

FOREWORD

FW

	Page
1. Foreword	2

Foreword

FOREWORD

1. Foreword

A: FOREWORD

These manuals are used when performing maintenance, repair or diagnosis of SUBARU IMPREZA WRX and SUBARU IMPREZA WRX STI.

Applicable model: 2012 MY GVE*****, GVF*****, GRE*****, GRF*****

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

HOW TO USE THIS MANUALS

HU

	Page
1. How to Use This Manuals	2



How to Use This Manuals

HOW TO USE THIS MANUALS

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.

How to Use This Manuals

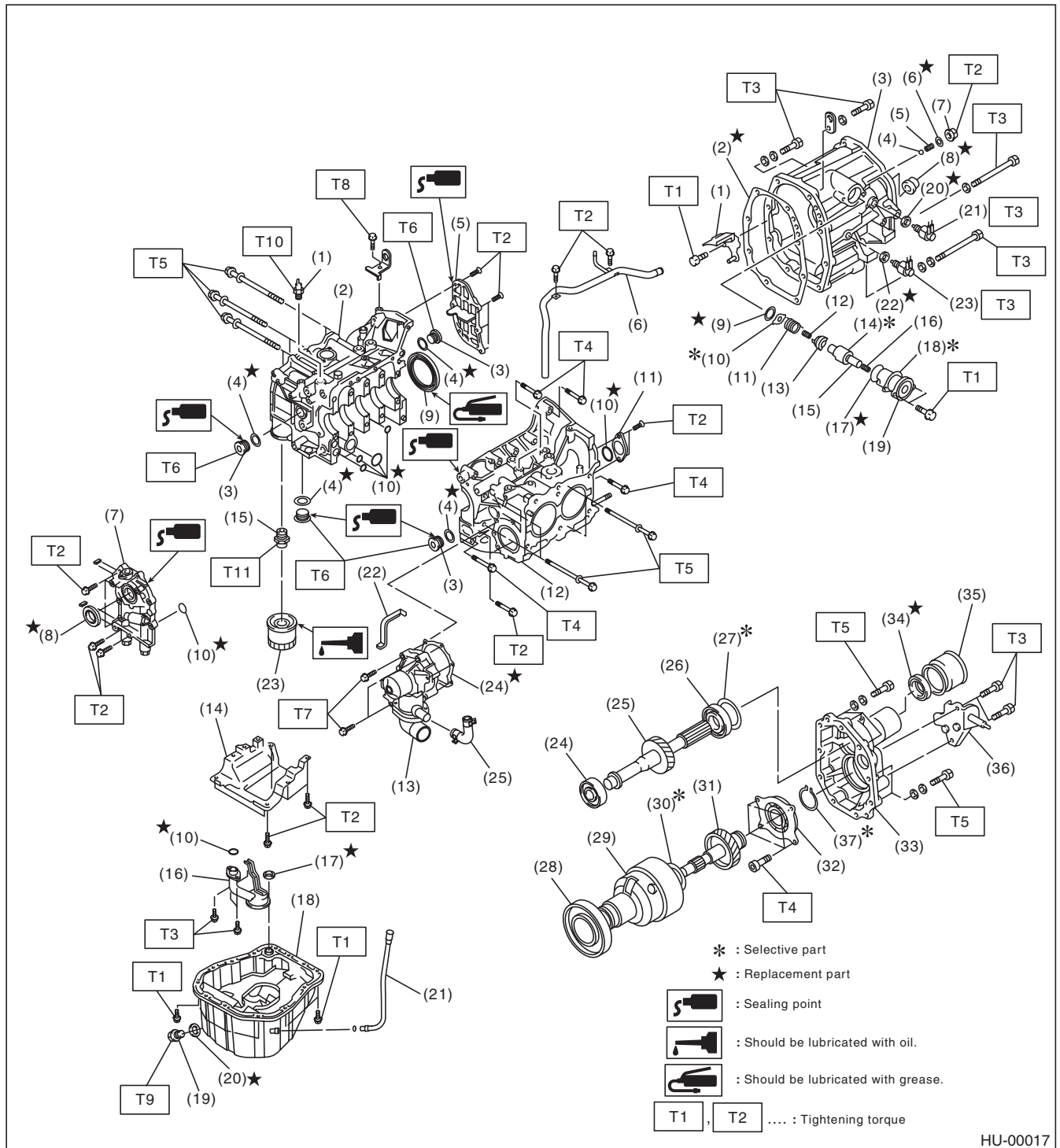
HOW TO USE THIS MANUALS

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

HU-3

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

- **NOTE:**

Describes additional information to make works easier.

- **CAUTION:**

Describes prohibited matters to prevent vehicle or parts damage, or matters that requires special attention during work.

- **WARNING:**

Describes matters that may cause serious damage to the operator or other person, or that may cause damage or accident.

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 part.

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)

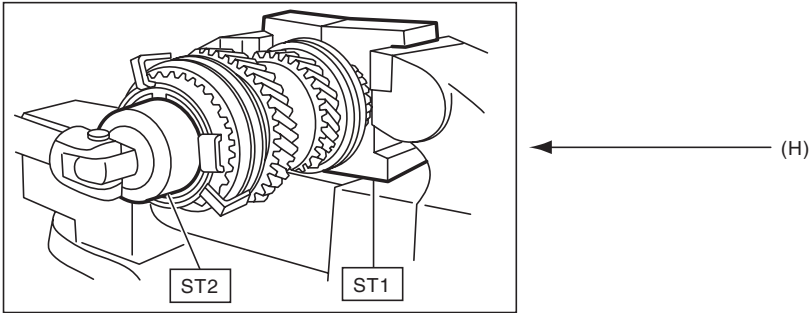
11) Tighten the lock nuts to the specified torque using ST1 and ST2.

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

ST1 498937000 TRANSMISSION HOLDER

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

Tightening torque: (G)
118 N·m (12.0 kgf-m, 86.8 ft-lb)



HU-00020

(A) Component
(B) Process
(C) Reference

(D) Cautions
(E) Tool number of special tool
(F) Name of special tool

(G) Tightening torque
(H) Illustration

How to Use This Manuals

HOW TO USE THIS MANUALS

8. DIAGNOSIS

Step-by-step process is employed for easier diagnosis.

9. SI UNITS

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

Example:

Tightening torque:

44 N·m (4.5 kgf·m, 33 ft-lb)

List of SI unit

Item	SI units	Conventional unit	Remarks
Force	N (Newton)	kgf	1 kgf = 9.807 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 = 9.807 N·m
Rotating speed	rpm	rpm	
Pressure	kPa (Kilopascal)	kgf/cm ²	1 kgf/cm ² = 98.07 kPa
		mmHg	1 mmHg = 0.1333 kPa
Power	W	PS	1 PS = 0.7355 kW
Calorie	W·h	cal	1 kcal = 1.163 W·h
Fuel consumption rate	g/kW·h	g/PS·h	1 g/PS·h = 1.3596 g/kW·h

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

How to Use This Manuals

HOW TO USE THIS MANUALS

10.EXPLANATION OF TERMINOLOGY

List

2ndr	Secondary
AAI	Air Assist Injection
AAR	Angular Adjusted Roller
A/B	Airbag
ABS	Anti-lock Brake System
A/C	Air Conditioner
AC	Angular Contact
ACC	Accessory
A/F	Air Fuel Ratio
ALT	Generator
APS	Accessory Power Supply Socket
ASSY	Assembly
AT	Automatic Transmission
ATF	Automatic Transmission Fluid
AUX	Auxiliary Storage Unit (External storage)
AVCS	Active Valve Control System
AWD	All Wheel Drive
BATT	Battery
BCM	Brake Control Module
BJ	Bell Joint
CAN	Controller Area Network
CD	Compact Disc
CD-R/RW	CD Recordable/Rewritable
COMPL	Complete
CPC	Canister Purge Control Solenoid Valve
CPU	Central Processing Unit
DCCD	Driver's Control Center Differential
DOHC	Double Overhead Camshaft
DOJ	Double Offset Joint
DTC	Diagnosis Trouble Code
DVD	Digital Versatile Disc or Digital Video Disc
EBD	Electronic Brake Distribution
EBJ	High-efficiency Compact Ball Fixed Joint
ECM	Engine Control Module
EDJ	High-efficiency Compact Double Offset Joint
E/G	Engine
EGI	Electronic Gasoline Injection
EGR	Exhaust Gas Recirculation
ELR	Emergency Locking Retractor
ETC	Electronic Throttle Control
EX	Exhaust
F/B	Fuse & Joint Box
FL	Fusible Link
Ft	Front
FWD	Front Wheel Drive
GPS	Global Positioning System
HI	High
HID	High-Intensity Discharge

H/L	Headlight
H/U	Hydraulic Unit
HVAC	Heater, Ventilator and Air Conditioner
I/F	Interface
IG	Ignition
IN	Intake
INT	Intermittent
I/O	Input / Output
IR	Infrared Ray
ISC	Idle Speed Control
LAN	Local Area Network
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LH	LH (Left Hand)
LHD	Left Hand Drive
LSD	Limited Slip Differential
M/B	Main Fuse & Relay Box
MD	Mini Disc
MID	Multi Information Display
MFI	Multi-Point Fuel Injection
MP-T	Multi-Plate Transfer
MT	Manual Transmission
NA	Natural Aspiration
NC	Normal Close (Relay)
NO	Normal Open (Relay)
OBD	On-Board Diagnosis
OP	Option Parts
PC	Personal Computer
PCD	Pitch Circle Diameter
PCV	Positive Crankcase Ventilation
PID	Parameter Identification
Pr	Primary
P/S	Power Steering
PTJ	Pillow Tripod Joint
P/W	Power Window
RAM	Random Access Memory
RH	RH (Right Hand)
RHD	Right Hand Drive
ROM	Read Only Memory
rpm	Revolution Per Minute
Rr	Rear
SDI	Subaru Diagnostic Interface
SI	Subaru Intelligent
SOHC	Single Overhead Camshaft
SRS	Supplemental Restraint System
SSM	Subaru Select Monitor
ST	Special Tool
STD	Standard
SW	Switch

How to Use This Manuals

HOW TO USE THIS MANUALS

T/B	Turbocharger
TCS	Traction Control System
TCM	Transmission Control Module
TGV	Tumble Generator Valve
T/M	Transmission
TPMS	Tire Pressure Monitoring System
UJ	Universal Joint
UV	Ultraviolet
VDC	Vehicle Dynamics Control
V.I.N.	Vehicle Identification Number
ViS-C	Viscous Coupling
VSV	Vacuum Switching Valve
VTD	Variable Torque Distribution
W/H	Wiring Harness

SPECIFICATIONS

SPC

	Page
1. Impreza	2



Impreza

SPECIFICATIONS

1. Impreza

A: DIMENSION

Model			4 door		5 door	
			WRX-S, WRX	STI-S, SE	WRX	STI, SE
Overall length	mm (in)		4,580 (180.3)		4,415 (173.8)	
Overall width	mm (in)		1,795 (70.7)		1,795 (70.7)	
Overall height (at C.W.)	mm (in)		1,475 (58.1)	1,470 (57.9)	1,475 (58.1)	1,470 (57.9)
Compartment	Length	mm (in)	1,985 (78.1)		1,985 (78.1)	
	Width	mm (in)	1,475 (58.1)		1,475 (58.1)	
	Height	mm (in)	1,200 (47.2), 1,170 (46.1)* ¹		1,200 (47.2), 1,170 (46.1)* ¹	
Wheelbase	mm (in)		2,625 (103.3)		2,625 (103.3)	
Tread	Front	mm (in)	1,530 (60.2)		1,530 (60.2)	
	Rear	mm (in)	1,540 (60.6)		1540 (60.6)	
Minimum road clearance	mm (in)		155 (6.1)	150 (5.9)	155 (6.1)	150 (5.9)

*1: Model with sunroof

B: ENGINE

Model		2.5 L turbo (WRX-S, WRX model)	2.5 L high power turbo (STI-S, STI, SE model)
Engine type		Horizontally opposed, liquid cooled, 4-cylinder, 4-stroke gasoline engine	
Valve arrangement		DOHC	
Bore × stroke	mm (in)	99.5 × 79 (3.92 × 3.11)	
Displacement	cm ³ (cu in)	2,457 (149.94)	
Compression ratio		8.4	8.2
Ignition order		1 — 3 — 2 — 4	
Idle speed	rpm	700±100	
Maximum output	kW (HP)/rpm	198 (265)/6,000	227 (305)/6,000
Maximum torque	N·m (kgf-m, ft-lb)/rpm	330 (33.7, 244)/4,000	394 (40.2, 290)/4,000

C: ELECTRICAL

Model		2.5 L turbo (WRX-S, WRX model)	2.5 L high power turbo (STI-S, STI, SE model)
Ignition timing (at idling)	BTDC	12°±10°	15°±10°
Spark plug	Type and manufacturer	NGK: SILFR6A	
Generator		12 V — 110 A	
Battery	Type and capacity (5HR)	12 V — 48 AH (55D23L)	

D: TRANSMISSION

Transmission type			6MT	5MT
Clutch type			DSPD	
Gear ratio		1st	3.636	3.166
		2nd	2.235	1.882
		3rd	1.521	1.296
		4th	1.137	0.972
		5th	0.971	0.738
		6th	0.756	—
		Reverse	3.545	3.333
Reduction gear (Front)	Final reduction	Type of gear	Hypoid	
		Gear ratio	3.900	
Reduction gear (Rear)	Transfer reduction	Type of gear	Helical	
		Gear ratio	1.103	1.000
	Final reduction	Type of gear	Hypoid	
		Gear ratio	3.545	3.900

6MT: 6-forward speeds and 1-reverse with synchromesh

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

DSPD: Dry Single Plate Diaphragm

E: STEERING

Type			Rack and pinion	
Turns, lock to lock			2.8	
Minimum turning diameter	m (ft)	Curb to curb	11.0 (36.1)	
		Wall to wall	11.8 (38.7)	

F: SUSPENSION

Front	Macpherson strut type suspension
Rear	Double-wishbone type suspension

Impreza

SPECIFICATIONS

G: BRAKE

Model	WRX-S, WRX	STI-S, STI, SE
Service brake system	Dual circuit hydraulic with vacuum suspended power unit	
Front	Ventilated disc brake	
Rear	Disc brake	Ventilated disc brake
Parking brake	Mechanical on rear brakes	

H: TIRE

Rim size	17 × 8 J	18 × 8 1/2J
Tire size	235/45R17	245/40R18
Type	Tubeless, Steel belted radial	

I: CAPACITY

Model		WRX-S, WRX	STI-S, STI, SE
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) 4.3 (4.5, 3.8)
	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)	4.1 (4.3, 3.6)
Rear differential gear oil	ℓ (US qt, Imp qt)	0.8 (0.8, 0.7)	1.0 (1.1, 0.9)
Power steering fluid	ℓ (US qt, Imp qt)	0.7 (0.7, 0.6)	
Engine coolant	ℓ (US qt, Imp qt)	7.4 (7.8, 6.5)	7.7 (8.1, 6.8)

Impreza

SPECIFICATIONS

J: WEIGHT

Model		4 door								
		2.5 L DOHC turbo								
		WRX	WRX-S							
		5MT	5MT							
OP code		U4	C0	C0	C4	U4	U4	U4	U4	U4
		XX	XR	CH	4H	XX	4 R	5 R	OH	QH
Vehicle weight (C.W.)	Total	kg (lb)	1,455 (3,208)	1,455 (3,208)	1,475 (3,252)	1,475 (3,252)	1,455 (3,208)	1,470 (3,241)	1,470 (3,241)	1,475 (3,252)
	Front	kg (lb)	830 (1,830)	830 (1,830)	840 (1,852)	840 (1,852)	830 (1,830)	835 (1,841)	835 (1,841)	840 (1,852)
	Rear	kg (lb)	625 (1,378)	625 (1,378)	635 (1,400)	635 (1,400)	625 (1,378)	635 (1,400)	635 (1,400)	635 (1,400)
Gross vehicle weight (G.V.W.)		kg (lb)	1,990 (4,387)	1,990 (4,387)	1,990 (4,387)	1,990 (4,387)	1,990 (4,387)	1,990 (4,387)	1,990 (4,387)	1,990 (4,387)
Gross axle weight (G.A.W.)	Front	kg (lb)	1,020 (2,249)	1,020 (2,249)	1,020 (2,249)	1,020 (2,249)	1,020 (2,249)	1,020 (2,249)	1,020 (2,249)	1,020 (2,249)
	Rear	kg (lb)	1,030 (2,271)	1,030 (2,271)	1,030 (2,271)	1,030 (2,271)	1,030 (2,271)	1,030 (2,271)	1,030 (2,271)	1,030 (2,271)
Option	Aluminum wheel 18 in (BBS)		—	—	—	—	—	—	—	—
	Navigation		—	—	—	—	—	○	—	○
	Sunroof		—	—	○	○	—	○	○	○
	HID		—	—	—	—	—	—	○	○
	Front fog light		—	—	○	○	—	○	○	○
	Genuine leather seat		—	—	○	○	—	—	○	○
	Seat heater		—	○	○	○	—	○	○	○
	Cold weather package		—	○	○	○	—	○	○	○
	Satellite tuner		—	—	○	—	—	—	—	—

Impreza

SPECIFICATIONS

Model		4 door								
		2.5 L DOHC high power turbo								
		STI-S						SE		
		6MT						6MT		
OP code		C0	C4	U4	U4	U4	U4	C0	U4	
		OR	SH	3 R	MR	SH	UH	VR	XR	XX
Vehicle weight (C.W.)	Total	kg (lb)	1,550 (3,417)	1,550 (3,417)	1,535 (3,384)	1,535 (3,384)	1,550 (3,417)	1,550 (3,417)	1,535 (3,384)	1,535 (3,384)
	Front	kg (lb)	890 (1,962)	890 (1,962)	885 (1,951)	885 (1,951)	890 (1,962)	890 (1,962)	885 (1,951)	885 (1,951)
	Rear	kg (lb)	660 (1,455)	660 (1,455)	650 (1,433)	650 (1,433)	660 (1,455)	660 (1,455)	650 (1,433)	650 (1,433)
Gross vehicle weight (G.V.W.)		kg (lb)	2,030 (4,475)	2,030 (4,475)	2,030 (4,475)	2,030 (4,475)	2,030 (4,475)	2,030 (4,475)	2,030 (4,475)	2,030 (4,475)
Gross axle weight (G.A.W.)	Front	kg (lb)	1,050 (2,315)	1,050 (2,315)	1,050 (2,315)	1,050 (2,315)	1,050 (2,315)	1,050 (2,315)	1,050 (2,315)	1,050 (2,315)
	Rear	kg (lb)	1,040 (2,293)	1,040 (2,293)	1,040 (2,293)	1,040 (2,293)	1,040 (2,293)	1,040 (2,293)	1,040 (2,293)	1,040 (2,293)
Option	Aluminum wheel 18 in (BBS)		—	○	○	—	○	○	—	—
	Navigation		—	—	○	—	—	○	○	—
	Sunroof		○	○	—	—	○	○	—	—
	HID		○	○	○	○	○	○	—	—
	Front fog light		○	○	○	—	○	○	—	—
	Genuine leather seat		—	○	—	—	○	○	—	—
	Seat heater		○	○	○	○	○	○	○	—
	Cold weather package		○	○	○	○	○	○	○	—
	Satellite tuner		—	—	—	—	—	—	—	—

SPC-6

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Impreza

SPECIFICATIONS

Model		5 door							
		2.5 L DOHC turbo							
		WRX							
		5MT							
OP code		C0	C0	C4	U4	U4	U4	U4	U4
		XR	CH	4H	XX	4 R	5 R	OH	QH
Vehicle weight (C.W.)	Total kg (lb)	1,455 (3,208)	1,475 (3,252)	1,475 (3,252)	1,455 (3,208)	1,470 (3,241)	1,470 (3,241)	1,475 (3,252)	1,475 (3,252)
	Front kg (lb)	830 (1,830)	840 (1,852)	840 (1,852)	830 (1,830)	835 (1,841)	835 (1,841)	840 (1,852)	840 (1,852)
	Rear kg (lb)	625 (1,378)	635 (1,400)	635 (1,400)	625 (1,378)	635 (1,400)	635 (1,400)	635 (1,400)	635 (1,400)
Gross vehicle weight (G.V.W.) kg (lb)		1,990 (4,387)	1,990 (4,387)	1,990 (4,387)	1,990 (4,387)	1,990 (4,387)	1,990 (4,387)	1,990 (4,387)	1,990 (4,387)
Gross axle weight (G.A.W.)	Front kg (lb)	1,020 (2,249)	1,020 (2,249)	1,020 (2,249)	1,020 (2,249)	1,020 (2,249)	1,020 (2,249)	1,020 (2,249)	1,020 (2,249)
	Rear kg (lb)	1,030 (2,271)	1,030 (2,271)	1,030 (2,271)	1,030 (2,271)	1,030 (2,271)	1,030 (2,271)	1,030 (2,271)	1,030 (2,271)
Option	Aluminum wheel 18 in (BBS)	—	—	—	—	—	—	—	—
	Navigation	—	—	—	—	—	○	—	○
	Sunroof	—	○	○	—	○	○	○	○
	HID	—	—	—	—	—	—	○	○
	Front fog light	—	○	○	—	○	○	○	○
	Genuine leather seat	—	○	○	—	—	—	○	○
	Seat heater	○	○	○	—	○	○	○	○
	Cold weather package	○	○	○	—	○	○	○	○
	Satellite tuner	—	○	—	—	—	—	—	—

SPC-7

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Impreza

SPECIFICATIONS

Model		5 door					
		2.5 L DOHC high power turbo					
		STI				SE	
		6MT				6MT	
OP code		C0	C4	U4	U4	C0	U4
		OR	SH	3 R	RR	XR	XX
Vehicle weight (C.W.)	Total kg (lb)	1,545 (3,406)	1,545 (3,406)	1,530 (3,373)	1,530 (3,373)	1,530 (3,373)	1,530 (3,373)
	Front kg (lb)	890 (1,962)	890 (1,962)	885 (1,951)	885 (1,951)	885 (1,951)	885 (1,951)
	Rear kg (lb)	655 (1,444)	655 (1,444)	645 (1,422)	645 (1,422)	645 (1,422)	645 (1,422)
Gross vehicle weight (G.V.W.) kg (lb)		2,030 (4,475)	2,030 (4,475)	2,030 (4,475)	2,030 (4,475)	2,030 (4,475)	2,030 (4,475)
Gross axle weight (G.A.W.)	Front kg (lb)	1,050 (2,315)	1,050 (2,315)	1,050 (2,315)	1,050 (2,315)	1,050 (2,315)	1,050 (2,315)
	Rear kg (lb)	1,040 (2,293)	1,040 (2,293)	1,040 (2,293)	1,040 (2,293)	1,040 (2,293)	1,040 (2,293)
Option	Aluminum wheel 18 in (BBS)	—	○	○	○	—	—
	Navigation	—	—	○	—	—	—
	Sunroof	○	○	—	—	—	—
	HID	○	○	○	○	—	—
	Front fog light	○	○	○	○	—	—
	Genuine leather seat	—	○	—	—	—	—
	Seat heater	○	○	○	○	○	—
	Cold weather package	○	○	○	○	○	—
	Satellite tuner	—	—	—	—	—	—

PRECAUTION

PC

	Page
1. Precaution	2



Precaution

PRECAUTION

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. 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.

2. BRAKE FLUID

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

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

3. RADIATOR FAN

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

4. ROAD TEST

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

5. AIRBAG

To prevent bodily injury from unexpected deployment of airbags and unnecessary maintenance, follow the instructions in this manual when performing maintenance on 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.

6. 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.

7. 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.

8. AIRBAG SPECIAL TOOL

To prevent unexpected deployment, only use special tools.

9. WINDOW

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

10. WINDOW ADHESIVE

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

11. 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.

12. 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.

13.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.

14.AIR CONDITIONER REFRIGERANT

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

15.REMOVAL AND INSTALLATION OPERATION OF HOSES, ETC.

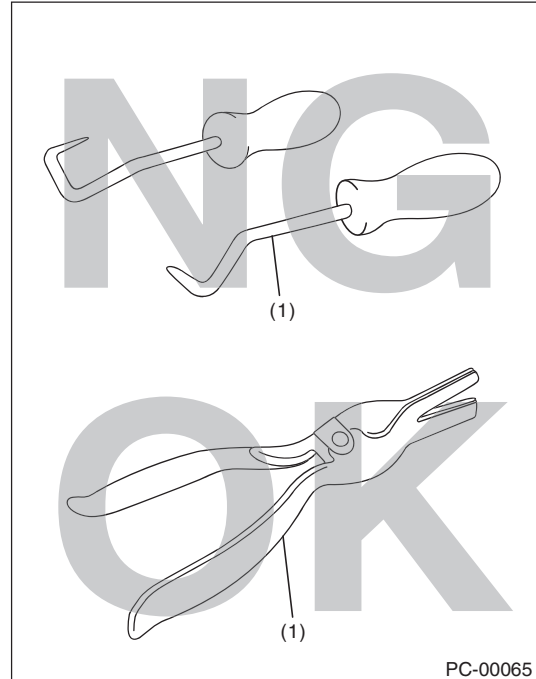
1. Before the removal and installation operation of hoses, etc.

- 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

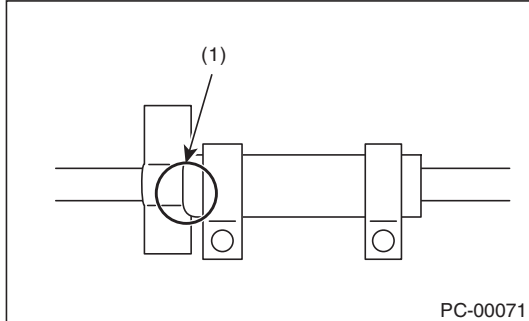
- When draining hose using pliers, be sure to cover the hose with cloth and rotate the hose slightly to extract straight.

