

### 1. Foreword

#### A: FOREWORD

These manuals are used when performing maintenance, repair or diagnosis of SUBARU TRIBECA.

Applicable model:

2009MY WX\*\*\*\*\*

The manuals contain the latest information at the time of publication. Changes in the specifications, methods, etc. may be made without notice.

# HOW TO USE THIS MANUALS

***HU***

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### **1. How to Use This Manuals**

#### **A: HOW TO USE THIS MANUALS**

##### **1. STRUCTURE**

Each section consists of SCT that are broken down into SC that are divided into sections for each component. The specification, maintenance and other information for the components are included, and the diagnostic information has also been added where necessary.

##### **2. CONTENTS**

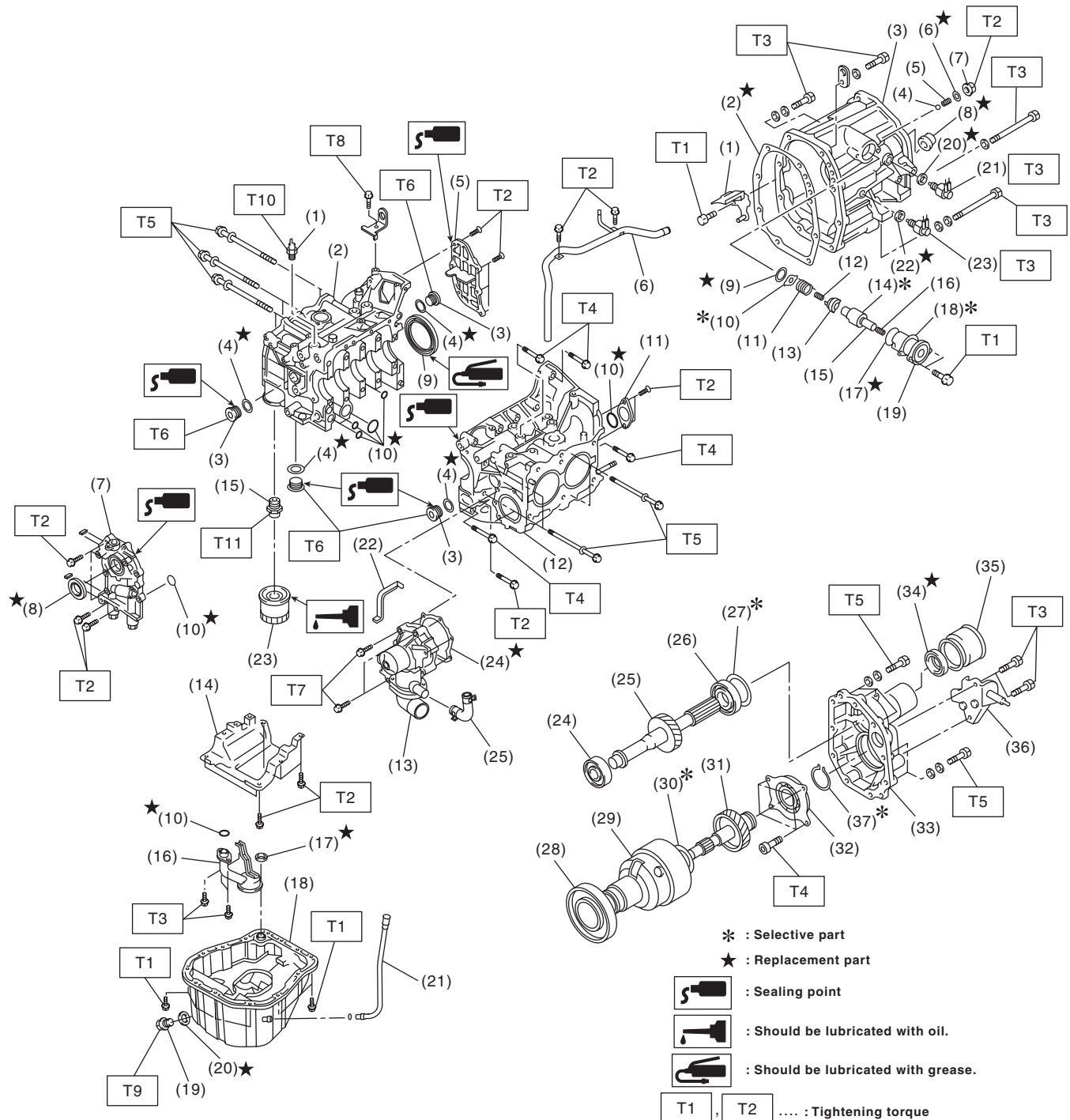
The first page has an index with tabs.

### 3. COMPONENT

Illustrations are provided for each component. The information necessary for repair work (tightening torque, grease up points, etc.) is described on these illustrations. Information is described using symbol.

To order parts, refer to parts catalogue.

**Example:**



HU-00017

# How to Use This Manuals

## HOW TO USE THIS MANUALS

### 4. SPECIFICATION

If necessary, specifications are also included.

### 5. INSPECTION

Inspections to be carried out before and after maintenance are included.

### 6. MAINTENANCE

- Maintenance instructions for serviceable parts describe work area and detailed step with illustration. It also describes the use of special tool, tightening torque, caution for each procedure.
- If many serviceable parts are included in one service procedure, appropriate reference is provided for each parts.

**Example:**

#### 15.Main Shaft Assembly for Sin- (A) gle-Range

##### A: REMOVAL (B)

1) Remove the manual transmission assembly from vehicle. <Ref. to MT-33, REMOVAL, Manual Transmission Assembly.> (C)

11) Tighten the lock nuts to the specified torque using ST1 and ST2.

NOTE: (D)

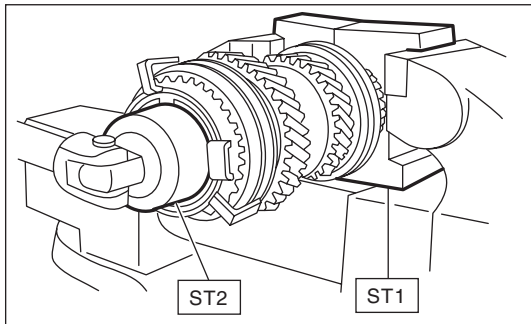
Secure the lock nuts in two places after tightening.

ST1 498937000 TRANSMISSION HOLDER

ST2 499987003 (E) SOCKET WRENCH (35) (F)

**Tightening torque:**

**118 N·m (12.0 kgf-m, 86.8 ft-lb) (G)**



HU-00020

(A) Component

(B) Process

(C) Reference

(D) Cautions

(E) Tool number of special tool

(F) Name of special tool

(G) Tightening torque

(H) Illustration

### 7. DIAGNOSIS

Tables showing a step-by-step process make it easy to conduct diagnosis.

### 8. SI UNITS

Measurements in these manuals are according to the SI units. Metric and yard/pound measurements are also included.

**Example:**

***Tightening torque:***

***44 N·m (4.5 kgf-m, 33 ft-lb)***

| Item                  | SI units                 | Conventional unit   | Remarks                             |
|-----------------------|--------------------------|---------------------|-------------------------------------|
| Force                 | N (Newton)               | kgf                 | 1 kgf = 9.80655 N                   |
| Mass (Weight)         | kg, g                    | kg, g               |                                     |
| Capacity              | ℓ, mℓ or cm <sup>3</sup> | ℓ or cc             | 1 cc = 1 cm <sup>3</sup> = 1 mℓ     |
| Torque                | N·m                      | kgf-m, kgf-cm       | 1 kgf-m = 9.80655 N·m               |
| Rotating speed        | rpm                      | rpm                 |                                     |
| Pressure              | kPa (kilopascal)         | kgf/cm <sup>2</sup> | 1 kgf/cm <sup>2</sup> = 98.0655 kPa |
|                       |                          | mmHg                | 1 mmHg = 0.133322 kPa               |
| Power                 | W                        | PS                  | 1 PS = 0.735499 kW                  |
| Calorie               | W·h                      | cal                 | 1 kcal = 1.16279 W·h                |
| Fuel consumption rate | g/kw·h                   | g/PS·h              | 1 g/PS·h = 1.3596 g/kW·h            |

The figure used in these manuals are described in the SI units and conventional units are described in ( ).

# How to Use This Manuals

## HOW TO USE THIS MANUALS

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### 9. EXPLANATION OF TERMINOLOGY

|      |                                               |      |                                   |
|------|-----------------------------------------------|------|-----------------------------------|
| AAI  | : Air Assist Injection                        | H/L  | : Headlight                       |
| A/B  | : Airbag                                      | H/U  | : Hydraulic Unit                  |
| ABS  | : Anti-lock Brake System                      | I/F  | : Interface                       |
| A/C  | : Air Conditioner                             | I/O  | : Input/Output                    |
| ACC  | : Accessory                                   | IG   | : Ignition                        |
| A/F  | : Air Fuel Ratio                              | INT  | : Intermittent                    |
| ALT  | : Generator                                   | ISC  | : Idle Speed Control              |
| ASSY | : Assembly                                    | LCD  | : Liquid Crystal Display          |
| AT   | : Automatic Transmission                      | LH   | : LH (Left Hand)                  |
| ATF  | : Automatic Transmission Fluid                | LSD  | : Limited Slip Differential       |
| AUX  | : Auxiliary                                   | M/B  | : Main Fuse & Relay Box           |
| AUX  | : Auxiliary Storage Unit                      | MFI  | : Multi Point Injection           |
| AWD  | : All Wheel Drive                             | MT   | : Manual Transmission             |
| BATT | : Battery                                     | NA   | : Natural Aspiration              |
| CAN  | : Controller Area Network                     | OP   | : Option Parts                    |
| CD   | : Compact Disc                                | P/W  | : Power Window                    |
| CPU  | : Central Processing Unit                     | PCV  | : Positive Crankcase Ventilation  |
| DOHC | : Double Overhead Camshaft                    | PTJ  | : Pillow Tripod Joint             |
| DOJ  | : Double Offset Joint                         | RH   | : RH (Right Hand)                 |
| DTC  | : Diagnostic Trouble Code                     | ROM  | : Read Only Memory                |
| DVD  | : Digital Versatile Disc                      | Rr   | : Rear                            |
| EBJ  | : High-efficiency Compact Ball Fixed Joint    | SOHC | : Single Overhead Camshaft        |
| ECM  | : Engine Control Module                       | SRS  | : Supplemental Restraint System   |
| EDJ  | : High-efficiency Compact Double Offset Joint | SSM  | : Subaru Select Monitor           |
| EGR  | : Exhaust Gas Recirculation                   | ST   | : Special Tool                    |
| EX   | : Exhaust                                     | SW   | : Switch                          |
| F/B  | : Fuse & Joint Box                            | TCS  | : Traction Control System         |
| Ft   | : Front                                       | TCM  | : Transmission Control Module     |
| FWD  | : Front Wheel Drive                           | TPMS | : Tire Pressure Monitoring System |
| GPS  | : Global Positioning System                   | VDC  | : Vehicle Dynamics Control        |
| HI   | : High                                        | VTD  | : Variable Torque Distribution    |
| HID  | : High Intensity Discharge                    |      |                                   |

# SPECIFICATIONS

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# TRIBECA

## SPECIFICATIONS

### 1. TRIBECA

#### A: DIMENSION

|                          |        |         |                                                                               |
|--------------------------|--------|---------|-------------------------------------------------------------------------------|
| Overall length           |        | mm (in) | 4,865 (191.5)                                                                 |
| Overall width            |        | mm (in) | 1,878 (73.9)                                                                  |
| Overall height (at C.W.) |        | mm (in) | Models without roof rail: 1,686 (66.4)<br>Models with roof rail: 1,720 (67.7) |
| Compartment              | Length | mm (in) | 7 Seater model: 2,495 (98.2)<br>5 Seater model: 1,815 (71.5)                  |
|                          | Width  | mm (in) | 1,476 (58.1)                                                                  |
|                          | Height | mm (in) | 1,390 (54.7)                                                                  |
| Wheelbase                |        | mm (in) | 2,749 (108.2)                                                                 |
| Tread                    | Front  | mm (in) | 1,580 (62.2)                                                                  |
|                          | Rear   | mm (in) | 1,578 (62.1)                                                                  |
| Minimum road clearance   |        | mm (in) | 213 (8.4)                                                                     |

#### B: ENGINE

|                                        |  |                                                                           |                             |
|----------------------------------------|--|---------------------------------------------------------------------------|-----------------------------|
| Engine type                            |  | Horizontally opposed, liquid cooled, 6-cylinder, 4-stroke gasoline engine |                             |
| Valve arrangement                      |  | Overhead camshaft                                                         |                             |
| Bore x stroke                          |  | mm (in)                                                                   | 92.0 x 91.0 (3.622 x 3.583) |
| Displacement                           |  | cm <sup>3</sup> (cu in)                                                   | 3,630 (221.5)               |
| Compression ratio                      |  | 10.5                                                                      |                             |
| Ignition order                         |  | 1 — 6 — 3 — 2 — 5 — 4                                                     |                             |
| Idle speed at Park or Neutral position |  | rpm                                                                       | 700                         |
| Maximum output                         |  | kW (HP)/rpm                                                               | 191 (256)/6,000             |
| Maximum torque                         |  | N·m (kgf-m, ft-lb)/rpm                                                    | 335 (34.2, 247)/4,400       |

#### C: ELECTRICAL

|                             |                         |             |                     |
|-----------------------------|-------------------------|-------------|---------------------|
| Ignition timing (at idling) |                         | BTDC        | 15°                 |
| Spark plug                  | Type and manufacturer   |             | NGK: SILFR6A        |
| Generator                   |                         | 12 V — 130A |                     |
| Battery                     | Type and capacity (5HR) |             | 12V — 52AH (75D23L) |

## D: TRANSMISSION

|                        |                 |              |         |
|------------------------|-----------------|--------------|---------|
| Transmission type      |                 |              | 5AT     |
| Clutch type            |                 |              | TCC     |
| Gear ratio             |                 | 1st          | 3.540   |
|                        |                 | 2nd          | 2.264   |
|                        |                 | 3rd          | 1.471   |
|                        |                 | 4th          | 1.000   |
|                        |                 | 5th          | 0.834   |
|                        |                 | Reverse      | 2.370   |
| Reduction gear (Front) | 1st reduction   | Type of gear | Helical |
|                        |                 | Gear ratio   | 1.000   |
|                        | Final reduction | Type of gear | Hypoid  |
|                        |                 | Gear ratio   | 3.583   |
| Reduction gear (Rear)  | Final reduction | Type of gear | Hypoid  |
|                        |                 | Gear ratio   | 3.583   |

5AT: Electronically controlled fully-automatic, 5-forward speeds and 1-reverse

TCC: Torque Converter Clutch

## E: STEERING

|                          |              |               |
|--------------------------|--------------|---------------|
| Type                     |              | Rack & pinion |
| Turns, lock to lock      |              | 3.44          |
| Minimum turning diameter | Curb to curb | 11.4 (37.4)   |
|                          | Wall to wall | 12.2 (40.0)   |

## F: SUSPENSION

|       |                                  |
|-------|----------------------------------|
| Front | Macpherson strut type suspension |
| Rear  | Double-wishbone type suspension  |

## G: BRAKE

|                      |                                                         |
|----------------------|---------------------------------------------------------|
| Service brake system | Dual circuit hydraulic with vacuum suspended power unit |
| Front                | Ventilated disc brake                                   |
| Rear                 | Ventilated disc brake                                   |
| Parking brake        | Mechanical on rear brakes                               |

## H: TIRE

|            |                               |
|------------|-------------------------------|
| Wheel size | 18 × 8JJ                      |
| Tire size  | P255/55 R18 104H              |
| Type       | Tubeless, Steel belted radial |

# TRIBECA

## SPECIFICATIONS

### I: CAPACITY

|                             |                                                   |                                          |                  |
|-----------------------------|---------------------------------------------------|------------------------------------------|------------------|
| Fuel tank                   | ℓ (US gal, Imp gal)                               |                                          | 64 (16.9, 14.1)  |
| Engine oil                  | Capacity (at overhaul)                            | ℓ (US qt, Imp qt)                        | 7.8 (8.2, 6.9)   |
|                             | Filling amount of engine oil<br>ℓ (US qt, Imp qt) | When replacing engine oil and oil filter | 6.5 (6.9, 5.7)   |
|                             |                                                   | When replacing engine oil only           | 6.3 (6.7, 5.5)   |
| ATF                         | ℓ (US qt, Imp qt)                                 |                                          | 9.8 (10.4, 8.6)  |
| Front differential gear oil | ℓ (US qt, Imp qt)                                 |                                          | 1.4 (1.5, 1.2)   |
| Rear differential gear oil  | ℓ (US qt, Imp qt)                                 |                                          | 0.8 (0.8, 0.7)   |
| Power steering fluid        | ℓ (US qt, Imp qt)                                 |                                          | 0.9 (0.95, 0.79) |
| Engine coolant              | ℓ (US qt, Imp qt)                                 |                                          | 7.6 (8.0, 6.7)   |

## J: WEIGHT

| Model                            |                                       |         | 5ST              |                  |                  |                  |                  |                  |                  |                  |
|----------------------------------|---------------------------------------|---------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Destination code                 |                                       |         | C0               |                  | U4               |                  |                  | C4               |                  |                  |
| OP code                          |                                       |         | CQ               | BP               | XX               | BA               | BM               | CT               | BT               | BS               |
| Curb weight (C.W.)               | Front                                 | kg (lb) | 1,051<br>(2,317) | 1,051<br>(2,317) | 1,041<br>(2,296) | 1,049<br>(2,314) | 1,052<br>(2,320) | 1,048<br>(2,311) | 1,050<br>(2,315) | 1,052<br>(2,320) |
|                                  | Rear                                  | kg (lb) | 841<br>(1,854)   | 847<br>(1,868)   | 831<br>(1,833)   | 847<br>(1,867)   | 849<br>(1,873)   | 842<br>(1,857)   | 847<br>(1,868)   | 850<br>(1,874)   |
|                                  | Total                                 | kg (lb) | 1,892<br>(4,172) | 1,898<br>(4,185) | 1,873<br>(4,129) | 1,897<br>(4,182) | 1,902<br>(4,193) | 1,891<br>(4,170) | 1,897<br>(4,183) | 1,902<br>(4,194) |
| Gross axle weight ratio (G.A.W.) | Front                                 | kg (lb) | 1,368<br>(3,016) | 1,368<br>(3,016) | 1,368<br>(3,016) | 1,368<br>(3,016) | 1,368<br>(3,016) | 1,368<br>(3,016) | 1,368<br>(3,016) | 1,368<br>(3,016) |
|                                  | Rear                                  | kg (lb) | 1,515<br>(3,340) | 1,515<br>(3,340) | 1,515<br>(3,340) | 1,515<br>(3,340) | 1,515<br>(3,340) | 1,515<br>(3,340) | 1,515<br>(3,340) | 1,515<br>(3,340) |
| Gross vehicle weight (G.V.W.)    |                                       |         | kg (lb)          | 2,586<br>(5,700) | 2,586<br>(5,700) | 2,586<br>(5,700) | 2,586<br>(5,700) | 2,586<br>(5,700) | 2,586<br>(5,700) | 2,586<br>(5,700) |
| Option                           | Leather seat                          |         | —                | ○                | —                | ○                | ○                | —                | ○                | ○                |
|                                  | Seat heater                           |         | ○                | ○                | —                | ○                | ○                | ○                | ○                | ○                |
|                                  | Sunroof                               |         | ○                | ○                | —                | ○                | ○                | ○                | ○                | ○                |
|                                  | Driver's memory seat                  |         | —                | ○                | —                | ○                | ○                | —                | ○                | ○                |
|                                  | Navigation system                     |         | —                | —                | —                | —                | ○                | —                | —                | —                |
|                                  | DVD                                   |         | —                | —                | —                | —                | —                | —                | —                | ○                |
|                                  | Home link                             |         | ○                | ○                | —                | ○                | ○                | —                | —                | —                |
|                                  | HID headlight                         |         | ○                | ○                | —                | —                | —                | —                | —                | —                |
|                                  | Rear view camera                      |         | —                | —                | —                | —                | ○                | ○                | ○                | ○                |
|                                  | XM+high grade audio                   |         | —                | —                | —                | —                | ○                | —                | —                | —                |
|                                  | High grade audio & speakers           |         | —                | —                | —                | —                | —                | ○                | ○                | ○                |
|                                  | Satellite-compatible+high grade audio |         | —                | ○                | —                | ○                | —                | —                | —                | —                |

# TRIBECA

## SPECIFICATIONS

| Model                                 |                                       | BASE             |                  |                  |                  |                  |                  |                  |                  |                  |
|---------------------------------------|---------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Destination code                      |                                       | C0               |                  |                  | U4               |                  |                  |                  | C4               |                  |
| OP code                               |                                       | AL               | BC               | BH               | XX               | BA               | BM               | BN               | BT               | BS               |
| Curb weight (C.W.)                    | Front kg (lb)                         | 1,041<br>(2,295) | 1,051<br>(2,317) | 1,054<br>(2,324) | 1,038<br>(2,288) | 1,047<br>(2,309) | 1,050<br>(2,315) | 1,052<br>(2,320) | 1,048<br>(2,311) | 1,051<br>(2,317) |
|                                       | Rear kg (lb)                          | 863<br>(1,903)   | 880<br>(1,940)   | 881<br>(1,943)   | 859<br>(1,894)   | 876<br>(1,932)   | 879<br>(1,938)   | 881<br>(1,943)   | 876<br>(1,932)   | 876<br>(1,932)   |
|                                       | Total kg (lb)                         | 1,904<br>(4,198) | 1,931<br>(4,258) | 1,935<br>(4,267) | 1,897<br>(4,182) | 1,924<br>(4,242) | 1,929<br>(4,253) | 1,933<br>(4,263) | 1,924<br>(4,242) | 1,928<br>(4,251) |
| Gross axle weight ratio (G.A.W.)      | Front kg (lb)                         | 1,368<br>(3,016) | 1,368<br>(3,016) | 1,368<br>(3,016) | 1,368<br>(3,016) | 1,368<br>(3,016) | 1,368<br>(3,016) | 1,368<br>(3,016) | 1,368<br>(3,016) | 1,368<br>(3,016) |
|                                       | Rear kg (lb)                          | 1,515<br>(3,340) | 1,515<br>(3,340) | 1,515<br>(3,340) | 1,515<br>(3,340) | 1,515<br>(3,340) | 1,515<br>(3,340) | 1,515<br>(3,340) | 1,515<br>(3,340) | 1,515<br>(3,340) |
| Gross vehicle weight (G.V.W.) kg (lb) |                                       | 2,586<br>(5,700) | 2,586<br>(5,700) | 2,586<br>(5,700) | 2,586<br>(5,700) | 2,586<br>(5,700) | 2,586<br>(5,700) | 2,586<br>(5,700) | 2,586<br>(5,700) | 2,586<br>(5,700) |
| Option                                | Leather seat                          | —                | ○                | ○                | —                | ○                | ○                | ○                | ○                | ○                |
|                                       | Seat heater                           | ○                | ○                | ○                | —                | ○                | ○                | ○                | ○                | ○                |
|                                       | Sunroof                               | —                | ○                | ○                | —                | ○                | ○                | ○                | ○                | ○                |
|                                       | Driver's memory seat                  | —                | ○                | ○                | —                | ○                | ○                | ○                | ○                | ○                |
|                                       | Navigation system                     | —                | —                | ○                | —                | —                | ○                | ○                | —                | —                |
|                                       | DVD                                   | —                | ○                | ○                | —                | —                | —                | ○                | —                | ○                |
|                                       | Home link                             | ○                | ○                | ○                | —                | ○                | ○                | ○                | —                | —                |
|                                       | HID headlight                         | —                | ○                | ○                | —                | —                | —                | —                | —                | —                |
|                                       | Rear view camera                      | —                | ○                | ○                | —                | —                | ○                | ○                | ○                | ○                |
|                                       | XM+high grade audio                   | —                | —                | ○                | —                | —                | ○                | ○                | —                | —                |
|                                       | High grade audio & speakers           | —                | —                | —                | —                | —                | —                | —                | ○                | ○                |
|                                       | Satellite-compatible+high grade audio | —                | ○                | —                | —                | ○                | —                | —                | —                | —                |

# PRECAUTION

*PC*

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### 1. Precaution

#### A: CAUTION

Please clearly understand and adhere to the following general precautions. They must be strictly followed to avoid any injury to the person doing the work or people in the area.

#### 1. VEHICLE DYNAMICS CONTROL (VDC)

Handle the VDC as a total system. Do not disassemble or attempt to repair individual parts. Doing so could prevent the VDC system from operating when needed or cause it to operate incorrectly and result in injury.

#### 2. BRAKE FLUID

If brake fluid gets in your eyes or on your skin, do the following:

- Wash eyes and seek immediate medical attention.
- Wash your skin with soap and then rinse thoroughly with water.

Follow all government regulations concerning disposal of refuse when disposing.

#### 3. RADIATOR FAN

The radiator fan may rotate without warning, even when the engine is not ON. Do not place your hand, cloth, tools or other items near the fan at any time.

#### 4. ROAD TEST

Always conduct road tests in accordance with traffic rules and regulations to avoid bodily injury and interrupting traffic.

#### 5. AIRBAG

To prevent bodily injury from unexpected deployment of airbags and unnecessary maintenance, follow the instructions in this manual when performing maintenance on or near the airbag components, around front of the vehicle (radiator panel, front wheel apron, front side frame, bumper, hood, front fender), around side of the vehicle (front door, rear door, center pillar, rear fender, side sill, rear wheel apron), and on or near the airbag wiring harnesses. To prevent unexpected deployment, turn the ignition switch to OFF and disconnect the ground cable from battery, then wait at least 20 seconds before starting work.

#### 6. AIRBAG AND SEAT BELT PRETENSIONER DISPOSAL

To prevent bodily injury from unexpected airbag deployment, do not dispose the airbag modules and seat belt pretensioner in the same way as other waste. Follow all government regulations concerning disposal of refuse.

#### 7. AIRBAG MODULE

Carefully observe the following when handling and storing the airbag module to prevent bodily injury from unexpected deployment:

- Do not hold the harnesses or connectors to carry the module.
- Do not face the bag in the direction that it opens towards yourself or other people.
- Do not face the bag in the direction that it opens towards the floor or walls.

#### 8. AIRBAG SPECIAL TOOL

To prevent unexpected deployment, only use special tools.

#### 9. WINDOW

Always wear safety glasses when working around any glass to prevent glass fragments from damaging your eyes.

#### 10. WINDOW ADHESIVE

Always use the recommended or equivalent adhesive when attaching glass to prevent it from coming falling, resulting in accidents and injury.

