

1. Foreword

A: FOREWORD

These manuals are used when performing maintenance, repair or diagnosis of Subaru Forester.

Application model: 2008 MY*****

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

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. INDEX

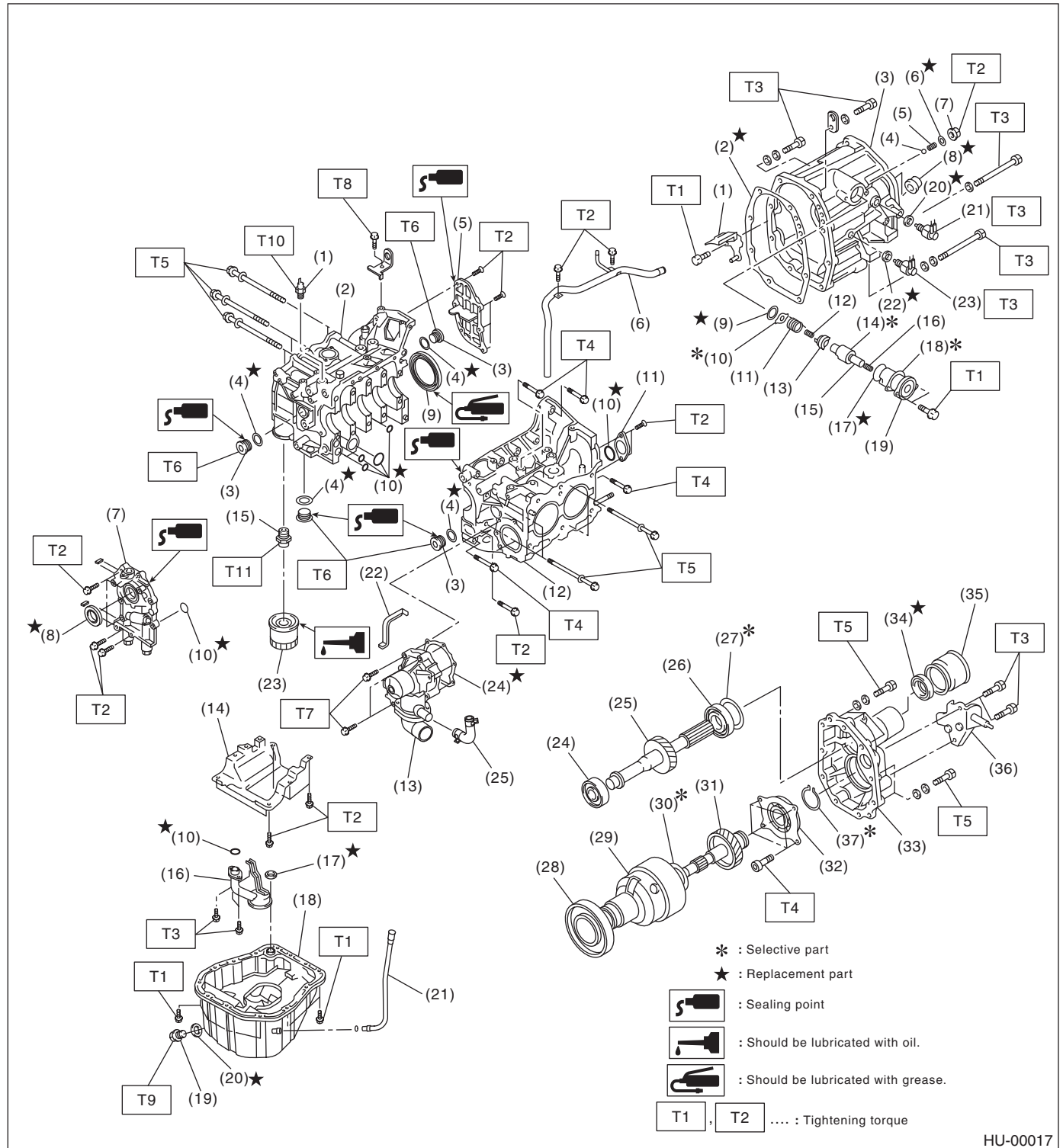
The first page has an index with tabs.

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.

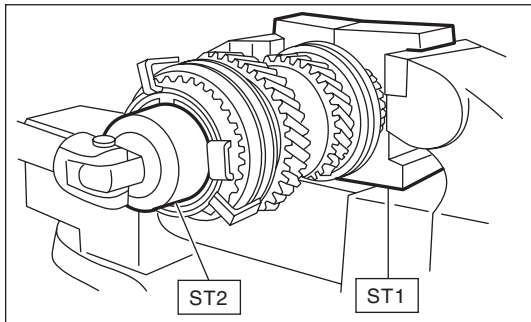
NOTE: (D)
Secure the lock nuts in two Places after tightening.

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)

9. EXPLANATION OF TERMINOLOGY

List

AAI	: Air Assist Injection	MD	: Mini Disc
A/B	: Airbag	MID	: Multi-information Display
ABS	: Antilock Brake System	MFI	: Multipoint Fuel Injection
A/C	: Air Conditioner	MP-T	: Multi-Plate Transfer
A/F	: Air Fuel Ratio	MT	: Manual Transmission
ALT	: Generator	NA	: Natural Aspiration
ASSY	: Assembly	NC	: Normal Close (Relay)
AT	: Automatic Transmission	NO	: Normal Open (Relay)
ATF	: Automatic Transmission Fluid	OP	: Option Parts
AWD	: All Wheel Drive	P/S	: Power Steering
BATT	: Battery	P/W	: Power Window
CD-R/RW	: CD Recordable/Rewritable	PCD	: Pitch Circle Diameter
CPU	: Central Processing Unit	PCV	: Positive Crankcase Ventilation
DOHC	: Double Overhead Camshaft	RH	: RH (Right Hand)
DVD	: Digital Versatile Disc	Rr	: Rear
ECM	: Engine Control Module	SOHC	: Single Overhead Camshaft
EGR	: Exhaust Gas Recirculation	SRS	: Supplemental Restraint System
ELR	: Emergency Locking Retractor	SSM	: Subaru Select Monitor
EX	: Exhaust	ST	: Special Tool
F/B	: Fuse & Joint Box	SW	: Switch
FL	: Fusible Link	TCS	: Traction Control System
Ft	: Full-time (AWD)	TGV	: Tumble Generator Valve
FWD	: Front Wheel Drive	T/M	: Transmission
GPS	: Global Positioning System	TPMS	: Tire Pressure Monitoring System
H/U	: Hydraulic Unit	ViS-C	: Viscous Coupling
IG	: Ignition	VSV	: Vacuum Switching Valve
INT	: Intermittent	VTD	: Variable Torque Distribution
ISC	: Idle Speed Control	W/H	: Wiring Harness
LH	: LH (Left Hand)	Pr	: Primary
LSD	: Limited Slip Differential	2ndr	: Secondary
M/B	: Main Fuse & Relay Box		

How to Use This Manuals

HOW TO USE THIS MANUALS

Forester

SPECIFICATIONS

1. Forester

A: DIMENSION

Model				2.5 L	
				AWD	
				Non-turbo	Turbo
Overall length				mm (in)	4,485 (176.6)
Overall width				mm (in)	1,735 (68.3)
Total height (at C.W.)				mm (in)	1,590 (62.6)1,585 (62.4)
Compartment	Head-room	Front	mm (in)	1,012 (39.8) 992 (39.0)*1	
		Rear	mm (in)	998 (39.3) 938 (36.9)*1	
	Leg room	Front	mm (in)	1,108 (43.6)	
		Rear	mm (in)	856 (33.7)	
	Shoulder room	Front	mm (in)	1,356 (53.4)	
		Rear	mm (in)	1,361 (53.6)	
Wheelbase				mm (in)	2,525 (99.4)
Tread	Front		mm (in)	1,495 (58.9)	
	Rear		mm (in)	1,485 (58.5)	
Minimum road clearance				mm (in)	205 (8.07)200 (7.87)

*1: Model with sunroof

B: ENGINE

Model			2.5 L Non-turbo	2.5 L Turbo
Engine type			Horizontally opposed, liquid cooled, 4-cylinder, 4-stroke gasoline engine	
Valve system mechanism	Method		SOHC	DOHC
	Number of valves		Intake 2/Exhaust 2	
Bore × stroke			99.5 × 79 (3.92 × 3.11)	
Displacement			2,457 (149.94)	
Compression ratio			10.0±0.2	8.4±0.2
Ignition order			1 — 3 — 2 — 4	
Idling speed [at neutral position on MT, or "P" or "N" position on AT]			rpm MT (U5.C0): 700±100 MT (U6): 650±100 AT: 700±100	700±100
Maximum output			kW (HP)/rpm 127 (170)/6,000	172 (230)/5,600
Maximum torque			N·m (kgf-m, ft-lb)/rpm 227 (23.1, 167)/4,400	319 (32.5, 235)/3,600

C: ELECTRICAL

Model		2.5 L Non-turbo	2.5 L Turbo
Ignition timing/Idle speed		BTDC/rpm MT (U5.C0): 10°±8°/700 MT (U6): 10°±8°/650 AT: 15°±8°/700	17°±10°/700
Spark plug		NGK: FR5AP-11	NGK: ILFR6B
Generator		12 V — 90 A	12 V — 110 A
Battery		MT: 12 V — 48 AH (55D23L) AT: 12 V — 52 AH (75D23L)	

D: TRANSMISSION

Model		2.5 L Non-turbo		2.5 L Turbo	
Transmission		5MT	4AT	5MT	4AT
Clutch type		DSPD	TCC	DSPD	TCC
Gear ratio	1st	3.454	2.785	3.454	2.785
	2nd	2.062	1.545	1.947	1.545
	3rd	1.448	1.000	1.366	1.000
	4th	1.088	0.694	0.972	0.694
	5th	0.780	—	0.738	—
	Rev.	3.333	2.272	3.333	2.272
Reduction gear (Front)	First deceleration	Type	—	Helical	—
		Gear ratio	—	1.000	—
	Final deceleration	Type	Hypoid		
		Gear ratio	4.111	4.444	4.111
Reduction gear (Rear)	Transfer reduction	Type	Helical	—	Helical
		Gear ratio	1.000	—	1.000
	Final deceleration	Type	Hypoid		
		Gear ratio	4.111	4.444	4.111

5MT: 5-forward speeds with synchromesh and 1-reverse

4AT: Electronically controlled fully-automatic, 4-forward speeds and 1-reverse

DSPD: Dry Single Plate Diaphragm

TCC: Torque Converter Clutch

E: STEERING

Model		All models
Type		Rack and Pinion, Integral
Turns, lock to lock		3.0
Minimum turning diameter	m (ft)	Curb to curb
		Wall to wall
		10.8 (35.4)
		11.6 (38.1)

F: SUSPENSION

Front	Macpherson strut type independent suspension
Rear	Dual link strut type independent suspension

G: BRAKE

Model	2.5 X, SPORTS Non-turbo	2.5 XS, 2.5 XT, SPORTS turbo, L.L.Bean
Service brake system	Dual circuit hydraulic with vacuum suspension and power unit	
Front	Ventilated disc brake	
Rear	Drum brake	Disc brake
Parking brake	Mechanical on rear brakes	

H: TIRE

Wheel size	16 × 6 ¹ / ₂ JJ, 16 × 6 ¹ / ₂ J	17 × 7JJ
Tire size	P215/60R16 94H	P215/55R17 93H
Type	Steel belted radial, tubeless	

I: CAPACITY

Model			2.5 L Non-turbo		2.5 L Turbo	
Transmission			5MT	4AT	5MT	4AT
Fuel tank ℓ (US gal, Imp gal)			60 (15.9, 13.2)			
Engine oil ℓ (US qt, Imp qt)	Total capacity (Overhaul)		5.0 (5.3, 4.4)			
	Filling amount of engine oil	When replacing engine oil and oil filter	4.2 (4.4, 3.7)			
		When replacing only engine oil	4.0 (4.2, 3.5)			
Transmission oil ℓ (US qt, Imp qt)			3.5 (3.7, 3.1)	—	3.5 (3.7, 3.1)	—
ATF ℓ (US qt, Imp qt)			—	9.3 (9.8, 8.2)	—	9.3 (9.8, 8.2)
Front differential gear oil ℓ (US qt, Imp qt)			—	1.2 (1.3, 1.1)	—	1.2 (1.3, 1.1)
Rear differential gear oil ℓ (US qt, Imp qt)			0.8 (0.8, 0.7)			
Power steering fluid ℓ (US qt, Imp qt)			0.7 (0.7, 0.6)			
Engine coolant ℓ (US qt, Imp qt)			Approx. 6.9 (Approx. 7.3, 6.1)	Approx. 6.8 (Approx. 7.2, 6.0)	Approx. 7.4 (Approx. 7.8, 6.5)	Approx. 7.3 (Approx. 7.7, 6.4)

J: WEIGHT**1. FOR U.S. MODEL**

Option code★ 1			U5ZK		U6ZK		U5YY		U6YY	
Engine type			2.5 L Non-turbo							
Grade			2.5 X				FORESTER SPORTS			
Transmission			5MT	4AT	5MT	4AT	5MT	4AT	5MT	4AT
Vehicle weight (C.W.)	Front axle	kg (lb)	789 (1,740)	810 (1,785)	789 (1,740)	810 (1,785)	789 (1,740)	810 (1,785)	789 (1,740)	810 (1,785)
	Rear axle	kg (lb)	635 (1,400)	635 (1,400)	635 (1,400)	635 (1,400)	635 (1,400)	635 (1,400)	635 (1,400)	635 (1,400)
	Total	kg (lb)	1,424 (3,140)	1,444 (3,185)	1,424 (3,140)	1,444 (3,185)	1,424 (3,140)	1,444 (3,185)	1,424 (3,140)	1,444 (3,185)
Total axle weight (G.A.W.)	Front axle	kg (lb)	930 (2,050)	930 (2,050)	930 (2,050)	930 (2,050)	930 (2,050)	930 (2,050)	930 (2,050)	930 (2,050)
	Rear axle	kg (lb)	1,000 (2,200)	1,000 (2,200)	1,000 (2,200)	1,000 (2,200)	1,000 (2,200)	1,000 (2,200)	1,000 (2,200)	1,000 (2,200)
Total vehicle weight (G.V.W.)			kg (lb)	1,880 (4,150)	1,880 (4,150)	1,880 (4,150)	1,880 (4,150)	1,880 (4,150)	1,880 (4,150)	1,880 (4,150)
Option	Aluminum wheel		—		—		—		—	
	Leather seats and leather door trim center decoration		—		—		—		—	
	High grade audio		—		—		—		—	
	Front fog light		○		○		—		—	
	Cruise control		○		○		○		○	
	Leather package base		—		—		—		—	
	Sunroof		—		—		—		—	
	VDC+VTD		—		—		—		—	
	Seat heater		—		—		—		—	
	Fully automatic air conditioner		—		—		○		○	
	Manual air conditioner		○		○		—		—	
	Cold zone package		—		—		—		—	
	Side airbag		○		○		○		○	
	Deicer		—		—		—		—	

★ 1: For option codes, refer to the ID section. <Ref. to ID-4, MODEL NUMBER PLATE, IDENTIFICATION, Identification.>

Forester

SPECIFICATIONS

Option code★ 1			U5SL		U6SL		U5SM	
Engine type			2.5 L Non-turbo					
Grade			2.5 XS					
Transmission			5MT	4AT	5MT	4AT	5MT	4AT
Vehicle weight (C.W.)	Front axle	kg (lb)	789 (1,740)	810 (1,785)	789 (1,740)	810 (1,785)	785 (1,730)	805 (1,775)
	Rear axle	kg (lb)	639 (1,410)	639 (1,410)	639 (1,410)	639 (1,410)	630 (1,390)	630 (1,390)
	Total	kg (lb)	1,429 (3,150)	1,449 (3,195)	1,429 (3,150)	1,449 (3,195)	1,414 (3,120)	1,435 (3,165)
Total axle weight (G.A.W.)	Front axle	kg (lb)	930 (2,050)	930 (2,050)	930 (2,050)	930 (2,050)	930 (2,050)	930 (2,050)
	Rear axle	kg (lb)	1,000 (2,200)	1,000 (2,200)	1,000 (2,200)	1,000 (2,200)	1,000 (2,200)	1,000 (2,200)
Total vehicle weight (G.V.W.)		kg (lb)	1,880 (4,150)	1,880 (4,150)	1,880 (4,150)	1,880 (4,150)	1,880 (4,150)	1,880 (4,150)
Option	Aluminum wheel		○		○		○	
	Leather seats and leather door trim center decoration		—		—		—	
	High grade audio		—		—		—	
	Front fog light		○		○		○	
	Cruise control		○		○		○	
	Leather package base		○		○		○	
	Sunroof		○		○		—	
	VDC+VTD		—		—		—	
	Seat heater		○		○		○	
	Fully automatic air conditioner		○		○		○	
	Manual air conditioner		—		—		—	
	Cold zone package		○		○		○	
	Side airbag		○		○		○	
	Deicer		○		○		○	

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Forester

SPECIFICATIONS

Option code★ 1		U6SM		U5TL	U6TL
Engine type		2.5 L Non-turbo			
Grade		2.5 XS		L.L.Bean	
Transmission		5MT	4AT	4AT	
Vehicle weight (C.W.)	Front axle kg (lb)	785 (1,730)	805 (1,775)	810 (1,785)	810 (1,785)
	Rear axle kg (lb)	630 (1,390)	630 (1,390)	644 (1,420)	644 (1,420)
	Total kg (lb)	1,414 (3,120)	1,435 (3,165)	1,454 (3,205)	1,454 (3,205)
Total axle weight (G.A.W.)	Front axle kg (lb)	930 (2,050)	930 (2,050)	930 (2,050)	930 (2,050)
	Rear axle kg (lb)	1,000 (2,200)	1,000 (2,200)	998 (2,200)	998 (2,200)
Total vehicle weight (G.V.W.) kg (lb)		1,880 (4,150)	1,880 (4,150)	1,882 (4,150)	1,882 (4,150)
Option	Aluminum wheel	○		○	○
	Leather seats and leather door trim center decoration	—		○	○
	High grade audio	—		—	
	Front fog light	○		○	○
	Cruise control	○		○	○
	Leather package base	○		○	○
	Sunroof	—		○	○
	VDC+VTD	—		—	—
	Seat heater	○		○	○
	Fully automatic air conditioner	○		○	○
	Manual air conditioner	—		—	—
	Cold zone package	○		○	○
	Side airbag	○		○	○
	Deicer	○		○	○

★ 1: For option codes, refer to the ID section. <Ref. to ID-4, MODEL NUMBER PLATE, IDENTIFICATION, Identification.>

Forester

SPECIFICATIONS

Option code★ 1		U4TL	U4TN	U4GW	U4GU
Engine type		2.5 L Turbo			
Grade		2.5 XT		FORESTER SPORTS	FORESTER SPORTS
Transmission		5MT	4AT	5MT	4AT
Vehicle weight (C.W.)	Front axle kg (lb)	846 (1,865)	871 (1,920)	846 (1,865)	864 (1,905)
	Rear axle kg (lb)	660 (1,455)	660 (1,455)	655 (1,445)	655 (1,445)
	Total kg (lb)	1,506 (3,320)	1,531 (3,375)	1,501 (3,310)	1,519 (3,350)
Total axle weight (G.A.W.)	Front axle kg (lb)	990 (2,190)	990 (2,190)	990 (2,190)	990 (2,190)
	Rear axle kg (lb)	1,020 (2,250)	1,020 (2,250)	1,020 (2,250)	1,020 (2,250)
Total vehicle weight (G.V.W.) kg (lb)		1,960 (4,320)	1,960 (4,320)	1,960 (4,320)	1,960 (4,320)
Option	Aluminum wheel	○	○	○	○
	Leather seats and leather door trim center decoration	○	○	—	—
	High grade audio	—	—	—	—
	Front fog light	○	○	—	—
	Cruise control	○	○	○	○
	Leather package base	○	○	○	○
	Sunroof	○	○	○	○
	VDC+VTD	—	○	—	○
	Seat heater	○	○	—	—
	Fully automatic air conditioner	○	○	○	○
	Manual air conditioner	—	—	—	—
	Cold zone package	○	○	—	—
	Side airbag	○	○	○	○
	Deicer	○	○	—	—

★ 1: For option codes, refer to the ID section. <Ref. to ID-4, MODEL NUMBER PLATE, IDENTIFICATION, Identification.>

2. FOR CANADA MODEL

Option code★ 1			COZK		COSL		COSM		COTL	
Engine type			2.5 L Non-turbo							
Grade			2.5 X		2.5 XS					
Transmission			5MT	4AT	5MT	4AT	5MT	4AT	5MT	4AT
Vehicle weight (C.W.)	Front axle	kg (lb)	790 (1,742)	810 (1,786)	790 (1,742)	810 (1,786)	785 (1,731)	805 (1,775)	790 (1,742)	810 (1,786)
	Rear axle	kg (lb)	635 (1,400)	635 (1,400)	640 (1,411)	640 (1,411)	630 (1,389)	630 (1,389)	645 (1,422)	645 (1,422)
	Total	kg (lb)	1,425 (3,142)	1,445 (3,186)	1,430 (3,153)	1,450 (3,197)	1,415 (3,120)	1,435 (3,164)	1,435 (3,164)	1,455 (3,208)
Total axle weight (G.A.W.)	Front axle	kg (lb)	930 (2,050)	930 (2,050)	930 (2,050)	930 (2,050)	930 (2,050)	930 (2,050)	930 (2,050)	930 (2,050)
	Rear axle	kg (lb)	1,000 (2,200)	1,000 (2,200)	1,000 (2,200)	1,000 (2,200)	1,000 (2,200)	1,000 (2,200)	1,000 (2,200)	1,000 (2,200)
Total vehicle weight (G.V.W.)			kg (lb)	1,880 (4,150)	1,880 (4,150)	1,880 (4,150)	1,880 (4,150)	1,880 (4,150)	1,880 (4,150)	1,880 (4,150)
Option	Aluminum wheel		—		○		○		○	
	Leather seats and leather door trim center decoration		—		—		—		○	
	High grade audio		—		—		—		—	
	Front fog light		○		○		○		○	
	Cruise control		○		○		○		○	
	Leather package base		—		○		○		○	
	Sunroof		—		○		—		○	
	VDC+VTD		—		—		—		—	
	Seat heater		—		○		○		○	
	Fully automatic air conditioner		—		○		○		○	
	Manual air conditioner		○		—		—		—	
	Cold zone package		—		○		○		○	
	Side airbag		○		○		○		○	
	Deicer		—		○		○		○	

★ 1: For option codes, refer to the ID section. <Ref. to ID-4, MODEL NUMBER PLATE, IDENTIFICATION, Identification.>

Forester

SPECIFICATIONS

Option code★ 1		COTL		COTN	COHL	COHN
Engine type		2.5 L Turbo				
Grade		2.5 XT			FORESTER SPORTS	
Transmission		5MT	4AT	4AT	5MT	4AT
Vehicle weight (C.W.)	Front axle kg (lb)	845 (1,863)	865 (1,907)	870 (1,918)	845 (1,863)	870 (1,918)
	Rear axle kg (lb)	660 (1,455)	660 (1,455)	660 (1,455)	660 (1,455)	660 (1,455)
	Total kg (lb)	1,505 (3,319)	1,525 (3,363)	1,530 (3,374)	1,505 (3,319)	1,530 (3,374)
Total axle weight (G.A.W.)	Front axle kg (lb)	990 (2,100)	990 (2,100)	990 (2,100)	990 (2,100)	990 (2,100)
	Rear axle kg (lb)	1,020 (2,250)	1,020 (2,250)	1,020 (2,250)	1,020 (2,250)	1,020 (2,250)
Total vehicle weight (G.V.W.) kg (lb)		1,960 (4,320)	1,960 (4,320)	1,960 (4,320)	1,960 (4,320)	1,960 (4,320)
Option	Aluminum wheel	○	○	○	○	○
	Leather seats and leather door trim center decoration	○	○	○	○	○
	High grade audio	—	—	—	—	—
	Front fog light	○	○	—	—	—
	Cruise control	○	○	○	○	○
	Leather package base	○	○	○	○	○
	Sunroof	○	○	○	○	○
	VDC+VTD	—	○	—	○	○
	Seat heater	○	○	○	○	○
	Fully automatic air conditioner	○	○	○	○	○
	Manual air conditioner	—	—	—	—	—
	Cold zone package	○	○	○	○	○
	Side airbag	○	○	○	○	○
	Deicer	○	○	○	○	○

★ 1: For option codes, refer to the ID section. <Ref. to ID-4, MODEL NUMBER PLATE, IDENTIFICATION, Identification.>

3. OPTION

Option	Front kg (lb)	Rear kg (lb)	Total kg (lb)
Aluminum wheel	−6.6 (−14.6)	−6.6 (−14.6)	−13.2 (−29.1)
Leather seats and leather door trim center decoration	1.2 (2.6)	3.0 (6.6)	4.2 (9.3)
Front fog light	0.7 (1.5)	−0.1 (−0.2)	0.6 (1.3)
Cruise control	1.5 (3.3)	0.2 (0.4)	1.7 (3.7)
Leather package base	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Sunroof	3.5 (7.7)	13.2 (29.1)	16.7 (36.8)
VDC+VTD	3.0 (6.6)	1.0 (2.2)	4.0 (8.8)
Seat heater	0.2 (0.4)	0.3 (0.7)	0.5 (1.1)
Fully automatic air conditioner	16.9 (37.3)	−1.4 (−3.1)	15.5 (34.2)
Manual air conditioner	16.9 (37.3)	−1.4 (−3.1)	15.5 (34.2)
Cold zone package	0.1 (0.2)	0.2 (0.4)	0.3 (0.7)
Side airbag	2.0 (4.4)	2.4 (5.3)	4.4 (9.7)
Deicer	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)

1. Precaution

A: CAUTION

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

1. ABS

Handle the ABS as a total system. Do not disassemble or attempt to repair individual parts. Follow the directions in this manual when performing maintenance on the ABSCM&H/U. When parts other than those specified are disassembled, the ABS system may not operate when needed, or may operate incorrectly and result in injury.

2. 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 the system may operate incorrectly and result in injury.

3. BRAKE FLUID

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

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

4. 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.

5. ROAD TEST

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

6. AIRBAG

To prevent bodily injury from unexpected deployment of airbags and unnecessary maintenance, follow the instructions in this manual when performing maintenance on the airbag components or nearby, around front of the vehicle (radiator panel, front wheel apron, front side frame, front bumper, front hood panel, front fender panel), around side of the vehicle (front door panel, center pillar, side sill), and the airbag wiring harnesses or nearby.

To prevent unexpected deployment, turn the ignition switch to OFF and disconnect the ground cable from battery, then wait at least 20 seconds to discharge electricity before starting work.

7. AIRBAG MODULE 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.

8. AIRBAG MODULE

Adhere to 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.

9. AIRBAG SPECIAL TOOLS

To prevent unexpected deployment, only use special tools.

10. WINDOW

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

11. WINDOW ADHESIVE

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

12. OIL

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

- 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 for environmental protection.
- Follow all government and local regulations concerning disposal of refuse when disposing.

13. FUEL

When handling and storing fuel, adhere to the following to prevent from unexpected accident.

- Be careful with fire.
- 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 from penetrating into floor or flowing out for environmental protection.
- Follow all government and local regulations concerning disposal of refuse when disposing.

14.ENGINE COOLANT

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

- Never remove the radiator cap since engine coolant may blow out when it is hot.
- Prepare a container and cloth to prevent scattering of engine coolant when performing work where 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.

15.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.

16.HOSE REMOVAL/INSTALLATION PROCEDURES

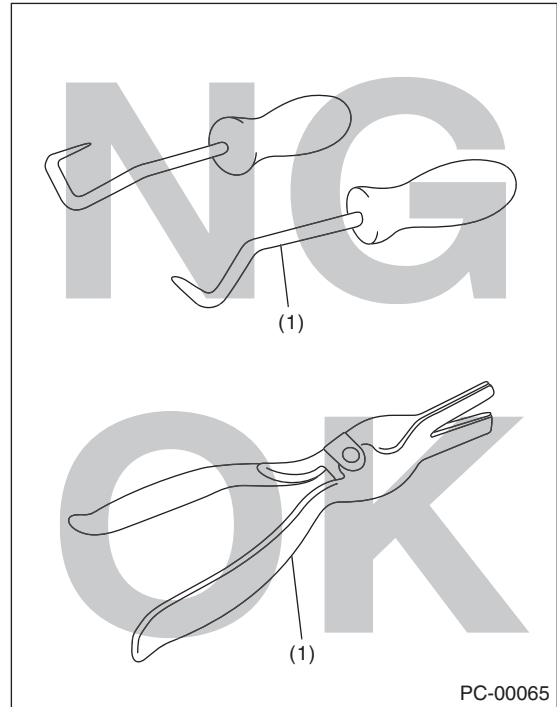
1. Hose Removal/Installation Pre-Procedures

- 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

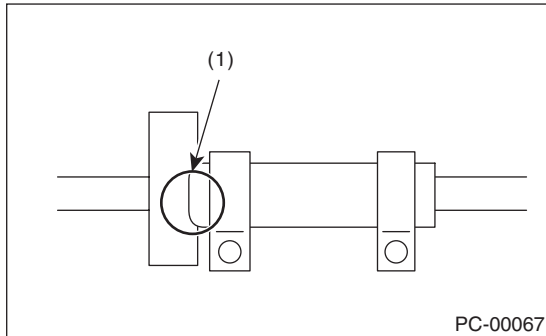
- When using pliers to make hose removal easier, always be sure to use a cloth to protect the hose, slightly rotate the hose, and then pull straight out by hand.