Precaution

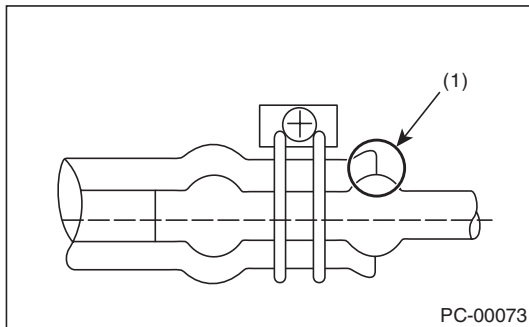
PRECAUTION

- 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

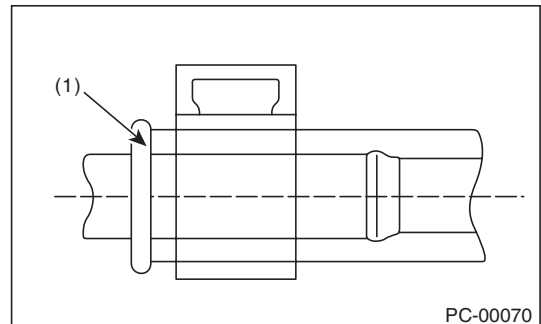
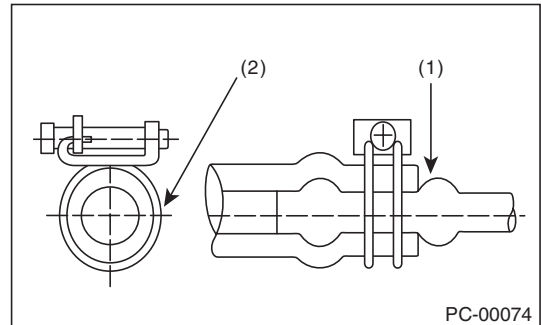


(1) Hose rides over the spool

- 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.

Precaution

PRECAUTION

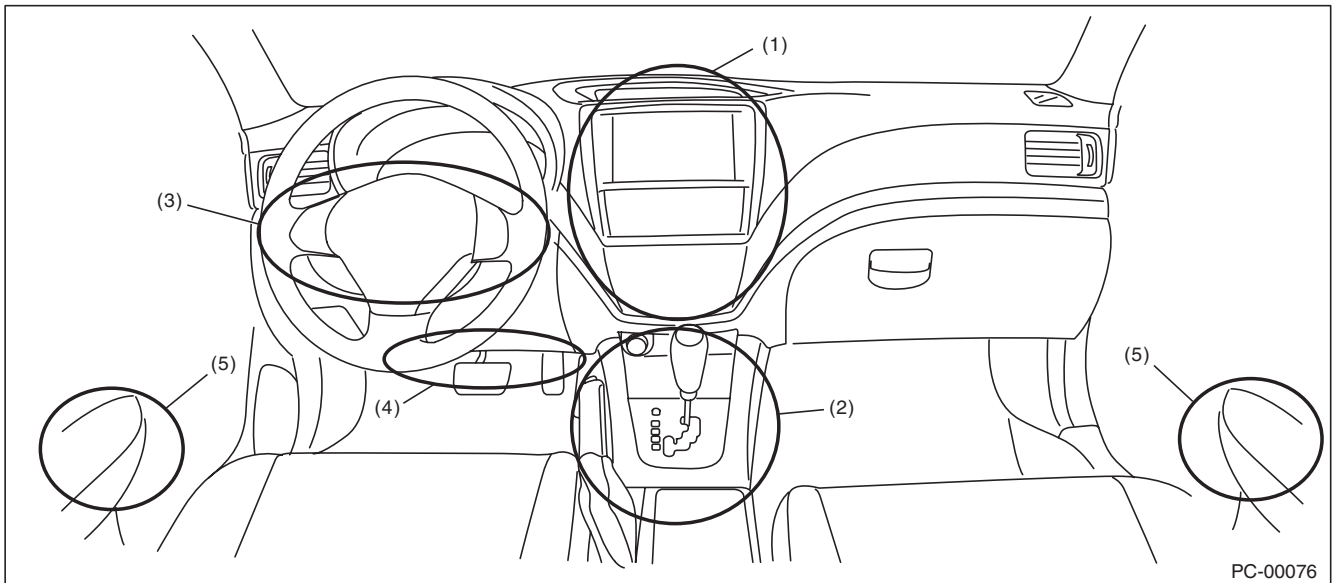
- For the parts below, replaces with a new part when the hose is removed or the installation position is changed.

Engine oil cooler hose, power steering suction hose, power steering return hose, fuel hose (delivery/return)

16. HANDLING PRECAUTIONS FOR SILICON-CONTAINING SPRAY

When silicon contained in the lubricant, rust inhibitor or glazing agent adheres to the electrical contact of the relay or switch, nonconducting silica dioxide (SiO_2) film will be formed, which may lead to poor continuity. Therefore, the following precautions must be observed when using the silicon-containing spray.

- Never spray directly to the electrical equipment.
- When using the spray close to the electrical equipment, always put the cover on it. Be sure to put the cover on the electrical equipment especially when using the spray to the locations shown in the figure below and their surrounding areas.



- | | | |
|---|---|-------------------------|
| (1) Audio, heater control switch | (3) Combination switch, steering switch | (5) Power window switch |
| (2) Shift/select lever switch, parking switch | (4) Stop light switch, brake light switch | |

- If the residual silicon remains in the vicinity of the electrical equipment after the spray has been used, the vaporized silicon stands around the electrical equipment and it may adhere to electrical contact. After using the spray, be sure to wipe the silicon off with a cloth.
- Even when using the spray to the place away from the electrical equipment, the droplet of the spray may be splashed to the periphery. Use as small amount of spray as possible, and take care not to splash the silicon to the periphery.

NOTE:

The "silicon" used in this section refers to "silicone", that is, silicon polymer.

Precaution

PRECAUTION

PC-6

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NOTE

NT

	Page
1. Note	2



Note

NOTE

1. Note

A: NOTE

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

1. FASTENERS NOTICE

Fasteners are used to prevent the parts from damage, dislocation and play due to looseness. Fasteners must be tightened to the specified torque. Do not apply paint, lubricant, rust retardant or other substance to the surface around bolts, nuts, etc. Doing so will make it difficult to obtain the correct torque and result in looseness and other problem.

2. STATIC ELECTRICITY DAMAGE

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

3. BATTERY

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

4. SERVICE PARTS

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

5. PROTECTING VEHICLE UNDER MAINTENANCE

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

6. ENSURING SECURITY DURING WORK

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

7. LIFT AND JACK

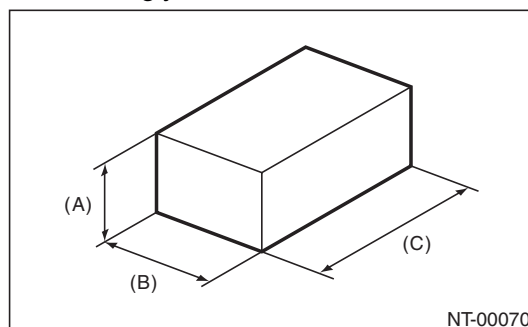
When using a lift or shop jack to raise a vehicle or using rigid rack to support a vehicle, always follow instructions concerning jack-up points and weight limits to prevent the vehicle from falling, which could result in injury. Be especially careful that the vehicle is balanced before raising it. Be 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. When the side sill interferes with the lift arm, a grooveless attachment can be used. In this case, perform the operation carefully because the dislocation from the side sill flange may occur.

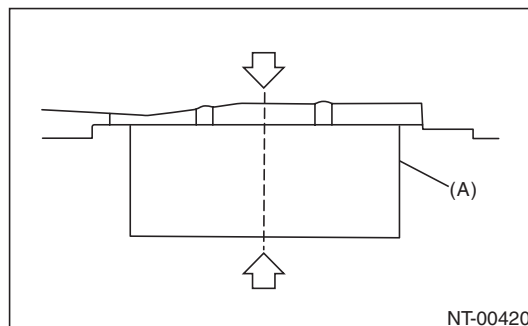
NOTE:

- 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 plate lift, use a rubber attachment. Place the attachment to the specified position of the vehicle, by adjusting front/rear and left/right sides accordingly.



- (A) 80 mm (3.1 in) or more
- (B) 80 — 100 mm (3.15 — 3.94 in)
- (C) 120 — 170 mm (4.72 — 6.69 in)

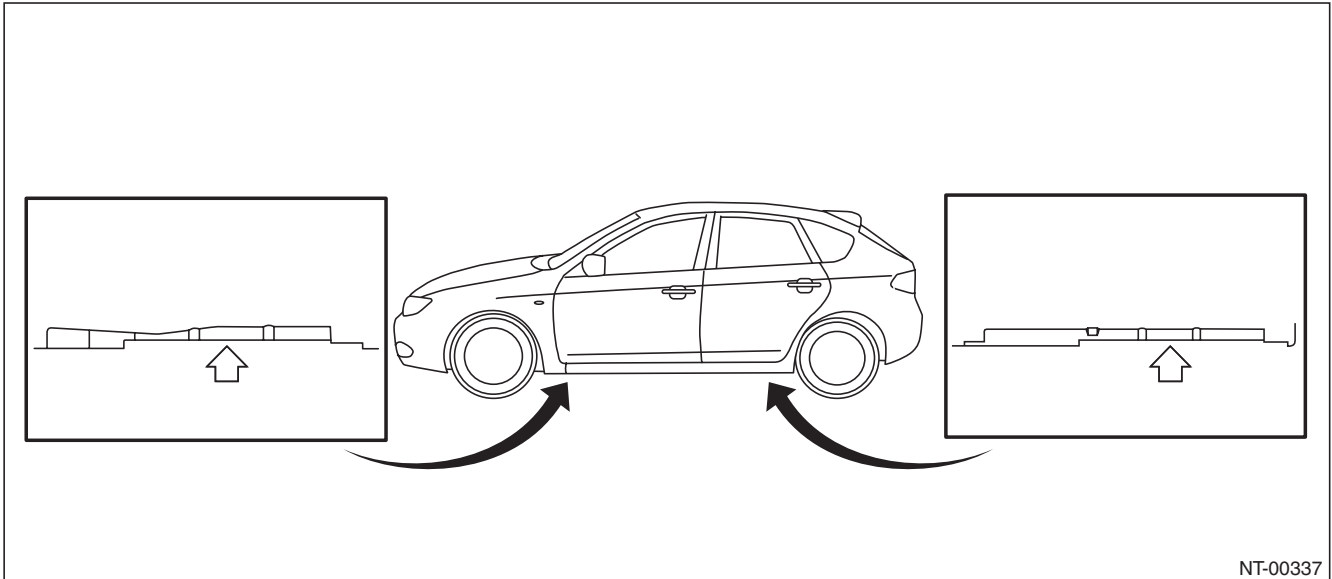
- When using an attachment, align the center of attachment (A) with the center of vehicle rib (the center of spoiler rib).



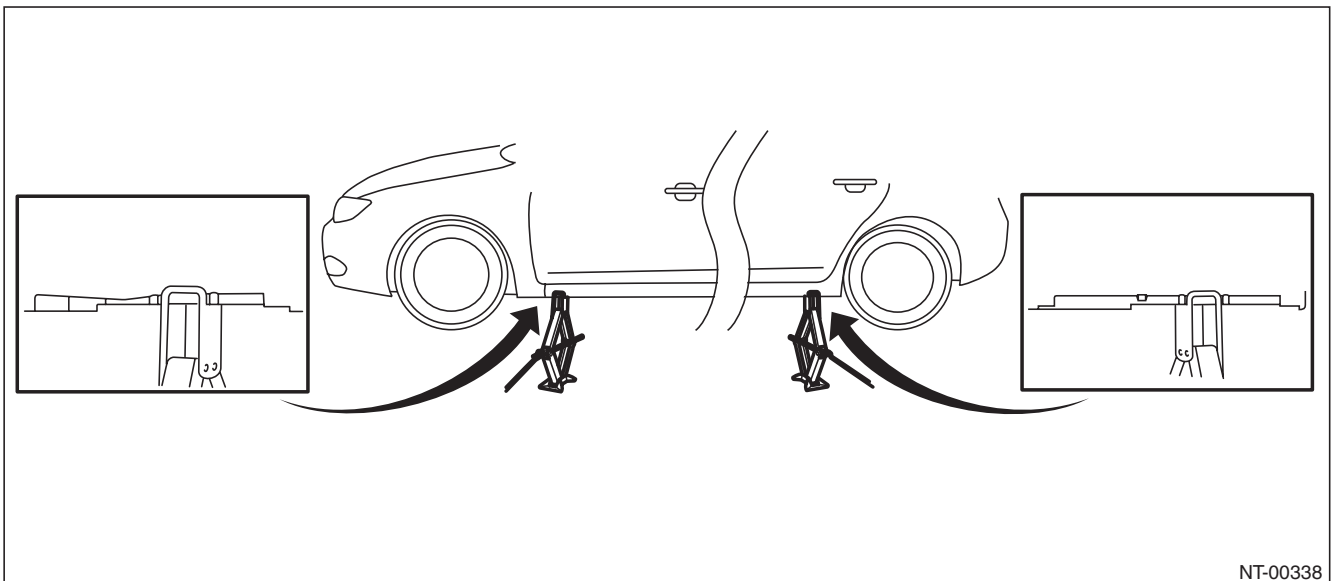
Note

NOTE

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



Pantograph jack
Set the jacks between protruding portions.



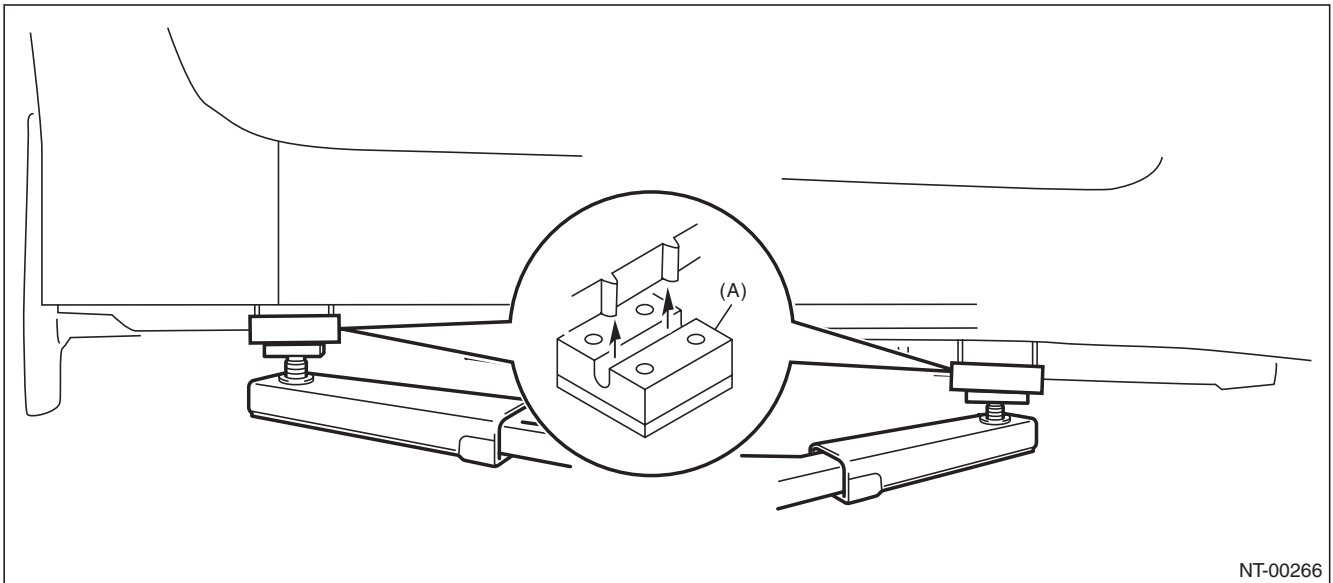
NT-3

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Note

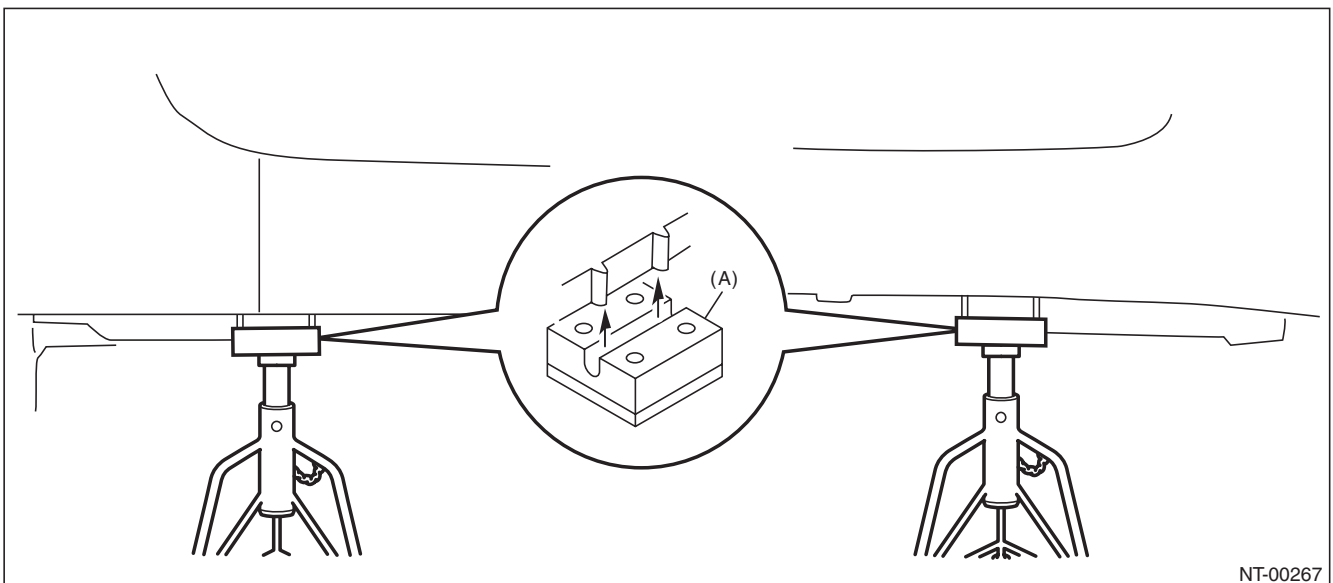
NOTE

Lift



(A) Attachment

Rigid rack



(A) Attachment

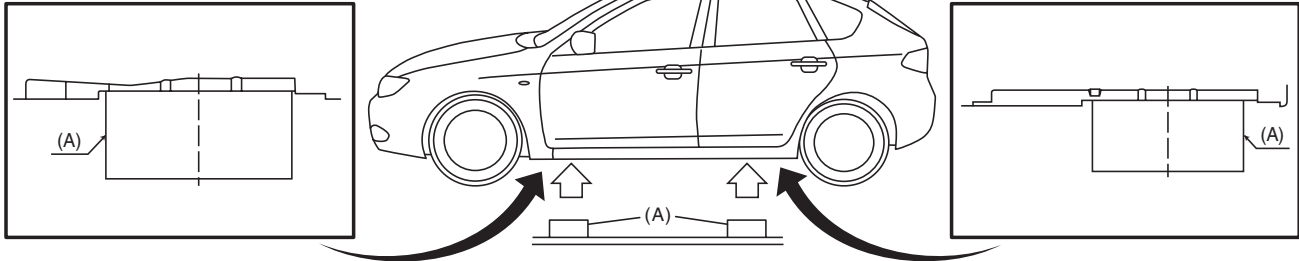
NT-4

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Note

NOTE

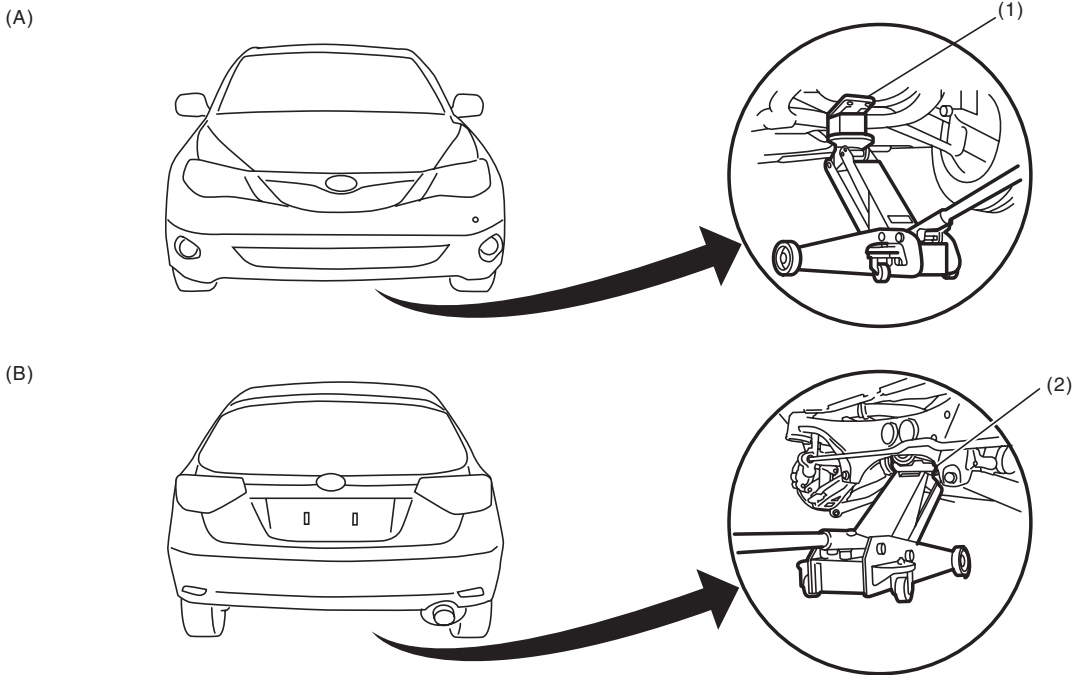
Plate lift



NT-00268

(A) Attachment

Garage jack



NT-00210

(A) Front

(B) Rear

(1) Front crossmember

(2) Rear differential

NT-5

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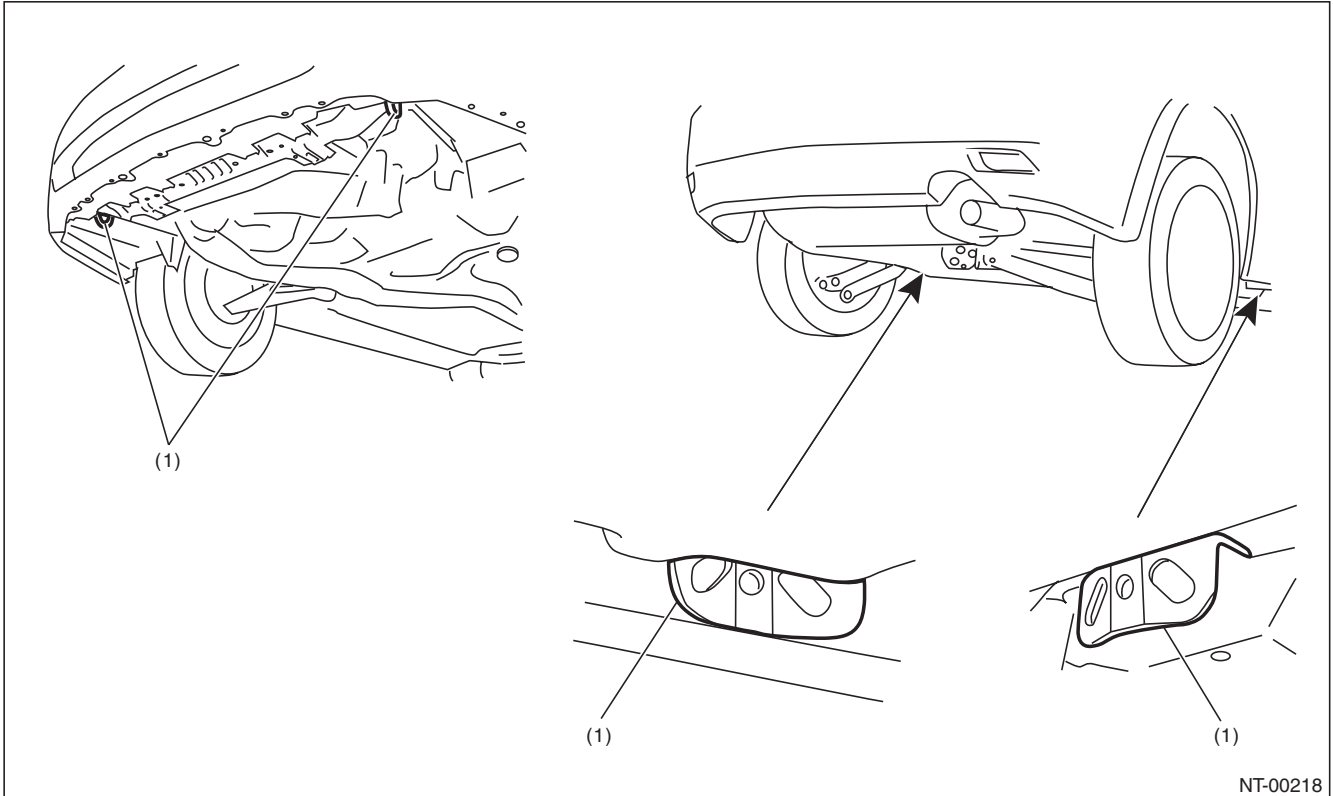
Note

