

1. Foreword

A: FOREWORD

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

Applicable model:

2011MY GE****, GH****

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

HOW TO USE THIS MANUALS

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1. How to Use This Manuals

A: HOW TO USE THIS MANUALS

1. STRUCTURE

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

2. CONTENTS

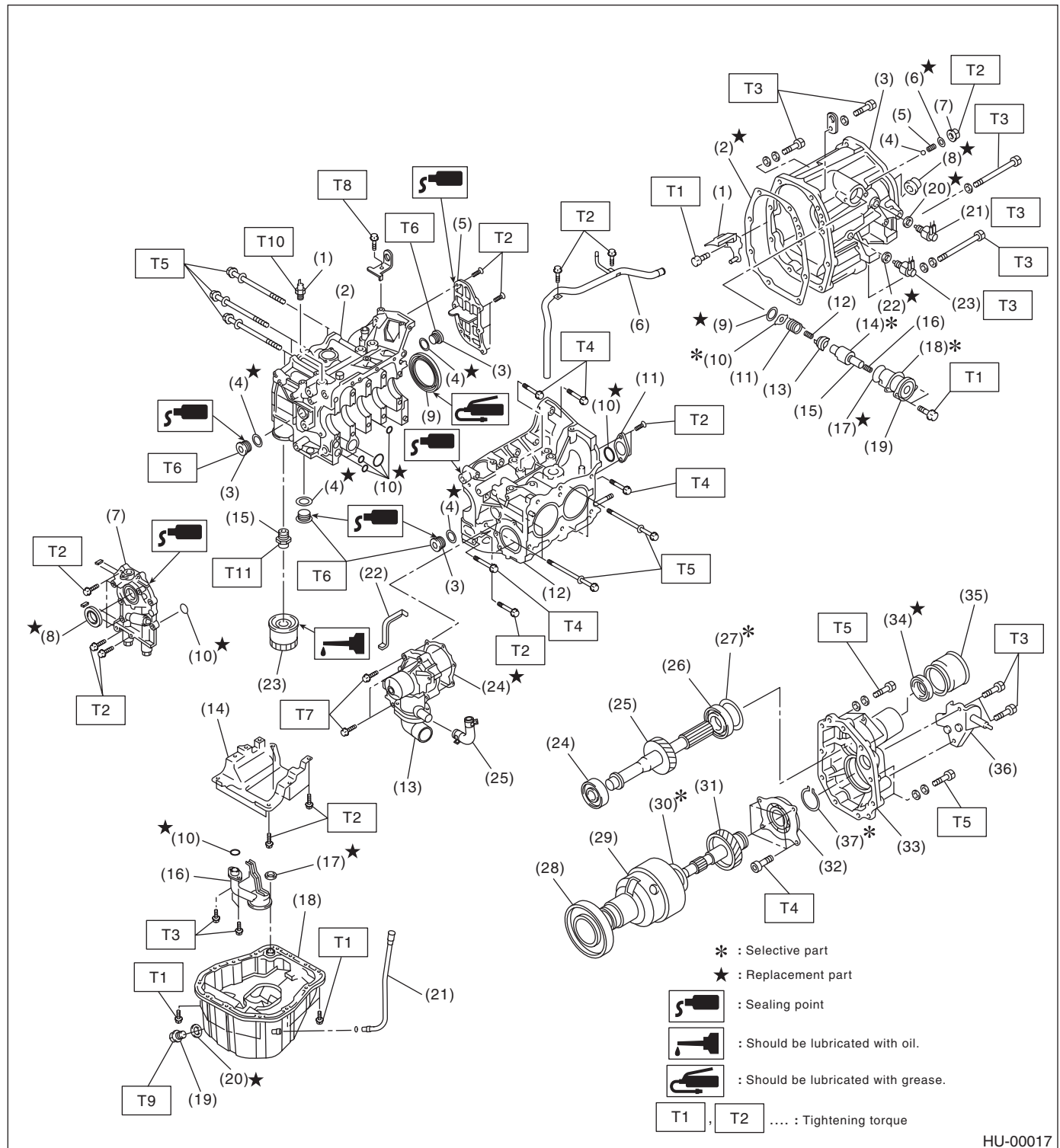
The first page has an index with tabs.

3. COMPONENT

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

To order parts, refer to parts catalogue.

Example:



HU-00017

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4. DEFINITIONS OF “NOTE”, “CAUTION”, AND “WARNING”

- **Note:**

The supplementary explanation to facilitate the work is described.

- **Caution:**

The matter that must not be performed because failure to follow the description causes damage to the vehicle or parts, and the one to which attention should be particularly paid during the work are described.

- **Warning:**

The matter that may seriously damage the worker or others and the one results in failures or accidents in case of failure to follow the description are described.

5. SPECIFICATIONS

If necessary, specifications are also included.

6. INSPECTION

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

7. 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 ← (A)

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.

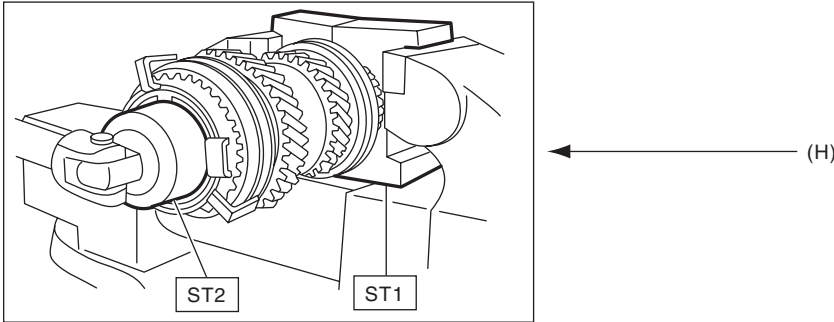
NOTE: ← (D)

Secure the lock nuts in two places after tightening.

ST1 498937000 TRANSMISSION HOLDER

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

Tightening torque:
120 N·m (12.2 kgf-m, 88.5 ft-lb) ← (G)



HU-00041

- | | | |
|---------------|---------------------------------|-----------------------|
| (A) Component | (D) Cautions | (G) Tightening torque |
| (B) Process | (E) Tool number of special tool | (H) Illustration |
| (C) Reference | (F) Name of special tool | |

8. DIAGNOSIS

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

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9. SI UNITS

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

Example:

Tightening torque:

45 N·m (4.6 kgf-m, 33.2 ft-lb)

SI unit list

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

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

10.EXPLANATION OF TERMINOLOGY

• List

AAI	: Air Assist Injection	HID	: High-Intensity Discharge
AAR	: Angular Adjusted Roller	H/U	: Hydraulic Unit
A/B	: Airbag	IG	: Ignition
ABS	: Anti-lock Brake System	IN	: Intake
A/C	: Air Conditioner	INT	: Intermittent
AC	: Angular Contact	I/O	: Input / Output
ACC	: Accessory	ISC	: Idle Speed Control
A/F	: Air Fuel Ratio	LAN	: Local Area Network
ALT	: Generator	LCD	: Liquid Crystal Display
ASSY	: Assembly	LED	: Light Emitting Diode
AT	: Automatic Transmission	LH	: LH (Left Hand)
ATF	: Automatic Transmission Fluid	LSD	: Limited Slip Differential
AVCS	: Active Valve Control System	M/B	: Main Fuse & Relay Box
AWD	: All Wheel Drive	MFI	: Multi-Point Fuel Injection
BATT	: Battery	MP-T	: Multi-Plate Transfer
BJ	: Bell Joint	MT	: Manual Transmission
CAN	: Controller Area Network	NA	: Natural Aspiration
CD	: Compact Disc	OP	: Option Parts
COMPL	: Complete	OBD	: On-Board Diagnosis
CPU	: Central Processing Unit	P/S	: Power Steering
DOHC	: Double Overhead Camshaft	P/W	: Power Window
DTC	: Diagnosis Trouble Code	PCV	: Positive Crankcase Ventilation
DOJ	: Double Offset Joint	PID	: Parameter Identification
DVD	: Digital Versatile Disc or Digital Video Disc	RAM	: Random Access Memory
EBD	: Electronic Brake Distribution	RH	: RH (Right Hand)
EBJ	: High-efficiency Compact Ball Fixed Joint	ROM	: Read Only Memory
EDJ	: High-efficiency Compact Double Offset Joint	rpm	: Revolution Per Minute
ECM	: Engine Control Module	SOHC	: Single Overhead Camshaft
EGI	: Electronic Gasoline Injection	SRS	: Supplemental Restraint System
E/G	: Engine	SSM	: Subaru Select Monitor
EGR	: Exhaust Gas Recirculation	ST	: Special Tool
EX	: Exhaust	SW	: Switch
ETC	: Electronic Throttle Control	TGV	: Tumble Generator Valve
F/B	: Fuse & Joint Box	VDC	: Vehicle Dynamics Control
FWD	: Front Wheel Drive	V.I.N.	: Vehicle Identification Number
GPS	: Global Positioning System	VTD	: Variable Torque Distribution

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SPECIFICATIONS

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Impreza

SPECIFICATIONS

1. Impreza

A: DIMENSION

Model		4 door	5 door	OUTBACK SPORT
Overall length		mm (in)	4,580 (180.3)	4,415 (173.8)
Overall width		mm (in)	1,740 (68.5)	
Overall height (at C.W.)		mm (in)	1,475 (58.1)	1,480 (58.3)
Compartment	Length	mm (in)	1,985 (78.1)	
	Width	mm (in)	1,475 (58.1)	
	Height	mm (in)	Model without sunroof: 1,200 (47.2) Model with sunroof: 1,170 (46.1)	
Wheelbase		mm (in)	2,620 (103.1)	
Tread	Front	mm (in)	1,495 (58.9)	1,490 (58.7)
	Rear	mm (in)	16 in wheel: 1,495 (58.9) 17 in wheel: 1,500 (59.1)	1,495 (58.9)
Minimum road clearance		mm (in)	155 (6.1)	160 (6.3)

B: ENGINE

Model		2.5 L
Engine type		Horizontally opposed, liquid cooled, 4-cylinder, 4-stroke gasoline engine
Valve arrangement		SOHC
Bore × stroke	mm (in)	99.5 × 79.0 (3.92 × 3.11)
Displacement	cm ³ (cu in)	2,457 (149.94)
Compression ratio		10.0
Ignition order		1 — 3 — 2 — 4
Idle speed at Park or Neutral position		rpm MT: 650 AT: 700
Maximum output		kW (HP)/rpm 127 (170)/6,000
Maximum torque		N·m (kgf-m, ft-lb)/rpm 230 (23.5, 170)/4,400

C: ELECTRICAL

Model		2.5 L
Ignition timing (at idling)		BTDC MT: 10°±8° AT: 15°±10°
Spark plug	Type and manufacturer	NGK: FR5AP-11
Generator		12 V — 90 A
Battery	Type and capacity (5HR)	AT: 12 V — 52 AH (65D23L) MT: 12 V — 48 AH (55D23L)
	CCA	430 A (65D23L) 390 A (55D23L)

D: TRANSMISSION

Model			2.5 L	
Transmission type			5MT	4AT
Clutch type			DSPD	TCC
Gear ratio		1st	3.454	2.785
		2nd	2.062	1.545
		3rd	1.448	1.000
		4th	1.088	0.694
		5th	0.780	—
		6th	—	—
		Reverse	3.333	2.272
Reduction gear (Front)	1st reduction	Type of gear	—	Helical
		Gear ratio	—	1.000
	Final reduction	Type of gear	Hypoid	Hypoid
		Gear ratio	3.900	4.111
Reduction gear (Rear)	Transfer reduction	Type of gear	Helical	—
		Gear ratio	1.000	—
	Final reduction	Type of gear	Hypoid	Hypoid
		Gear ratio	3.900	4.111

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

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

DSPD: Dry Single Plate Diaphragm

TCC: Torque Converter Clutch

E: STEERING

Type			Rack and pinion
Turns, lock to lock			2.8
Minimum turning diameter	m (ft)	Curb to curb	10.6 (34.8)
		Wall to wall	11.2 (36.7)

F: SUSPENSION

Front	Macpherson strut type suspension
Rear	Double-wishbone type suspension

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G: BRAKE

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

H: TIRE

Model	2.5i, 2.5i-S (16 in)	2.5i-S (17 in), OUTBACK SPORT
Rim size	16 × 6 ¹ / ₂ JJ	17 × 7JJ
Tire size	P205/55 R16 89V	P205/50 R17 88V
Type	Tubeless, Steel belted radial	

I: CAPACITY

Model			2.5 L	
			5MT	4AT
Fuel tank	ℓ (US gal, Imp gal)		64 (16.9, 14.1)	
Engine oil	Total capacity (at overhaul)	ℓ (US qt, Imp qt)	5.0 (5.3, 4.4)	
	When replacing engine oil and oil filter	ℓ (US qt, Imp qt)	4.2 (4.4, 3.7)	
	When replacing engine oil only	ℓ (US qt, Imp qt)	4.0 (4.2, 3.5)	
Transmission gear oil	ℓ (US qt, Imp qt)		3.5 (3.7, 3.1)	—
ATF	ℓ (US qt, Imp qt)		—	9.3 — 9.6 (9.8 — 10.1, 8.2 — 8.4)
Front differential gear oil	ℓ (US qt, Imp qt)		—	1.1 — 1.3 (1.2 — 1.4, 1.0 — 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)		6.8 (7.2, 6.0)	6.7 (7.1, 5.9)

J: WEIGHT

Model			4 door									
			2.5 i									
			MT							AT		
OP code			C0	U4	C0	U4	U4	U4	U4	C0	U4	C0
			FF	FF	KF	KF	KG	KE	UE	FF	FF	KF
Curb weight (C.W.)	Total	kg (lb)	1,395 (3,075)	1,395 (3,075)	1,385 (3,053)	1,385 (3,053)	1,405 (3,097)	1,405 (3,097)	1,405 (3,097)	1,425 (3,141)	1,425 (3,141)	1,415 (3,119)
	Front	kg (lb)	780 (1,719)	780 (1,719)	775 (1,708)	775 (1,708)	785 (1,730)	785 (1,730)	785 (1,730)	810 (1,785)	810 (1,785)	805 (1,774)
	Rear	kg (lb)	615 (1,356)	615 (1,356)	610 (1,345)	610 (1,345)	620 (1,367)	620 (1,367)	620 (1,367)	615 (1,356)	615 (1,356)	610 (1,345)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		—	—	○	○	○	○	○	—	—	○
	Cruise control		○	○	○	○	○	○	○	○	○	○
	Auto A/C		—	—	—	—	—	—	—	—	—	—
	Manual A/C		○	○	○	○	○	○	○	○	○	○
	Leather pack- age		—	—	○	○	○	○	○	—	—	○
	Genuine leather seat		—	—	—	—	—	—	—	—	—	—
	Premium audio		○	○	—	—	—	—	—	○	○	—
	High grade audio		—	—	○	○	○	○	—	—	—	○
	Navigation		—	—	—	—	—	—	○	—	—	—
	Satellite tuner		—	—	—	—	—	—	○	—	—	—
	Side airbag		○	○	○	○	○	○	○	○	○	○
	Curtain airbag		○	○	○	○	○	○	○	○	○	○
	VDC		○	○	○	○	○	○	○	○	○	○
	Front fog light		—	—	—	—	○	○	○	—	—	—
	Cold weather package		—	—	—	—	○	—	—	—	—	—
	Sunroof		—	—	—	—	○	○	○	—	—	—

Impreza

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Model			4 door								
			2.5 i				2.5 i-S				
			AT				MT		AT		
OP code			U4	U4	U4	U4	C0	C0	C0	C0	C4
			KF	KG	KE	UE	GG	IG	GG	IG	IG
Curb weight (C.W.)	Total	kg (lb)	1,415 (3,119)	1,435 (3,163)	1,435 (3,163)	1,435 (3,163)	1,420 (3,130)	1,415 (3,119)	1,450 (3,196)	1,445 (3,185)	1,450 (3,196)
	Front	kg (lb)	805 (1,774)	815 (1,796)	815 (1,796)	815 (1,796)	790 (1,741)	790 (1,741)	820 (1,807)	820 (1,807)	820 (1,807)
	Rear	kg (lb)	610 (1,345)	620 (1,367)	620 (1,367)	620 (1,367)	630 (1,389)	625 (1,378)	630 (1,389)	625 (1,378)	630 (1,389)
Gross vehicle weight (G.V.W.)			kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		○	○	○	○	○	○	○	○	○
	Cruise control		○	○	○	○	○	○	○	○	○
	Auto A/C		—	—	—	—	○	—	○	—	—
	Manual A/C		○	○	○	○	—	○	—	○	○
	Leather pack- age		○	○	○	○	○	○	○	○	○
	Genuine leather seat		—	—	—	—	○	—	○	—	—
	Premium audio		—	—	—	—	—	—	—	—	—
	High grade audio		○	○	○	—	○	○	○	○	○
	Navigation		—	—	—	○	—	—	—	—	—
	Satellite tuner		—	—	—	○	—	—	—	—	—
	Side airbag		○	○	○	○	○	○	○	○	○
	Curtain airbag		○	○	○	○	○	○	○	○	○
	VDC		○	○	○	○	○	○	○	○	○
	Front fog light		—	○	○	○	○	○	○	○	○
	Cold weather package		—	○	—	—	○	○	○	○	○
	Sunroof		—	○	○	○	○	○	○	○	○

Impreza

SPECIFICATIONS

Model			5 door											
			2.5 i											
			MT							AT				
OP code			C0	U4	C0	U4	U4	U4	U4	C0	U4	C0	U4	U4
			FF	FF	KF	KF	KG	KE	UE	FF	FF	KF	KF	KG
Curb weight (C.W.)	Total	kg (lb)	1,395 (3,075)	1,395 (3,075)	1,385 (3,053)	1,385 (3,053)	1,405 (3,097)	1,405 (3,097)	1,405 (3,097)	1,425 (3,141)	1,425 (3,141)	1,415 (3,119)	1,415 (3,119)	1,435 (3,163)
	Front	kg (lb)	780 (1,719)	780 (1,719)	775 (1,708)	775 (1,708)	785 (1,730)	785 (1,730)	785 (1,730)	810 (1,785)	810 (1,785)	805 (1,774)	805 (1,774)	815 (1,796)
	Rear	kg (lb)	615 (1,356)	615 (1,356)	610 (1,345)	610 (1,345)	620 (1,367)	620 (1,367)	620 (1,367)	615 (1,356)	615 (1,356)	610 (1,345)	610 (1,345)	620 (1,367)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		—	—	○	○	○	○	○	—	—	○	○	○
	Cruise control		○	○	○	○	○	○	○	○	○	○	○	○
	Auto A/C		—	—	—	—	—	—	—	—	—	—	—	—
	Manual A/C		○	○	○	○	○	○	○	○	○	○	○	○
	Leather pack-age		—	—	○	○	○	○	○	—	—	○	○	○
	Genuine leather seat		—	—	—	—	—	—	—	—	—	—	—	—
	Premium audio		○	○	—	—	—	—	—	○	○	—	—	—
	High grade audio		—	—	○	○	○	○	—	—	—	○	○	○
	Navigation		—	—	—	—	—	—	○	—	—	—	—	—
	Satellite tuner		—	—	—	—	—	—	○	—	—	—	—	—
	Side airbag		○	○	○	○	○	○	○	○	○	○	○	○
	Curtain air-bag		○	○	○	○	○	○	○	○	○	○	○	○
	VDC		○	○	○	○	○	○	○	○	○	○	○	○
	Front fog light		—	—	—	—	○	○	○	—	—	—	—	○
	Cold weather package		—	—	—	—	○	—	—	—	—	—	—	○
	Sunroof		—	—	—	—	○	○	○	—	—	—	—	○

Impreza

SPECIFICATIONS

Model			5 door										
			2.5 i		2.5 i-S					OUTBACK SPORT			
			AT		MT		AT			MT		AT	
OP code			U4	U4	C0	C0	C0	C0	C4	U4	U4	U4	U4
			KE	UE	GG	IG	GG	IG	IG	KJ	KG	KJ	KG
Curb weight (C.W.)	Total	kg (lb)	1,435 (3,163)	1,435 (3,163)	1,420 (3,130)	1,415 (3,119)	1,450 (3,196)	1,445 (3,185)	1,450 (3,196)	1,410 (3,108)	1,430 (3,152)	1,440 (3,174)	1,460 (3,218)
	Front	kg (lb)	815 (1,796)	815 (1,796)	790 (1,741)	790 (1,741)	820 (1,807)	820 (1,807)	820 (1,807)	790 (1,741)	800 (1,763)	820 (1,807)	830 (1,829)
	Rear	kg (lb)	620 (1,367)	620 (1,367)	630 (1,389)	625 (1,378)	630 (1,389)	625 (1,378)	630 (1,389)	620 (1,367)	630 (1,389)	620 (1,367)	630 (1,389)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		○	○	○	○	○	○	○	○	○	○	○
	Cruise control		○	○	○	○	○	○	○	○	○	○	○
	Auto A/C		—	—	○	—	○	—	—	—	—	—	—
	Manual A/C		○	○	—	○	—	○	○	○	○	○	○
	Leather pack-age		○	○	○	○	○	○	○	○	○	○	○
	Genuine leather seat		—	—	○	—	○	—	—	—	—	—	—
	Premium audio		—	—	—	—	—	—	—	—	—	—	—
	High grade audio		○	—	○	○	○	○	○	○	○	○	○
	Navigation		—	○	—	—	—	—	—	—	—	—	—
	Satellite tuner		—	○	—	—	—	—	—	—	—	—	—
	Side airbag		○	○	○	○	○	○	○	○	○	○	○
	Curtain air-bag		○	○	○	○	○	○	○	○	○	○	○
	VDC		○	○	○	○	○	○	○	○	○	○	○
	Front fog light		○	○	○	○	○	○	○	○	○	○	○
	Cold weather package		—	—	○	○	○	○	○	○	○	○	○
	Sunroof		○	○	○	○	○	○	○	—	○	—	○

PRECAUTION

PC

	Page
1. Precaution	2



1. Precaution

A: CAUTION

Please clearly understand and adhere to the following general precautions for environmental protection and 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 parts which are not instructed in this manual. Follow the directions in this manual when performing maintenance on the AB-SCM&H/U. When parts other than those specified are disassembled, it is possible that the ABS system will not operate when needed or cause it to 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. Follow the directions in this manual when performing maintenance on the VDCCM&H/U. When parts other than those specified are disassembled, it is possible that the VDC system will not operate when needed or cause it to operate incorrectly and result in injury.

3. BRAKE FLUID

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

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

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 interrupting traffic.

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, bumper, hood, front fender), around side of the vehicle (front door, rear door, center pillar, rear fender, side sill, rear wheel apron), around rear of the vehicle (rear seat cushion, rear floor, rear crossmember) 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 60 seconds before starting work.

7. AIRBAG DISPOSAL

To prevent bodily injury from unexpected airbag deployment, do not dispose the airbag modules 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 TOOL

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 falling, resulting in accidents and injury.

12.OIL

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

- Prepare a container and cloth to prevent scattering of oil when performing work where oil can be spilled. If the 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 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.

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 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.

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 recycle it.

16.REMOVAL AND INSTALLATION OPERATION OF HOSES, ETC.

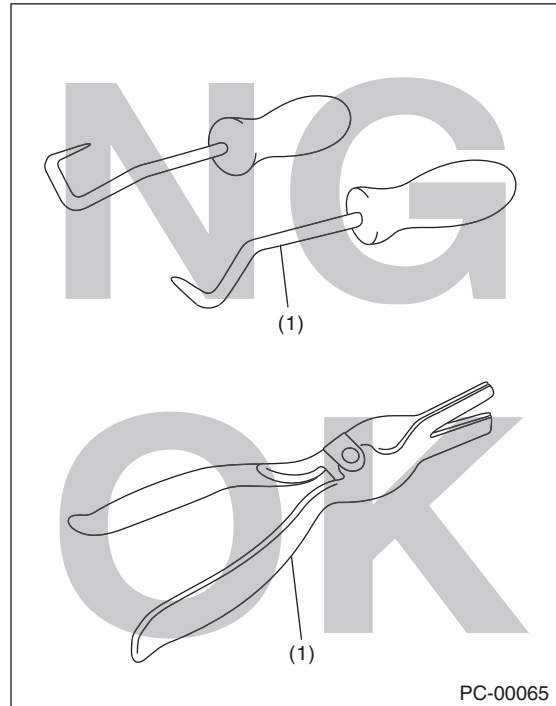
1. Before the removal and installation operation of hoses, etc.

- If you keep using the damaged or deformed hose, it results bleeds or leakage of the fat adheres or disconnection of the hose. Be careful not to spill fat adheres on exhaust pipes, etc. during maintenance to prevent emitting smoke or causing fires.
- Perform the operation with the hose removed. If the operation is performed without removing the hose, it may damage inner surface of the hose.

2. Removal and installation operation of hoses, etc. during the inspection

• Follow the instructions below when removing hose.

- Do not use a pointed hose remover (hose plucker) when using a general hose remover. It may damage the pipe surface or the hose.



(1) Hose remover

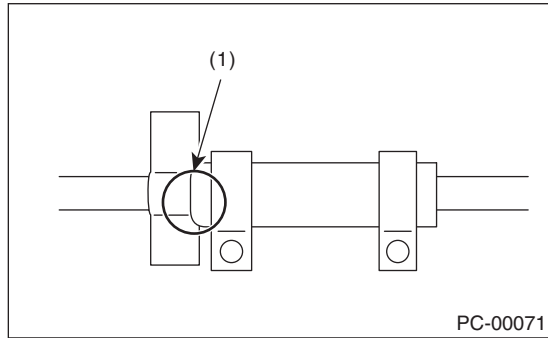
- When draining hose using pliers, be sure to cover the hose with cloth and rotate the hose slightly to extract straight.

Precaution

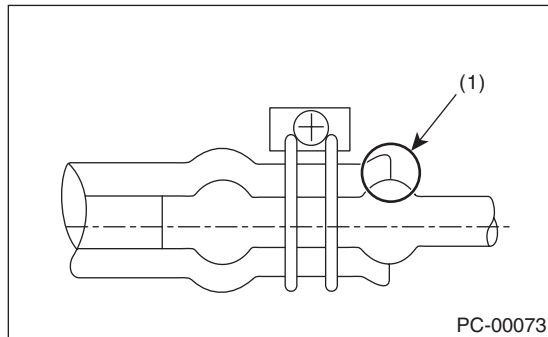
PRECAUTION

- If you keep using the hose, perform the inspection below and replace the hose with a new part if faulty.

- Replace the hose with a new part if it rides over the stay or spool.



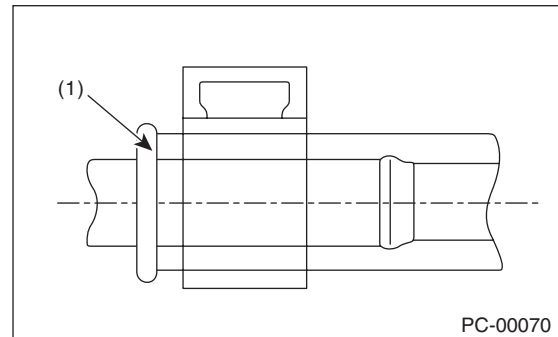
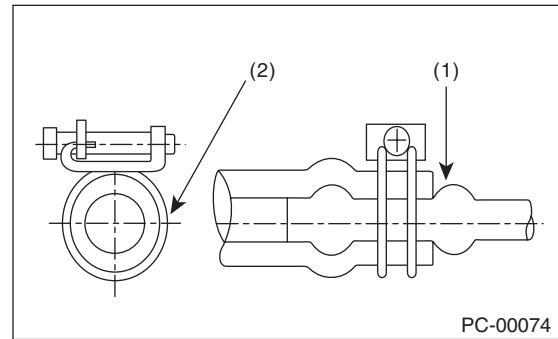
(1) Hose rides over the stay



(1) Hose rides over the spool

- Check if the surface and the inner surface of the hose are damaged, cracked, bend, hardened, softened, swelled, peeled or deformed due to the adherence or the entry of the foreign matter by bending the hose. Replace with the new part if faulty.
- Follow the instructions below during installation.
 - Check carefully for assembling position.
 - Never use lubricants.

- Insert the hose to the specified position (stopper or spool) securely.



- (1) Push against the spool. (Insert the hose and prevent it from becoming wrinkled.)
- (2) Tighten the hose outwards and apply force thoroughly.

- Check if the position, direction and hose layout of the hose clamp are correct. (Check if the position, direction, length and the gap around are correct, or if it is different from the condition before the work)
- After the installation, check that the hose is installed securely and there is no leakage. (Check if it is fixed securely with the clamp)
- For hose clips and hose clamps, perform the inspection below and replace them with a new part if faulty.
 - Check for deformation, rust, damage or foreign matters.
 - For hose clip, check if it works and has clamping force.
 - For hose clamp, check if it can tighten screw, not ovalized or the screw is not damaged.
- For hose pipes, perform the inspection below and replace with a new part if faulty.

Check if the pipe is not damaged, rusted, peeled (peeled plates included), covered with foreign matter, bent, compressed or cracked.
- For the parts below, replaces with a new part when the hose is removed or the installation position is changed.

ATF cooler hose, power steering suction hose, power steering return hose

NOTE

NT



	Page
1. Note	2



1. Note

A: NOTE

This information will improve the efficiency of maintenance and assure the sound work.

1. FASTENERS NOTICE

Fasteners must be tightened to the specified torque.

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

2. STATIC ELECTRICITY DAMAGE

Do not touch the control modules, connectors, logic boards and other such parts when there is a 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.

4. SERVICE PARTS

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

5. PROTECTING VEHICLE UNDER MAINTENANCE

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

6. ENSURING SECURITY DURING WORK

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

7. LIFT AND JACK

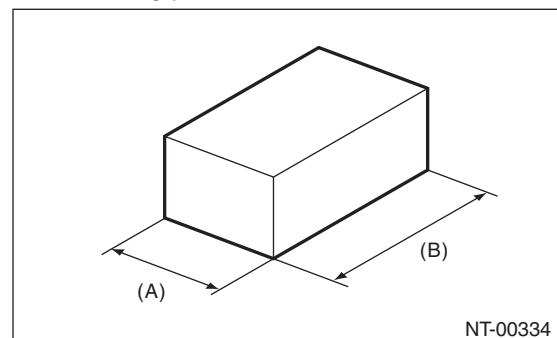
When using a lift or shop jack to raise a vehicle or using rigid rack to support a vehicle, always follow instructions concerning jack-up points and weight limits to prevent the vehicle from falling, which could result in injury. Be especially careful that the vehicle is balanced before raising it. Be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

CAUTION:

- **Not to let the side sill cover interfere with the lift arm, use an attachment.**
- **For models with side sill spoiler, use a spacer or an attachment to lift up the vehicle securely at jack up point, without contact of side sill spoiler and lift.**

NOTE:

- When using a lift, follow its operation manual.
 - When using, insert the body flange to the attachment groove.
 - When the side sill spoiler contacts the lift arm, use a lift attachment.
 - Do not work or leave unattended while the vehicle is supported with jack, support it with rigid racks.
 - Be sure to use the rigid racks with rubber attached to cradle to support the vehicle.
 - When using a lift, use an attachment or something similar.
 - When using a plate lift, use a rubber attachment. (Model with side sill spoilers)
- Place the attachment to the specified position of the vehicle, by adjusting front/rear and left/right sides accordingly.



(A) Approx. 100 mm (3.94 in)

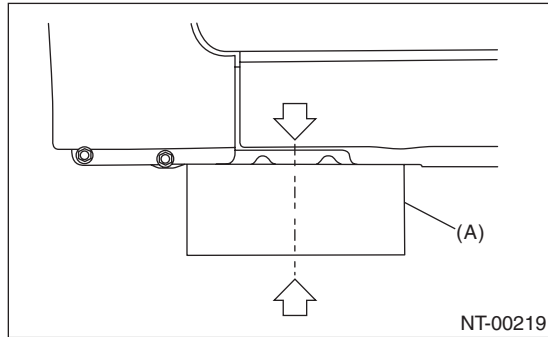
(B) 120 — 180 mm (4.72 — 7.01 in)

- When using an attachment, align the center of attachment with the center of vehicle cutout portion (the center of spoiler cutout portion).