Precaution

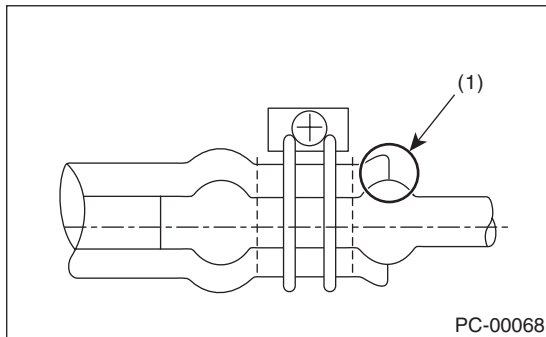
PRECAUTION

- **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

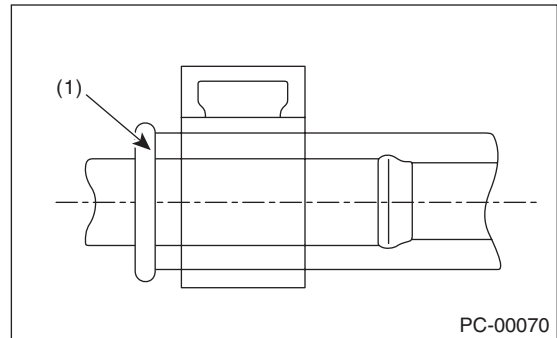
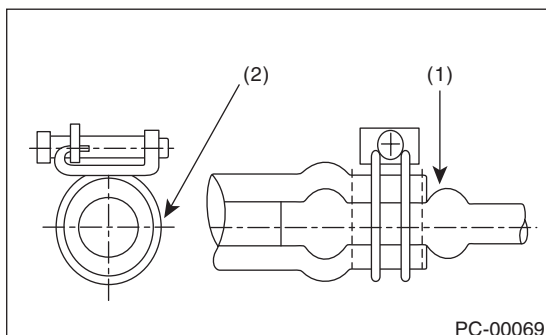


(1) Hose riding over a spool

- 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, MT oil cooler hose, power steering suction hose, and power steering return hose.

1. Note

A: NOTE

This is the information that can improve the efficiency of maintenance and assure the sound work.

1. FASTENER NOTICE

Replace the nonreusable parts with new parts. Check the tightening torque and tighten 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 risk 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 cables, always be sure to turn the ignition switch to OFF to prevent electrical damage to the control module from overcurrent.

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.

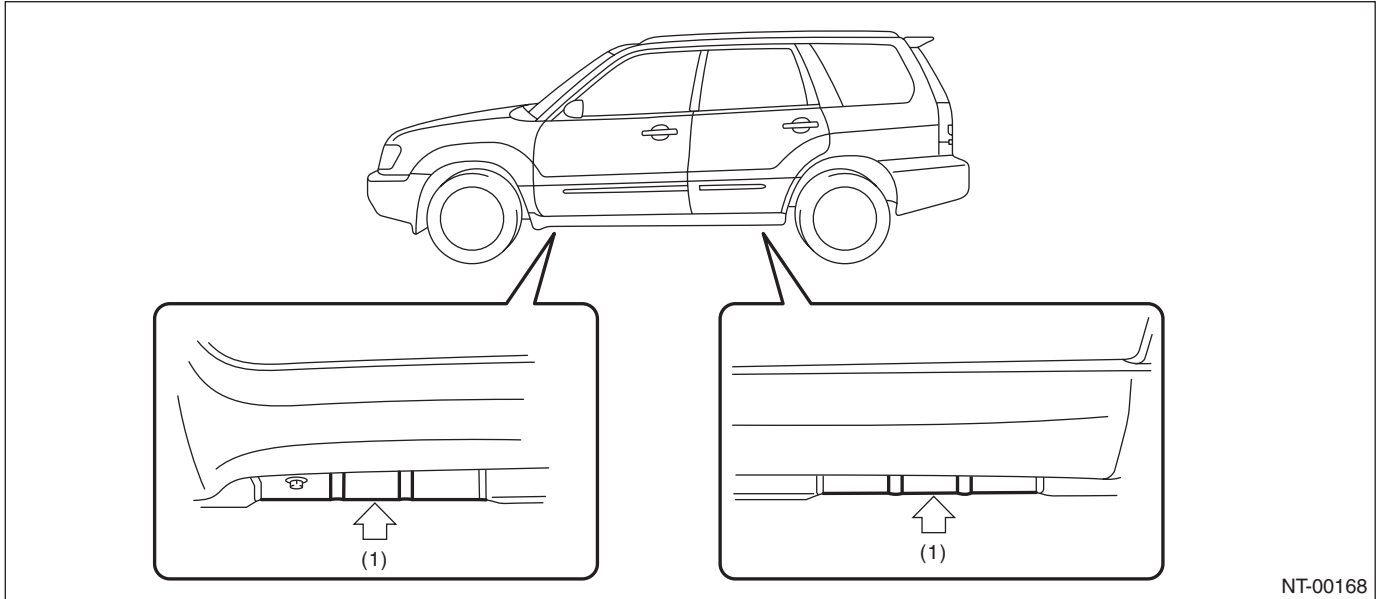
6. ENSURING SAFETY DURING WORK

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

7. LIFTS AND JACKS

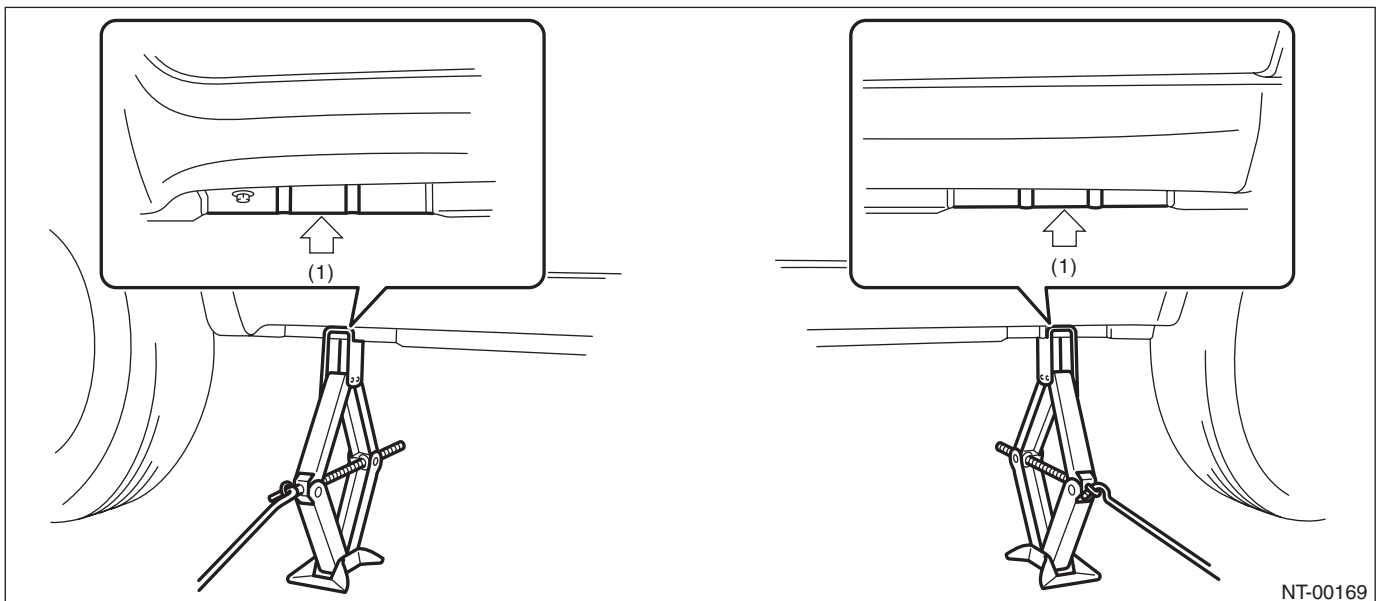
When using a lift or shop jack to raise a vehicle or using rigid racks to support a vehicle, always follow instructions concerning jack-up points and weight limits to prevent the vehicle from falling, which could result in injury. Be especially careful that the vehicle is balanced before raising it.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

SUPPORT LOCATIONS



(1) Jack-up point

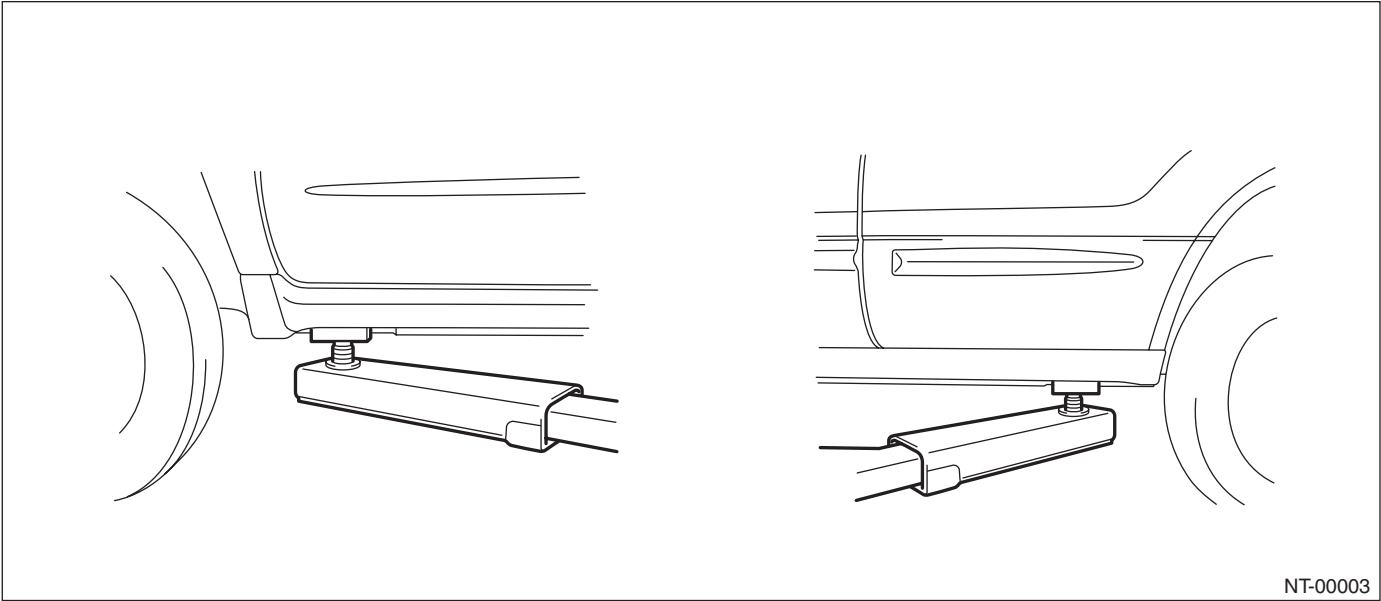
PANTOGRAPH JACK



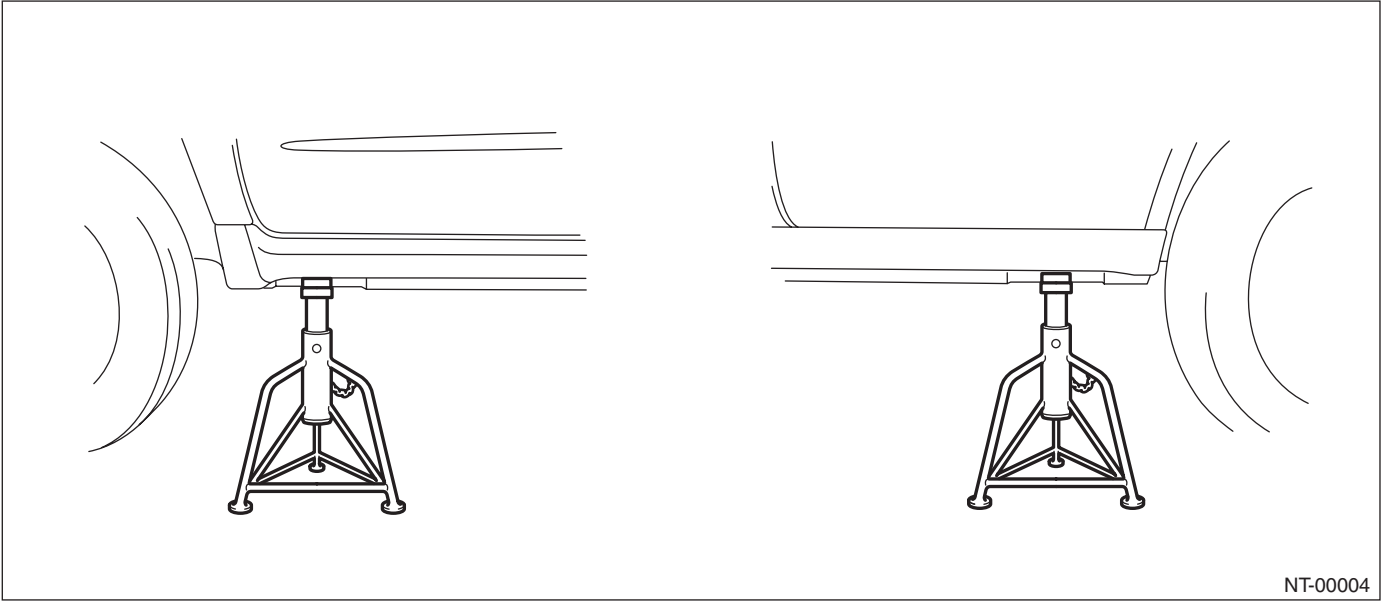
(1) Jack-up point

NOTE

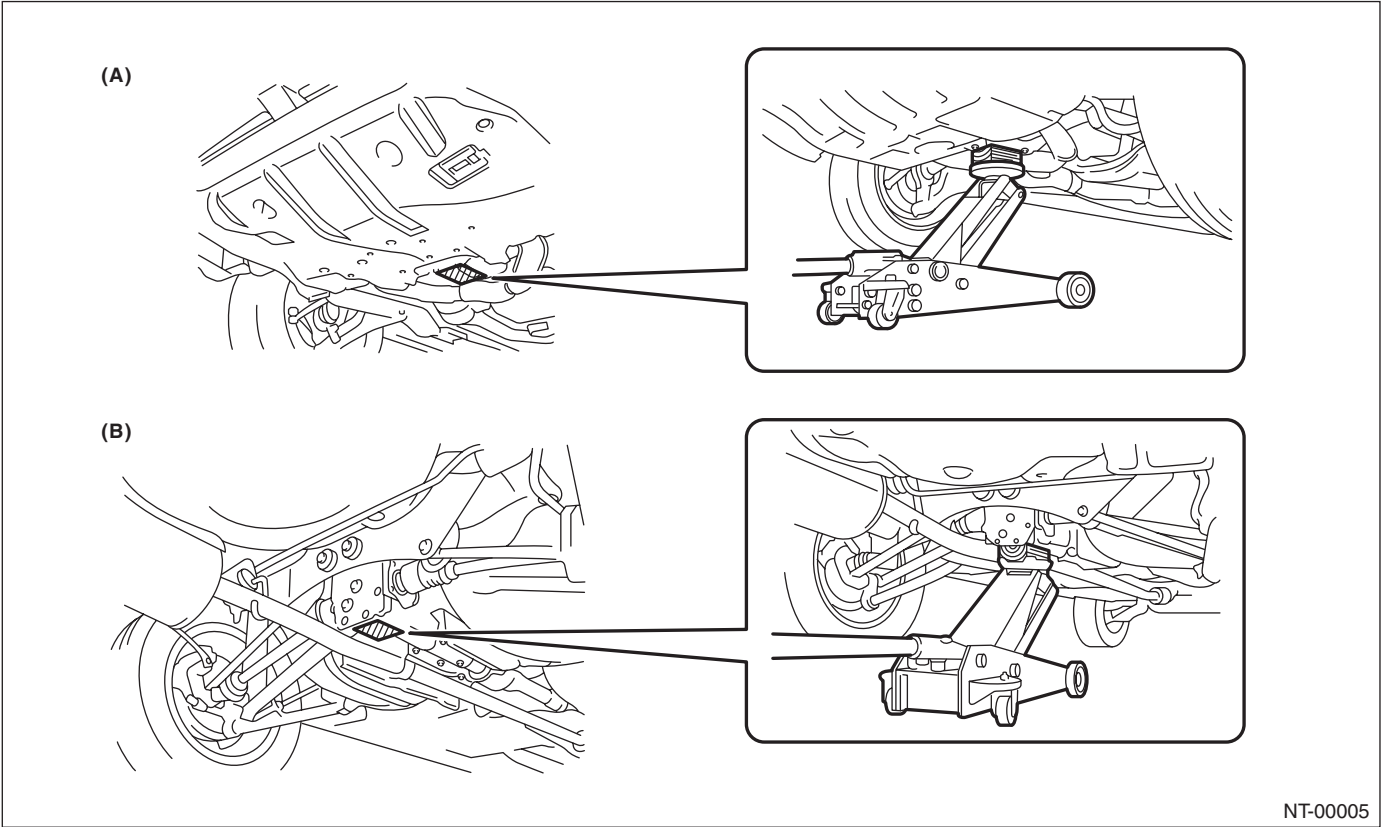
LIFT



RIGID RACK



JACK-UP POINT



NT-00005

(A) Front

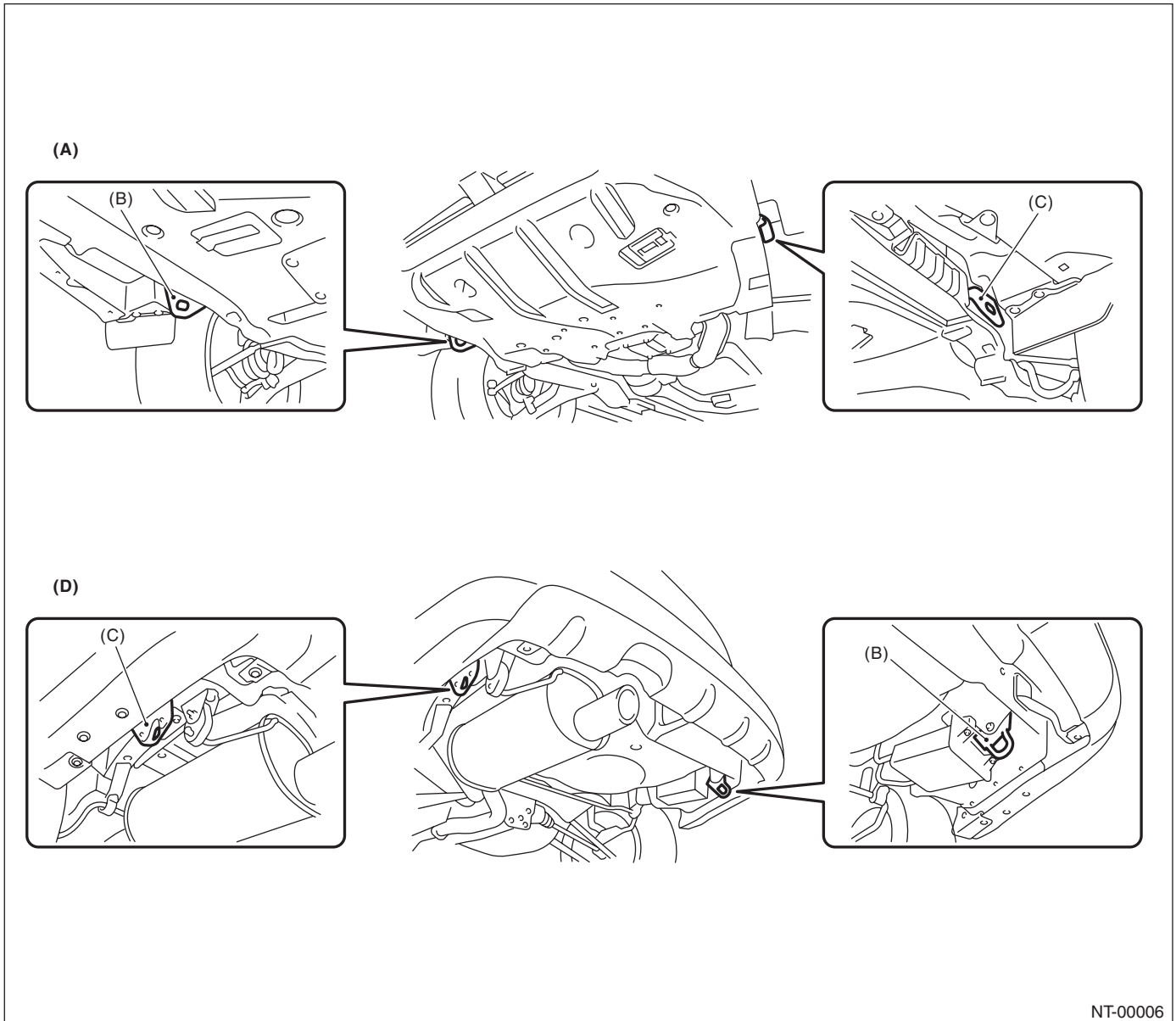
(B) Rear

Note

NOTE

8. TIE-DOWNS

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



NT-00006

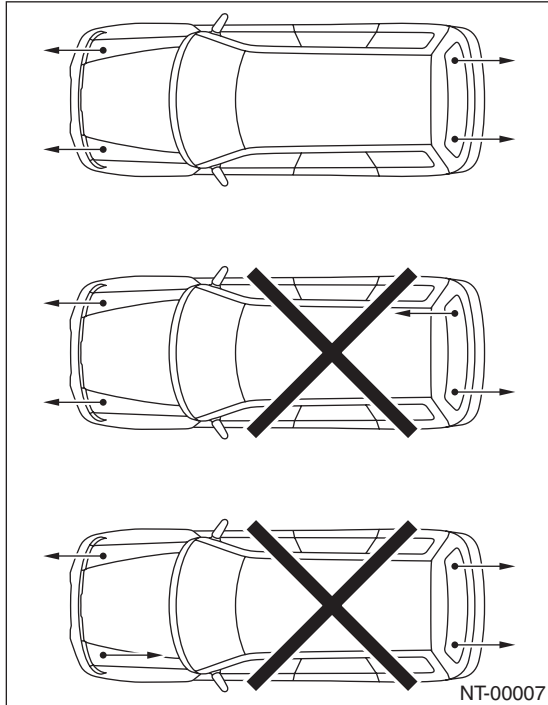
(A) Front

(B) Hook for tie-down and towing

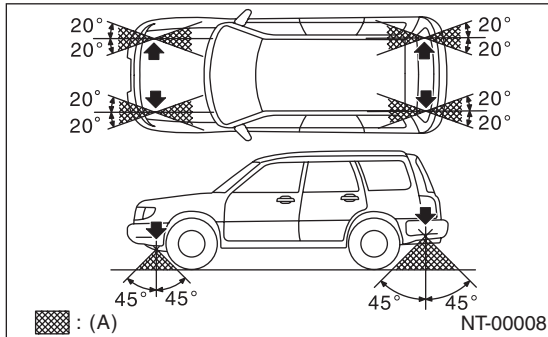
(C) Hook for tie-down

(D) Rear

CHAIN DIRECTION AT TIE-DOWN CONDITION



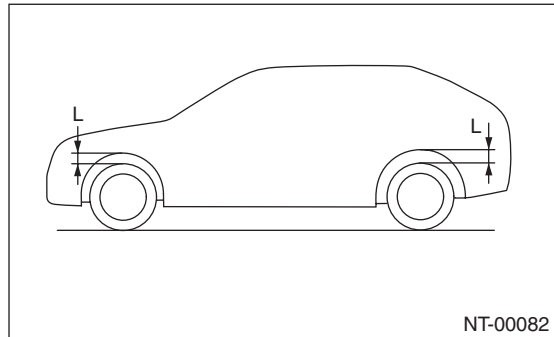
CHAIN PULLING RANGE AT TIE-DOWN CONDITION



(A) Chain pulling range at tie-down condition

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.

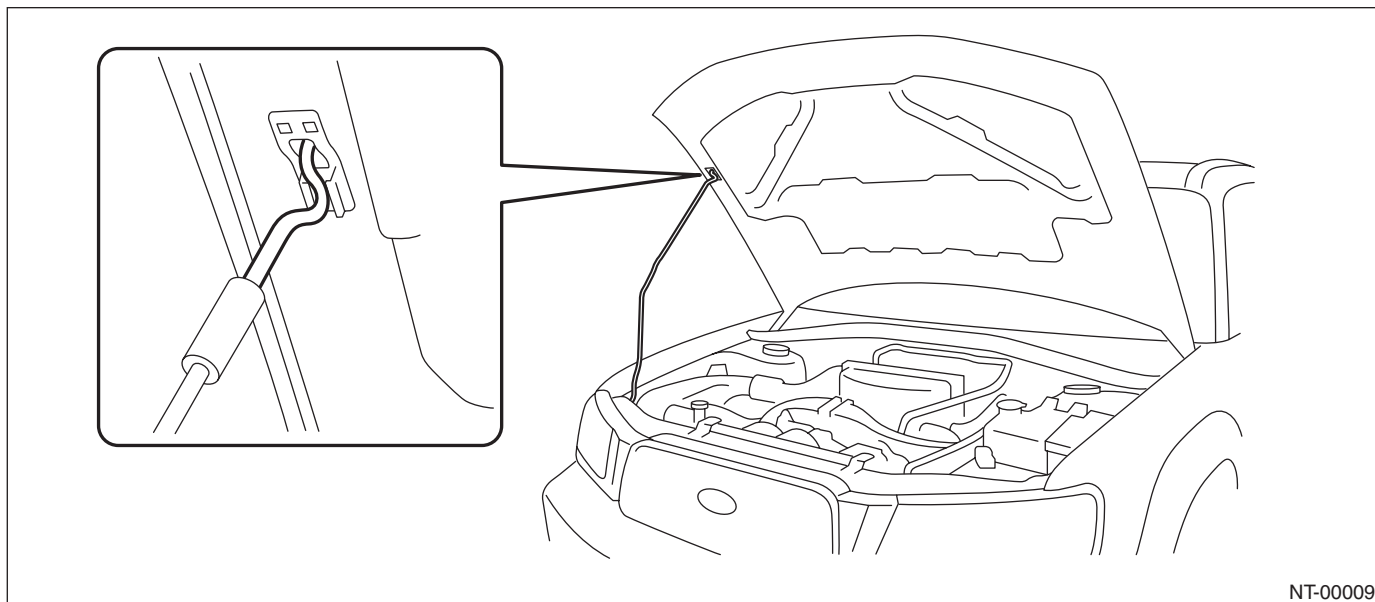


9. TOWING

Avoid towing vehicles except when the vehicle cannot be driven. For models with AWD or AT, 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.

10.FRONT HOOD STAY INSTALLATION AT THE CHECK AND GENERAL MAINTENANCE

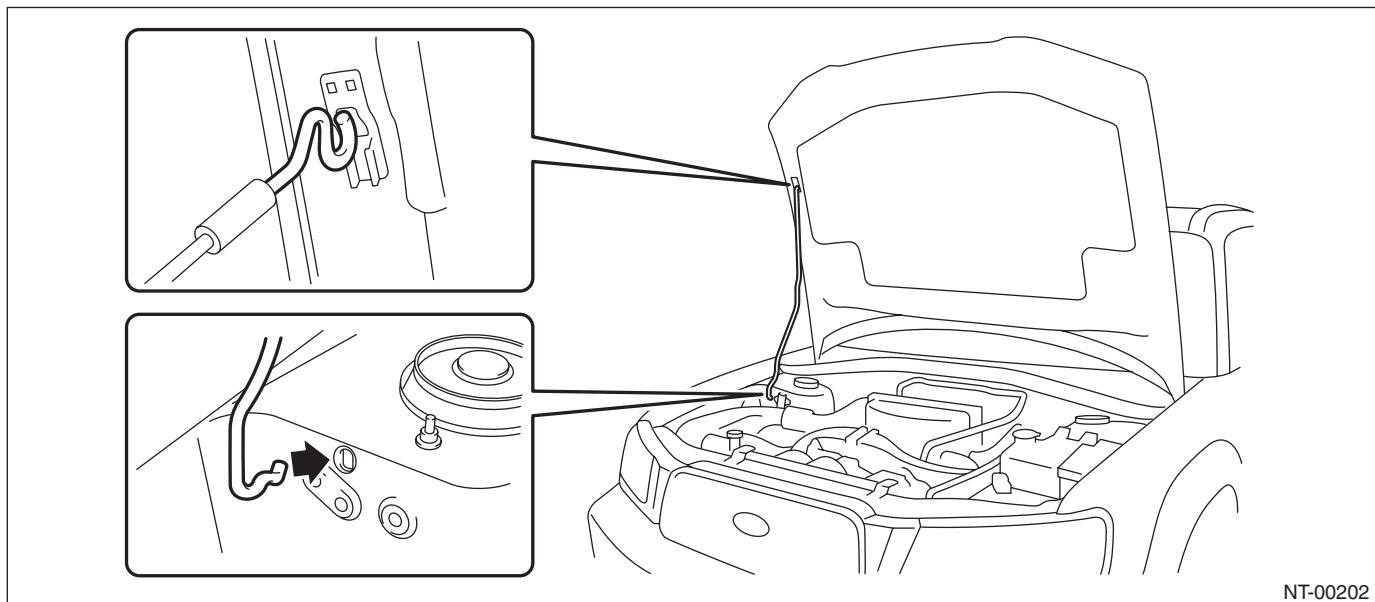


WHEN WIDER HOOD OPENING IS NECESSARY

Attach the stay ends to the front hood hole and the hole on the front of the suspension as shown in the figure below.