#### 11. OIL

When handling oil, follow the rules below to prevent unexpected accidents.

- Prepare a container and cloth when performing work which oil possibly spills. If oil spills, wipe it off immediately to prevent from penetrating into floor or flowing out, to protect the environmental.
- Follow all government regulations concerning disposal of refuse when disposing.

#### 12. FUEL

When handling and storing fuel, carefully observe the following to prevent unexpected accidents.

- Be careful of fires.
- Prepare a container and cloth to prevent scattering of fuels when performing work where fuels can be spilled. If the fuel spills, wipe it off immediately to prevent it from penetrating the floor or flowing out, to protect the environmental.
- Follow all government and local regulations concerning disposal of refuse when disposing.

## 13.ENGINE COOLANT

When handling engine coolant, adhere to the following to prevent from unexpected accident.

- Never remove the radiator cap because of the danger of engine coolant blowing out when the engine coolant is hot.
- Prepare a container and cloth to prevent spraying of engine coolant when performing work in which engine coolant can be spilled. If the fuel spills, wipe it off immediately to prevent from penetrating into floor or flowing out for environmental protection.
- Follow all government and local regulations concerning disposal of refuse when disposing.

## 14.AIR CONDITIONER REFRIGERANT

In order to prevent from global warming, avoid releasing air conditioner refrigerant into the atmosphere. Using a refrigerant recovery system, discharge and reuse it.

## 15.HOSE REMOVAL/INSTALLATION PROCEDURES

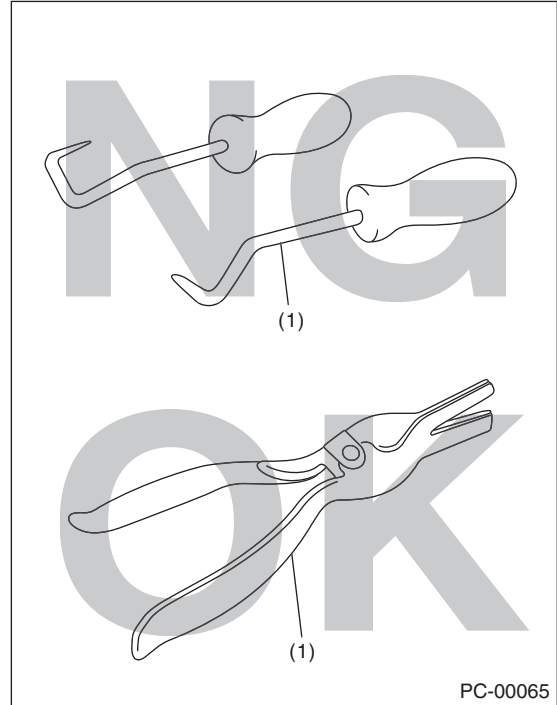
### 1. Hose Removal/Installation Pre-Procedures

- Be careful to inspect hoses so as not to use damaged or deformed hoses. Using such hoses could cause leakage or loss of oil, with leaked oil splashing on exhaust pipes or other hot parts, resulting in smoke or fire.
- Always remove hoses when performing work. Not removing the hoses and moving parts out of the way when performing procedures may damage the inside of hoses and cause other negative affects.

### 2. Hose Removal/Installation Procedures and Inspection

- Remove hoses according to the following instructions.

- If using the hose remover (general tool), do not use the sharp-pointed hose remover (hose plucker) as it may damage pipe surfaces or hoses.



(1) Hose remover

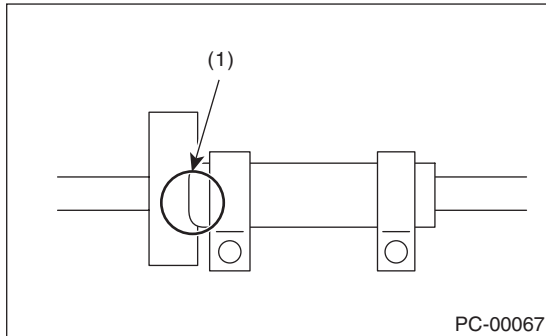
- When using pliers to make hose removal easier, always be sure to use a cloth to protect the hose, slightly rotate the hose, and then pull straight out by hand.

# Precaution

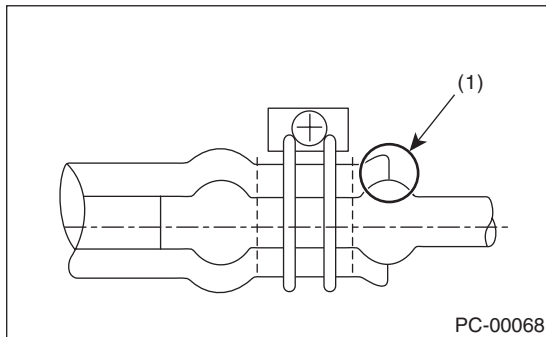
## PRECAUTION

- **Inspect the following points in continuous use, and replace any hoses that are damaged or defective with new parts.**

- Replace any hoses that are riding over the stay or spool with new parts.



(1) Hose riding over a stay

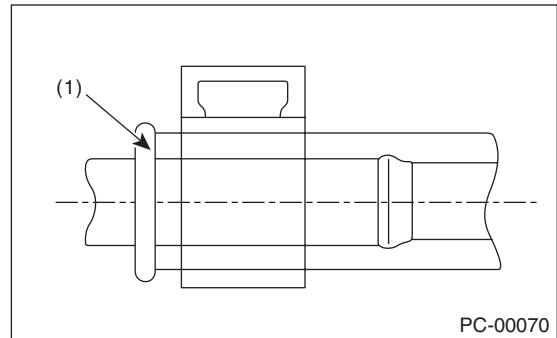
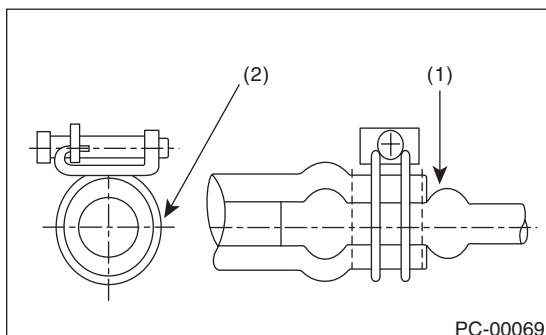


(1) Hose riding over a spool

- Check the inner and outer surfaces of the hose for damage, cracks, breakage, hardening/softening/swelling of rubber, internal peeling, and that there are no deformations caused by infiltration/adhesion of foreign matter, and no twisted hoses. Replace any defective hoses with new parts.

- **Install hoses according to the following instructions.**

- Carefully check the installation positions.
- Do not use any lubricants.
- Securely insert until the specified positions (until contacting spool).



- (1) Contacting the spool. (Do not excessively insert the hose to prevent the hose from becoming wrinkled up.)
- (2) Apply an equal clamping force all around the hose periphery.

- Check that the position and orientation of hose clamps, and the hose layout are correct. (Check that the position and orientation are matching, they are not excessively short/long, there are no differences with before performing the procedures, and that there is clearance between hoses and surrounding parts.)
- After installing, check that there are no disconnection of hoses or leakage from hoses. (Check that hoses are securely fixed by the clamps.)
- **Inspect the hose clips and clamps according to the following points, and replace any parts that are damaged or defective with new parts.**
  - Check for deformations, rust, damage, and adhering of foreign matter.
  - For clips, check that the spring functions and has clamping force.
  - For clamps, check that the screw can clinch, the clamp has not become oval shaped, and the screw is not damaged.
- **Inspect the pipes according to the following points, and replace any parts that are damaged or defective with new parts.**

Check that the pipes do not have any damage, rust, peeling (including peeling plating), foreign matter adhering, twisting, crushing, bending, or cracks.
- **Replace the following parts with new parts if the hoses have been removed or their installation positions have been changed.**

ATF cooler hose, engine oil cooler hose, power steering suction hose, and power steering return hose.

# NOTE

***NT***

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|               | Page |
|---------------|------|
| 1. Note ..... | 2    |



## 1. Note

### A: NOTE

This information will improve the efficiency of maintenance and assure that the finished work is of a good quality.

### 1. FASTENERS NOTICE

Fasteners are used to prevent the parts from damage, dislocation and play due to looseness. Fasteners must be tightened to the specified torque.

Do not apply paint, lubricant, rust retardant or other substance to the surface around bolts, nuts, etc. Doing so will make it difficult to obtain the correct torque and result in looseness and other problem.

### 2. STATIC ELECTRICITY DAMAGE

Do not touch the control modules, connectors, logic boards and other such parts when there is a possibility of static electricity. Always use a static electricity prevention cord or touch grounded metal for the elimination of static electricity before conducting work.

### 3. BATTERY

When removing the battery terminal, always be sure to turn the ignition to OFF to prevent electrical damage of the control module from overcurrent. Be sure to remove the battery ground cable first.

When removing the battery terminal, memories such as the stereo and control unit DTC are erased. Therefore, the content of each memory should be recorded first.

### 4. SERVICE PARTS

Use genuine parts for maximum performance and maintenance when conducting repairs. Subaru/FHI will not be responsible for poor performance resulting from the use of parts except for genuine parts.

### 5. PROTECTING VEHICLE UNDER MAINTENANCE

Make sure to attach the fender cover, seat covers, etc. before work.

### 6. ENSURING SECURITY DURING WORK

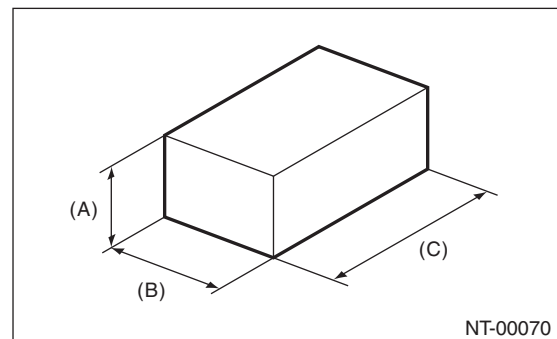
When working in a group of two or more, perform the work with calling each other to ensure mutual safety.

## 7. LIFT AND JACK

When using a lift or shop jack raise a vehicle or using rigid rack to support a vehicle, always follow instructions concerning jack-up points and weight limits to prevent the vehicle from falling, which could result in injury. Be especially careful that the vehicle is balanced before raising it. Be sure to set the wheel stoppers when jacking-up only the front or rear side of the vehicle.

### NOTE:

- When using a lift, follow its operation manual before work.
- Do not work or leave unattended while the vehicle is supported with jack, support it with rigid racks.
- Be sure to use the rigid racks with rubber attached to cradle to support the vehicle.
- When using a plate lift, use a rubber attachment.

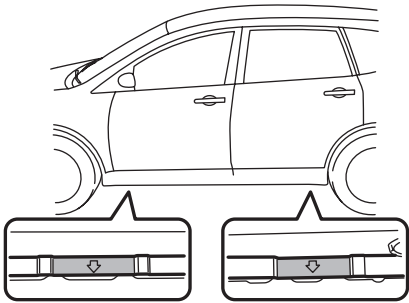


- (A) 80 mm (3.1 in) or more
- (B) 100 — 150 mm (3.94 — 5.91 in)
- (C) 120 — 190 mm (4.72 — 7.48 in)

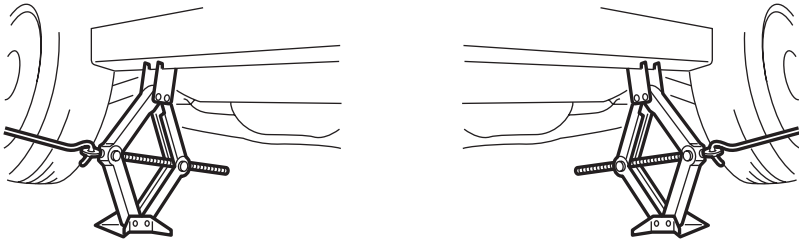
- Align the cushion rubber end of plate lift with the end of rubber attachment (Portion b). Also, align the protrusion portion of the supporting locations with the end of attachment (Portion a).

- Do not use the plate lift whose attachment does not reach the supporting locations.

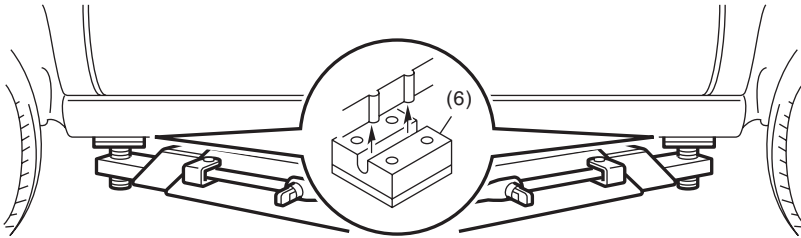
(1)



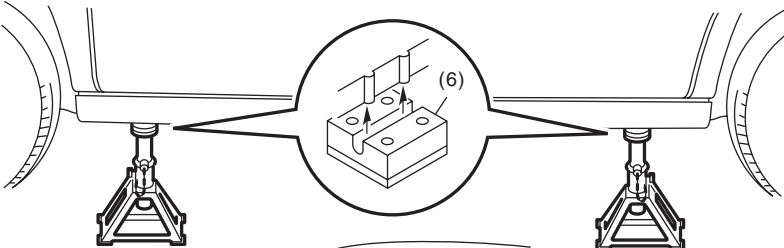
(2)



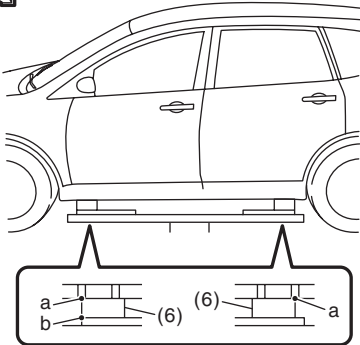
(3)



(4)



(5)



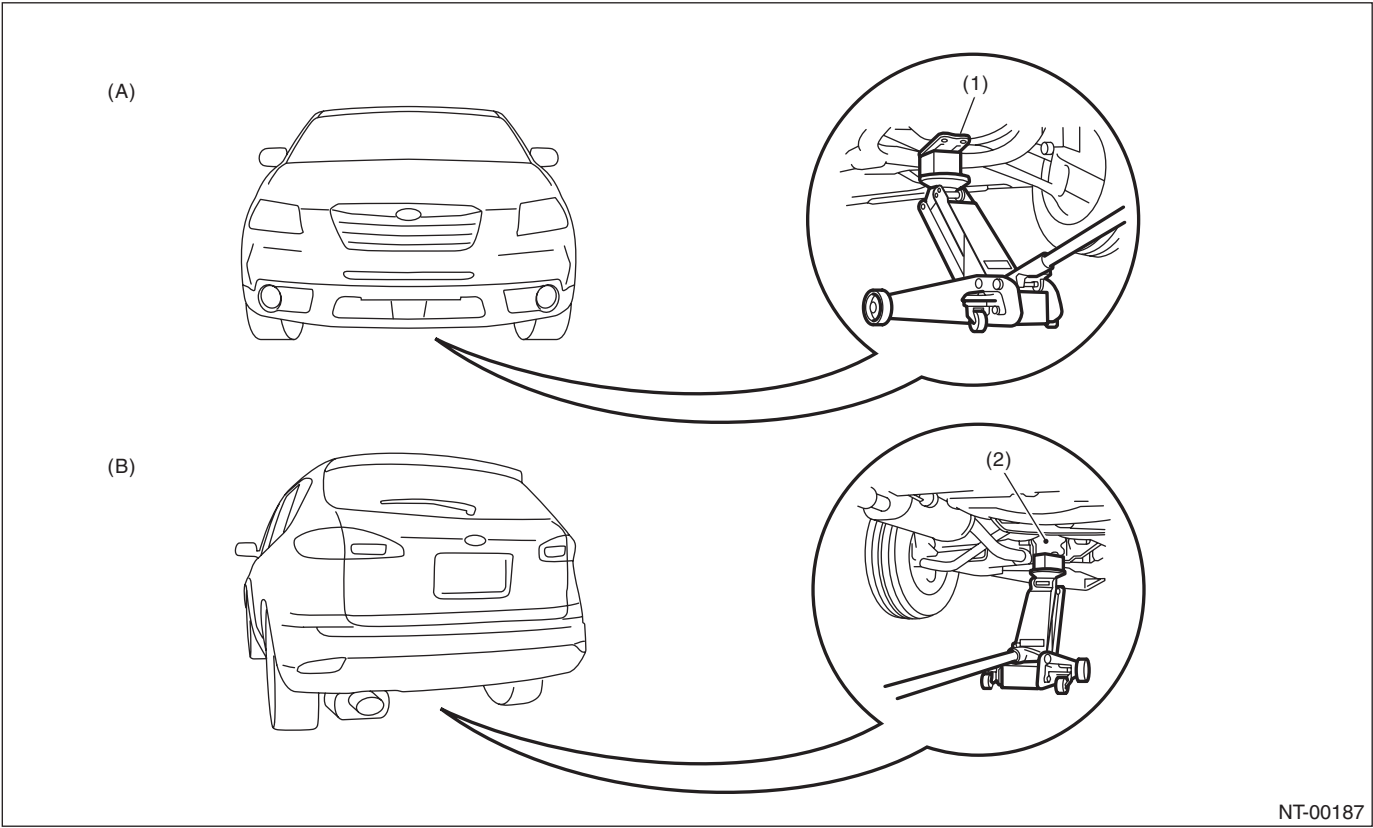
(1) Supporting locations  
(2) Pantograph jack

(3) Swing arm lift  
(4) Rigid rack

(5) Plate lift  
(6) Attachment

NT-00130

NOTE



NT-00187

(A) Front

(B) Rear

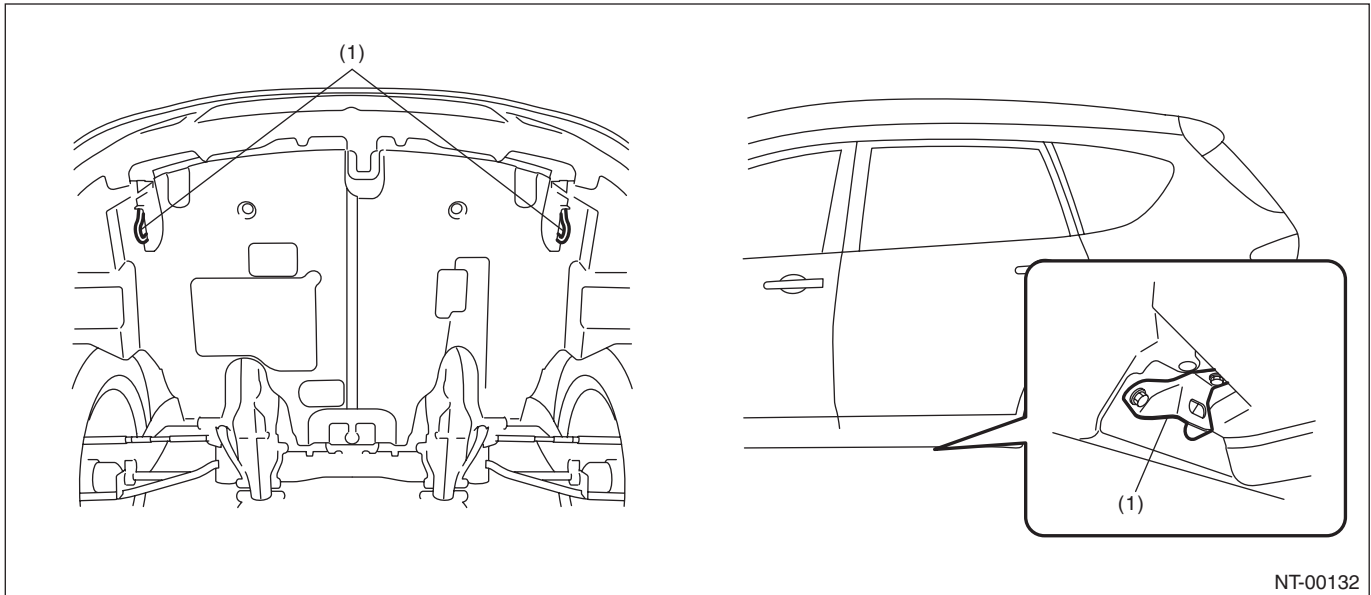
(1) Front crossmember

(2) Rear differential

## 8. TIE-DOWNS

Tie-downs are used when transporting vehicles and when using the chassis dynamo. Attach tie-down only to the specified locations on the vehicle.

- TIE-DOWN LOCATION



(1) Hook for tie-down

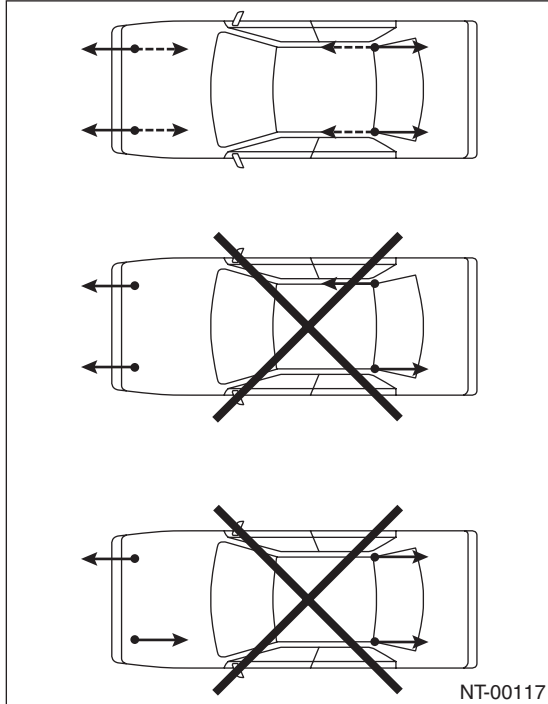
## Note

### NOTE

#### • CHAIN DIRECTION AT TIE-DOWN CONDITION

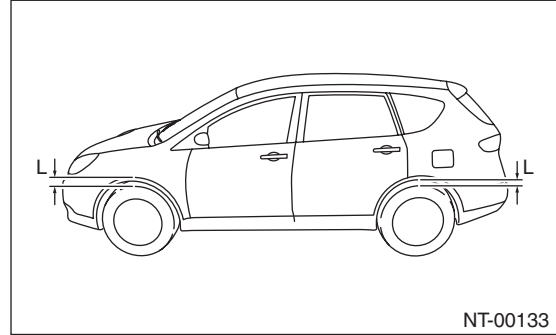
##### NOTE:

Pull the chains LH and RH in the same direction, but front and rear side in the counter direction. Pull all the chains in a same moment.

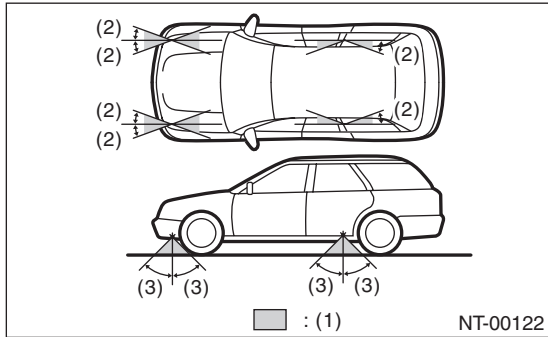


#### • VEHICLE SINKING VOLUME AT TIE-DOWN CONDITION

Measure the distance between the highest tire point and highest arch point before and after tie-down. Difference of measured values (sinking volume) should be within 50 mm (1.97 in) and make sure to fix the vehicle securely.



#### • CHAIN PULLING RANGE AT TIE-DOWN CONDITION



- (1) Chain pulling range at tie-down condition
- (2) 20°
- (3) 45°

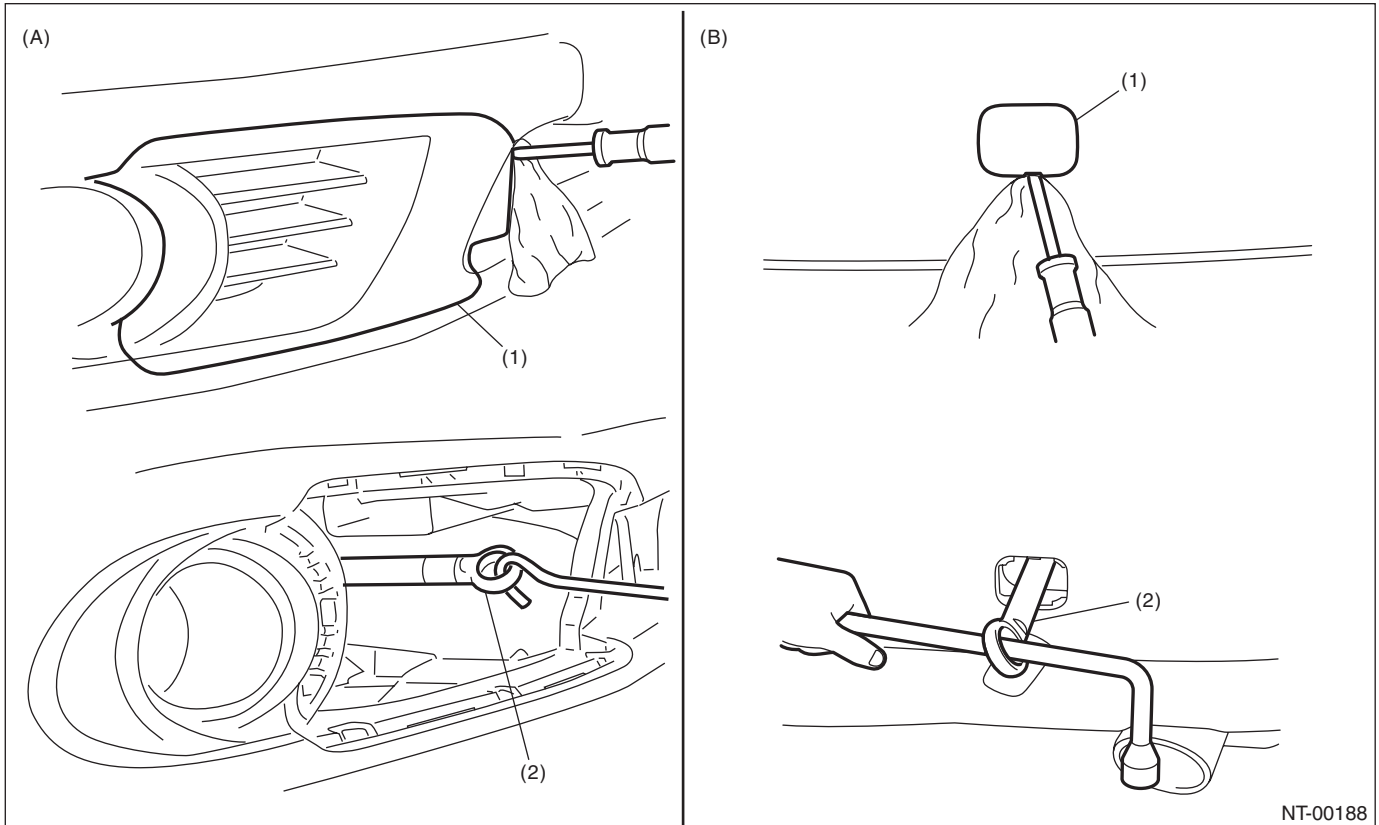
## 9. TOWING

Avoid towing vehicles except when the vehicle cannot be driven. For models with AWD, AT or VTD, use a loader instead of towing. When towing other vehicles, pay attention to the following to prevent hook or vehicle damage resulting from excessive weight.