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



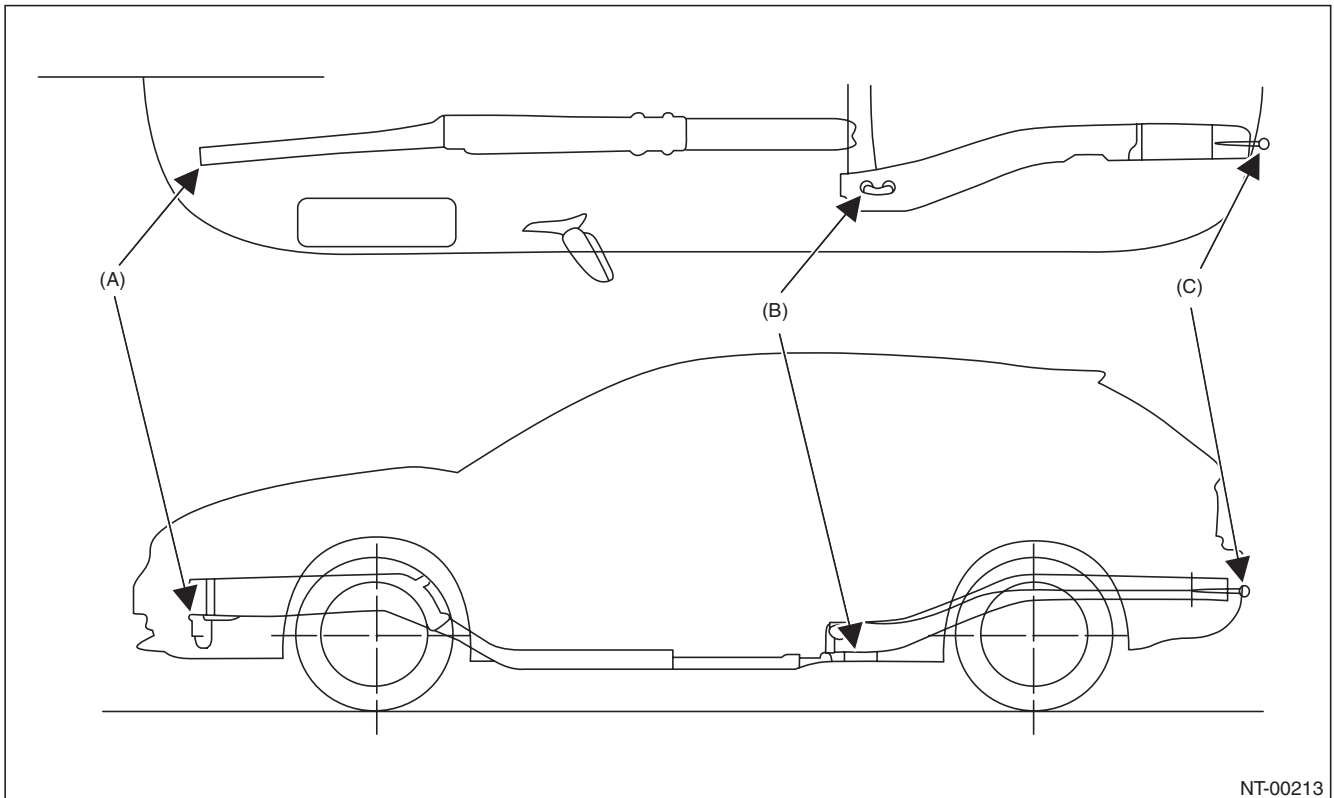
NT-00218

(1) Hook for tie-down

Note

NOTE

- Tie-down hook & eye bolt



NT-00213

(A) Front tie-down hook

(B) Rear tie-down hook

(C) Eye bolt

NT-7

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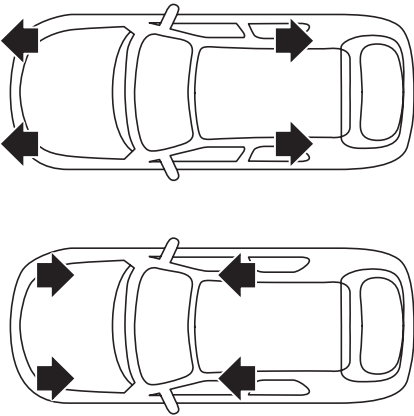
Note

NOTE

- Tie-down direction

CAUTION:

- Pull the front and rear of the vehicle in the opposite direction, and pull the left and right of the vehicle in the same direction.
- Patterns except for the followings (recommended) are not allowed.

	Recommended
Tie-down direction	 NT-00214

Note

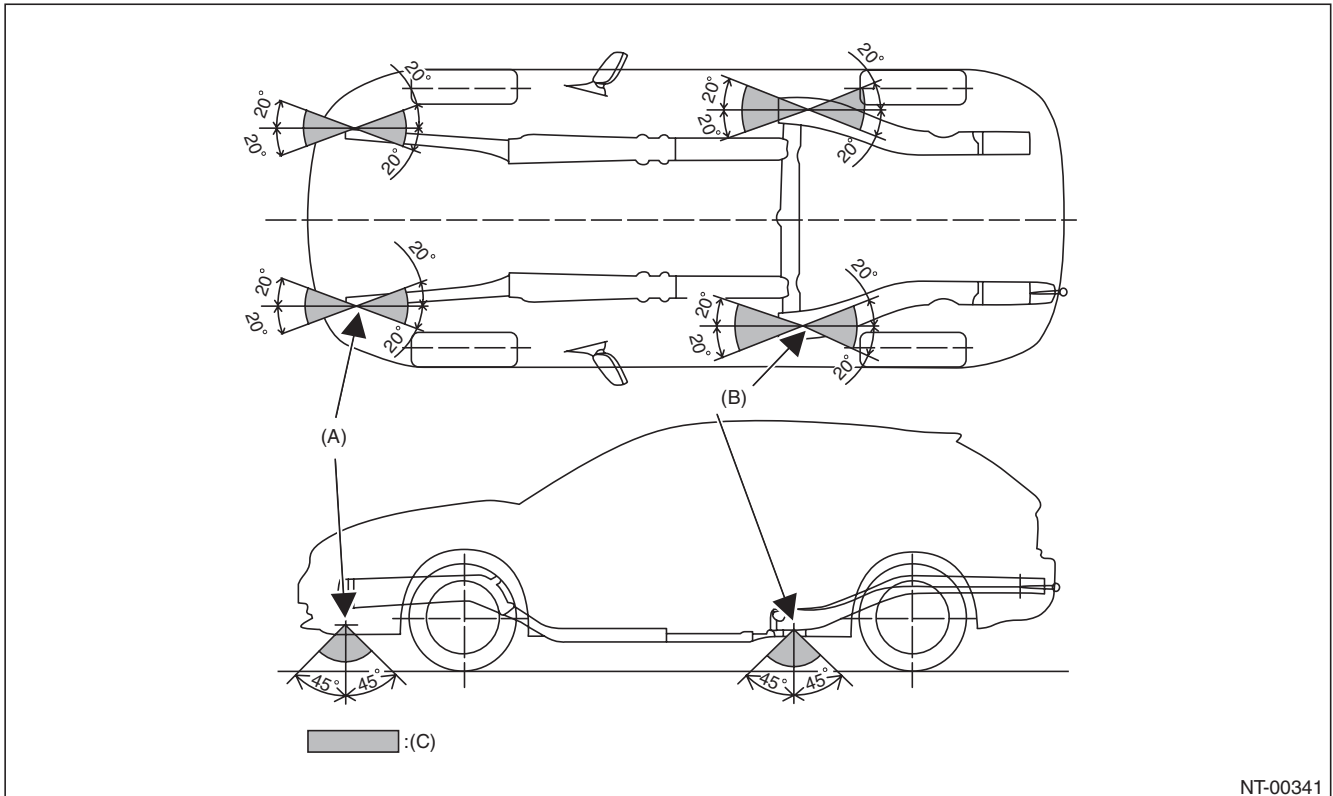
NOTE

- 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

NT-9

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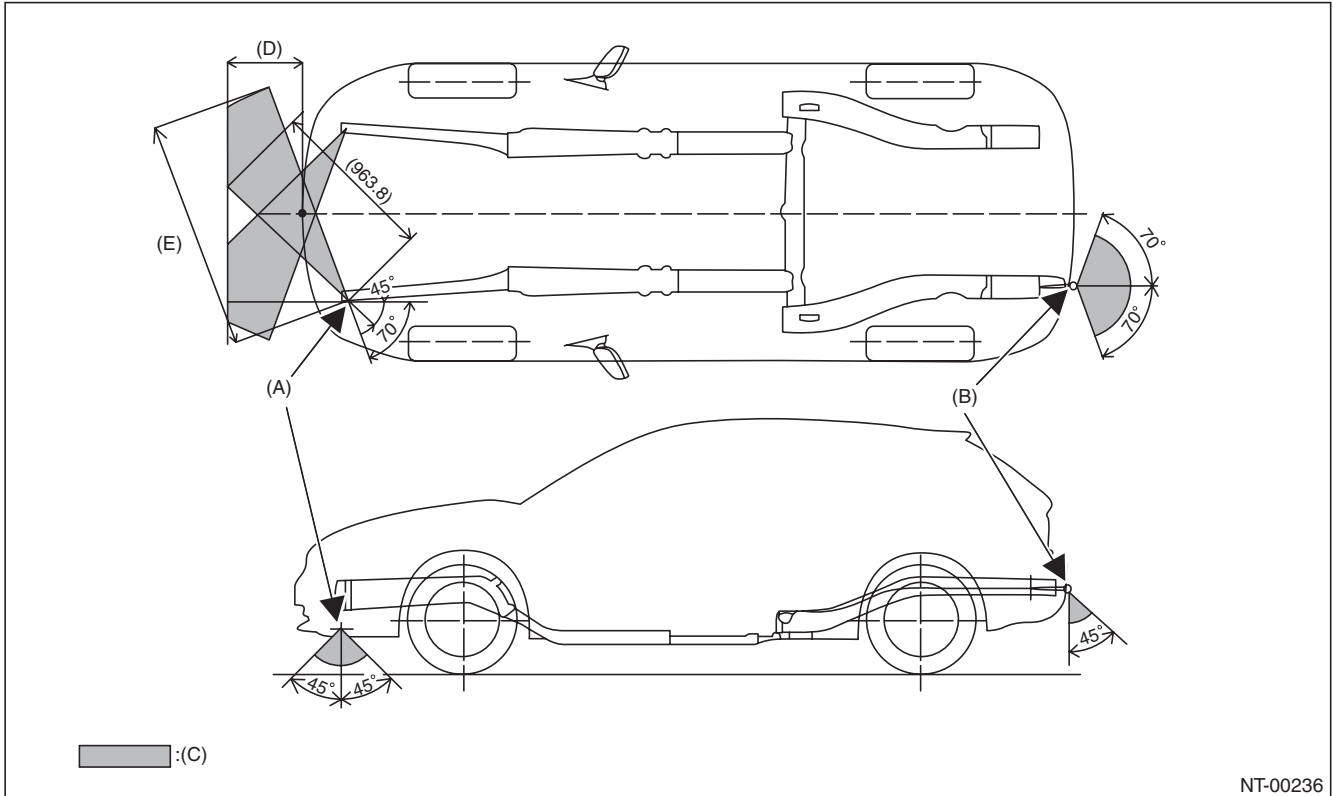
Note

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)

NT-10

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Note

NOTE

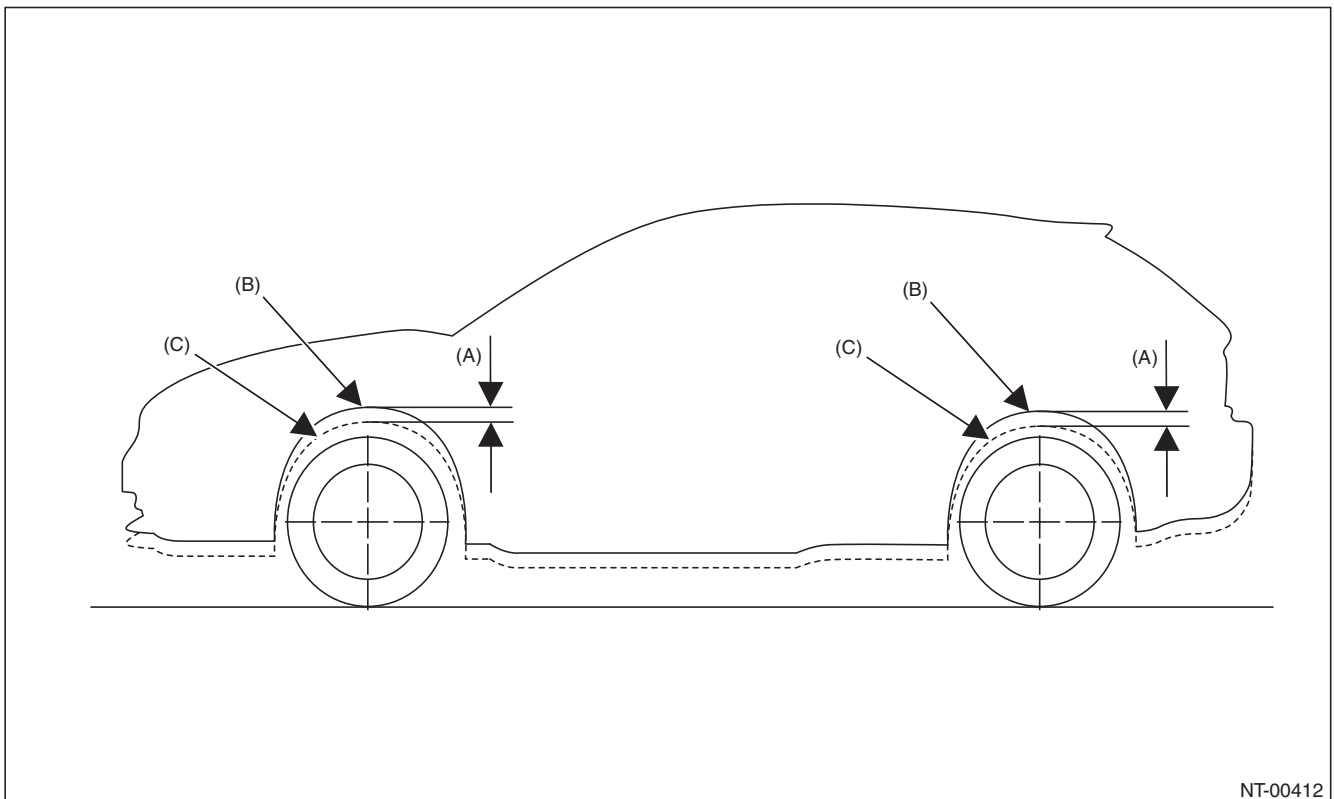
• Vehicle sinking volume at tie-down condition

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

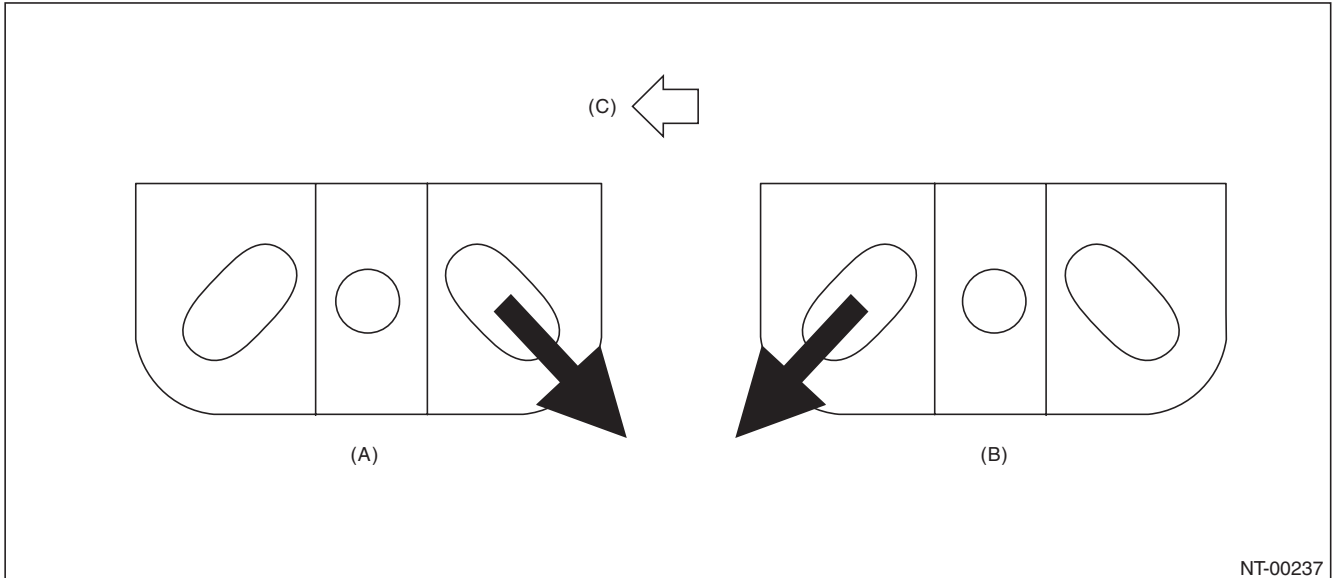
Note

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

Note

NOTE

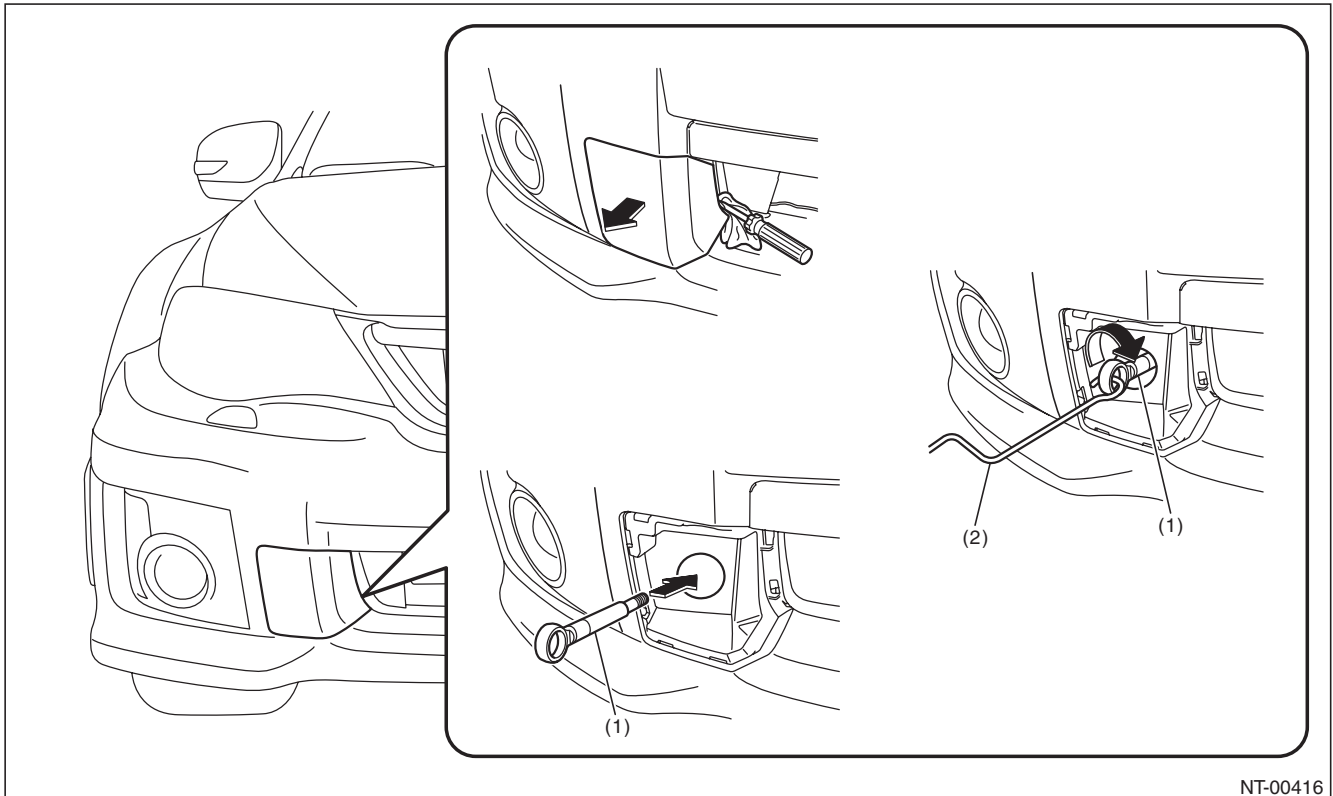
9. TOWING

Avoid towing vehicles except when the vehicle cannot be driven. When towing other vehicles, pay attention to the following to prevent eye bolt 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

Remove the hook cover, and install the towing hook (eye bolt).



NT-00416

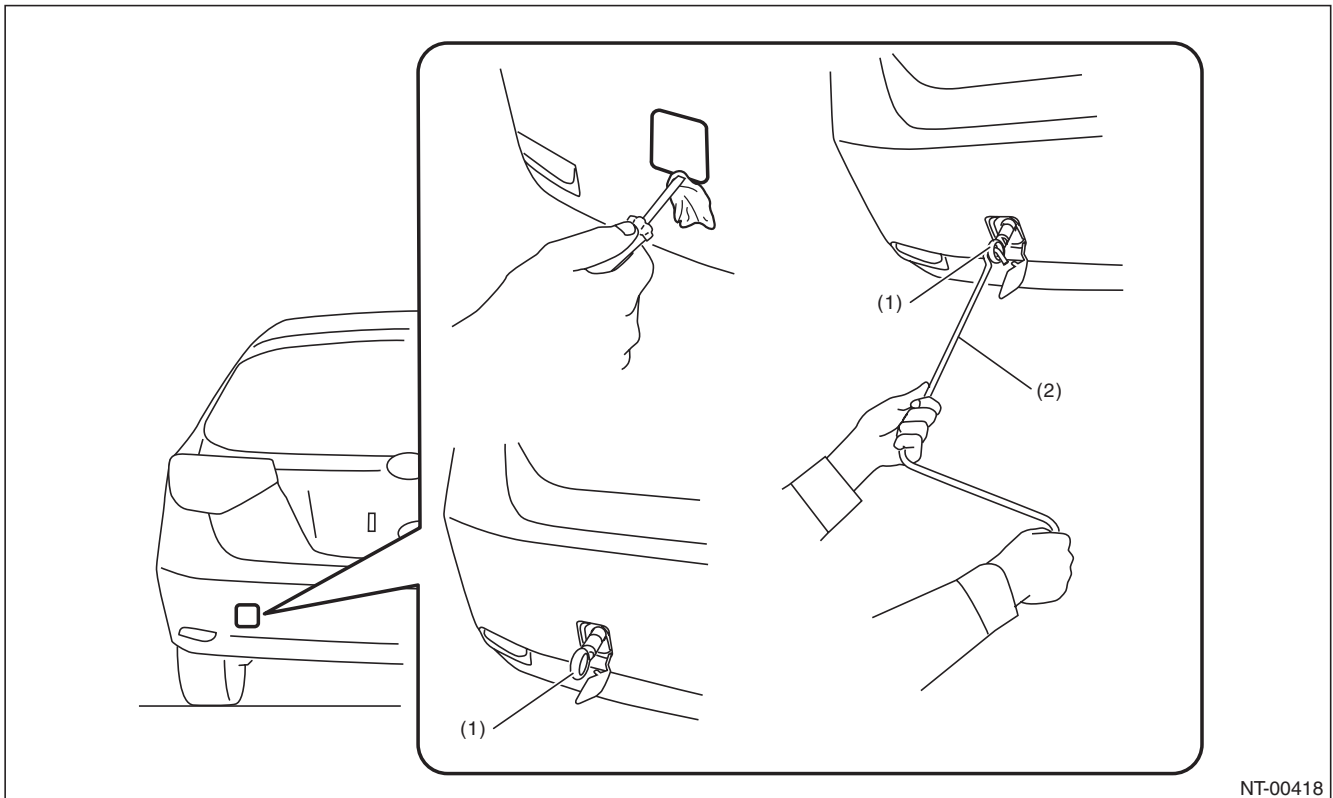
(1) Towing hook (eyebolt)

(2) Jack handle

Note

NOTE

• Rear

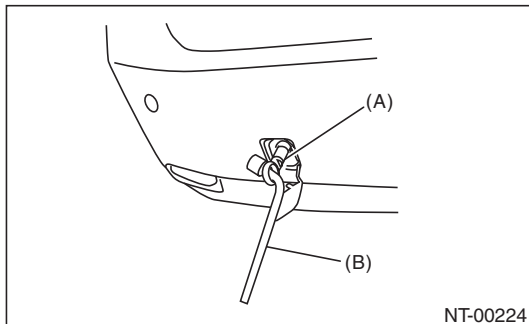


(1) Towing hook (eyebolt)

(2) Jack handle

CAUTION:

When tightening the eye bolt using a wheel wrench, be careful not to scratch the bumper.



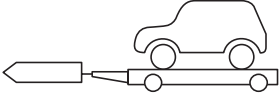
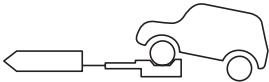
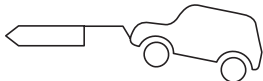
(A) Towing hook (eyebolt)

(B) Wheel wrench

Note

NOTE

Precautions

Towing	Precautions	AWD
		MT
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 carrying the vehicle onto a car carrier truck, refer to "LOADING ONTO CAR CARRIER TRUCK". <Ref. to NT-17, LOADING ONTO CAR CARRIER TRUCK, NOTE, Note.>	○
Rope  NT-00024	Check if both front and rear wheels are rotated normally.	○
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.	×

○ mark: OK, × mark: Prohibited

NT-15

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Note

NOTE

CAUTION:

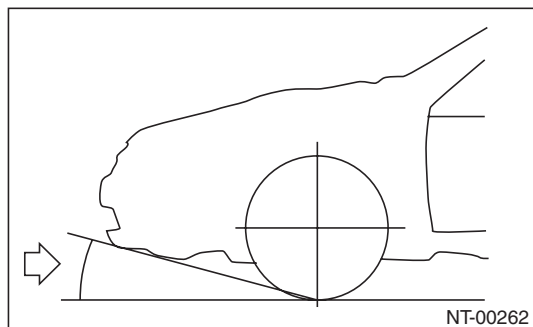
- Place the shift lever in “N” position during towing.
- Do not lift up the rear wheels to avoid unsteady rotation.
- Turn the ignition key to “ACC”, then check the steering wheel moves freely.
- Release the parking brake to avoid tire dragging.
- Since the power steering does not work, be careful for the heavy steering effort. (When engine is stopped)
- Since the servo brake does not work, be careful that the brake is not applied effectively. (When engine is stopped)
- In case of the malfunction of internal transmission or drive system, lift up four wheels (on a trailer) for towing.
- Do not use the towing hook (eye bolt) except when towing.
- Make sure to detach the towing hook (eye bolt) after towing. If it remains attached, airbag may not operate properly when receiving a shock. And it may also affect the crash performance of the vehicle.

