



SUBARU

SERVICE BULLETIN

APPLICABILITY: All Models
SUBJECT: Cylinder Head Gasket (residual carbon deposits and rubber coating removal)

NUMBER: 02-100-06R
DATE: 10/31/06

INTRODUCTION

The purpose of this bulletin is to provide Subaru's recommended procedure of removing the residual carbon deposits and the rubber coating after the cylinder head/gaskets are removed. If not removed properly, the new cylinder head gaskets may not seat properly when installed. There are two approved methods, using a scraper as illustrated or using 3M™ Roloc™ Bristle Discs, part # 051131-07528, Size 2 inch, Grade 120, Color White. Subaru does not recommend any other cleaning method.

Note: Using any other method which results in damage to the surface of the cylinder heads or block is not a matter for warranty.

REPAIR PROCEDURE/INFORMATION:

For demonstration purposes the photos are of a 2.5L SOHC engine, however the procedure applies to all engine types.



Removed Cylinder Head



Cylinder Block after Head Removal

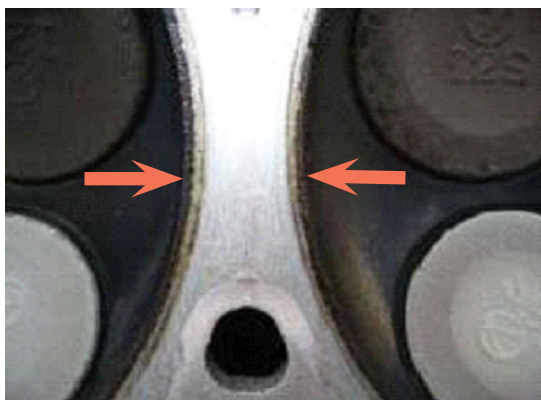
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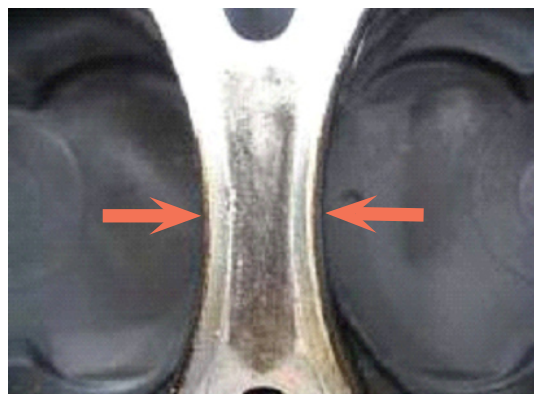
CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.

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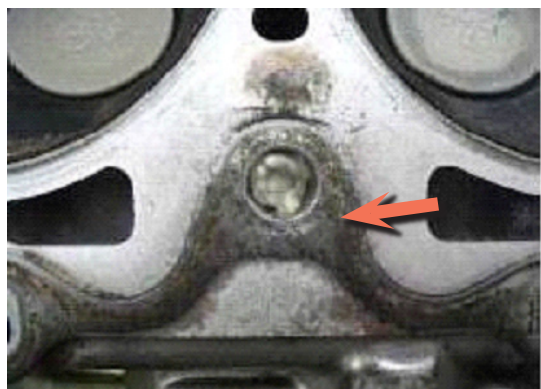




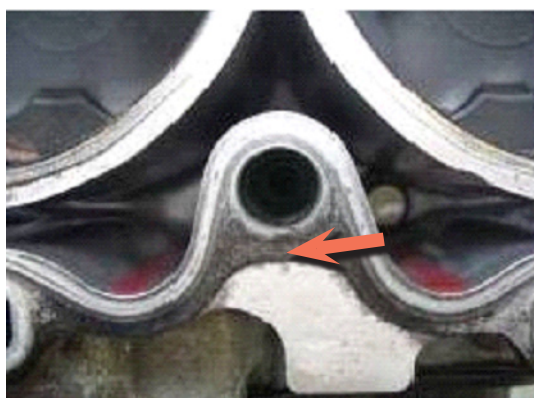
Accumulated carbon deposit on
bore sealing portion



Carbon deposit on cylinder block
bore sealing portion



Rubber coating residue on coolant sealing portion



Rubber coating residue on oil sealing portion

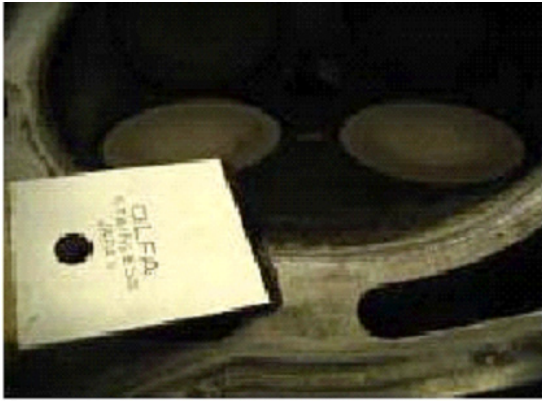


Using a gasket scraper, carefully clean any carbon deposits and rubber coating found on the surface of cylinder block and cylinder head.

CAUTION: Keep the scraper as flush as possible to the surface to avoid damage to the mating surface of cylinder block and cylinder head.

Continued on Next Page

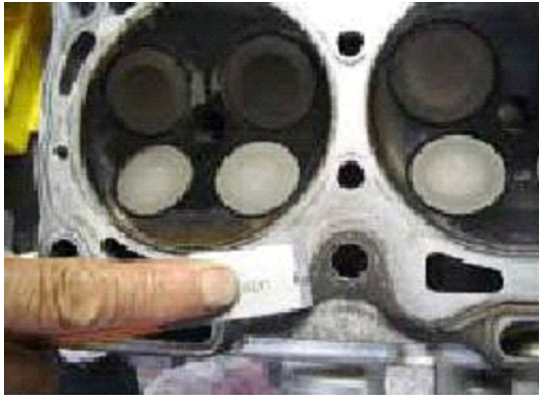
Cylinder Head



Cylinder Block



Carbon deposits being removed



Rubber coating being removed



Rubber coating being removed

Continued on Next Page



Finished cleaning (head)



Finished cleaning (block)

NOTE: After removing carbon deposit and rubber coating, clean the surfaces using a rag and cleaning solvent.



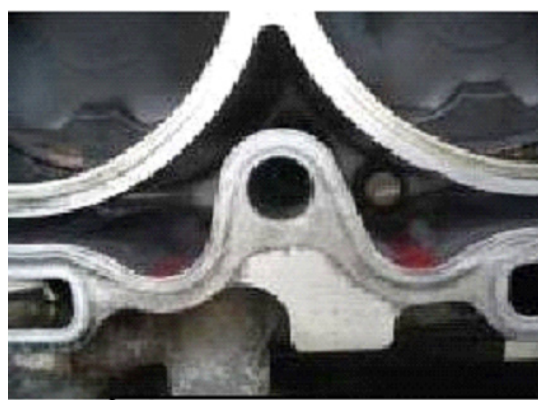
After cleaning bore sealing portion (head)



After cleaning bore sealing portion (block)



After cleaning coolant sealing portion (head)



After cleaning coolant sealing portion (block)

Continued on Next Page



After cleaning oil sealing portion (head)



After cleaning oil sealing portion (block)

ATTENTION:

GENERAL MANAGER ☐
 PARTS MANAGER ☐
 CLAIMS PERSONNEL ☐
 SERVICE MANAGER ☐

IMPORTANT - All
 Service Personnel
 Should Read and
 Initial in the boxes
 provided, right.



SUBARU

QUALITY DRIVEN® SERVICE

SERVICE BULLETIN

APPLICABILITY: All Turbo Equipped Models
SUBJECT: Turbo Vehicle Operation and Care

NUMBER: 02-101-07
DATE: 02/28/07

INTRODUCTION

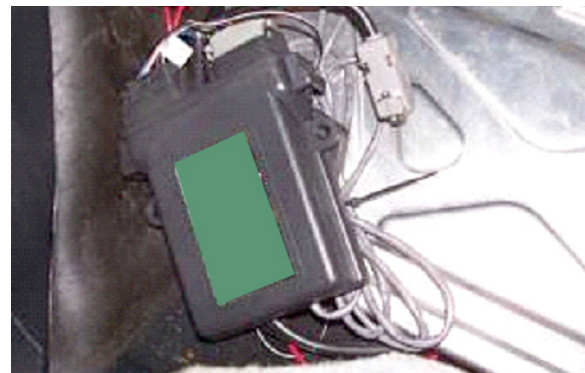
Many Subaru vehicles are equipped with turbo charged engines and are often referred to as performance or enthusiasts' vehicles. Turbo charged engines require some special care and precautions. Special attention should be paid to the following:

(1) MODIFICATIONS

Modifying the engine tuning of a Subaru to increase horse power by Engine Control Unit (ECU) replacement or reprogramming can lead to engine failures. Other external engine modifications, such as intake or exhaust systems, can also lead to failures. Any modifications can reduce engine durability and cause reliability deterioration.



Aftermarket Air Fuel Controller wired to ECM



Aftermarket Chip Processor

Intake system

Modifications to the intake systems, including the air cleaner, can cause the following:

- Allow foreign objects to enter the engine.
- Change the Air/Fuel mixture ratio, due to the change of intake air amount.
- System malfunctions due to a contaminated air flow sensor.
- Reduced engine durability due to higher horse power that exceeds engine design specifications.
- Turbo charger internal damage from excessive turbine speed.

continued...

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YOUTH
EDUCATIONAL
SYSTEMS
PROUD PARTNER



Aftermarket Cold Air Intake

Camshaft

Modifications to the Camshaft can create higher cylinder pressure due to the increase of intake air amount, and may result in engine damage.

Exhaust system

Modifications to the Exhaust System may create a reduction of exhaust resistance. This can lead to similar problems as found in Intake System modifications.



Aftermarket Exhaust System



Aftermarket Exhaust Bypass Valve

Body

Body modifications on vehicles may interfere with the flow of air to the Engine Cooling System, Intercooler, or Exhaust System. This can cause a raise in engine operating temperature which, in turn, would result in a rise in the intake air temperature which will affect the Engine Management System.

continued...

Ignition System

Modifications to the Engine Ignition System, such as “plugs”, can cause abnormal ignition, and result in engine damage.



Ring Land Damage from Detonation

Others

Relocation of any vehicle component may affect the Engine Management System and, in turn, cause potential engine damage.



Aftermarket Blow Off Valve



Ring Land Broken from Over Boosting

(2) MAINTENANCE

Engine Oil and oil filter

- Some brands of oil which are available in the aftermarket may not have enough lubrication ability and durability, regardless the price. (Poor performance oil causes damage on the crankshaft bearing, camshaft bearing, piston ring, cylinder liner, or turbo charger.)
- If the oil complies with the American Petroleum Institute (API) classification of SM (or SL minimum), and is within the recommended viscosity, it will not cause engine problems.
- A lack of oil may cause damage to the crankshaft bearing, camshaft bearing, piston ring, cylinder liner, or turbo charger.
- When the vehicle is used under severe driving conditions, moderate to hard acceleration on a somewhat regular basis, the engine oil and filter should be changed every 3,750 miles (6,000 km) or 3.75 months. For additional examples of severe driving conditions, refer to the Warranty & Maintenance Booklet.

continued...

- The use of a Genuine Subaru oil filter is strongly recommended. Many aftermarket oil filters have different filtration capacity and relief valve opening pressure. Those filters may not meet Subaru's requirements and may cause engine problems.



Aftermarket Oil Filter



Rod Bearing Spun from Lack of Oil

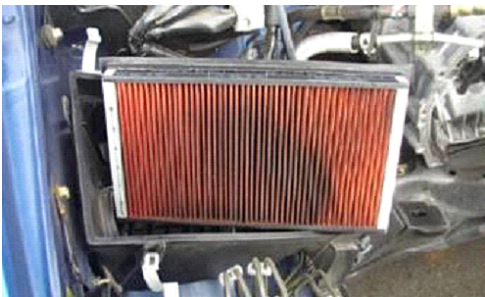
Coolant

- Use only Genuine Subaru Long Life Coolant.
- The use of a silicate type coolant deteriorates the aluminum surface of the radiator, causing loss in cooling performance, and may cause engine overheating.
- Use only Genuine Subaru coolant conditioner. Non-genuine coolant conditioners contain large particles that may clog the coolant passages in the radiator resulting in a loss of cooling performance and may cause engine overheating.

Please refer to Service Bulletin 09-42-05.

Air Cleaner

If the air cleaner element is contaminated, intake air flow is reduced. This condition will create an increase in engine vacuum causing an extra load on the turbo charger.



Contaminated Air Cleaner Element

(3) FUEL

Adequate quality and octane number fuel should be always used. The use of poor quality or low octane fuel can cause engine damage. Requirements vary by model, so please see the vehicle's owners manual for more details.

For example: 07MY Impreza WRX STI

Use super-premium unleaded gasoline with an octane rating of 93 AKI or higher. If super-premium unleaded gasoline with an octane rating of 93 AKI is not available, premium unleaded gasoline with an octane rating of 91 AKI or higher may be temporarily used. For optimum engine performance and driveability, it is required that you use super-premium grade unleaded gasoline with an octane rating of 93 AKI or higher.

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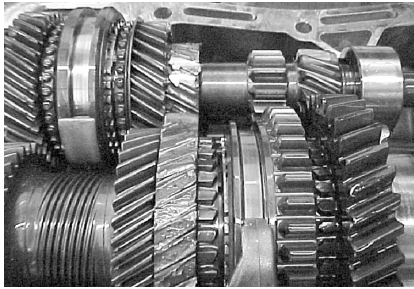
(4) DRIVING

Racing / Abusive Driving

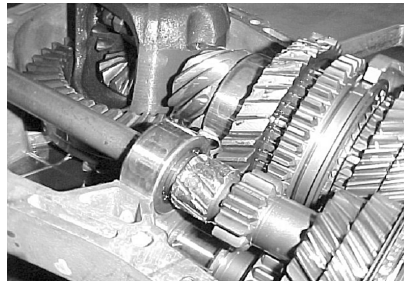
The term “racing” refers to all forms of racing whether street, drag, rally, sanctioned or unsanctioned, etc. Any damage that results from racing is not warrantable.

Some examples of abusive driving are exceeding maximum recommended RPMs, excessive torque transferred to the transmission during acceleration from a complete stop (dumping the clutch), downshifting at high RPMs and missing shifts.

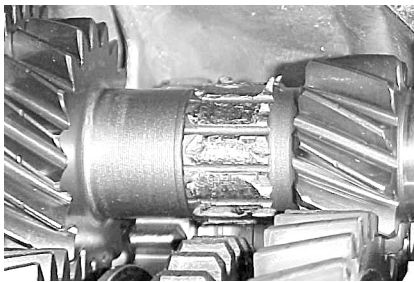
The photos below depict some results of abusive driving:



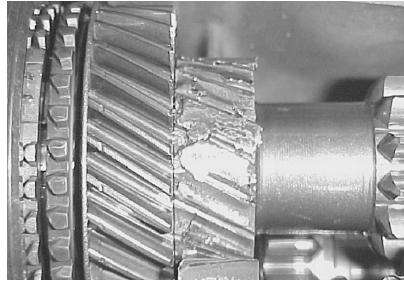
Second Gear Teeth Missing



First Gear Teeth Stripped from Mainshaft



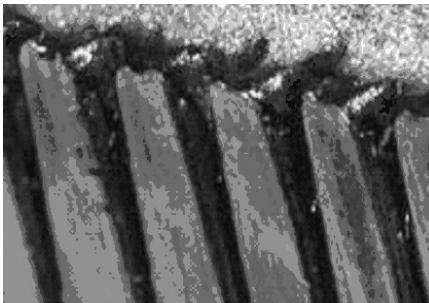
Reverse Gear Teeth Stripped



Second Gear Teeth Missing

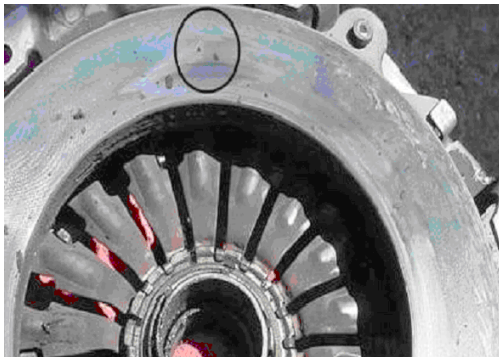


6-Speed 1-2 Shift Interlock
Arm Broken

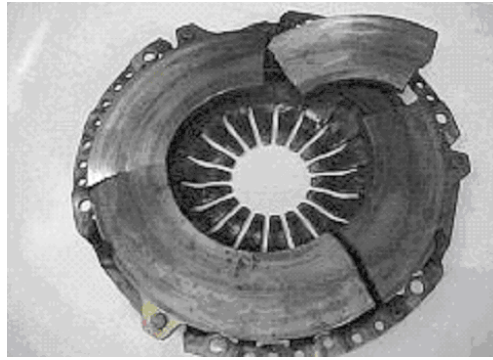


Damaged Land of Baulk Ring

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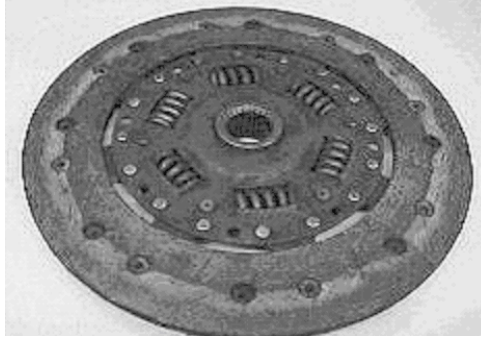
Over Heated Pressure Plate



Broken Pressure Plate



Over Heated Flywheel



Over Heated Clutch Disc



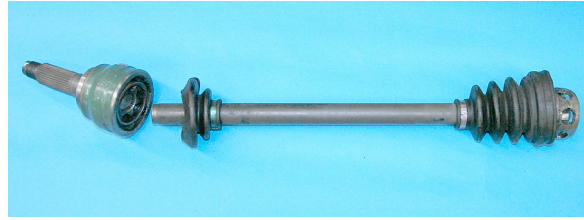
Rear Differential Gear Damage



Burnt automatic transmission clutches

continued...

The following 3 photos show an axle shaft that was sheared off at the “Bell Joint” (BJ) as the result of abuse.



Engine Over-revving

- Subaru engines are equipped with a fuel cut-off device that prevents engine over-revving on acceleration. However, over-revving due to shift-down on MT vehicles can not be prevented.
- Driving under these conditions will also consume engine oil at a much higher rate than consumed during normal driving conditions.
- It is highly recommended that the oil level should be checked at every fill-up, especially if the vehicle is being driven under severe driving conditions or aggressively.
- The fuel cut-off function is an emergency action to protect the engine from damage, therefore continuously revving the engine at the point of fuel cut-off is not recommended. Doing so will cause damage to the engine/catalytic converter from extremely high temperatures.
- In hard turning situations, and with less than a quarter tank of fuel, it is possible that fuel flow can be momentarily interrupted, which will result in intermittent combustion temperature increases. Such temperature increases will deteriorate the engine and affect long term durability.

SERVICE BULLETIN

APPLICABILITY

ALL MODELS AND YEARS

DATE

02-15-91

SUBJECT:**INCREASING TIRE LIFE**

You can help your customers increase their tire life by performing some simple maintenance during their periodic inspections.

The tires should be checked frequently for proper air pressure, wear, and cuts. Check air pressure when the tires are "cold", that is, after the vehicle has been parked for three hours or more. Correct pressures are specified in the tire placard. Do not let air out of warm tires to adjust pressure.

Tire wear will vary with each wheel. To increase the life of tires and keep wear uniform, it is best to rotate them every 6,200 miles (10,000 km) or at the 7,500 mile maintenance period.

When rotating tires, replace any unevenly worn or damaged tire. All four tires must be the same size and diameter. After rotating the tires, adjust tire pressure and be sure to check wheel nut tightness.

Failure to rotate tires regularly will cause uneven wear, such as cupping of rear tires.

Make sure that both front and rear suspensions are aligned properly. Improper alignment will cause uneven tire wear and affect the vehicle handling.

All manufacturers of tires used as original equipment on Subaru vehicles recommend these procedures as a minimum precaution. These suggestions are covered in the Subaru Owner's manuals.

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SERVICE BULLETIN

APPLICABILITY

SVX 1992-1997. ALL MODELS FROM 1992 - PRESENT.

DATE

10-01

SUBJECT:

IN-TRANSIT SPARK PLUG FOULING PROTECTION

All 1992 Legacy and SVX vehicles will incorporate a feature designed to reduce the chance of spark plug fouling while these vehicles are being transported prior to sale. It will be necessary to disconnect this feature during PDI.

SVX

This procedure can be found in 1-4 (01P0) Page 8 of the Service Manual. Upon receipt of the SVX, you should notice the check engine light flashing a steady on/off sequence with the key on. This indicates there is no trouble with the fuel system and that it is okay to proceed with removing the transit connector which is a normal part of the PDI procedure. The transit connector is a black 10 pin connector with a jumper wire which mates to a black 10 pin check connector located behind a trim panel at the lower area forward of the driver's door opening. The transit connector should be removed and discarded. Confirm that the check engine light no longer flashes.

If a trouble code is observed through the check engine light before the transit connector is removed, a fuel system problem is indicated and further troubleshooting should be performed according to Section 2-7 of the Service Manual.

LEGACY

1992 MY Legacy vehicles will arrive at dealers for PDI with the read memory connectors joined together. Spark plug fouling protection logic has been incorporated through these connectors and related wiring. The read memory connectors B54 and B55 are black 1 pin connectors located under the dash and will be temporarily secured to the main harness with a wrap of tape. As with the SVX, check for a steady on/off check engine light sequence before separating these connectors to confirm a normally operating fuel system. A trouble code output via the check engine light indicates a problem with the system and appropriate diagnostic steps should be performed according to the Service Manual. Confirm that the flashing stops when the connectors are separated.

Spark plug fouling protection is designed for in-transit use only prior to PDI. Do not attempt to repair a vehicle by utilizing these functions. Use proper and appropriate diagnostic procedures found in the Service Manual to identify and correct system malfunctions.

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SERVICE BULLETIN

APPLICABILITY

ALL YEARS AND MODELS

DATE

04-13-93

SUBJECT:

WIPER BLADE SERVICING

The major cause of windshield streaking complaints is contamination of the blade surface and/or windshield with atmospheric contaminants such as oil, dirt and road salt. These contaminants accumulate on the blades and glass during normal driving and can be increased by contact with contaminated car wash brushes or chamois.

The countermeasure to this complaint is a simple cleaning of the blades and glass using isopropyl alcohol. In some cases, it may be necessary to clean the glass using a non-abrasive household cleaner, followed by an alcohol wash. Care must be taken when using such materials to prevent paint damage.

Replacing wiper blades will not resolve the streaking complaint if the glass is oily.

Another factor affecting wiper blade longevity is the surface condition of the windshield. If the windshield is pitted by stone chips, wipers will wear out quickly. This condition is easily observed by using a magnifying glass to inspect the windshield.

These simple procedures can help satisfy your customers, in many cases, right at the Service Writer's area. Service Writers should explain this procedure to the customers also.

***For easy reference, you may want to file a copy of this in Section 12 - Body.**

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SERVICE BULLETIN

APPLICABILITY

SVX 1992 - 1997, ALL MODELS FROM 1995 TO
PRESENT

DATE 4/24/95

SUBJECT: THE FEDERAL MOTOR VEHICLE THEFT PREVENTION STANDARD

1. THE MOTOR VEHICLE THEFT LAW ENFORCEMENT ACT OF 1984

This law is designed to reduce the number of thefts and decrease the sale of stolen motor vehicle parts.

2. THE FEDERAL MOTOR VEHICLE THEFT PREVENTION STANDARD

The standard requires major original equipment motor vehicle parts be identified with the vehicle identification number (VIN) and replacement parts must have an identification marking. The standard is directed at potentially high theft vehicles and replacement parts for those vehicles.

3. VEHICLES AFFECTED

All 1992 model year and later Subaru SVX models starting with VIN NH100001 (see Service Bulletin 01-129-91 for applicable information on the SVX models) and 1995 model year Legacy models, as detailed in this Service Bulletin.

4. APPLICABLE PARTS

Hood
Engine
Transmission
Right Front Fender
Left Front Fender
Right Front Door
Left Front Door
Right Rear Door
Left Rear Door
Deck Lid (4 door sdn.)
Tailgate (s/w)
Right Rear Quarter Panel
Left Rear Quarter Panel
Rear Bumper
Front Bumper

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5. ORIGINAL EQUIPMENT PARTS LABEL

All applicable parts on each applicable vehicle will be marked in production with the full seventeen character VIN label shown in Figure 1.



Figure 1
Original Equipment Label
Vehicle Identification Number (VIN)

NOTE: ENGINE AND TRANSMISSION ASSEMBLIES WILL HAVE THE VIN STAMPED ON THE CASTING.

6. REPLACEMENT PARTS LABEL

All applicable replacement parts will have either replacement parts labels or casting stampings for engine and transmission assemblies. See Figure 2A.

The labels will have a peel-off cover to protect the label during painting, undercoating, etc. See Figure 2B.



Figure 2A
Replacement Parts Label

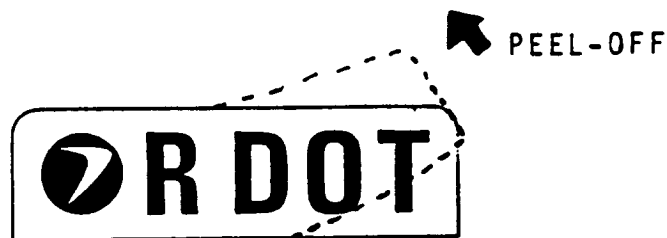


Figure 2B

NOTE: THE PEEL-OFF COVER MUST BE REMOVED AFTER PART PREPARATION, PAINTING, UNDERCOATING, ETC.

7. VEHICLE PREPARATION AND REPAIR

CAUTION: WHEN PREPARING A VEHICLE FOR SALE ALL IDENTIFYING LABELS MUST NOT BE REMOVED, DAMAGED OR COVERED OVER BY PAINT, UNDERCOATING, ETC.

Any applicable vehicle damaged before the sale to the first customer must be repaired so the identifying labels, either original or replacement (if an applicable replacement part is used), are present and legible.

- During accessory installation, the labels must not be damaged or removed.
- When the vehicles are being undercoated, the original equipment parts label must be masked to prevent covering over. When the undercoating is finished the mask must be removed.
- The labels cannot be damaged or removed during transit.
- All applicable parts labels should be examined during pre-delivery inspection (PDI) to make sure the labels are present and legible.

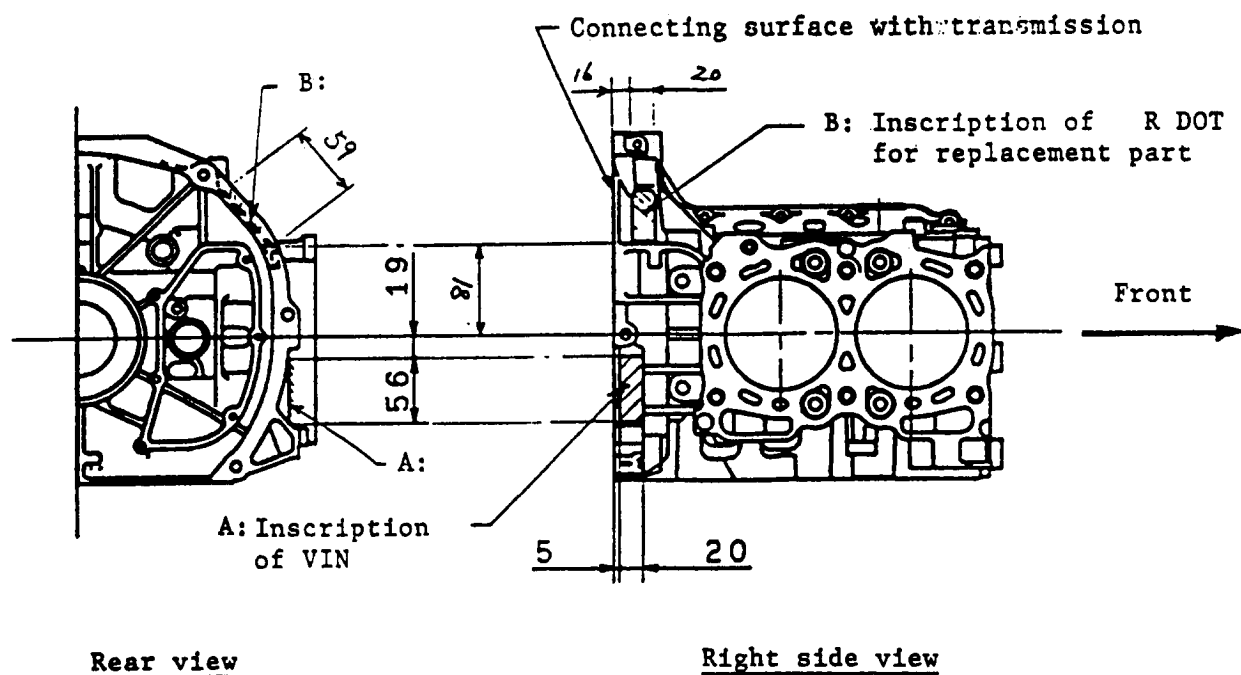
After the sale of the vehicle, parts covered by this standard can be repaired or replaced by the dealer or repair facility; however, any affixed label must remain visible after a repair or replacement.

8. EXCHANGE OF PARTS FROM NEW VEHICLES

Applicable parts marked in accordance with "The Motor Vehicle Theft Law Enforcement Act" must not be interchanged between vehicles since the vehicles will have the incorrect VIN on the interchanged part. If it is necessary to exchange an applicable part, a new part (which has the replacement part label) must be used.

Part Name: ENGINE	Applicability: SUBARU LEGACY 4 Door Sedan ☒ Station Wagon ☒	
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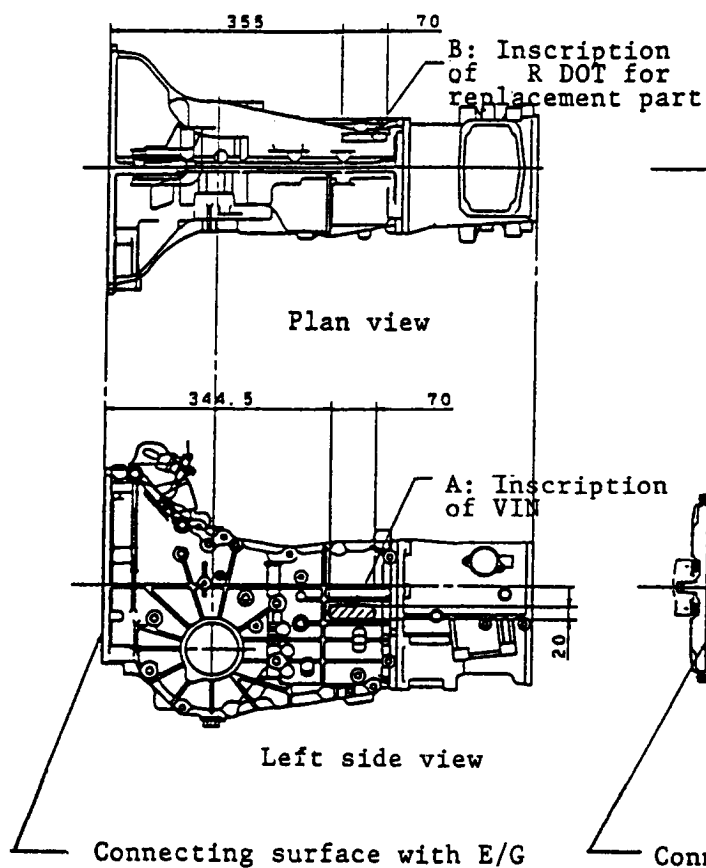
Location of Label:



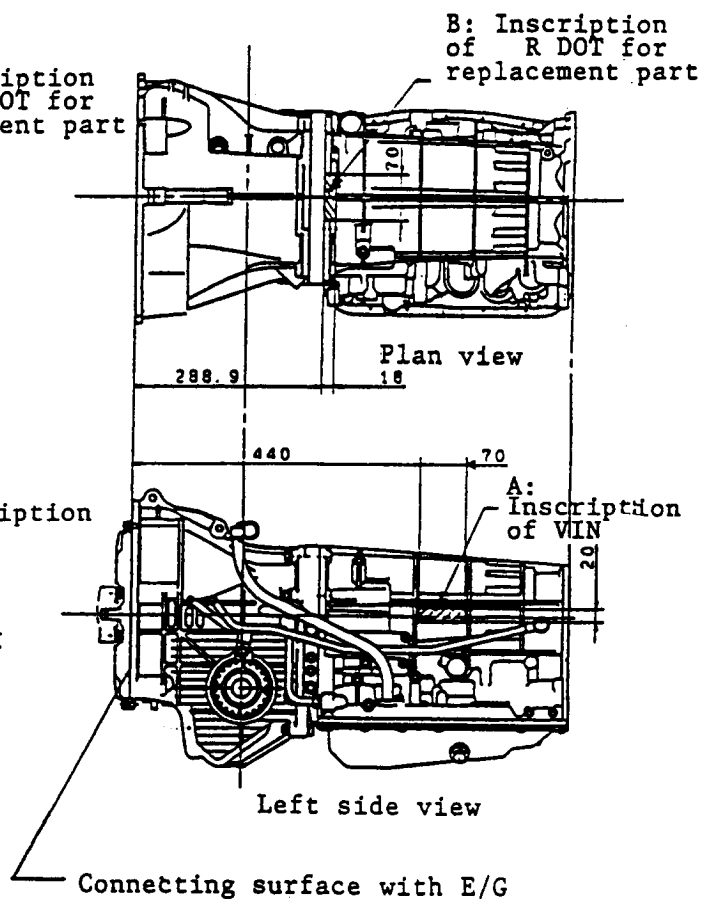
Part Name: TRANSMISSION	Applicability: SUBARU LEGACY 4 Door Sedan ☒ Station Wagon ☒	
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Location of Label:

Manual transmission

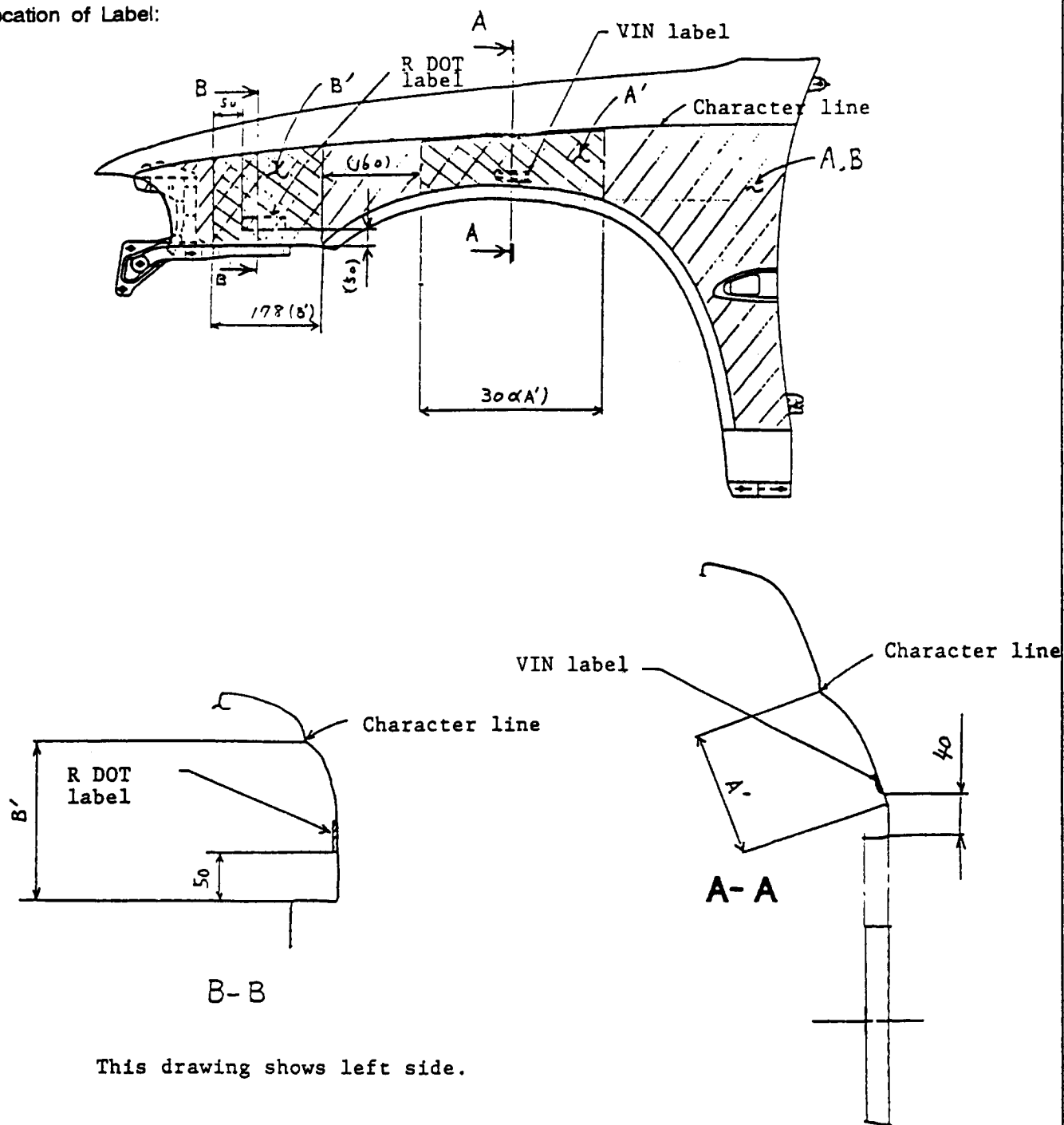


Automatic transmission



Part Name: FRONT FENDER	Applicability: SUBARU LEGACY 4 Door Sedan ☒ Station Wagon ☒	
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Location of Label:



Part Name:

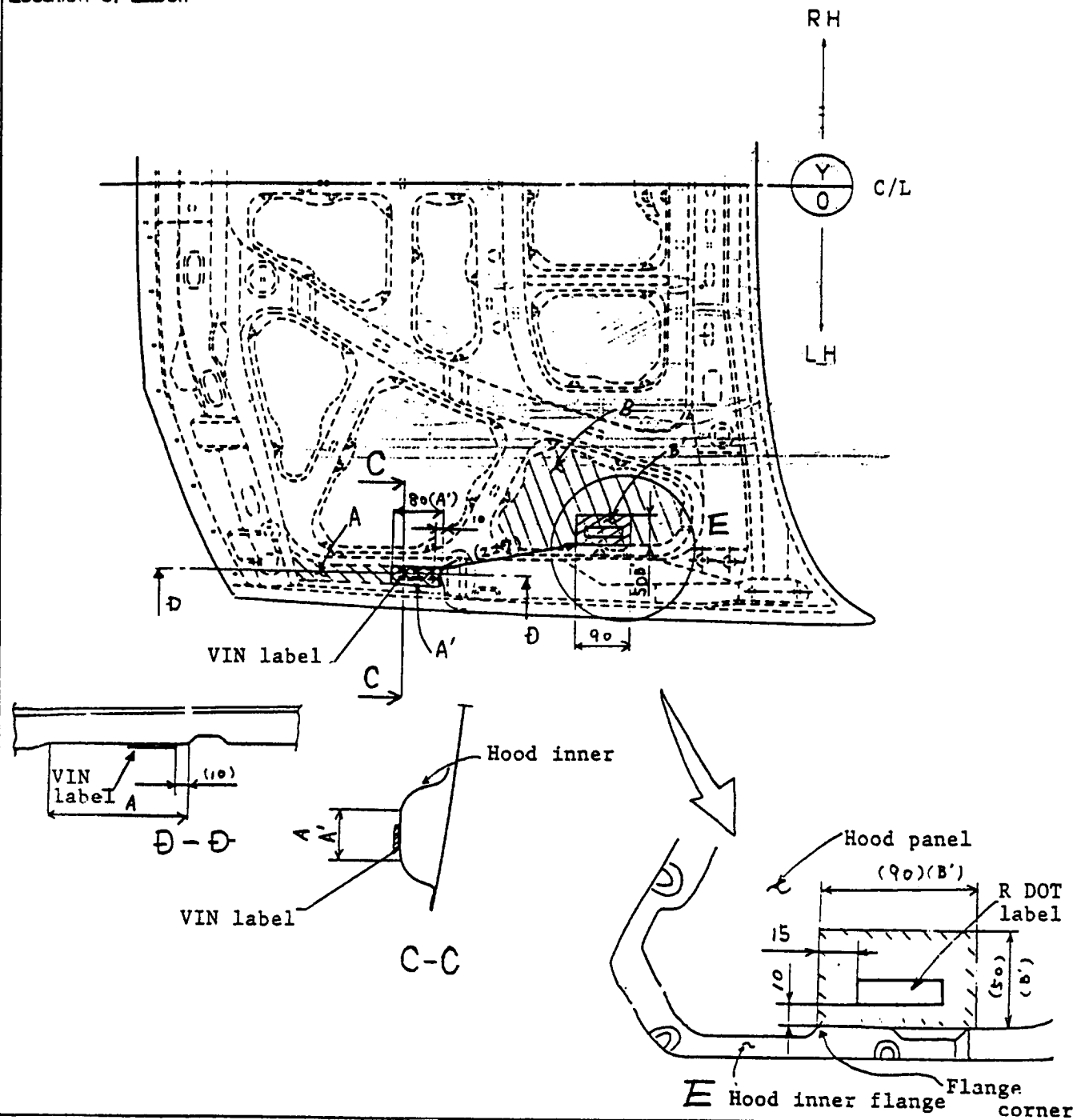
HOOD

Applicability: SUBARU LEGACY

4 Door Sedan ☒

Station Wagon ☒

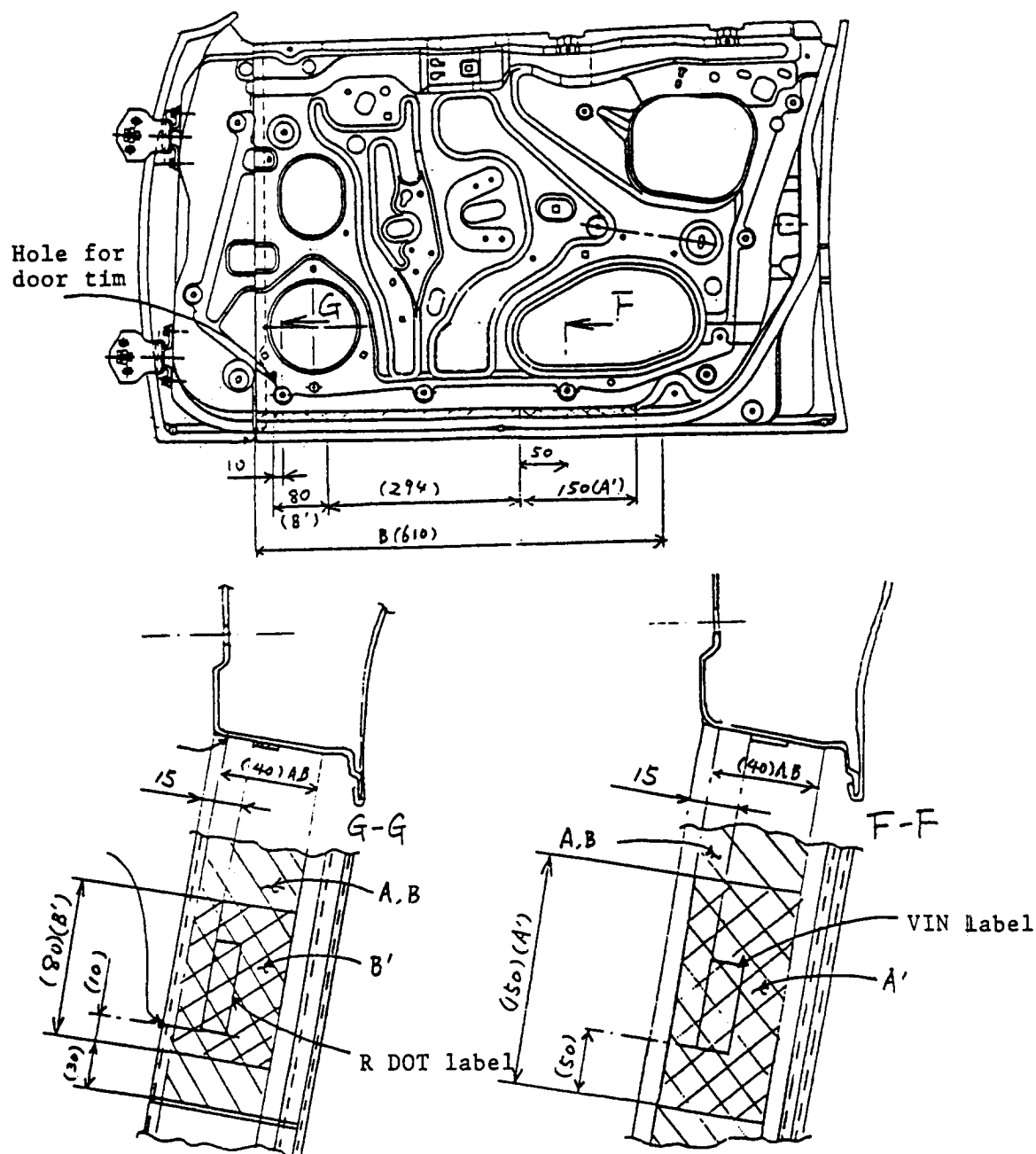
Location of Label:



Part Name: FRONT DOOR	Applicability: SUBARU LEGACY 4 Door Sedan ☒ Station Wagon ☒	
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Location of Label:

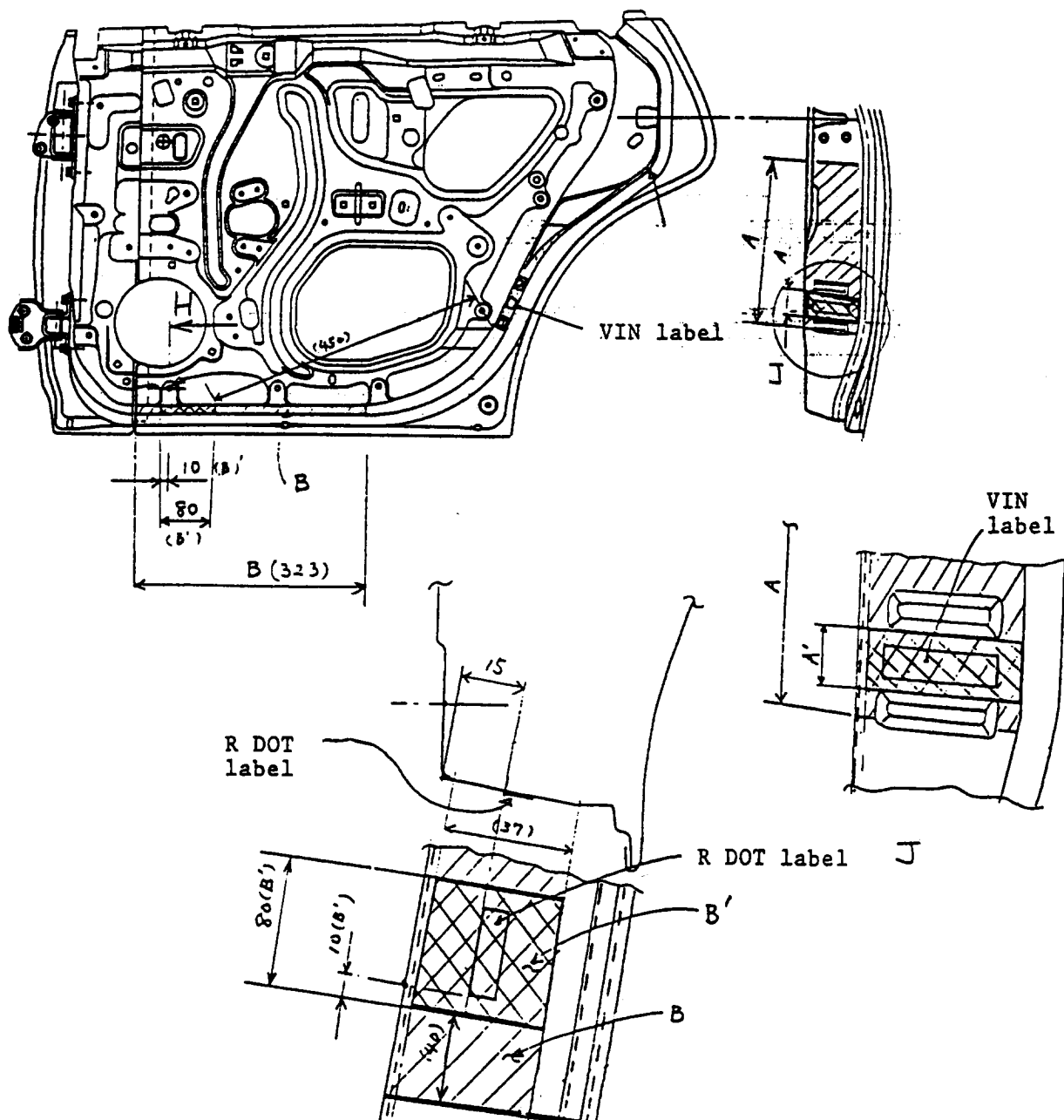
This drawing shows right side.



Part Name: REAR DOOR	Applicability: SUBARU LEGACY 4 Door Sedan ☒ Station Wagon ☒	
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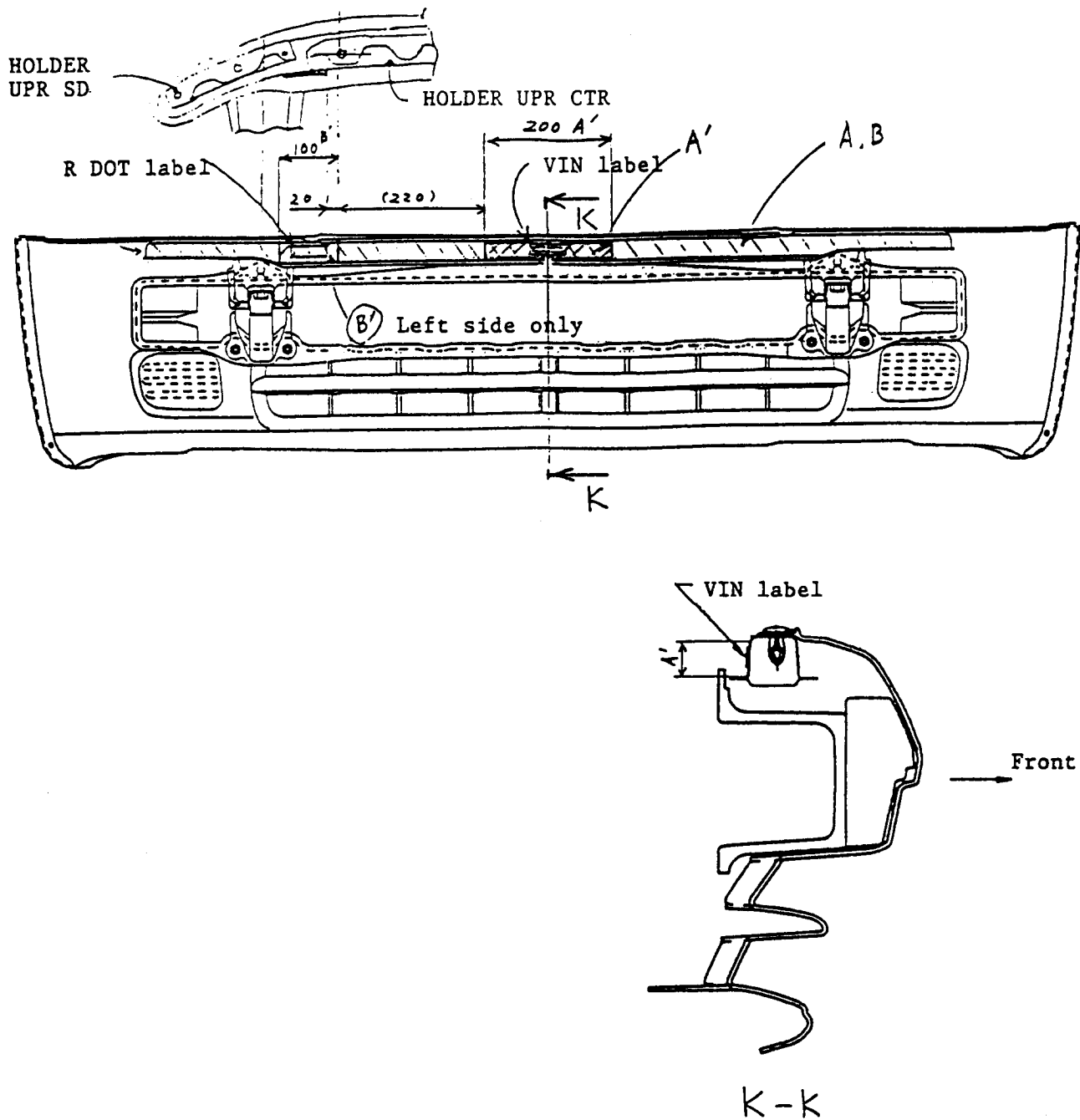
Location of Label:

This drawing shows right side.



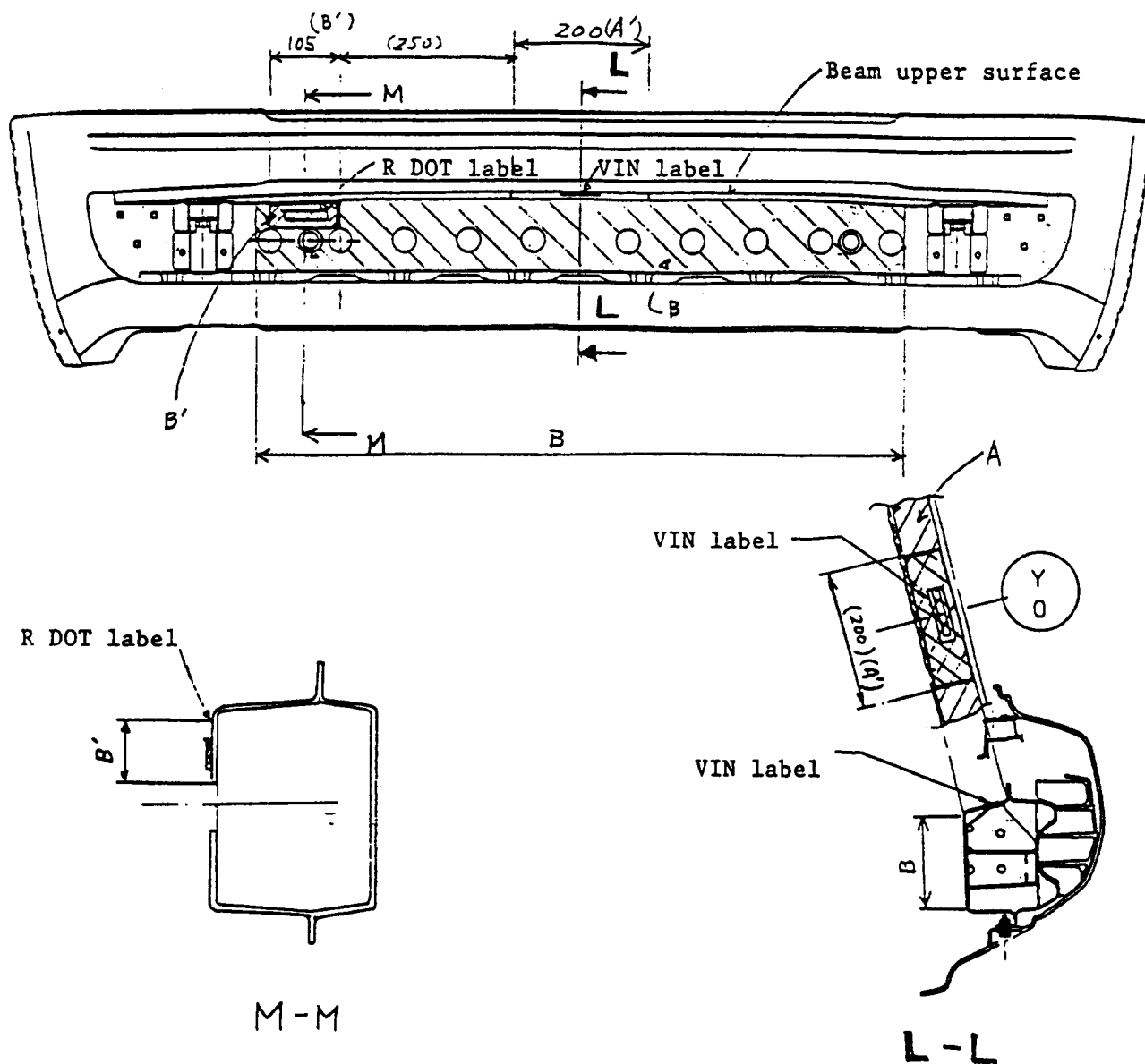
Part Name: FRONT BUMPER	Applicability: SUBARU LEGACY 4 Door Sedan ☒ Station Wagon ☒	
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Location of Label:



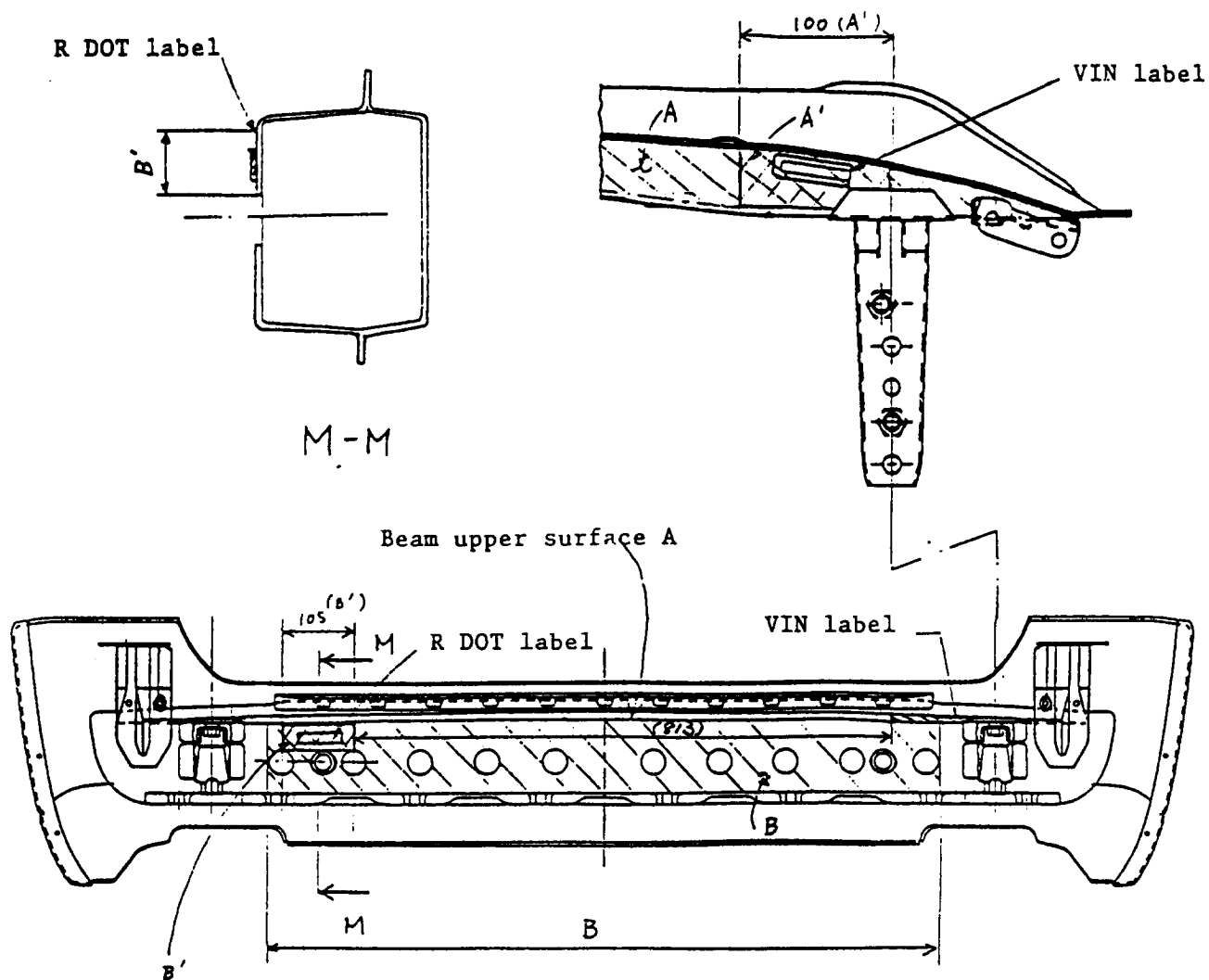
Part Name: REAR BUMPER	Applicability: SUBARU LEGACY 4 Door Sedan ☒ Station Wagon ☐	
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Location of Label:



Part Name: REAR BUMPER	Applicability: SUBARU LEGACY 4 Door Sedan ☐ Station Wagon ☒	
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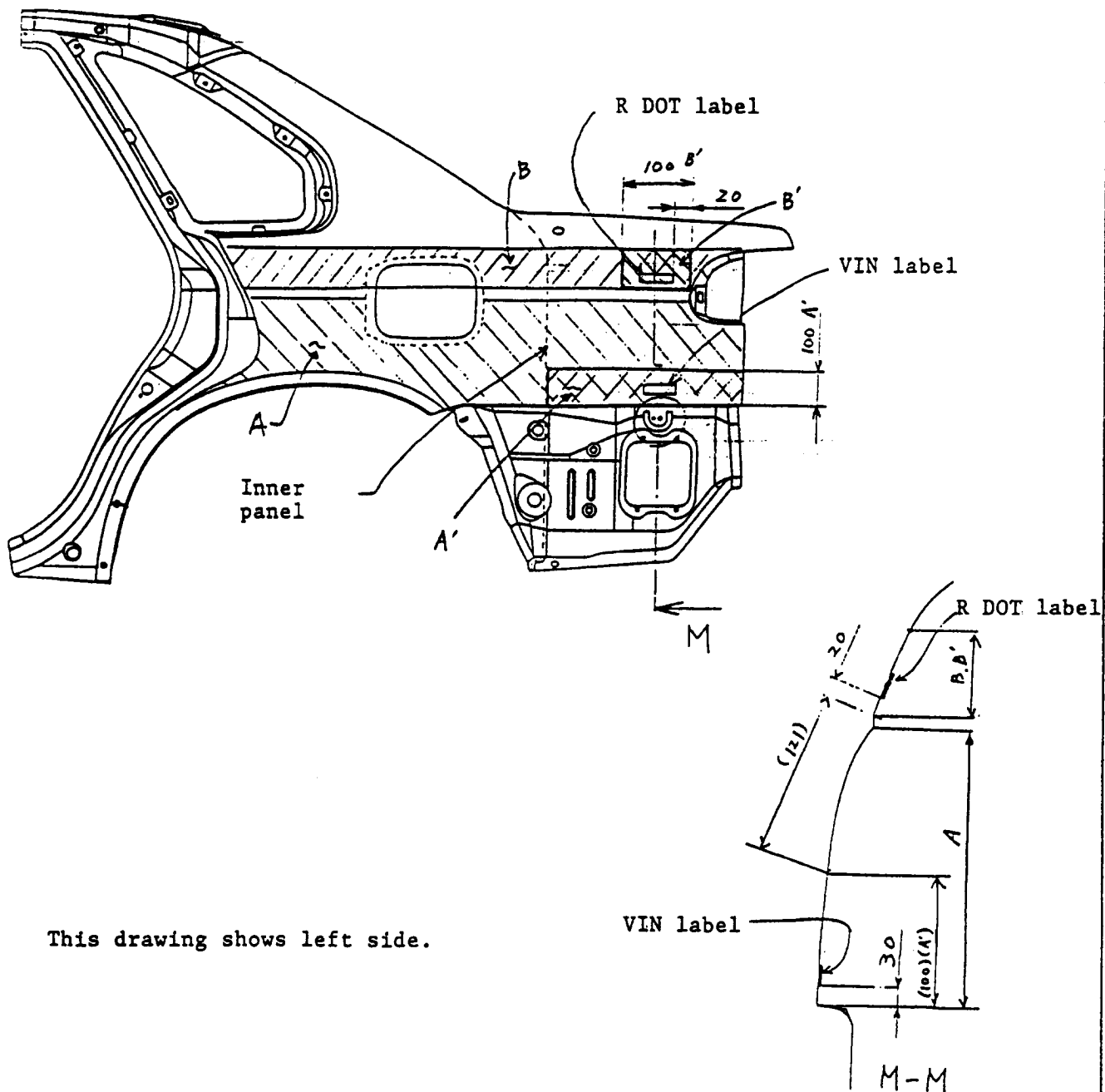
Location of Label:



Part Name:
REAR QUARTER PANEL

Applicability: SUBARU LEGACY.
4 Door Sedan ☒
Station Wagon ☐

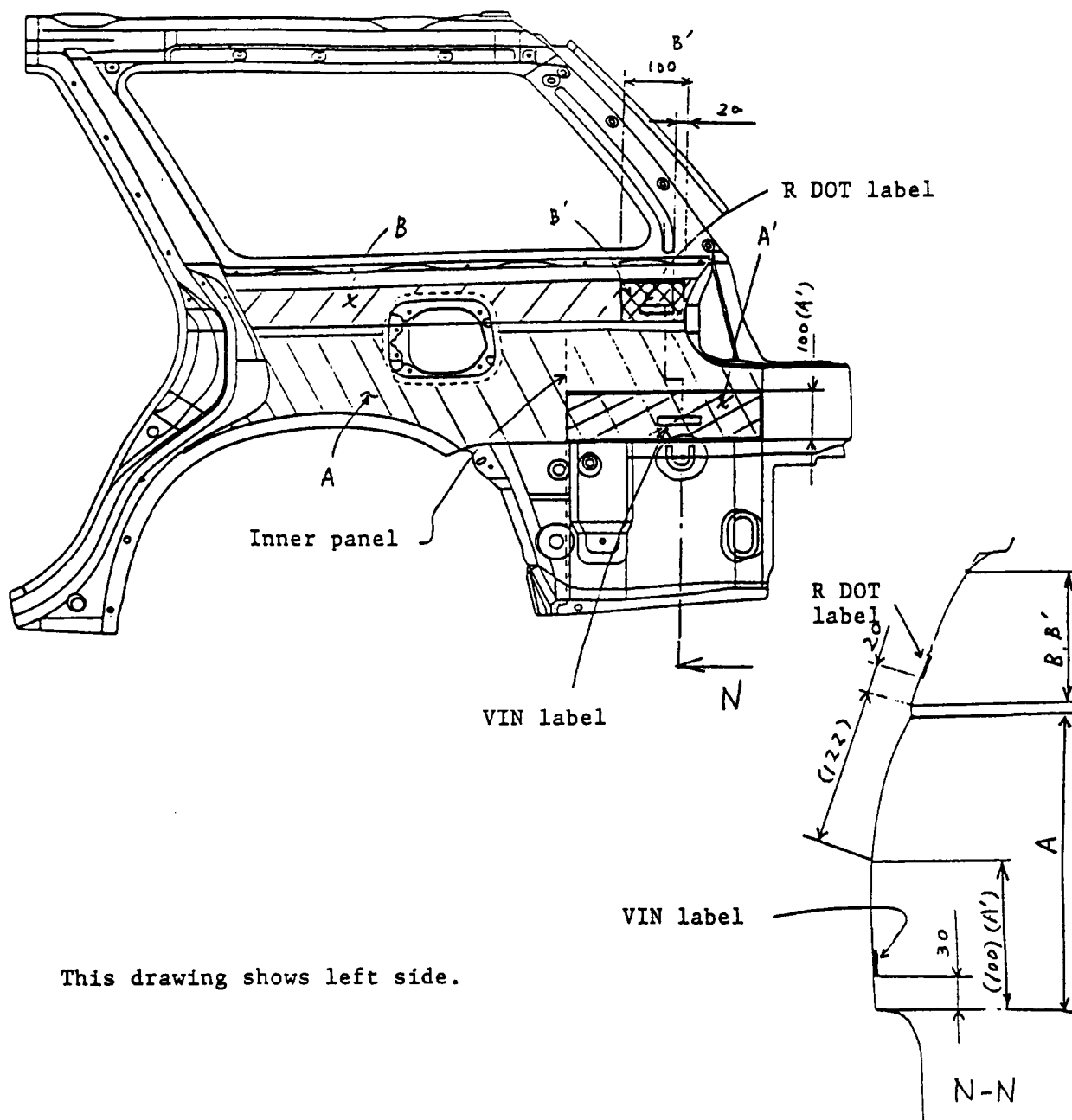
Location of Label:



Part Name:
REAR QUARTER PANEL

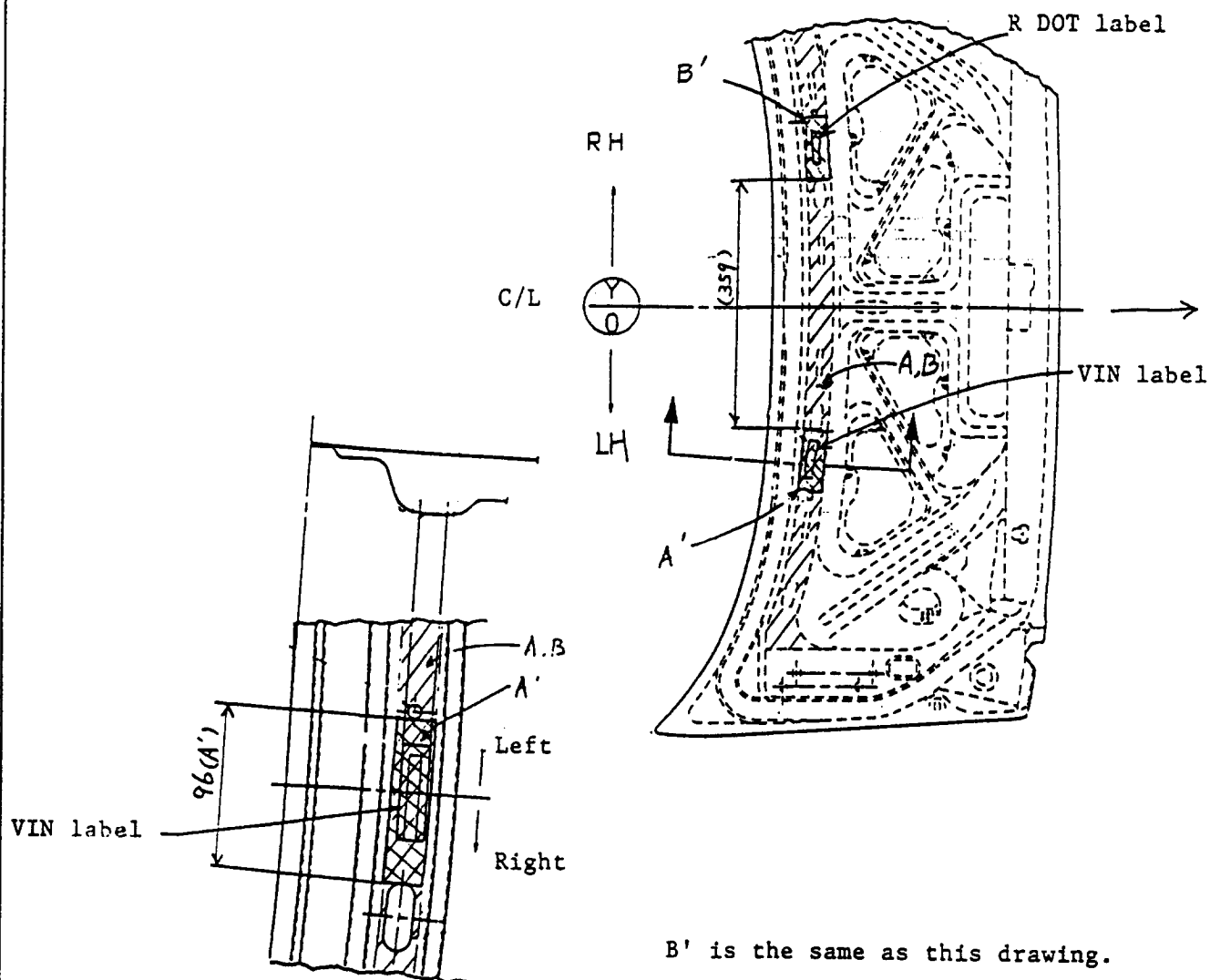
Applicability: SUBARU LEGACY
4 Door Sedan ☐
Station Wagon ☒

Location of Label:



Part Name: DECKLID	Applicability: SUBARU LEGACY 4 Door Sedan ☒ Station Wagon ☐	
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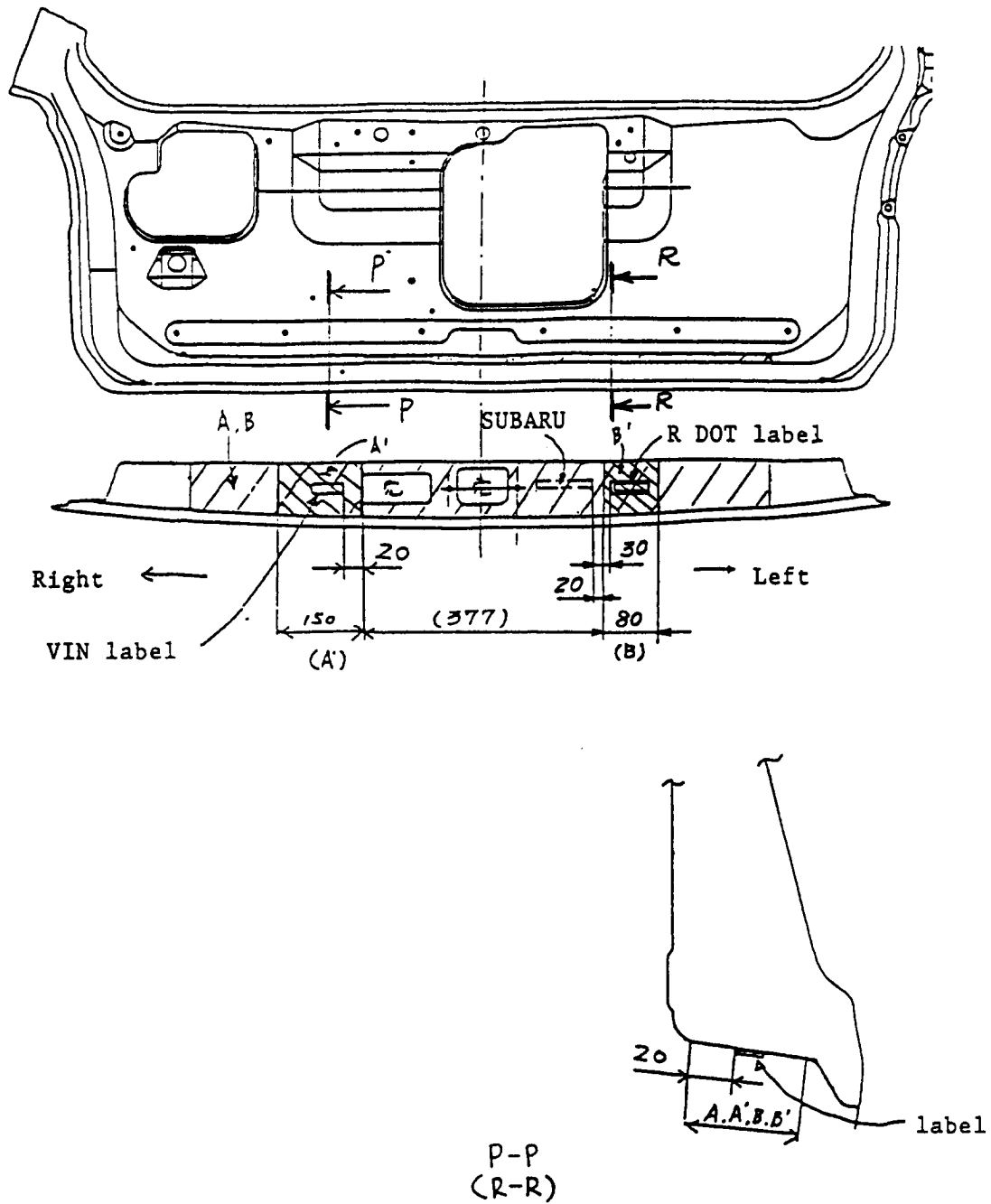
Location of Label:



Part Name:
TAILGATE

Applicability: SUBARU LEGACY
4 Door Sedan ☐
Station Wagon ☒

Location of Label:





SERVICE BULLETIN

APPLICABILITY ALL MODELS 1990 - 1999**DATE** 12/23/96**SUBJECT** RECOMMENDED SEALANTS AND ADHESIVES

Please use this information to update the Genuine Subaru Service Manuals section 1-3, General Information, "Sealants and Adhesives". All products listed in this bulletin are trademarks of the 3M, CEMENDINE, DOW-CORNING, THREEBOND, STAR CALK, ESSEX, SIKA and LOCTITE/ PERMATEX Corporations.

SEALANTS

APPLICATION	RECOMMENDATION	EQUIVALENTS
Differential oil drain plug, bearing cap #5 (Impreza only), oil pressure switch, etc.	THREEBOND 1105 (also referred to as FUJI BOND "C") SOA part number #004403010	3M T-3 Silicone (black) #08670
Oil pump and transmission case mating surfaces, flywheel and drive plate attachment bolts, engine service hole plug, coolant drain plug, oil separator cover, etc.	THREEBOND SUPER 1215 SOA part number #004403007	3M T-3 Silicone (black) #08670 LOCTITE/ PERMATEX #599 Ultra-Grey
Sealing weatherstripping and body grommets against water or dust entry.	STAR CALKING B-33A	3M Weatherstrip Adhesive (Black) #08011 or 3M Stripcalk #08578
Oil pan mating surface, oil pressure switch (Impreza only), etc.	THREEBOND 1207C SOA part number #004403012	3M T-3 Silicone (black) #08670 LOCTITE/ PERMATEX #599 Ultra-Grey
Transmission pan mating surface (4EAT without a paper gasket)	THREEBOND 1217B	3M T-3 Silicone (black) #08670 LOCTITE/ PERMATEX #599 Ultra-Grey
Roof rack, slat and rear spoiler hole sealing against water and dust entry.	Recommendation not available	3M T-3 Silicone (black) #08670
Water pump mechanical seal (Justy only)	THREEBOND 1303	LOCTITE/ PERMATEX #272 High strength and high temperature sealant

Note: The 3M T-3 Silicone product #08670 is "Oxene based" which is odor free and will not affect vehicle sensors I.E., oxygen sensor, etc.

CAUTION

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Special Instructions for using Silicone Sealants and Adhesives

- The bonding surfaces must be clean and dry.
- Silicone will not adhere to dried or Silicone products that sit for 10 minutes prior to joining the bonding surfaces because of surface skinning.
- Wait a minimum of (2) hours before installing fresh fluids, I.E., Engine oil, ATF, Anti-freeze, etc.
- 3M recommends using Coated Abrasive Discs and/or Scotch Brite (TM) surface conditioning products prior to applying silicone materials. For more information call the 3M Corporation Helpline at 1-800-3M HELPS.

ADHESIVES

APPLICATION	RECOMMENDATION	EQUIVALENTS
Weather stripping and other rubber parts including plastics and textiles. Except soft vinyl parts.	CEMENDINE 5430L	3M Super Weatherstrip Adhesives; #08001, #08002, #08008
Soft vinyl parts and other parts subjected to gasoline, grease, or oil. I.E., trim leather, gear shift boot, door handle cover, etc.	CEMENDINE 540	NO EXACT EQUIVALENT. 3M recommends; • Trim repairs #08001 • Leather repairs #08064 • Plastic Emblem repairs #08061 • Fabric repairs (spray) #08090
Metal, glass, plastic, rubber parts bonding and repairs to slightly torn weather stripping, etc.	CEMENDINE 3000	3M Quick Fix Adhesive #08155
Windshield and rear glass bonding to body.	ESSEX CHEMICAL CORPORATION URETANE "E"	3M Super fast urethane #08609 and Primer #08608
Impreza and Legacy models with "locking" style wheelcovers.	DOW CORNING 700 (black) 10.3 oz. cartridge for use with a caulking gun.	3M Super Silicone Sealant #08664(black) for use with a caulking gun or 3oz. tube #08662
Impreza S/W Roof spoiler bracket bonding to rear glass.	SIKA SF 255FC and primer SIKA SC 205	3M Fast Cure Epoxy #08107 or Channel Bonding and Sidelite Adhesive #08641.
Rear Window Defogger terminal tab bonding to glass.	Recommendation not available	LOCTITE/ PERMATEX #21351
Rear Window Defogger grid repair.	Recommendation not available	LOCTITE/ PERMATEX ##15067

Note: Whenever using the products mentioned in this bulletin, always follow the manufacturers recommendations and precautions.

SUBARU®



NUMBER 01-145-97

SERVICE BULLETIN

APPLICABILITY ALL SUBARU VEHICLES

DATE 06-06-97

SUBJECT TIE DOWN PROCEDURES TO PREVENT ENGINE DAMAGE

When any Subaru vehicle is tied down, it is required that the transmission be left in neutral with the emergency brake firmly applied. The vehicle is to be kept in neutral during transportation.

Please ensure all necessary personnel are informed of this important information.

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ATTENTION:GENERAL MANAGER ☐
CLAIMS PERSONNEL ☐PARTS MANAGER ☐
SERVICE MANAGER ☐

SUBARU *IMPORTANT - All Service Personnel Should Read and Initial***SERVICE BULLETIN****APPLICABILITY:** ALL MODELS 2000 - 2004MY**NUMBER:** 01-148-99**SUBJECT:** 2000MY Wiper Washer System**DATE:** 09/20/99

Most early production 2000MY Legacy vehicles had the Windshield Washer Reservoir filled with plain water instead of washer fluid solvent. Beginning with vehicles produced August 2, 1999, a change was made back to washer fluid. At approximately the same time, the green connector to the Windshield Washer Tank Pump was no longer connected during the production process. Due to these changes, please take note of the following:

1. **All 2000MY Legacy vehicles produced from August 2 to present will need to have the green washer tank pump connector plugged in during the PDI process.**
(The connector can be found at the base of the washer reservoir in front of the left strut tower.)
2. Vehicles with water (reservoir fluid, clear) will need to have washer solvent added to prevent freezing.

Starting VIN Numbers Effected

Body Type	From Water to Fluid	Connector Unplugged
4-Door Sedan	Y*200044	Y*200264
Station Wagon	Y*301994	Y*301138
Outback	Y*608438	Y*608595

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ATTENTION:GENERAL MANAGER ☐
CLAIMS PERSONNEL ☐PARTS MANAGER ☐
SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial

SUBARU **WARRANTY SERVICE BULLETIN****APPLICABILITY:** All years and models with automatic transaxles**NUMBER:** 01-154-02**SUBJECT:** Remanufactured Transaxle Repair**DATE:** 11/01/02**INTRODUCTION**

The last paragraph of Section 8.4.33.1 (Page 8.4.108) in the CDS Policies and Procedures Manual is amended to read as follows:

“Certain repairs may now be performed to a remanufactured transaxle that has been installed on a vehicle. A District Service Operations Manager authorization is required on all repairs or replacements of remanufactured units. Repairing a remanufactured unit, as opposed to replacing it, is optional and left to the dealer’s discretion.”

A specific list of allowable parts replacement on a remanufactured transaxle unit is as follows:

A/T Fluid Dipstick Tube	Shift Solenoid A
A/T Fluid Dipstick Tube O-Ring	Shift Solenoid B
A/T Fluid Dipstick	Line Pressure Duty Solenoid
A/T Vent Hose	Low Clutch Timing Solenoid
Pressure Check Access Plug	Lock-up Duty Solenoid
A/T Oil Filter	2-4 Brake Duty Solenoid
A/T Oil Cooler Pipe Gasket	2-4 Brake Timing Solenoid
Inhibitor Switch	Sport Shift Solenoid
Dust Seal	A/T Selector Lever
Rear Extension Seal	A/T Selector Shaft Seal
Transfer Case Gasket	Selector Detent Plate
Oil Pan Drain Plug	Parking Pawl
Oil Pan Drain Plug Gasket	Parking Pawl Rod
Torque Converter	Parking Pawl Spring

A complete remanufactured assembly must be used for any other remanufactured transaxle failure.

External electrical components not supplied with a remanufactured transaxle must be tested and, if necessary, repaired before proceeding with unit replacement.



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ATTENTION:

GENERAL MANAGER ○ PARTS MANAGER ○
 CLAIMS PERSONNEL ○ SERVICE MANAGER ○

IMPORTANT - All Service Personnel Should Read and Initial

SUBARU

SERVICE BULLETIN

APPLICABILITY: All Vehicles; All Dealer Service Personnel

NUMBER: 01-155-03

DATE: 04-17-03

SUBJECT: Subaru Technical Information System (STIS) Availability

Subaru of America, Inc. is proud to announce the newly created Subaru Technical Information System (STIS). This system is available free of charge through a link on www.subarunet.com to all Subaru dealerships.

You will have access to electronic versions of Service Manuals, Owners Manuals, Service Bulletins, Training Materials, Product/Service Campaign Bulletins, Warranty Bulletins and much more.

To access the site, simply:

- 1) Log-on to www.subarunet.com as you would normally do.
- 2) Navigate to the **Service** link under the “**Business**” banner.
- 3) Select “**STIS - Subaru Tech Info Sys**”.

Search for Publications via Publication Type and by Model Year and Model Line Information.

Search for Publications via Vehicle ID.

Search for Publications via Literature Number.



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WARRANTY BULLETIN

APPLICABILITY: All Manual Transmission Vehicles
SUBJECT: Warranty Information Update

NUMBER: 01-156-03
DATE: 11/18/03

INTRODUCTION

This bulletin reinforces Subaru of America's (SOA) position regarding repairs to Subaru vehicles necessitated by vehicle modifications, racing or abusive driving habits.

Under normal driving conditions SOA warrants wear items such as clutch discs and brake pads under the terms of the Basic New Car Warranty. If a clutch disc or a brake pad needs to be replaced at low mileage, the dealership must satisfy itself that the replacement is not the result of one of the exclusions listed in the CDS Policy, Guidelines and Procedures Manual and the Owner's Warranty Maintenance Manual.

Reference: CDS Policy, Guidelines and Procedures Manual

Sections: 8.1.10, 8.2.6.7 and 8.2.7.10

Reference: 2004 Warranty and Maintenance Manual

Pages 13 and 14

Other components that may require repair due to abuse, racing or unauthorized modifications include, but are not limited to:

- Transmission
- Differential
- Propeller Shaft
- Axle, Front or Rear
- Engine
- Emission System
- Suspension components
- Tires

If a determination for the cause of the failure cannot be made, the dealer must consult its **District Service Operations Manager** for authorization **prior** to proceeding with repairs under warranty.



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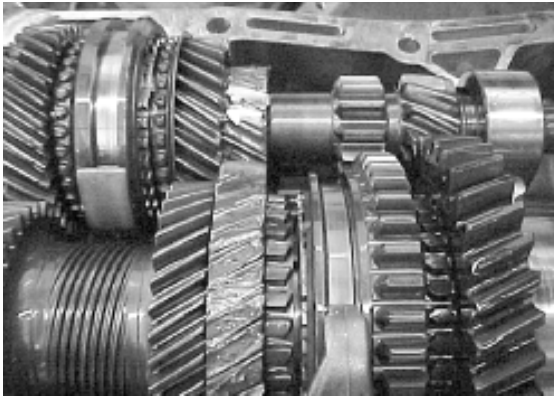
Some examples of abusive driving are exceeding maximum recommended RPMs, excessive torque transferred to the transmission during acceleration from a complete stop (dumping the clutch), downshifting at high RPMs and missing shifts.

The term "racing" refers to all forms of racing whether street, drag, rally, sanctioned or unsanctioned, etc. Any damage that results from racing is not warrantable.

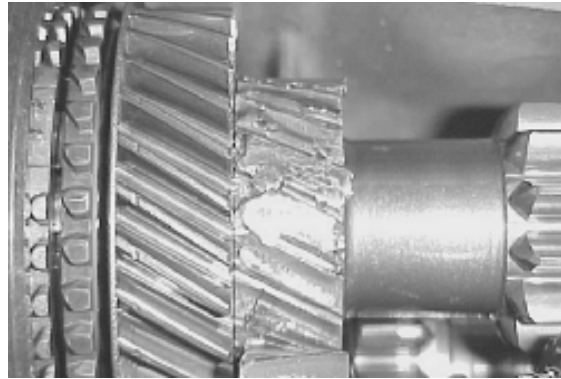
EXAMPLES

The photos below depict some results of abusive driving.

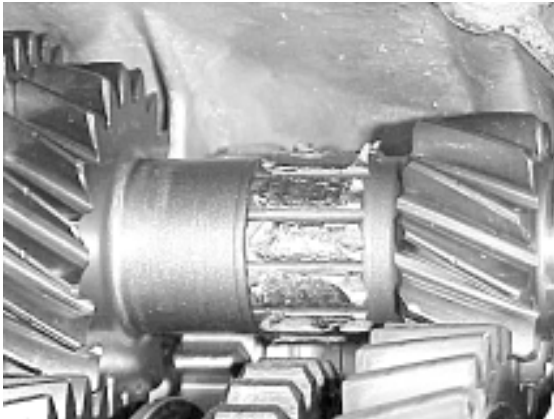
Second Gear Teeth Missing



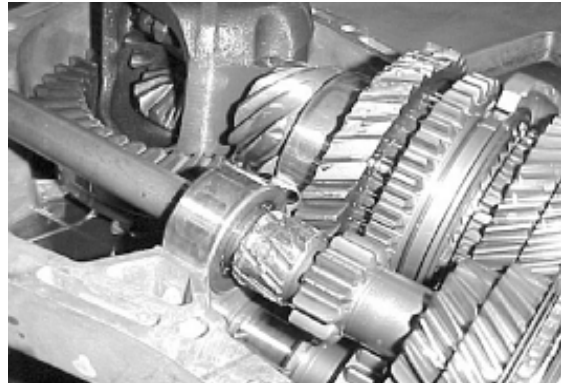
Second Gear Teeth Missing



Reverse Gear Teeth Stripped



First Gear Teeth Stripped from Mainshaft



6-Speed 1-2 Shift Interlock Arm Broken



SERVICE BULLETIN

APPLICABILITY

ALL MODELS 1990 - PRESENT

DATE

04-09-90

SUBJECT:**ENGINE OIL PAN REMOVAL**

This bulletin is for information only.

Use caution when removing the oil pan from Legacy engines to avoid damaging the block. The oil pan uses a fluid packing adhesive/sealant (Three Bond 1207C, P/N 004403012) in place of a gasket to seal the oil pan to the block. This seal must be broken to remove the oil pan. A gasket scraper or putty knife shaped tool can be used to perform the duties of the "oil pan cutter tool" described in the Legacy Service Manual 2-3, page 42 (W6A2).

To remove the oil pan, first remove the retaining bolts. Then, preferably using two tools, work them in between the oil pan and block mounting surface. Remove and repeat while prying as necessary, until the pan becomes free.

To avoid damaging the block be sure to:

1. Insert the tools flush with the block mounting surface to prevent them from digging in and gouging the block surface.
2. Avoid working in the sections of the engine where the block halves meet. This will prevent the possibility of hitting a stepped edge and damaging the block.



SUBARU

SERVICE BULLETIN

APPLICABILITY: 1999~04MY Forester 2.5L SOHC N/A,
1999~04MY Impreza 2.5L SOHC N/A,
2000~04MY Legacy 2.5L SOHC N/A
(Except 2004MY Legacy U5 Specification
Vehicles)
2003~06MY Baja 2.5L SOHC N/A

NUMBER: 02-94-05R
DATE: 12/01/06

SUBJECT: Revised Cylinder Block Specifications

INTRODUCTION

This service bulletin is to inform you that Fuji Heavy Industries, Ltd. (FHI) has revised the maximum bore diameter and the out of roundness limits of the cylinder bore. In conjunction with this, they have also released 60-micrometer (0.0024") oversized pistons.