- Do not tow other vehicles with a front tie-down hook.
- Make sure the vehicle towing is heavier than the vehicle being towed.
- Remove the hook cover, and then install the hook.

### CAUTION:

- Pull the screwdriver which is inserted into the hook cover.
- Do not remove the hook cover holding the slit of the hook cover.



(A) Front

(B) Rear

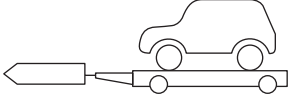
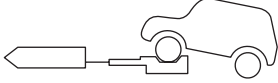
(1) Hook cover

(2) Hook

## Note

### NOTE

#### • NOTES

| Towing                                                                                                                                         | Precautions                                                                                                                                                                                                              | AT |
|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <p>Lifting up four wheels (On a trailer)</p>  <p>NT-00023</p> | <p>Towing the vehicle after lifting up all four wheels is a basic rule for AWD model.</p>                                                                                                                                | ○  |
| <p>Rope</p>  <p>NT-00024</p>                                  | <ul style="list-style-type: none"> <li>• Check if both front and rear wheels are rotated normally.</li> <li>• Driving speed 30 km/h (19 MPH) or less</li> <li>Allow driving distance 50 km (31 miles) or less</li> </ul> | ▲  |
| <p>Raising the front wheels</p>  <p>NT-00025</p>            | <p>Prohibition</p>                                                                                                                                                                                                       | ×  |
| <p>Lifting up the front wheels</p>  <p>NT-00026</p>         | <ul style="list-style-type: none"> <li>• Prohibited, due to damage on bumper, front grille, etc.</li> <li>• Do not raise the vehicle with bumper.</li> </ul>                                                             | ×  |

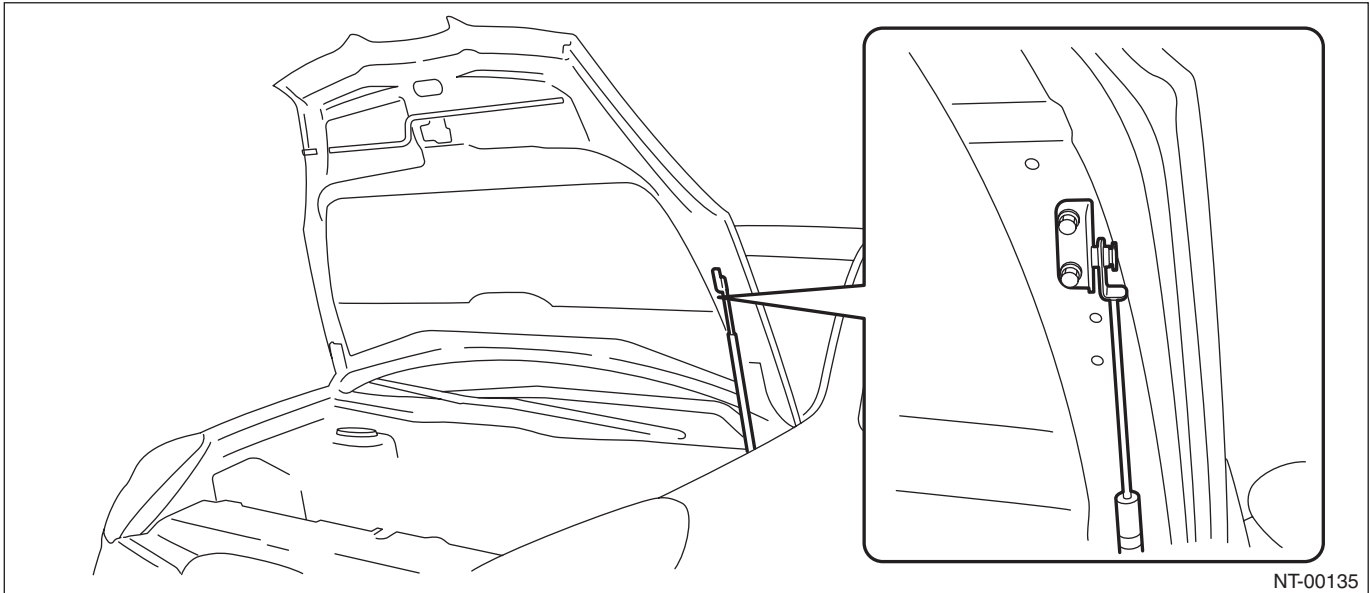
Marked ○ : OK, Marked × : Prohibited, Marked ▲ : Conditionally OK.

**CAUTION:**

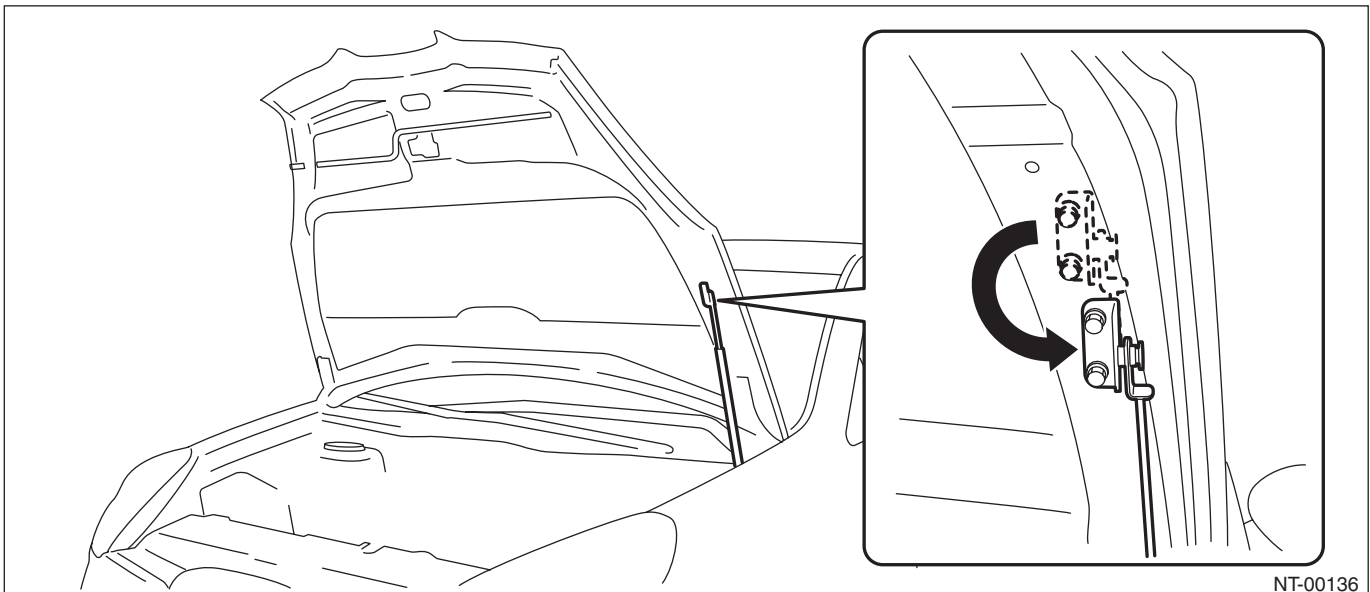
- Check ATF, gear oil and rear differential oil before driving.
- Place the shift lever in “N” position during towing.
- Do not lift up the rear wheels to avoid unsteady rotation.
- Turn the ignition key to “ACC”, then check the steering wheel moves freely.
- Release the parking brake to avoid tire dragging.
- Since the power steering does not work, be careful for the heavy steering effort. (When engine is stopped)
- Since the servo brake does not work, be careful that the brake is not applied effectively. (When engine is stopped)
- In case of the malfunction of internal transmission or drive system, lift up four wheels (on a trailer) for towing.

**10.FRONT HOOD DAMPER STAY**

- AT THE CHECK AND GENERAL MAINTENANCE



- WHEN WIDER HOOD OPENING IS NECESSARY  
Set the damper stay below as shown in the figure.



## NOTE

### 11.GENERAL SCAN TOOL

Using general scan tools will greatly improve the efficiency of repairing engine electronic controls. Subaru Select Monitor can be used to diagnose the engine, VDC, airbag and other electronically controlled parts.

### 12.AWD CIRCUIT MEASURES

Since VTD type is used in the center differential, cut-off of AWD circuit cannot be carried out.

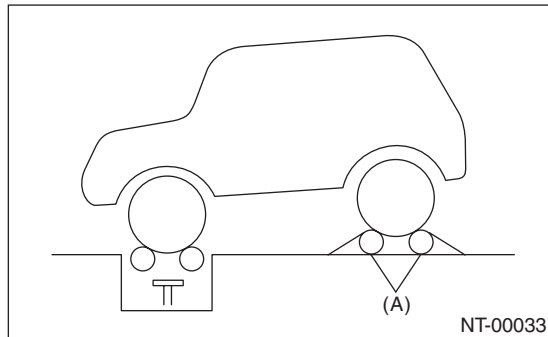
### 13.SPEEDOMETER TEST

#### 1) Rear wheel free roller system

- (1) Set the free roller on the floor of rear wheel side securely according to the wheel base and rear tread of the vehicle.
- (2) Let the vehicle ride on the tester and free roller gently.

#### CAUTION:

**Fix the vehicle using a pulling metal (chain or wire) to the front and rear towing hooks or tie-down hook to prevent the lateral runout of front wheels and springing out of vehicle.**



(A) Free roller

- (3) Set the speedometer tester.
- (4) Conduct the speedometer test work.

#### CAUTION:

**Do not suddenly accelerate or decelerate while working.**

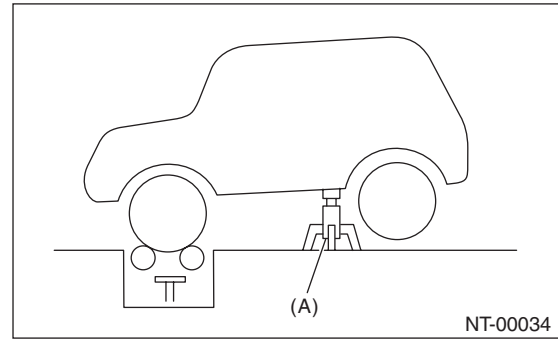
#### 2) Rear wheel jack-up system

- (1) Set the vehicle on speedometer tester.

#### CAUTION:

**Fix the vehicle using a pulling metal (chain or wire) to the front and rear towing hooks or tie-down hook to prevent the lateral runout of front wheels and springing out of vehicle.**

- (2) Jack up the rear wheels and set the rigid racks to the specified locations of side sill.



(A) Rigid rack

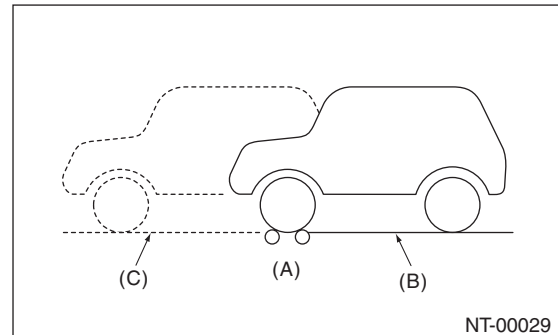
- (3) Conduct the speedometer test work.

#### CAUTION:

**Do not suddenly accelerate or decelerate while working.**

### 14.BRAKE TEST

- 1) Keep the front or rear wheels on the ground during measurement.



(A) Brake tester

- (B) Position for measuring front wheel
- (C) Position for measuring rear wheel

- 2) When the brake dragging force is large, inspect whether there is dragging in the brake or brake shoe.

#### Specifications:

|                                          | Braking force                                     |
|------------------------------------------|---------------------------------------------------|
| Rear wheel total                         | 10% or more of load on front or rear wheels       |
| Difference between right and left wheels | 8% or less of load on front or rear wheels        |
| Grand total                              | 50% or more of vehicle weight at the time of test |

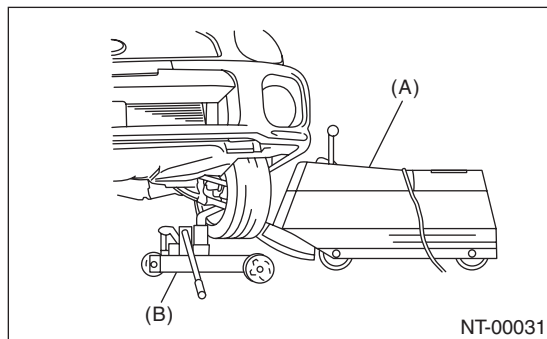
When measurement is difficult to carry out because both of front wheels are locked, check if braking force measurement in this condition conforms to standard grand total.

## 15.ON THE CAR WHEEL BALANCING

### CAUTION:

- Carry out this procedures after measuring the balance of each single tire.
- Set the vehicle so that the front and rear wheels are the same height.
- Release the parking brake during measurement.
- Rotate each wheel by hands, and make sure it rotates without dragging.
- Do not suddenly accelerate or decelerate while working.
- When an error is indicated during engine drive, do not use the motor drive together.

1) Set the rigid rack to the specified locations of side sill, jack up the front or rear two wheels of non-measuring side and set the pickup stands to two wheels of measuring side.



(A) Balancer body

(B) Pickup stand (left and right)

2) For drive wheel, drive the tires with engine for measurement.

3) For non-drive wheel, drive the tires from the on the car wheel balancer for measurement.

NOTE

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# IDENTIFICATION

*ID*

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|                         | Page |
|-------------------------|------|
| 1. Identification ..... | 2    |



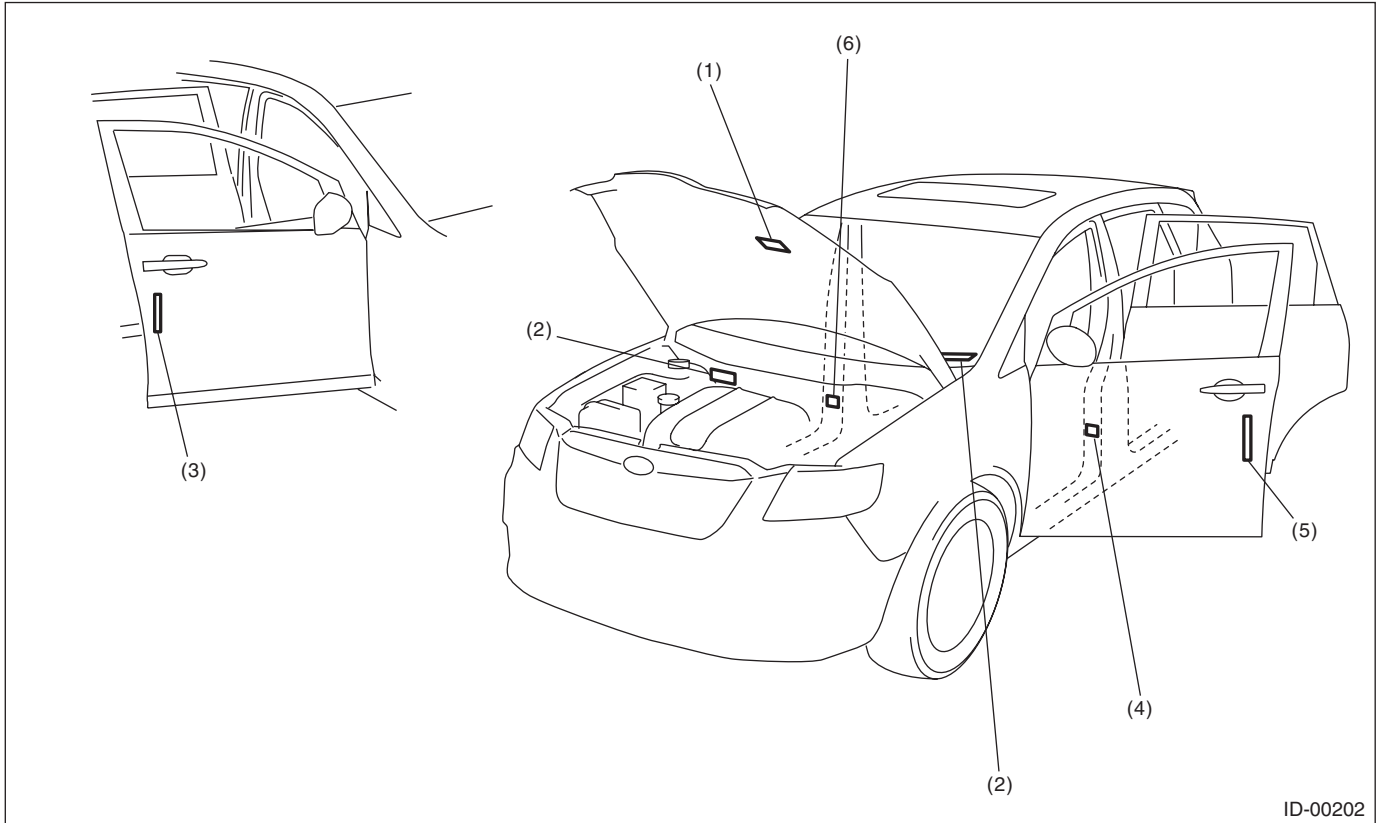
### 1. Identification

#### A: IDENTIFICATION

##### 1. IDENTIFICATION NUMBER AND LABEL LOCATIONS

The V.I.N. (Vehicle Identification Numbers) is used to classify the vehicle.

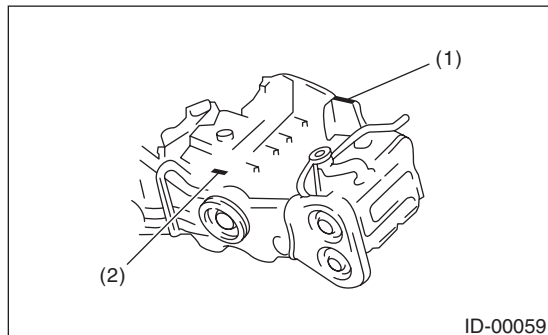
##### • POSITIONING OF THE PLATE LABEL FOR IDENTIFICATION



ID-00202

- |                                               |                                                      |                                                            |
|-----------------------------------------------|------------------------------------------------------|------------------------------------------------------------|
| (1) Emission control label                    | (3) Model number label                               | (5) FMVSS label (U.S. model)<br>CMVSS label (Canada model) |
| (2) Vehicle identification number<br>(V.I.N.) | (4) Tire inflation pressure label<br>(Driver's side) | (6) Radio noise label                                      |

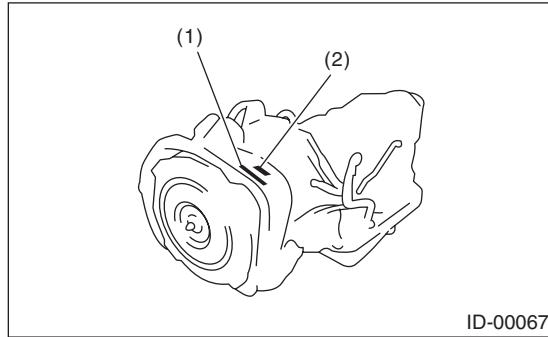
##### • ENGINE



ID-00059

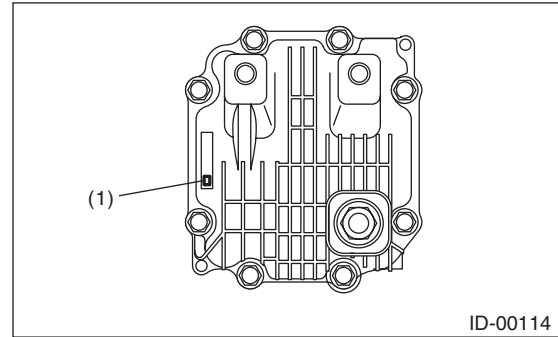
- |                                        |
|----------------------------------------|
| (1) Engine serial number (Punch mark)  |
| (2) Engine type (Crankcase upper side) |

## • AUTOMATIC TRANSMISSION



- (1) AT type label
- (2) Transmission serial number label

## • REAR DIFFERENTIAL



- (1) Type (label)

## • MODEL NUMBER LABEL

|                                  |                   |                              |                                               |                                |     |
|----------------------------------|-------------------|------------------------------|-----------------------------------------------|--------------------------------|-----|
| FUJI HEAVY INDUSTRIES LTD.       |                   |                              |                                               |                                |     |
| VIN<br>NIV                       | 4S4WX92DX94400001 |                              |                                               |                                |     |
| Applied Model<br>Modèle concerné | WXFDY2U           | Option Code<br>Code d'option | C0CQ                                          | Trim Code<br>Code de garniture | F40 |
|                                  |                   |                              |                                               | Color Code<br>Code de couleur  | 32J |
| Engine Type<br>Modèle de moteur  | EZ36DBC3LB        |                              | Transmission Type<br>Modèle de boîtes vitesse | TG5D9CJCAAA                    |     |

ID-00275

# Identification

## IDENTIFICATION

### 2. MEANING OF V.I.N.

The meaning of the V.I.N. is as follows:

**[4S4WX92DX94400001]**

The starting and ending brackets ( [ ] ) are stop marks.

| Digits  | Code   | Meaning                        | Details                                                                                                                                                                   |
|---------|--------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 — 3   | 4S4    | Manufacturer body area         | 4S4: MPV                                                                                                                                                                  |
| 4       | W      | Car line                       | W: TRIBECA                                                                                                                                                                |
| 5       | X      | Body type                      | X: SUV                                                                                                                                                                    |
| 6       | 9      | Displacement                   | 9: 3.6 L AWD                                                                                                                                                              |
| 7       | 2      | Grade                          | 1: 5Pass<br>2: 5Pass Limited<br>3: 5Pass Limited w/NAVI<br>6: 7Pass<br>7: 7Pass Limited<br>8: 7Pass Limited w/NAVI<br>9: 7Pass Limited DVD<br>0: 7Pass Limited w/NAVI&DVD |
| 8       | D      | Restraint system or GVWR Class | D: Class D (GVWR 5001 to 6000 lb)                                                                                                                                         |
| 9       | X      | Check digit                    | 0 — 9 & X                                                                                                                                                                 |
| 10      | 9      | Model year                     | 9: 2009MY                                                                                                                                                                 |
| 11      | 4      | Transmission type              | 4: Full-time AWD 5AT                                                                                                                                                      |
| 12 — 17 | 400001 | Serial number                  | 400001 —                                                                                                                                                                  |

## 3. MODEL NUMBER LABEL

The model number label indicates the type, V.I.N. <Ref. to ID-4, MEANING OF V.I.N., IDENTIFICATION, Identification.>, applied model, option code, trim code, engine type, transmission type and the exterior color code.

### WXFDY2U

| Digits | Code | Meaning                                                        | Details                  |
|--------|------|----------------------------------------------------------------|--------------------------|
| 1      | W    | Series                                                         | W: TRIBECA               |
| 2      | X    | Body type                                                      | X: Cross utility vehicle |
| 3      | F    | Total engine displacement<br>Drive system<br>Suspension system | F: 3.6 L AWD             |
| 4      | D    | Model year                                                     | D: 2009MY                |
| 5      | Y    | Destination                                                    | Y: U.S., Canada          |
| 6      | 2    | Grade                                                          | 2: 5ST<br>5: BASE        |
| 7      | U    | Transmission, fuel feed system                                 | U: DOHC MFI 5AT SS       |

The engine and transmission type are as follows.

### ENGINE

#### EZ36DBC3LB

| Digits  | Code | Meaning                 | Details                                                            |
|---------|------|-------------------------|--------------------------------------------------------------------|
| 1 and 2 | EZ   | Engine type             | EZ: 6 cylinders                                                    |
| 3 and 4 | 36   | Displacement            | 36: 3.6 L                                                          |
| 5       | D    | Fuel feed system        | D: MFI Non-turbo (DOHC, H6)                                        |
| 6       | B    | Emission control        | B: For USA                                                         |
| 7       | C    | Mounted transmission    | C: D-5AT                                                           |
| 8 — 10  | 3LB  | Detailed specifications | Used when ordering parts. For details, refer to the parts catalog. |

### TRANSMISSION

#### TG5D9CJCAA

| Digits  | Code | Meaning                     | Details                                                            |
|---------|------|-----------------------------|--------------------------------------------------------------------|
| 1       | T    | Transmission                | T: Transmission                                                    |
| 2       | G    | Transmission type           | G: Full-time AWD AT center differential                            |
| 3 and 4 | 5D   | Identification              | 5D: 5AT                                                            |
| 5       | 9    | Series                      | TRIBECA                                                            |
| 6       | C    | Transmission specifications | C: Full-time AWD VTD 5AT                                           |
| 7       | J    | Mounted vehicle             | J: 3.6 L DOHC                                                      |
| 8 — 10  | CAA  | Detailed specifications     | Used when ordering parts. For details, refer to the parts catalog. |

### REAR DIFFERENTIAL

#### XB

| Code | Reduction gear ratio | LSD  |
|------|----------------------|------|
| XB   | 3.583                | None |

# Identification

## IDENTIFICATION

### OPTION

C0CQ

| Digits | Code | Meaning          | Details                                                         |
|--------|------|------------------|-----------------------------------------------------------------|
| 1 — 2  | C0   | Destination      | C0: Canada<br>C4: Central and South America<br>U4: U.S. For USA |
| 3 — 4  | CQ   | Option equipment | Refer to the option list.                                       |

### OPTION LIST

|                                                  | AL                    | BA                    | BC                    | BH                    | BM                    | BN                    | BP                    | BS                    | BT                    | CQ                    | CT                    | XX |
|--------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----|
| Leather seat                                     |                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |                       |                       |    |
| Seat heater                                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |    |
| Sunroof                                          |                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |    |
| Driver's memory seat                             |                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |                       |                       |    |
| Navigation system                                |                       |                       |                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |                       |                       |                       |                       |                       |    |
| DVD                                              |                       |                       | <input type="radio"/> | <input type="radio"/> |                       | <input type="radio"/> |                       | <input type="radio"/> |                       |                       |                       |    |
| Home link                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |                       |                       | <input type="radio"/> |                       |    |
| HID headlight                                    |                       |                       | <input type="radio"/> | <input type="radio"/> |                       |                       | <input type="radio"/> |                       |                       | <input type="radio"/> |                       |    |
| Rear view camera                                 |                       |                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |                       | <input type="radio"/> | <input type="radio"/> |                       | <input type="radio"/> |    |
| XM+high grade audio & speakers                   |                       |                       |                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |                       |                       |                       |                       |                       |    |
| High grade audio & speakers                      |                       |                       |                       |                       |                       |                       |                       | <input type="radio"/> | <input type="radio"/> |                       | <input type="radio"/> |    |
| Satellite-compatible+high grade audio & speakers |                       | <input type="radio"/> | <input type="radio"/> |                       |                       |                       | <input type="radio"/> |                       |                       |                       |                       |    |

# RECOMMENDED MATERIALS

***RM***

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# Recommended Materials

## RECOMMENDED MATERIALS

### 1. Recommended Materials

#### A: RECOMMENDED MATERIALS

##### 1. GENERAL

To insure the best performance, always use the specified oil, gasoline, adhesive, sealant, etc. or a substitute of equivalent quality.

