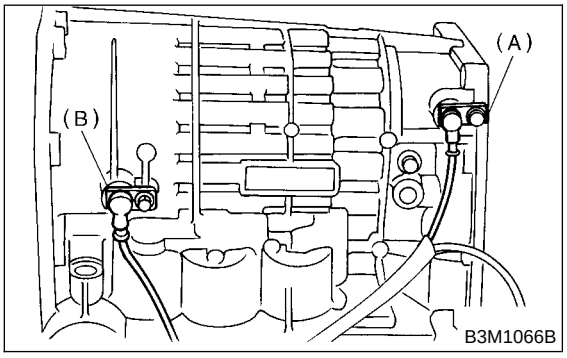
NOTE:
Do not separate the AT jack and transmission.

18) Remove the oil cooler outlet pipe.

CAUTION:
When removing outlet pipe, be careful not to lose balls and springs used with retaining screws.

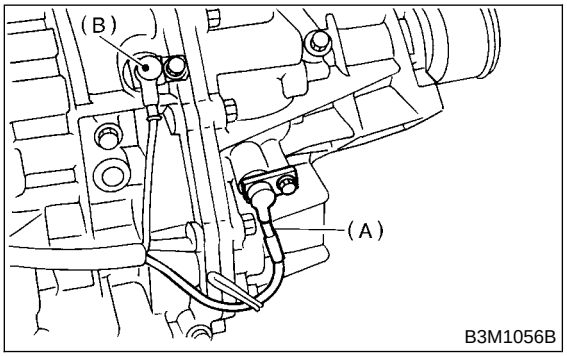
19) Remove front and rear vehicle speed sensor and torque converter turbine speed sensor.

- **Front vehicle speed sensor and torque converter turbine speed sensor**



(A) Front vehicle speed sensor
(B) Torque converter turbine speed sensor

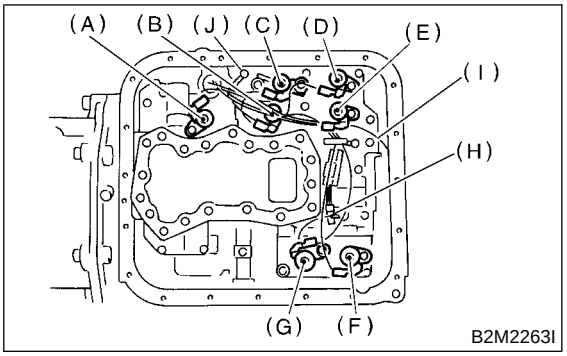
- **Rear vehicle speed sensor**



(A) Rear vehicle speed sensor
(B) Front vehicle speed sensor

20) Attach transmission rear crossmember bolt and tighten temporarily.

21) Remove the transmission jack.
22) Remove oil pan.
23) Disconnect duty solenoids and ATF temperature sensor connectors. Remove connectors from clip and disconnect connectors.

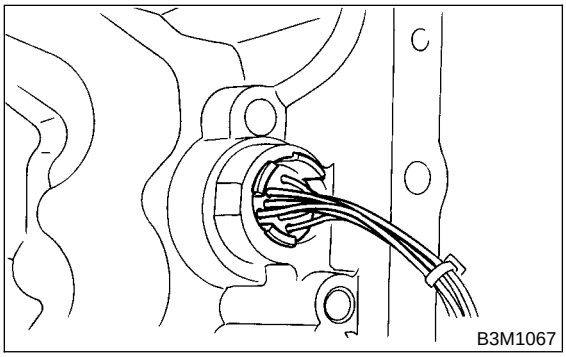


(A) Lock-up duty solenoid (Blue)
(B) Low clutch timing solenoid (Gray)
(C) Line pressure duty solenoid (Red)
(D) Shift solenoid 2 (Yellow)
(E) Shift solenoid 1 (Green)
(F) 2-4 brake timing solenoid (Black)
(G) 2-4 brake duty solenoid (Red)
(H) ATF temperature sensor
(I) Transfer duty solenoid (Brown)
(J) Transmission ground

24) Remove harness assembly.

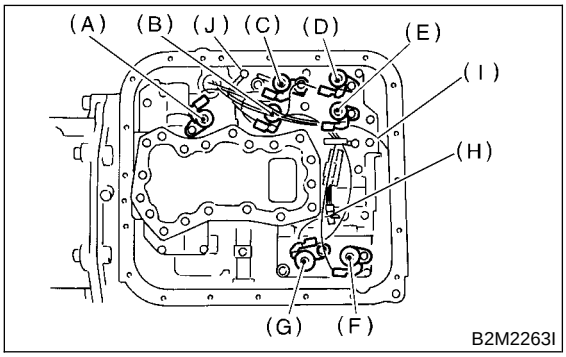
B: INSTALLATION S502709A11

1) Pass the harness assembly through the hole in the transmission case.



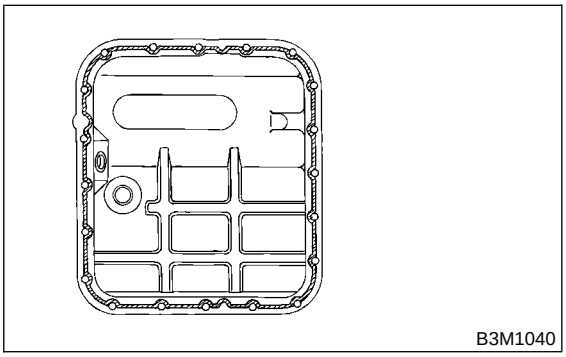
2) Connect harness connectors.
Connect connectors of same color, and secure connectors to valve body sing clips.

Tightening torque (transmission ground terminal):
8 N·m (0.8 kgf-m, 5.8 ft-lb)



(A) Lock-up duty solenoid (Blue)
(B) Low clutch timing solenoid (Gray)
(C) Line pressure duty solenoid (Red)
(D) Shift solenoid 2 (Yellow)
(E) Shift solenoid 1 (Green)
(F) 2-4 brake timing solenoid (Black)
(G) 2-4 brake duty solenoid (Red)
(H) ATF temperature sensor
(I) Transfer duty solenoid (Brown)
(J) Transmission ground

3) Apply proper amount of liquid gasket to the entire oil pan mating surface.
Fluid packing:
Three Bond 1217B

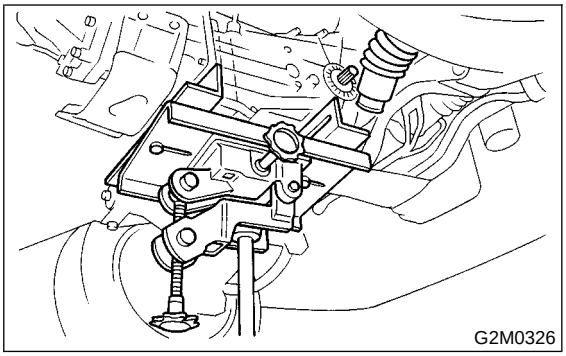


4) Install the oil pan.

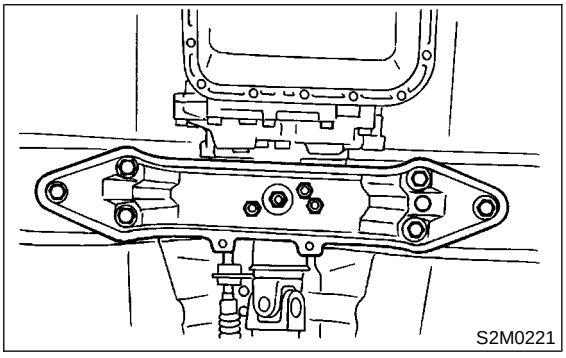
Tightening torque:
25 N·m (2.5 kgf-m, 18.1 ft-lb)

5) Place transmission jack under transmission.

CAUTION:
● Always support transmission case with a transmission jack.
● On AT vehicle, make sure that the support plates of transmission jack don't touch the oil pan.



6) Remove the transmission rear crossmember bolts.



7) Lower the AT jack.

NOTE:
Do not separate the AT jack and transmission.