AFFECTED VEHICLES AND PARTS INFORMATION

YEAR	ENGINE TYPE	MODEL	OVERSIZE PISTON PART NUMBER	GRADE
1999	2.5L SOHC N/A	Impreza/Forester	12006AC930	A
			12006AC940	B
2000~04	2.5L SOHC N/A	All	12006AC910	A
			12006AC920	B
2003~06	2.5L SOHC N/A	Baja	12006AC910	A
			12006AC920	B
RING SET FOR 2 PISTONS			12033AB880	
GASKET SET FOR REPLACING ONE SIDE ONLY			10104AA040	

REPAIR PROCEDURES/INFORMATION

When engine disassembly for repair is necessary the revised specifications must be used. The revised maximum bore diameter and the out of roundness limits of the cylinder bore are:

Maximum Bore Diameter

"A" = 3.9207"

"B" = 3.9203"

Out of Roundness Limit

0.0028"

continued...



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Refer to the appropriate service manual for the measuring process.

Note: Slight scuffing/scoring or discoloration to the cylinder bore is normal and should not result in an engine block replacement.

During reassembly if the OE piston to cylinder bore clearance is found to be excessive the pistons listed in this bulletin should be used to obtain the correct clearance.

CLAIM REIMBURSEMENT/WARRANTY INFORMATION

For vehicles within the Basic New Car or Powertrain Limited Warranty, refer to the Subaru Warranty Wizard[®] for claim submission information. All engine measurements must be noted on the repair order.

ATTENTION:GENERAL MANAGER ☐
CLAIMS PERSONNEL ☐PARTS MANAGER ☐
SERVICE MANAGER ☐

**SUBARU**

IMPORTANT - All Service Personnel Should Read and Initial

SERVICE BULLETIN

APPLICABILITY: 00~03MY Legacy/Outback;
04MY Legacy/ Outback Fed Spec only;
03~05MY Baja; 99~05MY Forester;
99~04MY Impreza with 2.5L SOHC engines

NUMBER: 02-96-05**DATE:** 09/09/05**SUBJECT:** 2.5L Remanufactured SOHC Short Block Release**INTRODUCTION**

Subaru of America, Inc. is making available remanufactured SOHC short blocks for use in engine repairs when the original equipment short block must be replaced, with the exception of new (in-stock) unsold vehicles. These remanufactured short blocks include oil pans, water pumps, thermostats, thermostat housings, and oil pumps. When compared with conventional repairs using an original equipment replacement short block, a new water pump, and new oil pump, these remanufactured short blocks provide significant savings to customers. These replacement assemblies are factory tested for peak performance. Each remanufactured SOHC short block is covered by the Genuine Subaru Remanufactured Engine Limited Warranty for 3-year or 36,000 mile from the date and mileage of installation (whichever occurs first), the Limited Warranty for Genuine Subaru Replacement Parts, or the balance of the Subaru New Vehicle Limited Warranties (when installed by a Subaru dealer) whichever is applicable.

PARTS INFORMATION

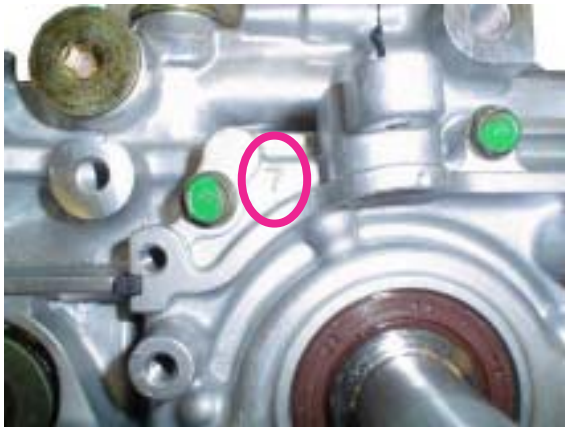
SOA450H300R1	REMAN SOHC SHORT BLOCK	Replaces 10103AB100
SOA450H400R1	REMAN SOHC SHORT BLOCK	Replaces 10103AB120 for 02MY Impreza only and 10103AB190 for 02MY Forester only
SOA450H500R1	REMAN SOHC SHORT BLOCK	Replaces 10103AB190
SOA450H600R1	REMAN SOHC SHORT BLOCK	Replaces 10103AB380 and 10103AB390 except for 03~05MY Forester (manual transmission only)
SOA450H700R1	REMAN SOHC SHORT BLOCK	Replaces 10103AB390 for 03~05MY Forester w/ 4EAT only

Continued on next page...**CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.**

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Vehicle Model	Engine Type	Original Equipment SOA Short Block PN	Remanufactured Replacement	Starting Production Date	Ending Production Date	PCV Pipe	Oil Pump	Water Pump
99 Forester 00-01 Forester 02 Forester 03-05 Forester MT 03-05 Forester AT	2.5L SOHC NA 2.5L SOHC NA 2.5L SOHC NA 2.5L SOHC NA 2.5L SOHC NA	10103AB100 10103AB190 10103AB190 10103AB380 10103AB390	SOA450H300R1 SOA450H500R1 SOA450H400R1 SOA450H600R1 SOA450R700R1	Mar-98 Apr-99 Dec-00 Nov-01 Nov-01	Jun-99 Feb-01 Feb-02 Mar-04 Mar-04	Non-threaded pipe for PCV Non-threaded pipe for PCV Non-threaded pipe for PCV Threaded pipe for PCV Threaded pipe for PCV	9mm 9mm 7mm 7mm 7mm	w/o cooler pipe w/o cooler pipe w/o cooler pipe w/o cooler pipe w/ cooler pipe
99 Impreza 00-01 Impreza 02 Impreza 03-04 Impreza MT 03-04 Impreza AT	2.5L SOHC NA 2.5L SOHC NA 2.5L SOHC NA 2.5L SOHC NA 2.5L SOHC NA	10103AB100 10103AB190 10103AB120 10103AB380 10103AB390	SOA450H300R1 SOA450H500R1 SOA450H400R1 SOA450H600R1 SOA450R600R1	Dec-97 Aug-98 Sep-00 Apr-02 Apr-02	Jun-99 Nov-00 May-02 Mar-04 Mar-04	Non-threaded pipe for PCV Non-threaded pipe for PCV Non-threaded pipe for PCV Threaded pipe for PCV Threaded pipe for PCV	9mm 9mm 7mm 7mm 7mm	w/o cooler pipe w/o cooler pipe w/o cooler pipe w/o cooler pipe w/o cooler pipe
00-01 Legacy / Outback MT 00-01 Legacy / Outback AT 02-03 Legacy / Outback MT 02-03 Legacy / Outback AT 04 FED Legacy / Outback MT 04 FED Legacy / Outback AT	2.5L SOHC NA 2.5L SOHC NA 2.5L SOHC NA 2.5L SOHC NA 2.5L SOHC NA 2.5L SOHC NA	10103AB180 10103AB190 10103AB380 10103AB390 10103AB380 10103AB390	SOA450H500R1 SOA450H500R1 SOA450H600R1 SOA450R600R1 SOA450H600R1 SOA450R600R1	Feb-99 Feb-99 Feb-01 Feb-01 Jan-03 Jan-03	May-01 May-01 Jun-03 Jun-03 Feb-04 Feb-04	Non-threaded pipe for PCV Non-threaded pipe for PCV Threaded pipe for PCV Threaded pipe for PCV Threaded pipe for PCV Threaded pipe for PCV	9mm 9mm 7mm 7mm 7mm 7mm	w/o cooler pipe w/o cooler pipe w/o cooler pipe w/o cooler pipe w/o cooler pipe w/o cooler pipe
03-05 Baja MT 03-05 Baja AT	2.5L SOHC NA 2.5L SOHC NA	10103AB380 10103AB390	SOA450H600R1 SOA450H600R1	Jul-02 Jul-02	Apr-05 Apr-05	Threaded pipe for PCV Threaded pipe for PCV	7mm 7mm	w/o cooler pipe w/o cooler pipe

Visual identification of 7mm and 9mm oil pumps.



Visual identification of threaded and non-threaded PCV pipes.



Visual identification of water pump with oil cooler pipe and without.



REPAIR PROCEDURES/INFORMATION

A gasket kit has been made available to speed the installation process. The kit (SOA Part Number 10105AA930) includes all the gaskets required for a basic short block replacement, including rocker cover gaskets. Three Bond sealers are not included. Oil filler duct and oil level gauge (dipstick) o-rings are not included and will need to be ordered separately if needed.

Continued on next page...

The configuration of the remanufactured SOHC short block requires some component transfer depending upon the existing engine configuration. Any transferred components should be inspected and replaced if necessary.

Be sure to remove the three plastic transit plugs (shown below) prior to installation. One is located in the oil pressure switch plug. The others are in the main oil gallery ports that feed each head.



If the engine being replaced has an oil cooler installed, the oil cooler assembly, oil cooler pipe, hoses, nipple, thermostat housing, and connector will need to be transferred from the existing block to the replacement hybrid block. Any transferred parts should always be inspected and replaced if needed. New oil cooler o-ring and thermostat gaskets are part of the gasket kit (10105AA930). The metal gasket for the oil cooler nipple should be re-used. Apply Threebond 1215 (SOA Part Number 004403007) to the threads of the oil cooler nipple to prevent coolant leakage. This transfer of components will require removal of the remanufactured short block's factory installed oil filter. In this case, the oil filter should be replaced. In the case of those engines without an oil cooler, there is no need to replace the oil filter that comes with the remanufactured short block. The water pump installation on the remanufactured short block already includes a thermostat and housing.

A small amount of oil will remain in the oil filter and pan following factory testing. There is no need to attempt to remove this oil. Oil will need to be added as part of the installation process, as the remaining oil in the engine is insufficient for engine operation. Always use oil of specified viscosity and grade as listed in the appropriate Subaru Service Manual.

As with any engine repair where the coolant is replaced, Genuine Subaru Coolant and Genuine Subaru Cooling System Conditioner must be used when re-filling the system for any repairs paid for by Subaru of America, Inc. Genuine Subaru Coolant and Genuine Subaru Cooling System Conditioner are recommended for usage in all repairs to maintain peak performance and inhibit corrosion. When installing cooling system conditioner be sure to follow the installation guidelines in the April 2004 Tech Tips (available on STIS) to ensure maximum performance.

Even though the Subaru Reman SOHC Short Block has been tested at the factory, it needs to be treated as a dry engine on initial start up. After installing the engine and filling it with the appropriate amount of engine oil and coolant, it should be cranked with no compression to allow oil circulation and the development of normal oil pressure. During this process the spark plugs should be removed, the fuel pump disabled, and ignition system disabled. Please see the appropriate Subaru Service Manual for these procedures. The engine should be cranked for no more than 3 consecutive 15 second cycles to prevent starter damage. The oil pressure level can be confirmed through observation of the vehicle's oil pressure indicator lamp or in more detail through use of an approved oil pressure gauge.

Continued on next page...

Customers should be instructed to follow new vehicle break-in driving procedures as described in the owner's manual.

A remanufactured short block must be used when replacing an original equipment short block anytime Subaru of America, Inc pays for the repair, with the exception of any repair to a new (in-stock) unsold vehicle.

Remanufactured short blocks can be easily identified due to a yellow RDOT tag on the unit's bell housing.

Repairs may be performed under warranty for manufacturing defects relating to the listed external component parts of the remanufactured short block.

These items include:

- The water pump and water pump gasket
- Thermostat, Thermostat housing, or gasket (as supplied with the unit)
- Oil pump, oil pump o-ring, sealer, and crankshaft seal
- Rear main seal
- Oil pan, oil pan sealer, and oil return seal
- Rear separator cover and sealer
- Piston pin access plug and seal
- Coolant production plugs

A DSOM authorization is required prior to replacing or repairing a remanufactured short block.

If there is damage to the internal block components due to the failure of external component(s), the unit should be replaced with another remanufactured short block. If there is an internal failure of a remanufactured short block including but not limited to: crankshaft, connecting rods, pistons, piston rings, bearings, or case the unit should be replaced with another remanufactured short block.

To ensure full core credit, dealers should follow all instructions contained in the Subaru Engine Core Document Packet. This packet contains a core return checklist; credit request and diagnosis form, core return procedures, and shipping labels. All items must be completed legibly and the packet attached to the core as indicated. The copy of the Credit Request and Diagnosis Form marked, as the "DEALER FILE COPY" should be kept as part of the vehicle record.

All engine short block cores must be returned using Roadway Reverse Logistics in order to receive core credit. All fluids must be drained from the core and the core properly packaged in the return container to prevent residual leakage or shipping damage during transit. This includes installing the three plastic transit plugs from the supplied unit. In addition, place the return unit in the original shipping bag or an equivalent substitute and seal it in a manner similar to the supplied unit. **The shipper is responsible for any fluid leakage during return shipment.**

If the core has been partially or fully disassembled, externally damaged, or a junkyard core substituted, no credit will be issued. A complete core consists of the complete short block assembly, oil pump, water pump, thermostat housing, and oil pan as a complete unit. The core should not be disassembled, in order to obtain full credit.

Continued on next page...

CLAIM REIMBURSEMENT/WARRANTY INFORMATION

2.5L remanufactured SOHC short blocks cannot be used for repairs to new (in-stock) unsold vehicles.

For vehicles within the New Vehicle Limited Warranty period, the Genuine Subaru Remanufactured Engine Limited Warranty, or under the terms of the Limited Warranty for Genuine Subaru Parts, repairs may be claimed using the following labor operations and failure coding information. Assembly installation or replacement claims require a DSOM authorization and must include the serial number of the unit installed (as listed on the yellow RDOT tag). The serial number must be placed in the Exch/Serial/Inv# field of the claim entry. Repair claims for external components require a DSOM authorization and must include the repaired unit's serial number in the Exch/Serial/Inv# field of the claim entry.

This information is supplied for use during this program's initial release. Always refer to the Subaru Warranty Wizard application for the most current information.

Continued on next page...

REMAN SOHC SHORT BLOCK INSTALLATION OR REPLACEMENT LABOR OPERATION DESCRIPTION	REMAN SOHC ONLY OPERATION NUMBER	2.5L REMAN SOHC ENGINE TIMES	NOTES
SHORT BLOCK 2.5L REMAN SOHC SHORT BLOCK	B295-041	6.6	+ 0.5 for Automatic Transmission Includes Engine R&R
ENGINE NOISE TESTING AND DIAGNOSIS	C295-101	0.4	Can be claimed one time per repair only.
ENGINE COMPRESSION AND / OR CYLINDER LEAK DOWN TESTING AND DIAGNOSIS	C295-111	1.2	Can be claimed one time per repair only.
REMAN SOHC SHORT BLOCK EXTERNAL COMPONENT REPAIR LABOR OPERATION DESCRIPTION	REMAN SOHC ONLY OPERATION NUMBER	2.5L REMAN SOHC ENGINE TIMES	NOTES
CAM BELT, TENSIONER / PULLEY R&R	B252-201	1.6	Add related 'C' Operation(s)
WATER PUMP / GASKET R&R	C259-401	0.5	
ENGINE OIL PUMP / O-RING R&R	C255-201	0.3	
FRONT CRANKSHAFT OIL SEAL R&R	C256-011	0.1	
ENGINE OIL AND / OR COOLANT LEAK TESTING AND DIAGNOSIS	C245-001	0.4	Can be claimed one time per repair only.
REAR CRANKSHAFT OIL SEAL R&R	B394-241	3.3	Automatic or Manual Transmission. Includes Flywheel or Torque Converter Drive Plate R&R and Leak Testing
ENGINE OIL SEPARATOR COVER, GASKET, SEALER, AND / OR REAR PISTON PIN ACCESS PLUG OR SEAL R&R	B394-601	3.5	Automatic or Manual Transmission. Includes Flywheel or Torque Converter Drive Plate R&R and Leak Testing
OIL PAN, SEALER / OIL RETURN O RING R&R	B255-301	1.2	
ENGINE OIL FILTER R&R	A255-231	0.3	
THERMOSTAT, HOUSING / GASKET R&R	B229-301	0.4	
FRONT PISTON PIN ACCESS PLUG OR SEAL R&R	A245-151	2.2	One or Both Sides. Includes Oil Leak Testing, R&R Cambelt, Cambelt Idler Pulley and/or Cover Spacer
COOLANT PASSAGE PRODUCTION PLUG, RESEAL	A246-152	0.6	Includes Leak Testing and Diagnosis.
OIL PAN DRAIN PLUG OR GASKET R&R	A245-321	0.3	Includes Draining and Refilling of Engine Oil and Filter Replacement if Necessary.

Continued on next page...

PART DESCRIPTION	REMAN SOHC ONLY FAIL CODES	NUMERIC DESCRIPTION CODES
WATER PUMP	CBA	02, 15, 25, 27, 28, 35
WATER PUMP GASKET	CBB	03, 29
ENGINE OIL PUMP	CBC	01, 15, 17, 22, 27
ENGINE OIL PUMP O-RING	CBD	03, 27, 29
FRONT CRANKSHAFT OIL SEAL	CBE	03, 29
OIL SEPARATOR COVER	CBG	27, 28
OIL SEPARATOR COVER SEALER	CBH	29, 34
REAR CRANKSHAFT OIL SEAL	CBI	03, 29
OIL PAN	CBJ	27, 28, 29
OIL PAN SEALER	CBK	29, 34
OIL RETURN O-RING	CBL	03, 29
OIL FILTER	CBM	13, 22, 34
THERMOSTAT	CBN	20, 21, 22, 39, 43
THERMOSTAT HOUSING	CBO	02, 27, 28
THERMOSTAT HOUSING GASKET	CBP	03, 29
PISTON PIN ACCESS PLUG	CBQ	27, 28
PISTON PIN ACCESS PLUG SEAL	CBR	03, 29
COOLANT PASSAGE PRODUCTION PLUG	CBS	02, 03, 27, 28, 29, 35
OIL DRAIN PLUG OR GASKET	CBT	02, 13, 15, 29, 34
REMAN SOHC SHORT BLOCK	AAO	02, 04, 11, 20, 27, 28



SUBARU

SERVICE BULLETIN

APPLICABILITY: All Models
SUBJECT: Cylinder Head Gasket (residual carbon deposits and rubber coating removal)

NUMBER: 02-100-06R
DATE: 10/31/06

INTRODUCTION

The purpose of this bulletin is to provide Subaru's recommended procedure of removing the residual carbon deposits and the rubber coating after the cylinder head/gaskets are removed. If not removed properly, the new cylinder head gaskets may not seat properly when installed. There are two approved methods, using a scraper as illustrated or using 3M™ Roloc™ Bristle Discs, part # 051131-07528, Size 2 inch, Grade 120, Color White. Subaru does not recommend any other cleaning method.

Note: Using any other method which results in damage to the surface of the cylinder heads or block is not a matter for warranty.

REPAIR PROCEDURE/INFORMATION:

For demonstration purposes the photos are of a 2.5L SOHC engine, however the procedure applies to all engine types.



Removed Cylinder Head



Cylinder Block after Head Removal

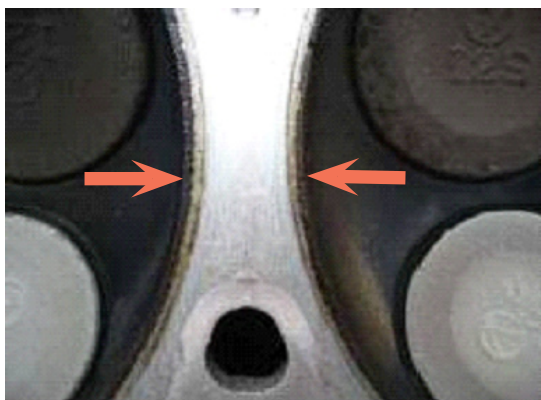
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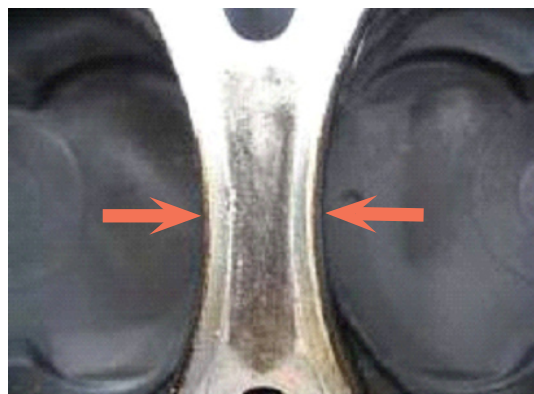
CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.

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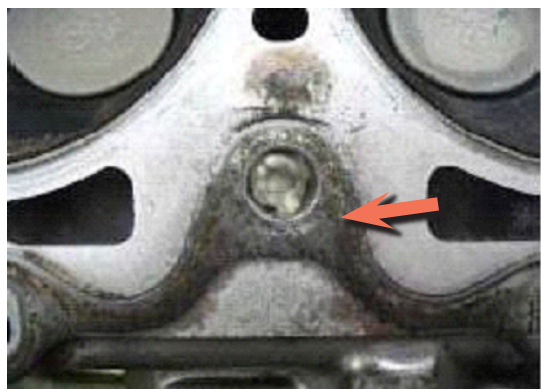




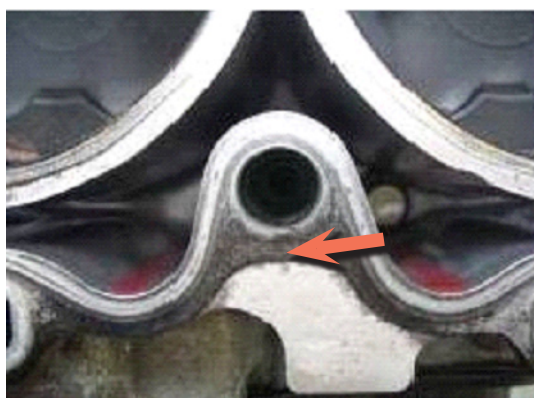
Accumulated carbon deposit on
bore sealing portion



Carbon deposit on cylinder block
bore sealing portion



Rubber coating residue on coolant sealing portion



Rubber coating residue on oil sealing portion

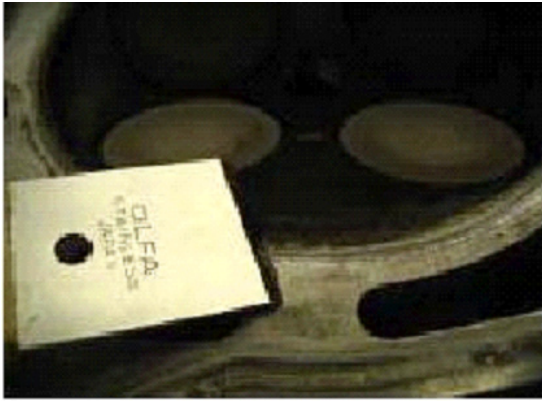


Using a gasket scraper, carefully clean any carbon deposits and rubber coating found on the surface of cylinder block and cylinder head.

CAUTION: Keep the scraper as flush as possible to the surface to avoid damage to the mating surface of cylinder block and cylinder head.

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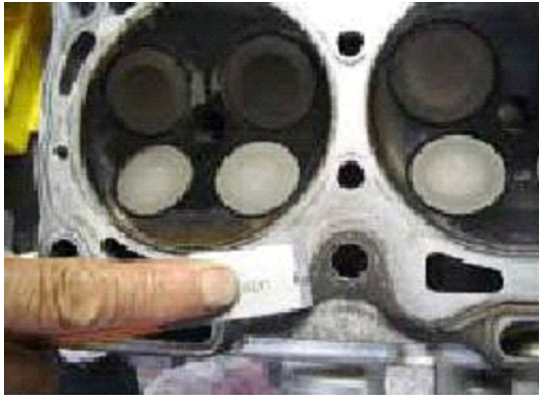
Cylinder Head



Cylinder Block



Carbon deposits being removed



Rubber coating being removed



Rubber coating being removed

Continued on Next Page



Finished cleaning (head)



Finished cleaning (block)

NOTE: After removing carbon deposit and rubber coating, clean the surfaces using a rag and cleaning solvent.



After cleaning bore sealing portion (head)



After cleaning bore sealing portion (block)



After cleaning coolant sealing portion (head)



After cleaning coolant sealing portion (block)

Continued on Next Page



After cleaning oil sealing portion (head)



After cleaning oil sealing portion (block)

SERVICE BULLETIN

APPLICABILITY: 1999~2002MY Subaru Vehicles
With Manual Transmission

NUMBER: 03-49-02R
DATE: 04/23/04

SUBJECT: Popping Out of Reverse

INTRODUCTION

This bulletin replaces the previous bulletin, 03-49-02. Please discard all copies of the previous bulletin.

If you encounter a customer complaint of vehicle popping out of reverse, refer to the appropriate section of the applicable MY Service Manual for proper diagnosis. If all diagnostic procedures are exhausted, the cause may be excessive incline by free-play inside the gear and hub assembly, and reverse gear dimension. As you encounter this customer complaint, use the chart below for counter measure parts. Modified parts are now available which have reduced tolerances inside the gear and hub assembly; and the reverse gear dimension has been changed.

PARTS LIST

Listed on the next page of this bulletin...



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MODEL	PART NAME	PART NUMBER AFTER COUNTERMEASURE	PART NUMBER BEFORE COUNTERMEASURE
2.0L Turbo	TM Main Shaft	32201AB040	32201AA820 (for 02MY Impreza)
	Reverse Idler Gear	32271AA130	32271AA080
	Gear & Hub ASSY	32219AA310	32219AA280
2.2L, 2.5L	TM Main Shaft	32201AA980	32201AA760 (for 99~01MY Impreza 2.2L)
		32201AA990	32201AA770 (for 99MY Legacy, 99~01MY Impreza 2.5L, 99~01MY Forester)
		32201AB010	32201AA790 (for 00~02MY Legacy, 02MY Impreza 2.5L, 02MY Forester)
	Reverse Idler Gear	32271AA130	32271AA080
	Washer Rev. Idler	32284AA010	NOT AVAILABLE
	Shaft Rev. Idler	32281AA010	32281AA001
	Gear & Hub ASSY	32219AA310	32219AA280

ATTENTION:GENERAL MANAGER ☐
CLAIMS PERSONNEL ☐PARTS MANAGER ☐
SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial

SUBARU **SERVICE BULLETIN**

APPLICABILITY: 1998 - 2004 Forester
1993 - 2004 Impreza (except WRX)
1990 - 1999 Legacy

NUMBER: 03-50-02
DATE: 12/23/02

SUBJECT: New Procedure for Replacing Rear
Wheel Bearings

INFORMATION

Ongoing studies of vehicle repairs and service procedures have helped us identify a new rear wheel bearing replacement procedure for the vehicles described above. Additionally, several design changes have been made to increase the durability of the original equipment caged ball bearings in all types of operating conditions.

The installation of secondary dust shields to the axle (August 2000 vehicle production), and changes to the wheel bearing itself represent some of the results of continued study. The most recent production changes were:

1. Material change of the grease.
2. Treatment changes to the rear ball bearing & inner race.
3. Initial preload applied in production changed.

These changes took place effective August 21, 2001, starting with the following VIN's:

Impreza	Sedan	2*517136
	Wagon	2*817579
Forester		2*735724

To reduce the possibility of repeat premature failures, Subaru is introducing a new procedure to service the rear wheel bearings of the models listed above that entails replacing the rear wheel bearing on the vehicle.

This new procedure will eliminate the heavy forces needed to service the rear wheel bearings that occur in using a hydraulic press. This smooth, low force installation eliminates the chances of deforming the wheel bearing housing and increases the efficiency of repair.

Effective January 2, 2003, this new approved procedure must be used when replacing rear wheel bearings for any repair submitted to Subaru of America, Inc. for reimbursement.



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In addition, this repair procedure is required on retail repairs to be eligible for any Subaru Replacement Parts Warranty.

A new special tool kit has been developed (supplied by Kent Moore, J-45697) to perform this procedure on the vehicle. The new tools are designed to work only with tapered roller bearing. The repair procedure is not listed in this bulletin but can be found in Subaru Service Publication Booklet Number MSA5TT0201. This supercedes the old booklet of MSA5TT0001.

Subaru is also authorizing the installation of a taper roller type bearing, part number 28016AA030, as the replacement part on the applicable Impreza & Forester models. This taper bearing is the same bearing that is applicable to 99 model year & prior Legacy models.

If you have diagnosed a failed rear wheel bearing, repair it with the new procedure and check the condition of the remaining side. Replace only if needed.

The new genuine Subaru rear wheel bearings are not to be packed with grease of any kind. The bearing is ready to install out of the box.

The labor operation numbers for the replacement of the rear wheel bearing and its effective parts will not be changed, however, the new time for one side replacement will be .8 hour and 1.5 for both sides.

ATTENTION:GENERAL MANAGER ☐
CLAIMS PERSONNEL ☐PARTS MANAGER ☐
SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial

SUBARU **SERVICE BULLETIN**

APPLICABILITY: All 1999~2002MY and some
2003MY 2.5L Vehicles;
All 2002MY and some
2003MY 2.0L WRX Vehicles

NUMBER: 03-51-02R
DATE: 05/01/03

SUBJECT: Cold Clutch Judder (revised bulletin)

INTRODUCTION

In the event you encounter a customer concern of cold clutch judder that goes away after the first few applications, replacement of some clutch parts will be necessary to repair the vehicle. Prior to replacing these parts, you should confirm the engine and transmission mounting is not broken, loose, or misaligned.

2.5L *

Use **Clutch Kit: 32098AA020**. This kit contains the following parts (and they can also be purchased separately):

Flywheel	12342AA061
Cover	30210AA590
Disc	30100AA851
Bolts (8pc)	800610740

** If the OE flywheel and cover has more then 30,000 miles on it and is in good condition, it can be reused. After 30,000 miles of driving, the surface finish is equivalent to the replacement flywheel and cover.*

2.0L **

Flywheel	12342AA071
Cover	30210AA570
Disc	30100AA840
Bolts (8pc)	800610740

continued on next page...



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*** 2002 WRX vehicles with an engine number of #331738 and after can also reuse the OE flywheel and cover if it is in good condition and has more then 30,000 miles on it. Vehicles produced prior to E/G #331738 will need to install all 4 parts.*

These countermeasure parts were installed into production as listed below:

STARTING VIN							
	LEGACY				IMPREZA		FORESTER
	BAJA	SEDAN	WAGON	OUTBACK	SEDAN	WAGON	
2.5L	36103910	36206712	36305452	36622108	3G506077	3G805549	3G732771
2.0L					3G500127	3G800014	

Vehicles after the listed countermeasure, or repairs to vehicles after the clutch set has been installed, can be repaired using individual parts as needed. Repair history should be checked to determine what parts are currently in the vehicle. The parts system should be checked for any future information regarding these parts.

CLAIM REIMBURSEMENT/WARRANTY INFORMATION

For vehicles within the Basic New Car Limited Warranty coverage period, please refer to the Warranty Labor Time Guide for the applicable labor operation numbers and labor time. Please use **Fail Code JAB-48**.

SERVICE BULLETIN

APPLICABILITY: 1995~2002MY Legacy;
1997~2003MY 2.5L Impreza; and
1998~2003MY Forester Vehicles.
All models have Manual Transmission.
SUBJECT: Clutch Pedal Sticking (revised)

NUMBER: 03-52-03R
DATE: 07/15/03

INTRODUCTION

In the event you encounter a customer complaint of the clutch pedal not returning completely after being engaged, or has a spongy pedal feel or a light feel in the shifting pedal while shifting, the following repair method should be followed. This condition may affect certain manual transmission vehicles with a hydraulic clutch system under certain weather conditions.

PROCEDURE

To correct this condition you must replace the parts in the chart that match your vehicle using the following procedure:

For Natural Aspiration models with hydraulic clutches

- 1) Remove the intake chamber from the backside of the intake manifold.
- 2) Remove the clutch hose and the clutch operating cylinder. In this procedure it is not necessary to remove the master cylinder, the clutch pipe and bracket.
- 3) Replace the clutch hose and the clutch operating cylinder with new parts as listed in the chart. Note that two pieces of gasket (P/N 114130151) used on the connector of the operating cylinder must be replaced with new ones when replacing the clutch hose. Tightening torque of the bolt is: 37 ± 3 Nm (3.8 ± 0.3 kgm) or 27 ± 2 ft. lbs.
- 4) Bolt the operating cylinder onto the transmission.
- 5) Add brake fluid.
- 6) Bleed the air from the system.
- 7) Install the intake chamber.
- 8) Check the following items:
 - a) Insure there is no leakage from the line, check whether fluid leakage occurs after the clutch pedal has been fully depressed.
 - b) Check whether the clutch performs normally.



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For Turbo models

- 1) Remove the intercooler.
- 2) Remove the clutch operating cylinder hose. In this procedure, the clutch master cylinder, clutch pipe and bracket are unnecessary to be removed.
- 3) Replace the clutch hose that was removed with the new one listed in the chart. Note that two pieces of gasket (**P/N 114130151**) used on the connector of the operating cylinder must be replaced with new ones when replacing the clutch hose. Tightening torque of the bolt is: 37 ± 3 Nm (3.8 ± 0.3 kgm) or 27 ± 2 ft. lbs.
- 4) Add brake fluid.
- 5) Bleed the air from the system.
- 6) Install the intercooler.
- 7) Check the following items:
 - a) Insure there is no leakage from the line, check whether fluid leakage occurs after the clutch pedal has been fully depressed.
 - b) Check whether the clutch performs normally.

MODEL	Clutch Operating Cylinder	Hose - Clutch	Gaskets for Hose
02MY~ WRX (5MT)	Unnecessary to replace	37251AA003	114130151 X 2
Legacy (5MT)	30620AA042	37251AC001	114130151 X 2
Impreza (5MT)	30620AA042	37251AC001	114130151 X 2
Forester (5MT)	30620AA042	37251AC001	114130151 X 2

This change was incorporated in production after the following VIN numbers:

Legacy	All	36*00000	Beginning of the 03 MY
Impreza	Sedan	26529238	April 10,2002
Impreza	Wagon	26835444	April 10,2002
Forester	All	36713250	April 10,2002

ATTENTION:GENERAL MANAGER ☐
CLAIMS PERSONNEL ☐PARTS MANAGER ☐
SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial

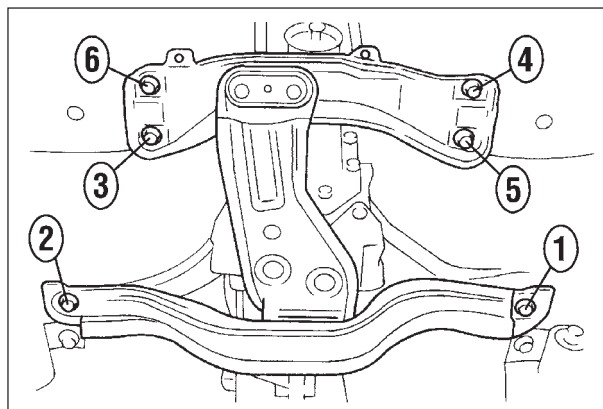
SUBARU **SERVICE BULLETIN****APPLICABILITY:** All A/T and M/T Vehicles
SUBJECT: Transmission Rear Cross-Member**NUMBER:** 03-53-04
16-54-04
DATE: 08/20/04**INTRODUCTION**

The purpose of this bulletin is to prevent the possibility of damaging the bolts and/or threads that secure the transmission rear cross member.

REPAIR PROCEDURES/INFORMATION

When performing service work or installing SOA's accessory short throw shifter, it is extremely important that the transmission is supported properly when removing or reinstalling the cross member. If not, damage to the bolts and/or threads will occur. Support the transmission using a transmission jack, regardless if the vehicle is supported by a lift or car ramps (**Figure 1**). It is recommended that hand tools be used for the removal and installation of the bolts. Inspect for bolt thread damage and replace as necessary. Be sure to clean any protective wax from the mating surfaces and be sure to start all bolts several threads by hand before using tightening tools. **Note: If severe damage is evident to the threads, the use of a Heli-coil® type kit is an approved repair method.**

During reinstallation, follow the torque sequence, below (**Figure 2**) and the torque specifications (**Figure 3; next page**).

**Figure 1****Figure 2***continued on next page...***CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.**

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Bolts must be torqued to the proper specifications (**Figure 3**).

T1: 70 N·m (7.1 kgf-m, 51 ft-lb)

T2: 140 N·m (14.3 kgf-m, 103 ft-lb)

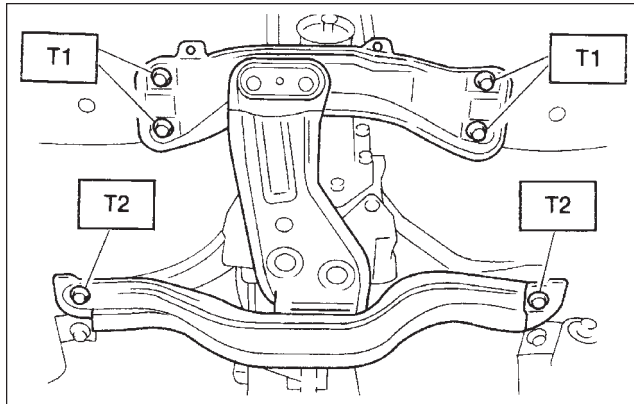


Figure 3

ATTENTION:

GENERAL MANAGER ☐ PARTS MANAGER ☐
CLAIMS PERSONNEL ☐ SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial

**SUBARU****SERVICE BULLETIN**

APPLICABILITY: 2002~2003MY Impreza Vehicles
SUBJECT: Countermeasure to Eliminate Front
Strut Noise

NUMBER: 05-35-05
DATE: 10/04/05

INTRODUCTION

If you encounter an abnormal noise coming from the lower portion of the front strut assembly, there is the possibility that the coil spring is rubbing the lower spring seat. To eliminate the noise, a rubber seat tube will need to be installed.

PARTS INFORMATION

PART NAME	PART NUMBER
Rubber Seat Tube	20325FE000 (enough for 4 vehicles)

The following will also be needed:

- ThreeBond 2706 quick-drying degreasing cleaner or equivalent
- **Any one of the following:** ThreeBond 1521 synthetic rubber-based adhesive, Permatex Black Super Weatherstrip Adhesive, 3M™ Black Super Weatherstrip Adhesive, or equivalent.

REPAIR PROCEDURES/INFORMATION

- 1) Raise vehicle on lift and remove wheels to gain access to the lower portion of the front strut (see Figure 1).

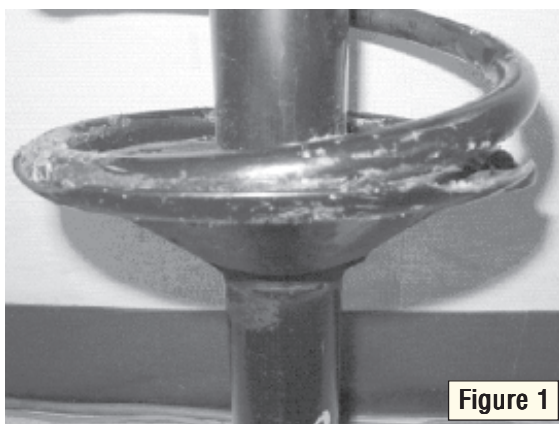
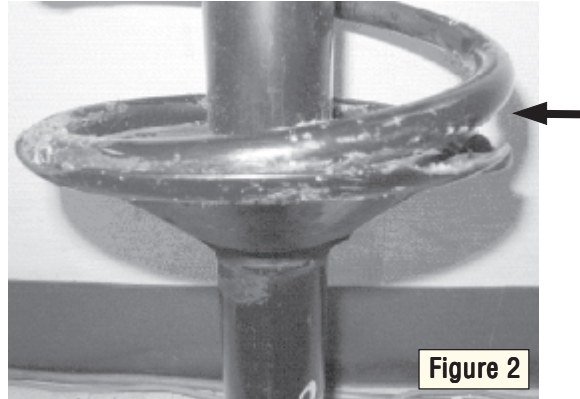


Figure 1

**CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.**

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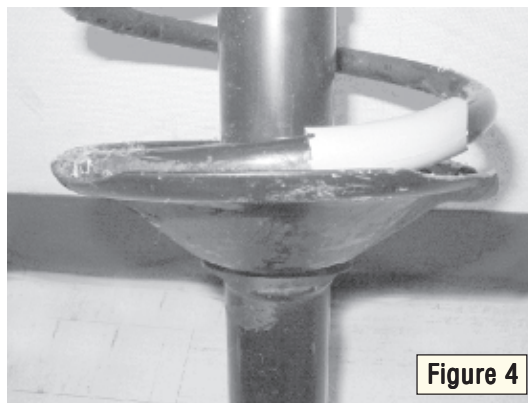
- 2) Clean the coil spring where it starts to rise from the coil spring seat to approximately 60mm (2 3/8") with de-greaser (see Figure 2).



- 3) Cut the rubber seat tube at the holes which will provide approximately a 60mm length (see Figure 3).



- 4) Apply adhesive agent to the inside of the rubber seat tube then install to coil spring. Make sure to slide rubber seat tube as closely as possible to where the coil spring starts to rise from the coil spring seat (see Figure 4).



- 5) Reinstall wheels and road test vehicle to confirm noise is gone.

CLAIM REIMBURSEMENT/WARRANTY INFORMATION

For vehicles under the Basic New Car Limited Warranty period, this repair may be claimed using:

Note: For claim submission purposes only, use part # SOA635077 (includes rubber seat tube, degreaser and adhesive which are enough for one vehicle).

Labor Description	Labor Operation	Fail Code	Labor Time
Front Coil Spring Modification (both sides)	A 611-208	NAD-48	0.4

ATTENTION:

GENERAL MANAGER ☐
 PARTS MANAGER ☐
 CLAIMS PERSONNEL ☐
 SERVICE MANAGER ☐

IMPORTANT - All
 Service Personnel
 Should Read and
 Initial in the boxes
 provided, right.



SUBARU

QUALITY DRIVEN® SERVICE

SERVICE BULLETIN

APPLICABILITY: All Models
SUBJECT: Tire Rotation Pattern

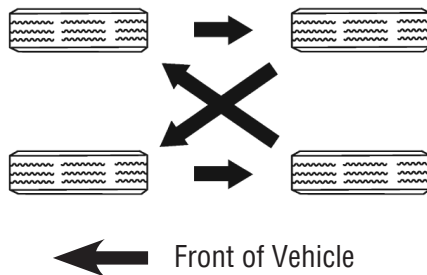
NUMBER: 05-37-07
DATE: 03/12/07

INTRODUCTION

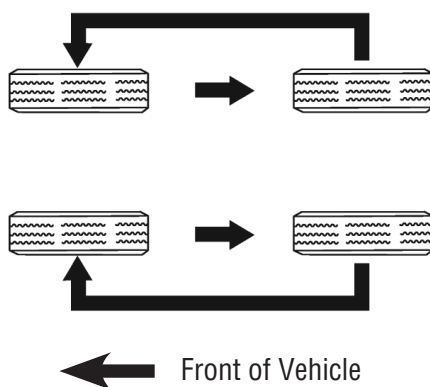
In an effort to further reduce uneven tire wear and prolong tire life, the tire rotation pattern has been changed for non-directional tires. To maximize the life of each tire and ensure that the tires wear uniformly, it is best to rotate the tires every 7,500 miles (12,000 km). Note: The tire rotation pattern for directional tires has not changed.

Reminder: When rotating tires on a vehicle equipped with TPMS (Tire Pressure Monitoring System) make sure to re-register the tires.

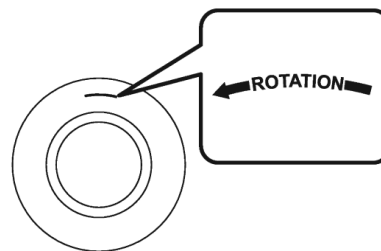
Tire Rotation Pattern for Non-Directional Tires



Tire Rotation Pattern for Directional Tires



Tire Rotation Branding



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AUTOMOTIVE
**Youth
 Educational
 Systems**
PROUD PARTNER

SERVICE BULLETIN

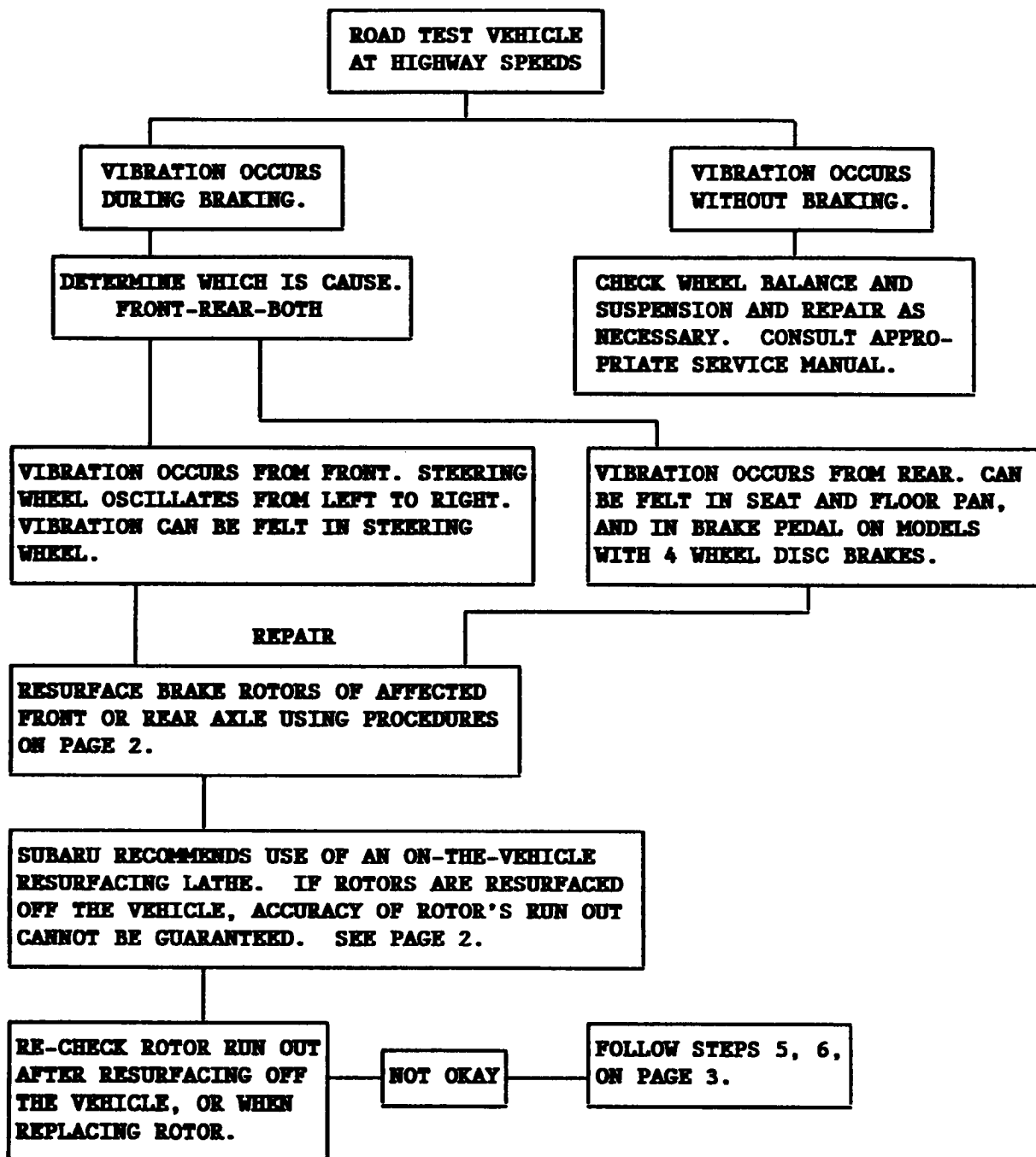
APPLICABILITY All Subaru Models

DATE 09-08-92

SUBJECT: BRAKE VIBRATION DIAGNOSIS AND REPAIR

When encountering a customer complaint of brake vibration on any Subaru vehicles, the following procedures are required to ensure a proper repair.

DIAGNOSIS



BRAKE ROTOR RESURFACING PROCEDURE

Resurfacing rotors with excessive run out is best done **on the vehicle** when possible, using a Twin Arbor Vehicle-Mounted Brake Lathe, such as the Ammco 710 model.

1. **When using an on-the-vehicle resurfacing lathe:**
 - a. Measure the thickness of the rotor after resurfacing to confirm if it's within specification. (See specifications on Page 4.)
 - b. If the thickness is less than specification, replace the rotor with a new one.
 - c. Run out doesn't need to be re-checked after resurfacing the rotor when using the on-the-vehicle resurfacing lathe.
2. **When using an off-the-vehicle resurfacing lathe. (i.e. Ammco Model 4000). (This method is not recommended.)**
 - a. Remove rust and foreign material completely from mounting area of rotor using solvent or wire brush.
 - b. Secure the rotor on both sides and mount rotor using a centering cone. See Figure 1.

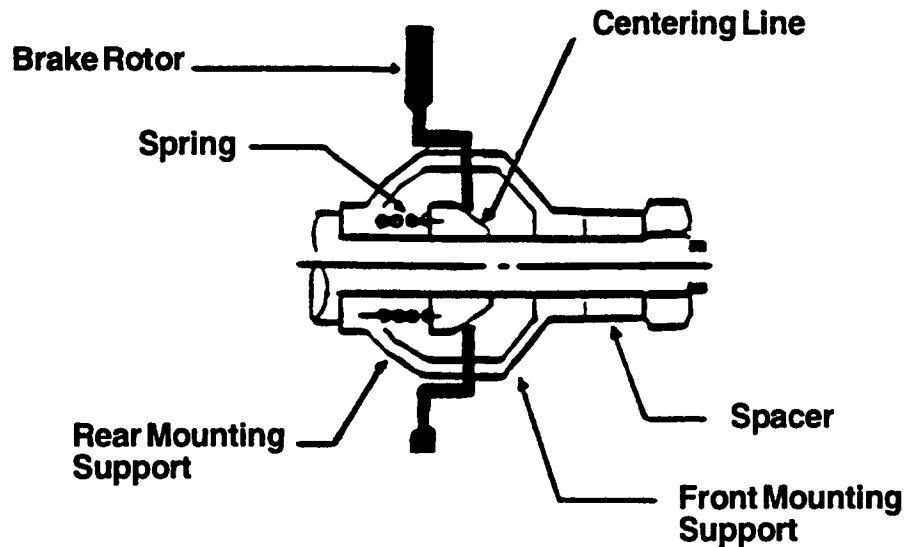
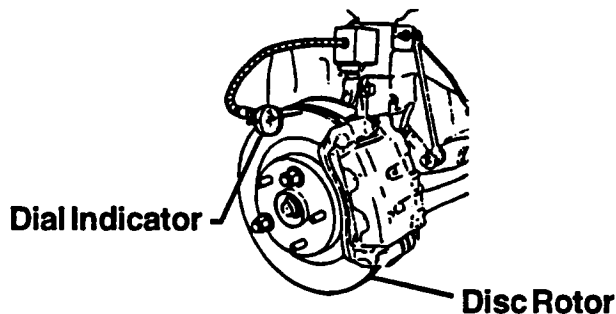


Figure 1

- c. Measure the thickness of the rotor after resurfacing to confirm it is within specification. (See specifications on Page 4.)
- d. Reinstall the brake rotor on the vehicle using all lugs. Install the lugs with their flat side in and tighten slightly, using a socket or wrench, then re-check run out. See Page 3.
- e. If rust was evident before resurfacing the rear rotor, replace the brake pads using Part Numbers: 26296AA061 for Legacys with Solid Rotors and 26296AA081 for Legacys with Ventilated Rotors.

CHECKING PROCEDURE FOR BRAKE ROTOR RUN OUT

1. Measure free play of bearing by pushing and pulling hub in an axial direction.
 - a. Confirm free play of bearing in an axial direction is 0.05mm or less.
 - b. Front wheel bearing free play on all models except Legacy, SVX, and XT6 is not required to be measured due to the ball bearing design.
2. Mount rotor to the hub securely with all lugs, flat side in and tighten slightly, using a socket or wrench.
3. Clean pad contact surfaces of rotor (especially where measurement will be taken).
4. Attach dial indicator gauge on caliper mount or strut and measure maximum run out of rotor on both sides at a point of 5mm inside from the circumference of rotor by rotating rotor gradually. See Figure 2. Run out is best checked when the rotor is cool. (See specifications on Page 4.)



Make sure that dial indicator is set 5mm (0.20in) inward of rotor outer perimeter.

Figure 2

5. In case the run out of a new or resurfaced rotor is out of specification when re-checking, relocate the rotor to another position on the hub and re-check run out. Repeat the process of relocating the rotor to compensate for minor run out variations between the rotor and hub.
6. If relocating the rotor does not correct run out, check the hub run out for inaccuracy and repair as necessary.

The rotor specifications below should be used to determine if a rotor is to be replaced or resurfaced.

MODEL	RUNOUT (MM)		RESURFACING LIMIT (MM)	
	FRONT	REAR	FRONT	REAR
JUSTY	0.1		15.5	
LOYALE	0.075	*0.1	16	*8.5
XT	0.075	*0.1	16	*8.5
XT-6	0.075	0.075	20	8.5
LEGACY	0.075	0.075	22	8.5
SVX	0.075	0.075	26	8.5

*NOTE: Turbo Models Only

BRAKE SERVICE FACTS

1. Brake rotors can be resurfaced more than once for poor run out or thickness variation if still within the minimum thickness standard after resurfacing.
2. Brake rotor discoloration or visible brake pad imprints on the rotor, do not warrant brake rotor replacement.
3. Resurfacing or replacing rotors is not necessary unless a vibration complaint is confirmed or the rotor is scored because a brake pad was allowed to wear to the backing plate.
4. Never resurface or remove the zinc coating on a new rotor. The zinc coating will be eliminated after the first few stops.
5. Resurfacing rotors is not a recommended repair for brake noise.
6. Brake pads should be reused if not worn to their limit when a brake rotor is replaced or resurfaced for vibration.
7. A major cause of brake vibration is inaccurate rotor resurfacing due to incorrect rotor lathe mounting and a brake lathe with excessive shaft run out.
8. When brake pads are worn to the minimum limit and brake pad replacement is necessary, only replace the brake pads. Rotor replacement or resurfacing is not necessary.
9. For any brake repair procedure **always** inspect the brake system for abnormalities. Example: Sticking or binding caliper, tight or binding pads, uneven wear, rust, foreign material, lack of lubrication, etc.

CAUTION

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ATTENTION:
 GENERAL MANAGER ☐
 CLAIMS PERSONNEL ☐

 PARTS MANAGER ☐
 SERVICE MANAGER ☐
IMPORTANT - All Service Personnel Should Read and Initial



SERVICE BULLETIN

APPLICABILITY: 1997~04MY Legacy, Outback & Baja
 (Excluding VDC Equipped Vehicles);
 1998~04MY Impreza and Forester

SUBJECT: Replacement of ECU for ABS Repair

NUMBER: 06-31-03R
DATE: 12/08/04

INTRODUCTION

In order to improve serviceability of ABS system, the ECU was subdivided and has been newly established as a spare part. This service bulletin details the part numbers and replacement procedures of the ECU as a spare part.

PARTS NUMBERS AND APPLICABLE MODELS

VEHICLE	MODEL YEAR	TRANS TYPE	ECU SPARE PART	IDENTIFICATION MARK	HYDRAULIC CONTROL UNIT / ECU ASSY
Legacy* (1)	97 & 98	AT	27529AC03A	C3	27539AC03A
		MT	27529AC04A	C4	27539AC04A
	99 to 01	AT	27529AC05A	C5	27539AC05A
		MT	27529AC06A	C6	27539AC06A
	02 to 04	AT	27529AE04B	CG	27539AE04B
		MT	27529AE05B	CH	27539AE05B
Outback* (2)	00 & 01	AT	27529AE02A	CE	27539AE02A
		MT	27529AE03A	CF	27539AE03A
	02 to 04	AT	27529AE06B	CI	27539AE06B
		MT	27529AE07B	CJ	27539AE07B
Impreza	98 to 01	AT	27529AC050	C5	27539AC050
		MT	27529AC060	C6	27539AC060
	02 & 03	AT	27529FE110	CC	27539FE110
		MT	27529FE120	CD	27539FE120
	04	AT	27529FE170	CU	27539FE170
		MT	27529FE180	CV	27539FE180
		MT with DCCD	27529FE200	CY	27539FE200
Forester	98	AT	27529AC030	C3	27539AC030
		MT	27529AC040	C4	27539AC040
	99 to 02	AT	27529FC000	C7	27539FC000
		MT	27529FC010	C8	27539FC010
	03 & 04	AT	27529SA001	C0	27594SA000
		MT	27529SA011	CP	27594SA010



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***NOTES (FOR TABLE ON PREVIOUS PAGE):**

- (1) Legacy includes Outback models from 97MY to 99MY.
- (2) Outback models includes Baja.

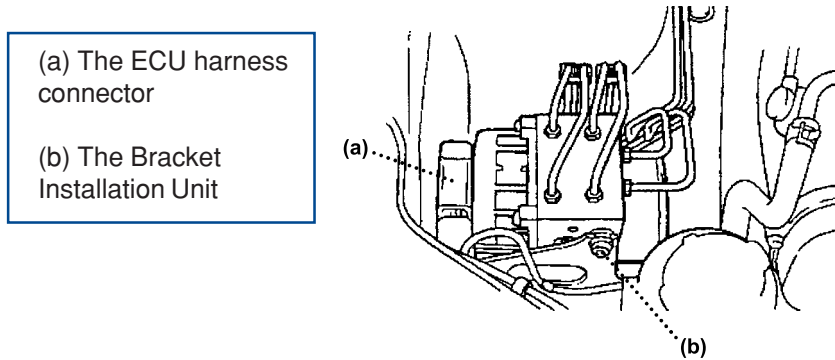
REPAIR PROCEDURE

- 1) Turn off the ignition switch.
- 2) Disconnect the negative terminal from the battery.
- 3) Disconnect the air intake duct from the Air Box.
- 4) Remove the air cleaner case from the inner fender well.

Removal of ECU

NOTE: When removing the ECU, the brake pipes remain connected.

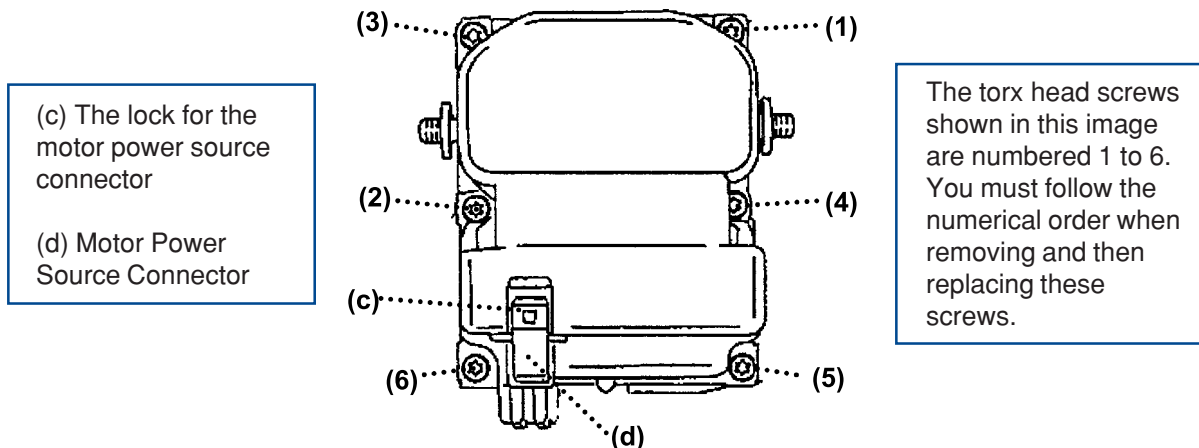
- 1) Disconnect all electrical connections from the ECU (top and bottom).
- 2) Remove the two installation bolts (M8) from the bracket of the hydraulic unit and the ECU assembly.



- 3) Lift the hydraulic unit and the ECU assembly from the bracket by about 5 cm (0.2 inches) and support it with a small piece of wood.

CAUTION: Be careful not to deform the brake pipe during this procedure.

- 4) Unlock the connector for the motor power source and disconnect the connector as shown in figure 2 below.



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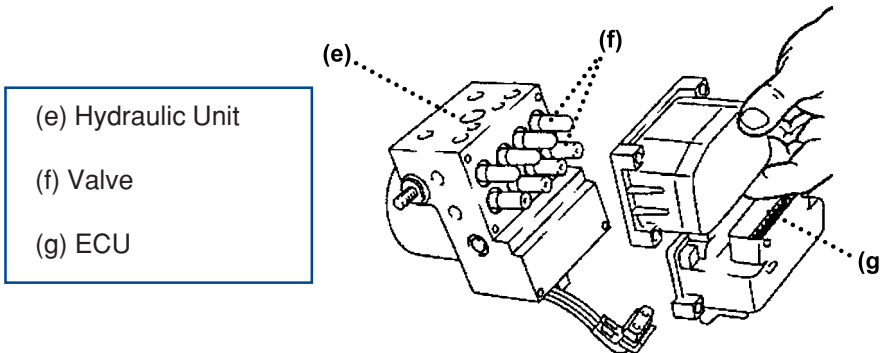
- 5) Remove the 6 torx head screws (T20) which join the hydraulic unit and the ECU.

NOTE: Do not reuse the torx head screws once removed.

- 6) Remove the ECU from the hydraulic unit by pulling it gently.

NOTE:

- A) Do not insert anything into the gap between the ECU and the hydraulic unit.**
- B) Do not pry the ECU, but pull it straight from the hydraulic unit.**
- C) Do not reuse the seal from the ECU.**



Installation of new ECU

- 1) Confirm that the sealing surface of the hydraulic unit is clean.

NOTE:

- A) Do not machine the sealing surface.**
 - B) If the sealing surface is damaged, replace not only ECU but also the hydraulic unit and the ECU assembly with new one.**
 - C) Clean dust or foreign material from the sealing surface with a clean cloth and alcohol.**
 - D) Do not blow compressed air onto the ECU surface or the hydraulic unit.**
- 2) In order to prevent **damage on the valves** protruded from the hydraulic unit, do not tilt the ECU against the hydraulic unit when assembling.
 - 3) Install the new ECU.
 - 4) Temporarily tighten 6 screws by hand.

NOTE: Do not reuse the screws that were previously removed from the ECU.

- 5) Tighten the 6 screws in the exact order shown in Figure 4.4; use the specified tightening torque of $2.65 \pm 0.30\text{Nm}$ ($1.95 \pm 0.22\text{ft-lbs}$) (26.4 inch-lbs).
- 6) Check if the screws are securely tightened by confirming no clearance between ECU and hydraulic unit visually.
- 7) Connect the motor power source connector to ECU.

NOTE: Confirm that you hear a clicking sound when locking the connector lock.

continued on next page...

- 8) Install the hydraulic unit and the ECU assembly onto the bracket and tighten the two nuts with a tightening torque of $18 \pm 5\text{Nm}$ ($13.28 \pm 3.69\text{ft-lbs}$) (44.28 inch-lbs).

NOTE: Attach the damper under the hydraulic unit with the hydraulic unit and the bracket securely.

- 9) Reconnect the ECU harness connector with the ECU.

Restoration of surrounding parts

- 1) Install the air cleaner case.
- 2) Install the air intake duct.
- 3) Connect the negative terminal to the battery.

Testing after replacement

- 1) Confirm that the ABS warning lamp light comes on normally and then turns off when the ignition switch is turned on.
- 2) Connect the select monitor and confirm in the first display that the model year, driving system and transmission system are correct.
- 3) Confirm that the ABS warning lamp does not light when starting the engine and driving up to more than 12.5 m/h (20 km/h).

NOTE: If something abnormal was found in above three testing procedures, follow the repair instructions described in the diagnostic procedures of the vehicle's Service Manual.

CLAIM REIMBURSEMENT/WARRANTY INFORMATION

For vehicles within the warranty period, this repair can be claimed using the following warranty information:

LABOR DESCRIPTION	LABOR OPERATION	FAIL CODES	LABOR TIME
ABS Testing and Diagnosis	B 566-001		0.5
ABS Electronic Control Unit	C 536-101	UCD 39, 40, 41, 42, or 43	1.0

SERVICE BULLETIN

APPLICABILITY: All Models; All Years
SUBJECT: Brake Vibration Diagnostics and
Revised Flat Rate Time

NUMBER: 06-32-03
DATE: 11/01/03

INTRODUCTION

The purpose of this bulletin is twofold:

Studies confirm that rarely is it necessary to resurface Brake Rotors and/or Drums on all four wheels when a confirmed brake vibration exists. With proper diagnostics, front or rear brake vibrations can be isolated eliminating the need to resurface all four rotors and/or rear brake drums.

Warranty policy states that only the actual source of the issue is warrantable and preventative repairs for what might occur in the future are not a matter for warranty. Therefore, it is required that each brake vibration complaint be narrowed to the source and only that repair be completed.

ADJUSTMENT TO FLAT RATE TIME ALLOWANCES

With the introduction of on-car brake resurfacing equipment and even more recent advances of this equipment that reduce the times necessary for set-up / calibration, measurement and use, the flat rate time allowances will be reduced. The reductions in flat rate time allowances will become effective January 1, 2004.

Please provide the following information to the appropriate personnel at your dealership.

The labor operation numbers for brake rotor resurfacing on vehicles has not changed. Listed below is the new time allowance.

Labor Operation	Time
A511-111	0.5 hour
A511-114	1.0 hour
A521-111	0.5 hour
A521-114	1.0 hour



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REPAIR PROCEDURE

Use the following procedure along with the troubleshooting chart shown on the next page.

Road test the vehicle to confirm brake vibration. If vibration is felt while braking, verify at what speed. Typically, front rotor vibration is felt at higher speeds (above 50mph) and in the steering wheel (circumference direction and/or side to side). If this is the case, the front rotors and pads will need to be inspected.

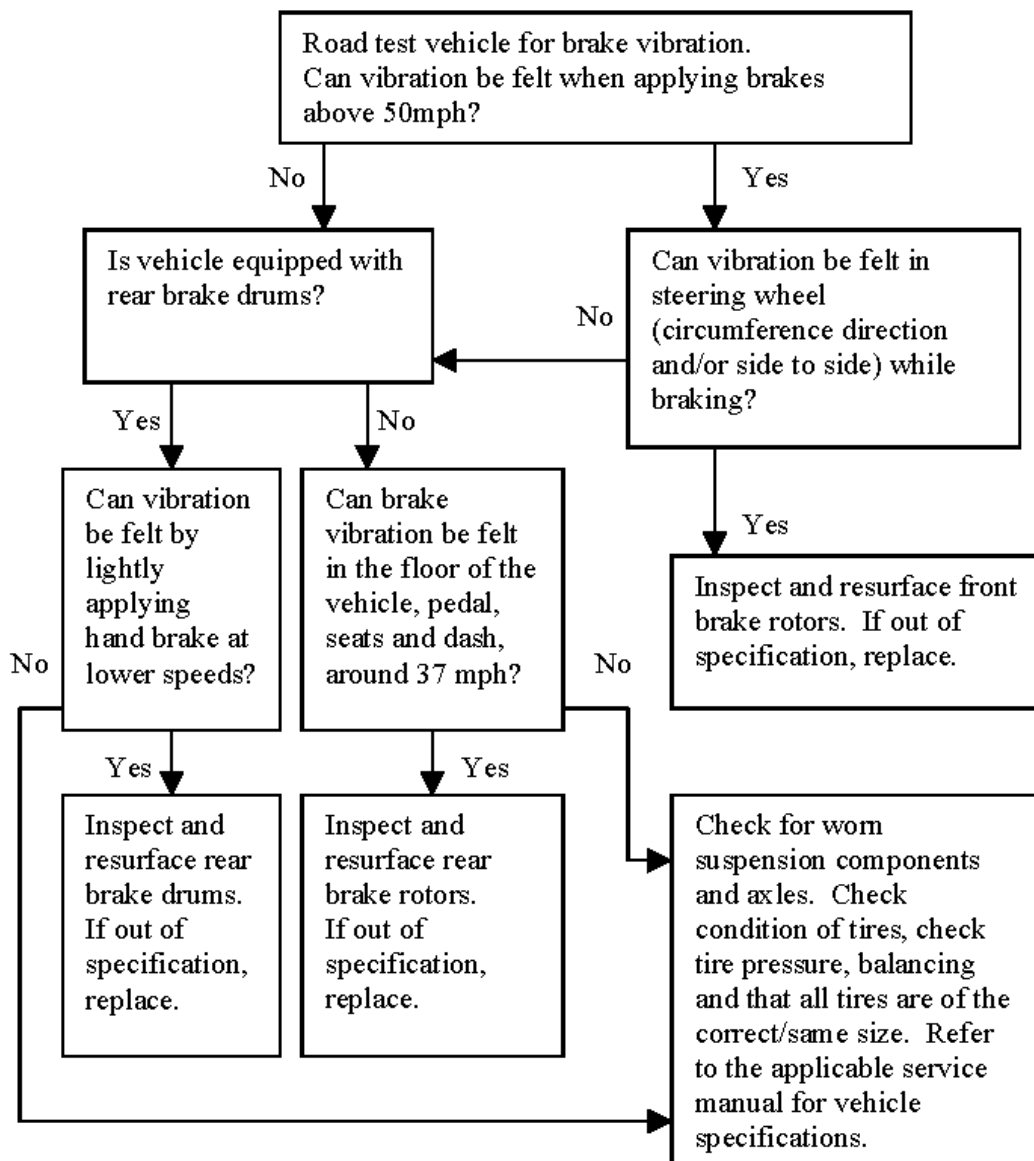
Typically, rear brake vibration is felt at lower speeds (below 50mph). Vibration will also be felt in the floor of the vehicle, pedal, seats and dash. If this is the case, the rear rotors and pads will need to be inspected.

To check for rear drum vibration, road test the vehicle at lower speeds. Be extremely careful not to lock the rear brakes. With the parking brake release button pushed in, pull the parking brake lever slowly and gently, which applies the rear parking brakes. If vibration is felt, the rear drums and shoes will need to be inspected.

Always refer to the applicable service manual for brake, brake drum, and rotor specifications. When resurfacing always check rotor/drum thickness before and after. These measurements must be noted on the repair order. If the rotor/drum is out of specification after resurfacing, it will need to be replaced.

BRAKE VIBRATION TROUBLESHOOTING CHART

Diagnostics: Whenever diagnosing for vibration, the first items that should be checked are; worn and/or loose suspension components, axles, tire pressure, conditions of tires and check that all tires are of the correct/same size. In some cases tires out of balance can also cause vibration. Always refer to the applicable Service Manual for vehicle specifications.



SERVICE BULLETIN

APPLICABILITY: 2001~2003MY Subaru Vehicles
(Refer to Page 3 for Specific
Model/Modification Applicability)
SUBJECT: Disc Brake Pad Modification

NUMBER: 06-33-04
DATE: 01/15/04

INTRODUCTION

The purpose of this bulletin is to address unevenly or prematurely worn brake pads. There is the possibility that the pads are too tight in the caliper and have insufficient clearance as a result of rust buildup and dirt. If that is the case, the backplate of the disc brake pads will need to be slightly filed no more than 0.1mm (0.0039") on each end to remove the rust.

NOTE: THE FOLLOWING PROCEDURE IS NOT APPLICABLE TO NEW BRAKE PADS.

REPAIR PROCEDURE/INFORMATION

Be extremely careful when filing the backplate of the inner and outer brake pad. Make sure that both ends are filed evenly; do not file shorter than the dimensions shown below (Figure 1 & 2). Failure to do so will create a rattle or clank noise. After filing, make sure to apply grease on both ends of the backplate where filed.

FIG. 1 - Front Brake Pad

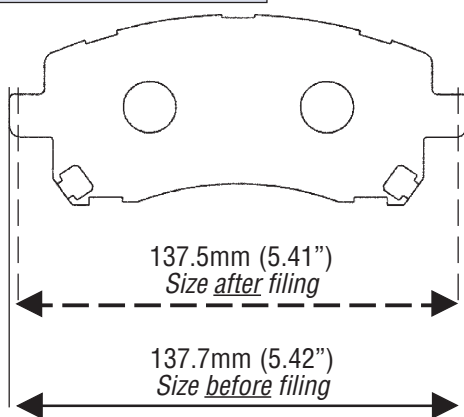
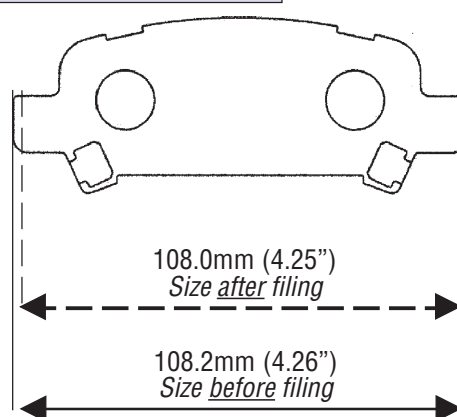


FIG. 2 - Rear Brake Pad



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CLAIM REIMBURSEMENT/WARRANTY INFORMATION

For vehicles within the Basic New Car Limited Warranty period, this repair can be claimed using the following:

LABOR DESCRIPTION	OPERATION NUMBER	FAIL CODE	LABOR TIME
Brake Pad Backplates, File – Front	A 511-101	QAU-48	0.5
Brake Pad Backplates, File – Rear	A 521-101	QCC-48	0.4

continued on next page...

APPLICABILITY CHART

X = Model/Modification Applicability

MODEL YEAR	MODEL	TRIM LEVEL	FRONT	REAR	NOTES
2001	Legacy	L-Sedan	X	X	
		GT-Sedan	X	X	
		GT-LTD-Sedan	X	X	
		Outback-Sedan	X	X	
		L-Wagon	X	X	
		GT-Wagon	X	X	
		Outback-Wagon	X	X	
		Outback-LTD-Wagon	X	X	
		Outback-H-6-Wagon	X	X	
2001	Impreza	L-Coupe	X	--	
		RS-Coupe	X	X	
		L-Sedan	X	--	
		RS-Sedan	X	X	
		L-Wagon	X	--	
		Outback-Wagon	X	--	
2001	Forester	L-Forester	X	--	
		S-Forester	X	X	
2002	Legacy	L-Sedan	X	X	* Applicable up to VIN 2*209463 * Applicable up to VIN 2*209463 * Applicable up to VIN 2*209463 * Applicable up to VIN 2*209463
		GT-Sedan	X *	X	
		GT-LTD-Sedan	X *	X	
		Outback-LTD-Sedan	X *	X	
		Outback-H-6-Sedan	X *	X	* Applicable up to VIN 2*309463 * Applicable up to VIN 2*633636 * Applicable up to VIN 2*633636 * Applicable up to VIN 2*633636
		L-Wagon	X	X	
		GT-Wagon	X *	X	
		Outback-Wagon	X *	X	
		Outback-LTD-Wagon	X *	X	
		Outback-H-6-Wagon	X *	X	
2002	Impreza	RS-Sedan	--	X	
		WRX-Sedan	X	X	
		WRX-Wagon	X	X	
2002	Forester	L-Forester	X	--	
		S-Forester	X	X	
2003	Legacy	L-Sedan	--	X	
		GT-Sedan	--	X	
		GT-LTD-Sedan	--	X	
		Outback-LTD-Sedan	--	X	
		Outback-H-6-Sedan	--	X	
		L-Wagon	--	X	
		GT-Wagon	--	X	
		Outback-Wagon	--	X	
		Outback-LTD-Wagon	--	X	
		Outback-H-6-Wagon	--	X	
		Baja	--	X	
		Baja Sport	--	X	
2003	Impreza	RS-Sedan	--	X	
		WRX-Sedan	--	X	
		TS-Wagon	--	X	
		Outback-Wagon	--	X	
		WRX-Wagon	--	X	
2003	Forester	2.5 XS	--	X	



SERVICE BULLETIN

APPLICABILITY: 2001MY and later Impreza WRX
SUBJECT: Modification to Rear Brake Caliper

NUMBER: 06-36-06
DATE: 06/23/06

INTRODUCTION

This bulletin is for informational purposes only.

A production change was made to the rear brake caliper on 01MY and newer Impreza WRX. The washer between the caliper body and the backing plate has been discontinued. A change has been made to the caliper body to maintain the correct geometry, although the part numbers have not changed.

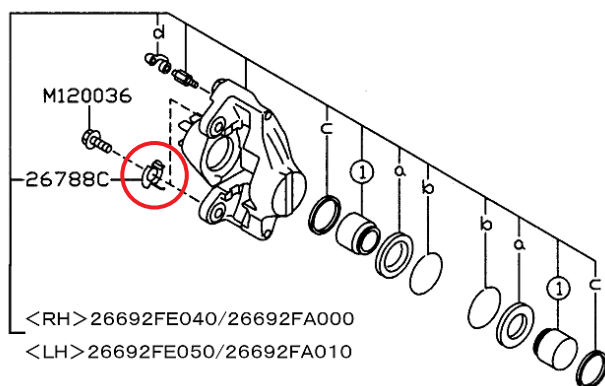
PRODUCTION LINE CHANGE

Production line changes have been incorporated into the following VINs :

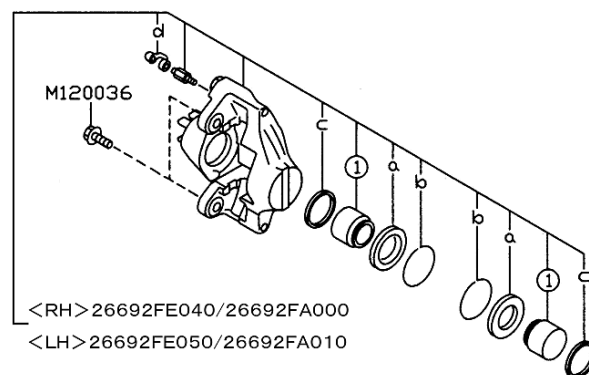
MODEL		VIN	STARTING MONTH
Impreza	Sedan	6*521076	April, 2006
	Wagon	6*817076	

PART INFORMATION

Old Disk Brake Kit: 26692FE040/050 (LH/RH)



New Disk Brake Kit: 26692FE040/050 (LH/RH)



Note: Though there were design changes made to this part, the part numbers remain the same.



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REPAIR PROCEDURE/INFORMATION

Refer to the applicable Subaru Service Manual located on the STIS (Subaru Technical Information System) web site.

CLAIM REIMBURSEMENT/WARRANTY INFORMATION

For vehicles within the basic New Car Limited Warranty period, refer to the Subaru Warranty Wizard™ for claim submission information.

SERVICE BULLETIN

APPLICABILITY

ALL MODELS

DATE 12/02/94

SUBJECT:

REPAIR OF REAR WINDOW DEFOGGER METAL TAB

REPAIR OF REAR WINDOW DEFOGGER GRIDS

This is a reprint of Service Bulletin 7-50-93 that includes additional information.

TAB REPAIR

If you encounter a broken wiring tab connector from the rear window defogger grid, it is recommended the rear window NOT be replaced. The tab should be resecured using a commercially available repair kit.

One such repair kit is available from Premier Autoware under par #57827. Phone # 1-800-654-6333. Other kits may be available through your local supplier.

Follow the instructions supplied with the repair kit to ensure a proper repair.

GRID REPAIR

Rear window defogger grids can be repaired using a kit available from Loctite Corporation Part Number 15067.

Effective immediately, dealer warranty repairs will not be accepted for replacement of rear windows because of open defogger grids.

Repairs should not exceed 4" in length on any one line.

Diagnosis of Grids

Locate the exact point of the break in the grid line as follows:

1. Turn on ignition switch and rear window defogger switch.
2. Connect the positive lead of a voltmeter to the right rear window defogger grid contact.
3. With the negative voltmeter lead, touch the defogger grid line at its mid-point on the rear window.
 - a. If a reading of approximately 6 volts is obtained, the grid line is operative.

CAUTION

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- b. If a 12 volt reading is obtained, the break in the grid line is between the positive contact and the point where the negative voltmeter lead is touching the grid line. To locate the exact point of breakage, move the negative voltmeter lead slowly toward the positive side of the grid until a zero (0) reading is obtained.
 - c. If no voltage reading is observed, the break is between the negative side of the grid and the point where the negative voltmeter lead is touching the grid line. To locate the exact point of breakage, move the negative voltmeter lead slowly toward the negative side of the grid to the point where a +12 volt reading is just obtained.
4. Turn off rear defogger switch and ignition switch.

Repair Procedure (Read all manufacturer warnings.)

After the break in the grid line has been located, make repairs as follows:

1. Place protective covering over work area to prevent staining of upholstery in event of spillage of materials.
2. Make sure the glass is cleaned before attempting the repair.
3. The stencil enclosed in the kit is wider than the Subaru grids, therefore, electrical tape may be used to create the proper size stencil.
4. Thoroughly shake the bottle of conductive resin.
5. Apply the resin with the brush, making sure to overlap both ends of the broken line with the resin.
6. After the surface is tack free, about one (1) minute, repeat resin. Do this three (3) times. Recap the bottle of resin tightly.
7. Wait 20 minutes and then carefully remove the electrical tape.
8. Wait 24 hours before turning the defogger on.
9. Clean the brush for future applications using acetone.

FLAT RATE INFORMATION

Item Description/ Failure Code	Operation Number	Labor Descriptions	Time
REAR DEFROSTER METAL TAB/GRID UDA-01,39	B860-311	REAR DEFROSTER METAL TAB/GRID - REPAIR	0.5
		MATERIAL (REPAIR KIT) SHOULD BE CHARGED IN *SUBLET - 860-317	

***Sublet charges should be fair and reasonable.**

SERVICE BULLETIN

* THIS BULLETIN IS SUPERCEDED *

APPLICABILITY

1998 - 2004 FORESTER, 1992 - 2003 IMPREZA,
1990 - 2004 LEGACY

DATE 11-9-95

SUBJECT FUEL INJECTOR REMOVAL PROCEDURES

When removing and/or replacing the fuel injector(s), it is imperative that the following instructions be strictly adhered to. **Failing to do so may result in damage to the injector(s).**

NOTE: Pliers or any other tools not specified in these instructions should not be used under any circumstances to prevent damage to the fuel injector(s).

The removed fuel injectors will be remanufactured to new standards and used as a future replacement part(s). Physically damaged fuel injector(s) that cannot be remanufactured will not be accepted by Subaru of America Inc. and a partial dealer charge back will be issued.

FUEL INJECTOR REMOVAL

1. Disconnect the fuel pump connector. Start the engine and allow the engine to stall. Crank the engine for 5 seconds and turn the ignition switch to the off position.
2. Remove the air cleaner upper case, air flow meter and the air inlet boot as an assembly. On SVX vehicles also remove the power steering hose tie-wrap on the right side of the engine.
3. Remove the fuel injector cap(s) being very careful not to misplace the rubber spacer(s) fitted between the cap(s) and the injector(s). The rubber spacer(s) must be reinstalled with the new injector(s). Refer to Figure 1.
4. Using only your fingers, turn the fuel injector(s) 90 degrees. The fuel injector(s) connectors on both sides of the engine should be pointed towards the front of the vehicle. Refer to Figure 2.

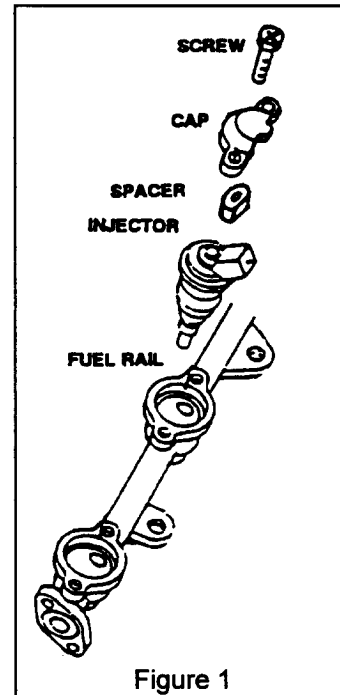


Figure 1

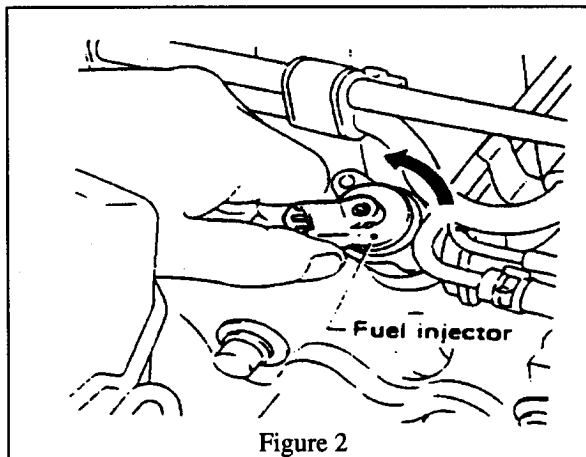


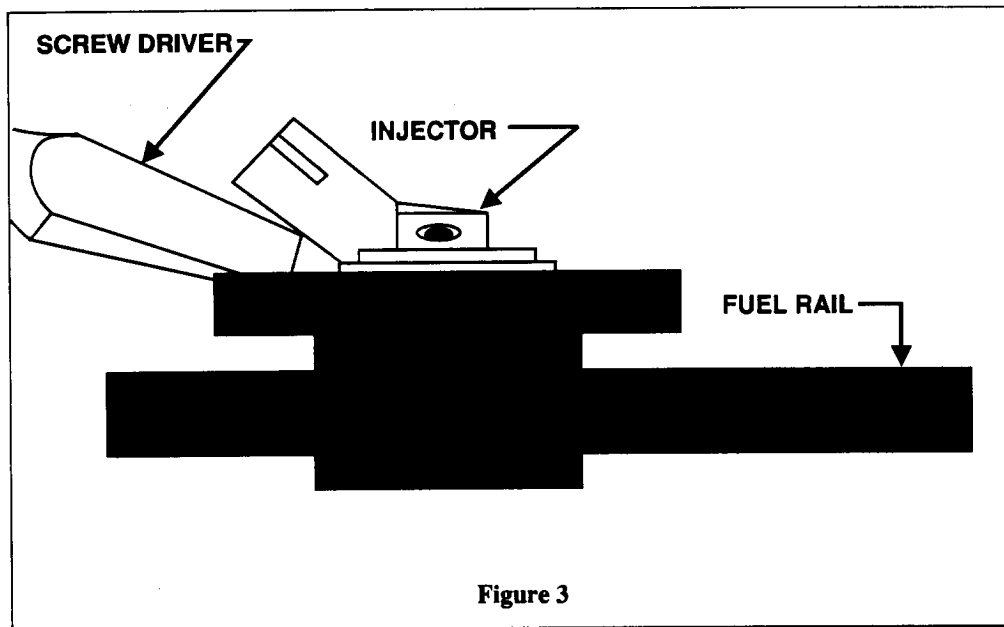
Figure 2

CAUTION

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5. Using a large flat screwdriver with a 3/8 to 1/2 inch blade gently pry the injector up by twisting the screw driver between the underside of the fuel injector connector area and the fuel injector cap mounting area. Refer to Figure 3. NOTE: Do not damage the fuel injector cap mounting threads.



6. Remove the fuel injector(s) and place it in the box that contained the new injector(s) or wrap it to protect it during return shipping and handling. Any injectors received damaged will not be accepted.

FUEL INJECTOR INSTALLATION

1. Coat the fuel injector "O" ring(s) of the new injector(s) and the mating area of the fuel rail with engine oil. Install the fuel injector(s) into the fuel rail and carefully push it in by hand until it is fully seated. Make sure the injector connector is in the correct position so the injector cap can be installed correctly.
2. Place the rubber spacer(s) back in position and install the injector cap and bolts.
3. Reconnect the fuel pump connector.
4. Reinstall the air cleaner case, air flow meter, air inlet boot and tie-wrap for SVX vehicles that was previously removed.
5. Start the engine while holding the accelerator open 1/4 throttle to clear any fuel that may have dripped into the intake manifold.
6. Carefully check each injector for leaks.

ATTENTION:GENERAL MANAGER ☐
CLAIMS PERSONNEL ☐PARTS MANAGER ☐
SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial

SUBARU **SERVICE BULLETIN****APPLICABILITY:** 2002MY Impreza WRX
SUBJECT: Fuel Smell in Cold Weather**NUMBER:** 09-36-03
DATE: 04/01/03**INTRODUCTION**

Some 2002 model Impreza WRX (2.0L Turbo) may experience a fuel smell in cold weather (temperature < 14°F) from the rubber hose connector, located under the intake manifold, between two direct fuel-feed metal lines to the injectors.

REPAIR

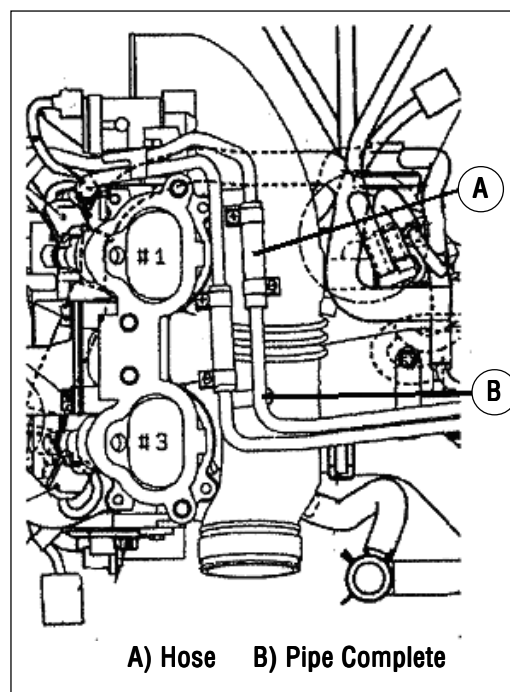
The changing of the pipe and hose size was adopted, starting with engine number 673467 to better align the two fuel lines. This was accomplished by shortening the fuel pipe and lengthening the hose both by 30mm. To complete this service procedure, you must replace the fuel pipe assembly and hose as a set.

Follow the service procedure in the appropriate service manual to remove the intake manifold from the vehicle.

PARTS

Replace the pipe and hose as a set.

PART NUMBER	DESCRIPTION
17544AA134	Pipe complete (30mm shorter than Old one)
807707140	Hose (30mm longer than Old one)



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SERVICE BULLETIN

APPLICABILITY: 2002~2003MY Impreza WRX
SUBJECT: New WRX Radiator

NUMBER: 09-37-03
DATE: 07/15/03

INTRODUCTION

If you are replacing the radiator in a WRX with a production date prior to September 2002 you will need to make a few changes. A radiator cap has been added to all new radiators being produced for this model, which requires you to add a new pipe and two hoses. These items must be ordered and installed as a set when ordering the new radiator.

VEHICLES AFFECTED

Production change: September, 2002.

MODEL	STARTING VIN
Sedan	2*507194
Wagon	2*806590

PARTS INFORMATION

The new style radiator has a radiator cap that is incorporated into the top tank. The old style radiator did not have the radiator cap incorporated in the top.

Since the old style radiator was discontinued in production, the new style radiator must be substituted for it. In this situation you must install a new overflow pipe and overflow hose A & B as a set along with the new radiator.



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Install the following parts as a set:

MANUAL TRANSMISSION		AUTOMATIC TRANSMISSION	
Radiator MT	45111FE101	Radiator AT	45111FE111
Pipe Overflow	45175FE010	Pipe Overflow	45175FE010
Hose Overflow B	45162FE010	Hose Overflow B	45162FE010
Hose Overflow A	45162FE000	Hose Overflow A	45162FE000

CAUTION

The new system is provided with two different caps, one on the radiator and one on the pressurized tank as shown in the below table. Accordingly, pay special attention not to mix up those caps. If they are switched, it could cause overheating which may lead to engine failure.

RADIATOR CAP (VALVE OPENING PRESSURE IS 137kPa)



A round shape pressure relief valve cap is provided on the radiator upper tank and the valve opening pressure is 137kPa.

Only a pressure relief valve is provided, but no vacuum relief valve is provided.

Do not remove this cap for coolant supply. Remove it only if there is a malfunction or for inspection and cleaning.

PRESSURIZED TANK CAP (VALVE OPENING PRESSURE IS 108kPa)



The cap installed on the pressurized tank is provided with a vacuum relief valve as well as a pressure relief valve to collect vapor in the overflow tank.