##### 2. FUEL

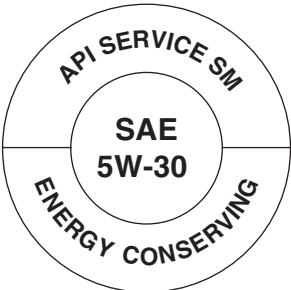
Always use gasoline of the same or higher octane value than specified in the owner's manual. Ignoring the specifications below will result in damage or poor performance of engine and fuel injection system. Use the specified gasoline to correct performance.

##### Unleaded gasoline

In order to reduce air pollution, use unleaded gasoline for the vehicle equipped with catalytic converter. Using leaded gasoline may damage the catalytic converter.

##### 3. LUBRICANTS

Use either lubricants in the table below or equivalent lubricants. See the table below to choose the correct SAE viscosity.

| Lubricants                                                         | Recommended materials                                                                                                      |                                                                                                           |
|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
|                                                                    | API standard                                                                                                               | ILSAC Standard                                                                                            |
| Engine oil<br>Choose oil suitable for the standard from the right. | SM "Energy-saving type"<br><br>RM-00049 | GF-4<br><br>RM-00002 |
| AT front differential gear oil                                     | GL-5                                                                                                                       | —                                                                                                         |
| Rear differential gear oil                                         | GL-5                                                                                                                       | —                                                                                                         |

# Recommended Materials

## RECOMMENDED MATERIALS

| SAE viscosity No. and applicable temperature                  |     |     |     |    |    |    |    |     |
|---------------------------------------------------------------|-----|-----|-----|----|----|----|----|-----|
| Engine oil                                                    |     |     |     |    |    |    |    |     |
| (°C)                                                          | -30 | -20 | -10 | 0  | 10 | 20 | 30 | 40  |
| (°F)                                                          | -22 | -4  | 14  | 32 | 50 | 68 | 86 | 104 |
| <div>10W-30 or 10W-40</div> <div>5W-30 Recommend</div>        |     |     |     |    |    |    |    |     |
| RM-00060                                                      |     |     |     |    |    |    |    |     |
| Rear differential gear oil and AT front differential gear oil |     |     |     |    |    |    |    |     |
| (°C)                                                          | -30 | -20 | -10 | 0  | 10 | 20 | 30 | 40  |
| (°F)                                                          | -22 | -4  | 14  | 32 | 50 | 68 | 86 | 104 |
| <div>90</div> <div>85W</div> <div>80W</div> <div>75W-90</div> |     |     |     |    |    |    |    |     |
| RM-00058                                                      |     |     |     |    |    |    |    |     |

## Recommended Materials

### RECOMMENDED MATERIALS

#### 4. FLUID

Use the fluids specified in the table below. Do not mix two different kinds or makes of fluid.

#### CAUTION:

**Always use the recommended or equivalent ATF. Using material except recommended one or substitute would cause trouble.**

| Fluid                        | Recommended materials    | Alternative      | Remarks |
|------------------------------|--------------------------|------------------|---------|
| Automatic transmission fluid | SUBARU ATF HP            | IDEMITSU: ATF HP | —       |
| Power steering fluid         | DEXRON III or SUBARU ATF | —                | —       |
| Brake fluid                  | FMVSS No. 116 DOT3       | DOT4             | —       |

#### 5. COOLANT

Use genuine coolant to protect the engine.

| Engine Coolant                  | Recommended materials                       | Item number | Alternative             |
|---------------------------------|---------------------------------------------|-------------|-------------------------|
| Coolant                         | SUBARU SUPER COOLANT<br>(Concentrated type) | —           | —                       |
|                                 | SUBARU SUPER COOLANT<br>(Diluted type)      | K0670Y0000  |                         |
| Water for dilution              | Distilled water                             | —           | Soft water or tap water |
| Cooling system protective agent | Cooling system conditioner                  | SOA345001   | —                       |

#### 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 other than DENSO OIL 8.

| Air conditioner | Recommended materials | Item number | Alternative |
|-----------------|-----------------------|-------------|-------------|
| Refrigerant     | HFC134a               | —           | None        |
| Compressor oil  | DENSO OIL 8           | —           | None        |

#### 7. GREASE

Use grease and supplementary lubricants shown in the table below.

| Grease                   | Application point                             | Recommended materials      | Item number | Alternative |
|--------------------------|-----------------------------------------------|----------------------------|-------------|-------------|
| Supplementary lubricants | Oxygen sensor                                 | Spray type lubricant       | —           | —           |
| Grease                   | Select lever                                  | NIGHTIGHT LYW No. 2 grease | —           | KOPR-KOTE   |
|                          | Brake pedal                                   | ESA MIC45-A EQUIV          | —           | —           |
|                          | Steering gearbox                              | VALIANT GREASE M2          | 003608001   | —           |
|                          | Disc brake (lock pin, guide pin, piston boot) | NIGLUBE RX-2               | 000041000   | —           |
|                          | Between brake pad and shim                    | Molykote AS-880N           | K0777YA010  | —           |
|                          | Brake pad clip                                | Molykote M7439             | K0770YA000  | —           |
|                          | Front axle PTJ                                | NKG302                     | —           | —           |
|                          | • Front axle EBJ<br>• Rear axle EBJ           | NTG2218-M                  | —           | —           |
|                          | Rear axle DOJ                                 | NKG205                     | —           | —           |

## Recommended Materials

### RECOMMENDED MATERIALS

#### 8. ADHESIVE

Use the adhesives shown in the table below, or equivalent.

| Adhesive | Application point                                                                          | Recommended materials                                                                                                        | Item number | Alternative |
|----------|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|
| Adhesive | Windshield, front quarter glass, rear window glass, rear quarter glass, rear gate and body | Dow Automotive's adhesive: ESSEX U-400HV or the equivalent<br>Glass primer: U-401 and U-402<br>Painted surface primer: U-413 | —           | —           |
|          | Rearview mirror base                                                                       | REPAIR KIT IN MR                                                                                                             | 65029FC000  | —           |

#### 9. SEAL MATERIAL

Use the seal material shown in the table below, or equivalent.

| Seal material | Application point                                                                                                                                                                                                                                                                                            | Recommended materials | Item number | Alternative          |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------|----------------------|
| Seal material | Converter case                                                                                                                                                                                                                                                                                               | THREE BOND 1215       | 004403007   | DOW CORNING No. 7038 |
|               | Transmission oil pan                                                                                                                                                                                                                                                                                         | THREE BOND 1217B      | K0877YA020  | —                    |
|               | <ul style="list-style-type: none"> <li>• Engine oil pressure switch</li> <li>• Cylinder head (Nipple)</li> <li>• Camshaft bowl-shape plug</li> <li>• Rear differential lock nut</li> </ul>                                                                                                                   | THREE BOND 1324       | 004403042   | —                    |
|               | <ul style="list-style-type: none"> <li>• PCV valve</li> <li>• Steering adjusting screw</li> </ul>                                                                                                                                                                                                            | THREE BOND 1141       | 004403006   | —                    |
|               | <ul style="list-style-type: none"> <li>• Cylinder block</li> <li>• Cam cap</li> <li>• Engine oil pan</li> <li>• Cylinder head gasket (Block, head)</li> <li>• Rocker cover</li> <li>• Oil pan upper</li> <li>• Block (Oil pan upper)</li> <li>• Chain cover (Block, head, cam cap, oil pan upper)</li> </ul> | THREE BOND 1217G      | K0877Y0100  | —                    |
|               | <ul style="list-style-type: none"> <li>• Door (Front sealing cover)</li> <li>• Door (Rear sealing cover)</li> </ul>                                                                                                                                                                                          | 3M Butyl Rubber 8626  | —           | —                    |

**Recommended Materials**

RECOMMENDED MATERIALS

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# PRE-DELIVERY INSPECTION

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| 1. Pre-delivery Inspection ..... | 2    |



### 1. Pre-delivery Inspection

#### A: GENERAL DESCRIPTION

The purposes of the pre-delivery inspection (PDI) are as follows.

- Remove the additional parts used for ensuring the vehicle quality during transportation and restore the vehicle to its normal condition.
- Check the vehicle before delivery is in normal condition.
- Check the vehicle or parts for any damage occurred during transportation or storage.
- Check the vehicle after repair is in normal condition.
- Make sure to provide a complete vehicle to customer.

For above reasons, all SUBARU dealers (dealerships) must carry out the PDIs before delivery of vehicle. Refer to this manual unless otherwise specified.

## B: PRE-DELIVERY INSPECTION (PDI) PROCEDURE

### STATIC CHECKS JUST AFTER VEHICLE RECEIPT

| Procedure                                                   | Check point                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Appearance check                                         | <ol style="list-style-type: none"> <li>1. If the vehicle is covered with protective coating, visually check the vehicle body for damage and dents. If the protective coating has been removed, visually check the body painted area for damage or stains in detail.</li> <li>2. Visually check the glass and light lenses for any damage, cracks or excessive gaps between body sheet metal.</li> <li>3. Visually check the plated parts for any damage.</li> </ol> |
| 2. Tire check                                               | <ol style="list-style-type: none"> <li>1. Check the tires for damage, defective, and dents on wheels.</li> <li>2. Check the tire air pressure.</li> </ol>                                                                                                                                                                                                                                                                                                           |
| 3. Fuse installation                                        | If the vehicle is about to be delivered to customer, attach a back-up fuse.                                                                                                                                                                                                                                                                                                                                                                                         |
| 4. Lock/unlock and open/close operation checks of doors     | <ol style="list-style-type: none"> <li>1. Using the key, check the trunk lid can be locked or unlocked normally.</li> <li>2. Open and close all doors to check that there are no defective.</li> <li>3. Operate the power door lock switch to check that the door (rear gate) is locked and unlocked normally.</li> </ol>                                                                                                                                           |
| 5. Operation check of child safety lock system              | Check the child safety lock system operates normally.                                                                                                                                                                                                                                                                                                                                                                                                               |
| 6. Lock/unlock and open/close operation checks of rear gate | <ol style="list-style-type: none"> <li>1. Check if the rear gate can be unlocked normally through the emergency hole.</li> <li>2. Open and close the rear gate to see that there are no abnormal conditions.</li> </ol>                                                                                                                                                                                                                                             |
| 7. Operation check of fuel lid opener lock release lever    | Operate the fuel lid opener to check that the fuel filler lid is unlocked normally.                                                                                                                                                                                                                                                                                                                                                                                 |
| 8. Accessory check                                          | <p>Check that the following accessories are provided.</p> <ul style="list-style-type: none"> <li>• Owner's manual</li> <li>• Warranty booklet</li> <li>• Maintenance note</li> <li>• Spare key</li> <li>• Jack</li> <li>• Tool set</li> <li>• Spare tire</li> </ul>                                                                                                                                                                                                 |
| 9. Operation check of front hood lock release system        | Operate the front hood lock release lever to check that the front hood is unlocked normally.                                                                                                                                                                                                                                                                                                                                                                        |
| 10. Battery                                                 | Check the battery terminals for any abnormal conditions such as rust and trace of battery fluid leaks.                                                                                                                                                                                                                                                                                                                                                              |
| 11. Brake fluid                                             | Check that the fluid level is normal.                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 12. Engine oil                                              | Check that the oil level is normal.                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 13. AT front differential oil                               | Check that the AT front differential oil level is normal.                                                                                                                                                                                                                                                                                                                                                                                                           |
| 14. Engine coolant                                          | Check that the engine coolant level is normal.                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 15. Window washer fluid                                     | Check that the window washer fluid level is normal.                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 16. Front hood latch check                                  | Check that the hood is closed and latched securely.                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 17. Keyless entry system                                    | Check that the keyless entry system operates normally.                                                                                                                                                                                                                                                                                                                                                                                                              |
| 18. Alarm system                                            | Check that the alarm system operates normally.                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 19. Seat                                                    | <ol style="list-style-type: none"> <li>1. Check the seat surfaces for stains or dirt.</li> <li>2. Check the seat installation conditions and functionality.</li> <li>3. Check that the occupant detection system for passenger's seat operates normally.</li> </ol>                                                                                                                                                                                                 |
| 20. Seat belt                                               | <ol style="list-style-type: none"> <li>1. Check the seat belt installation conditions and functionality.</li> <li>2. Check that the seat belt warning system operates normally.</li> </ol>                                                                                                                                                                                                                                                                          |

# Pre-delivery Inspection

## PRE-DELIVERY INSPECTION

### CHECKS WITH THE ENGINE RUNNING

| Procedure                          | Check point                                                                                                                                                                                                                                |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 21. Delivery (test) mode connector | Turn the ignition switch to ON and check that the malfunction indicator light starts blinking.                                                                                                                                             |
| 22. Immobilizer system             | 1. Check that the engine starts with all keys that are equipped on vehicle.<br>2. 60 seconds after turning ignition switch from ON to ACC or OFF, or immediately after removing the key, check that the security indicator light blinking. |
| 23. Starting condition             | Start the engine and check that the engine starts smoothly.                                                                                                                                                                                |
| 24. Exhaust system                 | Check that the exhaust noise is normal and no leaks are found.                                                                                                                                                                             |
| 25. Indicator and warning lights   | Check that all the indicator and warning lights are operating normally.                                                                                                                                                                    |
| 26. Heater & ventilation           | Check that the heater & ventilation system operates normally.                                                                                                                                                                              |
| 27. Air conditioner                | Check that the air conditioner operates normally.                                                                                                                                                                                          |
| 28. Clock                          | Check that the clock operates normally.                                                                                                                                                                                                    |
| 29. Audio                          | Check the radio, CD player and AUX for normal operation.                                                                                                                                                                                   |
| 30. Accessory power supply socket  | Check that each of the accessory power supply sockets operate normally.                                                                                                                                                                    |
| 31. Navigation system              | 1. Check all display functions for normal operation.<br>2. Check the map disc (DVD) are provided on vehicle.<br>3. Check that the navigation system operates normally.<br>4. Check that the rear view camera operates normally.            |
| 32. Rear entertainment system      | Check that the rear entertainment system operates normally.                                                                                                                                                                                |
| 33. Lighting system                | Check that the lighting system operates normally.                                                                                                                                                                                          |
| 34. Wiper deicer                   | Check that the wiper deicer operates normally.                                                                                                                                                                                             |
| 35. Illumination control           | Check that the illumination control operates normally.                                                                                                                                                                                     |
| 36. Window washer                  | Check that the window washer system operates normally.                                                                                                                                                                                     |
| 37. Wiper                          | Check that the wiper system operates normally.                                                                                                                                                                                             |
| 38. Power window                   | Check that the power window operations normally.                                                                                                                                                                                           |
| 39. Sunroof                        | Check that the sunroof operates normally.                                                                                                                                                                                                  |
| 40. Door mirror                    | Check that the remote control mirror operates normally.                                                                                                                                                                                    |

### DYNAMIC TEST WITH THE VEHICLE RUNNING

| Procedure            | Check point                                             |
|----------------------|---------------------------------------------------------|
| 41. Brake test       | Check the foot brake for normal operations.             |
| 42. Parking brake    | Check the parking brake for normal operations.          |
| 43. AT shift control | Check that the AT shift patterns are correct.           |
| 44. Cruise control   | Check that the cruise control system operates normally. |

### CHECKS AFTER DYNAMIC TEST

| Procedure                      | Check point                                                                                                                                    |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 45. ATF level                  | Check that the ATF level is correct.                                                                                                           |
| 46. Power steering fluid level | Check that the power steering fluid level is normal.                                                                                           |
| 47. Fluid leak check           | Check for fluid/oil leaks.                                                                                                                     |
| 48. Water leak test            | Spray the vehicle with water and check for water leaks.                                                                                        |
| 49. Appearance check 2         | 1. Remove the protective coating (if any).<br>2. Check the body paints for damage and stain.<br>3. Check the plated parts for damage and rust. |

## 1. APPEARANCE CHECK

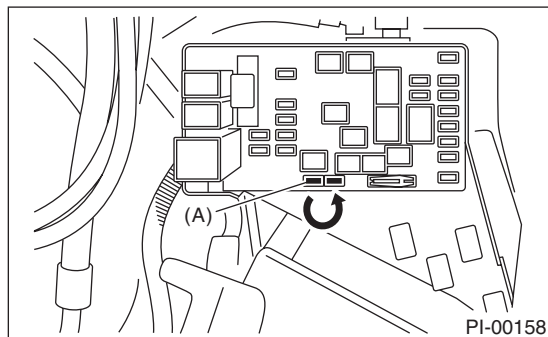
- If the vehicle is covered with protective coating, visually check the vehicle body for damage and dents.
- When the protective coating is removed, visually check the body paints for damage or stains in detail and repair as necessary.
- Visually check the windshield glass, door glasses and light lenses for any damage, cracks or excessive gaps to the body sheet metal and repair as necessary.
- Visually check the plated parts, such as the grilles and door knobs, for damage or loss of gloss and replace the parts as necessary.

## 2. TIRE CHECK

- Check the tires for damage, defective, and dents on wheels.
- Check and adjust the tire size, spare tire and tire air pressure described on the tire air pressure label (driver's side).

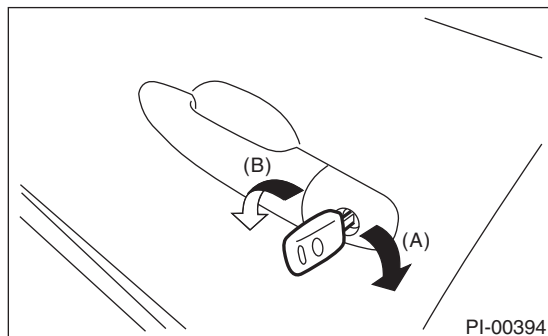
## 3. FUSE INSTALLATION

Fuses for the back-up circuit have been removed to prevent battery discharge. If the vehicle is about to be delivered to the customer, attach a 20 A fuse (A) as shown in the figure.



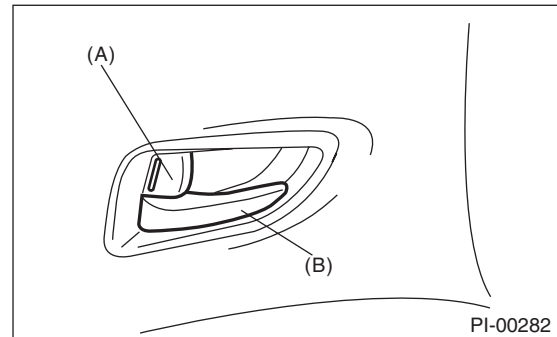
## 4. LOCK/UNLOCK AND OPEN/CLOSE OPERATION CHECKS OF DOORS

1) Using the key, lock and unlock the door several times to check for normal operation. Open and close the door several times for smooth movement.



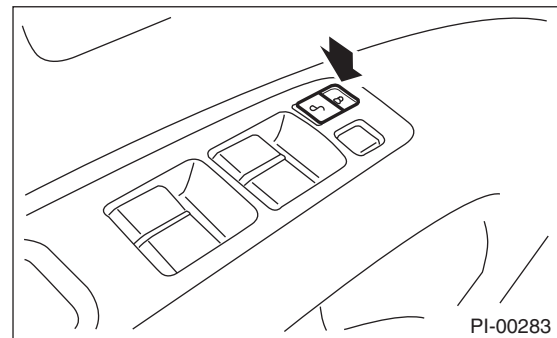
- (A) Unlock  
(B) Lock

2) Completely close the driver's door, and then check the smooth movement with operating door lock knob from lock to unlock several times. Set the door lock knob (A) to lock position. Then pull the inner remote (B) to ensure that doors will not open. For other doors, place the door lock knob (A) to lock position and then pull the inner remote (B) to ensure that doors will not open.

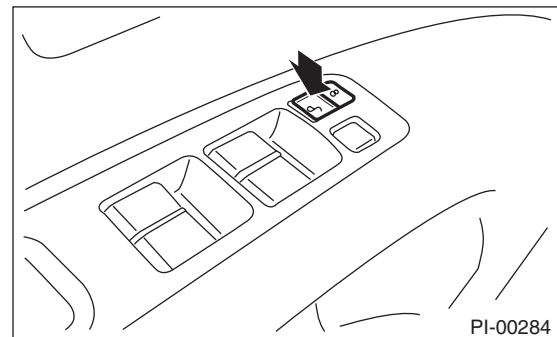


- (A) Door lock knob  
(B) Inner remote

3) Close all the doors, and then press the lock on power door lock switch at driver's side. Check that all doors including rear gate are locked.



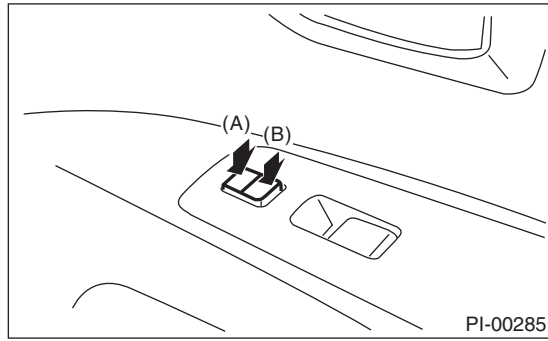
4) Press the driver's side power door lock switch to unlock side. Check that all doors including rear gate are unlocked.



# Pre-delivery Inspection

## PRE-DELIVERY INSPECTION

5) Check that the power door lock switch on the passenger's side also locks and unlocks.

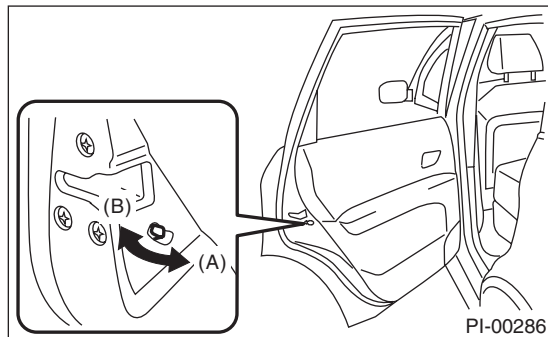


- (A) Lock
- (B) Unlock

6) Insert the key to ignition switch, and open the driver's side door. Press lock on power door lock. Check that the door is not locked.

### 5. OPERATION CHECK OF CHILD SAFETY LOCK SYSTEM

1) Set the child safety lock on both rear doors to the lock position.



- (A) Lock
- (B) Unlock

2) Close the rear doors completely.

3) Check that the lock levers of the rear doors are in the unlock position. Then, pull inner remote of rear doors to ensure that the doors will not open.

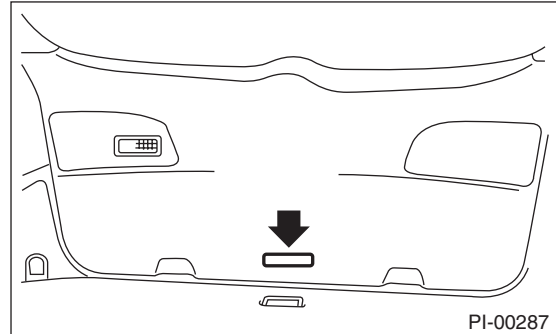
4) Pull the outer handles to ensure that doors will open.

### 6. LOCK/UNLOCK AND OPEN/CLOSE OPERATION CHECKS OF REAR GATE

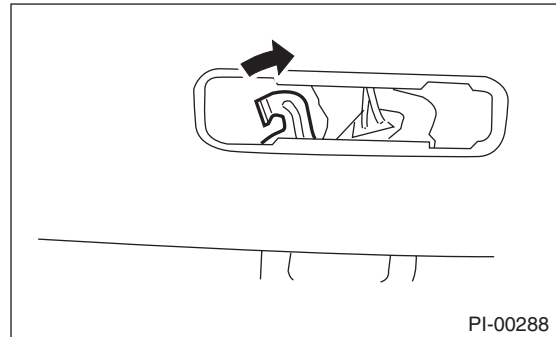
1) Open and close the rear gate several times for smooth movement.

2) Operate the rear gate lever and check that the rear gate opens normally.

(1) Remove the cover inside the rear gate.



(2) Operate the lever to check that the it opens normally.



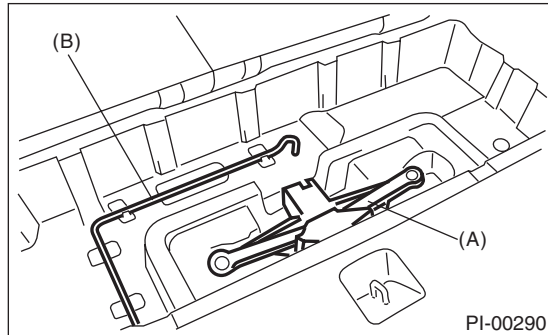
### 7. OPERATION CHECK OF FUEL LID OPENER LOCK RELEASE LEVER

Operate the fuel lid opener to check that the fuel filler lid is unlocked normally. Check that the filler cap is securely closed.

## 8. ACCESSORY CHECK

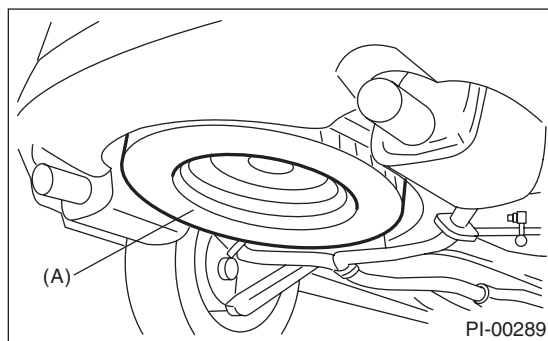
Check that the following accessories are provided.