NOTE:

Before setting the front hood in this position, remove the windshield washer hose attaching clip from the front hood.



11.TRAINING

For an information about training, contact a dealer or agent.

12.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, ABS, air conditioner and other parts.

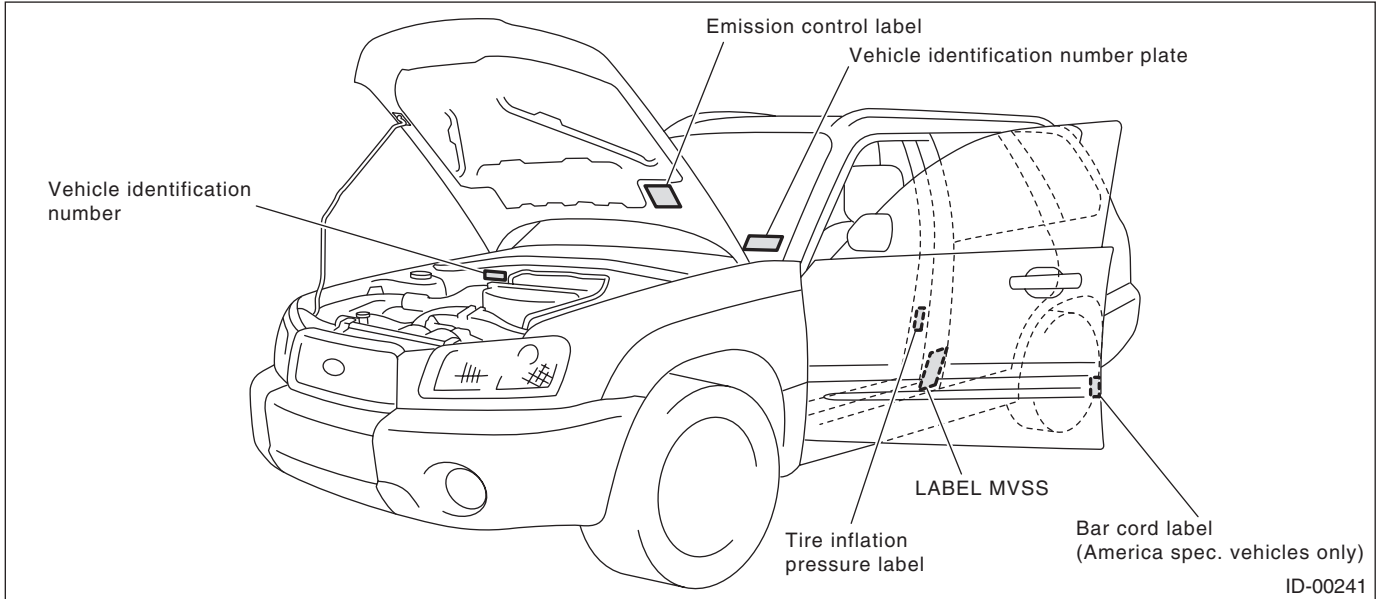
1. Identification

A: IDENTIFICATION

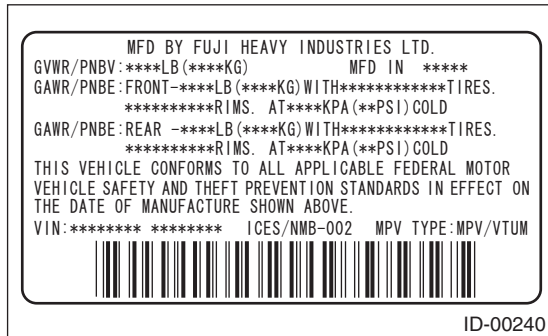
1. IDENTIFICATION NUMBER AND LABEL LOCATIONS

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

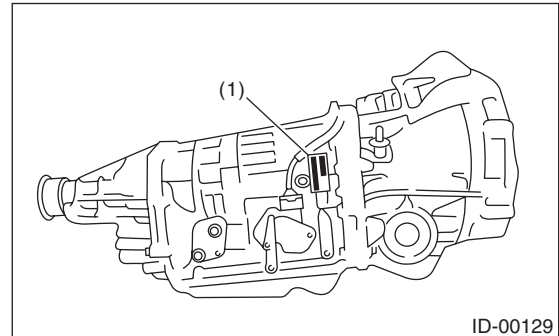
• POSITIONING OF THE PLATE LABEL FOR IDENTIFICATION



• LABEL MVSS

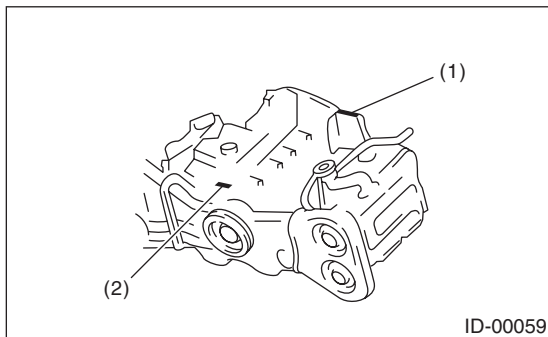


• AUTOMATIC TRANSMISSION



(1) AT type and transmission serial number label

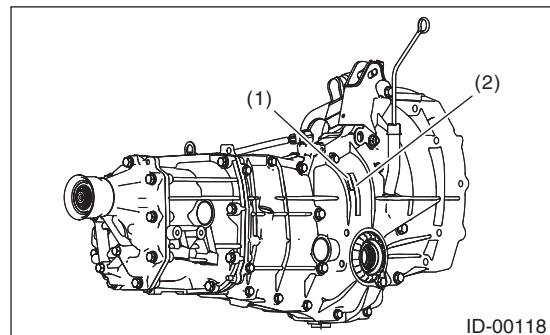
• ENGINE



(1) Engine serial number (Punch mark)

(2) Engine type (Crankcase upper side)

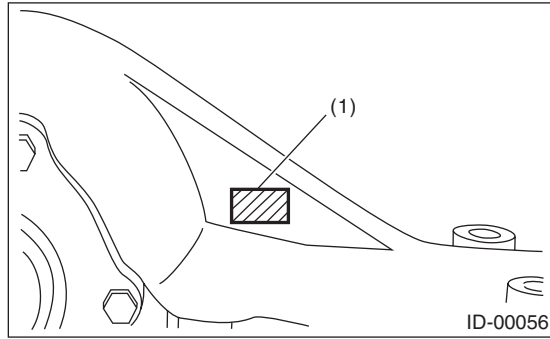
• MANUAL TRANSMISSION



(1) Transmission serial number

(2) MT type label

- **REAR DIFFERENTIAL**



(1) Type (white paint)

Identification

IDENTIFICATION

2. MEANING OF V.I.N.

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

JF1SG636X8G700001

The large parentheses ([]) located in front and back are stop marks.

Digits	Code	Meaning	Details
1 — 3	JF1	Origin of manufacture of body	JF1: FHI manufactured passenger car
4	S	Car line	S: Forester
5	G	Body type	G: Wagon
6	6	Displacement class	6: 2.5 L AWD
7	3	Grade	3: 2.5 X 5: 2.5 XS 6: FORESTER SPORTS 7: L.L. Bean 9: 2.5 XT
8	6	Restraint	6: Manual belt, dual airbags, side airbags
9	X	Check numbers	X or 0 — 9
10	8	Model year	8: 2008MY
11	G	Transmission type	G: Full-time AWD 5 speed MT S/R H: Full-time AWD 4 speed AT
12 — 17	700001	Serial number	—

3. MODEL NUMBER PLATE

The model number plate indicates: the applied model, the option code, the trim code, the engine type, the transmission type, and the exterior color code. This information is helpful when placing orders for parts.

SG9FY4J

Digits	Code	Meaning	Details
1	S	Series	S: Forester
2	G	Body type	G: Wagon
3	9	Total engine displacement Drive system	9: 2.5 L AWD
4	F	Model year	F: 2008MY
5	Y	Destination	Y: U.S.A., Canada
6	4	Grade	4: 2.5 X 6: 2.5 XS 9: 2.5 XT A: FORESTER SPORTS C: L.L. Bean
7	J	Transmission, fuel feed system	D: DOHC turbo MFI 5 speed MT J: SOHC MFI 5 speed MT P: DOHC turbo MFI 4 speed AT R: SOHC MFI 4 speed AT

The engine and transmission type are as follows.

Engine

EJ253ASQFB

Digits	Code	Meaning	Details
1 and 2	EJ	Engine type symbol	EJ: 4 cylinder
3 and 4	25	Displacement class	25: 2.5 L
5	3	Fuel feed system	3: MFI non-turbo (SOHC) 5: MFI DOHC turbo
6	A	Exhaust regulations	A: For states not using California emission standards B: For all states C: For states using California emission standards
7	S	Mounted transmission	E: 5MT (WAD) P: 4AT S: 5MT
8 — 10	QFB	Detailed specifications	Used for ordering parts. Refer to parts catalog for details.

Transmission

TY755VC7AA

Digits	Code	Meaning	Details
1	T	Transmission	T: Transmission
2	Y	Transmission system	V: Full-time AWD AT center differential (VTD) Y: Full-time AWD MT center differential Z: Full-time AWD AT MPT
3 and 4	75	Classification	1B: AT 75: MT
5	5	Series	5: MT, AT
6	V	Transmission basic specifications	L: MP-T full-time AWD direct 4 speed AT M: VTD center differential full-time AWD direct 4 speed AT V: Full-time AWD 5 speed MT single range with viscous coupling center differential
7	C	Installed body	C: 2.5 L SOHC B: 2.5 L DOHC turbo 5 speed MT W: 2.5 L DOTC turbo 4 speed AT
8 — 10	7AA	Detailed specifications	Used for ordering parts. Refer to parts catalog for details.

Rear differential

T2

Code	Reduction gear ratio	LSD
T2	4.111	None
JP	4.111	Viscous
TP	4.444	None
CF	4.444	Viscous

Option code

U5ZK

Digits	Code	Meaning	Details
1 — 2	U5	Destination	C0: Canada U4: U.S. (for all states) U5: U.S. (for states using California emission standards) U6: U.S. (for states not using California emission standards)
3 — 4	ZK	Vehicle main options	—

Identification

IDENTIFICATION

Recommended Materials

RECOMMENDED MATERIALS

1. Recommended Materials

A: RECOMMENDED MATERIALS

1. GENERAL

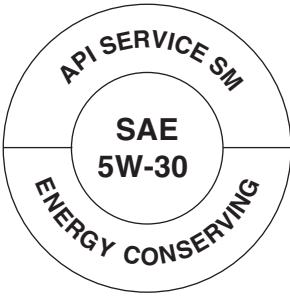
To insure the best performance, always use the specified oil, gasoline, adhesive, sealant, etc. or a substitute of equivalent quality.

2. FUEL

- Use unleaded gasoline to reduce air pollution, because using leaded gasoline will damage the catalytic converter.
- Do not use the low quality gasoline, or improper fuel such as diesel fuel, fuel alcohol, or gasoline additive because they will adversely affect on engine components.
- Always use gasoline that is equivalent to that prescribed in the instruction manual or that of high octane value. There is the possibility of damaging or improper operation of the engine and fuel injection system if the specifications are not observed. Use the prescribed gasoline type to maintain proper vehicle performance.

3. LUBRICANTS

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

Lubricants	Recommended materials	
	API spec.	ILSAC spec.
Engine oil Choose oil suitable for the standard from the right.	SM grade "Energy conservation"  RM-00049	GF-4  RM-00002
Manual transmission oil	GL-5	—
Front differential oil	GL-5	—
Rear differential oil	GL-5	—

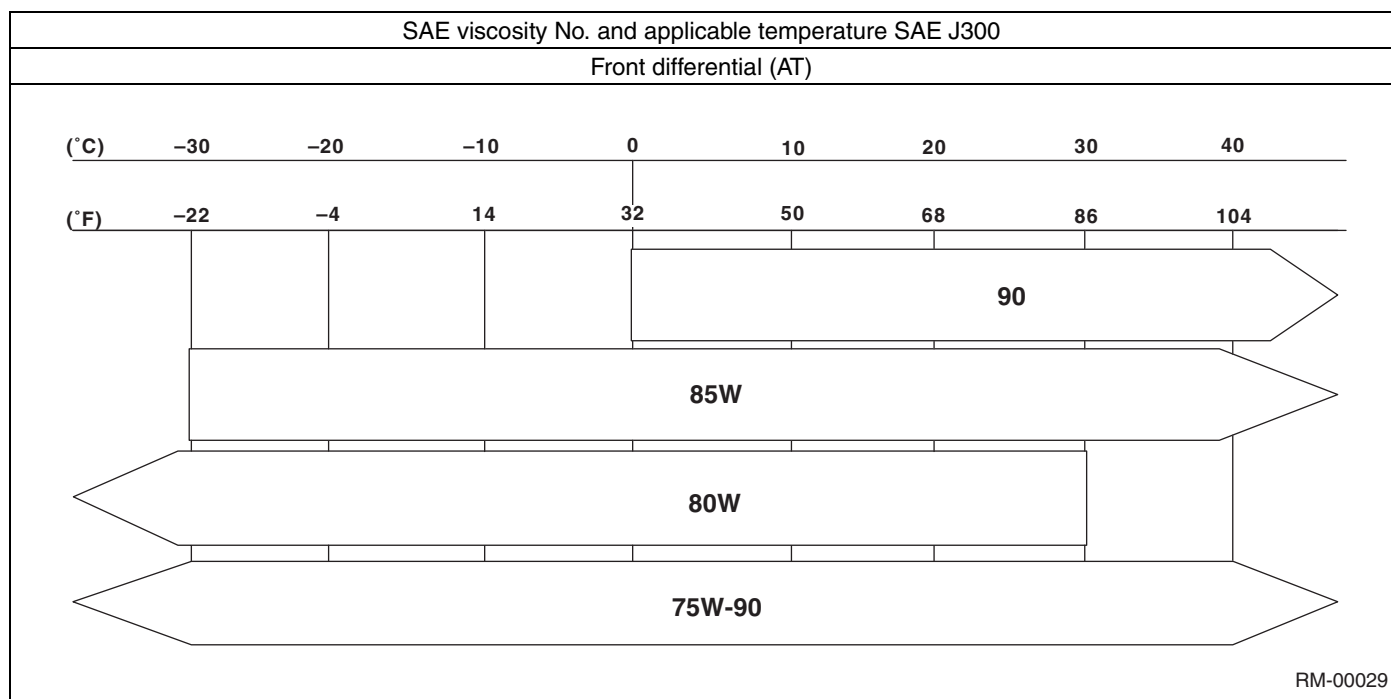
Recommended Materials

RECOMMENDED MATERIALS

SAE viscosity No. and applicable temperature SAE J300								
Engine oil								
(°C)	-30	-20	-10	0	10	20	30	40
(°F)	-22	-4	14	32	50	68	86	104
10W-30 or 10W-40								
5W-30 Recommend								
RM-00059								
Manual transmission oil and rear differential oil								
(°C)	-30	-20	-10	0	10	20	30	40
(°F)	-22	-4	14	32	50	68	86	104
90								
85W								
80W								
75W-90								
RM-00004								

Recommended Materials

RECOMMENDED MATERIALS



4. FLUID

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

Fluid	Recommended materials	Item number	Alternative
Automatic transmission fluid	SUBARU ATF HP	—	Idemitsu: ATF HP Castrol: Transmax J
Power steering fluid	SUBARU ATF HP	—	DEXRON III
Brake fluid	FMVSS No. 116 DOT3	—	FMVSS No. 116 DOT4
Clutch fluid	FMVSS No. 116 DOT3	—	FMVSS No. 116 DOT4

5. ENGINE COOLANT

Use genuine engine coolant to protect the engine.

Engine coolant	Recommended materials	Item number	Alternative
Coolant	SUBARU coolant	000016218	Phosphoric acid (non-amine) type
Water for dilution	Distilled water	—	Soft water or tap water
Cooling system protecting agent	Cooling system conditioner	SOA345001	None

6. REFRIGERANT

Standard air conditioners on Subaru vehicles use HFC134a refrigerant. Do not mix it with other refrigerants. Also, do not use any air compressor oil other than ZXL200PG.

Air conditioner	Recommended materials	Item number	Alternative
Refrigerant	HFC134a	—	None
Compressor oil	ZXL200PG	—	None

Recommended Materials

RECOMMENDED MATERIALS

7. GREASE

Use the grease and supplementary lubricants shown in the table below.

Grease	Application point	Recommended materials	Item number	Alternative
Supplementary lubricants	• Oxygen sensor • Bolts etc.	Spray type lubricant	—	—
Grease	MT main shaft	NICHIMOLY N-130	—	—
	Clutch master cylinder push rod	Silicone grease G-40M	004404003	—
	• Gear shift lever • Select lever • Clutch activating cylinder • Accelerator pedal • Clutch pedal • Brake pedal • Hill holder • Clutch bearing • Clutch release lever	NIGTITE LYW No. 2 grease	—	KOPR-KOTE
	Steering shaft bearing	KOPR-KOTE	003603001	—
	Selector lever lock plate unit	Suncall GLO-244	0029408040	—
	Steering gearbox	Variant grease M-2	—	One luber MO or One luber SG
	• Disc brake • Drum brake wheel cylinder	Niglube RX-2	000041000	—
	• Drum brake • Brake shoe	Molykote No. 7439	K0770YA000	—
	Brake pad	Molykote AS-880N	K0777YA010	—
	Front axle AARi	One luber C	28395SA020	—
	Front axle AC	Olistamoly	28395SA030	—
	Rear axle EBJ	NKG106	28395TC000	—
	Rear axle DOJ	NKG205	28495AG000	—
	• Water pump • Door latch • Door striker	Silicone grease G-30M	004404002	—

8. ADHESIVES

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

Adhesive	Application point	Recommended materials	Item number	Alternative
Adhesive	Windshield, rear window glass, rear quarter glass, rear gate and body	Dow Automotive's Adhesive: ESSEX U-400 HV or equivalent Glass primer: U-401 and No. U-402 Paint surface primer: U-413	—	—
	Rearview mirror base	REPAIR KIT IN MR	65029FC000	—
	Soft vinyl	Cemedine 540	—	3M's EC-776, EC-847 or EC-1022 (Spray type)
	Momentary sealant	Cemedine 3000	—	Armstrong's Eastman 910

Recommended Materials

RECOMMENDED MATERIALS

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	• MT transmission case • Torque converter clutch case	THREE BOND 1215	—	Dow corning's No. 7038
	• Cylinder block • DOHC cam cap (Turbo model) • Oil pump • Engine oil pan • SOHC cam cap • DOHC rocker cover • Separator cover • DOHC semicircular plug	THREE BOND 1217G	K0877Y0100	—
	ATF oil pan	THREE BOND 1217B	K0877YA020	—
	• Rear differential • Engine oil pressure switch • Cylinder head (Nipple)	THREE BOND 1324	004403042	—
	• Rear differential • Service hole plug	THREE BOND 1105	004403010	Dow corning's No. 7038
	Weather strip	Star caulking B-33A	000018901	Butyl rubber sealant
	• Steering adjusting screw • PCV Valve	THREE BOND 1141	004403006	—
	• Front sealing cover • Rear sealing cover	3M Butyl Rubber 8626	—	—

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 that the vehicle before shipment is in normal condition.
- Check that there are no scratches on the vehicle and that none of the vehicle protective parts are missing when shipping or in storage.
- Make sure to deliver a complete vehicle to customer.

For above reasons, all SOA service centers must carry out the PDIs before delivery of vehicle.

Furthermore, all SOA service centers and PDI centers must inspect the status of all vehicles and clarify the responsible party.

B: PRE-DELIVERY INSPECTION (PDI) PROCEDURE

Follow the procedures shown in the table below.

Static Checks Just After Vehicle Receipt

Step	Check point
1. Appearance check	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 inspect the body paints for small areas of damage or rust. 2. Visually check the glass and light lenses for any damage, cracks or excessive gaps between body sheet metal. 3. Visually check the plated parts for any damage.
2. Tire check	1. Check the tires for damage, defective, and dents on wheels. 2. Check the tire air pressure.
3. Fuse installation	If the vehicle is about to be shipped to the customer, attach a room light fuse.
4. Air conditioner harness connection	If the vehicle is about to be shipped to the customer, connect the air conditioner harness.
5. Check the doors for lock/unlock and open/close operations	1. Using the key, check the trunk lid can be locked or unlocked normally. 2. Open and close all doors to check that there are no defective.
6. Operation check of child safety locks	Check the child safety lock system operates normally.
7. Check the rear gate for lock/unlock and open/close operations	1. Open and close the rear gate to see that there are no abnormal conditions. 2. Check if the rear gate can be unlocked normally through the emergency hole. 3. Operate the power door lock switch to check that the rear gate is locked and unlocked normally.
8. Operation check of fuel lid opener lock release lever	Operate the fuel lid opener to check that the fuel lid is unlocked normally.
9. Accessory check	Check that the following accessories are provided. • Owner's manual • Warranty booklet • Maintenance note • Spare key • Key number plate • Jack • Tool set • Spare tire
10. Operation check of front hood lock release system	Operate the front hood lock release lever to check that the front hood opens normally.
11. Battery	Check the battery for any abnormal conditions such as rust and trace of battery fluid leaks.
12. Brake fluid	Check the fluid amount.
13. Engine oil	Check the oil amount.
14. Transmission fluid	Check the fluid amount.
15. AT front differential oil	Check the AT front differential oil amount.
16. Engine coolant	Check the engine coolant amount.
17. Clutch fluid	Check the clutch fluid amount.
18. Window washer fluid	Check the window washer fluid amount.
19. Front hood latch check	Check that the hood is closed and latched completely.
20. Keyless entry system	Check that the keyless entry system operates normally.
21. Alarm system	Check that the alarm system operates normally.
22. Seat	1. Check the seat surfaces for stains or dirt. 2. Check the seat installation conditions and functionality. 3. Check that the passenger's seat occupant detection system operates normally.
23. Seat belt	1. Check the seat belt installation conditions and functionality. 2. Check the seat belt warning functionality for normal operations.
24. TPMS	1. Turn the transmitter power of TPMS to ON. 2. When the display of the TPMS warning light does not operate normally, perform the diagnosis while referring to TPMS (diag).

Pre-delivery Inspection

PRE-DELIVERY INSPECTION

Checks with the Engine Running

Step	Check point
25. Test mode connector	Test mode connector
26. 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.
27. Starting condition	Start the engine and check that the engine starts smoothly.
28. Exhaust system	Check that the exhaust noise is normal and no leaks are found.
29. Indicator and warning lights	Check that all indicator lights and warning lights operate normally.
30. Heater & ventilation	Check that the heater & ventilation system operates normally.
31. Air conditioner	Check that the air conditioner operates normally.
32. Clock	Check that the clock operates normally.
33. Radio	Check that the radio system operates normally.
34. Accessory power socket	Check that the accessory power socket operates normally.
35. Lighting system	Check that the lighting system 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 operation check	Check the power window for normal operations.

Dynamic Test with the Vehicle Running

Step	Check point
39. Brake test	Check the foot brake for normal operations.
40. Parking brake	Check the parking brake for normal operations.
41. AT shift control	Check that the AT shifts normally.
42. Cruise control	Check that the cruise control system operates normally.

Checks after Dynamic Test

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

1. APPEARANCE CHECK

- 1) If the vehicle is covered with protective coating, visually check the vehicle body for damage and dents.
- 2) When there is no protective coating, check the body paints for damage or stains in detail and repair as necessary.
- 3) Check the window glass, door glass, and lights for any cracks or damage and replace the parts as necessary.
- 4) Check the plated parts, such as the grilles and door knobs, for damage or loss of gloss and replace the parts as necessary.

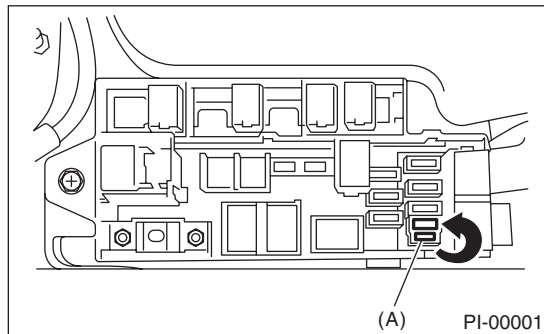
2. TIRE CHECK

- Check the outer side surface of the tire damage.
- Check the tire air pressure by referring to the following table.

Tire size	Tire inflation pressure kPa (kg/cm ² , psi)	
	Front	Rear
P215/60R16	200 (2.0, 29)	190 (1.9, 28)
P215/55R17	220 (2.2, 32)	210 (2.1, 30)

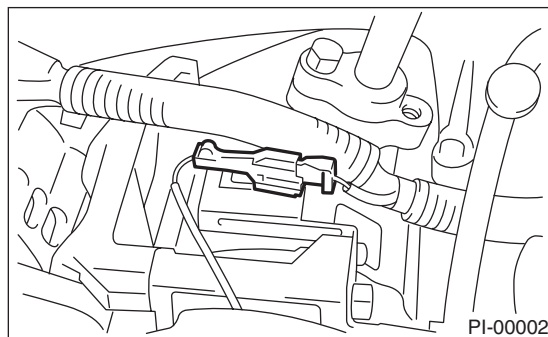
3. FUSE INSTALLATION.

A vehicle just delivered has no fuse for the room light circuit to prevent battery discharge. Attach a 15 A fuse (A) as shown in the figure.



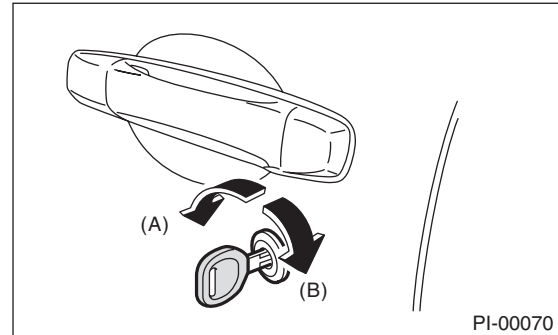
4. CONNECTION OF AIR CONDITIONER HARNESS

A vehicle just delivered has its air conditioner harness disconnected to protect the air conditioner compressor. Connect the harness as shown in the figure.



5. CHECK THE DOORS FOR LOCK/ UNLOCK AND OPEN/CLOSE OPERATIONS

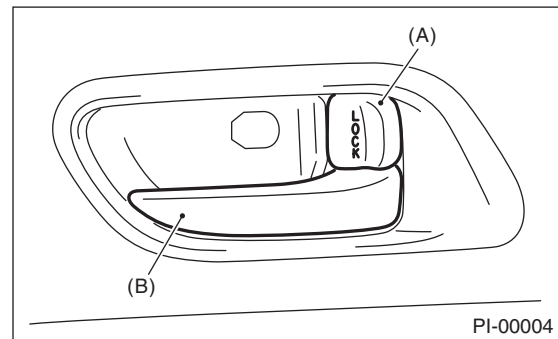
- 1) Using the key, lock and unlock the door several times to check for normal operation. Open and close the door several times for smooth movement.



- (A) Unlock
(B) Lock

- 2) Close the door of driver seat completely, and place the door lock knob (A) to the 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.



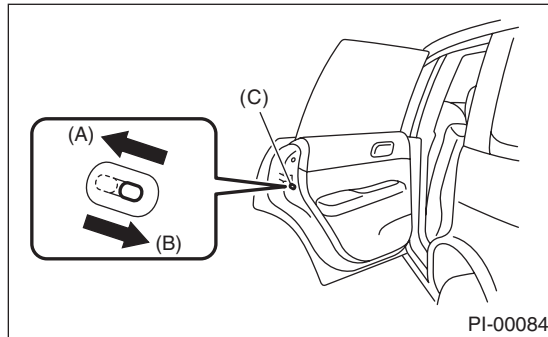
- (A) Door lock knob
(B) Inner remote

Pre-delivery Inspection

PRE-DELIVERY INSPECTION

6. CHECK THE OPERATION OF CHILD SAFETY LOCKS

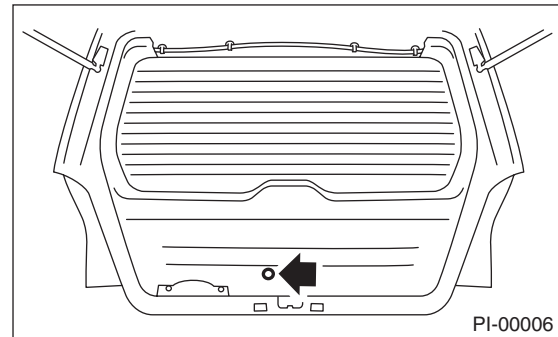
- 1) Set the child safety lock on both rear doors to the lock position.
- 2) Close the rear doors completely.
- 3) Check that the lock levers of the rear doors are in the unlock position. Then, pull inner remote of rear doors to ensure that doors will not open.
- 4) Pull the outer handles of the rear doors to ensure that doors will open.



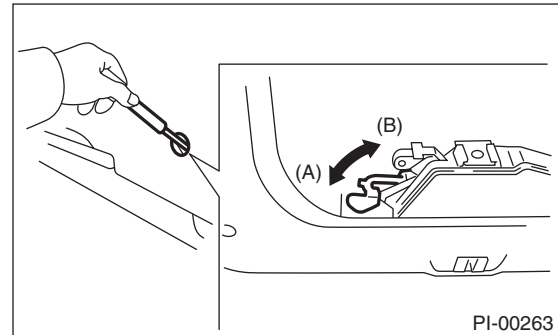
- (A) Unlock
- (B) Lock
- (C) Child safety lock

7. CHECK THE REAR GATE FOR LOCK/ UNLOCK AND OPEN/CLOSE OPERATIONS

- 1) Open and close the rear gate several times for smooth movement.
- 2) Operate the rear gate emergency lever to check that the rear gate is locked and unlocked normally.
 - (1) Remove the cover inside the rear gate.