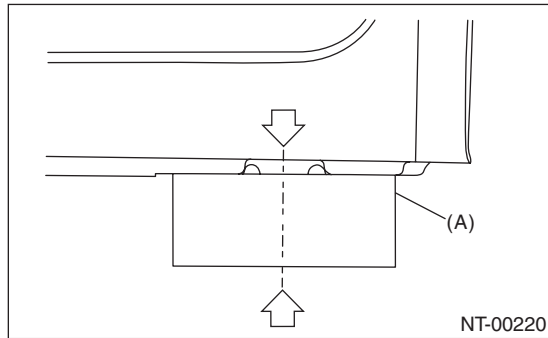
- Model without side sill spoiler

For the models without side sill spoiler, align the center of attachment with the center of vehicle cutout portions.

Front



Rear

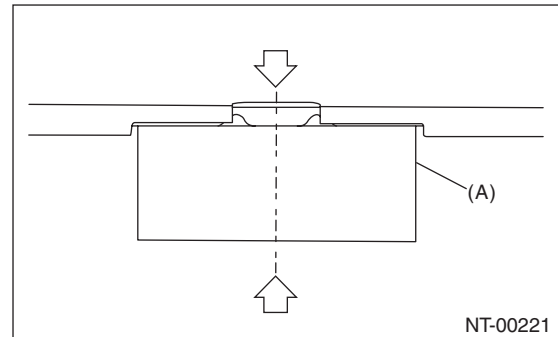


(A) Attachment

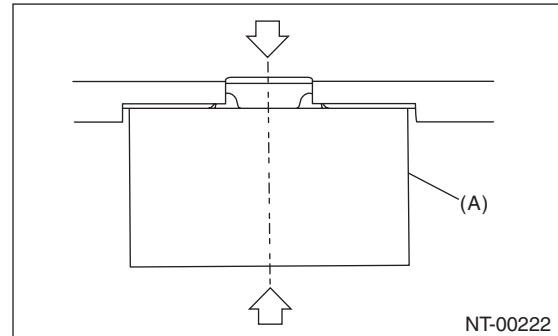
- Model with side sill spoiler

For the models with side sill spoiler, align the center of attachment with the center of vehicle cutout portion (the center of spoiler cutout portion).

Front



Rear

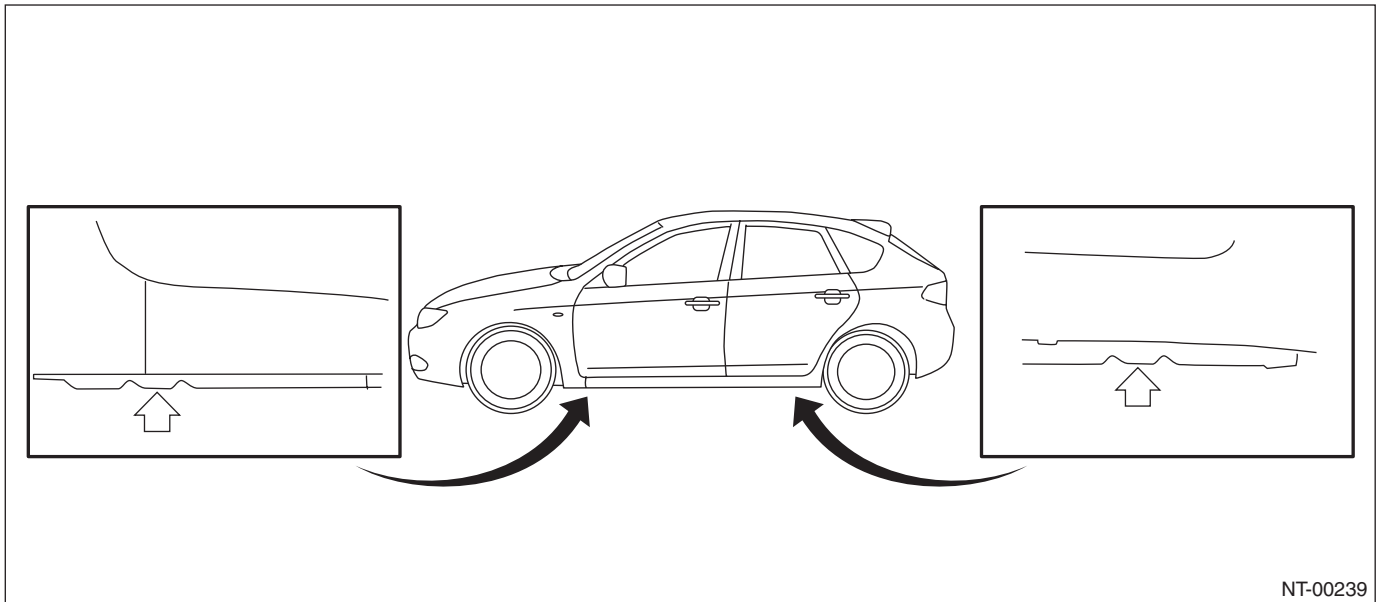


(A) Attachment

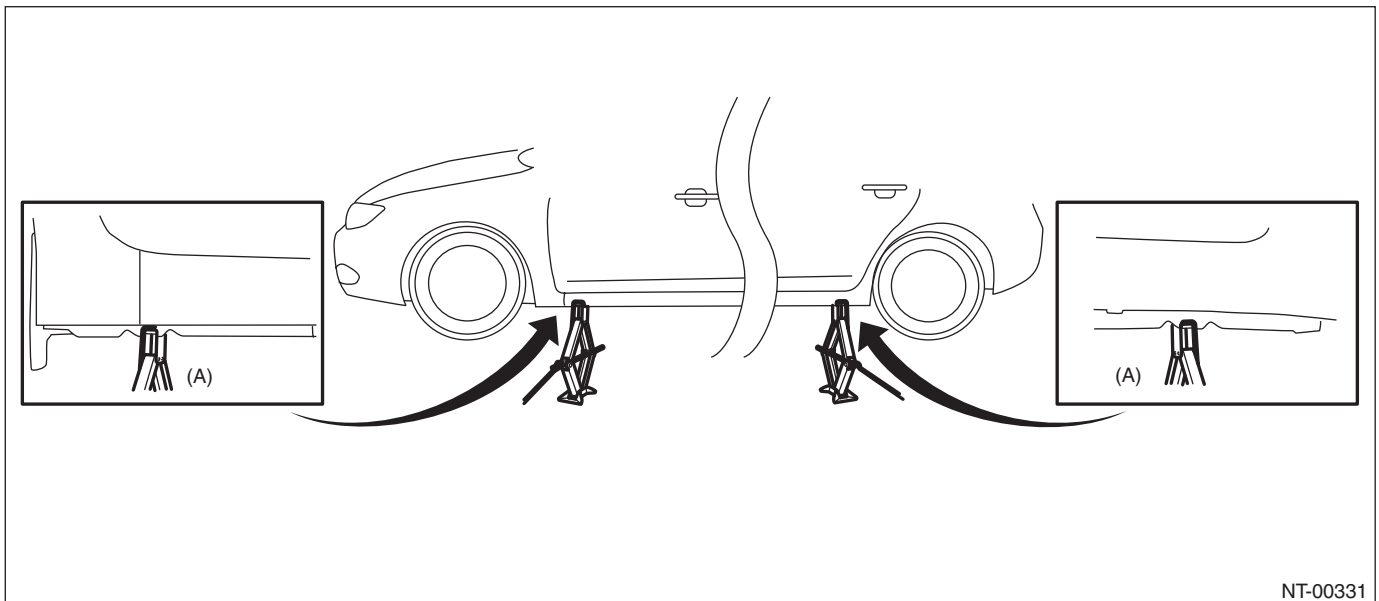
Note

NOTE

- Do not use the plate lift whose attachment does not reach the supporting locations.
The figure of vehicle indicates the supporting locations, supporting procedures, etc. for 5 door model, and they are same for 4 door model.
SUPPORT LOCATIONS

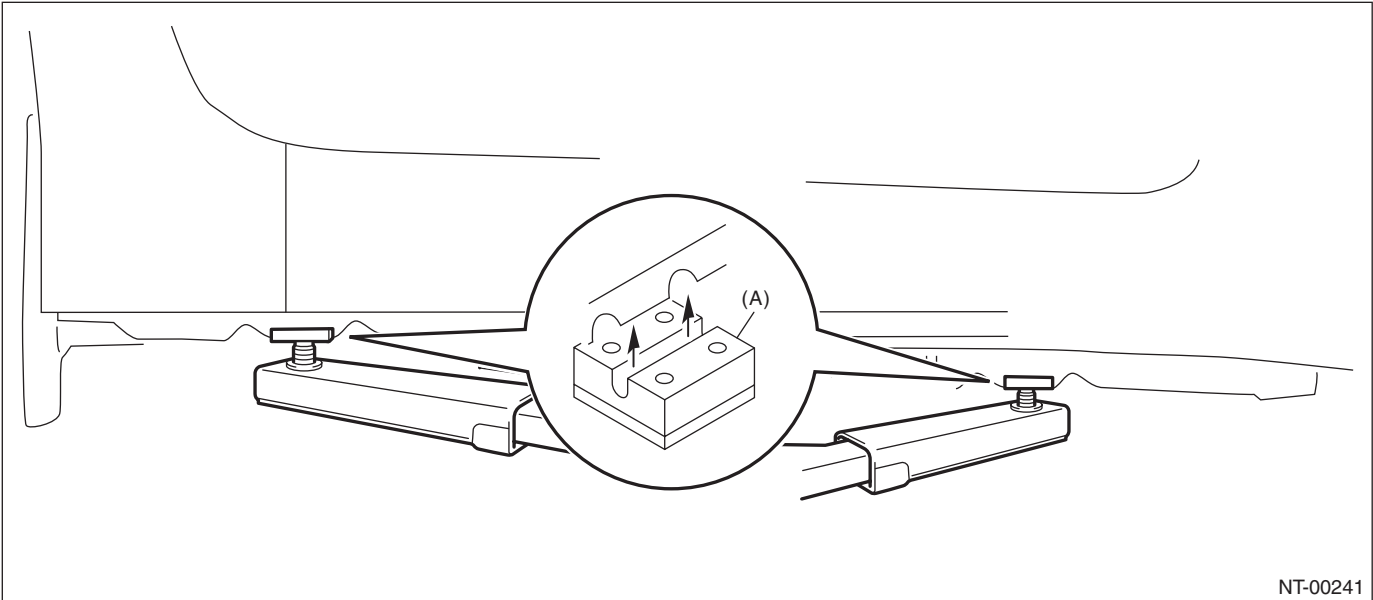


Pantograph jack



- (A) Set the jacks between cutout portions.

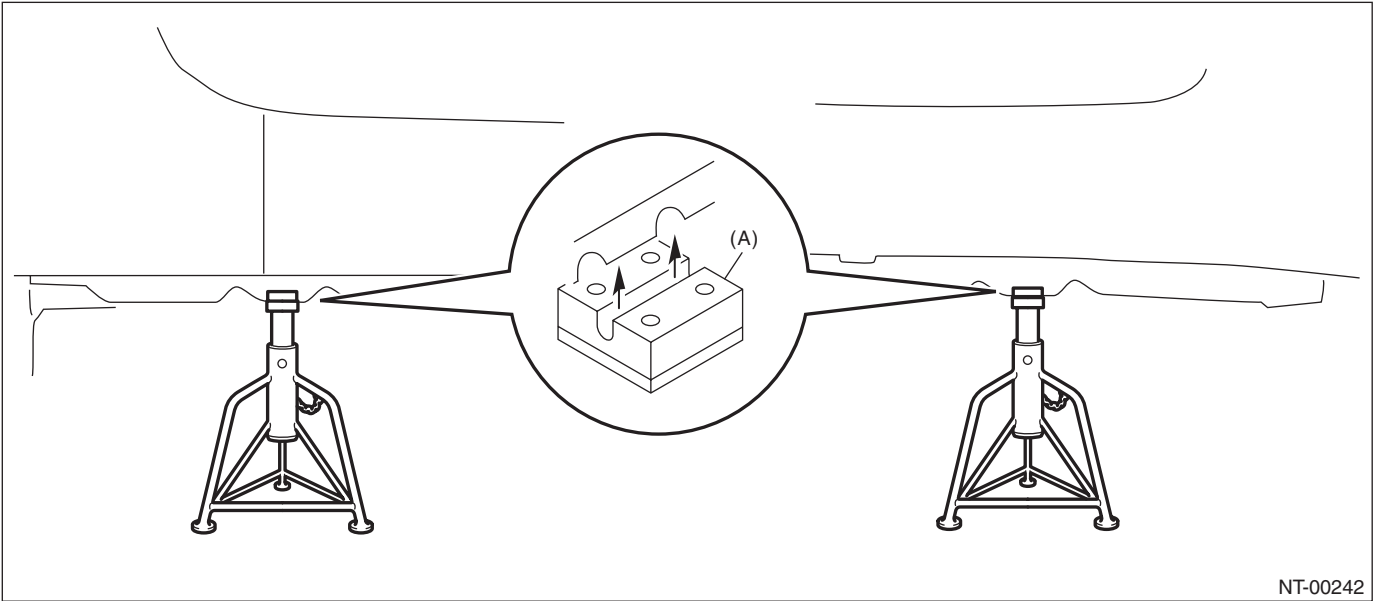
Lift



NT-00241

(A) Attachment

Rigid rack



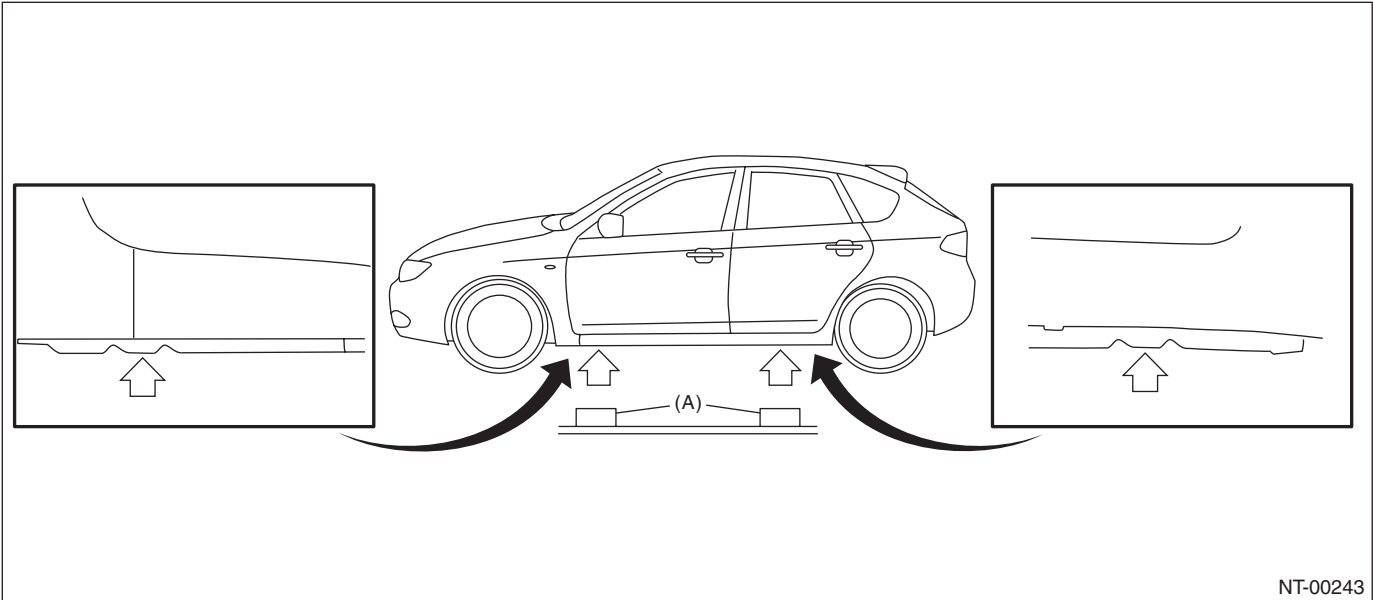
NT-00242

(A) Attachment

Note

NOTE

Plate lift



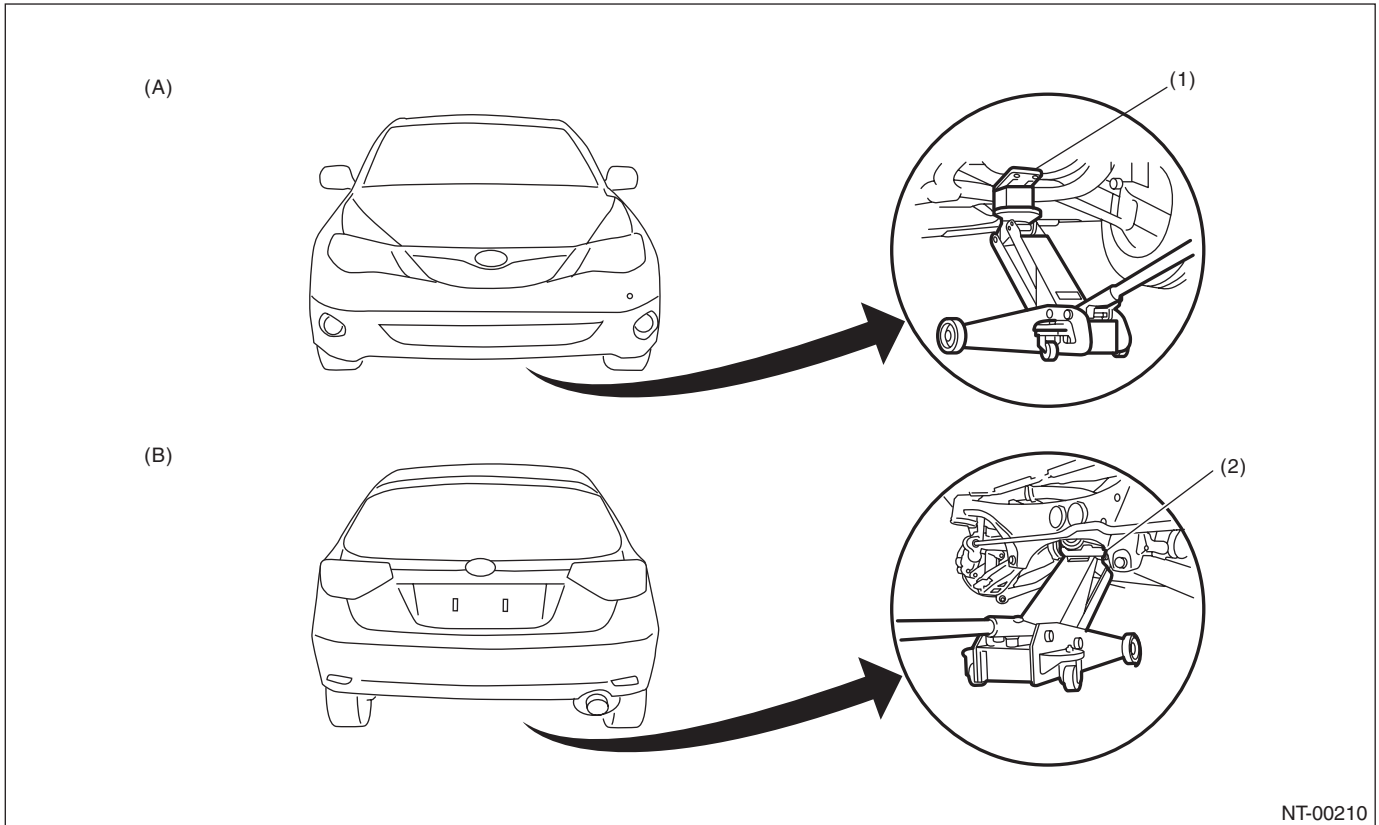
(A) Attachment

NT-00243

JACK-UP POINT (WHEN USING A GARAGE JACK)

CAUTION:

If jacking up the front side of the vehicle, make sure that the jack is attached at the center of the jack-up plate not at the sides.



NT-00210

(A) Front

(B) Rear

(1) Front crossmember

(2) Rear differential

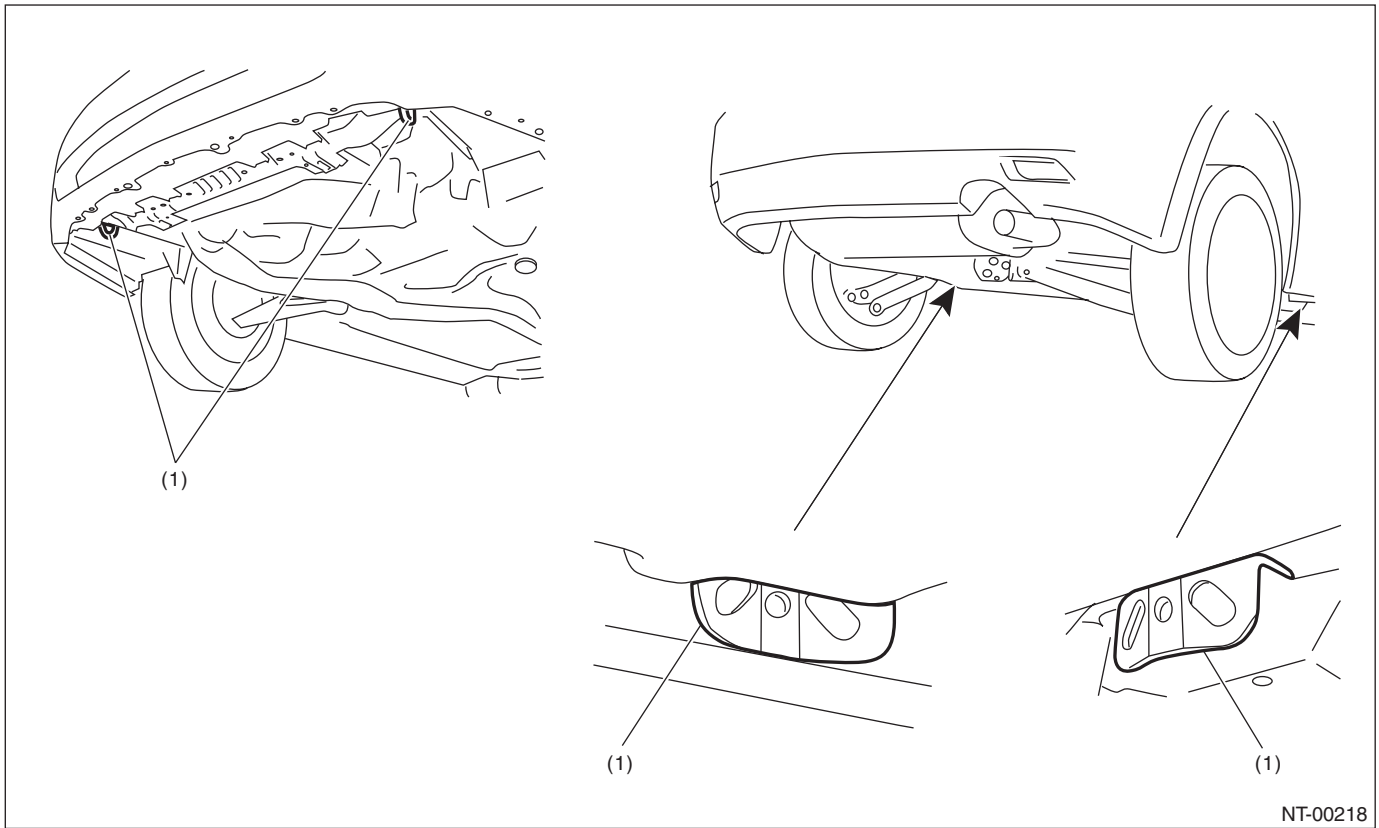
Note

NOTE

8. TIE-DOWNS

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

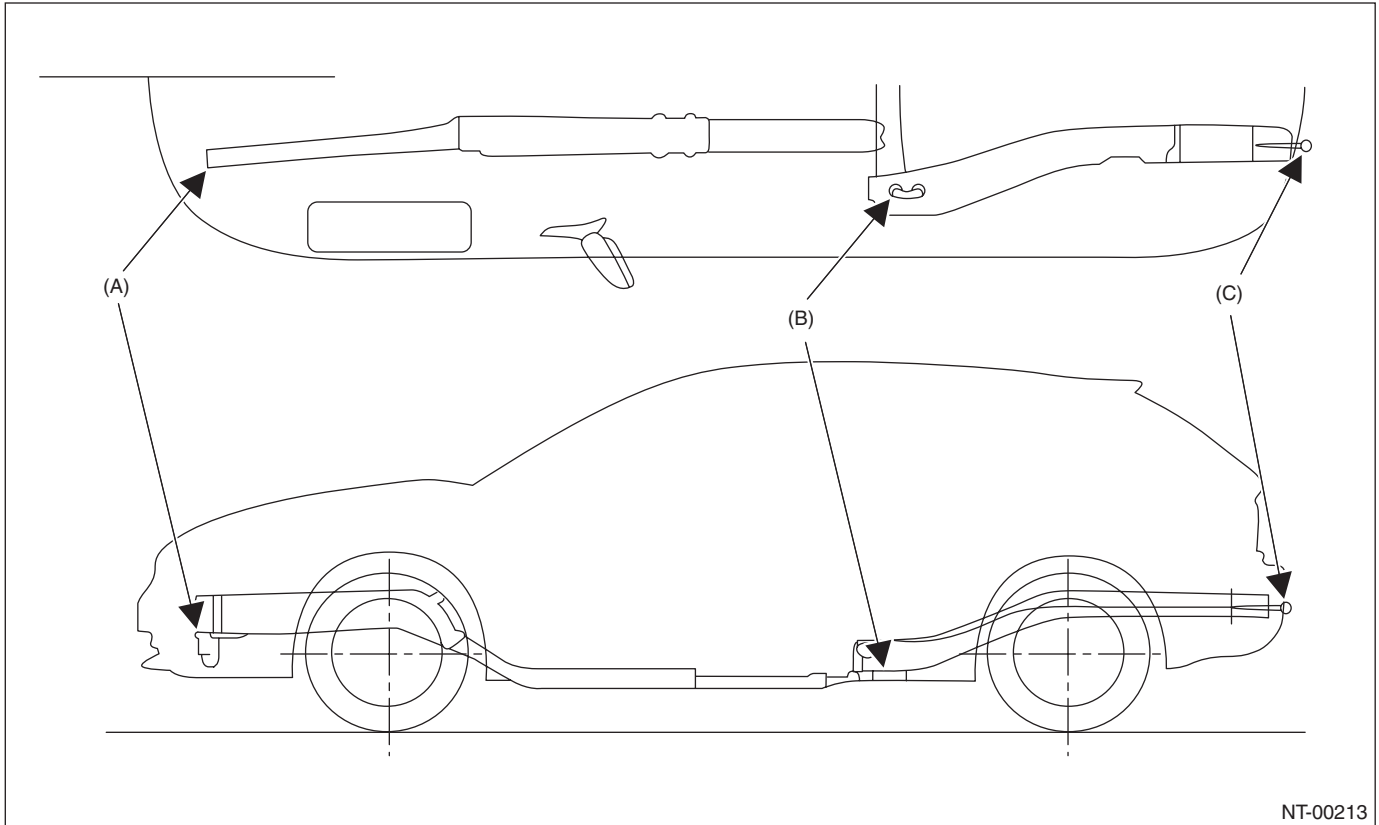
• TIE-DOWN LOCATION



NT-00218

(1) Hook for tie-down

• TIE-DOWN HOOK & EYE BOLT



NT-00213

(A) Front tie-down hook

(B) Rear tie-down hook

(C) Eye bolt

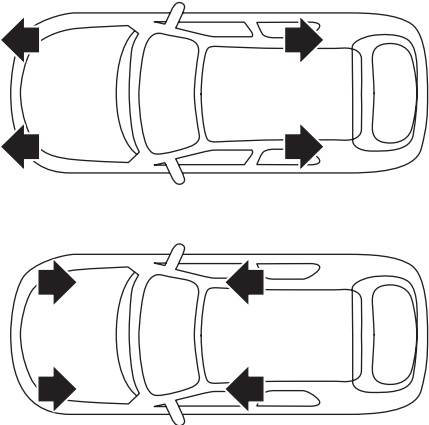
Note

NOTE

- Tie-down direction

CAUTION:

- Pull the tie-down chains LH and RH in the same direction, but front and rear side in the counter direction.
- Directions except the followings (recommended) are inappropriate.

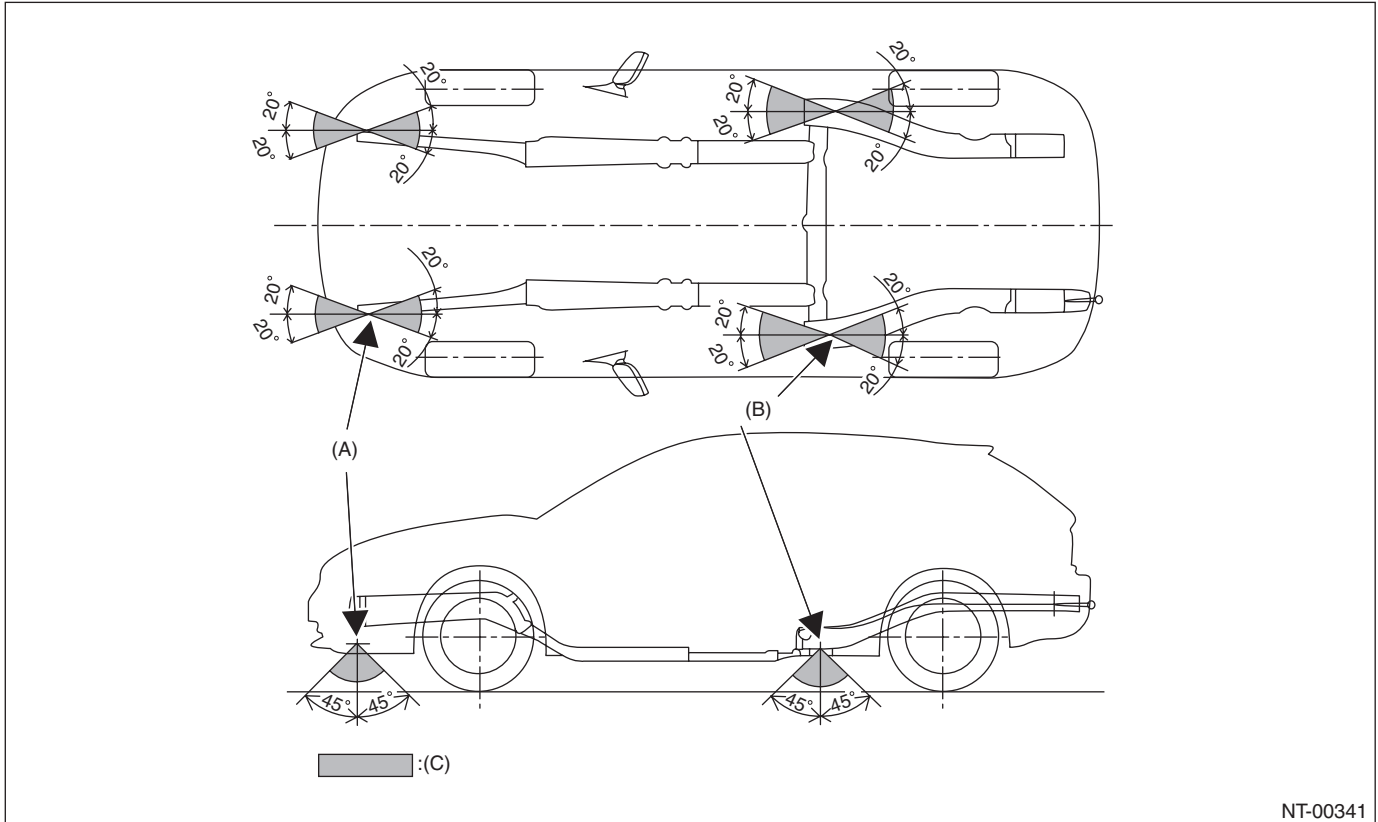
	Recommended
Tie-down direction	 NT-00214

• TIE-DOWN RANGE

For ground transportation

CAUTION:

When the vehicle is tied down from vehicle inside, hook the hooks of tie-down chain on the rear tie-down hooks from vehicle inside. When the vehicle is tied down from vehicle outside, hook the hooks of tie-down chain on the rear tie-down hooks from vehicle outside.