- Owner's manual
- Warranty booklet
- Maintenance note
- Spare key
- Jack
- Tool set



- (A) Jack
- (B) Jack handle

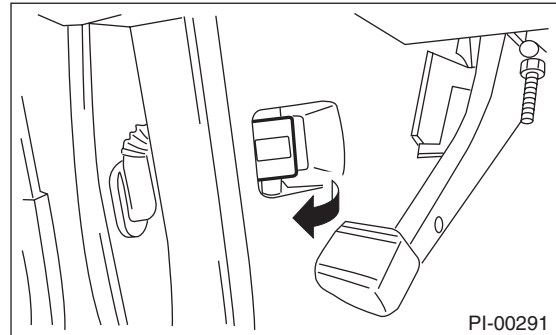
- Spare tire



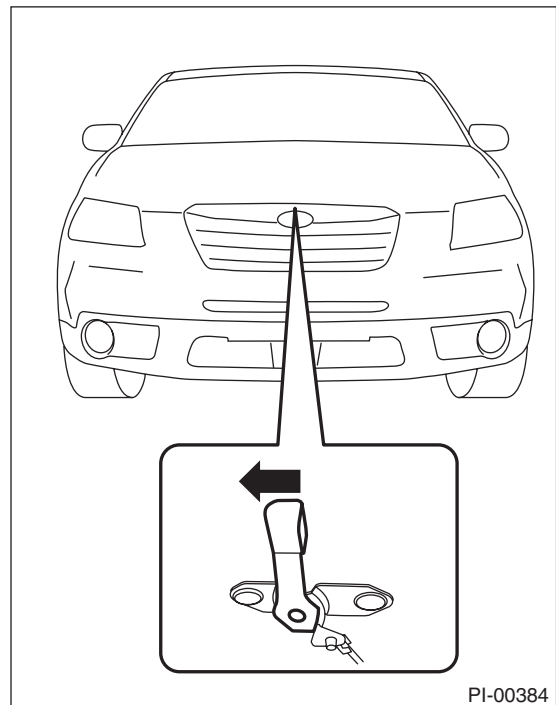
- (A) Spare tire

## 9. OPERATION CHECK OF FRONT HOOD LOCK RELEASE SYSTEM

Operate the front hood lock release lever to check that the front hood is unlocked normally.

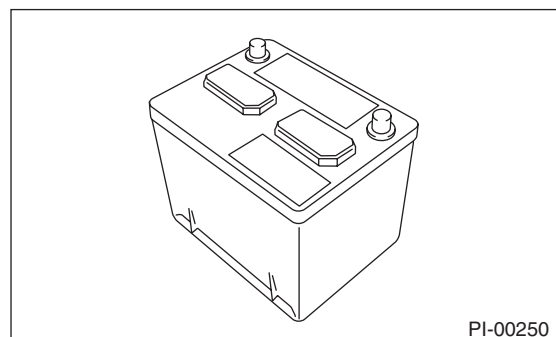


Operate the lever and check that the front hood is opened normally.



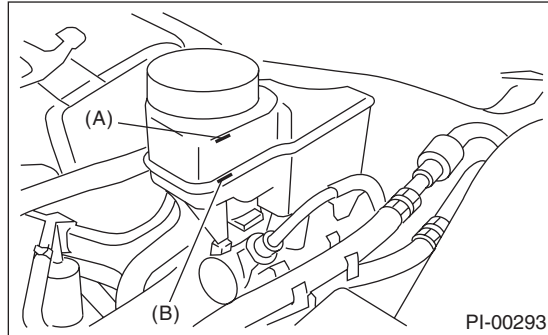
## 10. BATTERY

Check the battery terminals to make sure that there are no rust or corruptions due to fluid leaks.



### 11. BRAKE FLUID

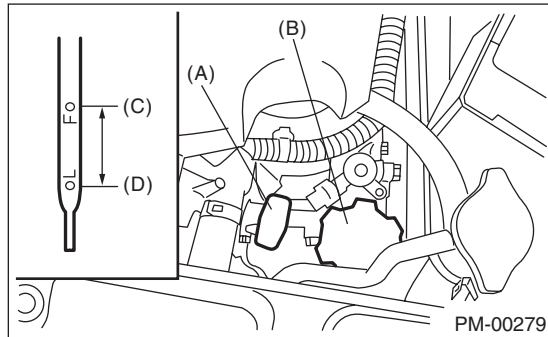
Check that the brake fluid level is normal. If the amount is insufficient, test the brake line to identify brake fluid leaks and check the brake operation. After that, refill the brake fluid tank with the specified type of fluid.



- (A) MAX. level
- (B) MIN. level

### 12. ENGINE OIL

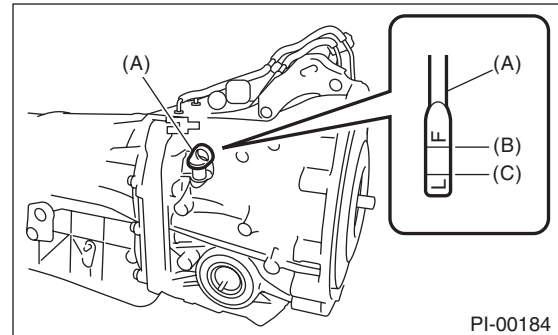
Check the engine oil amount. If the amount of oil is insufficient, check that no leaks are found. Then, add the necessary amount of the specified engine oil.



- (A) Oil level gauge
- (B) Engine oil filler cap
- (C) "F" line
- (D) "L" line

### 13. AT FRONT DIFFERENTIAL OIL

Check that the AT front differential oil level is normal. If the amount of oil is insufficient, check that no leaks are found. Then, add the necessary amount of the specified AT front differential oil.



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

### 14. ENGINE COOLANT

Check that the engine coolant level on the reservoir tank is normal. If the amount of engine coolant is insufficient, check that no leaks are found. Then, add the necessary amount of coolant with the specified concentration.

### 15. WINDOW WASHER FLUID

Check that the window washer fluid level is normal. If the amount is insufficient, check that no leaks are found. Then, add the necessary amount of washer fluid.

### 16. FRONT HOOD LATCH CHECK

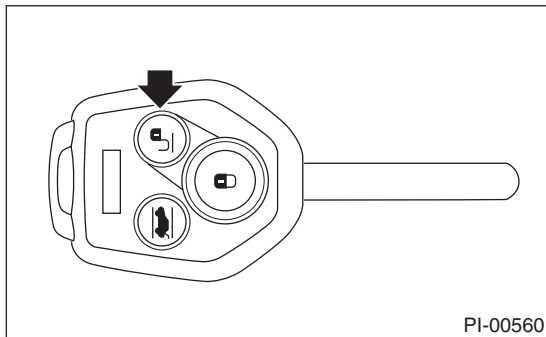
Close the front hood. Check that the front hood is securely latched.

## 17.KEYLESS ENTRY SYSTEM

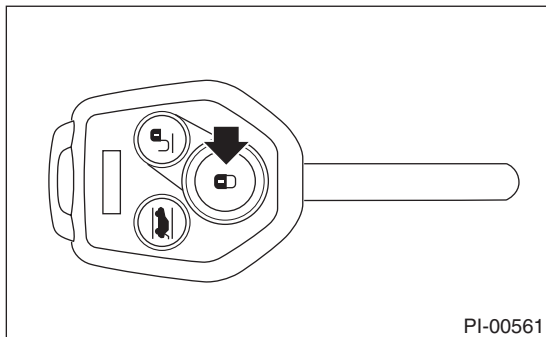
### NOTE:

The following inspections show the initial settings. When the settings are different from the initial settings, use Subaru Select Monitor to check the details of each setting for inspections. <Ref. to LAN(diag)-30, OPERATION, Read Current Data.>

- 1) Fully open all the door windows.
- 2) Remove the key from the ignition switch and close all the doors including rear gate.
- 3) Press the rear gate open button for one second or more. Check if the rear gate is unlocked and the hazard light blinks twice and the buzzer sounds twice.

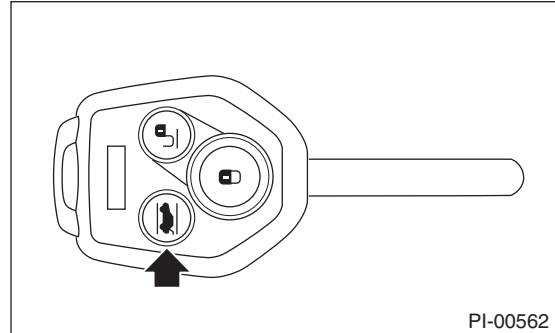


- 4) Press the “LOCK” button on the keyless transmitter with one of the doors (including the rear gate) opened. Check if all doors are locked, hazard light blinks five times and the buzzer sounds five times and warning shows one of the doors (including the rear gate) open.
- 5) Close all the doors including rear gate. Press the “LOCK” button momentarily on the keyless transmitter. Check that all the doors (including rear gate and trunk) are locked, hazard light blinks once and buzzer sounds once.



- 6) Press the “UNLOCK” button momentarily on the keyless transmitter. Check that the driver’s door is unlocked and hazard light blinks twice and the buzzer sounds twice.

And press the “UNLOCK” button momentarily again in 5 seconds. Check that all the doors including rear gate are unlocked.



- 7) Within a distance of 10 m from a vehicle, press keyless transmitter’s “LOCK” button three times within 5 seconds. Check that the horn honks once and that the hazard light blinks three times.

- 8) Move the power door lock switch to the lock position with one of doors (including the rear gate) opened. Next, close all the doors including rear gate. Check if all doors are locked and buzzer sounds once and the hazard light flashes once.

- 9) Check buzzer operation.

The buzzer rings when the doors are locked or unlocked. The buzzer can be turned off if desired. Turn the buzzer off or on with following procedure.

- (1) Close all the doors including rear gate, then remove the key from ignition key lock.
- (2) Press the power door lock switch to lock or unlock and hold it until the operation is finished.
- (3) Insert the key into ignition key lock, and insert and remove the key in ignition key lock 5 times within 10 seconds.
- (4) When finished step (3), open and close the driver’s door once within 10 seconds.

### NOTE:

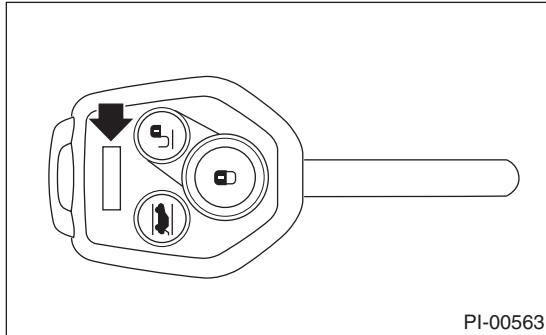
When opening and closing of the door is not available within 10 seconds, hazard light blinks once and the change over operation is cancelled. Retry from the step (1).

- (5) Hazard light blinks 3 times and the buzzer sound turns ON or OFF.

# Pre-delivery Inspection

## PRE-DELIVERY INSPECTION

10) Press the “Panic” button of the keyless transmitter. Check if the alarm condition happens (horn sounds continuously, hazard light blinks, security indicator comes on). Check whether this condition lasts until any button on the keyless transmitter is pressed or lasts for 30 seconds.

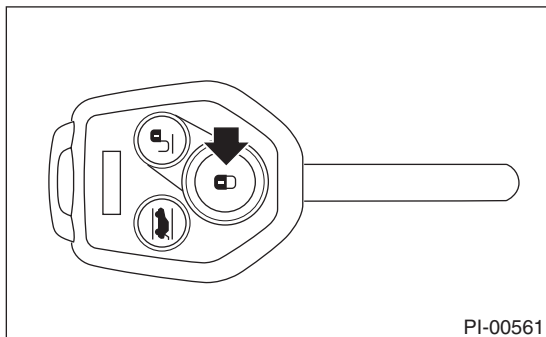


### 18.ALARM SYSTEM

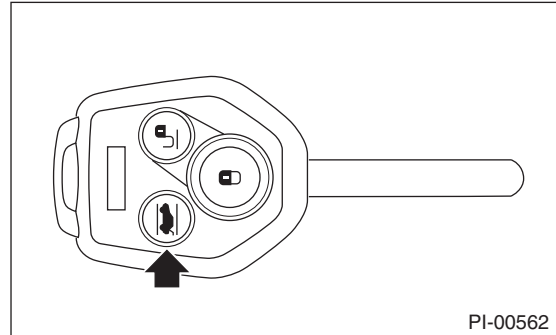
#### NOTE:

The following inspections show the initial settings. When the settings are different from the initial settings, use Subaru Select Monitor to check the details of each setting for inspections. <Ref. to LAN(diag)-31, OPERATION, Function Setting (Customize).>

- 1) Fully open all the door windows.
- 2) Remove the key from the ignition switch and close all the doors including rear gate.
- 3) Press the “LOCK” button momentarily on the keyless transmitter. All doors are locked, and buzzer sound once, hazard blinks once, security indicator light blinks faster (five times per two seconds) for 30 seconds and goes slower (twice per two seconds), then the alarm system is in set condition.



4) Press the “UNLOCK” button momentarily on the keyless transmitter. When the door of the driver’s seat is unlocked, the buzzer sounds twice, the hazard light flashes twice, the room light turns on and the security indicator light flashes once in three seconds, and the alarm system enters the release mode.



5) Close all the doors including rear gate. Press the “LOCK” button momentarily on the keyless transmitter. When all the doors are locked, buzzer sounds once, hazard blinks once and the alarm system is in set condition in 30 seconds.

6) Unlock a door using the inner lock knob and open the door while the security system is in the set mode. Check if the alarm condition happens (horn sounds continuously, hazard light blinks, security indicator comes on). Check if this condition lasts for a maximum of three minutes or until the “UNLOCK” button of the keyless transmitter is pressed.

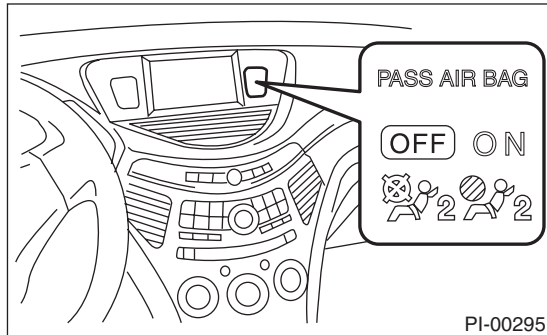
#### NOTE:

The alarm condition will cease in 30 seconds once the door is closed.

7) When none of above is applicable, check the troubleshooting of security system.

**19. SEAT**

- 1) Check the seat surfaces for stains or dirt.
- 2) Check that each seat provides full functionality in sliding and reclining. Check all available functions of the rear seat such as a trunk-through center arm-rest.
- 3) Check the passenger detection system.
  - (1) Turn the ignition switch to ON.
  - (2) Check that the ON and OFF passenger side airbag indicator light simultaneously for approximately six seconds, extinguish for two seconds and then only the OFF light lights.



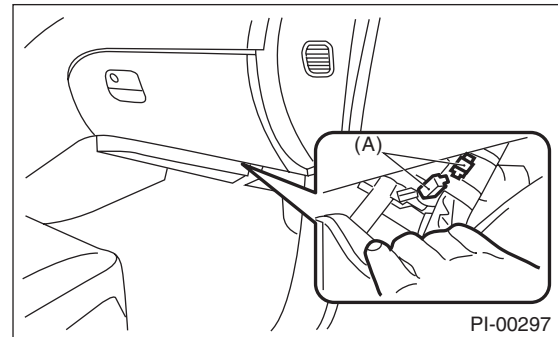
- (3) Have a person weighing approximately 70 kg (155 lb) or more sit in the passenger's seat, and check whether the passenger's airbag indicator light illuminate or not.
- (4) Empty the passenger seat, then check whether the passenger side airbag indicator light turns off.

**20. SEAT BELT**

- 1) Check installation condition of seat belt.
- 2) Pull out the seat belt and then release it. Check that the belt retracts smoothly.
- 3) Check seat belt warning function.
  - (1) Turn the ignition switch to ON without fastening driver's and passenger's seat belts.
  - (2) Check if the Seat belt warning lights of driver's and passenger's side blink for about six seconds and the buzzer beeps intermittently.
  - (3) Then, check that the seat belt warning light comes on, and flashes in about 15-second cycles. (If the passenger seat is empty, the seat belt warning light for passenger side does not operate.)

**21. DELIVERY (TEST) MODE CONNECTOR**

Turn the ignition switch to ON and check that the malfunction indicator light starts blinking. If the light blinks, return the ignition key to LOCK. Peel the mat at the back of the glove box lower cover and pull out the delivery (test) mode connector. Then disconnect the delivery (test) mode connector. Then, turn the ignition key to ON again. If the engine malfunction indicator light blinks at that time in spite of the disconnected delivery (test) mode connector, carry out an engine diagnosis.



(A) Delivery (test) mode connector (green)

**22. IMMOBILIZER SYSTEM**

- 1) Check that the engine starts with all keys that are equipped on vehicle.
- 2) 60 seconds after turning ignition switch from ON to ACC or OFF, or immediately after removing the key, check that the security indicator light blinking.

**NOTE:**

If malfunctions occur, refer to "IMMOBILIZER (DIAGNOSIS)".

**23. STARTING CONDITION**

Start the engine and check that the engine starts smoothly. If the battery voltage is low, recharge or replace the battery. If there are any noises when starting, immediately stop the engine and check and repair the abnormal components.

**24. EXHAUST SYSTEM**

Listen to the exhaust noise to see if no noises are observed. Check for exhaust leaks.

**25. INDICATOR AND WARNING LIGHTS**

Check that all the indicator and warning lights are off. However, check that either OFF or ON illuminates for PASS AIR BAG OFF and ON indicator.

**26. HEATER & VENTILATION**

Operate the heater & ventilation system to check for normal airflow outlet control, air inlet control, airflow capacity and heating performance.

# Pre-delivery Inspection

## PRE-DELIVERY INSPECTION

### 27.AIR CONDITIONER

Operate the front and rear cooler. Check that the A/C compressor operates normally and enough cooling is provided.

#### NOTE:

Idle the engine and operate the air conditioner for 5 minutes to prevent insufficient lubrication of air conditioner system.

### 28.CLOCK

Check the clock for normal operations and enough accuracy.

### 29.AUDIO

Check the radio for full functionality and normal noise level. Check the CD player and AUX operations.

### 30.ACCESSORY POWER SUPPLY SOCKET

- 1) Check the operation of the rear accessory power supply socket.
- 2) Check operation of the accessory power supply socket in console box.

### 31.NAVIGATION SYSTEM

- 1) Check all display functions for normal operation.
- 2) Check the map disc (DVD) are provided on vehicle.
- 3) Check that the navigation system operates normally.
- 4) Check that the rear view camera operates normally.

### 32.REAR ENTERTAINMENT SYSTEM

Check that the rear entertainment system operates normally.

### 33.LIGHTING SYSTEM

- 1) Check the headlight operations.
- 2) Check the stop light operation.
- 3) Check other lights for normal operations.

### 34.WIPER DEICER

Check that the wiper deicer operates normally.

### 35.ILLUMINATION CONTROL

Check that the illumination control operates normally.

### 36.WINDOW WASHER

- Make sure the nozzle and hose are not clogged.
- Make sure the hose is not bent.
- While the vehicle is at a standstill, make sure that the washer injection position is as shown in the figure.

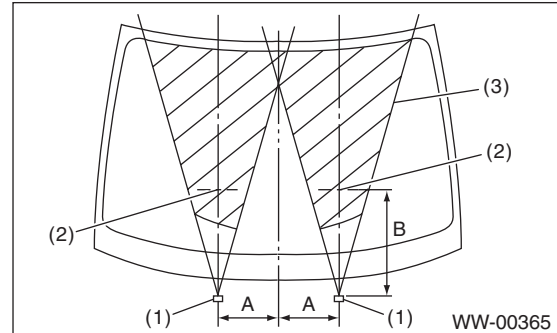
#### NOTE:

Washer injection position can not be adjusted.

#### Front injection position:

**A: 250 mm (9.84 in)**

**B: 433 mm (17.0 in)**



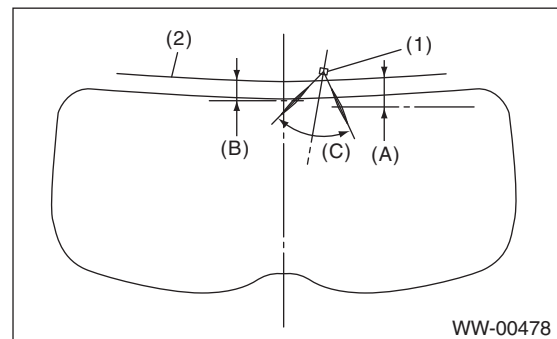
- (1) Nozzle
- (2) Spray center aiming position
- (3) Spray area (shaded area)

#### Rear injection position:

**A: 106 mm (4.17 in)**

**B: 93 mm (3.66 in)**

**C: 72°**



- (1) Nozzle
- (2) Upper edge of the rear gate glass
- (A) From the upper edge of the rear gate glass to the middle of the washer injection distance
- (B) From the upper edge of the rear gate glass to the middle of the washer injection distance
- (C) 72°

### 37.WIPER

Check the front and rear wipers for normal operations.

## 38. POWER WINDOW

Operate the power window switches one by one to check that each of the power windows goes up and down without noises.

## 39. SUNROOF

Check that the sunroof operates normally.

## 40. DOOR MIRROR

Check that the remote control mirror operates normally.

## 41. BRAKE TEST

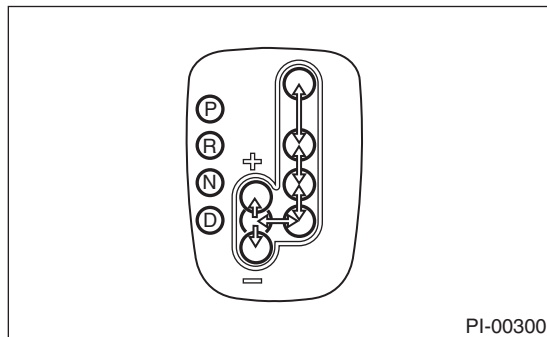
Check the foot brake for normal operations.

## 42. PARKING BRAKE

Check the parking brake for normal operations. When applying the parking brake pedal with force of 300 N (30.6 kgf, 67.5 lbf), check that the parking brake pedal is at 5 to 6 notches.

## 43. AT SHIFT CONTROL

- 1) Turn the ignition switch to ON.
- 2) While brake pedal is not depressed, check if the select lever does not move from "P" range.
- 3) While brake pedal is depressed, check if the select lever moves from "P" range.
- 4) Set the select lever to other than "P" range.
- 5) When the ignition switch is turned OFF, check if the key can be removed from the ignition switch.
- 6) Set the AT select lever to each gear position and check the shifting while driving the vehicle.



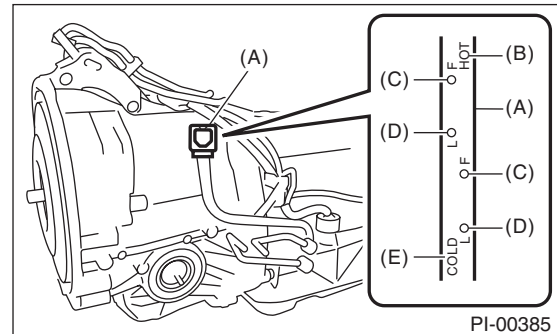
| Selector position | Gear position |     |     |     |     |
|-------------------|---------------|-----|-----|-----|-----|
|                   | 1st           | 2nd | 3rd | 4th | 5th |
| D                 | OK            | OK  | OK  | OK  | OK  |
| SPORT shift       | OK            | OK  | OK  | OK  | OK  |

## 44. CRUISE CONTROL

Operate the cruise control system. Check that the system is activated and deactivated correctly.

## 45. ATF LEVEL

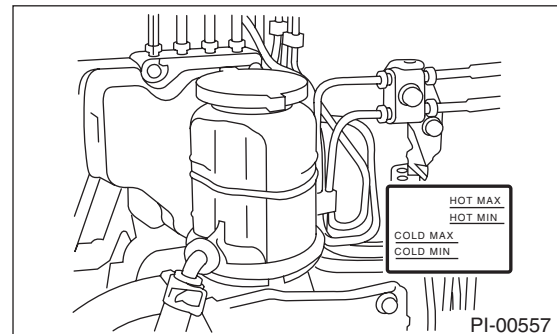
After selecting all positions (P, R, N, D), set the select lever in "P" range. Idle the engine for 1 — 2 minutes, and measure the ATF level. If the amount is insufficient, check that no leaks are found. Then, add the necessary amount of the specified ATF.



- (A) Level gauge
- (B) ATF level range at "HOT"  
[70 — 80°C (158 — 176°F)]
- (C) Upper level
- (D) Lower level
- (E) ATF level range at "COLD"  
[20 — 30°C (68 — 86°F)]

## 46. POWER STEERING FLUID LEVEL

Check that the power steering fluid level is normal. If the amount is insufficient, check that no leaks are found. Then add the necessary amount of the specified power steering fluid.



## 47. FLUID LEAK CHECK

Check entire areas of the vehicle for any trace of coolant/oil/fluid leaks.

### 48. WATER LEAK TEST

Spray the vehicle with water using a hose and check that no water enters the passenger compartment.

- Before performing the water leakage test, remove anything that may obstruct the operation or which must be kept dry.
- Close all the windows and doors securely. Close the hood and trunk lid before starting the test.
- Spray the vehicle with water using a hose. The rate of water spray must be approx. 20 — 25 ℓ (5.3 — 6.6 US gal, 4.4 — 5.5 Imp gal) per minute.

When spraying water on areas adjacent to the floor and wheel house, increase the pressure. When spraying water on areas other than the floor and wheel house, decrease the pressure. But the force of water must be made strong occasionally by pressing the end of the hose.

#### NOTE:

Be sure to keep the hose at least 10 cm (3.9 in) from vehicle.

Check the following areas.

- Front window and body framework mating portion
- Door mating portions
- Glass mating portions
- Rear quarter window mating portions
- Rear window and body framework mating portion
- Around roof drips

If any dampness in the compartments is discovered after the water has been applied, carefully check all the areas that may have possibly contributed to the leak.

### 49. APPEARANCE CHECK 2

1) When vehicle body is covered with protective film, peel it off.

#### NOTE:

- Use of steam facilitates peeling off the wrap guard.
- For a vehicle left for a long time or at low temperature, sprinkle some water heated to 50 — 60°C (122 — 140°F) over the vehicle to raise its surface temperature before peeling off the wrap guard. Do not use the water heated to over 60°C (140°F).
- If the adhesive remains exists on the coated surface, soak a flannel rag, etc. with a small amount of coating wax or solvent such as oil benzene and IPA, put the soaked cloth on the remains lightly, and then wipe them off with a flannel rag etc.
- Keep solvent from touching the resin or rubber parts. Do not use coating wax or solvent while the component surface temperature is high due to hot weather etc.

- If the coated surface is swollen out due to seams or moisture, expose the vehicle to the sunlight for a few hours or heat the seam and swollen portions using a dryer etc.