- (2) Operate the driver to check that the rear gate is locked and unlocked normally.



- (A) Lock
- (B) Unlock

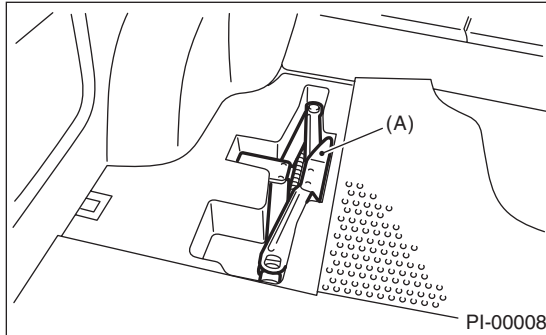
8. OPERATION CHECK OF FUEL LID OPENER LOCK RELEASE LEVER

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

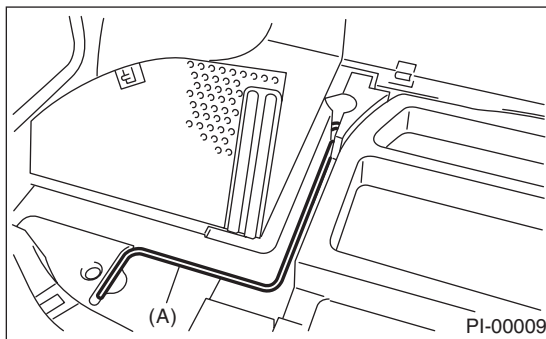
9. ACCESSORY CHECK

Check that the following accessories are provided.

- Owner's manual
- Warranty booklet
- Maintenance note
- Spare key
- Key number plate
- Jack
- Tool set
- Spare tire



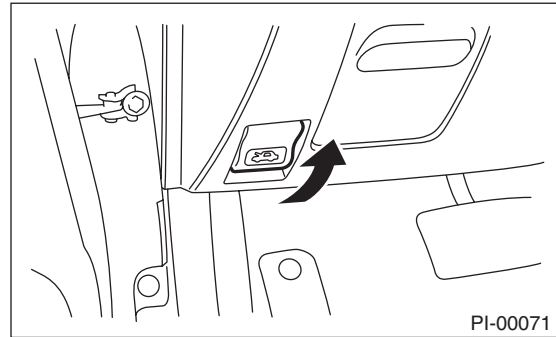
(A) Jack



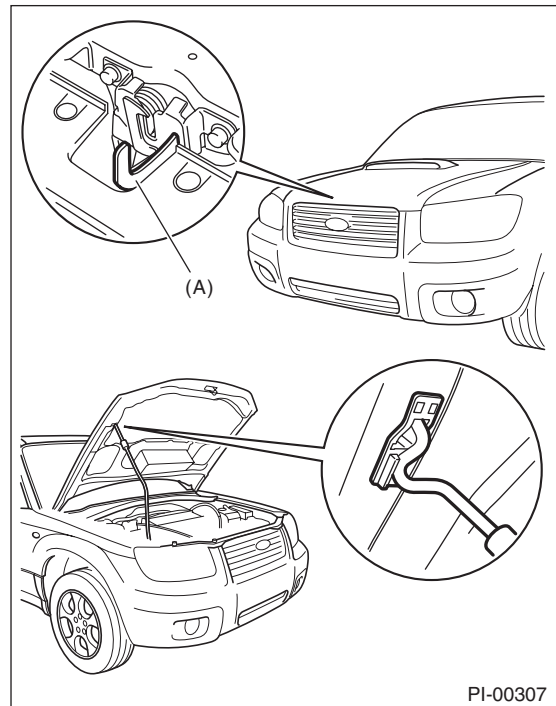
(A) Jack handle

10. OPERATION CHECK OF FRONT HOOD LOCK RELEASE SYSTEM

Operate the front hood release knob to check that the front hood is locked normally.



Operate the lever (A) and check that the front hood is opened normally. Support the front hood with hood stay.

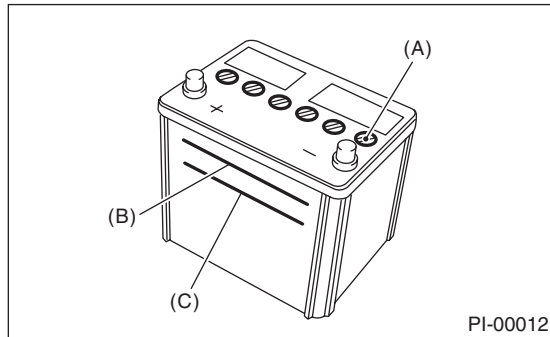


Pre-delivery Inspection

PRE-DELIVERY INSPECTION

11.BATTERY

Check the battery terminals to make sure that no rust or corruptions due to fluid leaks are found. Check that the battery caps are securely tightened.



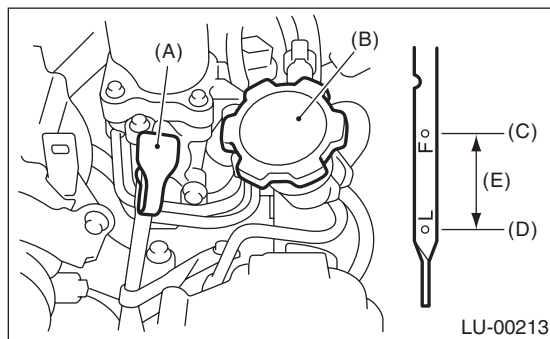
- (A) Cap
- (B) Upper level
- (C) Lower level

12.BRAKE FLUID

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

13.ENGINE OIL

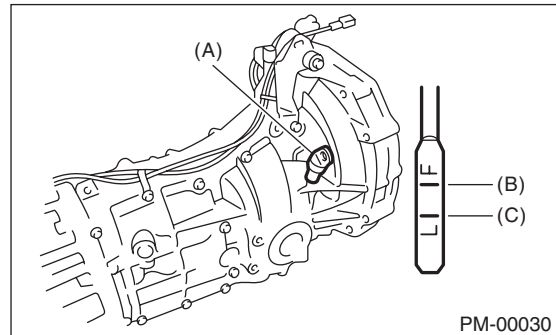
Check the engine oil amount. If the amount of oil is insufficient, check that no leaks are found. Then, add the necessary amount of the specified engine oil.



- (A) Engine oil level gauge
- (B) Engine oil filler cap
- (C) Upper level
- (D) Lower level
- (E) Approx. 1 0 (1.1 US qt, 0.9 Imp qt)

14.TRANSMISSION FLUID

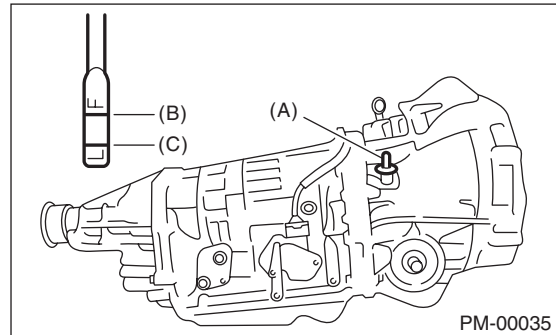
Check the transmission fluid amount. If the amount of fluid is inappropriate, check that no leaks are found. Then, add the necessary amount of specified fluid.



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

15.AT FRONT DIFFERENTIAL OIL

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



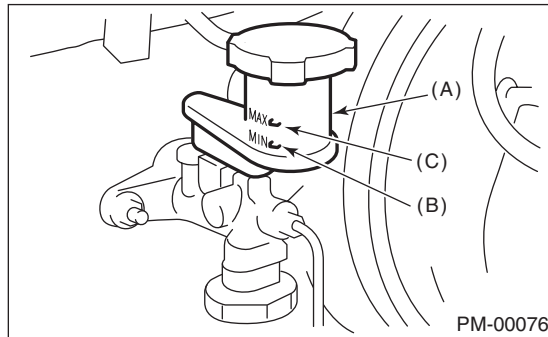
- (A) Oil level gauge
- (B) Upper level
- (C) Lower level

16.ENGINE COOLANT

Check the coolant amount on the reservoir. 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.

17. CLUTCH FLUID

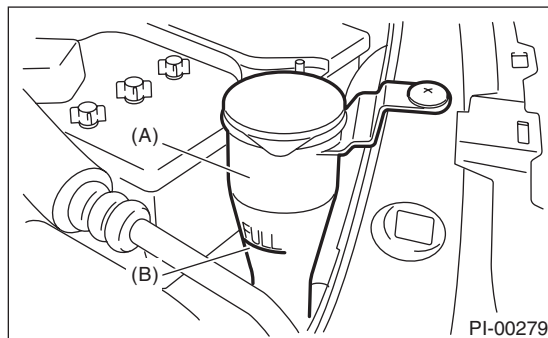
Check the clutch fluid amount. If the amount of fluid is insufficient, check that no leaks are found. Then, add the necessary amount of specified fluid.



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

18. WINDOW WASHER FLUID

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



- (A) Window washer tank
- (B) FULL level

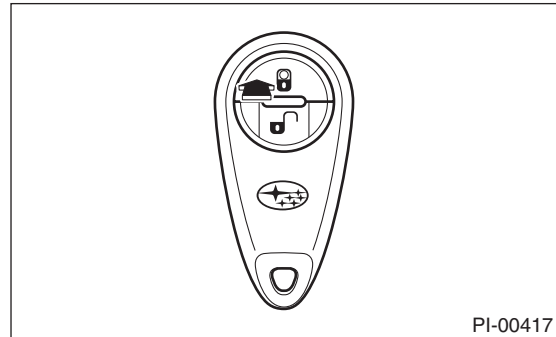
19. FRONT HOOD LATCH CHECK

Retract the front hood stay and close the front hood. Check that the front hood is completely latched.

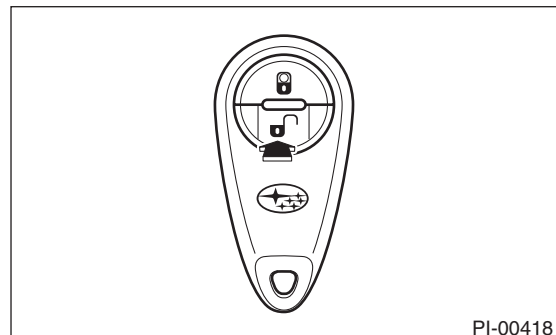
20. KEYLESS ENTRY SYSTEM

Check the keyless entry system operations as follows:

- 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/ARM" button once on the keyless transmitter. Check if all the doors are locked, the buzzer sounds once and hazard light blinks once.



- 4) Press the "UNLOCK/DISARM" button once on the keyless transmitter. Check if the driver's side door is unlocked, the buzzer sounds twice and hazard light blinks twice.



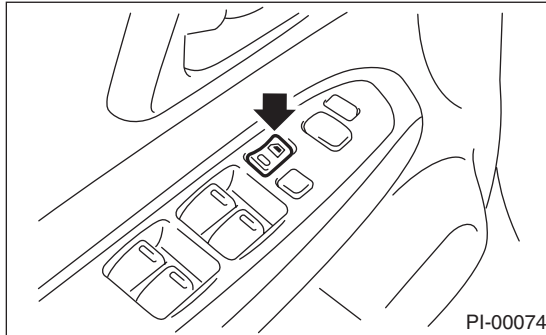
- 5) Press the "UNLOCK/DISARM" button once on the keyless transmitter within 5 seconds. Check that all doors (including rear gate) are unlocked.
- 6) Press the "LOCK/ARM" button on the keyless transmitter for approximately 2 seconds. Check whether a panic state (horn continuously honks) occurs. Also, check whether that state continues for 30 seconds or until the keyless transmitter button is pressed.
- 7) Press the "LOCK/ARM" button once on the keyless transmitter with one door (including the rear gate) open. Check that the buzzer sounds five times and the door open warning is issued. Next, close all the doors including rear gate. Check if all the doors are locked, the buzzer sounds once and hazard light blinks once.

Pre-delivery Inspection

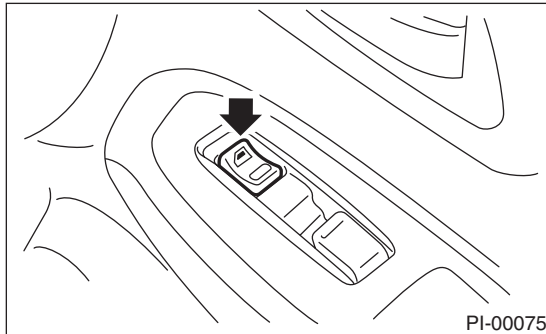
PRE-DELIVERY INSPECTION

8) Press the “LOCK” side of the power door switch with one door (including the rear gate) open. Next, close all the doors including rear gate. Check if all the doors are locked, the buzzer sounds once and hazard light blinks once.

- Driver’s side



- Passenger’s side



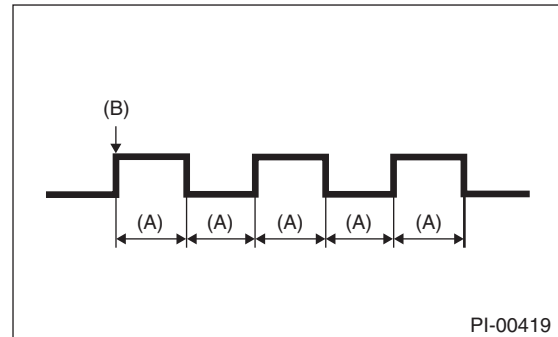
CHECK ALARM OPERATION.

The system uses a buzzer to ring an alarm when the doors are locked or unlocked. The alarm can be turned off if desired.

Switch the buzzer ON/OFF

Perform the following procedures to switch the LOCK/UNLOCK answer-back buzzer ON/OFF by keyless.

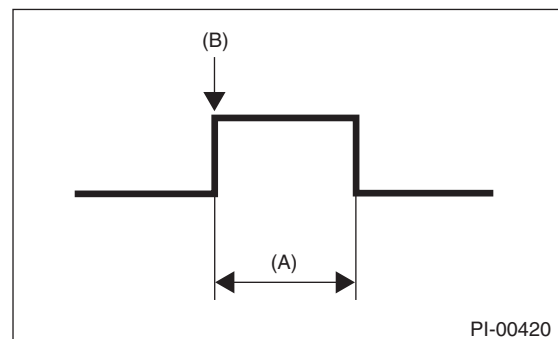
- 1) Open the door, and turn the ignition switch to OFF.
- 2) Press the “UNLOCK/DISARM” button, and turn the ignition switch to ON.
- 3) After turning the ignition switch to ON in step 2), repeat OFF → ON of the ignition switch five times within 10 seconds.
- 4) Within 10 seconds after the fifth time of ON → OFF of the ignition switch in step 3), perform open → close of the door.
- 5) After switching the answer-back buzzer setting ON → OFF, or OFF → ON, the hazard will blink three times.



(A) 0.3 second

(B) Timing to switch the answer-back buzzer ON/OFF

6) If the open → close of the door is not performed within 10 seconds after step 4), the hazard will blink once.



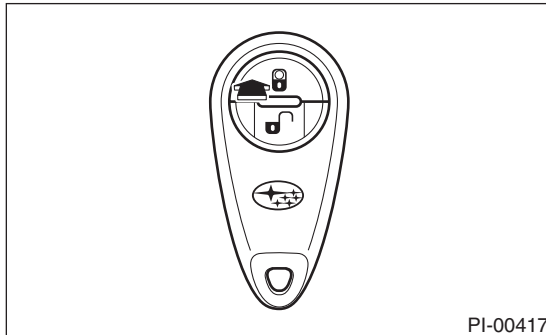
(A) 0.3 second

(B) Timing of 10 second elapse time without the door open → close operation

21.ALARM SYSTEM

Check that the alarm system is operating as shown below.

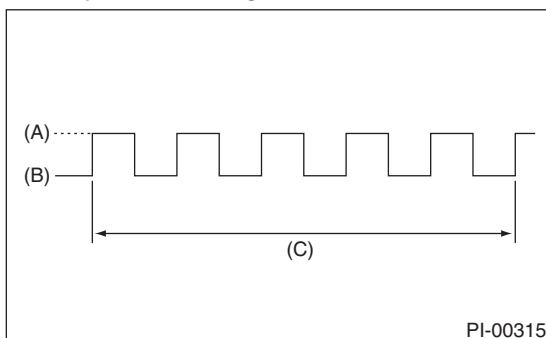
- 1) Fully open all the door windows.
- 2) Remove the key from the ignition switch and close all the doors including rear gate.
- 3) Press the “LOCK/ARM” button once on the keyless transmitter.



4) If all the doors are locked, the buzzer sounds once, the hazard light blinks once and security indicator light blinks as shown in the figure, the alarm system is in the arming preparatory state.



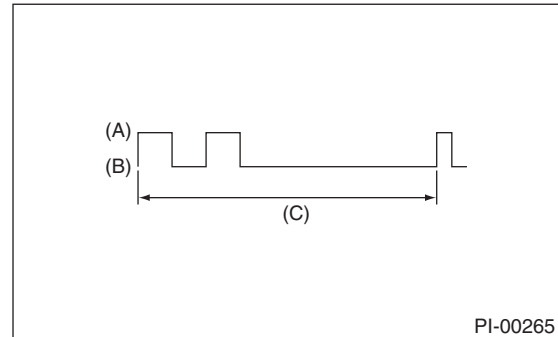
- Alarm system arming state



- (A) Light ON
- (B) Light OFF
- (C) 2 seconds

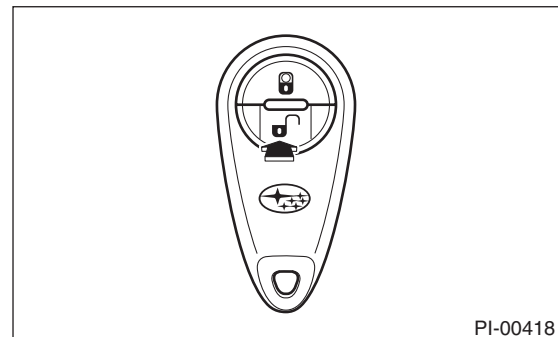
5) Check that the condition described in 4) lasts for 30 seconds and then the system is brought into the arming state.

- Alarm system arming state (all models)



- (A) Light ON
- (B) Light OFF
- (C) 2 seconds

6) Press the “UNLOCK/DISARM” button once on the keyless transmitter.



Pre-delivery Inspection

PRE-DELIVERY INSPECTION

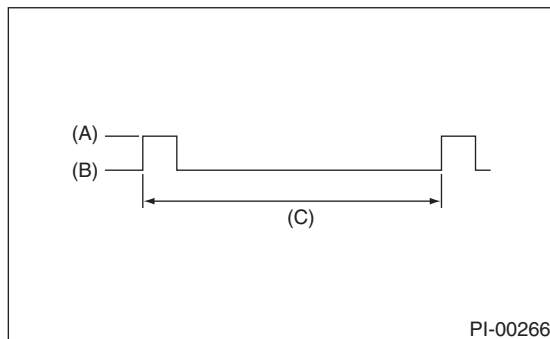
7) The driver's side door is unlocked, the buzzer sounds twice and hazard light blinks twice, the room light is lit and if the security indicator light is extinguished, the alarm system has been disarmed.

NOTE:

After pressing the "UNLOCK/DISARM" button on the keyless transmitter, the security indicator light does not blink on models without an immobilizer.

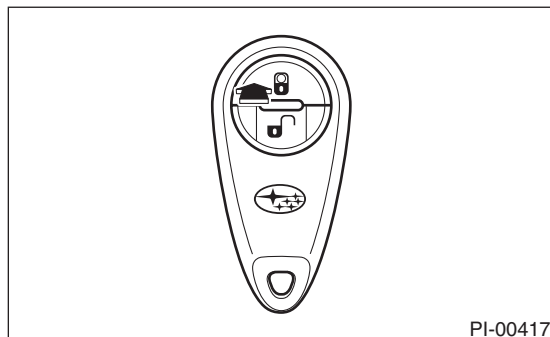


- Alarm system unarming preparatory state (model with immobilizer)



- (A) Light ON
- (B) Light OFF
- (C) 3 seconds

8) Press the "LOCK/ARM" button once on the keyless transmitter with one door (including the rear gate) open.

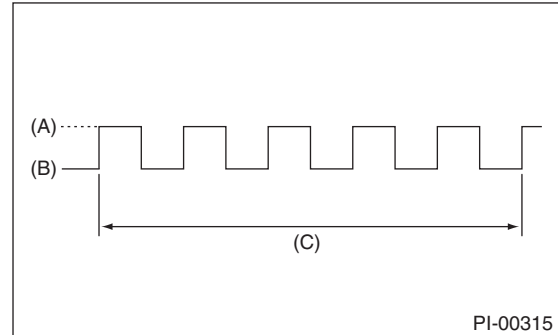


9) Check that the buzzer sounds five times and the door open warning is issued.

10) Close all the doors including rear gate.

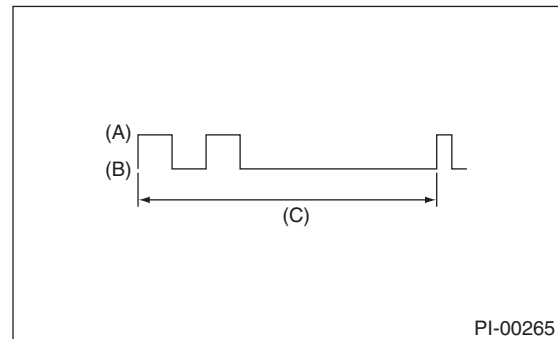
11) Check that it is in the arming state (all the doors are locked, the buzzer sounds once and hazard light blinks once).

- Alarm system arming preparatory state



- (A) Light ON
- (B) Light OFF
- (C) 2 seconds

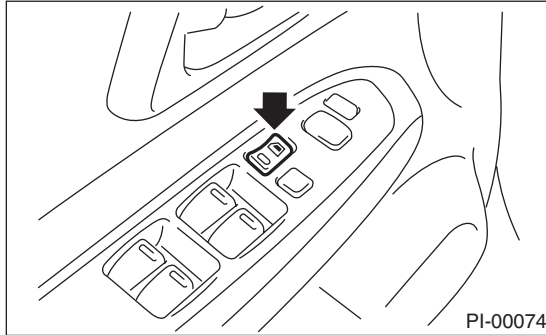
12) Check that the condition described in 11) lasts for 30 seconds and then the system is brought into the arming state.



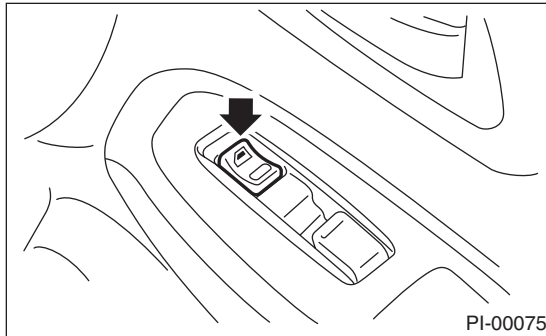
- (A) Light ON
- (B) Light OFF
- (C) 2 seconds

13) Press the “LOCK” side of the power door switch with all doors (including the rear gate) open.

- Driver’s side



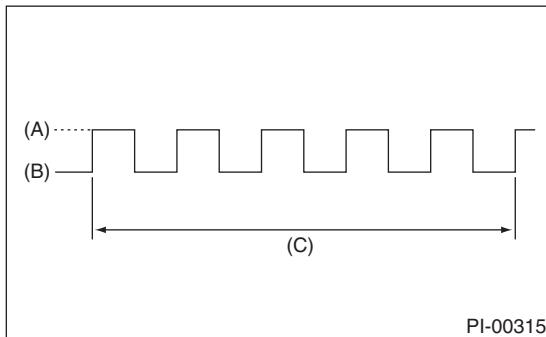
- Passenger’s side



14) Close all the doors including rear gate.

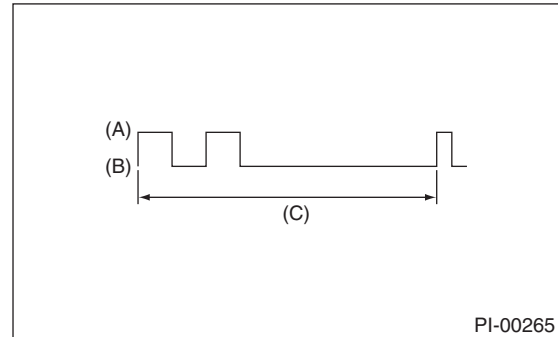
15) If all the doors are locked, the buzzer sounds once and hazard light blinks once, the alarm system is in the arming preparatory state.

- Alarm system arming preparatory state



- (A) Light ON
- (B) Light OFF
- (C) 2 seconds

16) Check that the condition described in 15) lasts for 30 seconds and then the system is brought into the arming state.



- (A) Light ON
- (B) Light OFF
- (C) 2 seconds

17) Use the inner lock knob or key to unlock the door, and open the door while the alarm system is in the arming state.

18) Check whether the alarm state (horn continuously honks, hazard light blinks, and security indicator light illuminates) has occurred.

19) Check that the state described in 18) lasts for 30 seconds or more, or until the keyless transmitter button “UNLOCK/DISARM” is pressed.

20) Also, check that the starter motor does not operate and the engine does not start even if the ignition key is turned to the “START” position while in the arming state.

21) For model with impact sensor, manually tap on the windshield glass to cause an alarm to occur while the alarm system is in the arming state.

22) Perform troubleshooting on the security system if the above does not apply. <Ref. to SL-22, INSPECTION, Security System.>

Pre-delivery Inspection

PRE-DELIVERY INSPECTION

22. SEAT

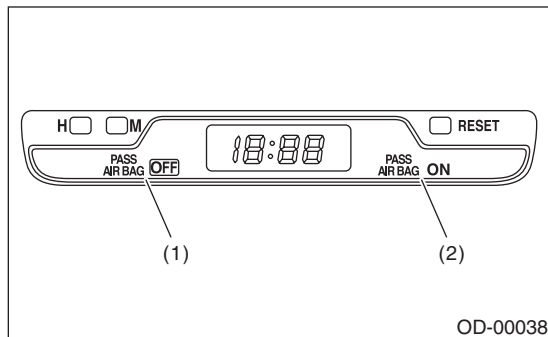
1) Check that each seat provides full functionality in sliding and reclining. Check all of the functions of the rear seat.

2) Check that the passenger's seat occupant detection system.

(1) Empty the passenger's seat and turn the ignition switch to ON.

(2) Check the ON and OFF of passenger's airbag indicator light come on simultaneously for about 6 seconds and go off for 2 seconds, and then only OFF comes on again.

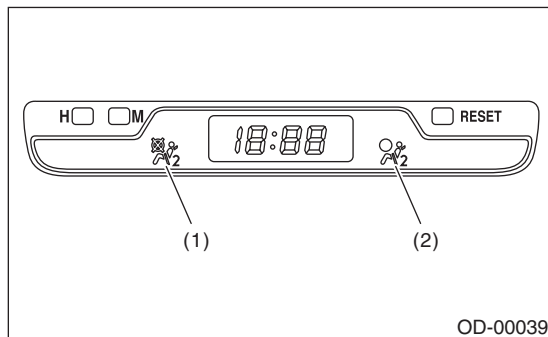
- U.S. model



(1) Passenger's airbag OFF indicator light

(2) Passenger's airbag ON indicator light

- Canada model



(1) Passenger's airbag OFF indicator light

(2) Passenger's airbag ON indicator light

(3) Have an adult sit down in the passenger's seat, and check if the passenger's airbag indicator lamp lights in about 4 seconds.

(4) Empty the passenger's seat and check if the OFF of passenger's airbag indicator light comes on in about 2 seconds.

23. SEAT BELT

1) Pull out the seat belt and then release it. Check that the belt retracts smoothly.

2) Check seat belt warning system

(1) Turn the ignition switch to ON without fastening driver's and passenger's seat belts.

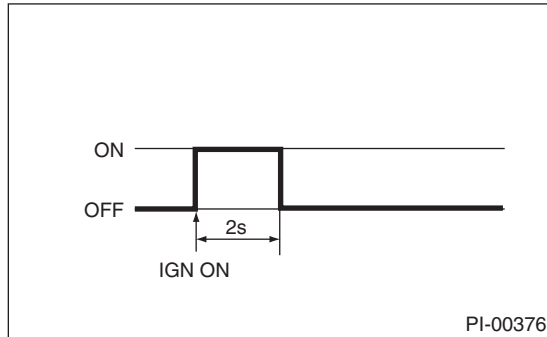
(2) Check if the seat belt warning lights of driver's and passenger's side blink for about 6 seconds and the buzzer beeps intermittently.

(3) Then, check that the seat belt warning light comes on and blinks, and buzzer beeps in 15 second cycles. (If the passenger's seat is empty, seat belt warning light for passenger's side does not operate.)

24.TPMS

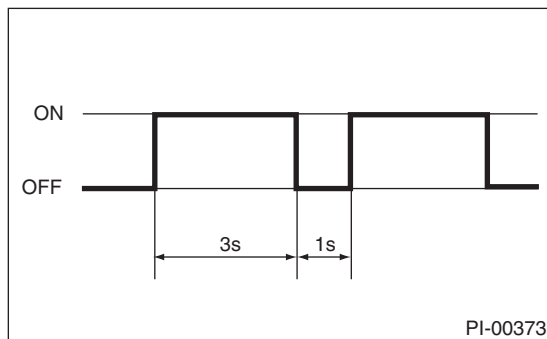
1) Turn the ignition switch to ON and check TPMS warning light is in normal operation.