This cap is never to be installed onto the new style radiator. If so, it could cause overheating or serious engine failure.

Add coolant from the pressurized tank and the overflow bottle as needed.

ATTENTION:GENERAL MANAGER ☐
CLAIMS PERSONNEL ☐PARTS MANAGER ☐
SERVICE MANAGER ☐*IMPORTANT - All Service Personnel Should Read and Initial*

SUBARU **SERVICE BULLETIN****APPLICABILITY:** All Models
SUBJECT: Cautions Concerning Engine Coolant**NUMBER:** 09-42-05
DATE: 04/15/05**INTRODUCTION**

The purpose of this bulletin is to inform of cautions concerning engine coolant.

REPAIR PROCEDURES/INFORMATION

When adding, replacing or servicing the cooling system always use **Genuine Subaru Long Life Coolant**. Genuine Subaru Long Life Coolant is a phosphate (non-amine) type and is specially formulated for all Subaru vehicles equipped with aluminum engines and radiators. Coolant of other types may not provide the proper protection to aid against corrosion of aluminum parts. If an equivalent must be used, make sure it is a phosphate (non-amine) type. As a reminder, use of Genuine Subaru Long Life Coolant is mandatory on all repairs paid for by Subaru of America, Inc. that require the replenishment of coolant. This holds true for any claim type.

Do not use flushing machines.

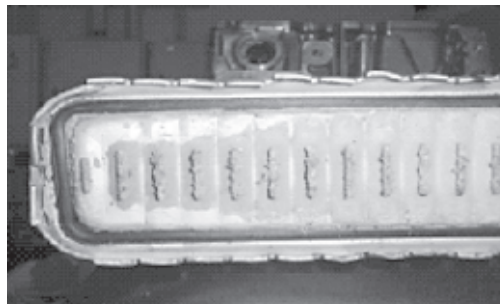
If a flushing machine has been used to service other brand vehicles with copper radiators, a chemical reaction between copper ions and Subaru coolant may occur. This could also cause clogging of the radiator.

If regular flushing is required, only use fresh tap water. Do not use hard water. Hard water will create calcium build up which will clog the radiator.

Whenever the coolant is changed, you must add Genuine Subaru Cooling System Conditioner. Genuine Subaru Cooling System Conditioner has been tested and approved for aluminum engines and radiators.

Do not use after-market coolant reinforcement agents, sealers and/or flushing agents as those chemicals could corrode aluminum parts.

This photo shows the condition of a clogged radiator that has been filled with non-genuine coolant. The residue is corroded aluminum.

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SUBARU

SERVICE BULLETIN

APPLICABILITY: All Models
SUBJECT: Radiator Cap

NUMBER: 09-45-06
DATE: 11/28/06

INTRODUCTION

The purpose of this bulletin is to provide the inspection and cleaning procedure for the radiator cap.

Whenever servicing the coolant/radiator, it is imperative that the filler neck and cap are clean of all contaminants and debris.

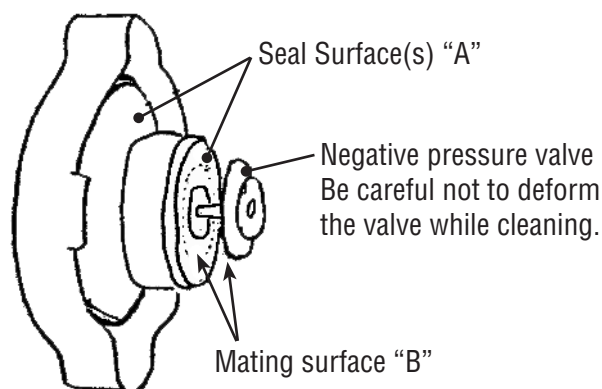
If foreign material is left in the filler neck sealing area, it will become embedded in the rubber seal and will prevent the cap from sealing properly. Before making the determination that the radiator cap is faulty, perform the following repair procedure.

REPAIR PROCEDURE/INFORMATION

Caution: The engine cooling system is under pressure and may be extremely hot. To prevent personal injury or vehicle damage, be sure to take appropriate precautions while performing this procedure.

- 1) Wash and clean the rubber seal surface(s) "A" using clean water and a soft bristle brush.
- 2) Carefully open the negative pressure valve. Using clean water and a soft bristle brush wash and clean the mating surface "B" between the valve and the rubber seal.

Note: Clean thoroughly. Failure to do so will prevent the cap from holding pressure.



Continued on Next Page



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- 3) After cleaning, check valve-opening pressure of cap using a cap tester according to the applicable service manual.
- 4) Clean the filler neck sealing surface of any and all contaminants.

Note: If the valve opening pressure stays within the predetermined specification the cap is reusable. Only replace caps that failed the pressure test.

Special note: If the vehicle has any record of overheating the cap may not be reusable even after cleaning due to the deterioration of the sealing materials.

WARRANTY/CLAIM INFORMATION

For vehicles under the Basic New Car Limited Warranty period, this repair may be claimed using:

LABOR DESCRIPTION	LABOR OPERATION	FAIL CODE	LABOR TIME
Radiator Pressure Cap, R&R	B 228-121	CAH-29	0.2
Cooling System Pressure Testing & Diagnosis (Includes cleaning cap)	C 228-001		0.3

ATTENTION:GENERAL MANAGER
CLAIMS PERSONNELPARTS MANAGER
SERVICE MANAGER

IMPORTANT - All Service Personnel Should Read and Initial

SUBARU **SERVICE BULLETIN****APPLICABILITY:** 2002 - 2003 Impreza**NUMBER:** 10-72-02R**DATE:** 07/15/03**SUBJECT:** Countermeasure to Prevent Icing in the
Evaporator on Air Conditioned Vehicles
Correction**INTRODUCTION**

There is a possibility that icing could occur in the evaporator core of air conditioned equipped Impreza vehicles. During operation under warm, high humidity conditions the customer would notice a diminished output of air from the dash vents causing the cabin temperature to rise. The icing condition can be eliminated by replacing the original Thermosensor with a new fin sensitive type sensor and placing it in the proper location.

The location of the original Thermosensor will depend on the production date of the vehicle. In December 2001, it was moved to the right side of the evaporator. You will replace the surface mounted probe with the internal fin-mounted probe if the condition still exists on vehicles up to the production change listed in this bulletin.

The part number for the new Thermosensor is **P/N 72166FE010** & the Plastic Holder is **P/N 73552FE000**. The o-rings needed are **P/N 73039FA100 (1)**, **P/N 73039FA110 (1)**, **P/N 73561FA040 (2)**, and **P/N 73561FA030 (2)**; a total of 6 o-rings in all.

Production change took place with the following Impreza vehicle information:

October 2002	Sedan ~3*511336
	Wagon ~3*801514

REPAIR PROCEDURE

- 1) This procedure is different than what is shown in the service manual.
- 2) Start by evacuating the A/C system.
- 3) While the system is evacuating, start removing the (9) screws and 1 clip that hold the glove box assembly in place. Remove the connector for the glove box light. This is a different type of clip. You must lift the end of the connector to get the locking tab out. There is no depression tab to push.

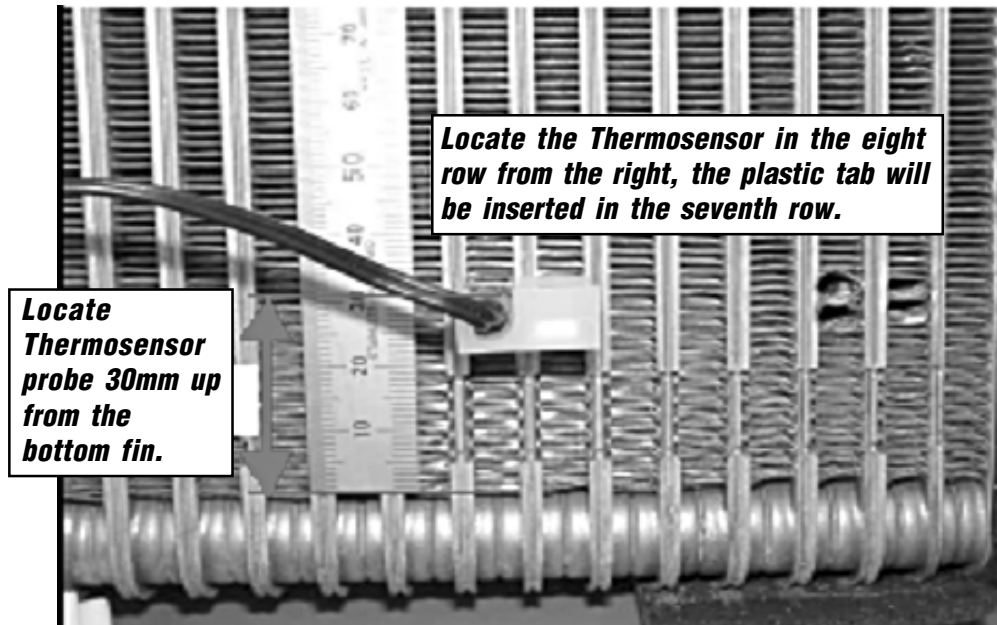
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- 4) Remove the A pillar lower kick panel
- 5) Remove the daytime running lights relay and bracket as an assembly.
- 6) Remove the daytime running light control module and bracket.
- 7) Remove the heater control cable, intake side.
- 8) Disconnect the heater recirculation door cable.
- 9) Remove the two (2) nuts and one (1) bolt that hold the blower assembly in place. The upper nut is hidden behind the white wire tie clip that is mounted to the same stud. At this time, disconnect the electrical connectors from the blower unit. Be careful of the sealing packing material on the unit.
- 10) Remove the five (5) screws and one (1) hidden black clip that hold the white evaporator cover to the main case.
 - a) Lift the cover guide pin off then, and remove the cover. It is easier if you set the heater control to DEF before removing the cover.
- 11) Check to insure the system is completely discharged.
- 12) Remove the high and low pressure lines from the expansion valve block from under the hood on the firewall. There is one (1) 10mm bolt holding these two lines in place. If you are working on a WRX, it may be easier to also remove some of the firewall line clips to gain more clearance. If there is not enough clearance, you may need to remove the air box or intercooler on turbo models.
- 13) Remove two (2) 4mm Alan screws from the same location, These are found after the lines are removed. Do not remove the aluminum block at this time. It must come out from the inside.
- 14) From under the dash you can now remove the expansion valve block (gold in color), followed by the aluminum block previously mentioned. Cover openings to prevent contamination and catch any oil that may leak out to prevent customer complaints.
- 15) You can now slide the evaporator out to the right with the Thermosensor probe attached. Work it out slowly because the wiring harness attached above the evaporator on the top of the dash will be in the way.
- 16) Remove the old surface mounted Thermosensor and discard it. Replace it with the new style internal Thermosensor **P/N 72166FE010** and Plastic Holder **P/N 73552FE000** at the new location as shown in the picture in this bulletin. The metal Thermosensor and clip goes in the eighth row from the right and 30 mm up from the bottom fin. Assemble the Thermosensor and the plastic holder first, then push them both into position. The plastic tab goes to the right of the metal Thermosensor in the seventh row.
- 17) Replace all six (6) of the o-rings as listed on page one of this bulletin on the high and low pressure lines and the expansion valve.
- 18) After the evaporator is reinstalled and the lines are secured, test the integrity of the seals by pulling and holding a vacuum on the system. This is done before the final assembly.
- 19) The white cover must be sealed from the lower corner where the Thermosensor wire goes through to the top side as far as you can reach. Failure to do this will cause water to leak out on the carpets.
- 20) Assembly is in the reverse order of disassembly.

INSTALLATION LOCATION OF THERMOSENSOR



CLAIM REIMBURSEMENT / WARRANTY INFORMATION

For vehicles within the warranty period, this repair can be claimed using the following warranty information:

LABOR DESCRIPTION	OPERATION NUMBER	FAIL CODE	LABOR TIME
Thermister Relocation	A015-335	CUK-48	1.2

ATTENTION:

GENERAL MANAGER ☐PARTS MANAGER ☐CLAIMS PERSONNEL ☐SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial

NUMBER 11-51-97

APPLICABILITY All models 1995 - 2004

DATE 12/5/97

SUBJECT Diagnostic Service Cautions

Service Bulletin #11-50-97, concerning State emission testing of Full-Time 4WD and AWD models, includes a **Warning Statement** that testing of subject vehicles must never be performed on single two-wheel dynamometer nor should the diagnostic service FWD fuse be installed in the engine compartment. Attempting to do so will result in uncontrolled vehicle movement and may cause an accident or injuries to persons nearby.

Should you encounter a need to perform diagnostic service on a Full-Time 4WD or AWD model such as transfer clutch pressure test or service requiring the front wheels raised on rollers (brake tester, chassis dynamometer, etc.) and usage of the diagnostic FWD fuse, **please ensure proper vehicle tie-down procedures and operate the vehicle at extremely low speed (5-10 mph).**

!CAUTION!

The above diagnostic service cautions are to preclude uncontrolled vehicle movement and/or injuries to persons nearby.

If you have any questions, please contact the Subaru Technical Helpline for assistance.

CAUTION

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SERVICE BULLETIN

APPLICABILITY 1990 - 2004 ALL MODELS
DATE 06-11-96
SUBJECT OUTSIDE MIRROR GLASS REPLACEMENT PROCEDURE

Tools required: small regular screwdriver, heat gun, safety glasses, gloves, scraper or equivalent.

If you encounter a customer complaint of a cracked or distorted outside mirror glass (LH or RH), the following steps should be followed after confirming proper operation of the mirror assembly (warranty coverage for cracks and distortions from product failure only - NOT from stone chips, abuse, etc.).

Part numbers for the replacement mirrors can be obtained through normal parts channels. In some cases, a heated mirror replacement will be used in a non-heated mirror assembly. This is a normal part number supersession.

Note: Wear Safety Glasses & Gloves

Removal of damaged mirror

- 1) Heat the mirror holder. See figure 1. Take care not to overheat the mirror assembly or the painted surface.
- 2) Carefully insert a regular screwdriver between the mirror and the mirror holder. Gently lift the mirror out of the holder.
- 3) If you are working with a heated mirror, it will be necessary to disconnect the wires at this time.
- 4) Clean the old adhesive from the mirror holder assembly. Using a scraper or equivalent.

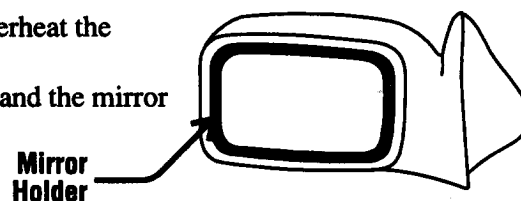


figure 1

Installation of mirror glass

- 1) If the new mirror glass has a protective coating on it, remove it now.
- 2) Install either the two urethane strips or the two pieces of double sided tape to the mirror assembly. (Supplied with the replacement mirror.)
- 3) If you are working with a heated mirror, it will be necessary to connect the wires at this time.
- 4) Position the mirror and carefully press into place, making sure the mirror is positioned behind the mirror holder.
- 5) Confirm proper operation of the mirror assembly.

This new operation number can be claimed using the following warranty information for vehicles within the terms of the Subaru Limited Warranty, since it is not necessary to remove the mirror assembly from the vehicle:

Failure Code	Operation #	Labor Description	Labor Time
Outside Rear View Mirror XBK-01, 02, 05, 56	A916-101 A916-102	Outside Rear View Mirror - One Replace OutsideRear View Mirror - Both Replace	0.3 0.5

CAUTION

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ATTENTION:GENERAL MANAGER ☐PARTS MANAGER ☐CLAIMS PERSONNEL ☐SERVICE MANAGER ☐*IMPORTANT - All Service Personnel Should Read and Initial*

SUBARU **SERVICE BULLETIN****APPLICABILITY:** 2002 Impreza Sedan only**NUMBER:** 12-74-01**SUBJECT:** Trunk Lock Cylinder**DATE:** 11/29/01**DESCRIPTION**

The 2002MY Impreza Owner's Manual contains a description about a 'Valet Lock' feature. This feature is not present on the trunk lock of the 2002MY Impreza sedan prior to August 20, 2001 production.

The trunk lock on 2002MY Impreza Sedans produced prior to August 20, 2001 does not incorporate the 'Valet Lock' feature, because limited access to the trunk could still be gained through the rear seat pass through opening even if the trunk itself is locked.

FHI has decided to incorporate this 'Valet Lock' feature in production starting with VIN 2*516709 (August 20th, 2001).

If you encounter a customer who would like this feature installed in their vehicle, there is a modified Trunk lock key available. P/N 57449FE010 - Key Lock Trunk. Each will contain a trunk lock cylinder with a separate key

This new trunk lock will not be coded to match door locks and ignition, so the customer will have an additional key to open the trunk.

Labor Description	Operation #	Failure Code	Labor Time
Trunk Lock Cylinder - Replace	A915-421	SCN-58	0.3

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ATTENTION:GENERAL MANAGER ☐ PARTS MANAGER ☐
CLAIMS PERSONNEL ☐ SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial

SUBARU **SERVICE BULLETIN****APPLICABILITY:** 1999MY~04MY Legacy, Forester,
Impreza and Baja Vehicles**NUMBER:** 12-78-03R**DATE:** 11/12/04**SUBJECT:** Floor Mat Hook Repair**INTRODUCTION**

In the event you encounter a customer complaint of the floor mat hook becoming loose or pulling through the carpet, the following repair method should be followed in lieu of replacing the entire carpet assembly.

PARTS INFORMATION

DESCRIPTION	PART NUMBER
Carpet Mat Clip	95033FC050
Washer/Lock Tab	512300171

REPAIR PROCEDURE

- 1) Remove the trunk/fuel door release lever cover if equipped. On models without this cover, remove the door sill trim.
- 2) Working on the underside of the carpet, use a small flat blade screwdriver to release the lock on the floor mat hook and extend the collapsible portion to avoid further tearing/elongation of the carpet.
- 3) Note the orientation then carefully remove the old floor mat hook and discard it.
- 4) Insert the new floor mat hook (part # 95033FC050) through the carpet.

continued...**CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.**

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- 5) Install the washer/lock tab (part # 512300171) on the underside of the carpet with the “tang” pointing upward and aligned with the base of the floor mat hook as shown in figure 1 below. (Note: The carpet has been omitted from the photo in order to show detail.)
- 6) Using a pair of pliers with its jaws protected, compress the collapsible portion of the floor mat hook ensuring that the lock is engaged. (See figure 2 below.)

Refit the carpet and reinstall all trim in the reverse order of removal.

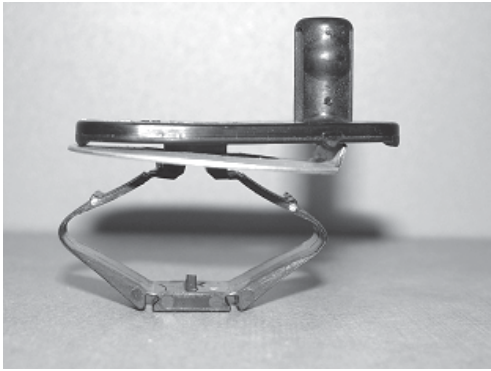


FIGURE 1

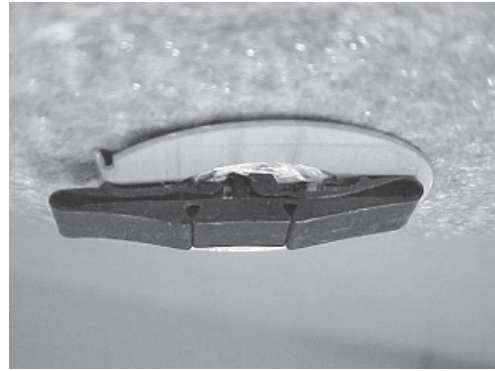


FIGURE 2

WARRANTY LABOR TIME INFORMATION

LABOR DESCRIPTION	LABOR OPERATION	LABOR TIME	FAIL CODE
Floor Mat Hook	A 913-331	0.2 hours	YBV -01, 05, 23, 29.

ATTENTION:GENERAL MANAGER ☐
CLAIMS PERSONNEL ☐PARTS MANAGER ☐
SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial

SUBARU **SERVICE BULLETIN**

APPLICABILITY: 1998~current MY Forester
2000~current MY Legacy/Outback Wagon
2002~current MY Impreza Wagon
SUBJECT: Rear Gate Stay Diagnosis

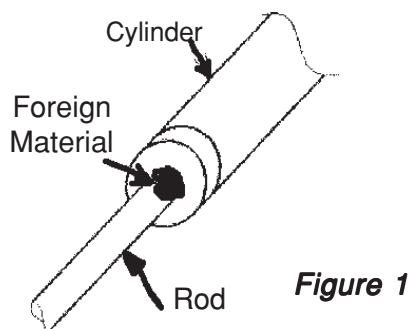
NUMBER: 12-85-05R
DATE: 02/25/05

INTRODUCTION

This bulletin provides information to properly diagnosis the rear gate stays and also avoids unnecessary replacement of non-failed stays.

REPAIR PROCEDURES/INFORMATION**Visual inspection**

Check the lower end of the rear gate stay for foreign material. If foreign material (as an example, sand particle) gets lodged at the end of the cylinder it will cause the gas within the cylinder to leak (see Figure1). If foreign material is found lodged at the end of the cylinder, the cylinder should be replaced.

**Figure 1**

Note: Read all cautions prior to diagnosing and proper disposal as listed in the applicable service manual.

Measurement check

If you cannot determine which stay may have leaked, they can be checked separately using the following method. A push-pull or brake pedal effort gauge should be used. Each stay needs to be checked individually.

continued...



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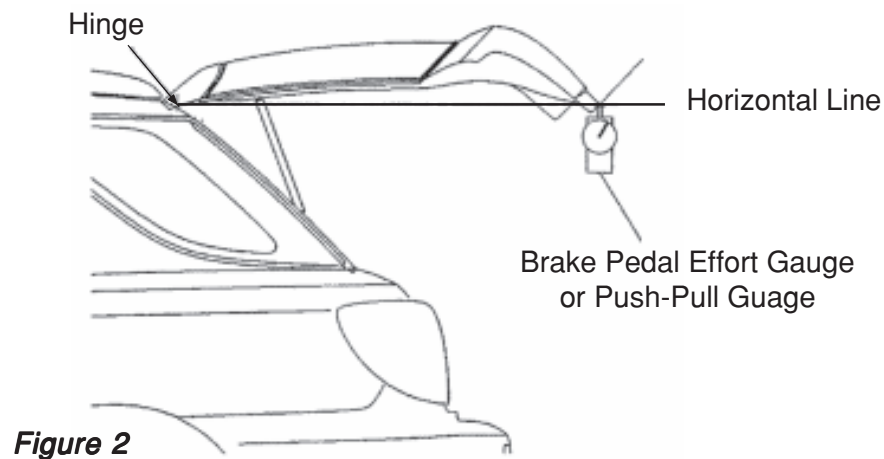
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Note: If using a brake pedal effort gauge, it is advisable to put duct tape on the gauge on the area that will come in contact with the vehicle. Doing so will protect the painted surface of the vehicle's rear gate.

Disconnect one stay (refer to the applicable service manual) at a time. Be sure to zero the needle or gauge on your measuring device before proceeding with any testing. Using the brake pedal effort gauge, measure the load by placing the gauge at the lower edge of the rear gate (see Figure 2). Push up on the rear gate using the gauge and stop when the gate edge is parallel (horizontal) with the rear gate hinge. Record your measurement (see figure 2). Compare your measurements with the ones on the following chart to determine if replacement is necessary. If the measurement is within specification, reinstall the removed stay and remove the opposite one.

Repeat the measuring procedure. If both stays are within specification no replacement is necessary.



This chart provides specifications to determine if the rear gate stay(s) has failed.

	LEGACY	IMPREZA	FORESTER 98MY thru 02MY	FORESTER 03MY and later
Not Failed	Less than 60N (6.1 kgf, 13.5 lb)	Less than 30N (3.0 kgf, 6.7 lb)	Less than 40N (4.0 kgf, 9.0 lb)	Less than 45N (4.6 kgf, 10.1 lb)
Failed	160N (16.3 kgf, 36.0 lb)	100N (10.2 kgf, 22.5 lb)	130N (13.3 kgf, 29.2 lb)	110N (11.2 kgf, 24.7 lb)

Note: Above values will vary slightly depending upon ambient temperatures. Failed values listed are that of a stay where the gas has leaked out completely. Values will vary depending upon the amount of remaining gas in the cylinder.

CLAIM REIMBURSEMENT/WARRANTY INFORMATION

For vehicles within the Basic New Car Limited Warranty period, refer to the Warranty Labor Time guide for claim information.

ATTENTION:GENERAL MANAGER ☐PARTS MANAGER ☐CLAIMS PERSONNEL ☐SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial



SERVICE BULLETIN

APPLICABILITY: All 2002 Impreza
SUBJECT: Paint Codes and Color Names

NUMBER: 13-75-01R
DATE: 02/09/01

Note: This is the most accurate information at the time of printing.

The various paint manufacturers designate their own stock numbers and their formulas are updated on a continual basis. If there are any problems with the listed vendor numbers, please have body shop personnel contact the specific paint vendor for updated information.

The paint codes are found on the VIN Plate located on the Left Strut Tower. The color code is depicted by a solid color or by a combined upper and lower color code.

Example: 1) Color Code: 54A = Black Granite Pearl
 2) Color Code: BXG = Black Granite Pearl & Titanium Pearl

Paint Color	Dist Code	Paint Code	Two-Tone Code
Aspen White	WHM	51E`	51E*
Aspen White/Graystone Metallic	WXG	51E/09V	0G5*
Blue Ridge Pearl	BRP	95H	95H*
Midnight Black Pearl	BLB	08V	08V
Midnight Black Pearl/Graystone Metallic	BXL	08V/09V	0A9
Platinum Silver Metallic	SIL	01G	01G
Platinum Silver Metallic/Graystone Metallic	SXG	01G/09V	0T9
Savana Green Metallic	GRN	07V	07V
Savana Green Metallic/Graystone Metallic	GXG	07V/09V	0A6
Sedona Red Pearl	RSP	94H	94H
Sedona Red Pearl/Graystone Metallic	RXT	94H/09V	0L1
Blaze Yellow	YEL	797	797
WR Blue Pearl	BLU	02C	02C

* Indicates a "carry-over" color.



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Code	Color Name	Sherwin - Williams	PPG	Dupont	BASF	AKZO Nobel	STANDOX	ICI	Spies Hecker
01G	Platinum Silver	63487	300064	M9393	01G	SUB9106	01G	XLA9B	24494
09V	Graystone	63488	300035	M9398	09V	SUB9101	09V	XLA3B	24497
08V	Midnight Black	63489	194511	M9397	08V	SUB9104	08V	XLA4B	24491
02C	WR Blue	63490	194512	M9394	02C	SUB9105	02C	XLA5B	24492
07V	Savana Green	63491	402020	M9396	07V	SUB9103	07V	XLA2B	24496
797	Blaze Yellow	63537	83989	F4968	797	SUB1003	797	LFL5B	22207

ATTENTION:GENERAL MANAGER ☐PARTS MANAGER ☐CLAIMS PERSONNEL ☐SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial



SERVICE BULLETIN

APPLICABILITY: All 2002 Impreza (superceded)**NUMBER:** 13-75-01**SUBJECT:** Paint Codes and Color Names**DATE:** 02/09/01

Note: This is the most accurate information at the time of printing.

The various paint manufacturers designate their own stock numbers and their formulas are updated on a continual basis. If there are any problems with the listed vendor numbers, please have body shop personnel contact the specific paint vendor for updated information.

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Savana Green Metallic/Graystone Metallic	GXG	07V/09V	0A6
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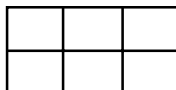
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ATTENTION:GENERAL MANAGER ☐PARTS MANAGER ☐CLAIMS PERSONNEL ☐SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial



SERVICE BULLETIN

APPLICABILITY: 2000~2003 All Models**NUMBER:** 15-105-01**DATE:** 1/04/02

SUBJECT: Auto Dimming Electrochromic
Compass Mirror Trouble Shooting
Guide

DESCRIPTION

The purpose of this Trouble Shooting Guide is to assist the technician in diagnosis of an Auto Dimming Electrochromic Compass Mirror complaint. The information below will guide you through the diagnosis of the mirror and direct you as to the appropriate correction.

MIRROR TROUBLE SHOOTING GUIDE

CONDITION	POSSIBLE CAUSE	ACTION
Mirror face does not darken.	- EC function is not on. - Mirror is not receiving power. - Light sensor is blocked.	Use pinpoint test A.
Mirror face is always dark.	Light sensor is blocked.	Use pinpoint test B.
Compass display is inaccurate.	- Compass pod is not mounted properly. - External magnetic influence is present. - Zone setting is incorrect. - Compass is not calibrated.	Use pinpoint test C.
There is no compass display.	- Compass display is switched off. - Mirror is not receiving power. - Compass pod is not connected.	Use pinpoint test D.
Some segments of display do not work.	Damaged mirror head.	Use pinpoint test E.
Display does not dim at night.	Damaged mirror head.	Use pinpoint test F.
Display is always dim.	- Light sensor opening blocked. - Damaged mirror head.	Use pinpoint test G.



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PINPOINT TEST A: MIRROR FACE DOES NOT DARKEN

NOTE: Mirror will only darken when forward facing (toward windshield) light sensor reads low light (night conditions) and rear facing (toward driver) light sensor is exposed to light source such as head lights through rear window.

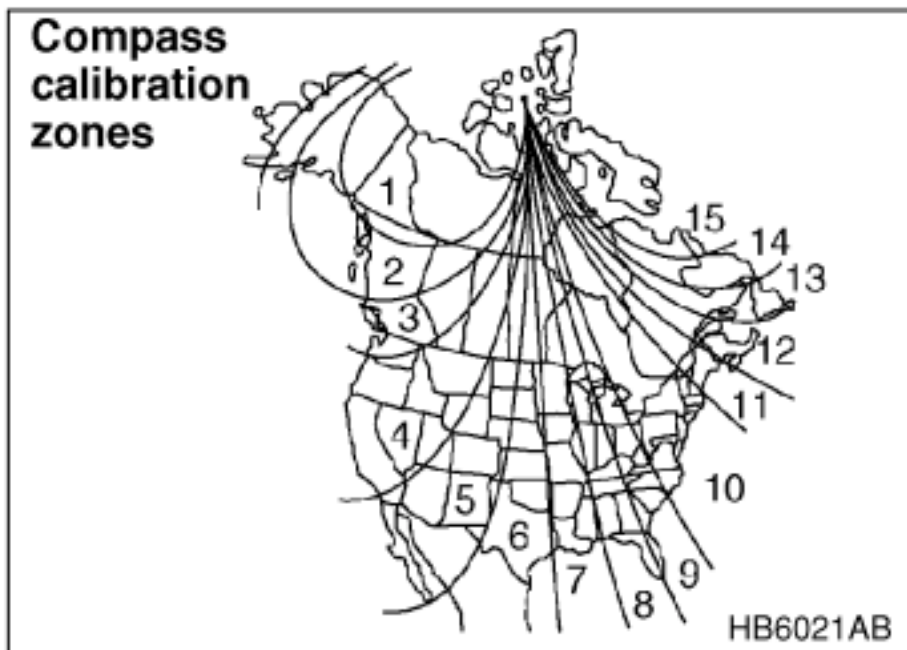
TEST STEP	RESULT	ACTION
A1: Is green LED on?	YES NO	Go to A2. Push left button. Verify green light is ON. Go to A2. If NO green light, Go to A3.
A2: With the glass side of the mirror in lighted environment, cover round opening in back of mirror. Verify that rear facing light sensor to right of display is not blocked from light source . <i>Note: At certain angles, it may be possible that light shining toward the rear of the vehicle and into the mirror is temporarily blocked by the center headrest. Under no circumstances should that safety feature be removed.</i> Does mirror face dim?	YES NO	Test finished. Mirror functional. Go to A3.
A3: Remove 7-pin connector from back of mirror. Turn ignition to ON position. Measure voltage across pins 1 & 2 of harness connector with positive lead on pin 1. Is voltage between 9V and 16V?	YES NO	Replace mirror head. Go to A4.
A4: Verify the correct power harness connection to vehicle. Check wiring to conector (back of mirror): 1) Pin 1 to Ignition controlled 12V. 2) Pin 2 to Ground. 3) Pin 3 to 12V when car in Reverse. Is power harness installed correctly?	YES NO	Replace mirror head. Reinstall harness following instructions. Go to A1.

PINPOINT TEST B: MIRROR FACE IS ALWAYS DARK

TEST STEP	RESULT	ACTION
B1: Is anything blocking the forward facing, (toward windshield) sensor opening? <i>(Mirror should be evaluated in daylight conditions.)</i>	YES NO	Remove obstruction. Verify that mirror changes to high reflectance (mirror clears). Replace mirror head.

PINPOINT TEST C: COMPASS DISPLAY IS INACCURATE

TEST	RESULT	ACTION
C1: Is pod snapped onto mount?	YES	Go to C2.
	NO	Snap pod on. Go to C2.
C2: Is external magnetic influence (roof antenna, etc.) close to mirror?	YES	Move external magnet to location further from mirror.
	NO	Go to C3.
C3: Is geographical zone set correctly? Procedure to check zone setting: 1) Refer to Compass Calibration Zone Map (Fig.1) to find correct compass zone setting for your geographical location. 2) To check the zone setting, push and hold right button until "ZONE" appears in the display.	YES	Go to C4. Set zone Procedure: 1) To check the zone setting, push and hold right button until "Zone" appears in the display. 2) Press button repeatedly until desired compass zone number is reached. The display will change back to the compass direction after 3 seconds right button is not activated.
	NO	Set zone. Go to C4.

**Figure 1**

C4: Has compass been calibrated?	YES	Replace mirror head.
	NO	Mirror Calibration Procedure: 1) For optimum calibration, switch off all non-essential electrical accessories (rear window defrost, heater/air conditioning, map lamps, wipers, etc.) and ensure all doors are shut. 2) Drive to an open, level area away from large metallic objects or structures. 3) Hold the left button for approximately 3 seconds until "CAL" text appears in the display. Release the left button to enter the calibration mode. 4) Drive slowly in a circle until the "CAL" text disappears in the display (about two or three circles). The compass is now calibrated. 5) Go to C5
C5: Is compass display accurate?	YES	Test Complete, compass is functional. Replace mirror head.
	NO	Refer to Figure 1 below.

PINPOINT TEST D: THERE IS NO COMPASS DISPLAY

TEST	RESULT	ACTION
D1: Press right most button. Does display turn on?	YES	Test finished. Mirror is functional.
	NO	Go to D2.
D2: Test per A3. Is voltage between 9V and 16V?	YES	Go to D3.
	NO	Test per A4 then go to D1.
D3: Is the harness from the mirror head connected to the pod?	YES	Replace mirror head.
	NO	Plug in compass connector and verify that display turns on.

PINPOINT TEST E: SOME SEGMENTS OF DISPLAY DO NOT WORK

TEST	RESULT	ACTION
E1: Turn ignition to ON position and watch display. Do all segments light up?	YES	Test is finished. Mirror is functional.
	NO	Replace mirror head.

PINPOINT TEST F: DISPLAY DOES NOT DIM AT NIGHT

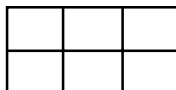
TEST	RESULT	ACTION
F1: Cover both forward and rear facing light sensor openings. Does display dim after 10 seconds?	YES	Test is finished. Mirror is functional.
	NO	Replace mirror head.

PINPOINT TEST G: DISPLAY IS ALWAYS DIM

TEST	RESULT	ACTION
G1: Are light sensor openings in front and back of mirror blocked?	YES	Remove blockage.
	NO	Replace mirror head.

ADDITIONAL COMMENTS

We welcome and encourage feedback regarding failure details. In addition to listing this information on the back of the repair order, we would appreciate any entries into the claim comments field. As an additional reminder, please remember to replace the "spring clip" included with the original mirror with the one found in each kit. Failure to perform this step may result in a loose mirror.

ATTENTION:GENERAL MANAGER ☐PARTS MANAGER ☐CLAIMS PERSONNEL ☐SERVICE MANAGER ☐*IMPORTANT - All Service Personnel Should Read and Initial***SUBARU** **SERVICE BULLETIN**

APPLICABILITY: 2002~2003 Impreza
SUBJECT: Gauge Pack Repair Kit

NUMBER: 15-106-02
DATE: 06/04/02

DESCRIPTION

Should you receive a customer complaint for inadequate lighting of the turbo gauge of the Performance Gauge Pack, a repair kit has been made available. This repair kit contains installation instructions as well as the turbo gauge. New installations should use the improved lighting Performance Gauge Pack (Turbo) - H5010FE040.

- For Performance Gauge Pack (Turbo) H5010FE011, use repair kit H5010FE048

CLAIM REINBURSEMENT AND ENTRY PROCEDURES

For vehicles within the 3 Year/36,000 Mile Basic Warranty period that previously had the Performance Gauge Pack installed, this repair kit can be claimed one time using the following warranty information.

Operation Code	Part & Failure Code	Labor Time	Claim Type
A063-771	ZEZ-42	0.3 hrs.	WC

For vehicles beyond the 3 Year/36,000 Mile Basic Warranty period, but within the 1 Year/Unlimited Mile Parts Warranty period, that previously had the Performance Gauge Pack installed, this repair kit can be claimed one time using the following warranty information.

Operation Code	Part & Failure Code	Labor Time	Claim Type
A063-771	ZEZ-42	0.3 hrs.	PW

For vehicles beyond the 3 Year/36,000 Mile Basic Warranty and the 1 Year/Unlimited Mile Parts Warranty, contact your DSOM for assistance.

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IMPREZA

GENUINE PARTS

Gauge Pack Repair Kit

Installation Manual

Genuine part number: H5010FE048

Applicable models: "TURBO"MODEL

For customers

Before using this product, please read this installation and operation manual thoroughly. Store it in a handy location for your reference to help you use the product in the proper way. To insure proper installation, have the installation done by a designated Subaru dealer.

Important

Read this manual before you use this product. Store it in a location where you can refer to it at any time.

For installation personnel

This manual explains how to install and handle the Gauge Pack Repair Kit. Make sure to read this manual carefully for correct installation before starting installation. If the product is installed in a location or method other than that described in this manual, the person who installed it is responsible for any damage or malfunction.

1 Safety precautions

In this installation Manual, items to which you need to pay special attention to are indicated by

⚠ CAUTION and 📖 ADVICE. The meanings of these indications are as follows.

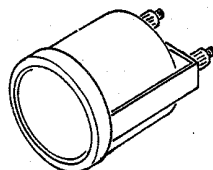
⚠ CAUTION:	If you handle the product incorrectly or do not follow the instructions, you may be injured or property damage may occur.
📖 ADVICE	This indicates the instructions that you should observe or that is convenient to know.



Precaution on installation

1. Do not hit or drop the gauge. It may cause an incorrect needle indication, needle lock glass breakage, or other failure.
2. Use proper tools to install/remove bolts, screws, and nuts, and do not torque more than necessary.
3. Connect all wires securely to the correct locations. Wiring should be routed properly (no excess tension and no pinching).
4. Do not wipe the gauge panel with organic solvent such as thinner. The surface may be damaged.
5. During the installation, take care not to damage the vehicle body or interior trim.

2 Component parts



Turbo/Vacuum gauge

3 Tools in use



Screwdriver(+)

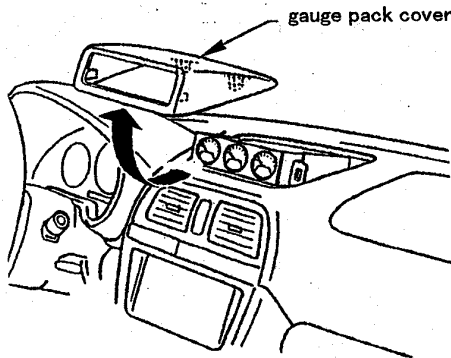
4 Preparing for installation

1. Park the vehicle in a safe place and apply the parking brake securely by pulling up on the parking brake lever.
2. Make sure that the gear is in a neutral position (P-range for AT), turn off the engine, and take out the ignition key from ignition cylinder.
3. Disconnect the negative battery (-) terminal.
4. Open the package and check the component parts and the quantity as shown in the component parts section of the manual and check for any defective parts.

5 Installation procedure

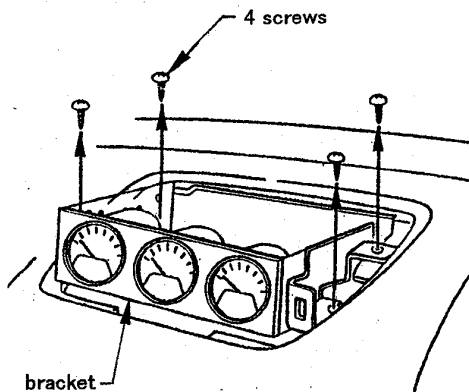
Exchange the Gauge

1. Remove the gauge pack cover by pulling towards rear of vehicle and upward.

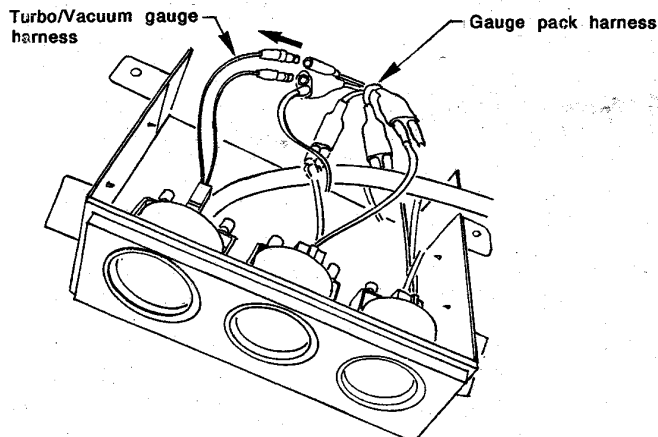


2. Remove 4 screws securing the bracket to the dashboard and move bracket off of dashboard.

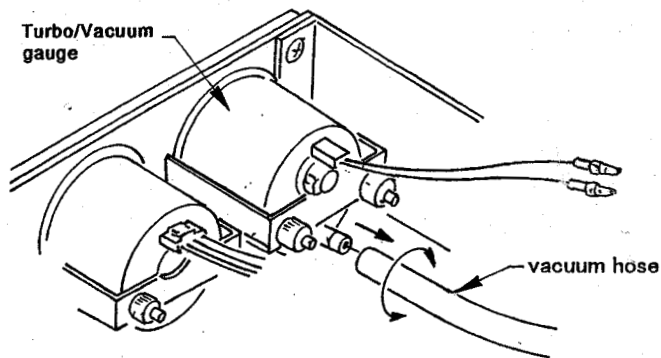
Note: To avoid damage, be sure to cover the dashboard.



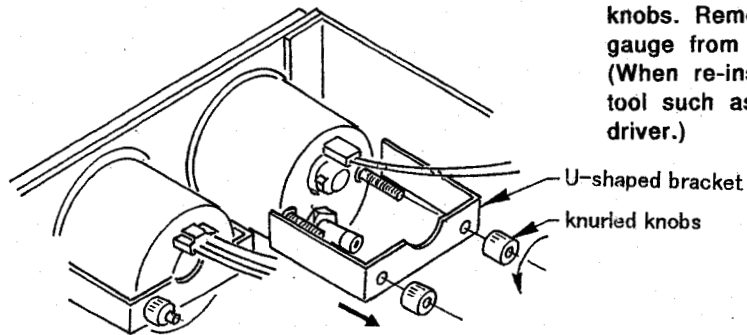
3. Disengage Turbo/Vacuum gauge harness from Gauge pack harness.



4. Disengage Turbo/Vacuum hose by twisting and pulling.



5. Remove Turbo/Vacuum gauge by unscrewing knurled knobs. Remove lock washers, U-shaped bracket and gauge from the bezel.
(When re-installing tighten by hand. Do not use any tool such as pliers. Verify gauge is aligned towards driver.)



6. Discard old Turbo/Vacuum gauge.

7. Reinstall new Turbo/Vacuum gauge in the reverse order

SERVICE BULLETIN

APPLICABILITY: 2002~2003MY Impreza Vehicles
SUBJECT: Speaker Performance

NUMBER: 15-111-04
DATE: 01/30/04

INTRODUCTION

In the event you encounter a customer complaint of speaker performance, it may be caused by the connector on the front speaker.

The complaints may include:

- Cracking and/or popping from the front speakers.
- No sound from front speakers (right, left or both).
- No sound from all speakers.
- Sound is distorted when increasing volume.

Based on the customer's complaint, the front speakers will need to be replaced. If after replacing the front speakers a problem still exists, proceed with diagnosing the remaining components of the audio system.

It is important to note that a problem with just one front speaker can affect all other speakers.

PARTS INFORMATION

Front Speaker Assembly — Part # 86301FE040.

CLAIM REIMBURSEMENT/WARRANTY INFORMATION

For vehicles within the Basic New Car Limited Warranty period, this repair can be claimed using the following.

LABOR DESCRIPTION	OPERATION NUMBER	FAIL CODE	LABOR TIME
Front Door Speakers, Both - Replace	A 031-324	ZGN-38* ZGN-42**	0.5

* Claims with confirmed symptoms.

** Claims with unconfirmed symptoms.



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SUBARU

SERVICE BULLETIN

APPLICABILITY: 2002MY and Later Impreza

NUMBER: 15-119-06

SUBJECT: Chattering/Vibration from
Front Door Speakers

DATE: 11/29/06

INTRODUCTION

If you encounter a customer complaint that the front door speaker(s) chatter and/or vibrate when the volume is set high, refer to the following repair procedure.

PARTS/MATERIAL INFORMATION

Countermeasure 1

3M™ Heavy Drip–Chek™ Sealer 08531

Countermeasure 2

SOA part # 61244FE100, Sealing Cover (with urethane) F Door, RH

SOA part # 61244FE110, Sealing Cover (with urethane) F Door, LH

3M™ Windo-Weld™ Round Ribbon Sealer 08625 or butyl tape as an equivalent.

Caution: Make sure to read and follow the directions, precautions, warnings, etc of the 3M™ products.

REPAIR PROCEDURE/INFORMATION

Verify the customer's complaint by playing a commercially purchased CD and/or the radio.

Note: It is not advisable to play a burned (home made) CD, due to the fact the recording levels may have been set extremely high, which may cause undesirable chattering, vibration and/or distortion.

- 1) Check to make sure there is nothing in the door pockets that could cause chattering and/or vibrations. If there is, remove the objects.
- 2) Remove the door trim (refer to the applicable service manual) and check for loose or missing screws, broken or missing clips. Replace if necessary.
- 3) Check to make sure that the sealing cover is properly applied (no peeling, no misalignment, no breakage). Repair and/or replace as necessary.

Continued on Next Page



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If the speakers still chatter and/or vibrate, perform the following countermeasure(s):

[A] Standard speaker, perform Countermeasure 1 & 2.

[B] High-grade speaker, perform Countermeasure 1.

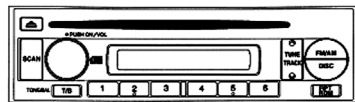
- Sealing covers with urethane are used with high-grade speakers; therefore countermeasure 2 does not need to be performed.

How to distinguish between Standard speaker and High-grade speaker

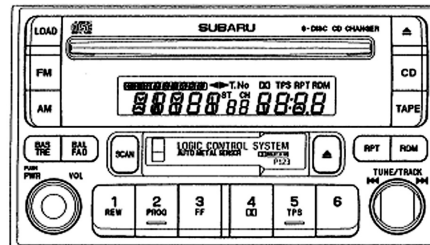
Vehicles equipped with standard speakers use a sealing cover **without** urethane.

Vehicles equipped with high-grade speakers use a sealing cover **with** urethane.

[A] Standard audio with standard speaker

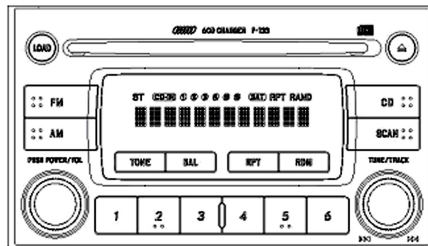


1 DIN Radio (02MY and After)

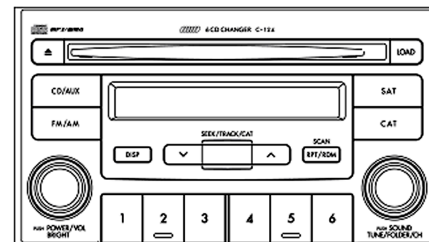


2 DIN Radio (02MY through 05MY)

[B] High-grade audio with high-grade speaker



2 DIN Radio (05MY through 07MY)



2 DIN Radio (07MY)

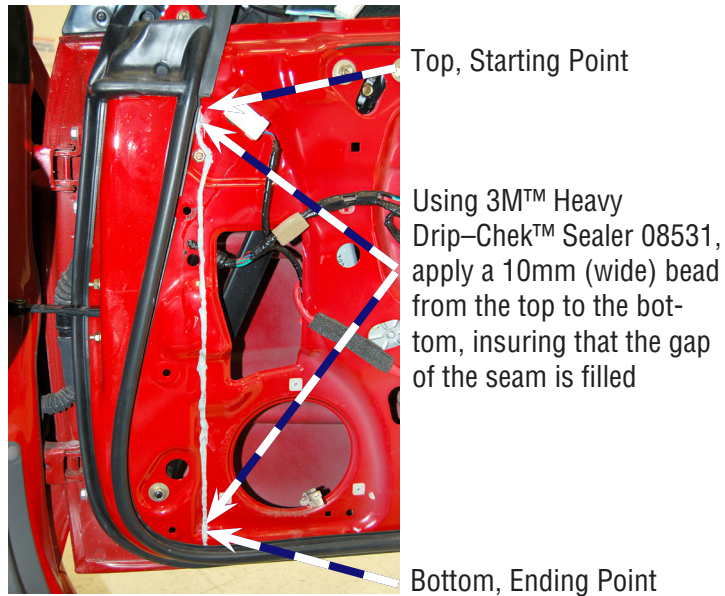
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Countermeasure 1

- 1) Remove the door trim, speaker and sealing cover (see figure 1, below).



- 2) Apply 3M™ Heavy Drip–Chek™ Sealer 08531 to the gap of the seam of the inner door panel (See figure 2, below).



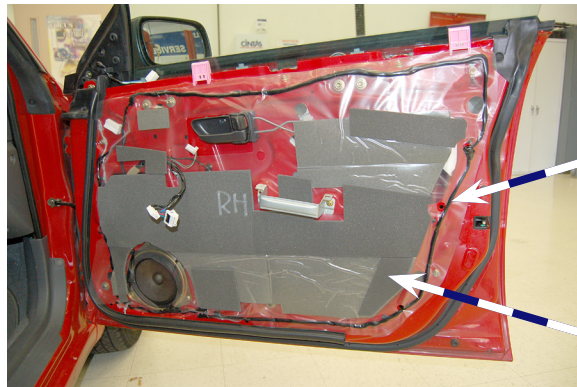
- 3) Reinstall the sealing cover (if equipped with standard speakers perform countermeasure 2), speaker and door trim.
- 4) Verify that the chatter and/or vibration is eliminated.

Countermeasure 2

- 1) Remove the door trim, speaker and sealing cover.

Continued on Next Page

- 2) Install a new sealing cover using 3M™ Windo-Weld™ Round Ribbon Sealer 08625 (See figure 3, below). Make sure to use a uniform bead and press firmly to insure the sealing cover stays in place. **Note:** Breaks in the bead will allow water leakage and contamination.



3M™ Windo-Weld™ Round Ribbon Sealer 08625

Sealing cover with urethane

- Reinstall the speaker and door trim.
- Verify that the chatter and/or vibration is eliminated.

WARRANTY/CLAIM INFORMATION

For vehicles under the Basic New Car Limited Warranty period, this repair may be claimed using:

LABOR DESCRIPTION	LABOR OPERATION	FAIL CODE	LABOR TIME
Front Door Speaker Vibration Modification - One Door (Includes diagnostics)	B 915 - 212	YMK - 48	0.6
Front Door Speaker Vibration Modification - Both Doors – ADD	C 915 - 225	YMK - 48	0.3

ATTENTION:

GENERAL MANAGER ☐
 PARTS MANAGER ☐
 CLAIMS PERSONNEL ☐
 SERVICE MANAGER ☐

IMPORTANT - All
 Service Personnel
 Should Read and
 Initial in the boxes
 provided, right.



SUBARU

QUALITY DRIVEN® SERVICE

SERVICE BULLETIN

APPLICABILITY: All Models Equipped with an
 In-dash CD Changer/Player
SUBJECT: In-dash CD Changer/Player Discs

NUMBER: 15-120-07
DATE: 03/07/07

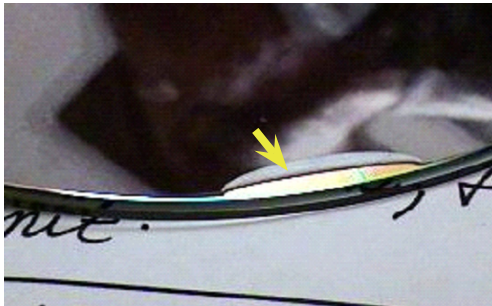
INTRODUCTION

The purpose of this bulletin is to inform of cautions concerning compact discs. There have been an increasing number of changers/players being replaced under warranty. We have found that the majority of all failures are the result of the use of damaged CDs, non-compatible user-created CDs and labels, or multiple CDs inserted at the same time jamming the player or damaging the CD. The resultant damage to the player is generally not detected until after the audio exchange has been completed.

Customers coming in with CD changer/player issues should be reminded at the time of the unit exchange that the use of CDs as described above are the potential causes of problems.

We encourage you to make a copy of page 3 of this bulletin and provide it to your customers when an exchange unit is installed.

EXAMPLES OF PEELING LABELS



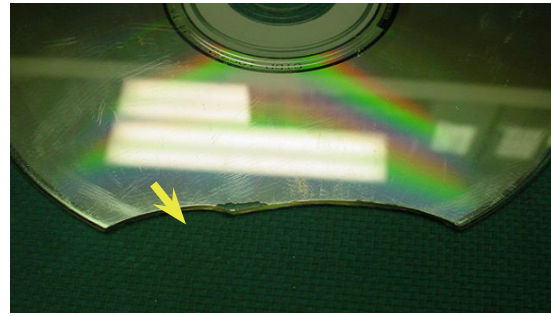
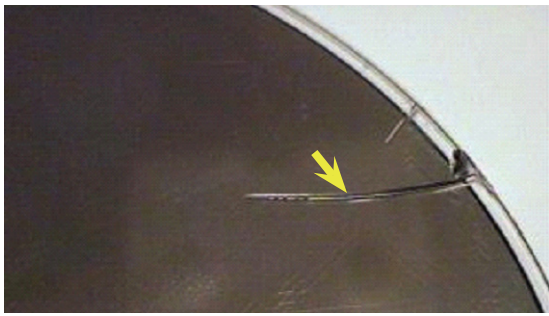
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**CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD
 RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.**

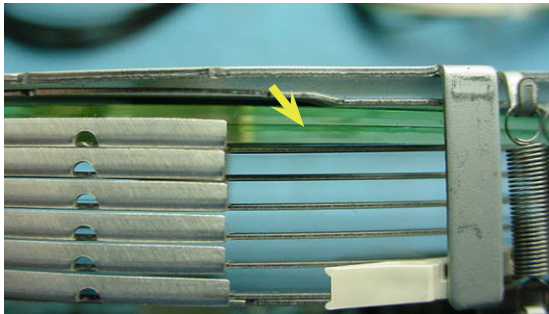
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Automotive
 Youth
 Educational
YES
 Systems
 PROUD PARTNER

EXAMPLES OF BROKEN/CRACKED DISCS



EXAMPLE OF DOUBLE-DISC INSERTION



EXAMPLE OF ODD-SHAPED DISC





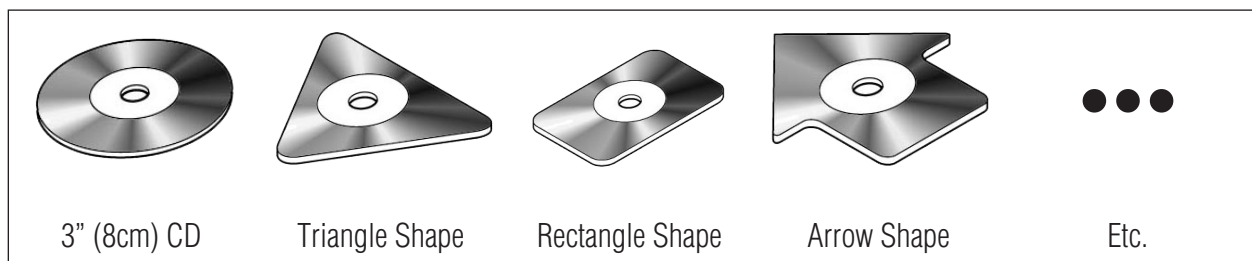
PLEASE USE CAUTION WHEN USING YOUR GENUINE SUBARU IN-DASH CD CHANGER/PLAYER

In-dash compact disc (CD) players are a great way to enjoy crystal-clear music in your Subaru. Subaru CD players are designed to play standard 4 3/4 inch diameter CDs, which carry the “Compact Disc Digital Audio” logo.

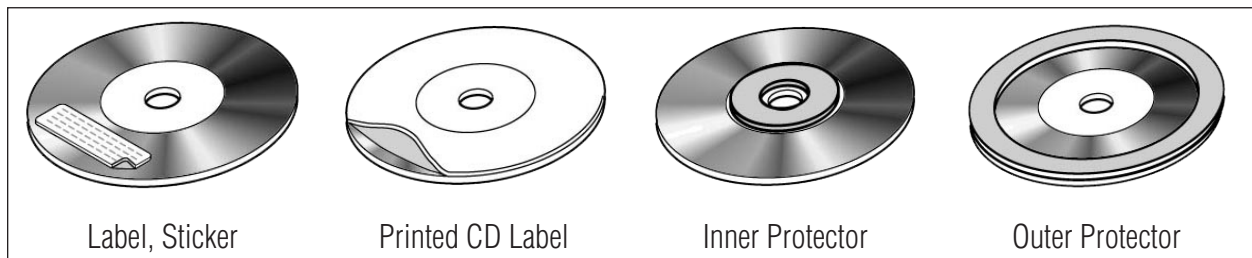


The following CDs may cause problems when loading, playing, or ejecting due to the complexity of your CD player's internal mechanisms.

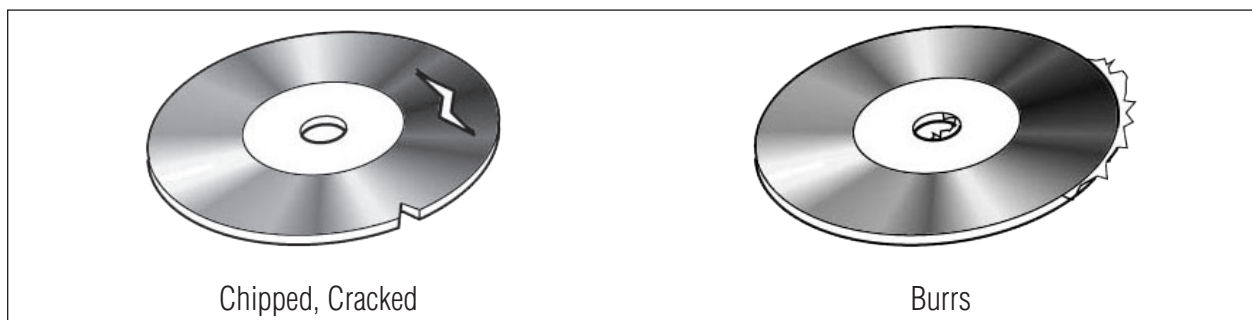
1. Small size, irregularly shaped discs.



2. Excessively thick discs.



3. Damaged Discs



4. Poor quality discs.

SERVICE BULLETIN

APPLICABILITY ALL MODELS WITH 4EAT 87.5MY TO PRESENT

DATE 03-06-92

SUBJECT: ONE WAY CLUTCH OPERATION

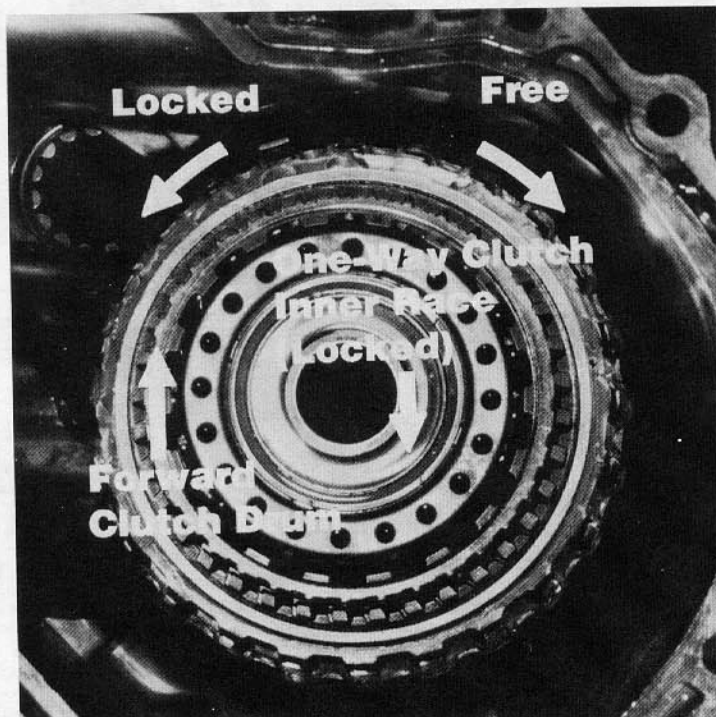
The purpose of this Bulletin is to provide the technician with a concise method of checking the one-way clutch 1-2 and 3-4 proper operation during reassembly.

Use this information as a Service Manual Correction for Service Manuals with Section 3-2 4EAT "One Way Clutch 1-2 and 3-4".

One-Way Clutch 1-2

O.W.C. (1-2) is provided to prevent the counterclockwise rotation (as viewed from the front of the transmission) of the forward clutch assembly for 1st gear ratio in the "D" range and 1st gear ratio in the "3" range. In the "D" range when upshifting from 1st to 2nd gear ratio, the forward clutch begins to rotate clockwise. In this position, the one way clutch rotates freely to allow the shift from 1st gear ratio to 2nd gear ratio to occur. See Figure 1.

NOTE: BE SURE TO USE THE ILLUSTRATION AND TEXT WHICH FOLLOWS TO PROPERLY CHECK THE INSTALLED CONDITION OF THE ONE WAY CLUTCH 1-2.



Make sure that the forward clutch rotates freely in the clockwise direction and is locked in the counterclockwise direction, as viewed from the front of the vehicle.

Figure 1

One-Way Clutch 3-4

The one way clutch (3-4) is provided to prevent the counterclockwise rotation (as viewed from the front of the transmission) of the rear internal gear assembly of the rear planetary gear during 1st gear ratio, 2nd gear ratio and 3rd gear ratio of the "D" range, "3" range, "2" range and "1st hold range". In "D" range 4th gear, the rear internal gear assembly rotates clockwise so that the one way clutch rotates freely to allow the shift from 3rd to 4th gear ratios to occur. See Figure 2.

NOTE: BE SURE TO USE THE ILLUSTRATION AND TEXT WHICH FOLLOWS TO PROPERLY CHECK THE INSTALLED CONDITION OF THE ONE WAY CLUTCH 3-4.

Assemble the rear internal gear, and secure the outer race. Make sure that the internal gear is locked in the counterclockwise direction, and free to rotate in the clockwise direction.



Figure 2

CAUTION

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ATTENTION:GENERAL MANAGER ☐
CLAIMS PERSONNEL ☐PARTS MANAGER ☐
SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial

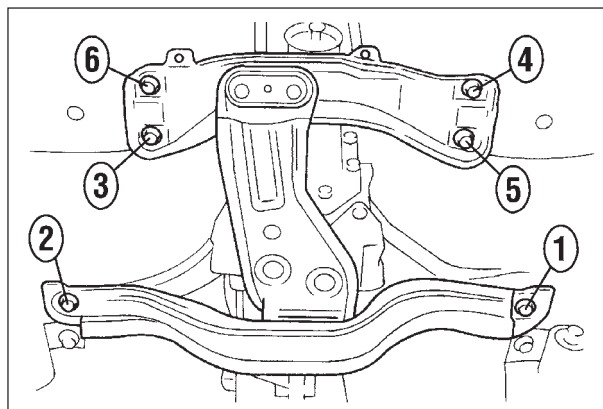
SUBARU **SERVICE BULLETIN****APPLICABILITY:** All A/T and M/T Vehicles
SUBJECT: Transmission Rear Cross-Member**NUMBER:** 03-53-04
16-54-04
DATE: 08/20/04**INTRODUCTION**

The purpose of this bulletin is to prevent the possibility of damaging the bolts and/or threads that secure the transmission rear cross member.

REPAIR PROCEDURES/INFORMATION

When performing service work or installing SOA's accessory short throw shifter, it is extremely important that the transmission is supported properly when removing or reinstalling the cross member. If not, damage to the bolts and/or threads will occur. Support the transmission using a transmission jack, regardless if the vehicle is supported by a lift or car ramps (**Figure 1**). It is recommended that hand tools be used for the removal and installation of the bolts. Inspect for bolt thread damage and replace as necessary. Be sure to clean any protective wax from the mating surfaces and be sure to start all bolts several threads by hand before using tightening tools. **Note: If severe damage is evident to the threads, the use of a Heli-coil® type kit is an approved repair method.**

During reinstallation, follow the torque sequence, below (**Figure 2**) and the torque specifications (**Figure 3; next page**).

**Figure 1****Figure 2***continued on next page...***CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.**

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Bolts must be torqued to the proper specifications (**Figure 3**).

T1: 70 N·m (7.1 kgf-m, 51 ft-lb)

T2: 140 N·m (14.3 kgf-m, 103 ft-lb)

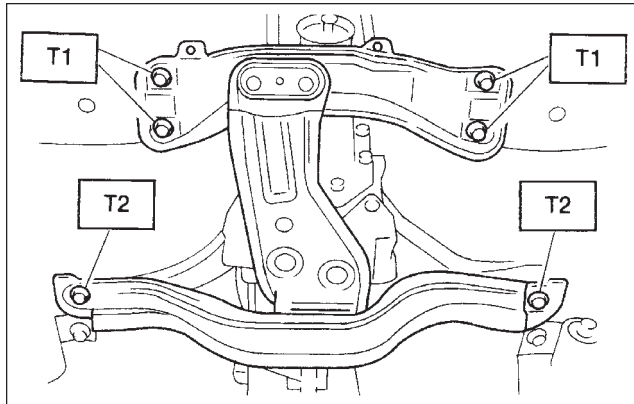


Figure 3

ATTENTION:

GENERAL MANAGER ☐ PARTS MANAGER ☐
 CLAIMS PERSONNEL ☐ SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial



SERVICE BULLETIN

APPLICABILITY: 1999 - 2002 All Models
SUBJECT: TCU Code 45 and AWD Harsh Engagement

NUMBER: 16-66-02
DATE: 03/15/03

INTRODUCTION

If you encounter a TCU Code 45 (intake manifold pressure signal), and have confirmed the wiring and connectors as outlined in the appropriate Service Manual, it will be necessary to replace the TCU with one listed below. Please note that if the same vehicle is experiencing an ECM code for the pressure signal, replacement of the TCU will not correct it. You will need to diagnose and repair according to the Service Manual.

These new TCUs also include a slight logic change to address AWD harsh engagement. Some customers may comment, when they are driving in snow and ice and they try to accelerate during slow speed driving, that they feel a bang from the rear of the vehicle. This is caused by the transfer clutch being applied quickly when the system detects slight wheel slippage. You should confirm the AWD is working properly prior to replacing the TCU.

These logic changes were incorporated into production from the start of 2003 model year.

LEGACY		TCU	
99MY	2.2L	LHD CAL	31711AE154
		POSTAL CAL	31711AE164
		LHD FED	31711AE404
		POSTAL FED	31711AE414
	2.5L	GT	31711AE174
		OBK	31711AE184
00MY	2.5L	L	31711AE10C
		GT	31711AE11C
01MY	2.5L	OBK	31711AE12C
		L	31711AF33C
	2.5L	GT	31711AF34C
		OBK	31711AF35C
02MY	2.5L	OBK	31711AF37B
		L	31711AF90B
	2.5L	GT	31711AF91B
		OBK	31711AF92B
	3.0L	OBK	31711AF95B

IMPREZA		TCU	
99MY	2.2L	CAL	31711AE314
		FED	31711AE424
	2.5L		31711AE324
00-	2.2L		31711AE532
01MY	2.5L		31711AE552
02MY	2.5L	TS,OBK	31711AE951
		RS	31711AE961

FORESTER		TCU	
99MY	2.5L		31711AE234
00-	2.5L		31711AE672
01MY			
02MY	2.5L		31711AF491



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ATTENTION:

GENERAL MANAGER ☐ PARTS MANAGER ☐
CLAIMS PERSONNEL ☐ SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial

**SERVICE BULLETIN**

APPLICABILITY: SRS Airbag-Equipped Vehicles
SUBJECT: Airbag Procedures

NUMBER: 17-02-95R
DATE: 3-27-01

IMPORTANT: WHEN SERVICING THE SRS AIRBAG SYSTEM, ALWAYS FOLLOW THE SERVICE PROCEDURES, PRECAUTIONS, AND WARNINGS INDICATED IN THE APPROPRIATE SUBARU SERVICE MANUALS AND RELATED SERVICE BULLETINS. FAILURE TO DO SO MAY RESULT IN PERSONAL INJURY AND/OR DAMAGE TO THE SYSTEM.

FRONT SENSOR(S) (If Applicable)*INSPECTION STANDARD:*

- Check the front section for damage, regardless of whether or not the airbag deployed; or
- The designated trouble code is outputted during self- diagnosis. Please refer to the diagnostics section in the appropriate service manual for further information.

REPLACE THE FRONT SENSOR(S) IF ONE OR MORE OF THE FOLLOWING CONDITIONS EXIST:

- Airbag is deployed.
- Bracket is cracked, deformed, or damaged in any manner.
- The housing is cracked, deformed, or damaged in any manner.
- The label that identifies the manufacturing number is peeling off or deteriorated.
- Harness circuit is broken, wire core is exposed, corrugated tubing is cracked, etc.
- Front sensor is dropped to the floor or ground.
- Front sensor had been determined to be faulty during self-diagnosis.

(continued on next page)

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AIRBAG MODULE (DRIVER'S AND/OR PASSENGER'S)

INSPECTION STANDARD:

- The vehicle is damaged in a collision, regardless of whether or not the airbag deployed; or
- The designated trouble code is outputted during self diagnosis. Please refer to the diagnostics section in the appropriate service manual for further information.

REPLACE THE AIRBAG MODULE IF ONE OR MORE OF THE FOLLOWING CONDITIONS EXIST:

- The Airbag is deployed.
- The pad surface is scratched, cracked, deformed, or damaged in any manner.
- The harness and/or connector is cracked or deformed, their circuits are broken, wire core is exposed, etc.
- The mounting bracket is cracked, deformed, or damaged in any manner.
- The mounting surface has been fouled with a foreign matter such as oil, grease, water, cleaning solvent, etc.
- The airbag module has been dropped to the floor or ground.
- The airbag module had been determined to be faulty during self-diagnosis.

AIRBAG CONTROL MODULE

INSPECTION STANDARD:

- The vehicle is damaged in a collision, regardless of whether or not the airbag deployed; or
- The designated trouble code is outputted during self-diagnosis. Please refer to the diagnostics section in the appropriate service manual for further information.

REPLACE THE AIRBAG CONTROL MODULE IF ONE OR MORE OF THE FOLLOWING CONDITIONS EXIST:

- The Airbag is deployed.
- The control module is cracked, deformed or damaged in any manner.
- The mounting bracket is cracked, deformed, or damaged in any manner.
- The connector is scratched, cracked, deformed, or damaged in any manner.
- The control module is dropped to the floor or ground.
- The control module had been determined to be faulty during self-diagnosis.

(continued on next page)

MAIN HARNESS

INSPECTION STANDARD:

- The vehicle is damaged in a collision regardless of whether or not the airbag deployed; or
- The designated trouble code is outputted during self-diagnosis. Please refer to the diagnostics section in the appropriate service manual for further information.

REPLACE THE MAIN HARNESS IF ONE OR MORE OF THE FOLLOWING CONDITIONS EXIST:

- Harness circuit is broken, wire core is exposed, corrugated tubing is cracked, etc.
- Connector is scratched, cracked, deformed, or damaged in any manner.
- The designated trouble code is output during self-diagnosis. Please refer to the diagnostics section in the appropriate service manual for further information.

COMBINATION SWITCH & ROLL CONNECTOR

INSPECTION STANDARD:

- The vehicle is damaged in a collision, regardless of whether or not the airbag deployed; or
- The designated trouble code is outputted during self-diagnosis. Please refer to the diagnostics section in the appropriate service manual for further information.

REPLACE THE COMBINATION SWITCH & ROLL CONNECTOR IF THE FOLLOWING CONDITION EXISTS:

- The combination switch or steering roll connector is cracked, deformed, or damaged in any manner.

(continued on next page)

STEERING WHEEL

INSPECTION STANDARD:

- The vehicle is damaged in a collision, regardless of whether or not the airbag deployed.

REPLACE THE STEERING WHEEL IF ONE OR MORE OF THE FOLLOWING CONDITIONS EXIST:

- The steering wheel is cracked, deformed, or damaged in any manner.
- Ensure that the new airbag module fits properly in the steering wheel when installed.
- After installing the airbag module, ensure that it is free of interference with the steering wheel.
Also, clearance between all points should be equal.

STEERING COLUMN ASSEMBLY

INSPECTION STANDARD:

- The vehicle is damaged in a collision, regardless of whether or not the airbag deployed.

REPLACE THE STEERING COLUMN ASSEMBLY IF ONE OR MORE OF THE FOLLOWING CONDITIONS EXIST:

- Ensure that the steering wheel free play, in axial and radial directions, is within specifications. Please refer to the diagnostics section in the appropriate service manual for further information.
- Ensure that the clearance between the steering column bracket and capsule is within specifications. Please refer to the diagnostics section in the appropriate service manual or SUBARU service bulletin number 17-01-92 (which can be found in the *SERVICE BULLETIN MANUAL AND SERVICE HELPLINE PUBLICATIONS UPDATE SUPPLEMENT*, Volume Number 14), item 4, for further information.

(continued on next page)

SIDE AIRBAG MODULE (DRIVER'S AND/OR PASSENGER'S, IF APPLICABLE)

INSPECTION PROCEDURE:

- The vehicle is damaged in a collision, regardless of whether or not the airbag deployed; or
- The designated trouble code is outputted during self diagnosis. Please refer to the diagnostics section in the appropriate service manual for further information.

REPLACE THE SIDE AIRBAG MODULE IF ONE OR MORE OF THE FOLLOWING CONDITIONS EXIST:

- The Airbag is deployed.
- The pad surface is scratched, cracked, deformed, or damaged in any manner.
- The harness and/or connector is cracked or deformed, their circuits are broken, wire core is exposed, etc.
- The mounting bracket is cracked, deformed, or damaged in any manner.
- The mounting surface has been fouled with a foreign matter such as oil, grease, water, cleaning solvent, etc.
- The airbag module has been dropped to the floor or ground.
- The airbag module had been determined to be faulty during self-diagnosis.

SIDE AIRBAG SENSOR (DRIVER'S AND/OR PASSENGER'S, IF APPLICABLE)

INSPECTION STANDARDS:

- Check the side section of the vehicle for damage, regardless of whether or not the airbag deployed; or
- The designated trouble code is outputted during self- diagnosis. Please refer to the diagnostics section in the appropriate service manual for further information.

REPLACE THE SIDE AIRBAG SENSOR(S) IF ONE OR MORE OF THE FOLLOWING CONDITIONS EXIST:

- Airbag is deployed.
- Bracket is cracked, deformed, or damaged in any manner.
- The housing is cracked, deformed, or damaged in any manner.
- The label that identifies the manufacturing number is peeling off or deteriorated.
- Harness circuit is broken, wire core is exposed, etc.
- Sensor is dropped to the floor or ground.
- Sensor had been determined to be faulty during self-diagnosis.

(continued on next page)

SEAT BELT PRE-TENSIONERS (DRIVER'S AND/OR PASSENGER'S)

INSPECTION PROCEDURE:

- The vehicle is damaged in a collision, regardless of whether or not the airbag deployed; or
- The designated trouble code is outputted during self diagnosis. Please refer to the diagnostics section in the appropriate service manual for further information.

REPLACE THE SEAT BELT PRE-TENSIONER(S) IF ONE OR MORE OF THE FOLLOWING CONDITIONS EXIST:

- Airbag is deployed (if front airbags are deployed, the front seatbelt pre-tensioners have also discharged).
- Bracket is cracked, deformed, or damaged in any manner.
- The housing is cracked, deformed, or damaged in any manner.
- The label that identifies the manufacturing number is peeling off or deteriorated.
- Harness circuit is broken, wire core is exposed, etc.
- The belt webbing is extended and will not retract.
- Pre-tensioner is dropped to the floor or ground.
- The pre-tensioner has been determined to be faulty during self-diagnosis.



SERVICE BULLETIN

APPLICABILITY: 1995MY and after Legacy
1998MY and after Forester
1993MY and after Impreza
2003MY and after Baja

NUMBER: 17-06-01R
DATE: 05/11/05

SUBJECT: Seat Belt Latch Slides to the Lower Seat Belt Anchor

DESCRIPTION

In the event you encounter a customer complaint of the seat belt latch sliding down the webbing to the lower seat belt anchor, it may be caused by the latch web stop button separating from the belt webbing. This stop button may become loose and fall off if the belt webbing is jammed between the body panel and door when the door is closed.

Use the chart below to locate and order the correct repair kit for your application.

Button Kit	Button Color
64780AC500EW	Beige (use with Beige Belt)
64780AC500VB	Black (use with Black Belt)

REPAIR PROCEDURES

- 1) Inspect the belt webbing for damage. If damaged replace the seat belt assembly.
- 2) Remove any piece of broken stopper button from the belt webbing.
- 3) Lift the belt latch up and beyond the original stopper button location and hold in place using adhesive tape.
- 4) Locate the original stopper hole (about 500mm up from bottom anchor) in the webbing and insert the new male stopper button from the backside of the belt. Push the other part of the button over the pin sticking through the front belt webbing.
- 5) Using a suitable tool, crimp the two parts together until the new button thickness is 4.5~5.0mm.
- 6) Remove the adhesive tape from the latch and confirm the stopper button holds the latch in the proper position.

continued...



CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.

Subaru Service Bulletins are intended for use by professional technicians ONLY. They are written to inform those technicians of conditions that may occur in some vehicles, or to provide information that could assist in the proper servicing of the vehicle. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do the job correctly and safely. If a condition is described, DO NOT assume that this Service Bulletin applies to your vehicle, or that your vehicle will have that condition.

For vehicles within the Basic New Car Limited Warranty period, this repair can be claimed using:

Item Description/Fail Code	Operation Number	Labor Description	Flat Rate Time
Front seat belt stopper button YEF-01, 02, 05, 08	A913-722	Front seat belt stopper button R&R	One or Both sides 0.2

ATTENTION:

GENERALMANAGER ☐ PARTSMANAGER ☐
 CLAIMSPERSONNEL ☐ SERVICEMANAGER ☐
 IMPORTANT - All Service Personnel Should Read and Initial



SERVICE BULLETIN

APPLICABILITY: 2000~2002 Impreza Service Manuals
 2000~2002 Legacy & Outback Service Manuals
 2000~2002 Forester Service Manuals

NUMBER: 18-69-01
DATE: 07/1/2001

SUBJECT: Service Manual Corrections

Place a REVISED label on the appropriate page of the noted effected Service Manual and update the Service Manual Correction Binder with the following pages:

Model	Year	Book/Vol #	MSA#	Section	Page	Reference
Forester	2000	5	MSA5T0024A	3-2	57	[T816]
Forester	2000	6	MSA5T0025A	4-4	73	[T8Y3]
Forester	2001	5	MSA5T0124A	3-2	57	[T816]
Forester	2001	6	MSA5T0125A	4-4	73	[T8Y3]
Forester	2002	5	MSA5T0224A	AT	AT-59	--
Forester	2002	6	MSA5T0225A	ABS	ABS-79	--
Impreza	2000	5	MSA5T0014A	3-2	59	[T816]
Impreza	2001	4	MSA5T0113A	AT	AT-49	--
Impreza	2001	4	MSA5T0113A	AT	AT-50	--
Impreza	2002	1	MSA5T0210A	PM	PM-20	--
Impreza	2002	4	MSA5T0213A	AT	AT-69	--
Legacy	2000	5	MSA5T0005A	3-2	59	[T816]
Legacy	2001	4	MSA5T0104A	AT	AT-72	--
Legacy	2001	6	MSA5T0106A	ABS	ABS-84	--
Legacy	2001	7	MSA5T0107A	CC	CC-30	--
Legacy	2001	7	MSA5T0107A	CC	CC-35	--
Legacy	2002	4	MSA5T0204A	AT	AT-73	--
Legacy	2002	6	MSA5T0206A	ABS	ABS-75	--
Legacy	2002	1	MSA5T0201A	PM	PM-8	--
Legacy	2002	1	MSA5T0201A	PM	PM-23	--
Legacy	2002	1	MSA5T0201A	PM	PM-24	--
Legacy	2002	3	MSA5T0203A	EN(H6)	EN(H6)-29	--



CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.

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813 : PREPARE SUBARU SELECT MONITOR.

CHECK : *Do you have a Subaru Select Monitor?*

YES : Go to step 815.

NO : Go to step 814.

814 : CHECK INPUT SIGNAL FOR TCM.

- 1) Connect connectors to TCM and ECM.
- 2) Start the engine, and warm-up the transmission until ATF temperature is above 80°C (176°F).

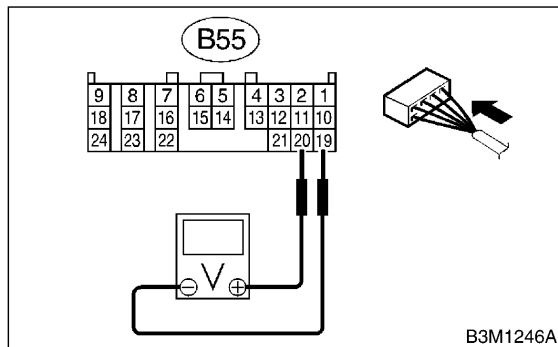
NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 3) Engine idling.
- 4) Measure voltage between TCM connectors.

Connector & terminal

(B55) No. 20 (+) — No. 19 (-):



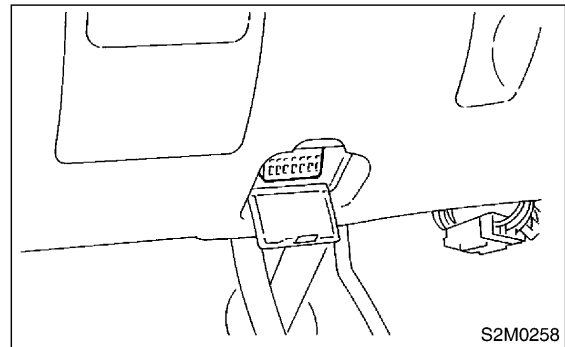
CHECK : *Is the voltage between 0.4 and 1.6 V?*

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.

NO : Go to step 816.

815 : CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.

- 1) Connect connectors to TCM and ECM.
- 2) Turn ignition switch to OFF.
- 3) Connect Subaru Select Monitor to data link connector.



- 4) Start the engine, and turn Subaru Select monitor switch to ON.
- 5) Warm-up the engine until engine coolant temperature is above 80°C (176°F).
- 6) Engine idling.
- 7) Read data of intake manifold pressure signal using Subaru Select Monitor.

● Display shows intake manifold pressure signal value sent from ECM.

CHECK : *Is the value between 0.4 and 1.6 V?*

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.

NO : Go to step 816.

816 : CHECK POOR CONTACT.

CHECK : *Is there poor contact in intake manifold pressure signal circuit?*

YES : Repair poor contact.

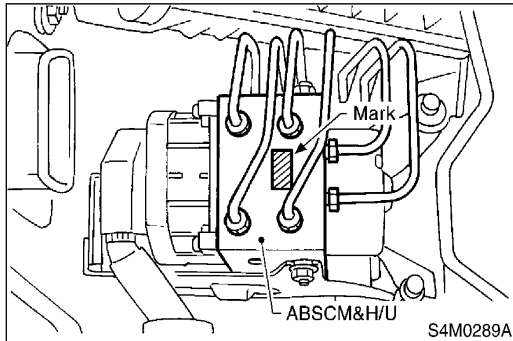
NO : Replace TCM. <Ref. to 3-2 [W23A0].>

8Y1 : CHECK ALL FOUR WHEELS FOR FREE TURNING.

- CHECK** : *Have the wheels been turned freely such as when the vehicle is lifted up, or operated on a rolling road?*
- YES** : The ABS is normal. Erase the trouble code. <Ref. to 4-4 [T6D2].>
- NO** : Go to step **8Y2**.

8Y2 : CHECK SPECIFICATIONS OF ABSCM&H/U.

Check specifications of the mark to the ABSCM&H/U.



Mark	Model
C7	AWD AT
C8	AWD MT

- CHECK** : *Does the vehicle specification and the ABSCM&H/U specification match?*
- YES** : Go to step **8Y3**.

CAUTION:

Be sure to turn ignition switch to OFF when removing ABSCM&H/U.

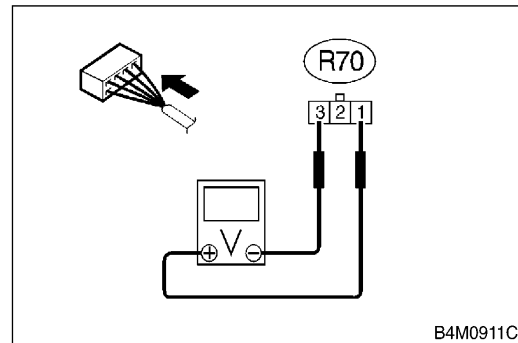
- NO** : Replace ABSCM&H/U. <Ref. to 4-4 [W14A0].>

8Y3 : CHECK INPUT VOLTAGE OF G SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Remove console box.
- 3) Disconnect G sensor from body. (Do not disconnect connector.)
- 4) Turn ignition switch to ON.
- 5) Measure voltage between G sensor connector terminals.

Connector & terminal

(R70) No. 1 (+) — No. 3 (–):



- CHECK** : *Is the voltage between 4.75 and 5.25 V?*
- YES** : Go to step **8Y4**.
- NO** : Repair harness/connector between G sensor and ABSCM&H/U.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Automatic Transmission (Diagnostics)

No.	Step	Check	Yes	No
5	CHECK INPUT SIGNAL FOR TCM. 1) Connect connectors to TCM and ECM. 2) Start the engine, and warm-up the transmission until ATF temperature is above 80 C (176 F). NOTE: If ambient temperature is below 0 C (32 F), drive the vehicle until the ATF reaches its operating temperature. 3) Engine idling. 4) Measure voltage between TCM connector and chassis ground. Connector & terminal (B55) No. 20 (+) Chassis ground (-):	Is the voltage between 0.4 and 1.6 V?	Even if AT OIL TEMP warning lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step 7.
6	CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR. 1) Connect connectors to TCM and ECM. 2) Connect Subaru Select Monitor to data link connector. 3) Start the engine, and turn Subaru Select monitor switch to ON. 4) Warm-up the engine until engine coolant temperature is above 80 C (176 F). 5) Engine idling. 6) Read data of intake manifold pressure signal using Subaru Select Monitor. ● Display shows intake manifold pressure signal value sent from ECM.	Is the value between 0.4 and 1.6 V?	Even if AT OIL TEMP warning lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step 7.
7	CHECK POOR CONTACT.	Is there poor contact in intake manifold pressure signal circuit?	Repair poor contact.	Replace TCM. <Ref. to AT-45, Transmission Control Module (TCM).>

DIAGNOSTICS PROCEDURE WITH DIAGNOSIS CONNECTOR

ABS (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ALL FOUR WHEELS FOR FREE TURNING.	Have the wheels been turned freely such as when the vehicle is lifted up, or operated on a rolling road?	The ABS is normal. Erase the DTC.	Go to step 2.
2	CHECK SPECIFICATIONS OF ABSCM&H/U. Check specifications of the mark to the ABSCM&H/U. C7: AT C8: MT	Does the vehicle specification and the ABSCM&H/U specification match?	Go to step 3.	Replace ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> CAUTION: Be sure to turn ignition switch to OFF when removing ABSCM&H/U.
3	CHECK INPUT VOLTAGE OF G SENSOR. 1) Turn ignition switch to OFF. 2) Remove console box. 3) Disconnect G sensor from body. (Do not disconnect connector.) 4) Turn ignition switch to ON. 5) Measure voltage between G sensor connector terminals. Connector & terminal (R70) No. 1 (+) No. 3 (-):	Is the voltage between 4.75 and 5.25 V?	Go to step 4.	Repair harness/connector between G sensor and ABSCM&H/U.
4	CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect connector from ABSCM&H/U. 3) Measure resistance between ABSCM&H/U connector terminals. Connector & terminal (F49) No. 6 No. 28:	Is the resistance between 4.3 and 4.9 kΩ?	Go to step 5.	Repair harness/connector between G sensor and ABSCM&H/U.
5	CHECK GROUND SHORT IN G SENSOR OUTPUT HARNESS. 1) Disconnect connector from G sensor. 2) Measure resistance between ABSCM&H/U connector and chassis ground. Connector & terminal (F49) No. 6 Chassis ground:	Is the resistance more than 1 MΩ?	Go to step 6.	Repair harness between G sensor and ABSCM&H/U.
6	CHECK BATTERY SHORT OF HARNESS. Measure voltage between ABSCM&H/U connector and chassis ground. Connector & terminal (F49) No. 6 (+) Chassis ground (-):	Is the voltage less than 1 V?	Go to step 7.	Repair harness between G sensor and ABSCM&H/U.
7	CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between ABSCM&H/U connector and chassis ground. Connector & terminal (F49) No. 6 (+) Chassis ground (-):	Is the voltage less than 1 V?	Go to step 8.	Repair harness between G sensor and ABSCM&H/U.

813 : PREPARE SUBARU SELECT MONITOR.

CHECK : *Do you have a Subaru Select Monitor?*

YES : Go to step 815.

NO : Go to step 814.

814 : CHECK INPUT SIGNAL FOR TCM.

- 1) Connect connectors to TCM and ECM.
- 2) Start the engine, and warm-up the transmission until ATF temperature is above 80°C (176°F).

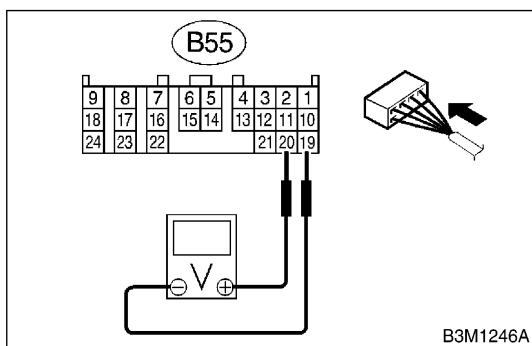
NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 3) Engine idling.
- 4) Measure voltage between TCM connectors.

Connector & terminal

(B55) No. 20 (+) — No. 19 (-):



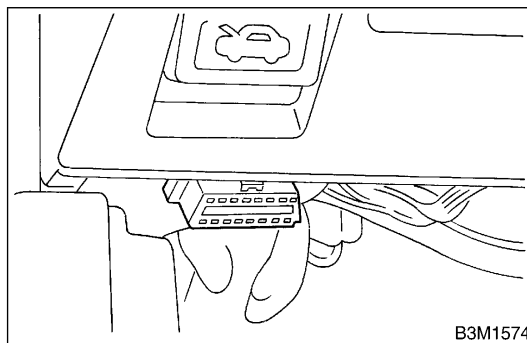
CHECK : *Is the voltage between 0.4 and 1.6 V?*

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.

NO : Go to step 816.