- Dispose of the peeled wrap guard as burnable industrial garbage.

2) Check the whole vehicle body for flaking paint, damage by transportation, corrosion, dirt, cracks or blisters.

#### NOTE:

- It is better to determine an inspection pattern in order to avoid missing an area, since the total inspection area is wide.

- Do not repair the body paint unless absolutely necessary. Also, if the vehicle is in need of repair to remove scratches or corroded paint, the repair area must be limited to the minimum. Re-painting and spray painting must be avoided as possible.

3) Check each window glass for scratches carefully. Slight damage may be removed by polishing with cerium oxide. (Fill a cup half with cerium oxide, and add warm water to it. Then agitate the content until it turns to wax. Apply this wax to a soft cloth, and polish the glass with it.)

4) Check each portion of the vehicle body and underside components for the formation of rust. If rust is discovered, remove it with sandpaper of #80 to #180 and treat the surface with rust preventive. After this treatment is completed, flush the portion thoroughly, and prepare the surface for repair painting.

5) Check each portion of body and all of the plated parts for deformation or distortion. Also, check each light lens for cracks.

6) Peel the protective tape, vinyl wrapping and identification seal attached to the following places.

- Seats
- Door trim
- Floor carpet
- Side sill
- Front hood lock release lever
- Edge rear
- Rear wiper
- Door mirror
- Front and rear disc brakes

# PERIODIC MAINTENANCE SERVICES

# *PM*

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## General Description

### PERIODIC MAINTENANCE SERVICES

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## 1. General Description

### A: GENERAL DESCRIPTION

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

# Schedule

## PERIODIC MAINTENANCE SERVICES

## 2. Schedule

### A: MAINTENANCE SCHEDULE 1

|    |                                        | Maintenance interval<br>[Number of months or km (miles), whichever occurs first]                                            |     |    |      |     |      |    |      |     |      |     |      |     |      |     |       |     |          |
|----|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----|----|------|-----|------|----|------|-----|------|-----|------|-----|------|-----|-------|-----|----------|
|    | Months                                 | 3                                                                                                                           | 7.5 | 15 | 22.5 | 30  | 37.5 | 45 | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  | 97.5 | 105 | 112.5 | 120 | Remarks  |
|    | × 1,000 km                             | 4.8                                                                                                                         | 12  | 24 | 36   | 48  | 60   | 72 | 81.4 | 96  | 108  | 120 | 132  | 144 | 156  | 168 | 180   | 192 |          |
|    | × 1,000 miles                          | 3                                                                                                                           | 7.5 | 15 | 22.5 | 30  | 37.5 | 45 | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  | 97.5 | 105 | 112.5 | 120 |          |
| 1  | Engine oil                             | R                                                                                                                           | R   | R  | R    | R   | R    | R  | R    | R   | R    | R   | R    | R   | R    | R   | R     | R   |          |
| 2  | Engine oil filter                      | R                                                                                                                           | R   | R  | R    | R   | R    | R  | R    | R   | R    | R   | R    | R   | R    | R   | R     | R   |          |
| 3  | Spark plug                             |                                                                                                                             |     |    |      |     |      |    |      | R   |      |     |      |     |      |     |       | R   |          |
| 4  | Drive belt(s)                          |                                                                                                                             |     |    |      | I   |      |    |      | I   |      |     |      | I   |      | R   |       |     |          |
| 5  | Fuel line                              |                                                                                                                             |     |    |      | (I) |      |    |      | (I) |      |     |      | (I) |      |     |       | I   | Note (1) |
| 6  | Air cleaner element                    |                                                                                                                             |     |    |      | R   |      |    |      | R   |      |     |      | R   |      |     |       | R   | Note (2) |
| 7  | Cooling system                         |                                                                                                                             |     |    |      | I   |      |    |      | I   |      |     |      | I   |      |     |       | I   |          |
| 8  | Engine coolant                         | Replace after the first 11 years or 220,000 km (137,500 miles), and every six years or 120,000 km (75,000 miles) thereafter |     |    |      |     |      |    |      |     |      |     |      |     |      |     |       |     |          |
| 9  | ATF                                    |                                                                                                                             |     |    |      | I   |      |    |      | I   |      |     |      | I   |      |     |       | I   | Note (3) |
| 10 | Front and rear differential oil        |                                                                                                                             |     |    |      | I   |      |    |      | I   |      |     |      | I   |      |     |       | I   |          |
| 11 | Brake line                             |                                                                                                                             |     | I  |      | I   |      | I  |      | I   |      | I   |      | I   |      | I   |       | I   |          |
| 12 | Brake fluid                            |                                                                                                                             |     |    |      | R   |      |    |      | R   |      |     |      | R   |      |     |       | R   |          |
| 13 | Disc brake pad and disc                |                                                                                                                             |     | I  |      | I   |      | I  |      | I   |      | I   |      | I   |      | I   |       | I   |          |
| 14 | Parking brake                          |                                                                                                                             |     | I  |      | I   |      | I  |      | I   |      | I   |      | I   |      | I   |       | I   |          |
| 15 | Suspension                             |                                                                                                                             |     | I  |      | I   |      | I  |      | I   |      | I   |      | I   |      | I   |       | I   |          |
| 16 | Wheel bearing                          |                                                                                                                             |     |    |      |     |      |    |      | (I) |      |     |      |     |      |     |       | (I) |          |
| 17 | Axle boots and joints                  |                                                                                                                             |     | I  |      | I   |      | I  |      | I   |      | I   |      | I   |      | I   |       | I   |          |
| 18 | Tire rotation                          |                                                                                                                             | I   | I  | I    | I   | I    | I  | I    | I   | I    | I   | I    | I   | I    | I   | I     | I   | Note (4) |
| 19 | Steering system (Power steering)       |                                                                                                                             |     | I  |      | I   |      | I  |      | I   |      | I   |      | I   |      | I   |       | I   |          |
| 20 | Supplemental Restraint System “Airbag” | Inspect every 10 years                                                                                                      |     |    |      |     |      |    |      |     |      |     |      |     |      |     |       |     |          |
| 21 | A/C filter                             | Replace every 15 months or 24,000 km (15,000 miles).                                                                        |     |    |      |     |      |    |      |     |      |     |      |     |      |     |       |     |          |
|    |                                        |                                                                                                                             |     |    |      |     |      |    |      |     |      |     |      |     |      |     |       |     |          |

Symbols used:

R: Replace

I: Inspection

(R) or (I): Recommended service for safe vehicle operation.

NOTE:

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

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

(3) ATF filter is maintenance free part. ATF filter needs replacement, when it has physically rust, damaged or ATF leaked.

(4) A tire should be replaced when the tread wear indicator appears as a solid band across the tread. The indicators appear when the remaining tread has been worn to 1.8 mm (0.071 in) or less.

(5) When the A/C filter is mounted

## Schedule

### PERIODIC MAINTENANCE SERVICES

## B: MAINTENANCE SCHEDULE 2

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

## 3. Engine Oil

### A: REPLACEMENT

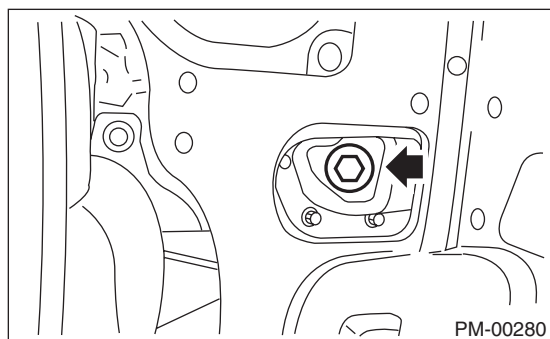
#### CAUTION:

**Be careful not to spill the engine oil on exhaust pipe to prevent it from emitting smoke or fire. If engine oil adheres, wipe it off completely.**

- 1) Set the vehicle on a lift.
- 2) Open the engine oil filler cap for quick draining of engine oil.
- 3) Lift up the vehicle.
- 4) Drain engine oil by loosening the engine oil drain plug.

#### NOTE:

Prepare the container for draining of engine oil.



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

#### NOTE:

Use a new drain plug gasket.

#### Tightening torque:

**44 N·m (4.5 kgf-m, 33 ft-lb)**

- 6) Lower the vehicle.
- 7) Using engine oil of proper quality and viscosity, fill engine oil through the oil filler duct to the "F" line on level gauge. Make sure that the vehicle is parked on a level surface when checking oil level.

#### Recommended oil:

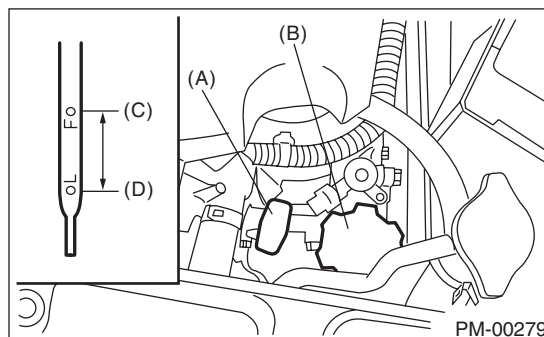
**<Ref. to LU(H6DO)-2, SPECIFICATION, General Description.>**

#### Engine oil capacity:

**<Ref. to LU(H6DO)-2, SPECIFICATION, General Description.>**

- 8) Close the engine oil filler cap.
- 9) Start the engine and warm it up for a time.

- 10) After the engine stops, recheck the oil level. If necessary, add engine oil up to the "F" line on the level gauge.



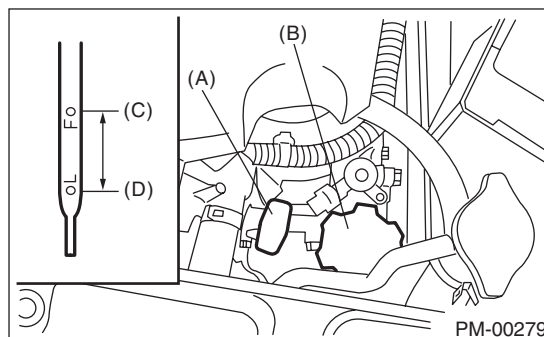
- (A) Oil level gauge
- (B) Engine oil filler cap
- (C) "F" line
- (D) "L" line

### B: INSPECTION

- 1) Park the vehicle on a level surface.
- 2) Remove the oil level gauge and wipe it clean.
- 3) Reinsert the level gauge all the way. Be sure that the level gauge is correctly inserted and properly orientated.
- 4) Remove it again and check the reading. If the engine oil level is below "L" line, add oil to bring the level up to "F" line.
- 5) After turning off the engine, wait a few minutes for the oil to return to the oil pan before checking the level.

#### NOTE:

To prevent overfilling of engine oil, do not add oil above "F" line when the engine is cold.



- (A) Oil level gauge
- (B) Engine oil filler cap
- (C) "F" line
- (D) "L" line

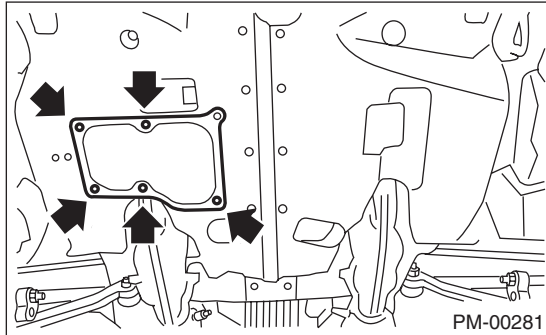
### 4. Engine Oil Filter

#### A: REPLACEMENT

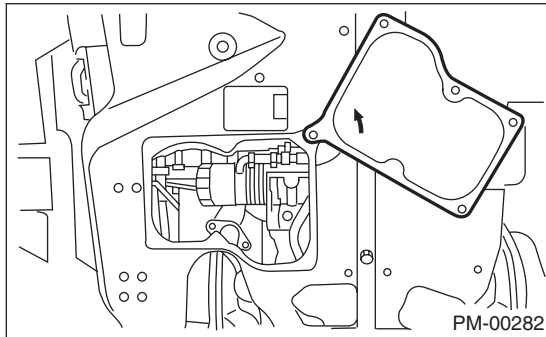
##### CAUTION:

**Be careful not to spill the engine oil on exhaust pipe to prevent it from emitting smoke or fire. If engine oil adheres, wipe it off completely.**

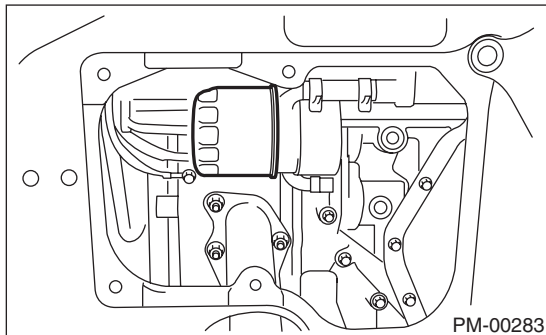
- 1) Set the vehicle on a lift.
- 2) Lift up the vehicle.
- 3) Drain the engine oil. <Ref. to LU(H6DO)-9, REPLACEMENT, Engine Oil.>
- 4) Remove the service hole cover clip.



- 5) Rotate the service hole cover in the arrow direction.



- 6) Remove the oil filter using ST.  
ST 4985447000 OIL FILTER WRENCH



- 7) Clean the oil filter installing surface of oil cooler.
- 8) Obtain a new oil filter and apply a thin coat of engine oil to the seal rubber.
- 9) Install the oil filter turning it by hand, being careful not to damage the seal rubber.

- 10) Tighten more (approx. 3/4 turn) after the seal rubber contacts the oil cooler. When using a torque wrench, tighten to 14 N·m (1.4 kgf-m, 10.3 ft-lb).

- 11) Install the service hole cover.

- 12) Lower the vehicle.

- 13) Refill the engine oil. <Ref. to LU(H6DO)-9, INSPECTION, Engine Oil.>

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

##### NOTE:

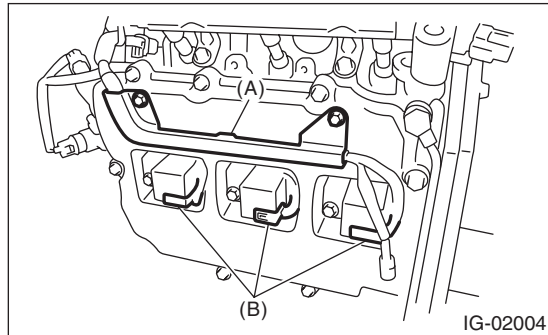
The filter element and filter case are permanently jointed; therefore, interior cleaning is not necessary.

- 15) Check the engine oil level. <Ref. to LU(H6DO)-9, INSPECTION, Engine Oil.>

## 5. Spark Plug

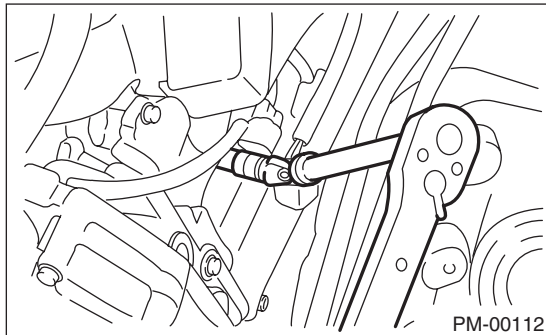
### A: REPLACEMENT

- 1) Remove the battery and battery carrier.
- 2) Remove the air cleaner case.
- 3) Detach the connector from ignition coil.
- 4) Remove the ignition coil.



- (A) Bracket  
(B) Connector

- 5) Remove the spark plug with a spark plug socket.



- 6) Tighten the new spark plug lightly with hand, and then secure with a spark plug socket to the specified torque.

#### **Recommended spark plug:**

**NGK: SILFR6A**

#### **Tightening torque:**

**21 N·m (2.1 kgf-m, 15.5 ft-lb)**

- 7) Tighten the ignition coil.

#### **Tightening torque:**

**16 N·m (1.6 kgf-m, 11.8 ft-lb)**

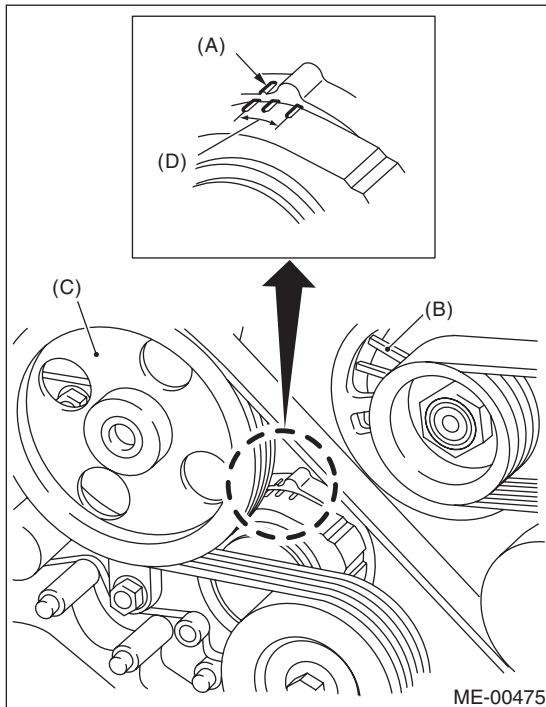
#### **NOTE:**

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

## 6. V-belt

### A: INSPECTION

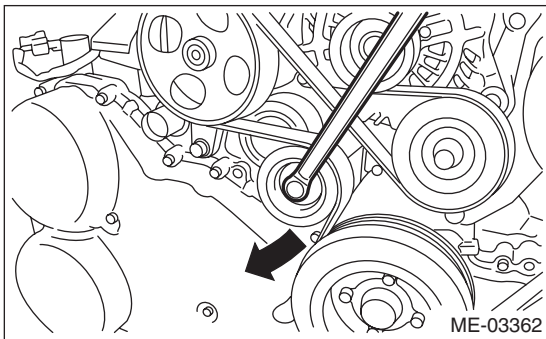
- 1) Replace the belts if cracks, fraying or wear are found.
- 2) Make sure that the V-belt automatic belt tension indicator (A) is within the range of its use limit (D).



- (A) Indicator
- (B) Generator
- (C) Power steering oil pump
- (D) Service limit

### B: REPLACEMENT

- 1) Remove the collector cover.
- 2) Install the tool to belt tension adjuster assembly installation bolt.
- 3) Rotate the tool clockwise and loosen the V-belt to remove.



- 4) Install in the reverse order of removal.

## 7. Fuel Line

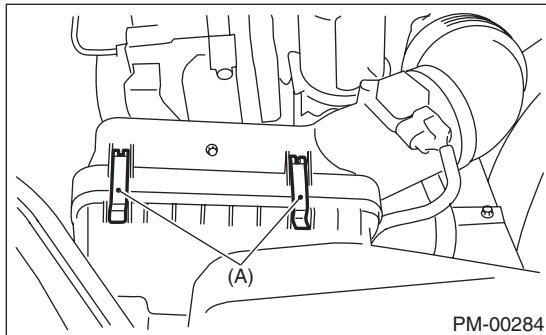
### A: INSPECTION

The fuel line is located mostly internally, so check pipes, areas near pipes, and engine compartment piping for rust, hose damage, loose band, etc. If faulty parts are found, repair or replace them. <Ref. to FU(H6DO)-58, Fuel Delivery & Evaporation Lines.>

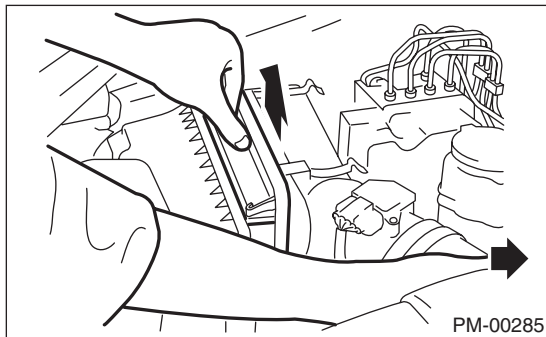
### 8. Air Cleaner Element

#### A: REPLACEMENT

- 1) Disconnect the ground cable from battery.
- 2) Disconnect the connector from mass air flow sensor.
- 3) Remove the clips (A) on air cleaner case.



- 4) While pushing the duct toward the back end of the vehicle, remove the air cleaner element.



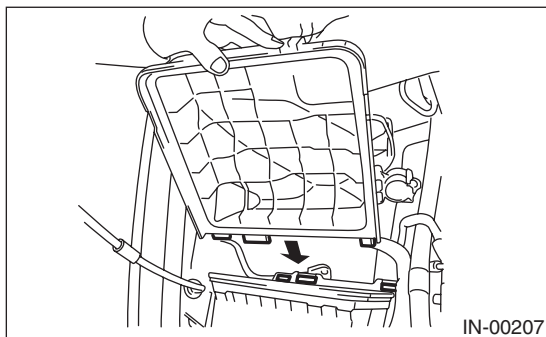
- 5) Check that there are no foreign objects in the clean side.
- 6) Install in the reverse order of removal.

#### CAUTION:

**When replacing the air cleaner element, use SUBARU Genuine air cleaner element according to the engine type. Using other air cleaner element may affect engine performance.**

#### NOTE:

Fasten with a clip after inserting the lower tab of case.



## 9. Cooling System

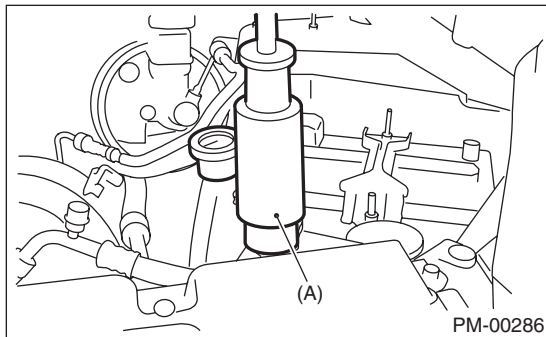
### A: INSPECTION

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

**157 kPa (1.6 kg/cm<sup>2</sup>, 23 psi)**

#### NOTE:

- Hose joints and other connections for leakage
- Each portion of radiator for leakage
- Be particularly careful not to deform the filler neck of radiator when installing and removing the tester and after testing.



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

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

#### NOTE:

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

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

### Radiator cap valve open pressure

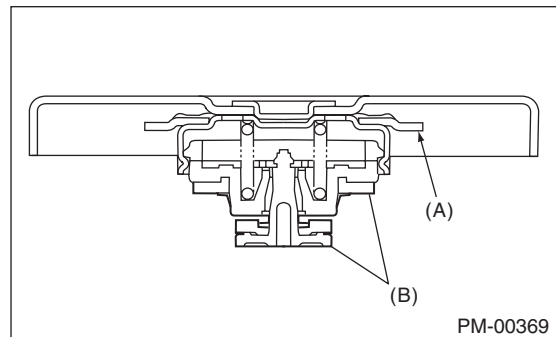
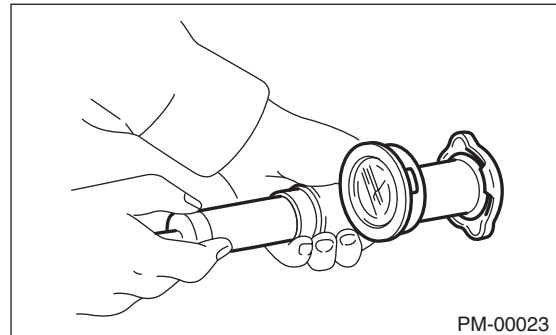
#### Standard:

**73.6 — 103 kPa**

**(0.75 — 1.05 kg/cm<sup>2</sup>, 11 — 15 psi)**

#### Service limit:

**63.6 kPa (0.649 kg/cm<sup>2</sup>, 9.22 psi)**



- (A) Check points for deformation  
(B) Check points for deformation, damage, rust

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

<Ref. to CO(H6DO)-14, Water Pump.> <Ref. to CO(H6DO)-15, Thermostat.> <Ref. to CO(H6DO)-17, Radiator.> <Ref. to CO(H6DO)-22, Radiator Cap.>

4) Check the radiator fan operates using Subaru Select Monitor, when the coolant temperature exceeds 95°C (203°F). If it does not operate, check the radiator fan system.

<Ref. to CO(H6DO)-10, INSPECTION, Radiator Fan System.>

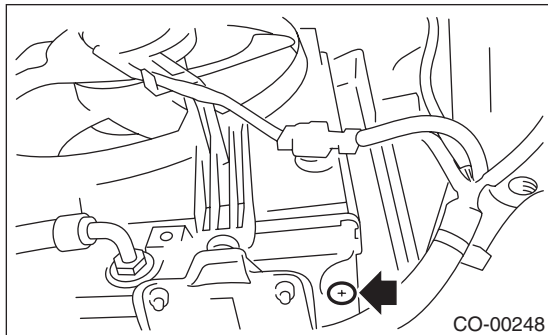
### 10.Engine Coolant

#### A: REPLACEMENT

##### WARNING:

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

- 1) Lift up the vehicle.
- 2) Remove the under cover.
- 3) Place a container under radiator drain pipe.
- 4) Remove the radiator 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) Pour cooling system conditioner through the filler neck.

##### **Cooling system protective agent:**

**Cooling system conditioner (Part number: SOA345001)**

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

##### **Recommended engine coolant:**

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

##### **Coolant capacity (Fill up to "FULL" level):**

**Approx. 7.6 ℓ (8.0 US qt, 6.7 Imp qt)**

##### NOTE:

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

- 10) Close the radiator cap, and start the engine. Race 5 to 6 times at 3,000 rpm or less, then stop the engine. (Complete this operation within 40 seconds.)

- 11) Wait for one minute after the engine stops, then open the radiator cap. If the engine coolant level drops, add engine coolant into radiator up to the filler neck position.

- 12) Perform the procedures 10) and 11) again.

- 13) Install the radiator cap and reservoir tank cap properly.

- 14) Start the engine and operate the heater at maximum hot position and the blower speed setting to "LO".

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

##### NOTE:

- Be careful with the engine coolant temperature gauge to prevent overheating.
- If the radiator hose becomes harden by engine coolant pressure at this time, air purge seems to be mostly completed.

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

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

- 18) Install the radiator cap and reservoir tank cap properly.

- 19) Set the heater setting to maximum hot position and the blower speed setting to "LO" and start the engine. Perform racing at 3,000 rpm or less. If the flowing sound is heard from heater core, repeat the procedures from step 10) again.