- Normal operation (at IG ON (light check))

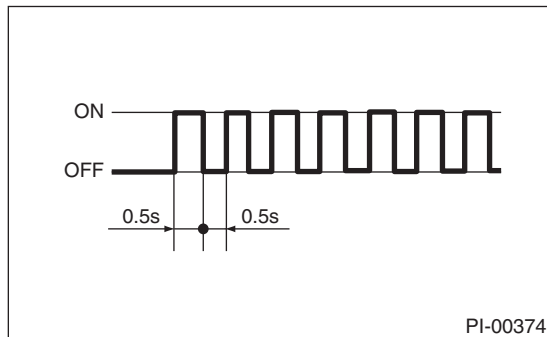


2) When the TPMS warning light does not operate normally, follow the following table procedures to inspect and repair.

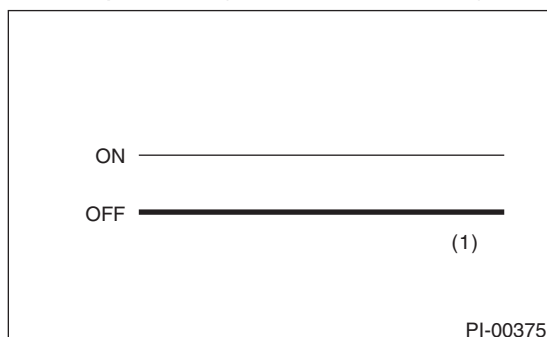
- Transmitter power for all wheels OFF *1



- Transmitter power for 1 to 3 wheels OFF *2

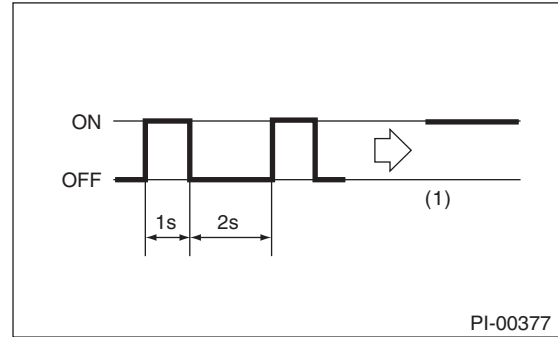


- Normal operation (at normal condition) *3



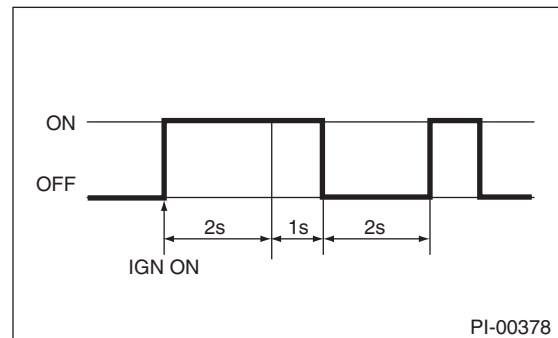
(1) Light OFF

- System failure (at normal condition)

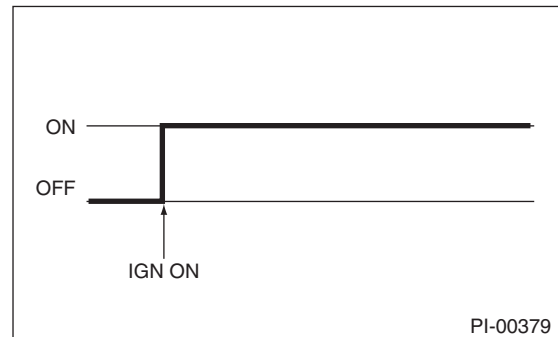


(1) Lights after blinking 25 times

- System failure (at IG ON)



- At the tire pressure decrease warning or ID un-registered



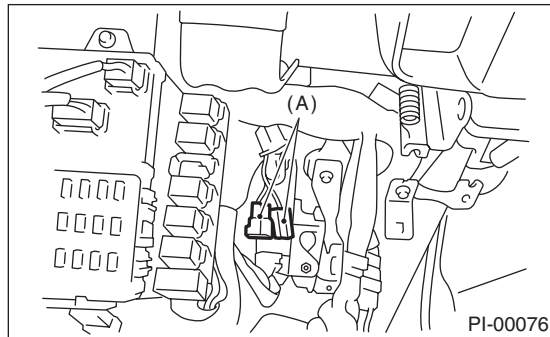
Pre-delivery Inspection

PRE-DELIVERY INSPECTION

Step		Check	Yes	No
1	TPMS WARNING LIGHT CHECK. 1) IG ON 2) Check the state of the TPMS warning light.	Does the state of the TPMS warning light become *1?	Go to step 2.	Go to step 3.
2	VALVE POWER SUPPLY ON. 1) Contact the transmitter registration tool to the side wall near the air valve of the tire. 2) Press and hold the switch for 4 seconds or more. 3) Perform the same procedures for all wheels.	Does the state of the TPMS warning light become *3?	Go to step 10.	Go to step 9.
3	ID CHECK. 1) While checking the display of the Subaru Select Monitor, transmit the transmitter ID by using the transmitter registration tool.	Does the ID of the installed transmitter match the registered ID?	Go to step 6.	Go to step 4.
4	ID RE-REGISTRATION. 1) Register the transmitter. 2) After the ID registration, check if the state of the TPMS warning light becomes *3.	Does the state of the TPMS warning light become *3?	Go to step 11.	Go to step 6.
5	TIRE PRESSURE ADJUSTMENT. 1) Check the tire pressure for all tires. 2) Adjust the tire pressure. 3) Check the state of the TPMS warning light.	Does the state of the TPMS warning light become *3?	Go to step 7.	Go to step 6.
6	DIAGNOSIS. 1) Using the Subaru Select Monitor, check the diagnostic history.	Is DTC displayed on the Subaru Select Monitor?	Repair the trouble cause. <Ref. to TPM(diag)-2, Basic Diagnostic Procedure.>	Go to step 7.
7	DELETION OF DIAGNOSTIC HISTORY. 1) Using the Subaru Select Monitor, perform the Clear Memory.	Is DTC displayed on the Subaru Select Monitor?	Repair the trouble cause. <Ref. to TPM(diag)-2, Basic Diagnostic Procedure.>	Go to step 8.
8	TPMS WARNING LIGHT CHECK. 1) IG OFF 2) IG ON 3) Check the state of the TPMS warning light.	Is the display of the TPMS warning light *3?	Finish the procedures.	Perform the diagnosis again. <Ref. to TPM(diag)-2, Basic Diagnostic Procedure.>
9	CHECK TPMS WARNING LIGHT.	Does the state of the TPMS warning light become *1 or *2?	Go to step 3.	Go to step 5.
10	FORCED DATA TRANSMISSION. 1) Contact the transmitter registration tool to the side wall near the air valve of the tire. 2) Press and hold the switch for 4 seconds or more. 3) Perform the same procedures for all wheels.	Does the state of the TPMS warning light become *3?	Finish the procedures.	Go to step 5.
11	CHECK FORCED DATA TRANSMISSION. 1) Contact the transmitter registration tool to the side wall near the air valve of the tire. 2) Press and hold the switch for 4 seconds or more. 3) Perform the same procedures for all wheels.	Does the state of the TPMS warning light become *3?	Go to step 7.	Go to step 5.

25.TEST MODE CONNECTOR

Turn the ignition switch to ON and check that the engine malfunction indicator light starts blinking. If the light blinks, return the ignition key to LOCK and disconnect the 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 test mode connector, carry out an engine diagnosis.



(A) Test mode connector (Green)

26.IMMOBILIZER SYSTEM

- 1) Check if all keys of the vehicle can start the engine.
- 2) 60 seconds after turning the ignition switch from ON to ACC or OFF, or immediately after removing the key, check if the security indicator light blinks.

NOTE:

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

27.STARTING CONDITION

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

28.EXHAUST SYSTEM

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

29.INDICATOR AND WARNING LIGHTS

Check that all indicator lights and warning lights operate normally.

30.HEATER & VENTILATION

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

31.AIR CONDITIONER

Operate the air conditioner. Check that the A/C compressor operates normally and enough cooling is provided.

NOTE:

To prevent the insufficient lubrication of the air conditioner, operate the air conditioner for five minutes at idling.

32.CLOCK

Check the clock for normal operations and enough accuracy.

33.RADIO

Check the radio for full functionality and normal noise level. Also check the CD unit operations.

34.ACCESSORY POWER SOCKET

- 1) Check operation of the accessory power socket in console box.
- 2) Check operation of the accessory power socket in luggage room.

35.LIGHTING SYSTEM

- 1) Check the headlight operations.
- 2) Check the stop light operation.
- 3) For model with manual headlight beam levelizer, check the operation of headlight beam levelizer.
- 4) Check other lights for normal operations.

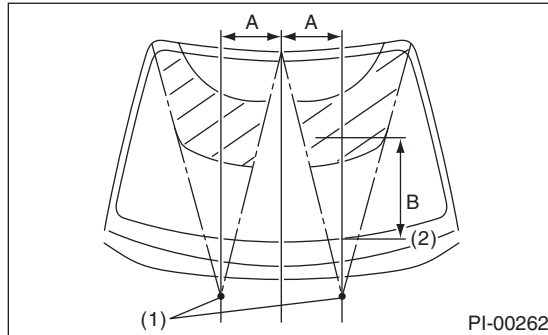
36.WINDOW WASHER

Check that the window washer system injects washer fluid to the specified area of the windshield and rear window glass shown in the figure.

Front injection position:

A: 250 mm (9.84 in)

B: 345 mm (13.58 in)

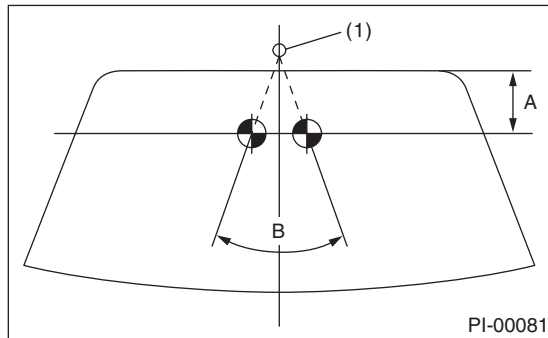


- (1) Nozzle
- (2) Ceramic line

Rear injection position:

A: 35 mm (1.38 in)

B: 72°



- (1) Nozzle

37.WIPER

Check the front and rear wipers for normal operations.

38.POWER WINDOW OPERATION CHECK

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

39.BRAKE TEST

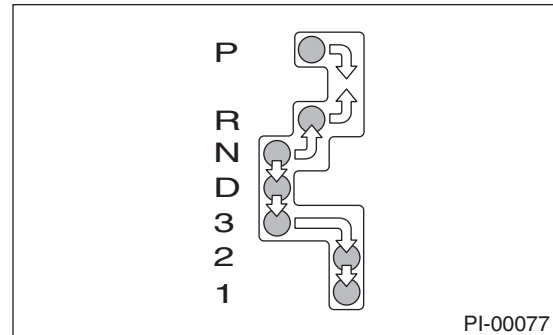
Check the foot brake for normal operations.

40.PARKING BRAKE

Check the parking brake for normal operations. When pulling the parking brake lever with force of 196 N (20 kgf, 44 lb), check that the lever stroke of parking brake lever is 7 or 8 notches.

41.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 ignition key switch cannot be removed.
- 6) Set the AT selector lever to each gear position while checking that the demanded gear position is correctly attained.



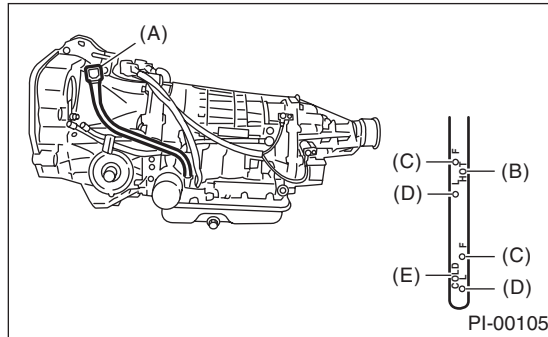
Selector position	Gear position			
	1st	2nd	3rd	4th
D	OK	OK	OK	OK
3	OK	OK	OK	—
2	—	OK	—	—
1	OK	—	—	—

42.CRUISE CONTROL

Operate the cruise control system. Check whether operating and canceling of other systems can be executed correctly.

43.ATF LEVEL

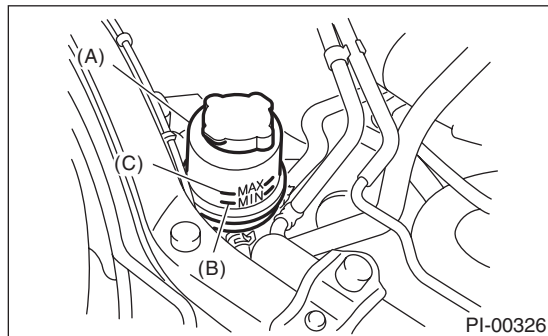
After selecting all positions (P, R, N, D, 3, 2, 1), set the select lever in P range. Measure the ATF level with engine idling for one or two minutes. If the amount of ATF is insufficient, check that no leaks are found. Then, add the necessary amount of the specified ATF.



- (A) Level gauge
- (B) Inspection position when "HOT"
(70 — 80°C (158 — 176°F))
- (C) Upper level
- (D) Lower level
- (E) Inspection position when "COLD"
(20 — 30°C (68 — 86°F))

44.POWER STEERING FLUID LEVEL

Check that the power steering fluid level is normal. If insufficient, check for leaks. Then add the necessary amount of the specified power steering fluid.



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

45.FLUID LEAK CHECK

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

46.WATER LEAK CHECK

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 before starting the test.
- Connect a hose to a tap, and spray water on the vehicle. The rate of water spray must be approx. 20 to 25   (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.

47. APPEARANCE CHECK 2

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

NOTE:

- It is easier to remove the wrap guard using steam.
- For the vehicle left for a long time or at low temperature, sprinkle some water heated 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.
- If a yellow label is attached to the fog light lens, remove it.

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 exterior parts for deformation or distortion. Also, check each light lens for cracks.

General Description

PERIODIC MAINTENANCE SERVICES

1. General Description

A: GENERAL DESCRIPTION

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

Schedule

PERIODIC MAINTENANCE SERVICES

2. Schedule

A: MAINTENANCE SCHEDULE

1. FOR U.S. MODEL

		MAINTENANCE INTERVAL [Number of months or km (miles), whichever occurs first]																		
	Months	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120	Remarks	
	× 1,000 km	4.8	12	24	36	48	60	72	81.4	96	108	120	132	144	156	168	180	192		
	× 1,000 miles	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120		
1	Engine oil		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R		
2	Engine oil filter		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R		
3	Spark plug					R				R				R				R	Non-turbo Model	
										R								R	Turbo Model	
4	Drive belt					I				I				I		R				
5	Timing belt					I				I				I		R				
6	Fuel line					(I)				(I)				(I)				I	Note (1)	
7	Fuel filter									R								R	Note (1)	
8	Air cleaner element					R				R				R				R	Note (2)	
9	Cooling system					I				I				I				I		
10	Engine coolant					R				R				R				R		
11	Clutch system			I		I		I		I		I		I		I		I		
12	Transmission oil					I				I				I				I		
13	ATF					I				I				I				I		
14	Front & rear differential gear oil					I				I				I				I		
15	Brake line			I		I		I		I		I		I		I		I		
16	Brake fluid					R				R				R				R		
17	Disc brake pads and discs					I				I				I				I		
18	Brake linings and drums					I				I				I				I		
19	Parking brake			I		I		I		I		I		I		I		I		
20	Suspension			I		I		I		I		I		I		I		I		
21	Wheel bearing									(I)								(I)		
22	Axle boots and joints			I		I		I		I		I		I		I		I		
23	Tire rotation		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	Note (4)	
24	Steering system (Power steering)			I		I		I		I		I		I		I		I		
25	Airbag system	10th-year inspection																		
26	ATF filter assembly	Annual inspection																		Note (3)
27	Air conditioner filter	Every 12 months or 12,000 km (7,500 miles) inspection																		

Symbol

R: Replace

I: Inspect

(R) or (I): Inspections recommended for vehicle safety

NOTE:

1. This inspection is not necessary to observe exhaust gas regulations or is the responsibility of the manufacturer under the current basic EPA regulations that must be observed by law.

2. Replace the air cleaner element more frequently than the periodic replacement if the vehicle is being used in an excessively dusty environment.

3. The ATF filter needs replacement when it is physically damaged, rusty or ATF leaked.

4. Replace the tires if the tread-wear indicator has caused a bar-shaped cut across the tread. The indicator will appear when the remaining amount of tread is less than 1.6 mm (0.063 in).

Schedule

PERIODIC MAINTENANCE SERVICES

2. FOR CANADA MODEL

		MAINTENANCE INTERVAL																		
		[Number of months or km (miles), whichever occurs first]																		
	Months	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120	Remarks	
	× 1,000 km	4.8	12	24	36	48	60	72	81.4	96	108	120	132	144	156	168	180	192		
	× 1,000 miles	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120		
1	Engine oil	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	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				R				R	Non-turbo Model	
										R								R	Turbo Model	
4	Drive belt					I				I				I		R				
5	Timing belt					I				I				I		R				
6	Fuel line					(I)				(I)				(I)				I	Note (1)	
7	Fuel filter									R								R	Note (1)	
8	Air cleaner element					R				R				R				R	Note (2)	
9	Cooling system					I				I				I				I		
10	Engine coolant					R				R				R				R		
11	Clutch system			I		I		I		I		I		I		I		I		
12	Transmission oil					I				I				I				I		
13	ATF					I				I				I				I		
14	Front & rear differential gear oil					I				I				I				I		
15	Brake line			I		I		I		I		I		I		I		I		
16	Brake fluid					R				R				R				R		
17	Disc brake pads and discs					I				I				I				I		
18	Brake linings and drums					I				I				I				I		
19	Parking brake			I		I		I		I		I		I		I		I		
20	Suspension			I		I		I		I		I		I		I		I		
21	Wheel bearing									(I)								(I)		
22	Axle boots and joints			I		I		I		I		I		I		I		I		
23	Tire rotation		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	Note (4)	
24	Steering system (Power steering)			I		I		I		I		I		I		I		I		
25	Airbag system	10th-year inspection																		
26	ATF filter assembly	Annual inspection																		Note (3)
27	Air conditioner filter	Every 12 months or 12,000 km (7,500 miles) inspection																		

Symbol

R: Replace

I: Inspect

(R) or (I): Inspections recommended for vehicle safety

NOTE:

1. This inspection is not necessary to observe exhaust gas regulations or is the responsibility of the manufacturer under the current basic EPA regulations that must be observed by law.

2. Replace the air cleaner element more frequently than the periodic replacement if the vehicle is being used in an excessively dusty environment.

3. The ATF filter needs replacement when it is physically damaged, rusty or ATF leaked.

4. Replace the tires if the tread-wear indicator has caused a bar-shaped cut across the tread. The indicator will appear when the remaining amount of tread is less than 1.6 mm (0.063 in).

Schedule

PERIODIC MAINTENANCE SERVICES

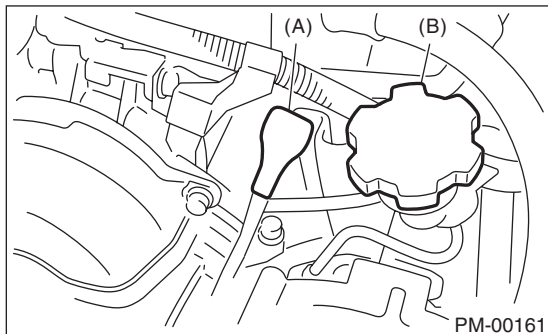
B: PERIODIC REPLACEMENT PARTS

Item	Every	Repeat short distance drive	Repeat rough muddy road drives	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 filter	15 months				I		
	24,000 km						
	15,000 miles						
Fuel line	15 months				I		
	24,000 km						
	15,000 miles						
Transmission oil	15 months						R
	24,000 km						
	15,000 miles						
ATF	15 months						R
	24,000 km						
	15,000 miles						
Front & rear differential gear oil	15 months						R
	24,000 km						
	15,000 miles						
Brake line	15 months	I	I		I		I
	24,000 km						
	15,000 miles						
Brake fluid	15 months					R	
	24,000 km						
	15,000 miles						
Disc brake pads and discs	15 months	I	I		I		I
	24,000 km						
	15,000 miles						
Brake linings and drums	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		I
	12,000 km						
	7,500 miles						
Axle boots and joints	7.5 months	I	I	I	I		I
	12,000 km						
	7,500 miles						
Steering system (Power steering)	7.5 months	I	I	I	I		I
	12,000 km						
	7,500 miles						

3. Engine Oil

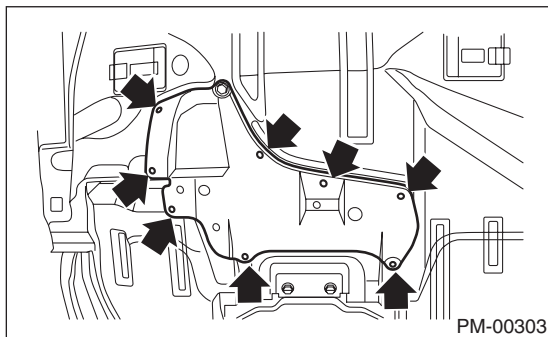
A: REPLACEMENT

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

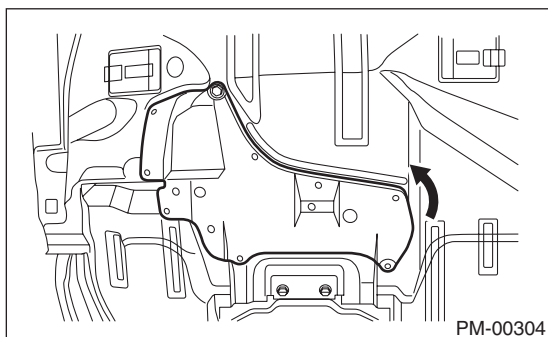


- (A) Oil level gauge
(B) Engine oil filter cap

- 3) Lift up the vehicle.
- 4) Remove the service hole cover clip.



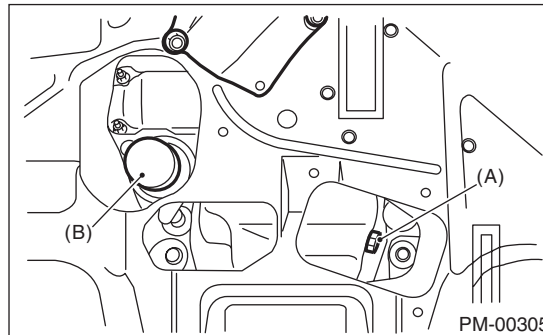
- 5) Rotate the service hole cover in the arrow direction.



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

NOTE:

Prepare the container for draining of engine oil.



- (A) Engine oil drain plug
(B) Oil filter

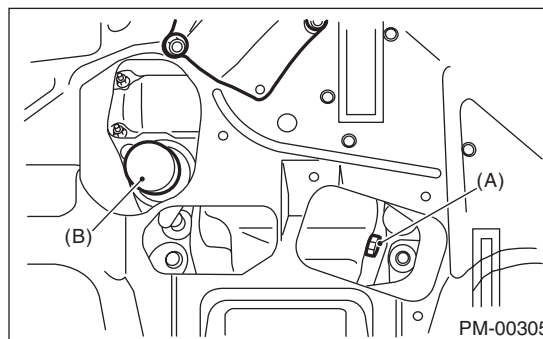
CAUTION:

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

- 7) Replace the drain plug gasket with a new part.
- 8) Tighten the engine oil drain plug after draining engine oil.

Tightening torque:

44 N·m (4.5 kgf-m, 33 ft-lb)



- (A) Engine oil drain plug
(B) Oil filter

9) Fill engine oil up to the upper level of the level gauge. Place the vehicle on a level surface when checking oil level. Use engine oil of proper quality and viscosity, selected in accordance with the table in figure.

Recommended oil:

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

Engine oil capacity:

Upper level:

Approx. 4.0 ℓ (4.2 US qt, 3.5 Imp qt)

Lower level:

Approx. 3.0 ℓ (3.2 US qt, 2.6 Imp qt)

CAUTION:

It is acceptable to fill an engine with oil of another brand when replacing the oil, but make sure to use an oil with an API standard and SAE viscosity number specified by Subaru.

NOTE:

- The vehicle will start well even when temperatures are low or high by increasing the cranking speed by reducing viscous friction for the appropriate viscosity.
- It is acceptable to use oil having the viscosities described below if the vehicle is being used in desert locations or in excessive environments where temperatures are extremely high.

API standard: SM or SL

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

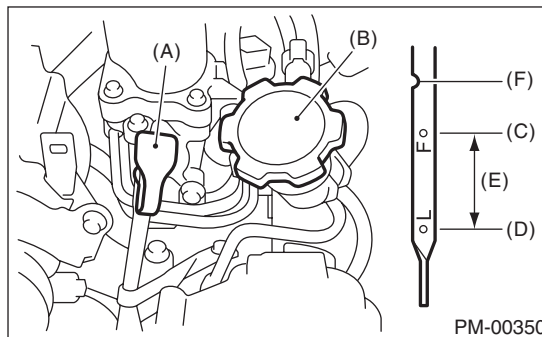
10) Close the engine oil filler cap.

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

12) Stop the engine to inspect the oil level again. If necessary, add engine oil up to the upper level on level gauge. <Ref. to PM-7, INSPECTION, Engine Oil.>

B: INSPECTION

- 1) Park the vehicle on a level surface.
- 2) Remove the oil level gauge and wipe away all of the oil.
- 3) Reinsert the level gauge all the way. Be sure that the level gauge is correctly inserted and in the correct position.
- 4) Remove the level gauge again and record the oil level. If the oil level is below the "L" line, add oil to bring the level up to the "F" line.



- (A) Engine oil level gauge
- (B) Engine oil filler cap
- (C) Upper level
- (D) Lower level
- (E) Approx. 1 ℓ (1.1 US qt, 0.9 Imp qt)
- (F) Notch mark

5) Wait for several minutes until the oil has returned to the oil pan after stopping the engine.

6) Immediately after driving or while the engine is warm, the engine oil level may be shown between the "F" line and the notch mark. This is caused by thermal expansion of engine oil.

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

CAUTION:

If the engine oil is spilt over exhaust pipe or the under cover, wipe it off completely with cloth.

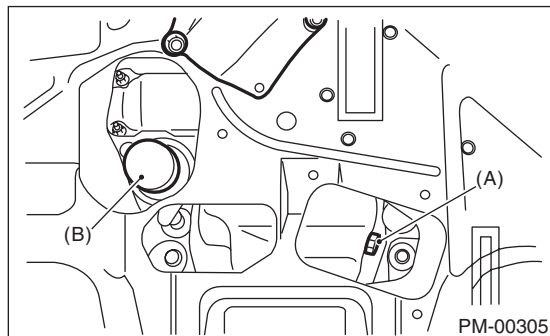
NOTE:

Upper level and lower level are set when the engine is cold because the oil level gauge is used for daily maintenance.

4. Engine Oil Filter

A: REPLACEMENT

1) Remove the engine oil filter.



(A) Engine oil drain plug

(B) Oil filter

ST 18332AA000	OIL FILTER WRENCH (Outer diameter: 68 mm (2.68 in) for oil filter)
ST 18332AA010	OIL FILTER WRENCH (Outer diameter: 65 mm (2.56 in) for oil filter)

CAUTION:

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

2) Clean the oil filter installation surface on cylinder block.

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

CAUTION:

Be careful because the oil filters having an outer diameter of 80 mm (3.15 in) cannot be used.

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

- Tighten the oil filter 68 mm (2.68 in) in diameter (approx. 1 rotation) after the seal rubber of the oil filter comes in contact with cylinder block or oil cooler. When using a torque wrench, tighten to the following torque values.

Tightening torque

14 N·m (1.4 kgf-m, 10.3 ft-lb)

- Tighten the oil filter 65 mm (2.56 in) in diameter (approx. 2/3 — 3/4 rotation) after the seal rubber of the oil filter comes in contact with cylinder block or oil cooler. When using a torque wrench, tighten to the following torque values.

Tightening torque

12 N·m (1.2 kgf-m, 8.8 ft-lb)

CAUTION:

Be careful not to tighten excessively, or oil may leak.

5) After mounting the oil filter, fill the prescribed amount of engine oil. <Ref. to PM-6, REPLACEMENT, Engine Oil.>

NOTE:

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

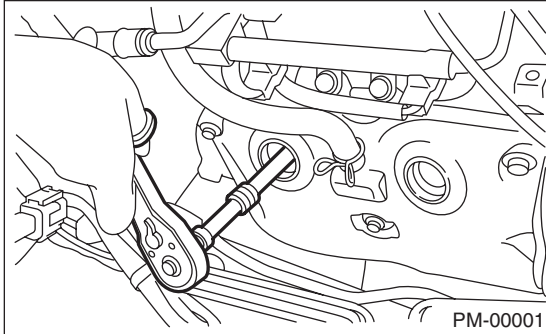
6) After installing the oil filter, run the engine and make sure that no oil is leaking around seal rubber.

7) Check the engine oil level. <Ref. to LU(H4SO)-10, REPLACEMENT, Engine Oil.>

5. Spark Plug

A: REPLACEMENT

- 1) Remove the intake duct and intake chamber.
- 2) Remove the washer tank and set to the side.
- 3) Disconnect the spark plug cord.
- 4) Remove the spark plug with a plug-wrench.