10.LOADING ONTO CAR CARRIER TRUCK

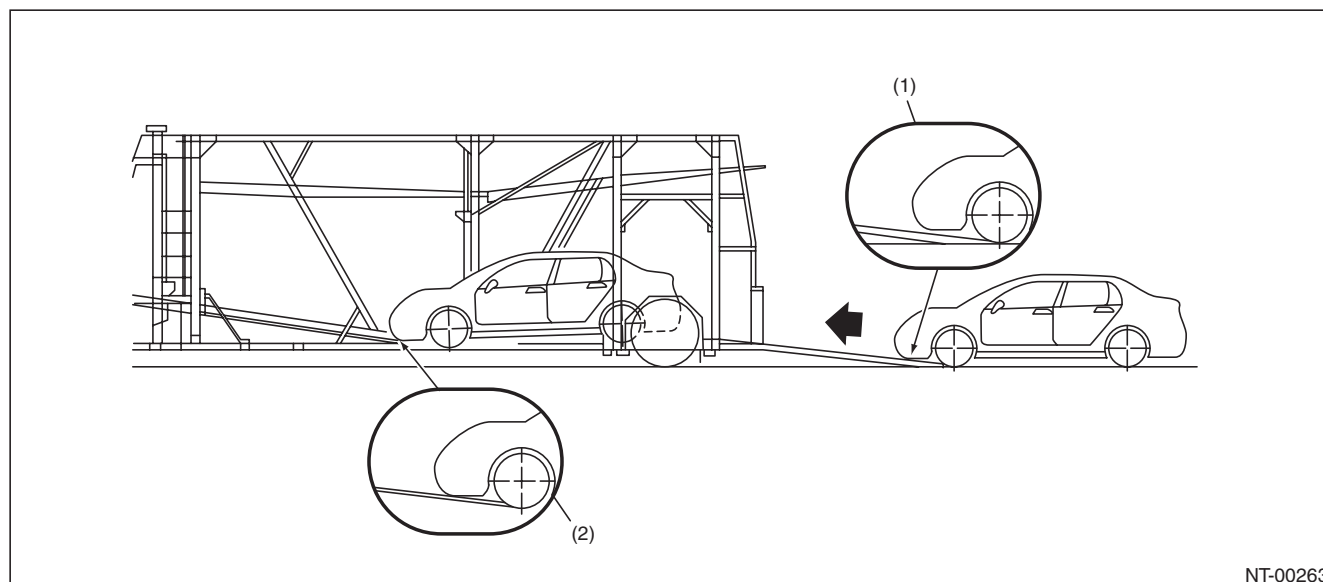
When carrying the vehicle onto a car carrier truck, observe the following precautions.

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.

Before lowering the vehicle from the carrier car, perform the following operations.

CAUTION:

Always perform the following operations before lowering the vehicle from the carrier car. Otherwise, the power unit will rotate reversely, which may cause the damage to the engine, vacuum pump, and transmission.

- 1) Start the engine.
- 2) Set the transmission shift position into driving direction of the vehicle. (When the vehicle drives forward, do not set the transmission into R range. When the vehicle drives rearward, do not set the transmission into 1 — 6 speed.)

CAUTION:

Be sure to perform 2) mentioned above even if the engine cannot be started in some reasons.

Note

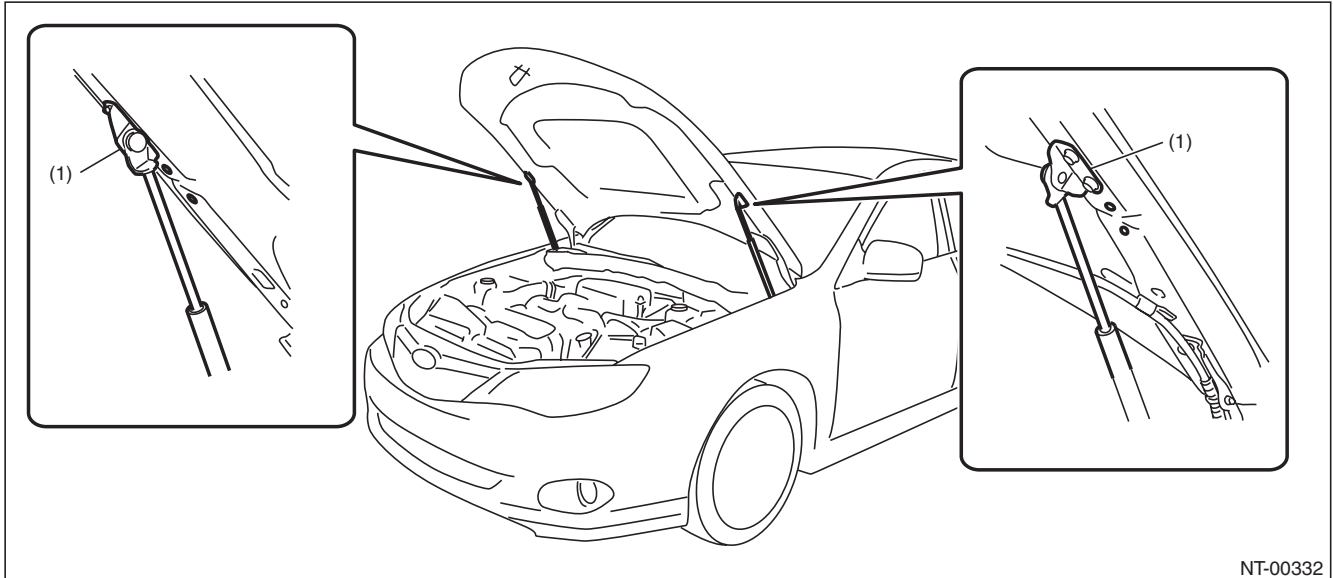
NOTE

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.



NT-00332

(1) Normal attached position

Note

NOTE

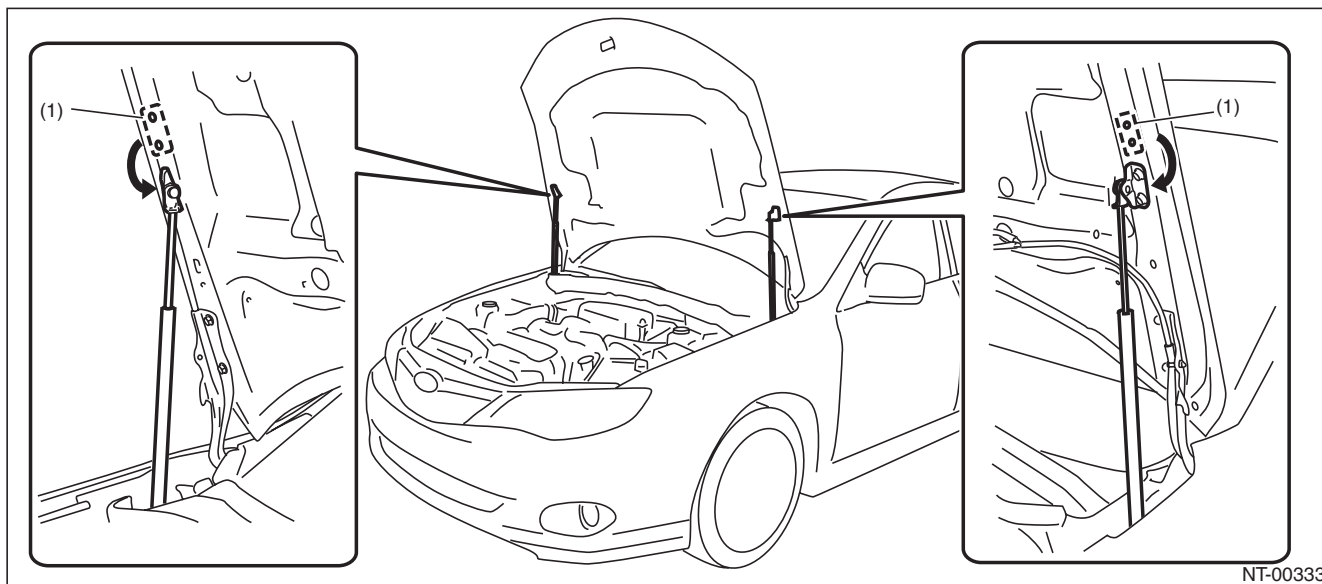
2) When wider hood opening is necessary, set the damper stay below as shown in the figure.

Tightening torque:

<Ref. to EB-8, 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 and other electronically controlled parts.

Note

NOTE

NT-20

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IDENTIFICATION

ID

	Page
1. Identification	2



Identification

IDENTIFICATION

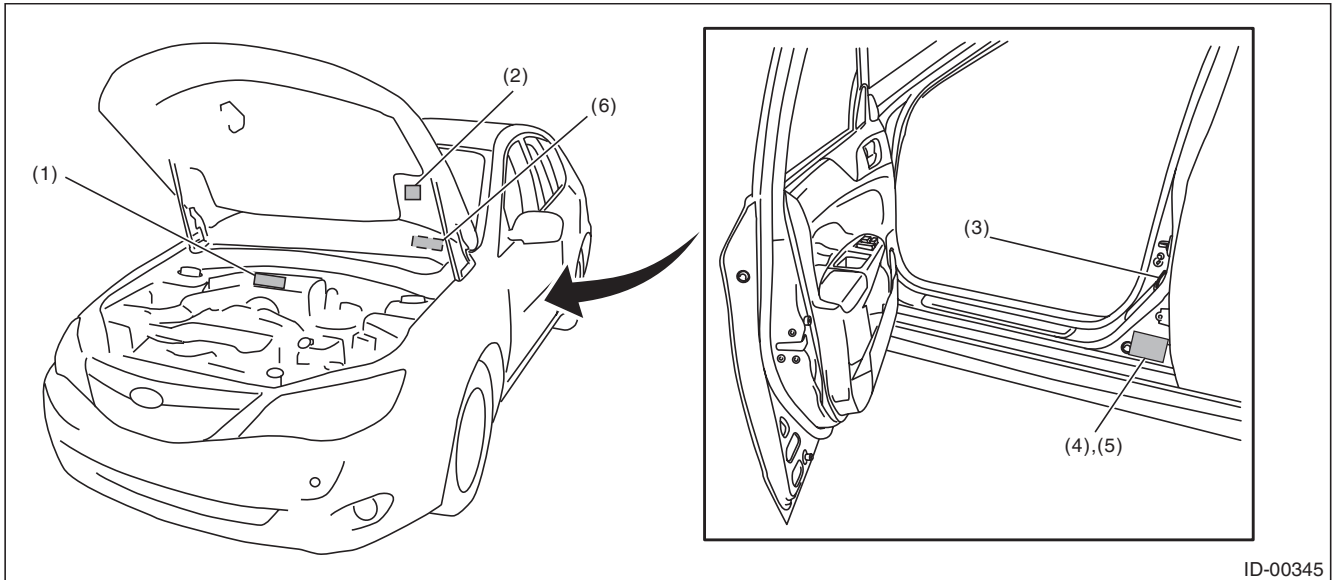
1. Identification

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.)

(2) Emission control label

(3) Tire inflation pressure label

(4) MVSS label (Apply on the left side of center pillar outer)

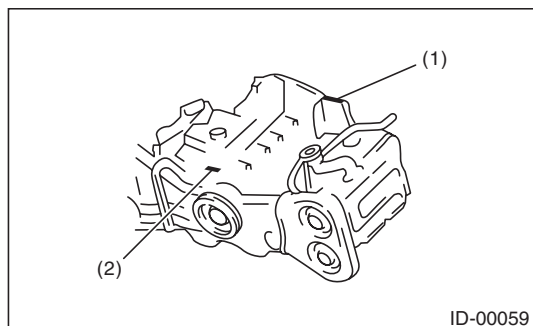
(5) Model number label (Apply on the right side of center pillar outer)

(6) Vehicle identification number (V.I.N. PLATE)

Identification

IDENTIFICATION

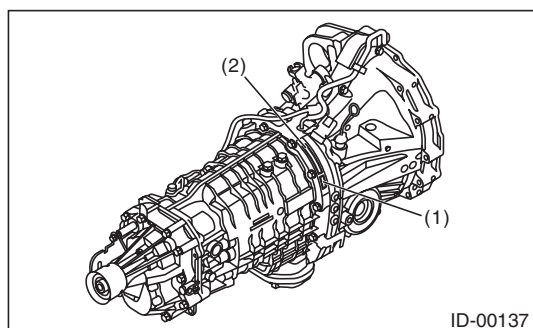
• Engine



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

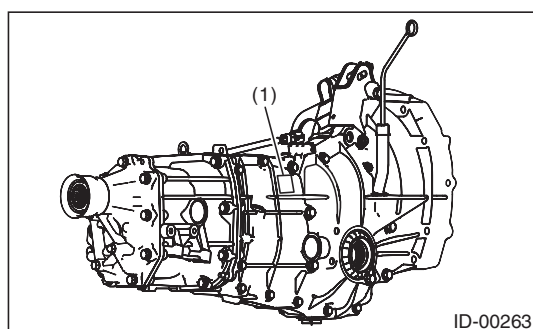
• Manual transmission

6MT



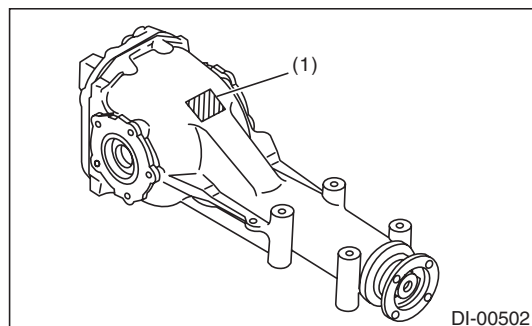
- (1) Transmission serial No.
- (2) MT type label

5MT



- (1) MT type and transmission serial number label

• Rear differential



- (1) Identification (white paint)

• Model number label



• MVSS label



Identification

IDENTIFICATION

2. MEANING OF V.I.N.

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

JF1GR8H6XCL200001[

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	R	Body type	V: 4 door wide body R: 5 door wide body
6	8	Displacement	7: 2.5 L AWD turbo 8: 2.5 L AWD high power turbo
7	H	Grade	E: WRX F: WRX-S G: SE H: STI J: STI-S
8	6	Restraint	6: Manual belts, dual airbag, side airbag, curtain airbag
9	X	Check digit	0 — 9&X
10	C	Model year	C: 2012MY
11	L	Transmission type	G: Full-time AWD single range 5MT L: Full-time AWD 6MT
12 — 17	200001	Serial number	002001 — 199999: 4 door 200001 — 399999: 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.

GRFEYEH

Digits	Code	Meaning	Details
1	G	Series	G: IMPREZA
2	R	Body type	V: 4 door wide body R: 5 door wide body
3	F	Total engine displacement Drive system Suspension system	E: 2.5 L AWD turbo F: 2.5 L AWD high power turbo
4	E	Model year	E: 2012MY
5	Y	Destination	Y: U.S., Canada
6	E	Grade	E: STI F: WRX G: WRX-S T: SE V: STI-S
7	H	Transmission, fuel feed system	D: MFI turbo 5MT AWD H: MFI high power turbo 6MT AWD

Identification

IDENTIFICATION

The engine and transmission type are as follows.

Engine

EJ257BG5LB

Digits	Code	Meaning	Details
1 and 2	EJ	Engine type symbol	EJ: 4 cylinder
3 and 4	25	Displacement	25: 2.5 L
5	7	Fuel feed device	5: MFI turbo 7: MFI high power turbo
6	B	Exhaust regulations	B: U.S. (FED, CAL)
7	G	Mounted transmission	E: 5MT G: 6MT
8 — 10	5LB	Detailed specifications	Used when ordering parts. For details, refer to the parts catalog.

Transmission (MT)

TY856UW1MA

Digits	Code	Meaning	Details
1	T	Transmission	T: Transmission
2	Y	Transmission system	Y: Full-time AWD MT center differential
3 and 4	85	Distance between gear center	75: Between main shaft and drive pinion 85: Between main shaft and drive pinion
5	6	Classification	6: 6MT 8: 5MT
6	U	Transmission specifications	U: Full-time AWD single range 6MT with driver's control center differential V: Full-time AWD single range 5MT with viscous coupling center differential
7	W	Mounted engine	W: 925 DOHC turbo
8 — 10	1MA	Detailed specifications	Used when ordering parts. For details, refer to the parts catalog.

Rear differential

Code	Reduction gear ratio	LSD
H3	3.545	Torsen
B2	3.900	None

Identification

IDENTIFICATION

Option code

MH

- 1-digit number

OP code	M	O	Q	R	S	U	V	3	4	5
18 in Tire & Aluminum wheel (BBS)	—	—	—	○	○	○	—	○	—	—
Navigation	—	—	○	—	—	○	○	○	—	○
Sunroof	—	○	○	—	○	○	—	—	○	○
HID headlight	○	○	○	○	○	○	○	○	—	—
Front fog light	—	○	○	○	○	○	—	○	○	○

- 2-digit number

OP code	H	R
Genuine leather seat	○	—
Seat heater	○	○
Cold weather package	○	○
Satellite tuner	—	—

RECOMMENDED MATERIALS

RM

	Page
1. Recommended Materials	2



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

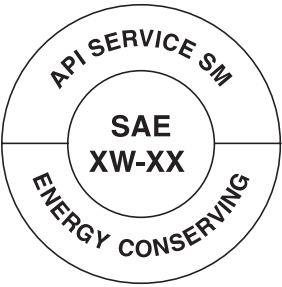
Always use gasoline of the same or higher octane value than specified in the owner's manual. Ignoring the specifications below will result in damage or poor performance of engine and fuel injection system. To gain proper performance, always use specified gasoline.

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 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) Required								
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								

RM-3

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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
Power steering fluid	SUBARU ATF	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	
Water for dilution	Distilled water	—	Soft water or tap water
Cooling system protective agent	Cooling system conditioner	SOA345001	—

6. REFRIGERANT

Standard air conditioners on Subaru vehicles use HFC134a refrigerant. Do not mix it with other refrigerants. Also, do not use any compressor oil 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 portion) • MT main shaft (oil seal lip) • Clutch release lever • Clutch release bearing • Clutch operating cylinder	NICHIMOLY N-130	—	—
	Clutch master cylinder push rod	SILICONE GREASE G-40M	—	—
	• Gear shift lever • Clutch pedal • Brake pedal • Release bearing	NIGHTIGHT LYW No. 2 grease	—	—
	Steering gearbox	VALIANT GREASE M-2	003608001	ONE LUBER SG
	Disc brake (Lock pin, guide pin, piston boot)	NIGLUBE RX-2	000041000	—
	Brake pad end surface	Molykote M7439	K0770YA000	—
	Between brake pad and shim	Molykote AS880N	K0777YA010	—
	Parking brake	Brake grease	—	—
	Rear axle EBJ	NKG814	—	—
	Front axle AAR	One-Luber GKN-C	—	—
	Front axle PTJ	NKG302	—	—
	Rear axle EDJ	NKG814	—	—
	• Door latch • Door striker	SILICONE GREASE G-30M	004404002	—

8. ADHESIVE

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

Adhesive	Application point	Recommended materials	Item number	Alternative
Adhesive	Windshield, rear quarter glass, rear window glass, rear gate glass 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	• Transmission case • Transmission oil pan (6MT) • MT extension case • Clutch housing (6MT)	THREE BOND 1215	004403007	DOW CORNING No. 7038
	• Rear differential • Oil pressure switch	THREE BOND 1324	004403042	—
	• Service hole plug • PCV nipple • Intake manifold nipple (STI model) • Rear differential	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 • DOHC rocker cover	THREE BOND 1217G	K0877Y0100	—

PRE-DELIVERY INSPECTION

PI

	Page
1. Pre-delivery Inspection	2

Pre-delivery Inspection

PRE-DELIVERY INSPECTION

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 panels. 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. Fuses	If the vehicle is about to be delivered to customer, attach the room light fuse.
4. Door lock/unlock & open/close	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 system	Check the child safety lock system operates normally.
6. Rear gate lock/unlock & open/close	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.
7. Fuel lid opener lock release lever	Operate the fuel lid opener to check that the fuel filler lid can be unlocked normally.
8. Accessory	Check that the following accessories are equipped. • Owner's manual • Warranty booklet • Maintenance note • Spare key • Key No. plate • Jack • Jack handle • Tool set • Spare tire • Towing hook (eyebolt) • Security ID plate
9. Front hood lock release system	Operate the front hood lock release lever to check that the front hood opens normally.
10. Battery	Check the battery for any abnormal conditions such as rust or traces of battery fluid leaks.
11. Brake fluid	Check the fluid level.
12. Engine oil	Check the engine oil amount.
13. Transmission gear oil	• Check that the transmission gear oil level is normal. (5MT model) • Check for leakage of the transmission gear oil. (6MT model)
14. Differential gear oil	Check for leakage of gear oil from the rear differential.

Pre-delivery Inspection

PRE-DELIVERY INSPECTION

Operation	Check point
15. Engine coolant	Check the engine coolant level.
16. Clutch fluid	Check the clutch fluid amount.
17. Window washer fluid	Check the window washer fluid amount.
18. Front hood latch	Check that the front hood is closed normally and locked securely.
19. Keyless entry system	Check that the keyless entry system operates normally.
20. Security system	Check that the security system operates normally.
21. Seat	1. Check the seat surfaces for stains or dirt. 2. Check the seat installation conditions and functionality.
22. Seat belt	Check the seat belt installation conditions and functionality.
23. TPMS (U.S. models only)	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).
24. ECM protector	For Canada model, check the ECM protector installation conditions.

Checks with the Engine Running

Operation	Check point
25. Delivery (test) mode connector	Turn the ignition switch to ON and check that the malfunction indicator light starts blinking.
26. Immobilizer system	1. Check that the engine starts with all keys that are equipped on vehicle. 2. 60 seconds after turning ignition switch from ON to ACC or OFF, or immediately after removing the key, check that the security indicator light is blinking.
27. Starting condition	Start the engine and check that the engine starts smoothly.
28. Exhaust system	Check that the exhaust noise is normal and no leaks are found.
29. Indicator light and warning lights	Check that all indicator lights and warning lights are operating correctly.
30. Heater & ventilation	Check that the heater & ventilation system operates normally.
31. Air conditioner	Check that the air conditioner operates normally.
32. Clock	Check that the clock operates normally.
33. Audio	Check the radio and AUX operate normally.
34. Navigation	Check the navigation and AUX operate normally.
35. Front accessory power supply socket	Check that the front accessory power supply socket operates normally.
36. Lighting system	Check that the lighting system operates normally.
37. Window washer	Check that the window washer system operates normally.
38. Wiper	Check that the wiper system operates normally.
39. Power window	Check that the power window operates normally.
40. Sunroof	Check that the sunroof operates normally.
41. Rear defogger system	Check that the rear defogger system operates normally.
42. Parking brake	Check the parking brake for normal operations.

Dynamic Test with the Vehicle Running

Operation	Check point
43. Brake test	Check the foot brake for normal operations.
44. Shift control	Check that the shift patterns are correct.
45. Cruise control	Check that the cruise control system operates normally.

Checks after Dynamic Test

Operation	Check point
46. Power steering fluid level	Check that the power steering fluid level is normal.
47. Fluid leakage	Check for fluid/oil leaks.
48. Water leakage	Spray the vehicle with water and check for water leaks.
49. 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.

Pre-delivery Inspection

PRE-DELIVERY INSPECTION

1. APPEARANCE

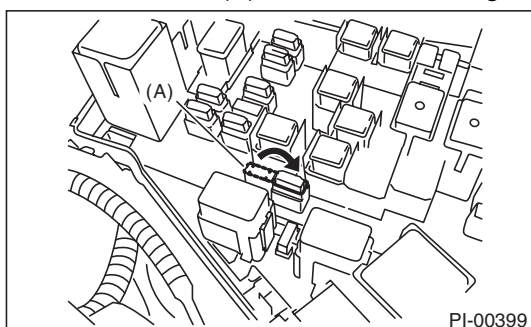
- If the vehicle is covered with protective coating, visually check the vehicle body for damage and dents.
- When there is no protective coating, check the body paints for damage or stains in detail and repair as necessary.
- Check the window glass, door glass, and lights for any cracks or damage, and 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 for damage on the outside surface of the tires.
- Check and correct the tire size, spare tire and tire air pressure described on the tire air pressure label (driver's side).

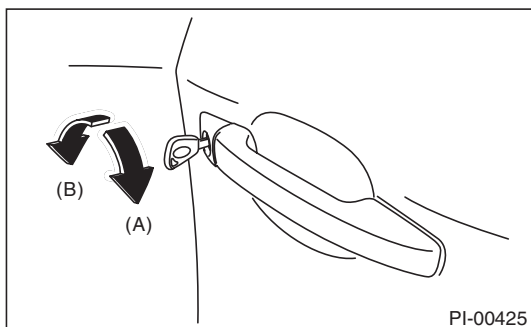
3. FUSE

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

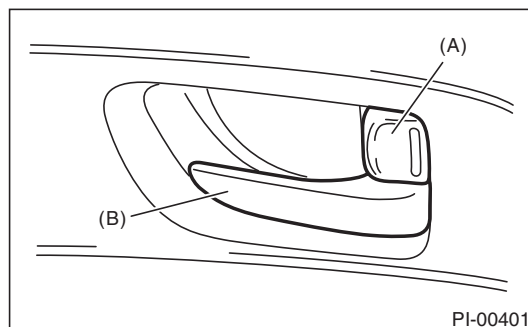
1) Using the key, lock and unlock the door several times to check for normal operation. Open and close the door several times for smooth movement.