NT-00341

(A) Front tie-down hook

(B) Rear tie-down hook

(C) Chain pulling range at tie-down condition

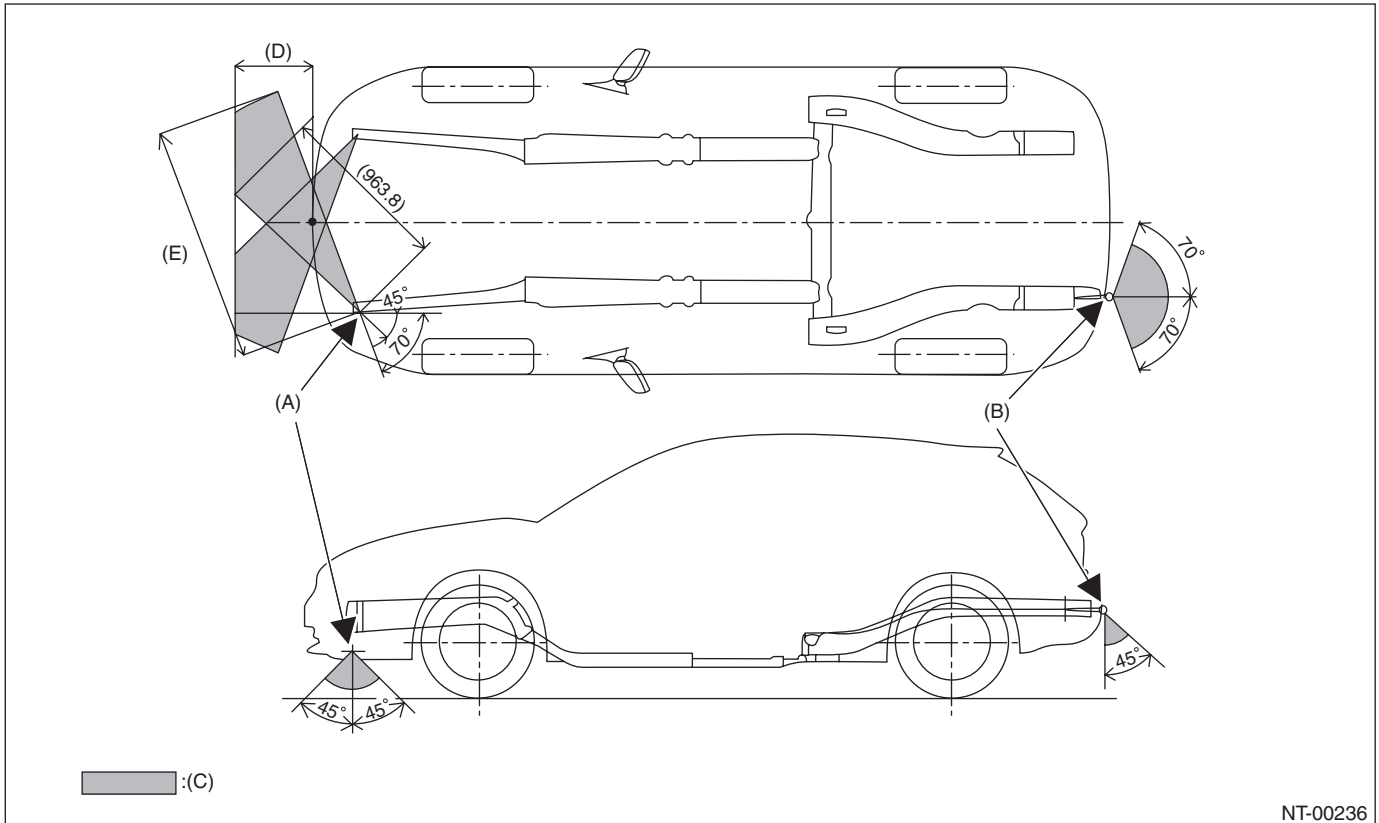
Note

NOTE

For sea transportation

CAUTION:

The eye bolts are exclusively used for towing and sea transportation tie-down, and do not use them for ground and freight transportation.



(A) Front tie-down hook

(C) Chain pulling range at tie-down condition

(E) 1,320 mm (52.0 in)

(B) Eye bolt

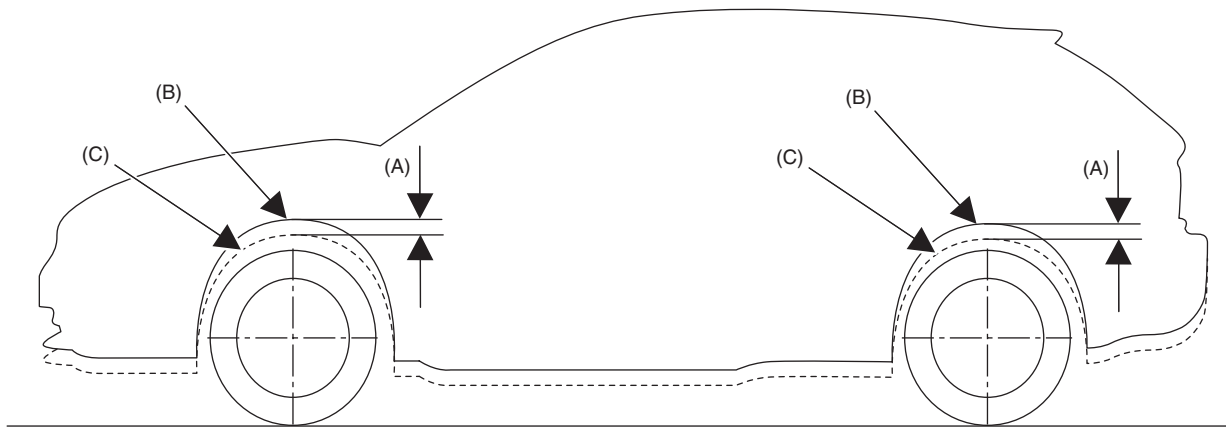
(D) 400 mm (15.7 in)

• VEHICLE SINKING VOLUME AT TIE-DOWN CONDITION**CAUTION:**

The vehicle sinking volume at tie-down condition should be less than 50 mm (1.97 in) and make sure to fix the vehicle securely.

Check to see if the tensions of chains or belts at tie-down condition are appropriate in the following procedures.

- 1) Before tie-down, measure the distance between the highest tire point and highest arch point at the center of wheel.
- 2) After tie-down, measure the distance between the highest tire point and highest arch point at the center of wheel.
- 3) If the distance (A) between the measured value of 1) and 2) above, is less than 50 mm (1.97 in), it is judged as OK. If the distance is 50 mm (1.97 in) or more, it is judged as NG because the tension is too high.



NT-00412

(B) Arch position before tie-down

(C) Arch position after tie-down

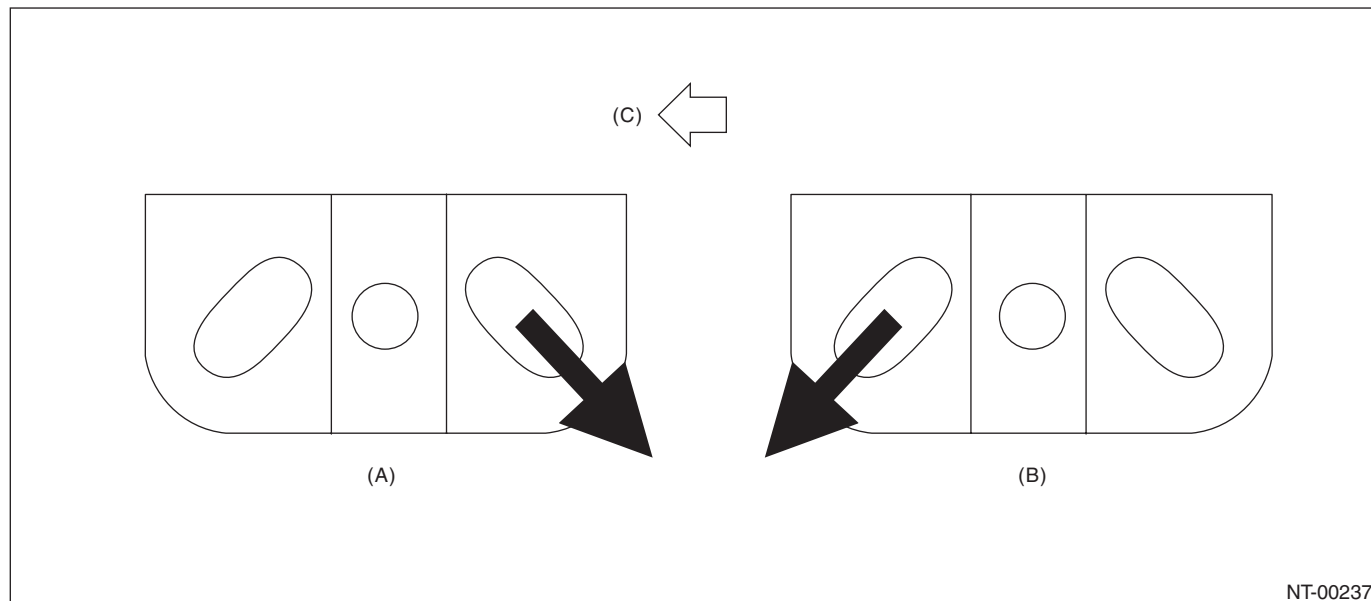
Note

NOTE

• NOTES FOR THE USE OF TIE-DOWN HOOK

When the vehicle is tied down from the rear side, use the holes at the rear side, and when the vehicle is tied down from the front side, use the holes at the front side.

When the vehicle is tied down from vehicle inside, hook the hooks of tie-down chain from vehicle inside, and when the vehicle is tied down from vehicle outside, hook the hooks of tie-down chain from vehicle outside.



(A) When the vehicle is tied down towards the rear side

(B) When the vehicle is tied down towards the front side

(C) Vehicle front

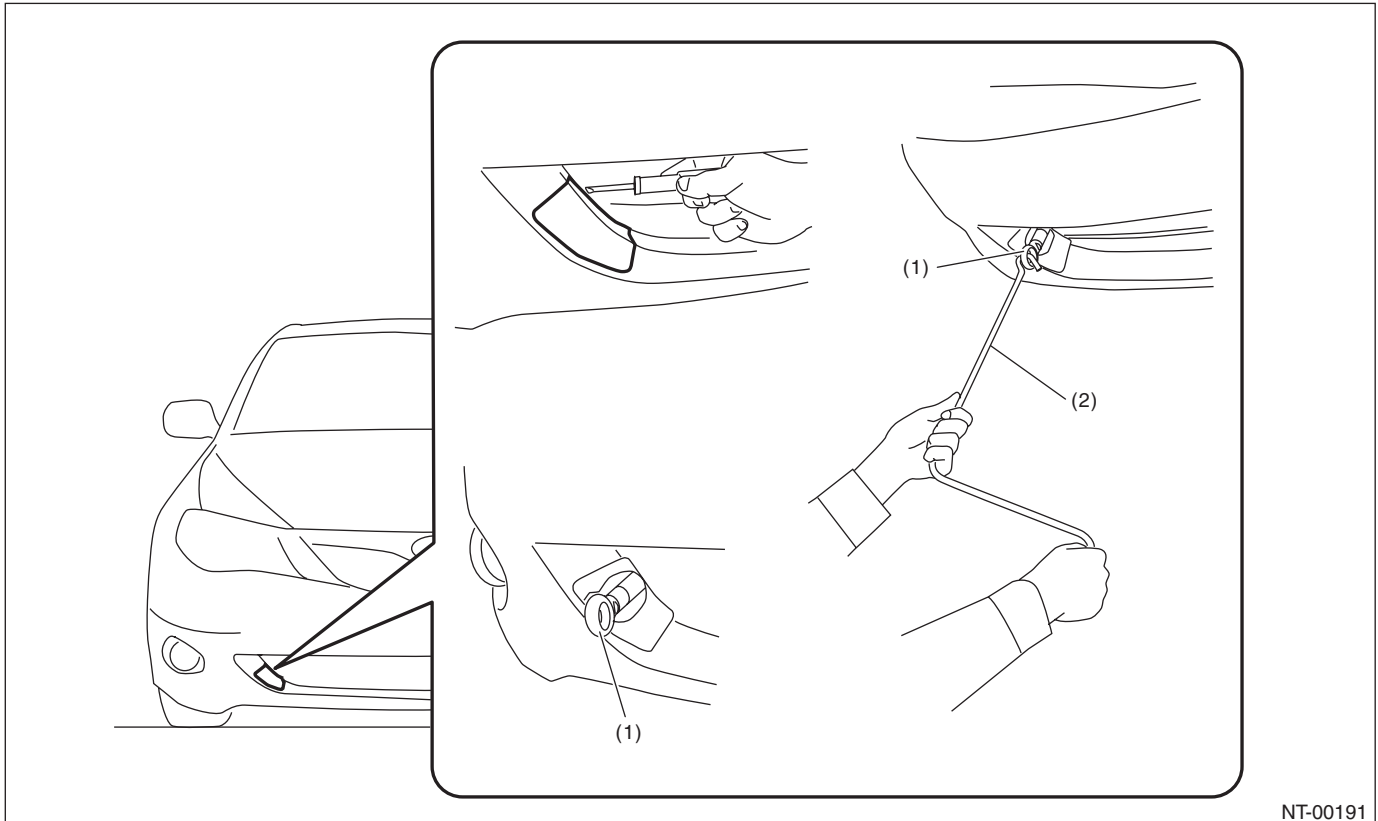
9. TOWING

Avoid towing vehicles except when the vehicle cannot be driven. For models with AWD and AT, use a car carrier truck 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.

• Front

- Except for XV model



NT-00191

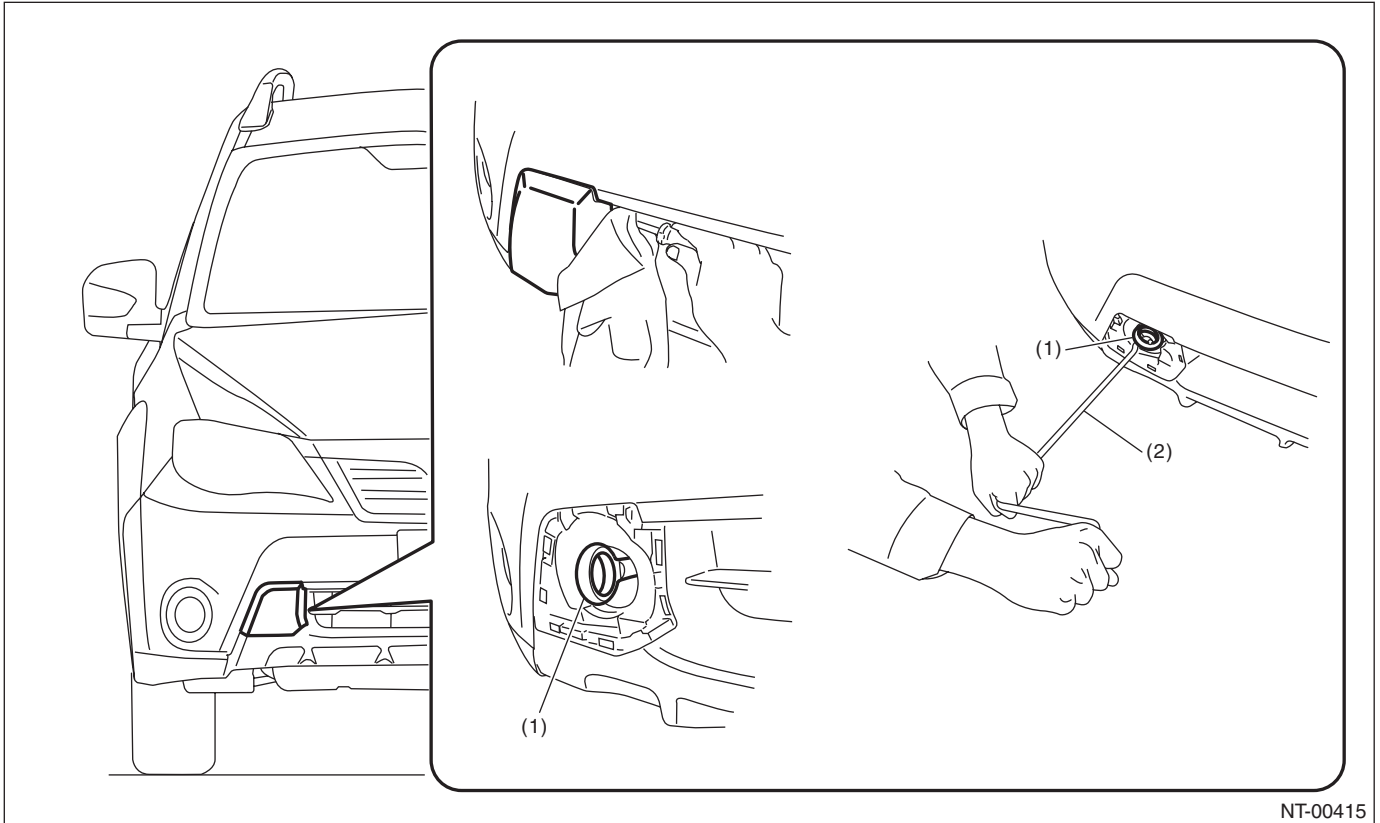
(1) Eye bolt

(2) Jack handle

Note

NOTE

- XV model

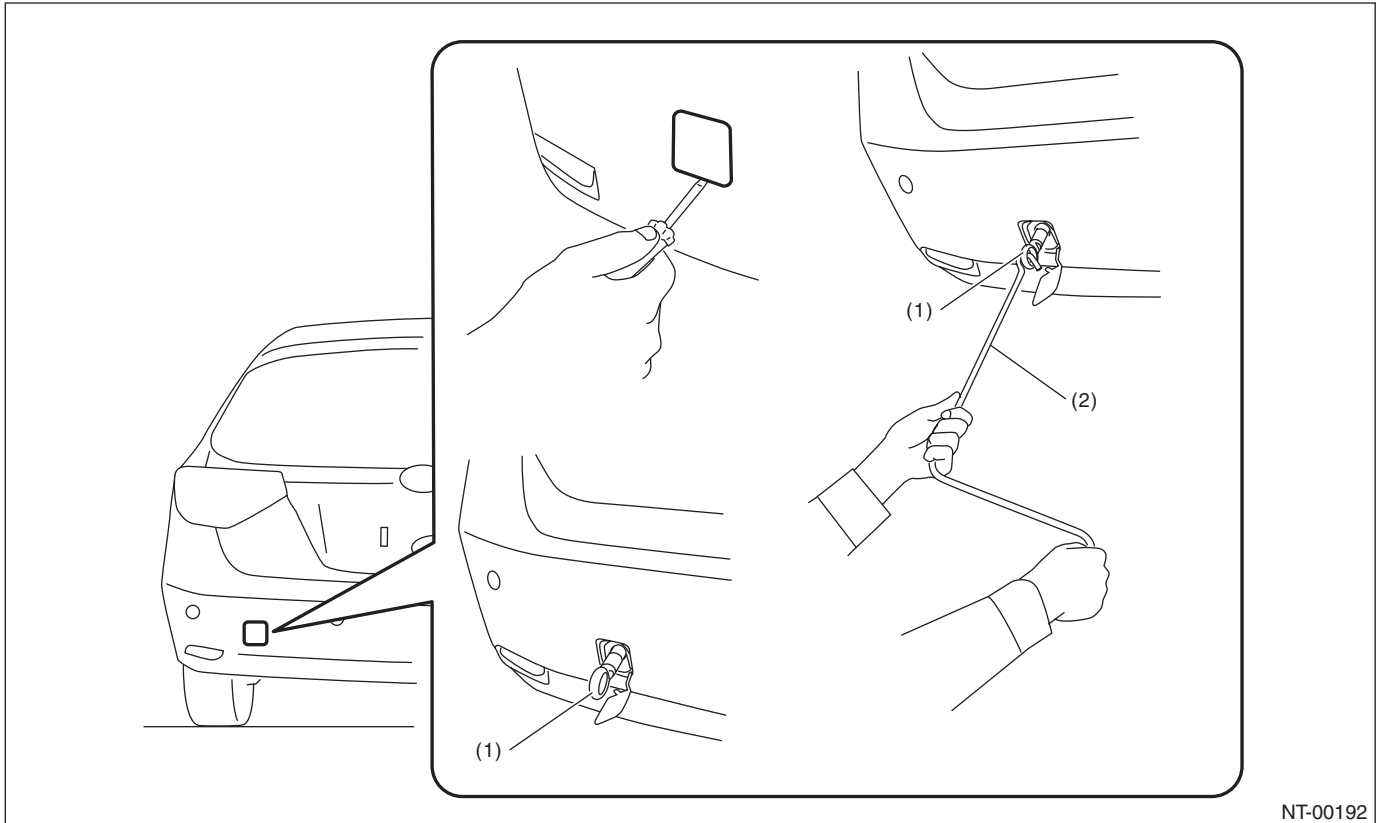


NT-00415

(1) Eye bolt

(2) Jack handle

• Rear

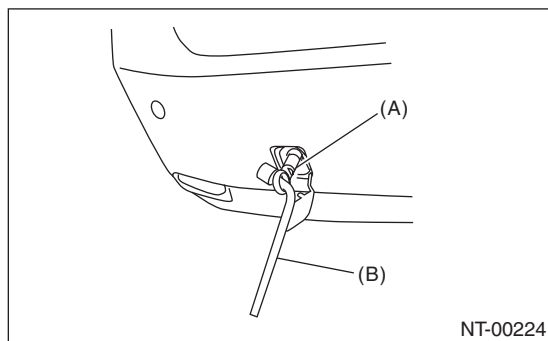


(1) Eye bolt

(2) Jack handle

CAUTION:

- Do not use the towing hook except when towing.
- Make sure to detach the towing hook after use. If the hook remains attached, the airbag may not operate properly when receiving shock from the front side.
- When tightening the eye bolt using a wheel wrench, be careful not to scratch the bumper.



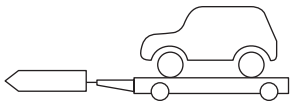
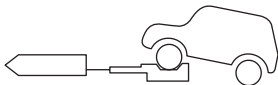
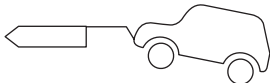
(A) Eye bolt

(B) Wheel wrench

Note

NOTE

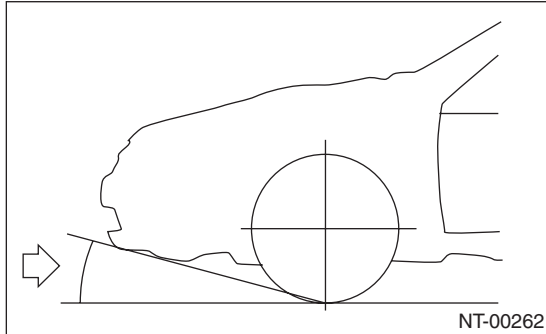
Precautions

Towing	Precautions	MT	AT
Lifting up four wheels (On a trailer)  NT-00023	Towing the vehicle after lifting up all four wheels is a basic rule for AWD model. CAUTION: When loading on a carrier transport, make sure to follow the procedures for "LOADING ONTO CAR CARRIER TRUCK". <Ref. to NT-19, LOADING ONTO CAR CARRIER TRUCK, NOTE, Note.>	○	○
Rope  NT-00024	• Check if both front and rear wheels are rotated normally. • AT model driving conditions: Driving speed of 30 km/h (19 MPH) or less Allow driving distance 50 km (31 miles) or less	○	▲
Raising the front wheels  NT-00025	Prohibited for full-time AWD model.	×	×
Lifting up the front wheels  NT-00026	• Prohibited, due to damage on bumper, front grille, etc. • Do not raise the vehicle with bumper.	×	×

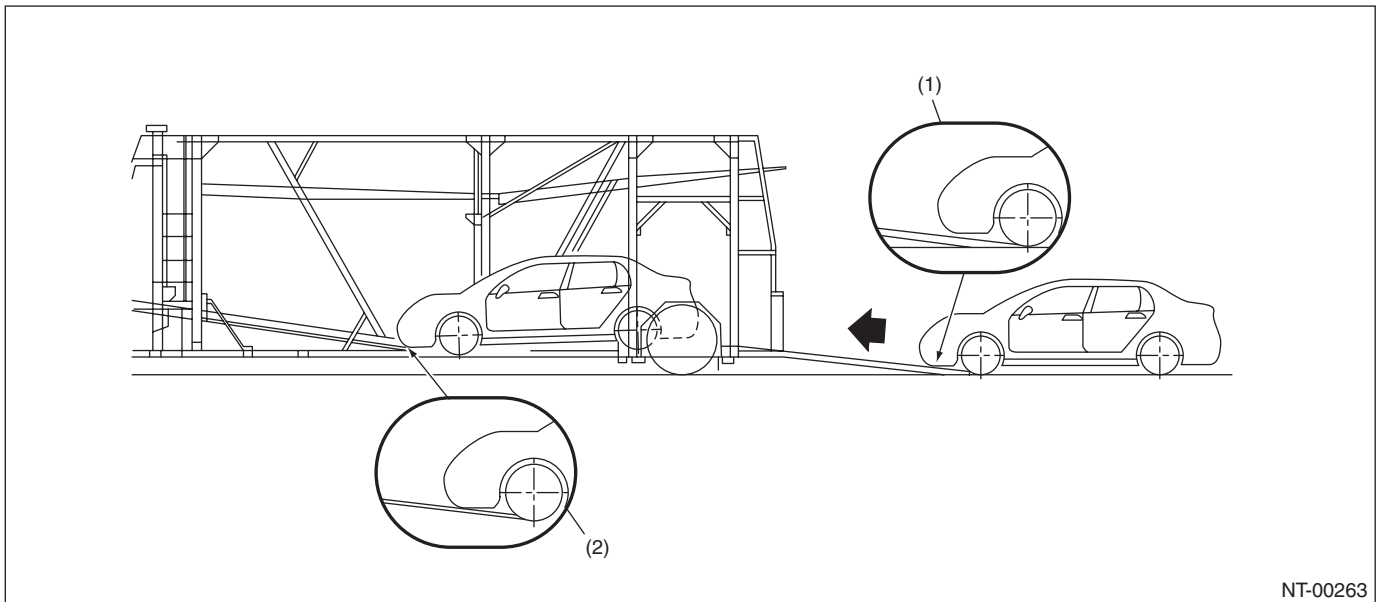
10.LOADING ONTO CAR CARRIER TRUCK

CAUTION:

- When carrying the vehicle onto a car carrier truck, perform the operation being careful with the gap between the height of the carrier's floor and the vehicle lower side because of little clearance under the front bumper.



- Use a supporting board (rubber) where the clearance is too small.
- Perform the operation being careful with the position shown in the figure below.



(1) Use a supporting board (rubber) to ensure clearance from the ramp.

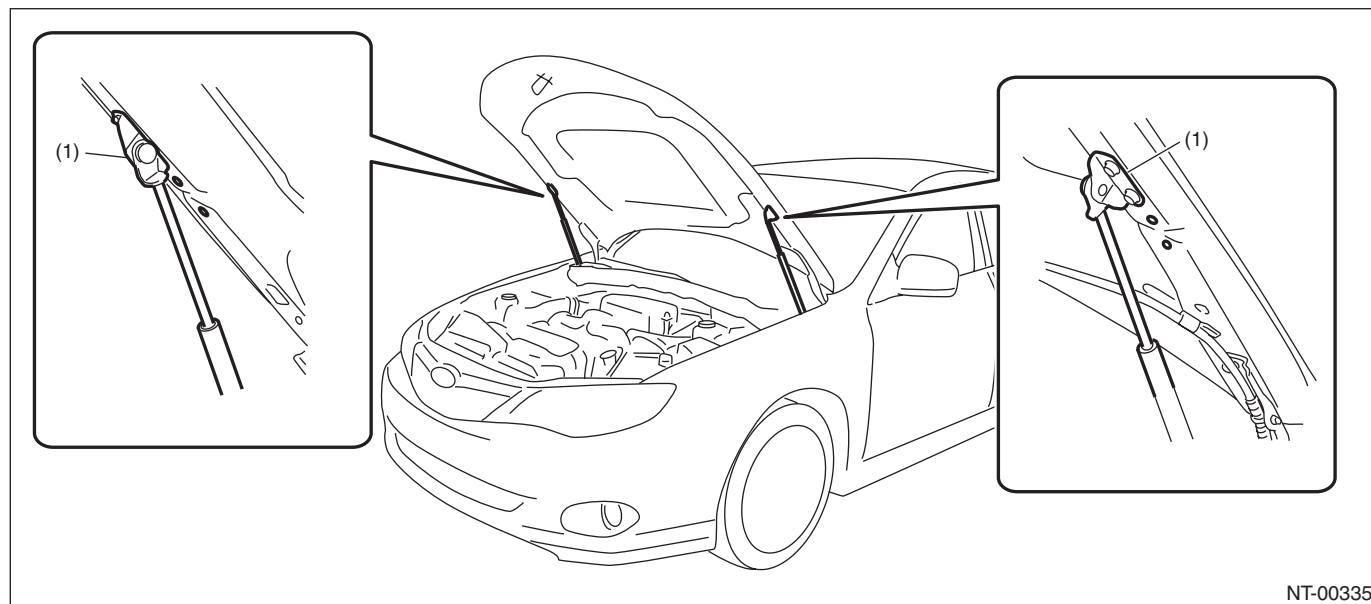
(2) Before carrying the vehicle completely, lower the lower center floor until it is level to make clearance.

11.FRONT HOOD DAMPER STAY

1) Always perform works such as inspections and maintenance with both damper stays attached.

CAUTION:

- At the inspection and general maintenance, do not detach the damper stays.



(1) Normal attached position

2) When wider hood opening is necessary, set the damper stay below as shown in the figure.