8) Remove the oil cooler outlet pipe.

CAUTION:
When removing outlet pipe, be careful not to lose balls and springs used with retaining screws.

9) Install the front and rear vehicle speed sensor, and also the torque converter turbine speed sensor, and then fasten the harness.

Tightening torque:
7 N·m (0.7 kgf-m, 5.1 ft-lb)

10) Install oil cooler outlet pipe.

CAUTION:
Be sure to use a new aluminum washer.

Tightening torque:
25 N·m (2.5 kgf-m, 18.1 ft-lb)

11) Install transmission rear crossmember bolts.

Tightening torque:
75 N·m (7.6 kgf-m, 55 ft-lb)

12) Install propeller shaft. <Ref. to DS-15 INSTALLATION, Propeller Shaft.>
13) Install shield cover. (If equipped)
14) Install front, center, rear exhaust pipes and muffler. (Non-turbo model)
With OBD:
<Ref. to EX(SOHC)-6, INSTALLATION, Front Exhaust Pipe.>, <Ref. to EX(SOHC)-9, INSTALLATION, Rear Exhaust Pipe.> and <Ref. to EX(SOHC)-11, REMOVAL, Muffler.>
Without OBD:
<Ref. to EX(SOHCw/oOBD)-7, INSTALLATION, Front Exhaust Pipe.>, <Ref. to EX(SOHCw/oOBD)-10, INSTALLATION, Rear Exhaust Pipe.> and <Ref. to EX(SOHCw/oOBD)-12, INSTALLATION, Muffler.>
15) Install center, rear exhaust pipe and muffler. (Turbo model) <Ref. to EX(DOHC TURBO)-10, INSTALLATION, Center Exhaust Pipe.>, <Ref. to EX(DOHC TURBO)-14, INSTALLATION, Rear Exhaust Pipe.> and <Ref. to EX(DOHC TURBO)-15, INSTALLATION, Muffler.>
16) Install under cover. (Turbo model)
17) Lower the vehicle.
18) Install the transmission connector to the stay.
19) Install air cleaner case. (Non-turbo model) <Ref. to IN(SOHC)-7, INSTALLATION, Air Cleaner Case.>
20) Install intercooler. (Turbo model) <Ref. to IN(DOHC TURBO)-10, INSTALLATION, Intercooler.>

14. Rear Vehicle Speed Sensor

S502710

A: REMOVAL S502710A18

When removing the rear vehicle speed sensor, refer to “Front Vehicle Speed Sensor.” <Ref. to AT-32 REMOVAL, Front Vehicle Speed Sensor.>

B: INSTALLATION S502710A11

When installing the rear vehicle speed sensor, refer to “Front Vehicle Speed Sensor.” <Ref. to AT-34 INSTALLATION, Front Vehicle Speed Sensor.>

15. Torque Converter Turbine Speed Sensor S502711

A: REMOVAL S502711A18

When removing the torque converter turbine speed sensor, refer to “Front Vehicle Speed Sensor.” <Ref. to AT-32 REMOVAL, Front Vehicle Speed Sensor.>

B: INSTALLATION S502711A11

When installing the torque converter turbine speed sensor, refer to “Front Vehicle Speed Sensor.” <Ref. to AT-34 INSTALLATION, Front Vehicle Speed Sensor.>

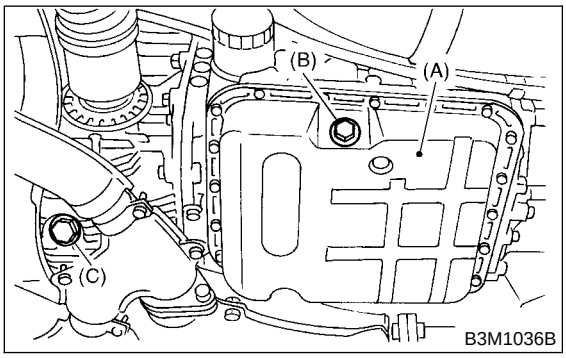
16. Control Valve Body S502564

A: REMOVAL S502564A18

1) Set vehicle on a lift.
2) Disconnect battery ground terminal from battery.
3) Lift vehicle.
4) Clean transmission exterior.
5) Remove under cover.
6) Drain ATF completely.

NOTE:
Tighten ATF drain plug after draining ATF.

Tightening torque:
25 N·m (2.5 kgf-m, 18.1 ft-lb)

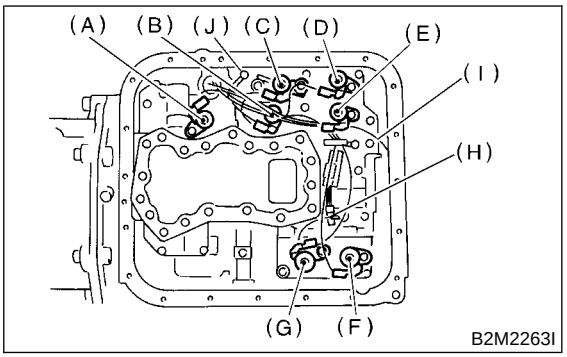


(A) Oil pan
(B) Drain plug
(C) Differential oil drain plug

7) Remove the oil pan.

NOTE:
- Remove and clean the magnet.
- Remove the old gasket on the oil pan and transmission case completely.

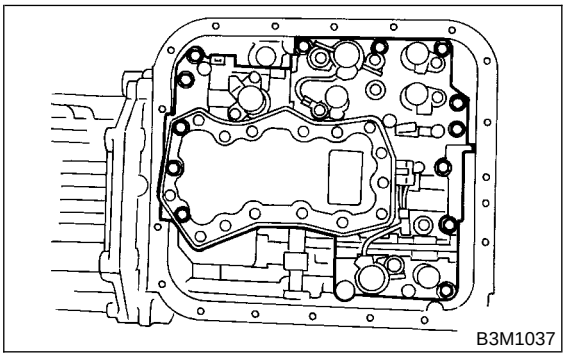
8) Disconnect duty solenoids and ATF temperature sensor connectors. Remove connectors from clip and disconnect connectors.



(A) Lock-up duty solenoid (Blue)
(B) Low clutch timing solenoid (Gray)
(C) Line pressure duty solenoid (Red)
(D) Shift solenoid 2 (Yellow)
(E) Shift solenoid 1 (Green)
(F) 2-4 brake timing solenoid (Black)
(G) 2-4 brake duty solenoid (Red)
(H) ATF temperature sensor
(I) Transfer duty solenoid (Brown)
(J) Transmission ground

9) Remove the control valve.

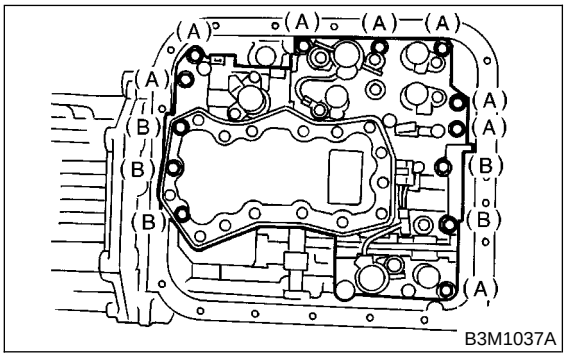
CAUTION:
When removing control valve body, be careful not to interfere with transfer duty solenoid wiring.



B: INSTALLATION S502564A11

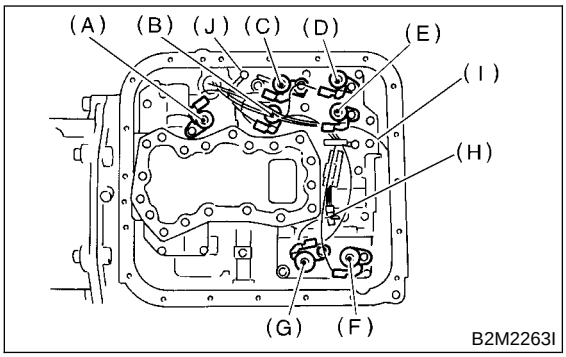
1) Set the range select lever in “N” position.
2) Install the control valve and ground earth terminal.