- (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.

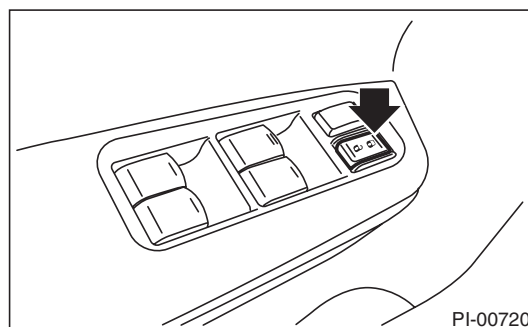
For other doors, place the door lock knob (A) to lock position and then pull the inner remote (B) to ensure that doors will not open.



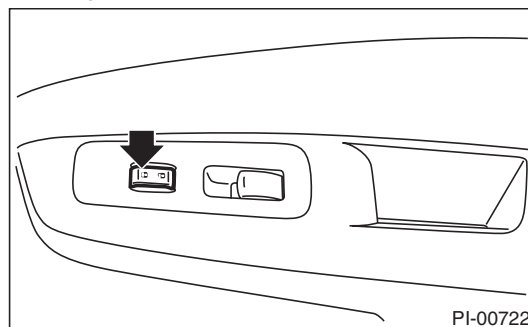
- (A) Door lock knob
- (B) Inner remote

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

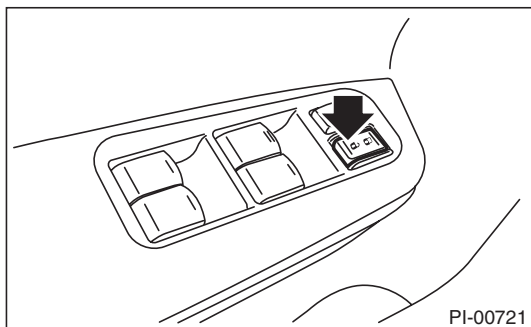
PRE-DELIVERY INSPECTION

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.

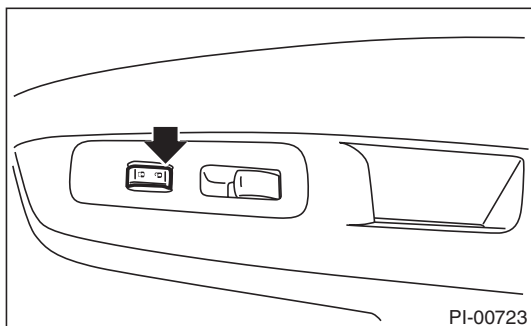
NOTE:

Pressing the release button will open the rear gate.

- Driver's side

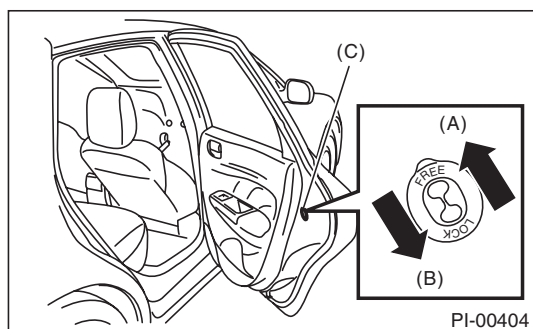


- Passenger's side



5. CHILD SAFETY LOCK SYSTEM

- 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.

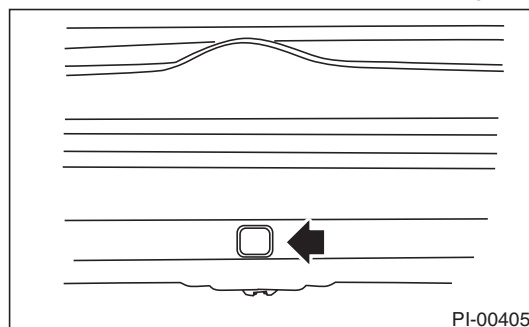


- (A) Unlock
- (B) Lock
- (C) Child safety lock lever

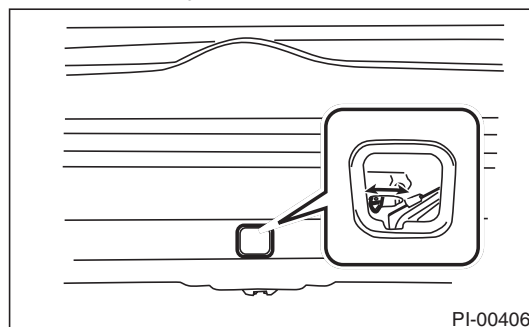
6. REAR GATE LOCK/UNLOCK AND OPEN/CLOSE OPERATIONS

- 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.



7. FUEL LID OPENER LOCK RELEASE LEVER

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

Pre-delivery Inspection

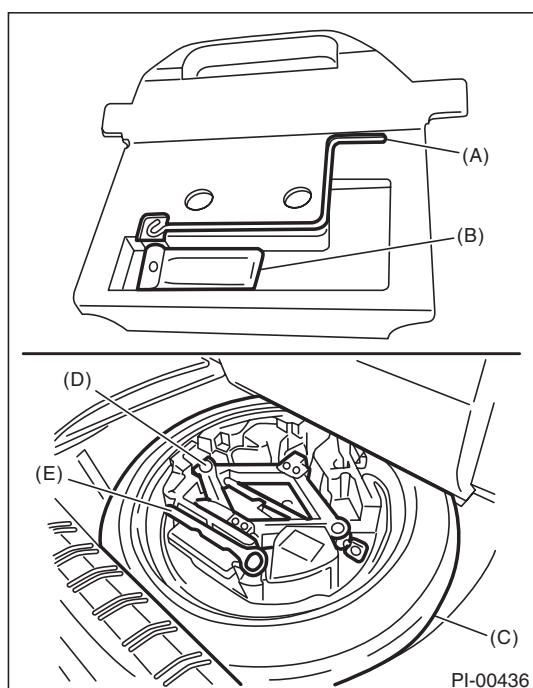
PRE-DELIVERY INSPECTION

8. ACCESSORY

Check that the following accessories are provided.

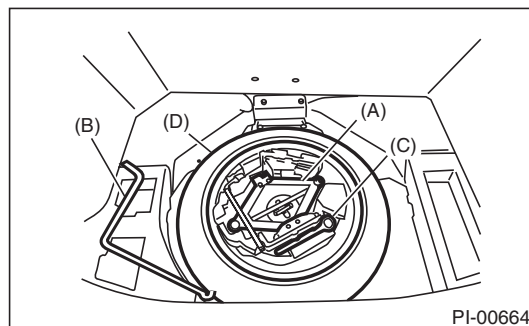
- Owner's manual
- Warranty booklet
- Maintenance note
- Spare key
- Tool set
- Towing hook (eyebolt)
- Spare tire
- Key No. plate
- Security ID plate
- Jack
- Jack handle

4 door model



- (A) Jack handle
- (B) Tool set
- (C) Spare tire
- (D) Jack
- (E) Towing hook (eyebolt)

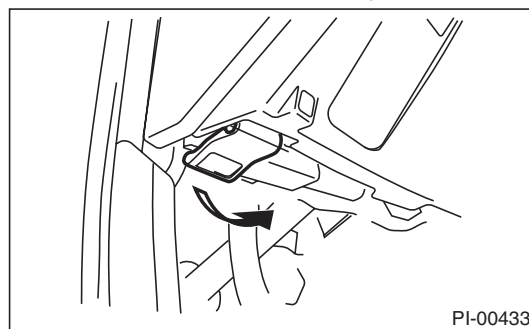
5 door model



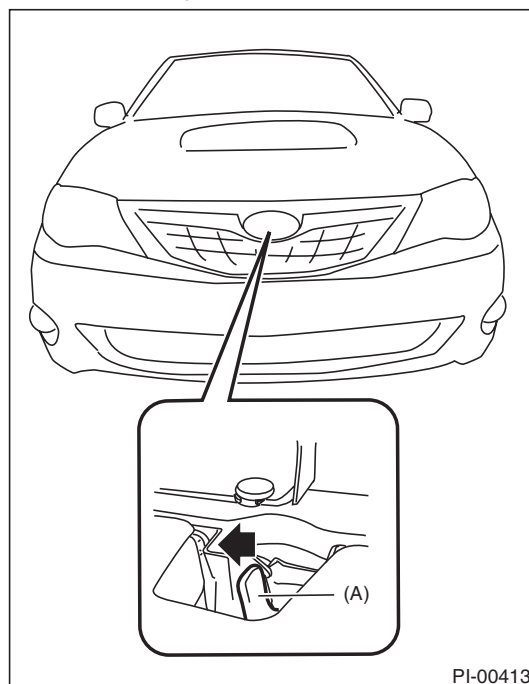
- (A) Jack
- (B) Jack handle
- (C) Towing hook (eyebolt)
- (D) Spare tire

9. FRONT HOOD LOCK RELEASE SYSTEM

Operate the front hood release knob to check that the front hood will unlock properly.

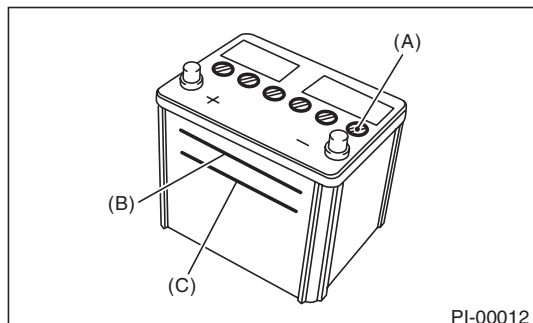


Operate the lever (A) and check that the front hood is opened normally.



10.BATTERY

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



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

11.BRAKE FLUID

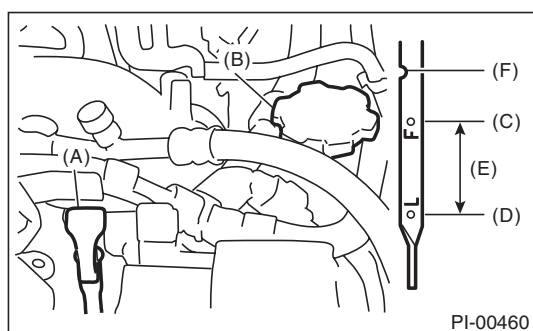
Check the brake fluid amount. If the amount is insufficient, carry out a brake line test to identify brake fluid leaks and check the brake operation. After that, refill the brake fluid tank with the specified type of fluid.

CAUTION:

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

12.ENGINE OIL

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



- (A) Oil level gauge
- (B) Engine oil filler cap
- (C) "F" line
- (D) "L" line
- (E) Approx. 1.0 ̸ (1.1 US qt, 0.9 Imp qt)
- (F) Notch mark

CAUTION:

If any engine oil is spilled on the exhaust pipe, under cover, wipe off completely to prevent fires or emission of smoke.

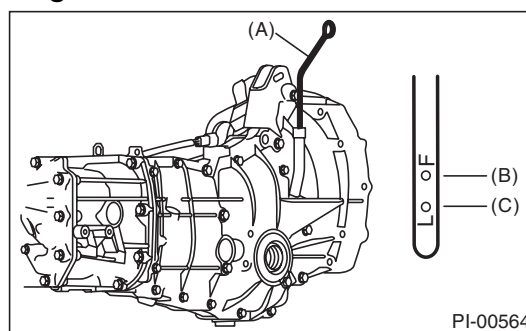
13.TRANSMISSION GEAR OIL

5MT model

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

6MT model

Check for leakage of the transmission gear oil.

14.REAR DIFFERENTIAL GEAR OIL

Check for leakage of gear oil from the rear differential.

15.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:

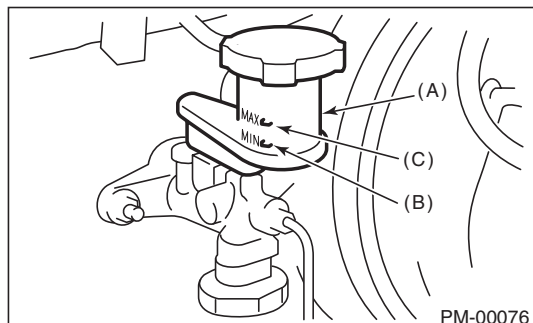
If any engine coolant is spilled on the exhaust pipe, wipe off completely to prevent fires or emission of smoke.

Pre-delivery Inspection

PRE-DELIVERY INSPECTION

16. CLUTCH FLUID

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



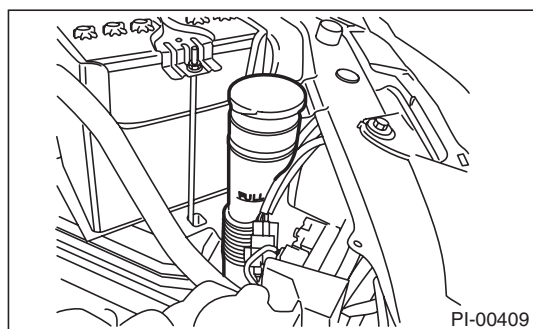
- (A) Reservoir tank
- (B) MIN. level
- (C) MAX. level

CAUTION:

If any clutch fluid is spilled on the exhaust pipe, wipe off completely to prevent fires or emission of smoke.

17. 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.



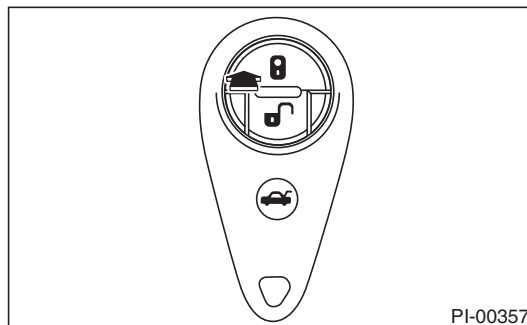
18. FRONT HOOD LATCH

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

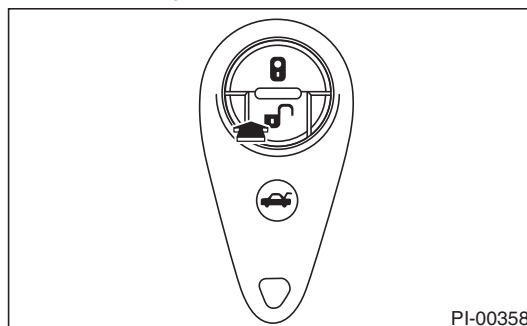
19. KEYLESS ENTRY SYSTEM

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.

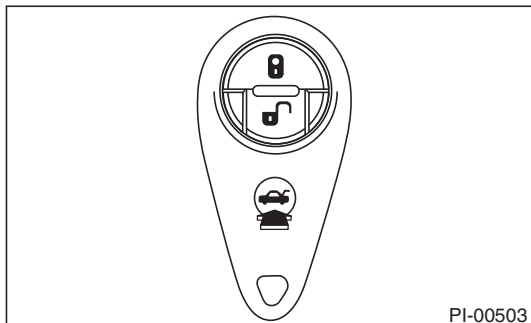


- Within 5 seconds, press the "UNLOCK/DISARM" button momentarily on the keyless transmitter. Check that all doors (including rear gate) are unlocked.
- Lock all the doors including rear gate. Press the rear gate unlock button to unlock the rear gate. Check that the buzzer sounds twice, and the hazard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

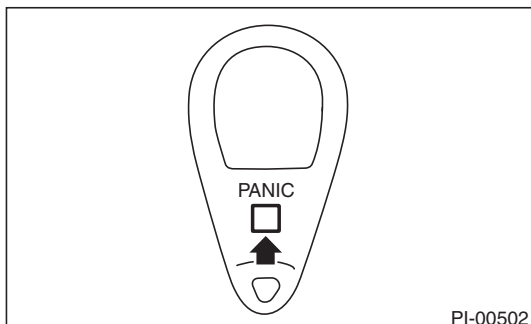
Pre-delivery Inspection

PRE-DELIVERY INSPECTION

- 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)

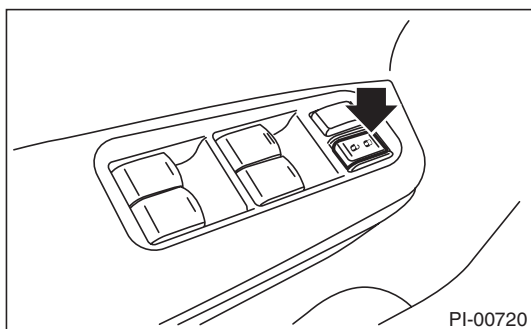


- Press the "PANIC" button of the keyless transmitter. Check that the panic mode (the horn keeps sounding) is initiated. Also, check that this condition continues for 30 seconds or until when any of the buttons on the keyless transmitter are pressed.

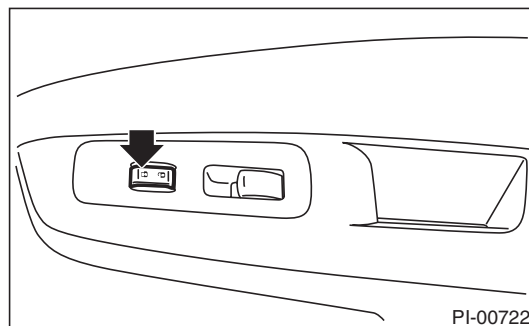


- Press the "LOCK/ARM" button momentarily on the keyless transmitter with one of the doors (including the rear gate) opened. Check that the buzzer sounds 5 times, and the hazard light flashes 5 times to notify the door not being fully closed. Next, close all the doors including rear gate. Check if all 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



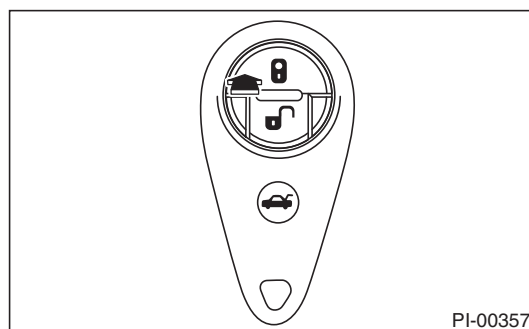
Alarm sound operational check

- 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.

20.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.



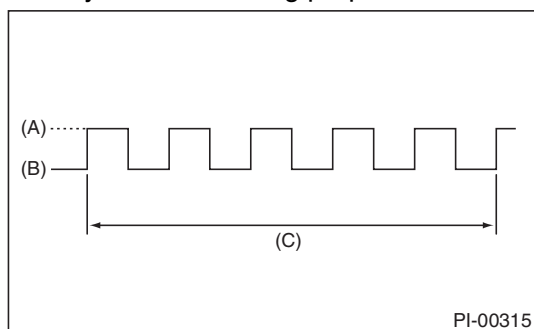
Pre-delivery Inspection

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.



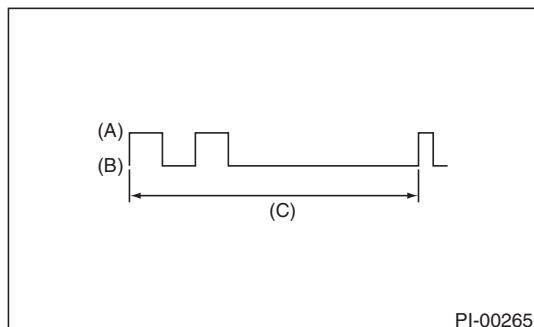
- Alarm system monitoring prepared condition



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

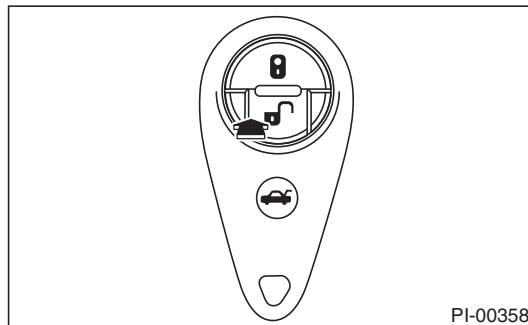
5) Check that the system enters monitoring condition 30 seconds after the condition in 4).

- Alarm system monitoring condition (all models)



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

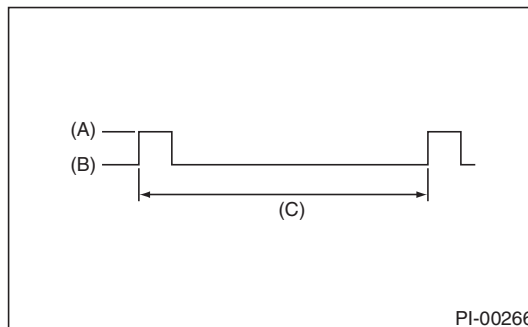
6) Press the "UNLOCK/DISARM" button on the keyless transmitter once.



7) The alarm system is in the non-monitoring condition if the driver's door is unlocked, the buzzer sounds twice, the hazard light flashes twice, the room light turns on, and the security display light flashes according to the following figure.



- Alarm system non-monitoring condition

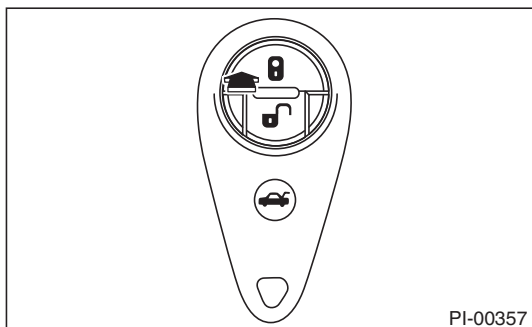


- (A) Light ON
- (B) Light OFF
- (C) 3 seconds

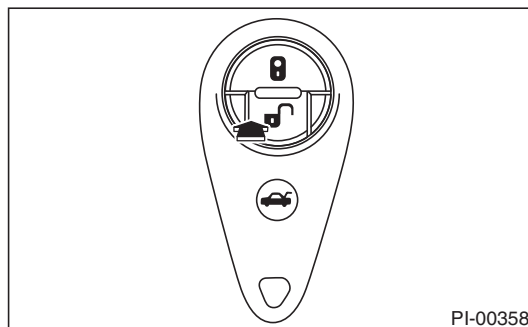
Pre-delivery Inspection

PRE-DELIVERY INSPECTION

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



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

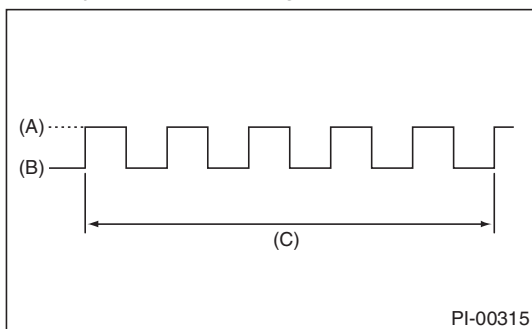


9) Check that the buzzer sounds 5 times to give the door not fully closed warning.

10) Close all the doors including rear gate.

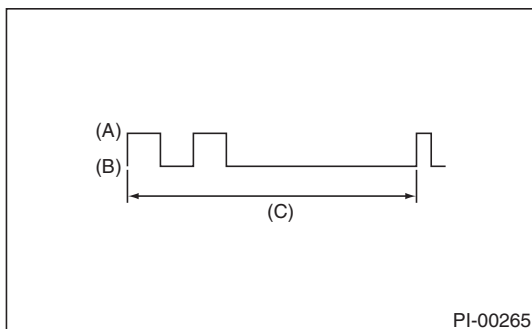
11) Check that the system is in the monitoring condition (all the doors become locked and the buzzer sounds once, and the hazard light flashes once).

- Alarm system monitoring prepared condition



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

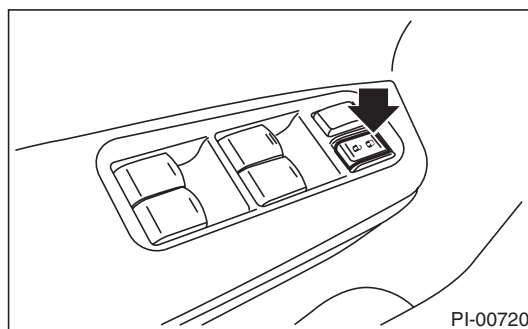
12) Check that the system enters monitoring condition 30 seconds after the condition in 11).



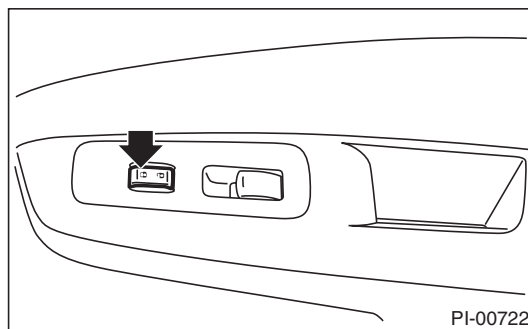
- (A) Light ON
- (B) Light OFF
- (C) 2 seconds

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



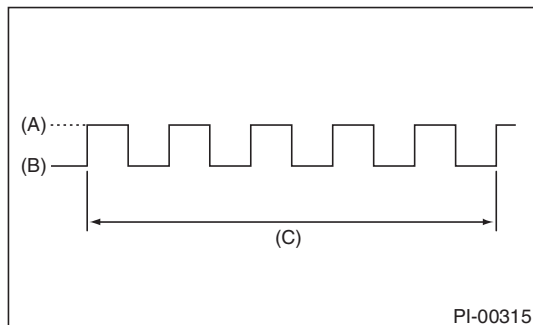
15) Close all the doors including rear gate.