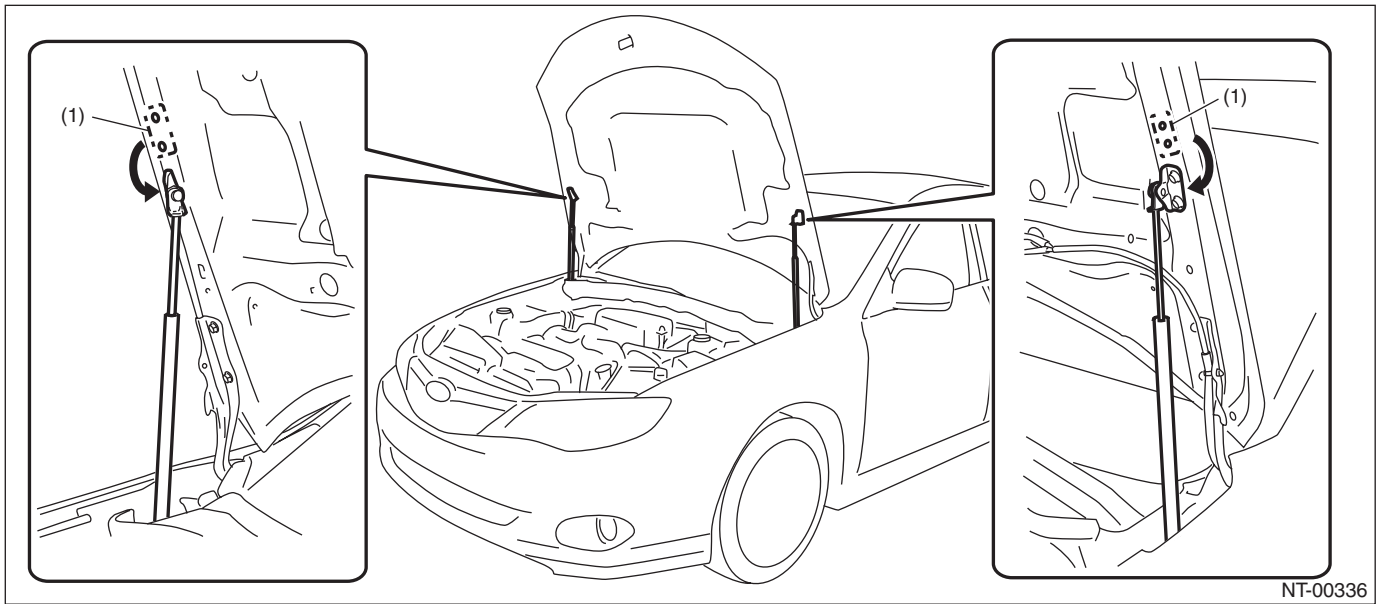
Tightening torque:

<Ref. to EB-9, FRONT HOOD, COMPONENT, General Description.>

CAUTION:

- Always perform works such as inspections and maintenance with both damper stays attached.
- Do not leave one side of damper stay removed.
- The hood cannot be closed with the hood damper on the full open side. When it is necessary to close, tie the hood striker and the radiator panel with a string etc. to fix them.

- After work, set the damper stays back to the normal position and tighten the bolts to the specified torque.



(1) Normal attached position

12. TRAINING

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

13. GENERAL SCAN TOOL

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

NOTE

IDENTIFICATION

ID

	Page
1. Identification	2



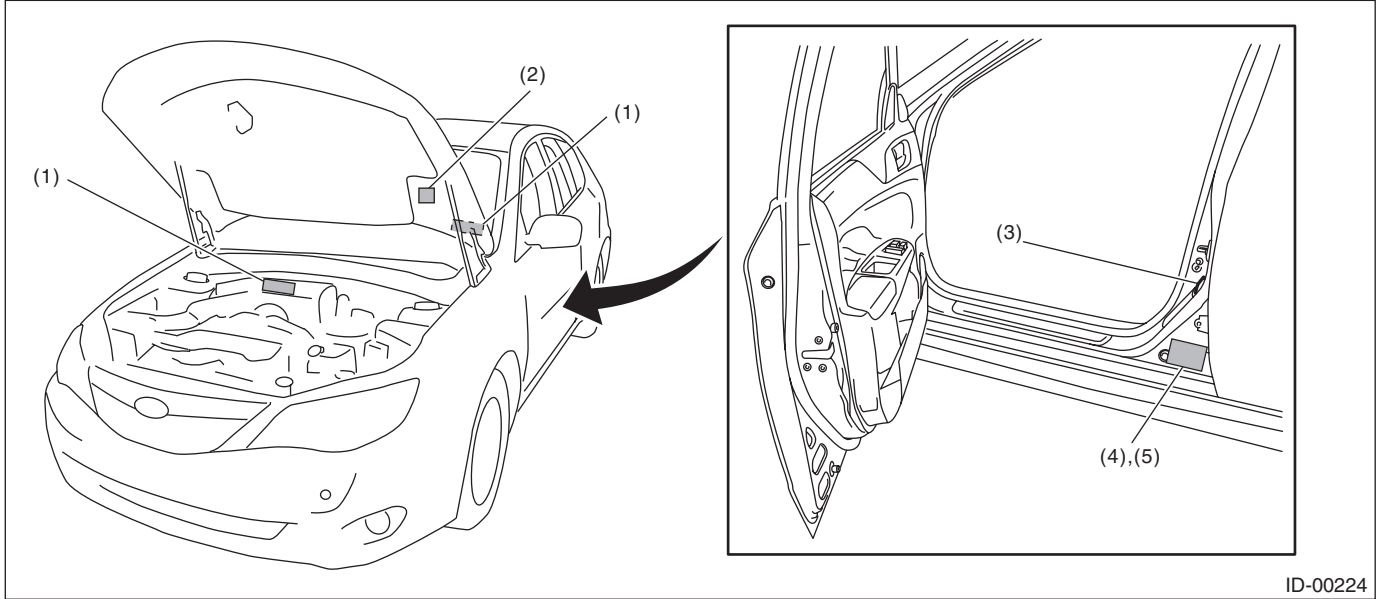
1. Identification

A: IDENTIFICATION

1. IDENTIFICATION NUMBER & LABEL LOCATIONS

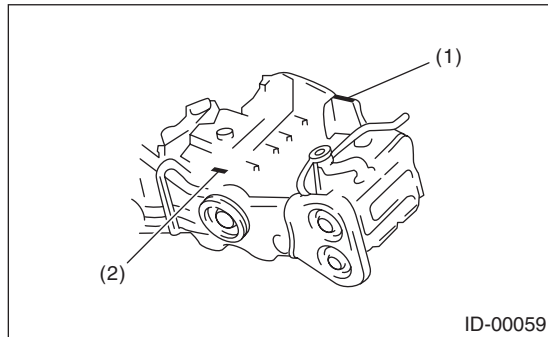
The V.I.N. (Vehicle Identification Numbers) is used to classify the vehicle.

• POSITIONING OF THE LABEL FOR IDENTIFICATION



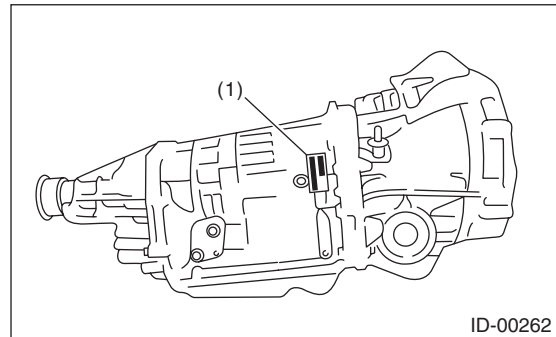
- | | | |
|--|-----------------------------------|-------------------------------------|
| (1) Vehicle identification number (V.I.N.) | (3) Tire inflation pressure label | (5) Model number label (Right side) |
| (2) Emission control label | (4) MVSS label (Left side) | |

• Engine



- | |
|--|
| (1) Engine serial number |
| (2) Engine type (casting) crankcase upper side |

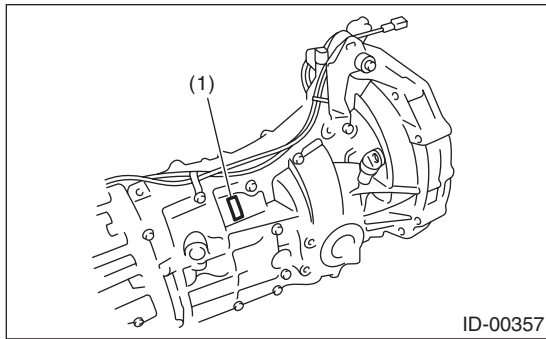
• AUTOMATIC TRANSMISSION



- | |
|--|
| (1) AT type and transmission serial number label |
|--|

• MANUAL TRANSMISSION

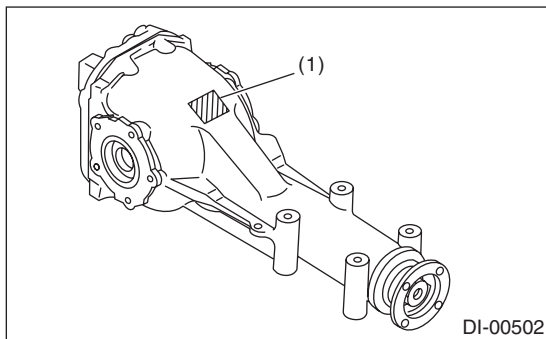
5MT



ID-00357

(1) MT type and transmission serial number

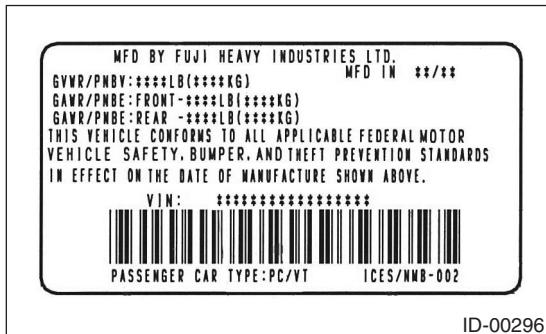
• REAR DIFFERENTIAL



DI-00502

(1) Identification (white paint)

• MVSS LABEL



ID-00296

Identification

IDENTIFICATION

2. MEANING OF V.I.N.

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

JF1GE6A6XBG500001

The starting and ending brackets () are stop marks.

Digits	Code	Meaning	Details
1 — 3	JF1	Manufacturer body area	JF1: Passenger car, FHI made
4	G	Car line	G: IMPREZA
5	E	Body type	E: 4 door H: 5 door
6	6	Displacement	6: 2.5 L AWD
7	A	Grade	A: 2.5 i B: 2.5 i Limited C: 2.5 i-S D: OUTBACK SPORTS
8	6	Restraint	6: Manual belts, dual airbag, side airbag, curtain airbag
9	X	Check digit	0 — 9&X
10	B	Model year	B: 2011MY
11	G	Transmission type	G: Full-time AWD single range 5MT H: Full-time AWD 4AT
12 — 17	500001	Serial number	From 500001: 4 door From 800001: 5 door

3. MODEL NUMBER LABEL

The model number label 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.

GHCDY7J

Digits	Code	Meaning	Details
1	G	Series	G: IMPREZA
2	H	Body type	E: 4 door H: 5 door
3	C	Total engine displacement Drive system Suspension system	C: 2.5 L AWD
4	D	Model year	D: 2011MY
5	Y	Destination	Y: U.S., Canada
6	7	Grade	7: 2.5 i 8: 2.5 i-S 9: OUTBACK SPORTS
7	J	Transmission, fuel feed system	J: MFI 5MT AWD L: MFI 4AT SPORT shift AWD

The engine and transmission type are as follows.

Engine

EJ253BS3FB

Digits	Code	Meaning	Details
1 and 2	EJ	Engine type	EJ: 4 cylinder
3 and 4	25	Displacement	25: 2.5 L
5	3	Fuel feed system	3: MFI non-turbo (SOHC)
6	B	Exhaust regulations	B: U.S. (FED, CAL)
7	S	Transmission	P: AT S: 5MT
8 — 10	3FB	Detailed specifications	Used when ordering parts. For details, refer to the parts catalog.

Transmission (MT)

TY758VC1AA

Digits	Code	Meaning	Details
1	T	Transmission	T: Transmission
2	Y	Transmission system	Y: Full-time AWD MT center differential
3 and 4	75	Distance between gear center	75: Between main shaft and drive pinion
5	8	Series	8: 5MT
6	V	Transmission specifications	V: Full-time AWD 5 speed MT single range with viscous coupling center differential
7	C	Mounted engine	C: 925 SOHC
8 — 10	1AA	Detailed specifications	Used when ordering parts. For details, refer to the parts catalog.

Transmission (AT)

TZ1B8LC2AA

Digits	Code	Meaning	Details
1	T	Transmission	T: Transmission
2	Z	Transmission type	Z: Full-time AWD AT MP-T
3 and 4	1B	Identification	1B: AT (direct control method)
5	8	Series	8: AT
6	L	Transmission specifications	L: Full-time AWD with MP-T 4AT (direct control method)
7	C	Engine type	C: 925 SOHC
8 — 10	2AA	Detailed specifications	Used when ordering parts. For details, refer to the parts catalog.

Rear differential

Code	Reduction gear ratio	LSD
T1	3.900	None
T2	4.111	None

Identification

IDENTIFICATION

Option code

FW

- 1-digit number

	F	G	I	K	U
Aluminum wheel	—	○	—	○	○
Cruise control	○	○	○	○	○
Auto A/C	—	○	—	—	—
Manual A/C	—	—	○	—	—
Leather package	—	○	○	○	○
Genuine leather seat	—	○	—	—	—
High grade audio	—	○	○	○	—
Navigation system	—	—	—	—	○
Satellite tuner	—	—	—	—	○

- 2-digit number

	E	F	G	J
Side airbag	○	○	○	○
Curtain airbag	○	○	○	○
VDC	○	○	○	○
Front fog light	○	—	○	○
Cold weather package	—	—	○	○
Sunroof	○	—	○	—

RECOMMENDED MATERIALS

RM

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Recommended Materials

RECOMMENDED MATERIALS

1. Recommended Materials

A: RECOMMENDED MATERIALS

1. GENERAL

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

2. FUEL

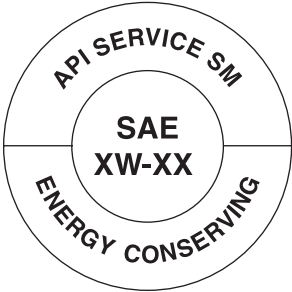
Always use gasoline of the same or higher octane value than specified in the owner's manual. Ignoring the specifications below will result in damage or poor performance of engine and fuel injection system. To gain proper performance, always use specified gasoline.

UNLEADED GASOLINE

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

3. LUBRICANT

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

Lubricant	Recommended materials	
	API standard	ILSAC standard
Engine oil Choose oil suitable for the standard from the right.	SN or SM grade "Resource conserving" or "Energy conserving"  RM-00076 Those with the above API service labels	GF-5 or GF-4  RM-00002 Those with the above ILSAC certification mark (Starburst mark)
Manual transmission gear oil	GL-5	—
AT front differential gear oil	GL-5	—
Rear differential gear oil	GL-5	—

Recommended Materials

RECOMMENDED MATERIALS

SAE viscosity No. and applicable temperature								
Engine oil								
(°C)	-30	-20	-10	0	10	20	30	40
(°F)	-22	-4	14	32	50	68	86	104
(1)								
RM-00075								
(1) 5W-30 (synthetic oil)								
Manual transmission gear oil, front differential gear oil and rear differential gear 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-00058								

Recommended Materials

RECOMMENDED MATERIALS

4. FLUID

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

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

5. COOLANT

Use the coolants specified in the table below to protect the engine.

Coolant	Recommended materials	Item number	Alternative
Coolant	SUBARU SUPER COOLANT (Concentrated type)	—	—
	SUBARU SUPER COOLANT (Diluted type)	K0670Y0001	
Cooling system protective agent	Cooling system conditioner	SOA345001	—

6. REFRIGERANT

Standard air conditioners on Subaru vehicles use HFC134a refrigerant. Do not mix it with other refrigerants. Also, do not use any compressor oil except for DH-PR.

Air Conditioner	Recommended materials	Item number	Alternative
Refrigerant	HFC134a	—	None
Compressor oil	DH-PR	—	None

Recommended Materials

RECOMMENDED MATERIALS

7. GREASE

Use grease and supplementary lubricants shown in the table below.

Grease	Application point	Recommended materials	Item number	Alternative
Supplementary lubricants	Oxygen sensor	Spray type lubricant	004301003	—
Grease	- MT main shaft (spline parts) - MT main shaft (oil seal lip) - Clutch release lever	NICHIMOLY N-130	—	—
	Clutch master cylinder push rod	SILICONE GREASE G-40M	—	—
	- Gear shift lever - Clutch operating cylinder - Clutch pedal - Brake pedal - Release bearing - Select lever (except shift lock)	NIGHTIGHT LYW No. 2 grease	—	—
	Select lever (shift lock)	SANKOL	—	—
	Steering gearbox	VALIANT GREASE M-2	003608001	ONE LUBER SG
	- Disc brake (Lock pin, guide pin, piston boot) - Drum brake wheel cylinder	Brake grease (NIGLUBE RX-2)	000041000	—
	Between brake pad and shim	Molykote AS-880N	K0777YA010	—
	- Brake pad clip - Brake shoe of drum brake	Molykote M7439	K0770YA000	—
	Front axle AAR	ONE LUBER C	—	—
	Rear axle EBJ	NKG814	—	—
	Rear axle DOJ	NKG814	—	—
	- Door latch - Door striker	SILICONE GREASE G-30M	—	—

8. ADHESIVE

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-400HV or equivalent Glass primer: U-401 and U-402 Painted surface primer: U-413	—	—
	Rearview mirror base	REPAIR KIT IN MR	65029FC000	—

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	• Converter case • Transmission case	THREE BOND 1215	004403007	DOW CORNING No. 7038
	Transmission oil pan (AT model)	THREE BOND 1217B	K0877YA020	—
	• Rear differential • Oil pressure switch (Engine) • PCV valve • Engine oil separator cover (when reusing bolts) • Engine oil pump mounting bolt (when reusing bolts) • Timing belt guide cam sprocket side mounting bolt (when reusing bolts)	THREE BOND 1324	004403042	—
	• Rear differential • Service hole plug	THREE BOND 1105	004403010	DOW CORNING No. 7038
	Rear differential (side retainer bolt)	THREE BOND 1110B	K0879Y0020	—
	Steering adjusting screw	THREE BOND 1102	004403006	THREE BOND 1215
	• Front door sealing cover • Rear door sealing cover	3M Butyl Rubber 8626	—	—
	• Engine oil pan • Separator cover • Camshaft cap • Cylinder block • Oil pump • Rocker cover	THREE BOND 1217G	K0877Y0100	—

PRE-DELIVERY INSPECTION

PI

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1. Pre-delivery Inspection

A: GENERAL DESCRIPTION

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

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

For above reasons, all SOAs (dealerships) must carry out the PDIs before delivery of vehicle.

Refer to this manual unless otherwise specified.

B: PRE-DELIVERY INSPECTION (PDI) PROCEDURE

Perform the procedures indicated in the table below.

Static Checks Just After Vehicle Receipt

Operation	Check point
1. Appearance	1. If the vehicle is covered with protective coating, visually check the vehicle body for damage and dents. If the protective coating has been removed, visually check the painted body surfaces in detail for 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. 4. Check the instrument panel, console and trim for stains or dirt.
2. Tire	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 delivered to customer, attach the room light fuse.
4. Door lock/unlock and open/close operations	1. Using the key, check the door can be locked or unlocked normally. 2. Open and close all doors to check that there are no problems. 3. Operate the power door lock switch to check that the rear gate locks and unlocks normally.
5. Child safety lock	Check the child safety lock system operates normally.
6. Trunk lid open/close operations	1. Using the key, check that the trunk lid can be locked or unlocked normally. 2. Operate the trunk lock release lever to check that the trunk lid opens normally. 3. Use the valet key to check that the lock cannot be released. 4. Open and close the trunk lid to check that there are no problems.
7. Rear gate lock/unlock and open/close operation	1. Check if the rear gate can be unlocked normally through the emergency hole. 2. Open and close the rear gate to check that there are no problems.
8. Operation check of trunk lid release lever	Operate the trunk lid release lever to check that the trunk lock is unlocked normally.
9. Fuel lid opener lock release lever	Operate the fuel lid opener to check that the fuel filler lid can be unlocked normally.
10. Accessory	Check that the following accessories are equipped. • Owner's manual • Warranty booklet • Maintenance note • Spare key • Key No. plate • Security ID plate • Jack • Tool set • Spare tire • Towing hook
11. Front hood lock release	Operate the front hood lock release lever to check that the front hood opens normally.
12. Battery	Check the battery for any abnormal conditions such as rust or traces of battery fluid leaks.
13. Brake fluid	Check the brake fluid amount.
14. Engine oil	Check the engine oil amount.
15. Transmission gear oil	Check the transmission gear oil amount.
16. AT front differential oil	Check for leakage of AT front differential oil.
17. Engine coolant	Check the engine coolant level.
18. Clutch fluid	Check the clutch fluid amount.
19. Window washer fluid	Check the window washer fluid amount.
20. Front hood latch	Check that the front hood is closed normally and locked securely.
21. Keyless entry system	Check that the keyless entry system operates normally.
22. Security system	Check that the security system operates normally.

Pre-delivery Inspection

PRE-DELIVERY INSPECTION

Operation	Check point
23. Seat	1. Check the seat surfaces for stains or dirt. 2. Check the seat installation conditions and functionality.
24. Seat belt	Check the seat belt installation conditions and functionality.
25. TPMS (U.S. model)	1. Turn the TPMS transmitter power supply to ON. 2. If the display of TPMS warning light does not operate normally, perform the diagnosis by referring to TPMS (Diagnosis).
26. ECM protector	For Canada model, check the ECM protector installation conditions.

Checks with the Engine Running

Operation	Check point
27. Delivery (test) mode connector	Turn the ignition switch to ON and check that the malfunction indicator light starts blinking.
28. 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 is blinking.
29. Starting condition	Start the engine and check that the engine starts smoothly.
30. Exhaust system	Check that the exhaust noise is normal and no leaks are found.
31. Indicator and warning lights	Check that all indicator lights and warning lights are operating correctly.
32. Heater & ventilation	Check that the heater & ventilation system operates normally.
33. Air conditioner	Check that the air conditioner operates normally.
34. Clock	Check that the clock operates normally.
35. Audio	Check the radio and AUX operate normally.
36. Navigation	Check the navigation and AUX operate normally.
37. Front accessory power supply socket	Check that the front accessory power supply socket operates normally.
38. Lighting system	Check that the lighting system operates normally.
39. Illumination control	Check that the illumination control operates normally.
40. Window washer	Check that the window washer system operates normally.
41. Wiper	Check that the wiper system operates normally.
42. Wiper deicer	Check that the wiper deicer operates normally.
43. Power window	Check that the power window operates normally.
44. Sunroof	Check that the sunroof operates normally.
45. Rear defogger	Check that the rear defogger operates normally.
46. Door mirror	Check that the remote control mirror and heated mirror operate normally.

Dynamic Test with the Vehicle Running

Operation	Check point
47. Brake test	Check the foot brake for normal operations.
48. Parking brake	Check the parking brake for normal operations.
49. AT shift control	Check that the AT shift patterns are correct.
50. Cruise control	Check that the cruise control system operates normally.

Checks after Dynamic Test

Operation	Check point
51. ATF level	Check that the ATF level is correct.
52. Power steering fluid level	Check that the power steering fluid level is normal.
53. Fluid leakage	Check for fluid/oil leaks.
54. Water leak test	Spray the vehicle with water and check for water leaks.
55. Appearance 2	1. Remove the protective coating (if equipped). 2. Check the body paints for damage and stain. 3. Check the plated parts for damage and rust.

1. APPEARANCE

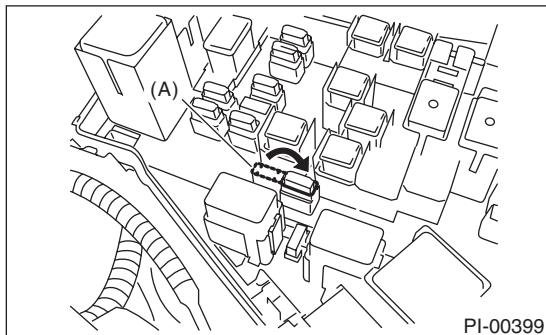
- If the vehicle is covered with protective coating, visually check the vehicle body for damage and dents.
- When there is no protective coating, check the body paints for damage or stains in detail and repair as necessary.
- Check the window glass, door glass, and lights for any cracks or damage, and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

2. TIRE

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

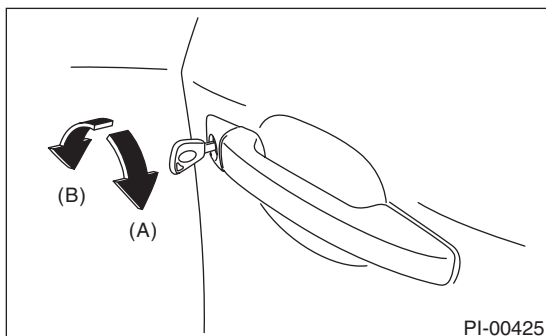
3. FUSE INSTALLATION

Fuses for the room light circuit on initially delivered vehicles are removed to prevent battery discharge. Attach the 20 A fuse (A) as shown in the figure.



4. DOOR LOCK/UNLOCK AND OPEN/CLOSE OPERATIONS

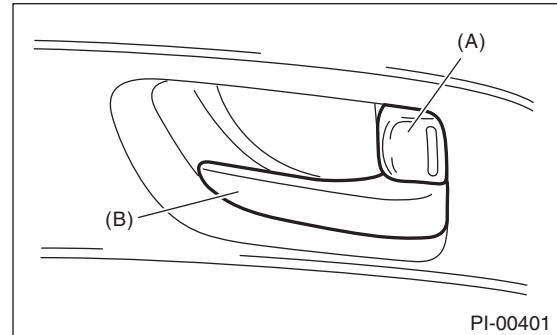
1) Using the key, lock and unlock the door several times to check for normal operation. Open and close the door several times for smooth movement.



- (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.

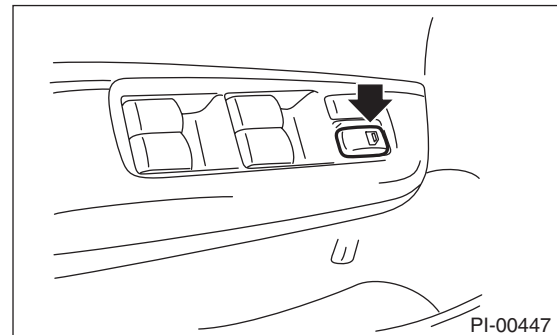
For other doors, place the door lock knob (A) to lock position and then pull the inner remote (B) to ensure that doors will not open.



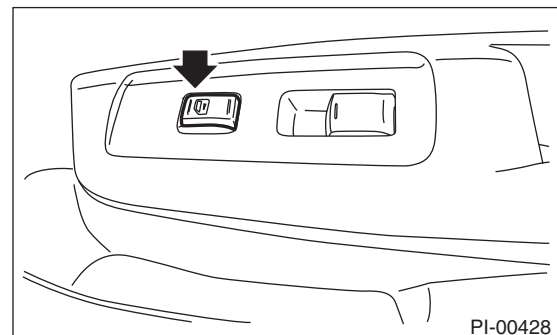
- (A) Door lock knob
- (B) Inner remote

3) Close all doors, and press the lock side of power door lock switch on the driver's and passenger's sides. Check that all doors (including the rear gate) lock.

- Driver's side



- Passenger's side

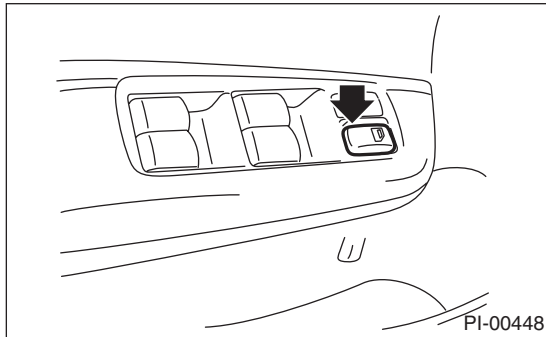


Pre-delivery Inspection

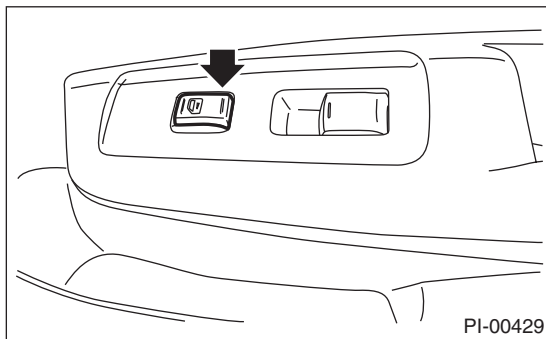
PRE-DELIVERY INSPECTION

4) Press the unlock side of the power door lock switch on the driver and passenger sides. Check that all doors including rear gate are unlocked.

- Driver's side

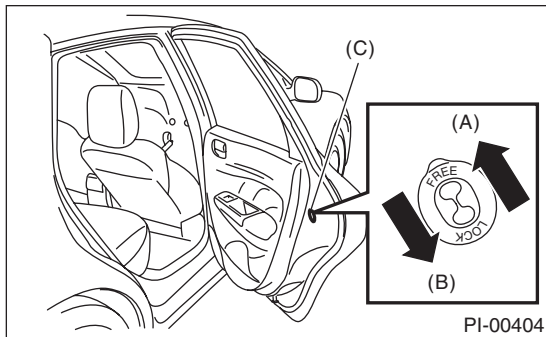


- Passenger's side



5. CHILD SAFETY LOCK

1) Set the child safety lock lever 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 to ensure that doors will open.



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

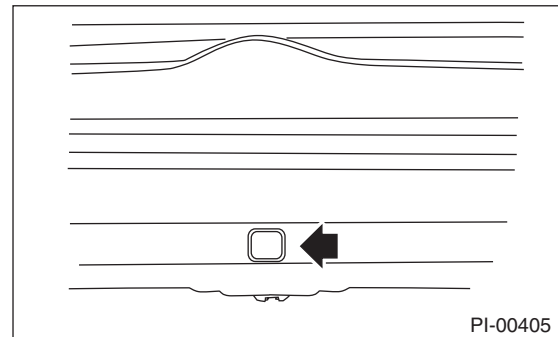
6. TRUNK LID OPEN/CLOSE OPERATIONS

1) Operate the trunk lock release lever to check that the trunk lid opens.
2) Open and close the trunk lid several times for smooth movement.

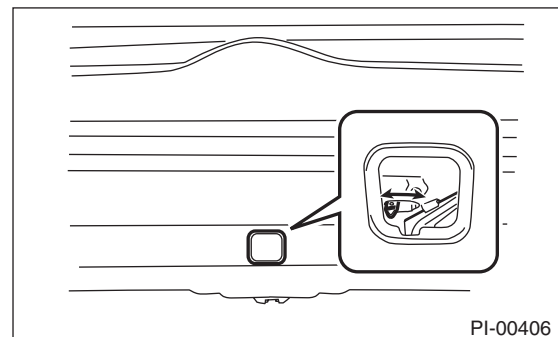
7. REAR GATE LOCK/UNLOCK AND OPEN/CLOSE OPERATIONS

1) Open and close the rear gate several times for smooth movement.
2) Operate the rear gate emergency release lever to check that the rear gate can be locked and unlocked properly.

(1) Remove the cover inside the rear gate.

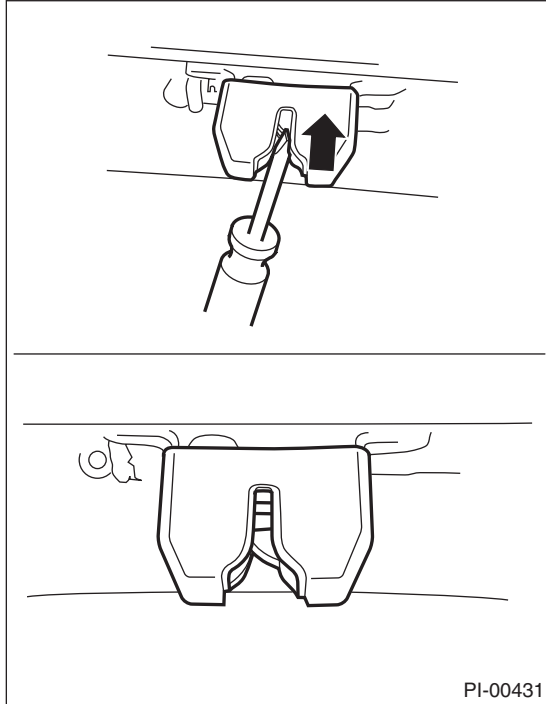


(2) Operate the lever using a tool such as a screwdriver to check that the rear gate is unlocked normally.