Tightening torque:
8 N·m (0.8 kgf-m, 5.8 ft-lb)



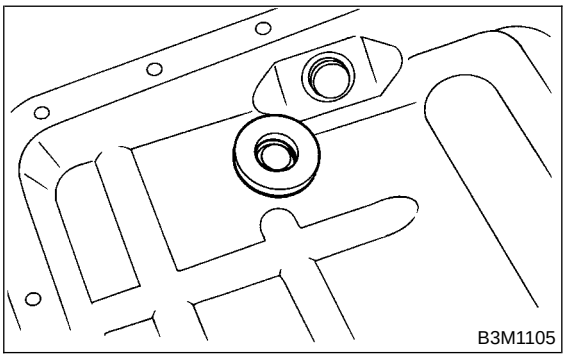
(A) Short bolts
(B) Long bolts

3) Connect all connector.

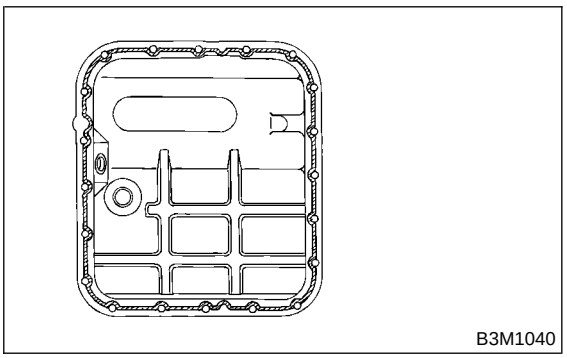


(A) Lock-up duty solenoid (Blue)
(B) Low clutch timing solenoid (Gray)
(C) Line pressure duty solenoid (Red)
(D) Shift solenoid 2 (Yellow)
(E) Shift solenoid 1 (Green)
(F) 2-4 brake timing solenoid (Black)
(G) 2-4 brake duty solenoid (Red)
(H) ATF temperature sensor
(I) Transfer duty solenoid (Brown)
(J) Transmission ground

4) Attach the magnet at the specified position.



5) Apply proper amount of liquid gasket to the entire oil pan mating surface.
Fluid packing:
Three Bond 1217B



6) Install the oil pan.

Tightening torque:
4.9 N·m (0.5 kgf-m, 3.6 ft-lb)

7) Install under cover. (Turbo model)
8) Pour ATF into the oil charge pipe.

Recommended fluid:
Dexron III type automatic transmission fluid

Fluid capacity:
Non-turbo model
8.4 — 8.7 ℓ (8.9 — 9.2 US qt, 7.4 — 7.7 Imp qt)
Turbo model
9.3 — 9.6 ℓ (9.8 — 10.1 US qt, 8.2 — 8.4 Imp qt)

9) Check the level of the ATF.
<Ref. to AT-9 Automatic Transmission Fluid.>

C: DISASSEMBLY S502564A06

Refer to “AUTOMATIC TRANSMISSION” <Pub. No. G0853ZE> a separate publication.

D: ASSEMBLY S502564A02

Refer to “AUTOMATIC TRANSMISSION” <Pub. No. G0853ZE> a separate publication.

E: INSPECTION S502564A10

Refer to “AUTOMATIC TRANSMISSION” <Pub. No. G0853ZE> a separate publication.

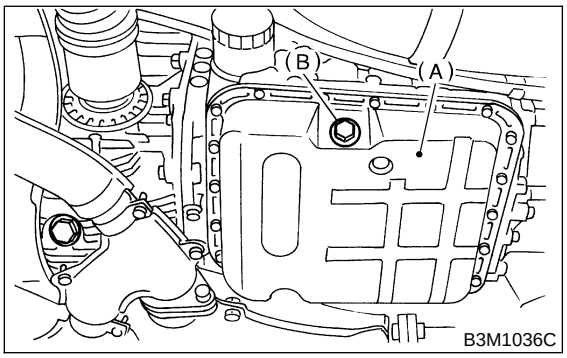
17. Shift Solenoids, Duty Solenoids and ATF Temperature Sensor S502227

A: REMOVAL S502227A18

1) Set vehicle on a lift.
2) Disconnect battery ground terminal from battery.
3) Lift vehicle.
4) Remove under cover.
5) Clean transmission exterior.
6) Drain ATF completely.

NOTE:
Tighten ATF drain plug after draining ATF.

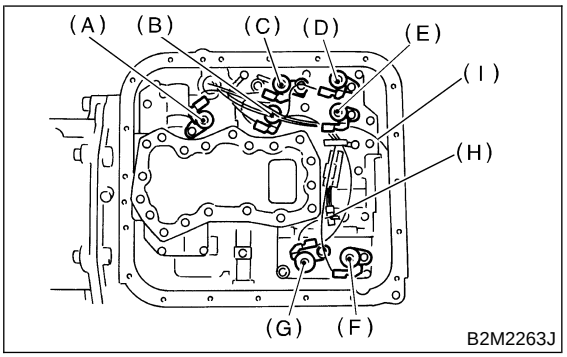
Tightening torque:
25 N·m (2.5 kgf-m, 18.1 ft-lb)



(A) Oil pan
(B) Drain plug

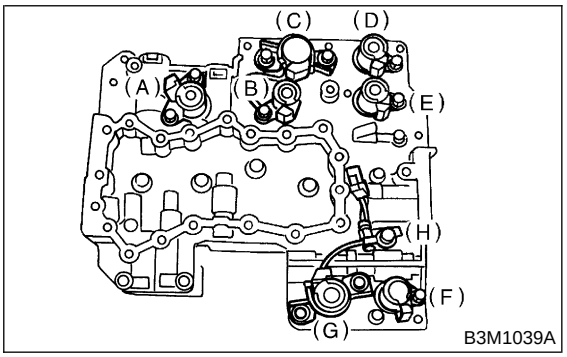
7) Remove oil pan.

8) Disconnect solenoid and sensor connectors. Remove connectors from clip and disconnect connectors.



(A) Lock-up duty solenoid (Blue)
(B) Low clutch timing solenoid (Gray)
(C) Line pressure duty solenoid (Red)
(D) Shift solenoid 2 (Yellow)
(E) Shift solenoid 1 (Green)
(F) 2-4 brake timing solenoid (Black)
(G) 2-4 brake duty solenoid (Red)
(H) ATF temperature sensor
(I) Transfer duty solenoid (Brown)

9) Remove solenoids, duty solenoids and ATF temperature sensor.

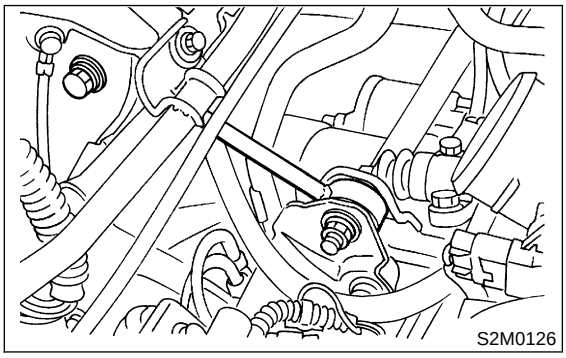


(A) Lock-up duty solenoid (Blue)
(B) Low clutch timing solenoid (Gray)
(C) Line pressure duty solenoid (Red)
(D) Shift solenoid 2 (Yellow)
(E) Shift solenoid 1 (Green)
(F) 2-4 brake timing solenoid (Black)
(G) 2-4 brake duty solenoid (Red)
(H) ATF temperature sensor

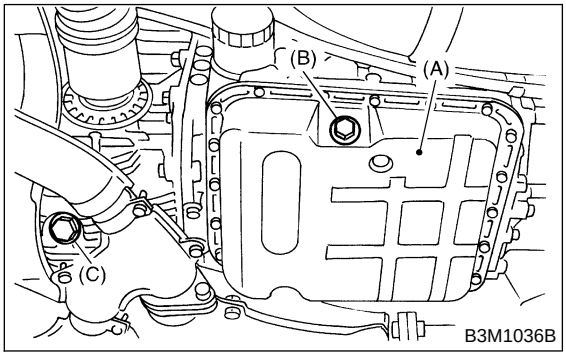
1. TRANSFER DUTY SOLENOID AND TRANSFER VALVE BODY S502227A1801

1) Set vehicle on a lift.
2) Disconnect battery ground terminal.
3) Remove air intake duct. <Ref. to IN(SOHC)-8, REMOVAL, Air Intake Duct.>
4) Remove air cleaner case. <Ref. to IN(SOHC)-7, REMOVAL , Air Cleaner Case.>
5) Remove intercooler. (Turbo model) <Ref. to IN(DOHC TURBO)-10, REMOVAL, Intercooler.>

6) Remove pitching stopper.