- 5) Install a new spark plug.

Spark plug:

Non-turbo model

NGK: FR5AP-11

Turbo model:

NGK: ILFR6B

Spark plug gap:

Non-turbo model

1.0 — 1.1 mm (0.039 — 0.043 in)

Turbo model

0.7 — 0.8 mm (0.028 — 0.031 in)

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

Tightening torque:

21 N·m (2.1 kgf-m, 15.5 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 crack, fraying or wear is found.
- 2) Check the V-belt tension and adjust it if necessary by changing the generator installing position or idler pulley installing position. <Ref. to PM-10, REPLACEMENT, V-belt.>

Belt tension (A):

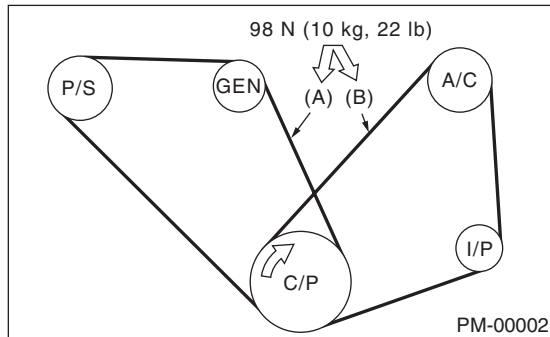
When replaced: 7.0 — 9.0 mm
(0.276 — 0.354 in)

When reused: 9.0 — 11.0 mm
(0.354 — 0.433 in)

Belt tension (B):

When replaced: 7.5 — 8.5 mm
(0.295 — 0.335 in)

When reused: 9.0 — 10.0 mm
(0.354 — 0.394 in)



(A) Front side belt

(B) Rear side belt

C/P Crank pulley

GEN Generator

P/S Power steering oil pump pulley

A/C A/C compressor pulley

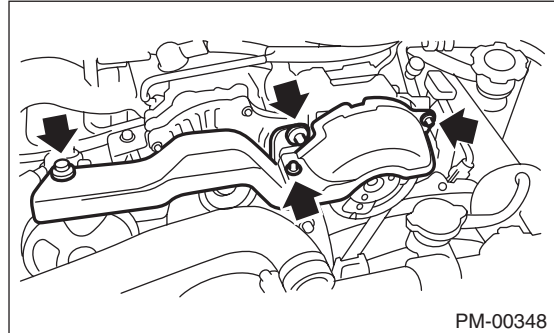
I/P Idler pulley

B: REPLACEMENT

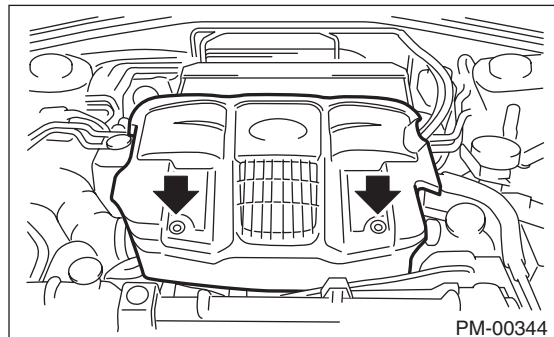
1. V-BELT COVER

Remove the V-belt covers.

- Non-turbo model



- Turbo model



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

NOTE:

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

- 1) Loosen the lock bolt (A).
- 2) Loosen the slider bolt (B).
- 3) Remove the front side belt (C).
- 4) Install a new belt, and tighten the slider bolt so as to obtain the specified belt tension.
- 5) Tighten the lock bolt (A).
- 6) Tighten the slider bolt (B).

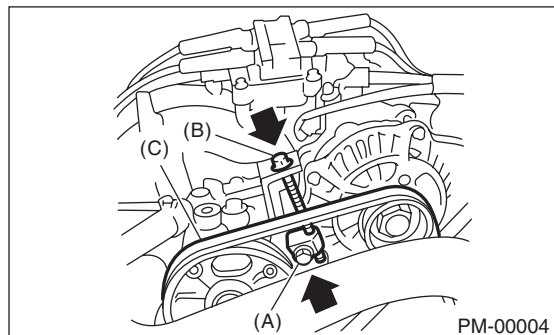
Tightening torque:

Lock bolt

25 N·m (2.5 kgf-m, 18.4 ft-lb)

Slider bolt

8 N·m (0.8 kgf-m, 5.9 ft-lb)



3. REAR SIDE BELT (FOR AIR CONDITIONER)

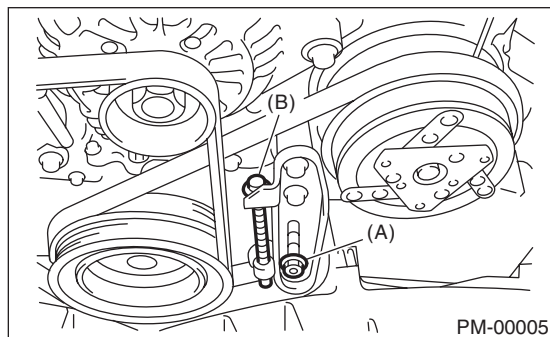
NOTE:

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

- 1) Remove the front side belts.
- 2) Loosen the lock nut (A).
- 3) Loosen the slider bolt (B).
- 4) Remove the rear side belt.
- 5) Install a new belt, and tighten the slider bolt so as to obtain the specified belt tension.
- 6) Tighten the lock nut (A).
- 7) Install the front side belt. <Ref. to ME(H4SO)-41, FRONT SIDE BELT, INSTALLATION, V-belt.>

Tightening torque:

23 N·m (2.3 kgf-m, 17.0 ft-lb)



Timing Belt

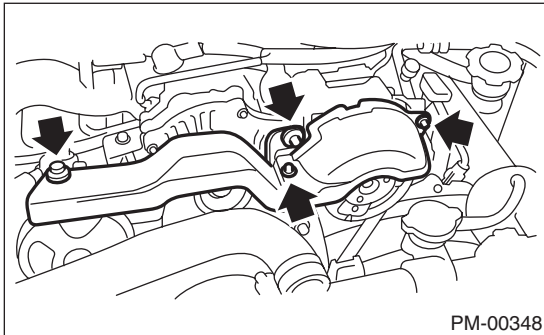
PERIODIC MAINTENANCE SERVICES

7. Timing Belt

A: REPLACEMENT

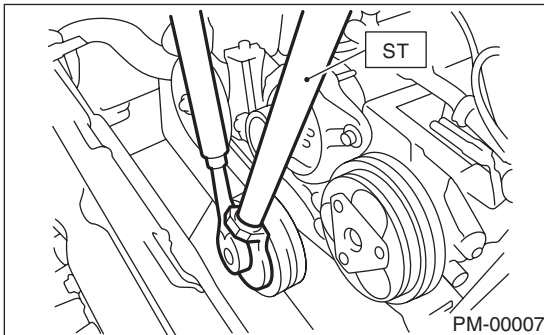
1. NON-TURBO MODEL

- 1) Remove the radiator fan and air conditioner fan. <Ref. to CO(H4SO)-32, Radiator Main Fan and Fan Motor.> <Ref. to CO(H4SO)-38, Radiator Sub Fan and Fan Motor.>
- 2) Protect the radiator with cardboard and blanket.
- 3) Remove the V-belt covers.

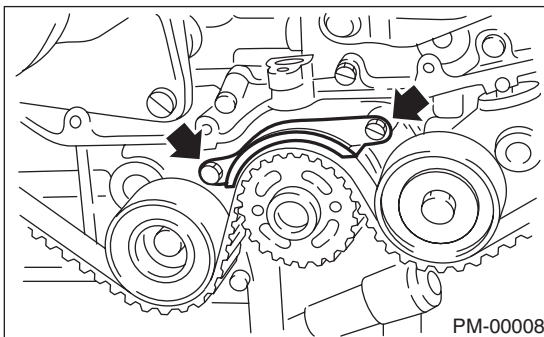


- 4) Remove the V-belts. <Ref. to ME(H4SO)-41, V-belt.>
- 5) Remove the A/C compressor V-belt tensioner.
- 6) Using the ST, lock the crankshaft and remove pulley bolt.

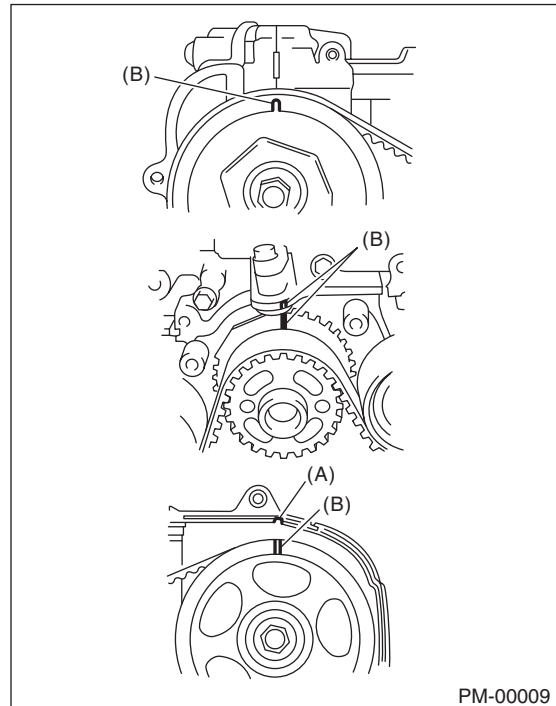
ST 499977100 CRANK PULLEY WRENCH



- 7) Remove the crank pulley.
- 8) Remove the belt cover LH.
- 9) Remove the front timing belt cover.
- 10) Remove the timing belt guide. (MT model)

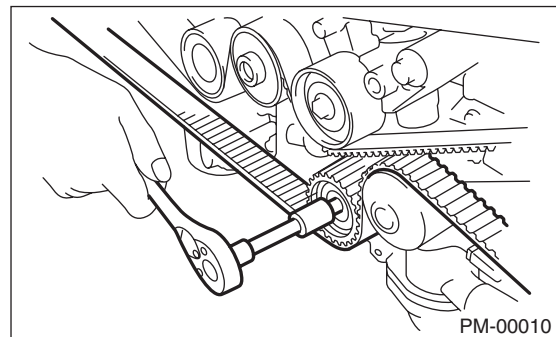


- 11) Turn the crankshaft and align the alignment marks on crankshaft, and left and right cam sprockets with notches of belt cover and cylinder block.
- ST 499987500 CRANKSHAFT SOCKET

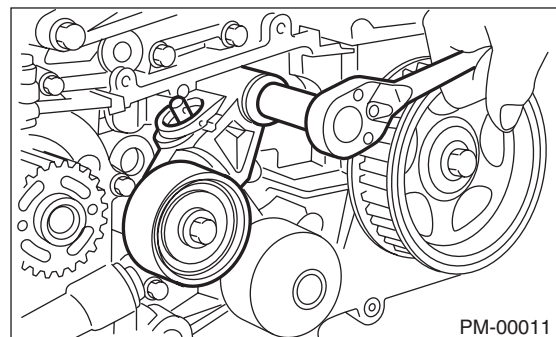


- (A) Notch
(B) Alignment mark

- 12) Remove the belt idler.
- 13) Remove the belt idler (No. 2).



- 14) Remove the timing belt.
- 15) Remove the automatic belt tension adjuster assembly.



16) Install in the reverse order of removal. <Ref. to ME(H4SO)-46, INSTALLATION, Timing Belt.>

2. TURBO MODEL

1) Remove the radiator fan and air conditioner fan. <Ref. to CO(H4SO)-33, TURBO MODEL, REMOVAL, Radiator Main Fan and Fan Motor.> <Ref. to CO(H4SO)-38, Radiator Sub Fan and Fan Motor.>

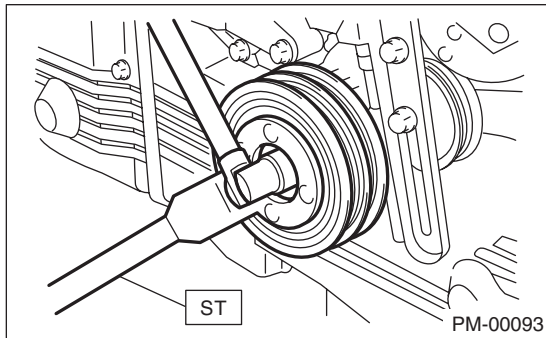
2) Protect the radiator with cardboard and blanket.

3) Remove the V-belts. <Ref. to ME(H4SO)-41, V-belt.>

4) Remove the A/C compressor V-belt tensioner.

5) Using the ST, lock the crankshaft and remove pulley bolt.

ST 499977100 CRANK PULLEY WRENCH



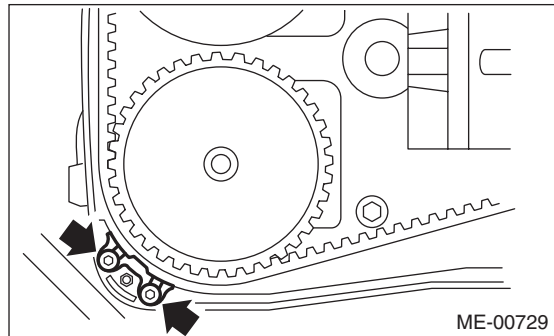
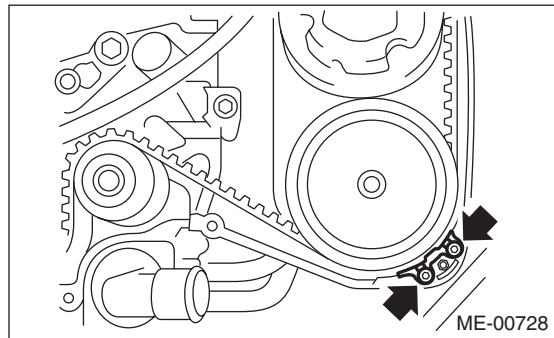
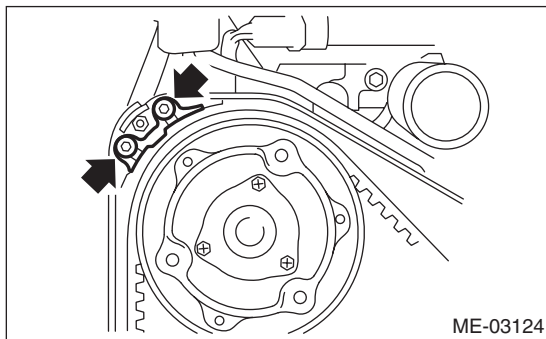
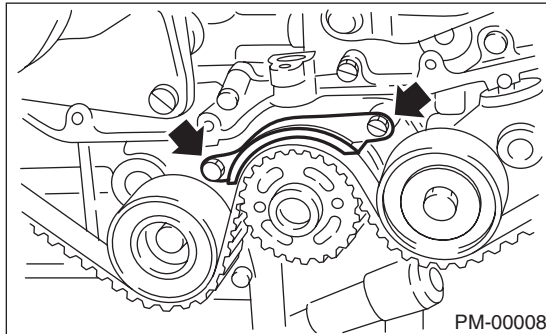
6) Remove the crank pulley.

7) Remove the belt cover (LH).

8) Remove the belt cover (RH).

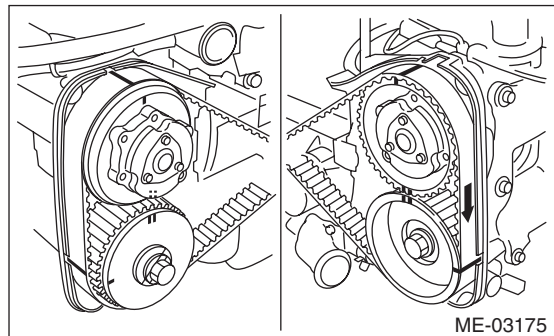
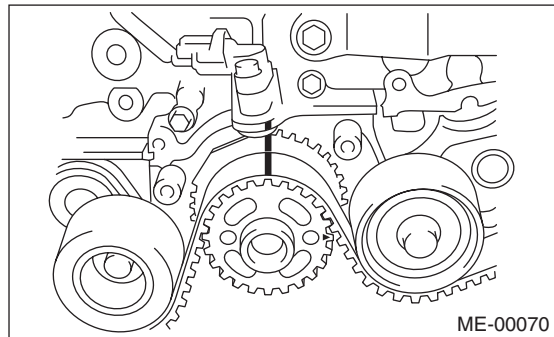
9) Remove the front belt cover.

10) Remove the timing belt guide. (MT model)



11) Turn the crankshaft and align the alignment marks on crankshaft, and left and right cam sprockets with notches of belt cover and cylinder block. Use the ST to turn crankshaft.

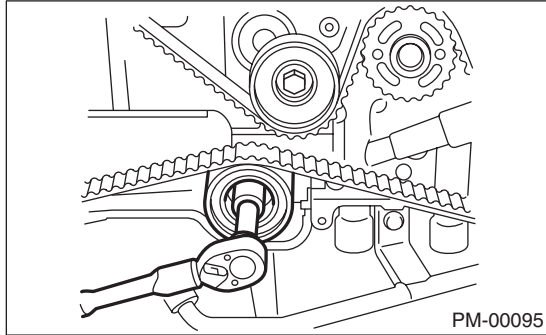
ST 499987500 CRANKSHAFT SOCKET



Timing Belt

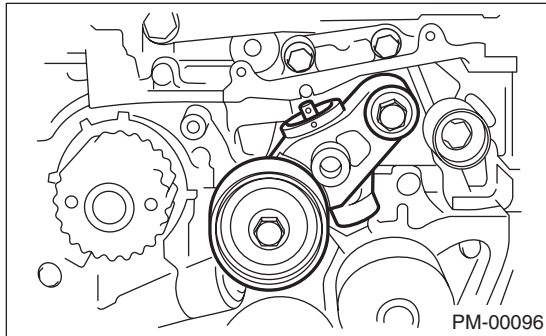
PERIODIC MAINTENANCE SERVICES

12) Remove the belt idler.



13) Remove the timing belt.

14) Remove the automatic belt tension adjuster assembly.



15) Install in the reverse order of removal. <Ref. to ME(H4DOTC)-45, INSTALLATION, Timing Belt.>

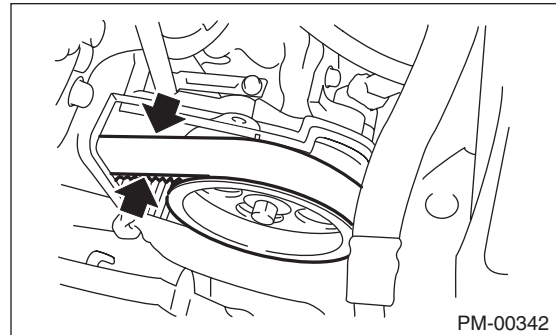
CAUTION:

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

B: INSPECTION

1. SOHC MODEL

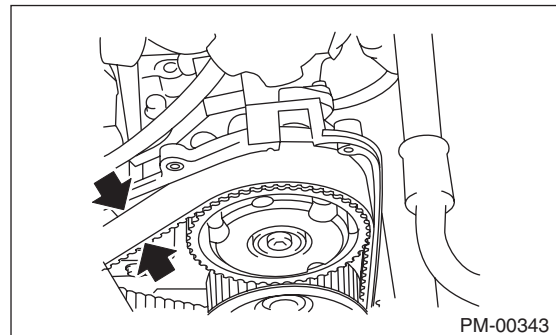
- 1) Remove the timing belt cover (LH).
- 2) While cranking engine at least four rotations, check the timing belt back surface for cracks or damage. Replace the faulty timing belt as needed.
- 3) If the surface of timing belt (surface indicated by the arrow in the figure) is worn abnormally (scuffing and coming out of core) or damaged, inspect the idlers, tensioner, water pump pulley and cam sprocket and check the idler alignment for squareness. Replace the worn or damaged timing belt.



4) Install the timing belt cover (LH).

2. DOHC MODEL

- 1) Remove the timing belt cover (LH).
- 2) While cranking engine at least four rotations, check the timing belt back surface for cracks or damage. Replace the faulty timing belt as needed.
- 3) If the surface of timing belt (surface indicated by the arrow in the figure) is worn abnormally (scuffing and coming out of core) or damaged, inspect the idlers, tensioner, water pump pulley and cam sprocket and check the idler alignment for squareness. Replace the worn or damaged timing belt.



4) Install the timing belt cover (LH).

8. Fuel Line

A: INSPECTION

Check the pipes and for rust around the pipe, damage to the hose, and for looseness of the band. If faulty parts are found, repair or replace them. <Ref. to FU(H4SO)-60, Fuel Delivery and Evaporation Lines.>

9. Fuel Filter

A: REPLACEMENT

For fuel filter replacement procedure, refer to FU section.

<Ref. to FU(H4SO)-57, Fuel Filter.>

B: INSPECTION

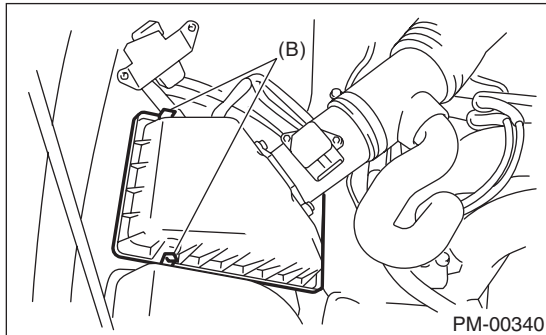
1) If the filter is clogged, or if the replacement interval has been reached, replace it.

10. Air Cleaner Element

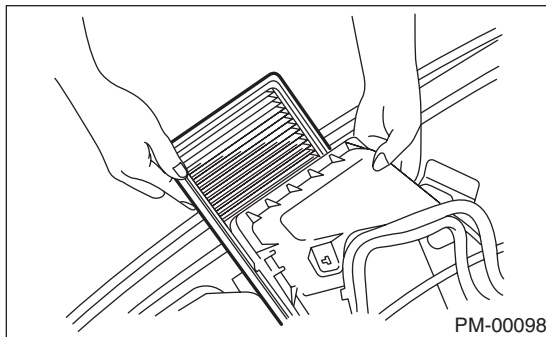
A: REMOVAL

1. NON-TURBO MODEL

- 1) Remove the clips (B) on air cleaner case.

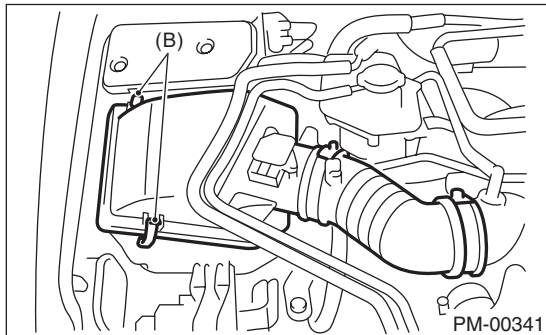


- 2) Remove the air cleaner element.

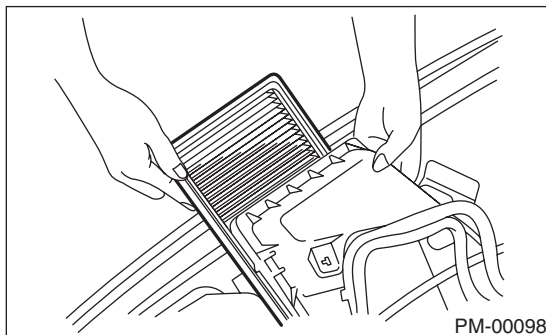


2. TURBO MODEL

- 1) Remove the clips (B) on air cleaner case.



- 2) Remove the air cleaner element.



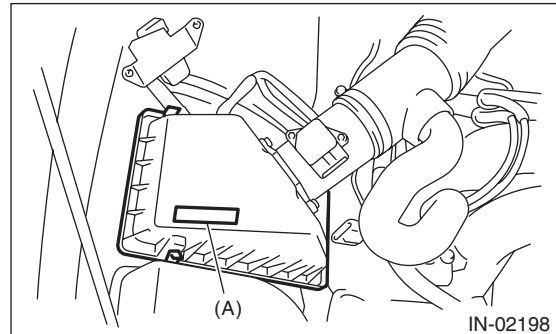
B: INSTALLATION

1. NON-TURBO MODEL

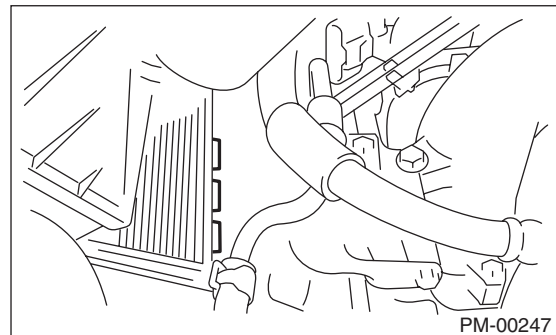
Install in the reverse order of removal.

NOTE:

•The air cleaner element differs depending on the destination market. For the specification of U5 model, refer to the NOTE (A) on the upper side of air cleaner upper cover.



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

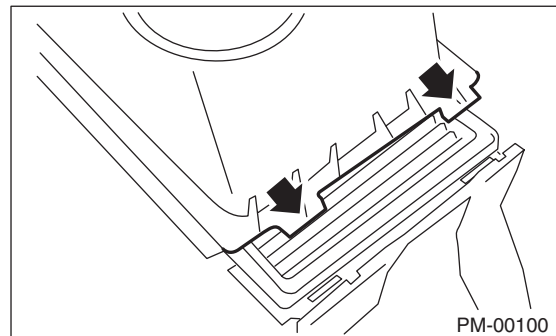


2. TURBO MODEL

Install in the reverse order of removal.

CAUTION:

Position the protrusion on the air cleaner upper cover with the hole in the air cleaner lower case to mount the upper cover on the case.



C: INSPECTION

- Replace with a new part if the air cleaner element is extremely damaged or dirty.
- Replace the air cleaner upper cover when the HC adsorption filter is damaged. (U5 model)

11.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.

Pressure:

Non-turbo model

157 kPa (1.6 kg/cm², 23 psi)

Turbo model

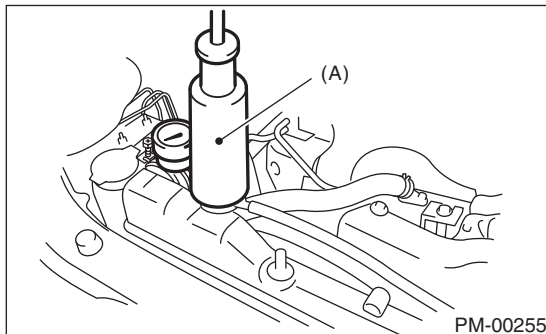
122 kPa (1.2 kg/cm², 18 psi)

Check the following points:

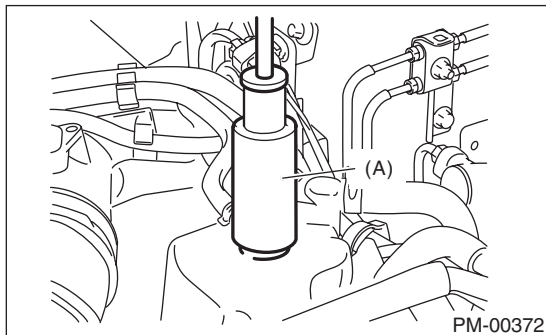
- Leak from radiator
- Hose joints and other connections for leakage

CAUTION:

- For Turbo model, inspection must be carried out at the side of coolant filler tank, not at the side of radiator.
- 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.
- Non-turbo model



- Turbo model



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

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. If the valve opened at the service limit or less, replace the radiator cap.

CAUTION:

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

Non-turbo model radiator side and turbo model coolant filler tank side

Specification:

93 — 123 kPa

(0.95 — 1.25 kg/cm², 14 — 18 psi)

Service limit:

83 kPa (0.85 kg/cm², 12 psi)

Radiator side on turbo models

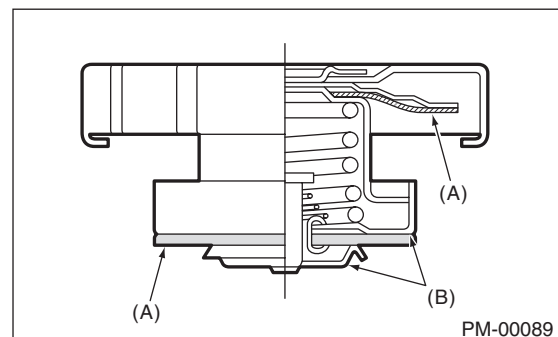
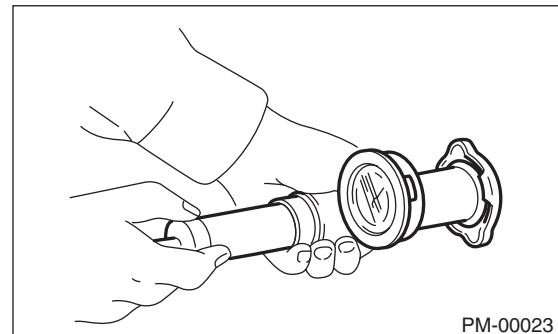
Specification:

122 — 152 kPa

(1.24 — 1.55 kg/cm², 18 — 22 psi)

Service limit:

112 kPa (1.14 kg/cm², 16 psi)



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

3) Start the engine, and then inspect that it does not overheat or it is cooled excessively. If it overheats or it is cooled excessively, check the cooling system. <Ref. to CO(H4SO)-22, INSPECTION, Water Pump.> <Ref. to CO(H4SO)-24, INSPECTION, Thermostat.> <Ref. to CO(H4SO)-25, Radiator.> <Ref. to CO(H4SO)-31, 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(H4SO)-11, Radiator Fan System.>

12.Engine Coolant

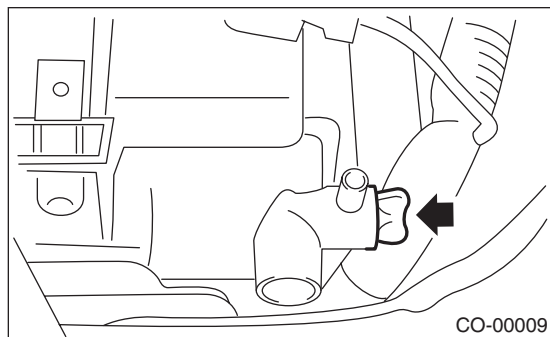
A: REPLACEMENT

1. REPLACEMENT OF ENGINE COOLANT

WARNING:

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

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



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

CAUTION:

Be careful not to spill coolant on the floor.