Pre-delivery Inspection

PRE-DELIVERY INSPECTION

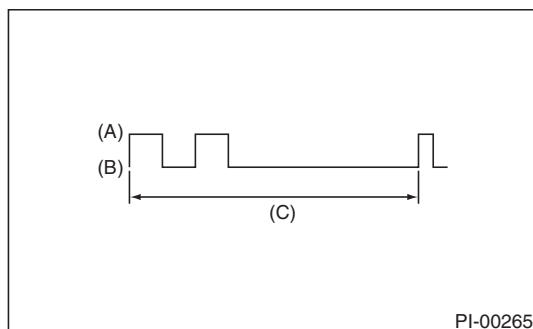
16) If all doors become locked, the buzzer sounds once, and the hazard light flashes once, the alarm system is in the monitoring prepared condition.

- 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 ignition 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-26, INSPECTION, Security System.>

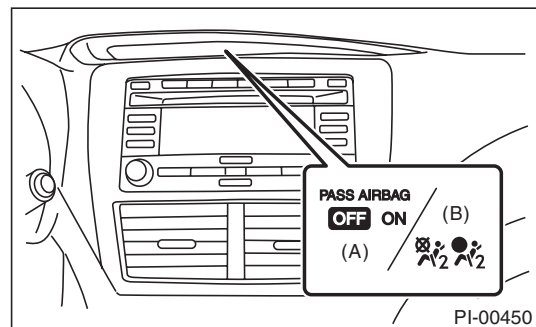
21. SEAT

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. model)
- (B) Airbag ON/OFF indicator light (Canada, Mexico 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.

22. 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.

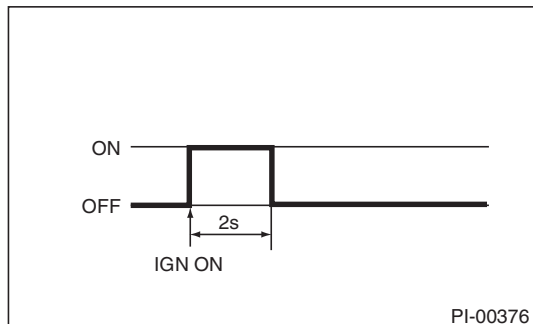
(2) Check the seat belt warning lights of the driver's and the passenger's blink for approximately six seconds and the buzzer sounds intermittently.

(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.)

23.TPMS (U.S. MODELS ONLY)

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

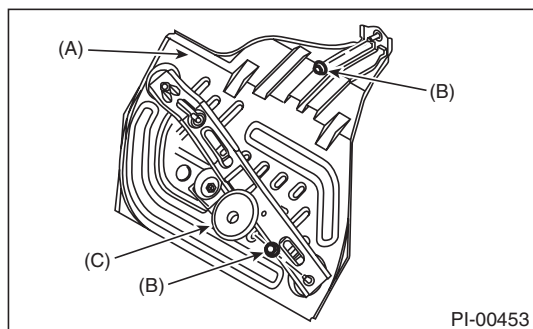
- Normal operation (IG ON (Light check))



2) If the TPMS warning light display does not operate normally, check and repair the system. <Ref. to TPM(diag)-2, Basic Diagnostic Procedure.>

24.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.

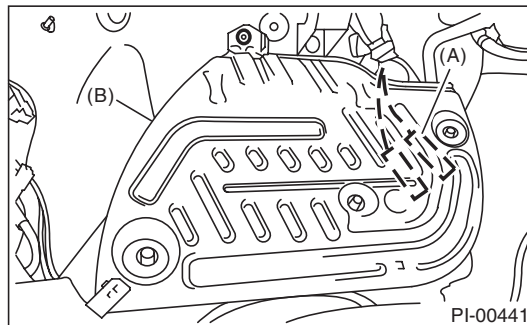


- (A) ECM protector
- (B) Special nut
- (C) Plastic cover

25.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

26.IMMOBILIZER SYSTEM

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

NOTE:

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

27.STARTING CONDITION

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

28.EXHAUST SYSTEM

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

29.INDICATOR AND WARNING LIGHTS

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

30.HEATER & VENTILATION

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

Pre-delivery Inspection

PRE-DELIVERY INSPECTION

31. AIR CONDITIONER

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

NOTE:

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

32. CLOCK

Check the clock for normal operations and enough accuracy.

33. 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.

34. 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.

35. FRONT ACCESSORY POWER SUPPLY SOCKET

Check the operation of the front accessory power supply socket.

36. LIGHTING SYSTEM

- 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.
- 4) Check that the manual leveler operates normally.

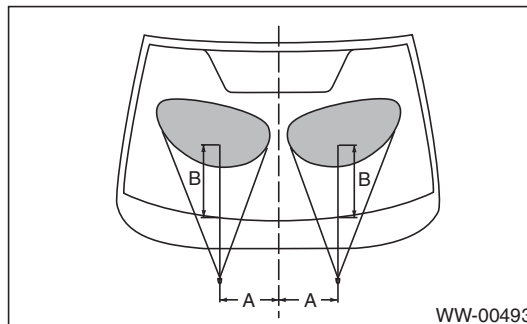
37. WINDOW WASHER

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)

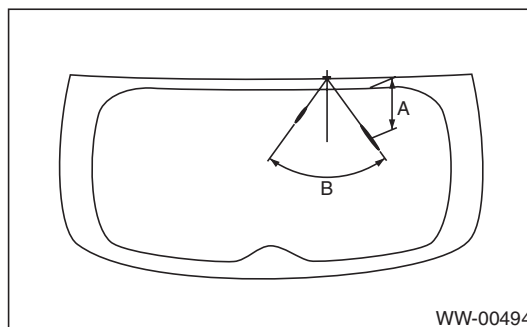
B: 315 mm (12.4 in)



Rear spray position:

A: 140 mm (5.5 in)

B: 70°



38. WIPER

Check the front and rear wipers for normal operations.

39. POWER WINDOW

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

40. SUNROOF

Check that the sunroof operates normally.

41. REAR DEFOGGER SYSTEM

Check that the rear defogger system operates normally.

42. 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.

43. BRAKE TEST

Check the foot brake for normal operations.

44. SHIFT CONTROL

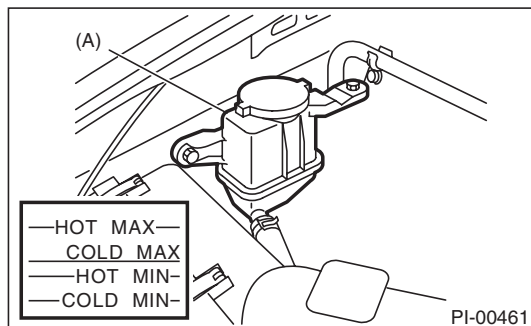
- 1) Check for smooth operation to each position.
- 2) Check that the lever cannot be moved to the reverse position unless the slider is pulled up. (6MT model)
- 3) Check that the lever can be moved to the reverse position when the slider is pulled up. (6MT model)

45. CRUISE CONTROL

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

46. POWER STEERING FLUID LEVEL

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



(A) Reservoir tank

CAUTION:

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

47. FLUID LEAKAGE

Check entire areas of the vehicle for any trace of coolant/oil (such as engine and gear oil)/fluid (such as brake) leaks.

48. WATER LEAKAGE

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 — 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.

Pre-delivery Inspection

PRE-DELIVERY INSPECTION

49. 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 and front fog light.

PERIODIC MAINTENANCE SERVICES

PM

	Page
1. General Description	2
2. Schedule	3
3. Engine Oil	5
4. Engine Oil Filter	7
5. Spark Plug	8
6. V-belt	10
7. Timing Belt	12
8. Fuel Line	14
9. Fuel Filter	15
10. Air Cleaner Element	16
11. Cooling System	17
12. Engine Coolant	19
13. Clutch System	20
14. Transmission Gear Oil	21
15. Front & Rear Differential Gear Oil	23
16. Brake Line	26
17. Brake Fluid	28
18. Disc Brake Pad and Disc	29
19. Parking Brake	30
20. Suspension	31
21. Wheel Bearing	33
22. Axle Boots & Joints	34
23. Tire Rotation	35
24. Steering System (Power Steering)	36
25. A/C Filter	39

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		
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																		Note (5)	
11	Clutch system			I		I		I		I		I		I		I		I		
12	Transmission gear oil					I				I				I				I		
13	Front and rear differential oil					I				I				I				I		
14	Brake line			I		I		I		I		I		I		I		I		
15	Brake fluid					R				R				R				R		
16	Disc brake pad and disc			I		I		I		I		I		I		I		I		
17	Parking brake			I		I		I		I		I		I		I		I		
18	Suspension			I		I		I		I		I		I		I		I		
19	Wheel bearing									(I)								(I)		
20	Axle boots and joints			I		I		I		I		I		I		I		I		
21	Tire rotation		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	Note (3)	
22	Steering system (power steering)			I		I		I		I		I		I		I		I		
23	A/C filter	Check every 12 months or every 12,000 km (7,500 miles).																		Note (4)

Symbols used:

R: Replace

I: Inspection

P: Perform

(I): Inspections recommended for vehicle safety

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.

4. When the vehicle is used under extremely dusty conditions, the A/C filter should be replaced more often.

5. Replace the first time after 11 years or every 220,000 km (137,500 miles), and thereafter every six years or every 120,000 km (75,000 miles).

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 tow-ing 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						
Front and rear differential oil	15 months						R
	24,000 km						
	15,000 miles						
Brake line	7.5 months				I		
	12,000 km						
	7,500 miles						
Brake fluid	15 months					R	
	24,000 km						
	15,000 miles						
Disc brake pad 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						

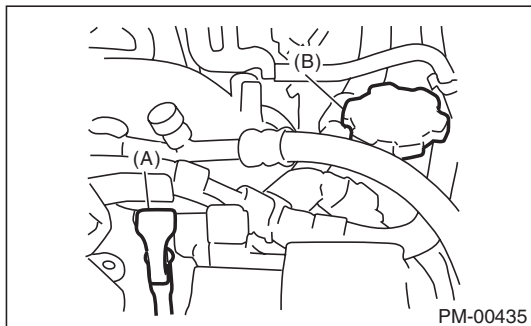
Engine Oil

PERIODIC MAINTENANCE SERVICES

3. Engine Oil

A: REPLACEMENT

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

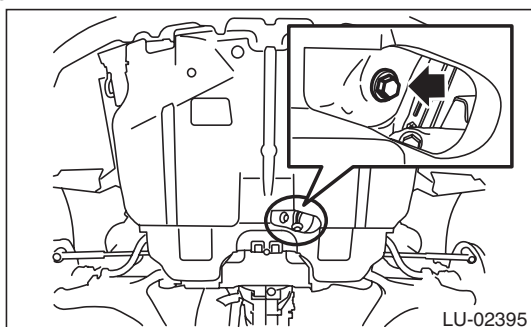


- (A) Oil level gauge
(B) Oil filler cap

CAUTION:

If any engine oil is spilled on the exhaust pipe, under cover, wipe off completely to prevent fires or emission of smoke.

- 3) Lift up the vehicle.
- 4) Drain engine oil by loosening the engine oil drain plug.



NOTE:

Prepare the container for draining of engine oil.

- 5) Replace the drain plug gasket.

NOTE:

Use a new drain plug gasket.

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

Tightening torque:

44 N·m (4.5 kgf-m, 32.5 ft-lb)

- 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: SN, SM, or SL
ILSAC standard: GF-4 or GF-5
SAE viscosity No.: 30, 40, 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.>

Engine Oil

PERIODIC MAINTENANCE SERVICES

B: INSPECTION

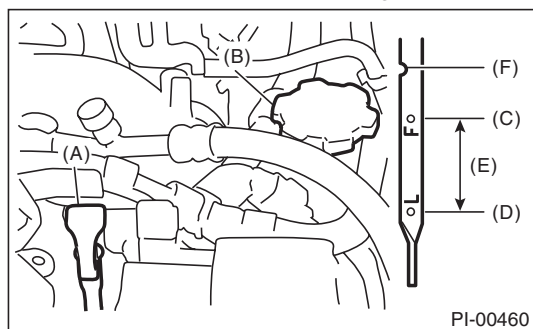
CAUTION:

If any engine oil is spilled on the exhaust pipe, under cover, wipe off completely to prevent fires or emission of smoke.

- 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) Remove the level gauge again and record the oil level. If the engine oil level is below the "L" line, add oil to bring the level up to but not over the "F" line.
- 5) Start the engine and warm it up for a time.
- 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.
 - As the oil level gauge is used for daily maintenance, the "F" and "L" lines are set assuming that the engine is cold.
- 7) To prevent overfilling the engine oil, do not add oil above the "F" line when the engine is cold.



- (A) Oil level gauge
- (B) Oil filler cap
- (C) "F" line
- (D) "L" line
- (E) Approx. 1 0 (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 under cover.
- 3) Remove the oil filter using ST.

- Oil filter (Black)

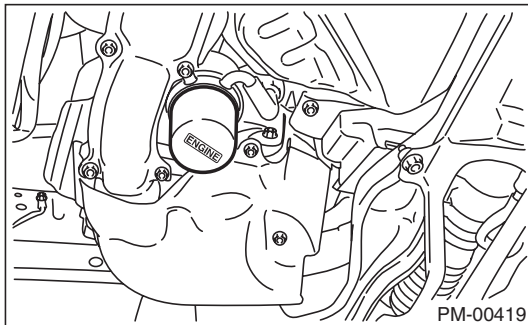
ST 18332AA000 OIL FILTER WRENCH
(OUTER DIAMETER: 68 MM
(2.68 IN) FOR OIL FILTER)

- Oil filter (Blue)

General tool Oil filter wrench
(65/67 mm 14 Flutes)

CAUTION:

If any engine oil is spilled on the exhaust pipe, under cover, wipe off completely to prevent fires or emission of smoke.



- 4) Clean the oil filter installation surface of the oil cooler.

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

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

- Tighten the oil filter (Black) 68 mm (2.68 in) in diameter (approx. one rotation) after the seal rubber of the oil filter comes in contact with the oil cooler. 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. Excessive tightening may cause oil to leak.

- 7) 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.

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

Spark Plug

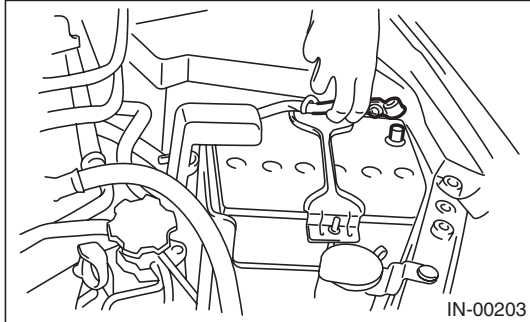
PERIODIC MAINTENANCE SERVICES

5. Spark Plug

A: REPLACEMENT

1. RH SIDE

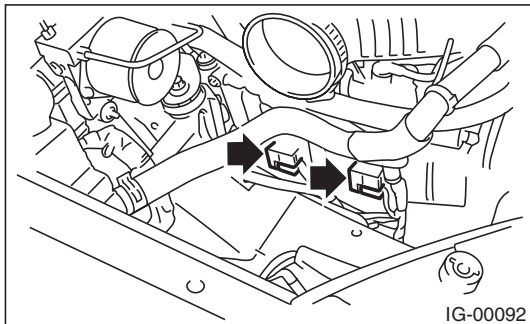
- 1) Disconnect the ground cable from battery.



- 2) Remove the air cleaner case. <Ref. to IN(STI)-8, REMOVAL, Air Cleaner Case.>
- 3) Disconnect the connector from ignition coil.
- 4) Remove the ignition coil.

NOTE:

Turn #3 ignition coil by 180 degrees to remove it.



- 5) Remove the spark plug with a spark plug socket.
- 6) Install in the reverse order of removal.

Tightening torque (Spark plug):

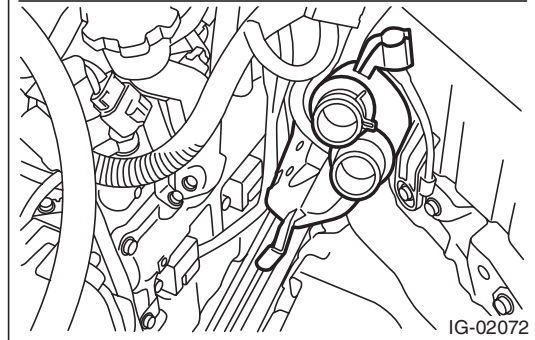
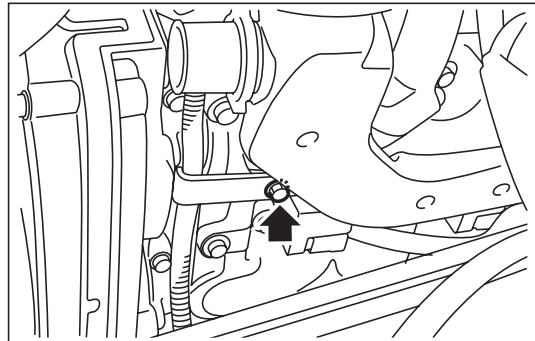
21 N·m (2.1 kgf-m, 15.5 ft-lb)

Tightening torque (Ignition coil):

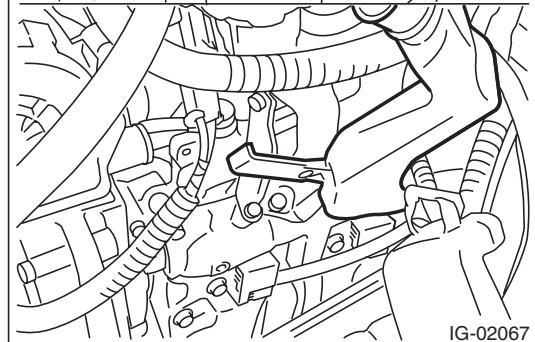
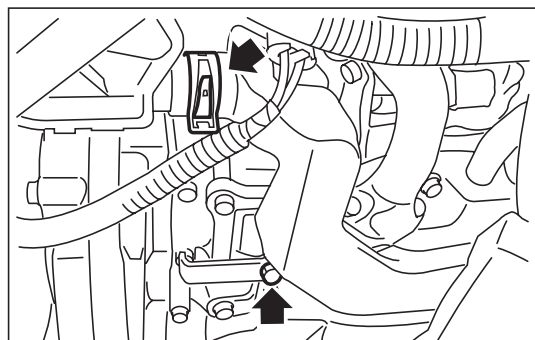
16 N·m (1.6 kgf-m, 11.8 ft-lb)

2. LH SIDE

- 1) Remove the battery. <Ref. to SC(STI)-27, REMOVAL, Battery.>
 - 2) Remove the secondary air pump. <Ref. to EC(STI)-27, REMOVAL, Secondary Air Pump.> <Ref. to EC(w/o STI)-29, REMOVAL, Secondary Air Pump.>
 - 3) Remove the bolts that secure the air duct to the rocker cover (LH), and lift the air duct.
- STI model



- Except for STI model



Spark Plug

PERIODIC MAINTENANCE SERVICES

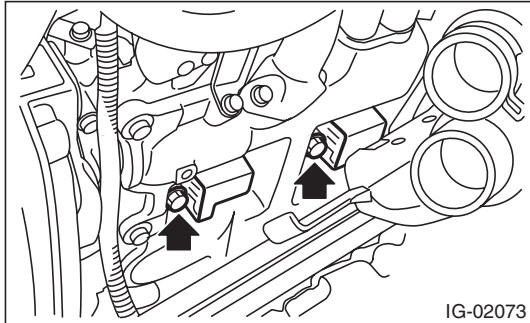
4) Disconnect the connector from ignition coil.

5) Remove the ignition coil.

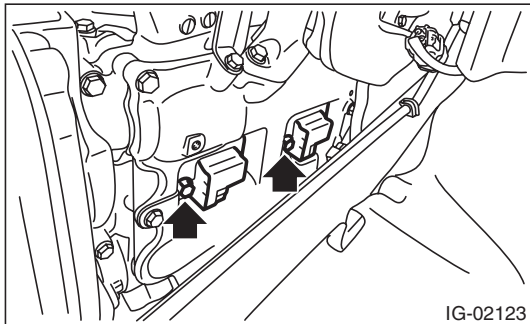
NOTE:

Turn #4 ignition coil by 180 degrees to remove it.

- STI model



- Except for STI model



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

7) Install in the reverse order of removal.

Tightening torque (Spark plug):

21 N·m (2.1 kgf-m, 15.5 ft-lb)

Tightening torque (Ignition coil):

16 N·m (1.6 kgf-m, 11.8 ft-lb)

Tightening torque (Air duct):

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

V-belt

PERIODIC MAINTENANCE SERVICES

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.

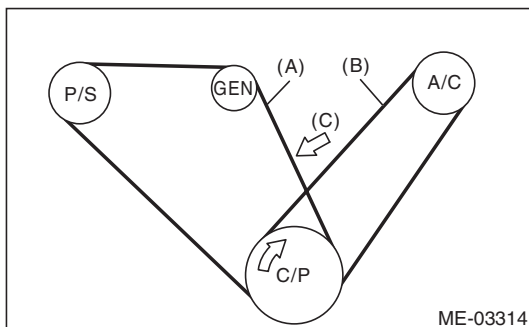
1. PROCEDURE (WITHOUT BELT TENSION GAUGE)

- 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-10, REPLACEMENT, V-belt.>

When pressing with belt tension 98 N (10 kgf, 22 lbf)

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.

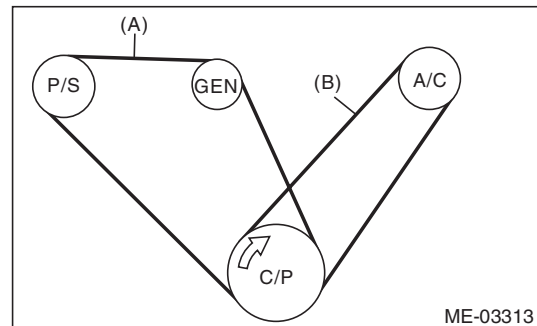
Belt tension

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

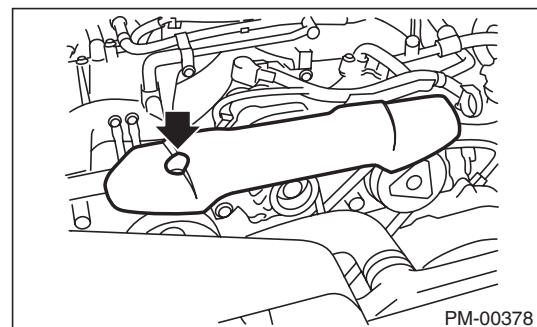
B: REPLACEMENT

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).

PM-10

Brought to you by Ebay Seller "SubaruManuals"

- 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).

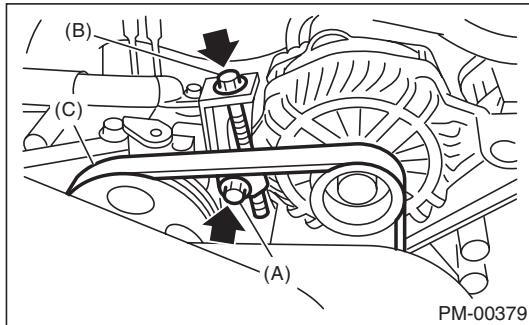
Tightening torque:

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(STI)-41, REAR SIDE BELT, INSTALLATION, V-belt.> <Ref. to ME(w/o STI)-40, REAR SIDE BELT, INSTALLATION, V-belt.>
- 4) Install the front side belt. <Ref. to ME(STI)-40, INSTALLATION, V-belt.> <Ref. to ME(w/o STI)-39, INSTALLATION, V-belt.>

Timing Belt

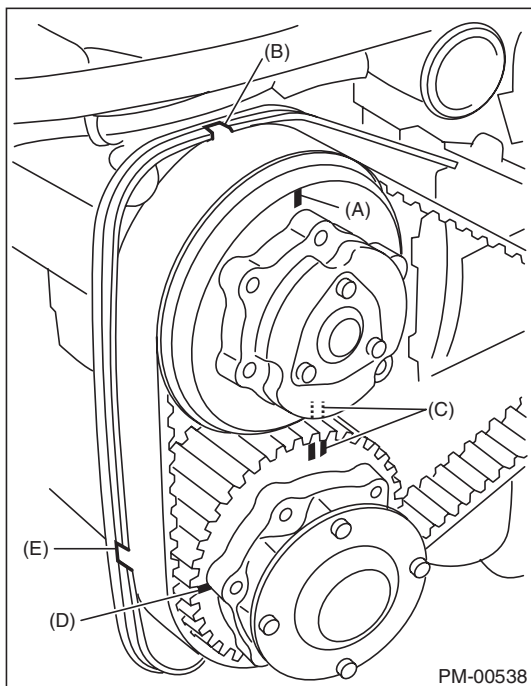
PERIODIC MAINTENANCE SERVICES

7. Timing Belt

A: INSPECTION

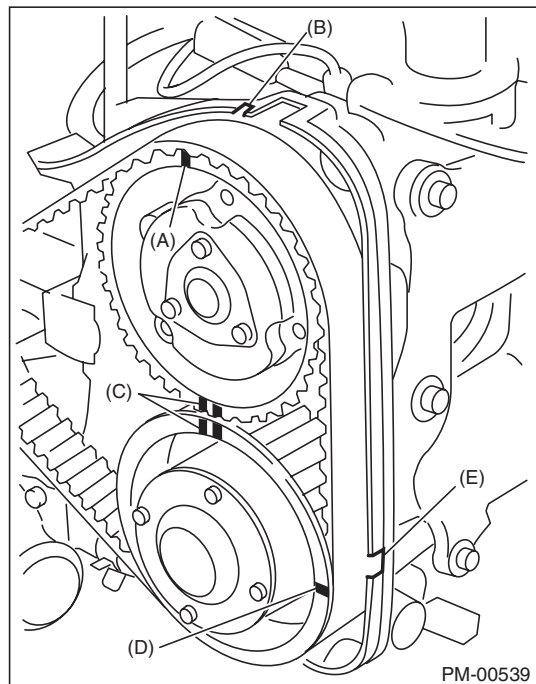
1. CHECK TIMING BELT POSITION

- 1) Remove the timing belt cover (LH) and (RH).
- 2) Turn the crank pulley and align single line mark (A) on the intake cam sprocket (RH) with notch (B) on timing belt cover and check the following.
 - (1) Make sure double lines (C) on intake and exhaust cam sprocket (RH side) are aligned.
 - (2) Make sure single line (D) on exhaust cam sprocket (RH side) is aligned to timing belt cover notch (E).