S2M0126

7) Remove front exhaust pipe with center exhaust pipe. (Non-turbo model)
With OBD:
<Ref. to EX(SOHC)-5, REMOVAL, Front Exhaust Pipe.>
Without OBD:
<Ref. to EX(SOHCw/oOBD)-6, REMOVAL, Front Exhaust Pipe.>
8) Remove center exhaust pipe. (Turbo Model) <Ref. to EX(DOHC TURBO)-9, REMOVAL, Center Exhaust Pipe.>
9) Remove rear exhaust pipe and muffler. (Non-turbo model)
Non-turbo model with OBD:
<Ref. to EX(SOHC)-9, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(SOHC)-11, REMOVAL, Muffler.>
Non-turbo model without OBD:
<Ref. to EX(SOHCw/oOBD)-10, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(SOHCw/oOBD)-12, REMOVAL, Muffler.>
Turbo model:
<Ref. to EX(DOHC TURBO)-14, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(DOHC TURBO)-15, REMOVAL, Muffler.>
10) Raise vehicle and drain ATF.

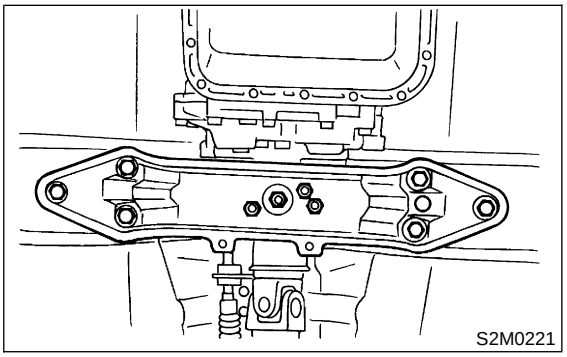


B3M1036B

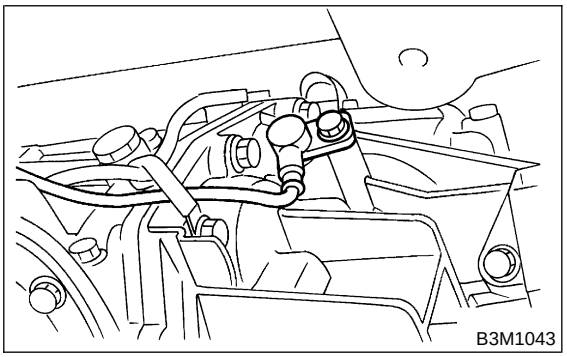
(A) Oil pan
(B) Drain plug
(C) Differential oil drain plug

11) Remove heat shield cover. (If equipped)
12) Remove propeller shaft. <Ref. to DS-14, REMOVAL, Propeller Shaft.>

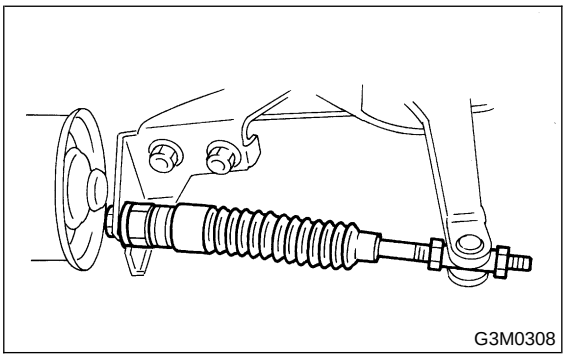
13) Remove rear crossmember.
(1) Support transmission using a transmission jack and raise slightly.
(2) Remove bolts and nuts as shown in Figure.


S2M0221

14) Remove rear vehicle speed sensor.


B3M1043

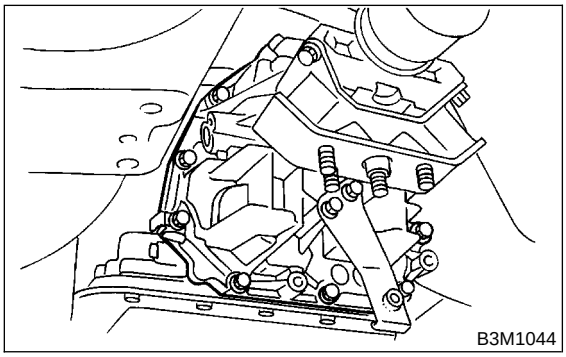
15) Remove select cable nut.


G3M0308

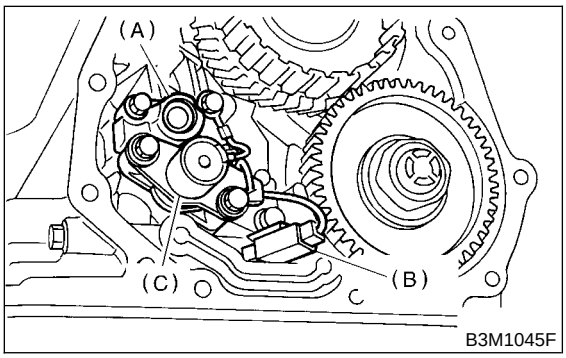
16) Move gear select cable so that extension bolts can be removed.
17) Remove bolts.

18) Remove extension case.

NOTE:
Use a container to catch oil flowing from extension.



19) Disconnect transfer duty solenoid connector.
20) Remove transfer duty solenoid and transfer valve body.

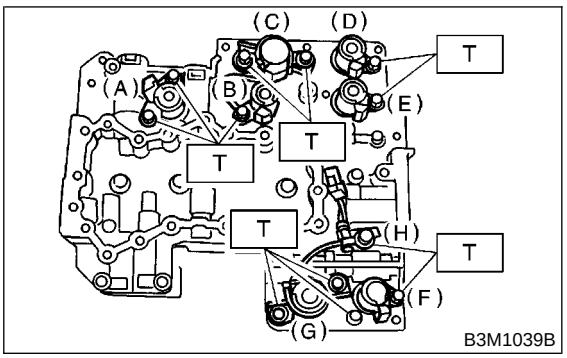


(A) Transfer valve body
(B) Transfer duty solenoid connector
(C) Transfer duty solenoid

B: INSTALLATION S502227A11

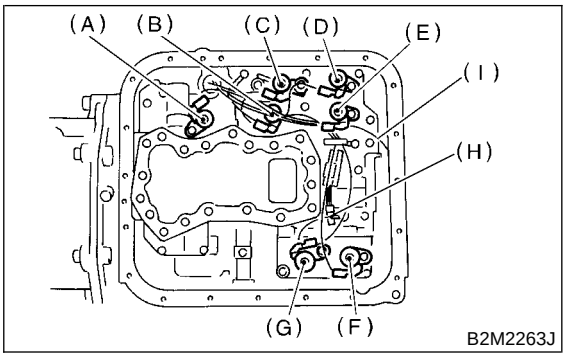
1) Install solenoids and ATF temperature sensor.