- 6) Drain the coolant from reservoir tank.
- 7) Tighten the drain cock securely after draining coolant.
- 8) Pour cooling system conditioner through the filler neck.

Cooling system protecting agent:

**Cooling system conditioner
(Part No. SOA635071)**

- 9) Slowly pour the coolant from radiator filler port to neck of filler. Then, pour the coolant into reservoir tank up to "FULL" level.

Coolant capacity (fill up to "FULL" level)

Turbo AT model

Approx. 7.3 ℓ (7.7 US qt, 6.4 Imp qt)

Turbo MT model

Approx. 7.4 ℓ (7.8 US qt, 6.5 Imp qt)

Non-turbo AT model

Approx. 6.8 ℓ (7.2 US qt, 6.0 Imp qt)

Non-turbo MT model

Approx. 6.9 ℓ (7.3 US qt, 6.1 Imp qt)

NOTE:

The SUBARU Genuine Coolant containing anti-freeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crank-case. Always use SUBARU genuine coolant or phosphoric acid type coolant of equivalent quality, since other coolant may cause corrosion.

CAUTION:

Be careful not to spill engine coolant on the exhaust pipe to prevent it from emitting smoke or causing a fire. If engine coolant spilled, wipe it off completely.

- 10) Close the radiator cap (on Non-turbo models) or the coolant filler tank cap (on turbo models), start the engine and race 5 to 6 times at less than 3,000 rpm, then stop the engine. (Complete this operation within 40 seconds.)

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

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

- 13) Close the radiator cap (on non-turbo models) or the coolant filler tank cap (on turbo models), and the reservoir tank cap.

- 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.

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

17) Open the radiator cap (on non-turbo models) or the coolant filler tank cap (on turbo models). If the engine coolant level drops, add engine coolant into the radiator filler neck (on non-turbo models) or the coolant filler tank filler neck (on turbo models) up to the filler neck position.

Then, pour the coolant into reservoir tank up to "FULL" level.

18) Close the radiator cap (on non-turbo models) or the coolant filler tank cap (on turbo models), and the reservoir tank cap.

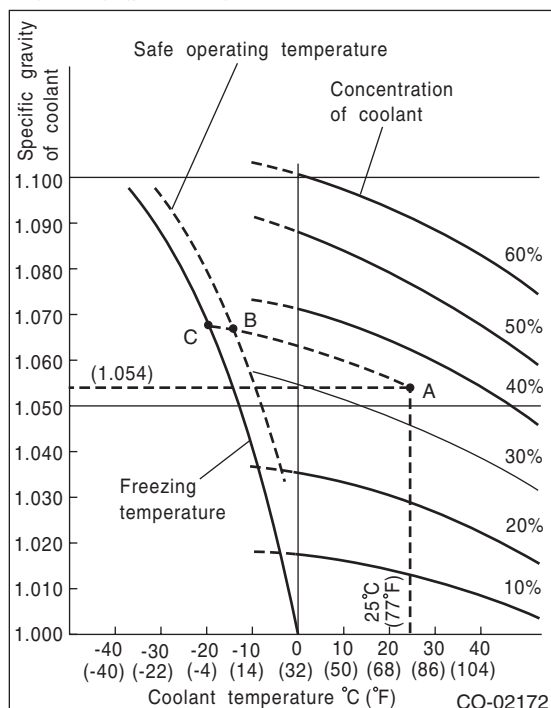
19) Set the heater setting to maximum hot position and the blower speed setting to "LO" and start the engine. Perform racing at less than 3,000 rpm. If the flowing sound is heard, repeat the procedures from 15) again.

2. RELATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE

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

[Example]

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



3. PROCEDURE TO ADJUST THE CONCENTRATION OF THE COOLANT

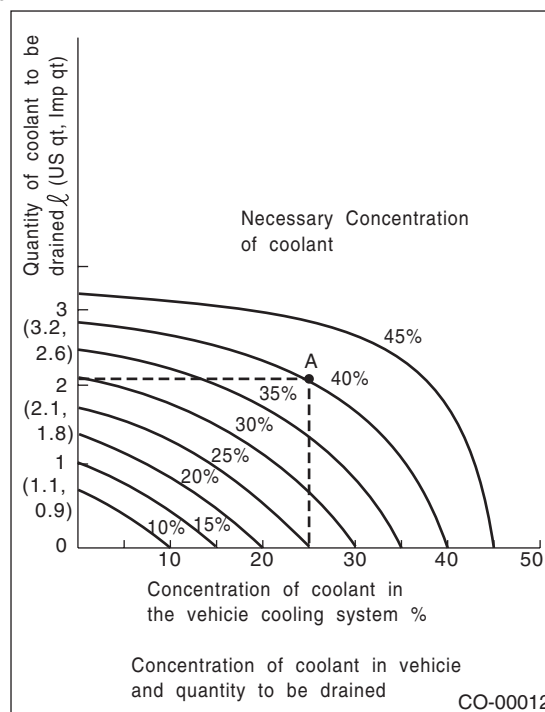
To adjust the concentration of coolant according to temperature, find the proper fluid concentration in the above diagram and replace the necessary amount of coolant with an undiluted solution of SUBARU genuine coolant (concentration 50%).

The amount of engine coolant that should be replaced can be determined using the diagram.

[Example]

Assume that the engine coolant concentration must be increased from 25% to 40%. Find point A, where the 25% line of engine coolant concentration intersects with the 40% curve of the necessary engine coolant concentration, and read the scale on the vertical axis of the graph at height A. The quantity of coolant to be drained is 2.1 ℓ (2.2 US qt, 1.8 Imp qt). Drain 2.1 ℓ (2.2 US qt, 1.8 Imp qt) of coolant from the cooling system and add 2.1 ℓ (2.2 US qt, 1.8 Imp qt) of the undiluted solution of SUBARU coolant.

If a coolant concentration of 50% is needed, drain all the coolant and refill with the undiluted solution only.



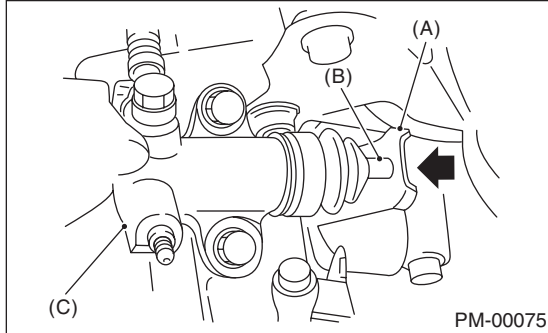
Clutch System

PERIODIC MAINTENANCE SERVICES

13. Clutch System

A: INSPECTION AND ADJUSTMENT

1) Push the release lever to retract the push rod of the operating cylinder and check if the fluid level in the clutch reservoir tank rises.



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

2) If the fluid level rises, pedal free play is correct.
3) If the fluid level does not rise, or the push rod cannot be retracted, adjust the clutch pedal. <Ref. to CL-25, Clutch Pedal.>

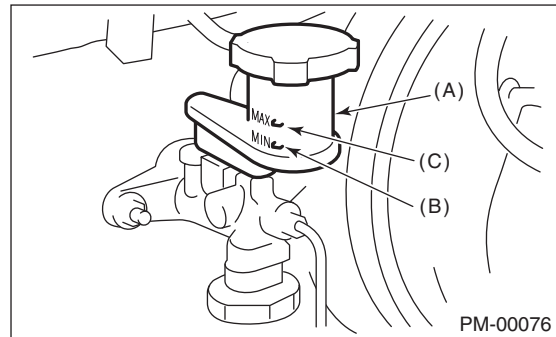
4) Check the fluid level using the scale on the outside of the clutch reservoir tank (A). If the level is below "MIN" (B), inspect the clutch master cylinder, operating cylinder and hydraulic line for fluid leaks. If fluid leaks are found, repair or replace. If fluid leaks are not found, add clutch fluid to bring it up to "MAX" (C) of clutch reservoir tank.

Recommended clutch fluid:

FMVSS No. 116, New part DOT3 or DOT4 brake fluid

CAUTION:

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



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

14. Transmission Gear Oil

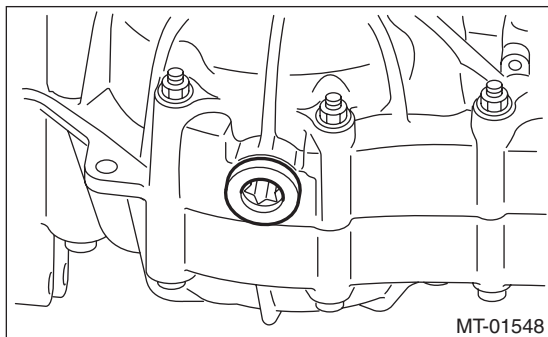
A: REPLACEMENT

1. MANUAL TRANSMISSION

1) Drain the gear oil by removing drain plug.

CAUTION:

- Before starting work, cool off the transmission gear oil well.
- If transmission gear oil adheres to the exhaust pipe, wipe it off completely.



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

Tightening torque:

Copper gasket

70 N·m (7.1 kgf-m, 51.6 ft-lb)

Aluminum gasket

44 N·m (4.5 kgf-m, 32.5 ft-lb)

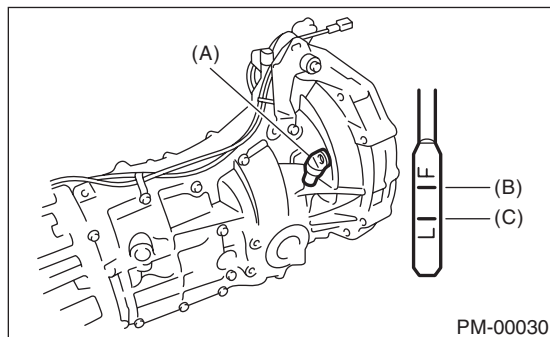
3) Fill the transmission gear oil through the oil level gauge hole up to the upper point of level gauge.

CAUTION:

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

Gear oil capacity:

3.5 ℓ (3.7 US qt, 3.1 Imp qt)



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

15.Hill-holder System

A: INSPECTION AND ADJUSTMENT

1) Move the hill holder up an inclination of more than 3° to confirm the stopping and starting functions.

(1) When the vehicle does not stop:

Tighten the PHV cable adjustment nuts.

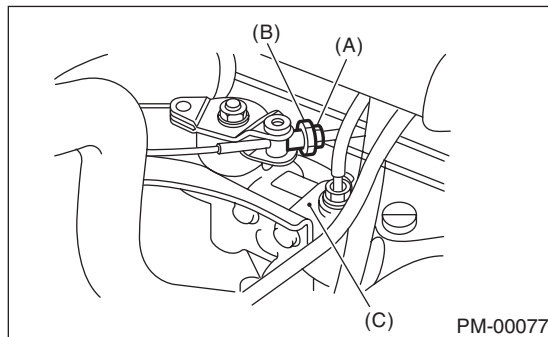
(2) When the vehicle does not start:

A: When the hill holder is released later than engagement of clutch (engine tends to stall): Loosen the adjusting nut gradually until smooth starting is enabled.

B: When the hill holder is released earlier than engagement to clutch (vehicle slips down slightly): Tighten the adjusting nut so that hill holder is released later than engagement of clutch (status in A). Then make adjustment the same as in A.

CAUTION:

- When turning the adjusting nuts, use a pliers to hold the inner cable to prevent over-turning.
- Replace the pressure hold valve (PHV) or PHV cable with new parts if there is a problem or damage.



- (A) Lock nut
- (B) Adjusting nut
- (C) Pressure hold valve

16.ATF

A: INSPECTION

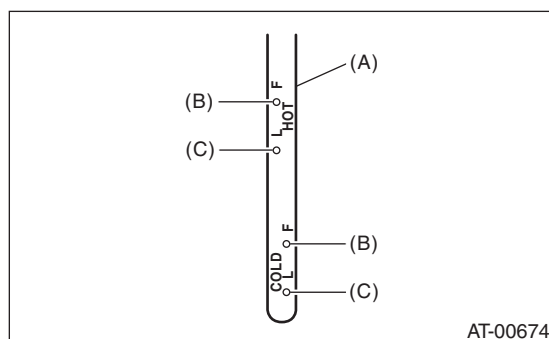
NOTE:

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

1) Raise the ATF temperature by driving a distance of 5 — 10 km (3 — 6 miles). Otherwise, idle the engine to raise ATF temperature to 70 — 80°C (158 — 176°F) on Subaru Select Monitor. <Ref. to 4AT(diag)-16, READ CURRENT DATA, OPERATION, Subaru Select Monitor.>

2) Make sure the vehicle is level.

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



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

4) Make sure that ATF level is between the upper level and lower level on the HOT side.

If the ATF level is below the lower level, check for leaks in the transmission. If there are leaks, it is necessary to replace the gasket, oil seals, plugs, or repair other parts.

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

CAUTION:

- Be careful not to exceed the upper level.
- Adding ATF up to the upper level when the transmission is cold will overfill the ATF. Do not fill beyond the upper level as overfilling can cause problems.

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

B: REPLACEMENT

1. ATF

- 1) Lift up the vehicle.
- 2) Drain the ATF completely.

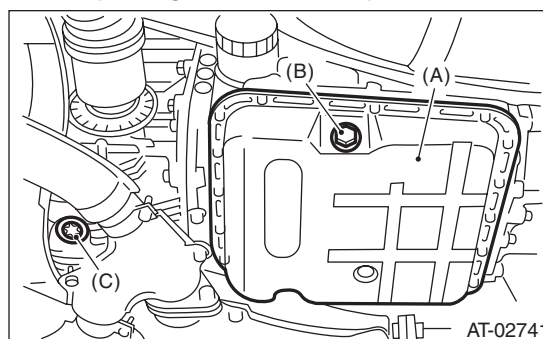
CAUTION:

After running the engine or after idling for a long time, the ATF is hot. Be careful not to burn yourself.

3) Replace the gasket with new part, and then tighten the drain plug (ATF).

Tightening torque:

25 N·m (2.5 kgf-m, 18.1 ft-lb)



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

- 4) Lower the vehicle.
- 5) Fill ATF from the oil charger pipe.

Recommended fluid:

SUBARU ATF

Capacity:

Fill with the same amount of ATF that was drained from drain plug hole.

Capacity when transmission is overhauled:

9.3 — 9.6 ℓ (9.8 — 10.1 US qt, 8.2 — 8.4 Imp qt)

- 6) Bleed the air of control valve.
<Ref. to 4AT-61, Air Bleeding of Control Valve.>
- 7) Check the level and leaks of ATF.
<Ref. to 4AT-28, INSPECTION, Automatic Transmission Fluid.>

2. ATF FILTER

NOTE:

- The ATF filter is maintenance free.
- ATF filter needs replacement when it is physically damaged or ATF leaked.
- For the replacement procedure of ATF filter, refer to "ATF FILTER". <Ref. to 4AT-63, ATF Filter.>

Front & Rear Differential Gear Oil

PERIODIC MAINTENANCE SERVICES

17. Front & Rear Differential Gear Oil

A: REPLACEMENT

1. FRONT DIFFERENTIAL (MT MODEL)

For MT model, differential oil works as manual transmission oil to lubricate differential. <Ref. to PM-23, Transmission Gear Oil.>

2. FRONT DIFFERENTIAL (AT MODEL)

- 1) Lift up the vehicle.
- 2) Remove the differential gear oil drain plug using TORX® bit T70, and drain the differential gear oil completely.

CAUTION:

- Immediately after the vehicle has been running, the differential gear oil is very hot. Be careful not to burn yourself.
 - Be careful not to spill differential gear oil on the exhaust pipe to prevent it from emitting smoke or causing a fire. If differential gear oil is spilled on the exhaust pipe, wipe it off completely.
- 3) Replace the gasket with a new part and tighten the differential gear oil drain plug using the TORX® bit T70.

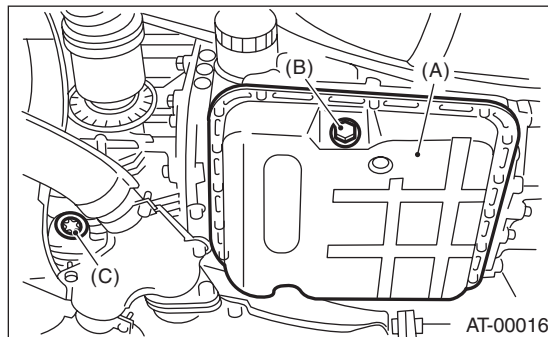
Tightening torque:

Aluminum gasket

44 N·m (4.5 kgf-m, 32.5 ft-lb)

Copper gasket

70 N·m (7.1 kgf-m, 51.6 ft-lb)



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

- 4) Lower the vehicle.
- 5) Pour differential gear oil from the gauge hole into the differential.

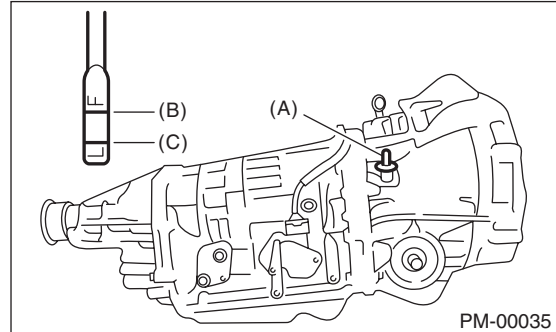
Recommended gear oil:

<Ref. to 4AT-3, SPECIFICATION, General Description.>

- 6) Check the level of differential gear oil.
<Ref. to 4AT-30, INSPECTION, Differential Gear Oil.>

Gear oil capacity:

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



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

3. REAR DIFFERENTIAL

- 1) Remove the drain plug, and drain the differential gear oil.
- 2) Remove the filler plug for quick draining oil.
- 3) Install the drain plug after draining oil.

NOTE:

Apply liquid gasket to the drain plug threads.

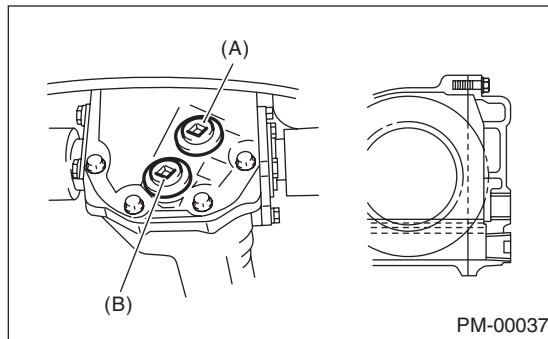
Liquid gasket:

THREE BOND 1105 (Part No. 004403010)

Tightening torque:

49.0 N·m (5.0 kgf-m, 36.2 ft-lb)

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



(A) Filler plug

(B) Drain plug

Oil capacity:

0.8 ℓ (0.8 US qt, 0.7 Imp qt)

NOTE:

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

CAUTION:

If the gear oil spilled on the exhaust pipe, wipe it off completely.

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

NOTE:

Apply liquid gasket to the threads of the filler plug screws.

Liquid gasket:

THREE BOND 1105 (Part No. 004403010)

Tightening torque:

49.0 N·m (5.0 kgf-m, 36.2 ft-lb)

18.Brake Line

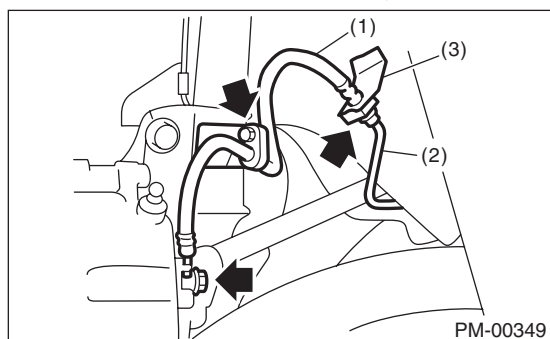
A: INSPECTION

1. BRAKE LINE

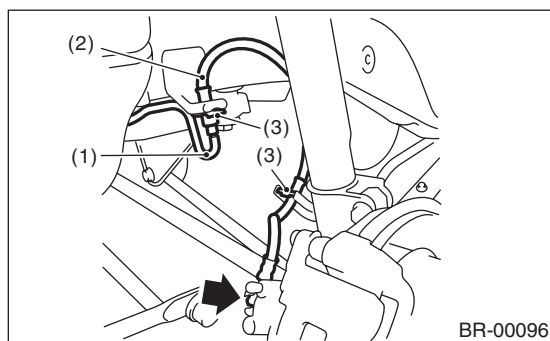
- 1) Check for scratches, swelling, corrosion, traces of fluid leakage on the brake hoses or pipe joints.
- 2) Check the possibility of adjacent parts interfering with brake pipes/hoses during driving, and loose connections/clamps.
- 3) Check any trace of fluid leakage, scratches, etc. on master cylinder,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



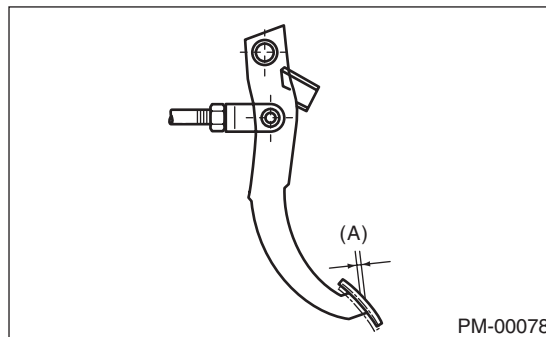
- (1) Brake pipe
- (2) Rear brake hose
- (3) Clamp

2. SERVICE BRAKE

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

Brake pedal free play:

0.5 — 2.0 mm (0.02 — 0.08 in)



(A) Pedal free play

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

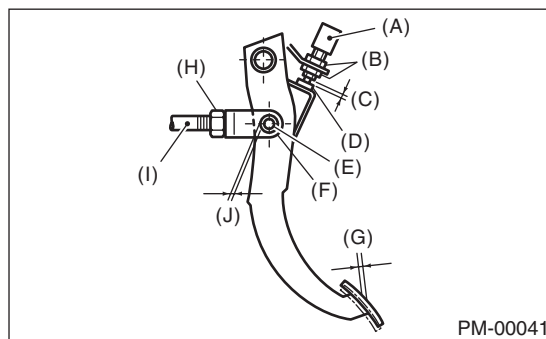
(1) Make sure the engine is off. (No vacuum is applied to brake booster.)

(2) Inspect that there is play between brake booster clevis and pin at brake pedal installing portion.

[Depress brake pedal pad with a force of less than 10 N (1 kgf, 2 lb) to a stroke of 0.5 to 2.0 mm (0.02 to 0.08 in).]

(3) Depress the surface of brake pad by hand.

(4) 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 0.3 mm (0.012 in).



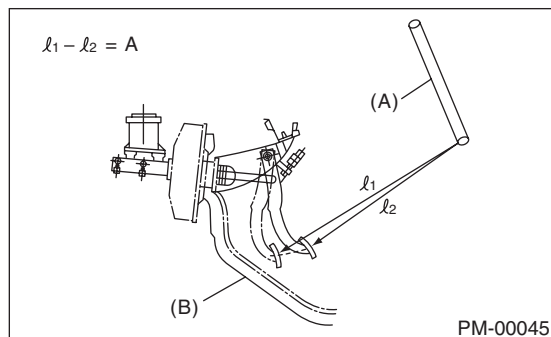
- (A) Brake switch
- (B) Adjusting nut
- (C) 0.3 mm (0.012 in)
- (D) Stopper
- (E) Clevis pin
- (F) Clevis
- (G) Pedal free play
- (H) Lock nut
- (I) Brake booster operating rod
- (J) Play at pin

3) Check the pedal stroke.

While the engine is idling, depress the brake pedal with a 490 N (50 kgf, 110 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

105 mm (4.13 in) or less/ 490 N (50 kgf, 110 lb)



- (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.

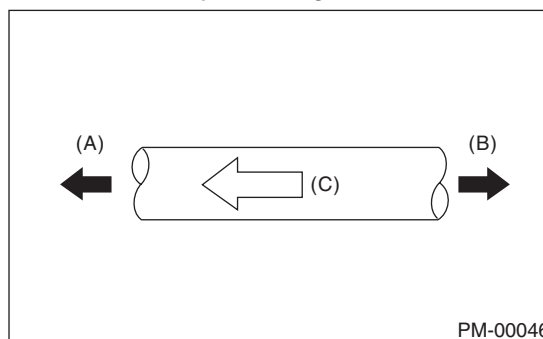
2) With the brake pedal depressed, start the engine. Check that the pedal moves slightly toward the floor.

3) With the brake pedal depressed, stop the engine and keep the pedal depressed for 30 seconds. Check that the pedal height does not change.

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

Blow air into vacuum hose from its brake booster side. Check that the air flows out to the engine side of the air hose. Next blow air into hose from engine side: Check that the air does not flow out to the brake booster side.

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



- (A) Engine side
- (B) Brake booster side
- (C) ENG

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

CAUTION:

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

6) Check that the vacuum hose is securely mounted.

19.Brake Fluid

A: INSPECTION

1) Check that the brake fluid level remains between MIN and MAX. If out of the specified range, refill or drain fluid. If the fluid level becomes close to MIN, check the brake pad for wear and refill fluid.

CAUTION:

If the brake fluid spilled on the exhaust pipe, wipe it off completely.

2) Check the fluid for discoloration. If the fluid color has excessively changed, drain the fluid and refill with new fluid.

B: REPLACEMENT

CAUTION:

- Do not let brake fluid come into contact with the painted surface of the vehicle body. Wash away with water immediately and wipe off if it is spilled by accident.
- Avoid mixing brake fluid of different brands to prevent fluid performance from degrading.
- Be careful not to allow dirt or dust to enter into reservoir tank.

NOTE:

- While working, keep the reservoir tank filled with brake fluid to eliminate entry of air.
 - Operate the brake pedal slowly.
 - For convenience and safety, perform work with 2 people.
 - The required amount of brake fluid is approximately 500 mℓ (16.9 US fl oz, 17.6 Imp fl oz) for entire brake system.
- 1) Lift up the vehicle and set rigid racks at the specified locations, or keep the vehicle lifted.
 - 2) Remove both the front and rear wheels.
 - 3) Drain the brake fluid from the reservoir tank.
 - 4) Refill the reservoir tank with recommended brake fluid.

Recommended brake fluid:

Refer to SPECIFICATION of General Description. <Ref. to BR-2, SPECIFICATION, General Description.>

Repeat the same procedure as for bleeding air from the brake line, until new brake fluid comes out from vinyl tube. <Ref. to BR-43, PROCEDURE, Air Bleeding.>

20.Disc Brake Pad and Disc

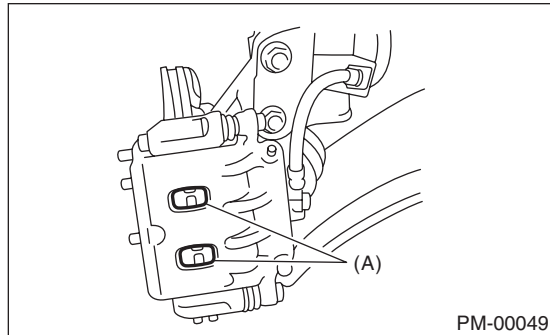
A: INSPECTION

1. DISC BRAKE PADS AND DISCS

- 1) Lift up the vehicle, and remove the wheels.
- 2) Visually check the pad thickness through inspection hole of disc brake assembly. Replace the pad if necessary.

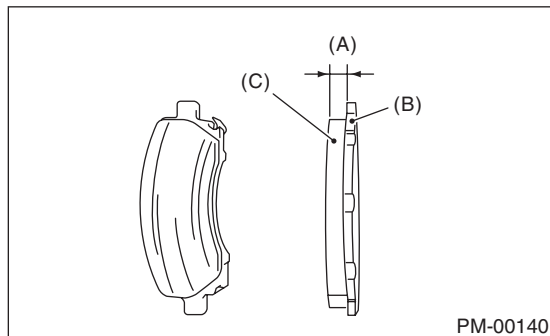
CAUTION:

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

Pad thickness	mm (in)	
	Front	Rear
Standard	11 (0.43)	9 (0.35)
Wear limit	1.5 (0.059)	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.

Brake disc thickness	mm (in)	
	Front	Rear
Standard	24 (0.94)	10 (0.39)
Wear limit	22 (0.87)	8.5 (0.335)

- 4) Remove the caliper body. <Ref. to BR-18, Front Disc Brake Assembly.> <Ref. to BR-25, Rear Disc Brake Assembly.>

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

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

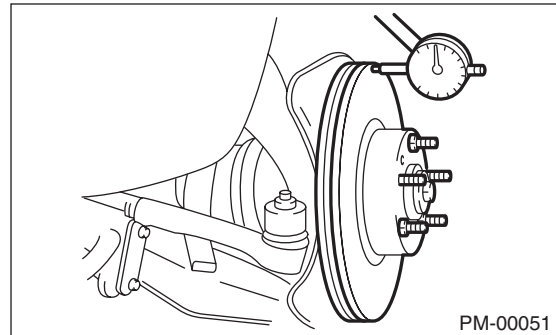
Disc rotor runout limit:

Front

0.075 mm (0.0030 in)

Rear

0.070 mm (0.0028 in)



Brake Lining and Drum

PERIODIC MAINTENANCE SERVICES

21.Brake Lining and Drum

A: INSPECTION

1. REAR DRUM BRAKE

1) Remove the brake drum and check for fluid leaks from the wheel cylinder.