##### CAUTION:

**If engine coolant adheres to the exhaust pipe, wipe it off completely.**

## B: ADJUSTMENT

### 1. PROCEDURE TO ADJUST THE CONCENTRATION OF THE SUBARU SUPER COOLANT

**CAUTION:**

**Use the SUBARU Super Coolant with a 50 — 60% concentration in order to obtain maximum anti-freeze and anti-rust performance.**

To adjust the concentration of SUBARU Super Coolant according to temperature, find the proper SUBARU Super Coolant concentration in the table, and add diluting water to the SUBARU Super Coolant (undiluted type) until it reaches the proper dilution.

| Relationship of SUBARU SUPER COOLANT concentration and freezing temperature |               |               |               |
|-----------------------------------------------------------------------------|---------------|---------------|---------------|
| SUBARU Super Coolant concentration                                          | 50%           | 55%           | 60%           |
| Freezing temp.                                                              | −36°C (−33°F) | −41°C (−42°F) | −50°C (−58°F) |

***Recommended engine coolant and diluting water:***

***For the recommended engine coolant and dilution water, refer to “RM” section. <Ref. to RM-4, COOLANT, RECOMMENDED MATERIALS, Recommended Materials.>***

# Automatic Transmission Fluid

## PERIODIC MAINTENANCE SERVICES

### 11. Automatic Transmission Fluid

#### A: INSPECTION

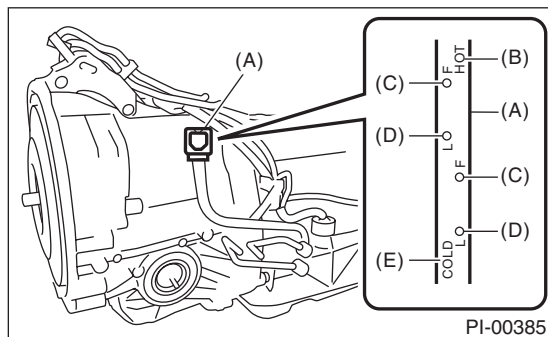
##### CAUTION:

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

1) Raise the ATF temperature by driving a distance of 5 to 10 km (3 to 6 miles). Otherwise, idle the engine to raise ATF temperature to 70 — 80°C (158 — 176°F) on Subaru Select Monitor. <Ref. to 5AT(diag)-16, READ CURRENT DATA, OPERATION, Subaru Select Monitor.>

2) Make sure the vehicle is level.

3) After selecting all positions (P, R, N, D), shift the select lever in “P” range. Idle the engine for 1 or 2 minutes, and measure the ATF level.



- (A) Level gauge
- (B) ATF level range at “HOT”  
[70 — 80°C (158 — 176°F)]
- (C) Upper level
- (D) Lower level
- (E) ATF level range at “COLD”  
[20 — 30°C (68 — 86°F)]

4) Make sure that ATF level is above the center of upper and lower marks at “HOT” side.

5) If the ATF level is below the center between upper and lower marks, add the recommended ATF until the fluid level is found above the center between upper and lower marks.

##### CAUTION:

- Use care not to exceed the upper limit level.
- Adding ATF to the upper limit mark on “HOT” side when the ATF temperature is below 70°C (158°F) will overfilling of ATF, causing a transmission failure.

6) Check ATF level after raising ATF temperature to 70 — 80°C (158 — 176°F) by running the vehicle or by idling the engine again.

7) Check the ATF for leaks.

Check for leaks in the transmission. If there are leaks, it is necessary to repair or replace gasket, oil seals, plugs or other parts.

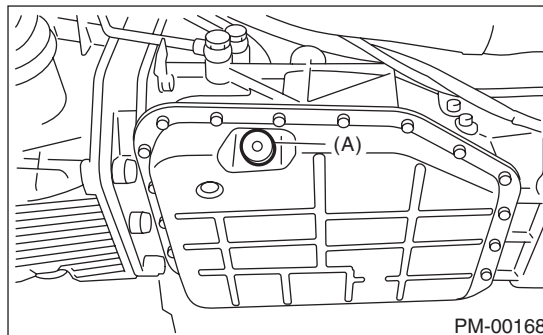
#### B: REPLACEMENT

##### 1. AUTOMATIC TRANSMISSION FLUID

1) Drain the ATF by removing ATF drain plug.

##### NOTE:

Before starting work, cool off the ATF well.



(A) ATF drain plug

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

##### Tightening torque:

**20 N·m (2.0 kgf·m, 14.8 ft·lb)**

3) Pour in the ATF using the oil charger pipe.

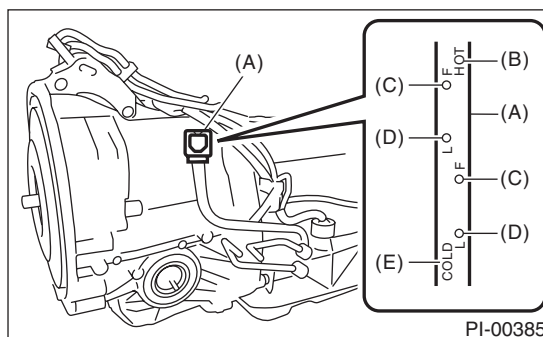
##### Recommended ATF:

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

##### Capacity:

**Fill with the same amount of ATF as drained.**

4) Check the ATF level. <Ref. to PM-14, INSPECTION, Automatic Transmission Fluid.>



- (A) Level gauge
- (B) ATF level range at “HOT”  
[70 — 80°C (158 — 176°F)]
- (C) Upper level
- (D) Lower level
- (E) ATF level range at “COLD”  
[20 — 30°C (68 — 86°F)]

##### CAUTION:

**If ATF is spilt over exhaust pipe, wipe it off using cloth.**

## 2. ATF FILTER

### NOTE:

Basically, the ATF filter is maintenance free, but when it is rusted or physically damaged or leaking, the ATF filter needs to be replaced.

For the replacement procedure of ATF filter, refer to "ATF FILTER". <Ref. to 5AT-59, ATF Filter.>

# Front & Rear Differential Gear Oil

## PERIODIC MAINTENANCE SERVICES

### 12. Front & Rear Differential Gear Oil

#### A: REPLACEMENT

##### 1. FRONT DIFFERENTIAL

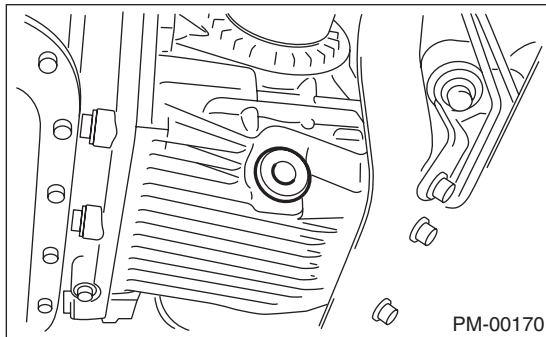
###### CAUTION:

Be careful not to spill the differential gear oil on exhaust pipe to prevent it from emitting smoke or fire. If differential gear oil adheres to the exhaust pipe, wipe it off completely using cloth.

1) Drain the differential gear oil by removing drain plug using TORX® bit T70.

###### NOTE:

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



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

###### Tightening torque:

**70 N·m (7.1 kgf·m, 51.6 ft·lb)**

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

###### Recommended gear oil:

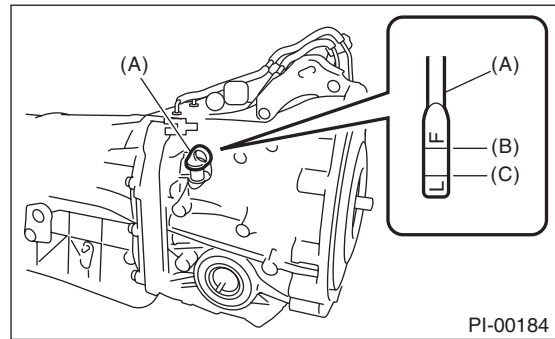
**Refer to “RM” section. <Ref. to RM-2, LUBRICANTS, RECOMMENDED MATERIALS, Recommended Materials.>**

###### NOTE:

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

###### Gear oil capacity:

**1.3 — 1.5 ℓ (1.4 — 1.6 US qt, 1.1 — 1.3 Imp qt)**



(A) Oil level gauge

(B) Upper level

(C) Lower level

##### 2. REAR DIFFERENTIAL

1) Drain the oil by removing drain plug.

2) Remove the filler plug for quick draining oil.

3) Tighten the drain plug after draining oil and replacing with a new gasket.

###### Tightening torque:

**50 N·m (5.1 kgf·m, 36.9 ft·lb)**

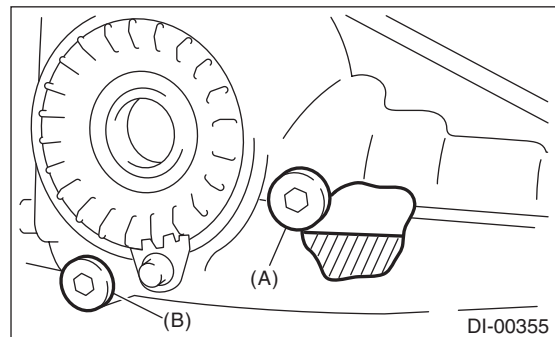
4) Pour oil to the bottom end of filler plug hole.

###### Recommended gear oil:

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

###### Oil capacity:

**0.8 ℓ (0.8 US qt, 0.7 Imp qt)**



(A) Filler plug

(B) Drain plug

###### NOTE:

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

5) Replace the gasket with a new part and tighten the filler plug.

###### Tightening torque:

**50 N·m (5.1 kgf·m, 36.9 ft·lb)**

## 13.Brake Line

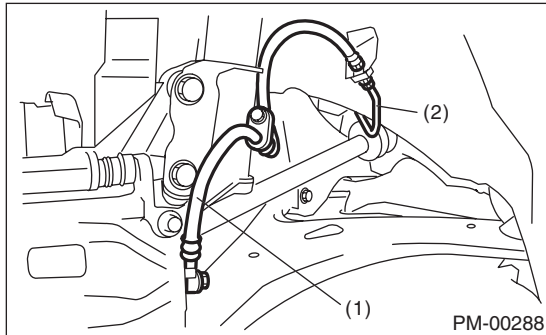
### A: INSPECTION

#### 1. BRAKE LINE

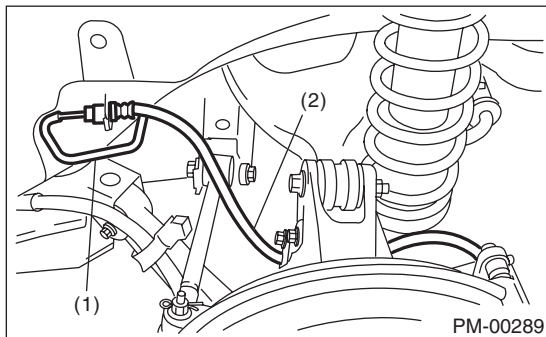
- 1) Check for scratches, swelling, corrosion, traces of fluid leakage on the brake hoses or pipe joints.
- 2) Check the possibility of adjacent parts interfering with brake pipes/hoses during driving, and loose connections/clamps.
- 3) Check any trace of fluid leakage, scratches, etc. on master cylinder,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

#### NOTE:

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



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



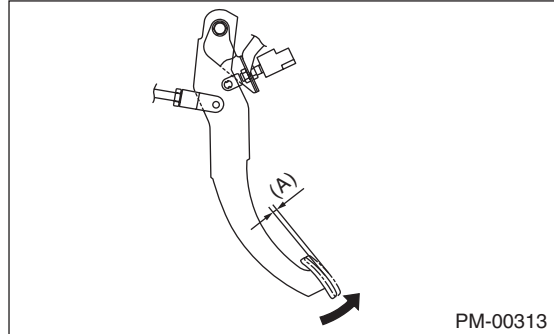
- (1) Rear brake pipe
- (2) Rear brake hose

#### 2. SERVICE BRAKE

- 1) Check the free play of brake pedal with pulling up the force of less than 10 N (1 kgf, 2 lb).

**Brake pedal free play (Pulling up direction of pedal)**

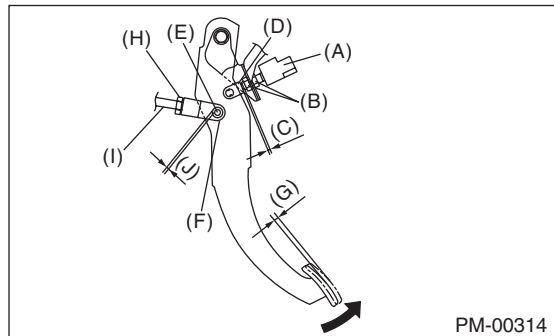
**0.5 — 2.0 mm (0.02 — 0.08 in)**



(A) Pedal free play

- 2) If the free play is out of specifications above, adjust the brake pedal as follows.

- (1) Make sure the engine is off. (No vacuum is applied to brake booster.)
- (2) There should be play between brake booster clevis and pin at brake pedal installing portion. [Pulling up the brake pedal pad with a force of 10 N (1 kgf, 2 lb) or less to a stroke of 0.5 to 2.0 mm (0.02 to 0.08 in).]
- (3) If there is no free play between clevis pin and clevis, turn brake switch adjusting nut until the clearance between stopper and screw of brake switch becomes 0.8 mm (0.031 in).



- (A) Brake switch
- (B) Adjusting nut
- (C) 0.8 mm (0.031 in)
- (D) Stopper
- (E) Clevis pin
- (F) Clevis
- (G) Pedal free play
- (H) Lock nut
- (I) Brake booster operating rod
- (J) Play at pin

# Brake Line

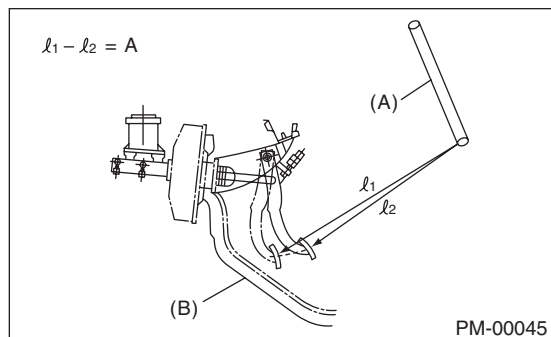
## PERIODIC MAINTENANCE SERVICES

### 3) Check the pedal stroke.

While the engine is idling, depress the brake pedal with a 500 N (51 kgf, 112 lb) load and measure the distance between the brake pedal and steering wheel. With the brake pedal released, measure the distance between pedal and steering wheel again. The difference between the two measured values must be less than specified value. If the measured value is more than specification, there is possibility of entering air in hydraulic unit.

#### **Brake pedal stroke A:**

**115 mm (4.5 in)/500 N (51 kgf, 112 lb) or less**



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

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

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

## 3. BRAKE SERVO SYSTEM

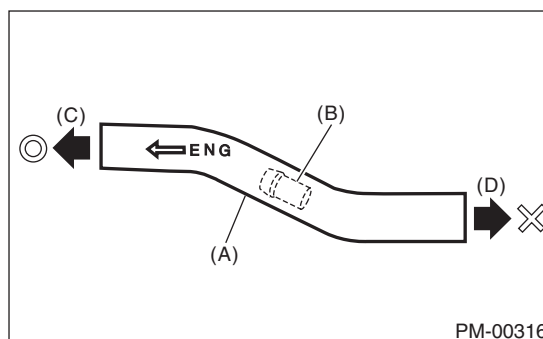
1) With the engine off, depress the brake pedal several times applying the same pedal force. Make sure the travel distance should not change.

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

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

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

Make sure air flows from the booster end to engine end but does not flow in the opposite direction in the check valve.



- (A) Vacuum hose
- (B) Check valve
- (C) Engine side
- (D) Brake booster side

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

#### NOTE:

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

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

## 14.Brake Fluid

### A: REPLACEMENT

- 1) Either jack-up the vehicle and place a rigid rack under it, or lift up the vehicle.
- 2) Remove all the wheels.
- 3) Drain the brake fluid from master cylinder.
- 4) Refill the reservoir tank with recommended brake fluid.

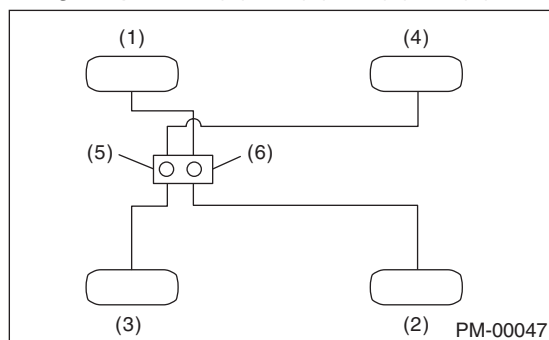
#### **Recommended brake fluid:**

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

#### **NOTE:**

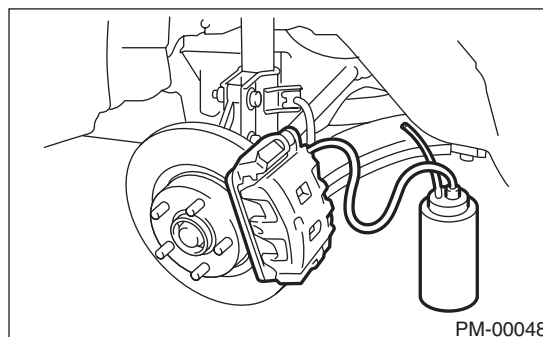
- Avoid mixing different brands of brake fluid to prevent degrading the quality of fluid.
- Be careful not to allow dirt or dust to get into the reservoir tank.

Bleeding sequence (1) → (2) → (3) → (4)



- (1) Front RH
- (2) Rear LH
- (3) Front LH
- (4) Rear RH
- (5) Secondary
- (6) Primary

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



#### **NOTE:**

- Cover the bleeder with cloth, when loosening it, to prevent brake fluid from being splashed over surrounding parts.
  - While bleeding air, keep the reservoir tank filled with brake fluid to prevent entry of air.
  - Operate the brake pedal slowly.
  - For convenience and safety, perform work with 2 people.
  - The amount of brake fluid required is approx. 600 mℓ (20.3 US fl oz, 21.1 Imp fl oz) for total brake system.
- 6) Instruct your co-worker to depress the brake pedal slowly two or three times and then hold it depressed.
  - 7) Loosen the bleeder screw approximately 1/4 turn until a small amount of brake fluid drains into the container, and then quickly tighten the screw.
  - 8) Repeat steps 6) and 7) until there are no air bubbles in drained brake fluid and new fluid flows through vinyl tube.

#### **NOTE:**

Add brake fluid as necessary while bleeding air, so that the brake fluid in the tank is always between MAX and MIN.

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

#### **Tightening torque:**

**8 N·m (0.8 kgf-m, 5.8 ft-lb)**

- 10) Bleed air from each wheel cylinder by following steps from 5) to 9).
- 11) Depress the brake pedal with a force of approx. 294 N (30 kgf, 66 lb) and hold it there for approx. 20 seconds. At this time check the pedal to see if it makes any unusual movement. Visually inspect the bleeder screws and brake pipe joints to confirm there is no fluid leakage.
- 12) Install the wheels, and drive the vehicle for a short distance between 2 to 3 km (1 to 2 mile) to confirm brakes are operating properly.

# Disc Brake Pad and Disc

## PERIODIC MAINTENANCE SERVICES

### 15.Disc Brake Pad and Disc

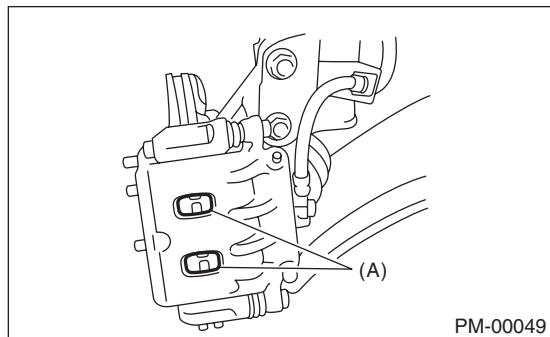
#### A: INSPECTION

1) Jack-up the vehicle and support with rigid racks. Then remove the wheels.

2) Visually check the pad thickness through inspection hole of disc brake assembly. Replace the pad if necessary.

#### NOTE:

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



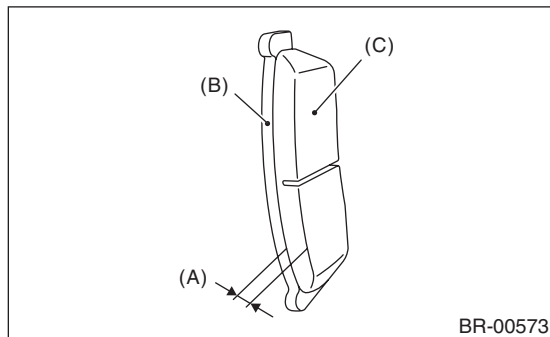
(A) Inspection hole

#### • Front

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

#### • Rear

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



- (A) Pad thickness
- (B) Back metal
- (C) Lining

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

#### • Front

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

#### • Rear

| Disc rotor thickness |  | mm (in)   |
|----------------------|--|-----------|
| Standard value       |  | 18 (0.71) |
| Wear limit           |  | 16 (0.63) |

4) Remove the caliper body. <Ref. to BR-15, Front Disc Brake Assembly.> <Ref. to BR-23, Rear Disc Brake Assembly.>

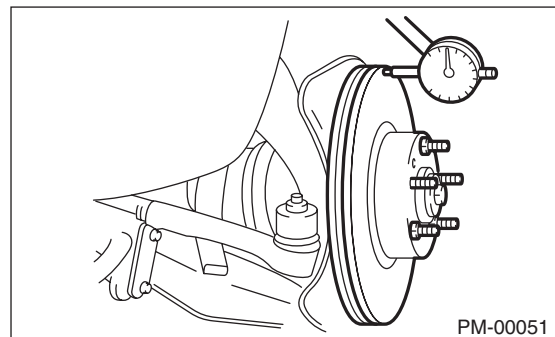
5) Tighten the wheel nuts to secure disc rotor.

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

#### Disc rotor runout limit:

**Front: 0.05 mm (0.002 in)**

**Rear: 0.05 mm (0.002 in)**



## 16. Parking Brake

### A: INSPECTION

Inspect the brake linings and disc rotor of both sides of the rear brake at the same time by removing disc rotor.

1) Inspect the brake shoes for damage or deformation and check the brake linings for wear.

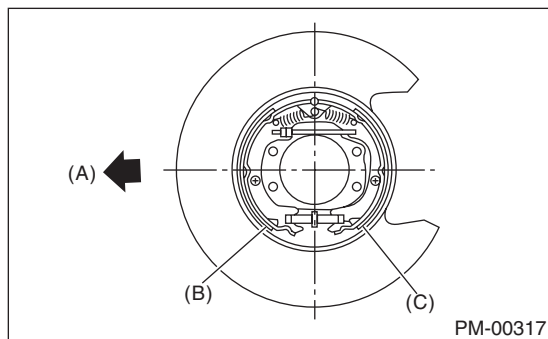
#### NOTE:

Always replace both primary and secondary brake shoes for the left and right wheels at the same time.

**Thickness of brake lining (except for back metal):**

**Standard: 4.0 mm (0.157 in)**

**Wear limit: 1.5 mm (0.059 in)**



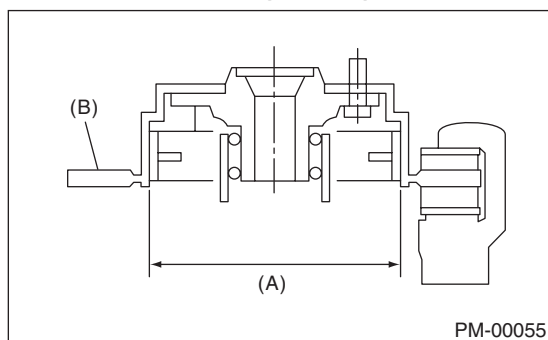
- (A) Forward
- (B) Brake shoe (Primary side)
- (C) Brake shoe (Secondary side)

2) Check the inside of disc rotor for wear, dents or other damage. If the inside surface of disc rotor is streaked, correct the surface with emery cloth (#200 or more). If it is unevenly worn or tapered, correct or replace it.

**Brake drum inside diameter:**

**Standard: 210 mm (8.26 in)**

**Wear limit: 211 mm (8.30 in)**



- (A) Inside diameter
- (B) Disc

3) If the deformation or wear of back plate, shoe, etc. is noticeable, replace them.

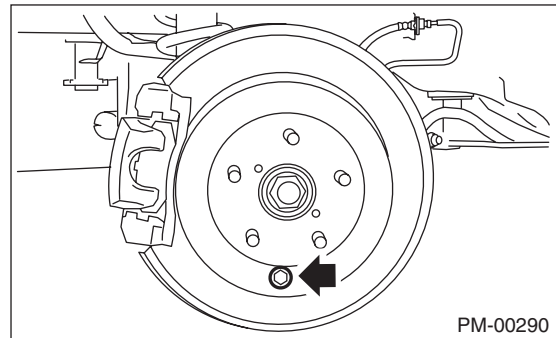
4) When the shoe return spring tension is excessively weakened, replace it.

5) Check whether the parking brake pedal is at the predetermined number of notches (5 to 6 notches).

### B: ADJUSTMENT

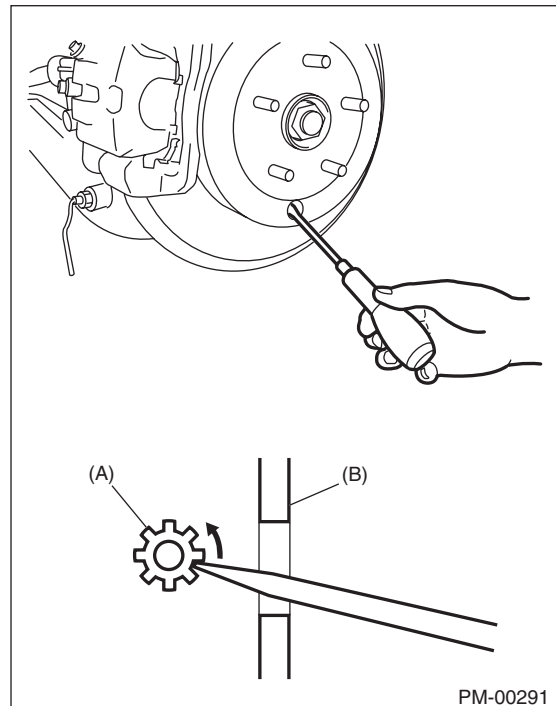
1) Remove the rear tire and release the parking brake.

2) Remove the cover (rubber) installed on the disc rotor.



3) Turn the disc rotor so that the service hole is directly below.

4) Turn the adjuster toward arrow mark (upward) until it is locked slightly, by using flat-tip screwdriver as shown in the figure.



- (A) Adjuster
- (B) Disc rotor

5) Turn back (downward) the adjuster several notches until the brake pedal no longer has any drag.

6) Install the cover (rubber) in original position correctly.