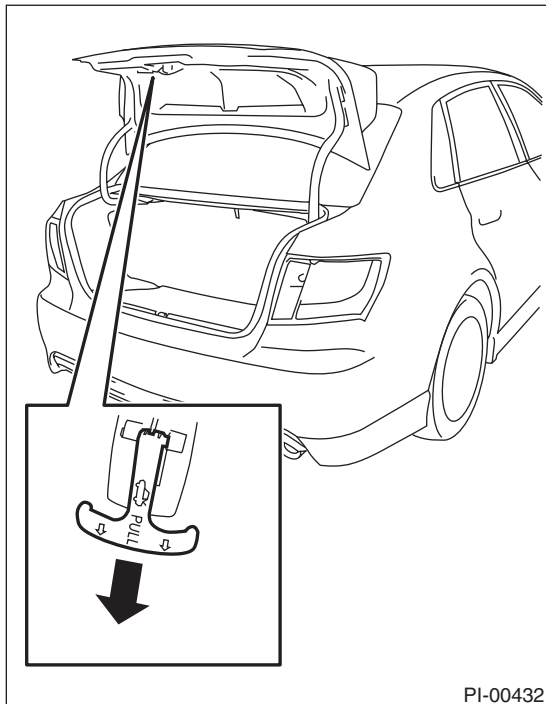


8. OPERATION CHECK OF TRUNK LID RELEASE HANDLE

1) Use a flat tip screwdriver. Slide the screwdriver blade from the slit aperture of the lock assembly fully to the end until you hear a click. This places the latch in the locked position.



2) Move the release handle from outside the vehicle in the direction of the arrow to check if the latch is released.



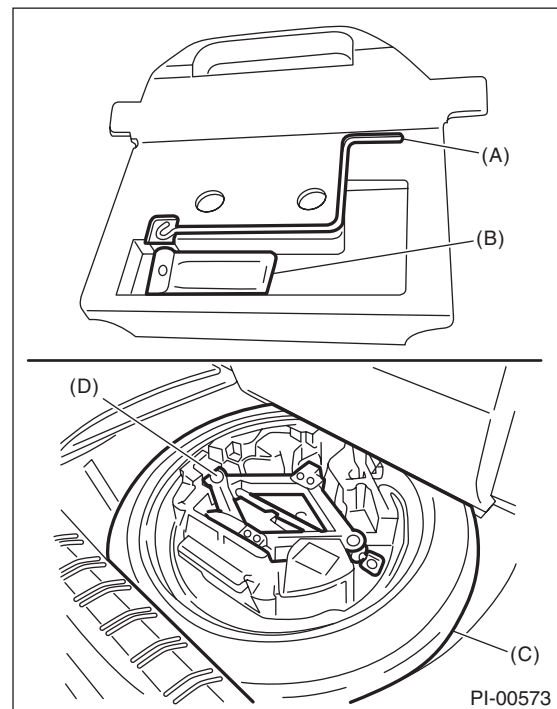
9. FUEL LID OPENER LOCK RELEASE LEVER

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

10. ACCESSORY

Check that the following accessories are provided.

- Owner's manual
 - Warranty booklet
 - Maintenance note
 - Spare key
 - Key No. plate
 - Security ID plate
 - Jack
 - Tool set
 - Spare tire
- 4 door

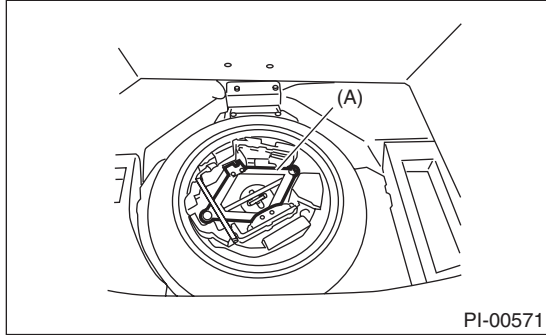


- (A) Jack handle
- (B) Tool set
- (C) Spare tire
- (D) Jack

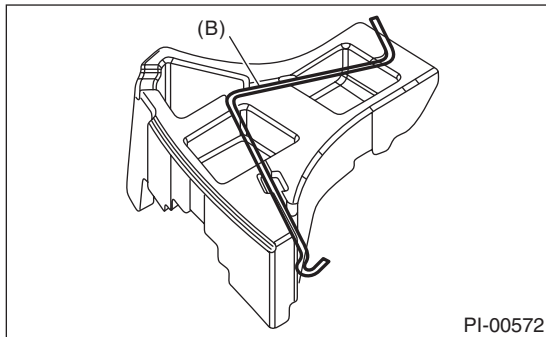
Pre-delivery Inspection

PRE-DELIVERY INSPECTION

5 door



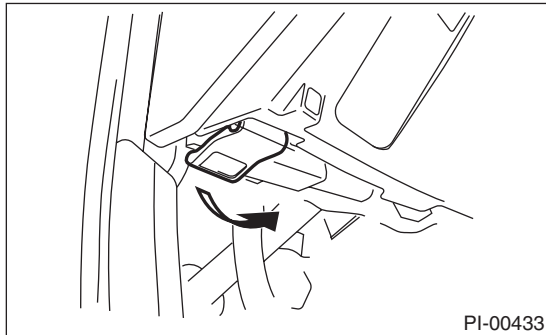
(A) Jack



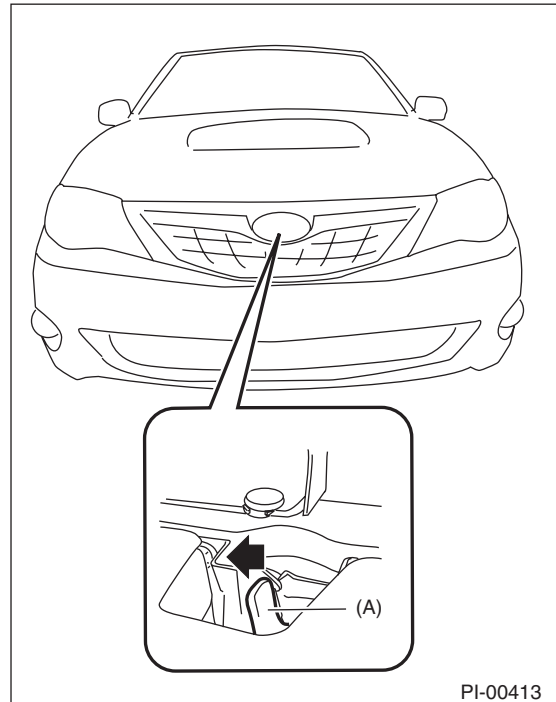
(B) Jack handle

11.FRONT HOOD LOCK RELEASE

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

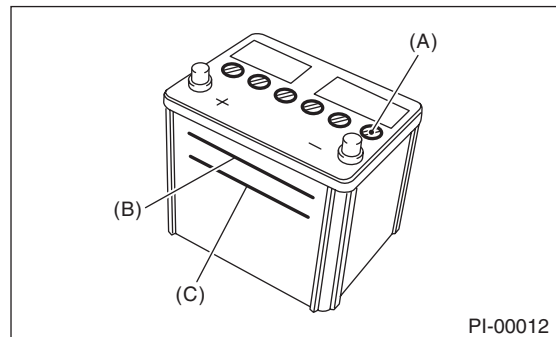


Operate the lever (A) and check that the front hood is opened normally.



12.BATTERY

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



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

13.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.

CAUTION:

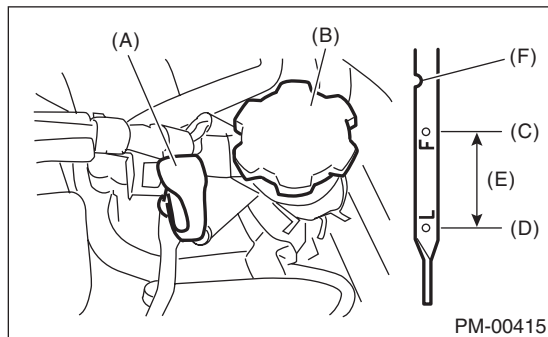
If the brake fluid is spilt over exhaust pipe, wipe it off with cloth to avoid emitting smoke or causing a fire.

14.ENGINE OIL

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

NOTE:

- Just after driving or while the engine is warm, engine oil level shows in the range between the "F" line and the notch mark. This is caused by thermal expansion of engine oil.
- To prevent overfilling of engine oil, do not add oil above "F" line when the engine is cold.



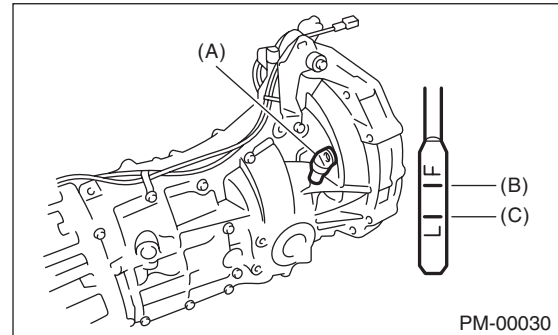
- (A) Engine oil level gauge
- (B) Engine oil filler cap
- (C) "F" line
- (D) "L" line
- (E) Approx. 1 ℓ (1.1 US qt, 0.9 Imp qt)
- (F) Notch mark

15.TRANSMISSION GEAR OIL

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

CAUTION:

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



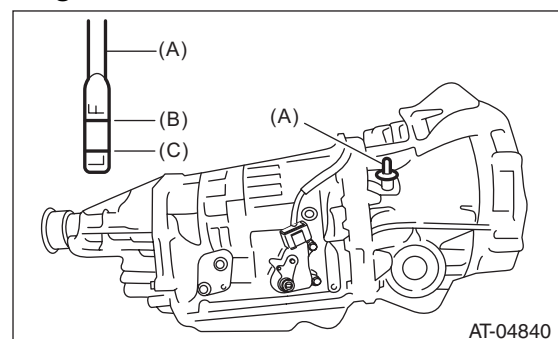
- (A) Oil level gauge
- (B) Upper level
- (C) Lower level

16.AT FRONT DIFFERENTIAL OIL

Check the AT front differential oil amount. If the amount of oil is insufficient, check for leaks. Then, add the necessary amount of the specified AT front differential oil.

CAUTION:

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



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

Pre-delivery Inspection

PRE-DELIVERY INSPECTION

17.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.

CAUTION:

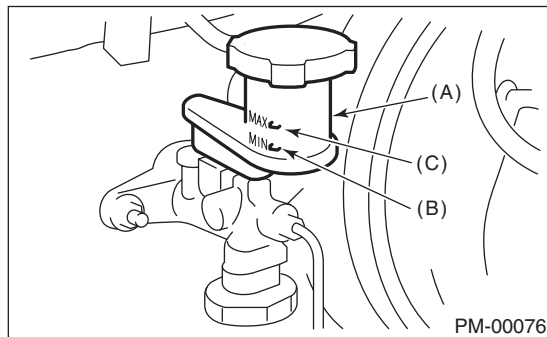
If the coolant is spilt over exhaust pipe, wipe it off with cloth to avoid emitting smoke or causing a fire.

18.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.

CAUTION:

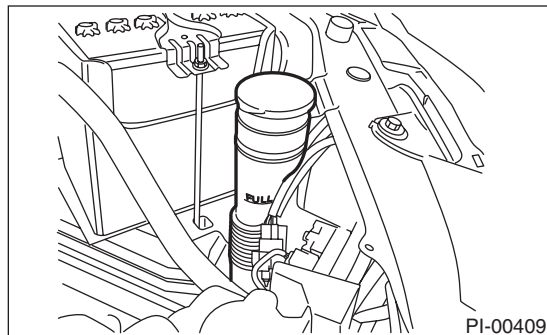
If any clutch fluid is spilt on the exhaust pipe, wipe it off with a cloth to avoid emitting smoke or causing a fire.



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

19.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.



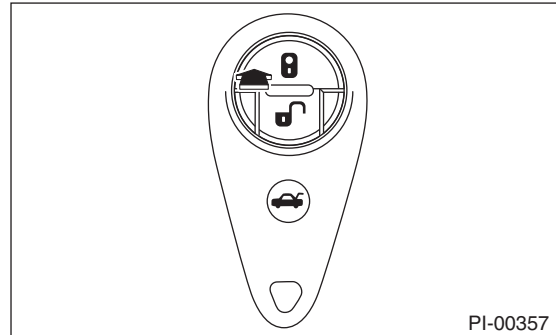
20.FRONT HOOD LATCH

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

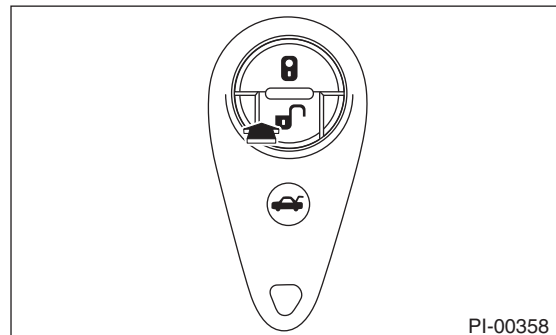
21.KEYLESS ENTRY SYSTEM

Check the keyless entry system operations as follows:

- Fully open all the door windows.
- Remove the key from the ignition switch and close all the doors including rear gate.
- Press the "LOCK/ARM" button momentarily on the keyless transmitter. Check that all the doors become locked, the buzzer sounds once, and the hazard lights flash once.

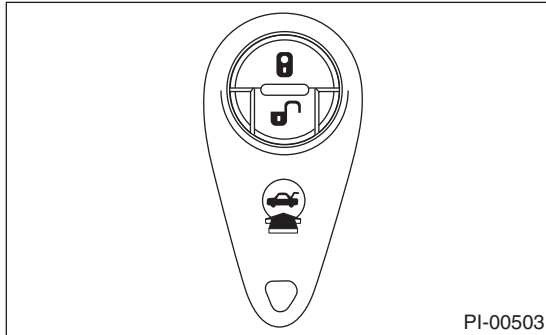


- Press the "UNLOCK/DISARM" button momentarily on the keyless transmitter. Check that the driver's door is unlocked, the buzzer sounds twice, and the hazard lights flash twice.

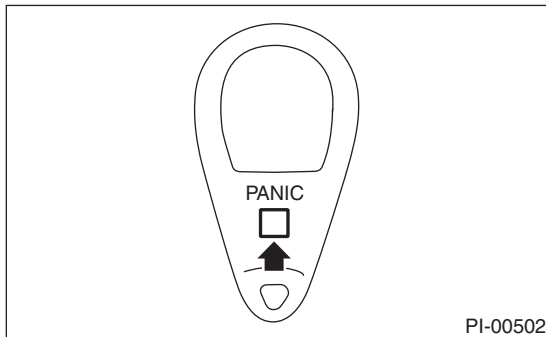


- Within 5 seconds, press the "UNLOCK/DISARM" button momentarily on the keyless transmitter. Check that all doors (including rear gate) are unlocked.
- Lock all the doors including rear gate. Check that the buzzer sounds twice, and the hazard lights flash twice, when the rear gate unlock button is pressed to unlock the rear gate. Press the release button and check that the rear gate opens. (Wagon model)

- Check that the buzzer sounds twice, and the hazard lights flash twice, when the trunk lid unlock button is held down to unlock the trunk lid. (Sedan model)

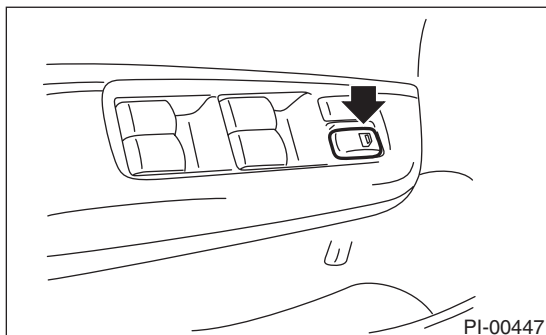


- Press the “Panic” button of the keyless transmitter. Check that the panic mode (the horn keeps sounding) is initiated. Also, check that this condition continues for 30 seconds or until when any of the buttons on the keyless transmitter are pressed.

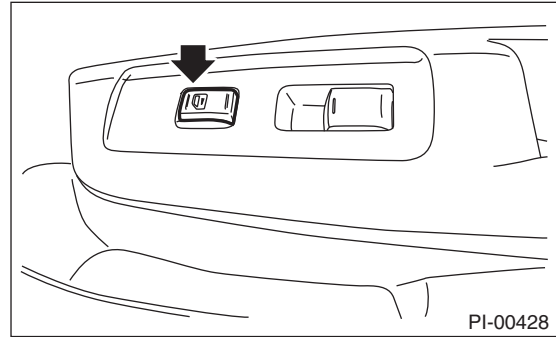


- Press the “LOCK/ARM” button momentarily on the keyless transmitter with one of the doors (including the rear gate) opened. Check that the buzzer sounds 5 times, and the hazard light flashes 5 times to notify the door not being fully closed. Next, close all the doors including rear gate. Check if all doors are locked and buzzer sounds once and the hazard light flashes once.
- With one of the doors open (including the rear gate), press the “LOCK” side of the power door lock switch. Next, close all the doors including rear gate. Check if all doors are locked and buzzer sounds once and the hazard light flashes once.

- Driver's side



- Passenger's side



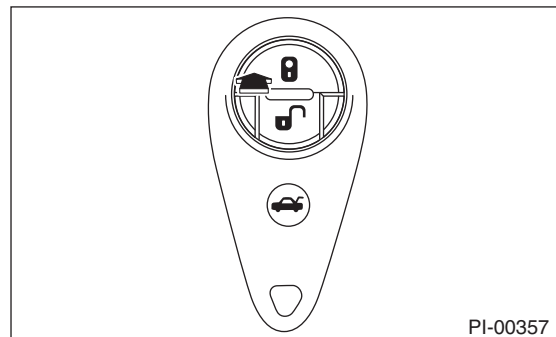
Alarm sound operational check

- The system uses the buzzer and sounds the alarm when the door is locked or unlocked. The alarm sound can be turned OFF. To turn the alarm sound from ON to OFF, close all doors, (with the key not inserted in the key cylinder), hold down the “UNLOCK” side of the power door lock switch and insert the key in the key cylinder. Within 10 seconds, insert and take out the key for 5 times or more, and within 10 seconds after that, open and close the driver's door. With the door closed, the hazard light will flash 3 times, indicating that the alarm sound has been turned OFF. To turn the alarm sound from OFF to ON, perform this procedure again. The hazard light will flash 3 times, indicating that the alarm has been turned ON.

22.SECURITY SYSTEM

Check that the security system operates as indicated 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 on the keyless transmitter once.



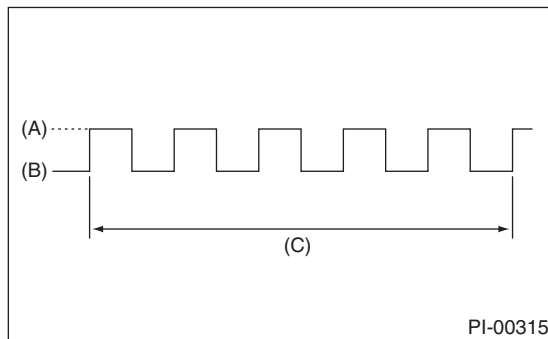
Pre-delivery Inspection

PRE-DELIVERY INSPECTION

4) If all doors lock, buzzer sounds once, the hazard light flashes once, and the security display light flashes as indicated below, the alarm system is in the monitoring condition.



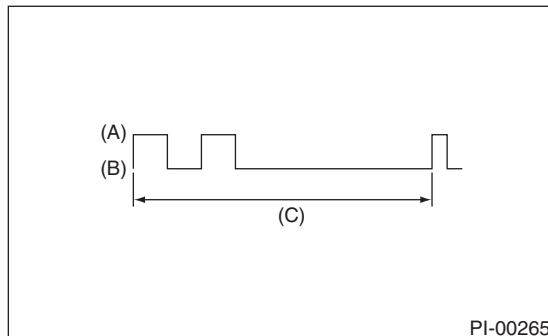
- Alarm system monitoring prepared condition



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

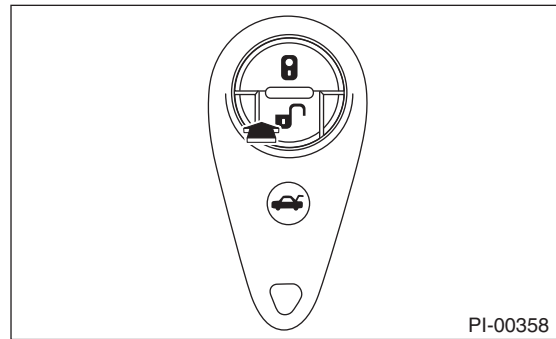
5) Check that the system enters monitoring condition 30 seconds after the condition in 4).

- Alarm system monitoring condition (all models)



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

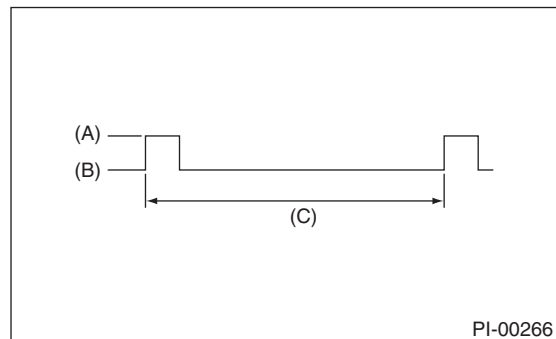
6) Press the "UNLOCK/DISARM" button on the keyless transmitter once.



7) The alarm system is in the non-monitoring conditions if the driver's side door is unlocked, the buzzer sounds twice, the hazard lights flash twice, the room light turns on, and the security display light flashes.

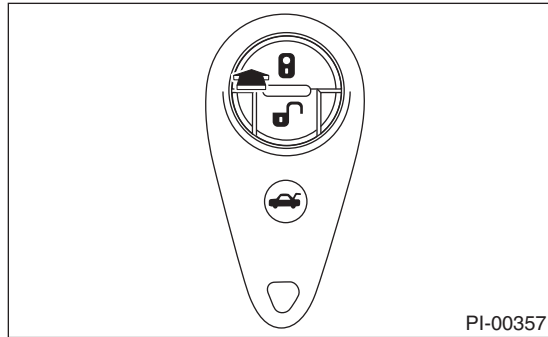


- Alarm system non-monitoring condition



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

8) Press the “LOCK/ARM” button once on the keyless transmitter with one of the doors (including the rear gate) opened.

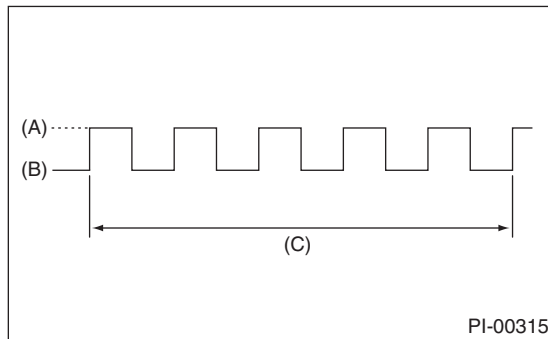


9) Check that the buzzer sounds 5 times to give the door not fully closed warning.

10) Close all the doors including rear gate.

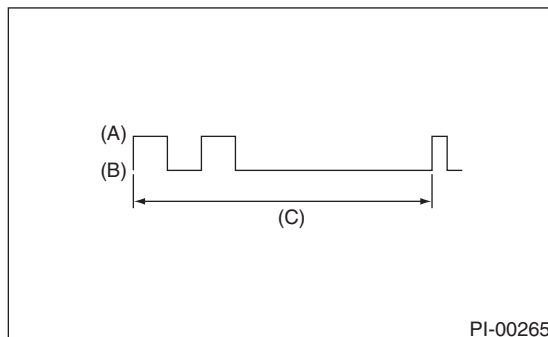
11) Check that the system is in the monitoring condition (all the doors become locked and the buzzer sounds once, and the hazard light flashes once).

- Alarm system monitoring prepared condition



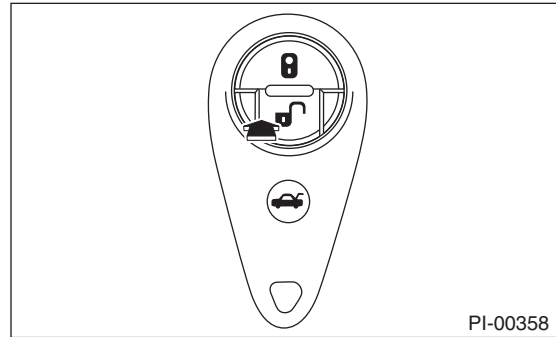
- (A) Light ON
- (B) Light OFF
- (C) 2 seconds

12) Check that the system enters monitoring condition 30 seconds after the condition in 11).



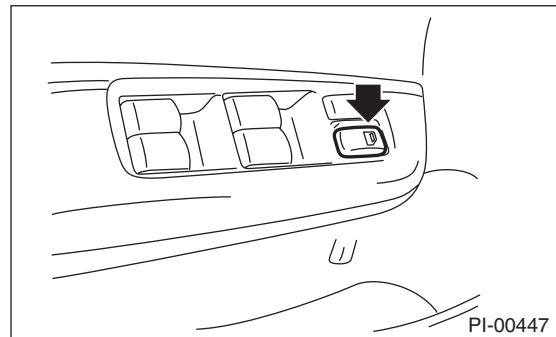
- (A) Light ON
- (B) Light OFF
- (C) 2 seconds

13) Press the “UNLOCK/DISARM” button on the keyless transmitter once and turn into non-monitoring condition.

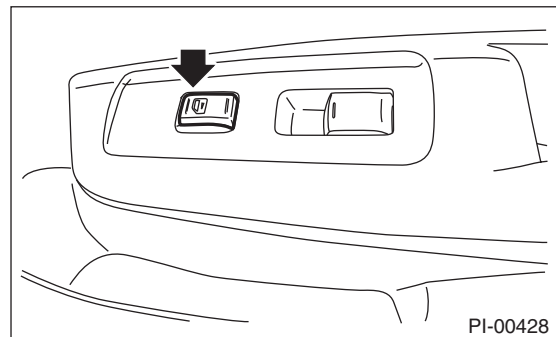


14) With one of all the doors open (including the rear gate), press the “LOCK” side of the power door lock switch.

- Driver’s side



- Passenger’s side

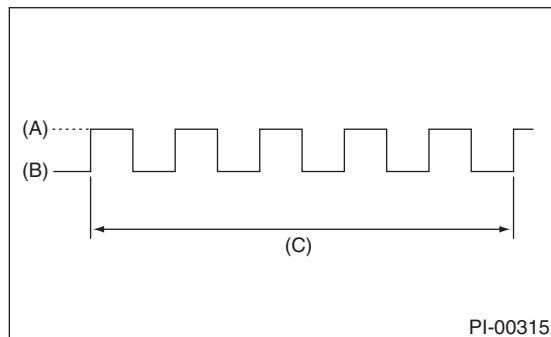


15) Close all the doors including rear gate.

PRE-DELIVERY INSPECTION

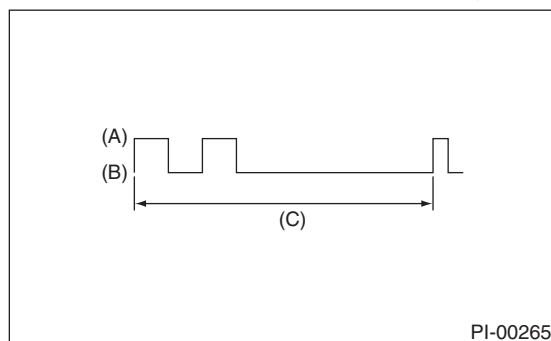
16) If all doors become locked, the buzzer sounds once, and the hazard light flashes once, the alarm system is in the monitoring prepared condition.

- Alarm system monitoring prepared condition



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

17) Check that the system enters monitoring condition 30 seconds after the condition in 16).



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

18) When the alarm system is in the monitoring condition, use the inner lock knob or the key to unlock the door, and open the door.

19) Check that the alarm condition occurs (horn sounds continuously, hazard light flashes, security indicator illuminates).

20) Check that the condition in 19) continues for 30 seconds or more, or until the "UNLOCK/DISARM" button of the keyless transmitter is pressed, or until the switch is turned ON with the correct ignition key.

21) On models equipped with an impact sensor, hit the windshield glass with your hand with the alarm system in the monitoring condition, to check that the alarm condition occurs.

22) When none of above is applicable, perform troubleshooting for the security system. <Ref. to SL-25, INSPECTION, Security System.>

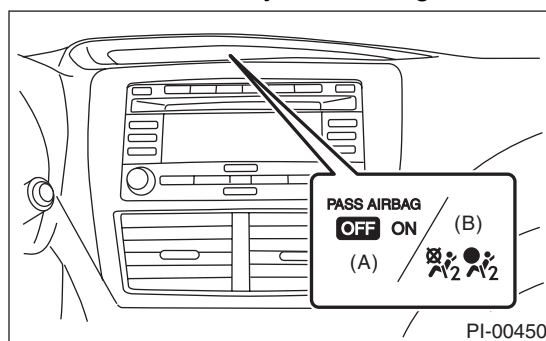
23. SEAT

1) Check that each seat provides full functionality in sliding and reclining. Check all available functions of the rear seat such as a trunk-through center armrest.

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

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

(2) Check that the passenger airbag ON/OFF indicator lights both turn on simultaneously for approximately six seconds, and after turning off for two seconds, only the OFF light illuminates.



- (A) Airbag ON/OFF indicator light (U.S. (U4) model)
(B) Airbag ON/OFF indicator light (Canada, Mexico (CO, C4) model)

3) With a person weighing approximately 70 kg (155 lb) or more sitting in the passenger's seat, check whether the ON light of the passenger's airbag ON/OFF indicator illuminates or not.

4) Have the passenger get out of the passenger's seat, and check whether the OFF light of the passenger side airbag ON/OFF indicator illuminates.

24. SEAT BELT

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

2) Check seat warning system

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

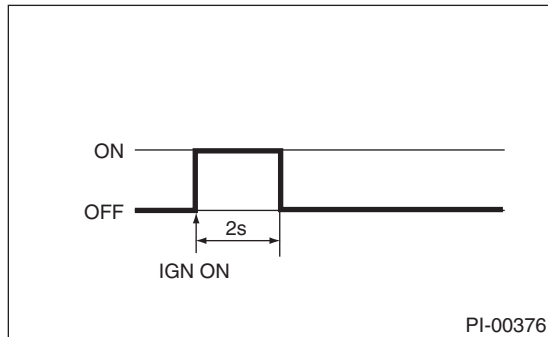
(2) Check the seat belt warning lights of the driver's and the passenger's blink for approximately six seconds and the buzzer sounds intermittently.

(3) Then check that the seat belt warning lights illuminate and blink in a cycle of approximately 15 seconds. (If no one is seated on the passenger's seat, the seat belt warning light of the passenger's will not operate.)

25.TPMS (U.S. MODEL)

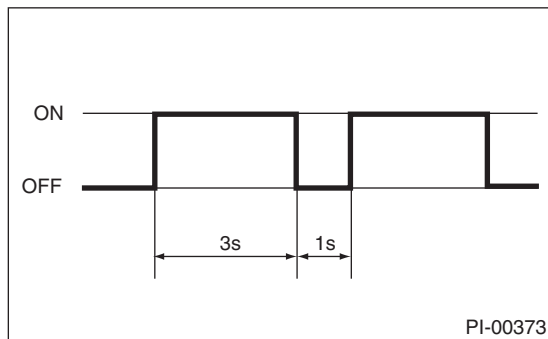
1) Turn the ignition switch to ON, and check that the TPMS warning light is in a normal operation condition.

- Normal operation (IG ON (Light check))

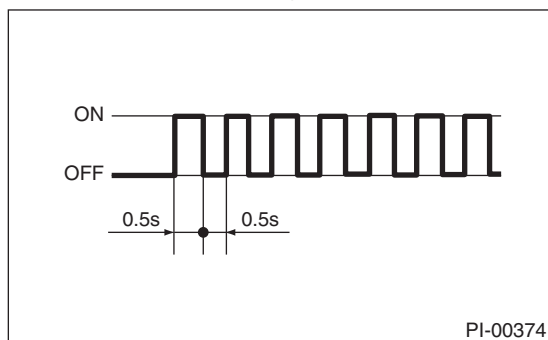


2) If the display of TPMS warning light does not operate normally, check and repair it in the following procedures.