815 : CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.

- 1) Connect connectors to TCM and ECM.
- 2) Turn ignition switch to OFF.
- 3) Connect Subaru Select Monitor to data link connector.



- 4) Start the engine, and turn Subaru Select monitor switch to ON.
 - 5) Warm-up the engine until engine coolant temperature is above 80°C (176°F).
 - 6) Engine idling.
 - 7) Read data of intake manifold pressure signal using Subaru Select Monitor.
- Display shows intake manifold pressure signal value sent from ECM.

CHECK : *Is the value between 0.4 and 1.6 V?*

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.

NO : Go to step 816.

816 : CHECK POOR CONTACT.

CHECK : *Is there poor contact in intake manifold pressure signal circuit?*

YES : Repair poor contact.

NO : Replace TCM. <Ref. to 3-2 [W23A0].>

DIAGNOSTIC PROCEDURE WITH TROUBLE CODE

Automatic Transmission

H: TROUBLE CODE 45 — INTAKE MANIFOLD PRESSURE SIGNAL — S004509D48

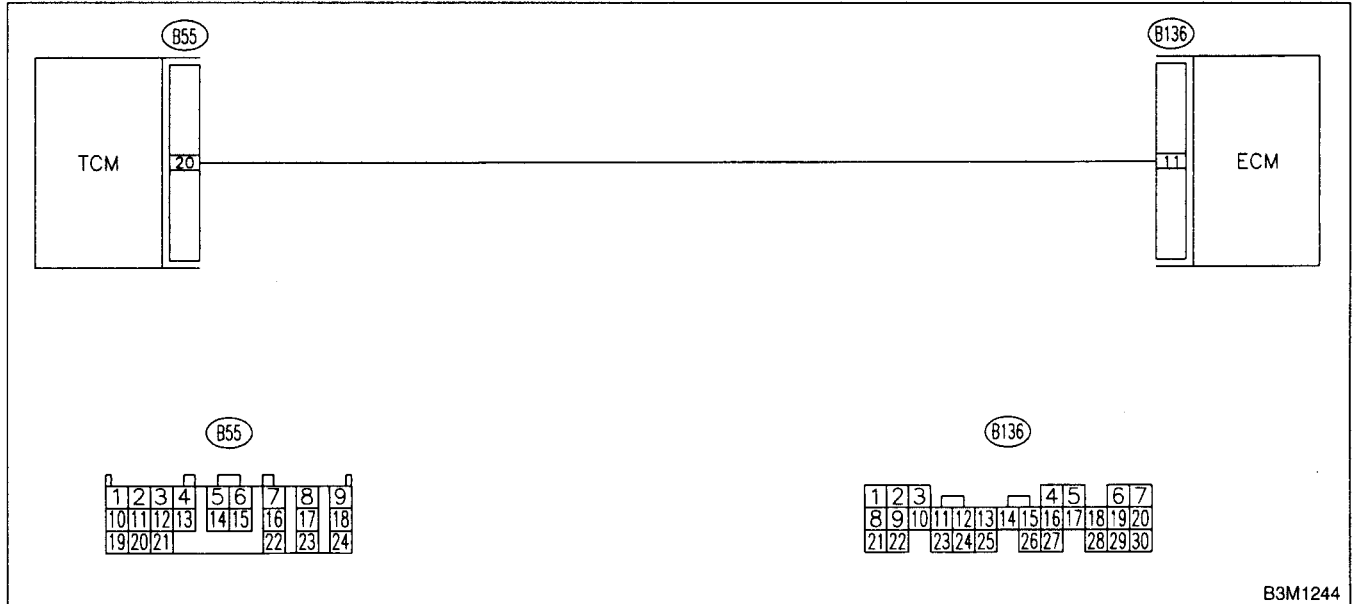
DIAGNOSIS:

Input signal circuit of TCM from ECM is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.

WIRING DIAGRAM:



No.	Step	Check	Yes	No
1	CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM. 1) Turn ignition switch to OFF. 2) Disconnect connectors from TCM and ECM. 3) Measure resistance of harness between TCM and ECM connector. <i>Connector & terminal</i> <i>(B55) No. 20 — (B136) No. 11:</i>	Is the resistance less than 1 Ω ?	Go to step 2.	Repair open circuit in harness between TCM and ECM connector.
2	CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM. Measure resistance of harness between TCM connector and chassis ground. <i>Connector & terminal</i> <i>(B55) No. 20 — Chassis ground:</i>	Is the resistance more than 1 M Ω ?	Go to step 3.	Repair short circuit in harness between TCM and ECM connector.
3	PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select Monitor?	Go to step 5.	Go to step 4.
4	CHECK INPUT SIGNAL FOR TCM. 1) Connect connectors to TCM and ECM. 2) Start the engine, and warm-up the transmission until ATF temperature is above 80°C (176°F). NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature. 3) Engine idling. 4) Measure voltage between TCM connectors. <i>Connector & terminal</i> <i>(B55) No. 20 (+) — No. 19 (-):</i>	Is the voltage between 0.4 and 1.6 V?	Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step 6.

DIAGNOSTIC PROCEDURE WITH TROUBLE CODE

Automatic Transmission

No.	Step	Check	Yes	No
5	CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR. 1) Connect connectors to TCM and ECM. 2) Turn ignition switch to OFF. 3) Connect Subaru Select Monitor to data link connector. 4) Start the engine, and turn Subaru Select monitor switch to ON. 5) Warm-up the engine until engine coolant temperature is above 80°C (176°F). 6) Engine idling. 7) Read data of intake manifold pressure signal using Subaru Select Monitor. ● Display shows intake manifold pressure signal value sent from ECM.	Is the value between 0.4 and 1.6 V?	Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step 6.
6	CHECK POOR CONTACT.	Is there poor contact in intake manifold pressure signal circuit?	Repair poor contact.	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>

IDLE MIXTURE

PERIODIC MAINTENANCE SERVICES

Note: Idle Mixture is not adjustable on North American Market vehicles.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

	Step	Check	Yes	No
5	CHECK INPUT SIGNAL FOR TCM. 1)Connect the connectors to TCM and ECM. 2)Start the engine, and warm-up the transmission until the ATF temperature is above 80°C (176°F). NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature. 3)Engine idling. 4)Measure the voltage between TCM connector and chassis ground. Connector & terminal (B55) No. 20 (+) — Chassis ground (-):	Is the voltage between 0.4 and 1.6 V?	Even if the AT OIL TEMP warning lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step 7.
6	CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR. 1)Connect the connectors to TCM and ECM. 2)Connect the Subaru Select Monitor to data link connector. 3)Start the engine, and turn the Subaru Select monitor switch to ON. 4)Warm-up the engine until the engine coolant temperature is above 80°C (176°F). 5)Engine idling. 6)Read the data of intake manifold pressure signal using Subaru Select Monitor. •Display shows the intake manifold pressure signal value sent from ECM.	Is the value between 0.4 and 1.6 V?	Even if the AT OIL TEMP warning lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step 7.
7	CHECK POOR CONTACT.	Is there poor contact in intake manifold pressure signal circuit?	Repair poor contact.	Replace the TCM. <Ref. to AT-45, Transmission Control Module (TCM).>

8I3 : PREPARE SUBARU SELECT MONITOR.

CHECK : *Do you have a Subaru Select Monitor?*

YES : Go to step 8I5.

NO : Go to step 8I4.

8I4 : CHECK INPUT SIGNAL FOR TCM.

- 1) Connect connectors to TCM and ECM.
- 2) Start the engine, and warm-up the transmission until ATF temperature is above 80°C (176°F).

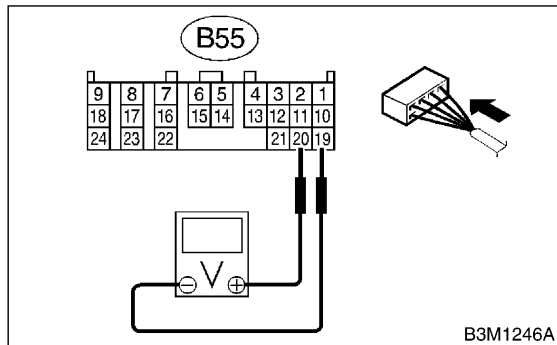
NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 3) Engine idling.
- 4) Measure voltage between TCM connectors.

Connector & terminal

(B55) No. 20 (+) — No. 19 (-):



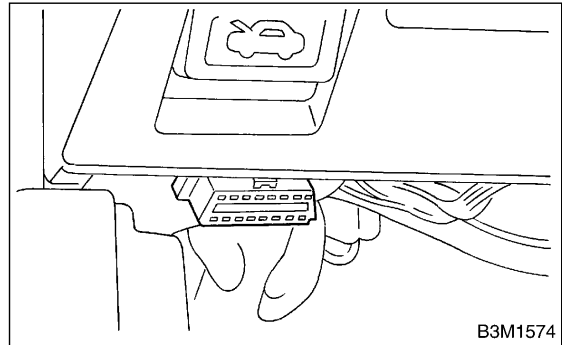
CHECK : *Is the voltage between 0.4 and 1.6 V?*

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.

NO : Go to step 8I6.

8I5 : CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.

- 1) Connect connectors to TCM and ECM.
- 2) Turn ignition switch to OFF.
- 3) Connect Subaru Select Monitor to data link connector.



- 4) Start the engine, and turn Subaru Select monitor switch to ON.
 - 5) Warm-up the engine until engine coolant temperature is above 80°C (176°F).
 - 6) Engine idling.
 - 7) Read data of intake manifold pressure signal using Subaru Select Monitor.
- Display shows intake manifold pressure signal value sent from ECM.

CHECK : *Is the value between 0.4 and 1.6 V?*

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.

NO : Go to step 8I6.

8I6 : CHECK POOR CONTACT.

CHECK : *Is there poor contact in intake manifold pressure signal circuit?*

YES : Repair poor contact.

NO : Replace TCM. <Ref. to 3-2 [W23A0].>

DIAGNOSTIC PROCEDURE WITH TROUBLE CODE

Automatic Transmission (DIAGNOSTICS)

No.	Step	Check	Yes	No
3	CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM. Measure resistance of harness between TCM connector and chassis ground. Connector & terminal WITHOUT VDC SYSTEM (B55) No. 20 Chassis ground: WITH VDC SYSTEM (B54) No. 10 Chassis ground:	Is the resistance more than 1 MΩ?	Go to step 4.	Repair short circuit in harness between TCM and ECM connector.
4	PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select Monitor?	Go to step 6.	Go to step 5.
5	CHECK INPUT SIGNAL FOR TCM. 1) Connect connectors to TCM and ECM. 2) Start the engine, and warm-up the transmission until ATF temperature is above 80 C (176 F). NOTE: If ambient temperature is below 0 C (32 F), drive the vehicle until the ATF reaches its operating temperature. 3) Engine idling. 4) Measure voltage between TCM connector and chassis ground. Connector & terminal 2.5 ℓ ENGINE MODEL (B55) No. 20 (+) Chassis ground (-): 3.0 ℓ ENGINE MODEL WITHOUT VDC SYSTEM (B55) No. 20 (+) Chassis ground (-): 3.0 ℓ ENGINE MODEL WITH VDC SYSTEM (B54) No. 10 (+) Chassis ground (-):	Is the voltage between 0.4 and 1.6 V?	Even if AT OIL TEMP lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step 7.
6	CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR. 1) Connect connectors to TCM and ECM. 2) Turn ignition switch to OFF. 3) Connect Subaru Select Monitor to data link connector. 4) Start the engine, and turn Subaru Select monitor switch to ON. 5) Warm-up the engine until engine coolant temperature is above 80 C (176 F). 6) Engine idling. 7) Read data of intake manifold pressure signal using Subaru Select Monitor. ● Display shows intake manifold pressure signal value sent from ECM.	Is the value between 0.4 and 1.6 V?	Even if AT OIL TEMP lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step 7.
7	CHECK POOR CONTACT.	Is there poor contact in intake manifold pressure signal circuit?	Repair poor contact.	Replace TCM. <Ref. to AT-42 Transmission Control Module (TCM).>

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (DIAGNOSTICS)

No.	Step	Check	Yes	No
1	CHECK ALL FOUR WHEELS FOR FREE TURNING.	Have the wheels been turned freely such as when the vehicle is lifted up, or operated on a rolling road?	The ABS is normal. Erase the trouble code.	Go to step 2.
2	CHECK SPECIFICATIONS OF ABSCM&H/U. Check specifications of the mark to the ABSCM&H/U. C5: AT (Except OUTBACK) C6: MT (Except OUTBACK) CE: AT (OUTBACK) CF: MT (OUTBACK)	Does the vehicle specification and the ABSCM&H/U specification match?	Go to step 3.	Replace ABSCM&H/U. <Ref. to ABS-7 ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> CAUTION: Be sure to turn ignition switch to OFF when removing ABSCM&H/U.
3	CHECK INPUT VOLTAGE OF G SENSOR. 1) Turn ignition switch to OFF. 2) Remove console box. 3) Disconnect G sensor from body. (Do not disconnect connector.) 4) Turn ignition switch to ON. 5) Measure voltage between G sensor connector terminals. Connector & terminal (R70) No. 1 (+) No. 3 (-):	Is the voltage between 4.75 and 5.25 V?	Go to step 4.	Repair harness/connector between G sensor and ABSCM&H/U.
4	CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect connector from ABSCM&H/U. 3) Measure resistance between ABSCM&H/U connector terminals. Connector & terminal (F49) No. 6 No. 28:	Is the resistance between 4.3 and 4.9 kΩ?	Go to step 5.	Repair harness/connector between G sensor and ABSCM&H/U.
5	CHECK GROUND SHORT IN G SENSOR OUTPUT HARNESS. 1) Disconnect connector from G sensor. 2) Measure resistance between ABSCM&H/U connector and chassis ground. Connector & terminal (F49) No. 6 Chassis ground:	Is the resistance more than 1 MΩ?	Go to step 6.	Repair harness between G sensor and ABSCM&H/U.
6	CHECK BATTERY SHORT OF HARNESS. Measure voltage between ABSCM&H/U connector and chassis ground. Connector & terminal (F49) No. 6 (+) Chassis ground (-):	Is the voltage less than 1 V?	Go to step 7.	Repair harness between G sensor and ABSCM&H/U.
7	CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between ABSCM&H/U connector and chassis ground. Connector & terminal (F49) No. 6 (+) Chassis ground (-):	Is the voltage less than 1 V?	Go to step 8.	Repair harness between G sensor and ABSCM&H/U.

DIAGNOSTICS CHART WITH TROUBLE CODE

Cruise Control System (DIAGNOSTICS)

7. Diagnostics Chart with Trouble Code S003620

A: LIST OF DIAGNOSTIC TROUBLE CODE S003620E40

Diagnostic trouble code	Item	Contents of diagnosis	Reference
21	Inner relay is seized.	Cruise control module inner relay is seized when main switch is OFF.	<Ref. to CC-30 DIAGNOSTIC TROUBLE CODE 21, 24, 25 AND 2A - CRUISE CONTROL MODULE BUILT-IN RELAY, CPU RAM -, Diagnostics Chart with Trouble Code.>
22	Vehicle speed sensor	Vehicle speed signal changes more than 10 km/h (6 MPH) within 350 ms.	<Ref. to CC-31 DIAGNOSTIC TROUBLE CODE 22 - VEHICLE SPEED SENSOR -, Diagnostics Chart with Trouble Code.>
24	Cruise control module is abnormal.	Two vehicle speed values stored in cruise control module memory are not the same.	<Ref. to CC-30 DIAGNOSTIC TROUBLE CODE 21, 24, 25 AND 2A - CRUISE CONTROL MODULE BUILT-IN RELAY, CPU RAM -, Diagnostics Chart with Trouble Code.>
25	Cruise control module is abnormal.	Two output values stored in cruise control module memory are not the same.	<Ref. to CC-30 DIAGNOSTIC TROUBLE CODE 21, 24, 25 AND 2A - CRUISE CONTROL MODULE BUILT-IN RELAY, CPU RAM -, Diagnostics Chart with Trouble Code.>
28	Wiring harness opened.	Open wiring harness circuit is detected via control module relay when main switch is ON.	<Ref. to CC-34 DIAGNOSTIC TROUBLE CODE 28 - WIRING HARNESS OPENED. -, Diagnostics Chart with Trouble Code.>
35	Motor drive system is abnormal.	- Motor output circuit is open or shorted. - Motor drive circuit is open or shorted.	<Ref. to CC-35 DIAGNOSTIC TROUBLE CODE 35 and 36 - ACTUATOR MOTOR - Diagnostics Chart with Trouble Code.>
36	Trouble of Motor.	Motor turning speed is low.	<Ref. to CC-35 DIAGNOSTIC TROUBLE CODE 35 and 36 - ACTUATOR MOTOR - Diagnostics Chart with Trouble Code.>
37	Motor clutch drive system is abnormal.	- Motor clutch output circuit is open or shorted. - Motor clutch drive circuit is open or shorted.	<Ref. to CC-37 DIAGNOSTIC TROUBLE CODE 37 - ACTUATOR MOTOR CLUTCH -, Diagnostics Chart with Trouble Code.>
38	Motor drive shaft does not engage properly.	Motor drive gear engagement is not properly adjusted.	<Ref. to CC-39 DIAGNOSTIC TROUBLE CODE 38 - MOTOR DRIVE SHAFT DOES NOT ENGAGE PROPERLY. -, Diagnostics Chart with Trouble Code.>
39	Motor is overloaded.	Current flows through motor more frequently than under normal conditions.	<Ref. to CC-40 DIAGNOSTIC TROUBLE CODE 39 - MOTOR IS OVERLOADED. -, Diagnostics Chart with Trouble Code.>
2A	Cruise control module is abnormal.	Cruise control module self-diagnosis function senses abnormality.	<Ref. to CC-30 DIAGNOSTIC TROUBLE CODE 21, 24, 25 AND 2A - CRUISE CONTROL MODULE BUILT-IN RELAY, CPU RAM -, Diagnostics Chart with Trouble Code.>

B: DIAGNOSTIC TROUBLE CODE 21, 24, 25 AND 2A — CRUISE CONTROL MODULE BUILT-IN RELAY, CPU RAM — S003620F29

DIAGNOSIS:

- Poor welding of built-in relay of cruise control module.
- Failure of built-in CPU RAM of cruise control module.

DIAGNOSTICS CHART WITH TROUBLE CODE

Cruise Control System (DIAGNOSTICS)

E: DIAGNOSTIC TROUBLE CODE 35 and 36

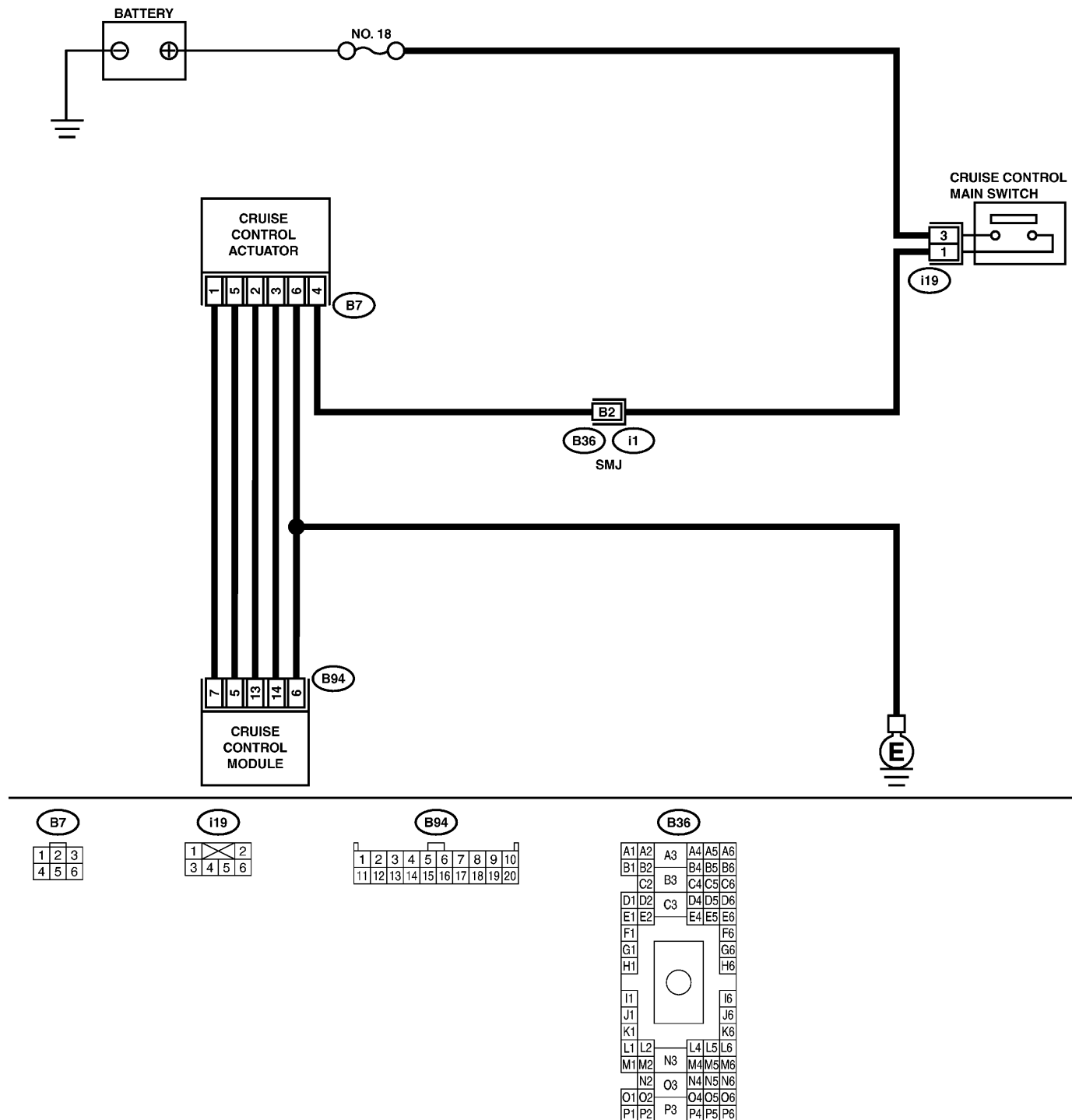
— ACTUATOR MOTOR —

S003620F32

DIAGNOSIS:

Open or poor contact of cruise control actuator motor.

WIRING DIAGRAM:



B6M1529

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Automatic Transmission (Diagnostics)

No.	Step	Check	Yes	No
3	CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM. Measure the resistance of harness between TCM connector and chassis ground. Connector & terminal Without VDC system (B55) No. 20 Chassis ground: With VDC system (B54) No. 10 Chassis ground:	Is the resistance more than 1 MΩ?	Go to step 4.	Repair short circuit in harness between TCM and ECM connector.
4	PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select Monitor?	Go to step 6.	Go to step 5.
5	CHECK INPUT SIGNAL FOR TCM. 1) Connect the connectors to TCM and ECM. 2) Start the engine, and warm-up the transmission until the ATF temperature is above 80 C (176 F). NOTE: If ambient temperature is below 0 C (32 F), drive the vehicle until the ATF reaches its operating temperature. 3) Engine idling. 4) Measure the voltage between TCM connector and chassis ground. Connector & terminal Without VDC system (B55) No. 20 (+) Chassis ground (-): With VDC system (B54) No. 10 (+) Chassis ground (-):	Is the voltage between 0.4 and 1.6 V?	Even if the AT OIL TEMP warning lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step 7.
6	CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR. 1) Connect the connectors to TCM and ECM. 2) Connect the Subaru Select Monitor to data link connector. 3) Start the engine, and turn the Subaru Select monitor switch to ON. 4) Warm-up the engine until the engine coolant temperature is above 80 C (176 F). 5) Engine idling. 6) Read the data of intake manifold pressure signal using Subaru Select Monitor. ● Display shows the intake manifold pressure signal value sent from ECM.	Is the value between 0.4 and 1.6 V?	Even if the AT OIL TEMP warning lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step 7.
7	CHECK POOR CONTACT.	Is there poor contact in intake manifold pressure signal circuit?	Repair poor contact.	Replace the TCM. <Ref. to AT-49, Transmission Control Module (TCM).>

DIAGNOSTICS CHART WITH DIAGNOSIS CONNECTOR

ABS (Diagnostics)

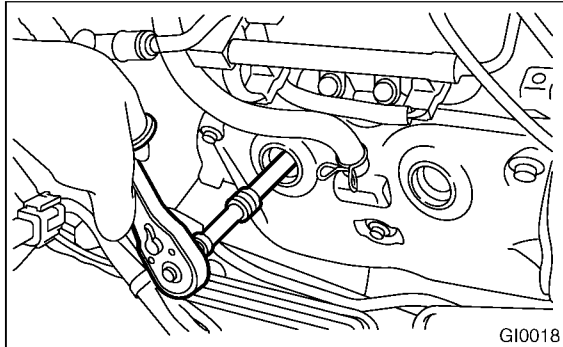
No.	Step	Check	Yes	No
1	CHECK ALL FOUR WHEELS FOR FREE TURNING.	Have the wheels been turned freely such as when the vehicle is lifted up, or operated on a rolling road?	The ABS is normal. Erase the diagnostic trouble code.	Go to step 2.
2	CHECK SPECIFICATIONS OF ABSCM&H/U. Check specifications of the mark to the ABSCM&H/U. CG: AT (Except OUTBACK) CH: MT (Except OUTBACK) CI: AT (OUTBACK) CJ: MT (OUTBACK)	Does the vehicle specification and the ABSCM&H/U specification match?	Go to step 3.	Replace ABSCM&H/U. <Ref. to ABS-7, ABS Control Module and Hydraulic Control Unit (ABSCM&H/U).> CAUTION: Be sure to turn ignition switch to OFF when removing ABSCM&H/U.
3	CHECK INPUT VOLTAGE OF G SENSOR. 1) Turn ignition switch to OFF. 2) Remove console box. 3) Disconnect G sensor from body. (Do not disconnect connector.) 4) Turn ignition switch to ON. 5) Measure voltage between G sensor connector terminals. Connector & terminal (R70) No. 1 (+) No. 3 (-):	Is the voltage between 4.75 and 5.25 V?	Go to step 4.	Repair harness/connector between G sensor and ABSCM&H/U.
4	CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS. 1) Turn ignition switch to OFF. 2) Disconnect connector from ABSCM&H/U. 3) Measure resistance between ABSCM&H/U connector terminals. Connector & terminal (F49) No. 6 No. 28:	Is the resistance between 4.3 and 4.9 kΩ?	Go to step 5.	Repair harness/connector between G sensor and ABSCM&H/U.
5	CHECK GROUND SHORT IN G SENSOR OUTPUT HARNESS. 1) Disconnect connector from G sensor. 2) Measure resistance between ABSCM&H/U connector and chassis ground. Connector & terminal (F49) No. 6 Chassis ground:	Is the resistance more than 1 MΩ?	Go to step 6.	Repair harness between G sensor and ABSCM&H/U.
6	CHECK BATTERY SHORT OF HARNESS. Measure voltage between ABSCM&H/U connector and chassis ground. Connector & terminal (F49) No. 6 (+) Chassis ground (-):	Is the voltage less than 1 V?	Go to step 7.	Repair harness between G sensor and ABSCM&H/U.
7	CHECK BATTERY SHORT OF HARNESS. 1) Turn ignition switch to ON. 2) Measure voltage between ABSCM&H/U connector and chassis ground. Connector & terminal (F49) No. 6 (+) Chassis ground (-):	Is the voltage less than 1 V?	Go to step 8.	Repair harness between G sensor and ABSCM&H/U.

5. Spark Plugs SA07683

A: REPLACEMENT SA07683A20

1. 2.5 L MODEL SA07683A2001

- 1) Disconnect battery ground cable.
- 2) Remove intake duct and intake chamber.
- 3) Remove washer tank and put it aside.
- 4) Disconnect spark plug cord.
- 5) Remove spark plug with a plug-wrench.



- 6) Set new spark plug.

Recommended spark plug:

CHAMPION RC10YC4

NGK BKR5E-11

NGK BKR6E-11

Spark plug gap

1.0 — 1.1 mm (0.039 — 0.043 in)

- 7) Tighten spark plug lightly with hand, and then secure with a plug-wrench to the specified torque.

Tightening torque:

20.6 N·m (2.10 kgf-m, 15.19 ft-lb)

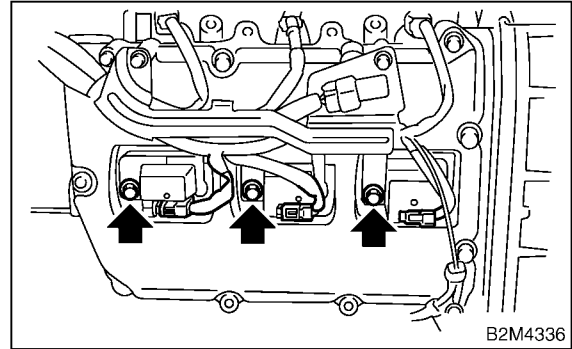
NOTE:

- Be sure to place the gasket between the cylinder head and spark plug.
- If torque wrench is not available, tighten spark plug until gasket contacts cylinder head; then tighten further 1/4 to 1/2 turns.

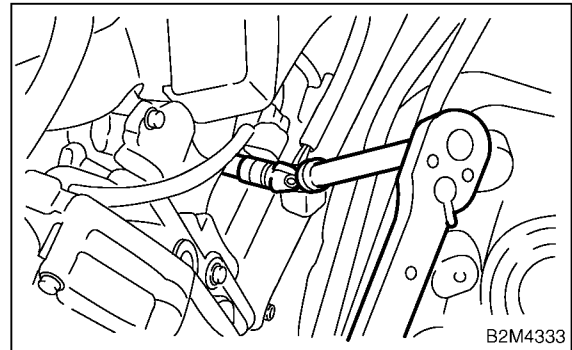
2. 3.0 L MODEL SA07683A2002

- 1) Disconnect battery cables and then remove battery and battery carrier.
- 2) Remove washer tank and put it aside.
- 3) Remove air cleaner lower case.
- 4) Disconnect connector from ignition coil.

- 5) Remove ignition coil.



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



- 7) Set new spark plug.

Recommended spark plug:

NGK PLFR 6A-11

- 8) Tighten spark plug lightly with hand, and then secure with a plug-wrench to the specified torque.

Tightening torque:

21 N·m (2.1 kgf-m, 15 ft-lb)

- 9) Tighten ignition coil.

Tightening torque:

16 N·m (1.6 kgf-m, 12 ft-lb)

NOTE:

- Be sure to place the gasket between the cylinder head and spark plug.
- If torque wrench is not available, tighten spark plug until gasket contacts cylinder head; then tighten further 1/4 to 1/2 turn.

16. Front & Rear Differential Oil

SA07693

A: REPLACEMENT

SA07693A20

1. FRONT DIFFERENTIAL (MANUAL TRANSMISSION)

SA07693A2001

For M/T vehicle, manual transmission oil works as differential oil to lubricate differential. Refer to "Transmission Oil". <Ref. to PM-21, MANUAL TRANSMISSION, REPLACEMENT, Transmission Oil.>

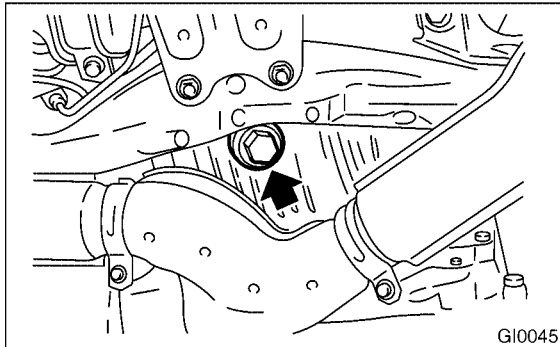
2. FRONT DIFFERENTIAL (AUTOMATIC TRANSMISSION)

SA07693A2002

1) Drain differential gear oil by removing drain plug after allowing the engine to cool for 3 to 4 hours.

NOTE:

Before starting work, cool off the engine well.



2) Reinstall drain plug after draining differential gear oil and tighten it to the specified torque.

Tightening torque:

44 N·m (4.5 kgf-m, 32.5 ft-lb)

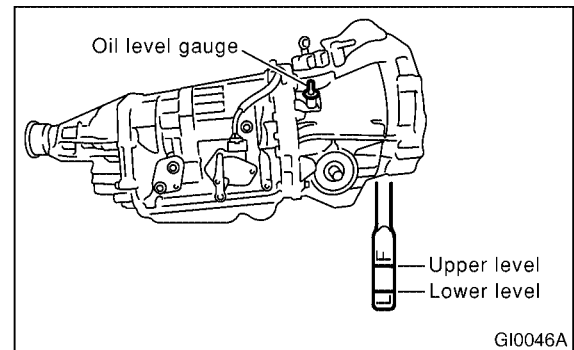
NOTE:

- Be sure to place a gasket between the transmission case and drain plug.
- Replace the gasket with a new one.
- Each oil manufacturer has its base oil and additives. Thus, do not mix two or more brands.

3) Fill differential gear oil through the oil level gauge hole up to the upper point of level gauge.

Differential gear oil capacity:

1.1 — 1.3 ℓ (1.2 — 1.4 US qt, 1.0 — 1.1 Imp qt)



3. REAR DIFFERENTIAL

SA07693A2003

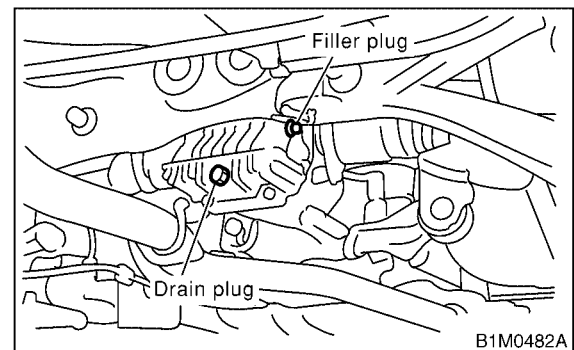
● L and BRIGHTON AT model

- 1) Drain oil by removing drain plug.
- 2) Remove filler plug for quicker draining.
- 3) Replace drain plug gasket with a new one.
- 4) Tighten drain plug to the specified torque.

Tightening torque:

34 N·m (3.5 kgf-m, 25.3 ft-lb)

5) After installing drain plug, fill oil fully up to the mouth of filler plug.



Oil capacity:

0.9 ℓ (1.0 US qt, 0.8 Imp qt)

- 6) Replace filler plug gasket with a new one.
- 7) Install filler plug onto rear differential gear case.

Tightening torque:

34 N·m (3.5 kgf-m, 25.3 ft-lb)

FRONT & REAR DIFFERENTIAL OIL

Periodic Maintenance Services

● Except L and BRIGHTON AT model

- 1) Drain oil by removing drain plug.
- 2) Remove filler plug for quicker draining.
- 3) Tighten drain plug after draining oil.

NOTE:

Apply fluid packing to drain plug threads before installation.

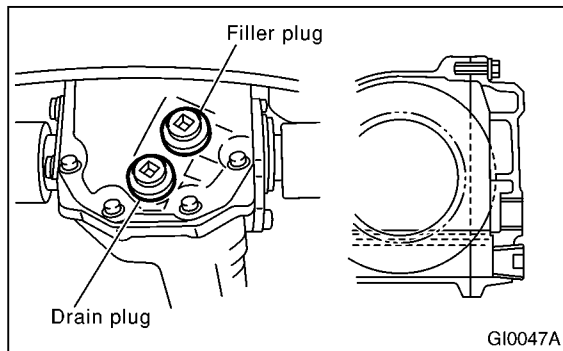
Fluid packing:

Three Bond 1105

Tightening torque:

49 N·m (5.0 kgf-m, 36.2 ft-lb)

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



Oil capacity:

0.8 ℓ (0.8 US qt, 0.7 Imp qt)

NOTE:

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

- 5) Install filler plug onto rear differential gear case firmly.

NOTE:

Apply fluid packing to filler plug before installation.

Fluid packing:

Three Bond 1105

Tightening torque:

49 N·m (5.0 kgf-m, 36.2 ft-lb)

ENGINE CONTROL MODULE (ECM) I/O SIGNAL

Engine (DIAGNOSTICS)

Content	Con- nector No.	Termi- nal No.	Signal (V)		Note
			Ignition SW ON (Engine OFF)	Engine ON (Idling)	
GND (power supply)	B134	22	0	0	—
	B136	17	0	0	—
GND (control systems)	B134	7	0	0	—
		15	0	0	—
GND (oxygen sensor heater LH)	1	B137	0	0	—
	2	B137			
GND (oxygen sensor heater RH)	1	B137	0	0	—
	2	B137			

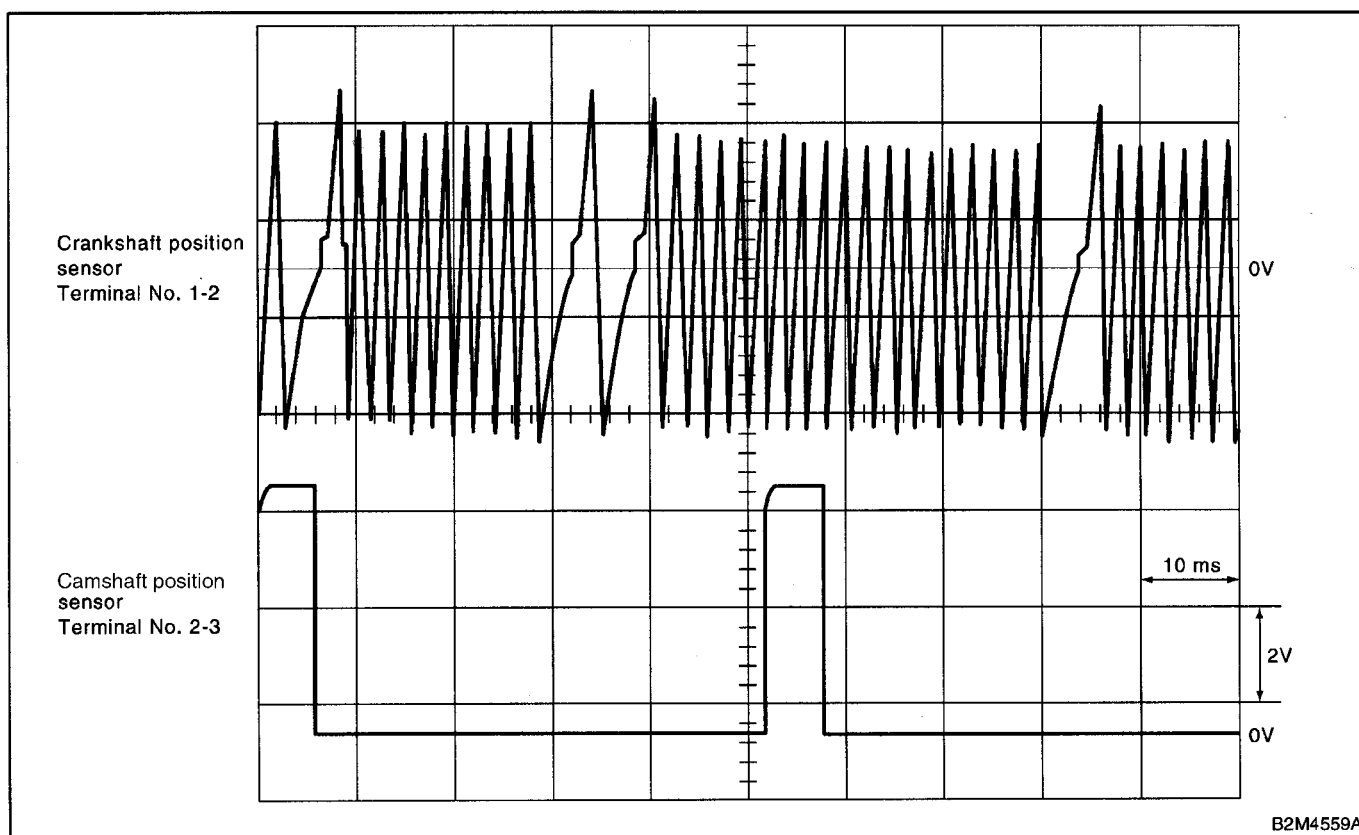
B: MEASUREMENT

S048526A14

Measure input/output signal voltage.

1. WAVEFORM

S048526A1401



ATTENTION:GENERAL MANAGER ☐PARTS MANAGER ☐CLAIMS PERSONNEL ☐SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial



SERVICE BULLETIN

APPLICABILITY: 2001MY Legacy Service Manual
2002MY Impreza Service Manual

NUMBER: 18-70-01

DATE: 09/01/01

SUBJECT: Service Manual Corrections

Place a REVISED label on the appropriate page of the noted effected Service Manual and update the Service Manual Correction Binder with the following pages:

Model	Year	Book/Vol #	MSA#	Section	Page	Reference
Legacy	2001	Supplement	MSA5T0109A	EN(H6)	90	--
Legacy	2001	Supplement	MSA5T0109A	EN(H6)	243	--
Legacy	2001	Supplement	MSA5T0109A	EN(H6)	243A	--
Legacy	2001	Supplement	MSA5T0109A	EN(H6)	243B	--
Legacy	2001	Supplement	MSA5T0109A	EN(H6)	243C	--
Impreza	2002	Section 3	MSA5T0212A	EN(DOHC TURBO)	82	--
Impreza	2002	Section 3	MSA5T0212A	EN(DOHC TURBO)	225	--
Impreza	2002	Section 3	MSA5T0212A	EN(DOHC TURBO)	225A	--
Impreza	2002	Section 3	MSA5T0212A	EN(DOHC TURBO)	225B	--
Impreza	2002	Section 3	MSA5T0212A	EN(DOHC TURBO)	225C	--



CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.

Subaru Service Bulletins are intended for use by professional technicians ONLY. They are written to inform those technicians of conditions that may occur in some vehicles, or to provide information that could assist in the proper servicing of the vehicle. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do the job correctly and safely. If a condition is described, DO NOT assume that this Service Bulletin applies to your vehicle, or that your vehicle will have that condition.

LIST OF DIAGNOSTIC TROUBLE CODE (DTC)

Engine (DIAGNOSTICS)

DTC No.	Item	Index
P0400	EGR system malfunction	<Ref. to EN(H6)-212 DTC P0400 — EGR system malfunction —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0420	Catalyst system efficiency below threshold	<Ref. to EN(H6)-216 DTC P0420 — CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0442	Evaporative emission control system malfunction	<Ref. to EN(H6)-218 DTC P0442 — EVAPORATIVE EMISSION CONTROL SYSTEM MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0444	Evaporative emission control system purge control valve circuit low input	<Ref. to EN(H6)-222 DTC P0444 — EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0445	Evaporative emission control system purge control valve circuit high input	<Ref. to EN(H6)-226 DTC P0445 — EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0447	Evaporative emission control system vent control low input	<Ref. to EN(H6)-228 DTC P0447 — EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0448	Evaporative emission control system vent control high input	<Ref. to EN(H6)-232 DTC P0448 — EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0451	Evaporative emission control system pressure sensor range/performance problem	<Ref. to EN(H6)-234 DTC P0451 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR RANGE/PERFORMANCE PROBLEM —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0452	Evaporative emission control system pressure sensor low input	<Ref. to EN(H6)-236 DTC P0452 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0453	Evaporative emission control system pressure sensor high input	<Ref. to EN(H6)-240 DTC P0453 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0457	Evaporative Emission Control System Malfunction	Refer to page EN(H6)-243
P0461	Fuel level sensor circuit range/performance problem	<Ref. to EN(H6)-244 DTC P0461 — FUEL LEVEL SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0462	Fuel level sensor circuit low input	<Ref. to EN(H6)-246 DTC P0462 — FUEL LEVEL SENSOR CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0463	Fuel level sensor circuit high input	<Ref. to EN(H6)-250 DTC P0463 — FUEL LEVEL SENSOR CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0464	Fuel level sensor intermittent input	<Ref. to EN(H6)-254 DTC P0464 — FUEL LEVEL SENSOR INTERMITTENT INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0480	Cooling fan relay 1 circuit low input	<Ref. to EN(H6)-256 DTC P0480 — COOLING FAN RELAY 1 CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0483	Cooling fan function problem	<Ref. to EN(H6)-260 DTC P0483 — COOLING FAN FUNCTION PROBLEM —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0500	Vehicle speed sensor malfunction	<Ref. to EN(H6)-264 DTC P0500 — VEHICLE SPEED SENSOR MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Memo:

**DTC P0457 - EVAPORATIVE EMISSION CONTROL SYSTEM MALFUNCTION --
REFER TO SERVICE MANUAL CORRECTION BINDER**

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (DIAGNOSTICS)

DTC P0457 — EVAPORATIVE EMISSION CONTROL SYSTEM MALFUNCTION —

- **DTC DETECTING CONDITION:**
 - Two consecutive driving cycles with fault
- **TROUBLE SYMPTOM:**
 - Gasoline smell
 - Fuel filler cap loose or missing

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H6)-48 OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H6)-45 OPERATION, Inspection Mode.>.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (DIAGNOSTICS)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H6)-87 List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK FUEL FILLER CAP. 1) Turn ignition switch to OFF. 2) Check the fuel filler cap. NOTE: The DTC code is stored in memory if fuel filler cap is or was loose or if the cap chain was caught while tightening.	Is the fuel filler cap tightened securely?	Go to step 3.	Tighten fuel filler cap securely.
3	CHECK FUEL FILLER PIPE PACKING.	Is there any damage to the seal between fuel filler cap and fuel filler pipe?	Repair or replace fuel filler cap and fuel filler pipe. <Ref. to FU(H6)-61, Fuel Filler Pipe.>	Go to step 4.
4	CHECK DRAIN VALVE. 1) Connect test mode connector. 2) Turn ignition switch to ON. 3) Operate drain valve. NOTE: Drain valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H6)-49, Compulsory Valve Operation Check Mode.>	Does drain valve produce operating sound?	Go to step 5.	Replace drain valve. <Ref. to EC(H6)-20, Drain Valve.>
5	CHECK PURGE CONTROL SOLENOID VALVE. Operate purge control solenoid valve. NOTE: Purge control solenoid valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H6)-49, Compulsory Valve Operation Check Mode.>	Does purge control solenoid valve produce operating sound?	Go to step 6.	Replace purge control solenoid valve. <Ref. to EC(H6)-8, Purge Control Solenoid Valve.>
6	CHECK PRESSURE CONTROL SOLENOID VALVE. Operate pressure control solenoid valve. NOTE: Pressure control solenoid valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H6)-49, Compulsory Valve Operation Check Mode.>	Does pressure control solenoid valve produce operating sound?	Go to step 7.	Replace pressure control solenoid valve. <Ref. to EC(H6)-16, Pressure Control Solenoid Valve.>
7	CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE. Turn ignition switch to OFF.	Is there a hole of more than 2.5 mm (0.1 in) dia. on fuel line?	Repair or replace fuel line. <Ref. to FU(H6)-77, Fuel Delivery, Return and Evaporation Lines.>	Go to step 8.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
8	CHECK CANISTER.	Is the canister damaged or is there a hole of more than 2.5 mm (0.1 in) dia. in it?	Repair or replace the canister. <Ref. to EC(H6)-7, Canister.>	Go to step 9 .
9	CHECK FUEL TANK. Remove the fuel tank. <Ref. to FU(H6)-52, Fuel Tank.>	Is the fuel tank damaged or is there a hole of more than 2.5 mm (0.1 in) dia. in it?	Repair or replace the fuel tank. <Ref. to FU(H6)-52, Fuel Tank.>	Go to step 10 .
10	CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.	Are there holes of more than 2.5 mm (0.1 in) dia., cracks, clogging or disconnections of hoses or pipes in evaporative emission control system?	Repair or replace the hoses or pipes.	Contact with SOA (distributor) service. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.

LIST OF DIAGNOSTIC TROUBLE CODE (DTC)

ENGINE (DIAGNOSTICS)

DTC No.	Item	Index
P0327	Knock sensor circuit low input	<Ref. to EN(DOHC TURBO)-182, DTC P0327 — KNOCK SENSOR CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0328	Knock sensor circuit high input	<Ref. to EN(DOHC TURBO)-184, DTC P0328 — KNOCK SENSOR CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0335	Crankshaft position sensor circuit malfunction	<Ref. to EN(DOHC TURBO)-186, DTC P0335 — CRANKSHAFT POSITION SENSOR CIRCUIT MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0336	Crankshaft position sensor circuit range/performance problem	<Ref. to EN(DOHC TURBO)-188, DTC P0336 — Crankshaft Position Sensor Circuit Range/Performance Problem —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0340	Camshaft position sensor circuit malfunction	<Ref. to EN(DOHC TURBO)-190, DTC P0340 — CAMSHAFT POSITION SENSOR CIRCUIT MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0341	Camshaft position sensor circuit range/performance problem	<Ref. to EN(DOHC TURBO)-192, DTC P0341 — CAMSHAFT POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0420	Catalyst system efficiency below threshold	<Ref. to EN(DOHC TURBO)-196, DTC P0420 — CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0442	Evaporative emission control system malfunction	<Ref. to EN(DOHC TURBO)-199, DTC P0442 — EVAPORATIVE EMISSION CONTROL SYSTEM MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0444	Evaporative emission control system purge control valve circuit low input	<Ref. to EN(DOHC TURBO)-204, DTC P0444 — EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0445	Evaporative emission control system purge control valve circuit high input	<Ref. to EN(DOHC TURBO)-208, DTC P0445 — EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0447	Evaporative emission control system vent control low input	<Ref. to EN(DOHC TURBO)-210, DTC P0447 — EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0448	Evaporative emission control system vent control high input	<Ref. to EN(DOHC TURBO)-214, DTC P0448 — EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0451	Evaporative emission control system pressure sensor range/performance problem	<Ref. to EN(DOHC TURBO)-216, DTC P0451 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR RANGE/PERFORMANCE PROBLEM —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0452	Evaporative emission control system pressure sensor low input	<Ref. to EN(DOHC TURBO)-218, DTC P0452 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0453	Evaporative emission control system pressure sensor high input	<Ref. to EN(DOHC TURBO)-222, DTC P0453 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0457	Evaporative emission control system malfunction	Refer to page EN(DOHC TURBO)-225
P0461	Fuel level sensor circuit range/performance problem	<Ref. to EN(DOHC TURBO)-225, DTC P0461 — FUEL LEVEL SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0462	Fuel level sensor circuit low input	<Ref. to EN(DOHC TURBO)-228, DTC P0462 — FUEL LEVEL SENSOR CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0463	Fuel level sensor circuit high input	<Ref. to EN(DOHC TURBO)-232, DTC P0463 — FUEL LEVEL SENSOR CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

**BA:DTC P0461 — FUEL LEVEL SENSOR CIRCUIT RANGE/PERFORMANCE
PROBLEM —**

- **DTC DETECTING CONDITION:**
 - Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-49, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-46, Inspection Mode.>.

DTC P0457 EVAPORITVE EMISSION CONTROL SYSTEM MALFUNCTION

- Refer to the Service Manual Correction Binder.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (DIAGNOSTICS)

DTC P0457 — EVAPORATIVE EMISSION CONTROL SYSTEM MALFUNCTION —

- **DTC DETECTING CONDITION:**
 - Two consecutive driving cycles with fault
- **TROUBLE SYMPTOM:**
 - Gasoline smell
 - Fuel filler cap loose or missing

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode
<Ref. to EN(DOHC TURBO)-49 OPERATION, Clear Memory Mode and Inspection Mode.>
<Ref. to EN(DOHC TURBO)-46 OPERATION, Inspection Mode.>.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (DIAGNOSTICS)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-80, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK FUEL FILLER CAP. 1) Turn ignition switch to OFF. 2) Check the fuel filler cap. NOTE: The DTC code is stored in memory if fuel filler cap is or was loose or if the cap chain was caught while tightening.	Is the fuel filler cap tightened securely?	Go to step 3.	Tighten fuel filler cap securely.
3	CHECK FUEL FILLER PIPE PACKING.	Is there any damage to the seal between fuel filler cap and fuel filler pipe?	Repair or replace fuel filler cap and fuel filler pipe. <Ref. to FU(DOHC TURBO)-55, Fuel Filler Pipe.>	Go to step 4.
4	CHECK DRAIN VALVE. 1) Connect test mode connector. 2) Turn ignition switch to ON. 3) Operate drain valve. NOTE: Drain valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(DOHC TURBO)-50 Compulsory Valve Operation Check Mode.>	Does drain valve produce operating sound?	Go to step 5.	Replace drain valve. <Ref. to EC (DOHC TURBO)-17, Drain Valve.>
5	CHECK PURGE CONTROL SOLENOID VALVE. Operate purge control solenoid valve. NOTE: Purge control solenoid valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(DOHC TURBO)-50, Compulsory Valve Operation Check Mode.>	Does purge control solenoid valve produce operating sound?	Go to step 6.	Replace purge control solenoid valve. <Ref. to EC(DOHC TURBO)-7, Purge Control Solenoid Valve.>
6	CHECK PRESSURE CONTROL SOLENOID VALVE. Operate pressure control solenoid valve. NOTE: Pressure control solenoid valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(DOHC TURBO)-50, Compulsory Valve Operation Check Mode.>	Does pressure control solenoid valve produce operating sound?	Go to step 7.	Replace pressure control solenoid valve. <Ref. to EC(DOHC TURBO)-12, Pressure Control Solenoid Valve.>
7	CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE. Turn ignition switch to OFF.	Is there a hole of more than 2.5 mm (0.1 in) dia. on fuel line?	Repair or replace fuel line. <Ref. to FU(DOHC TURBO)-68, Fuel Delivery, Return and Evaporation Lines.>	Go to step 8.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
8	CHECK CANISTER.	Is the canister damaged or is there a hole of more than 2.5 mm (0.1 in) dia. in it?	Repair or replace the canister. <Ref. to EC(DOHC, TURBO)-6 Canister.>	Go to step 9.
9	CHECK FUEL TANK. Remove the fuel tank. <Ref. to FU(DOHC TURBO)-52, Fuel Tank.>	Is the fuel tank damaged or is there a hole of more than 2.5 mm (0.1 in) dia. in it?	Repair or replace the fuel tank. <Ref. to FU(DOHC TURBO)-52, Fuel Tank.>	Go to step 10.
10	CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.	Are there holes of more than 2.5 mm (0.1 in) dia., cracks, clogging or disconnections of hoses or pipes in evaporative emission control system?	Repair or replace the hoses or pipes.	Contact with SOA (distributor) service. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.

ATTENTION:

GENERAL MANAGER



PARTS MANAGER



CLAIMS PERSONNEL



SERVICE MANAGER

*IMPORTANT - All Service Personnel Should Read and Initial*



SERVICE BULLETIN

APPLICABILITY: 2002 Impreza and Legacy
SUBJECT: Service Manual Corrections

NUMBER: 18-71-03
DATE: 02/21/03

INTRODUCTION

Place a REVISED label on the appropriate page of the noted effected Service Manual and update the Service Manual Correction Binder with the following pages:

Model	Year	Book/Vol#	MSA#	Section	Page	Reference
Legacy	2002	3	MSA5T0203A	LU(H6)	2	N/A
Impreza	2002	3	MSA5T0212A	ME(DOHC TURBO)	8	N/A
				ME(DOHC TURBO)	9	N/A
				ME(DOHC TURBO)	60	N/A
				ME(DOHC TURBO)	62	N/A



CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.

Subaru Service Bulletins are intended for use by professional technicians ONLY. They are written to inform those technicians of conditions that may occur in some vehicles, or to provide information that could assist in the proper servicing of the vehicle. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do the job correctly and safely. If a condition is described, DO NOT assume that this Service Bulletin applies to your vehicle, or that your vehicle will have that condition.



GENERAL DESCRIPTION

Lubrication

1. General Description

S148001

A: SPECIFICATIONS

S148001E49

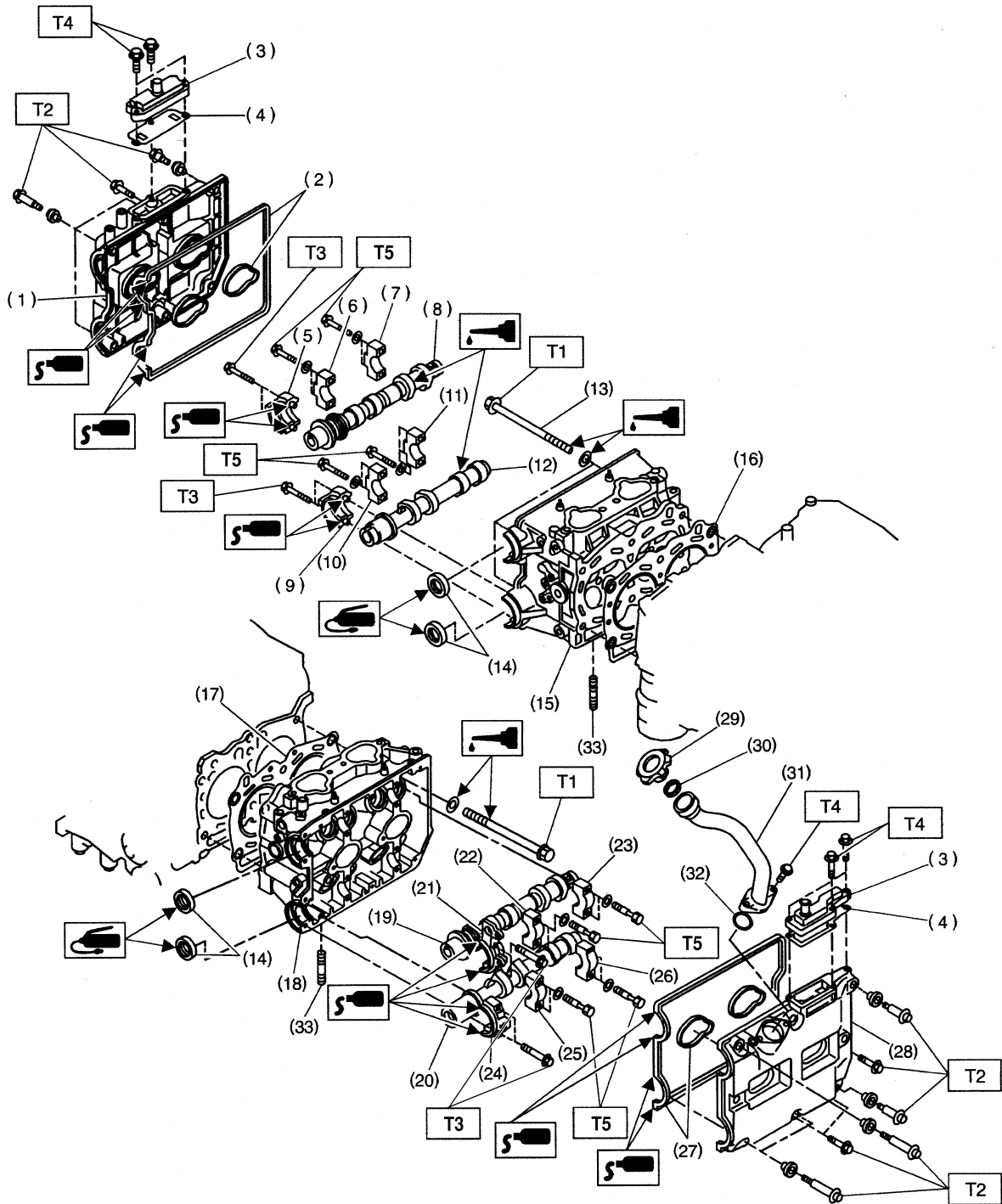
Lubrication method				Forced lubrication	
Oil pump	Pump type			Trochoid type	
	Number of teeth	Inner rotor		9	
		Outer rotor		10	
	Outer rotor diameter × thickness			78 × 11 mm (3.07 × 0.43 in)	
	Tip clearance between inner and outer rotors		STANDARD	0.04 — 0.14 mm (0.0016 — 0.0055 in)	
			LIMIT	0.20 mm (0.0079 in)	
	Side clearance between inner rotor and pump case		STANDARD	0.02 — 0.08 mm (0.0008 — 0.0031 in)	
			LIMIT	0.15 mm (0.0059 in)	
	Case clearance between outer rotor and pump case		STANDARD	0.11 — 0.18 mm (0.0043 — 0.0071 in)	
LIMIT			0.25 mm (0.0098 in)		
Oil filter	Type			Full-flow filter type	
	Filtration area			1,300 cm ² (201.5 sq in)	
	By-pass valve opening pressure			160 kPa (1.63 kg/cm ² , 23 psi)	
	Outer diameter × width			80 × 75 mm (3.15 × 2.95 in)	
	Oil filter to engine thread size			M 20 × 1.5	
Relief valve operation pressure				588 kPa (6 kg/cm ² , 85 psi)	
Oil pressure switch	Type			Immersed contact point type	
	Working voltage — wattage			12 V — 3.4 W or less	
	Warning light activation pressure			15 kPa (0.153 kg/cm ² , 2.2 psi)	
	Proof pressure			More than 980 kPa (9.993 kg/cm ² , 142 psi)	
Oil capacity	Total capacity			6.8 ℓ (7.2 US qt, 6.0 Imp qt)	
	Engine oil amount for refill			5.8 ℓ (6.1 US qt, 5.1 Imp qt)	

LU(H6)-2

GENERAL DESCRIPTION

MECHANICAL

2. CYLINDER HEAD AND CAMSHAFT



S2M1188A

ME(DOHC TURBO)-8

GENERAL DESCRIPTION

MECHANICAL

- | | | |
|---------------------------------------|---------------------------------------|----------------------|
| (1) Rocker cover (RH) | (15) Cylinder head (RH) | (29) Oil filler cap |
| (2) Rocker cover gasket (RH) | (16) Cylinder head gasket (RH) | (30) Gasket |
| (3) Oil separator cover | (17) Cylinder head gasket (LH) | (31) Oil filler duct |
| (4) Gasket | (18) Cylinder head (LH) | (32) O-ring |
| (5) Intake camshaft cap (Front RH) | (19) Intake camshaft (LH) | (33) Stud bolt |
| (6) Intake camshaft cap (Center RH) | (20) Exhaust camshaft (LH) | |
| (7) Intake camshaft cap (Rear RH) | (21) Intake camshaft cap (Front LH) | |
| (8) Intake camshaft (RH) | (22) Intake camshaft cap (Center LH) | |
| (9) Exhaust camshaft cap (Front RH) | (23) Intake camshaft cap (Rear LH) | |
| (10) Exhaust camshaft cap (Center RH) | (24) Exhaust camshaft (Front LH) | |
| (11) Exhaust camshaft cap (Rear RH) | (25) Exhaust camshaft cap (Center LH) | |
| (12) Exhaust camshaft (RH) | (26) Exhaust camshaft cap (Rear LH) | |
| (13) Cylinder head bolt | (27) Rocker cover gasket (LH) | |
| (14) Oil seal | (28) Rocker cover (LH) | |

Tightening torque: N·m (kgf-m, ft-lb)

T1: <Ref. to ME(DOHC TURBO)-64, INSTALLATION, Cylinder Head Assembly.>

T2: 5 (0.5, 3.6)

T3: 10 (1.0, 7.3)

T4: 6.4 (0.65, 4.7)

T5: 20 (2.0, 14.7)

ME(DOHC TURBO)-9

CAMSHAFT

MECHANICAL

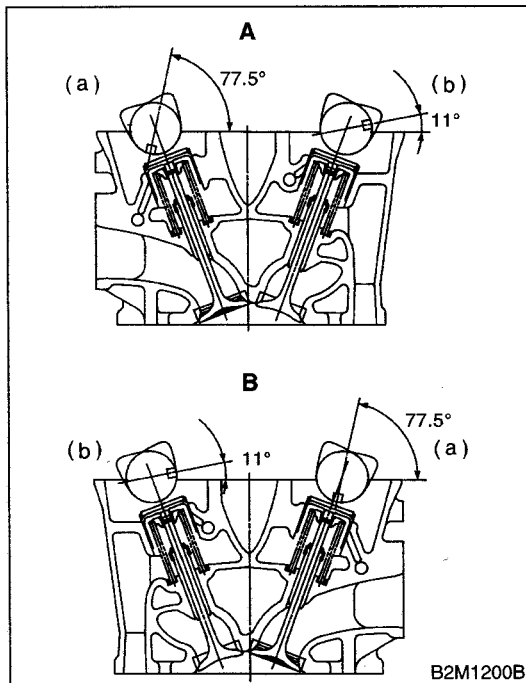
B: INSTALLATION

1) Camshaft installation:

Apply engine oil to the cylinder head at camshaft bearing location before installing the camshaft. Install the camshaft so that each valve is close to or in contact with "base circle" of cam lobe.

CAUTION:

- When the camshafts are positioned as shown in the figure, camshafts need to be rotated at a minimum to align with the timing belt during installation.
 - Right-hand camshaft need not be rotated when set at the position shown in the figure.
- Left-hand intake camshaft: Rotate 80° clockwise.
Left-hand exhaust camshaft: Rotate 45° counterclockwise.



- A Left side cylinder head
B Right side cylinder head
(a) Intake camshaft
(b) Exhaust camshaft

2) Camshaft cap installation:

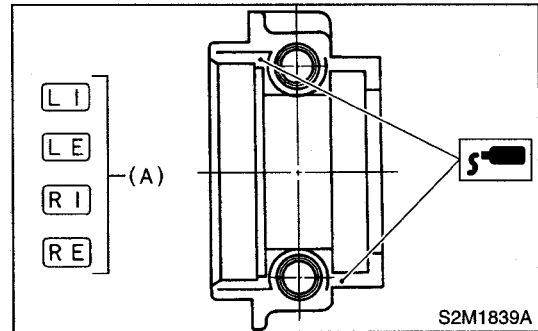
- (1) Apply fluid packing sparingly to the cap mating surface.

CAUTION:

Do not apply fluid packing excessively. Failure to do so may cause excess packing to come out and flow toward oil seal, resulting in oil leaks.

Fluid packing:

THREE BOND 1215 or equivalent



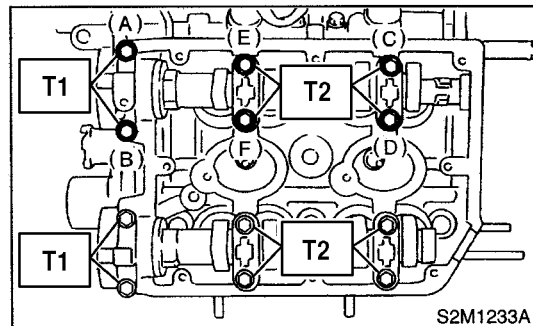
- (2) Apply engine oil to cap bearing surface and install the cap on camshaft as shown by identification mark (A).

- (3) Gradually tighten the cap in at least two stages in alphabetical sequence shown in the figure, and then tighten to specified torque.

Tightening torque:

T1: 10 N·m (1.0 kgf-m, 7.3 ft-lb)

T2: 20 N·m (2.0 kgf-m, 14.7 ft-lb)



- (4) Similarly, tighten the cap on exhaust side. After tightening the cap, ensure the camshaft rotates only slightly while holding it at "base" circle.

Tightening torque:

T1: 10 N·m (1.0 kgf-m, 7.3 ft-lb)

T2: 20 N·m (2.0 kgf-m, 14.7 ft-lb)

ME(DOHC TURBO)-60

CAMSHAFT

MECHANICAL

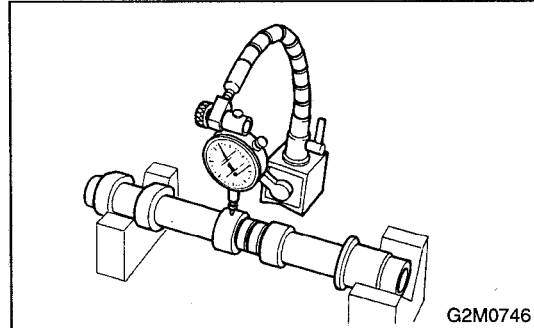
- 14) Install the crankshaft pulley. <Ref. to ME(DOHC TURBO)-46, INSTALLATION, Crankshaft Pulley.>
- 15) Install the V-belt. <Ref. to ME(DOHC TURBO)-44, INSTALLATION, V-belt.>

C: INSPECTION

- 1) Measure the bend, and repair or replace if necessary.

Limit:

0.020 mm (0.0008 in)



- 2) Check the journal for damage and wear. Replace if faulty.
- 3) Measure the outside diameter of camshaft journal. If the journal diameter is not as specified, check the oil clearance.

	Camshaft journal	
	Front	Center, rear
Standard	37.946 — 37.9635 mm (1.4939 — 1.4946 in)	29.946 — 29.963 mm (1.1790 — 1.1796 in)

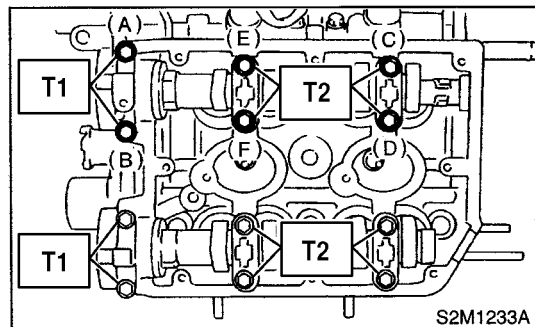
- 4) Measurement of the camshaft journal oil clearance:

- (1) Clean the bearing caps and camshaft journals.
- (2) Place the camshafts on the cylinder head. (Without installing the valve rocker.)
- (3) Place a plastigauge across each of the camshaft journals.
- (4) Gradually tighten the cap in at least two stages in alphabetical sequence shown in the figure, and then tighten to specified torque.

Tightening torque:

T1: 10 N·m (1.0 kgf·m, 7.3 ft·lb)

T2: 20 N·m (2.0 kgf·m, 14.7 ft·lb)



CAUTION:
Do not turn the camshaft.

ME(DOHC TURBO)-62

SERVICE BULLETIN

APPLICABILITY: 1999~2004MY Subaru Vehicles
SUBJECT: Service Manual Corrections

NUMBER: 18-74-04
DATE: 01/15/04

INTRODUCTION

Place a REVISED label on the appropriate pages of the noted effected Service Manuals and update the appropriate Service Manual Correction Binder(s) with the following pages:

YEAR	MODEL	BOOK/VOL#	MSA#	SECTION	PAGE	REFERENCE
1999	Forester	Sect. 1	MSA5T9910A	1-3	13	G5C0
	Forester	Sect. 1	MSA5T9910A	1-3	15	G5G0
	Forester	Sect. 1	MSA5T9910A	1-5	14	G6A1
	Forester	Sect. 2	MSA5T9911A	2-2	11	W8B0
	Impreza	Sect. 1	MSA5T9901A	1-3	6	G5C0
	Impreza	Sect. 1	MSA5T9901A	1-3	8	G5E0
	Impreza	Sect. 1	MSA5T9901A	1-5	13	G6A1
	Impreza	Sect. 2	MSA5T9902A	2-5	6	W1A0
	Forester	Sect. 1	MSA5T0020A	1-3	13	G5C0
	Forester	Sect. 1	MSA5T0020A	1-3	15	G5G0
2000	Forester	Sect. 1	MSA5T0020A	1-5	12	G6A1
	Forester	Sect. 3	MSA5T0022A	2-5	25	W9B1
	Impreza	Sect. 1	MSA5T0010A	1-3	13	G5C0
	Impreza	Sect. 1	MSA5T0010A	1-3	15	G5G0
	Impreza	Sect. 1	MSA5T0010A	1-5	12	G6A1
	Impreza	Sect. 3	MSA5T0012A	2-5	22	W9A0
	Legacy	Sect. 1	MSA5T0001A	1-3	13	G5C0
	Legacy	Sect. 1	MSA5T0001A	1-3	15	G5G0
	Legacy	Sect. 1	MSA5T0001A	1-5	11	G6A2
	Legacy	Sect. 3	MSA5T0003A	2-5	23	W9B1
	Forester	Sect. 1	MSA5T0120A	1-3	13	G5C0
	Forester	Sect. 1	MSA5T0120A	1-5	12	G6A1
	Forester	Sect. 1	MSA5T0120A	1-3	15	G5G0
	Forester	Sect. 3	MSA5T0122A	2-5	24	W9B0
2001	Impreza	Sect. 2	MSA5T0111A	--	CO-6	--
	Impreza	Sect. 1	MSA5T0110A	--	PM-18	--
	Impreza	Sect. 1	MSA5T0110A	--	RM-4	--

continued on next page...



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YEAR	MODEL	BOOK/VOL#	MSA#	SECTION	PAGE	REFERENCE
2001	Legacy	Sect. 2	MSA5T0102A	--	CO(H4)-6	--
	Legacy	6 Cyl. Sup.	MSA5T0109A	--	CO(H6)-18	--
	Legacy	6 Cyl. Sup.	MSA5T0109A	--	PM-19	--
	Legacy	6 Cyl. Sup.	MSA5T0109A	--	RM-4	--
	Legacy	Sect. 1	MSA5T0101A	--	PM-18	--
	Legacy	Sect. 1	MSA5T0101A	--	RM-4	--
2002	Forester	Sect. 3	MSA5T0222A	--	CO-12	--
	Forester	Sect. 3	MSA5T0222A	--	CO-13	--
	Forester	Sect. 1	MSA5T0220A	--	PM-14	--
	Forester	Sect. 1	MSA5T0220A	--	RM-4	--
	Impreza	Sect. 2	MSA5T0211A	--	CO-25	--
	Impreza	Sect. 1	MSA5T0210A	--	PM-18	--
	Impreza	Sect. 1	MSA5T0210A	--	RM-4	--
	Legacy	Sect. 3	MSA5T0203A	--	CO(H6)-18	--
	Legacy	Sect. 2	MSA5T0202A	--	CO-12	--
	Legacy	Sect. 1	MSA5T0201A	--	PM-18	--
	Legacy	Sect. 1	MSA5T0201A	--	RM-5	--
	Legacy	Sect. 1	MSA5T0201A	--	RM-5	--
2003	Forester	Sect. 3	MSA5T0322A	--	CO(SOHC)-14	--
	Forester	Sect. 1	MSA5T0320A	--	PM-17	--
	Forester	Sect. 1	MSA5T0320A	--	RM-4	--
	Impreza	Sect. 2	MSA5T0311A	--	CO(H4SO)-29	--
	Impreza	Sect. 1	MSA5T0310A	--	PM-19	--
	Impreza	Sect. 1	MSA5T0310A	--	RM-5	--
	Legacy	Sect. 2	MSA5T0302A	--	CO(H4SO)-14	--
	Legacy	Sect. 3	MSA5T0303A	--	CO(H6DO)-22	--
	Legacy	Sect. 1	MSA5T0301A	--	PM-19	--
	Legacy	Sect. 1	MSA5T0301A	--	RM-4	--
	Legacy	Sect. 1	MSA5T0301A	--	RM-4	--
	Legacy	Sect. 1	MSA5T0301A	--	RM-4	--
2004	Forester	Sect. 2	MSA5T0421A	--	CO(H4SO)-17	--
	Forester	Sect. 1	MSA5T0420A	--	PM-19	--
	Forester	Sect. 1	MSA5T0420A	--	RM-4	--
	Impreza	Sect. 3	MSA5T0412A	--	CO(H4DOTC)-17	--
	Impreza	Sect. 2	MSA5T0411A	--	CO(H4SO)-12	--
	Impreza	Sect. 1	MSA5T0410A	--	PM-20	--
	Impreza	Sect. 1	MSA5T0410A	--	RM-6	--
	Legacy	Sect. 4	MSA5T0403A	--	CO(H4DOTC)-13	--
	Legacy	Sect. 2	MSA5T0401A	--	CO(H4SO)-12	--
	Legacy	Sect. 5	MSA5T0404A	--	CO(H6DO)-18	--
	Legacy	Sect. 1	MSA5T0400A	--	PM-22	--
	Legacy	Sect. 1	MSA5T0400A	--	RM-4	--
	Legacy	Sect. 1	MSA5T0400A	--	RM-4	--
	Legacy	Sect. 1	MSA5T0400A	--	RM-4	--
	Legacy	Sect. 1	MSA5T0400A	--	RM-4	--

C: LUBRICANTS

Lubricants	Specifications	Remarks
• Engine oil	• API Classification: SJ or SH with the words "Energy Conserving or Energy Conserving II" • New API Certified • CCMC Specification: G4 or G5 • ACEA Specification: A1 or A2 or A3	• For SAE viscosity number, refer to the following table. • If it is impossible to get SJ or SH grade, you may use SG grade.
• Transmission and differential gear oil	• API Classification: GL-5	• For SAE viscosity number, refer to the following table.
• AWD rear differential gear oil		
• Automatic transmission	• "DEXRON IIE" or "DEXRON III" type	—
• Power steering fluid	• "DEXRON IIE" or "DEXRON III" type	—
• Coolant	• Genuine SUBARU Coolant (Part No. 000016218) (Anti-freeze, anti-corrosive ethylene glycol base)	• For further coolant specifications, refer to the following table.
• Coolant Conditioner	• Subaru Coolant Conditioner SOA635071	—
• Brake fluid	• DOT3 or DOT4	• FMVSS NO. 116 • Avoid mixing brake fluid of different brands to prevent the fluid performance from degrading. • When brake fluid is added, be careful not to allow any dust into the reservoir.
• Clutch fluid	• DOT3 or DOT4	• FMVSS NO. 116 • Avoid mixing brake fluid of different brands to prevent the fluid performance from degrading. • When brake fluid is added, be careful not to allow any dust into the reservoir.

Lubricants	Recommended	Application	Equivalent
• Spray lubricants	SUBARU CRC (P/N 004301003)	O ₂ sensor	—
• Grease	SUNLIGHT 2 N: glube R (P/N 003602010)	Steering shaft bearing, bushing for manual transmission gear shift system	—
	Valiant grease M-2 (P/N 003608001)	Steering gearbox	—
	Niglube RX-2 (P/N 003606000 or 725191040)	Piston boot of disc brake and sliding pin	—
	Molykote No. 7439 (P/N 725191460)	Contacting surfaces of drum brake shoes and shoe clearance adjuster	—
	Molylex No.2 (P/N 723223010)	Rear BJ and DOJ (for except front axle of AT vehicle) joints of axle shafts	—
	NTG2218 (CP/N 28093AA020)	BJ (for front axle) joints of axle shafts	—
	FX clutch grease (P/N 000040901)	Splines of transmission main shaft	—
	Slicolube G-30M (P/N 004404002)	Control cables and throttle linkages subject to cold weather, water-pump impeller, door latch, striker, battery terminals, etc.	—
	SSG-6003 (P/N 28093TA000)	SFJ joints of axle shafts	—

E: COOLANT**CAUTION:**

- Avoid using any coolant or only water other than this designated type to prevent corrosion.
- SUBARU's engine is aluminum alloy, and so special care is necessary.
- To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

Coolant Specifications							
Lowest anticipated atmospheric temperature	SUBARU coolant-to-*water ratio (Volume) %	Specification gravity					Freezing point
		at 10°C (50°F)	at 20°C (68°F)	at 30°C (86°F)	at 40°C (104°F)	at 50°C (122°F)	
Above -30°C (-22°F)	50 — 50	1.084	1.079	1.074	1.068	1.062	-36°C (-33°F)
Above -15°C (5°F)	30 — 70	1.053	1.049	1.044	1.039	1.034	-16°C (-3°F)

*: It is recommended that distilled water be used.

F: SEALANTS

	Recommended	Application	Equivalent
Sealant	Three Bond 1105 (P/N 004403010)	Rear differential oil drain plug, bearing cap (#5), etc.	Dow Corning's No. 7038
	Three Bond 1215 (P/N 004403007)	Matching surface of oil pump, transmission case, etc. Flywheel and drive plate tightening bolts, etc.	Dow Corning's No. 7038
	Starcalking B-33A (P/N 000018901)	Sealing against water and dust entry through weatherstrips, grommets, etc.	Butyl Rubber Sealant
	Three Bond 1217B	Matching surface of transmission oil pan	—
	Three Bond 1102 (P/N 004403006)	Steering gear box adjust screw	—
	Three Bond 1280B	Matching surface of engine cam cap	—

G: ADHESIVES

Adhesive	Cemedine 5430L	Weatherstrips and other rubber parts, plastics and textiles except soft vinyl parts.	3M's EC-1770 EC-1368
	Cemedine 540	Soft vinyl parts, and other parts subject to gasoline, grease or oil, e.g. trim leather, door inner remote cover, etc.	3M's EC-776 EC-847 EC-1022 (Spray Type)
	Cemedine 3000	Bonding metals, glass, plastic and rubber parts. Repairing slightly torn weatherstrips, etc.	Armstrong's Eastman 910
	Essex Chemical Crop's Urethane E	Windshield to body panel.	Sunstar 580

6. Replace Engine Coolant and Inspect Cooling System, Hoses and Connections

MAINTENANCE INTERVAL [Number of months or km (miles), whichever occurs first]																	
Months	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120
× 1,000 km	4.8	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192
× 1,000 miles	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120
California					P				P				P				P
All states except California					P				P				P				P

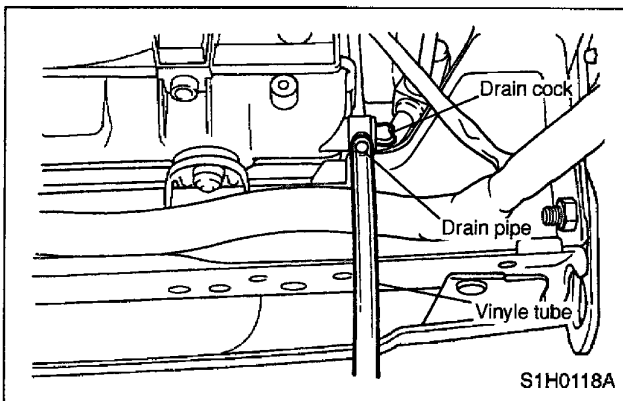
A: REPLACEMENT

1. REPLACEMENT OF COOLANT

WARNING:

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

- 1) Lift up the vehicle.
- 2) Remove undercover.
- 3) Fit vinyl tube to drain pipe.

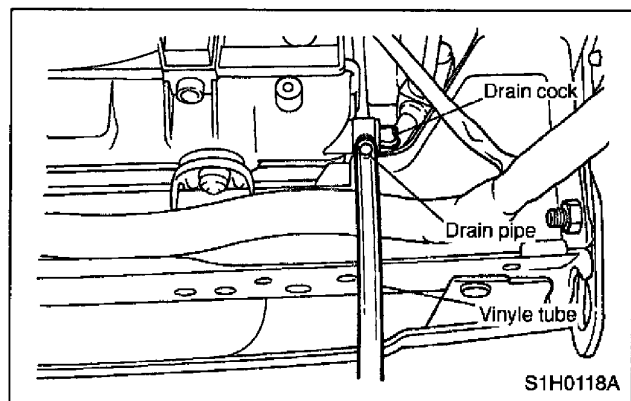


- 4) Place a container under vinyl tube.
- 5) Loosen drain cock to drain engine coolant into container.
- 6) For quick draining, open radiator cap.

CAUTION:

Be careful not to spill coolant on the floor.

- 7) Drain coolant from reservoir tank.
- 8) Tighten radiator drain plug securely after draining coolant. (Drain tube may face downward.)



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

Coolant capacity (fill up to "FULL" level)
Approx. 6.0 ℓ (6.3 US qt, 5.3 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing anti-freeze and anti-rust agents is especially made for SUBARU engines, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolants may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

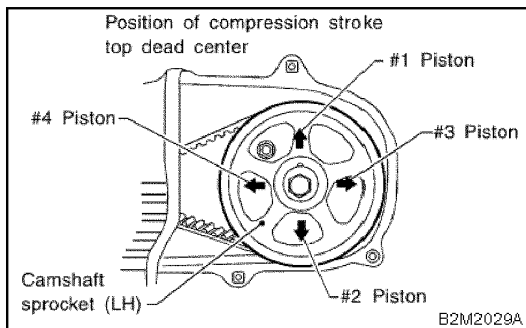
- 11) Securely install radiator cap and reservoir tank cap.
- 12) Run engine for more than five minutes at 2,000 to 3,000 rpm. (Run engine until radiator becomes hot in order to purge air trapped in cooling system.)
- 13) Stop engine and wait until coolant temperature lowers. Then open radiator cap to check

6) Similar to adjustment procedures used for #1 cylinder, adjust #2, #3 and #4 cylinder valve clearances.

NOTE:

Be sure to set cylinder pistons to their respective top dead centers on the compression stroke before adjusting valve clearances.

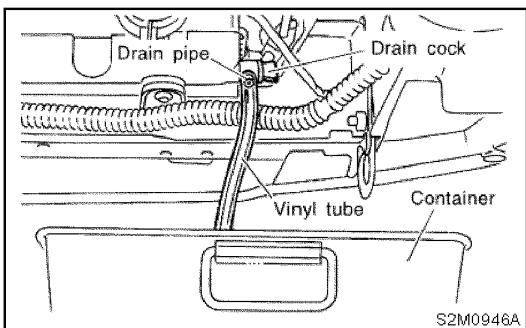
To set #3, #2 and #4 cylinder pistons to their top dead centers on the compression stroke, turn crankshaft pulley clockwise 90° at a time starting with arrow mark on left-hand camshaft sprocket facing up.



8. Engine Coolant

A: DRAINING OF ENGINE COOLANT

- 1) Lift-up the vehicle.
- 2) Remove under cover.
- 3) Fit vinyl tube to drain pipe.



- 4) Loosen drain cock to drain engine coolant into container.

NOTE:

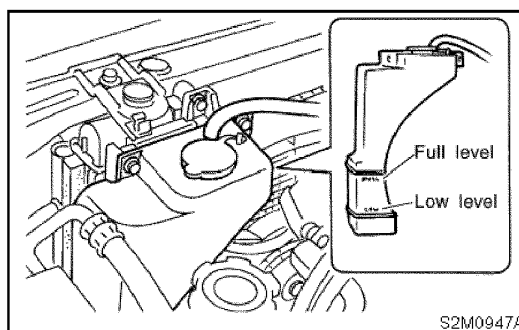
Remove radiator cap so that engine coolant will drain faster.

B: FILLING OF ENGINE COOLANT

- 1) Fill engine coolant into radiator up to filler neck position.

CAUTION: The Subaru Genuine Coolant containing anti-freeze and anti-rust agents is especially made for SUBARU engines, which have an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into reservoir tank up to upper level.



- 3) Attach radiator cap and reservoir tank cap properly.
- 4) Install air vent plug.
- 5) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 6) Stop engine and wait until temperature drops to a safe level.
- 7) If engine coolant level drops in radiator, add engine coolant to filler neck position.
- 8) If engine coolant level drops from upper level of reservoir tank, add engine coolant to upper level.
- 9) Attach radiator cap and reservoir tank cap properly.

C: LUBRICANTS

Lubricants	Specifications	Remarks
Engine oil	- API Classification: SJ or SH with the words "Energy Conserving or Energy Conserving II" - New API Certified - CCMC Specification: G4 or G5 - ACEA Specification: A1 or A2 or A3	- For SAE viscosity number, refer to the following table. - If it is impossible to get SH or SG grade, you may use SF grade.
- Transmission and differential gear oil - AWD rear differential gear oil	API Classification: GL-5	For SAE viscosity number, refer to the following table.
Automatic transmission	"DEXRON IIE" or "DEXRON III" type	—
Power steering fluid	"DEXRON IIE" or "DEXRON III" type	—
Coolant	Genuine SUBARU Coolant (Part No. 000016218) (Anti-freeze, anti-corrosive ethylene glycol base)	For further coolant specifications, refer to the following table.
Coolant Conditioner	Subaru Coolant Conditioner SOA635071	
Brake fluid	DOT3 or DOT4	- FMVSS NO. 116 - Avoid mixing brake fluid of different brands to prevent the fluid performance from degrading. - When brake fluid is added, be careful not to allow any dust into the reservoir.
Clutch fluid	DOT3 or DOT4	- FMVSS NO. 116 - Avoid mixing brake fluid of different brands to prevent the fluid performance from degrading. - When brake fluid is added, be careful not to allow any dust into the reservoir.

Lubricants	Recommended	Application	Equivalent
Spray lubricants	SUBARU CRC (P/N 004301003)	O ₂ sensor	—
Grease	SUNLIGHT 2 N: glube R (P/N 003602010)	Steering shaft bearing, bushing for manual transmission gear shift system	—
	Valiant grease M-2 (P/N 003608001)	Steering gearbox	—
	Niglube RX-2 (P/N 003606000 or 725191040)	Piston boot of disc brake and sliding pin	—
	Molykote No. 7439 (P/N 725191460)	Contacting surfaces of drum brake shoes and shoe clearance adjuster	—
	Molylex No.2 (P/N 723223010)	BJ of rear axle shafts	—
	VU-3A702 (P/N 23223GA050)	DOJ of rear axle shafts	—
	NTG2218 (CP/N 28093AA020)	BJ of front axle shafts	—
	SSG-6003 (P/N 28093TA000)	SFJ of front axle shaft	—
	FX clutch grease (P/N 000040901)	Splines of transmission main shaft	—
	Slicolube G-30M (P/N 004404002)	Control cables and throttle linkages subject to cold weather, water-pump impeller, door latch, striker, battery terminals, etc.	—
	Slicolube G-40M (P/N 004404003)	Clutch master cylinder push rod end	—

E: COOLANT**CAUTION:**

- Avoid using any coolant or only water other than this designated type to prevent corrosion.
- SUBARU's engine is aluminum alloy, and so special care is necessary.
- To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

Coolant Specifications							
Lowest anticipated atmospheric temperature	SUBARU coolant-to-*water ratio (Volume) %	Specification gravity					Freezing point
		at 10°C (50°F)	at 20°C (68°F)	at 30°C (86°F)	at 40°C (104°F)	at 50°C (122°F)	
Above -30°C (-22°F)	50 — 50	1.084	1.079	1.074	1.068	1.062	-36°C (-33°F)
Above -15°C (5°F)	30 — 70	1.053	1.049	1.044	1.039	1.034	-16°C (-3°F)

*: It is recommended that distilled water be used.

F: SEALANTS

	Recommended	Application	Equivalent
Sealant	Three Bond 1105 (P/N 004403010)	Rear differential oil drain plug, retainer bolt, etc.	Dow Corning's No. 7038
	Three Bond 1215 (P/N 004403007)	Matching surface of oil pump, transmission case, etc. Flywheel and drive plate tightening bolts, etc.	Dow Corning's No. 7038
	Starcalking B-33A (P/N 000018901)	Sealing against water and dust entry through weatherstrips, grommets, etc.	Butyl Rubber Sealant
	Three Bond 1102 (P/N 004403006)	Steering gear box adjust screw	—

G: ADHESIVES

Adhesive	Cemedine 5430L	Weatherstrips and other rubber parts, plastics and textiles except soft vinyl parts.	3M's EC-1770 EC-1368
	Cemedine 540	Soft vinyl parts, and other parts subject to gasoline, grease or oil, e.g. trim leather, door inner remote cover, etc.	3M's EC-776 EC-847 EC-1022 (Spray Type)
	Cemedine 3000	Bonding metals, glass, plastic and rubber parts. Repairing slightly torn weatherstrips, etc.	Armstrong's Eastman 910
	Essex Chemical Corp's Urethane E	Windshield to body panel.	Sunstar 580

6. Replace Engine Coolant and Inspect Cooling and Heating System, Hoses and Connections

MAINTENANCE INTERVAL [Number of months or km (miles), whichever occurs first]																	
Months	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120
× 1,000 km	4.8	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192
× 1,000 miles	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120
California					P				P				P				P
All states except California					P				P				P				P

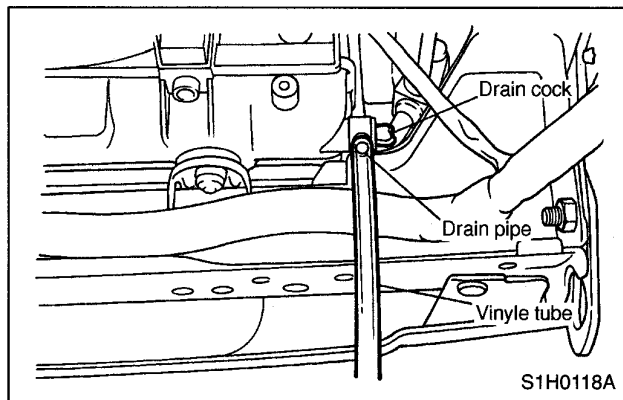
A: REPLACEMENT

1. REPLACEMENT OF COOLANT

WARNING:

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

- 1) Lift up the vehicle.
- 2) Fit vinyle tube to drain pipe.