## **Parking Brake**

### **PERIODIC MAINTENANCE SERVICES**

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7) Install the rear tires.

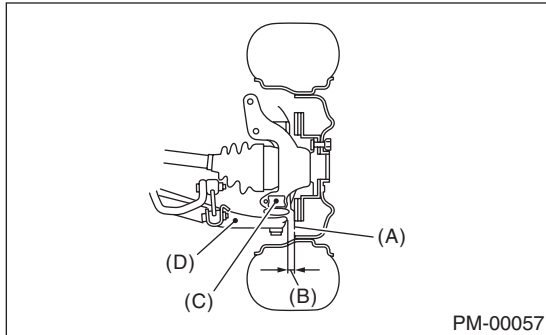
8) Adjust so that the parking brake pedal is at the predetermined number of notches (5 to 6 notches).

## 17. Suspension

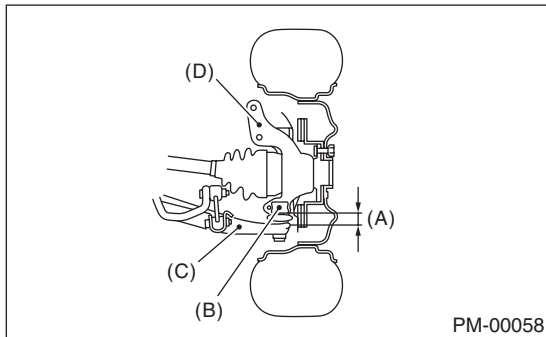
### A: INSPECTION

#### 1. SUSPENSION BALL JOINT

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



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



- 4) If relative movement is observed in the step 2), 3), remove and inspect the ball joint. If the free play exceeds standard value, replace the ball joint. <Ref. to FS-17, Front Ball Joint.>

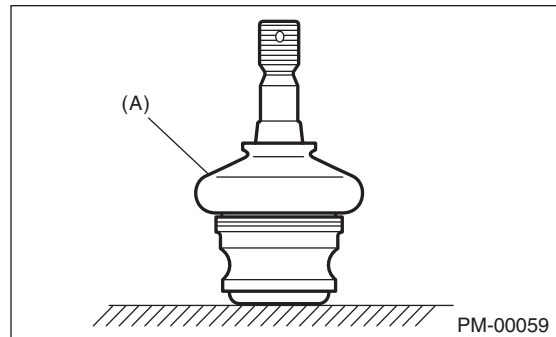
#### 5) Damage of dust seal

Visually inspect the ball joint dust seal. When there is damage, remove the front arm. <Ref. to FS-18, Front Arm.> Measure the play of ball joint. <Ref. to FS-17, Front Ball Joint.>

- (1) When looseness exceeds standard value, replace the ball joint.
- (2) If the dust seal is damaged, replace with a new ball joint.

#### NOTE:

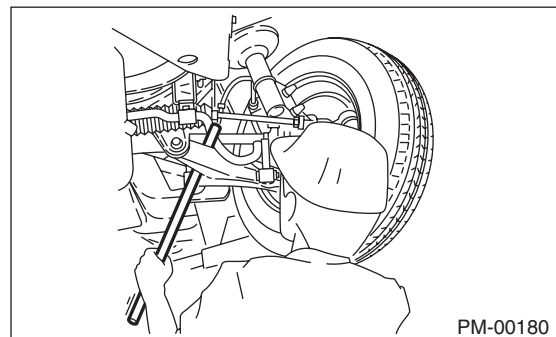
When the front arm ball joint has been removed or replaced, check the toe-in of front wheel. If the front wheel toe-in is not at specified value, adjust the toe-in. <Ref. to FS-7, Wheel Alignment.>



(A) Dust seal

#### 2. FRONT, REAR SUSPENSION BUSHING

Apply pressure with tire lever etc. to inspect the bushing for abnormal fatigue or damage. Replace the bushings and the arm assembly or link assembly if there is abnormal fatigue or damage.



### 3. WHEEL ARCH HEIGHT

1) Unload the cargoes and set the vehicle in curb weight (empty) condition.

2) Check the wheel arch height of the front and rear suspensions to ensure that they are within specified values. <Ref. to FS-7, Wheel Alignment.>

3) When the wheel arch height is out of standard, visually inspect following components and replace deformed parts.

- Suspension components [Front strut assembly and rear shock absorber assembly]
- Parts connecting suspension and body

4) When no components are deformed, adjust wheel arch height by replacing coil spring in the suspension whose wheel arch height is out of standard. <Ref. to FS-7, Wheel Alignment.> <Ref. to RS-8, Wheel Alignment.>

### 4. WHEEL ALIGNMENT OF FRONT SUSPENSION

1) Check the alignment of front suspension to ensure that following items conform to standard values.

- Toe-in
- Camber
- Caster
- Steering angle

<Ref. to FS-7, Wheel Alignment.>

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

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

3) When the toe-in and camber are out of standard value, adjust them so that they conform to standard value.

4) When the right-and-left turning angles of tire are out of standard, adjust to standard value.

### 5. WHEEL ALIGNMENT OF REAR SUSPENSION

1) Check the alignment of rear suspension to ensure that following items are within standard values.

- Toe-in
- Camber
- Thrust angle

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

2) When the camber angle does not conform to standard value, visually inspect the following components. If the deformation is observed, replace the damaged parts.

- Suspension components [Shock absorber, rear upper arm, front lateral link, rear lateral link, rear trailing link, sub frame]
- Parts connecting suspension and body

3) When the toe-in and thrust angle are out of standard value, adjust them so that they conform to standard value.

### 6. OIL LEAKAGE OF STRUT AND SHOCK ABSORBER

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

### 7. TIGHTNESS OF BOLTS AND NUTS

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

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

### 8. DAMAGE TO SUSPENSION PARTS

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

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

## 18. Wheel Bearing

### A: INSPECTION

#### 1. FRONT WHEEL BEARING

**NOTE:**

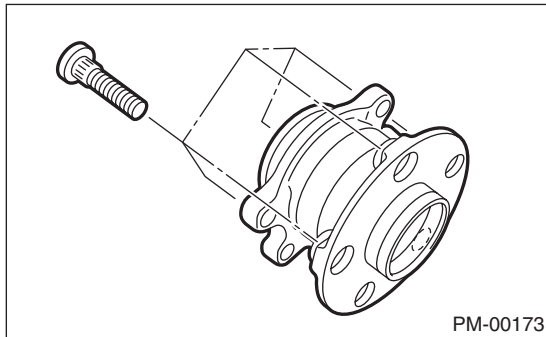
Inspect the condition of front wheel bearing grease.

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

**Service limit:**

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

- 5) Remove the bolts and self-locking nuts, and extract the front arm from front crossmember.
  - 6) Remove the PTJ of front drive shaft from transmission. <Ref. to DS-27, Front Drive Shaft.>
  - 7) While supporting the front drive shaft horizontally with one hand, turn the hub with the other hand to check for noise or binding.
- If the hub is noisy or binds, replace the front axle.



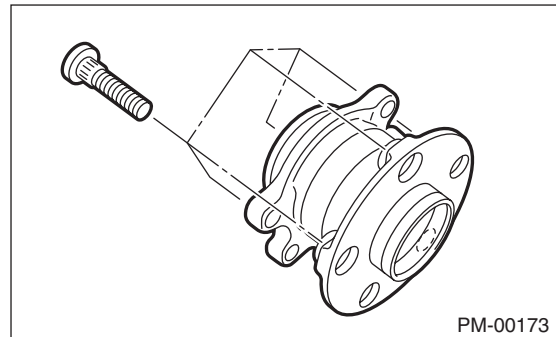
#### 2. REAR WHEEL BEARING

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

**Service limit:**

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

- 5) Remove the DOJ of rear drive shaft from rear differential. <Ref. to DS-32, Rear Drive Shaft.>
  - 6) While supporting rear drive shaft horizontally with one hand, turn the hub with the other hand to check for noise or binding.
- If the hub is noisy or binds, replace the rear axle.



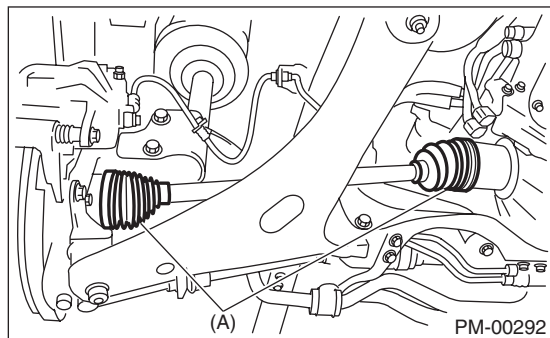
### 19. Axle Boots & Joints

#### A: INSPECTION

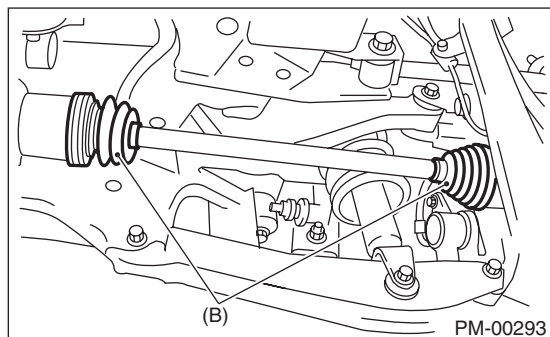
##### 1. FRONT AND REAR AXLE BOOTS

Inspect the front axle boots (A) and rear axle boots (B) for deformation, damage or failure. If faulty, replace with a new part. <Ref. to DS-27, Front Drive Shaft.> <Ref. to DS-32, Rear Drive Shaft.>

- Front



- Rear



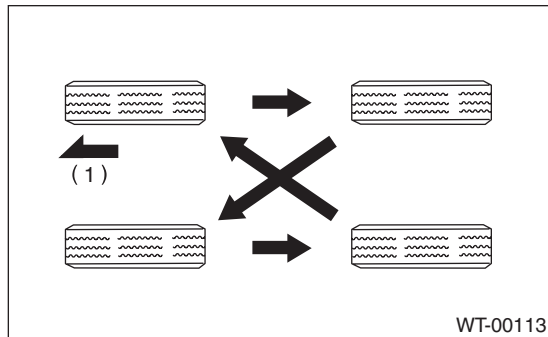
##### 2. PROPELLER SHAFT

Inspect the propeller shaft for damage or failure. If faulty, replace with a new part. <Ref. to DS-10, Propeller Shaft.>

## 20. Tire Rotation

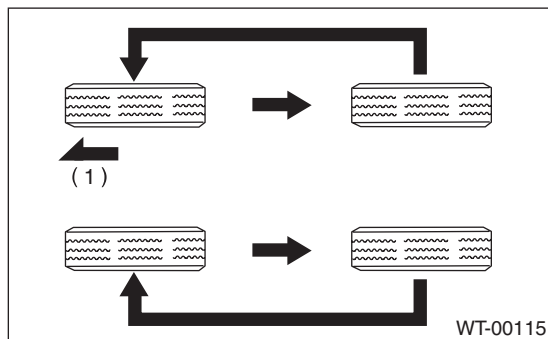
### A: INSPECTION

- 1) When the tread has worn down to 1.8 mm (0.071 in) or the wear indicator appears across the tread, replace the tire. (Replace the right and left tire as a set.)
  - 2) If the tire appears to be worn unevenly, adjust the wheel alignment.
  - 3) Rotate tires periodically (12,000 km/7,500 miles) as shown in the figure, in order to prevent them from uneven wear and to prolong their life.
- Without instruction for the direction of tire rotation

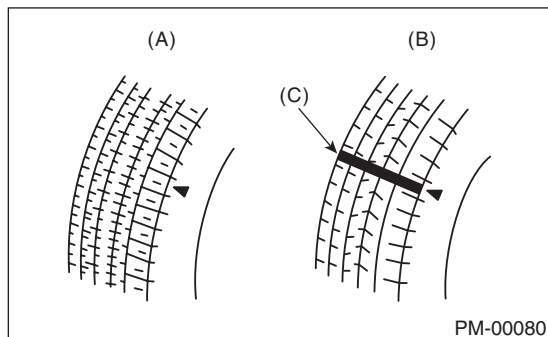


(1) Front

- With instruction for the direction of tire rotation



(1) Front



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

# Steering System (Power Steering)

## PERIODIC MAINTENANCE SERVICES

### 21. Steering System (Power Steering)

#### A: INSPECTION

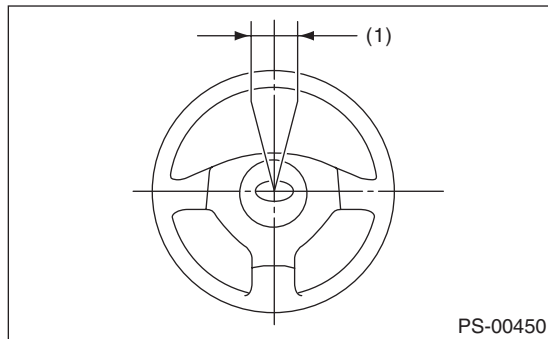
##### 1. STEERING WHEEL

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

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

##### **Steering wheel free play:**

**0 — 17 mm (0 — 0.67 in)**



(1) Steering wheel free play

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

##### **Maximum permissible play:**

**0.5 mm (0.020 in)**

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

##### (1) Steering force:

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

##### (2) Pulled to one side:

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

##### (3) Wheel runout:

Steering wheel should not show any sign of runout.

##### (4) Return factor:

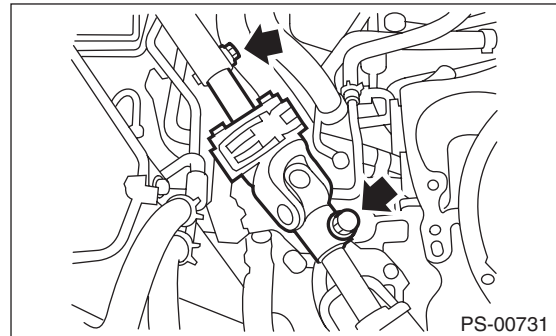
Steering wheel should return to its original position after it has been turned and then released.

##### 2. STEERING SHAFT JOINT

When the steering wheel free play is excessive, disconnect the universal joint of steering shaft and check it for any play and yawing torque (at the point of the crossing direction). Also inspect for any damage to sealing or worn serrations. If the joint is loose, retighten the mounting bolts to the specified torque.

##### **Tightening torque:**

**24 N·m (2.4 kgf-m, 17.7 ft-lb)**



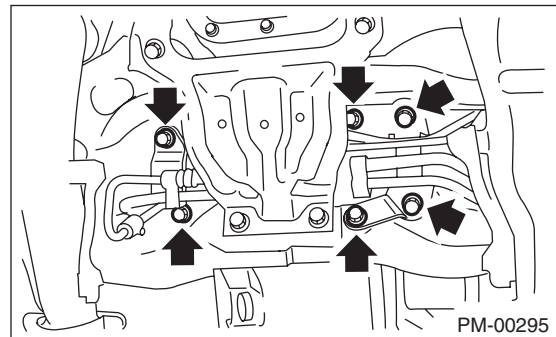
##### 3. GEARBOX

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

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

##### **Tightening torque:**

**60 N·m (6.1 kgf-m, 44.1 ft-lb)**



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

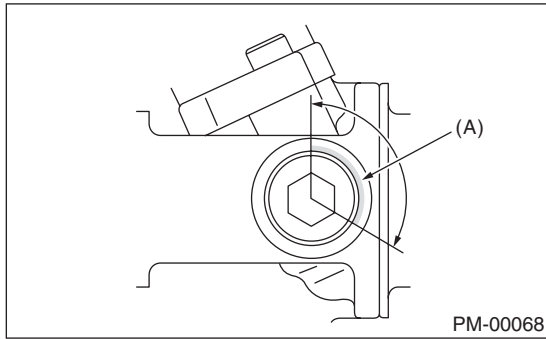
- 3) With the vehicle placed on a level surface, quickly turn the steering wheel to the left and right.

While steering wheel is being rotated, check the gear backlash. If any noise is noticed, adjust the gear backlash.

- 4) Apply liquid gasket to at least 1/3 of entire perimeter of adjusting screw thread.

- 5) Tighten the adjusting screw to 25 N·m (2.5 kgf-m, 18.1 ft-lb) and then loosen.

- 6) Tighten the adjusting screw to 5.9 N·m (0.60 kgf-m, 4.4 ft-lb) and then loosen 20°.



(A) Apply liquid gasket to at least 1/3 of entire perimeter.

- 7) Install the lock nut. While holding the adjusting screw with wrench, tighten the lock nut using ST. ST 926230000 SPANNER

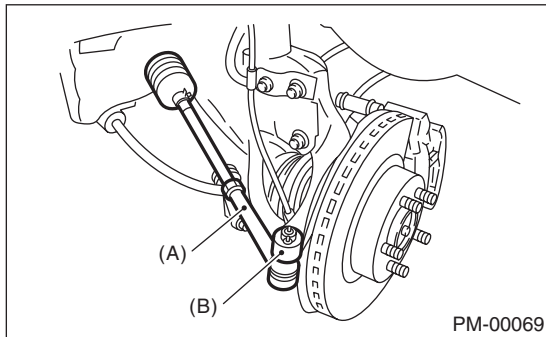
## **Tightening torque (lock nut):**

**25 N·m (2.5 kgf-m, 18.4 ft-lb)**

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

## **4. TIE-ROD**

- 1) Check the tie-rod and tie-rod ends for bends, scratches or other damage.



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

- 2) Check the connections of knuckle ball joints for play, inspect for damage on dust seals, and check free play of ball studs. If the castle nut is loose, retighten it to the specified torque, then tighten it further up to 60° until the cotter pin hole is aligned.

## **Tightening torque:**

**27 N·m (2.75 kgf-m, 19.9 ft-lb)**

- 3) Check the lock nut on the tie-rod for tightness. If it is loose, retighten it to the specified torque.

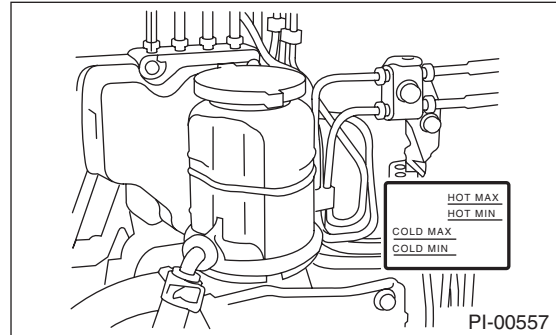
## **Tightening torque:**

**85 N·m (8.7 kgf-m, 63 ft-lb)**

## **5. POWER STEERING FLUID LEVEL**

### **NOTE:**

- At power steering fluid temperature 20°C (68°F); read the fluid level on the “COLD” side.
  - At power steering fluid temperature 80°C (176°F); read the fluid level on the “HOT” side.
- 1) Place the vehicle with engine “OFF” on a level surface.
  - 2) Check the fluid level using the scale on the outside of the reservoir tank. If the level is below “MIN”, add fluid to bring it up to “MAX”.



### **NOTE:**

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

### **Recommended fluid:**

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

### **Fluid capacity:**

**0.9 ℓ (1.0 US qt, 0.8 Imp qt)**

## **6. POWER STEERING FLUID FOR LEAKS**

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

If the fluid leaks are found, retighten their fitting bolts (or nuts) and/or replace their parts.

### **NOTE:**

- Wipe the leaked fluid off after correcting fluid leaks.
- Also pay attention to clearances between hoses (or pipes) and other parts when inspecting fluid leaks.

# Steering System (Power Steering)

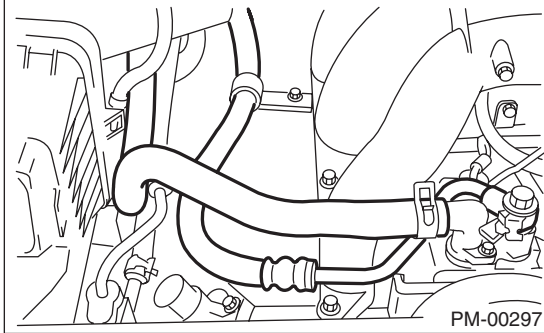
## PERIODIC MAINTENANCE SERVICES

### 7. HOSES OF OIL PUMP FOR DAMAGES

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

#### NOTE:

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



### 8. POWER STEERING PIPES FOR DAMAGES

Check the power steering pipes for corrosion and damage.

Replace the pipes with new parts if necessary.

### 9. GEARBOX BOOTS

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

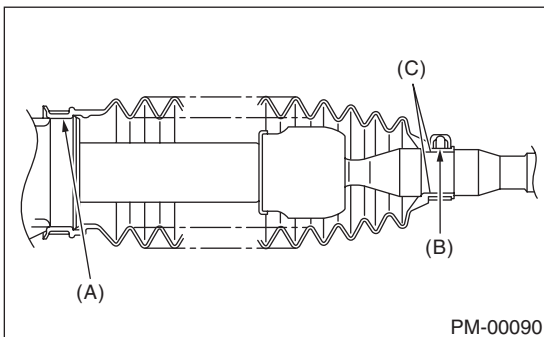
1) Positions (A) and (B) of the gearbox boot are fitted correspondingly in grooves (A) and (B) of the gearbox and rod (C).

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

3) Boot does not have crack or hole.

#### NOTE:

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



### 10. FITTING BOLTS AND NUTS

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

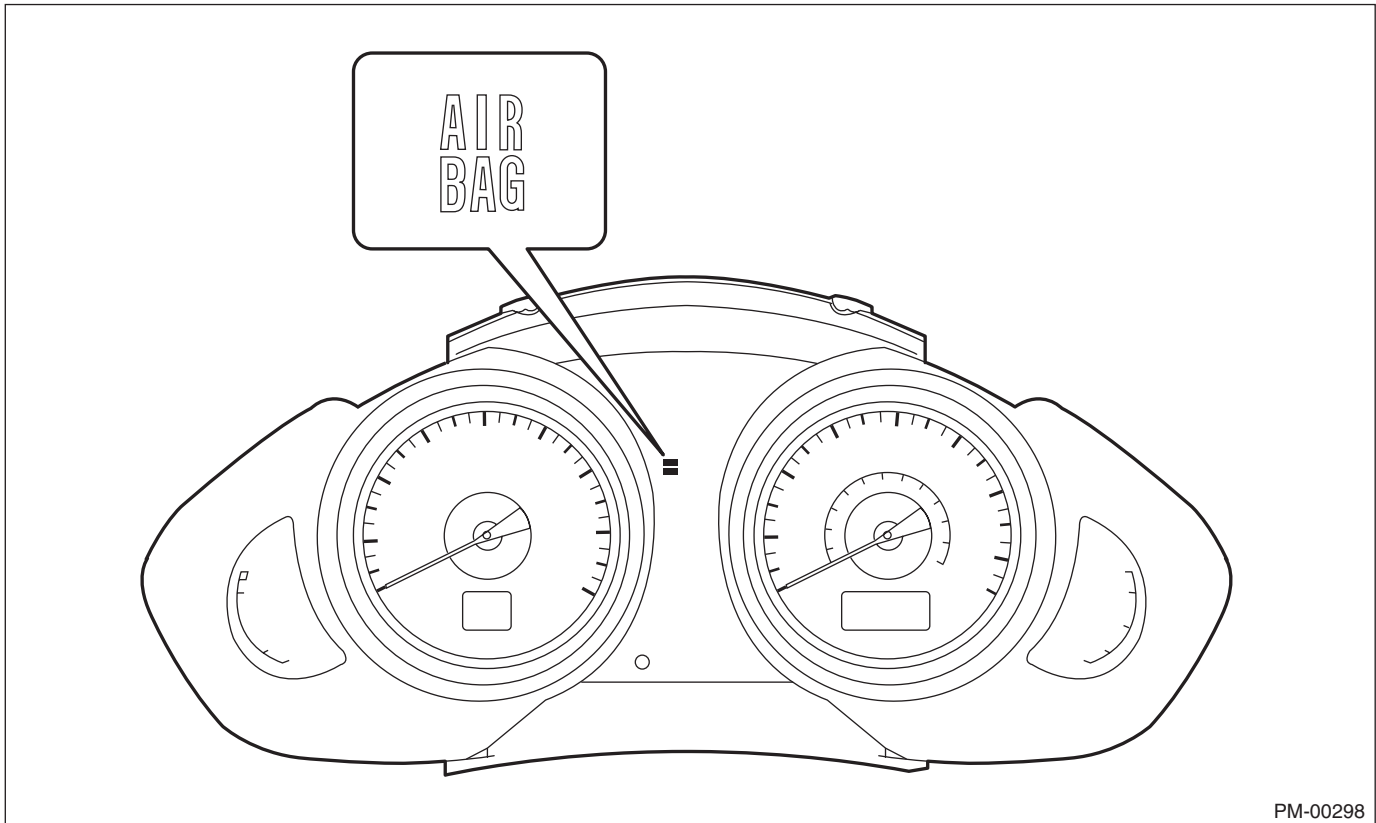
Inspect and/or retighten them when engine is cold.

## 22. Supplemental Restraint System

### A: INSPECTION

Check the airbag system in accordance with the result of the self-diagnosis. <Ref. to AB(diag)-2, Basic Diagnostic Procedure.>

1) Make sure that airbag connectors are connected. If not, properly connect. When the ignition switch is turned ON with the connector(s) disconnected, the airbag warning light blinks to identify the fault.



PM-00298

2) Connect the Subaru Select Monitor to data link connector. Turn the ignition switch to ON, and Subaru Select Monitor switch to ON.

3) Read the Diagnostic Trouble Code (DTC) using Subaru Select Monitor. <Ref. to AB(diag)-24, READ DIAGNOSTIC TROUBLE CODE (DTC), OPERATION, Subaru Select Monitor.>

4) Inspect the airbag system according to the Diagnostic Trouble Code (DTC).

### **23.A/C Filter**

#### **A: REPLACEMENT**

For the A/C filter replacement procedures, refer to the AC section. <Ref. to AC-53, REPLACEMENT, A/C Filter.>

**ENGINE SECTION**

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

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

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

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

**FUEL INJECTION (FUEL SYSTEMS)****FU(H6DO)****EMISSION CONTROL  
(AUX. EMISSION CONTROL DEVICES)****EC(H6DO)****INTAKE (INDUCTION)****IN(H6DO)****MECHANICAL****ME(H6DO)****EXHAUST****EX(H6DO)****COOLING****CO(H6DO)****LUBRICATION****LU(H6DO)****SPEED CONTROL SYSTEMS****SP(H6DO)****IGNITION****IG(H6DO)****STARTING/CHARGING SYSTEMS****SC(H6DO)****ENGINE (DIAGNOSTICS)****EN(H6DO)(diag)****GENERAL DESCRIPTION****GD(H6DO)**



# FUEL INJECTION (FUEL SYSTEMS)

## *FU(H6DO)*

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