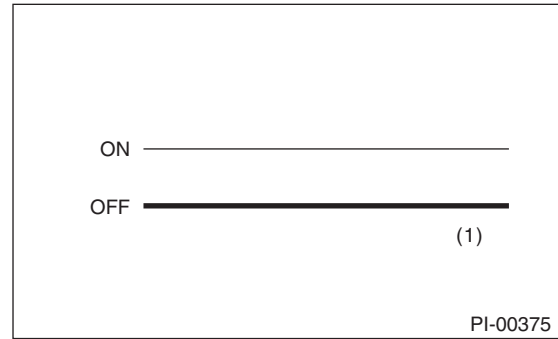
- Transmitter power supplies for all the wheels are OFF *1 (Radiowave stop mode)



- Transmitter power supplies for the wheels 1 to 3 are OFF *2 (Radiowave stop preparation mode & SSM communication start)

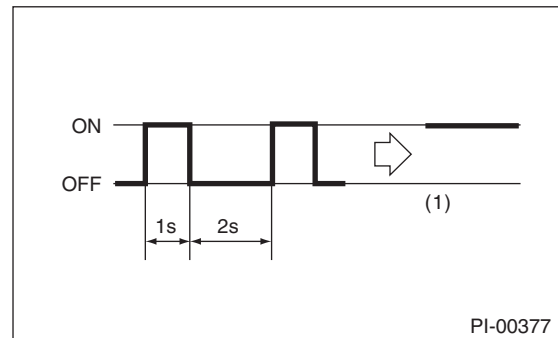


- Normal operation (Normal condition) *3



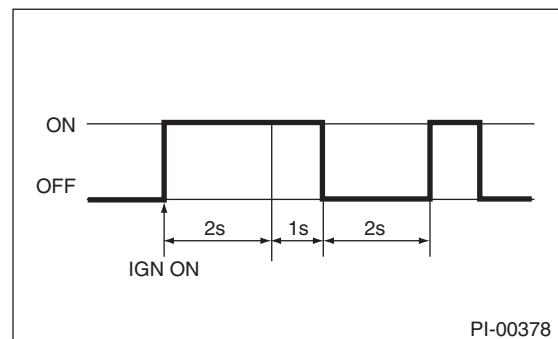
(1) Light OFF

- System failure (Normal condition)

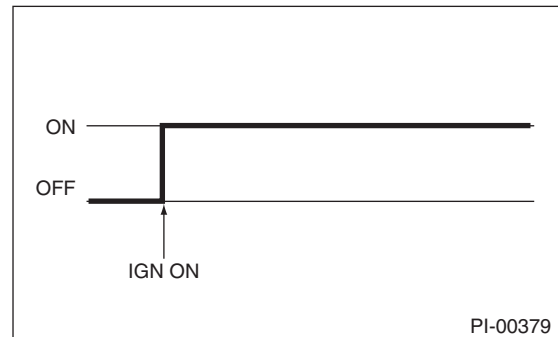


(1) Illuminates after 25 blinks

- System failure (IG ON)



- During tire pressure decrease warning, or ID has not registered



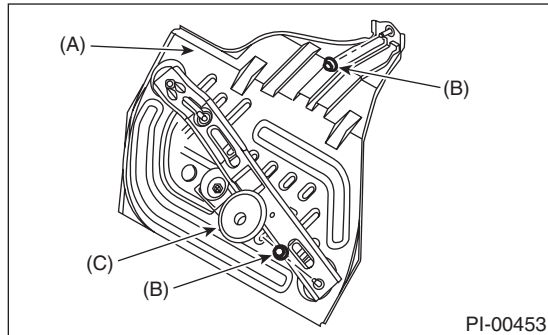
Pre-delivery Inspection

PRE-DELIVERY INSPECTION

Step		Check	Yes	No
1	CHECK TPMS WARNING LIGHT. 1) IG ON 2) Check the TPMS warning light condition.	Does the TPMS warning light condition become *1?	Go to step 2.	Go to step 3.
2	TURN THE BULB POWER SUPPLY TO ON. 1) Touch the transmitter registration tool to the side wall area near the air valve on the tire. 2) Press the switch and hold it for 4 seconds or more. 3) Perform the same procedures for the four tires.	Does the TPMS warning light condition become *3?	Go to step 10.	Go to step 9.
3	CHECK ID. 1) While checking the display of the Subaru Select Monitor, transmit the transmitter ID using the transmitter registration tool.	Does the ID of equipped transmitter match with the registered ID?	Go to step 6.	Go to step 4.
4	RE-REGISTER ID. 1) Register the transmitter. 2) After the completion of ID registration, check if the TPMS warning light condition becomes *3.	Does the TPMS warning light condition become *3?	Go to step 11.	Go to step 6.
5	CHECK TIRE INFLATION PRESSURE. 1) Check the tire inflation pressures of all the four wheels. 2) Adjust the tire inflation pressures. 3) Check the TPMS warning light condition.	Does the TPMS warning light condition become *3?	Go to step 7.	Go to step 6.
6	DIAGNOSIS. 1) Check the trouble history using the Subaru Select Monitor.	Is DTC displayed on Subaru Select Monitor?	Repair the trouble cause. <Ref. to TPM(diag)-2, PROCEDURE, Basic Diagnostic Procedure.>	Go to step 7.
7	CLEAR TROUBLE HISTORY. 1) Using the Subaru Select Monitor, perform the clear memory.	Is DTC displayed on Subaru Select Monitor?	Repair the trouble cause. <Ref. to TPM(diag)-2, PROCEDURE, Basic Diagnostic Procedure.>	Go to step 8.
8	CHECK TPMS WARNING LIGHT. 1) IG OFF 2) IG ON 3) Check the TPMS warning light condition.	Does the TPMS warning light display show *3?	Finish the check operation.	Perform the diagnosis again. <Ref. to TPM(diag)-2, PROCEDURE, Basic Diagnostic Procedure.>
9	CHECK TPMS WARNING LIGHT.	Does the TPMS warning light condition become *1 or *2?	Go to step 3.	Go to step 5.
10	TRANSMIT DATA FORCIBLY. 1) Touch the transmitter registration tool to the side wall area near the air valve on the tire. 2) Press the switch and hold it for 4 seconds or more. 3) Perform the same procedures for the four tires.	Does the TPMS warning light condition become *3?	Finish the check operation.	Go to step 5.
11	TRANSMIT DATA FORCIBLY. 1) Touch the transmitter registration tool to the side wall area near the air valve on the tire. 2) Press the switch and hold it for 4 seconds or more. 3) Perform the same procedures for the four tires.	Does the TPMS warning light condition become *3?	Go to step 7.	Go to step 5.

26.ECM PROTECTOR

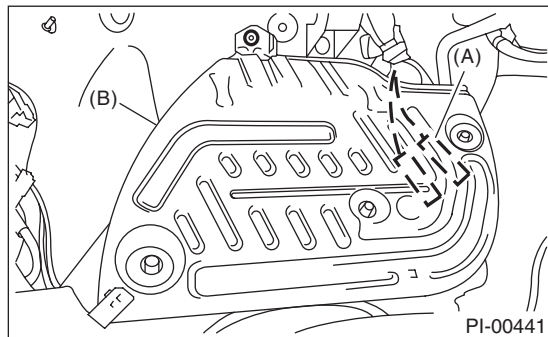
For Canada model, check the ECM protector installation conditions. Make sure that the special nut and the plastic cover of ECM protector are securely installed.



- (A) ECM protector
- (B) Special nut
- (C) Plastic cover

27.DELIVERY (TEST) MODE CONNECTOR

- 1) Turn the ignition switch to ON and check that the malfunction indicator light starts blinking.
- 2) If the light blinks, return the ignition key to LOCK.
- 3) Disconnect the delivery (test) mode connector under the passenger's seat.
- 4) Then, turn the ignition key to ON again.
- 5) If the malfunction indicator light blinks even though the delivery (test) mode connector is disconnected, carry out an engine diagnosis.
- 6) Put the disconnected delivery (test) mode connector behind the ECM protector.



- (A) Delivery (test) mode connector
- (B) ECM protector

28.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 is blinking.

NOTE:

If malfunctions occur, refer to "IMMOBILIZER (DIAGNOSIS)". <Ref. to IM(diag)-2, Basic Diagnostic Procedure.>

29.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.

30.EXHAUST

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

31.INDICATOR AND WARNING LIGHTS

Check that all indicator lights and warning lights are operating correctly.

32.HEATER & VENTILATION

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

33.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.

34.CLOCK

Check the clock for normal operations and enough accuracy.

35.AUDIO

- 1) Check if the AM/FM radio broadcasting can be heard.
- 2) Check that all the radio functions work properly and the noise level is normal.
- 3) Check the CD and AUX for normal operation.
- 4) Check that the AUX is installed into the console without looseness.

36. NAVIGATION SYSTEM

- 1) Check all display functions for normal operation. (Refer to the operation manual.)
- 2) Check that the navigation system operates normally.
- 3) Check the radio, CD (DVD) player and AUX for normal operation.
- 4) Check that the AUX is installed into the console without looseness.

37. FRONT ACCESSORY POWER SUPPLY SOCKET

Check the operation of the front accessory power supply socket.

38. LIGHTING

- 1) Check the headlight operations. When pulling out the key, check if the headlight illuminates by turning the headlight switch from OFF to ON.
- 2) Check the stop light operation.
- 3) Check other lights for normal operations.

39. ILLUMINATION CONTROL

Check that the illumination control operates normally.

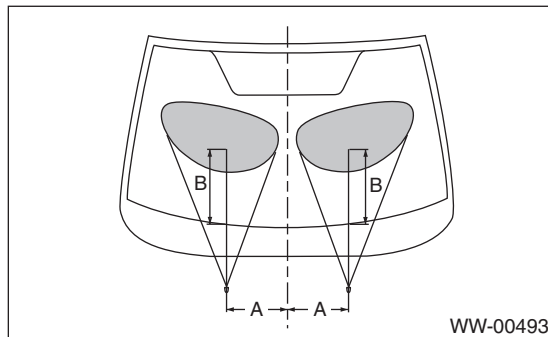
40. WINDOW WASHER

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

Front spray position:

A: 250 mm (9.8 in)

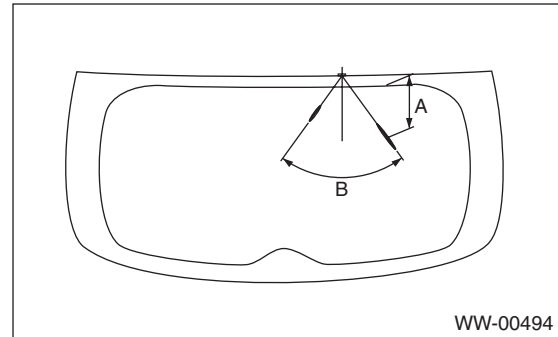
B: 315 mm (12.4 in)



Rear spray position:

A: 140 mm (13.97 cm)

B: 70°



41. WIPER

Check the front and rear wipers for normal operations.

42. WIPER DEICER

Check that the wiper deicer operates normally.

NOTE:

When an ambient temperature is 5°C or more, wiper deicer operation is cancelled. Press the switch for 3 seconds or more to perform the compulsory operation.

43. POWER WINDOW

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

44. SUNROOF

Check that the sunroof operates normally.

45. REAR DEFOGGER

Press the rear defogger switch and check that the light inside the switch is activated for approx. 15 minutes and the rear defogger automatically turns to OFF.

46. DOOR MIRROR

- Check that the remote control mirror operates normally.
- Check that the heated mirror operates normally.

47. BRAKE TEST

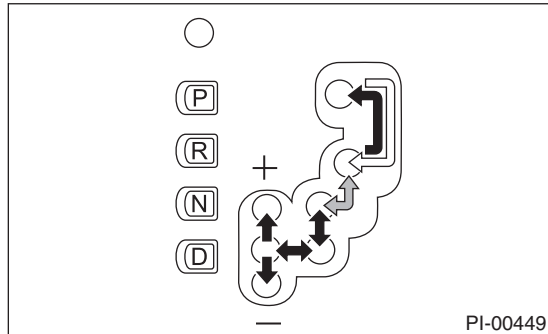
Check the foot brake for normal operations.

48. PARKING BRAKE

Check the parking brake for normal operations. When pulling the parking brake lever with a force of 200 N (20 kgf, 45 lb), check that the lever stroke of parking brake lever is 7 to 8 notches.

49.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 to OFF, check if the ignition key switch cannot be removed.
- 6) Set the AT selector lever to each gear position and check the shifting while driving the vehicle.



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

50.CRUISE CONTROL

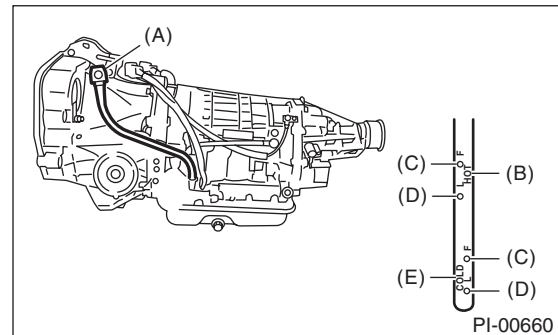
Operate the cruise control system. Check that the system is activated and deactivated correctly.

51.ATF LEVEL

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

CAUTION:

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



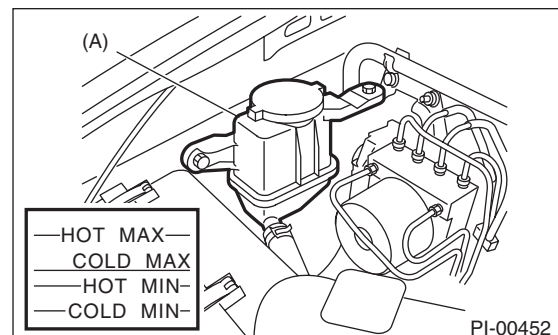
- (A) Level gauge
- (B) Inspection position when "HOT" [70 — 80°C (158 — 176°F)]
- (C) Upper level
- (D) Lower level
- (E) Inspection position when "COLD" [20 — 30°C (68 — 86°F)]

52.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.

CAUTION:

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



- (A) Reservoir tank

53.FLUID LEAKAGE

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

54. WATER LEAK TEST

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

- Before performing the water leakage test, remove anything that may obstruct the operation or which must be kept dry.
- Close all the windows and doors securely. Close the front hood, trunk lid and rear gate 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 ℓ (5.3 — 6.6 US gal, 4.4 — 5.5 Imp gal) per minute.

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

NOTE:

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

55. APPEARANCE 2

1) If protective coating (lap guard) is applied, remove it.

NOTE:

- When removing the lap guard, using steam will make it easier to remove.
- Vehicle left for a extended periods or at low temperatures, spray the vehicle with water heated 50 — 60°C (122 — 140°F) to raise the surface temperature before peeling off the wrap guard. Do not use the water heated to over 60°C (140°F).
- If the adhesive remains exist 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 solvents while the component surface temperature is hot due to hot weather etc.

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

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

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

NOTE:

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

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

6) Peel the identification seal attached to the rear combination light.

PERIODIC MAINTENANCE SERVICES

PM

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General Description

PERIODIC MAINTENANCE SERVICES

1. General Description

A: GENERAL DESCRIPTION

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

Schedule

PERIODIC MAINTENANCE SERVICES

2. Schedule

A: MAINTENANCE SCHEDULE 1

1. U.S.

		Maintenance interval [Number of months or km (miles), whichever occurs first]																		
	Months	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120	Remarks	
	× 1,000 km	4.8	12	24	36	48	60	72	81.4	96	108	120	132	144	156	168	180	192		
	× 1,000 miles	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120		
1	Engine oil		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R		
2	Engine oil filter		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R		
3	Spark plug					R				R				R				R		
4	Drive belt(s)					I				I				I		R				
5	Camshaft drive belt					I				I				I		R				
6	Fuel line					(I)				(I)				(I)				I	Note (1)	
7	Fuel filter									R								R		
8	Air cleaner element					R				R				R				R	Note (2)	
9	Cooling system					I				I				I				I		
10	Engine coolant	Replace after the first 11 years or 220,000 km (137,500 miles), and every six years or 120,000 km (75,000 miles) thereafter.																		
11	Clutch system			I		I		I		I		I		I		I		I		
12	Transmission gear 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 pad and disc			I		I		I		I		I		I		I		I		
18	Parking brake			I		I		I		I		I		I		I		I		
19	Suspension			I		I		I		I		I		I		I		I		
20	Wheel bearing									(I)								(I)		
21	Axle boots and joints			I		I		I		I		I		I		I		I		
22	Tire rotation		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	Note (3)	
23	Steering system (power steering)			I		I		I		I		I		I		I		I		
24	A/C filter	Check every 12 months or every 12,000 km (7,500 miles).																		

Symbols used:

R: Replace

I: Inspection

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

NOTE:

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

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

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

Schedule

PERIODIC MAINTENANCE SERVICES

2. CANADA

		Maintenance interval [Number of months or km (miles), whichever occurs first]																	Remarks
	Months	3	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120	
	× 1,000 km	4.8	12	24	36	48	60	72	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	
4	Drive belt(s)					I				I				I		R			
5	Camshaft drive belt					I				I				I		R			
6	Fuel line					(I)				(I)				(I)				I	Note (1)
7	Fuel filter									R								R	Note (1)
8	Air cleaner element					R				R				R				R	Note (2)
9	Cooling system					I				I				I				I	
10	Engine coolant	Replace after the first 11 years or 220,000 km (137,500 miles), and every six years or 120,000 km (75,000 miles) thereafter.																	
11	Clutch system			I		I		I		I		I		I		I		I	
12	Transmission gear 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 pad and disc			I		I		I		I		I		I		I		I	
18	Parking brake			I		I		I		I		I		I		I		I	
19	Suspension			I		I		I		I		I		I		I		I	
20	Wheel bearing									(I)								(I)	
21	Axle boots and joints			I		I		I		I		I		I		I		I	
22	Tire rotation		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	Note (3)
23	Steering system (power steering)			I		I		I		I		I		I		I		I	
24	A/C filter	Check every 12 months or every 12,000 km (7,500 miles).																	

Symbols used:

R: Replace

I: Inspection

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

NOTE:

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

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

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

Schedule

PERIODIC MAINTENANCE SERVICES

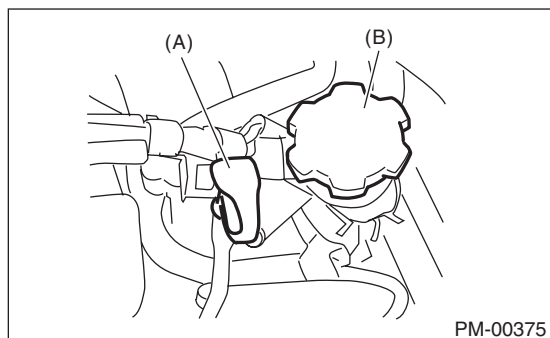
B: MAINTENANCE SCHEDULE 2

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

3. Engine Oil

A: REPLACEMENT

1) Open the engine oil filter cap for quick draining of engine oil.



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

2) Lift up the vehicle.

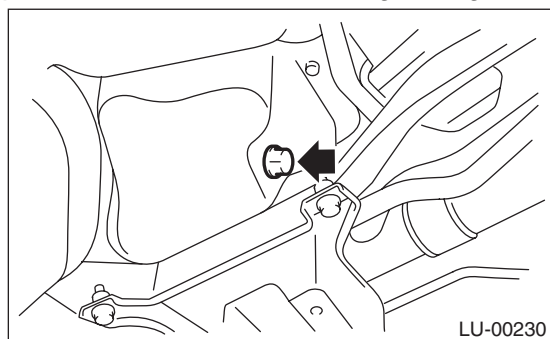
3) Drain engine oil by loosening the engine oil drain plug.

CAUTION:

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

NOTE:

Prepare the container for draining of engine oil.



4) Replace the drain plug gasket.

NOTE:

Use a new drain plug gasket.

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

Tightening torque:

44 N·m (4.5 kgf-m, 32.5 ft-lb)

6) Lower the vehicle.

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

Recommended oil:

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

Engine oil capacity

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

NOTE:

- The proper viscosity helps vehicle get good cold and hot starting by reducing viscous friction and thus increasing cranking speed.
- When replenishing oil, it does not matter if the oil to be added is a different brand from that in the engine; however, use oil having the API standard and SAE viscosity No. designated by SUBARU.
- If vehicle is used in desert areas with very high temperatures or for other heavy duty applications, the following viscosity oils may be used:

API standard: SM or SN

ILSAC standard: GF-4 or GF-5

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

8) Close the engine oil filler cap.

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

10) Stop the engine to inspect the oil level again. <Ref. to PM-6, INSPECTION, Engine Oil.>

B: INSPECTION

CAUTION:

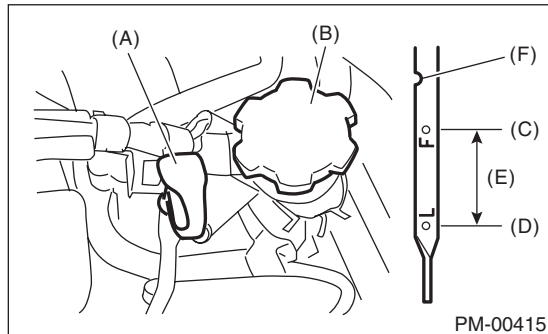
If the engine oil is spilt over exhaust pipe or the under cover, wipe it off with cloth to avoid emitting smoke or causing a fire.

- 1) Park the vehicle on a level surface.
- 2) Remove the oil level gauge and wipe it clean.
- 3) Reinsert the oil level gauge all the way. Be sure that the oil level gauge is correctly inserted and properly orientated.
- 4) Pull out the oil level gauge again, and check the oil level. If the engine oil level is below "L" line, make sure that there is no oil leakage from the engine, then add oil to raise the level up to the "F" line.
- 5) Start the engine to circulate the oil in engine room.

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

NOTE:

- Just after driving or while the engine is warm, engine oil level shows in the range between the “F” line and the notch mark. This is caused by thermal expansion of engine oil.
- To prevent overfilling of engine oil, do not add oil above “F” line when the engine is cold.
- As the oil level gauge is used for daily inspection, standard of “F” line and “L” line of the oil level gauge is set for the condition that engine is cold.



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

4. Engine Oil Filter

A: REPLACEMENT

- 1) Lift up the vehicle.
- 2) Remove the oil filter.

- Oil filter (Black)

Remove using the ST.

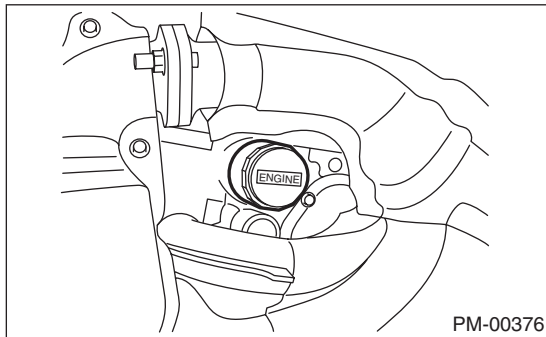
ST 18332AA000 OIL FILTER WRENCH (OUTER DIAMETER: 68 MM (2.68 IN) FOR OIL FILTER)

- Oil filter (Blue)

Remove using a general tool (65/67 mm 14 Flutes).

CAUTION:

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



- 3) Clean the oil filter installing surface of cylinder block.

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

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

- Tighten the oil filter (Black) with an outer diameter of 68 mm (2.68 in) (approx. 1 rotation) after the seal rubber of the oil filter comes in contact with cylinder block. When using a torque wrench, tighten to 14 N·m (1.4 kgf-m, 10.3 ft-lb).

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

CAUTION:

Do not tighten excessively, or oil may leak.

- 6) Run the engine and make sure that no oil is leaking around seal rubber.

NOTE:

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

- 7) Check the engine oil level. <Ref. to PM-6, INSPECTION, Engine Oil.>

5. Spark Plug

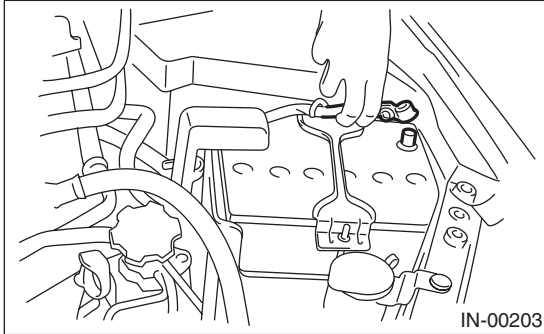
A: REPLACEMENT

Spark plug:

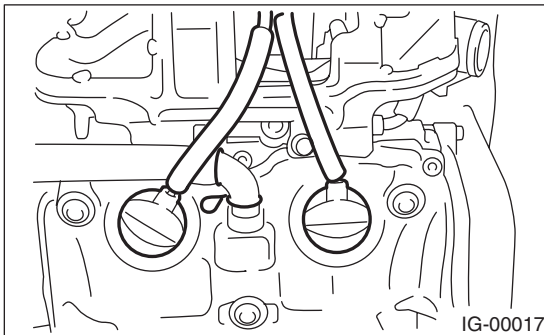
Refer to “SPECIFICATION” for spark plug.
<Ref. to SPC-2, ELECTRICAL, Impreza.>

1. RH SIDE

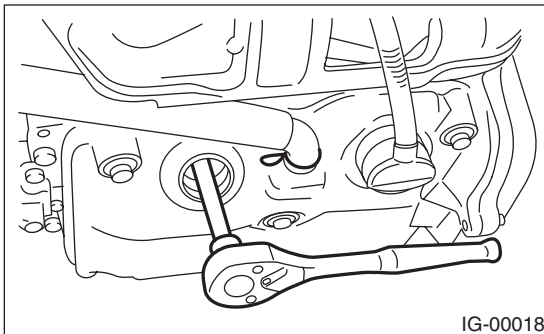
- 1) Disconnect the ground cable from battery.



- 2) Remove the air cleaner case. <Ref. to IN(H4SO)-5, REMOVAL, Air Cleaner Case.>
- 3) Remove the spark plug cords by pulling the boot. (Do not pull the cord itself.)



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



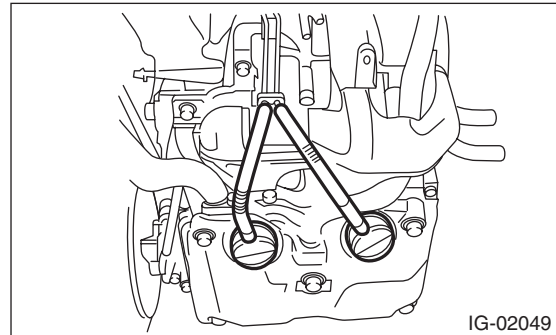
- 5) Install in the reverse order of removal.

Tightening torque:

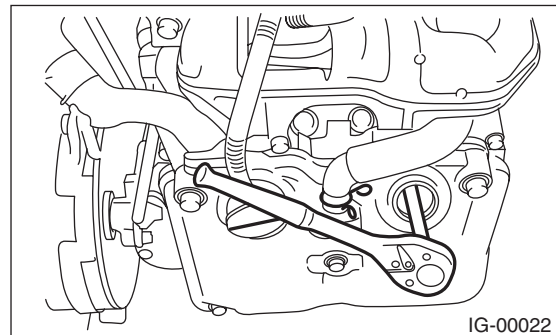
21 N·m (2.1 kgf-m, 15.5 ft-lb)

2. LH SIDE

- 1) Remove the battery. <Ref. to SC(H4SO)-22, REMOVAL, Battery.>
- 2) Remove the spark plug cords by pulling the boot. (Do not pull the cord itself.)



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



- 4) Install in the reverse order of removal.

Tightening torque:

21 N·m (2.1 kgf-m, 15.5 ft-lb)

6. V-belt

A: INSPECTION

CAUTION:

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

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

NOTE:

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

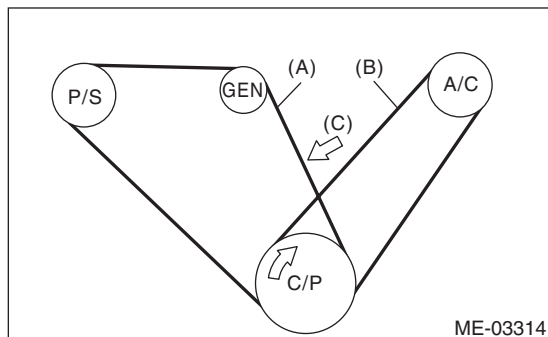
1. PROCEDURE (WITHOUT BELT TENSION GAUGE)

- 1) Replace the belts if cracks, fraying or wear are found.
- 2) Check the V-belt tension and adjust it if necessary by changing the generator installing position or idler pulley installing position. <Ref. to PM-11, REPLACEMENT, V-belt.>

Belt tension (force of 98 N (10 kgf, 22 lbf) is applied)

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

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



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

2. PROCEDURE (WITH BELT TENSION GAUGE)

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

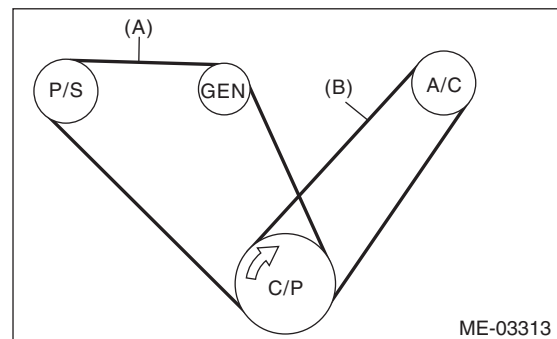
Belt tension

When installing new parts:

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

At inspection:

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

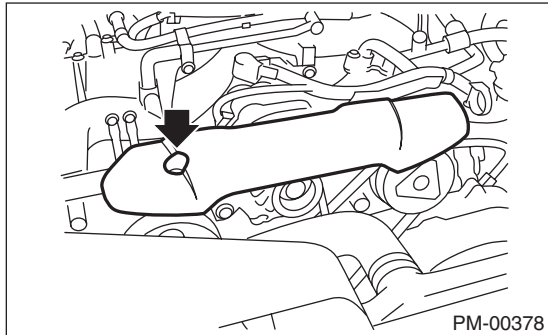


- (A) Front side belt
- (B) Rear side belt
- C/P Crank pulley
- GEN Generator pulley
- P/S Power steering oil pump pulley
- A/C A/C compressor pulley

B: REPLACEMENT**1. FRONT SIDE BELT (FOR POWER STEERING OIL PUMP AND GENERATOR)****NOTE:**

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

- 1) Remove the V-belt covers.



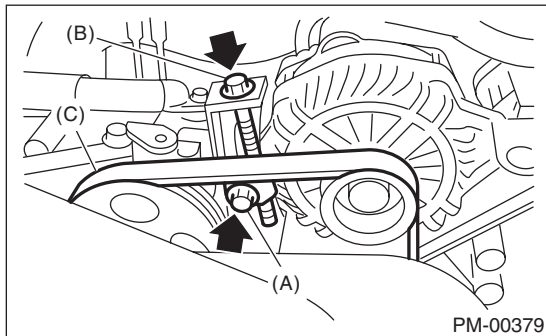
- 2) Loosen the lock bolt (A).
- 3) Loosen the slider bolt (B).
- 4) Remove the front side belt (C).
- 5) Install a new belt, and tighten the slider bolt so as to obtain the specified belt tension.
- 6) Tighten the lock bolt (A).
- 7) Tighten the slider bolt (B).

Tightening torque:**Lock bolt**

25 N·m (2.5 kgf-m, 18.4 ft-lb)

Slider bolt

8 N·m (0.8 kgf-m, 5.9 ft-lb)



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

2. REAR SIDE BELT (FOR A/C)**CAUTION:**

Always use new rear side belt.