- (3) Make sure single line (A) on intake cam sprocket (LH side) is aligned to timing belt cover notch (B).
- (4) Make sure double lines (C) on intake and exhaust cam sprocket (LH side) are aligned.

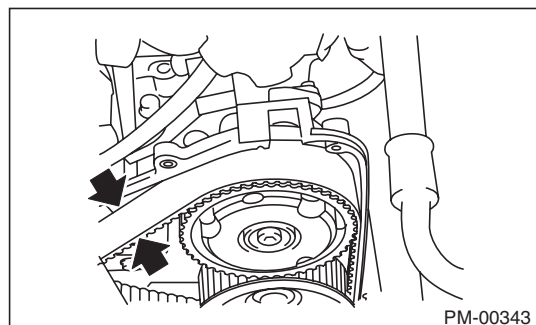
- (5) Check that the single line mark (D) on the exhaust cam sprocket (LH side) and notch (E) on the timing belt cover are aligned.



- 3) When cam sprocket 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 faulty timing belts with new parts as required.
- 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 timing belt with new part.



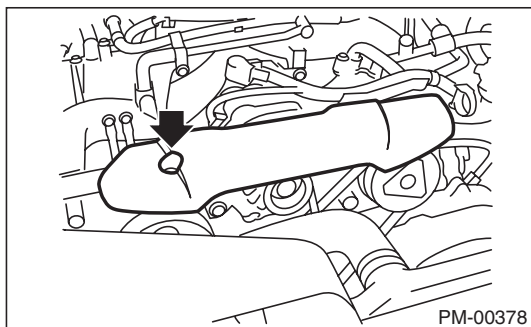
- 4) Install the timing belt cover (LH).

Timing Belt

PERIODIC MAINTENANCE SERVICES

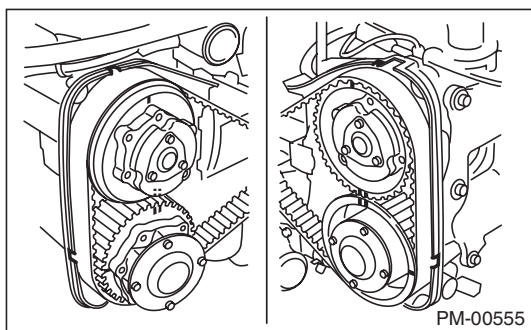
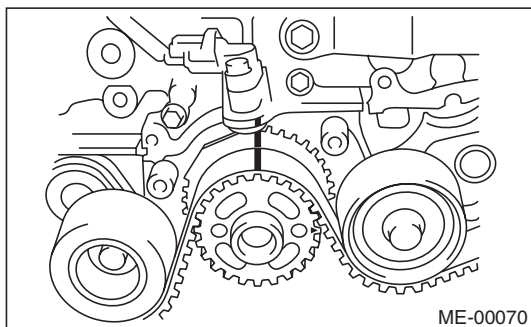
B: REPLACEMENT

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

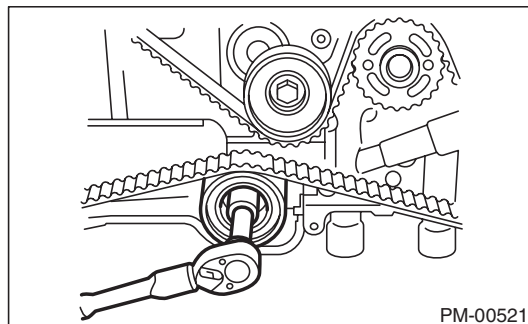


- 4) Remove the V-belts. <Ref. to ME(STI)-40, V-belt.> <Ref. to ME(w/o STI)-39, V-belt.>
- 5) Remove the crank pulley. <Ref. to ME(STI)-47, REMOVAL, Crank Pulley.> <Ref. to ME(w/o STI)-46, REMOVAL, Crank Pulley.>
- 6) Remove the timing belt cover. <Ref. to ME(STI)-49, REMOVAL, Timing Belt Cover.> <Ref. to ME(w/o STI)-48, 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.

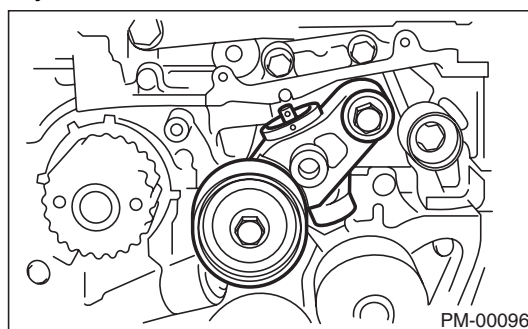
ST 499987500 CRANKSHAFT SOCKET



- 8) Remove the belt idler.



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



- 11) Install in the reverse order of removal. <Ref. to ME(STI)-52, INSTALLATION, Timing Belt.> <Ref. to ME(w/o STI)-51, INSTALLATION, Timing Belt.>

CAUTION:

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

Fuel Line

PERIODIC MAINTENANCE SERVICES

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(STI)-93, Fuel Delivery, Return and Evaporation Lines.>

9. Fuel Filter

A: REPLACEMENT

For fuel filter replacement procedure, refer to FU section. <Ref. to FU(STI)-85, Fuel Filter.>

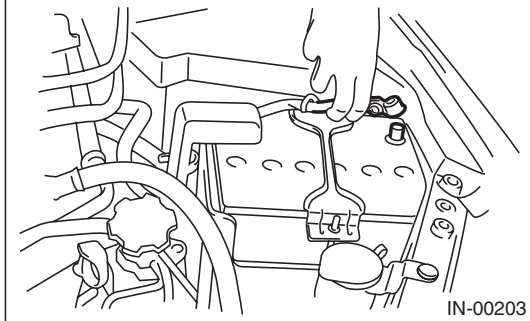
Air Cleaner Element

PERIODIC MAINTENANCE SERVICES

10. Air Cleaner Element

A: REPLACEMENT

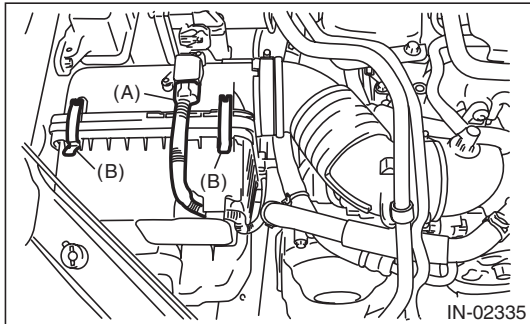
1) Disconnect the ground cable from battery.



2) Remove the air intake duct. <Ref. to IN(STI)-10, REMOVAL, Air Intake Duct.>

3) Disconnect the connector (A) from mass air flow and intake air temperature sensor.

4) Remove the clip (B) from the air cleaner case.



5) Open the air cleaner case, and remove the air cleaner element.

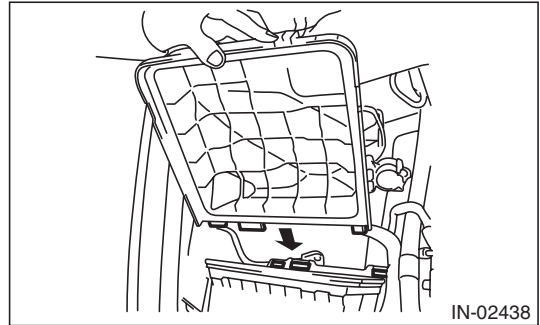
6) Install in the reverse order of removal.

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.



11. Cooling System

A: INSPECTION

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

Pressure:

122 kPa (1.2 kgf/cm², 18 psi)

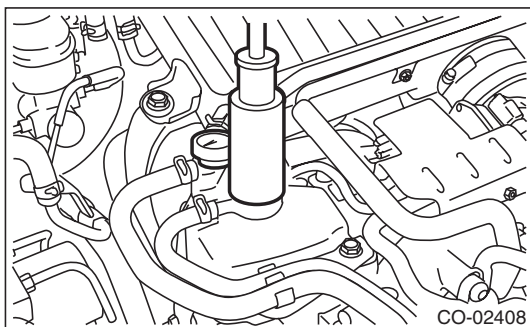
- Each portion of radiator for leakage
- Hose joints and other connections for leakage

CAUTION:

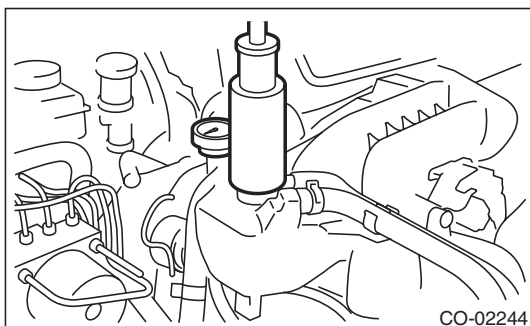
- If any engine coolant is spilled on the exhaust pipe or under cover, wipe off completely to prevent fires or emission of smoke.
- Be careful not to deform the filler neck of filler tank when installing and removing the tester, and while operating the tester.

NOTE:

- Be sure to install the tester to filler tank side.
 - STI model



- Except for STI model



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

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

NOTE:

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

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

Radiator cap valve open pressure

Filler tank side

Specification:

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

Service limit:

83 kPa (0.85 kgf/cm², 12 psi)

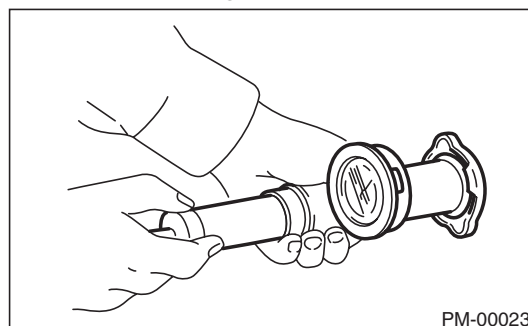
Radiator side

Specification:

122 — 152 kPa (1.24 — 1.55 kgf/cm², 18 — 22 psi)

Service limit:

112 kPa (1.14 kgf/cm², 16 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(STI)-15, Water Pump.> <Ref. to CO(STI)-17, Thermostat.> <Ref. to CO(STI)-19, Radiator.> <Ref. to CO(STI)-22, Radiator Cap.> <Ref. to CO(w/o STI)-15, Water Pump.> <Ref. to CO(w/o STI)-17, Thermostat.> <Ref. to CO(w/o STI)-19, Radiator.>

Cooling System

PERIODIC MAINTENANCE SERVICES

4) Check the radiator fan operates using Subaru Select Monitor, when the coolant temperature exceeds the specified value. If it does not operate, check the radiator fan system. <Ref. to CO(STI)-7, Radiator Fan System.> <Ref. to CO(w/o STI)-7, Radiator Fan System.>

Engine coolant temperature:

Except for STI model

<Ref. to CO(w/o STI)-8, INSPECTION, Radiator Fan System.>

STI model

<Ref. to CO(STI)-8, INSPECTION, Radiator Fan System.>

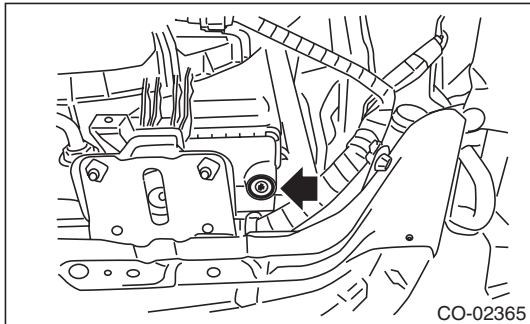
12.Engine Coolant

A: REPLACEMENT

WARNING:

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

- 1) Lift up the vehicle.
- 2) Remove the under cover.
- 3) Place a container under 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 any engine coolant is spilled on the exhaust pipe, wipe off completely to prevent fires or emission of smoke.

NOTE:

- Be sure to open the radiator cap on the filler tank side.
 - Be careful not to spill coolant on the floor.
- 6) Drain the coolant from reservoir tank.
 - 7) Tighten the radiator drain cock securely after draining coolant.
 - 8) Pour cooling system conditioner through the filler neck.

Cooling system protective agent:

Cooling system conditioner (SOA345001)

- 9) Fill the engine coolant into coolant filler tank 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 coolant filler tank 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 coolant filler tank cap. If the engine coolant level drops, add engine coolant into the coolant filler tank up to the filler neck position.

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

14) Install the coolant filler tank 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 coolant filler tank 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 coolant filler tank 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 heater core, repeat the procedures from step 16).

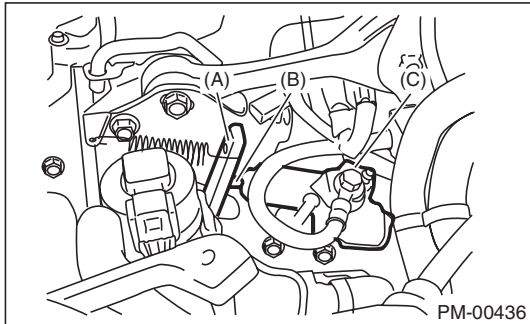
Clutch System

PERIODIC MAINTENANCE SERVICES

13. Clutch System

A: INSPECTION AND ADJUSTMENT

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



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

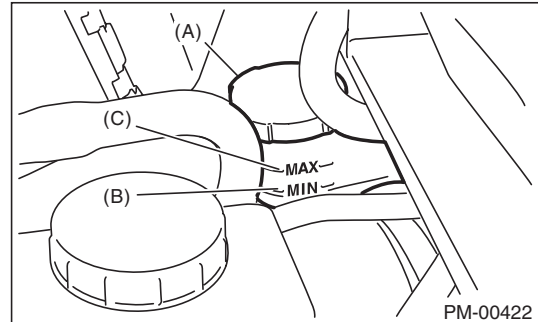
2) If the fluid level rises, pedal free play is correct.
3) If the fluid level does not rise, or the push rod cannot be retracted, adjust the clutch pedal. <Ref. to CL-29, Clutch Pedal.>
4) Check the fluid level using the scale on the outside of the clutch reservoir tank (A). If the level is below "MIN" (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 spilled on the exhaust pipe, wipe off completely to prevent fires or emission of smoke.
- 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

14. Transmission Gear Oil

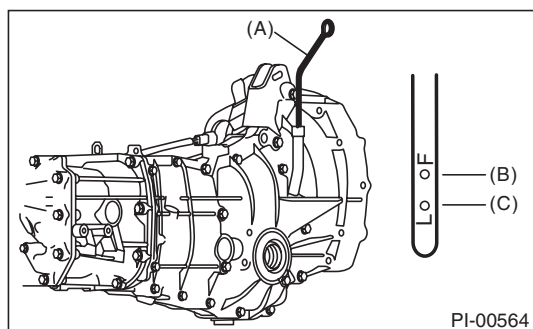
A: INSPECTION

1. 6MT MODEL

Check the gear oil for leaks.

2. 5MT MODEL

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. 6MT MODEL

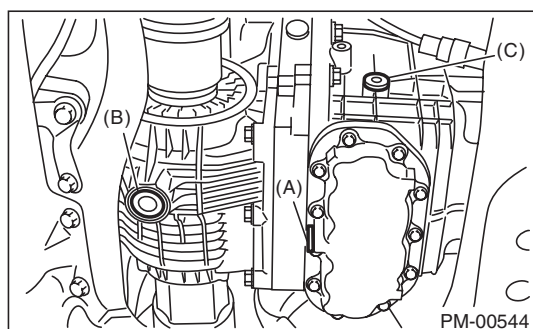
CAUTION:

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.

- 1) Drain the gear oil by removing drain plug (A) and (B).



- (A) Drain plug (oil pan side)
- (B) Drain plug (clutch housing side)
- (C) Filler plug

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

Tightening torque:

Oil pan side

50 N·m (5.1 kgf-m, 36.9 ft-lb)

Clutch housing side

70 N·m (7.1 kgf-m, 51.6 ft-lb)

- 3) Remove the filler plug and add transmission gear oil up to the lower edge of the filler plug hole.

CAUTION:

- Carefully refill oil while watching the level. Excessive or insufficient oil must be avoided.
- Make sure to check the fluid level with the vehicle parked at a flat horizontal position.

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:

<Ref. to SPC-4, CAPACITY, Impreza.>

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

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

2. 5MT MODEL

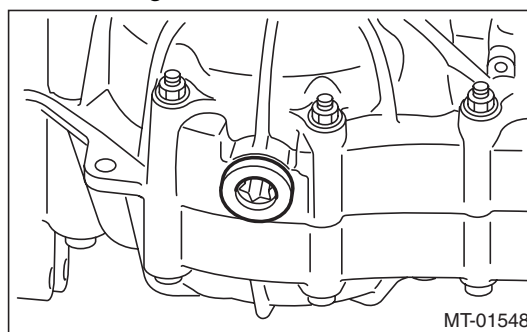
CAUTION:

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.

- 1) Drain the gear oil by removing drain plug.
- 2) Remove the drain plug using TORX® bit T70, and then drain gear oil.



Transmission Gear Oil

PERIODIC MAINTENANCE SERVICES

3) 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)

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

Recommended gear oil:

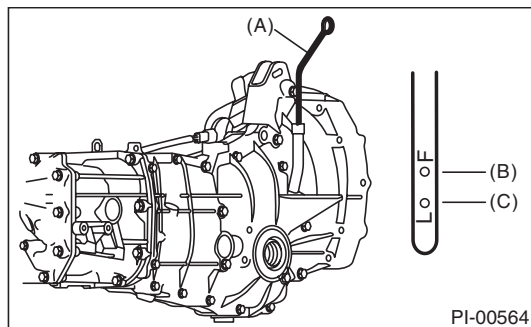
Refer to "RM" section. <Ref. to RM-2, LUBRICANT, RECOMMENDED MATERIALS, Recommended Materials.>

NOTE:

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

Gear oil capacity:

<Ref. to SPC-4, CAPACITY, Impreza.>



(A) Oil level gauge

(B) Upper level

(C) Lower level

Front & Rear Differential Gear Oil

PERIODIC MAINTENANCE SERVICES

15. Front & Rear Differential Gear Oil

A: INSPECTION

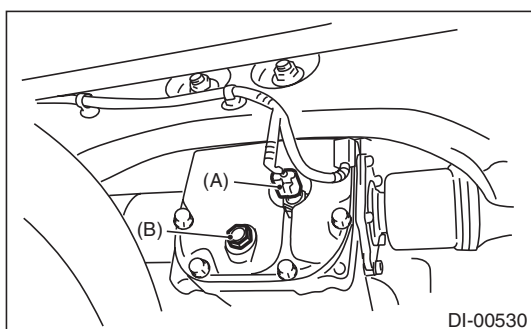
1. FRONT DIFFERENTIAL

As well as transmission oil, differential oil is used to lubricate the differential. Refer to "Transmission Oil". <Ref. to PM-21, Transmission Gear Oil.>

2. REAR DIFFERENTIAL

STI model

1) Disconnect the oil temperature switch connector.



- (A) Connector
(B) Oil drain plug

2) Remove the oil temperature switch and check the gear oil. Replace the gear oil if it is contaminated or deteriorated. <Ref. to PM-24, REPLACE-
MENT, Front & Rear Differential Gear Oil.>

CAUTION:

- Gear oil is extremely hot just after driving. Be wary of receiving burns.
- If differential oil spills on exhaust pipes, wipe it off with a cloth to avoid generating smoke or causing a fire.

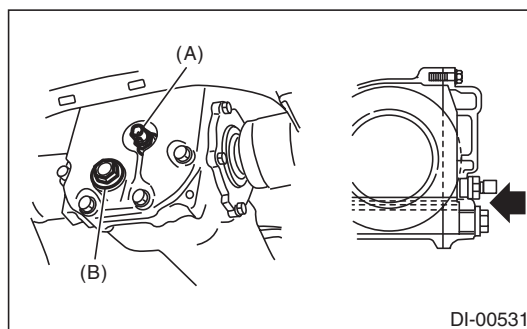
NOTE:

Remove the oil temperature switch and adapter as a unit.

3) Check that the gear oil level is within -5 mm (-0.2 in) from the bottom of the filler plug hole. If the level is low, make sure that there is no leakage, and refill up to the bottom of the filler plug hole.

Recommended gear oil:

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



- (A) Oil temperature switch
(B) Oil drain plug

4) Install the oil temperature switch.

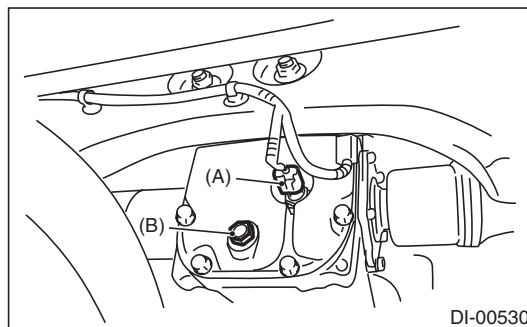
NOTE:

- Install the oil temperature switch and the filler plug as a unit.
- Use a new gasket.

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)

5) Connect the oil temperature switch connector.



- (A) Oil temperature switch
(B) Oil drain plug

Front & Rear Differential Gear Oil

PERIODIC MAINTENANCE SERVICES

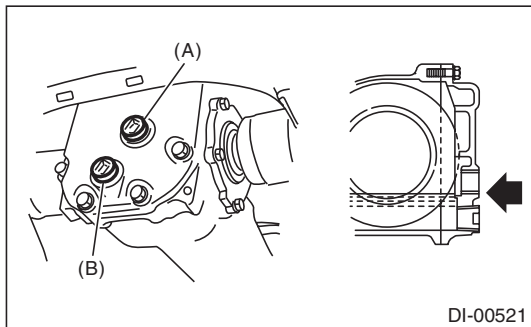
Except for STI model

1) Remove the filler plug, and then check the gear oil. Replace the gear oil if it is contaminated or deteriorated.

CAUTION:

- Gear oil is extremely hot just after driving. Be wary of receiving burns.
- If differential oil spills on exhaust pipes, wipe it off with a cloth to avoid generating smoke or causing a fire.

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

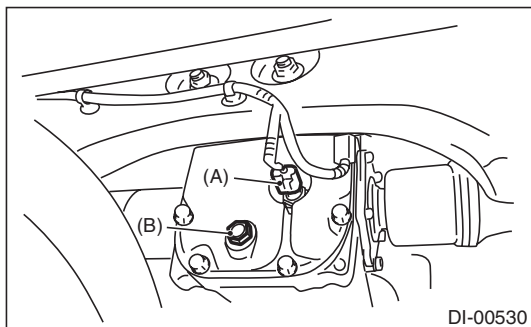
1. FRONT DIFFERENTIAL

As well as transmission oil, differential oil is used to lubricate the differential. Refer to "Transmission Oil". <Ref. to PM-21, Transmission Gear Oil.>

2. REAR DIFFERENTIAL

• STI model

1) Disconnect the oil temperature switch connector.



- (A) Connector
(B) Oil drain plug

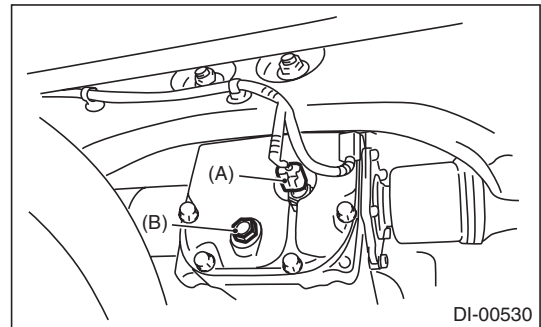
2) Remove the oil drain plug and oil temperature switch, and drain the gear oil.

CAUTION:

Gear oil is extremely hot just after driving. Be wary of receiving burns.

NOTE:

Remove the oil temperature switch and adapter as a unit.



- (A) Oil temperature switch
(B) Oil drain plug

3) Tighten the oil drain plug.

NOTE:

Use a new gasket.

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)

4) Fill the differential carrier with gear oil to the bottom of oil temperature switch hole.

NOTE:

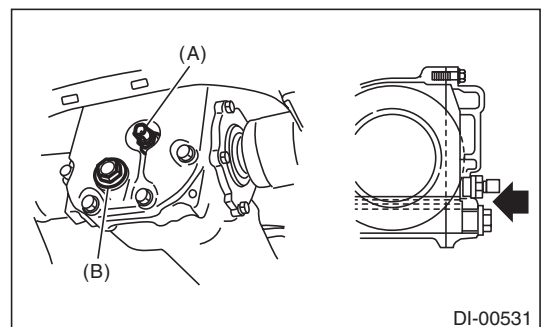
Carefully refill oil while watching the level. Excessive or insufficient oil must be avoided.

Recommended gear oil:

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

Oil capacity:

<Ref. to SPC-4, CAPACITY, Impreza.>



- (A) Oil temperature switch
(B) Oil drain plug

Front & Rear Differential Gear Oil

PERIODIC MAINTENANCE SERVICES

5) Install the oil temperature switch.

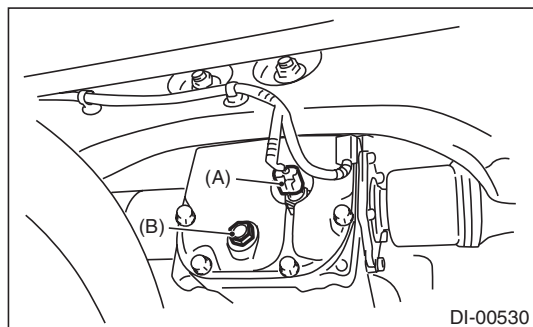
NOTE:

- Use a new gasket.
- Install the oil temperature switch and adapter as a unit.

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)

6) Connect the oil temperature switch connector.



(A) Oil temperature switch

(B) Oil drain plug

Oil capacity:

<Ref. to SPC-4, CAPACITY, Impreza.>

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 drain plug threads.