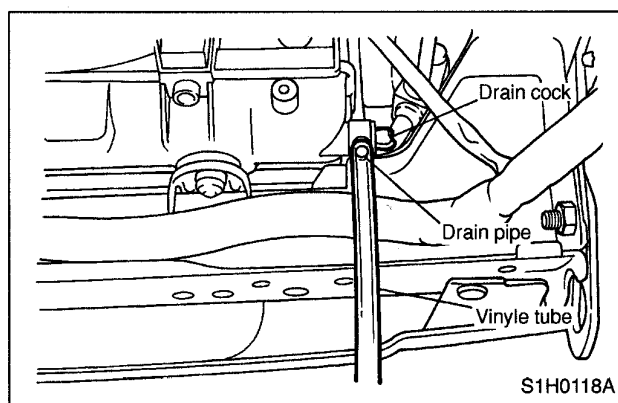


- 3) Place a container under vinyle tube.
- 4) Loosen drain cock to drain engine coolant into container.
- 5) For quick draining, open radiator cap.

CAUTION:

Be careful not to spill coolant on the floor.

- 6) Drain coolant from reservoir tank.
- 7) Tighten radiator drain cock securely after draining coolant. (Drain tube may face downward.)



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

Coolant capacity (fill up to "FULL" level)
Approx. 6.2 ℓ (6.6 US qt, 5.5 Imp qt)

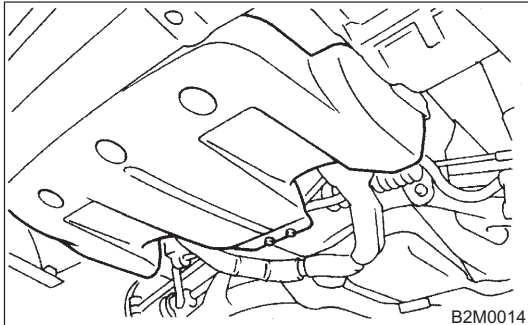
CAUTION: The Subaru Genuine Coolant Containing anti-freeze and anti-rust agents is especially made for SUBARU engines, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolants may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 10) Securely install radiator cap and reservoir tank cap.
- 11) Run engine for more than five minutes at 2,000 to 3,000 rpm. (Run engine until radiator becomes hot in order to purge air trapped in cooling system.)
- 12) Stop engine and wait until coolant temperature lowers. Then open radiator cap to check

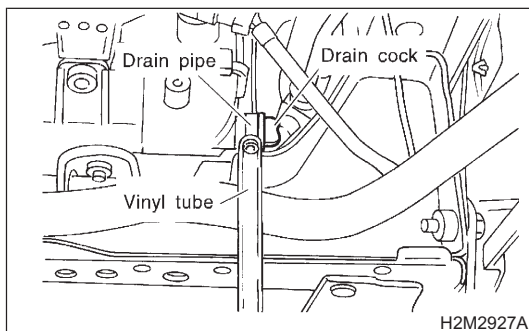
1. On-car Services

A: DRAINING OF ENGINE COOLANT

- 1) Lift-up the vehicle.
- 2) Remove under cover.



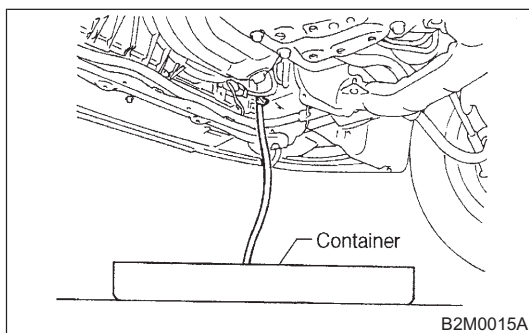
- 3) Fit vinyl tube to drain pipe.



- 4) Loosen drain cock to drain engine coolant into container.

NOTE:

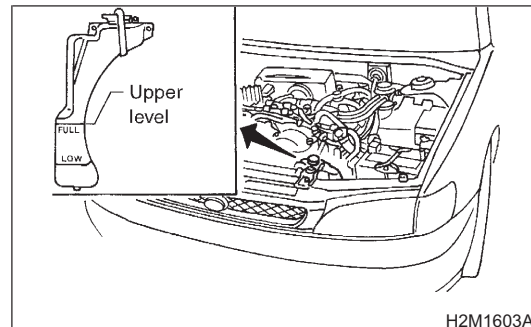
Remove radiator cap so that engine coolant will drain faster.



Caution: The Subaru Genuine Coolant containing anti-freeze and anti-rust agents is especially made for SUBARU engines, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolants may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

B: FILLING OF ENGINE COOLANT

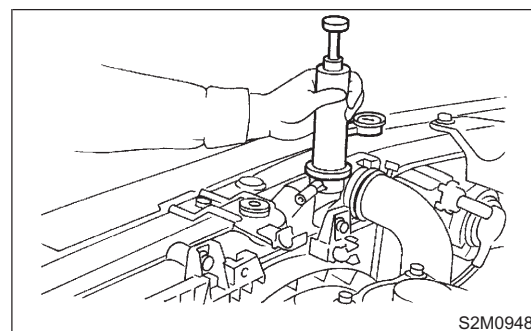
- 1) Fill engine coolant into radiator up to filler neck position.
- 2) Fill engine coolant into reservoir tank up to upper level.



- 3) Attach radiator cap and reservoir tank cap properly.
- 4) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 5) Stop engine and wait until temperature drops to a safe level.
- 6) If engine coolant level drops in radiator, add engine coolant to filler neck position.
- 7) If engine coolant level drops from upper level of reservoir tank, add engine coolant to upper level.
- 8) Attach radiator cap and reservoir tank cap properly.

C: CHECKING OF COOLING SYSTEM

- 1) Remove radiator cap, top off radiator, and attach tester to radiator in place of cap.
- 2) Apply a pressure of 157 kPa (1.6 kg/cm², 23 psi) to radiator to check if:
 - (1) Engine coolant leaks at/around radiator.
 - (2) Engine coolant leaks at/around hoses or connections.



CAUTION:

Engine should be off.

Wipe engine coolant from check points in advance.

Be careful to prevent engine coolant from spurting out when removing tester.

Be careful also not to deform filler neck of radiator when installing or removing tester.

C: LUBRICANTS

Lubricants	Specifications	Remarks
Engine oil	API Classification: SJ or SH with the words "Energy Conserving II" New API Certified CCMC Specification: G4 or G5 ACEA Specification: A1, A2 or A3	For SAE viscosity number, refer to the following table. If it is impossible to get SJ or SH grade, you may use SG grade.
Transmission and differential gear oil AWD rear differential gear oil	API Classification: GL-5	For SAE viscosity number, refer to the following table.
Automatic transmission	"DEXRON II, IIE" or "DEXRON III" type	—
Power steering fluid	"DEXRON II, IIE" or "DEXRON III" type	—
Coolant	Genuine SUBARU Coolant (Part No. 000016218) (Anti-freeze, anti-corrosive ethylene glycol base)	For further coolant specifications, refer to the following table.
Coolant Conditioner	Subaru Coolant Conditioner SOA635071	—
Brake fluid	DOT3 or DOT4	FMVSS NO. 116 Avoid mixing brake fluid of different brands to prevent the fluid performance from degrading. When brake fluid is added, be careful not to allow any dust into the reservoir.
Clutch fluid	DOT3 or DOT4	FMVSS NO. 116 Avoid mixing brake fluid of different brands to prevent the fluid performance from degrading. When clutch fluid is added, be careful not to allow any dust into the reservoir.

Lubricants	Recommended	Application	Equivalent
Spray lubricants	SUBARU CRC (P/N 004301003)	O ₂ sensor	—
Grease	SUNLIGHT 2 N: glube R (P/N 003602010)	Steering shaft bearing, bushing for manual transmission gear shift system	—
	Valiant grease M-2 (P/N 003608001)	Steering gearbox	—
	Niglube RX-2 (P/N 003606000 or 725191040)	Piston boot of disc brake and sliding pin	—
	Molykote No. 7439 (P/N 725191460)	Contacting surfaces of drum brake shoes and shoe clearance adjuster	—
	Molylex No.2 (P/N 723223010)	Rear BJ joints of axle shafts	—
	VU-3A702 (P/N 23223GA050)	Rear DOJ joints of axle shafts	—
	NTG2218 (CP/N 28093AA020)	BJ (for front axle) joints of axle shafts	—
	FX clutch grease (P/N 000040901)	Splines of transmission main shaft	—
	Slicolube G-30M (P/N 004404002)	Control cables and throttle linkages subject to cold weather, water-pump impeller, door latch, striker, battery terminals, etc.	—
	SSG-6003 (P/N 28093TA000)	SFJ joints of axle shafts	—
	Molykote AS-880N (P/N 26298AC000)	Contacting surfaces of brake pad and inner shim	—

E: COOLANT**CAUTION:**

- Avoid using any coolant or only water other than this designated type to prevent corrosion.
- SUBARU's engine is aluminum alloy, and so special care is necessary.
- To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

Coolant Specifications							
Lowest anticipated atmospheric temperature	SUBARU coolant-to-*water ratio (Volume) %	Specification gravity					Freezing point
		at 10°C (50°F)	at 20°C (68°F)	at 30°C (86°F)	at 40°C (104°F)	at 50°C (122°F)	
Above -30°C (-22°F)	50 — 50	1.084	1.079	1.074	1.068	1.062	-36°C (-33°F)
Above -15°C (-22°F)	30 — 70	1.053	1.049	1.044	1.039	1.034	-16°C (-3°F)

*: It is recommended that distilled water be used.

F: SEALANTS

	Recommended	Application	Equivalent
Sealant	Three Bond 1105 (P/N 004403010)	Rear differential oil drain plug, bearing cap (#5), etc.	Dow Corning's No. 7038
	Three Bond 1215 (P/N 004403007)	Matching surface of oil pump, transmission case, etc. Flywheel and drive plate tightening bolts, etc.	Dow Corning's No. 7038
	Starcalking B-33A (P/N 000018901)	Sealing against water and dust entry through weatherstrips, grommets, etc.	Butyl Rubber Sealant
	Three Bond 1217B	Matching surface of transmission oil pan	—
	Three Bond 1102 (P/N 004403006)	Steering gear box adjust screw	—
	Three Bond 1280B	Matching surface of engine cam cap	—

G: ADHESIVES

Adhesive	Cemedine 5430L	Weatherstrips and other rubber parts, plastics and textiles except soft vinyl parts.	3M's EC-1770 EC-1368
	Cemedine 540	Soft vinyl parts, and other parts subject to gasoline, grease or oil, e.g. trim leather, door inner remote cover, etc.	3M's EC-776 EC-847 EC-1022 (Spray Type)
	Cemedine 3000	Bonding metals, glass, plastic and rubber parts. Repairing slightly torn weatherstrips, etc.	Armstrong's Eastman 910
	Essex Chemical Crop's Urethane E	Windshield to body panel.	Sunstar 580

6. Replace Engine Coolant and Inspect Cooling System, Hoses and Connections

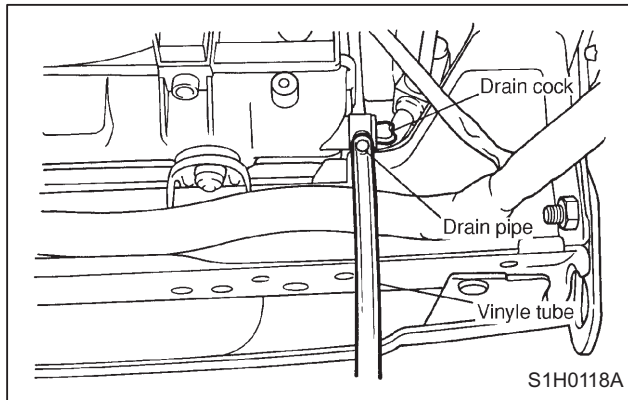
MAINTENANCE INTERVAL																	
[Number of months or km (miles), whichever occurs first]																	
Months	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120
1,000 km	4.8	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192
1,000 miles	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120
					P				P				P				P

A: REPLACEMENT

1. REPLACEMENT OF COOLANT

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

- 1) Lift up the vehicle.
- 2) Remove undercover.
- 3) Fit vinyl tube to drain pipe.

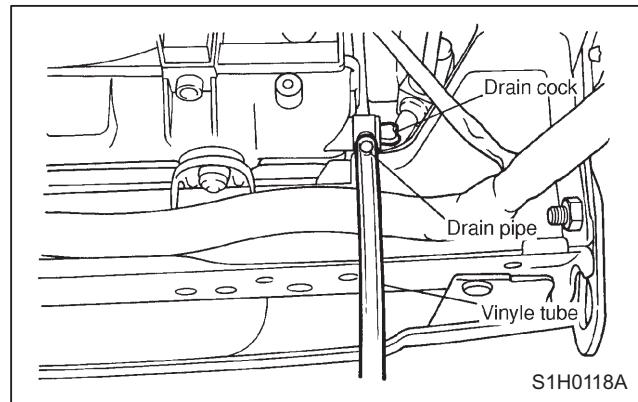


- 4) Place a container under vinyl tube.
- 5) Loosen drain cock to drain engine coolant into container.
- 6) For quick draining, open radiator cap.

CAUTION:

Be careful not to spill coolant on the floor

- 7) Drain coolant from reservoir tank.
- 8) Tighten radiator drain plug securely after draining coolant. (Drain tube may face downward.)



9) Fill engine coolant into radiator up to filler neck position.

10) Fill engine coolant into reservoir tank up to ^aFULL^o level.

Coolant capacity (fill up to "FULL" level)
Approx. 6.0ℓ (6.3 US qt, 5.3 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing anti-freeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolants may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

11) Securely install radiator cap and reservoir tank cap.

12) Run engine for more than five minutes at 2,000 to 3,000 rpm. (Run engine until radiator becomes hot in order to purge air trapped in cooling system.)

13) Stop engine and wait until coolant temperature lowers. Then open radiator cap to check coolant level and add coolant up to radiator fill-

B: FILLING OF ENGINE COOLANT

1) Fill engine coolant into radiator up to filler neck position.

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

MT model;

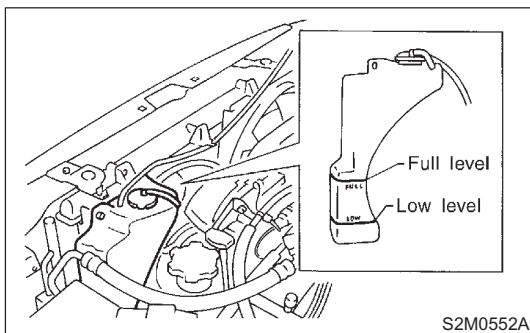
Approx. 6.0ℓ (6.3 US qt, 5.3 Imp qt)

AT model;

Approx. 6.2ℓ (6.6 US qt, 5.5 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

2) Fill engine coolant into reservoir tank up to upper level.



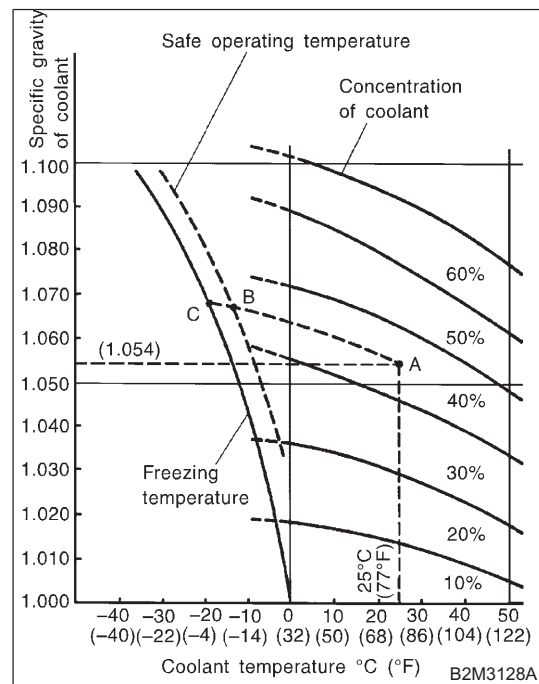
- 3) Attach radiator cap and reservoir tank cap properly.
- 4) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 5) If engine coolant level drops in radiator, add engine coolant to filler neck position.
- 6) If engine coolant level drops from upper level of reservoir tank, add engine coolant to upper level.
- 7) Attach radiator cap and reservoir tank cap properly.

1. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE

The concentration and safe operating temperature of the SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

[Example]

If the coolant temperature is 25°C (77°F) and its specific gravity is 1.054, the concentration is 35% (point A), the safe operating temperature is -14°C (7°F) (point B), and the freezing temperature is -20°C (-4°F) (point C).



C: LUBRICANTS

Lubricants	Specifications	Remarks
Engine oil	API Classification: SJ or SH with the words "Energy Conserving II" New API Certified CCMC Specification: G4 or G5 ACEA Specification: A1, A2 or A3	For SAE viscosity number, refer to the following table. If it is impossible to get SJ or SH grade, you may use SG grade.
Transmission and differential gear oil AWD rear differential gear oil	API Classification: GL-5	For SAE viscosity number, refer to the following table.
Automatic transmission	"DEXRON II, IIE" or "DEXRON III" type	—
Power steering fluid	"DEXRON II, IIE" or "DEXRON III" type	—
Coolant	Genuine SUBARU Coolant (Part No. 000016218) (Anti-freeze, anti-corrosive ethylene glycol base)	For further coolant specifications, refer to the following table.
Coolant Conditioner	Subaru Coolant Conditioner SOA635071	—
Brake fluid	DOT3 or DOT4	FMVSS NO. 116 Avoid mixing brake fluid of different brands to prevent the fluid performance from degrading. When brake fluid is added, be careful not to allow any dust into the reservoir.
Clutch fluid	DOT3 or DOT4	FMVSS NO. 116 Avoid mixing brake fluid of different brands to prevent the fluid performance from degrading. When clutch fluid is added, be careful not to allow any dust into the reservoir.

Lubricants	Recommended	Application	Equivalent
Spray lubricants	SUBARU CRC (P/N 004301003)	O ₂ sensor	—
Grease	SUNLIGHT 2 N: glube R (P/N 003602010)	Steering shaft bearing, bushing for manual transmission gear shift system	—
	Valiant grease M-2 (P/N 003608001)	Steering gearbox	—
	Niglube RX-2 (P/N 003606000 or 725191040)	Piston boot of disc brake and sliding pin	—
	Molykote No. 7439 (P/N 725191460)	Contacting surfaces of drum brake shoes and shoe clearance adjuster	—
	Molylex No.2 (P/N 723223010)	BJ of rear axle shafts	—
	VU-3A702 (P/N 23223GA050)	DOJ of rear axle shafts	—
	NTG2218 (CP/N 28093AA020)	BJ of front axle shafts	—
	SSG-6003 (P/N 28093TA000)	SFJ of front axle shaft	—
	FX clutch grease (P/N 000040901)	Splines of transmission main shaft	—
	Slicolube G-30M (P/N 004404002)	Control cables and throttle linkages subject to cold weather, water-pump impeller, door latch, striker, battery terminals, etc.	—
	Slicolube G-40M (P/N 004404003)	Clutch master cylinder push rod end	—
	Molykote AS-880N (P/N 26298AC000)	Contacting surfaces of brake pad and inner shim	—

E: COOLANT**CAUTION:**

- Avoid using any coolant or only water other than this designated type to prevent corrosion.
- SUBARU's engine is aluminum alloy, and so special care is necessary.
- To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

Coolant Specifications							
Lowest anticipated atmospheric temperature	SUBARU coolant-to-water ratio (Volume) %	Specification gravity					Freezing point
		at 10°C (50°F)	at 20°C (68°F)	at 30°C (86°F)	at 40°C (104°F)	at 50°C (122°F)	
Above -30°C (-22°F)	50 — 50	1.084	1.079	1.074	1.068	1.062	-36°C (-33°F)
Above -15°C (5°F)	30 — 70	1.053	1.049	1.044	1.039	1.034	-16°C (3°F)

*: It is recommended that distilled water be used.

F: SEALANTS

	Recommended	Application	Equivalent
Sealant	Three Bond 1105 (P/N 004403010)	Rear differential oil drain plug, retainer bolt, etc.	Dow Corning's No. 7038
	Three Bond 1215 (P/N 004403007)	Matching surface of oil pump, transmission case, etc. Flywheel and drive plate tightening bolts, etc.	Dow Corning's No. 7038
	Starcalking B-33A (P/N 000018901)	Sealing against water and dust entry through weatherstrips, grommets, etc.	Butyl Rubber Sealant
	Three Bond 1102 (P/N 004403006)	Steering gear box adjust screw	—

G: ADHESIVES

Adhesive	Cemedine 5430L	Weatherstrips and other rubber parts, plastics and textiles except soft vinyl parts.	3M's EC-1770 EC-1368
	Cemedine 540	Soft vinyl parts, and other parts subject to gasoline, grease or oil, e.g. trim leather, door inner remote cover, etc.	3M's EC-776 EC-847 EC-1022 (Spray Type)
	Cemedine 3000	Bonding metals, glass, plastic and rubber parts. Repairing slightly torn weatherstrips, etc.	Armstrong's Eastman 910
	Essex Chemical Crop's Urethane E	Windshield to body panel.	Sunstar 580

6. Replace Engine Coolant and Inspect Cooling and Heating System, Hoses and Connections

MAINTENANCE INTERVAL [Number of months or km (miles), whichever occurs first]																	
Months	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120
x 1,000 km	4.8	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192
x 1,000 miles	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120
					P				P				P				P

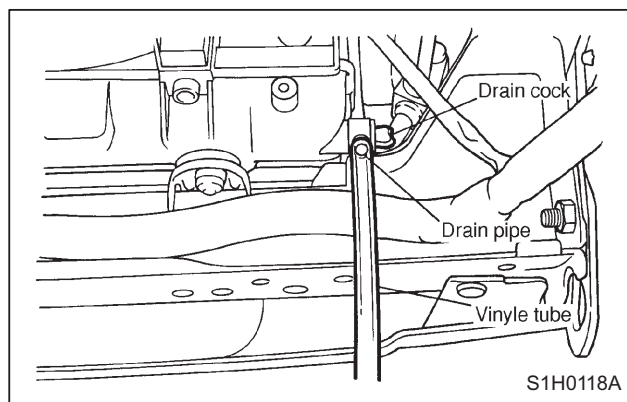
A: REPLACEMENT

1. REPLACEMENT OF COOLANT

WARNING:

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

- 1) Lift up the vehicle.
- 2) Fit vinyle tube to drain pipe.

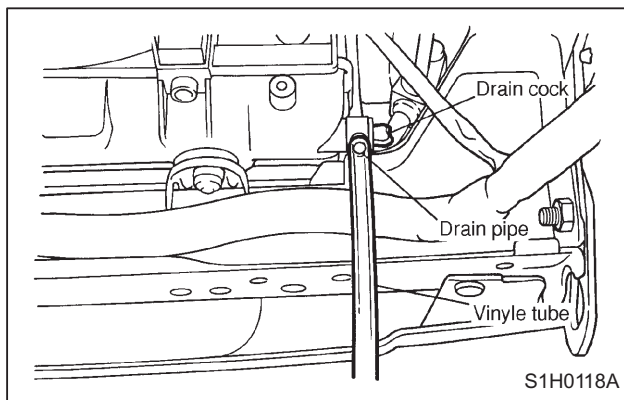


- 3) Place a container under vinyle tube.
- 4) Loosen drain cock to drain engine coolant into container.
- 5) For quick draining, open radiator cap.

CAUTION:

Be careful not to spill coolant on the floor.

- 6) Drain coolant from reservoir tank.
- 7) Tighten radiator drain cock securely after draining coolant. (Drain tube may face downward.)



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

Coolant capacity (fill up to "FULL" level)
Approx. 6.2 ℓ (6.6 US qt, 5.5 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing anti-freeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolants may cause corrosion.

To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 10) Securely install radiator cap and reservoir tank cap.
- 11) Run engine for more than five minutes at 2,000 to 3,000 rpm. (Run engine until radiator becomes hot in order to purge air trapped in cooling system.)
- 12) Stop engine and wait until coolant temperature lowers. Then open radiator cap to check coolant level and add coolant up to radiator fill-

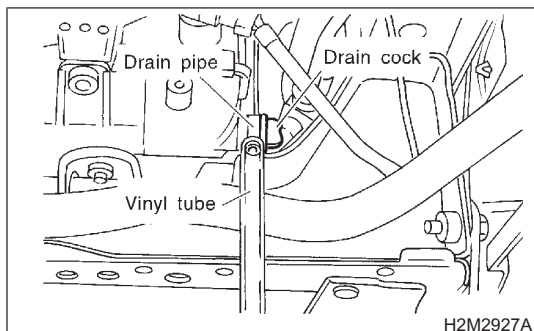
9. Engine Coolant

A: DRAINING OF ENGINE COOLANT

WARNING:

The radiator is pressurized. Wait until engine cools down before working on the radiator.

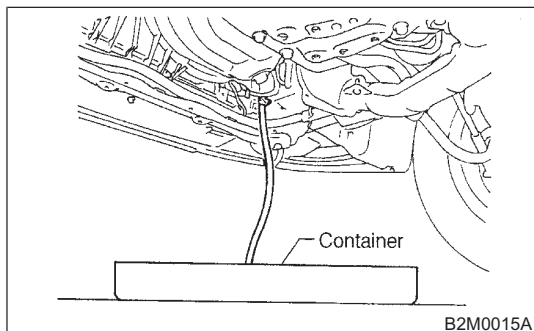
- 1) Lift-up the vehicle.
- 2) Remove under cover.
- 3) Fit vinyl tube to drain pipe.



- 4) Loosen drain cock to drain engine coolant into container.

NOTE:

Remove radiator cap so that engine coolant will drain faster.



B: FILLING OF ENGINE COOLANT

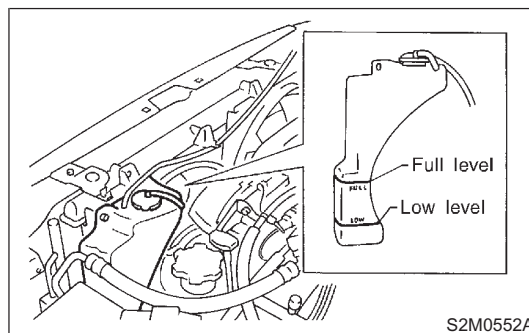
- 1) Fill engine coolant into radiator up to filler neck position.

Coolant capacity (fill up to "FULL" level):
Approx. 6.2ℓ (6.6 US qt, 5.5 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.

To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into reservoir tank up to upper level.



- 3) Attach radiator cap and reservoir tank cap properly.
- 4) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 5) If engine coolant level drops in radiator, add engine coolant to filler neck position.
- 6) If engine coolant level drops from upper level of reservoir tank, add engine coolant to upper level.
- 7) Attach radiator cap and reservoir tank cap properly.

1. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE

The concentration and safe operating temperature of the SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

C: LUBRICANTS

Lubricants	Specifications	Remarks
Engine oil	API Classification: SJ or SH with the words "Energy Conserving II" New API Certified CCMC Specification: G4 or G5 ACEA Specification: A1, A2 or A3	For SAE viscosity number, refer to the following table. If it is impossible to get SJ or SH grade, you may use SG grade.
Transmission and differential gear oil AWD rear differential gear oil	API Classification: GL-5	For SAE viscosity number, refer to the following table.
Automatic transmission fluid	DEXRON II, IIE or III type	—
Power steering fluid	DEXRON II, IIE or III type	—
Coolant	Genuine SUBARU Coolant (Part No. 000016218) (Anti-freeze, anti-corrosive ethylene glycol base)	For further coolant specifications, refer to the following table.
Coolant Conditioner	Subaru Coolant Conditioner SOA635071	—
Brake fluid	DOT3 or DOT4	FMVSS No. 116 Avoid mixing brake fluid of different brands to prevent the fluid performance from degrading. When brake fluid is added, be careful not to allow any dust into the reservoir.
Clutch fluid	DOT3 or DOT4	FMVSS No. 116 Avoid mixing brake fluid of different brands to prevent the fluid performance from degrading. When clutch fluid is added, be careful not to allow any dust into the reservoir.

Lubricants	Recommended	Application	Equivalent
Spray lubricants	SUBARU CRC (P/N 004301003)	O ₂ sensor	—
Grease	SUNLIGHT 2 (P/N 003602010)	Steering shaft bearing, bushing for manual transmission gear shift system	—
	Valiant grease M-2 (P/N 003608001)	Steering gearbox	—
	Niglube RX-2 (P/N 003606000 or 725191040)	Piston boot of disc brake and sliding pin	—
	Molykote No. 7439 (P/N 725191460)	Contacting surfaces of drum brake shoes and shoe clearance adjuster	—
	Molylex No.2 (P/N 723223010)	BJ of rear axle shaft	—
	VU-3A702 (P/N 23223GA050)	DOJ of rear axle shaft	—
	NTG2218 (P/N 28093AA000)	BJ of front axle shaft	—
	SSG-6003 (P/N 28093TA000)	SFJ of front axle shafts	—
	FX clutch grease (P/N 000040901)	Splines of transmission main shaft	—
	Slicolube G-30M (P/N 004404002)	Control cables and throttle linkages subject to cold weather, water-pump impeller, door latch, striker, battery terminals, etc.	—
	Slicolube G-40M (P/N 004404003)	Clutch master cylinder push rod end	—
	Molykote AS-880N (P/N 26298AC000)	Contacting surfaces of brake pad and shoe inner shim	—

E: COOLANT

CAUTION: Avoid using any coolant or only water other than this designated type to prevent corrosion. SUBARU's engine is aluminum alloy, and so special care is necessary. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

Coolant Specifications							
Lowest anticipated atmospheric temperature	SUBARU coolant-to-*water ratio (Volume) %	Specification gravity					Freezing point
		at 10°C (50°F)	at 20°C (68°F)	at 30°C (86°F)	at 40°C (104°F)	at 50°C (122°F)	
Above -30°C (-22°F)	50 — 50	1.084	1.079	1.074	1.068	1.062	-36°C (-33°F)
Above -15°C (5°F)	30 — 70	1.050	1.049	1.042	1.037	1.032	-16°C (3°F)

*: It is recommended that distilled water be used.

F: SEALANTS

	Recommended	Application	Equivalent
Sealant	Three Bond 1105 (P/N 004403010)	Rear differential oil drain plug, retainer bolts, etc.	Dow Corning's No. 7038
	Three Bond 1215 (P/N 004403007)	Matching surface of oil pump, oil pan, oil pressure switch, transmission case, etc. Flywheel and drive plate tightening bolts, etc.	Dow Corning's No. 7038
	Starcalking B-33A (P/N 000018901)	Sealing against water and dust entry through weatherstrips, grommets, etc.	Butyl Rubber Sealant
	Three Bond 1102 (P/N 004403006)	Steering gear box adjust screw	—
	Three Bond 1280B	Matching surface of SOHC engine cam cap	—

G: ADHESIVES

Adhesive	Cemedine 5430L	Weatherstrips and other rubber parts, plastics and textiles except soft vinyl parts.	3M's EC-1770 EC-1368
	Cemedine 540	Soft vinyl parts, and other parts subject to gasoline, grease or oil, e.g. trim leather, door inner remote cover, etc.	3M's EC-776 EC-847 EC-1022 (Spray Type)
	Cemedine 3000	Bonding metals, glass, plastic and rubber parts. Repairing slightly torn weatherstrips, etc.	Armstrong's Eastman 910
	Essex Chemical Crop's Urethane E	Windshield to body panel.	Sunstar 580

6. Replace Engine Coolant and Inspect Cooling System, Hoses and Connections

MAINTENANCE INTERVAL [Number of months or km (miles), whichever occurs first]																	
Months	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120
x 1,000 km	4.8	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192
x 1,000 miles	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120
					P				P				P				P

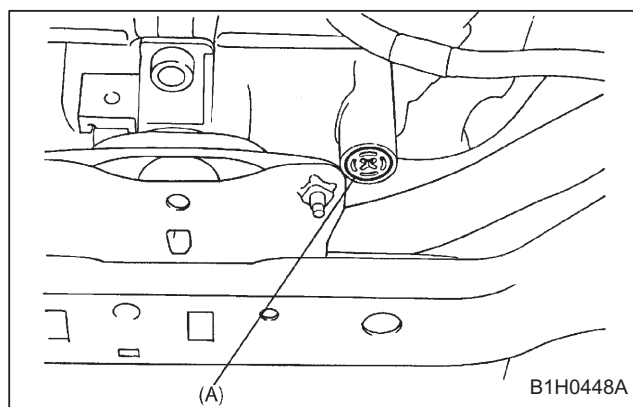
A: REPLACEMENT

1. REPLACEMENT OF COOLANT

WARNING:

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

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



- 5) For quick draining, open radiator cap.

CAUTION:

Be careful not to spill coolant on the floor.

- 6) Drain coolant from reservoir tank.
- 7) Tighten radiator drain screw securely after draining coolant.
- 8) Slowly pour prepared coolant from radiator filler port to neck of filler, then pour into reservoir tank up to "FULL" level.

Coolant capacity (fill up to "FULL" level)

MT model:

Approx. 6.8ℓ (7.2 US qt, 6.0 Imp qt)

AT model:

Approx. 6.7ℓ (7.1 US qt, 5.9 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing anti-freeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 9) Securely install radiator cap.
- 10) Run engine for more than five minutes at 2,000 to 3,000 rpm. (Run engine until radiator becomes hot in order to purge air trapped in cooling system.)
- 11) Stop engine and wait until coolant temperature lowers. Then open radiator cap to check coolant level and add coolant up to radiator filler neck. Next, add coolant into reservoir tank up to "FULL" level.
- 12) After adding coolant, securely install radiator and reservoir tank caps.

2. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE

The concentration and safe operating temperature of the SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

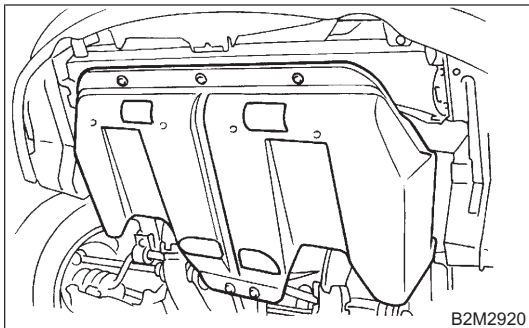
[Example]

If the coolant temperature is 25°C (77°F) and its specific gravity is 1.054, the concentration is 35% (point A), the safe operating temperature

9. Engine Coolant

A: DRAINING OF ENGINE COOLANT

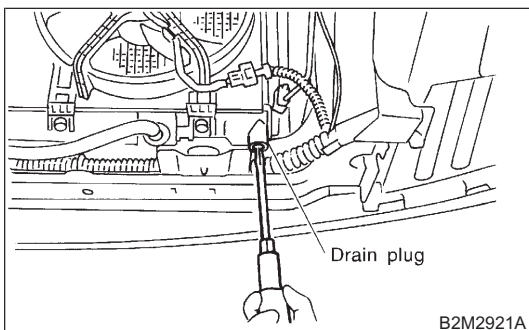
- 1) Lift-up the vehicle.
- 2) Remove under cover.



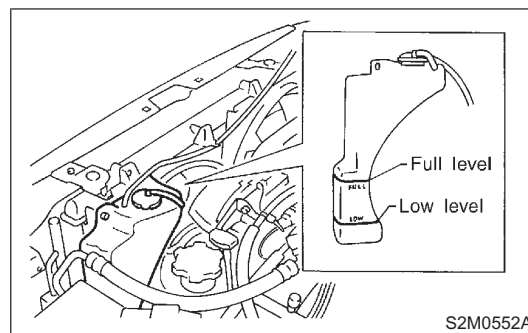
- 3) Remove drain cock to drain engine coolant into container.

NOTE:

Remove radiator cap so that engine coolant will drain faster.



- 2) Fill engine coolant into reservoir tank up to upper level.



- 3) Attach radiator cap and reservoir tank cap properly.
- 4) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 5) If engine coolant level drops in radiator, add engine coolant to filler neck position.
- 6) If engine coolant level drops from upper level of reservoir tank, add engine coolant to upper level.
- 7) Attach radiator cap and reservoir tank cap properly.

1. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE

The concentration and safe operating temperature of the SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

B: FILLING OF ENGINE COOLANT

- 1) Fill engine coolant into radiator up to filler neck position.

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

MT model;

Approx. 6.4ℓ (6.8 US qt, 5.6 Imp qt)

AT model;

Approx. 6.3ℓ (6.7 US qt, 5.5 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

C: LUBRICANTS

Lubricants	Specifications	Remarks
Engine oil	API Classification: SJ or SH with the words "Energy Conserving II" New API Certified CCMC Specification: G4 or G5 ACEA Specification: A1, A2 or A3	For SAE viscosity number, refer to the following table. If it is impossible to get SJ or SH grade, you may use SG grade.
Transmission and differential gear oil AWD rear differential gear oil	API Classification: GL-5	For SAE viscosity number, refer to the following table.
Automatic transmission	"DEXRON II, IIE" or "DEXRON III" type	—
Power steering fluid	"DEXRON II, IIE" or "DEXRON III" type	—
Coolant	Genuine SUBARU Coolant (Part No. 000016218) (Anti-freeze, anti-corrosive ethylene glycol base)	For further coolant specifications, refer to the following table.
Coolant Conditioner	Subaru Coolant Conditioner SOA635071	—
Brake fluid	DOT3 or DOT4	FMVSS NO. 116 Avoid mixing brake fluid of different brands to prevent the fluid performance from degrading. When brake fluid is added, be careful not to allow any dust into the reservoir.
Clutch fluid	DOT3 or DOT4	FMVSS NO. 116 Avoid mixing brake fluid of different brands to prevent the fluid performance from degrading. When clutch fluid is added, be careful not to allow any dust into the reservoir.

Lubricants	Recommended	Application	Equivalent
Spray lubricants	SUBARU CRC (P/N 004301003)	O ₂ sensor	—
Grease	SUNLIGHT 2 N: glube R (P/N 003602010)	Steering shaft bearing, bushing for manual transmission gear shift system	—
	Valiant grease M-2 (P/N 003608001)	Steering gearbox	—
	Niglube RX-2 (P/N 003606000 or 725191040)	Piston boot of disc brake and sliding pin	—
	Molykote No. 7439 (P/N 725191460)	Contacting surfaces of drum brake shoes and shoe clearance adjuster	—
	Molylex No.2 (P/N 723223010)	Rear BJ joints of axle shafts	—
	VU-3A702 (P/N 23223GA050)	Rear DOJ joints of axle shafts	—
	NTG2218 (CP/N 28093AA020)	BJ (for front axle) joints of axle shafts	—
	FX clutch grease (P/N 000040901)	Splines of transmission main shaft	—
	Slicolube G-30M (P/N 004404002)	Control cables and throttle linkages subject to cold weather, water-pump impeller, door latch, striker, battery terminals, etc.	—
	SSG-6003 (P/N 28093TA000)	SFJ joints of axle shafts	—
	Molykote AS-880N (P/N 26298AC000)	Contacting surfaces of brake pad and inner shim	—

6. Replace Engine Coolant and Inspect Cooling System, Hoses and Connections

MAINTENANCE INTERVAL [Number of months or km (miles), whichever occurs first]																	
Months	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120
x 1,000 km	4.8	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192
x 1,000 miles	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120
					P				P				P				P

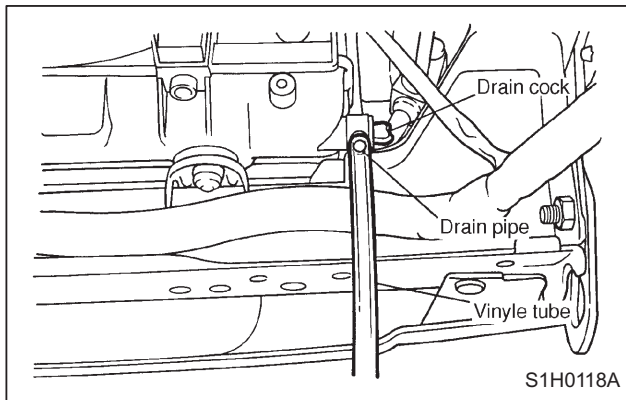
A: REPLACEMENT

1. REPLACEMENT OF COOLANT

WARNING:

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

- 1) Lift up the vehicle.
- 2) Remove undercover.
- 3) Fit vinyle tube to drain pipe.

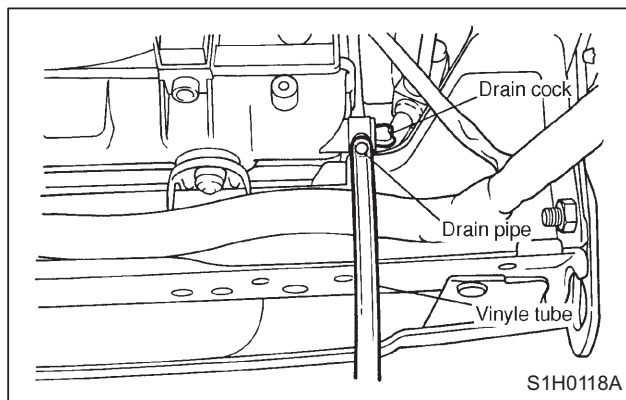


- 4) Place a container under vinyle tube.
- 5) Loosen drain cock to drain engine coolant into container.
- 6) For quick draining, open radiator cap.

CAUTION:

Be careful not to spill coolant on the floor.

- 7) Drain coolant from reservoir tank.
- 8) Tighten radiator drain plug securely after draining coolant. (Drain tube may face downward.)



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

Coolant capacity (fill up to "FULL" level)
Approx. 6.0 l (6.3 US qt, 5.3 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing anti-freeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 11) Securely install radiator cap and reservoir tank cap.
- 12) Run engine for more than five minutes at 2,000 to 3,000 rpm. (Run engine until radiator becomes hot in order to purge air trapped in cooling system.)
- 13) Stop engine and wait until coolant temperature lowers. Then open radiator cap to check coolant level and add coolant up to radiator fill-

E: COOLANT

CAUTION: Avoid using any coolant or only water other than this designated type to prevent corrosion. SUBARU's engine is aluminum alloy, and so special care is necessary. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

Coolant Specifications							
Lowest anticipated atmospheric temperature	SUBARU coolant-to-water ratio (Volume) %	Specification gravity					Freezing point
		at 10 C (50 F)	at 20 C (68 F)	at 30 C (86 F)	at 40 C (104 F)	at 50 C (122 F)	
Above -30 C (-22 F)	50 — 50	1.084	1.079	1.074	1.068	1.062	-36 C (-33 F)
Above -15 C (5 F)	30 — 70	1.053	1.049	1.044	1.039	1.034	-16 C (3 F)

*: It is recommended that distilled water be used.

F: SEALANTS

	Recommended	Application	Equivalent
Sealant	Three Bond 1105 (P/N 004403010)	Rear differential oil drain plug, bearing cap (#5), etc.	Dow Corning's No. 7038
	Three Bond 1215 (P/N 004403007)	Matching surface of oil pump, transmission case, etc. Flywheel and drive plate tightening bolts, etc.	Dow Corning's No. 7038
	Starcalking B-33A (P/N 000018901)	Sealing against water and dust entry through weatherstrips, grommets, etc.	Butyl Rubber Sealant
	Three Bond 1217B	Matching surface of transmission oil pan	—
	Three Bond 1102 (P/N 004403006)	Steering gear box adjust screw	—
	Three Bond 1280B	Matching surface of engine cam cap	—

G: ADHESIVES

Adhesive	Cemedine 5430L	Weatherstrips and other rubber parts, plastics and textiles except soft vinyl parts.	3M's EC-1770 EC-1368
	Cemedine 540	Soft vinyl parts, and other parts subject to gasoline, grease or oil, e.g. trim leather, door inner remote cover, etc.	3M's EC-776 EC-847 EC-1022 (Spray Type)
	Cemedine 3000	Bonding metals, glass, plastic and rubber parts. Repairing slightly torn weatherstrips, etc.	Armstrong's Eastman 910
	Essex Chemical Crop's Urethane E	Windshield to body panel.	Sunstar 580

B: FILLING OF ENGINE COOLANT

- 1) Fill engine coolant into radiator up to filler neck position.

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

MT model;

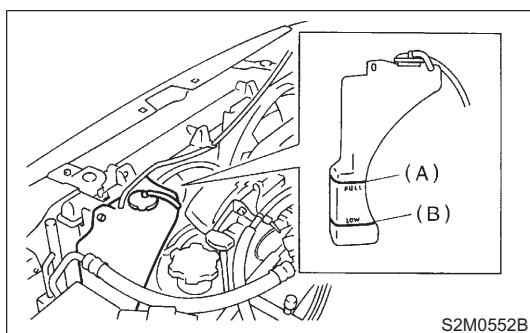
Approx. 6.0ℓ (6.3 US qt, 5.3 Imp qt)

AT model;

Approx. 6.2ℓ (6.6 US qt, 5.5 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into reservoir tank up to full level.



- (A) Full level
(B) Low level

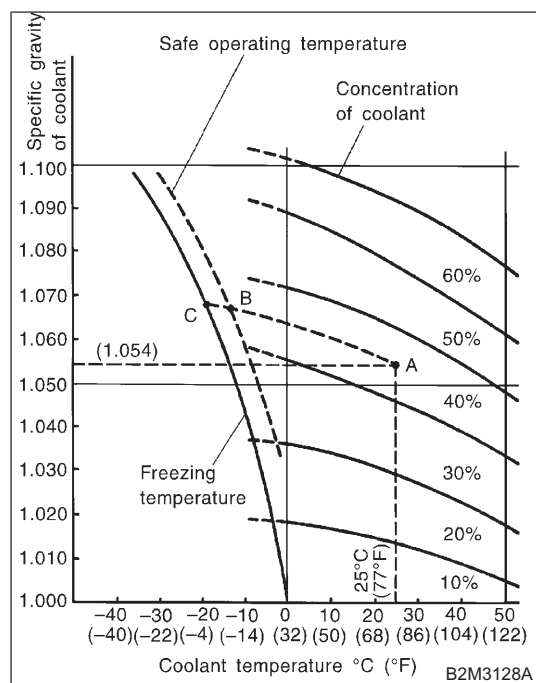
- 3) Attach radiator cap and reservoir tank cap properly.
- 4) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 5) If engine coolant level drops in radiator, add engine coolant to filler neck position.
- 6) If engine coolant level drops from upper level of reservoir tank, add engine coolant to upper level.
- 7) Attach radiator cap and reservoir tank cap properly.

1. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE

The concentration and safe operating temperature of the SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

[Example]

If the coolant temperature is 25°C (77°F) and its specific gravity is 1.054, the concentration is 35% (point A), the safe operating temperature is -14°C (7°F) (point B), and the freezing temperature is -20°C (-4°F) (point C).



2. Engine Coolant S106060

A: REPLACEMENT S106060A20

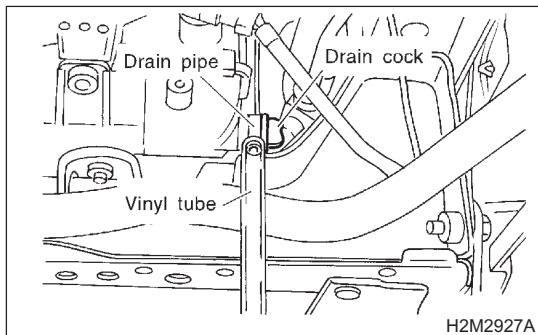
1. DRAINING OF ENGINE COOLANT

S106060A2001

WARNING:

The radiator is pressurized. Wait until engine cools down before working on the radiator.

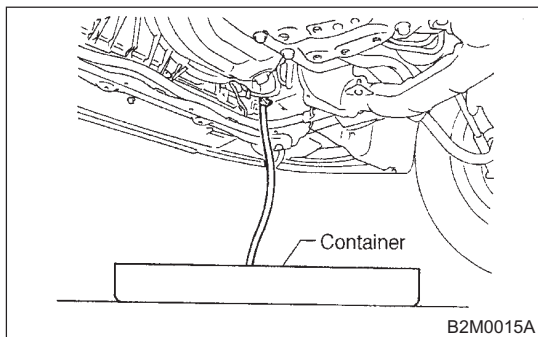
- 1) Lift-up the vehicle.
- 2) Remove under cover.
- 3) Fit vinyl tube to drain pipe.



- 4) Loosen drain cock to drain engine coolant into container.

NOTE:

Remove radiator cap so that engine coolant will drain faster.



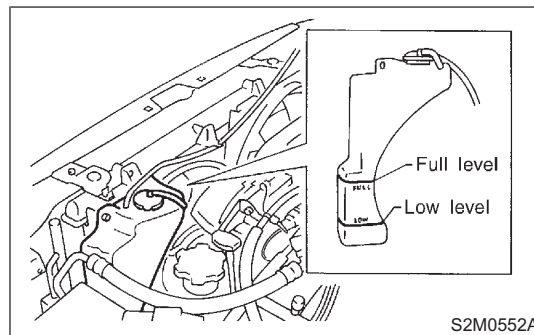
2. FILLING OF ENGINE COOLANT S106060A2002

- 1) Fill engine coolant into radiator up to filler neck position.

Coolant capacity (fill up to "FULL" level):
Approx. 6.2 (6.6 US qt, 5.5 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into reservoir tank up to upper level.



- 3) Attach radiator cap and reservoir tank cap properly.
- 4) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 5) If engine coolant level drops in radiator, add engine coolant to filler neck position.
- 6) If engine coolant level drops from upper level of reservoir tank, add engine coolant to upper level.
- 7) Attach radiator cap and reservoir tank cap properly.

13. Coolant SA07689

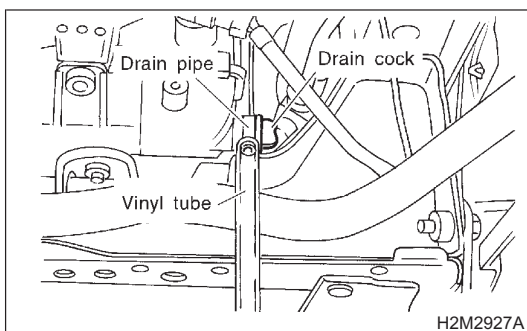
A: REPLACEMENT SA07689A20

1. REPLACEMENT OF COOLANT SA07689A2001

WARNING:

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

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



- 6) For quick draining, open radiator cap.

CAUTION:

Be careful not to spill coolant on the floor.

- 7) Drain coolant from reservoir tank.
- 8) Tighten radiator drain cock securely after draining coolant.
- 9) Slowly pour prepared coolant from radiator filler port to neck of filler, then pour into reservoir tank up to "FULL" level.

Coolant capacity (fill up to "FULL" level)
Approx. 6.2ℓ (6.6 US qt, 5.5 Imp qt)

NOTE: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 10) Securely install radiator cap.

- 11) Run engine for more than five minutes at 2,000 to 3,000 rpm. (Run engine until radiator becomes hot in order to purge air trapped in cooling system.)

- 12) Stop engine and wait until coolant temperature lowers. Then open radiator cap to check coolant level and add coolant up to radiator filler neck. Next, add coolant into reservoir tank up to "FULL" level.

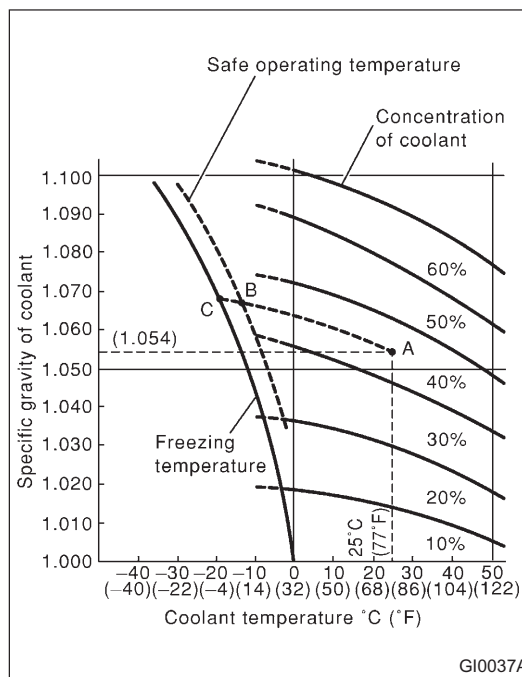
- 13) After adding coolant, securely install radiator and reservoir tank caps.

2. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE SA07689A2002

The concentration and safe operating temperature of the SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

[Example]

If the coolant temperature is 25°C (77°F) and its specific gravity is 1.054, the concentration is 35% (point A), the safe operating temperature is -14°C (7°F) (point B), and the freezing temperature is -20°C (-4°F) (point C).



RECOMMENDED MATERIALS

Recommended Materials

SAE viscosity	SAE viscosity No. and applicable temperature SAE J300								
Manual transmission oil	(°C)	-30	-20	-10	0	10	20	30	40
	(°F)	-22	-4	14	32	50	68	86	104
	90								
	85W								
Rear differential	80W								
	75W-90								
Front differential	GI0004A								
	(°C)	-30	-20	-10	0	10	20	30	40
	(°F)	-22	-4	14	32	50	68	86	104
	90								
	85W								
	80W								
	80W-90								
GI0005A									

4. FLUID SA05678G2204

Use the fluids specified in the table below. Do not mix two different kinds or makes of fluid.

Fluid	Recommended	Alternative	Remarks
Automatic transmission fluid	DEXRON III	—	—
Power steering fluid	DEXRON III	—	—
Brake fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—
Clutch fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—

5. COOLANT SA05678G2205

Use genuine coolant to protect the engine. The table below shows the ratio of coolant to distilled water.

Coolant	Recommended	Item number	Alternative
Coolant	SUBARU coolant	000016218	None
Water for dilution	Distilled water	—	Tap water
Coolant Conditioner	Subaru Coolant Conditioner	SOA635071	None

6. REFRIGERANT SA05678G2206

Standard air conditioners on Subaru vehicles use HFC134a refrigerant. Do not mix it with other refrigerants. Also, do not use any air compressor oil except for ZXL200PG.

Air conditioner	Recommended	Item number	Alternative
Refrigerant	HFC134a	—	None
Compressor oil	ZXL200PG	—	None

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2. Engine Coolant

S106060

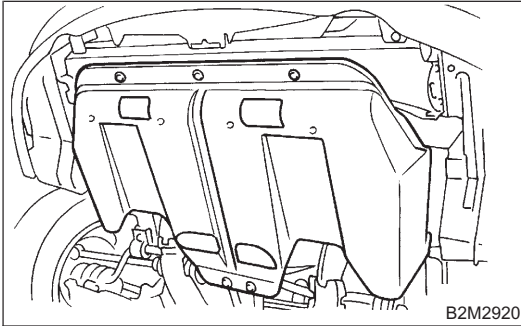
A: REPLACEMENT

S106060A20

1. DRAINING OF ENGINE COOLANT

S106060A2001

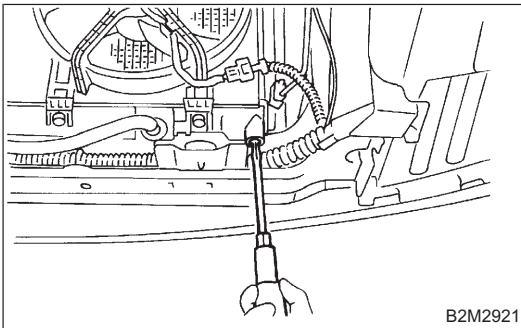
- 1) Lift-up the vehicle.
- 2) Remove under cover.



- 3) Remove drain cock to drain engine coolant into container.

NOTE:

Remove radiator cap so that engine coolant will drain faster.



2. FILLING OF ENGINE COOLANT

S106060A2002

- 1) Fill engine coolant into radiator up to filler neck position.

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

MT model;

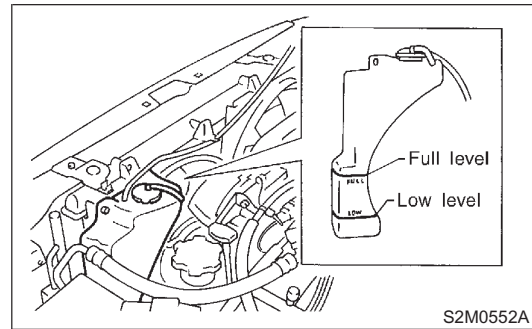
Approx. 6.4 ℓ (6.8 US qt, 5.6 Imp qt)

AT model;

Approx. 6.3 ℓ (6.7 US qt, 5.5 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into reservoir tank up to upper level.



- 3) Attach radiator cap and reservoir tank cap properly.
- 4) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 5) If engine coolant level drops in radiator, add engine coolant to filler neck position.
- 6) If engine coolant level drops from upper level of reservoir tank, add engine coolant to upper level.
- 7) Attach radiator cap and reservoir tank cap properly.

B: INSPECTION

S106060A10

1. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE

S106060A1001

The concentration and safe operating temperature of the SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

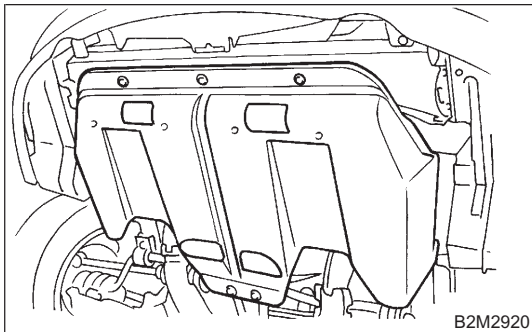
4. Engine Coolant S146060

A: REPLACEMENT S146060A20

1. DRAINING OF ENGINE COOLANT

S146060A2001

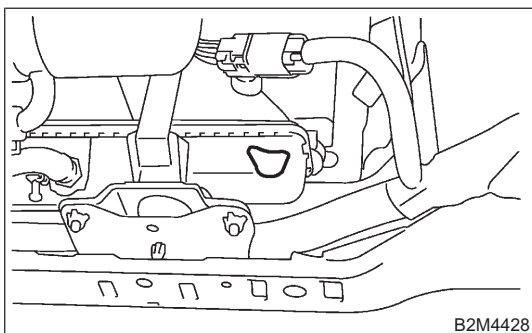
- 1) Lift-up the vehicle.
- 2) Remove under cover.



- 3) Remove drain cock to drain engine coolant into container.

NOTE:

Remove radiator cap so that engine coolant will drain faster.



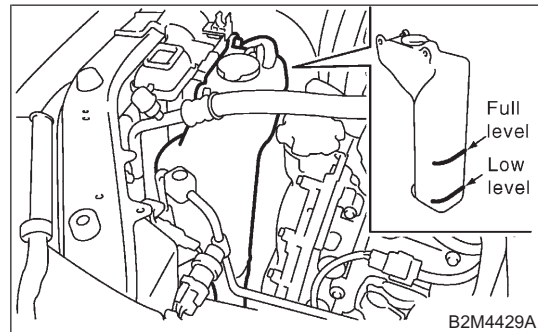
2. FILLING OF ENGINE COOLANT S146060A2002

- 1) Fill engine coolant into radiator up to filler neck position.

Coolant capacity (fill up to "FULL" level):
Approx. 7.7ℓ (8-1/8 US qt, 6-3/4 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into reservoir tank up to upper level.



- 3) Attach radiator cap and reservoir tank cap properly.
- 4) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 5) If engine coolant level drops in radiator, add engine coolant to filler neck position.
- 6) If engine coolant level drops from upper level of reservoir tank, add engine coolant to upper level.
- 7) Attach radiator cap and reservoir tank cap properly.

B: INSPECTION S146060A10

1. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE S146060A1001

The concentration and safe operating temperature of the SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

13. Coolant SA07689

A: REPLACEMENT SA07689A20

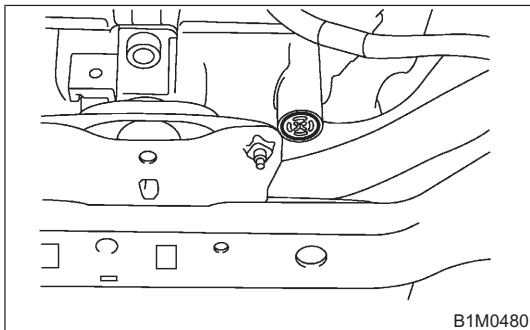
1. REPLACEMENT OF COOLANT SA07689A2001

WARNING:

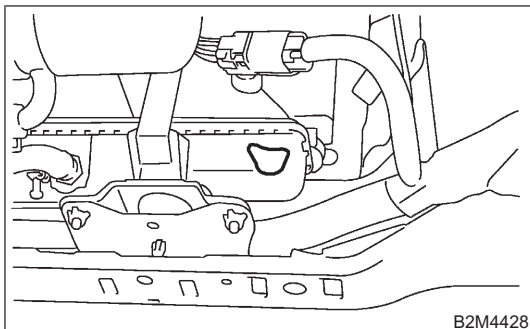
The radiator is of the pressurized type. Do not attempt to open the radiator cap immediately after the engine has been stopped.

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

2.5 L model



3.0 L model



- 5) For quick draining, open radiator cap.

CAUTION:

Be careful not to spill coolant on the floor.

- 6) Drain coolant from reservoir tank.
- 7) Tighten radiator drain screw securely after draining coolant.

- 8) Slowly pour prepared coolant from radiator filler port to neck of filler, then pour into reservoir tank up to "FULL" level.

Coolant capacity (fill up to "FULL" level)

2.5 L model

MT model:

Approx. 6.8ℓ (7.2 US qt, 6.0 Imp qt)

AT model:

Approx. 6.7ℓ (7.1 US qt, 5.9 Imp qt)

3.0 L model

Approx. 7.7ℓ (8.1 US qt, 6.8 Imp qt)

NOTE: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 9) Securely install radiator cap.
- 10) Run engine for more than five minutes at 2,000 to 3,000 rpm. (Run engine until radiator becomes hot in order to purge air trapped in cooling system.)
- 11) Stop engine and wait until coolant temperature lowers. Then open radiator cap to check coolant level and add coolant up to radiator filler neck. Next, add coolant into reservoir tank up to "FULL" level.
- 12) After adding coolant, securely install radiator and reservoir tank caps.

RECOMMENDED MATERIALS

Recommended Materials

SAE viscosity	SAE viscosity No. and applicable temperature SAE J300								
Manual transmission oil	(°C)	-30	-20	-10	0	10	20	30	40
	(°F)	-22	-4	14	32	50	68	86	104
Rear differential	90								
	85W								
	80W								
	75W-90								
Front differential	(°C)	-30	-20	-10	0	10	20	30	40
	(°F)	-22	-4	14	32	50	68	86	104
	90								
	85W								
	80W								
	80W-90								

GI0004A

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GI0004A

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4. FLUID SA05678G2204

Use the fluids specified in the table below. Do not mix two different kinds or makes of fluid.

Fluid	Recommended	Alternative	Remarks
Automatic transmission fluid	DEXRON III	—	—
Power steering fluid	DEXRON III	—	—
Brake fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—
Clutch fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—

5. COOLANT SA05678G2205

Use genuine coolant to protect the engine. The table below shows the ratio of coolant to distilled water.

Coolant	Recommended	Item number	Alternative
Coolant	SUBARU coolant	000016218	None
Water for dilution	Distilled water	—	Tap water
Coolant Conditioner	Subaru Coolant Conditioner	SOA635071	None

6. REFRIGERANT SA05678G2206

Standard air conditioners on Subaru vehicles use HFC134a refrigerant. Do not mix it with other refrigerants. Also, do not use any air compressor oil except for ZXL200PG.

Air conditioner	Recommended	Item number	Alternative
Refrigerant	HFC134a	—	None
Compressor oil	ZXL200PG	—	None

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replacement page for MSA5T0109A

COOLANT

Periodic Maintenance Services

13. Coolant SA07689

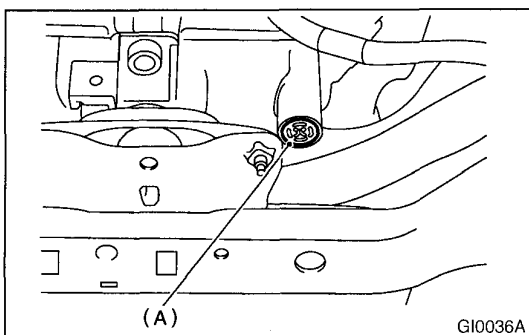
A: REPLACEMENT SA07689A20

1. REPLACEMENT OF COOLANT SA07689A2001

WARNING:

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

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



- 5) For quick draining, open radiator cap.

CAUTION:

Be careful not to spill coolant on the floor.

- 6) Drain coolant from reservoir tank.
- 7) Tighten radiator drain screw securely after draining coolant.
- 8) Slowly pour prepared coolant from radiator filler port to neck of filler, then pour into reservoir tank up to "FULL" level.

Coolant capacity (fill up to "FULL" level)

MT model:

Approx. 6.8 ℓ (7.2 US qt, 6.0 Imp qt)

AT model:

Approx. 6.7 ℓ (7.1 US qt, 5.9 Imp qt)

NOTE: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 9) Securely install radiator cap.

10) Run engine for more than five minutes at 2,000 to 3,000 rpm. (Run engine until radiator becomes hot in order to purge air trapped in cooling system.)

11) Stop engine and wait until coolant temperature lowers. Then open radiator cap to check coolant level and add coolant up to radiator filler neck. Next, add coolant into reservoir tank up to "FULL" level.

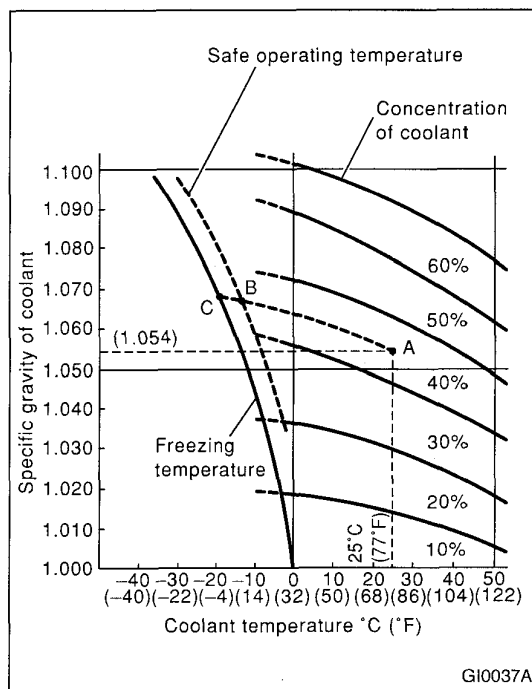
- 12) After adding coolant, securely install radiator and reservoir tank caps.

2. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE SA07689A2002

The concentration and safe operating temperature of the SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

[Example]

If the coolant temperature is 25°C (77°F) and its specific gravity is 1.054, the concentration is 35% (point A), the safe operating temperature is -14°C (7°F) (point B), and the freezing temperature is -20°C (-4°F) (point C).



RECOMMENDED MATERIALS

Recommended Materials

SAE viscosity	SAE viscosity No. and applicable temperature SAE J300									
Manual transmission oil	(°C)	-30	-20	-10	0	10	20	30	40	
	(°F)	-22	-4	14	32	50	68	86	104	
					90					
					85W					
Rear differential					80W					
					75W-90					
Front differential	(°C)	-30	-20	-10	0	10	20	30	40	
	(°F)	-22	-4	14	32	50	68	86	104	
					90					
					85W					
					80W					
					80W-90					

GI0004A

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GI0004A

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4. FLUID SA05678G2204

Use the fluids specified in the table below. Do not mix two different kinds or makes of fluid.

Fluid	Recommended	Alternative	Remarks
Automatic transmission fluid	DEXRON III	—	
Power steering fluid	DEXRON III	—	
Brake fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	
Clutch fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	

5. COOLANT SA05678G2205

Use genuine coolant to protect the engine. The table below shows the ratio of coolant to distilled water.

Coolant	Recommended	Item number	Alternative
Coolant	SUBARU coolant	000016218	None
Water for dilution	Distilled water	—	Tap water
Coolant Conditioner	Subaru Coolant Conditioner	SOA635071	None

6. REFRIGERANT SA05678G2206

Standard air conditioners on Subaru vehicles use HFC134a refrigerant. Do not mix it with other refrigerants. Also, do not use any air compressor oil except for ZXL200PG.

Air conditioner	Recommended	Item number	Alternative
Refrigerant	HFC134a	—	None
Compressor oil	ZXL200PG	—	None

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4. Engine Coolant

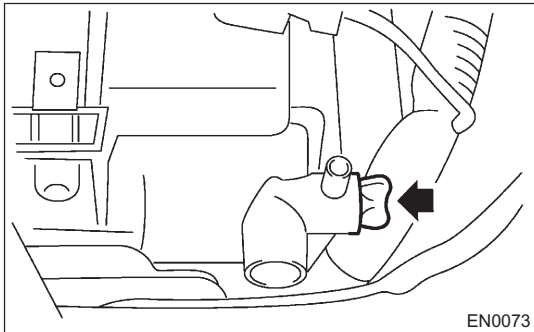
A: REPLACEMENT

1. DRAINING OF ENGINE COOLANT

- 1) Lift-up the vehicle.
- 2) Remove under cover.
- 3) Remove drain cock to drain engine coolant into container.

NOTE:

Remove radiator cap so that engine coolant will drain faster.



2. FILLING OF ENGINE COOLANT

- 1) Fill engine coolant into radiator up to filler neck position.

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

AT model

Approx. 6.4ℓ (6.8 US qt, 5.6 Imp qt)

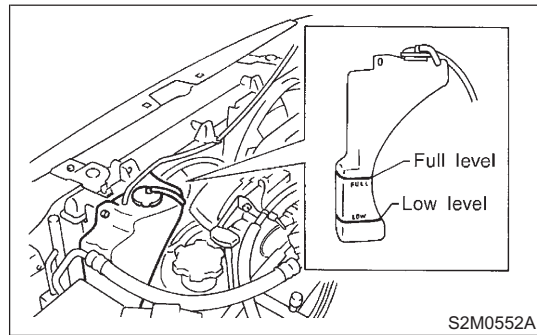
MT model

Approx. 6.3ℓ (6.7 US qt, 5.5 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.

NOTE: To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into reservoir tank up to upper level.



- 3) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 4) If engine coolant level drops in radiator, add engine coolant to filler neck position.
- 5) If engine coolant level drops from upper level of reservoir tank, add engine coolant to upper level.
- 6) Attach radiator cap and reservoir tank cap properly.

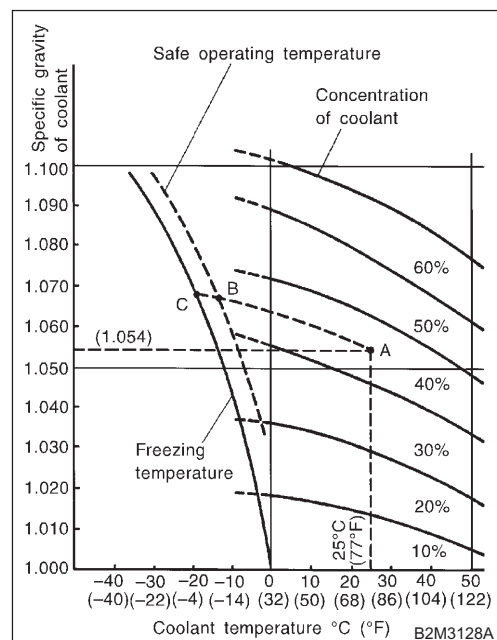
B: INSPECTION

1. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE

The concentration and safe operating temperature of the SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

[Example]

If the coolant temperature is 25°C (77°F) and its specific gravity is 1.054, the concentration is 35% (point A), the safe operating temperature is -14°C (7°F) (point B), and the freezing temperature is -20°C (-4°F) (point C).



2. PROCEDURE TO ADJUST THE CONCENTRATION OF THE COOLANT

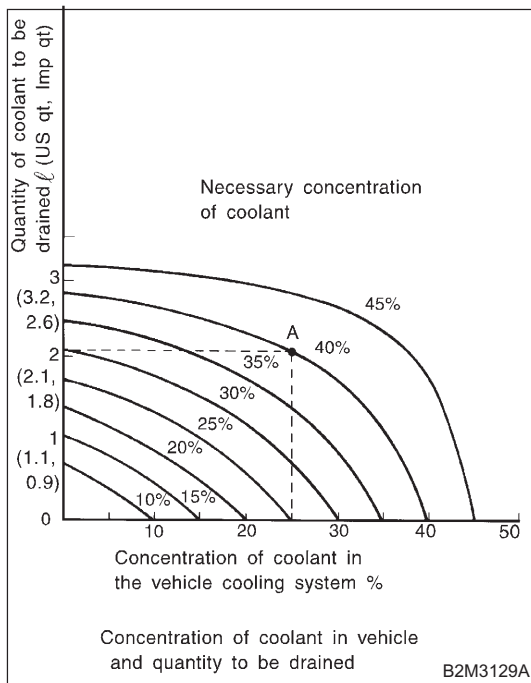
To adjust the concentration of the coolant according to temperature, find the proper fluid concentration in the above diagram and replace the necessary amount of coolant with an undiluted solution of SUBARU genuine coolant (concentration 50%).

The amount of coolant that should be replaced can be determined using the diagram.

[Example]

Assume that the coolant concentration must be increased from 25% to 40%. Find point A, where the 25% line of coolant concentration intersects with the 40% curve of the necessary coolant concentration, and read the scale on the vertical axis of the graph at height A. The quantity of coolant to be drained is 2.1 liters (2.2 US qt, 1.8 Imp qt). Drain 2.1 liters (2.2 US qt, 1.8 Imp qt) of coolant from the cooling system and add 2.1 liters (2.2 US qt, 1.8 Imp qt) of the undiluted solution of SUBARU coolant.

If a coolant concentration of 50% is needed, drain all the coolant and refill with the undiluted solution only.



12. Coolant

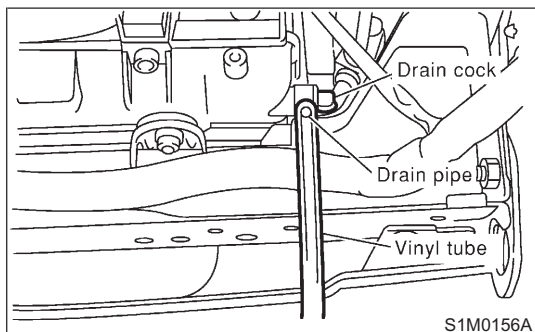
A: REPLACEMENT

1. REPLACEMENT OF COOLANT

WARNING:

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

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



- 6) For quick draining, open radiator cap.

CAUTION: Be careful not to spill coolant on the floor.

- 7) Drain coolant from reservoir tank.
- 8) Tighten radiator drain screw securely after draining coolant.
- 9) Install reservoir tank to original position.
- 10) Slowly pour prepared coolant from radiator filler port to neck of filler, then pour into reservoir tank up to "FULL" level.

Coolant capacity (fill up to "FULL" level)

Approx. 6.0ℓ (6.3 US qt, 5.3 Imp qt)

NOTE: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.

NOTE: To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

- 11) Securely install radiator cap.

- 12) Run engine for more than five minutes at 2,000 to 3,000 rpm. (Run engine until radiator becomes hot in order to purge air trapped in cooling system.)

- 13) Stop engine and wait until coolant temperature lowers. Then open radiator cap to check coolant level and add coolant up to radiator filler neck. Next, add coolant into reservoir tank up to "FULL" level.

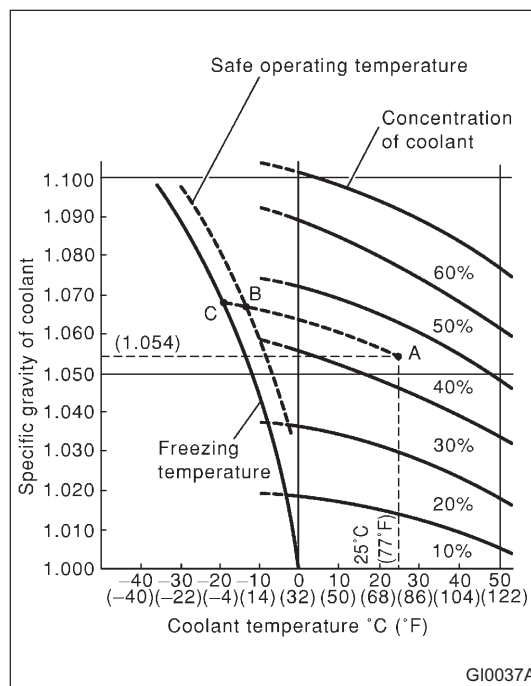
- 14) After adding coolant, securely install radiator and reservoir tank caps.

2. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE

The concentration and safe operating temperature of the SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

[Example]

If the coolant temperature is 25°C (77°F) and its specific gravity is 1.054, the concentration is 35% (point A), the safe operating temperature is -14°C (7°F) (point B), and the freezing temperature is -20°C (-4°F) (point C).



RECOMMENDED MATERIALS

4. FLUID

Fluid	Recommended	Alternative	Remarks
Automatic transmission fluid	DEXRON III	—	—
Power steering fluid	DEXRON III	—	—
Brake fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—
Clutch fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—

Coolant	Recommended	Item number	Alternative
Coolant	SUBARU coolant	000016218	None
Water for dilution	Distilled water	—	Tap water (Soft water)
Coolant Conditioner	Subaru Coolant Conditioner	SOA635071	None

Air conditioner	Recommended	Item number	Alternative
Refrigerant	HFC134a	—	None
Compressor oil	ZXL200PG	—	None

Grease	Application point	Recommended	Item number	Alternative
Supplementary lubricants	O ₂ sensor Bolts, etc.	SUBARU CRC	004301003	—

4. Engine Coolant

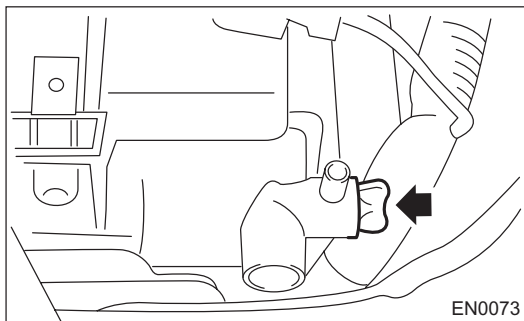
A: REPLACEMENT

1. DRAINING OF ENGINE COOLANT

- 1) Lift-up the vehicle.
- 2) Remove the under cover.
- 3) Remove the drain cock to drain engine coolant into container.

NOTE:

Remove the radiator cap so that engine coolant will drain faster.



2. FILLING OF ENGINE COOLANT

- 1) Fill engine coolant into radiator up to the filler neck position.

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

Non-turbo AT model

Approx. 6.9 ℓ (7.29 US qt, 6.07 Imp qt)

Non-turbo MT model

Approx. 7 ℓ (7.4 US qt, 6.2 Imp qt)

Turbo AT model

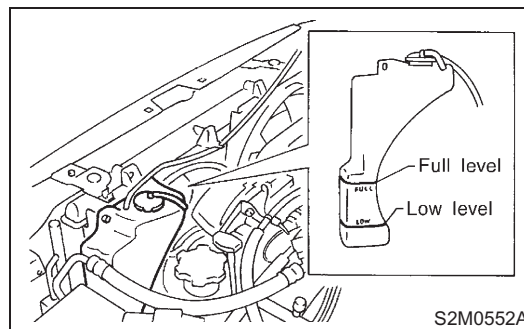
Approx. 7.6 ℓ (8.03 US qt, 6.69 Imp qt)

Turbo MT model

Approx. 7.7 ℓ (8.14 US qt, 6.78 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into reservoir tank up to the upper level.



- 3) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 4) If the engine coolant level drops in radiator, add the engine coolant to filler neck position.
- 5) If the engine coolant level drops from upper level of reservoir tank, add the engine coolant to the upper level.
- 6) Attach the radiator cap and reservoir tank cap properly.

12. Coolant

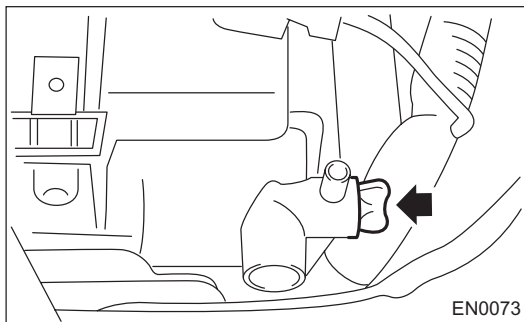
A: REPLACEMENT

1. REPLACEMENT OF COOLANT

WARNING:

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

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



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

CAUTION:

Be careful not to spill coolant on the floor.

- 6) Drain the coolant from reservoir tank.
- 7) Tighten the radiator drain screw securely after draining coolant.
- 8) Slowly pour the prepared coolant from radiator filler port to neck of filler, then pour into the reservoir tank up to the "FULL" level.

Coolant capacity (fill up to "FULL" level)

Non-turbo AT model:

Approx. 6.9 ℓ (7.3 US qt, 6.1 Imp qt)

Non-turbo MT model:

Approx. 7.0 ℓ (7.4 US qt, 6.2 Imp qt)

Turbo AT model:

Approx. 7.6 ℓ (8.0 US qt, 6.7 Imp qt)

Turbo MT model:

Approx. 7.7 ℓ (8.1 US qt, 6.8 Imp qt)

NOTE: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 9) Securely install the radiator cap.

- 10) Run engine for more than five minutes at 2,000 to 3,000 rpm. (Run engine until radiator becomes hot in order to purge air trapped in cooling system.)

- 11) Stop the engine and wait until coolant temperature lowers. Then open the radiator cap to check coolant level and add coolant up to radiator filler neck. Next, add coolant into reservoir tank up to "Full" level.

- 12) After adding coolant, securely install radiator and reservoir tank caps.

RECOMMENDED MATERIALS

RECOMMENDED MATERIALS

SAE viscosity	SAE viscosity No. and applicable temperature SAE J300																																																																	
Manual Transmission Oil	<table><tr><td>(°C)</td><td>-30</td><td>-20</td><td>-10</td><td>0</td><td>10</td><td>20</td><td>30</td><td>40</td></tr><tr><td>(°F)</td><td>-22</td><td>-4</td><td>14</td><td>32</td><td>50</td><td>68</td><td>86</td><td>104</td></tr><tr><td></td><td></td><td></td><td></td><td colspan="5">90</td><td></td></tr><tr><td></td><td colspan="8">85W</td><td></td></tr><tr><td></td><td colspan="6">80W</td><td></td><td></td><td></td></tr><tr><td></td><td colspan="8">75W-90</td><td></td></tr></table>								(°C)	-30	-20	-10	0	10	20	30	40	(°F)	-22	-4	14	32	50	68	86	104					90							85W										80W										75W-90								
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GI0004A

GI0005A

4. FLUID

Use the fluids specified in the table below. Do not mix two different kinds or makes of fluid.

Fluid	Recommended	Alternative	Remarks
Automatic transmission fluid	DEXRON III	—	—
Power steering fluid	DEXRON III	—	—
Brake fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—
Clutch fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—

5. COOLANT

Use the genuine coolant to protect the engine. The table below shows the ratio of coolant to distilled water.

Coolant	Recommended	Item number	Alternative
Coolant	SUBARU coolant	000016218	None
Water for dilution	Distilled water	—	Tap water
Coolant Conditioner	Subaru Coolant Conditioner	SOA635071	None

6. REFRIGERANT

Standard air conditioners on Subaru vehicles use HFC134a refrigerant. Do not mix it with other refrigerants. Also, do not use any air compressor oil except for DH-PR.

Air conditioner	Recommended	Item number	Alternative
Refrigerant	HFC134a	—	None
Compressor oil	DH-PR	—	None

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replacement page for MSA5T0210A

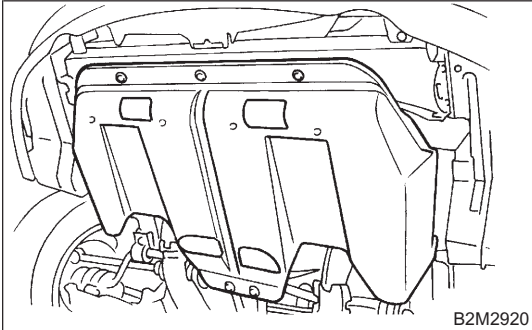
4. Engine Coolant S146060

A: REPLACEMENT S146060A20

1. DRAINING OF ENGINE COOLANT

S146060A2001

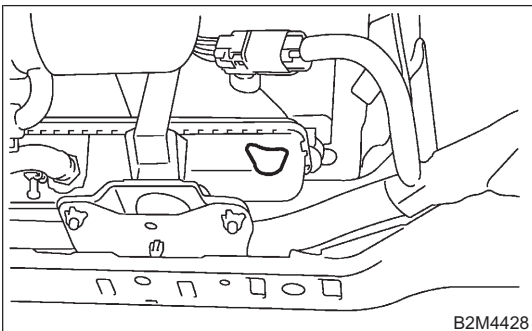
- 1) Lift-up the vehicle.
- 2) Remove under cover.



- 3) Remove drain cock to drain engine coolant into container.

NOTE:

Remove radiator cap so that engine coolant will drain faster.



2. FILLING OF ENGINE COOLANT S146060A2002

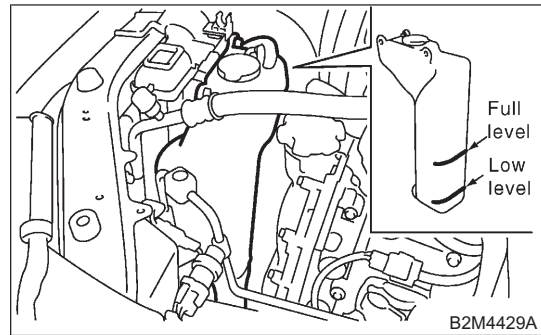
- 1) Fill engine coolant into radiator up to filler neck position.

Engine oil amount for refill:

Approx. 7.9ℓ (8.4 US qt, 7.0 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into reservoir tank up to upper level.



- 3) Attach radiator cap and reservoir tank cap properly.
- 4) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 5) If engine coolant level drops in radiator, add engine coolant to filler neck position.
- 6) If engine coolant level drops from upper level of reservoir tank, add engine coolant to upper level.
- 7) Attach radiator cap and reservoir tank cap properly.

B: INSPECTION S146060A10

1. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE S146060A1001

The concentration and safe operating temperature of the SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

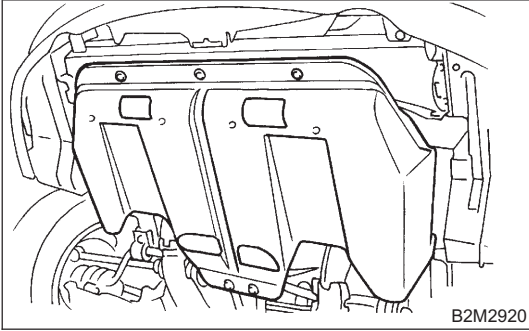
4. Engine Coolant S176060

A: REPLACEMENT S176060A20

1. DRAINING OF ENGINE COOLANT

S176060A2001

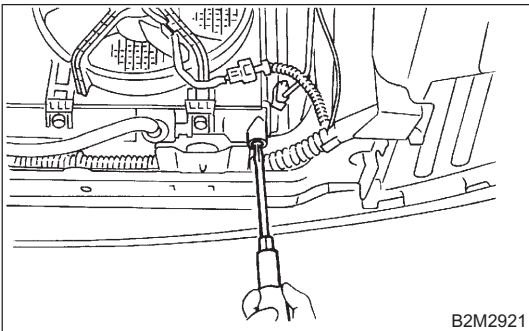
- 1) Lift-up the vehicle.
- 2) Remove under cover.



- 3) Remove drain cock to drain engine coolant into container.

NOTE:

Remove radiator cap so that engine coolant will drain faster.



2. FILLING OF ENGINE COOLANT S176060A2002

- 1) Fill engine coolant into radiator up to filler neck position.

Engine oil amount for refill:

MT model;

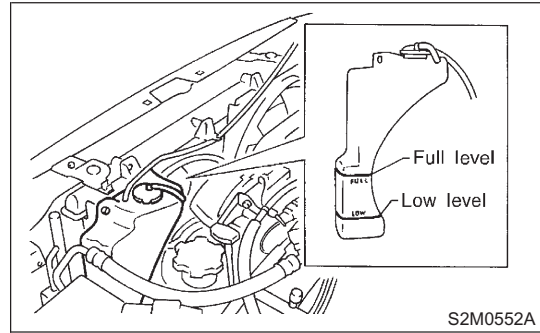
Approx. 6.8 ℓ (7.2 US qt, 6.0 Imp qt)

AT model;

Approx. 6.7 ℓ (7.1 US qt, 5.9 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into reservoir tank up to upper level.



- 3) Attach radiator cap and reservoir tank cap properly.
- 4) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 5) If engine coolant level drops in radiator, add engine coolant to filler neck position.
- 6) If engine coolant level drops from upper level of reservoir tank, add engine coolant to upper level.
- 7) Attach radiator cap and reservoir tank cap properly.

B: INSPECTION S176060A10

1. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE S176060A1001

The concentration and safe operating temperature of the SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

12. Coolant SA07689

A: REPLACEMENT SA07689A20

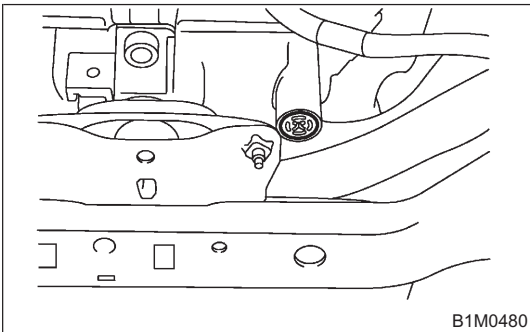
1. REPLACEMENT OF COOLANT SA07689A2001

WARNING:

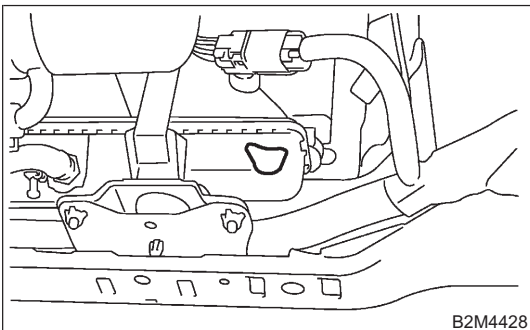
The radiator is of the pressurized type. Do not attempt to open the radiator cap immediately after the engine has been stopped.

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

2.5 L model



3.0 L model



- 5) For quick draining, open radiator cap.

CAUTION:

Be careful not to spill coolant on the floor.

- 6) Drain coolant from reservoir tank.
- 7) Tighten radiator drain screw securely after draining coolant.

- 8) Slowly pour prepared coolant from radiator filler port to neck of filler, then pour into reservoir tank up to "FULL" level.

Coolant amount for preparation

2.5 L model

MT model:

Approx. 6.8ℓ (7.2 US qt, 6.0 Imp qt)

AT model:

Approx. 6.7ℓ (7.1 US qt, 5.9 Imp qt)

3.0 L model

Approx. 7.9ℓ (8.4 US qt, 7.0 Imp qt)

NOTE: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion. To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (Part No. SOA635071) whenever the coolant is replaced.

- 9) Securely install radiator cap.
- 10) Run engine for more than five minutes at 2,000 to 3,000 rpm. (Run engine until radiator becomes hot in order to purge air trapped in cooling system.)
- 11) Stop engine and wait until coolant temperature lowers. Then open radiator cap to check coolant level and add coolant up to radiator filler neck. Next, add coolant into reservoir tank up to "FULL" level.
- 12) After adding coolant, securely install radiator and reservoir tank caps.

RECOMMENDED MATERIALS

Recommended Materials

4. FLUID SA05678G2204

Use the fluids specified in the table below. Do not mix two different kinds or makes of fluid.

Fluid	Recommended	Alternative	Remarks
Automatic transmission fluid	DEXRON III	—	—
Power steering fluid	DEXRON III	—	—
Brake fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—
Clutch fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—

5. COOLANT SA05678G2205

Use genuine coolant to protect the engine.