Tightening torque:
T: 8 N·m (0.8 kgf-m, 5.8 ft-lb)



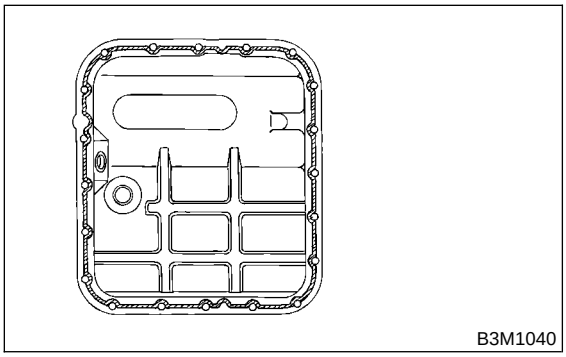
(A) Lock-up duty solenoid (Blue)
(B) Low clutch timing solenoid (Gray)
(C) Line pressure duty solenoid (Red)
(D) Shift solenoid 2 (Yellow)
(E) Shift solenoid 1 (Green)
(F) 2-4 brake timing solenoid (Black)
(G) 2-4 brake duty solenoid (Red)
(H) ATF temperature sensor

2) Connect harness connectors.
Connect connectors of same color, and secure connectors to valve body using clips.



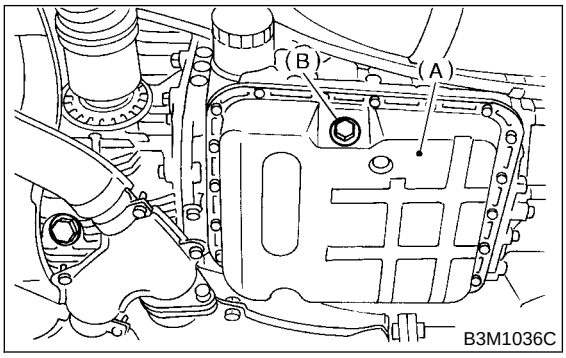
(A) Lock-up duty solenoid (Blue)
(B) Low clutch timing solenoid (Gray)
(C) Line pressure duty solenoid (Red)
(D) Shift solenoid 2 (Yellow)
(E) Shift solenoid 1 (Green)
(F) 2-4 brake timing solenoid (Black)
(G) 2-4 brake duty solenoid (Red)
(H) ATF temperature sensor
(I) Transfer duty solenoid (Brown)

3) Apply proper amount of liquid gasket to the entire oil pan mating surface.
Fluid packing:
Three Bond 1217B



4) Install oil pan.

Tightening torque:
4.9 N·m (0.50 kgf-m, 3.6 ft-lb)



(A) Oil pan
(B) Drain plug

5) Fill ATF up to the middle of the “COLD” side on level gauge by using the gauge hole.

Recommended fluid:
Dexron III type automatic transmission fluid

Fluid capacity:
Turbo model:
9.3 — 9.6 ℓ (9.8 — 10.1 US qt, 8.2 — 8.4 Imp qt)
Non-turbo model:
8.4 — 8.7 ℓ (8.9 — 9.2 US qt, 7.4 — 7.7 Imp qt)

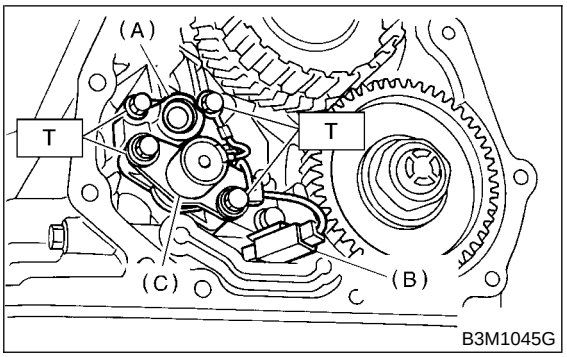
6) Check the ATF level. <Ref. to AT-9, Automatic Transmission Fluid.>

1. TRANSFER DUTY SOLENOID AND TRANSFER VALVE BODY S502227A1101

1) Install transfer duty solenoid and transfer valve body.
(1) Install transfer duty solenoid and transfer valve body.

Tightening torque:
T: 8 N·m (0.8 kgf-m, 5.8 ft-lb)

(2) Connect transfer duty solenoid connector.



(A) Transfer valve body
(B) Transfer duty solenoid connector
(C) Transfer duty solenoid

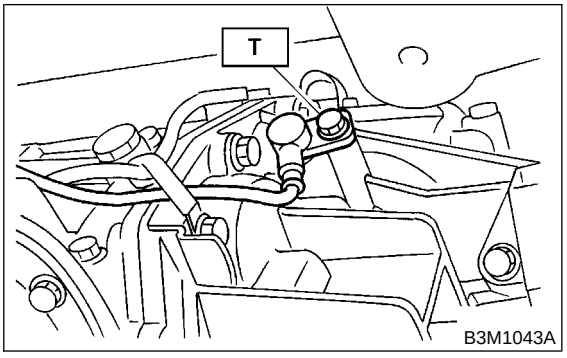
2) Install extension case to transmission case.
(1) Tighten 11 bolts.

Tightening torque:
25 N·m (2.5 kgf-m, 18.1 ft-lb)

(2) Install select cable.
(3) Adjust the select cable. <Ref. to CS-11, ADJUSTMENT, Select Cable.>

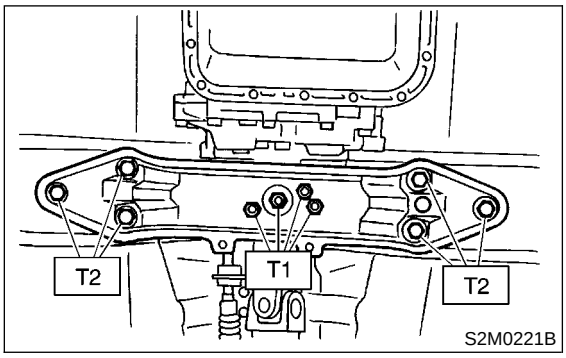
3) Install rear vehicle speed sensor.

Tightening torque:
T: 7 N·m (0.7 kgf-m, 5.1 ft-lb)



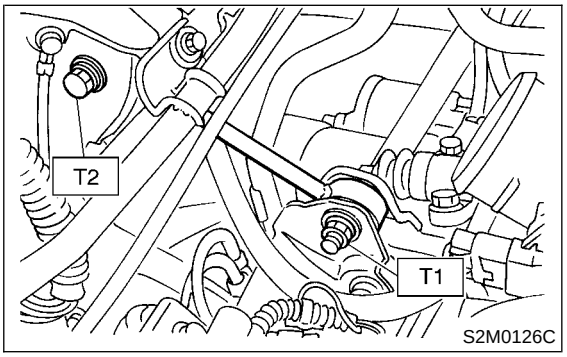
4) Install rear crossmember.
(1) Tighten bolts.

Tightening torque:
T1: 35 N·m (3.6 kgf-m, 26 ft-lb)
T2: 70 N·m (7.1 kgf-m, 51.4 ft-lb)



(2) Lower and remove transmission jack.
5) Install propeller shaft. <Ref. to DS-15, INSTALLATION, Propeller Shaft.>
6) Install front exhaust pipe and center exhaust pipe. (Non-turbo model)
With OBD:
<Ref. to EX(SOHC)-6, INSTALLATION, Front Exhaust Pipe.>
Without OBD:
<Ref. to EX(SOHCw/oOBD)-7, INSTALLATION, Front Exhaust Pipe.>
7) Install rear exhaust pipe and muffler. (Non-turbo model)
With OBD:
<Ref. to EX(SOHC)-11, INSTALLATION, Muffler.> and <Ref. to EX(SOHC)-9, INSTALLATION, Rear Exhaust Pipe.>
Without OBD:
<Ref. to EX(SOHCw/oOBD)-12, INSTALLATION, Muffler.> and <Ref. to EX(SOHCw/oOBD)-10, INSTALLATION, Rear Exhaust Pipe.>
8) Install center, rear exhaust pipe and muffler. (Turbo model) <Ref. to EX(DOHC TURBO)-10, INSTALLATION, Center Exhaust Pipe.>, <Ref. to EX(DOHC TURBO)-15, INSTALLATION, Muffler.> and <Ref. to EX(DOHC TURBO)-14, INSTALLATION, Rear Exhaust Pipe.>
9) Install under cover.
10) Install pitching stopper.