- 1) Remove the front side belts.
 - 2) Cut the rear side belt.
 - 3) Install a new belt using an installation jig. <Ref. to ME(H4SO)-40, REAR SIDE BELT, INSTALLATION, V-belt.>
 - 4) Install the front side belt.
- <Ref. to ME(H4SO)-39, FRONT SIDE BELT, INSTALLATION, V-belt.>

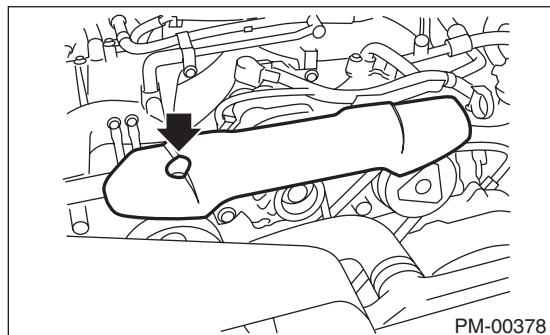
Timing Belt

PERIODIC MAINTENANCE SERVICES

7. Timing Belt

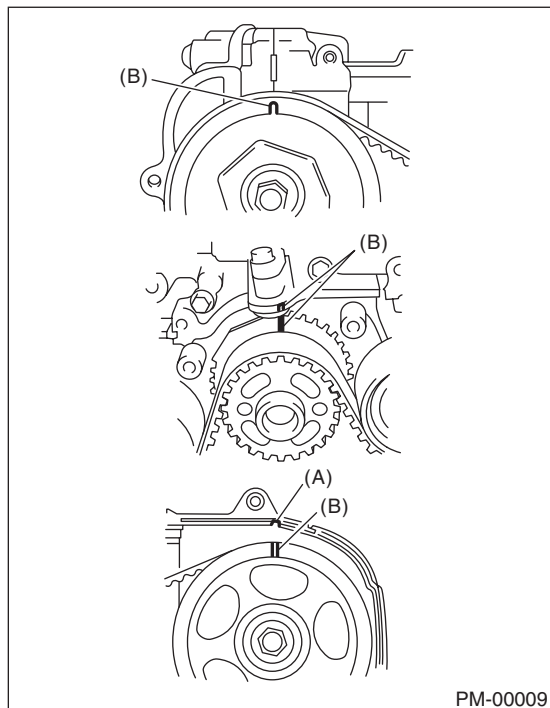
A: REPLACEMENT

- 1) Remove the radiator fan and air conditioner fan. <Ref. to CO(H4SO)-23, REMOVAL, Radiator Main Fan and Fan Motor.> <Ref. to CO(H4SO)-25, REMOVAL, Radiator Sub Fan and Fan Motor.>
- 2) Protect the radiator with cardboard and blanket.
- 3) Remove the V-belt covers.



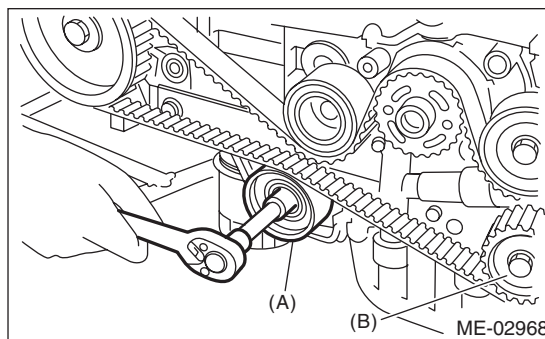
- 4) Remove the V-belts. <Ref. to ME(H4SO)-39, REMOVAL, V-belt.>
- 5) Remove the crank pulley. <Ref. to ME(H4SO)-46, REMOVAL, Crank Pulley.>
- 6) Remove the timing belt cover. <Ref. to ME(H4SO)-49, REMOVAL, Timing Belt Cover.>
- 7) Using ST, turn the crankshaft and align the alignment marks on crankshaft and left and right cam sprockets with alignment marks of belt cover and oil pump.

ST 499987500 CRANKSHAFT SOCKET

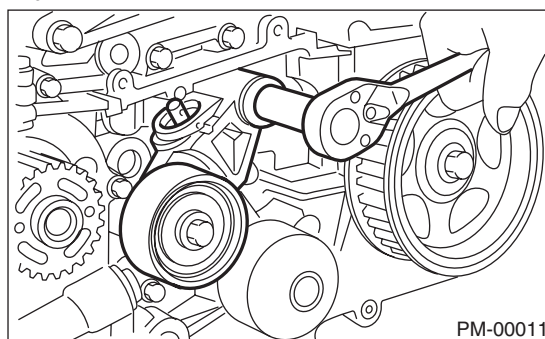


- (A) Notch
(B) Alignment mark

- 8) Remove the belt idler (A).
- 9) Remove the belt idler No. 2 (B).



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



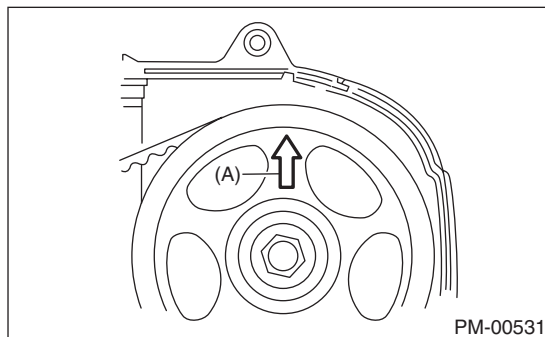
- 12) Install in the reverse order of removal. <Ref. to ME(H4SO)-51, INSTALLATION, Timing Belt.>

B: INSPECTION

1. CHECK TIMING BELT POSITION

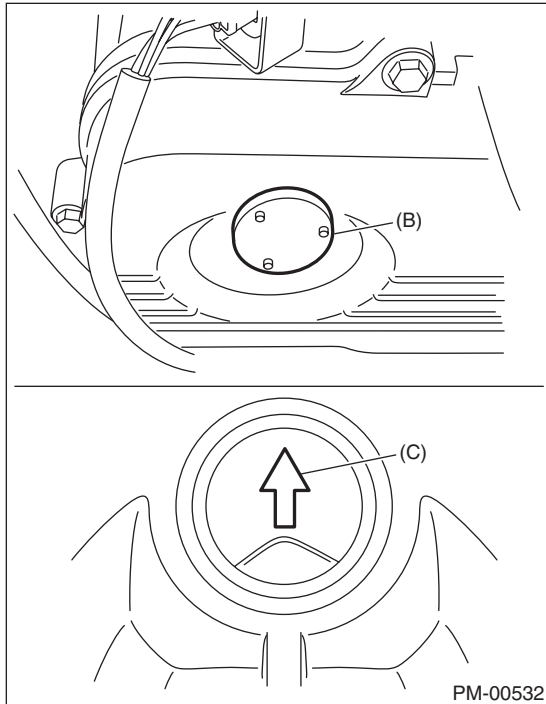
- 1) Remove the timing belt cover (LH).
- 2) Turn the crank pulley to set #1 cylinder piston to top dead center of compression stroke and check the followings.

- (1) Check that the arrow (A) of camshaft pulley LH points to the upright.



- (2) Remove the sealing rubber (B) of the timing belt cover RH.

(3) Check that the arrow (C) of camshaft pulley RH points to the upright.



3) When camshaft pulley or timing belt position is offset, check for any defect and repair or replace as required.

2. OTHER INSPECTIONS

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

8. Fuel Line

A: INSPECTION

For fuel line, check pipes, areas near pipes, and engine compartment piping for rust, hose damage, loose band, etc. If faulty parts are found, repair or replace them. <Ref. to FU(H4SO)-77, Fuel Delivery and Evaporation Lines.>

9. Fuel Filter

A: REPLACEMENT

For fuel filter replacement procedure, refer to FU section. <Ref. to FU(H4SO)-71, Fuel Filter.>

B: INSPECTION

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

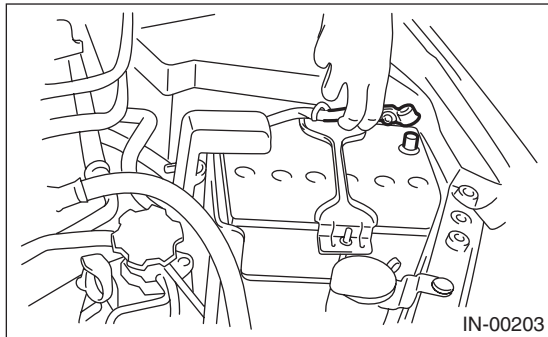
Air Cleaner Element

PERIODIC MAINTENANCE SERVICES

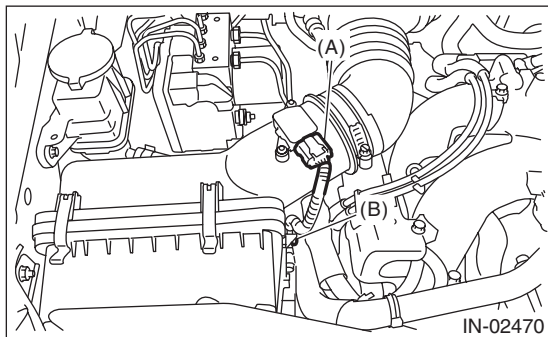
10. Air Cleaner Element

A: REPLACEMENT

1) Disconnect the ground cable from battery.

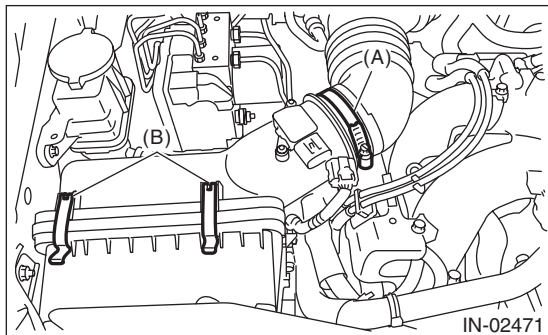


2) Disconnect the connector (A) from the mass air flow and intake air temperature sensor, and remove the clip (B).

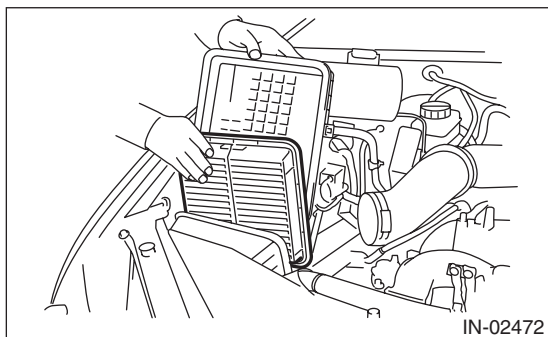


3) Loosen the clamp (A) which connects the air cleaner case to intake boot.

4) Remove the clips (B) securing the upper side of air cleaner case.



5) Remove the air cleaner case (rear) and air cleaner element.



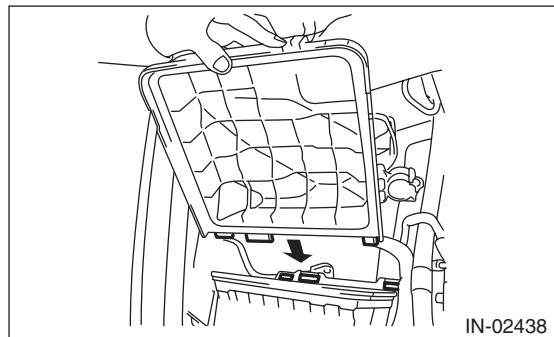
6) Install in the reverse order of removal.

CAUTION:

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

NOTE:

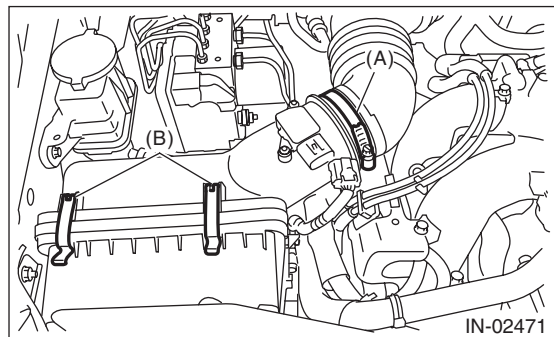
- Check that there are no foreign objects in the air cleaner case.
- When installing the air cleaner case (rear), align the protrusion of the air cleaner case (rear) to the hole on the air cleaner case (front) to install.



Tightening torque:

Clamp (A)

3 N·m (0.3 kgf-m, 2.2 ft-lb)



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. Check the following points:

Pressure:

157 kPa (1.6 kgf/cm², 23 psi)

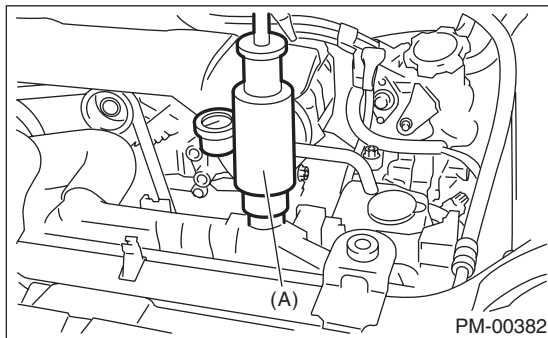
- Each portion of radiator for leakage
- Hose joints and other connections for leakage

CAUTION:

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

NOTE:

- 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.
- Be careful not to spill coolant when detaching tester from radiator.

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. Replace the radiator cap if the pressure is below the limit.

NOTE:

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

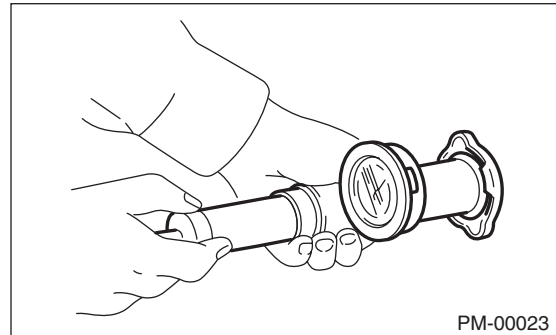
Radiator cap valve open pressure

Specification:

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

Service limit:

83 kPa (0.85 kgf/cm², 12 psi)



3) Start the engine, and then inspect that it does not overheat or it is not cooled excessively. If it overheats or it is cooled excessively, check the cooling system. <Ref. to CO(H4SO)-15, Water Pump.> <Ref. to CO(H4SO)-17, Thermostat.> <Ref. to CO(H4SO)-19, Radiator.> <Ref. to CO(H4SO)-22, Radiator Cap.>

4) Check the radiator fan operates using Subaru Select Monitor, when the coolant temperature rise to 95°C (203°F) or more. If it does not operate, check the radiator fan system. <Ref. to CO(H4SO)-7, Radiator Fan System.>

12.Engine Coolant

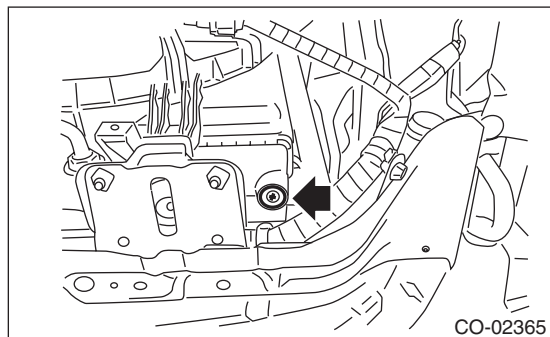
A: REPLACEMENT

1. REPLACEMENT OF ENGINE COOLANT

WARNING:

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

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



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

CAUTION:

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

NOTE:

Be careful not to spill coolant on the floor.

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

Cooling system protective agent:

Cooling system conditioner (SOA345001)

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

Recommended engine coolant:

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

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

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

NOTE:

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

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

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

13) Perform the procedures 11) and 12) again.

14) Install the radiator cap and reservoir tank cap properly.

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

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

NOTE:

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

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

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

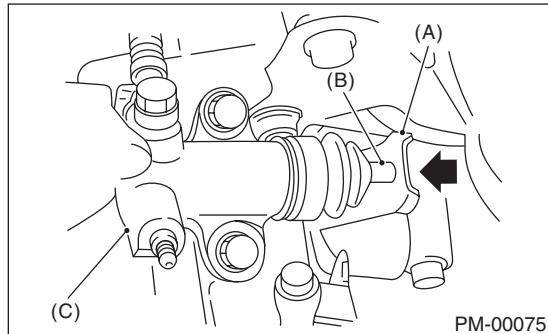
19) Install the radiator cap and reservoir tank cap properly.

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

13. Clutch System

A: INSPECTION AND ADJUSTMENT

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



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

2) If the fluid level rises, pedal free play is correct.
 3) If the fluid level does not rise, or the push rod cannot be retracted, adjust the clutch pedal. <Ref. to CL-21, Clutch Pedal.>
 4) Check the fluid level using the scale on the outside of the clutch reservoir tank (A). If the level is below "MIN" (B), inspect the clutch master cylinder, operating cylinder and hydraulic line for fluid leaks. If fluid leaks are found, repair or replace. If fluid leaks are not found, add clutch fluid to bring it up to "MAX" (C) of clutch reservoir tank.

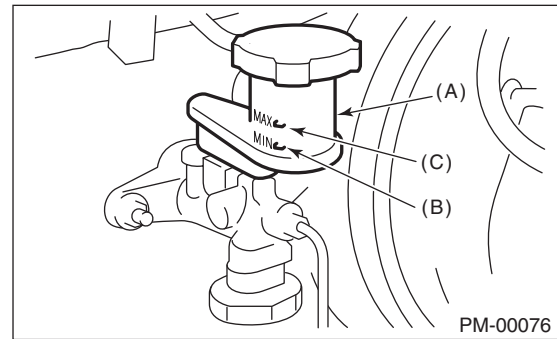
Recommended clutch fluid:

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

CAUTION:

- Prevent the clutch fluid from being splashed over vehicle body. If clutch fluid is splashed over vehicle body, flush it, and then wipe it up.
- If any clutch fluid is spilt on the exhaust pipe, wipe it off with a cloth to avoid emitting smoke or causing a fire.
- Avoid mixing brake fluid of different brands to prevent fluid performance from degrading.

- Be careful not to allow dirt or dust to get into the reservoir tank.



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

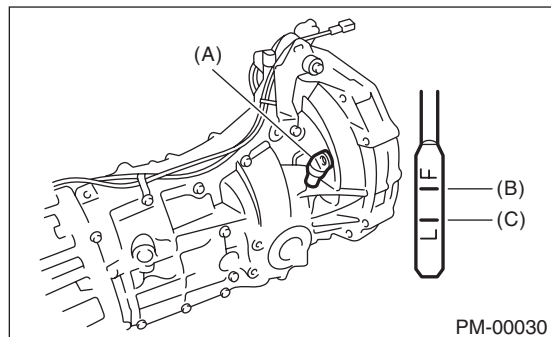
Transmission Gear Oil

PERIODIC MAINTENANCE SERVICES

14. Transmission Gear Oil

A: INSPECTION

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



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

B: REPLACEMENT

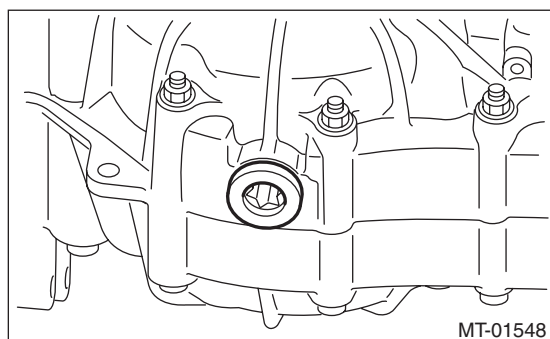
1) Drain the gear oil by removing drain plug.

CAUTION:

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

NOTE:

- Before starting work, cool off the transmission gear oil well.
- Drain the gear oil by removing drain plug using TORX® bit T70.



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

Tightening torque:

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

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

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

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

Recommended gear oil:

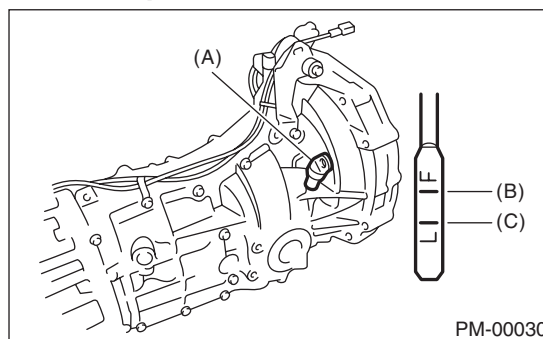
Refer to "RM" section. <Ref. to RM-2, LUBRICANT, RECOMMENDED MATERIALS, Recommended Materials.>

NOTE:

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

Gear oil capacity:

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



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

15. Automatic Transmission Fluid

A: INSPECTION

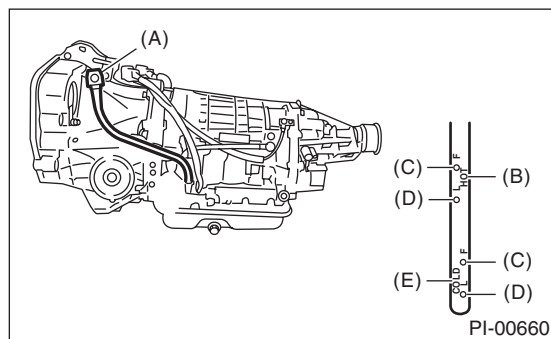
CAUTION:

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 to 10 km (3 to 6 miles). Otherwise, idle the engine to raise ATF temperature to 70 — 80°C (158 — 176°F) on Subaru Select Monitor. <Ref. to 4AT(diag)-16, Read Current Data.>

2) Make sure the vehicle is level.

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



- (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)]

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

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

CAUTION:

- Be careful not to exceed the upper level limit.
- Adding ATF to the upper limit mark on “HOT” side when the ATF temperature is less than 70°C (158°F) will overfill of ATF and cause a transmission failure.
- If the ATF is spilt over exhaust pipe, wipe it off with cloth to avoid emitting smoke or causing a fire.

6) Check ATF level after raising ATF temperature to 70 — 80°C (158 — 176°F) by driving the vehicle for 5 — 10 km (3 — 6 miles) or by idling the engine.

7) Check the ATF for leaks.

If there are leaks, it is necessary to repair or replace gaskets, oil seals, plugs or other parts.

B: REPLACEMENT

1) Lift up the vehicle.

2) Drain the ATF (Automatic Transmission Fluid) by removing drain plug.

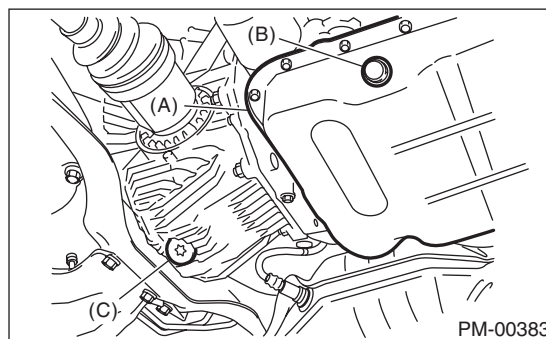
CAUTION:

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

NOTE:

Before starting work, cool off the ATF well.

3) Check the condition of ATF drained. <Ref. to 4AT-27, CONDITION CHECK, Automatic Transmission Fluid.>



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

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

Tightening torque:

25 N·m (2.5 kgf-m, 18.4 ft-lb)

5) Lower the vehicle.

6) Pour ATF from the oil charge pipe.

Recommended fluid:

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

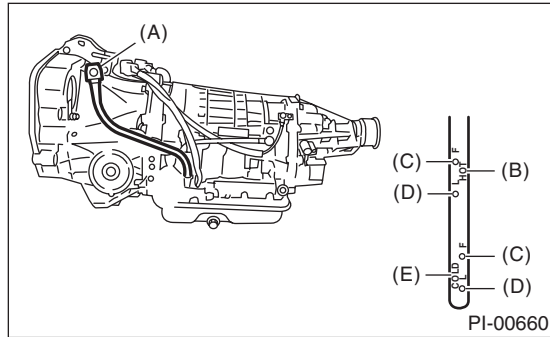
Fluid capacity:

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

Automatic Transmission Fluid

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7) Check the level and leaks of the ATF. <Ref. to PM-21, INSPECTION, Automatic Transmission Fluid.>



- (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)]

16. Front & Rear Differential Gear Oil

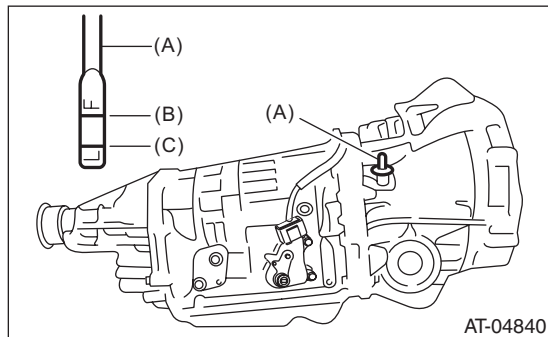
A: INSPECTION

1. FRONT DIFFERENTIAL (AT MODEL)

- 1) Park the vehicle on a level surface.
- 2) Remove the differential oil level gauge and wipe it clean.
- 3) Reinsert the level gauge all the way. Make sure the level gauge is inserted correctly and in the proper orientation.
- 4) Remove the oil level gauge again, and check the level of differential gear oil. If the differential gear oil level is below "L" line, add oil to bring the level up to "F" line.

NOTE:

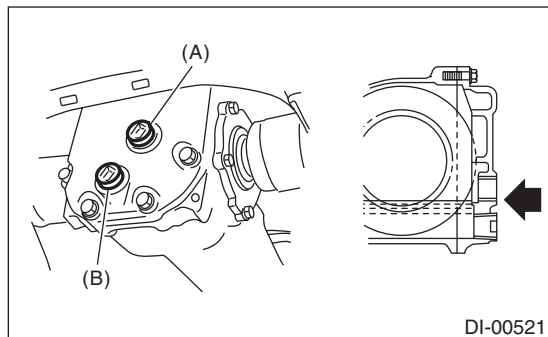
To prevent overfilling the differential gear oil, do not fill oil above the "F" line.



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

2. REAR DIFFERENTIAL

- 1) Remove the filler plug, and then check the gear oil. Replace the gear oil if it is contaminated or deteriorated.
- 2) Check that the gear oil level is up to the bottom of the filler plug hole. If the level is low, refill up to the bottom of filler plug.



- (A) Filler plug
- (B) Drain plug

B: REPLACEMENT

1. FRONT DIFFERENTIAL (MT MODEL)

For MT model, differential oil is used as manual transmission oil for lubricating the differential. Refer to "Transmission Oil". <Ref. to PM-20, Transmission Gear Oil.>

2. FRONT DIFFERENTIAL (AT MODEL)

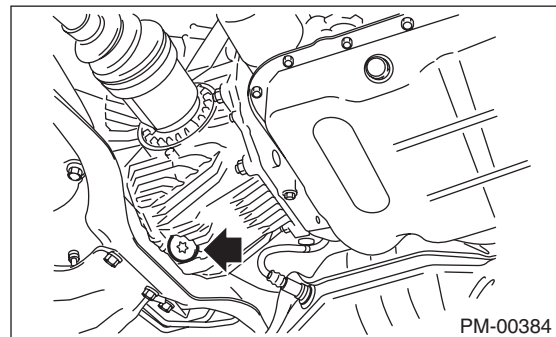
- 1) Lift up the vehicle.
- 2) Drain the differential gear oil by removing drain plug using TORX® bit T70.

CAUTION:

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

NOTE:

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



- 3) Replace the gasket with a new part and tighten the differential oil drain plug to the specified torque using the TORX® bit T70.

Tightening torque:

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

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

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

- 4) Lower the vehicle.

Front & Rear Differential Gear Oil

PERIODIC MAINTENANCE SERVICES

5) Fill differential gear oil through the oil level gauge hole.

Recommended fluid:

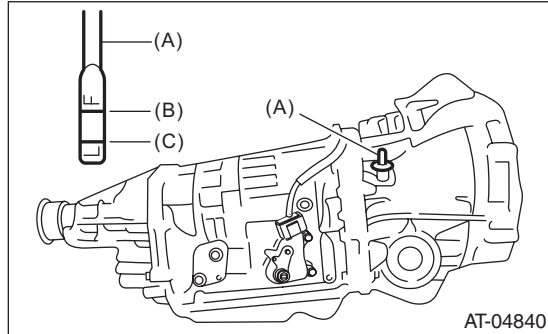
<Ref. to RM-2, LUBRICANT, RECOMMENDED MATERIALS, Recommended Materials.>

NOTE:

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

Gear oil capacity:

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

6) Check the level of differential gear oil.
<Ref. to 4AT-28, INSPECTION, Differential Gear Oil.>

3. REAR DIFFERENTIAL

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

NOTE:

Apply liquid gasket to the drain plug threads.

Liquid gasket:

THREE BOND 1105 (Part No. 004403010) or equivalent

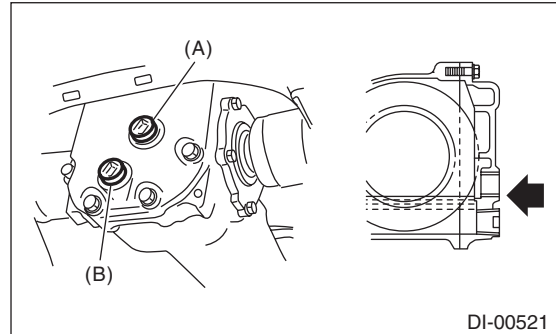
Tightening torque:

49 N·m (5.0 kgf·m, 36.2 ft-lb)

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

Recommended gear oil:

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



- (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.

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

NOTE:

Apply liquid gasket to the filler plug threads.

Liquid gasket:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

49 N·m (5.0 kgf·m, 36.2 ft-lb)

17.Brake Line

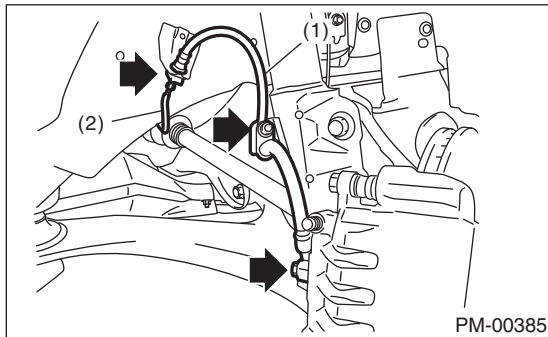
A: INSPECTION

1. BRAKE LINE

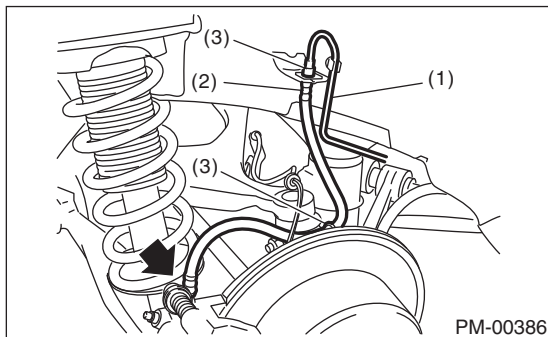
- 1) Check for scratches, swelling, corrosion, traces of fluid leakage on the brake hoses or pipe joints.
- 2) Check the possibility of adjacent parts interfering with brake pipes/hoses during driving, and loose connections/clamps.
- 3) Check any trace of fluid leakage, scratches, etc. on master cylinder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

NOTE:

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



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



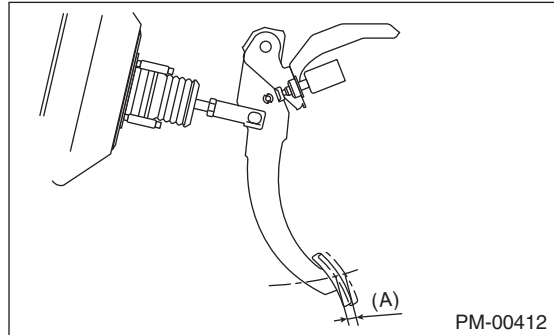
- (1) Rear brake pipe
- (2) Rear brake hose
- (3) Clamp

2. SERVICE BRAKE

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

Brake pedal play

0.5 — 2.0 mm (0.02 — 0.08 in)



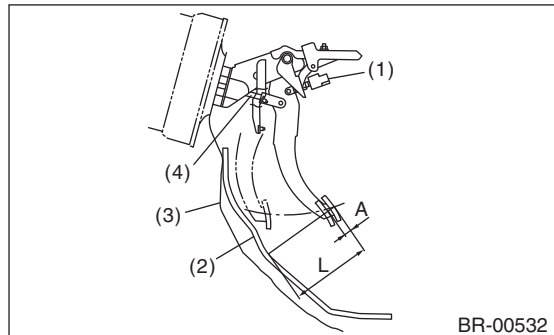
(A) Pedal free play

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

- (1) Remove the stop light switch. <Ref. to BR-44, REMOVAL, Stop Light Switch.>
- (2) Loosen the lock nut of the brake booster operating rod, and rotate the rod to adjust the pedal height L to be within the standard value.