Coolant	Recommended	Item number	Alternative
Coolant	SUBARU coolant	000016218	None
Water for dilution	Distilled water	—	Tap water
Coolant Conditioner	Subaru Coolant Conditioner	SOA635071	None

6. REFRIGERANT SA05678G2206

Standard air conditioners on Subaru vehicles use HFC134a refrigerant. Do not mix it with other refrigerants. Also, do not use any air compressor oil except for ZXL200PG.

Air conditioner	Recommended	Item number	Alternative
Refrigerant	HFC134a	—	None
Compressor oil	ZXL200PG	—	None

7. GREASE SA05678G2207

Use the grease and supplementary lubricants shown in the table below.

Grease	Application point	Recommended	Item number	Alternative
Supplementary lubricants	- O2 sensor - Bolts, etc.	SUBARU CRC	004301003	—
Grease	MT main shaft	FX clutch grease	000040901	—
	Clutch master cylinder push rod	Slicolube G-40M	004404003	—
	- Steering shaft bush (Toe board) - Gear shift bush	SUNLIGHT2	003602010	—
	Steering gear box	Valiant grease M-2	003608001	—
	Disc brake	Niglube RX-2	725191040	—
	Drum brake	Molykote No. 7439	725191460	—
	- Brake pad - Brake shoe	Molykote AS-880N	K0777YA010	—
	Front axle SFJ	SSG-6003	28093TA000	—
	Front axle BJ	NTG2218	28093AA000	—
	Rear axle BJ	Molylex No. 2	723223010	—
	Rear axle DOJ	VU-3A702	23223GA050	—
	- Control cable - Throttle linkage Water pump - Door latch - Door striker	Slicolube G-30M	004404002	—

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replacement page for MSA5T0201A

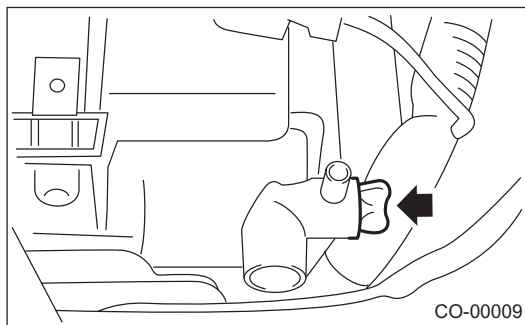
3. Engine Coolant

A: REPLACEMENT

1. DRAINING OF ENGINE COOLANT

- 1) Lift-up the vehicle.
- 2) Remove the under cover.
- 3) Loosen the drain cock to drain engine coolant into container.

NOTE: Remove the radiator cap so that engine coolant will drain faster.



2. FILLING OF ENGINE COOLANT

- 1) Fill engine coolant into the radiator up to filler neck position.

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

AT model

Approx. 6.8ℓ (7.19 US qt, 5.98 Imp qt)

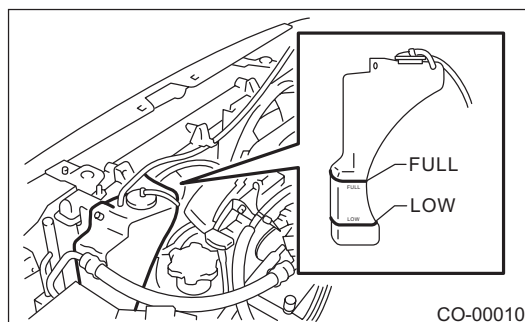
MT model

Approx. 6.9ℓ (7.40 US qt, 6.16 Imp qt)

NOTE: The Subaru Genuine Coolant containing antifreeze and anti-rust agents is especially made for Subaru engine, which has an aluminum crankcase. Always use Subaru Genuine Coolant, since other coolant may cause corrosion.

NOTE: To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into the reservoir tank up to "FULL" level.



- 3) Warm-up the engine completely for more than 5 minutes at 2,000 to 3,000 rpm.
- 4) If the engine coolant level drops in radiator, add engine coolant to filler neck position.
- 5) If the engine coolant level drops from FULL level of reservoir tank, add engine coolant to FULL level.
- 6) Attach the radiator cap and reservoir tank cap properly.

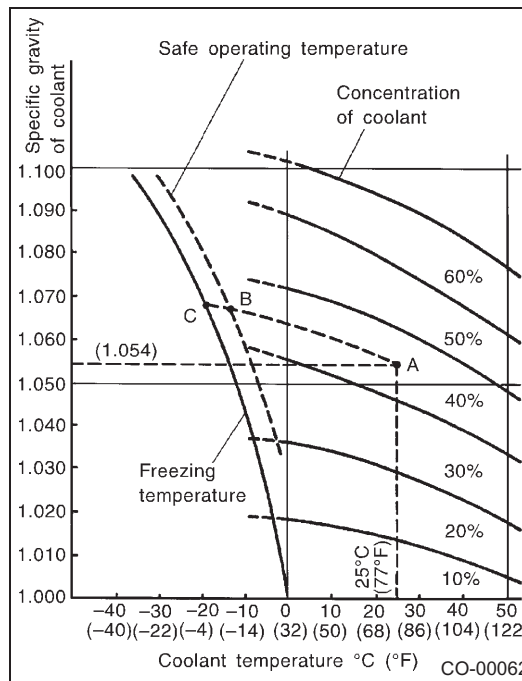
B: INSPECTION

1. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE

The concentration and safe operating temperature of the Subaru coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

[Example]

If the coolant temperature is 25°C (77°F) and its specific gravity is 1.054, the concentration is 35% (point A), the safe operating temperature is -14°C (7°F) (point B), and the freezing temperature is -20°C (-4°F) (point C).



12. Coolant

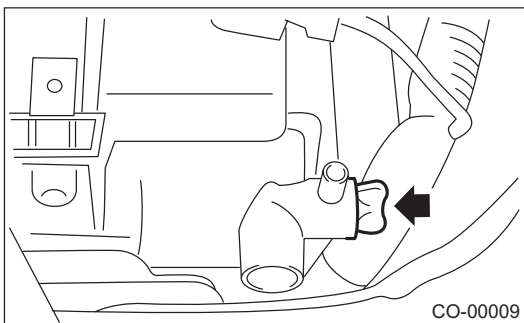
A: REPLACEMENT

1. REPLACEMENT OF COOLANT

WARNING:

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

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



- 5) For quick draining, open the radiator cap.
- NOTE: Be careful not to spill coolant on the floor.
- 6) Drain the coolant from reservoir tank.
 - 7) Tighten the radiator drain cock securely after draining coolant.
 - 8) Slowly pour the prepared coolant from radiator filler port to neck of filler, then pour into reservoir tank up to "FULL" level.

Coolant capacity (fill up to "FULL" level)

AT VEHICLES:

Approx. 6.8 ℓ (7.2 US qt, 6.0 Imp qt)

MT VEHICLES:

Approx. 6.9 ℓ (7.3 US qt, 6.1 Imp qt)

NOTE: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.

NOTE: To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

- 9) Securely install the radiator cap.

- 10) Run the engine for more than 5 minutes at 2,000 to 3,000 rpm. (Run the engine until radiator becomes hot in order to purge the air trapped in cooling system.)

- 11) Stop the engine and wait until coolant temperature lowers. Then open the radiator cap to check coolant level and add coolant up to radiator filler neck. Next, add coolant into reservoir tank up to "FULL" level.

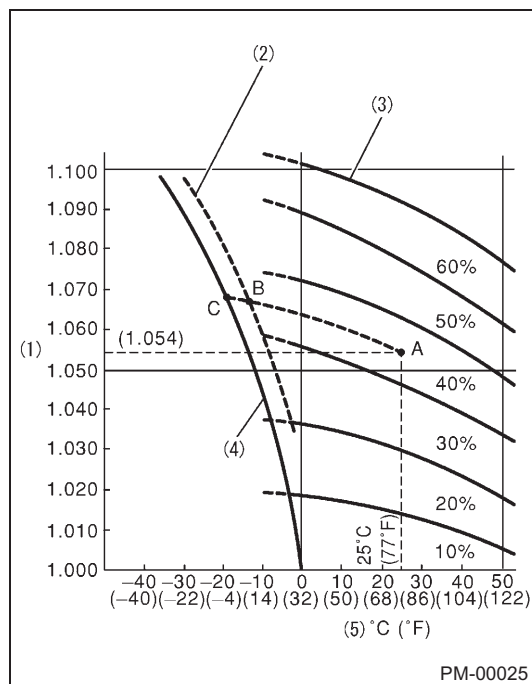
- 12) After adding coolant, securely install the radiator and reservoir tank caps.

2. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE

The concentration and safe operating temperature of the SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

[Example]

If the coolant temperature is 25°C (77°F) and its specific gravity is 1.054, the concentration is 35% (point A), the safe operating temperature is -14°C (7°F) (point B), and the freezing temperature is -20°C (-4°F) (point C).



- (1) Coolant gravity
- (2) Safe operating temperature
- (3) Concentration of coolant
- (4) Freezing temperature
- (5) Coolant temperature

RECOMMENDED MATERIALS

4. FLUID

Fluid	Recommended	Alternative	Remarks
Automatic transmission fluid	DEXRON III	—	—
Power steering fluid	DEXRON III	—	—
Brake fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—
Clutch fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—

Coolant	Recommended	Item number	Alternative
Coolant	SUBARU coolant	000016218	None
Water for dilution	Distilled water	—	Tap water (Soft water)
Coolant Conditioner	Subaru Coolant Conditioner	SOA635071	None

Air conditioner	Recommended	Item number	Alternative
Refrigerant	HFC134a	—	None
Compressor oil	ZXL200PG	—	None

Grease	Application point	Recommended	Item number	Alternative
Supplementary lubricants	O ₂ sensor Bolts, etc.	SUBARU CRC	004301003	—

4. Engine Coolant

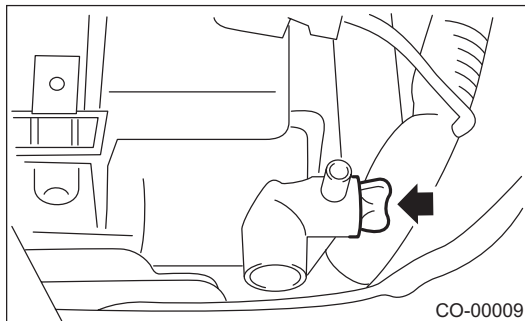
A: REPLACEMENT

1. DRAINING OF ENGINE COOLANT

- 1) Lift-up the vehicle.
- 2) Remove the under cover.
- 3) Remove the drain cock to drain engine coolant into container.

NOTE:

Remove the radiator cap so that engine coolant will drain faster.



2. FILLING OF ENGINE COOLANT

- 1) Fill engine coolant into radiator up to the filler neck position.

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

Non-turbo AT model

Approx. 6.9ℓ (7.29 US qt, 6.07 Imp qt)

Non-turbo MT model

Approx. 7ℓ (7.4 US qt, 6.2 Imp qt)

Turbo AT model

Approx. 7.6ℓ (8.03 US qt, 6.69 Imp qt)

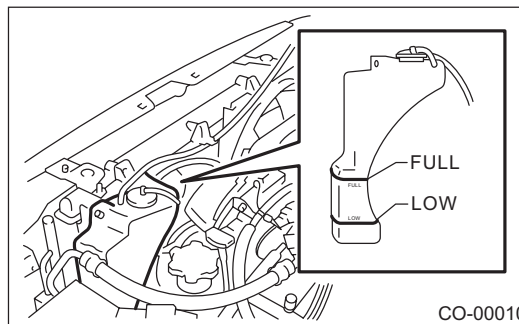
Turbo MT model

Approx. 7.7ℓ (8.14 US qt, 6.78 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.

NOTE: To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into reservoir tank up to the upper level.



- 3) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 4) If the engine coolant level drops in radiator, add the engine coolant to filler neck position.
- 5) If the engine coolant level drops from upper level of reservoir tank, add the engine coolant to the upper level.
- 6) Attach the radiator cap and reservoir tank cap properly.

B: INSPECTION

1. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE

The concentration and safe operating temperature of the SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

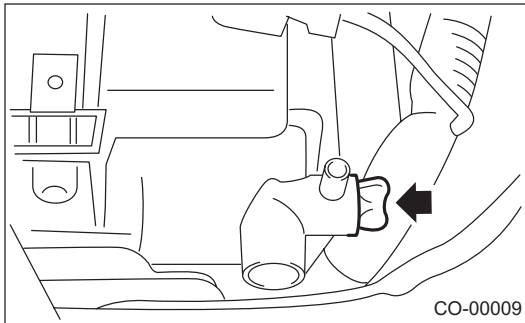
12.Coolant

A: REPLACEMENT

1. REPLACEMENT OF COOLANT

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

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



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

CAUTION: Be careful not to spill coolant on the floor.

- 6) Drain the coolant from reservoir tank.
- 7) Tighten the radiator drain screw securely after draining coolant.
- 8) Slowly pour the prepared coolant from radiator filler port to neck of filler, then pour into the reservoir tank up to "FULL" level.

Coolant amount for preparation

Non-turbo AT model:

Approx. 6.9ℓ (7.3 US qt, 6.1 Imp qt)

Non-turbo MT model:

Approx. 7.0ℓ (7.4 US qt, 6.2 Imp qt)

Turbo AT model:

Approx. 7.6ℓ (8.0 US qt, 6.7 Imp qt)

Turbo MT model:

Approx. 7.7ℓ (8.1 US qt, 6.8 Imp qt)

NOTE: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.

NOTE: To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

- 9) Securely install the radiator cap.
- 10) Run engine for more than five minutes at 2,000 to 3,000 rpm. (Run engine until radiator becomes hot in order to purge air trapped in cooling system.)
- 11) Stop the engine and wait until coolant temperature lowers. Then open the radiator cap to check coolant level and add coolant up to radiator filler neck. Next, add coolant into reservoir tank up to "FULL" level.
- 12) After adding coolant, securely the install radiator and reservoir tank caps.

5. COOLANT

Use the genuine coolant to protect the engine.

Coolant	Recommended	Item number	Alternative
Coolant	SUBARU coolant	000016218	None
Water for dilution	Distilled water	—	Tap water
Coolant Conditioner	Subaru Coolant Conditioner	SOA635071	None

6. REFRIGERANT

Standard air conditioners on Subaru vehicles use HFC134a refrigerant. Do not mix it with other refrigerants. Also, do not use any air compressor oil except for DH-PR.

Air conditioner	Recommended	Item number	Alternative
Refrigerant	HFC134a	—	None
Compressor oil	DH-PR	—	None

7. GREASE

Use the grease and supplementary lubricants shown in the table below.

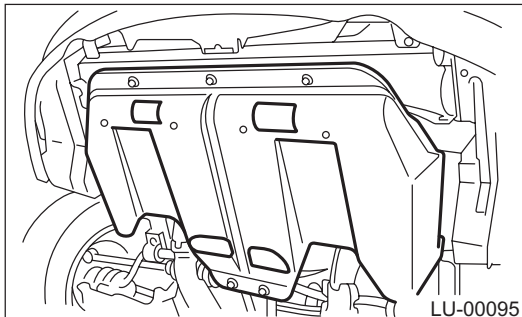
Grease	Application point	Recommended	Item number	Alternative
Supplementary lubricants	O ₂ sensor Bolts, etc.	SUBARU CRC	004301003	—
Grease	MT main shaft	FX clutch grease	000040901	—
	Clutch master cylinder push rod	Slicolube G-40M	004404003	—
	Gear shift lever Select lever Clutch operating cylinder Accelerator pedal Clutch pedal Brake pedal Clutch bearing Clutch release lever Steering shaft bearing	SUNLIGHT2	003602010	—
	Steering gear box	Valiant grease M-2	003608001	—
	Disc brake	Niglube RX-2	K0779GA102	—
	Drum brake Brake shoe	Molykote No. 7439	003602001	—
	Brake pad	Molykote AS-880N	K0777YA010	—
	Front axle SFJ	SSG-6003	28093TA000	—
	Front axle EBJ	NTG 2218	28093AA000	—
	Rear axle EBJ (Turbo model)	NTG 2218	28093AA000	—
	Rear axle BJ (Non-turbo model)	Molylex No. 2	723223010	—
	Rear axle DOJ	VU-3A702	23223GA050	—
	Throttle linkage Water pump Door latch Door striker	Slicolube G-30M	004404002	—

4. Engine Coolant

A: REPLACEMENT

1. DRAINING OF ENGINE COOLANT

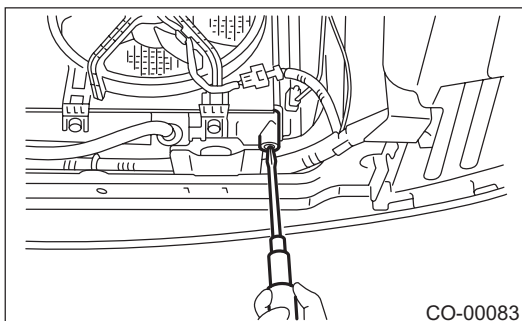
- 1) Lift-up the vehicle.
- 2) Remove under cover.



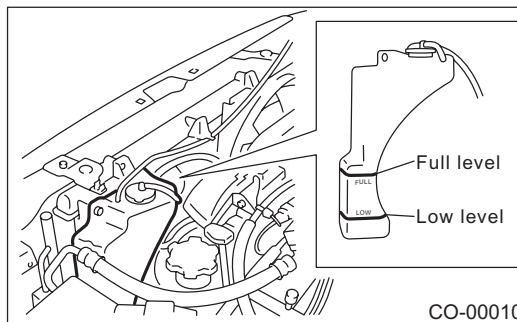
- 3) Remove drain cock to drain engine coolant into container.

NOTE:

Remove radiator cap so that engine coolant will drain faster.



- 2) Fill engine coolant into reservoir tank up to upper level.



- 3) Attach radiator cap and reservoir tank cap properly.
- 4) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 5) If engine coolant level drops in radiator, add engine coolant to filler neck position.
- 6) If engine coolant level drops from upper level of reservoir tank, add engine coolant to upper level.
- 7) Attach radiator cap and reservoir tank cap properly.

2. FILLING OF ENGINE COOLANT

- 1) Fill engine coolant into radiator up to filler neck position.

Engine coolant amount for refill:

MT model;

Approx. 6.8ℓ (7.2 US qt, 6.0 Imp qt)

AT model;

Approx. 6.7ℓ (7.1 US qt, 5.9 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.

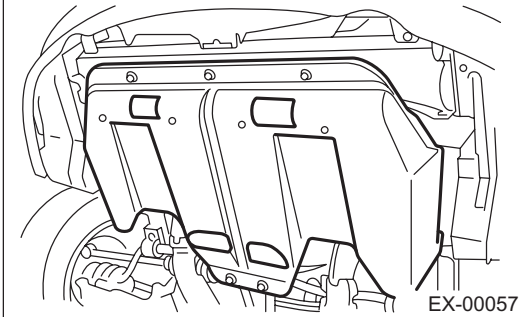
NOTE: To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

4. Engine Coolant

A: REPLACEMENT

1. DRAINING OF ENGINE COOLANT

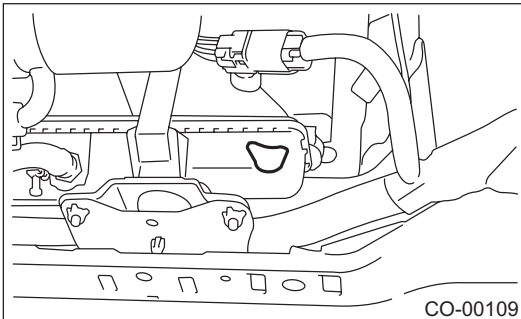
- 1) Lift-up the vehicle.
- 2) Remove under cover.



- 3) Remove drain cock to drain engine coolant into container.

NOTE:

Remove radiator cap so that engine coolant will drain faster.



2. FILLING OF ENGINE COOLANT

- 1) Fill engine coolant into radiator up to filler neck position.

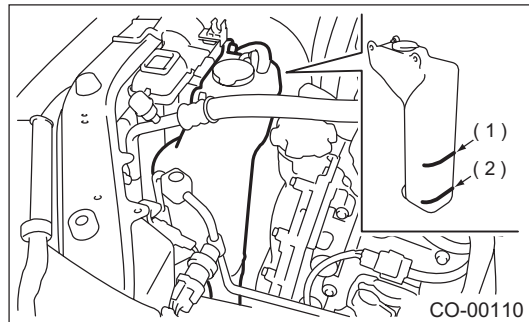
Coolant amount for refill:

Approx. 7.9 ℓ (8.4 US qt, 7.0 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.

NOTE: To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into reservoir tank up to upper level.



- (1) Full level
- (2) Low level

- 3) Attach radiator cap and reservoir tank cap properly.
- 4) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 5) If engine coolant level drops in radiator, add engine coolant to filler neck position.
- 6) If engine coolant level drops from upper level of reservoir tank, add engine coolant to upper level.
- 7) Attach radiator cap and reservoir tank cap properly.

12.Coolant

A: REPLACEMENT

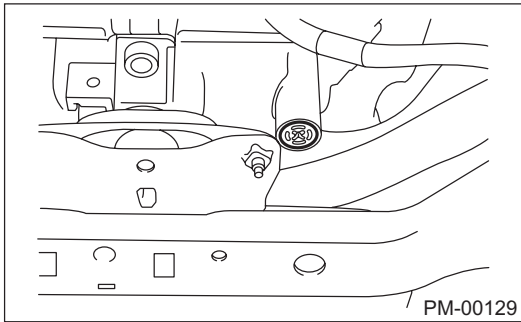
1. REPLACEMENT OF COOLANT

WARNING:

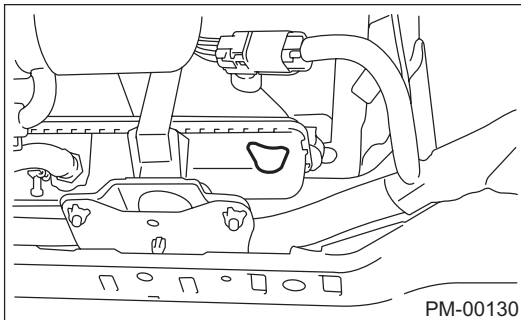
The radiator is of the pressurized type. Do not attempt to open the radiator cap immediately after the engine has been stopped.

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

2.5 L model



3.0 L model



- 5) For quick draining, open radiator cap.

CAUTION:

Be careful not to spill coolant on the floor.

- 6) Drain coolant from reservoir tank.
- 7) Tighten radiator drain screw securely after draining coolant.

- 8) Slowly pour prepared coolant from radiator filler port to neck of filler, then pour into reservoir tank up to "FULL" level.

Coolant amount for preparation

2.5 L model

MT model:

Approx. 6.8ℓ (7.2 US qt, 6.0 Imp qt)

AT model:

Approx. 6.7ℓ (7.1 US qt, 5.9 Imp qt)

3.0 L model

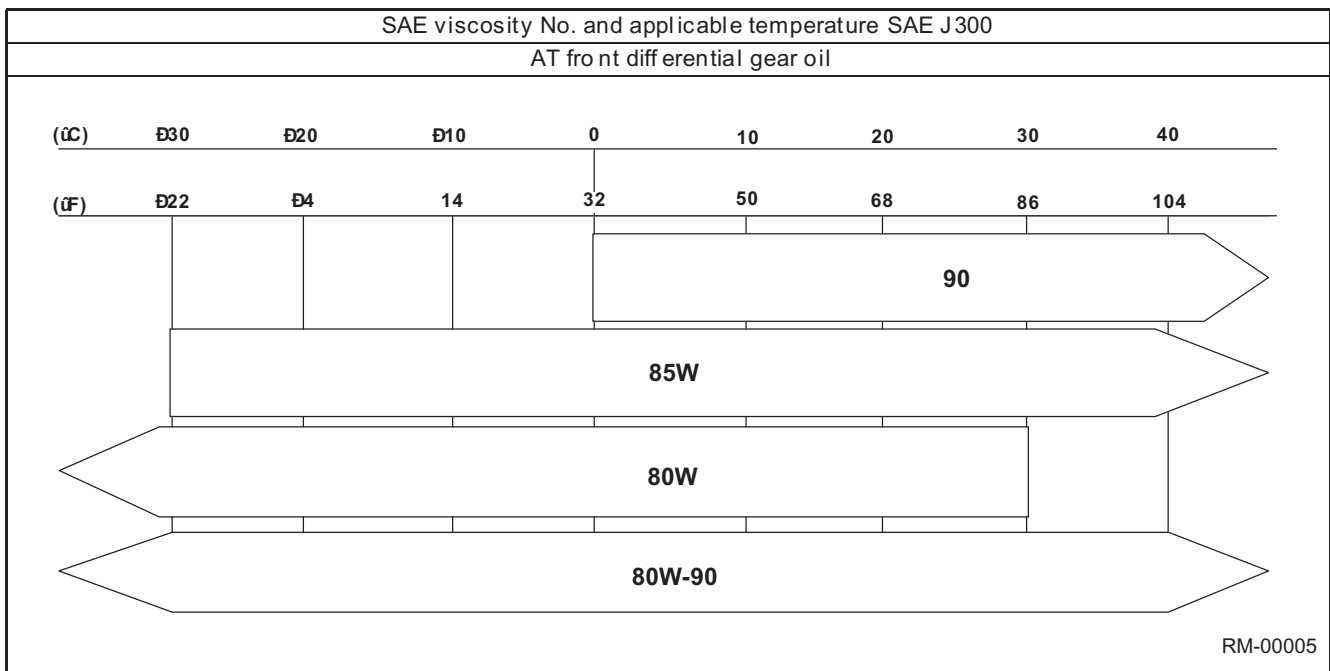
Approx. 7.9ℓ (8.4 US qt, 7.0 Imp qt)

NOTE: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.

NOTE: To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

- 9) Securely install radiator cap.
- 10) Run engine for more than five minutes at 2,000 to 3,000 rpm. (Run engine until radiator becomes hot in order to purge air trapped in cooling system.)
- 11) Stop engine and wait until coolant temperature lowers. Then open radiator cap to check coolant level and add coolant up to radiator filler neck. Next, add coolant into reservoir tank up to "FULL" level.
- 12) After adding coolant, securely install radiator and reservoir tank caps.

RECOMMENDED MATERIALS



4. FLUID

Use the fluids specified in the table below. Do not mix two different kinds or makes of fluid.

Fluid	Recommended	Alternative	Remarks
Automatic transmission fluid	DEXRON III	—	—
Power steering fluid	DEXRON III	—	—
Brake fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—
Clutch fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—

5. COOLANT

Use genuine coolant to protect the engine.

Coolant	Recommended	Item number	Alternative
Coolant	SUBARU coolant	000016218	None
Water for dilution	Distilled water	—	Tap water
Coolant Conditioner	SUBARU Coolant Conditioner	SOA635071	None

6. REFRIGERANT

Standard air conditioners on Subaru vehicles use HFC134a refrigerant. Do not mix it with other refrigerants. Also, do not use any air compressor oil except for ZXL200PG.

Air conditioner	Recommended	Item number	Alternative
Refrigerant	HFC134a	—	None
Compressor oil	ZXL200PG	—	None

3. Engine Coolant

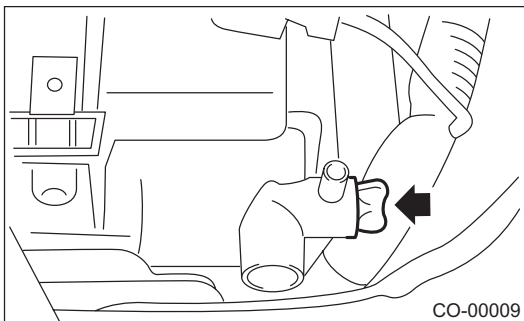
A: REPLACEMENT

1. DRAINING OF ENGINE COOLANT

- 1) Lift-up the vehicle.
- 2) Remove the under cover.
- 3) Loosen the drain cock to drain engine coolant into container.

NOTE:

Remove the radiator cap so that engine coolant will drain faster.



2. FILLING OF ENGINE COOLANT

- 1) Fill engine coolant into the radiator up to filler neck position.

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

Non-turbo (AT) model

Approx. 6.8ℓ (7.19 US qt, 5.98 Imp qt)

Non-turbo (MT) model

Approx. 6.9ℓ (7.29 US qt, 6.07 Imp qt)

Turbo (AT) model

Approx. 7.3ℓ (7.72 US qt, 6.42 Imp qt)

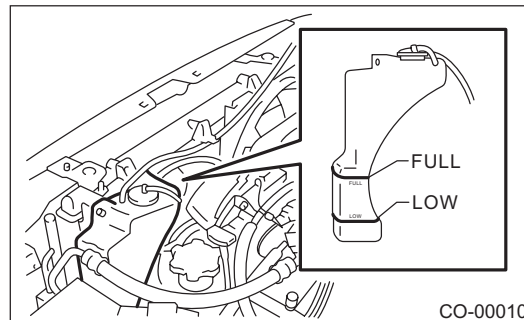
Turbo (MT) model

Approx. 7.4ℓ (7.82 US qt, 6.51 Imp qt)

NOTE: The Subaru Genuine Coolant containing antifreeze and anti-rust agents is especially made for Subaru engine, which has an aluminum crankcase. Always use Subaru Genuine Coolant, since other coolant may cause corrosion.

NOTE: To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into the reservoir tank up to FULL level.



- 3) Warm-up the engine completely for more than 5 minutes at 2,000 to 3,000 rpm.
- 4) If the engine coolant level drops in radiator, add engine coolant to filler neck position.
- 5) If the engine coolant level drops from FULL level of reservoir tank, add engine coolant to FULL level.
- 6) Attach the radiator cap and reservoir tank cap properly.

12. Coolant

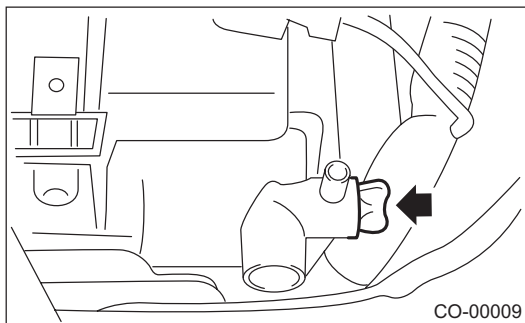
A: REPLACEMENT

1. REPLACEMENT OF COOLANT

WARNING:

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

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



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

CAUTION:

Be careful not to spill coolant on the floor.

- 6) Drain the coolant from reservoir tank.
- 7) Tighten the radiator drain cock securely after draining coolant.
- 8) Slowly pour the coolant from radiator filler port to neck of filler, then pour into reservoir tank up to "FULL" level.

Coolant capacity (fill up to "FULL" level)

Turbo AT model:

Approx. 7.3 ℓ (7.7 US qt, 6.4 Imp qt)

Turbo MT model:

Approx. 7.4 ℓ (7.8 US qt, 6.5 Imp qt)

Non-turbo AT model:

Approx. 6.8 ℓ (7.2 US qt, 6.0 Imp qt)

Non-turbo MT model:

Approx. 6.9 ℓ (7.3 US qt, 6.1 Imp qt)

NOTE: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.

NOTE: To prevent system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

- 9) Securely install the radiator cap.

10) Run the engine for more than 5 minutes at 2,000 to 3,000 rpm. (Run the engine until radiator becomes hot in order to purge the air trapped in cooling system.)

11) Stop the engine and wait until coolant temperature lowers. Then open the radiator cap to check coolant level and add coolant up to radiator filler neck. Next, add coolant into reservoir tank up to "FULL" level.

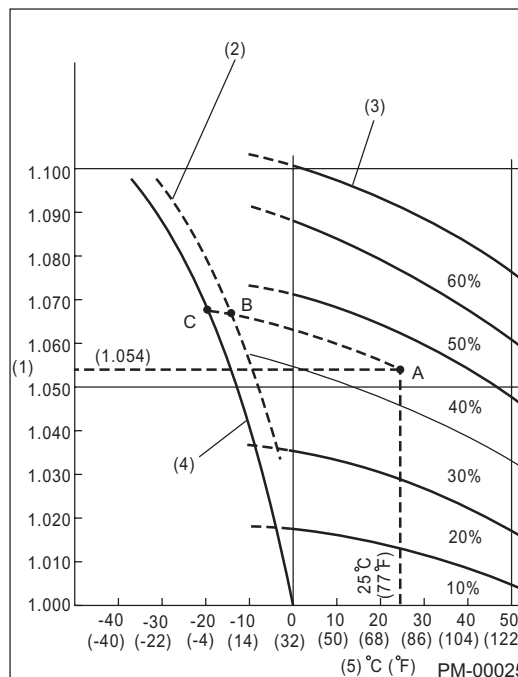
12) After adding coolant, securely install the radiator and reservoir tank caps.

2. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE

The concentration and safe operating temperature of the SUBARU Genuine Coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

[Example]

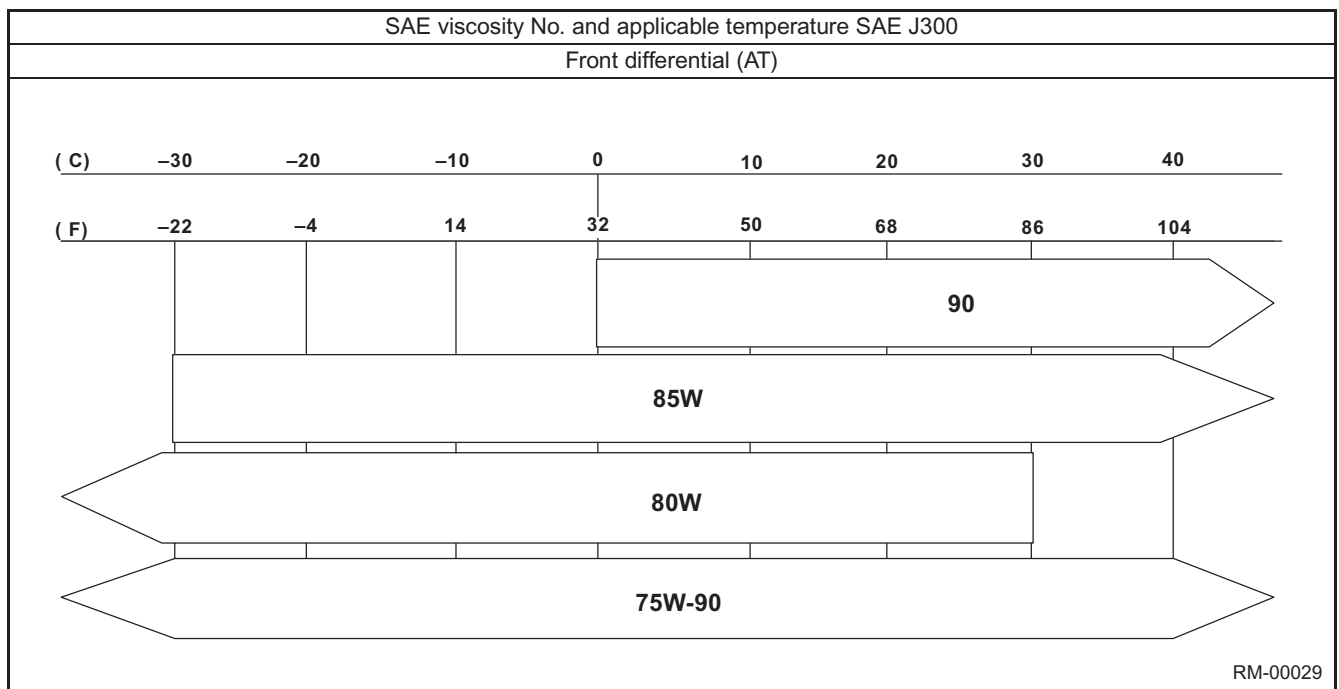
If the coolant temperature is 25°C (77°F) and its specific gravity is 1.054, the concentration is 35% (point A), the safe operating temperature is -14°C (7°F) (point B), and the freezing temperature is -20°C (-4°F) (point C).



- (1) Coolant gravity
- (2) Safe operating temperature
- (3) Concentration of coolant
- (4) Freezing temperature
- (5) Coolant temperature

RECOMMENDED MATERIALS

RECOMMENDED MATERIALS



4. FLUID

Use the fluids specified in the table below. Do not mix two different kinds or makes of fluid.

Fluid	Recommended	Alternative	Remarks
Automatic transmission fluid	DEXRON III	—	—
Power steering fluid	DEXRON III	—	—
Brake fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—
Clutch fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—

5. ENGINE COOLANT

Use genuine engine coolant to protect the engine.

Engine coolant	Recommended	Item number	Alternative
Coolant	SUBARU coolant	000016218	None
Water for dilution	Distilled water	—	Tap water (Soft water)
Coolant Conditioner	Subaru Coolant Conditioner	SOA635071	None

6. REFRIGERANT

Standard air conditioners on Subaru vehicles use HFC134a refrigerant. Do not mix it with other refrigerants. Also, do not use any air compressor oil except for ZXL200PG.

Air conditioner	Recommended	Item number	Alternative
Refrigerant	HFC134a	—	None
Compressor oil	ZXL200PG	—	None

4. Engine Coolant

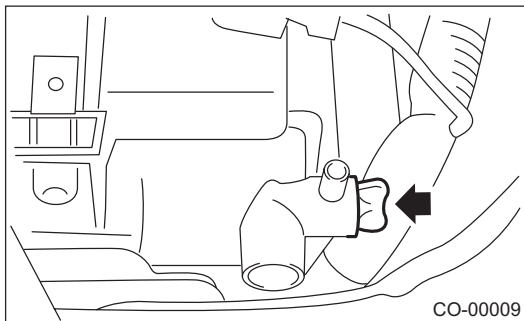
A: REPLACEMENT

1. DRAINING OF ENGINE COOLANT

- 1) Lift-up the vehicle.
- 2) Remove the under cover.
- 3) Remove the drain cock to drain engine coolant into container.

NOTE:

Remove the coolant filler tank cap so that engine coolant will drain faster.



- 4) Install the drain cock.

2. FILLING OF ENGINE COOLANT

- 1) Fill engine coolant into the coolant filler tank up to filler neck position.

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

AT model

Approx. 7.6 ℓ (8.03 US qt, 6.69 Imp qt)

MT model

Approx. 7.7 ℓ (8.14 US qt, 6.78 Imp qt)

CAUTION:

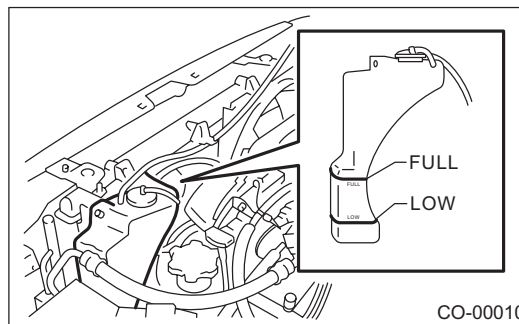
Do not mix up the coolant filler tank side cap with radiator side cap.

NOTE: Do not remove the radiator side cap when filling engine coolant.

- The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.

NOTE: To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into the reservoir tank up to Full level.



- 3) Warm-up the engine completely for more than 5 minutes at 2,000 to 3,000 rpm.
- 4) If the engine coolant level drops in coolant filler tank, add engine coolant to filler neck position.
- 5) If the engine coolant level drops from Full level of reservoir tank, add engine coolant to Full level.
- 6) Attach the coolant filler tank cap and reservoir tank cap properly.

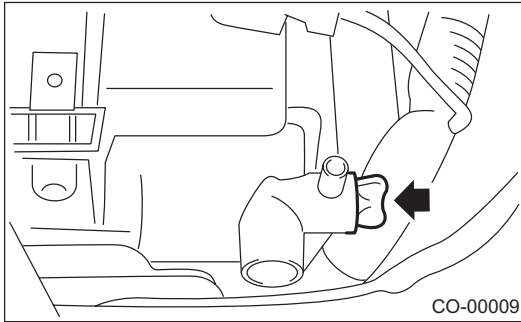
4. Engine Coolant

A: REPLACEMENT

1. DRAINING OF ENGINE COOLANT

- 1) Lift-up the vehicle.
- 2) Remove the under cover.
- 3) Remove the drain plug to drain engine coolant into container.

NOTE: Remove the radiator cap so that engine coolant will drain faster.



- 4) Install the drain plug.

2. FILLING OF ENGINE COOLANT

- 1) Fill engine coolant into the radiator up to filler neck position.

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

AT model:

Approx. 6.9ℓ (7.29 US qt, 6.07 Imp qt)

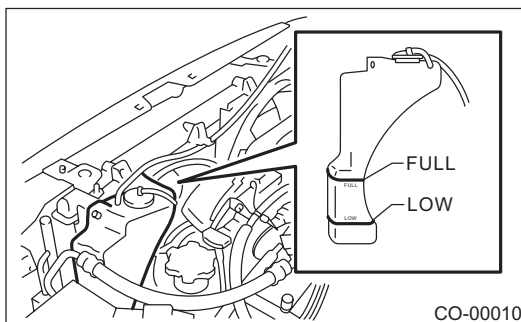
MT model:

Approx. 7.0ℓ (7.4 US qt, 6.2 Imp qt)

NOTE: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.

NOTE: To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into the reservoir tank up to Full level.



- 3) Warm-up the engine completely for more than 5 minutes at 2,000 to 3,000 rpm.
- 4) If the engine coolant level drops in radiator, add engine coolant to filler neck position.
- 5) If the engine coolant level drops from Full level of reservoir tank, add engine coolant to Full level.
- 6) Attach the radiator cap and reservoir tank cap properly.

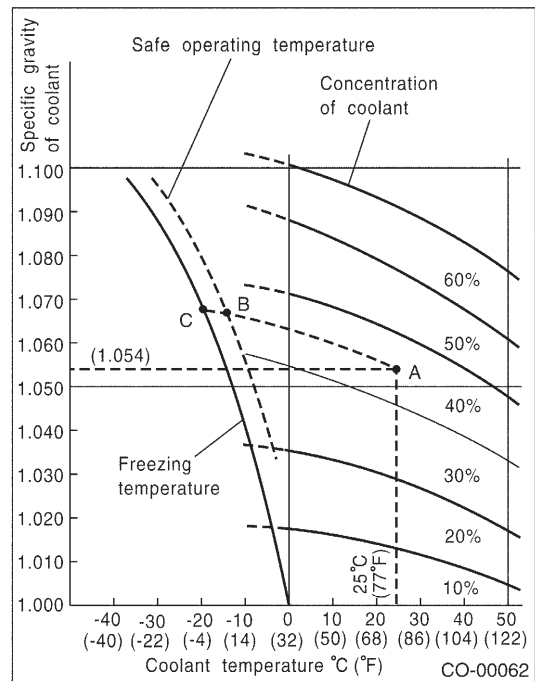
B: INSPECTION

1. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE

The concentration and safe operating temperature of the SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

[Example]

If the coolant temperature is 25°C (77°F) and its specific gravity is 1.054, the concentration is 35% (point A), the safe operating temperature is -14°C (7°F) (point B), and the freezing temperature is -20°C (-4°F) (point C).



CO(H4SO)-12

replacement page for MSA5T0411A

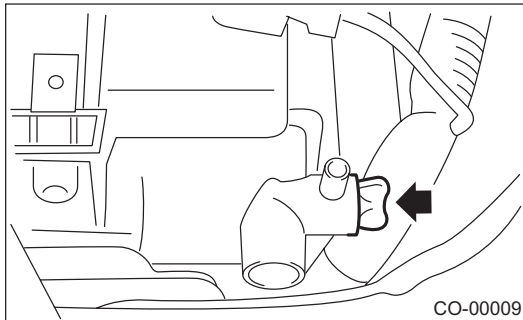
12.Coolant

A: REPLACEMENT

1. REPLACEMENT OF COOLANT

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

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



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

NOTE: In the case of turbo model, be sure to open the radiator cap of filler tank side.

• Be careful not to spill coolant on the floor.

- 6) Drain the coolant from reservoir tank.
- 7) Tighten the radiator drain cock securely after draining coolant.
- 8) Slowly pour the coolant into radiator. Pour the coolant up to air bleeder hole, and then install the cap. (Turbo model)
- 9) Pour the coolant from radiator filler port to neck of filler, then pour into reservoir tank up to "FULL" level.

Coolant capacity (fill up to "FULL" level)

2.0 L Turbo AT model:

Approx. 7.6ℓ (8.0 US qt, 6.7 Imp qt)

2.0 L Turbo MT model:

Approx. 7.7ℓ (8.1 US qt, 6.8 Imp qt)

2.5 L AT model:

Approx. 6.9ℓ (7.3 US qt, 6.1 Imp qt)

2.5 L MT model:

Approx. 7.0ℓ (7.4 US qt, 6.2 Imp qt)

STi model:

Approx. 7.7ℓ (8.1 US qt, 6.8 Imp qt)

NOTE: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.

NOTE: To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

- 10) Securely install the radiator cap.

- 11) Run the engine for more than 5 minutes at 2,000 to 3,000 rpm. (Run the engine until radiator becomes hot in order to purge the air trapped in cooling system.)

- 12) Stop the engine and wait until coolant temperature lowers. Then open the radiator cap to check coolant level and add coolant up to radiator filler neck. Next, add coolant into reservoir tank up to "FULL" level.

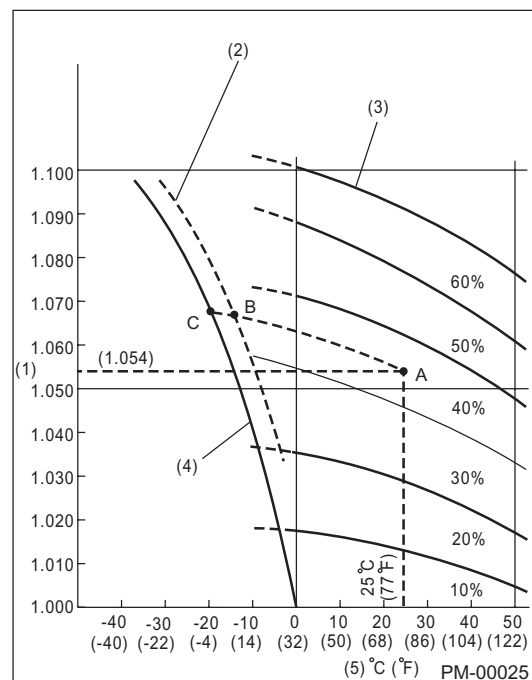
- 13) After adding coolant, securely install the radiator and reservoir tank caps.

2. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE

The concentration and safe operating temperature of the SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

[Example]

If the coolant temperature is 25°C (77°F) and its specific gravity is 1.054, the concentration is 35% (point A), the safe operating temperature is -14°C (7°F) (point B), and the freezing temperature is -20°C (-4°F) (point C).



- (1) Coolant gravity
- (2) Safe operating temperature
- (3) Concentration of coolant
- (4) Freezing temperature
- (5) Coolant temperature

RECOMMENDED MATERIALS

RECOMMENDED MATERIALS

4. FLUID

Use the fluids specified in the table below. Do not mix two different kinds or makes of fluid.

Fluid	Recommended	Alternative	Remarks
Automatic transmission fluid	DEXRON III	—	—
Power steering fluid	DEXRON III	—	—
Brake fluid	FMVSS No. 116 DOT3	—	—
Clutch fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—

5. COOLANT

Use genuine coolant to protect the engine.

Coolant	Recommended	Item number	Alternative
Coolant	SUBARU coolant	000016218	None
Water for dilution	Distilled water	—	Tap water (Soft water)
Coolant Conditioner	Subaru Coolant Conditioner	SOA635071	None

6. REFRIGERANT

Standard air conditioners on Subaru vehicles use HFC134a refrigerant. Do not mix it with other refrigerants. Also, do not use any compressor oil except for DH-PR.

Air conditioner	Recommended	Item number	Alternative
Refrigerant	HFC134a	—	None
Compressor oil	DH-PR	—	None

3. Engine Coolant

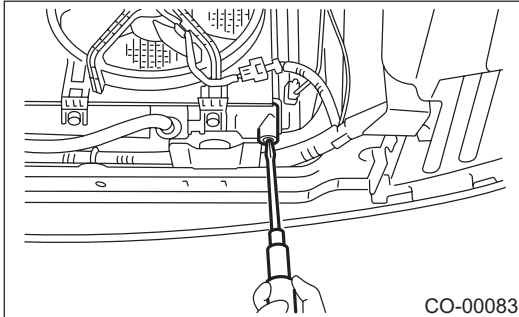
A: REPLACEMENT

1. DRAINING OF ENGINE COOLANT

- 1) Lift-up the vehicle.
- 2) Remove the under cover.
- 3) Remove the drain cock to drain engine coolant into container.

NOTE:

Remove the coolant filler tank cap so that engine coolant will drain faster.



- 4) Install the drain cock.

2. FILLING OF ENGINE COOLANT

- 1) Fill engine coolant into the coolant filler tank up to filler neck position.

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

AT model

Approx. 7.6ℓ (8.03 US qt, 6.69 Imp qt)

MT model

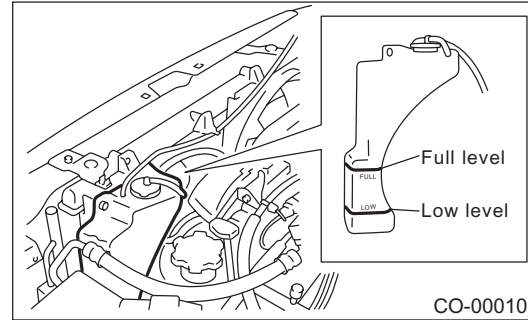
Approx. 7.7ℓ (8.14 US qt, 6.78 Imp qt)

CAUTION: Do not mix up the coolant filler tank side cap with radiator side cap.

NOTE:

- Do not remove the radiator side cap when filling engine coolant.
- The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.
- To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into the reservoir tank up to Full level.



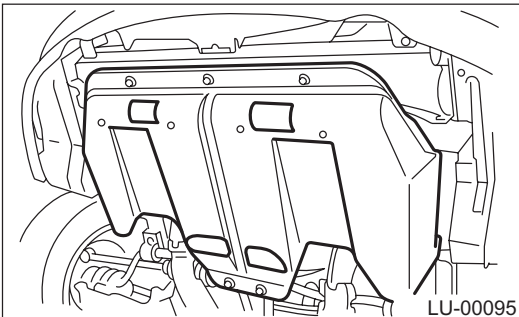
- 3) Warm-up the engine completely for more than 5 minutes at 2,000 to 3,000 rpm.
- 4) If the engine coolant level drops in coolant filler tank, add engine coolant to filler neck position.
- 5) If the engine coolant level drops from Full level of reservoir tank, add engine coolant to Full level.
- 6) Attach the coolant filler tank cap and reservoir tank cap properly.

4. Engine Coolant

A: REPLACEMENT

1. DRAINING OF ENGINE COOLANT

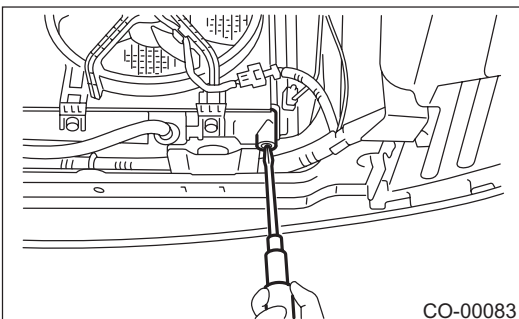
- 1) Lift-up the vehicle.
- 2) Remove under cover.



- 3) Remove drain cock to drain engine coolant from radiator.

NOTE:

Remove radiator cap so that engine coolant will drain faster.



2. FILLING OF ENGINE COOLANT

- 1) Fill engine coolant into radiator up to filler neck position.

Engine coolant amount for refill:

MT model;

Approx. 6.8ℓ (7.2 US qt, 6.0 Imp qt)

AT model;

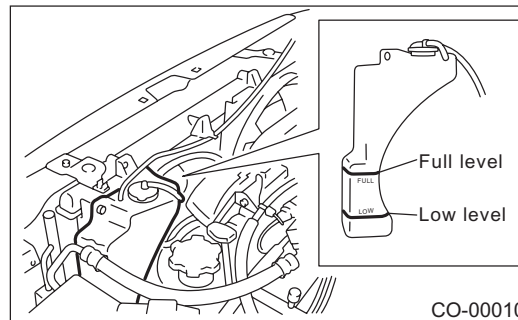
Approx. 6.7ℓ (7.1 US qt, 5.9 Imp qt)

CAUTION:

The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.

NOTE: To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into reservoir tank up to upper level.



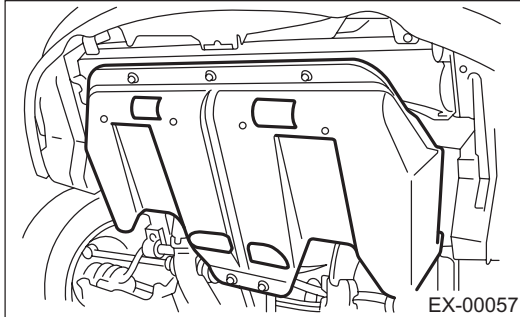
- 3) Attach radiator cap and reservoir tank cap properly.
- 4) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 5) If engine coolant level drops in radiator, add engine coolant to filler neck position.
- 6) If engine coolant level drops from upper level of reservoir tank, add engine coolant to upper level.
- 7) Attach radiator cap and reservoir tank cap properly.

4. Engine Coolant

A: REPLACEMENT

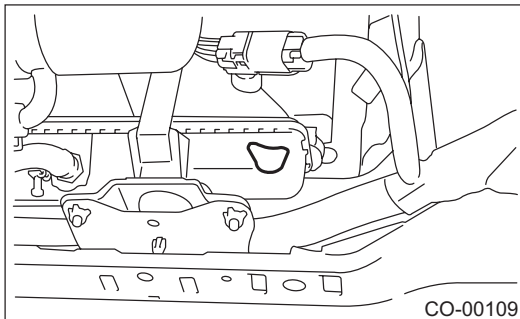
1. DRAINING OF ENGINE COOLANT

- 1) Lift-up the vehicle.
- 2) Remove under cover.



- 3) Remove drain cock to drain engine coolant into container.

NOTE: Remove radiator cap so that engine coolant will drain faster.



2. FILLING OF ENGINE COOLANT

- 1) Fill engine coolant into radiator up to filler neck position.

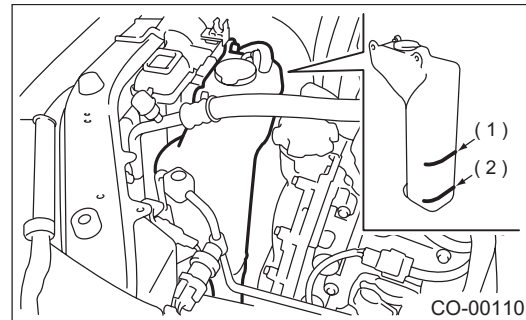
Coolant amount for refill:

Approx. 7.9ℓ (8.4 US qt, 7.0 Imp qt)

CAUTION: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.

NOTE: To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

- 2) Fill engine coolant into reservoir tank up to upper level.



- (1) Full level
- (2) Low level

- 3) Attach radiator cap and reservoir tank cap properly.
- 4) Warm-up engine completely for more than five minutes at 2,000 to 3,000 rpm.
- 5) If engine coolant level drops in radiator, add engine coolant to filler neck position.
- 6) If engine coolant level drops from upper level of reservoir tank, add engine coolant to upper level.
- 7) Attach radiator cap and reservoir tank cap properly.

12.Coolant

A: REPLACEMENT

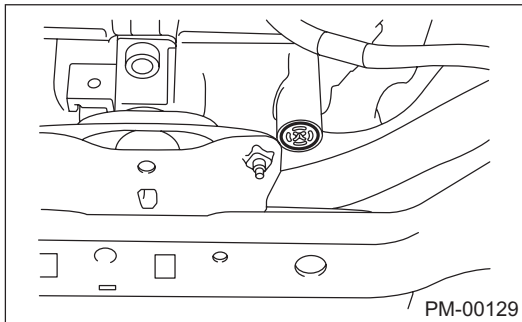
1. REPLACEMENT OF COOLANT

WARNING:

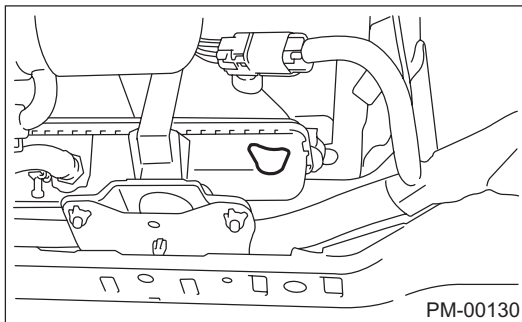
The radiator is of the pressurized type. Do not attempt to open the radiator cap immediately after the engine has been stopped.

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

2.5 L model



3.0 L model



- 5) For quick draining, open radiator cap.

CAUTION:

Be careful not to spill coolant on the floor.

- 6) Drain coolant from reservoir tank.
- 7) Tighten radiator drain screw securely after draining coolant.

- 8) Slowly pour prepared coolant from radiator filler port to neck of filler, then pour into reservoir tank up to "FULL" level.

Coolant amount for preparation

2.5 L Non-TURBO model

MT model:

Approx. 6.8ℓ (7.2 US qt, 6.0 Imp qt)

AT model:

Approx. 6.7ℓ (7.1 US qt, 5.9 Imp qt)

2.5 L TURBO model

MT model:

Approx. 7.4ℓ (7.8 US qt, 6.5 Imp qt)

AT model:

Approx. 7.3ℓ (7.7 US qt, 6.4 Imp qt)

3.0 L model

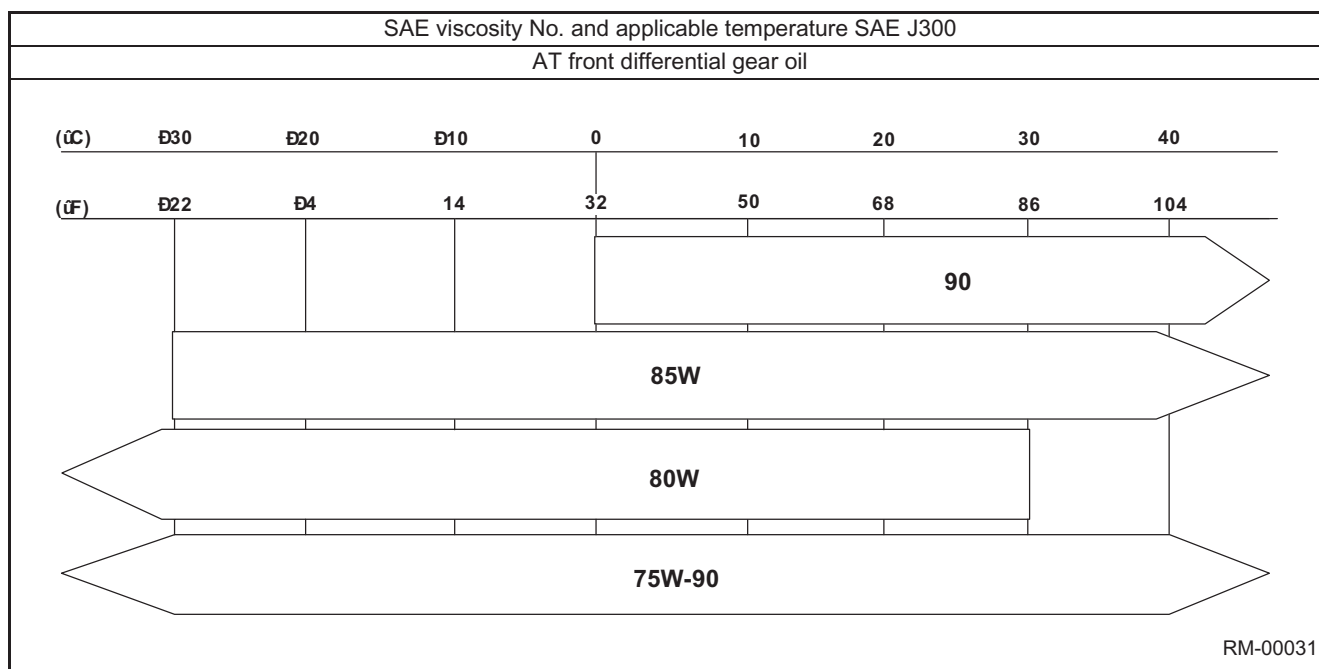
Approx. 7.9ℓ (8.4 US qt, 7.0 Imp qt)

NOTE: The SUBARU Genuine Coolant containing antifreeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.

NOTE: To prevent cooling system leaks, always add Genuine Subaru Cooling System Conditioner (P/N SOA635071) whenever the coolant is replaced.

- 9) Securely install radiator cap.
- 10) Run engine for more than five minutes at 2,000 to 3,000 rpm. (Run engine until radiator becomes hot in order to purge air trapped in cooling system.)
- 11) Stop engine and wait until coolant temperature lowers. Then open radiator cap to check coolant level and add coolant up to radiator filler neck. Next, add coolant into reservoir tank up to "FULL" level.
- 12) After adding coolant, securely install radiator and reservoir tank caps.

RECOMMENDED MATERIALS



4. FLUID

Use the fluids specified in the table below. Do not mix two different kinds or makes of fluid.

Fluid	Recommended	Alternative	Remarks
Automatic transmission fluid	DEXRON III	—	—
Power steering fluid	DEXRON III	—	—
Brake fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—
Clutch fluid	FMVSS No. 116 DOT3	FMVSS No. 116 DOT4	—

5. COOLANT

Use genuine coolant to protect the engine.

Coolant	Recommended	Item number	Alternative
Coolant	SUBARU coolant	000016218	None
Water for dilution	Distilled water	—	Tap water
Coolant Conditioner	Subaru Coolant Conditioner	SOA635071	None

6. REFRIGERANT

Standard air conditioners on Subaru vehicles use HFC134a refrigerant. Do not mix it with other refrigerants. Also, do not use any air compressor oil except for ZXL200PG.

Air conditioner	Recommended	Item number	Alternative
Refrigerant	HFC134a	—	None
Compressor oil	ZXL200PG	—	None

SERVICE BULLETIN

APPLICABILITY: 1999~2004MY Subaru Vehicles
SUBJECT: Service Manual Corrections

NUMBER: 18-75-04
DATE: 03/15/04

INTRODUCTION

Place a REVISED label on the appropriate pages of the noted effected Service Manuals and update the appropriate Service Manual Correction Binder(s) with the following pages:

YEAR	MODEL	BOOK/VOL#	MSA#	SECTION	PAGE	REFERENCE
2000	Impreza	Sect. 4	MSA5T0013A	2-7	152	[T10Q0]
	Impreza	Sect. 4	MSA5T0013A	2-7	155	[T10R1]
	Impreza	Sect. 4	MSA5T0013A	2-7	156	[T10S0]
	Impreza	Sect. 4	MSA5T0013A	2-7	398	[T11P0]
	Impreza	Sect. 4	MSA5T0013A	2-7	401	[T11Q1]
	Impreza	Sect. 4	MSA5T0013A	2-7	402	[T11R0]
2001	Impreza	Sect. 3	MSA5T0112A	--	EN-140	--
	Impreza	Sect. 3	MSA5T0112A	--	EN-142	--
	Impreza	Sect. 3	MSA5T0112A	--	EN-144	--
	Impreza	Sect. 3	MSA5T0112A	--	EN-348	--
	Impreza	Sect. 3	MSA5T0112A	--	EN-350	--
	Impreza	Sect. 3	MSA5T0112A	--	EN-352	--
	Impreza	Sect. 4	MSA5T0113A	--	MT-65	--
	Impreza	Sect. 4	MSA5T0113A	--	MT-66	--
	Legacy	Sect. 4	MSA5T0104A	--	MT-65	--
	Legacy	Sect. 4	MSA5T0104A	--	MT-66	--
2002	Forester	Sect. 5	MSA5T0224A	--	MT-78	--
	Forester	Sect. 5	MSA5T0224A	--	MT-79	--
	Impreza	Sect. 4	MSA5T0213A	--	MT-82	--
	Legacy	Sect. 4	MSA5T0204A	--	MT-80	--
	Legacy	Sect. 4	MSA5T0204A	--	MT-81	--
2003	Impreza	Sect. 4	MSA5T0313A	--	MT-84	--
	Legacy	Sect. 4	MSA5T0304A	--	MT-79	--
2004	Legacy	Sect. 6	MSA5T0405A	--	5MT-84	--
	Legacy	Sect. 6	MSA5T0405A	--	5MT-85	--
	Impreza	Sect. 6	MSA5T0415A	--	5MT-81	--



CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.

Subaru Service Bulletins are intended for use by professional technicians ONLY. They are written to inform those technicians of conditions that may occur in some vehicles, or to provide information that could assist in the proper servicing of the vehicle. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do the job correctly and safely. If a condition is described, DO NOT assume that this Service Bulletin applies to your vehicle, or that your vehicle will have that condition.

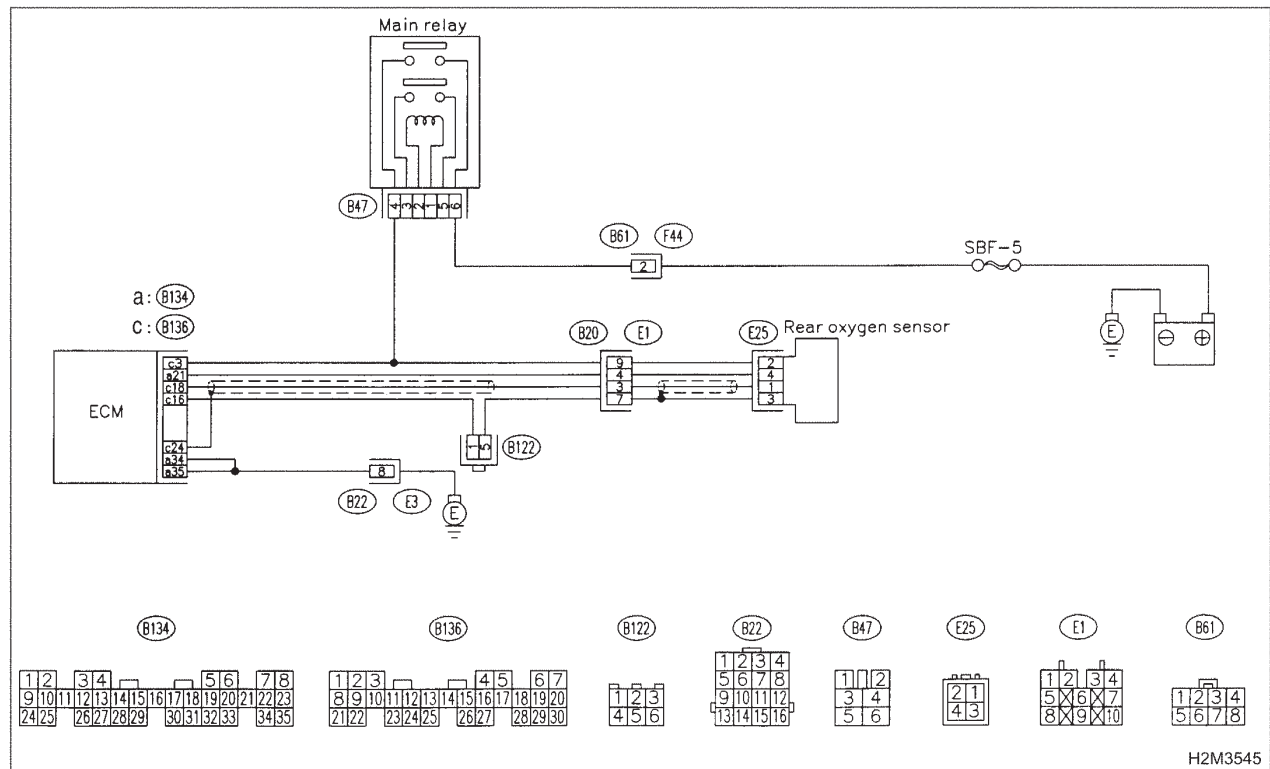


Q: DTC P0136 — REAR OXYGEN SENSOR CIRCUIT MALFUNCTION —**DTC DETECTING CONDITION:**

Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to 2-7 [T3D0].> and INSPECTION MODE <Ref. to 2-7 [T3E0].>.

WIRING DIAGRAM:

H2M3545

10Q1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P1130 or P1131?

YES : Go to step 10Q2.

NO : Go to step 10Q3.

10Q2 : CHECK FAILURE CAUSE OF P1130 OR P1131.

Inspect DTC P1130 or P1131 using "10. Diagnostics Chart with Trouble Code for 2200 cc Models". <Ref. to 2-7 [T10A0].>

CHECK : Is the failure cause of P1130 or P1131 in the fuel system?

YES : Check fuel system.

NOTE:

In this case, it is not necessary to inspect DTC P0136.

NO : Go to step 10Q3.

R: DTC P0139 — REAR OXYGEN SENSOR CIRCUIT SLOW RESPONSE —

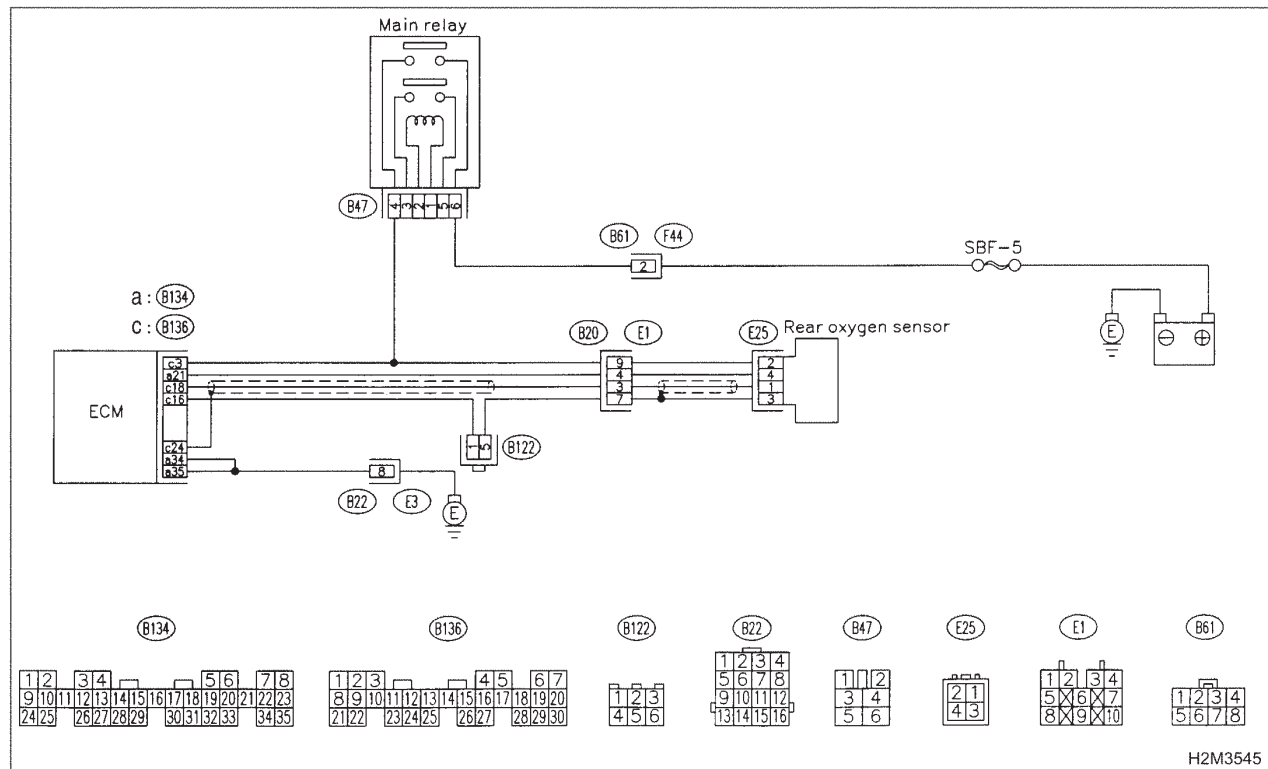
DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY MODE** <Ref. to 2-7 [T3D0].> and **INSPECTION MODE** <Ref. to 2-7 [T3E0].>

WIRING DIAGRAM:



10R1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0136?

YES : Inspect DTC P0136 using "10. Diagnostics Chart with Trouble Code for 2200 cc Models". <Ref. to 2-7 [T10A0].>

NOTE:

In this case, it is not necessary to inspect DTC P0139.

NO : Replace rear oxygen sensor. <Ref. to 2-7 [W9A0].>

S: DTC P0141 — REAR OXYGEN SENSOR HEATER CIRCUIT LOW INPUT —

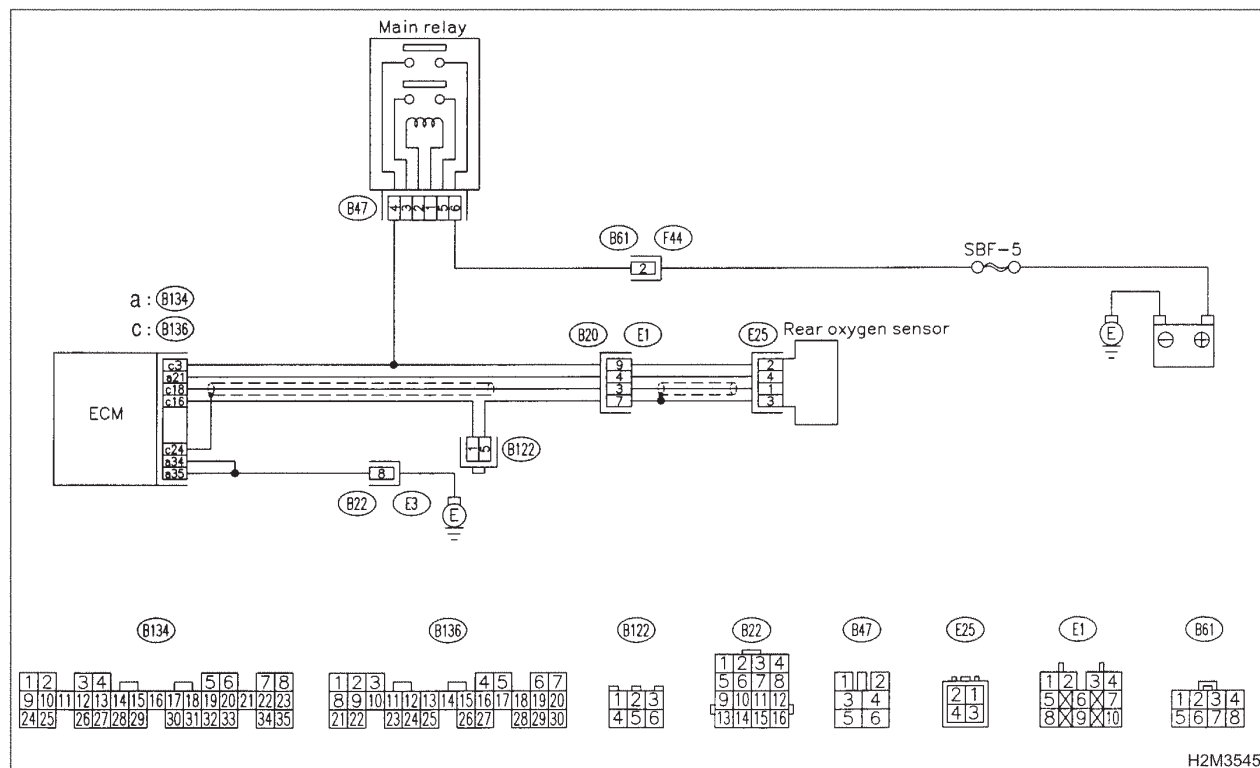
DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to 2-7 [T3D0].> and INSPECTION MODE <Ref. to 2-7 [T3E0].>.

WIRING DIAGRAM:



10S1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : *Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0141 and P0135 at the same time?*

YES : Go to step **10S2**.

NO : Go to step **10S3**.

P: DTC P0136 — REAR OXYGEN SENSOR CIRCUIT MALFUNCTION —

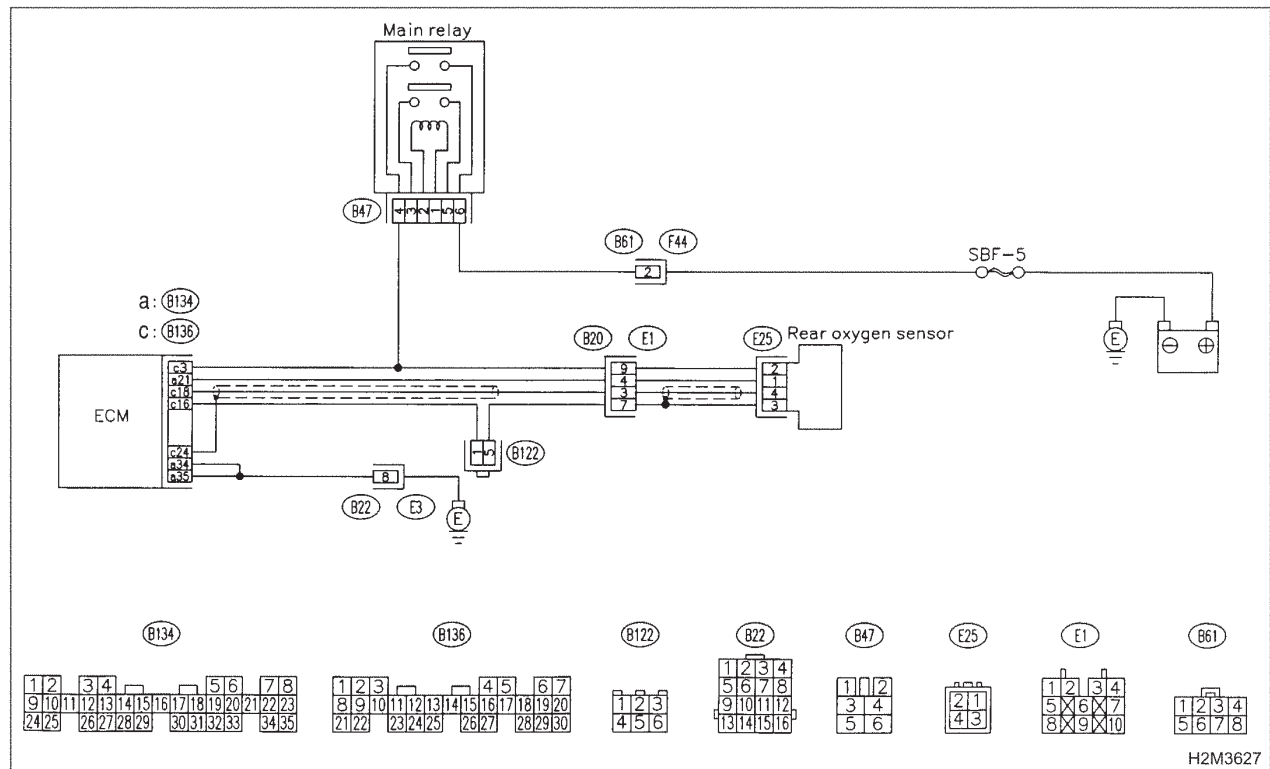
DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to 2-7 [T3D0].> and INSPECTION MODE <Ref. to 2-7 [T3E0].>.

WIRING DIAGRAM:



11P1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : **Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P1130 or P1131?**

YES : Go to step **11P2**.

NO : Go to step **11P3**.

11P2 : CHECK FAILURE CAUSE OF P0130.

Inspect DTC P1130 or P1131 using "11. Diagnostics Chart with Trouble Code for 2500 cc Models".
<Ref. to 2-7 [T11A0].>

CHECK : Is the failure cause of P1130 or P1131 in the fuel system?

YES : Check fuel system.

NOTE:

In this case, it is not necessary to inspect DTC P0136.

NO : Go to step **11P3**.

Q: DTC P0139 — REAR OXYGEN SENSOR CIRCUIT SLOW RESPONSE —

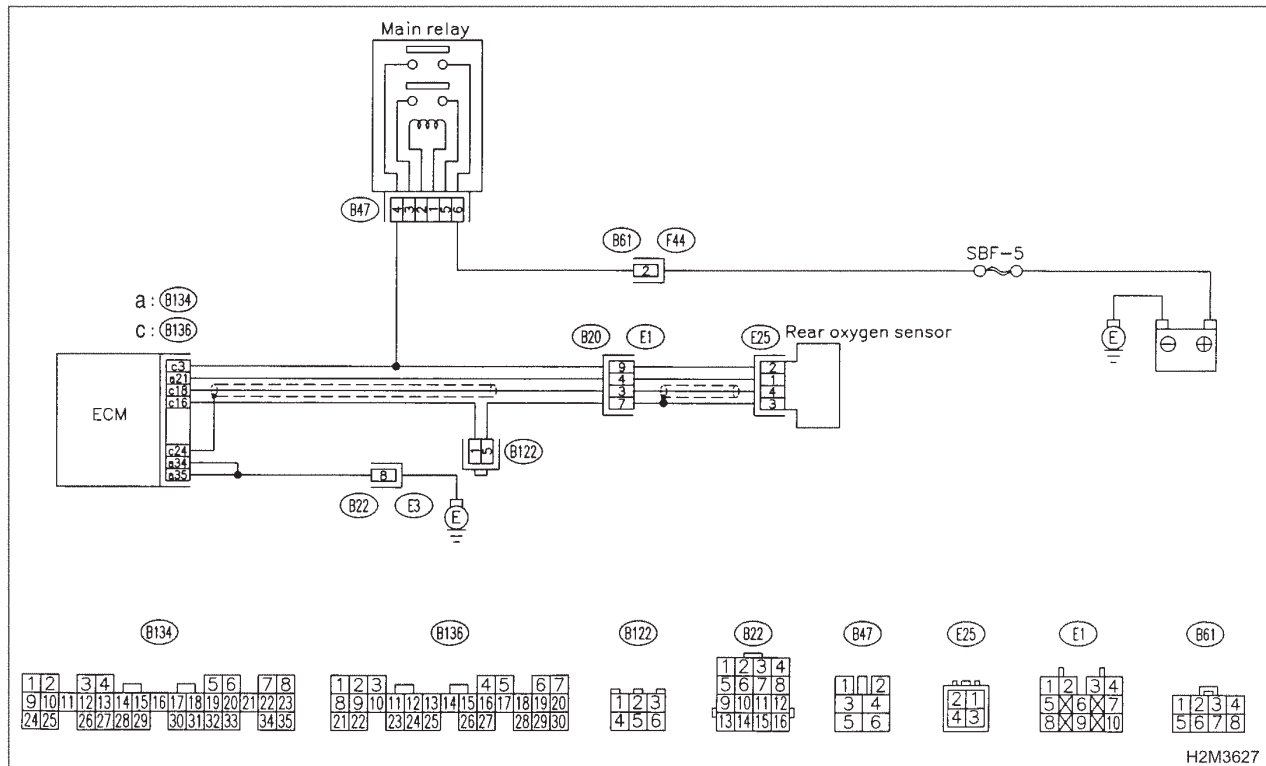
DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to 2-7 [T3D0].> and INSPECTION MODE <Ref. to 2-7 [T3E0].>

WIRING DIAGRAM:



11Q1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0136?

YES : Inspect DTC P0136 using "11. Diagnostics Chart with Trouble Code for 2500 cc Models". <Ref. to 2-7 [T11A0].>

NOTE:

In this case, it is not necessary to inspect DTC P0139.

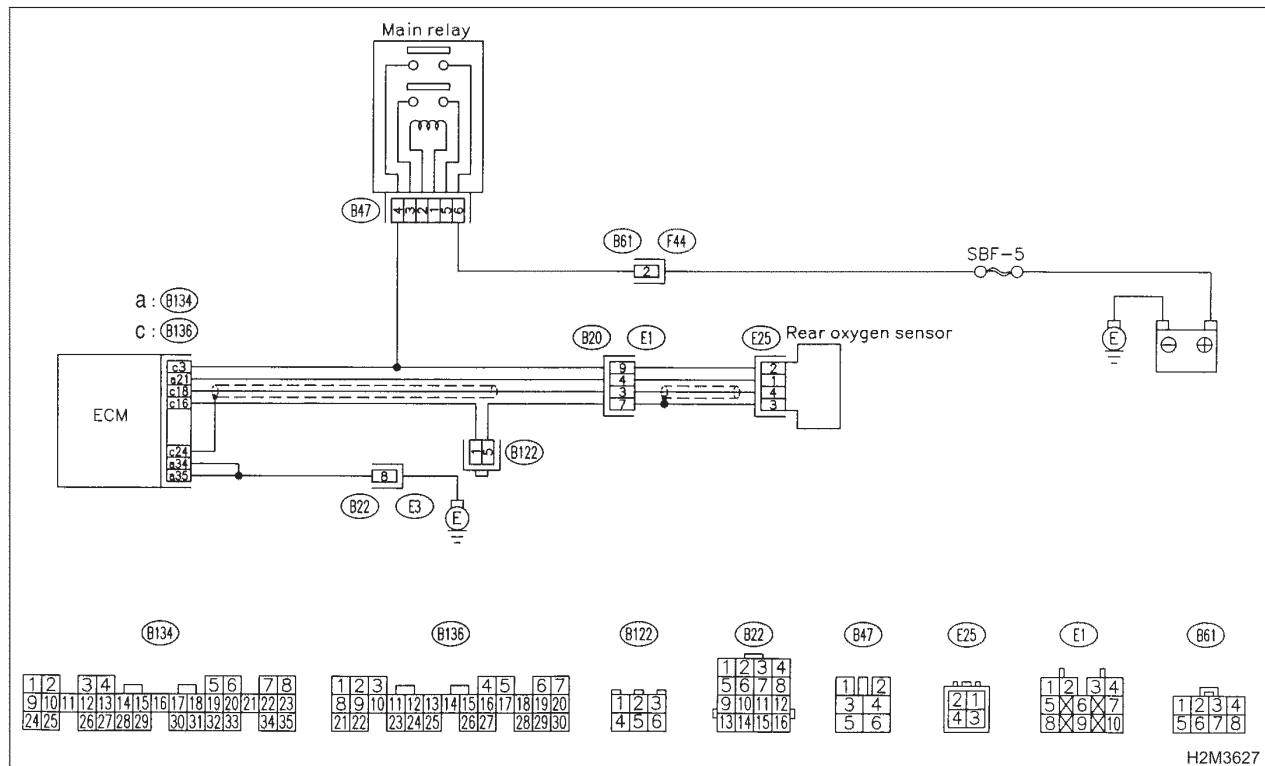
NO : Replace rear oxygen sensor. <Ref. to 2-7 [W9A0].>

R: DTC P0141 — REAR OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION**DTC DETECTING CONDITION:**

Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to 2-7 [T3D0].> and INSPECTION MODE <Ref. to 2-7 [T3E0].>.

WIRING DIAGRAM:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) FOR 2200 CC MODELS

Engine

P: DTC P0136 — REAR OXYGEN SENSOR CIRCUIT MALFUNCTION — S008636B28

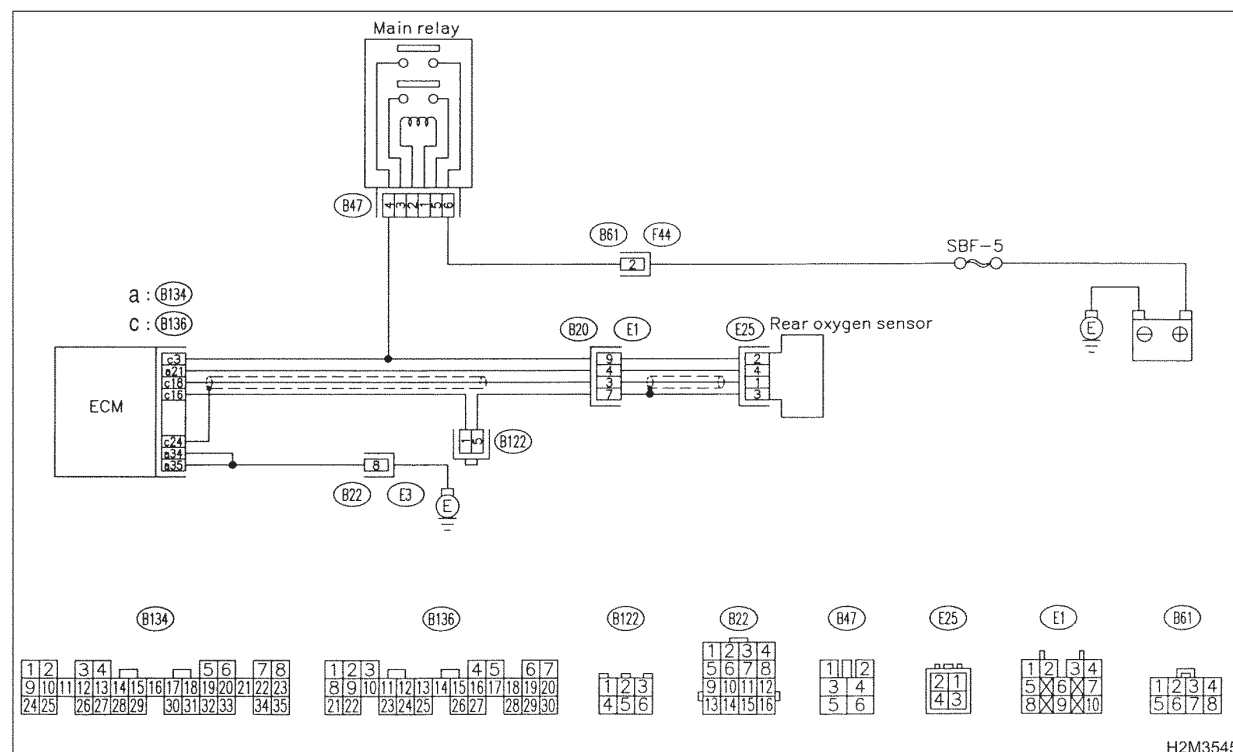
● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to EN-60 OPERATION, Clear Memory Mode.> and INSPECTION MODE <Ref. to EN-57 OPERATION, Inspection Mode.>.

● WIRING DIAGRAM:



H2M3545

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P1130 or P1131?	Go to step 2.	Go to step 3.
2	CHECK FAILURE CAUSE OF P1130 or P1131. Inspect DTC P1130 or P1131 using "17. List of Diagnostic Trouble Code (DTC) for 2200 cc Models". <Ref. to EN-93 LIST, List of Diagnostic Trouble Code (DTC) for 2200 cc Models.>	Is the failure cause of P1130 or P1131 in the fuel system?	Check fuel system. NOTE: In this case, it is not necessary to inspect DTC P0136.	Go to step 3.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) FOR 2200 CC MODELS

Engine

Q: DTC P0139 — REAR OXYGEN SENSOR CIRCUIT SLOW RESPONSE —

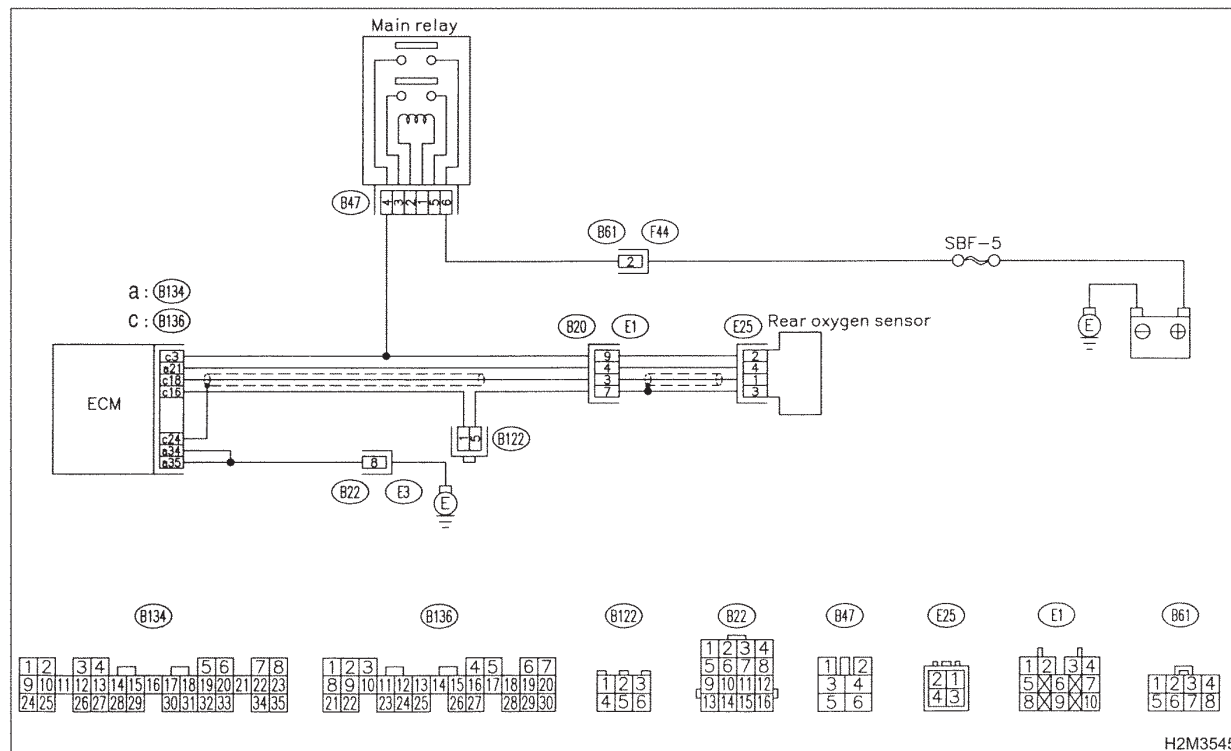
S008636B29

- **DTC DETECTING CONDITION:**
 - Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY MODE** <Ref. to EN-60 OPERATION, Clear Memory Mode.> and **INSPECTION MODE** <Ref. to EN-57 OPERATION, Inspection Mode.>.