If fluid leaks are found in the wheel cylinder, check the wheel cylinder and repair or replace it.

2) Inspect the brake shoes for damage or deformation and check the brake linings for wear beyond limit values.

CAUTION:

- Always replace the wheel leading and trailing brake shoes for the left and right wheels at the same time.
- When replacing either the left or the right brake assembly, always replace the leading shoe and the trailing shoe of one side.

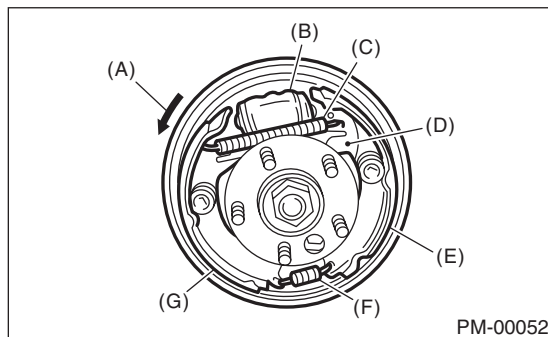
Thickness of lining (except for back metal)

Standard:

4.1 mm (0.161 in)

Service limit:

1.5 mm (0.059 in)



- (A) Direction of drum rotation (Forward)
- (B) Wheel cylinder
- (C) Upper shoe return spring
- (D) Adjusting lever
- (E) Trailing shoe
- (F) Lower shoe return spring
- (G) Leading shoe

3) Check the brake drum for wear, dents or other damage.

If the inside surface of brake drum is streaked, correct the surface with emery cloth (#200 or more). If it is unevenly worn or tapered, or the outer surface of the brake drum is damaged, repair or replace it.

Brake drum inside diameter:

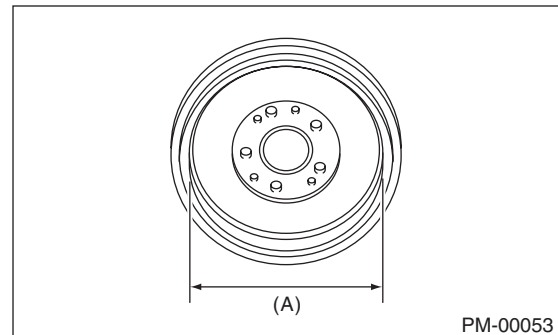
Standard:

228.6 mm (9.000 in)

Service limit:

230.6 mm (9.079 in)

If the deformation or wear of back plate, shoe, etc. is noticeable, replace problem parts.



(A) Inside diameter

2. PARKING BRAKE (REAR DISC BRAKE)

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 beyond limit values.

CAUTION:

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

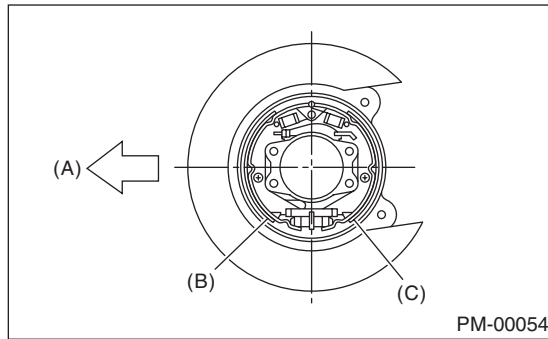
Thickness of brake lining (except for back metal):

Standard:

3.2 mm (0.126 in)

Service 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.

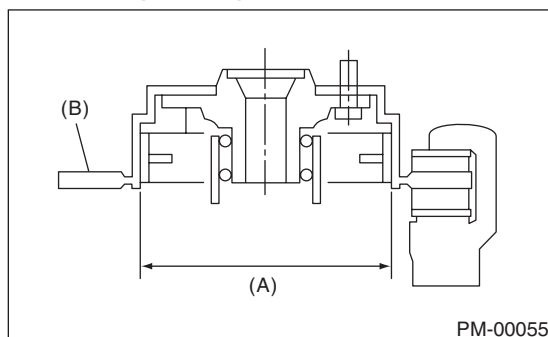
Brake drum inside diameter:

Standard:

170 mm (6.69 in)

Service limit:

171 mm (6.73 in)



(A) Inside diameter

(B) Disc

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

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

B: ADJUSTMENT

1. REAR DRUM BRAKE

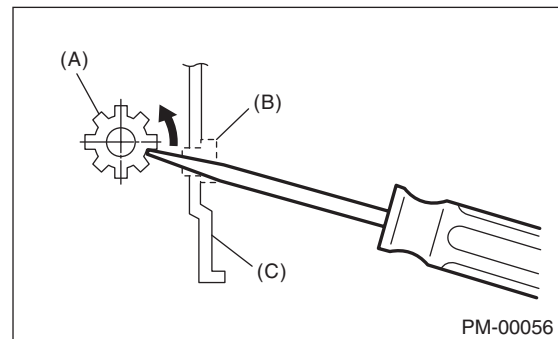
The main brake automatically adjusts itself, so no adjustments are needed.

2. PARKING BRAKE (REAR DISC BRAKE)

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

1) Remove the rear cover (rubber) installed at back plate.

2) 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) Rear cover (rubber)

(C) Back plate

3) Turn back (downward) the adjuster 3 to 4 notches.

4) Install the rear cover (rubber) in original position correctly.

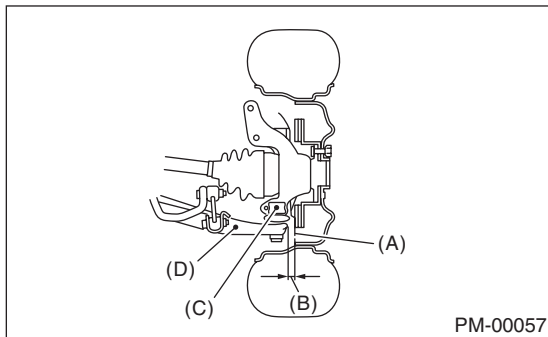
22. Suspension

A: INSPECTION

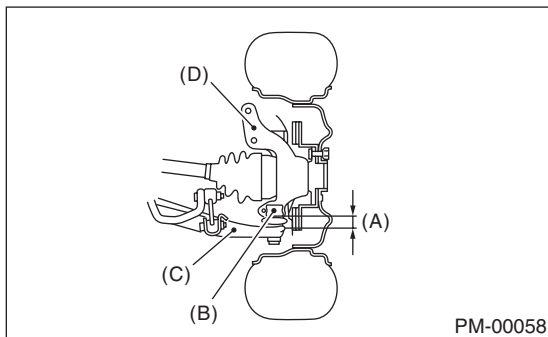
1. SUSPENSION BALL JOINT

1) Lift up the vehicle until front wheels are off ground.

2) Grasp the bottom of tire and move it in and out. If relative movement (B) is observed between the brake disc cover (A) and end of transverse link (D), ball joint (C) may be excessively worn.



3) Next, grasp the end of transverse link (C) and move it up and down. Relative movement (A) between the housing (D) and transverse link (C) boss indicates ball joint (B) may be excessively worn.



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

5) Damage of dust seal

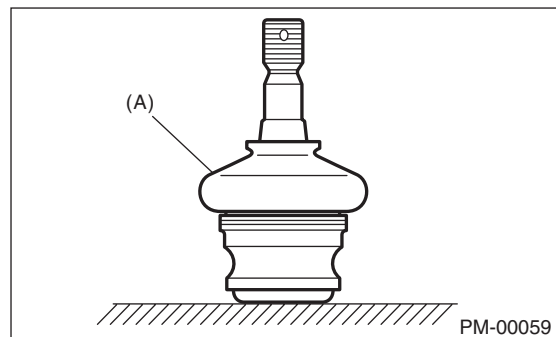
Visually inspect the ball joint dust seal. When there is damage, remove the transverse link to measure the play of ball joint. <Ref. to FS-15, Front Transverse Link.> <Ref. to FS-17, Front Ball Joint.>

(1) When looseness exceeds standard value, replace the ball joint.

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

NOTE:

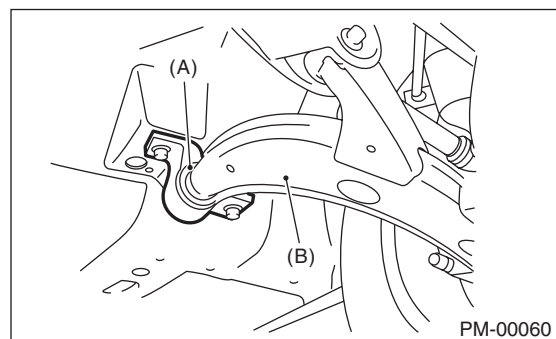
When the transverse link ball joint has been removed or replaced, check the toe-in of front wheel. If it is not within the specified value, adjust the toe-in. <Ref. to FS-6, Wheel Alignment.>



(A) Dust seal

2. TRANSVERSE LINK REAR BUSHING

Check around the rear bushing for oil leaks. If oil leaks, replace bushing.



(A) Rear bushing

(B) Transverse link

3. WHEEL ARCH HEIGHT

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

2) Then, check the wheel arch height of front and rear suspensions to ensure that they are within specified values. <Ref. to FS-6, Wheel Alignment.>

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

- Suspension components [Front strut assembly and rear strut 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-6, Wheel Alignment.> <Ref. to RS-7, Wheel Alignment.>

4. WHEEL ALIGNMENT OF FRONT SUSPENSION

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

- Toe-in
- Camber
- Caster
- Steering angle

<Ref. to FS-6, Wheel Alignment.>

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

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

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

4) If steering is not within the specified value, adjust it to standard value.

5. WHEEL ALIGNMENT OF REAR SUSPENSION

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

- Toe-in
- Camber
- Thrust angle

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

2) When the camber is out of the tolerance value, visually inspect the following components and replace deformed parts.

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

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

6. OIL LEAKAGE OF STRUT

Visually inspect the front strut and rear strut for oil leakage. If there is a bad oil leak, replace the front strut and rear strut.

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, pitting, etc. are noted, remove the rust and take rust prevention measure.

- Front suspension
 - Transverse link
 - Crossmember
 - Strut
- Rear suspension
 - Crossmember
 - Lateral link
 - Trailing link
 - Strut
- 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. Also, take rust prevention measure as required.

23. Wheel Bearing

A: INSPECTION

1. FRONT WHEEL BEARING

NOTE:

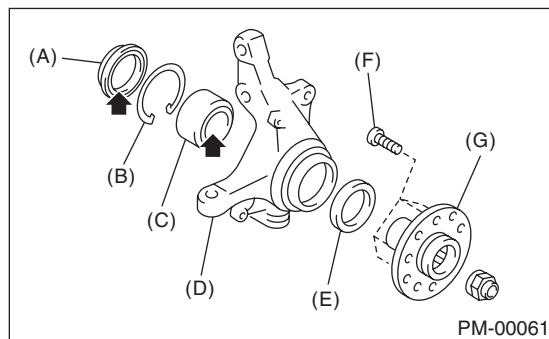
Inspect the condition of front wheel bearing grease.

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

Service limit:

0.05 mm (0.0020 in) Max.

- 5) Remove the bolts and self-locking nuts, and extract transverse link from the front crossmember.
 - 6) Remove the AARi of front drive shaft from transmission. <Ref. to DS-17, Front Axle.>
 - 7) While supporting the front drive shaft horizontally with one hand, turn the hub with the other hand to check for noise or binding.
- If the hub is noisy or binds, disassemble the front axle and replace the oil seals or bearing.



- (A) Inner oil seal
- (B) Snap ring
- (C) Bearing
- (D) Housing
- (E) Outer oil seal
- (F) Hub bolt
- (G) Hub

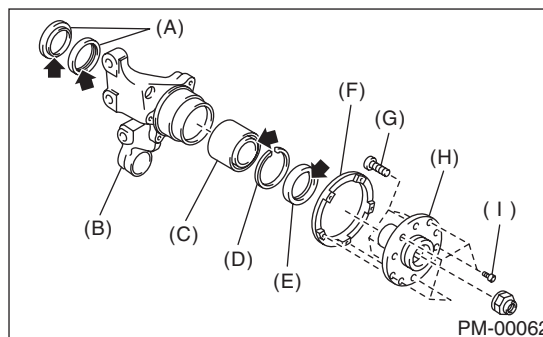
2. REAR WHEEL BEARING

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

Service limit:

0.05 mm (0.0020 in) Max.

- 5) Remove the DOJ of rear drive shaft from rear differential. <Ref. to DS-36, Rear Drive Shaft.>
 - 6) While supporting rear drive shaft horizontally with one hand, turn the hub COMPL with the other to check for noise or binding.
- If the hub COMPL is noisy or binds, disassemble the rear axle and replace the oil seals or bearing.



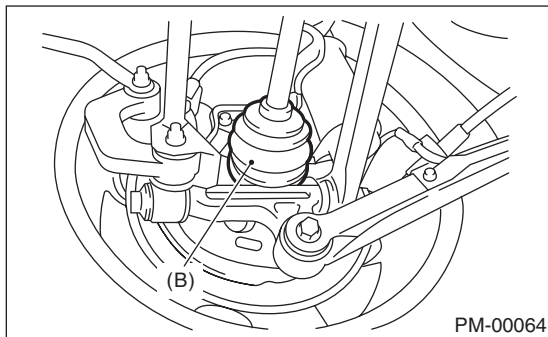
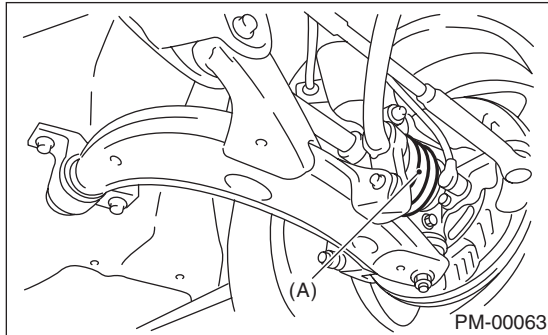
- (A) Inner oil seal
- (B) Rear housing
- (C) Bearing
- (D) Snap ring
- (E) Outer oil seal
- (F) Tone wheel
- (G) Hub bolt
- (H) Hub
- (I) Socket bolt

24. Axle Boots & Joints

A: INSPECTION

1. FRONT AND REAR AXLE BOOTS

Inspect the front axle boots (A) and rear axle boots (B) for deformation, damage or failure. If faulty, replace with new part. <Ref. to DS-30, Front Drive Shaft.> <Ref. to DS-36, Rear Drive Shaft.>



2. PROPELLER SHAFT

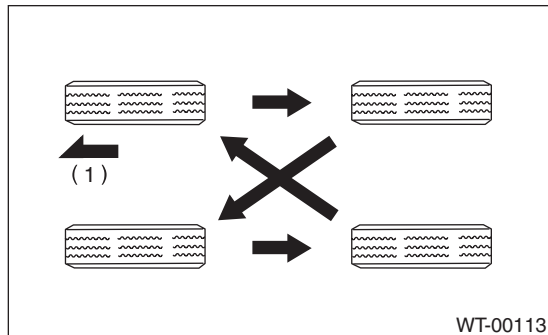
Inspect the propeller shaft for damage or failure. If faulty, replace with new part. <Ref. to DS-13, Propeller Shaft.>

25. Tire Rotation

A: INSPECTION

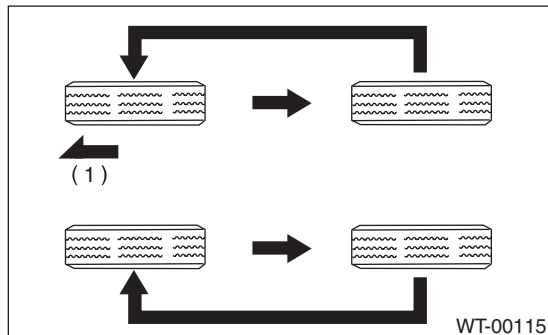
- 1) When the tread has worn down to less than 1.6 mm (0.063 in) or the wear indicator appears across the tread, replace the tire. (Replace the right and left tire as a set.)
- 2) If the tire appears to be worn unevenly, adjust the wheel alignment.
- 3) Next, make a tire rotation between front and rear as shown in the figure, to make sure that tires are worn evenly.

- When the direction of tire rotation is not specified

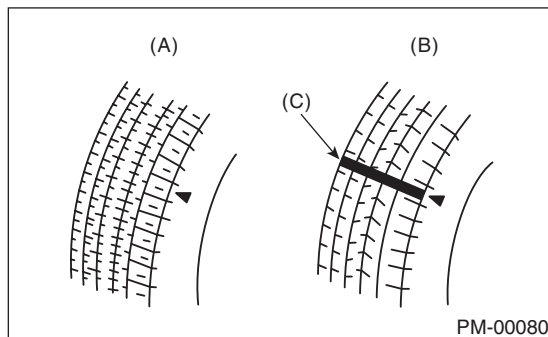


(1) Front

- When the direction of tire rotation is specified



(1) Front



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

26. Steering System (Power Steering)

A: INSPECTION

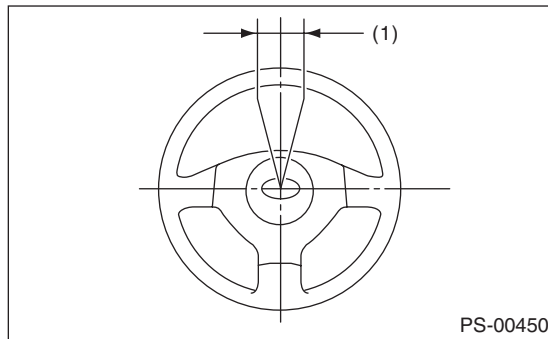
1. STEERING WHEEL

- 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 (outer periphery).

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 check if there is play in the direction.

Limit of play:

0.5 mm (0.020 in)

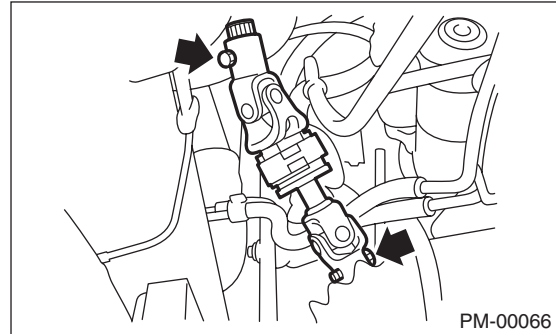
- 3) Drive the vehicle and check the following items.
 - (1) Steering force:
The effort required for steering should be smooth and even at all points, and should not vary.
 - (2) Pulled to one side:
Steering wheel should not be pulled to either side while driving on a level surface.
 - (3) Wheel runout:
Steering wheel should not show any sign of runout.
 - (4) Return shape:
The steering wheel should return to its original position after it has been turned by hand 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, 17.4 ft-lb)



Steering System (Power Steering)

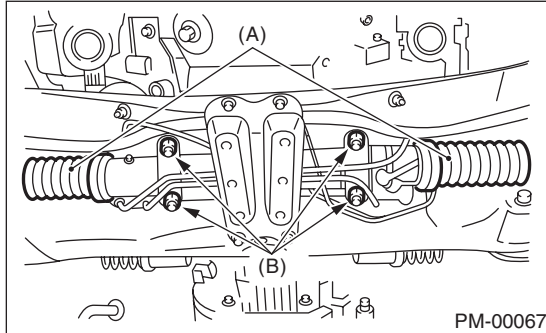
PERIODIC MAINTENANCE SERVICES

3. GEARBOX

1) Set the steering wheel in the straight position, then rotate it 90° in both the left and right directions. While steering wheel is being rotated, check the looseness of the gear box.

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)



(A) Boot

(B) Gearbox mounting bolt

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

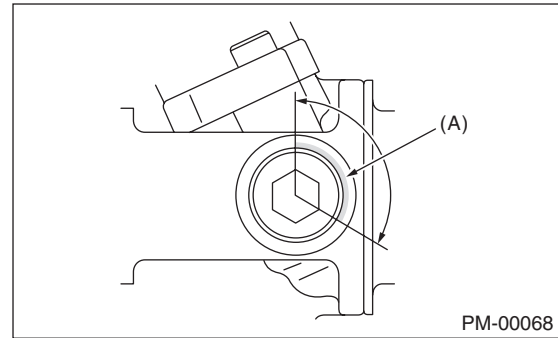
3) With the vehicle stopped on a level surface, quickly turn the steering wheel to the left and right. While steering wheel is being rotated, check the gear backlash. If any noise is noticed, adjust the gear backlash in the following manner.

(1) Tighten the adjusting screw to 9.8 N·m (0.99 kgf-m, 7.2 ft-lb) and then loosen.

(2) Tighten the adjusting screw to 4.9 N·m (0.49 kgf-m, 3.6 ft-lb) and then loosen.

(3) Tighten the adjusting screw to 4.9 N·m (0.49 kgf-m, 3.6 ft-lb) and then loosen 26°.

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



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

(5) Install the lock nut. While holding the adjusting screw with a wrench, tighten the lock nut using ST.

ST 926230000 SPANNER

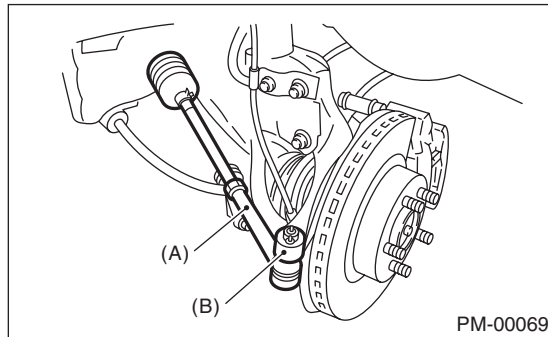
Tightening torque (lock nut):

39 N·m (4.0 kgf-m, 29 ft-lb)

Hold the adjusting screw with a 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 the knuckle ball joints for play, inspect for damage on dust seals, and check that there is no free play in the ball studs. If castle nut is loose, retighten it to the specified torque, then tighten further up to a maximum of 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 end for tightness. If it is loose, retighten it to the specified value.

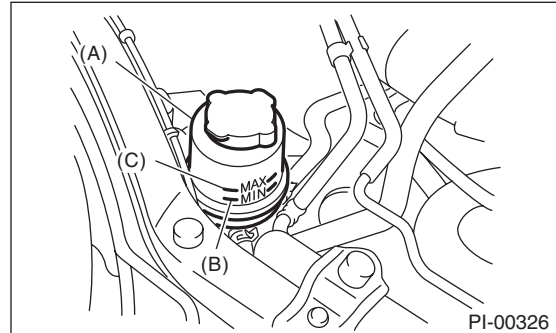
Tightening torque:

83 N·m (8.5 kgf-m, 61.5 ft-lb)

5. POWER STEERING FLUID LEVEL

NOTE:

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



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:

DEXRON III

Fluid capacity:

0.7 ℓ (0.7 US qt, 0.6 Imp qt)

6. POWER STEERING FLUID FOR LEAKS

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

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

CAUTION:

- Be careful not to spill the power steering fluid on exhaust pipe, to prevent causing a fire. If the power steering fluid spilled, wipe it off completely.
- Also pay attention to interference between hoses or pipes and other parts when inspecting fluid leaks.

Steering System (Power Steering)

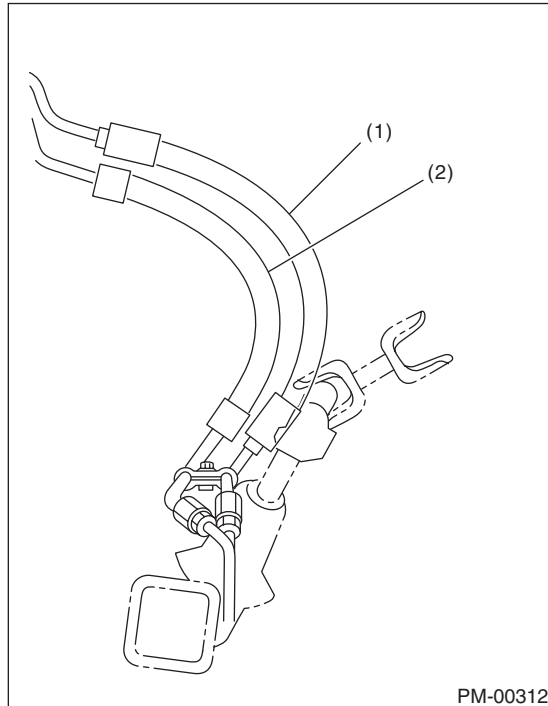
PERIODIC MAINTENANCE SERVICES

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.

CAUTION:

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



- (1) Pressure hose
- (2) Return hose

8. POWER STEERING PIPES FOR DAMAGES

Check the power steering pipes for corrosion and damage.

Replace the pipes with new parts if necessary.

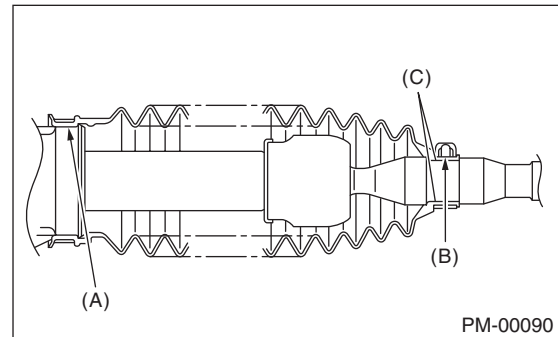
9. GEARBOX BOOTS

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

- 1) The (A) and (B) positions of the gearbox boot are fitted in (A) and (C) grooves of gearbox and the rod.
- 2) Clips are fitted outside of positions (A) and (B) of boot.
- 3) Check that there is no cracks or holes in the boot.

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

NOTE:

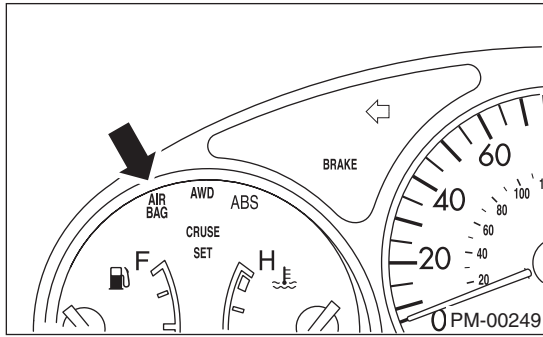
Inspect and/or retighten the bolts and nuts when the engine is cold.

27. Airbag System

A: INSPECTION

Check the airbag system according to the results of the self-diagnosis. <Ref. to AB(diag)-2, Basic Diagnostic Procedure.>

1) Make sure the airbag connector is connected. If not connected, connect correctly. When disconnected, and the ignition switch is ON, a problem occurs and the airbag warning light blinks.



2) Turn on the ignition switch and connect the service connector airbag diagnostics terminal (mounted below the lower cover) to the ground terminal.

3) The warning light blinks and the DTC is displayed to identify the problem. When the airbag system is in good condition (when no trouble codes are stored in memory), the warning light blinks in 0.6 second intervals while the diagnostics terminal is connected to the ground terminal.

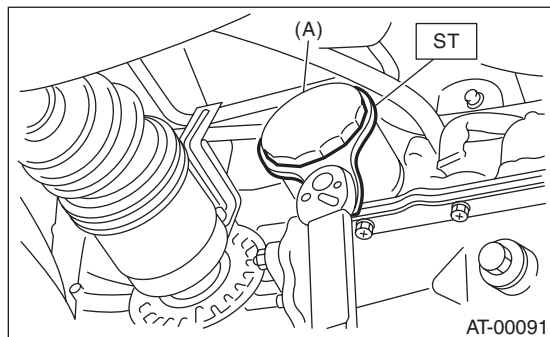
4) When the warning light displays the DTC, inspect the airbag system according to the diagnostic procedure. <Ref. to AB(diag)-2, Basic Diagnostic Procedure.>

28.ATF Filter

A: REMOVAL

- 1) Lift up the vehicle.
- 2) Using the ST, remove the ATF filter.

ST 498545400 OIL FILTER WRENCH



(A) ATF filter

B: INSTALLATION

- 1) Apply a thin coat of ATF to the oil seal part of new ATF filter.
- 2) Install the ATF filter. Turn it by hand, being careful not to damage oil seal.
- 3) Tighten the ATF filter using ST.

Calculate the ATF filter tightening torque using following formula.

Calculate the ATF filter tightening torque using following formula.

$$T2 = L2 / (L1 + L2) \times T1$$

T1: 14 N·m (1.4 kgf-m, 10.1 ft-lb)

[Required torque setting]

T2: Tightening torque

L1: ST length 78 mm (3.07 in)

L2: Torque wrench length

Example:

Torque wrench length mm (in)	Tightening torque N·m (kgf-m, ft-lb)
100 (3.94)	7.7 (0.79, 5.7)
150 (5.91)	9.0 (0.92, 6.7)
200 (7.87)	9.8 (1.0, 7.2)

NOTE:

Align the ST with the torque wrench while tightening the ATF filter.

ST 498545400 OIL FILTER WRENCH

- 4) Fill ATF.
- 5) Inspect the level of ATF. <Ref. to 4AT-28, Automatic Transmission Fluid.>

C: INSPECTION

- 1) Check for rust, holes, ATF leaks or other damage.
- 2) Replace the part if any damage is found in the inspection.