Pedal height L:

150 — 160 mm (5.91 — 6.30 in)



- (1) Stop light switch
- (2) Mat
- (3) Toe board
- (4) Brake booster operating rod

- (3) Tighten the lock nut.

Locknut tightening torque:

22 N·m (2.2 kgf-m, 16 ft-lb)

- (4) Install the stop light switch. <Ref. to BR-44, INSTALLATION, Stop Light Switch.>

Brake Line

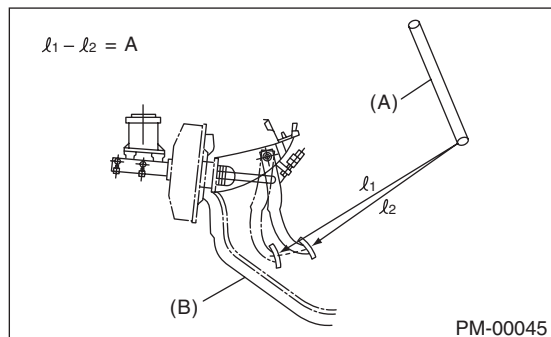
PERIODIC MAINTENANCE SERVICES

3) Check the pedal stroke.

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

Brake pedal stroke A:

95 mm (3.74 in)/ 490 N (50 kgf, 110 lbf) or less



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

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

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

3. BRAKE SERVO SYSTEM

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

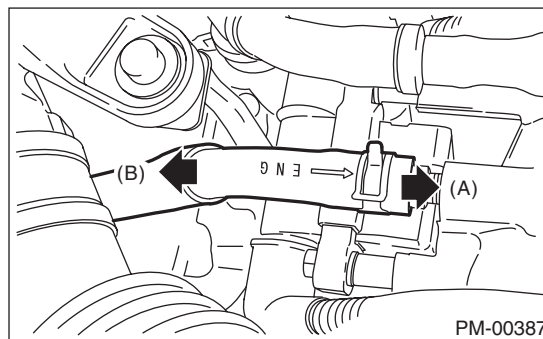
2) With the brake pedal depressed, start the engine. Make sure the pedal should move slightly toward the floor.

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

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

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

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



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

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

NOTE:

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

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

18.Brake Fluid

A: INSPECTION

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

2) Check the fluid for discoloration. If the fluid is extremely discolored, replace with the new fluid.

B: REPLACEMENT

CAUTION:

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

NOTE:

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

Recommended brake fluid:

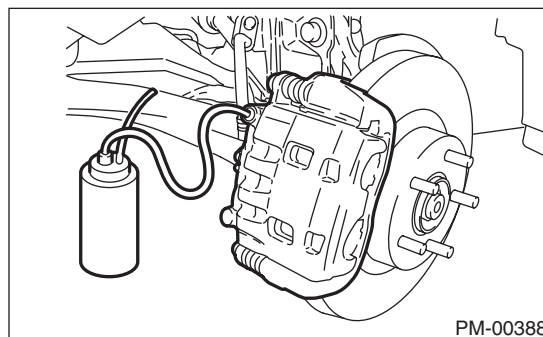
Refer to "RM" section. <Ref. to RM-4, FLUID, RECOMMENDED MATERIALS, Recommended Materials.>

Perform the same procedure as for bleeding the brake line, until new brake fluid comes out from vinyl tube. <Ref. to BR-37, PROCEDURE, Air Bleeding.>

NOTE:

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

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



6) Instruct your co-worker to depress the brake pedal slowly two or three times and then hold it depressed.

7) Loosen the bleeder screw approximately 1/4 turn until a small amount of brake fluid drains into the container, and then quickly tighten the screw.

8) Repeat steps 6) and 7) until there are no air bubbles in drained brake fluid and new fluid flows through vinyl tube.

NOTE:

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

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

Tightening torque:

8 N·m (0.8 kgf-m, 5.9 ft-lb)

10) Bleed air from each wheel cylinder by following steps from 5) to 9).

11) Depress the brake pedal with a force of approx. 294 N (30 kgf, 66 lbf) and hold it there for approx. 20 seconds. At this time check the pedal to see if it makes any unusual movement. Visually inspect the bleeder screws and brake pipe joints to confirm there is no fluid leakage.

Disc Brake Pad and Disc

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19.Disc Brake Pad and Disc

A: INSPECTION

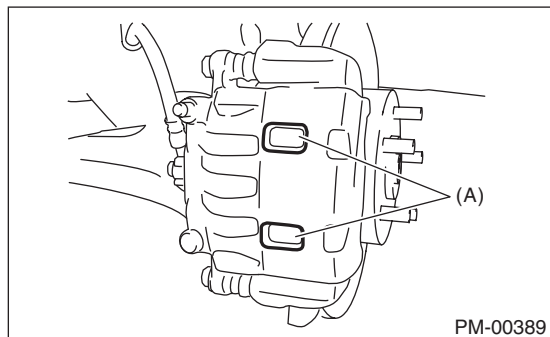
1. DISC BRAKE PAD AND DISC

1) Jack-up the vehicle and support it with rigid racks. Remove the wheels.

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

NOTE:

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



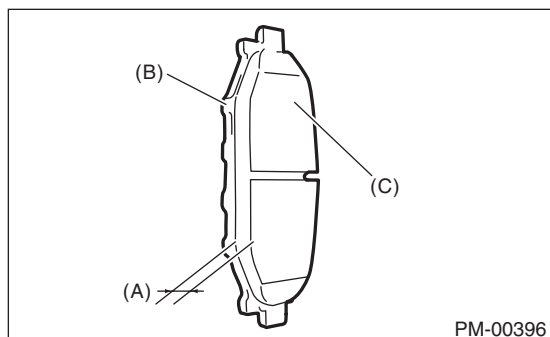
(A) Inspection hole

• Front (back metal not included)

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

• Rear (back metal not included)

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



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

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

• Front

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

• Rear

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

4) Remove the caliper body. <Ref. to BR-16, Front Disc Brake Assembly.> <Ref. to BR-23, Rear Disc Brake Assembly.>

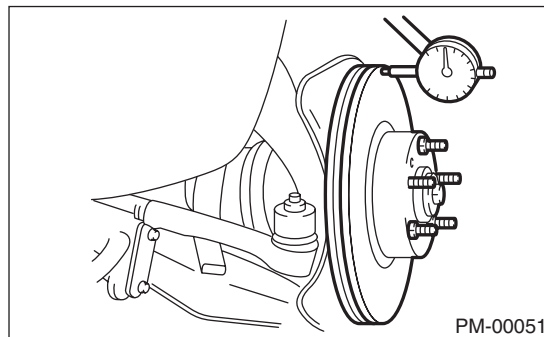
5) Tighten the wheel nuts to secure disc rotor.

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

Disc rotor runout limit:

Front: 0.050 mm (0.0020 in)

Rear: 0.050 mm (0.0020 in)



20. Parking Brake

A: INSPECTION

1. REAR DRUM BRAKE

- 1) Remove the brake drum and check that there is no fluid leakage from the wheel cylinder. If fluid leaks are found in the wheel cylinder, check the wheel cylinder and replace it.
- 2) Inspect the brake shoes for damage or deformation and check the brake linings for wear.

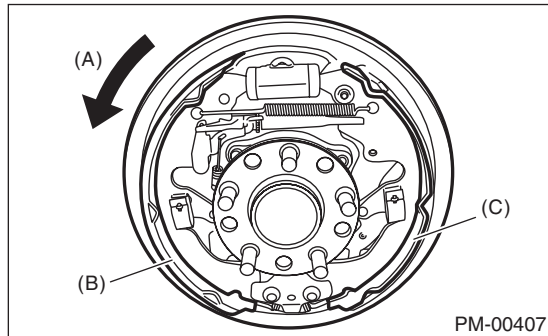
NOTE:

- Always replace both 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 brake lining (except for back metal):

Standard: 4.5 mm (0.177 in)

Service limit: 1.5 mm (0.059 in)



- (A) Direction of drum rotation (Forward)
- (B) Leading shoe
- (C) Trailing shoe

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

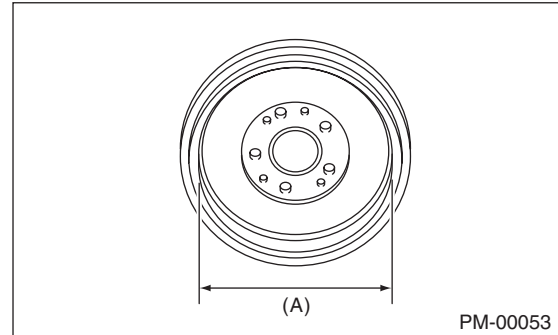
If the inside surface of the brake drum is streaked, correct the surface with emery cloth (#200 or more). If it is unevenly worn or tapered, or the outer surface of the brake drum is damaged, repair or replace it.

Brake drum inside diameter:

Standard: 254 mm (10.000 in)

Service limit: 256 mm (10.08 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)

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

Disc rotor inner diameter:

Standard

190 mm (7.48 in)

Service limit

191 mm (7.52 in)

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

Lining thickness:

Standard

2.8 mm (0.11 in)

Service limit

1.5 mm (0.059 in)

NOTE:

Replace the right and left brake shoe as a set.

B: ADJUSTMENT

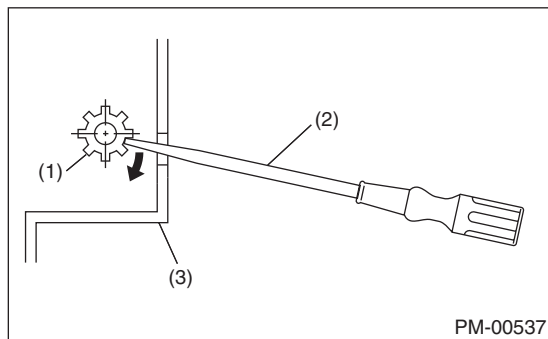
1. REAR DRUM BRAKE

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



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

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

CAUTION:

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

- 6) Install the adjusting hole cover to the disc rotor.
- 7) Adjust the parking brake lever stroke. <Ref. to PB-8, LEVER STROKE, ADJUSTMENT, Parking Brake Assembly (Rear Disc Brake).>

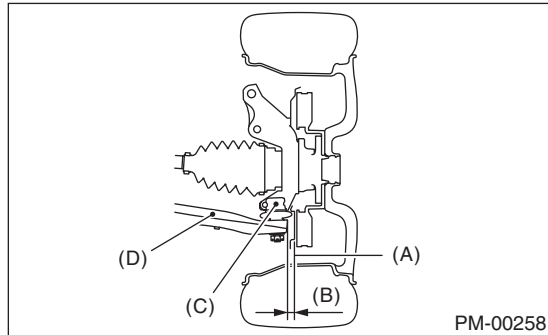
21. Suspension

A: INSPECTION

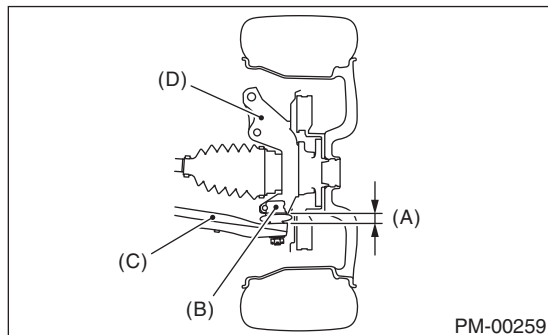
1. SUSPENSION BALL JOINT

1) Jack up the vehicle until front tires are off ground.

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



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



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

5) Damage of dust cover

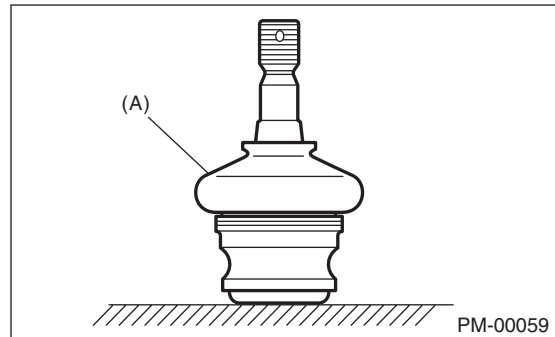
Visually inspect the ball joint dust cover. If it is damaged, remove the front arm. <Ref. to FS-19, Front Arm.> Measure the play of the ball joint. <Ref. to FS-17, Front Ball Joint.>

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

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

NOTE:

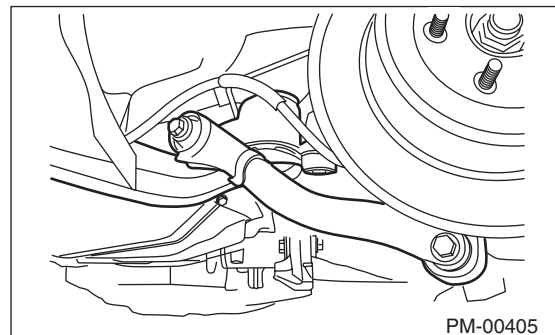
When the front arm ball joint has been removed or replaced, check the toe of front wheel. If the front wheel toe is outside the specified range, <Ref. to FS-7, Wheel Alignment.> adjust toe-in.



(A) Dust cover

2. FRONT, REAR SUSPENSION BUSHING

Apply pressure with tire lever etc. to inspect the bushing for fatigue or cracks. If defective, replace the bushing.



3. WHEEL ARCH HEIGHT

1) Unload the vehicle, so that it is at curb weight.

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

3) If the wheel arch height is out of the specification, visually check the following components and replace deformed parts.

- Suspension components [Front strut assembly and rear shock absorber assembly]

- Parts connecting suspension and body

4) When no components are deformed, adjust the wheel arch height by replacing the suspension for which the wheel arch height is not within tolerance. <Ref. to FS-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-7, Wheel Alignment.>

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

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

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

4) When the rotating angles of the right and left tires are outside the tolerance value, adjust them so that they conform to the specified value.

5. WHEEL ALIGNMENT OF REAR SUSPENSION

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

- Toe-in
- Camber
- Thrust angle

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

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

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

3) If the toe-in or thrust angle is out of the specification, adjust to the standard value.

6. OIL LEAKAGE OF STRUT AND SHOCK ABSORBER

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

7. TIGHTNESS OF BOLTS AND NUTS

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

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

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

8. DAMAGE TO SUSPENSION PARTS

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

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

22. Wheel Bearing

A: INSPECTION

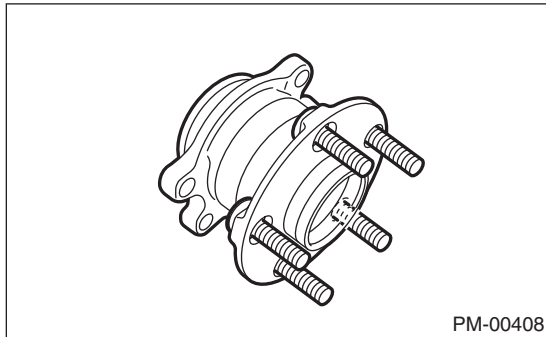
1. FRONT HUB UNIT

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

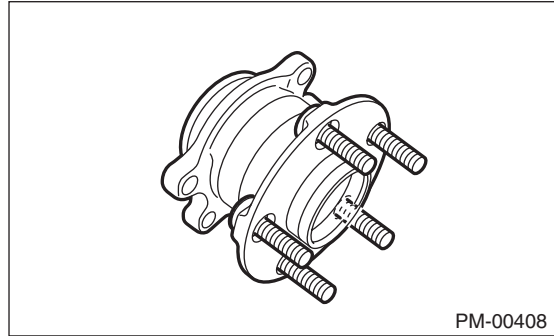
Service limit:

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

- 5) Remove the bolts and self-locking nuts, and extract transverse link from the front crossmember.
 - 6) Remove the AAR of front drive shaft from transmission. <Ref. to DS-13, Front Axle.>
 - 7) While supporting the front drive shaft horizontally with one hand, turn the hub with the other hand to check for noise or binding.
- If the hub is noisy or binds, replace the front hub unit.



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



2. REAR HUB UNIT

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

Service limit:

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

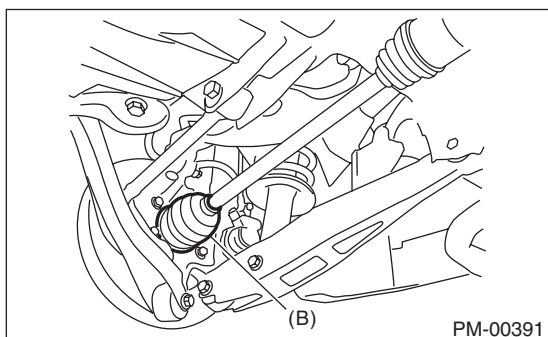
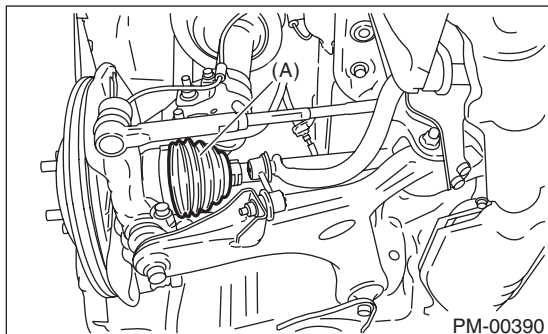
- 5) Remove the DOJ of rear drive shaft from rear differential. <Ref. to DS-30, Rear Drive Shaft.>

23. 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-26, Front Drive Shaft.> <Ref. to DS-30, Rear Drive Shaft.>



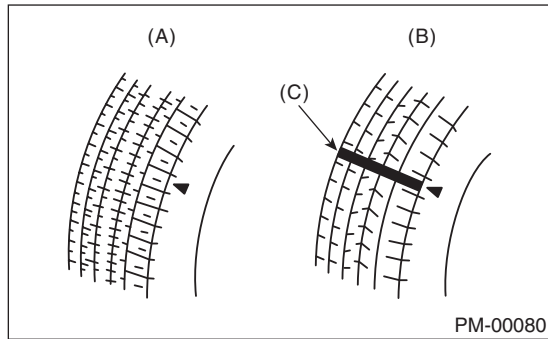
2. PROPELLER SHAFT

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

24. 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.)

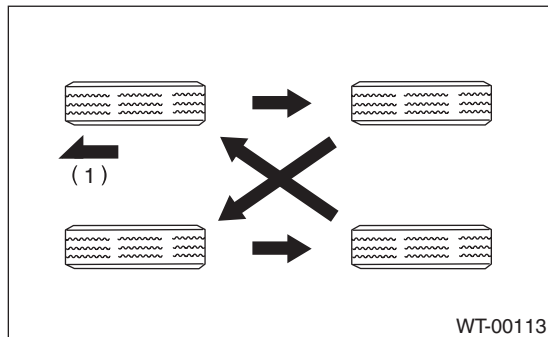


- (A) New tread
- (B) Damaged tread
- (C) Tread wear indicator

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

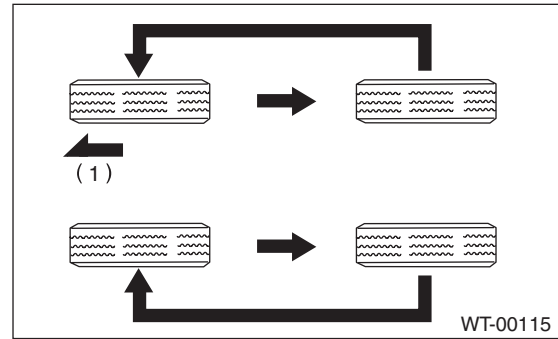
3) Next, make a tire rotation between front and rear as shown in the figure, make sure tires are worn evenly.

- When the direction of tire rotation is not specified

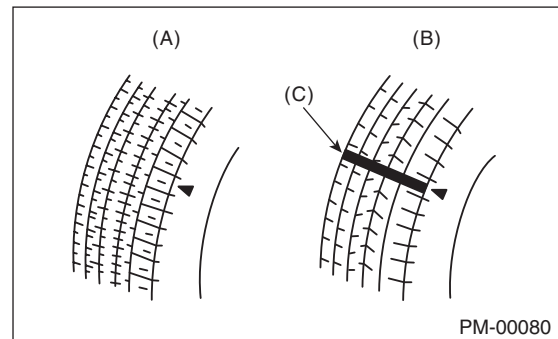


(1) Front

- When the direction of tire rotation is specified



(1) Front



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

Steering System (Power Steering)

PERIODIC MAINTENANCE SERVICES

25. Steering System (Power Steering)

A: INSPECTION

1. STEERING WHEEL

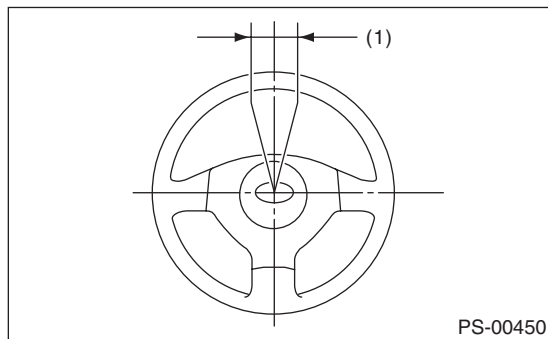
1) Set the steering wheel in a straight-ahead position, and check the wheel spokes to make sure they are correctly set in their specified positions.

2) Lightly turn the steering wheel to the left and right to determine the point where front wheels start to move.

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

Steering wheel free play:

0 — 17 mm (0 — 0.67 in)



(1) Steering wheel free play

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

Maximum permissible play:

0.5 mm (0.020 in)

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

(1) Steering force:

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

(2) Pulled to one side:

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

(3) Wheel runout:

Steering wheel should not show any sign of runout.

(4) Return factor:

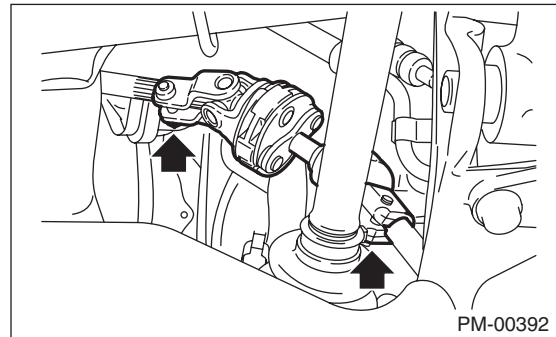
Steering wheel should return to its original position after it has been turned and then released.

2. STEERING SHAFT JOINT

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

Tightening torque:

24 N·m (2.4 kgf-m, 17.4 ft-lb)



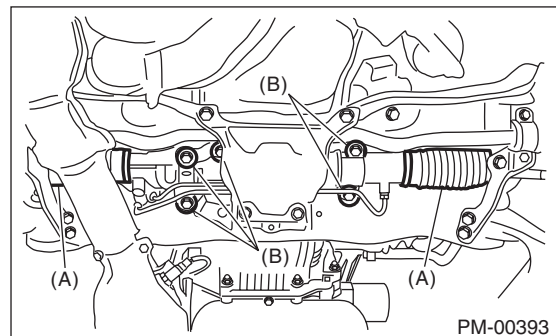
3. GEARBOX

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

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

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)



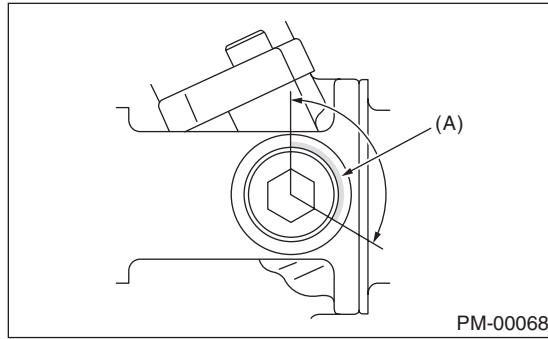
(A) Boot

(B) Gearbox mounting bolt

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

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

- (1) 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 perimeter.

- (2) Tighten the adjusting screw to 25 N·m (2.5 kgf-m, 18 ft-lb) and then loosen.
- (3) Tighten the adjusting screw to 3.9 N·m (0.4 kgf-m, 2.9 ft-lb) and then loosen it within 20°.
- (4) Install the lock nut. While holding the adjusting screw with a wrench, tighten the lock nut using ST.

ST 926230000 SPANNER

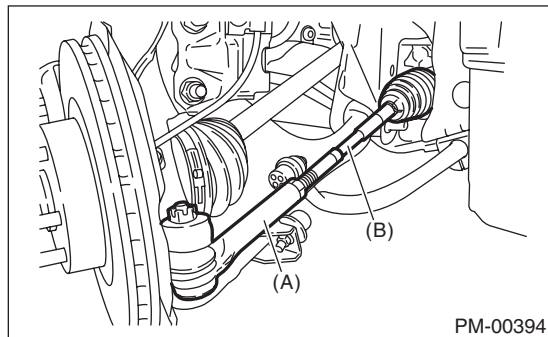
Tightening torque (lock nut):

25 N·m (2.5 kgf-m, 18.4 ft-lb)

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

4. TIE-ROD

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



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

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

Tightening torque:

27 N·m (2.75 kgf-m, 19.9 ft-lb)

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

Tightening torque:

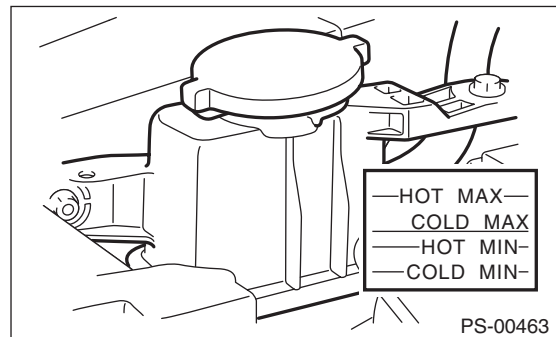
85 N·m (8.7 kgf-m, 62.7 ft-lb)

5. POWER STEERING FLUID LEVEL

NOTE:

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

- 1) Place the vehicle with engine "OFF" on a level surface.
- 2) Check the fluid level using the scale on the outside of the reservoir tank. If the level is below "MIN", fill fluid up to "MAX" level.



CAUTION:

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

NOTE:

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

Recommended fluid:

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

NOTE:

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

Steering System (Power Steering)

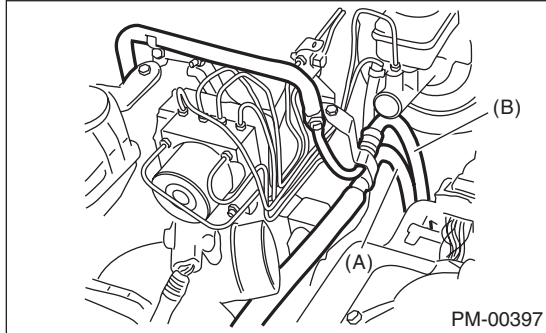
PERIODIC MAINTENANCE SERVICES

7. HOSES OF OIL PUMP FOR DAMAGES

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

NOTE:

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



(A) Pressure hose

(B) Return hose

10. FITTING BOLTS AND NUTS

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

Inspect and/or retighten them when engine is cold.

8. POWER STEERING PIPES FOR DAMAGES

Check the power steering pipes for corrosion and damage.

Replace the pipe with a new part if necessary.

9. GEARBOX BOOTS

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

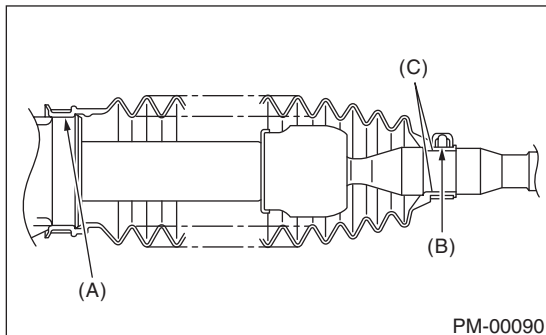
1) Positions (A) and (B) of the gearbox boot are fitted correspondingly in grooves (A) and (B) of the gearbox and rod (C).

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

3) Boot does not have crack or hole.

NOTE:

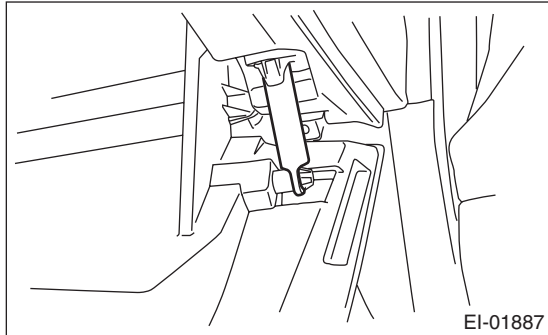
Rotate (B) position of gearbox boot against the torsion produced by the adjustment of toe-in etc. Apply grease to the groove (C).



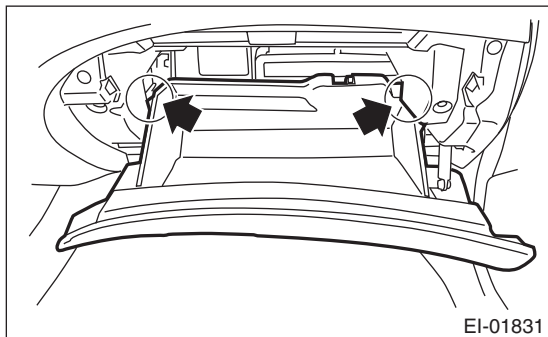
26.A/C Filter

A: REPLACEMENT

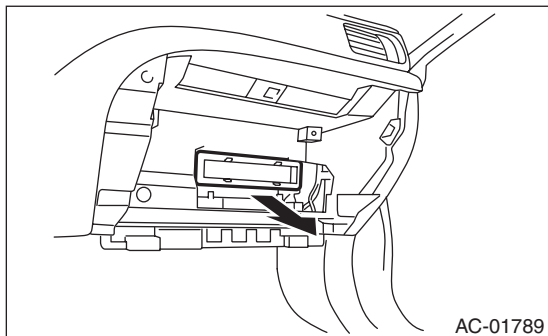
1) Remove the glove box damper.



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



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



4) Install in the reverse order of removal.

A/C Filter

PERIODIC MAINTENANCE SERVICES

ENGINE SECTION

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

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

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

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

FUEL INJECTION (FUEL SYSTEMS)**FU(H4SO)****EMISSION CONTROL
(AUX. EMISSION CONTROL DEVICES)****EC(H4SO)****INTAKE (INDUCTION)****IN(H4SO)****MECHANICAL****ME(H4SO)****EXHAUST****EX(H4SO)****COOLING****CO(H4SO)****LUBRICATION****LU(H4SO)****SPEED CONTROL SYSTEMS****SP(H4SO)****IGNITION****IG(H4SO)****STARTING/CHARGING SYSTEMS****SC(H4SO)****ENGINE (DIAGNOSTICS)****EN(H4SO)(diag)****GENERAL DESCRIPTION****GD(H4SO)**

FUEL INJECTION (FUEL SYSTEMS)

FU(H4SO)

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