- **WIRING DIAGRAM:**



H2M3545

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0136?	Inspect DTC P0136 using "17. List of Diagnostic Trouble Code (DTC) for 2200 cc Models". <Ref. to EN-93 LIST, List of Diagnostic Trouble Code (DTC) for 2200 cc Models.> NOTE: In this case, it is not necessary to inspect DTC P0139.	Replace rear oxygen sensor. <Ref. to EC-6 REMOVAL, Rear Catalytic Converter.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) FOR 2200 CC MODELS

Engine

R: DTC P0141 — REAR OXYGEN SENSOR HEATER CIRCUIT LOW INPUT —

S008636F03

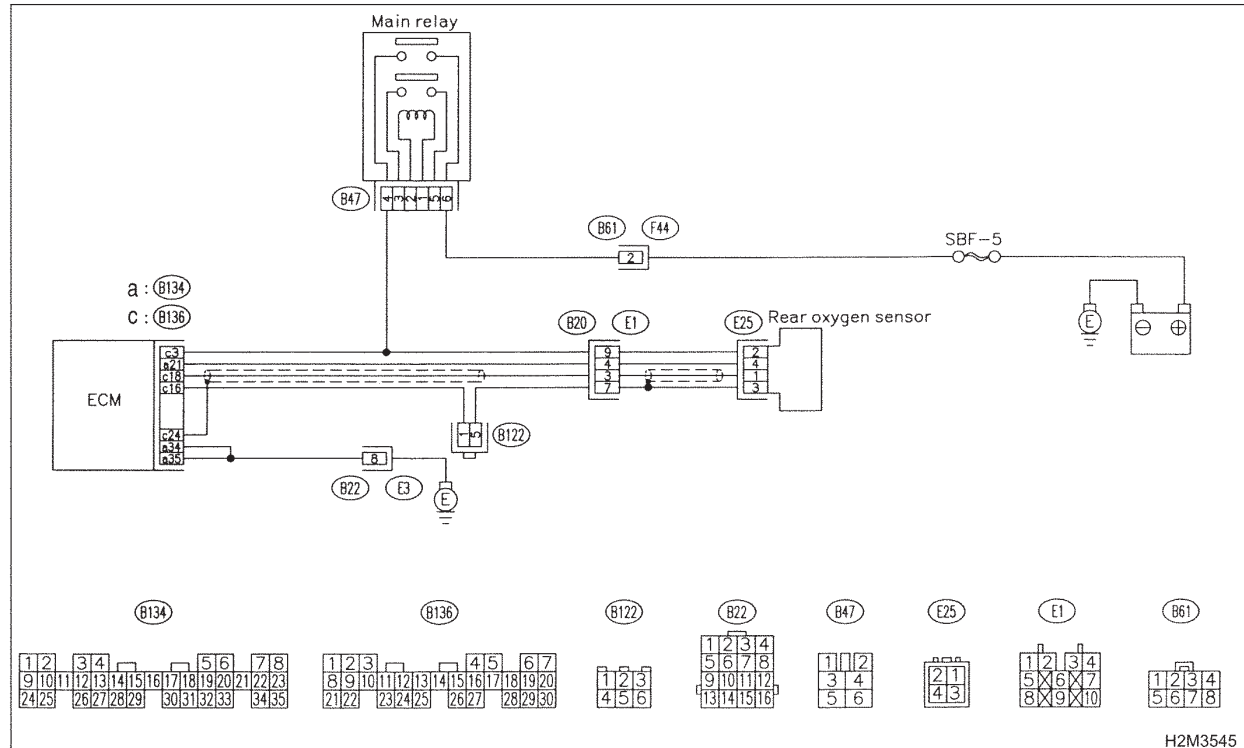
● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to EN-60 OPERATION, Clear Memory Mode.> and INSPECTION MODE <Ref. to EN-57 OPERATION, Inspection Mode.>.

● WIRING DIAGRAM:



No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0141 and P0135 at the same time?	Go to step 2.	Go to step 3.
2	CHECK GROUND CIRCUIT OF ECM. 1) Turn ignition switch to OFF. 2) Disconnect connector from ECM. 3) Measure resistance of harness between ECM connector and chassis ground. Connector & terminal (B134) No. 35 — Chassis ground:	Is the resistance less than 10 Ω?	Go to step 4.	Go to step 3.

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Replacement page for MSA5T0112A

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) FOR 2500 CC MODELS

Engine

O: DTC P0136 — REAR OXYGEN SENSOR CIRCUIT MALFUNCTION — S008638B28

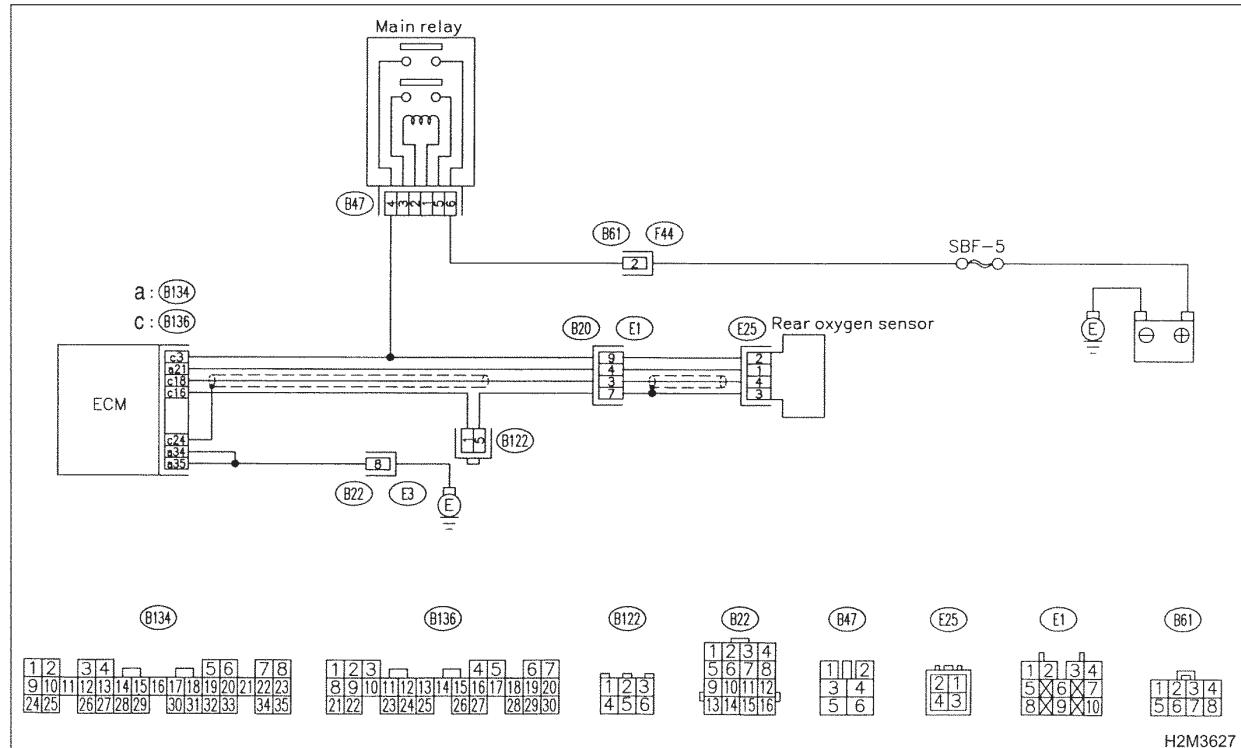
● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to EN-60 OPERATION, Clear Memory Mode.> and INSPECTION MODE <Ref. to EN-57 OPERATION, Inspection Mode.>.

● WIRING DIAGRAM:



No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P1130 or P1131?	Go to step 2.	Go to step 3.
2	CHECK FAILURE CAUSE OF P0136. Inspect DTC P1130 or P1131 using "19. List of Diagnostic Trouble Code (DTC) for 2500 cc Models". <Ref. to EN-300 LIST, List of Diagnostic Trouble Code (DTC) for 2500 cc Models.>	Is the failure cause of P1130 or P1131 in the fuel system?	Check fuel system. NOTE: In this case, it is not necessary to inspect DTC P0136.	Go to step 3.

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Replacement page for MSA5T0112A

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) FOR 2500 CC MODELS

Engine

P: DTC P0139 — REAR OXYGEN SENSOR CIRCUIT SLOW RESPONSE —

S008638B29

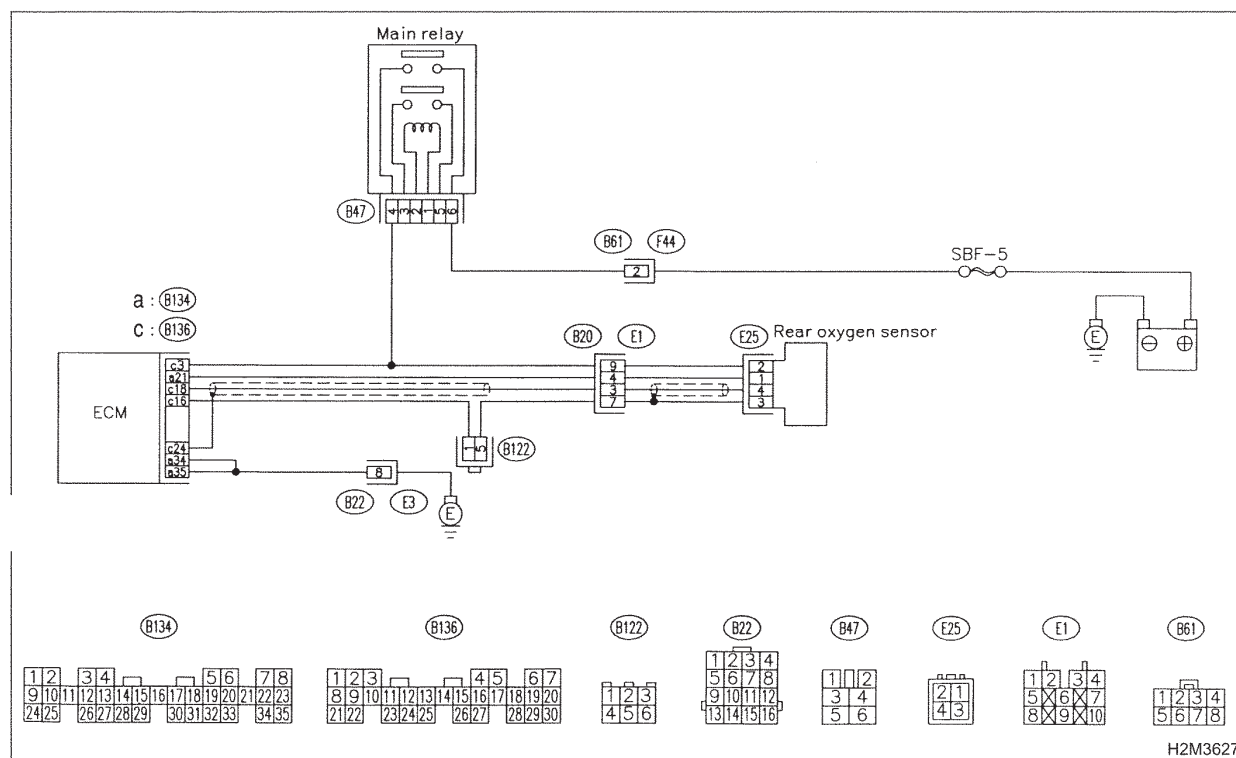
● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to EN-60 OPERATION, Clear Memory Mode.> and INSPECTION MODE <Ref. to EN-57 OPERATION, Inspection Mode.>.

● WIRING DIAGRAM:



No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0136?	Inspect DTC P0136 using "19. List of Diagnostic Trouble Code (DTC) for 2500 cc Models". <Ref. to EN-300 LIST, List of Diagnostic Trouble Code (DTC) for 2500 cc Models.> NOTE: In this case, it is not necessary to inspect DTC P0139.	Replace rear oxygen sensor. <Ref. to EC-6 REMOVAL, Rear Catalytic Converter.>

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Replacement page for MSA5T0112A

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) FOR 2500 CC MODELS

Engine

Q: DTC P0141 — REAR OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION

S008638B30

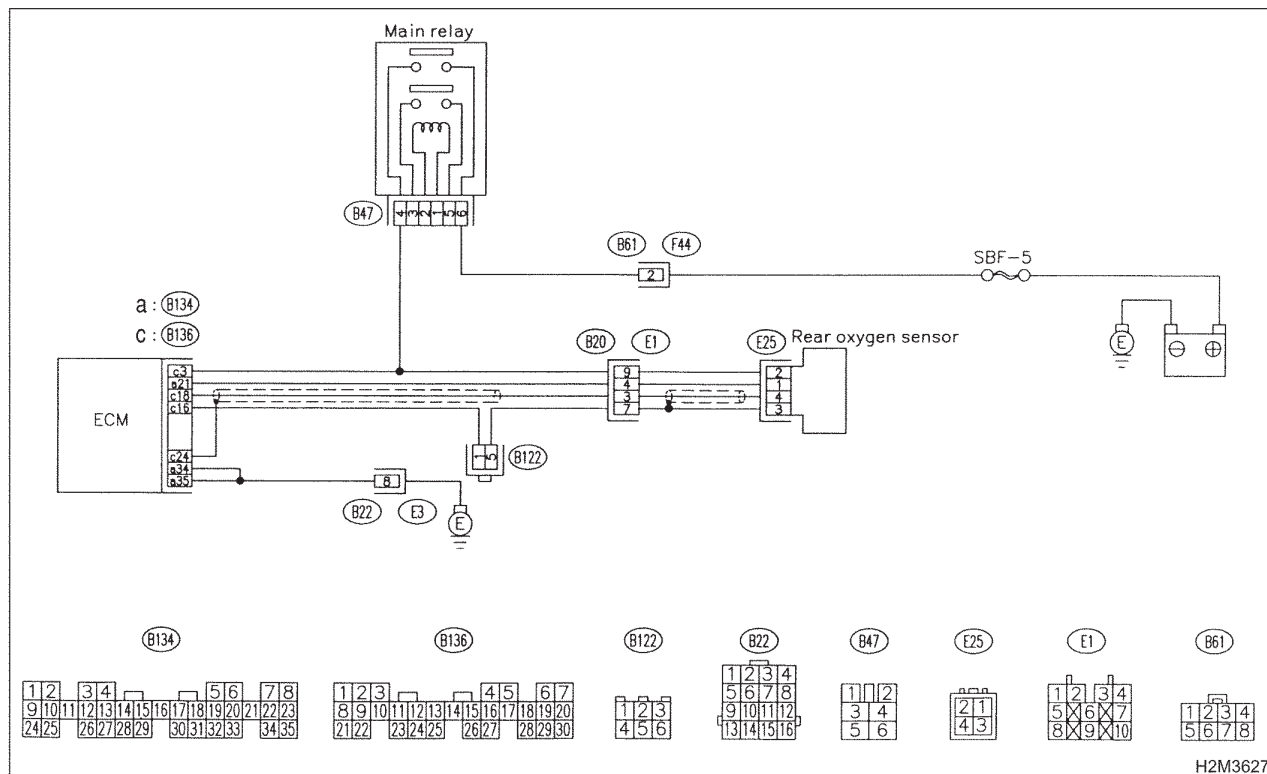
• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to EN-60 OPERATION, Clear Memory Mode.> and INSPECTION MODE <Ref. to EN-57 OPERATION, Inspection Mode.>.

• WIRING DIAGRAM:

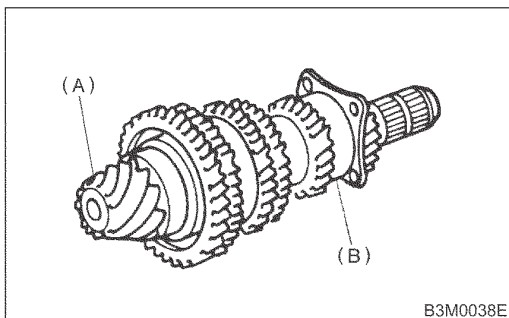


No.	Step	Check	Yes	No
1	CHECK GROUND CIRCUIT OF ECM. 1) Turn ignition switch to OFF. 2) Disconnect connector from ECM. 3) Measure resistance of harness between ECM connector and chassis ground. Connector & terminal (B134) No. 35 — Chassis ground:	Is the resistance less than 5 Ω?	Go to step 3.	Go to step 2.

DRIVE PINION SHAFT ASSEMBLY

Manual Transmission and Differential

- The ball bearing on the rear side of the drive pinion shaft should be checked for smooth rotation before the drive pinion assembly is disassembled. In this case, because a preload is working on the bearing, its rotation feels like it is slightly dragging unlike the other bearings.

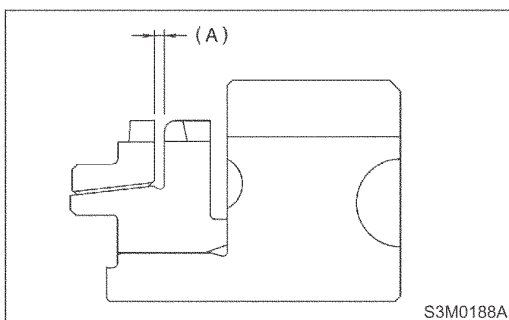


(A) Drive pinion shaft
(B) Ball bearing

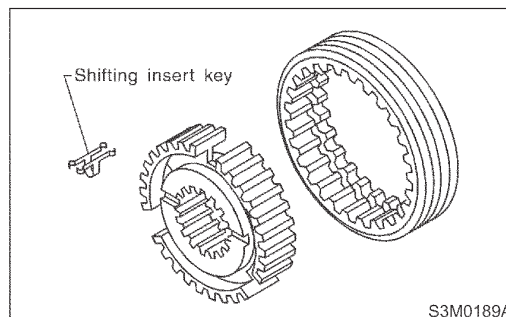
- Bearings having other defects
- 2) Bushing (each gear)
Replace the bushing in the following cases:
- When the sliding surface is damaged or abnormally worn.
 - When the inner wall is abnormally worn.
- 3) Gears
- Replace gears with new ones if their tooth surfaces are broken, damaged, or excessively worn.
 - Correct or replace if the cone that contacts the baulk ring is rough or damaged.
 - Correct or replace if the inner surface or end face is damaged.
- 4) Baulk ring
Replace the ring in the following cases:
- When the inner surface and end face are damaged.
 - When the ring inner surface is abnormally or partially worn down.
 - If the gap between the end faces of the ring and the gear splined part is excessively small when the ring is pressed against the cone.

Clearance (A):

0.5 — 1.0 mm (0.020 — 0.040 in)



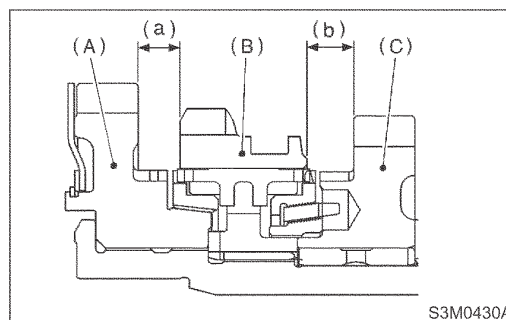
- When the contact surface of the synchronizer ring insert is scored or abnormally worn down.
- 5) Shifting insert key
Replace the insert if deformed, excessively worn, or defective in any way.



- 6) Oil seal
Replace the oil seal if the lip is deformed, hardened, damaged, worn, or defective in any way.
- 7) O-ring
Replace the O-ring if the sealing face is deformed, hardened, damaged, worn, or defective in any way.
- 8) Gearshift mechanism
Repair or replace the gearshift mechanism if excessively worn, bent, or defective in any way.
- 9) Inspect clearance between 1st, 2nd driven gear and reverse driven gear.

Clearance (a) and (b):

9.5 mm (0.374 in)



(A) 1st driven gear
(B) Reverse driven gear
(C) 2nd driven gear

1st and 2nd shifter fork		
Part No.	Mark	Remarks
32804AA060	1	Approach to 1st gear by 0.2 mm (0.008 in).
32804AA070	—	Standard
32804AA080	3	Approach to 2nd gear by 0.2 mm (0.008 in).

MT-65

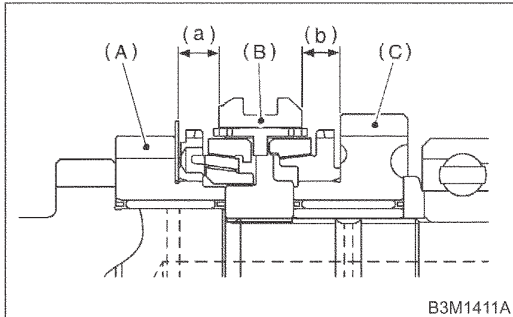
Replacement page for MSA5T0113A

DRIVE PINION SHAFT ASSEMBLY

Manual Transmission and Differential

10) Inspect clearance between 3rd, 4th drive gear and coupling sleeve. If any clearance is not within specifications, replace shifter fork as required.

Clearance (a) and (b):
9.3 mm (0.366 in)

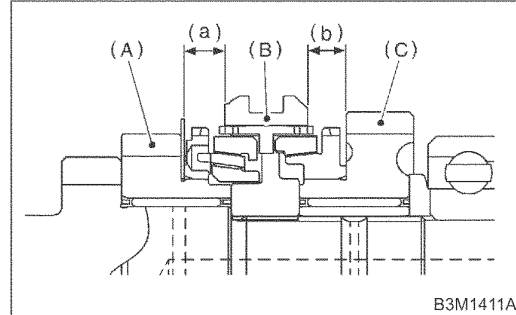


- (A) 3rd drive gear
 (B) Coupling sleeve
 (C) 4th drive gear

3rd – 4th shifter fork		
Part No.	Mark	Remarks
32810AA061	1	Approach to 4th gear by 0.2 mm (0.008 in).
32810AA071	—	Standard
32810AA101	3	Approach to 3rd gear by 0.2 mm (0.008 in).

11) Inspect clearance between 5th drive gear and coupling sleeve. If any clearance is not within specifications, replace shifter fork as required.

Clearance (a):
9.3 mm (0.374 in)



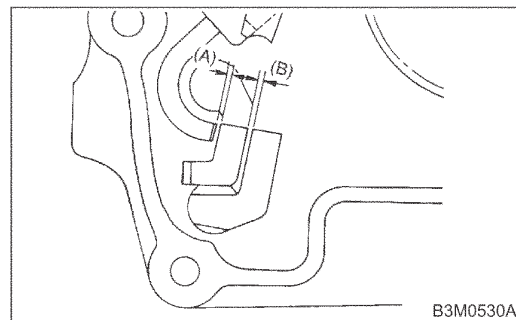
- (A) 5th drive gear
 (B) Coupling sleeve

5th shifter fork		
Part No.	Mark	Remarks
32812AA200	7	Approach to 5th gear by 0.2 mm (0.008 in).
32812AA210	—	Standard
32812AA220	9	Become distant from 5th gear by 0.2 mm (0.008 in).

12) Inspect rod end clearances (A) and (B). If any clearance is not within specifications, replace rod or fork as required.

Clearance (A):
1st — 2nd to 3rd — 4th:
0.4 — 1.4 mm(0.016 — 0.055 in)

Clearance (B):
3rd — 4th to 5th:
0.5 — 1.3 mm(0.020 — 0.051 in)



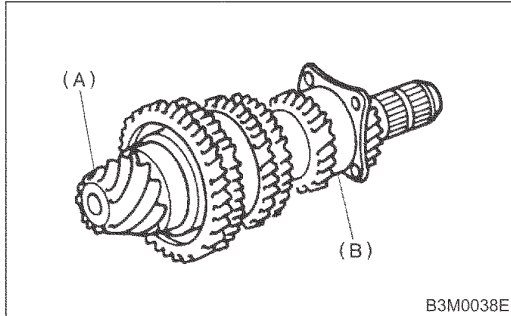
MT-66

Replacement page for MSA5T0113A

DRIVE PINION SHAFT ASSEMBLY

Manual Transmission and Differential

- The ball bearing on the rear side of the drive pinion shaft should be checked for smooth rotation before the drive pinion assembly is disassembled. In this case, because a preload is working on the bearing, its rotation feels like it is slightly dragging unlike the other bearings.

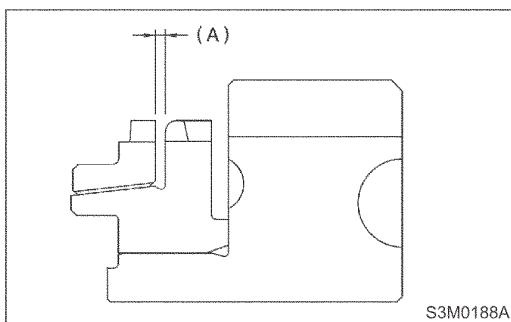


(A) Drive pinion shaft
(B) Ball bearing

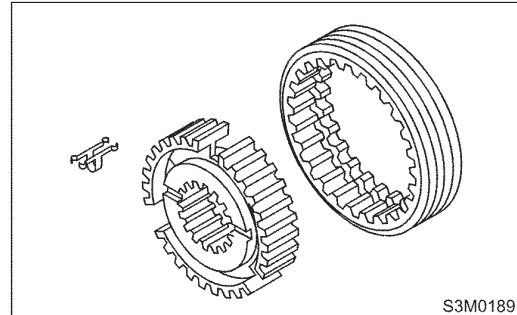
- Bearings having other defects
- 2) Bushing (each gear)
Replace the bushing in the following cases:
- When the sliding surface is damaged or abnormally worn.
 - When the inner wall is abnormally worn.
- 3) Gears
- Replace gears with new ones if their tooth surfaces are broken, damaged, or excessively worn.
 - Correct or replace if the cone that contacts the baulk ring is rough or damaged.
 - Correct or replace if the inner surface or end face is damaged.
- 4) Baulk ring
Replace the ring in the following cases:
- When the inner surface and end face are damaged.
 - When the ring inner surface is abnormally or partially worn down.
 - If the gap between the end faces of the ring and the gear splined part is excessively small when the ring is pressed against the cone.

Clearance (A):

0.5 — 1.0 mm (0.020 — 0.040 in)



- When the contact surface of the synchronizer ring insert is scored or abnormally worn down.
- 5) Shifting insert key
Replace the insert if deformed, excessively worn, or defective in any way.



6) Oil seal

Replace the oil seal if the lip is deformed, hardened, damaged, worn, or defective in any way.

7) O-ring

Replace the O-ring if the sealing face is deformed, hardened, damaged, worn, or defective in any way.

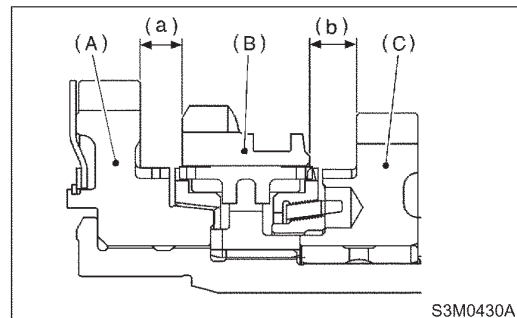
8) Gearshift mechanism

Repair or replace the gearshift mechanism if excessively worn, bent, or defective in any way.

9) Inspect clearance between 1st, 2nd driven gear and reverse driven gear. If any clearance is not within specifications, replace shifter fork as required.

Clearance (a) and (b):

9.5 mm (0.374 in)



(A) 1st driven gear
(B) Reverse driven gear
(C) 2nd driven gear

1st – 2nd shifter fork		
Part No.	Mark	Remarks
32804AA060	1	Approach to 1st gear by 0.2 mm (0.008 in).
32804AA070	—	Standard
32804AA080	3	Approach to 2nd gear by 0.2 mm (0.008 in).

MT-65

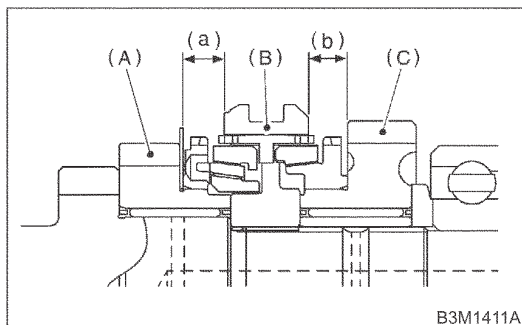
Replacement page for MSA5T0104A

DRIVE PINION SHAFT ASSEMBLY

Manual Transmission and Differential

10) Inspect clearance between 3rd, 4th drive gear and coupling sleeve. If any clearance is not within specifications, replace shifter fork as required.

Clearance (a) and (b):
9.3 mm (0.366 in)

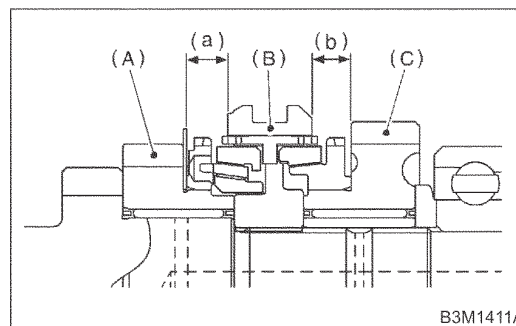


- (A) 3rd drive gear
 (B) Coupling sleeve
 (C) 4th drive gear

3rd – 4th shifter fork		
Part No.	Mark	Remarks
32810AA061	1	Approach to 4th gear by 0.2 mm (0.008 in).
32810AA071	—	Standard
32810AA101	3	Approach to 3rd gear by 0.2 mm (0.008 in).

11) Inspect clearance between 5th drive gear and coupling sleeve. If any clearance is not within specifications, replace shifter fork as required.

Clearance (a):
9.3 mm (0.366 in)



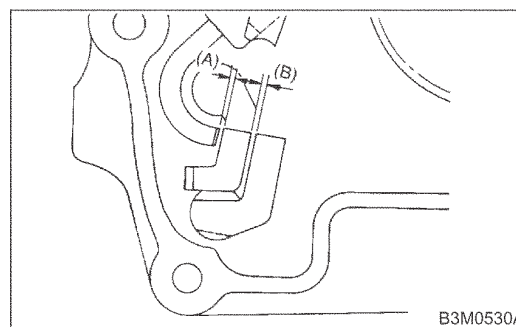
- (A) 5th drive gear
 (B) Coupling sleeve

5th shifter fork		
Part No.	Mark	Remarks
32812AA201	7	Approach to 5th gear by 0.2 mm (0.008 in).
32812AA211	—	Standard
32812AA221	9	Become distant from 5th gear by 0.2 mm (0.008 in).

12) Inspect rod end clearances (A) and (B). If any clearance is not within specifications, replace rod or fork as required.

Clearance (A):
1st — 2nd to 3rd — 4th:
0.4 — 1.4 mm (0.016 — 0.055 in)

Clearance (B):
3rd — 4th to 5th:
0.5 — 1.3 mm (0.020 — 0.051 in)



SHIFTER FORK AND ROD

Manual Transmission and Differential

CAUTION:

Apply a coat of grease to plunger to prevent it from falling.

6) Install 3-4 fork rod into 3-4 shifter fork via the hole on the rear of transmission case.

7) Align the holes in rod and fork, and drive straight pin into these holes.

CAUTION:

Replace straight pin with a new one.

NOTE:

- Set reverse fork rod to neutral.
- Make sure interlock plunger (installing before) is on the reverse fork rod side.

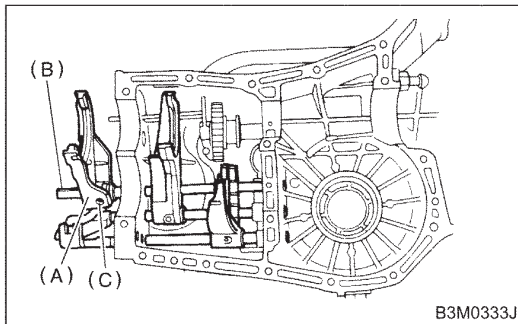
ST 398791700 STRAIGHT PIN REMOVER

8) Install 5th shifter fork onto the rear of reverse fork rod. Align holes in the two parts and drive straight pin into place.

CAUTION:

Replace straight pin with a new one.

ST 398791700 STRAIGHT PIN REMOVER

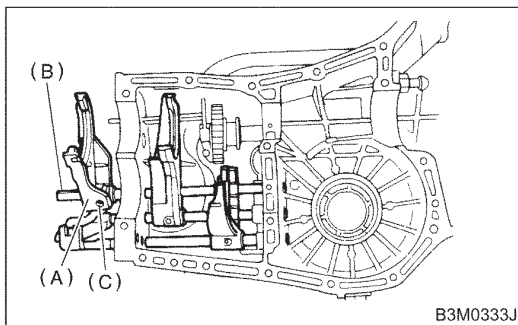


- (A) 5th shifter fork
(B) Reverse fork rod
(C) Straight pin

9) Position balls, checking ball springs and gaskets into 3-4 and 1-2 rod holes, and install plugs.

CAUTION:

Replace gasket with a new one.



10) Install differential assembly. <Ref. to MT-68, INSTALLATION, Front Differential Assembly.>

11) Install main shaft assembly.

12) Install drive pinion shaft assembly. <Ref. to MT-59, INSTALLATION, Drive Pinon Shaft Assembly.>

13) Install transmission case. <Ref. to MT-50, INSTALLATION, Transmission Case.>

14) Install transfer case with extension case assembly. <Ref. to MT-38, INSTALLATION, Transfer Case and Extension Case Assembly.>

15) Install back-up light switch and neutral position switch. <Ref. to MT-34, INSTALLATION, Switches and Harness.>

16) Install the manual transmission assembly to vehicle. <Ref. to MT-28, INSTALLATION, Manual Transmission Assembly.>

C: INSPECTION

S503255A10

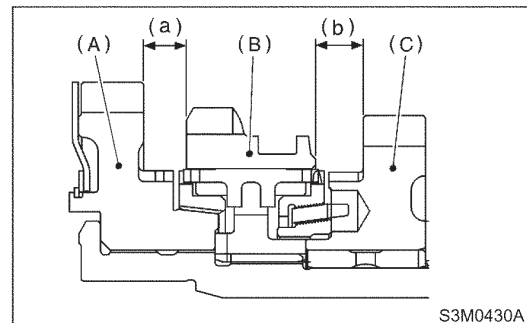
1) Check the shift shaft and shift rod for damage. Replace if damaged.

2) Gearshift mechanism

Repair or replace the gearshift mechanism if excessively worn, bent, or defective in any way.

3) Inspect clearance between 1st, 2nd driven gear and reverse driven gear. If any clearance is not within specifications, replace shifter fork as required.

**Clearance (a) and (b):
9.5 mm (0.374 in)**



- (A) 1st driven gear
(B) Reverse driven gear
(C) 2nd driven gear

1st – 2nd shifter fork		
Part No.	Mark	Remarks
32804AA060	1	Approach to 1st gear by 0.2 mm (0.008 in).
32804AA070	—	Standard
32804AA080	3	Approach to 2nd gear by 0.2 mm (0.008 in).

MT-78

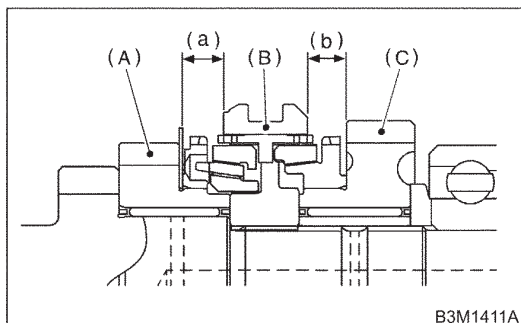
Replacement page for MSA5T0224A

SHIFTER FORK AND ROD

Manual Transmission and Differential

4) Inspect clearance between 3rd, 4th drive gear and coupling sleeve. If any clearance is not within specifications, replace shifter fork as required.

Clearance (a) and (b):
9.3 mm (0.366 in)

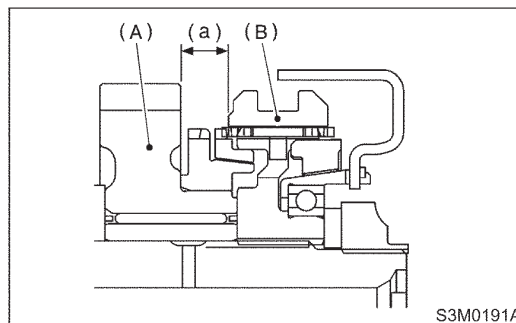


- (A) 3rd drive gear
- (B) Coupling sleeve
- (C) 4th drive gear

3rd – 4th shifter fork		
Part No.	Mark	Remarks
32810AA061	1	Approach to 4th gear by 0.2 mm (0.008 in).
32810AA071	—	Standard
32810AA101	3	Approach to 3rd gear by 0.2 mm (0.008 in).

5) Inspect clearance between 5th drive gear and coupling sleeve. If any clearance is not within specifications, replace shifter fork as required.

Clearance (a):
9.3 mm (0.366 in)



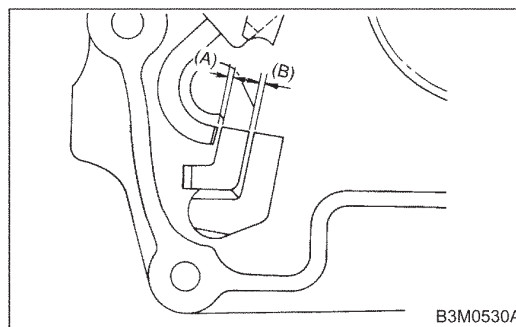
- (A) 5th drive gear
- (B) Coupling sleeve

5th shifter fork		
Part No.	Mark	Remarks
32812AA201	7	Approach to 5th gear by 0.2 mm (0.008 in).
32812AA211	—	Standard
32812AA221	9	Become distant from 5th gear by 0.2 mm (0.008 in).

6) Inspect rod end clearances (A) and (B). If any clearance is not within specifications, replace rod or fork as required.

Clearance (A):
1st — 2nd to 3rd — 4th:
0.4 — 1.4 mm (0.016 — 0.055 in)

Clearance (B):
3rd — 4th to 5th:
0.5 — 1.3 mm (0.020 — 0.051 in)



SHIFTER FORK AND ROD

MANUAL TRANSMISSION AND DIFFERENTIAL

C: INSPECTION

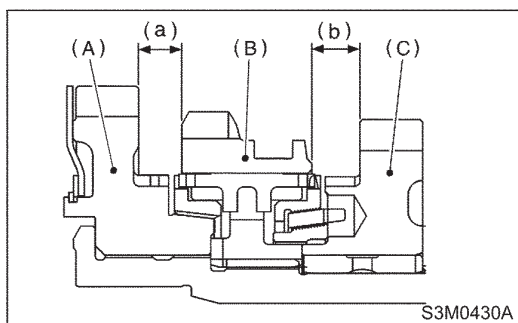
1) Check the shift shaft and shift rod for damage. Replace if damaged.

2) Gearshift mechanism

Repair or replace the gearshift mechanism if excessively worn, bent, or defective in any way.

3) Inspect the clearance between 1st, 2nd driven gear and reverse driven gear. If any clearance is not within specifications, replace the shifter fork as required.

Clearance (a) and (b):
9.5 mm (0.374 in)

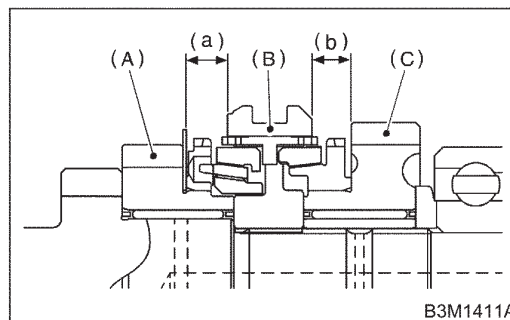


- (A) 1st driven gear
- (B) Reverse driven gear
- (C) 2nd driven gear

1st-2nd shifter fork		
Part No.	Mark	Remarks
32804AA060	1	Approach to 1st gear by 0.2 mm (0.008 in).
32804AA070	—	Standard
32804AA080	3	Approach to 2nd gear by 0.2 mm (0.008 in).

4) Inspect the clearance between 3rd, 4th drive gear and coupling sleeve. If any clearance is not within specifications, replace shifter fork as required.

Clearance (a) and (b):
9.3 mm (0.366 in)



- (A) 3rd drive gear
- (B) Coupling sleeve
- (C) 4th drive gear

3rd-4th shifter fork		
Part No.	Mark	Remarks
32810AA061	1	Approach to 4th gear by 0.2 mm (0.008 in).
32810AA071	—	Standard
32810AA101	3	Approach to 3rd gear by 0.2 mm (0.008 in).

SHIFTER FORK AND ROD

Manual Transmission and Differential

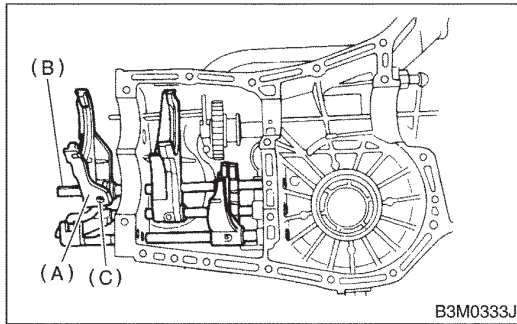
NOTE:

- Set reverse fork rod to neutral.
- Make sure interlock plunger (installing before) is on the reverse fork rod side.

ST 398791700 STRAIGHT PIN REMOVER

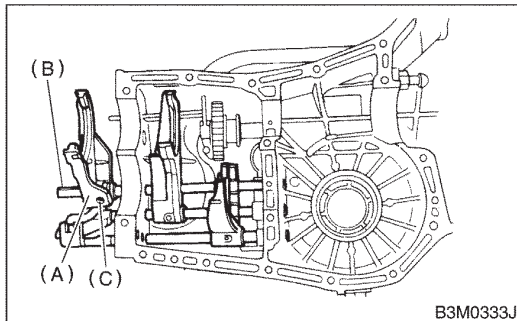
8) Install 5th shifter fork onto the rear of reverse fork rod. Align holes in the two parts and new drive straight pin into place.

ST 398791700 STRAIGHT PIN REMOVER



- (A) 5th shifter fork
(B) Reverse fork rod
(C) Straight pin

9) Position balls, checking ball springs and new gaskets into 3-4 and 1-2 rod holes, and install plugs.



10) Install differential assembly. <Ref. to MT-69, INSTALLATION, Front Differential Assembly.>

11) Install main shaft assembly.

12) Install drive pinion shaft assembly. <Ref. to MT-60, INSTALLATION, Drive Pinon Shaft Assembly.>

13) Install transmission case. <Ref. to MT-51, INSTALLATION, Transmission Case.>

14) Install transfer case with extension case assembly. <Ref. to MT-39, INSTALLATION, Transfer Case and Extension Case Assembly.>

15) Install back-up light switch and neutral position switch. <Ref. to MT-35, INSTALLATION, Switches and Harness.>

16) Install the manual transmission assembly to vehicle. <Ref. to MT-29, INSTALLATION, Manual Transmission Assembly.>

C: INSPECTION

S503255A10

1) Check the shift shaft and shift rod for damage. Replace if damaged.

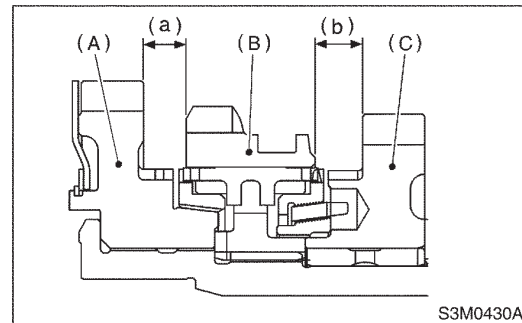
2) Gearshift mechanism

Repair or replace the gearshift mechanism if excessively worn, bent, or defective in any way.

3) Inspect clearance between 1st, 2nd driven gear and reverse driven gear. If any clearance is not within specifications, replace shifter fork as required.

Clearance (a) and (b):

9.5 mm (0.374 in)



- (A) 1st driven gear
(B) Reverse driven gear
(C) 2nd driven gear

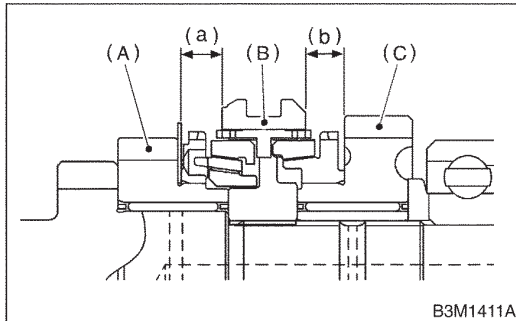
1st-2nd shifter fork		
Part No.	Mark	Remarks
32804AA060	1	Approach to 1st gear by 0.2 mm (0.008 in).
32804AA070	—	Standard
32804AA080	3	Approach to 2nd gear by 0.2 mm (0.008 in).

SHIFTER FORK AND ROD

Manual Transmission and Differential

4) Inspect clearance between 3rd, 4th drive gear and coupling sleeve. If any clearance is not within specifications, replace shifter fork as required.

Clearance (a) and (b):
9.3 mm (0.366 in)

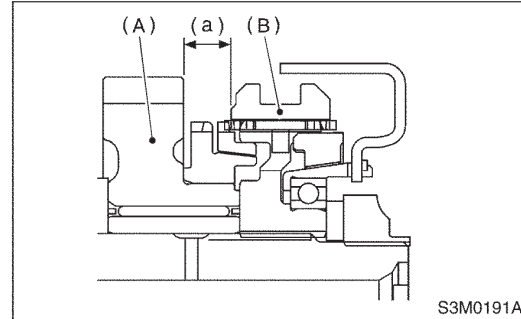


- (A) 3rd drive gear
- (B) Coupling sleeve
- (C) 4th drive gear

3rd-4th shifter fork		
Part No.	Mark	Remarks
32810AA061	1	Approach to 4th gear by 0.2 mm (0.008 in).
32810AA071	—	Standard
32810AA101	3	Approach to 3rd gear by 0.2 mm (0.008 in).

5) Inspect clearance between 5th drive gear and coupling sleeve. If any clearance is not within specifications, replace shifter fork as required.

Clearance (a):
9.3 mm (0.366 in)



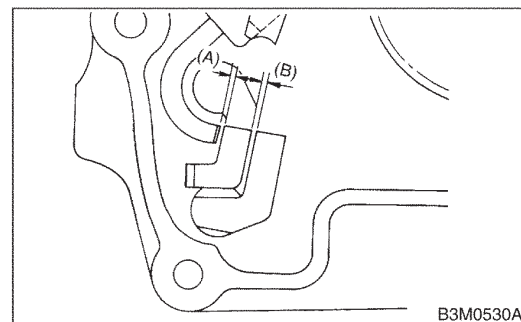
- (A) 5th drive gear
- (B) Coupling sleeve

5th shifter fork		
Part No.	Mark	Remarks
32812AA201	7	Approach to 5th gear by 0.2 mm (0.008 in).
32812AA211	—	Standard
32812AA221	9	Become distant from 5th gear by 0.2 mm (0.008 in).

6) Inspect rod end clearances (A) and (B). If any clearance is not within specifications, replace rod or fork as required.

Clearance (A):
1st — 2nd to 3rd — 4th:
0.4 — 1.4 mm (0.016 — 0.055 in)

Clearance (B):
3rd — 4th to 5th:
0.5 — 1.3 mm (0.020 — 0.051 in)

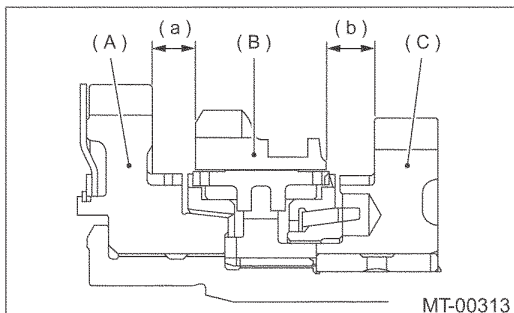


SHIFTER FORK AND ROD

MANUAL TRANSMISSION AND DIFFERENTIAL

3) Inspect the clearance between 1st, 2nd driven gear and reverse driven gear. If any clearance is not within specifications, replace the shifter fork as required.

Clearance (a) and (b):
9.5 mm (0.374 in)

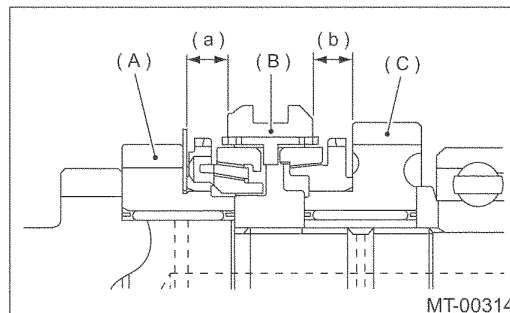


- (A) 1st driven gear
- (B) Reverse driven gear
- (C) 2nd driven gear

1st-2nd shifter fork		
Part No.	Mark	Remarks
32804AA060	1	Approach to 2nd gear by 0.2 mm (0.008 in).
32804AA070	—	Standard
32804AA080	3	Approach to 1st gear by 0.2 mm (0.008 in).

4) Inspect the clearance between 3rd, 4th drive gear and coupling sleeve. If any clearance is not within specifications, replace shifter fork as required.

Clearance (a) and (b):
9.3 mm (0.366 in)



- (A) 3rd drive gear
- (B) Coupling sleeve
- (C) 4th drive gear

3rd-4th shifter fork		
Part No.	Mark	Remarks
32810AA061	1	Approach to 4th gear by 0.2 mm (0.008 in).
32810AA071	—	Standard
32810AA101	3	Approach to 3rd gear by 0.2 mm (0.008 in).

SHIFTER FORK AND ROD

MANUAL TRANSMISSION AND DIFFERENTIAL

C: INSPECTION

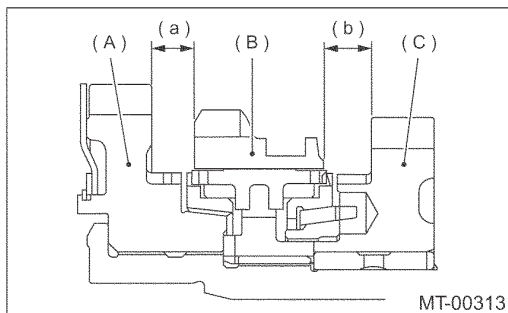
1) Check the shift shaft and shift rod for damage. Replace if damaged.

2) Gearshift mechanism

Repair or replace the gearshift mechanism if excessively worn, bent, or defective in any way.

3) Inspect clearance between 1st, 2nd driven gear and reverse driven gear. If any clearance is not within specifications, replace shifter fork as required.

Clearance (a) and (b):
9.5 mm (0.374 in)

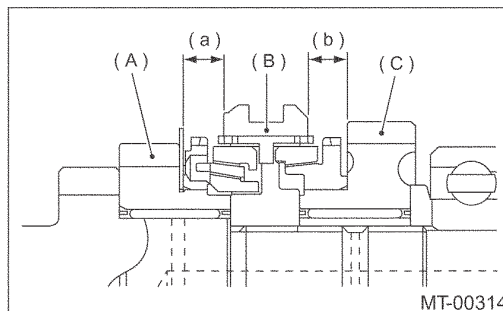


- (A) 1st driven gear
- (B) Reverse driven gear
- (C) 2nd driven gear

1st-2nd shifter fork		
Part No.	Mark	Remarks
32804AA060	1	Approach to 1st gear by 0.2 mm (0.008 in).
32804AA070	—	Standard
32804AA080	3	Approach to 2nd gear by 0.2 mm (0.008 in).

4) Inspect clearance between 3rd, 4th drive gear and coupling sleeve. If any clearance is not within specifications, replace shifter fork as required.

Clearance (a) and (b):
9.3 mm (0.366 in)

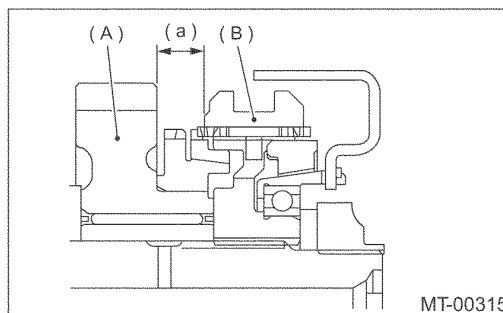


- (A) 3rd drive gear
- (B) Coupling sleeve
- (C) 4th drive gear

3rd-4th shifter fork		
Part No.	Mark	Remarks
32810AA061	1	Approach to 4th gear by 0.2 mm (0.008 in).
32810AA071	—	Standard
32810AA101	3	Approach to 3rd gear by 0.2 mm (0.008 in).

5) Inspect clearance between 5th drive gear and coupling sleeve. If any clearance is not within specifications, replace shifter fork as required.

Clearance (a):
9.3 mm (0.366 in)



- (A) 5th drive gear
- (B) Coupling sleeve

SHIFTER FORK AND ROD

MANUAL TRANSMISSION AND DIFFERENTIAL

~, ...install the 3-4 fork rod into 3-4 shifter fork via the hole on the rear of transmission case.

7) Align the holes in rod and fork, and new drive straight pin into these holes.

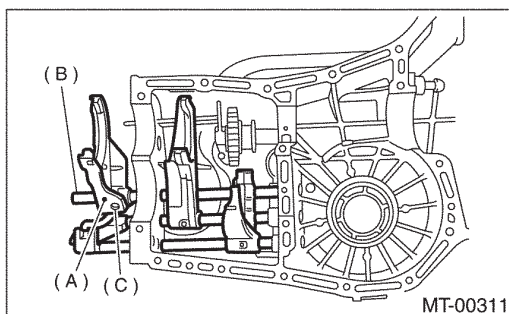
NOTE:

- Set the reverse fork rod to neutral.
- Make sure the interlock plunger (installing before) is on the reverse fork rod side.

ST 398791700 STRAIGHT PIN REMOVER

8) Install the 5th shifter fork onto the rear of reverse fork rod. Align holes in the two parts and new drive straight pin into place.

ST 398791700 STRAIGHT PIN REMOVER

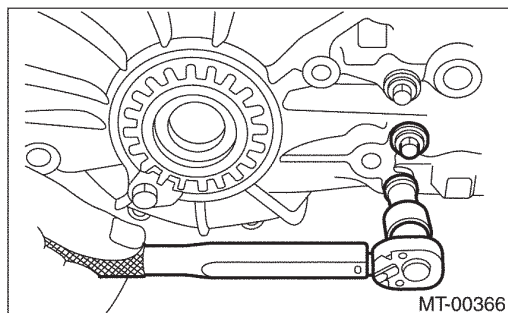


- (A) 5th shifter fork
- (B) Reverse fork rod
- (C) Straight pin

9) Position the balls, checking ball springs and new gaskets into 3-4 and 1-2 rod holes, and install plugs.

Tightening torque:

20 N·m (2.0 kgf·m, 14.1 ft·lb)



10) Install the differential assembly. <Ref. to 5MT-72, INSTALLATION, Front Differential Assembly.>

11) Install the main shaft assembly.

<Ref. to 5MT-58, INSTALLATION, Main Shaft Assembly.>

12) Install the drive pinion shaft assembly. <Ref. to 5MT-64, INSTALLATION, Drive Pinion Shaft Assembly.>

13) Install the transmission case. <Ref. to 5MT-56, INSTALLATION, Transmission Case.>

14) Install the transfer case with extension case assembly. <Ref. to 5MT-43, INSTALLATION, Transfer Case and Extension Case Assembly.>

15) Install the back-up light switch and neutral position switch. <Ref. to 5MT-39, INSTALLATION, Switches and Harness.>

16) Install the manual transmission assembly to vehicle. <Ref. to 5MT-31, INSTALLATION, Manual Transmission Assembly.>

C: INSPECTION

1) Check the shift shaft and shift rod for damage. Replace if damaged.

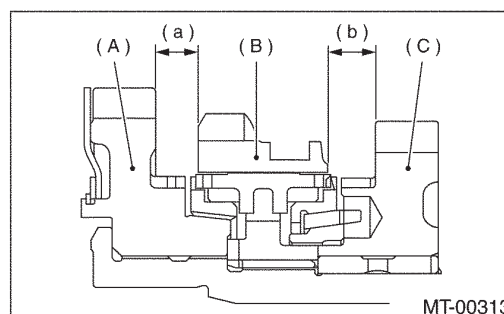
2) Gearshift mechanism:

Repair or replace the gearshift mechanism if excessively worn, bent, or defective in any way.

3) Inspect the clearance between 1st, 2nd driven gear and reverse driven gear. If any clearance is not within specifications, replace the shifter fork as required.

Clearance (a) and (b):

9.5 mm (0.374 in)



- (A) 1st driven gear
- (B) Reverse driven gear
- (C) 2nd driven gear

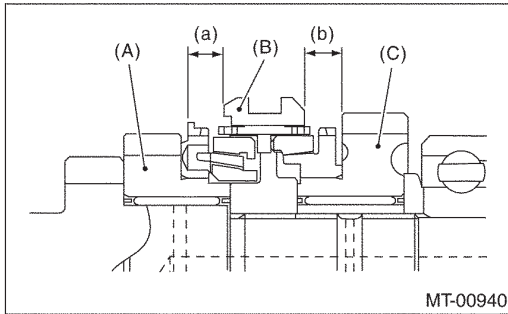
1st-2nd shifter fork		
Part No.	Mark	Remarks
32804AA060	1	Approach to 1st gear by 0.2 mm (0.008 in).
32804AA070	—	Standard
32804AA080	3	Approach to 2nd gear by 0.2 mm (0.008 in).

SHIFTER FORK AND ROD

MANUAL TRANSMISSION AND DIFFERENTIAL

4) Inspect the clearance between 3rd, 4th drive gear and coupling sleeve. If any clearance is not within specifications, replace the shifter fork as required.

Clearance (a) and (b):
9.3 mm (0.366 in)

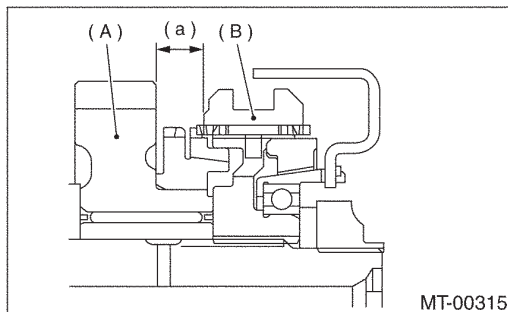


- (A) 3rd drive gear
- (B) Coupling sleeve
- (C) 4th drive gear

3rd-4th shifter fork		
Part No.	Mark	Remarks
32810AA061	1	Approach to 4th gear by 0.2 mm (0.008 in).
32810AA071	—	Standard
32810AA101	3	Approach to 3rd gear by 0.2 mm (0.008 in).

5) Inspect the clearance between 5th drive gear and coupling sleeve. If any clearance is not within specifications, replace the shifter fork as required.

Clearance (a):
9.3 mm (0.366 in)



- (A) 5th drive gear
- (B) Coupling sleeve

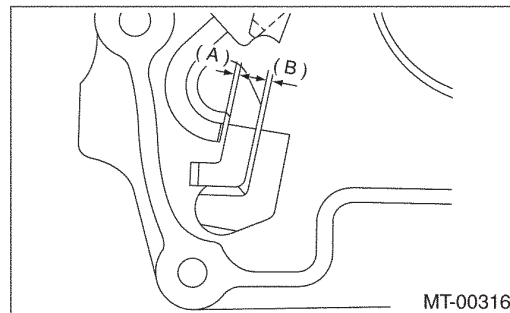
5th shifter fork (Non-TURBO)		
Part No.	Mark	Remarks
32812AA201	7	Approach to 5th gear by 0.2 mm (0.008 in).
32812AA211	—	Standard
32812AA221	9	Become distant from 5th gear by 0.2 mm (0.008 in).

5th shifter fork (Turbo)		
Part No.	Mark	Remarks
32812AA231	7	Approach to 5th gear by 0.2 mm (0.008 in).
32812AA241	—	Standard
32812AA251	9	Become distant from 5th gear by 0.2 mm (0.008 in).

6) Inspect the rod end clearances (A) and (B). If any clearance is not within specifications, replace the rod or fork as required.

Clearance (A):
1st-2nd to 3rd-4th:
0.4 — 1.4 mm (0.016 — 0.055 in)

Clearance (B):
3rd-4th to 5th:
0.5 — 1.3 mm (0.020 — 0.051 in)



5MT-85

replacement page for MSA5T0405A

SHIFTER FORK AND ROD

MANUAL TRANSMISSION AND DIFFERENTIAL

C: INSPECTION

1) Check the shift shaft and shift rod for damage. Replace if damaged.

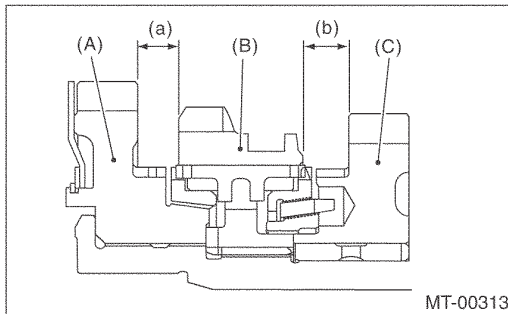
2) Gearshift mechanism:

Repair or replace the gearshift mechanism if excessively worn, bent, or defective in any way.

3) Inspect the clearance between 1st, 2nd driven gear and reverse driven gear. If any clearance is not within specifications, replace the shifter fork as required.

Clearance (a) and (b):

9.5 mm (0.374 in)



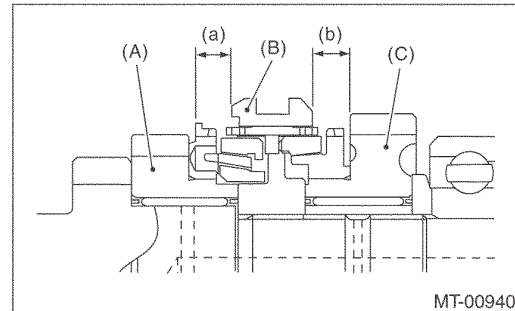
- (A) 1st driven gear
- (B) Reverse driven gear
- (C) 2nd driven gear

1st-2nd shifter fork		
Part No.	Mark	Remarks
32804AA060	1	Approach to 1st gear by 0.2 mm (0.008 in).
32804AA070	—	Standard
32804AA080	3	Approach to 2nd gear by 0.2 mm (0.008 in).

4) Inspect the clearance between 3rd, 4th drive gear and coupling sleeve. If any clearance is not within specifications, replace the shifter fork as required.

Clearance (a) and (b):

7.3 mm (0.287 in)



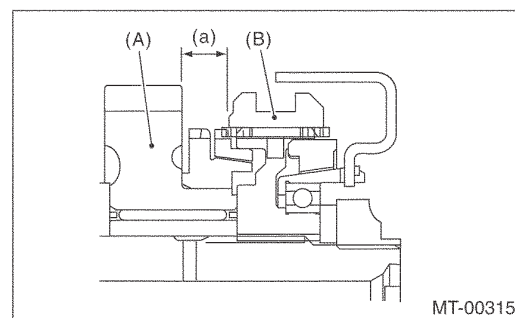
- (A) 3rd drive gear
- (B) Coupling sleeve
- (C) 4th drive gear

3rd-4th shifter fork		
Part No.	Mark	Remarks
32810AA061	1	Approach to 4th gear by 0.2 mm (0.008 in).
32810AA071	—	Standard
32810AA101	3	Approach to 3rd gear by 0.2 mm (0.008 in).

5) Inspect the clearance between 5th drive gear and coupling sleeve. If any clearance is not within specifications, replace the shifter fork as required.

Clearance (a):

9.3 mm (0.366 in)



- (A) 5th drive gear
- (B) Coupling sleeve



SERVICE BULLETIN

APPLICABILITY: 2002MY Legacy, Forester & Impreza
SUBJECT: Service Manual Corrections

NUMBER: 18-101-06
DATE: 02/13/06

INTRODUCTION

The purpose of this bulletin is to provide a description of current changes to Service Manuals available via the Subaru Technical Information System (STIS) web site. The tables contained within this bulletin are to be used as guides for becoming aware of the latest changes. We advise you to always refer to the STIS web site when looking for the latest Service information. Printed pages will **not** be made available to update printed Service Manuals.

YEAR	MODEL	BOOK/ VOL#	MSA#	SECTION	PAGE	DESCRIPTION OF CHANGE
2002	Legacy	2	MSA5T0202A	Engine	Emission Control Content Page	10. "Atmospheric Pressure Solenoid Valve" changed to "Fuel Tank Sensor Control Valve".
					EC-10 & 11	"Atmospheric Pressure Solenoid Valve" changed to "Fuel Tank Sensor Control Valve".
					EN-18	"Atmospheric Pressure Solenoid Valve" changed to "Fuel Tank Sensor Control Valve".
					EN-28	"Fuel Tank Pressure Control Solenoid Valve" changed to "Pressure Control Solenoid Valve". "Fuel tank sensor control valve" is added to the table.
					EN-205	For DTC P0442 illustration is changed.
					EN-208	For DTC P0447 illustration changed.
					EN-209 & 210	Connector designation R69 changed to R143.
					EN-212, 225, 229, 312, 320	Illustrations are changed.
					EN-304 to 306	For DTC P1400 Illustration is changed. In the diagnostic steps "Fuel Tank Pressure Control Solenoid Valve" changed to "Pressure Control Solenoid Valve".



CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.

Subaru Service Bulletins are intended for use by professional technicians ONLY. They are written to inform those technicians of conditions that may occur in some vehicles, or to provide information that could assist in the proper servicing of the vehicle. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do the job correctly and safely. If a condition is described, DO NOT assume that this Service Bulletin applies to your vehicle, or that your vehicle will have that condition.

YEAR	MODEL	BOOK/ VOL#	MSA#	SECTION	PAGE	DESCRIPTION OF CHANGE
2002	Legacy	2	MSA5T0202A	Engine	EN-308 & 309	For DTC P1400 Illustration is changed. In the diagnostic steps "Fuel Tank Pressure Control Solenoid Valve" changed to "Pressure Control Solenoid Valve".
					EN-314 to 316	For DTC P1446 illustration is changed. In the diagnosis steps "Atmospheric Pressure Solenoid Valve" changed to "Fuel Tank Sensor Control Valve".
					EN-318, 319	For DTC P1447 illustration is changed. In the diagnosis steps "Atmospheric Pressure Solenoid Valve" changed to "Fuel Tank Sensor Control Valve".
		3	MSA5T0203A	Engine H6	EN(H6)-28	"Fuel Tank Pressure Control Solenoid Valve" changed to "Pressure Control Solenoid Valve"
					EN(H6)-230 to 232	Illustration changed. In the diagnostic steps connector No. "(R69)" is changed to "(R143)".
					EN(H6)-234, 247, 346	Illustrations are changed.
					EN(H6)-340 to 342	For DTC P1400 Illustration is changed. In the diagnostic steps "Fuel Tank Pressure Control Solenoid Valve" changed to "Pressure Control Solenoid Valve".
					EN(H6)-344, 345	For DTC P1420 Illustration is changed. In the diagnostic steps "Fuel Tank Pressure Control Solenoid Valve" changed to "Pressure Control Solenoid Valve".
		6	MSA5T0206A	Brakes	BR-15 & 21	Specification changes.
		7	MSA5T0207A	Body	EB-14	Many changes, review on STIS.
					CC-3	Steps under Installation changed.
		8	MSA5T0208A	Wiring System	WI-2	60. "HARNESS REPAIR KIT" is added.
					WI-11	Illustration is changed.
					WI-12	13. Harness Repair Kit is added.
					WI-22, 23, 25, 28-30, 36, 38-40, 42-44, 47, 48, 50-62, 77, 78, 80, 81, 84, 88-93, 95-104, 106, 107, 113-115, 121, 129, 131, 134, 140, 141, 143, 148, 152, 153, 158, 159	All listed pages have been changed to reflect designation for use with the Harness Repair kit.
					WI-86, 94	Illustrations are changed.

YEAR	MODEL	BOOK/ VOL#	MSA#	SECTION	PAGE	DESCRIPTION OF CHANGE
2002	Legacy	8	MSA5T0208A	Wiring System	WI-189 & 191	In the table, “Atmospheric Pressure Solenoid Valve” is changed to “Drain valve” and “Internal pressure solenoid valve” is changed to “Fuel tank sensor control valve”.
					WI-193 to 204	Pages added for “Harness Repair Kit” Section.
2002	Forester	4	MSA5T0223A	Engine Diagnostic	EN-16	Callout (4) “Air filter” is changed to “Drain filter”.
					EN-24	“Fuel Tank Pressure Control Solenoid Valve” is changed to “Pressure Control Solenoid Valve”.
					EN-274 to 276 / 280* to 282*	For DTC P1400, illustration changed. In the diagnostic steps “Fuel Tank Pressure Control Solenoid Valve” is changed to “Pressure Control Solenoid Valve”.
					EN-278, 279 / 284*, 285* * indicates page number on STIS.	For DTC P1420 illustration changed. In the diagnostic steps “Fuel Tank Pressure Control Solenoid Valve” is changed to “Pressure Control Solenoid Valve”.
		6	MSA5T0225A	Brake	BR-17 & 23	Steps changed to reflect resurfacing of the rotors instead of replacement.
2002	Impreza	3	MSA5T0212A	Engine 2 (DOHC)	EN(DOHC TURBO)-277, 281	For DTCS P1086, 1087 wording for Throttle Position Sensor corrected to Tumble Generator Valve Position Sensor.
					EN(DOHC TURBO)-283, 284	Diagnostic steps for DTC P1088 changes/corrected.
					EN(DOHC TURBO)-290, 291	For DTCs P1092 & 1093 wording for Tumble Generator Valve RH is corrected to Tumble Generator Valve LH.
		4	MSA5T0213A	Transmission	MT-56	Front Diff. Backlash adjustment steps corrected/changed.

ATTENTION:GENERAL MANAGER ☐
CLAIMS PERSONNEL ☐PARTS MANAGER ☐
SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial

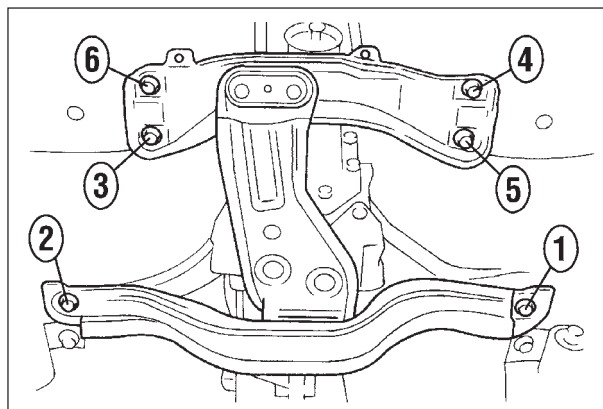
SUBARU **SERVICE BULLETIN****APPLICABILITY:** All A/T and M/T Vehicles
SUBJECT: Transmission Rear Cross-Member**NUMBER:** 03-53-04
16-54-04
DATE: 08/20/04**INTRODUCTION**

The purpose of this bulletin is to prevent the possibility of damaging the bolts and/or threads that secure the transmission rear cross member.

REPAIR PROCEDURES/INFORMATION

When performing service work or installing SOA's accessory short throw shifter, it is extremely important that the transmission is supported properly when removing or reinstalling the cross member. If not, damage to the bolts and/or threads will occur. Support the transmission using a transmission jack, regardless if the vehicle is supported by a lift or car ramps (**Figure 1**). It is recommended that hand tools be used for the removal and installation of the bolts. Inspect for bolt thread damage and replace as necessary. Be sure to clean any protective wax from the mating surfaces and be sure to start all bolts several threads by hand before using tightening tools. **Note: If severe damage is evident to the threads, the use of a Heli-coil® type kit is an approved repair method.**

During reinstallation, follow the torque sequence, below (**Figure 2**) and the torque specifications (**Figure 3; next page**).

**Figure 1****Figure 2***continued on next page...***CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.**

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Bolts must be torqued to the proper specifications (**Figure 3**).

T1: 70 N·m (7.1 kgf-m, 51 ft-lb)

T2: 140 N·m (14.3 kgf-m, 103 ft-lb)

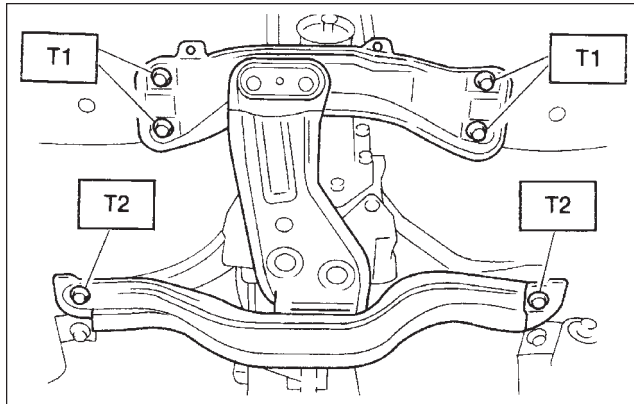


Figure 3

ATTENTION:

GENERAL MANAGER ☐
 PARTS MANAGER ☐
 CLAIMS PERSONNEL ☐
 SERVICE MANAGER ☐

IMPORTANT - All
 Service Personnel
 Should Read and
 Initial in the boxes
 provided, right.



SUBARU

QUALITY DRIVEN® SERVICE

SERVICE BULLETIN

APPLICABILITY: All Models
SUBJECT: Tire Rotation Pattern

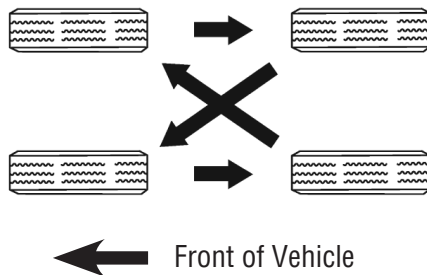
NUMBER: 05-37-07
DATE: 03/12/07

INTRODUCTION

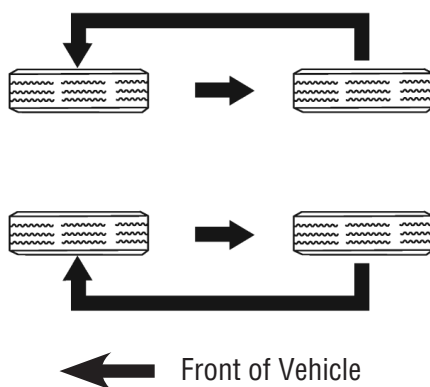
In an effort to further reduce uneven tire wear and prolong tire life, the tire rotation pattern has been changed for non-directional tires. To maximize the life of each tire and ensure that the tires wear uniformly, it is best to rotate the tires every 7,500 miles (12,000 km). Note: The tire rotation pattern for directional tires has not changed.

Reminder: When rotating tires on a vehicle equipped with TPMS (Tire Pressure Monitoring System) make sure to re-register the tires.

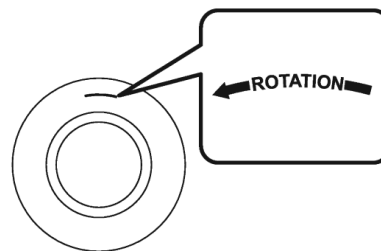
Tire Rotation Pattern for Non-Directional Tires



Tire Rotation Pattern for Directional Tires



Tire Rotation Branding



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ATTENTION:GENERAL MANAGER ☐
CLAIMS PERSONNEL ☐PARTS MANAGER ☐
SERVICE MANAGER ☐*IMPORTANT - All Service Personnel Should Read and Initial*

SUBARU **SERVICE BULLETIN****APPLICABILITY:** All Models
SUBJECT: Cautions Concerning Engine Coolant**NUMBER:** 09-42-05
DATE: 04/15/05**INTRODUCTION**

The purpose of this bulletin is to inform of cautions concerning engine coolant.

REPAIR PROCEDURES/INFORMATION

When adding, replacing or servicing the cooling system always use **Genuine Subaru Long Life Coolant**. Genuine Subaru Long Life Coolant is a phosphate (non-amine) type and is specially formulated for all Subaru vehicles equipped with aluminum engines and radiators. Coolant of other types may not provide the proper protection to aid against corrosion of aluminum parts. If an equivalent must be used, make sure it is a phosphate (non-amine) type. As a reminder, use of Genuine Subaru Long Life Coolant is mandatory on all repairs paid for by Subaru of America, Inc. that require the replenishment of coolant. This holds true for any claim type.

Do not use flushing machines.

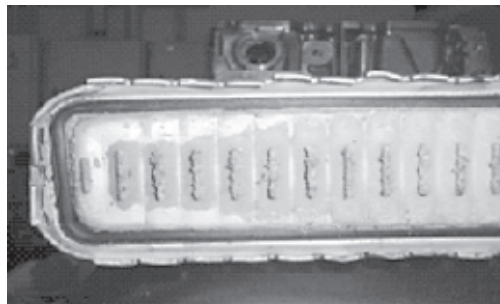
If a flushing machine has been used to service other brand vehicles with copper radiators, a chemical reaction between copper ions and Subaru coolant may occur. This could also cause clogging of the radiator.

If regular flushing is required, only use fresh tap water. Do not use hard water. Hard water will create calcium build up which will clog the radiator.

Whenever the coolant is changed, you must add Genuine Subaru Cooling System Conditioner. Genuine Subaru Cooling System Conditioner has been tested and approved for aluminum engines and radiators.

Do not use after-market coolant reinforcement agents, sealers and/or flushing agents as those chemicals could corrode aluminum parts.

This photo shows the condition of a clogged radiator that has been filled with non-genuine coolant. The residue is corroded aluminum.

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SUBARU

SERVICE BULLETIN

APPLICABILITY: All Models
SUBJECT: Radiator Cap

NUMBER: 09-45-06
DATE: 11/28/06

INTRODUCTION

The purpose of this bulletin is to provide the inspection and cleaning procedure for the radiator cap.

Whenever servicing the coolant/radiator, it is imperative that the filler neck and cap are clean of all contaminants and debris.

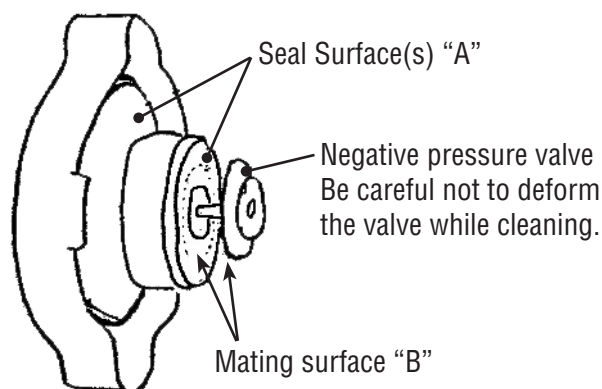
If foreign material is left in the filler neck sealing area, it will become embedded in the rubber seal and will prevent the cap from sealing properly. Before making the determination that the radiator cap is faulty, perform the following repair procedure.

REPAIR PROCEDURE/INFORMATION

Caution: The engine cooling system is under pressure and may be extremely hot. To prevent personal injury or vehicle damage, be sure to take appropriate precautions while performing this procedure.

- 1) Wash and clean the rubber seal surface(s) "A" using clean water and a soft bristle brush.
- 2) Carefully open the negative pressure valve. Using clean water and a soft bristle brush wash and clean the mating surface "B" between the valve and the rubber seal.

Note: Clean thoroughly. Failure to do so will prevent the cap from holding pressure.



Continued on Next Page



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- 3) After cleaning, check valve-opening pressure of cap using a cap tester according to the applicable service manual.
- 4) Clean the filler neck sealing surface of any and all contaminants.

Note: If the valve opening pressure stays within the predetermined specification the cap is reusable. Only replace caps that failed the pressure test.

Special note: If the vehicle has any record of overheating the cap may not be reusable even after cleaning due to the deterioration of the sealing materials.

WARRANTY/CLAIM INFORMATION

For vehicles under the Basic New Car Limited Warranty period, this repair may be claimed using:

LABOR DESCRIPTION	LABOR OPERATION	FAIL CODE	LABOR TIME
Radiator Pressure Cap, R&R	B 228-121	CAH-29	0.2
Cooling System Pressure Testing & Diagnosis (Includes cleaning cap)	C 228-001		0.3

ATTENTION:

GENERAL MANAGER ☐
 PARTS MANAGER ☐
 CLAIMS PERSONNEL ☐
 SERVICE MANAGER ☐

IMPORTANT - All
 Service Personnel
 Should Read and
 Initial in the boxes
 provided, right.



SUBARU

QUALITY DRIVEN® SERVICE

SERVICE BULLETIN

APPLICABILITY: 2006~07MY Forester Vehicles
SUBJECT: Muffler, Paint Flaking

NUMBER: 09-46-07
DATE: 03/08/07

INTRODUCTION

In the event you encounter a customer complaint that the paint is flaking from the back of the muffler, the following repair procedure needs to be performed in lieu of replacing the muffler. Please be aware that the paint on the rear of the muffler is for cosmetic purposes only.

MATERIAL NEEDED

- Wire brush
- 220 grit sandpaper
- Can of Dupli-Color High Heat (1200° F) flat black spray paint, available at local auto part stores or a can of Krylon High Heat (1200° F) BBQ & Stove flat black spray paint, available at local hardware stores.

Note: One can is sufficient for 5 repairs.



continued...

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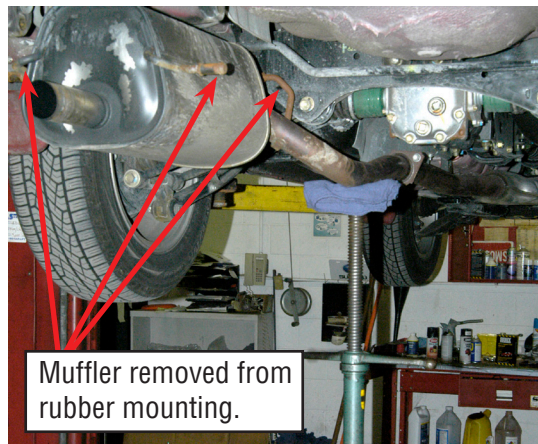
REPAIR PROCEDURE

1. Example of paint flaking from the back of the muffler.



Caution: Permit muffler to cool down before proceeding.

2. Support exhaust with screw jack and remove muffler from rubber mounting.



Note: Safety glasses and a respiratory mask should be worn.

3. Tape off the muffler using paper as illustrated.
4. Use a wire brush to remove the loose paint, followed up by using 220 grit sand paper to rough-up the finish.

5. Make sure the surface is free from sanding dust, dirt, oil and grease. A tack rag or cleaning solvent may be used.

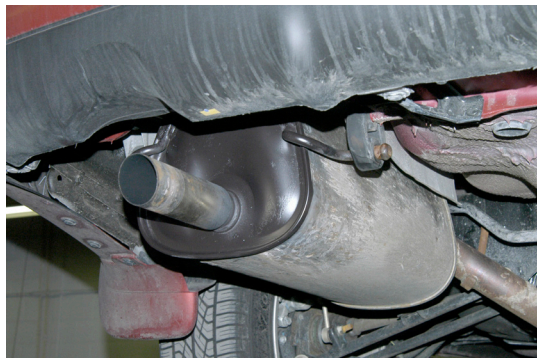


Note: Make sure to read and follow the cautions and instructions on the can before painting the muffler.

6. Carefully paint the muffler, avoiding overspray; a second coat may be required.



7. Remove tape and paper, reinstall muffler to rubber mounting.



CLAIM REIMBURSEMENT/WARRANTY INFORMATION

For vehicles within the Basic New Car Limited Warranty period, this repair may be claimed using:

LABOR DESCRIPTION	LABOR OPERATION	FAIL CODE	LABOR TIME
MUFFLER, REAR SURFACE REFINISHING	A229-288	EAE-64	0.4

Note: Up to \$2.00 may be charged out in sublet to cover the cost of the paint and materials.

ATTENTION:GENERAL MANAGER ☐
CLAIMS PERSONNEL ☐PARTS MANAGER ☐
SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial

SUBARU **SERVICE BULLETIN**

APPLICABILITY: 1998~current MY Forester
2000~current MY Legacy/Outback Wagon
2002~current MY Impreza Wagon
SUBJECT: Rear Gate Stay Diagnosis

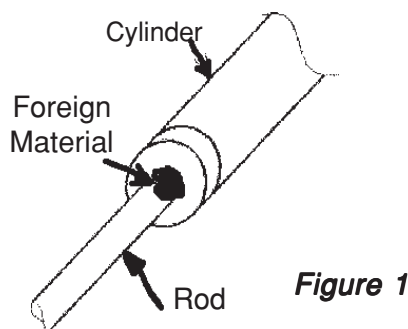
NUMBER: 12-85-05R
DATE: 02/25/05

INTRODUCTION

This bulletin provides information to properly diagnosis the rear gate stays and also avoids unnecessary replacement of non-failed stays.

REPAIR PROCEDURES/INFORMATION**Visual inspection**

Check the lower end of the rear gate stay for foreign material. If foreign material (as an example, sand particle) gets lodged at the end of the cylinder it will cause the gas within the cylinder to leak (see Figure1). If foreign material is found lodged at the end of the cylinder, the cylinder should be replaced.

**Figure 1**

Note: Read all cautions prior to diagnosing and proper disposal as listed in the applicable service manual.

Measurement check

If you cannot determine which stay may have leaked, they can be checked separately using the following method. A push-pull or brake pedal effort gauge should be used. Each stay needs to be checked individually.

continued...



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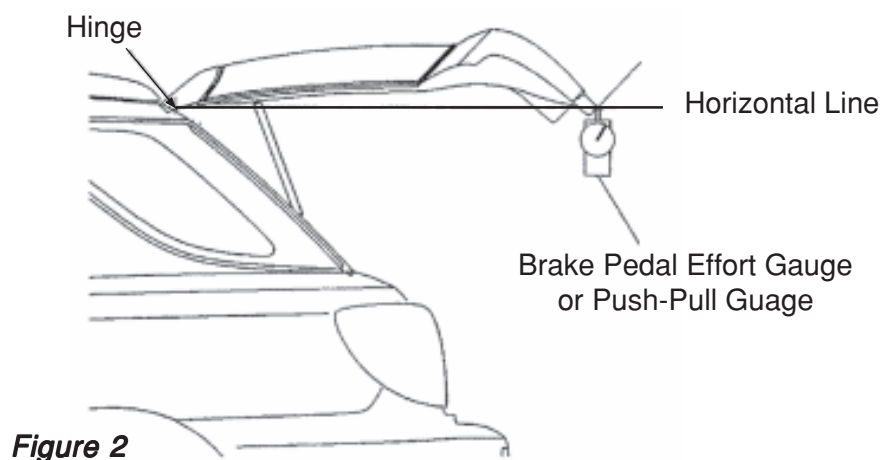
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Note: If using a brake pedal effort gauge, it is advisable to put duct tape on the gauge on the area that will come in contact with the vehicle. Doing so will protect the painted surface of the vehicle's rear gate.

Disconnect one stay (refer to the applicable service manual) at a time. Be sure to zero the needle or gauge on your measuring device before proceeding with any testing. Using the brake pedal effort gauge, measure the load by placing the gauge at the lower edge of the rear gate (see Figure 2). Push up on the rear gate using the gauge and stop when the gate edge is parallel (horizontal) with the rear gate hinge. Record your measurement (see figure 2). Compare your measurements with the ones on the following chart to determine if replacement is necessary. If the measurement is within specification, reinstall the removed stay and remove the opposite one.

Repeat the measuring procedure. If both stays are within specification no replacement is necessary.



This chart provides specifications to determine if the rear gate stay(s) has failed.

	LEGACY	IMPREZA	FORESTER 98MY thru 02MY	FORESTER 03MY and later
Not Failed	Less than 60N (6.1 kgf, 13.5 lb)	Less than 30N (3.0 kgf, 6.7 lb)	Less than 40N (4.0 kgf, 9.0 lb)	Less than 45N (4.6 kgf, 10.1 lb)
Failed	160N (16.3 kgf, 36.0 lb)	100N (10.2 kgf, 22.5 lb)	130N (13.3 kgf, 29.2 lb)	110N (11.2 kgf, 24.7 lb)

Note: Above values will vary slightly depending upon ambient temperatures. Failed values listed are that of a stay where the gas has leaked out completely. Values will vary depending upon the amount of remaining gas in the cylinder.

CLAIM REIMBURSEMENT/WARRANTY INFORMATION

For vehicles within the Basic New Car Limited Warranty period, refer to the Warranty Labor Time guide for claim information.

ATTENTION:

GENERAL MANAGER ☐
CLAIMS PERSONNEL ☐PARTS MANAGER ☐
SERVICE MANAGER ☐

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IMPORTANT - All Service Personnel Should Read and Initial

SERVICE BULLETIN

APPLICABILITY: 2007MY Subaru Vehicles
SUBJECT: Paint Code Information

NUMBER: 13-85-06
DATE: 07/13/06

INTRODUCTION

Note: This is the most accurate information available at the time of printing.

Various paint manufacturers designate their own stock numbers and coding information although many of the major suppliers now use the SOA paint codes to help eliminate confusion. Their color formulations are updated on a continual basis. Some vendors may have different color names than those provided by SOA. Be sure to double-check the codes and formulas to insure an accurate color match. If discrepancies arise, please refer your Body Shop contact inquiries to the specific paint vendor or jobber for the most updated formula information.

The paint coding information can be found on the vehicle's VIN plate which on Forester and Impreza models is located on top of the right front strut tower. For 2007, the information label on Legacy/Outback and B9 Tribeca has been re-located to the rear jamb edge of the right front door. The color codes will be three characters for solid colors and, three characters for a two-tone code.