Tightening torque:
T1: 49 N·m (5.0 kgf-m, 36.2 ft-lb)
T2: 57 N·m (5.8 kgf-m, 42 ft-lb)



11) Install air cleaner case. (Non-turbo model) <Ref. to IN(SOHC)-7, INSTALLATION, Air Cleaner Case.>
12) Install intercooler. (Turbo model) <Ref. to IN(DOHC TURBO)-10, INSTALLATION, Intercooler.>
13) Fill ATF up to the middle of the ″COLD″ side on level gauge by using the gauge hole.

Recommended fluid:
Dexron III type automatic transmission fluid

Fluid capacity:
Non-turbo model; 8.4 - 8.7 L (8.9 - 9.2 US qt, 7.4 - 7.3 lmp qt)
Turbo model; 9.3 - 9.6 L (9.8 - 10.1 US qt, 8.2 - 8.4 lmp qt)

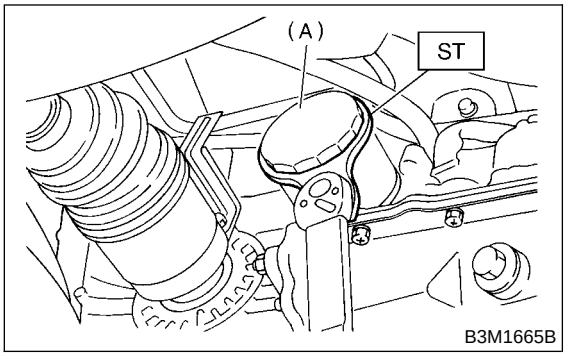
14) Check the ATF level. <Ref. to AT-9, Automatic Transmission Fluid.>

18. ATF Filter S502226

A: REMOVAL S502226A18

NOTE:
The ATF filter is maintenance free.

1) Lift vehicle.
2) Using ST, remove ATF filter.
ST 498545400 OIL FILTER WRENCH



(A) ATF filter

3) Get new ATF filter and apply a thin coat of ATF to the oil seal.

B: INSTALLATION S502226A11

1) Install ATF filter. Turn it by hand, being careful not to damage oil seal.
2) Using ST, tighten ATF filter to transmission case.
Calculate ATF filter torque specifications using the following formula.
T2 = L1/(L1 + L2) × T1
T1: 14 N·m (1.4 kgf-m, 10.1 ft-lb)
[Required torque setting]
T2: Tightening torque
L1: ST length 0.078 m (3.07 in)
L2: Torque wrench length
Example:

Torque wrench length mm (in)	Tightening torque N·m (kgf-m, ft-lb)
100 (3.94)	6 (0.6, 4.3)
150 (5.91)	5 (0.5, 3.6)
200 (7.87)	4 (0.4, 2.9)
250 (9.84)	3 (0.3, 2.2)

CAUTION:
Align ST with torque wrench while tightening ATF filter.

ST 498545400 OIL FILTER WRENCH
3) Add ATF.
4) Inspect level of ATF. <Ref. to AT-9 Automatic Transmission Fluid.>

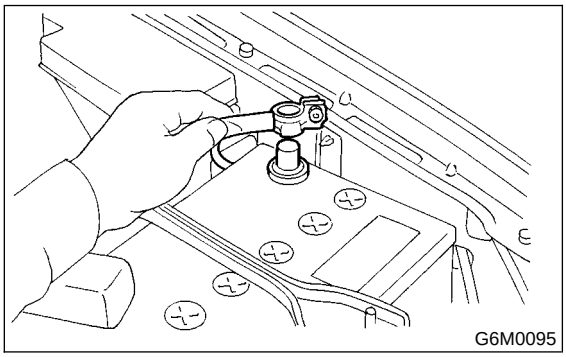
C: INSPECTION S502226A10

Replace the part if any defect is found from the inspection.
Check for rust, hole, ATF leaks, and other damage.

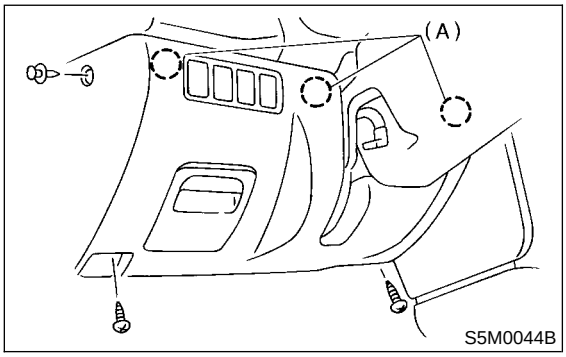
19. Transmission Control Module (TCM) S502225

A: REMOVAL S502225A18

1) Disconnect battery ground cable.



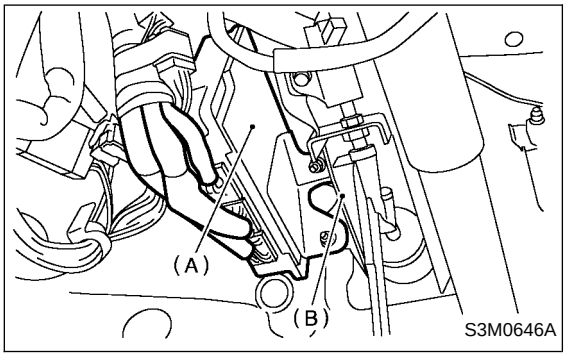
2) Remove lower cover and then disconnect connector.



(A) Clip

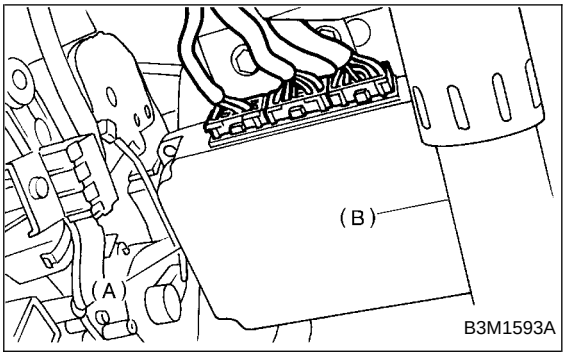
3) Disconnect connectors from transmission control module.

LHD model



(A) Transmission control module
(B) Brake pedal bracket

RHD model



(A) Transmission control module
(B) Column shaft

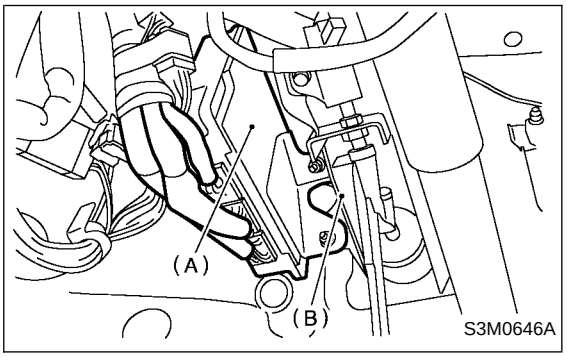
4) Remove transmission control module.

B: INSTALLATION S502225A11

1) Install transmission control module.

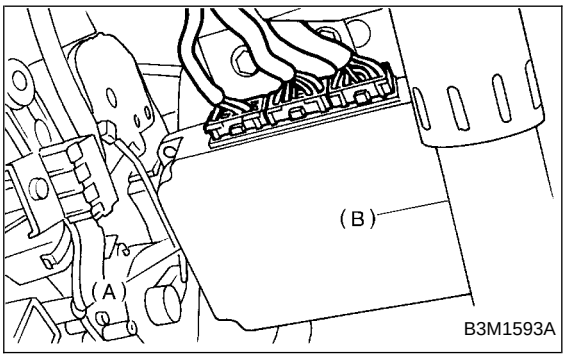
Tightening torque:
LHD model
7.5 N·m (0.76 kgf-m, 5.5 ft-lb)
RHD model
25 N·m (2.5 kgf-m, 18.1 ft-lb)

LHD model



(A) Transmission control module
(B) Brake pedal bracket

RHD model



(A) Transmission control module
(B) Column shaft

2) Install in the reverse order of removal.