Liquid gasket:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

49 N·m (5.0 kgf-m, 36.1 ft-lb)

Except for STI model

- 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.

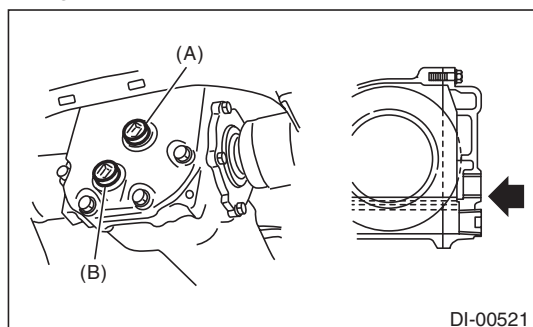
Liquid gasket:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

49 N·m (5.0 kgf-m, 36.1 ft-lb)

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



(A) Filler plug

(B) Oil drain plug

Recommended gear oil:

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

Brake Line

PERIODIC MAINTENANCE SERVICES

16.Brake Line

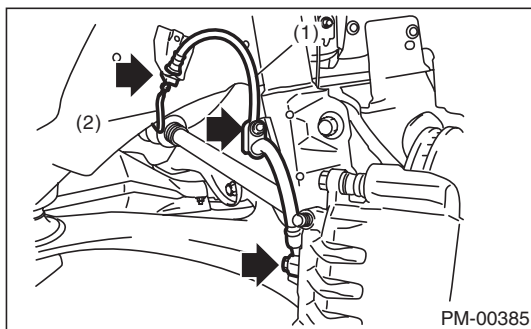
A: INSPECTION

1. BRAKE LINE

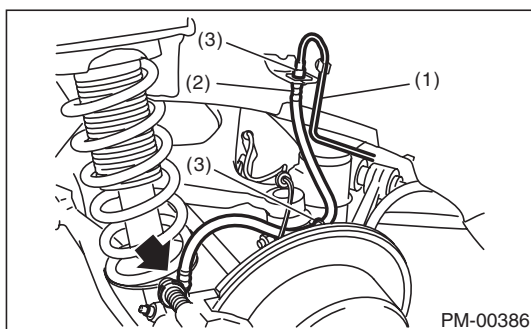
- 1) Check for scratches, swelling, corrosion, traces of fluid leakage on the brake hoses or pipe joints.
- 2) Check the possibility of adjacent parts interfering with brake pipes/hoses during driving, and loose connections/clamps.
- 3) Check any trace of fluid leakage, scratches, etc. on master cylinder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



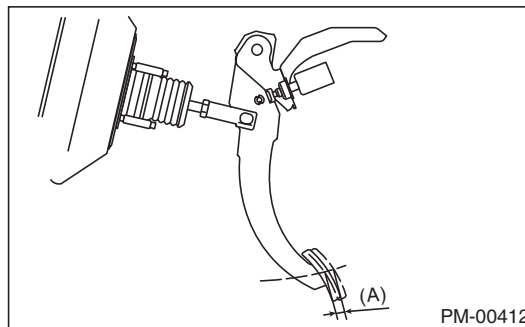
- (1) Rear brake pipe
(2) Rear brake hose
(3) Clamp

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

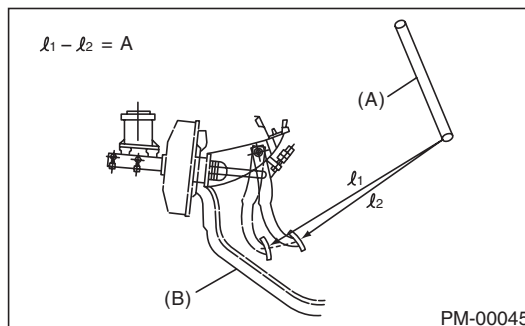
- 2) If the free play is out of specifications above, adjust the brake pedal. <Ref. to BR-45, INSPECTION, Brake Pedal.>

- 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.

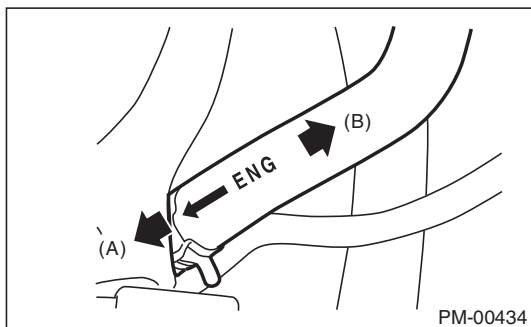
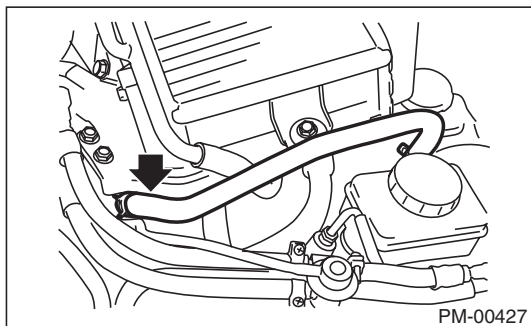
2) With the brake pedal depressed, start the engine. Make sure the pedal should move slightly toward the floor.

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.

Brake Fluid

PERIODIC MAINTENANCE SERVICES

17.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-39, PROCEDURE, Air Bleeding.>

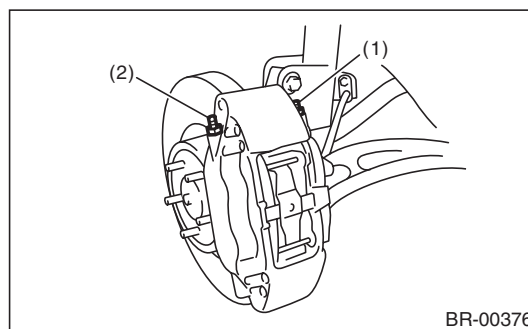
NOTE:

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.

NOTE:

For calipers with two air bleeder screws, bleed air from the inner side first and then the outer side.



(1) Inner side air bleeder screw

(2) Outer side air bleeder screw

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:

20 N·m (2.0 kgf-m, 14.8 ft-lb)

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

11) Depress the brake pedal with a force of approx. 294 N (30 kgf, 66 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

PERIODIC MAINTENANCE SERVICES

18.Disc Brake Pad and Disc

A: INSPECTION

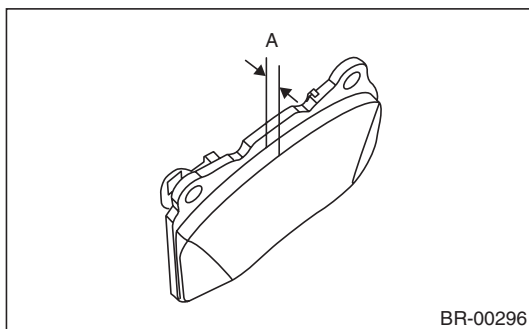
1. DISC BRAKE PAD AND DISC

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) Pad thickness

- Front (back metal not included)
17-inch type

Pad thickness mm (in)	
Standard	8.9 (0.350)
Wear limit	1.2 (0.047)

16-inch type

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

- Rear (back metal not included)
17-inch type

Pad thickness mm (in)	
Standard	9.0 (0.354)
Wear limit	1.2 (0.047)

15-inch type

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

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

- Front

17-inch type

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

16-inch type

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

- Rear

17-inch type

Disc rotor thickness mm (in)	
Standard	20 (0.79)
Wear limit	18 (0.71)

15-inch type

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

4) Remove the caliper body. <Ref. to BR-18, Front Disc Brake Assembly.> <Ref. to BR-28, 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:

STI model

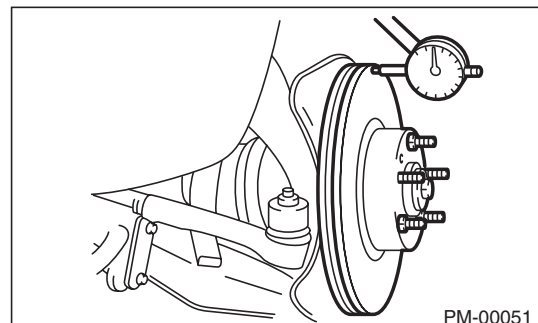
Front: 0.075 mm (0.0030 in)

Rear: 0.070 mm (0.0028 in)

Except for STI model

Front: 0.050 mm (0.0020 in)

Rear: 0.050 mm (0.0020 in)



Parking Brake

PERIODIC MAINTENANCE SERVICES

19. Parking Brake

A: INSPECTION

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)

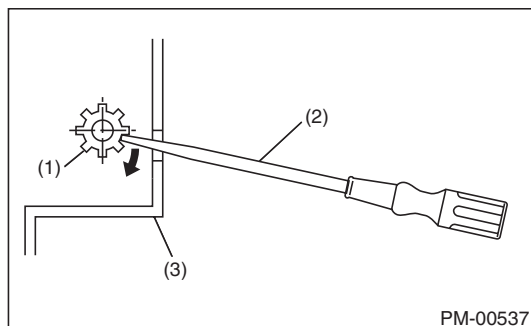
NOTE:

Replace the right and left primary and secondary brake shoes as a set.

B: ADJUSTMENT

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.

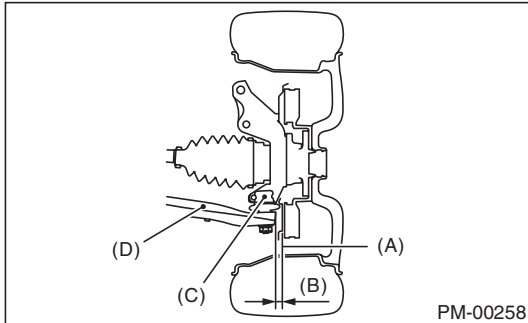
7) Adjust the parking brake lever stroke. <Ref. to PB-8, LEVER STROKE, ADJUSTMENT, Parking Brake Assembly (Rear Disc Brake).>

20. Suspension

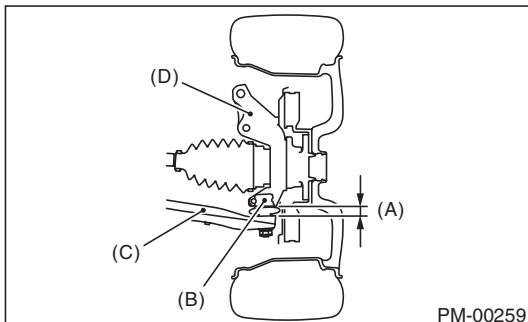
A: INSPECTION

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-18, Front Ball Joint.>

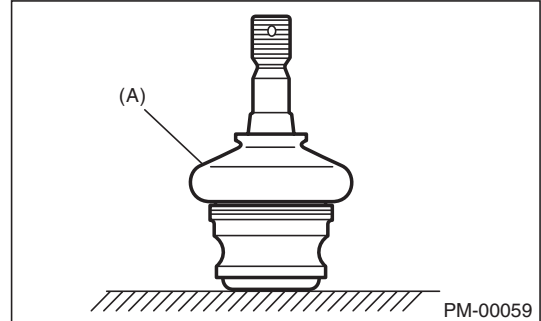
5) Damage of dust cover

Visually inspect the ball joint dust cover. If it is damaged, remove the front arm. <Ref. to FS-20, Front Arm.> Measure the play of the ball joint. <Ref. to FS-18, Front Ball Joint.>

- (1) If the free play exceeds standard value, replace the ball joint.
- (2) If the dust cover is damaged, replace with a new ball joint.

NOTE:

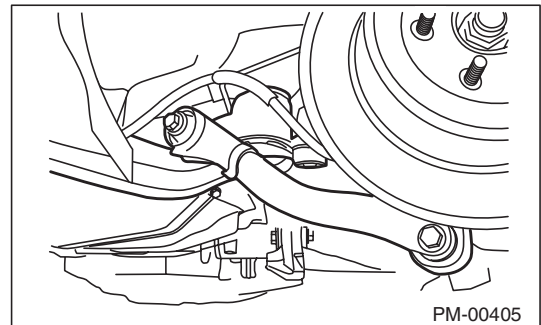
When the front arm ball joint has been removed or replaced, check the toe of front wheel. If the front wheel toe is outside the specified range, <Ref. to FS-8, Wheel Alignment.> adjust toe-in.



(A) Dust cover

2. FRONT, REAR SUSPENSION BUSHING

Apply pressure with tire lever or similar tool to inspect the bushing for fatigue or other damage. 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-8, 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-8, Wheel Alignment.>

Suspension

PERIODIC MAINTENANCE SERVICES

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 (Referential Value)
- Steering angle

<Ref. to FS-8, 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 not within tolerance, adjust them to standard.

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.

21. Wheel Bearing

A: INSPECTION

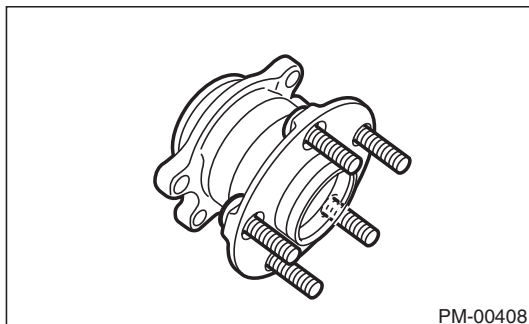
1. FRONT HUB UNIT

- 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:

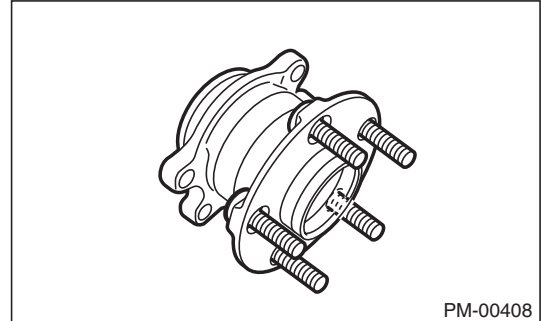
***Straight-ahead position within 0.05 mm
(0.0020 in)***

- 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-14, 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 EDJ of the rear drive shaft from the rear differential. <Ref. to DS-34, Rear Drive Shaft.>

Axle Boots & Joints

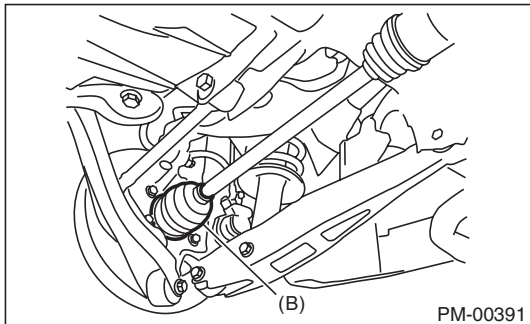
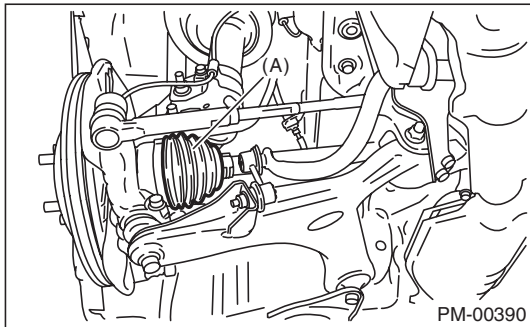
PERIODIC MAINTENANCE SERVICES

22. 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-27, Front Drive Shaft.> <Ref. to DS-34, Rear Drive Shaft.>



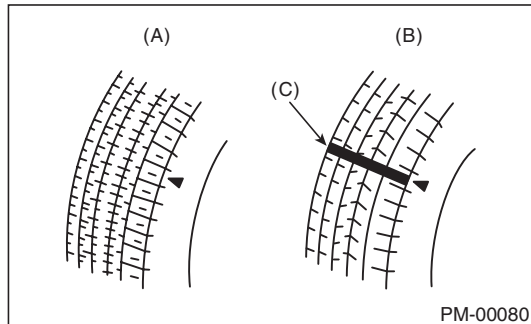
2. PROPELLER SHAFT

Inspect the propeller shaft for damage or failure. If faulty, replace with new part. <Ref. to DS-11, Propeller Shaft.>

23. 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 tires as a set.)

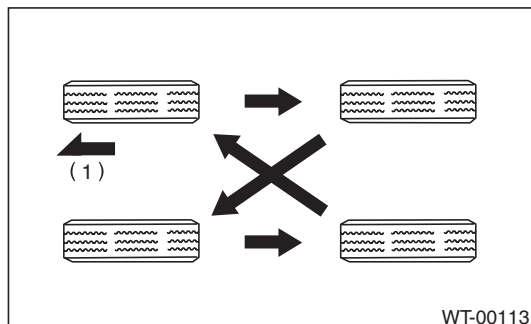


- (A) New tread
- (B) Damaged tread
- (C) Tread wear indicator

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

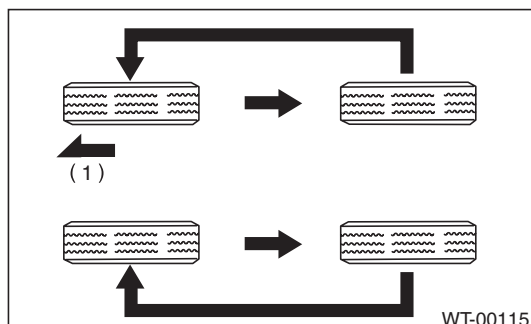
3) Next, make a tire rotation between front and rear as shown in the figure, make sure tires are worn evenly.

- When the direction of tire rotation is not specified



- (1) Front

- When the direction of tire rotation is specified



- (1) Front

Steering System (Power Steering)

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24. Steering System (Power Steering)

A: INSPECTION

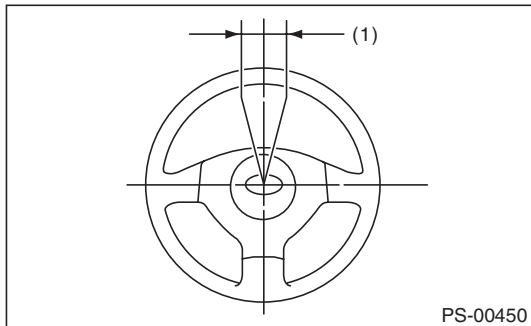
1. STEERING WHEEL

- 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:

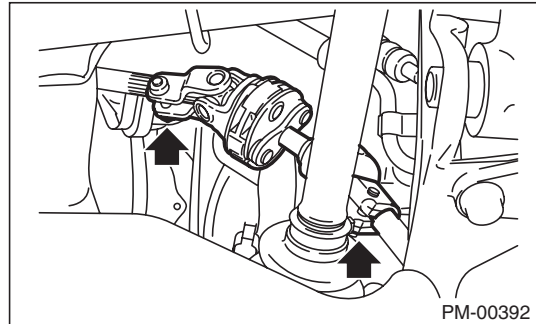
Steering wheel should return to its original position after it has been turned and then released.

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, 17.7 ft-lb)



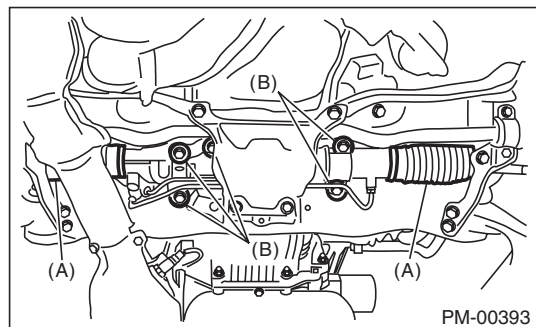
3. GEARBOX

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

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

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)



(A) Boot

(B) Gearbox mounting bolt

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

Steering System (Power Steering)

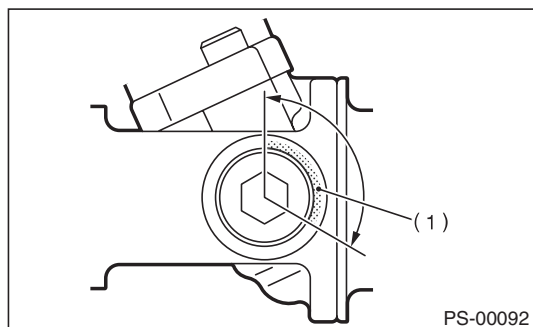
PERIODIC MAINTENANCE SERVICES

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) Loosen the adjusting screw, and apply liquid gasket to at least 1/3 of the entire perimeter of adjusting screw thread.

Liquid gasket:

THREE BOND 1102 or 1215



- (1) Apply liquid gasket to 1/3 or more of the entire perimeter.

- (2) Tighten the adjusting screw, then loosen it.

CAUTION:

Adjust the steering rack to the straight forward position.

Tightening torque:

9.8 N·m (1.0 kgf·m, 7.2 ft·lb)

- (3) Tighten the adjusting screw, then loosen it.

Tightening torque:

4.9 N·m (0.5 kgf·m, 3.5 ft·lb)

- (4) Tighten the adjusting screw.

Tightening torque:

4.9 N·m (0.5 kgf·m, 3.5 ft·lb)

- (5) Then, return the adjusting screw by 30° and fix it.

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

ST 926230000 SPANNER

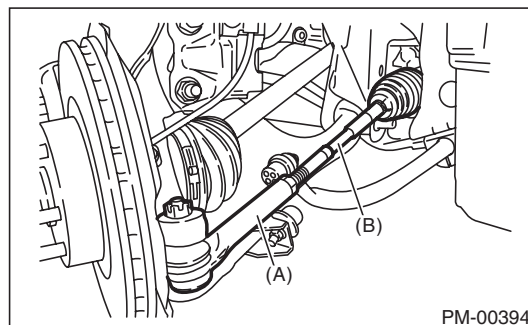
Tightening torque (lock nut):

40 N·m (4.1 kgf·m, 29.5 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)

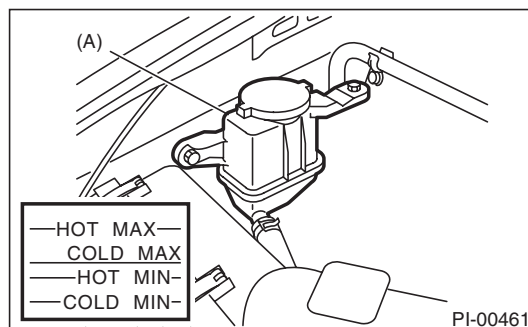
5. POWER STEERING FLUID LEVEL

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 (A). If the level is below "MIN", fill fluid up to "MAX" level.



Steering System (Power Steering)

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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:

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

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:

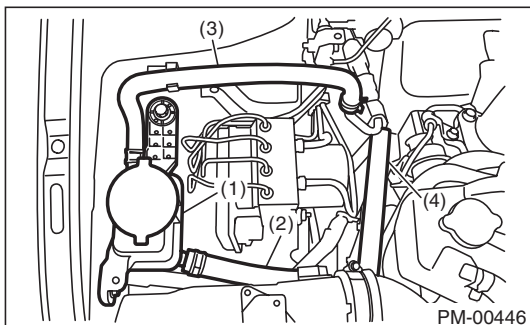
- Wipe the leaked fluid off after correcting fluid leaks.
- When inspecting the fluid leakage, be careful of the clearance between the hose (or piping) and other parts.

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.



- (1) Reservoir tank
- (2) Suction hose
- (3) Return hose
- (4) Pressure hose

8. POWER STEERING PIPES FOR DAMAGES

Check the power steering pipes for corrosion and damage.

Replace the pipe with a new part if necessary.

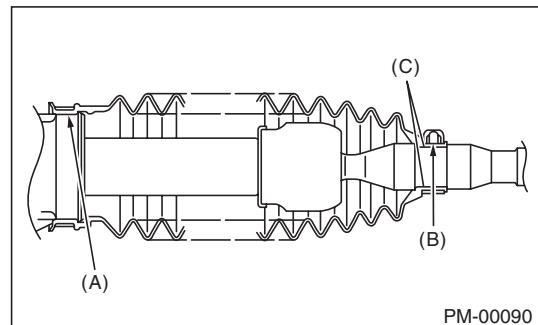
9. GEARBOX BOOTS

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).



10. FITTING BOLTS AND NUTS

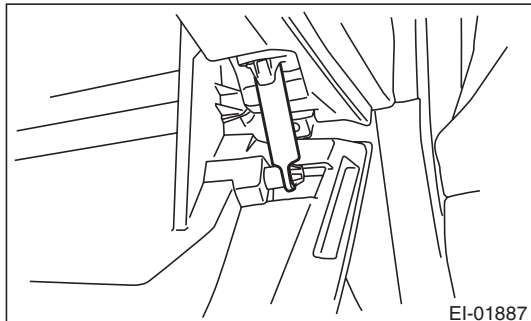
Inspect the fitting bolts and nuts of oil pump and bracket for looseness, and retighten them if necessary.

Inspect and/or retighten them when engine is cold.

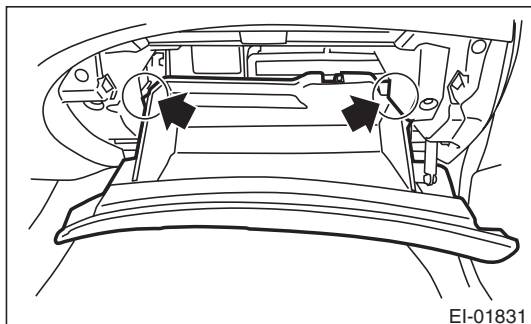
25.A/C Filter

A: REPLACEMENT

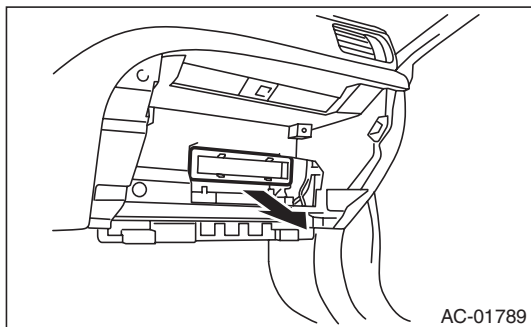
1) Remove the glove box damper.



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

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PM-40

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