EXAMPLES:

32J - Obsidian Black Pearl (monotone)

6B6 - Obsidian Black Pearl / Urban Gray Metallic (two-tone)



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2007 FORESTER PAINT CODES

EXTERIOR PAINT COLOR	PAINT CODE	TWO-TONE CODE
Obsidian Black Pearl	32J	--
Crystal Gray Metallic	48W	--
Champagne Gold Opal	39J	--
Garnet Red Pearl	33J	--
Aspen White	51E	--
*Newport Blue	64Z	--
*Urban Gray Metallic	45A	--
Obsidian Black Pearl / Urban Gray Metallic	32J / 45A	6B6
Newport Blue Pearl / Urban Gray Metallic	64Z / 45A	6H1
Crystal Grey Metallic / Urban Gray Metallic	48W / 45A	BR1
Evergreen Metallic / Urban Gray Metallic	55M / 45A	6B4
Garnet Red Pearl / Urban Gray Metallic	33J / 45A	6B7
Satin White / Platinum Silver Metallic	37J / 01G	BS2

* Indicates new color

2007 IMPREZA PAINT CODES

EXTERIOR PAINT COLOR	PAINT CODE	TWO-TONE CODE
Obsidian Black Pearl	32J	--
Crystal Grey Metallic	48W	--
*Urban Gray Metallic	26D	--
Garnet Red Pearl	33J	--
Satin White Pearl	37J	--
*Newport Blue Pearl	64Z	--
WR Blue Pearl	02C	--
Obsidian Black Pearl / Urban Gray Metallic	32J / 45A	6B6
Newport Blue Pearl / Urban Gray Metallic	64Z / 45A	6H1
Evergreen Metallic / Urban Gray Metallic	55M / 45A	6B4
Garnet Red Pearl / Urban Gray Metallic	33J / 45A	6B7
Urban Gray Metallic / Crystal Gray Metallic	45A / 48W	BR6

* Indicates new color

2007 LEGACY/OUTBACK PAINT CODES

EXTERIOR PAINT COLOR	PAINT CODE	TWO-TONE CODE
Brilliant Silver Metallic	39D	--
Champagne Gold Opal	39J	--
*Diamond Gray Metallic	65Z	--
*Newport Blue Pearl	64Z	--
Obsidian Black Pearl	32J	--
Regal Blue Pearl	35J	--
Satin White Pearl	37J	--
Brilliant Silver Metallic / Granite Gray Opal	39D/35S	3K3
Willow Green Opal / Moss Green Metallic	34W/38G	3U5
Newport Blue Pearl / Granite Gray Opal	64Z/35S	6S7

* Indicates new color

2007 B9 TRIBECA PAINT CODES

EXTERIOR PAINT COLOR	PAINT CODE	TWO-TONE CODE
Obsidian Black Pearl	32J	--
*Newport Blue Pearl	64Z	--
Seacrest Green Metallic	59E	--
*Harvest Gold Metallic	69K	--
*Diamond Gray Metallic	65Z	--
Titanium Silver Metallic	58E	--
Satin White Pearl	37J	--

* Indicates new color

2007 FORESTER PAINT CODES

CODE	COLOR NAME	DUPONT	SHERWIN- WILLIAMS/ MARTIN SENOUR	PPG	SPIES-HECKER	BASF-R/M GLASURIT	AKZO NOBEL	STANDOX
51E	Aspen White	51E	51E	91525	51E	51E	SUB4504	51E
33J	Garnet Red Pearl	33J	33J	904539	33J	33J	SUB9839	33J
32J	Obsidian Black Pearl	32J	32J	904540	32J	32J	SUB9841	32J
64Z*	Newport Blue Pearl	64Z	64Z	913969	64Z	64Z	SUB9532	64Z
01G	Platinum Silver Metallic	01G	01G	300064	01G	01G	SUB9106	01G
39J	Champagne Gold Pearl	39J	39J	29353	39J	39J	SUB9836	39J
48W	Crystal Gray Metallic	48W	48W	906935	48W	48W	SUB9869	48W
45A*	Urban Gray Metallic	45A	45A	906936	45A	45A	SUB9871	45A
37J	Satin White Pearl	37J	37J	907371	37J	37J	SUB9830	37J
55M	Evergreen Metallic	55M	55M	910428	55M	55M	SUB9833	55M

2007 IMPREZA PAINT CODES

CODE	COLOR NAME	DUPONT	SHERWIN- WILLIAMS/ MARTIN SENOUR	PPG	SPIES-HECKER	BASF-R/M GLASURIT	AKZO NOBEL	STANDOX
37J	Satin White Pearl	37J	37J	907371	37J	37J	SUB9830	37J
32J	Obsidian Black Pearl	32J	32J	904540	32J	32J	SUB9841	32J
64Z*	Newport Blue Pearl	64Z	64Z	913969	64Z	64Z	SUB9532	64Z
33J	Garnet Red Pearl	33J	33J	904539	33J	33J	SUB9839	33J
45A*	Urban Gray Metallic	45A	45A	906936	45A	45A	SUB9871	45A
26D	Steel Gray Metallic	26D	26D	301538	26D	26D	SUB9126	26D
02C	WR Blue Pearl	02C	02C	194512	02C	02C	SUB9105	02C
55M	Evergreen Metallic	55M	55M	910428	55M	55M	SUB9833	55M
48W	Crystal Gray Metallic	48W	48W	906935	48W	48W	SUB9869	48W

2007 LEGACY PAINT CODES

CODE	COLOR NAME	DUPONT	SHERWIN- WILLIAMS/ MARTIN SENOUR	PPG	SPIES-HECKER	BASF-R/M GLASURIT	AKZO NOBEL	STANDOX
64Z*	Newport Blue Pearl	64Z	64Z	913969	64Z	64Z	SUB9532	64Z
39D	Brilliant Silver Metallic	39D	39D	904537	39D	39D	SUB9842	39D
39J	Champagne Gold Opal	39J	39J	904459	39J	39J	SUB9836	39J
65Z*	Diamond Gray Metallic	65Z	65Z	913968	65Z	65Z	SUB9705	65Z
32J	Obsidian Black Pearl	32J	32J	904540	32J	32J	SUB9841	32J
35J	Regal Blue Pearl	35J	35J	904538	35J	35J	SUB9838	35J
37J	Satin White Pearl	37J	37J	907371	37J	37J	SUB9830	37J
34W	Willow Green Opal	34W	34W	907372	34W	34W	SUB9831	34W
38G	Moss Green Metallic	38G	38G	907370	38G	38G	SUB9832	38G
35S	Granite Gray Opal	35S	35S	904543	35S	35S	SUB9837	35S

007 B9 TRIBECA PAINT CODES

CODE	COLOR NAME	DUPONT	SHERWIN- WILLIAMS/ MARTIN SENOUR	PPG	SPIES-HECKER	BASF-R/M GLASURIT	AKZO NOBEL	STANDOX
32J	Obsidian Black Pearl	32J	32J	904540	32J	32J	SUB9841	32J
64Z*	Newport Blue Pearl	64Z	64Z	913969	64Z	64Z	SUB9532	64Z
69K*	Harvest Gold Metallic	69K	69K	914020	69K	69K	SUB9807	69K
59E	Seacrest Green Metallic	59E	59E	909545	59E	59E	SUB9618	59E
58E	Titanium Silver Metallic	58E	58E	909546	58E	58E	SUB9704	58E
65Z*	Diamond Gray Metallic	65Z	65Z	913968	65Z	65Z	SUB9705	65Z
37J	Satin White Pearl	37J	37J	907371	37J	37J	SUB9830	37J

ATTENTION:

GENERAL MANAGER ☐
 PARTS MANAGER ☐
 CLAIMS PERSONNEL ☐
 SERVICE MANAGER ☐

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QUALITY DRIVEN® SERVICE

SERVICE BULLETIN

APPLICABILITY: All Models Equipped with an
 In-dash CD Changer/Player
SUBJECT: In-dash CD Changer/Player Discs

NUMBER: 15-120-07
DATE: 03/07/07

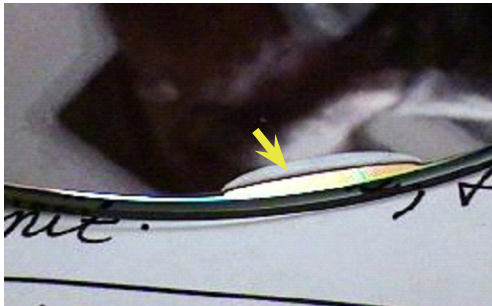
INTRODUCTION

The purpose of this bulletin is to inform of cautions concerning compact discs. There have been an increasing number of changers/players being replaced under warranty. We have found that the majority of all failures are the result of the use of damaged CDs, non-compatible user-created CDs and labels, or multiple CDs inserted at the same time jamming the player or damaging the CD. The resultant damage to the player is generally not detected until after the audio exchange has been completed.

Customers coming in with CD changer/player issues should be reminded at the time of the unit exchange that the use of CDs as described above are the potential causes of problems.

We encourage you to make a copy of page 3 of this bulletin and provide it to your customers when an exchange unit is installed.

EXAMPLES OF PEELING LABELS



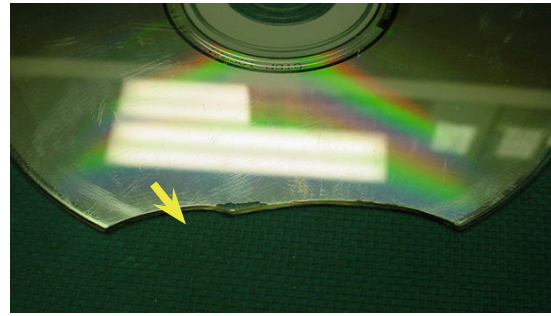
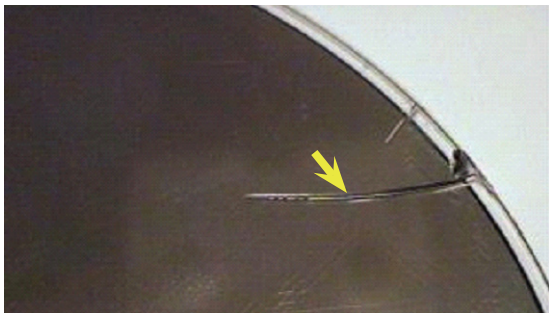
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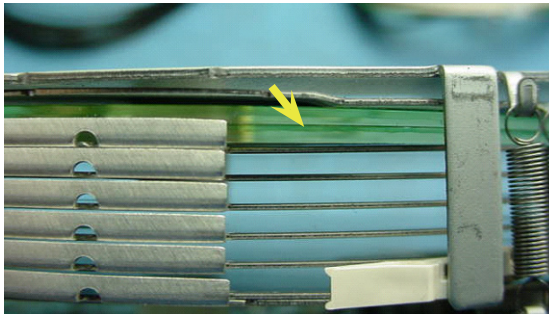
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EXAMPLES OF BROKEN/CRACKED DISCS



EXAMPLE OF DOUBLE-DISC INSERTION



EXAMPLE OF ODD-SHAPED DISC





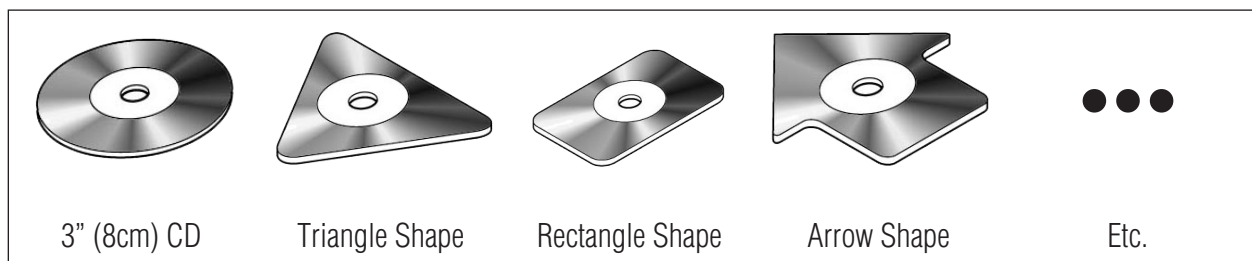
PLEASE USE CAUTION WHEN USING YOUR GENUINE SUBARU IN-DASH CD CHANGER/PLAYER

In-dash compact disc (CD) players are a great way to enjoy crystal-clear music in your Subaru. Subaru CD players are designed to play standard 4 3/4 inch diameter CDs, which carry the “Compact Disc Digital Audio” logo.

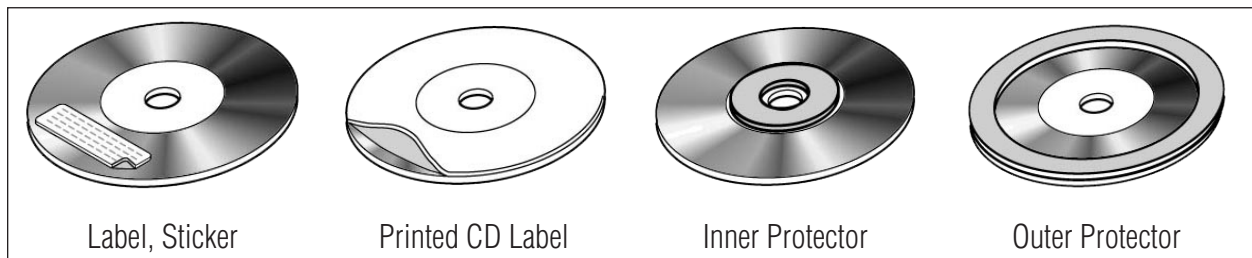


The following CDs may cause problems when loading, playing, or ejecting due to the complexity of your CD player's internal mechanisms.

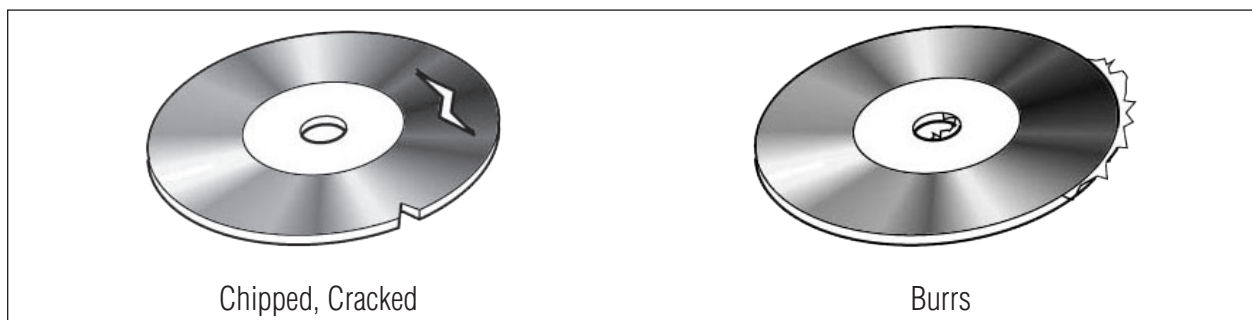
1. Small size, irregularly shaped discs.



2. Excessively thick discs.



3. Damaged Discs



4. Poor quality discs.

ATTENTION:GENERAL MANAGER ☐
CLAIMS PERSONNEL ☐PARTS MANAGER ☐
SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial

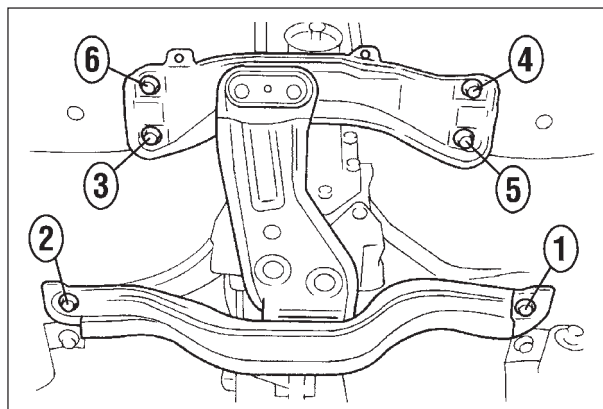
SUBARU **SERVICE BULLETIN****APPLICABILITY:** All A/T and M/T Vehicles
SUBJECT: Transmission Rear Cross-Member**NUMBER:** 03-53-04
16-54-04
DATE: 08/20/04**INTRODUCTION**

The purpose of this bulletin is to prevent the possibility of damaging the bolts and/or threads that secure the transmission rear cross member.

REPAIR PROCEDURES/INFORMATION

When performing service work or installing SOA's accessory short throw shifter, it is extremely important that the transmission is supported properly when removing or reinstalling the cross member. If not, damage to the bolts and/or threads will occur. Support the transmission using a transmission jack, regardless if the vehicle is supported by a lift or car ramps (**Figure 1**). It is recommended that hand tools be used for the removal and installation of the bolts. Inspect for bolt thread damage and replace as necessary. Be sure to clean any protective wax from the mating surfaces and be sure to start all bolts several threads by hand before using tightening tools. **Note: If severe damage is evident to the threads, the use of a Heli-coil® type kit is an approved repair method.**

During reinstallation, follow the torque sequence, below (**Figure 2**) and the torque specifications (**Figure 3; next page**).

**Figure 1****Figure 2***continued on next page...***CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.**

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Bolts must be torqued to the proper specifications (**Figure 3**).

T1: 70 N·m (7.1 kgf-m, 51 ft-lb)

T2: 140 N·m (14.3 kgf-m, 103 ft-lb)

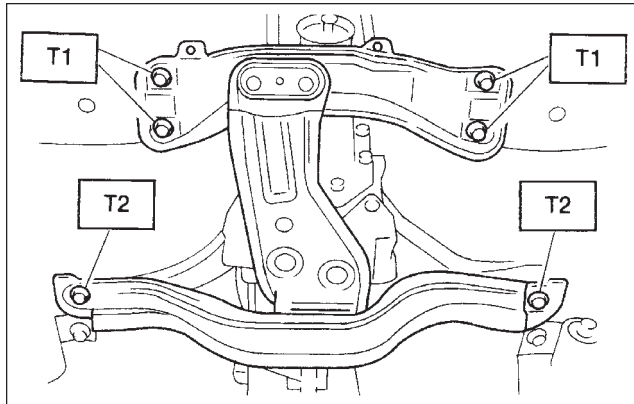


Figure 3



SERVICE BULLETIN

APPLICABILITY: 1995MY and after Legacy
1998MY and after Forester
1993MY and after Impreza
2003MY and after Baja

NUMBER: 17-06-01R
DATE: 05/11/05

SUBJECT: Seat Belt Latch Slides to the Lower Seat Belt Anchor

DESCRIPTION

In the event you encounter a customer complaint of the seat belt latch sliding down the webbing to the lower seat belt anchor, it may be caused by the latch web stop button separating from the belt webbing. This stop button may become loose and fall off if the belt webbing is jammed between the body panel and door when the door is closed.

Use the chart below to locate and order the correct repair kit for your application.

Button Kit	Button Color
64780AC500EW	Beige (use with Beige Belt)
64780AC500VB	Black (use with Black Belt)

REPAIR PROCEDURES

- 1) Inspect the belt webbing for damage. If damaged replace the seat belt assembly.
- 2) Remove any piece of broken stopper button from the belt webbing.
- 3) Lift the belt latch up and beyond the original stopper button location and hold in place using adhesive tape.
- 4) Locate the original stopper hole (about 500mm up from bottom anchor) in the webbing and insert the new male stopper button from the backside of the belt. Push the other part of the button over the pin sticking through the front belt webbing.
- 5) Using a suitable tool, crimp the two parts together until the new button thickness is 4.5~5.0mm.
- 6) Remove the adhesive tape from the latch and confirm the stopper button holds the latch in the proper position.

continued...



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For vehicles within the Basic New Car Limited Warranty period, this repair can be claimed using:

Item Description/Fail Code	Operation Number	Labor Description	Flat Rate Time
Front seat belt stopper button YEF-01, 02, 05, 08	A913-722	Front seat belt stopper button R&R	One or Both sides 0.2

ATTENTION:GENERAL MANAGER ☐PARTS MANAGER ☐CLAIMS PERSONNEL ☐SERVICE MANAGER ☐*IMPORTANT - All Service Personnel Should Read and Initial*

SUBARU **SERVICE BULLETIN****APPLICABILITY:** SRS Side Curtain Airbag Equipped Vehicles**NUMBER:** 17-09-04**DATE:** 11/23/04**SUBJECT:** Airbag Deployment Fixture Instruction Manual **Supplement****INTRODUCTION**

This is a supplement that contains information for using the **SPX Kent-Moore J-39401-B**, SRS Airbag Module Mounting and Deployment Tool to deploy SRS Side Curtain Airbag modules that have been set aside to be discarded.

- Follow all instructions for safe and proper deployment.
- Do not use any mounting method other than those described in this supplement for Side Curtain Airbag deployment.

**WARNING**

IMPROPER USE MAY RESULT IN SERIOUS INJURY OR DEATH.

Prepare the tool before use as described below.

- Position Base Unit Vertically and fill with water.
- Return to horizontal position before use.
- Do not store Base (tank) Unit below 32°F or 0°C.

**CAUTION**

VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY OR DEATH TO THOSE PERSONS OR OTHERS. THIS TOOL IS DESIGNED TO BE USED BY PROFESSIONAL AND TRAINED TECHNICIANS ONLY.

Read all instructions before beginning any work.

- Before use, choose a location to deploy the SRS Side Curtain Airbag module that is clear of any personnel, objects and hazardous material.
- Always wear eye protection.
- Advise personnel in the immediate area that you are going to deploy the SRS Airbag.

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- Always position the Airbag side of the module away from you and never position the Airbag side of the module downward.
 - Do not place any objects on the SRS Airbag module.
 - Before connecting the deployment harness, short the Red and Black wires together.
 - During deployment stand back the entire length of the Deployment Harness.
 - Allow the SRS Airbag sufficient time to cool down after deployment before removing the special tools.
 - Choose the correct mounting adapters to secure the Airbag module to the base. The Airbag module must be mounted so that when deployment occurs the Airbag does not strike the base or the mounting adapters.
 - Use the following instructions to prepare the SRS Side Curtain Airbag prior to deployment.
 - After completing the following steps, go to page 4 for wiring and deployment instructions.
- 1) Use sharp scissors to perform the following operations, **A thru E** (see Figure 1).
Do not remove or cut any other portion of the airbag itself, including the (white) material sleeve.

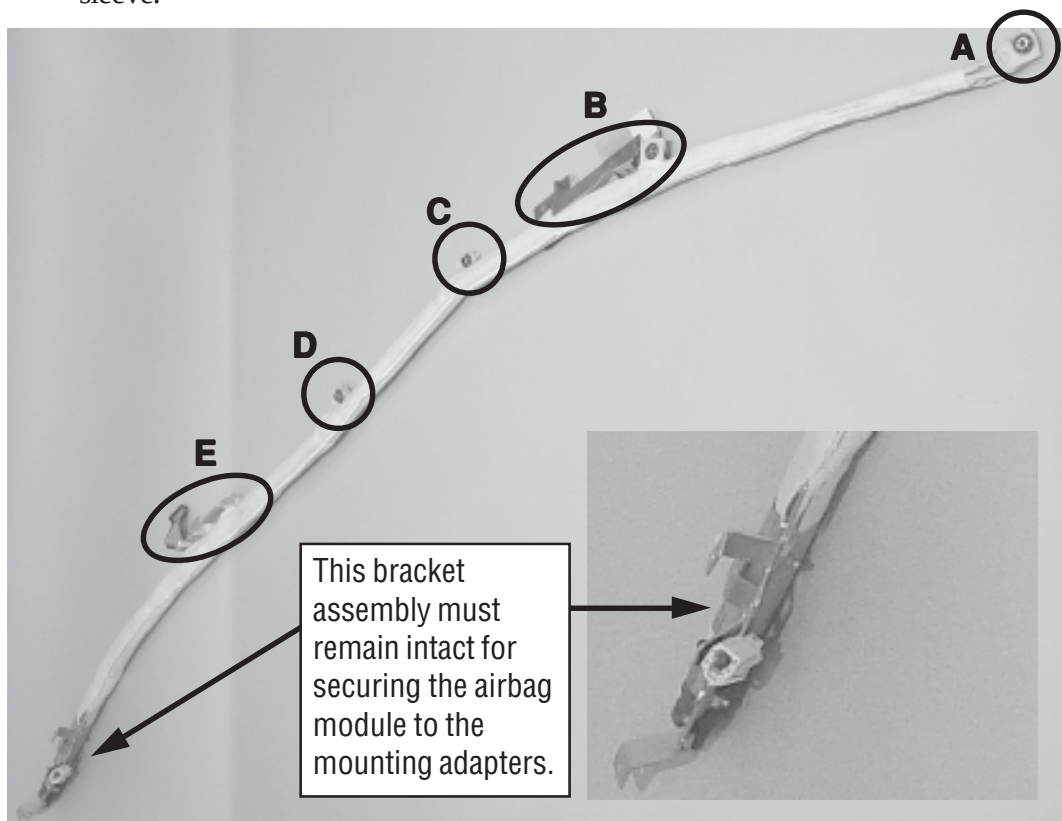
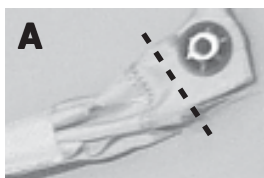
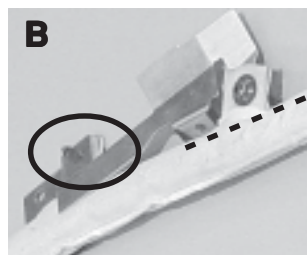


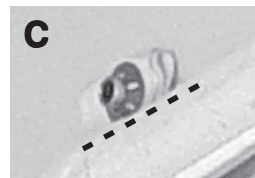
Figure 1



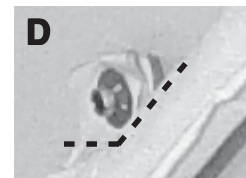
To remove grommet, cut material as close as possible.



To remove bracket, cut material as close to the grommet as possible. Remove black plastic trim clip.

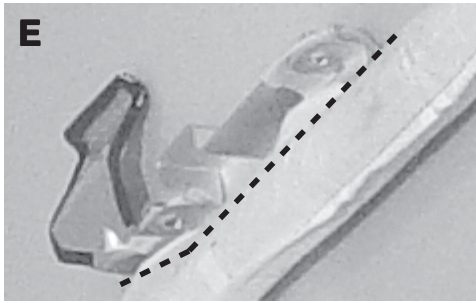


To remove grommet, cut material as close as possible.



To remove grommet, cut material as close as possible.

continued...



To remove bracket, cut material as close as possible.

- 2) Secure the mounting adapters to the base with the included 5/16 carriage bolts and nuts (see Figure 2).

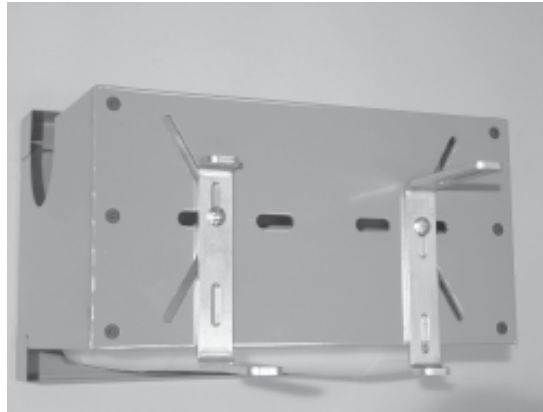


Figure 2

- 3) Secure Airbag module to the mounting adapters using the included 6mm bolts and nuts (see Figure 3). Make sure the airbag is laid out completely straight (not curled) to prevent any “whipping” effect during deployment.

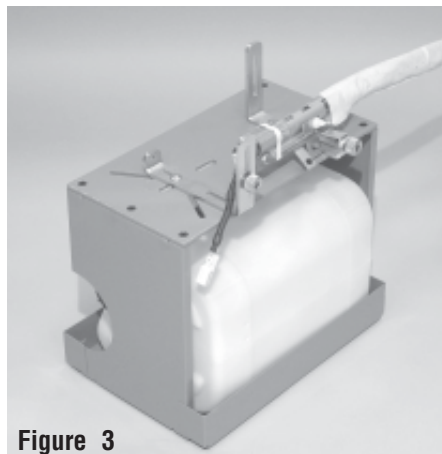


Figure 3



WARNING

FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN DAMAGE TO THE ADAPTER HARNESS AND POSSIBLE SCATTERING OF THE BROKEN PIECES AT HIGH SPEED. THOSE PIECES COULD CAUSE SERIOUS INJURY OR DEATH TO PERSONS NEARBY.

WIRING AND DEPLOYMENT INSTRUCTIONS

CAUTION: Always wear eye protection!

Use Test Adapter 98299FC030 and connect it to the deployment harness 98299PA030, not the SRS Airbag.

The deployment harness should have the Red and Black wires shorted together.

Connect the adapter to the SRS Airbag Module.

 WARNING
STAND BACK THE ENTIRE LENGTH OF THE DEPLOYMENT HARNESS.

Deployment will be **immediate** upon connecting 9V battery in the following process:

- 1) Make sure deployment area is clear.
- 2) Disconnect the shorted red and black wires.
- 3) Touch the red and black wires to the 9V battery. Airbag will deploy immediately!
- 4) Remove red and black wires from 9V battery.
- 5) Short red and black wires together.

 WARNING
IF THE SRS AIRBAG MODULE FAILS TO DEPLOY, DO NOT APPROACH IT FOR 30 SECONDS.

After 30 seconds check the following:

- 1) Battery connection
- 2) Battery voltage
- 3) Harness connection (visual inspection only)
- 4) Adapter connection (visual inspection only)
- 5) Module connection (visual inspection only)

If any of these items are not found to be at fault contact SOA Techline.

Storage of SRS Airbag Modules is explained in the appropriate Service Manual. Review the Service Manual for proper storage.

NOTE: Be sure to comply with any and all applicable federal, state, and local agency requirements for proper disposal.

ATTENTION:

GENERAL MANAGER ☐
CLAIMS PERSONNEL ☐PARTS MANAGER ☐
SERVICE MANAGER ☐

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SERVICE BULLETIN**APPLICABILITY:** 2007MY B9 Tribeca, Legacy, & Forester**NUMBER:** 18-107-06**SUBJECT:** Service Manual Corrections**DATE:** 07/17/06**INTRODUCTION**

The purpose of this bulletin is to provide a description of current changes to Service Manuals available via the Subaru Technical Information System (STIS) web site. The tables contained within this bulletin are to be used as guides for becoming aware of the latest changes. We advise you to always refer to the STIS web site when looking for the latest Service information. Printed pages will not be made available to update printed Service Manuals.

YEAR	MODEL	MSA#	SECTION	PAGE	DESCRIPTION OF CHANGE
Paper manuals may have different page numbering then what is reflected below, based on multiple new and revised pages. Please refer to the information contained on the STIS web site for all future, update service manual information.					
2007	B9 Tribeca	MSA5T0741A	Engine	ME(H6DO)-20, 64, 70	Addition of ST 499057000 Torx Plus for removing the Drive Plate.
		MSA5T0744A	Body	AB(diag)-25	Connector chart updated.
				AB(diag)-35-36	Inspection steps changed.
				AB(diag)-42,45	Figures changed.
				AB(diag)-52,58,64,118,124	Wiring diagrams for DTC's 11, 15, 22, 71 & 75 have changed.
				AB(diag)-72,81,83-84	Diagnostic steps changed for DTC's 26, 36, 38.
2007	Legacy	MSA5T0700A	General Information	PM-9	Wording for Engine Oil filling has been modified.
		MSA5T0701A	Engine (H4SO)	GD(H4SO)-107, 109, 111, 113	Illustration changes for DTC's P0335, P0336, P0340, P0341.
		MSA5T0703A	Engine (H6DO)	ME(H6DO)-19, 60, 66	Addition of ST 499057000 Torx Plus for removing the Drive Plate.

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YEAR	MODEL	MSA#	SECTION	PAGE	DESCRIPTION OF CHANGE
2007	Forester	MSA5T0721A	Engine (H4SO)	GD(H4SO)- 104, 106, 108, 110	Illustration changes for DTC's P0335, P0336, P0340, P0341.

ATTENTION:

GENERAL MANAGER ☐
CLAIMS PERSONNEL ☐PARTS MANAGER ☐
SERVICE MANAGER ☐

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SERVICE BULLETIN

APPLICABILITY: 2007MY Forester Vehicles
SUBJECT: Service Manual Corrections

NUMBER: 18-113-06
DATE: 12/08/06

INTRODUCTION

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Paper manuals may have different page numbering then what is reflected below, based on multiple new and revised pages. Please refer to the information contained on the STIS web site for all future, updated service manual information.

YEAR	MODEL	BOOK/ VOL#	MSA#	SECTION	PAGE(S)	DESCRIPTION OF CHANGE
2007	Forester		MSA5T0720A	General Information	SPC-3, 5-10	Information for Sports model added.
					ID-5	Information for Sports model added.
			MSA5T0721A	Engine (H4SO)	EN(H4SO)(diag)-33	"LED OPERATION MODE OF ENGINE" and the contents are deleted.
					EN(H4SO)(diag)-75, 77, 103-104, 108-109, 111-112, 126, 128, 132, 141, 169, 171, 176-178, 182, 196, 198, 201, 203, 209-210, 216, 219, 221, 233, 255, 257, 259-260, 262, 268, 272, 295-296, 298, 314-316, 318, 320, 322, 324, 326, 328, 330-331, 334	Part or all of the diagnostic steps for the following DTCs have been modified: P0026, 28, 102, 107, 108, 0122, 123, 126, 134, 222, 223, 304, 328, 420, 442, 447, 452, 456, 457, 458, 464, 851(AT), 851(MT), 852(AT), 852(MT), 1400, 1443, 1602, 2101, 2102, 2103, 2122, 2123, 2127, 2128, 2135, 2138.
					EN(H4DOTC)(diag)-35	"LED OPERATION MODE OF ENGINE" and the contents are deleted.
					EN(H4DOTC)(diag)-54	Step 4 under "INJECTOR COTROL" is modified.



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YEAR	MODEL	BOOK/ VOL#	MSA#	SECTION	PAGE(S)	DESCRIPTION OF CHANGE
2007	Forester		MSA5T0722A	Engine (DOTC)	EN(H4DOTC)(diag)-98, 99-100, 104, 106, 120, 122, 126, 157, 159, 167, 177, 192, 209-211, 212, 215, 218, 224-225, 231, 234, 236, 270, 272, 274-275, 277, 283, 293, 307-310, 322-323, 327-328, 353-356, 358, 360, 362, 364, 366, 368, 370-372, 374-375, 377, 379	Part or all of the diagnostic steps for the following DTCs have been modified: P0102, 107, 108, 122, 123, 126, 222, 223, 245, 328, 411, 420, 441, 442, 447, 452, 456, 457, 458, 464, 851(AT), 851(MT), 852(AT), 852(MT), 1400, 1443, 1602, 2016, 2021, 2101, 2102, 2103, 2122, 2123, 2127, 2128, 2135, 2138, 2419, 2420.
			MSA5T0723A	Transmission	4AT-3, 5, 12, 15, 17, 20, 26, 36-38, 41-45, 51, 53, 56, 101, 110, 113, 116, 120, 122	Many changes to the content on listed pages, review on STIS.
		4AT(diag)-8, 12, 26, 27, 85-86			Information for Sports model added.	
			MSA5T0724A	Chassis	VDC-1-32	VDC section added.
		VDC(diag)1-142			VDC diagnostic section added.	
			MSA5T0726A	Wiring System	WI-18, 143	Illustration modified.
		WI-20, 21, 23, 24, 25, 47, 60, 63, 67, 71, 75-78, 114, 137, 145, 146, 148, 149, 164, 165, 167, 168			Information for Sports model added.	
		WI-10, 11, 16, 22, 27, 29-31, 34-44, 48-59, 64-66, 68-70, 72-74, 79, 81, 83-85, 88-101, 103, 105-108, 112, 116, 118, 119, 121, 133, 141, 147, 150, 151, 154, 157, 158			Pages modified to include Harness Repair information.	
		WI-184-189			Harness Repair pages added.	

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System	Certification Standard	Enhanced Evap.	ORVR										
System E	LEV-II	yes	yes										
Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria		Secondary Parameters		Enable Conditions				Time Required		MIL Illum.
							FORESTER	Impreza WRX	Legacy & Outback				
(1) Catalyst	P0420	oxygen storage	accumulated variation of output voltage of rear oxygen sensor per 32 msec. divided by accumulated variation of lambda of front lambda sensor per 32 msec. $\Sigma (ro2sad_n - ro2sad_{n-1}) $ ----- $\Sigma (sglmd_n - sglmd_{n-1}) $		engine coolant temperature atmospheric pressure battery voltage components listed on #1 of page 03-E-1 closed loop control with oxygen sensors Estimated temperature in the catalyst on Map2 of page 03-E-3 AT MT difference between actual and target lambda < 0.10 vehicle speed amount of intake air intake air change every half engine revs. secondary oxygen sensor output change, Lean to Rich evaporative system monitoring misfire detection during 200 engine revs. accumulative time of canister purge after engine start learning value of EVAP conc. during purge after engine starting		>= 70	<--	<--	deg C	30-55	secs.	two driving cycles
							> 75.06029	<--	<--	KPa			
							> 10.9	<--	<--	V			
							no failure operating	<--	<--				
							>= 480	<--	520	deg C			
							>= 500	<--	535				
							>= 1000	<--	<--	msec			
							> 43.498	<--	46.605	mph			
							>= 12	<--	<--	g/s			
							and	<--	<--				
							< 40	<--	<--	g/s			
							< 0.02	<--	<--	g/rev			
							experienced after not in operation	<--	<--				
							< 5	<--	<--	time			
							>= 19.9	<--	5	sec			
							< 0.2	<--	<--				
							>= 235	<--	230	sec			
(2) Misfire	P0301 (#1 cyl)	crankshaft speed fluctuation	FTP emission threshold		fuel parameter determination in-manifold pressure change during 1/2 engine rev. throttle position change during 16 msec. fuel shut-off function VDC or auto. trans. torque control evaporative system monitoring battery voltage components listed on #2 of page 03-E-1 atmospheric pressure engine speed		< not extremely low	<--	<--		1000	engine revs.	two driving cycles
	< 13.33						<--	26.66	KPa				
	< 13.33						<--	<--	KPa				
	< 14						<--	<--	deg				
	< 14						<--	<--	deg				
	not operating						<--	<--					
	NA						<--	<--					
	not in operation						<--	<--					
	>= 8						<--	<--	V				
	no failure						<--	<--					
	>= 75.06029						<--	<--	KPa				
	>= 500						<--	600	rpm				
	and						<--	<--					
	< 6500						<--	<--	rpm				
	>= 15.0						<--	<--	%				
	> value from Map 3 on page 03-E-3						<--	<--					

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E											
2007 MY Summary Sheet for OBD Strategy (2)											
Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters		Enable Conditions				Time Required	MIL Illum.
						FORESTER	Impreza WRX	Legacy & Outback			
(3) Fuel system	P0171	fuel trim limits exceeded (based on a primary oxygen sensor) /Method 3 on page 02-5	fsobd = (sglmd - tglmda) + faf + flaf where, sglmd = measured lambda tglmda = target lambda faf = feed-back lambda coefficient every 64 msec. flaf = learning lambda	fuel learning system		in operation	<--	<--		10	two driving cycles
	engine coolant temperature			>=	70	<--	<--	deg C	x		
		P0172			intake air	>=	see Map 5 of page 03-E-3			5	time
				intake air change during 0.5 engine rev.	<=	0.02	<--	<--	g/rev		
				components listed on #3 of page 03-E-1		no failure	<--	<--			
				fuel learning system		in operation	<--	<--		10	two driving cycles
				engine coolant temperature	>=	70	<--	<--	deg C	x	
				intake air	>=	see Map 5 of page 03-E-3				5	time
				intake air change during 0.5 engine rev.	<=	0.02	<--	<--	g/rev		
				learning value of EVAP conc. during purge	<=	0.1	<--	<--			
				accumulative time of canister purge after engine start	>=	20	<--	<--	sec		
				continuous period after canister purge starting	>=	29884	<--	<--	msec		
				components listed on #3 of page 03-H-1		no failure	<--	<--			
	P2096 P2097	fuel trim limits exceeded (based on a secondary oxygen sensor)	Secondary learning lambda (LTFT of secondary O2 sensor)	Sub feed back learning condition		in enable condition	<--	<--		5	two driving
				all secondary parameters to be in enable conditions	>=	1	<--	<--	sec	x 1	cycles
(4) Front lambda sensor -Output voltage	P1152	output range check /Method 4 on page 02-7	output lambda when rear oxygen sensor feedback value being at low limit	engine coolant temperature	>=	70	<--	<--	deg C	10000	two driving cycles
				atmospheric pressure	>	75.06029	<--	<--	KPa		
				battery voltage	>	10.9	<--	<--	V		
				components listed on #4 of page 03-E-1		no failure	<--	<--			
	P1153		output lambda when rear oxygen sensor feedback value being at high limit	closed loop control with oxygen sensors		operating	<--	<--			
				rear oxygen sensor output voltage - feed-back target	>=	-0.2	<--	<--	V		
						and	<--	<--			
				or rear oxygen sensor feed - back adjust	<	0.1	<--	<--	V		
				or rear oxygen sensor feed - back adjust		on minimum limit	<--	<--			
				or rear oxygen sensor feed - back adjust		on maximum limit	<--	<--			
				intake air change during 0.5 engine rev.	<	0.02	<--	<--	g/rev		
				impedance of front lambda sensor	>=	0	<--	<--	ohm		
						and	<--	<--			
					<	50	<--	<--	ohm		
				after engine starting	>=	60000	<--	<--	msec		
				vehicle speed	>=	12.428	<--	<--	mph		
				amount of intake air	>=	6	<--	<--	g/s		
				accumulative time of canister purge after engine start	>=	19.9	<--	<--	sec		
				learning value of EVAP conc. during purge	<	0.2	<--	<--			
				all secondary parameters to be in enable conditions	>=	4096	<--	<--	msec		
				Target lambda load correction coefficient	>=	NA	<--	<--			
						and	<--	<--			
					<	NA	<--	<--			

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; **System E**

2007 MY Summary Sheet for OBD Strategy (3)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters		Enable Conditions				Time		MIL Illum.
						FORESTER	Impreza WRX	Legacy & Outback		Required		
(4) Front lambda sensor -Output voltage	P0131	circuit continuity	input voltage or input current	battery voltage components listed on #4 of page 03-E-1	>=	10.9 no failure	<-- --	<-- --	V	1000	msec	immediately
	P0132		input voltage or input current							1000	msec	
	P0134		impedance of front lambda sensor	battery voltage components listed on #4 of page 03-E-1	>=	10.9 no failure	<-- --	<-- --	V	5000	msec	
				accumulated variation of front lambda sensor heater control duty per 128ms.	>=	36000	<--	<--	msec			
					>=	70	<--	<--	%			
(5) Front lambda sensor -Response rate	P0133	comparison measured and feed-back signal	para fca = td2faf/td2lmd where, td2faf(N) = td2faf(n-1) + d2faf(n) td2lmd(N) = td2lmd(n-1) + d2lmd(n) add up for a total of 300 secs. d2faf(n) = (faf(n)-faf(n-1)) - (faf(n-1)-faf(n-2)) d2lmd(n) = (lmd(n)-lmd(n-1)) - (lmd(n-1)-lmd(n-2)) faf = feed-back lambda coefficient every 64 msecs. lmd = output lambda every 64 msecs.	components listed on #4 of page 03-E-1		no failure	<--	<--		210	sec	two driving cycles
				after engine starting	>=	120000	<--	<--	msec	32	ms	
				engine speed	>=	1000	<--	<--	rpm	×		
						and	<--	<--		4		
					<	3200	<--	<--	rpm	×		
				vehicle speed	>=	6.214	<--	<--	mph	1640	time	
						and	<--	<--				
					<	74.568	<--	<--	mph			
				amount of intake air	>=	10	<--	<--	g/s			
						and	<--	<--				
					<	31	<--	<--	g/s			
				atmospheric pressure	>=	75.06029	<--	<--	KPa			
				battery voltage	>=	10.9	<--	<--	V			
				closed loop control with oxygen sensors		operating	<--	<--				
				impedance of front lambda sensor	>=	0	<--	<--	ohm			
		and	<--	<--								
	<	50	<--	<--	ohm							
engine coolant temperature	>=	70	<--	<--	deg C							
intake air change during 0.5 engine rev.	<=	0.02	<--	<--	g/rev							
learning value of EVAP conc. during purge	<=	0.2	<--	<--								
total time of operating canister purge	>=	19.9	<--	<--	sec							
all secondary parameters to be in enable conditions	>=	1024	<--	<--	msec							
(6) Front lambda sensor -Heater	P0031	circuit continuity	the level of output voltage	battery voltage	>=	10.9	<--	<--	V	1	secs.	immediately
				components listed on #6 of page 03-E-1		no failure	<--	<--		4	ms	
				front lambda sensor heater control duty	<	87.5	<--	<--	%	×	250	
	P0032	the level of output voltage	battery voltage	>=	10.9	<--	<--	V	2	secs.		
			components listed on #6 of page 03-E-1		no failure	<--	<--		4	ms		
			front lambda sensor heater control duty	>=	12.5	<--	<--	%	×	500	time	
P0030	rationality check	impedance of front lambda sensor	battery voltage components listed on #6 of page 03-E-1 the condition as below front lambda sensor heater duty all secondary parameters to be in enable conditions after fuel shut-off	>	10.9 no failure experienced	<-- -- --	<-- -- --	V	10000	msec	two driving cycles	
					>=	35	<--	<--	%			
					>=	42000	<--	<--	msec			
					>=	20000	<--	<--	msec			

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E		2007 MY Summary Sheet for OBD Strategy (4)												
Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters		Enable Conditions					Time Required			MIL Illum.
						FORESTER	Impreza WRX	Legacy & Outback						
(7) Secondary oxygen sensor -Output voltage	P0140	output range check /Method 7 on page 02-13	maximum output voltage	components listed on #7 of page 03-E-1		no failure	<--	<--			200000	msec	two driving cycles	
				coolant temperature	>=	70	<--	<--	deg C					
			minimum output voltage	target output voltage of rear oxygen sensor	>=	0.6	<--	<--	V					
				amount of intake air	>=	10	<--	<--	g/s					
				battery voltage	>	10.9	<--	<--	V					
				closed loop control with oxygen sensors		in operation	<--	<--						
				the driving condition as below		experienced	<--	<--						
				the time of fuel shut of in decel	>=	5000	<--	<--	msec					
				from engine speed	>=	1700	<--	1600	rpm					
				misfire detection during 200 engine revs.	<	5	<--	<--	time					
(7)Secondary oxygen sensor - A lack of circuit continuity	P0138	output range check /Method 7 on page 02-13	maximum output voltage	secondary air system		not in operation	<--	<--			2500	msec	two driving cycles	
			caused by a lack of circuit continuity	closed loop control with oxygen sensors		in operation	<--	<--						
				misfire detection during 200 engine revs.	<	5	<--	<--	times					
				compensation factor for front lambda sensor		not in limit value	<--	<--						
				battery voltage	>	10.9	<--	<--	V					
	P0137		minimum output voltage	secondary air system		not in operation	<--	<--			20000	msec		
			caused by a lack of circuit continuity	closed loop control with oxygen sensors		in operation	<--	<--						
				misfire detection during 200 engine revs.	<	5	<--	<--	times		20000	msec		
				compensation factor for front lambda sensor		not in limit value	<--	<--						
				battery voltage	>	10.9	<--	<--	V		40000	msec		
				amount of intake air	>=	10	<--	<--	g/s					
				secondary air system		not in operation	<--	<--						
				closed loop control with oxygen sensors		in operation	<--	<--			150000	msec		
				misfire detection during 200 engine revs.	<	5	<--	<--	times	Forester, Impreza Legacy&Outback				
	compensation factor for front lambda sensor	>	not in limit value	<--	<--									
	battery voltage	>	10.9	<--	<--	V		* see table						
	amount of intake air	<	10	<--	<--	g/s								
	continuous time of rear O2 sensor heating	>=	25000	<--	<--	msec								
	fuel shut-off		no experienced	<--	<--			L e						
	secondary air system		not in operation	<--	<--									
	closed loop control with oxygen sensors		in operation	<--	<--									
	misfire detection during 200 engine revs.	<	5	<--	<--	times								
	compensation factor for front lambda sensor	>	not in limit value	<--	<--									
	battery voltage	>	10.9	<--	<--	V		fuel shut-off time (ms)	RO2KVNG F1	RO2KVNG F1				
	amount of intake air	<	10	<--	<--	g/s								
	continuous time of rear O2 sensor heating	>=	25000	<--	<--	msec								
	fuel shut-off		experienced	<--	<--			0	40000	150000				
								2000	40000	150000				
								10000	60000	150000				

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E

2007 MY Summary Sheet for OBD Strategy (5)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters		Enable Conditions				Time Required		MIL Illum.
						FORESTER	Impreza WRX	Legacy & Outback				
(8) Secondary oxygen sensor -Response rate	P0139	changing speed	shortest time change from rich(500 mV O2 output) to lean(200 mV) if voltage reduces from 550 mV to 150mV or the time of oxygen sensor output voltage >=kFSLDH1	components listed on #8 of page 03-E-1 battery voltage closed loop control with secondary oxygen sensor 5 sec. or more fuel shut-off in decel. after fuel shut-off accumulative time of rear O2 sensor heater operation continuous time of rear O2 sensor heater operation Estimated temperature in the catalyst	>	no failure 10.9 in operation experienced	<-- <-- <-- <--	<-- <-- <-- <--	V	1	time	two driving cycles
					>=	2000	<--	<--	msec			
					>=	60000	<--	<--	msec			
					>=	30000	<--	<--	msec			
					>=	400	<--	<--	deg C			
				number of the fuel shut-off in decel	>=	1	<--	<--	time			
(9) Secondary oxygen sensor -Heater	P0037	circuit continuity	shortest time change from lean(300 mV O2 output) to rich(500 mV) if voltage reduces from 250 mV to 550 mV. or the time of oxygen sensor output voltage <kFSLDL1	components listed on #8 of page 03-H-1 battery voltage closed loop control with secondary oxygen sensor 5 sec. or more fuel shut-off in decel. after fuel shut-off accumulative time of rear O2 sensor heater operation continuous time of rear O2 sensor heater operation Estimated temperature in the catalyst number of the fuel shut-off in decel	>	no failure 10.9 in operation experienced	<-- <-- <-- <--	<-- <-- <-- <--	V	1	time	two driving cycles
					>=	2000	<--	<--	msec			
					>=	60000	<--	<--	msec			
					>=	30000	<--	<--	msec			
					>=	0	<--	<--	deg C			
				number of the fuel shut-off in decel	>=	1	<--	<--	time			
(9) Secondary oxygen sensor -Heater	P0037	circuit continuity	the level of output voltage	battery voltage components listed on #9 of page 03-E-1 after engine starting rear oxygen sensor heater control duty	>=	10.9 no failure	<-- <--	<-- <--	V	2.56	secs.	two driving cycles
					>=	1	<--	<--	secs.	8	ms	
					<	75	<--	<--	%	320	time	
					>=	10.9 no failure	<-- <--	<-- <--	V	320	time	
					>=	1	<--	<--	secs.			
				rear oxygen sensor heater control duty	>=	25	<--	<--	%			
(11) Crankshaft position sensor	P0335	circuit continuity	crankshaft position sensor signal	components listed on #11 of page 03-E-1 battery voltage starter switch	>=	no failure 8 on	<-- <-- <--	<-- <-- <--	V	3000	msec	immediately
	P0336	rationality check	amount of crank sensor signal during 1 rev.	components listed on #11 of page 03-E-1 engine speed battery voltage cylinder number distinction	<	no failure 3000	<-- <--	<-- <--	rpm V	10	eng. revs.	two driving cycles
					>=	8	<--	<--		10	time	
(13) Mass air flow sensor	P0102	range check	output voltage							500	msec	immediately
	P0103									500	msec	
(13) Mass air flow sensor	P0101	rationality check	output voltage	engine speed	>=	600 and	<-- <--	<-- <--	rpm	10000	msec	two driving cycles
				throttle angle	<	900	<--	<--	rpm			
				coolant temperature	<	4.1	<--	<--	deg			
				intake manifold pressure	>=	70	<--	<--	deg C			
				component listed on #13 of page 03-E-1	<	52.66219	<--	<--	KPa			
				engine speed	>=	2500	<--	<--	rpm	3000	msec	
				throttle angle	>=	15	<--	<--	deg			
				coolant temperature	>=	70	<--	<--	deg C			
				intake manifold pressure	>=	53.3288	<--	<--	KPa			
				component listed on #13 of page 03-E-1		no failure	<--	<--				
(14) Engine coolant temperature sensor	P0117	range check	output voltage							0.5	sec	immediately
	P0118											
	P0125	rationality check	engine coolant temperature	battery voltage engine speed components listed on #14 of page 03-E-1 timer count up by temp./vehicle speed	>=	10.9 500 no failure see map 6 on page 03-E-4	<-- <-- <-- <--	<-- <-- <-- <--	V rpm	not determined		two driving cycles

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E

2007 MY Summary Sheet for OBD Strategy (6)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions				Time Required	MIL Illum.		
					FORESTER	Impreza WRX	Legacy & Outback					
(14') Engine coolant temperature sensor (stuck)	P0126		twoff-twmin where; twoff : Engine coolant temperature at the end of the last driving cycle twmin : Engine coolant temperature(min) after engine starting	component listed on #14' of page 03-E-1	>=	no failure	<--	<--		2500	msec	two driving cycles
				battery voltage	>=	10.9	<--	<--	V			
				fuel level	>=	25	<--	23.4375	%			
				after engine starting	>=	5	<--	<--	sec			
				vehicle speed	=	0	0	0	km/h			
				Fuel level of the current driving cycle	<	5	<--	4.6875	%			
				- Fuel level at the end of the last driving cycle	>=	70	<--	<--	deg C			
				Engine coolant temperature at the end of the last driving cycle	<	95	<--	<--	deg C			
				fuel temperature	<	35	<--	<--	deg C			
				Fuel temperature at the end of the last driving cycle	>	5	<--	<--	deg C			
-fuel temperature	<	2.5	<--	<--	deg C							
(17) Knock sensor	P0327 P0328	range check	output voltage	ignition switch		on	<--	<--		1000	msec	immediately
									1000	msec		
(18) Vehicle speed sensor	P0500	range check	vehicle speed(from ABS)	battery voltage	>=	NA	NA	10.9	V	512	msec	immediately
				after engine starting	>=	NA	<--	2000	msec			
				components listed on #18 of page 03-E-1		NA	<--	no failure				
	P0502	functional check	number of signal in 1377 msec.	fuel shut-off in decel.		operating	<--	NA		4000	msec	
	battery voltage			>=	10.9	<--	NA	V				
	P0503			engine speed	<	4000	<--	NA	rpm			
				components listed on #18 of page 03-E-1		no failure	<--	NA				
(19) Starter switch	P0512	functional check	starter 'off' signal	engine speed	>=	500	<--	<--	rpm	180000	msec	two driving cycles
				battery voltage	>=	8	<--	<--	V			
				components listed on #19 of page 03-E-1		no failure	<--	<--				
	P1518		starter 'on' signal	engine speed after continuous 0.8 sec. or more of < 500 rpm engine speed	>=	500	500	<--	rpm	800	msec	
				vehicle speed	<	0.6214	<--	<--	mph			
				components listed on #19 of page 03-E-1		no failure	<--	<--				
(23) Idle speed control (ISC)	P0506	functional check	actual - target eng. speed	components listed on #23 of page 03-E-1		no failure	<--	<--		10	sec	two driving cycles
				closed control in ISC		in operation	<--	<--				
				feedback value for ISC		limits reached	<--	<--				
				vehicle speed	=	0	<--	<--	km/h			
				engine coolant temperature	>=	70	<--	<--	deg C			
				atmospheric pressure	>=	75.06029	<--	<--	KPa			
	P0507		actual - target eng. speed	fuel level	>=	15	<--	<--	%			
				after engine starting	>=	10.49	<--	<--	sec			
				measured lambda	>=	0.9	<--	<--				
						and	<--	<--				
					<	1.1	<--	<--				
				after air condition switching on-off, off-on	>=	5.1	<--	<--	sec			
				battery voltage	>=	10.9	<--	<--	V			
				after in-manifold pressure change more than 30 mmHg	>	5.1	<--	<--	sec			
				after neutral switch on - off event	>	5.1	<--	<--	sec			
	P0519	functional check	actual - target eng. speed	battery voltage	>=	10.9	<--	<--	V	2000	msec	immediately
				after engine starting	>=	1000	<--	<--	msec			
				closed control in ISC		in operation	<--	<--				
				components listed on #23 of page 03-E-1		no failure	<--	<--				
				vehicle speed	<	2.4856	<--	<--	mph			
					<	7.4568	<--	2.4856	mph			
				feedback value for ISC	<=	0	0	<--	%			
				engine speed change every 180 degree engine rev.	>=	-5	-5	<--	rpm			
(24) Solenoid valve for purge control	P0458	circuit continuity	drain voltage of FET	battery voltage	>=	10.9	<--	<--	V	2500	msec	two driving cycles
				after engine starting	>=	1	<--	<--	secs.			
				ignition switch		on	<--	<--				
				duty ratio of 'on'	<	75	<--	<--	%			
	P0459		drain voltage of FET	battery voltage	>=	10.9	10.9	<--	V	2500	msec	
				after engine starting	>=	1	1	<--	secs.			
				ignition switch		on	on	<--				
				duty ratio of 'on'	>=	25	25	<--	%			

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E2007 MY Summary Sheet for OBD Strategy (7)												
Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters		Enable Conditions				Time Required		MIL Illum.
						FORESTER	Impreza WRX	Legacy & Outback				
(40) Radiator fan	P0691	circuit continuity	drain voltage of FET & signal from ECM for relays	engine speed battery voltage after engine starting ignition switch	>=	500	<--	<--	rpm V secs.	2500	msec	two driving cycles
	P0692		drain voltage of FET & signal from ECM for relays			10.9	<--	<--		2500		
	P0483	functional check	coolant temperature	components listed on #40 of page 03-E-1 engine speed idle switch vehicle speed radiator fan signal change coolant temperature battery voltage	>=	no failure 550 and 950 on 0 "off" to "on" 95 10.9	<-- <-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <-- <--	rpm rpm km/h degC V	300000	msec	two driving cycles
(46) Neutral switch	P0851	circuit continuity for AT	switch signal when park/ neutral="on" & any other switches="off" on AT	components listed on #46 of page 03-E-1 ignition switch after engine starting	>=	no failure on 2	<-- <-- <--	<-- <-- <--	secs. secs.	6.5	secs.	two driving cycles
	P0852		switch signal when park/ neutral="off" & any other switches="on" on AT	starter switch battery voltage range switch on AT TCM		turn off 10.9 no failure	<-- <-- <--	<-- <-- <--		64	ms	
	P0851	circuit continuity for MT	switch signal for MT	components listed on #46 of page 03-E-1 ignition switch after engine starting starter switch battery voltage driving condition change a) vehicle speed & engine speed	>=	no failure on 2 turn off 10.9 a) to b) 0 600 and 900 39.7696	<-- <-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <-- <--	secs. V mph rpm rpm mph	3	time	two driving cycles
	P0852			b) vehicle speed & engine speed	>=	1600 and 2550	<-- <-- <--	<-- <-- <--	rpm rpm rpm			

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; **System E**

2007 MY Summary Sheet for OBD Strategy (8)

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Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E		2007 MY Summary Sheet for OBD Strategy (9)										
Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters		Enable Conditions				Time Required		MIL Illum.
						FORESTER	Impreza WRX	Legacy & Outback				
(49)Evaporative emission control system for 0.02 inches leak	P0456 (0.02-leak)	functional check	P1 P1.tank pressure increase above -5mmHg during the period that is decided time for changing pressure from -15mmHg to -5 mmHg when Evap. system sealed	components listed on #49' of page 03-H-1		no failure	<--	<--		65 - 516	sec	two driving cycles
				closed air fuel ratio control (at starting a diagnosis)		in operation	<--	<--				
				fuel temperature	>=	-10	<--	<--	deg C			
						and	<--	<--				
					<	55	<--	<--	deg C			
				or								
				after engine start with coolant temperature of 40 deg C or below	<	2400	<--	<--	sec			
				after engine starting	>=	120	<--	<--	sec			
				fuel level	>=	15	<--	<--	%			
						and	<--	<--				
					<	85	<--	<--	%			
				fuel tank pressure	>=	-666.61	<--	-426.6304	Pa			
						and	<--	<--				
					<	1426.545	<--	<--	Pa			
				intake manifold vacuum (relative pressure)	<	-13.3322	<--	<--	KPa			
				Continuous two minutes of vehicle speed (at starting a diagnosis)	>=	31.07	<--	<--	mph			
				vehicle speed	>=	18.642	<--	<--	mph			
				atmospheric pressure	>=	75.06029	<--	<--	KPa			
				battery voltage	>=	10.9	<--	<--	V			
				total time of canister purge operation	>=	120000	<--	<--	msec			
				since last incomplete diagnosis event of 0.02 inches leak	>=	120000	<--	<--	msec			
					>=	600000	<--	<--	msec			
				engine speed	>=	1050	<--	<--	rpm			
						and	<--	<--				
					<	6000	<--	<--	rpm			
				(during diagnosis)								
				pressure change per sec. compare to previous sec.	<	58.66168	<--	<--	KPa			
				min-pressure change per sec.								
				- max-pressure change per sec. during monitoring	<	67.99422	<--	<--	Pa			
tank pressure change per sec.	<=	99.9915	<--	<--	Pa							
		see Map 10	<--	<--								
change of fuel level	<=	on page 03-E-8			liters/ms							
change of atmospheric pressure(modeD)	>	-0.4799592	<--	<--	KPa							
		and	<--	<--								
	<=	0.3199728	<--	<--	KPa							
change of atmospheric pressure(modeE)	>	-0.3199728	<--	<--	KPa							
		and	<--	<--								
	<=	0.3199728	<--	<--	KPa							
(50) Tank pressure sensor	P0453	range check	fuel tank pressure	vehicle speed	>=	1.2428	<--	<--	mph	15000	msec	immediately
				battery voltage	>=	10.9	<--	<--	V			
				components listed on #50 of page 03-E-1		no failure	<--	<--				
				all conditions for EVAP canister purge		to be in enable	<--	<--				
				learning value of EVAP conc. during purge	<=	0.08	<--	<--				
				feed-back lambda coefficient	>=	0.9	<--	<--				
	P0452			fuel temperature	<	35	<--	<--	deg C			
				atmospheric pressure	>	75.06029	<--	<--	KPa			
				battery voltage	>=	10.9	<--	<--	V			
				components listed on #50 of page 03-E-1		no failure	<--	<--				
P0451	rationality check	max. - min. tank pressure	change of fuel temperature	>=	7	<--	<--	deg C	1	sec	two driving cycles	
			count of detecting fuel level change above 5liters during 1min		16	<--	<--	time				
			fuel level	>=	15	<--	<--	%				
			fuel temperature	<	35	<--	<--	deg C				
			atmospheric pressure	>	75.06029	<--	<--	KPa				
			after engine starting	>=	60	<--	<--	sec				
(51) Fuel temperature sensor	P0182	range check	output voltage	battery voltage	>	10.9	<--	<--	V	2500	msec	immediately
	P0183											
	P0181	rationality check	fuel temperature - coolant temperature	components listed on #51 of page 03-E-1		no failure	<--	<--		120	sec	two driving cycles
				fuel level	>=	15	<--	<--	%			
				battery voltage	>	10.9	<--	<--	V			
				coolant temp. - coolant temp. at engine start	>	10	<--	<--	deg C			
		fuel temperature difference between max. and min.	after engine starting	>=	20	<--	<--	sec				
			accumulated amount of intake air	>	550	<--	<--	kg				
			after engine starting	>=	20000	<--	<--	msec				
(52) Fuel level sensor	P0462	range check	output voltage	components listed on #51 of page 03-E-1		no failure	<--	<--		2500	msec	two driving cycles
				battery voltage	>	10.9	<--	<--	V			
	P0463			battery voltage	>=	10.9	<--	<--	V	1000	msec	
				ignition switch		on	<--	<--				
				after engine starting	>=	3000	<--	<--	msec			
P0461	rationality check	max.- min. fuel level output	accumulated amount of intake air	>	330957	<--	<--	g	not determined			
			battery voltage	>=	10.9	<--	<--	V				
			after engine starting	>=	5000	<--	<--	msec				
			components listed on #52 of page 03-E-1		no failure	<--	<--					

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E												
2007 MY Summary Sheet for OBD Strategy (10)												
Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters		Enable Conditions				Time Required		MIL Illum.
						FORESTER	Impreza WRX	Legacy & Outback				
(52') Fuel level sensor - slosh	P0464	rationality check	integrated times of the condition reaching follows, DVFLMAX >= Threshold or SUMVFL >= Threshold where, - DVFLMAX is max. deviation of sensor output during 12.2 secs. - SUMVFL is integrated value of sensor output deviation during 12.2 secs.	engine speed battery voltage after engine starting ignition switch idle switch fuel level vehicle speed = 0 km/h components listed on #52' of page 03-E-1 Max - Min of tank pressure during 12.2 secs. Max - Min of battery voltage during 12.2 secs.	>=	500	<--	<--	rpm	12288	msec	two driving cycles
					>	10.9	<--	<--	V	x		
					>=	1	<--	<--	secs.	4		
						on	<--	<--				
						on	<--	<--				
					>=	15	<--	<--	%			
						and	<--	<--				
					<	85	<--	<--	%			
					>=	10000	<--	<--	msec			
						no failure	<--	<--				
(53) Solenoid valve for canister vent control	P0447	circuit continuity	drain voltage of FET and signal from ECM	battery voltage after engine starting	>=	10.9	<--	<--		2500	msec	immediately
			drain voltage of FET and signal from ECM	ignition switch	>=	1	<--	<--	secs.	2500	msec	
	P0448											
	P1443	functional check	fuel tank pressure	components listed on #53 of page 03-H-1 battery voltage barometric pressure solenoid valve for canister vent control fuel tank pressure at engine start		no failure	<--	<--		3000	msec	
					>=	10.9	<-	<-	V			
					>=	75.06029	<--	<--	KPa			
					>=	open	<--	<--				
					>=	-666.61	<--	-426.6304	Pa			
						and	<--	<--				
					<	1426.545	<--	<--	Pa			
(54) Pressure control valve	P1400	circuit continuity	drain voltage of FET and signal from ECM	battery voltage after engine starting	>=	10.9	<--	<--	V	2500	msec	two driving cycles
	P1420		drain voltage of FET and signal from ECM	ignition switch	>=	1	<--	<--	secs.	2500	msec	
(60) Manifold absolute pressure (MAP) sensor	P0107	range check	output voltage	components listed on #60 of page 03-E-1		no failure	<--	<--		500	msec	immediately
	P0108									500	msec	
	P0068	rationality check	output voltage	engine coolant temperature engine speed intake air every half engine revs. throttle position components listed on #60 of page 03-E-1	>=	70	<--	<--	deg C	3000	msec	two driving cycles
					<=	2500	<--	<--	rpm			
					>	1.356	<--	<--	g/rev			
					>=	10	<--	<--	deg			
					no failure	<--	<--					
			output voltage	engine coolant temperature engine speed	>=	70	<--	<--	deg C	3000	msec	
					>=	600	<--	<--	rpm			
						and	<--	<--				
					<	900	<--	<--	rpm			
					<=	0.4	<--	<--	g/rev			
					<=	2.75	<--	<--	deg			
						no failure	<--	<--				
(61) Intake air temperature sensor	P0111	rationality check	output voltage difference between max. and min.	coolant temp. before engine start coolant temperature battery voltage driving blow 50 km/h coolant temperature sensor	<	30	<--	<--	deg C	1	sec	two driving cycles
					>	95	<--	<--	deg C			
					>=	10.9	<--	<--	V			
						>=	600	<--	<--	sec		
						no failure	<--	<--				
	P0112 P0113	range check	output voltage	ignition switch		on	<--	<--		500	msec	immediately
									500	msec		
(64)Back-up power supply for memory of ECM	P1560	functional check	voltage of back-up power	engine speed battery voltage	>=	500	<--	<--	rpm	2500	msec	immediately
					>=	10.9	<--	<--	V			

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E														
2007 MY Summary Sheet for OBD Strategy (11)														
Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters		Enable Conditions				Time Required		MIL Illum.		
						FORESTER	Impreza WRX	Legacy & Outback						
(72) Thermostat	P0128	functional check	(estimated - measured) coolant temperature	engine coolant temperature engine coolant temperature at engine starting battery voltage vehicle speed components listed on #72 of page 03-E-1 estimated coolant temperature estimated ambient air temperature	< < >= >= >= >=	70 55 10.9 18.642 no failure 70 -7	<-- <-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <-- <--	deg C deg C V mph deg C deg C	not determined		two driving cycles		
(74) Fuel pump control module	P0230	Functional/ check	fuel controller output diagnostic signal	battery voltage fuel level after engine starting fuel pump control	>= >= >= 	8 16.66667 180000 on	8 <-- <-- <--	<-- 15.625 <-- <--	V % msec 	2500	msec	two driving cycles		
(76)Tumble generator valve (TGV)	P2008(RH) P2011(LH)	circuit continuity (for open circuit)	diagnostic input - open diagnostic input - short	battery voltage output signal from ECM	>= 	10.9 at before change "on" to "off"	10.9 	<-- 	V 	2 20 x 98	sec time ms	immediately		
		P2009(RH) P2012(LH)	circuit continuity (for short circuit)							diagnostic input - open diagnostic input - short	1 10 x 98		sec time ms	
	P2004(RH) P2005(LH)	functional check (for open stuck)	TGV angle	the time of TGV "close" signal output coolant temperature ambient temperature battery voltage components listed on #76 of page 03-E-1	>= >= >= >= 	2200 0 0 10.9 no failure	<-- <-- <-- <-- <--	3200 -30 -30 <-- <--	msec deg C deg C V 	3000	msec			
		P2006(RH) P2007(LH)		functional check (for closed stuck)	the time of TGV "open" signal output coolant temperature ambient temperature battery voltage components listed on #76 of page 03-E-1	>= >= >= >= 	1432 0 0 10.9 no failure	<-- <-- <-- <-- <--	4600 -30 -30 <-- <--				msec deg C deg C V 	
	(77) TGV position sensor	P2016(RH) P2021(LH)	range check	output voltage							500		msec	immediately
											P2017(RH) P2022(LH)		500	
	(78) Turbocharger pressure control solenoid	P0245	circuit continuity	ECM output signal	battery voltage after engine starting duty ratio for turbocharged pressure control	> >= <	10.9 1 75	<-- <-- <--	<-- <-- <--	V secs. %	640 4 x 160		ms ms time	immediately
P0246				battery voltage after engine starting duty ratio for turbocharged pressure control	> >= >	10.9 1 25	<-- <-- 	<-- <-- 	V secs. %	640 4 x 160	ms ms time			
P0244		functional check	intake manifold pressure								1	sec	immediately	

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E		2007 MY Summary Sheet for OBD Strategy (12)										
Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions					Time Required	MIL Illum.	
					FORESTER	Impreza WRX	Legacy & Outback					
(81) Positive crankcase ventilation system	P1491	circuit continuity	Positive crankcase ventilation diagnostic. signal	battery voltage engine speed	> =>	10.9 500	<-- <--	<-- <--	V rpm	2500 msec	immediately	
(82)Active Valve Control System (AVCS)	P0340 (RH) P0345 (LH)	circuit continuity for cam position sensor	amount of cam sensor signal during 2 rev.	battery voltage components listed on #82 of page 03-E-1	>=	8 no failure	<-- <--	<-- <--	V	100 50	revs	immediately
			cam sensor signal	starter switch		on	<--	<--		3000 msec		
	P2088 (RH) P2092 (LH)	circuit continuity for Oil control valve (OCV)	OCV control actual current	battery voltage components listed on #82 of page 03-E-1 OCV control duty	>=	10.9 no failure 99.61	<-- <--	<-- <--	V %	2000 msec	immediately	
			OCV control actual current	battery voltage components listed on #82 of page 03-E-1 OCV control duty	>=	10.9 no failure 0.39	<-- <--	<-- <--	V %	2000 msec		
	P0011 (RH) P0021 (LH)	functional check for AVCS system										
			vtd > 0 Σ vtd _n R bank L bank vtd < 0 Σ vtd _n R bank L bank where, vtd= target position- actual position	battery voltage components listed on #82 of page 03-E-1 engine speed coolant temperature AVCS target position change during 64msec. AVCS target position all secondary parameters to be in enable conditions	>=	10.9 no failure 1300 60 operating 1.07 0 3000	<-- <--	<- <--	V rpm deg C °C °C msec	30000 msec	two driving cycles	
	P0016 (Bank1) P0018 (Bank2)		Camshaft position	battery voltage components listed on #82 of page 03-E-1 engine speed coolant temperature AVCS	>=	10.9 no failure 500 60 not operating	<-- <--	<-- <--	V rpm deg C	20000 msec	two driving cycles	
(83) CAN system	P0600	functional check	bus off flag or error warning flag or communication ID from TCU or ECU or VDC/ABS ECU not received (LEGACY) communication ID from TCM not received (FORESTER,IMPREZA) or the data from ECU does not be updated (LEGACY) the data from AT does not be updated (FORESTER,IMPREZA)	battery voltage components listed on #83 of page 03-E-1 starter switch engine	>=	10.9 no failure off run	<-- <--	<-- <--	V	1 sec	immediately	
(84) Transmission control system	P0700	functional check /Method 11 on page 02-20	MIL request flag from TCM	battery voltage components listed on #84 of page 03-E-1	>=	10.9 no failure	<-- <--	<-- <--	V	2500 msec	immediately	
(95)Cold start emission reduction strategy	P1602	amount of intake air	Estimated exhaust gas temperature after 14 seconds at cold start	atmospheric pressure battery voltage	> >	75.06029 10.9 no failure	<-- <-	<-- <-	KPa V	14 sec	two driving cycles	
			Duration to satisfy	components listed on #95 of page 03-E-1								
			“nefbgd – ne” Duration to satisfy “Ignition timing retard”	engine vehicle speed Misfire detection during 200 engine rev. (Because of catalyst damages) Time after engine starting	<=	run 1.2428	<- <--	<- <--		mph		
					<	5	<--	<--				
					=	14		<-		sec		

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E													
2007 MY Summary Sheet for OBD Strategy (13)													
Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters		FORESTER	Enable Conditions	Legacy & Outback		Time Required		MIL Illum.	
							Impreza WRX						
(201) Throttle actuator control	P0638	functional check	motor control Duty	ignition switch		on	<--	<--	V	5000msec		immediately	
				motor supply voltage	>=	6.2	<--	<--					
				motor relay		on	<--	<--					
				CPU communication		no failure	<--	<--					
				previous diagnosis result		no failure	<--	<--					
				engine speed	<	500	<--	<--		rpm			
				ignition switch		on	<--	<--	<--	V	2sec		
				motor supply voltage	>=	6.2	<--	<--					
				motor relay		on	<--	<--					
				CPU communication		no failure	<--	<--					
				previous diagnosis result		no failure	<--	<--					
				engine speed	>=	500	<--	<--	rpm				
			target throttle position -	ignition switch		on	<--	<--	<--	rpm V deg V	see table 21-2 table 21-2		
				motor relay		on	<--	<--	<--				
				previous diagnosis result		no failure	<--	<--	<--				
				engine speed	>=	500	<--	<--					
				battery voltage	>=	6.2	<--	<--					
				throttle position sensor 1	>=	target throttle position	<--	<--					
motor supply voltage	>=	6.2		<--	<--								
throttle position sensor 1 circuit diagnosis		complete		<--	<--								
throttle position sensor 2 circuit diagnosis		complete		<--	<--								
throttle position sensor rationality diagnosis		complete		<--	<--								
	ignition switch		on	<--	<--	<--	V rpm V deg	1000msec					
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
	motor supply voltage	>=	6.2	<--	<--								
	engine speed	>=	500	<--	<--								
	battery voltage	>=	6.2	<--	<--								
	throttle position sensor 1	<	target throttle position	<--	<--	<--	V rpm V deg						
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
previous diagnosis result		no failure	<--	<--	<--								
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--	<--	<--								
	throttle position sensor 1 circuit diagnosis		complete	<--	<--	<--	V rpm V deg						
	throttle position sensor 2 circuit diagnosis		complete	<--	<--	<--							
	throttle position sensor rationality diagnosis		complete	<--	<--	<--							
	ignition switch		on	<--	<--	<--		V rpm V deg	5000msec				
	motor relay		on	<--	<--	<--							
	previous diagnosis result		no failure	<--	<--	<--							
motor supply voltage	>=	6.2	<--	<--	<--								
engine speed	<	500	<--	<--	300								
battery voltage	>=	6.2	<--										

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E2007 MY Summary Sheet for OBD Strategy (14)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters		FORESTER	Enable Conditions	Legacy & Outback		Time Required		MIL Illum.
							Impreza WRX					
(205) Throttle position sensor	P0122 (sensor1) P0222 (sensor2)	circuit continuity	output voltage (sensor2)	ignition switch motor supply voltage previous diagnosis result	on >=6 no failure		<--	<--	V	24 msec	immediately	
							<--	24 msec				
	P0123 (sensor1) P0223 (sensor2)	(sensor1) (sensor2)		<--	24 msec							
	P2135	rationality check	throttle position sensor 1(deg) - throttle position sensor 2(deg)	ignition switch motor supply voltage previous diagnosis result throttle position sensor 1 circuit diagnosis throttle position sensor 2 circuit diagnosis	on >=6 no failure complete complete		<-- <-- <-- <-- <--	<-- <-- <-- <-- <--	V	212 msec		
(206) Pedal position sensor	P2122 (sensor1) P2127 (sensor2)	circuit continuity	output voltage (sensor1) (sensor2)	ignition switch motor relay previous diagnosis result battery voltage	on on no failure >=6		<--	<--	V	100 msec	immediately	
							<--	100 msec				
	P2123 (sensor1) P2128 (sensor2)	(sensor1) (sensor2)		<--	32 msec 100 msec							
	P2138	rationality check	pedal position sensor 1 (deg) - pedal position sensor 2 (deg)	ignition switch previous diagnosis result battery voltage pedal position sensor 1 circuit diagnosis pedal position sensor 2 circuit diagnosis	on no failure >=6 complete complete		<-- <-- <-- <-- <--	<-- <-- <-- <-- <--	V	116 msec		

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E															
Component/ System	Fault Code	Monitor Strategy Description/Method	2007 MY Summary Sheet for OBD Strategy (15)		Secondary Parameters	FORESTER	Enable Conditions		Legacy & Outback		Time Required		MIL Illum.		
			Malfunction Criteria				Impreza								
							WRX								
(207) ECM performance	P0607	circuit continuity (inside ECM)	input voltage of throttle position sensor 1 main CPU - sub CPU	ignition switch previous diagnosis result battery voltage CPU communication starter switch the time after sub CPU reset	on no failure >= 6 no failure off >= 200	<-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <--	V msec		600	msec	immediately			
										400	msec				
										350	msec				
										300	msec				
										250	msec				
		circuit continuity (inside ECM)	input voltage of pedal position sensor 1 main CPU - sub CPU	ignition switch previous diagnosis result CPU communication battery voltage starter switch	on no failure no failure >= 6 off	<-- <-- <-- <-- <--	<-- <-- <-- <-- <--	V 		Forester, Impreza	750 830	msec			
										Forester, Impreza	550 720	msec			
										Forester, Impreza	400 610	msec			
										Forester, Impreza	300 415	msec			
		functional check (Sub CPU)	Watch dog signal from Sub CPU	ignition switch previous diagnosis result starter sw battery voltage the time after sub CPU reset	on no failure off >= 6 >= 200	<-- <-- <-- <-- <--	<-- <-- <-- <-- <--	V msec		200	msec	immediately			
		functional check (CPU communication)	(Main CPU) sum check error, key word error, data writing error or communication error from sub CPU data	ignition switch previous diagnosis result starter switch battery voltage the time after sub CPU reset	on no failure OFF >= 6 >= 200	<-- <-- <-- <-- <--	<-- <-- <-- <-- <--	V msec		200	msec	immediately			
			(Sub CPU) sum check error, key word error, or communication error from main CPU data	ignition switch previous diagnosis result battery voltage	on no failure >= 6	<-- <-- <--	<-- <-- <--	V 		200	msec				
functional check (AMP circuit in ECM)	throttle position sensor 1 - (amplified throttle position sensor 1) / 4	ignition switch previous diagnosis result battery voltage throttle position sensor 1	on no failure >= 6 < see Map24	<-- <-- <-- <--	<-- <-- <-- <--	V deg		24	msec	immediately					
											(amplified throttle position sensor 1) / 4	ignition switch previous diagnosis result battery voltage throttle position sensor 1 Map24 <table><tr><td>battery voltage (V)</td><td>TAAD (deg.)</td></tr><tr><td>7.5</td><td>27.5</td></tr><tr><td>8.0</td><td>31</td></tr></table>	battery voltage (V)	TAAD (deg.)	7.5
		battery voltage (V)	TAAD (deg.)												
7.5	27.5														
8.0	31														
functional check (cruise control)	cruise control	brake switch ignition switch motor relay battery voltage Sub CPU ETC activation previous diagnosis result CPU communication	on on on >= 6.2 available no failure no failure	<-- <-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <-- <--	V 		250	msec	immediately					
rationality check (brake switch circuit)	brake switch of main CPU brake switch of sub CPU	ignition switch battery voltage previous diagnosis result CPU communication	on >= 10.9 no failure no failure	<-- <-- <-- <--	<-- <-- <-- <--	V 		200	msec	immediately					

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E

2007 MY Summary Sheet for OBD Strategy (16)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters		FORESTER	Enable Conditions Impreza	Legacy & Outback		Time Required		MIL Illum.			
							WRX								
(207) ECM performance	P0607	functional check (instruction check)	(Main CPU) instruction error	ignition switch		off to on CPU reset	<-- <--	<-- <--		2	time	immediately			
			calculated data through CPU and FPU compare with expectation	ignition switch throttle position sensor 1 circuit diagnosis		on complete	<-- <--	<-- <--		512	msec				
			(Sub CPU) calculated data from Main CPU compare with expectation	CPU communication the time after sub CPU reset		no failure ≥ 200	<-- <--	<-- <--	msec	240 40 * 6	msec time				
		functional check (software flow check)	(Main CPU) software flow error	ignition switch		on	<--	<--		504	msec				
			(Sub CPU) calculated data from Main CPU compare with expectation	CPU communication the time after sub CPU reset		no failure ≥ 200	<-- <--	<-- <--	msec	240 40 * 6	msec time				
		functional check (software monitor check)	software monitor error	CPU communication the time after sub CPU reset		no failure ≥ 200	<-- <--	<-- <--	msec	248 msec					
		(208)RAM in ECM	P0604	functional check	(Main CPU) Setting value can be written in all RAM area, and the values can be read correctly	ignition switch		off to on (CPU reset)	<--	<--			not determined		immediately
					(Sub CPU) check sum data on RAM , calculated sum data compare	CPU communication ignition switch the time after sub CPU reset		no failure off to on ≥ 200	<-- <-- <--	<-- <-- <--	msec				
(209)ROM in ECM	P0605	functional check	check sum data on ROM , calculated sum data compare	(Main CPU) ignition switch		off to on (CPU reset)	<--	<--		not determined		immediately			
				(Sub CPU) ignition switch motor supply voltage previous diagnosis result CPU communication the time after sub CPU reset		on ≥ 6 no failure no failure ≥ 200	<-- <-- <-- <-- <--	<-- <-- <-- <-- <--	V msec						

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E (Forester AT)		2007 MY Summary Sheet for OBD Strategy (17)					
Component/ System	Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
(301) Range switch	P0705	functional check	"D" signal continuously	shifted vehicle speed	"N" to "3" >= 60 km/h	3.0 secs.	two driving cycles
			simultaneous signals	engine speed engine speed signal	> 3000 rpm not failure	3.0 secs.	
(302) Brake switch for AT	P0719	functional check	"on" signal	vehicle speed change	30 to 0 km/h	10 times	two driving cycles
	P0724	functional check	"off" signal	vehicle speed change	0 to 30 km/h	10 times	two driving cycles
(303) ATF temperature sensor	P0712	range check	output voltage	vehicle speed	>= 10 km/h	60.0 secs.	immediately
	P0713	range check	output voltage	vehicle speed	>= 10 km/h	60.0 secs.	immediately
(304) Turbine shaft speed sensor	P0715	range check	turbine shaft speed	engine speed output shaft speed range switch	>= 3000 rpm >= 1600 rpm "D", "3", "2" or "1"	3.0 secs.	immediately
(305) Vehicle speed sensor	P0720	range check	output shaft speed	determined output shaft speed determined output shaft speed	>= 800 rpm not failure	3.0 secs.	immediately
(306) Engine speed signal for AT	P0725	range check	engine speed	turbine shaft speed turbine shaft speed sensor vehicle speed vehicle speed sensor	>= 1000 rpm not failure >= 10 km/h not failure	3.0 secs.	immediately
(307) Automatic transmission gear ratio	P0731	functional check	GR/(1st gear ratio)	upshift or downshift events output shaft speed turbine shaft speed range switch throttle angle (at 1st gear) throttle angle (at not 1st gear) range switch turbine shaft speed sensor vehicle speed sensor	not in operation	3.0 secs.	immediately
	P0732		GR/(2nd gear ratio)		>= 300 rpm		
	P0733		GR/(3rd gear ratio)		>= 300 rpm		
	P0734		GR/(4th gear ratio)		"D", "3", "2" or "1"		
			where, GR = (turbine shaft speed) / (output shaft speed)		>= 30 deg >= 6 deg not failure not failure not failure		
(308) Lock-up clutch	P0741	functional check	engine speed - turbine shaft speed >= 40 + vehicle speed /2	duty ratio for duty solenoid valve engine speed signal turbine shaft speed sensor	>= 90 % not failure not failure	10.0 secs.	two driving cycles
(309) Lock-up clutch duty solenoid	P0743	functional check	drain level of FET for solenoid valve is not change in one duty cycle	on duty ratio for duty solenoid valve	>= 5 %	200 msecs.	immediately
			drain level of FET for solenoid valve	on duty ratio for duty solenoid valve	= 0 %	200 msecs.	
(310) AT line pressure linear solenoid	P0748	functional check	cur_mon cur_mon or cur_tgt - cur_mon	cur_tgt cur_tgt	>= 100 mA >= 100 mA	0.10 secs. 0.06secs.	immediately
			where, cur_mon=monitor current for solenoid cur_tgt=target current for solenoid				
(311) Low clutch duty solenoid	P0753	functional check	drain level of FET for solenoid valve is not change in one duty cycle	on duty ratio for duty solenoid valve	>= 5 %	200 msecs.	immediately
			drain level of FET for solenoid valve	on duty ratio for duty solenoid valve	= 0 %	200 msecs.	
(312) 2-4th brake duty solenoid	P0758	functional check	drain level of FET for solenoid valve is not change in one duty cycle	on duty ratio for duty solenoid valve	>= 5 %	200 msecs.	immediately
			drain level of FET for solenoid valve	on duty ratio for duty solenoid valve	= 0 %	200 msecs.	
(313) High clutch duty solenoid	P0763	functional check	drain level of FET for solenoid valve is not change in one duty cycle	on duty ratio for duty solenoid valve	>= 5 %	200 msecs.	immediately
			drain level of FET for solenoid valve	on duty ratio for duty solenoid valve	= 0 %	200 msecs.	
(314) Low&Reverse brake duty solenoid	P0768	functional check	drain level of FET for solenoid valve is not change in one duty cycle	on duty ratio for duty solenoid valve	>= 5 %	200 msecs.	immediately
			drain level of FET for solenoid valve	on duty ratio for duty solenoid valve	= 0 %	200 msecs.	
(317) CAN communication	P1718	functional check	CAN bus condition fail counter from ECM is not change	turbine shaft speed range switch	> 0 rpm "D", "3", "2" or "1"	500 msecs.	immediately

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E

2007 MY Summary Sheet for OBD Strategy (22)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters		Enable Conditions FORESTER	ble Conditions			Time Required		MIL Illum.
							Impreza	Legacy & Outback				
							WRX					
(96)-1 Secondary Air System (at operating)				=lowest temperature among *,*,and* at engine starting battery voltage battery voltage atmospheric pressure engine operated	>= 4.4 >= 10.9 >= 7 >= 75.06029 operating	<-- <-- <-- <--	<-- <-- <-- <--	deg C V V KPa	10	sec		
	P0410	secondary air flow is not detected (based on pressure sensor in piping)	<Monitoring for pressure of pump supplying> secondary air pressure in the pipe (after corrected by atmospheric pressure)	amount of intake air (ga) pump of secondary air comb. valve	>= 2 operating One comb. valve is opening (except both comb. valves are closing)	<-- <-- <--	<-- <-- <--	g/s				
	P2443	Control valve closed stick (Bank2)	<Monitoring for pulsation when one comb. valve closing> accumulated pulsation value when RH comb.valve is closing	area where monitoring is able to be executed see MAP 23 on page 03-E-10	>= 1	<--	---					
	P2441	Control valve closed stick (Bank1)	accumulated pulsation value when RH comb.valve is closing	after fuel shut-off	>= 0	<--	---	msec				
	P2440	Control valve opened stick (Bank1)	<Monitoring for pulsation when both comb. valves closing> accumulated pulsation value when RH and LH comb. valve are closing. flow when RH comb. valve is closing (dsaicflopr)	engine load (gn) after fuel shut-off	>= 0.2 >= 500	<-- <--	<-- 1000	g/rev msec				
	P2442	Control valve opened stick (Bank2)	accumulated pulsation value when RH and LH comb. valve are closing. flow when LH comb. valve is closing (dsaicflopl)									
	P2443	Control valve closed stick (Bank2)	<Monitoring for pressure when comb. valves switching> pressure change when LH comb. valve switches	amount of intake air (ga)	> 2 and	<-- <--	<-- <--	g/s				
	P2441	Control valve closed stick (Bank1)	pressure change when RH comb. valve switches	engine speed (ne) after fuel shut-off	< 20 < 4000 >= 500	<-- <-- <--	25 <-- 1000	g/s rpm msec				
	P0411	secondary air flow increase unusual	<Monitoring for excessive flow> flow when RH comb. valve is closing (dsaicflestafr) or flow when LH comb. valve is closing (dsaicflestafl) dsaicflp0rlvb – dsaicflp0rvb dsaicflp0rlvb – dsaicflp0lvb									

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E													
2007 MY Summary Sheet for OBD Strategy (23)													
Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria		Secondary Parameters		Enable Conditions				Time Required		MIL Illum.
							FORESTER	Impreza WRX	Legacy & Outback				
(96)-2 Secondary Air System (at disable)	P1410	Control valve open stick	difference between maximum value and minimum value of pressure in piping and accumulation change of pressure in piping every 4ms. and Change of atmosphere	engine speed after engine starting after secondary air system disable amount of intake air battery voltage	>= 500 >= 9000 >= 9000 >= 2 and < 400 >= 10.9	<-- <-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <-- <--	rpm msec msec g/s g/s V		2000 x 20	msec time	immediately	
	P2444	Pump "ON" stick	secondary air pressure in the pipe - secondary air pressure in the pipe (before the secondary air system operating)	battery voltage engine running ignition switch secondary air pressure in the pipe calculation completion (before the secondary air system operating) progress time after the control secondary air systems end Pump "ON" stick no failure	>= 3000 <= 8000	←← ←←	←← ←←	msec msec		8	sec		
(97) Secondary Air Control valve relay	P0413 (bank1) P0416 (bank2) P0414 (bank1) P0417 (bank2)	Circuit Continuity	drain voltage of FET & signal from ECM for relays drain voltage of FET & signal from ECM for relays	ignition switch battery voltage	>= 10.9	<-- <--	<-- <--	V		2500 2500	msec msec	immediately	
(98) Secondary Air Pump relay	P0418	Circuit Continuity	drain voltage of FET & signal from ECM for relays	ignition switch battery voltage	>= 10.9	<-- <--	<-- <--	V		2500 2500	msec msec	immediately	
	P1418		drain voltage of FET & signal from ECM for relays	Secondary Air Pump relay "low" no failure									
(99) Secondary Air Pressure Sensor	P2131	rationality check	pressure in piping - MAP	engine speed at engine starting vehicle speed in-mani press. at eng. start - MAP after secondary air system disable components listed on #62 of page 03-E-1	< 300 < 0.6214 < 1.331887 >= 2976 no failure	<-- <-- <-- <-- <--	<-- <-- <-- <-- <--	rpm mph KPa msec		328	msec	two driving cycles	
	P2432 P2433	range check	output voltage	ignition switch	on	<--	<--			500	msec	immediately	
(100) Solenoid valve for purge control 2	P2419	circuit continuity	drain voltage of FET and signal from ECM	battery voltage after engine starting	>= 10.9 >= 1	<-- <--	<-- <--	secs.		2500	msec	two driving cycles	
	P2420		drain voltage of FET and signal from ECM	ignition switch	on	<--	<--			2500	msec		
	P0441	rationality check	fuel tank pressure difference between at the end of EVAP sys. diagnosis & 3.5 secs. later	EVAP emission control sys. amount of intake air fuel tank pressure at the end of EVAP system diagnosis	no failure < 45 < -1.29989	<-- <-- <--	<-- <-- <--	g/s KPa		3500	msec	two driving cycles	