20. ATF Cooler Pipe and Hose

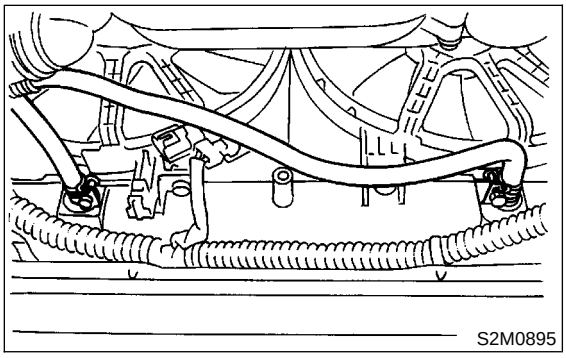
S502565

A: REMOVAL S502565A18

1. NON-TURBO MODEL S502565A1804

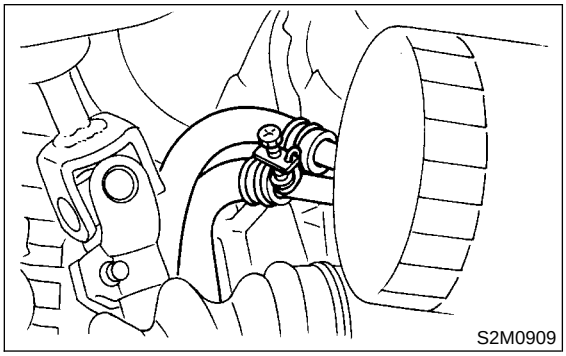
1) Set vehicle on a lift.
2) Remove battery and washer tank.
3) Lift vehicle.
4) Remove the under cover.
5) Disconnect ATF cooler hose from radiator.

NOTE:
● Do not remove with a screwdriver or other pointed tools.
● When the hose is difficult to remove, wrap a shop cloth around the hose to protect it. Turn it with pliers, and then pull directly out with your hand.

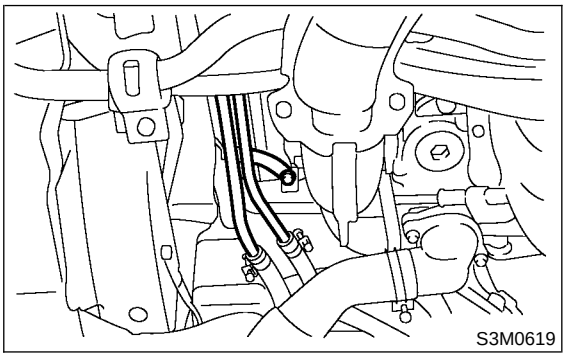

S2M0895

6) Disconnect ATF cooler hoses from pipes.

NOTE:
● Do not remove with a screwdriver or other pointed tools.
● When the hose is difficult to remove, wrap a shop cloth around the hose to protect it. Turn it with pliers, and then pull directly out with your hand.

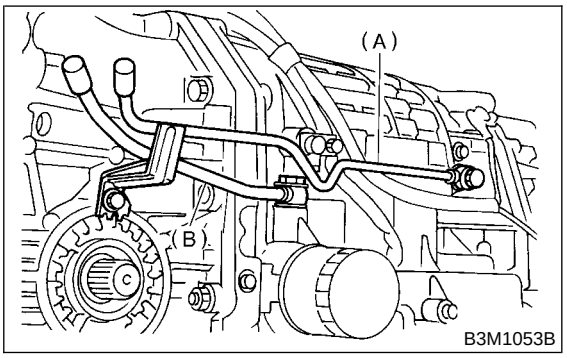

S2M0909

7) Remove ATF cooler pipe from cylinder head.


S3M0619

8) Remove the oil cooler inlet and outlet pipes.

CAUTION:
When removing outlet pipe, be careful not to lose ball and spring used with retaining screw.



B3M1053B

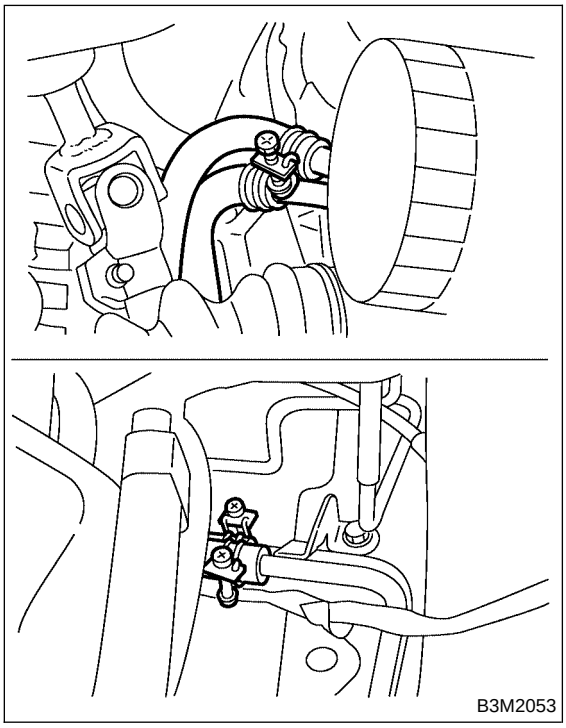
(A) Inlet pipe
(B) Outlet pipe

2. TURBO MODEL S502565A1805

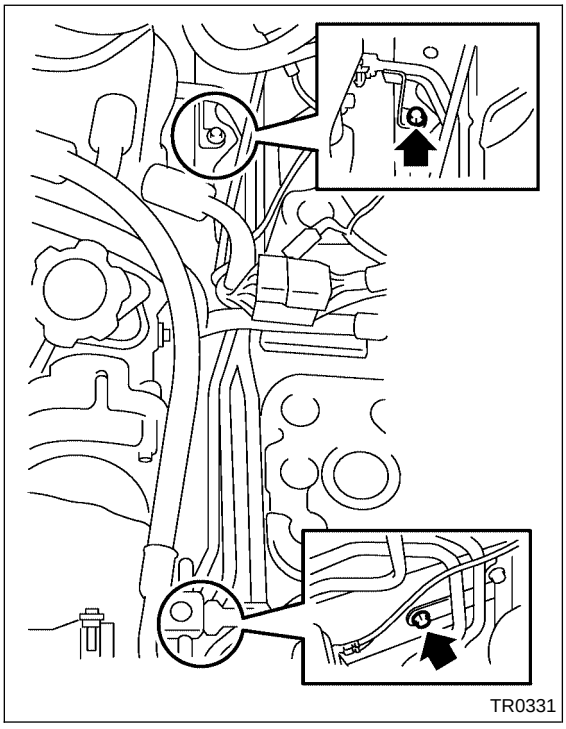
1) Set vehicle on a lift.
2) Remove battery and washer tank.
3) Lift vehicle.
4) Remove the under cover.
5) Disconnect ATF cooler hose from radiator.
   (1) Remove radiator. <Ref. to CO-25, REMOVAL, Radiator.>
   (2) Remove radiator under cover.
   (3) Remove ATF cooler hose from radiator.

6) Disconnect ATF cooler hoses from pipes.

NOTE:
● Do not remove with a screwdriver or other pointed tools.
● When the hose is difficult to remove, wrap a shop cloth around the hose to protect it. Turn it with pliers, and then pull directly out with your hand.

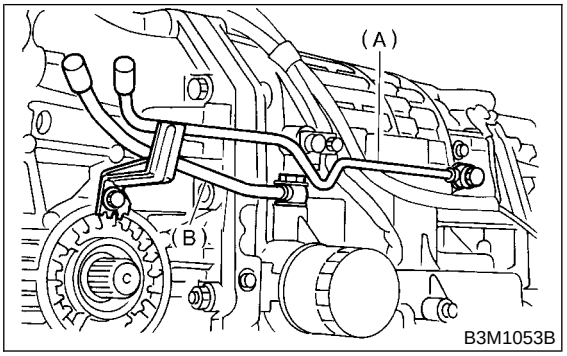


7) Remove ATF cooler pipe from frame.



8) Remove the oil cooler inlet and outlet pipes.

CAUTION:
When removing outlet pipe, be careful not to lose ball and spring used with retaining screw.



(A) Inlet pipe
(B) Outlet pipe

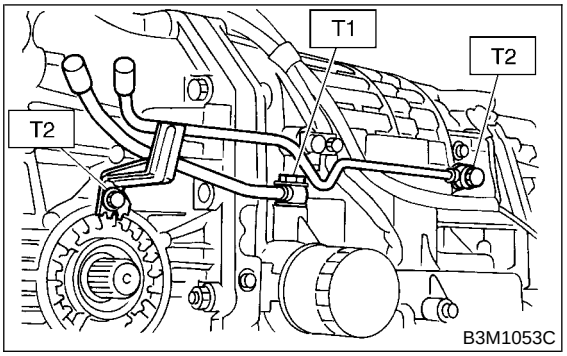
B: INSTALLATION S502565A11

1. NON-TURBO MODEL S502565A1104

1) Install the oil cooler outlet and inlet pipes.

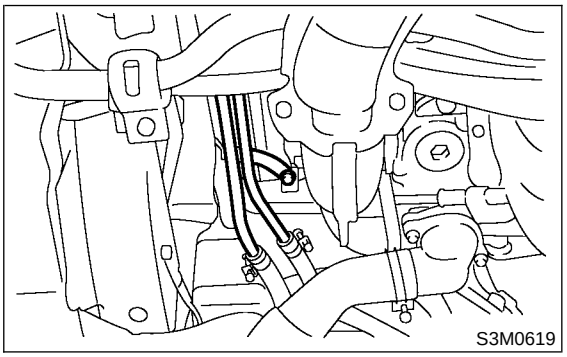
CAUTION:
Be sure to use a new aluminum washer.

Tightening torque:
T1: 44 N·m (4.5 kgf-m, 32.5 ft-lb)
T2: 25 N·m (2.5 kgf-m, 18.1 ft-lb)



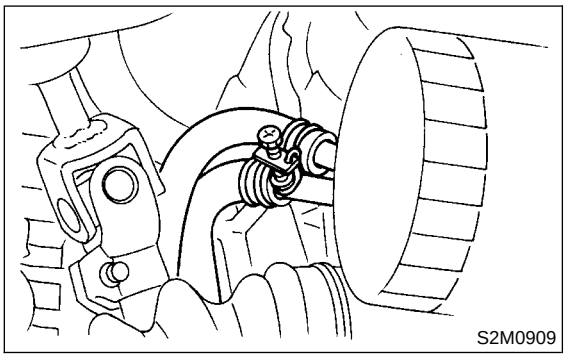
(A) Inlet pipe
(B) Outlet pipe

2) Install ATF cooler pipe to cylinder head.



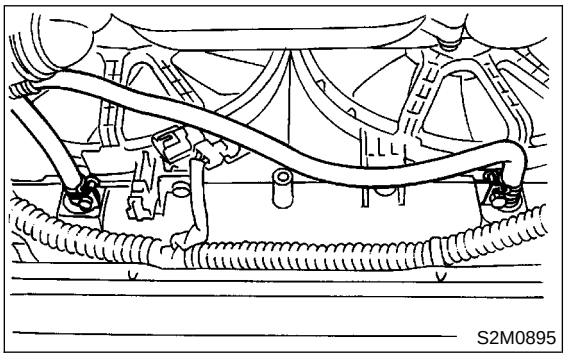
3) Connect ATF cooler hose to pipe transmission side.

NOTE:
● Install so that the hose is not folded over, excessively bent, or twisted.
● Be careful to insert the hose to the specified position.



4) Connect ATF cooler hose to pipe of radiator side.

NOTE:
● Install so that the hose is not folded over, excessively bent, or twisted.
● Be careful to insert the hose to the specified position.



5) Install the under cover.
6) Install battery and washer tank.
7) Fill ATF. <Ref. to AT-9 Automatic Transmission Fluid.>

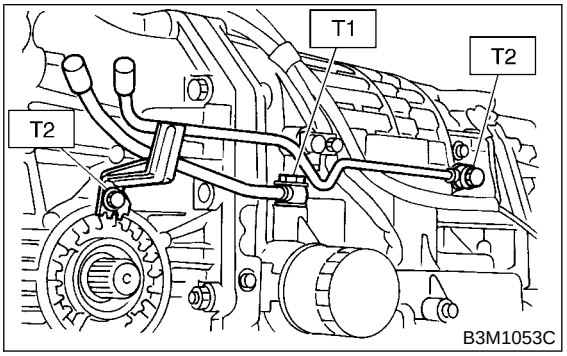
NOTE:
Make sure there are no ATF leaks in joints between the transmission, radiator, pipes, and hoses.

2. TURBO MODEL S502565A1105

1) Install the oil cooler outlet and inlet pipes.

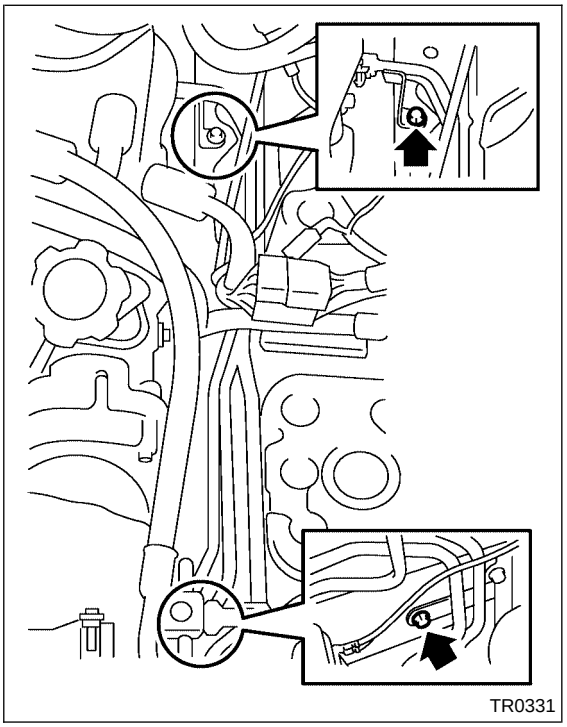
CAUTION:
Be sure to use a new aluminum washer.

Tightening torque:
T1: 44 N·m (4.5 kgf-m, 32.5 ft-lb)
T2: 25 N·m (2.5 kgf-m, 18.1 ft-lb)



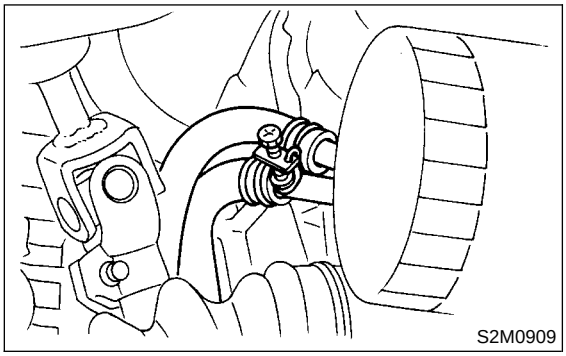
(A) Inlet pipe
(B) Outlet pipe

2) Install ATF cooler pipe to frame.



3) Connect ATF cooler hose to pipe transmission side.

NOTE:
● Install so that the hose is not folded over, excessively bent, or twisted.
● Be careful to insert the hose to the specified position.



4) Connect ATF cooler hose to pipe of radiator side.
   (1) Install ATF cooler hoses to radiator.
   (2) Install radiator under cover.
   (3) Install radiator. <Ref. to CO-27, INSTALLATION, Radiator.>
5) Install the under cover.
6) Install battery and washer tank.
7) Fill ATF. <Ref. to AT-9 Automatic Transmission Fluid.>

NOTE:
Make sure there are no ATF leaks in joints between the transmission, radiator, pipes, and hoses.

C: INSPECTION S502565A10

Repair or replace any defective hoses, pipes, clamps, and washers found from the inspection below.
1) Check for ATF leaks in joints between the transmission, radiator, pipes, and hoses.
2) Check for deformed clamps.
3) Lightly bend the hose and check for cracks in the surface and other damage.
4) Pinch the hose with your fingers and check for poor elasticity. Also check for poor elasticity in the parts where the clamp was by pressing with your fingernail.
5) Check for peeling, cracks, and deformation at the tip of the hose.

MEMO: