



SERVICE BULLETIN

APPLICABILITY 1995 - 1998 Legacy Service Manuals

DATE 4-24-98

SUBJECT Service Manual Corrections

Insert or replace the following pages into the applicable Service Manuals listed below:

YEAR	VOL #	MSA #	SECTION	PAGES	REFERENCE
1995	2	MSA5T9407A	3-2	85 / 86	[W600]
1995	2	MSA5T9407A	5-2	19 / 20	[W2B1] / [W2B2]
1995	2	MSA5T9407A	6-2	21 / 22	[W8B3] / [W9A1]
1995	2	MSA5T9407A	6-2	39 / 40	[W16B4] / [W17A1]
1995	2	MSA5T9407A	6-2	47 / 48	[W21B3] / [W21B4]
1995	2	MSA5T9407A	6-2	53 / 54	[W22A10] / [W22B1]
1996	4	MSA5T9602A	2-7	189 / 190	[T10T3] / [T10T4]
1997	6	MSA5T9701A	1-6	contents page / 2	[0100]
1997	6	MSA5T9701A	2-3B	contents page / 2	[S1A0]
1997	6	MSA5T9701A	2-3B	19 / All pages to end of section.	[W5B1] / [W5C2] / [W5D1] / [K100] / [K200]
1997	6	MSA5T9701A	2-7	221 / 222	[T10AA0] / [T10AA1]
1997	6	MSA5T9701A	Insert 1997 SUS supplement pages behind 1997 Sports Utility Sedan locator tab and in front of SUS repair section.		
1997	6	MSA5T9701A	2-7	Insert page 16A / 16B	[M5-7] / MEMO
1997	6	MSA5T9701A	4-7	7 / 8	[M6-2] / [M8-5]
1997	7	MSA5T9701A	6-3	Quick Reference Index / 2	
1998	8	MSA5T9801A	2-7	187 / 188	[T10AA3] / [T10AA4]
1998	9	MSA5T9802A	2-7	251 / 252	[T10AY9] / [T10AY10]
1998	9	MSA5T9802A	Insert 1999 Sports Utility Sedan Supplement and locator tab in the rear of this manual.		

Please perform these corrections promptly to ensure the most correct information is conveyed when the Service Manuals are used.

CAUTION

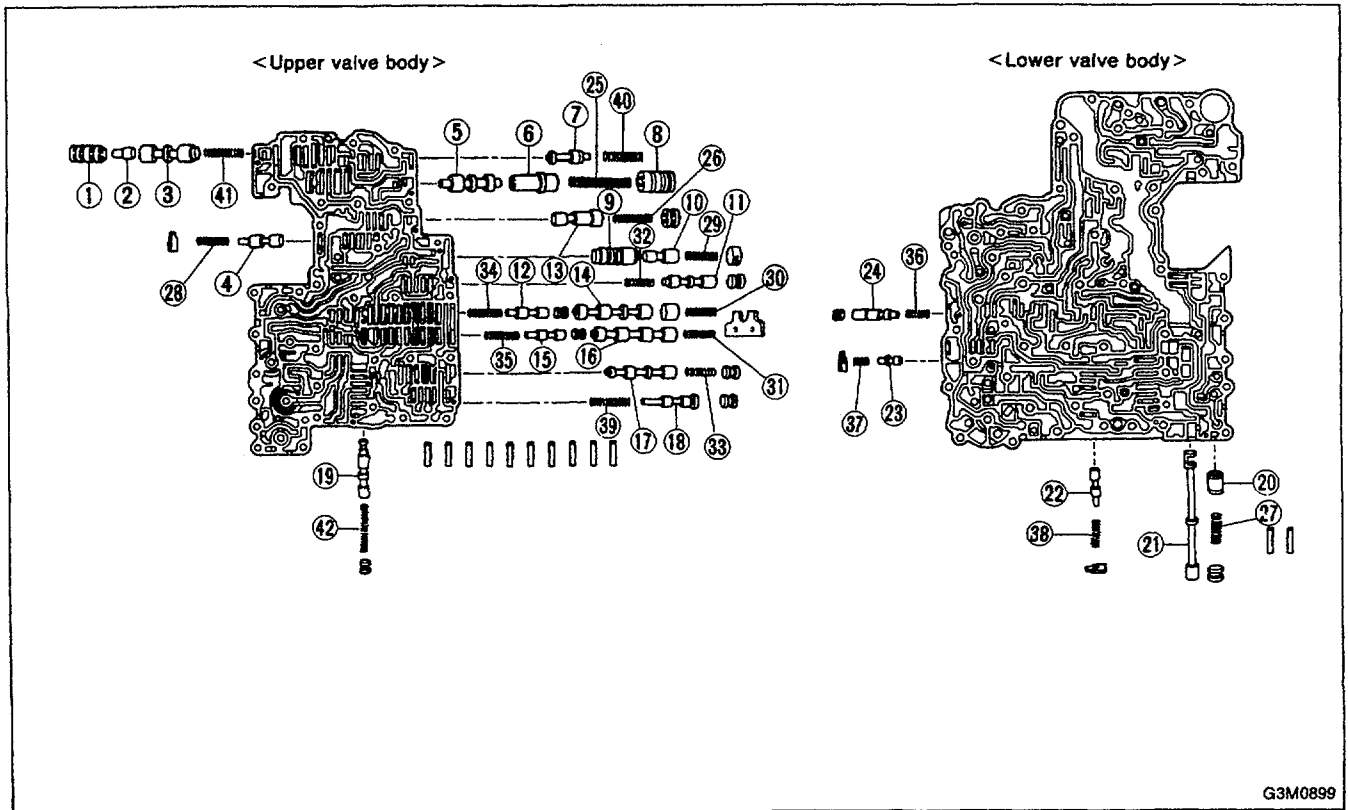
VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.

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



6. Control Valve Body

The control valve is composed of parts which are accurately machined to a high degree and should be handled carefully during disassembly and assembly. As these parts are similar in shape, they should be arranged in neat order on a table after disassembly so that they can be easily installed to their original positions. Spring loaded parts should be also handled carefully, as springs may jump out of place when the parts are disassembled or removed. Extreme care should be taken so as not to drop valves on the floor. Before assembling, the parts and valves should be dipped in a container filled with the ATF. Make sure that the valves are clean and free from any foreign material before assembly. Torque specifications should also be observed.

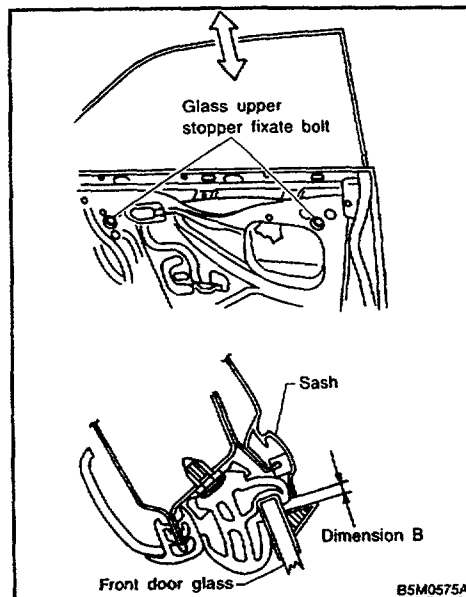
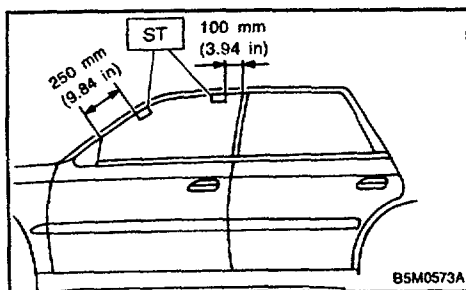
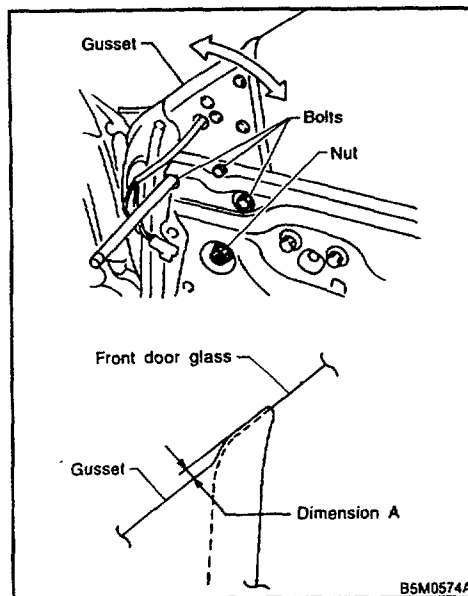
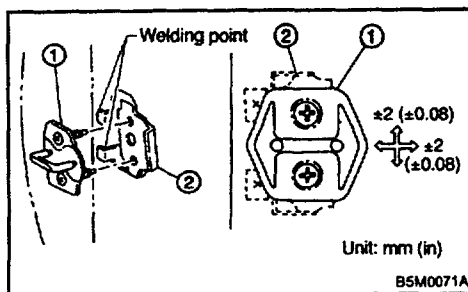


G3M0899

- | | | |
|-------------------------------------|-------------------------------------|--------------------------------------|
| ① Lock-up control sleeve | ⑱ Shift valve A | ⑳ Shift A spring |
| ② Lock-up control plug | ⑲ Overrunning clutch control valve | ㉑ Shuttle shift spring |
| ③ Lock-up control valve | ⑳ Overrunning clutch reducing valve | ㉒ Overrunning clutch control spring |
| ④ Pilot valve | ㉑ Shuttle shift valve | ㉓ 4-2 sequence spring |
| ⑤ Pressure regulator valve | ㉒ Modifier accumulator piston | ㉔ 4-2 relay spring |
| ⑥ Pressure regulator plug | ㉓ Manual valve | ㉕ Servo charger spring |
| ⑦ Torque converter regulation valve | ㉔ 1st reducing valve | ㉖ 3-2 timing spring |
| ⑧ Pressure regulator sleeve plug | ㉕ 3-2 timing valve | ㉗ 1st reducing spring |
| ⑨ Accumulator control sleeve | ㉖ Servo charger valve | ㉘ Overrunning clutch reducing spring |
| ⑩ Accumulator control plug | ㉗ Pressure regulator spring | ㉙ Torque converter regulator spring |
| ⑪ Shuttle duty shift valve | ㉘ Pressure modifier spring | ㉚ Lock-up control spring |
| ⑫ 4-2 sequence valve | ㉙ Modifier accumulator spring | ㉛ Shuttle duty shift spring |
| ⑬ Pressure modifier valve | ㉚ Pilot spring | |
| ⑭ Shift valve B | ㉛ Accumulator control spring | |
| ⑮ 4-2 relay valve | ㉜ Shift B spring | |

Unit: mm (in)

No.	Part name	Wire dia.	Outer dia.	Effective turn	Free length
25	Pressure regulator spring	1.6 (0.063)	14.0 (0.551)	5.6	31.5 (1.240)
26	Pressure modifier spring	0.8 (0.031)	6.8 (0.268)	10.0	31.95 (1.2579)
27	Modifier accumulator spring	1.3 (0.051)	9.8 (0.386)	8.8	30.5 (1.201)
28	Pilot spring	1.1 (0.043)	9.1 (0.358)	8.3	25.7 (1.012)
29	Accumulator control spring	0.4 (0.016)	6.6 (0.260)	11.0	27.5 (1.083)
30	Shift B spring	0.65 (0.0256)	7.0 (0.276)	9.5	25.0 (0.984)
31	Shift A spring	0.5 (0.020)	7.0 (0.276)	9.5	25.0 (0.984)
32	Shuttle shift spring	0.65 (0.0256)	5.65 (0.2224)	27.6	51.0 (2.008)
33	Overrunning clutch control spring	0.7 (0.028)	6.0 (0.236)	12.0	26.5 (1.043)
34	4-2 sequence spring	0.55 (0.0217)	6.95 (0.2736)	11.0	29.1 (1.146)
35	4-2 relay spring	0.55 (0.0217)	6.95 (0.2736)	11.0	29.1 (1.146)
36	Servo charger spring	0.7 (0.028)	6.7 (0.264)	9.0	23.0 (0.906)
37	3-2 timing spring	0.75 (0.0295)	6.75 (0.2657)	7.5	20.55 (0.8091)
38	1st reducing spring	0.75 (0.0295)	6.75 (0.2657)	12.5	25.4 (1.000)
39	Overrunning clutch reducing spring	1.05 (0.0413)	7.05 (0.2776)	15.21	34.7 (1.366)
40	Torque converter regulator spring	1.3 (0.051)	9.0 (0.354)	11.7	38.0 (1.496)
41	Lock-up control spring	0.75 (0.0295)	13.0 (0.512)	3.5	18.5 (0.728)
42	Shuttle duty shift spring	0.75 (0.0295)	5.65 (0.2224)	27.6	51.0 (2.008)



B: ADJUSTMENT

1. DOOR ASSY

1) Using ST, loosen bolts securing upper and lower hinges to body, and adjust fore-and-aft and vertical alignment of door.

ST 925610000 DOOR HINGE WRENCH

2) Loosen mounting screws approximately one rotation. Adjust striker (1) position by lightly tapping with hammer. (To adjust, utilize the shape of the striker nut plate (2) support.)

CAUTION:

- Use cloth to prevent damaging body or other parts.
- Do not directly tap striker plastic portion.
- Do not apply impact on spot-welded striker nut plate.

Hinge tightening torque (body side):

$29 \pm 5 \text{ N}\cdot\text{m}$ ($3.0 \pm 0.5 \text{ kg}\cdot\text{m}$, $21.7 \pm 3.6 \text{ ft}\cdot\text{lb}$)

Striker tightening torque:

$14 \pm 4 \text{ N}\cdot\text{m}$ ($1.4 \pm 0.4 \text{ kg}\cdot\text{m}$, $10.1 \pm 2.9 \text{ ft}\cdot\text{lb}$)

2. GUSSET

Loosen the 3 bolts and 1 nut securing the gusset. Rotate the gusset in the direction of the arrow until dimension A is within the specified range.

Dimension A:

$0.5 - 1.5 \text{ mm}$ ($0.020 - 0.059 \text{ in}$)

NOTE:

If dimension A is not within the specified range, adjust the front door glass upper limit position as outlined in steps (1) and (2).

(1) Raise the front door glass to the upper limit position and set the SPACER (FRONT DOOR) in position.

ST 62065FA100 SPACER (FRONT DOOR)

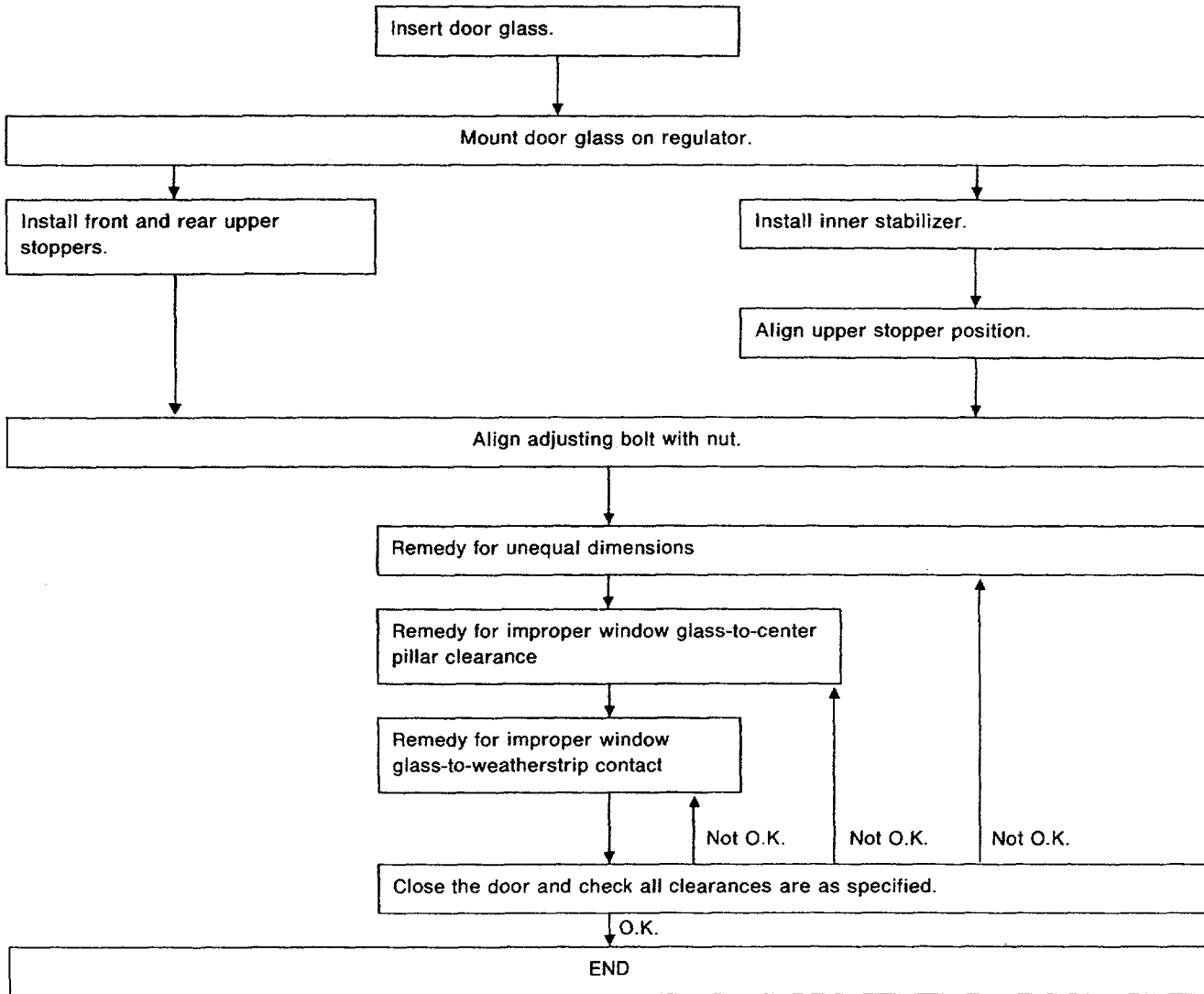
(2) Loosen the front and rear glass upper stopper fixate bolts. Adjust the front door glass upper limit position, then re-adjust the gusset until dimension B is within the specified range.

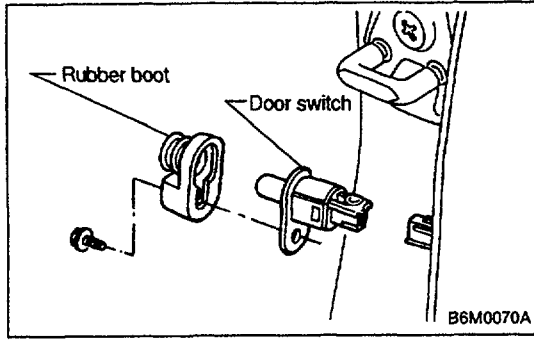
Dimension B:

$3 - 5 \text{ mm}$ ($0.12 - 0.20 \text{ in}$)

SERVICE PROCEDURE

2. PROCEDURE CHART FOR ADJUSTING DOOR GLASS





4. DOOR SWITCH

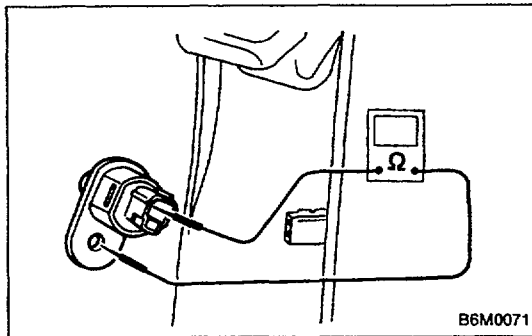
- 1) Remove rubber boot of door switch.
- 2) Remove screw which secures door switch to body.
- 3) Remove door switch while disconnecting connector.

5. TRUNK ROOM LIGHT SWITCH (SEDAN)

Refer to 5-1 [W2A3] as for removal and installation of trunk room light switch which is installed in trunk lid lock.

6. LUGGAGE ROOM LIGHT SWITCH (WAGON)

Refer to 5-2 [W3A2] as for removal and installation of luggage room light switch which is installed in rear gate lock.

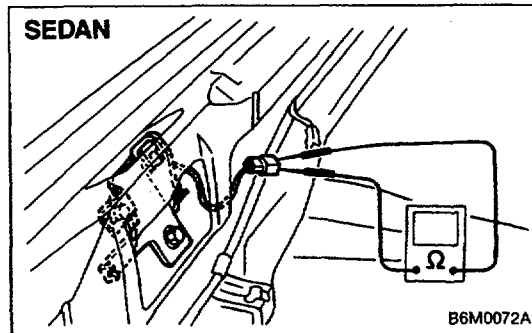


B: INSPECTION

1. DOOR SWITCH

Move switch and check continuity between terminal of door switch and switch body.

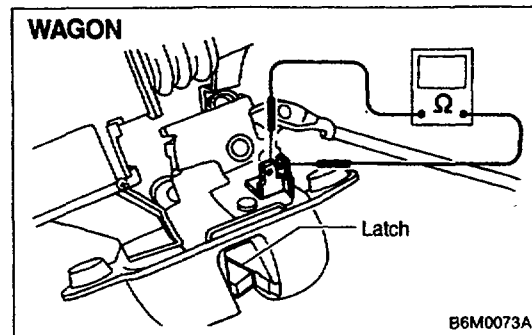
Switch position	Terminal	Switch body
Open (ON)	○	○
Push in (OFF)		



2. TRUNK ROOM LIGHT SWITCH (SEDAN)

Move switch and check continuity between terminals of trunk room light switch.

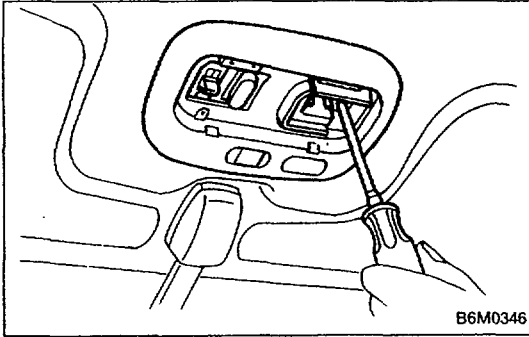
Terminal	1	2
Switch position		
Open (ON)	○	○
Push in (OFF)		



3. LUGGAGE ROOM LIGHT SWITCH (WAGON)

Move switch and check continuity between terminals of luggage room light switch.

Terminal	1	2
Switch position		
Open (ON)	○	○
Push in (OFF)		



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9. Spot Light

A: REMOVAL AND INSTALLATION

1. SPOT LIGHT AND SWITCH

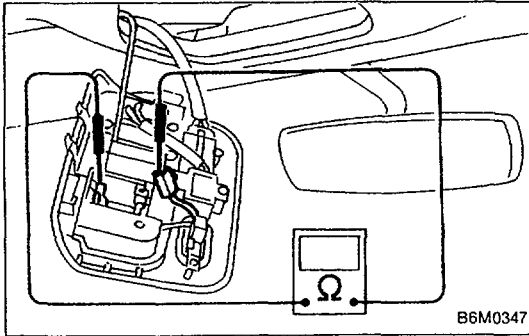
- 1) Pry spot light lens off using a screwdriver.
- 2) Remove screws which secure spot light body.
- 3) Remove spot light body while disconnecting connector(s).

B: INSPECTION

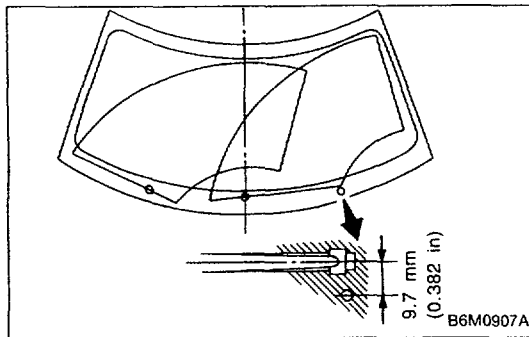
1. SPOT LIGHT SWITCH

Move switch and check continuity between terminal of spot light switch connector and steel plate as shown.

Switch position	Connector terminal	Plate
Open (OFF)		
Push in (ON)		



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10. Front Wiper and Washer

A: ON-CAR SERVICES

1. ADJUSTMENT

- 1) Turn the wiper switch to OFF position.
- 2) Adjust blades in original position as shown in figure by changing wiper arm installation.

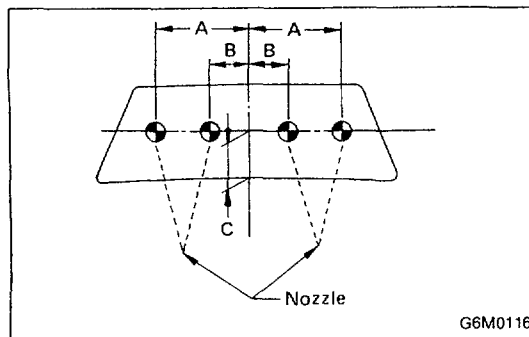
- 3) Stop the vehicle.
- 4) Adjust washer ejecting point on windshield glass as shown in figure.

Ejecting point:

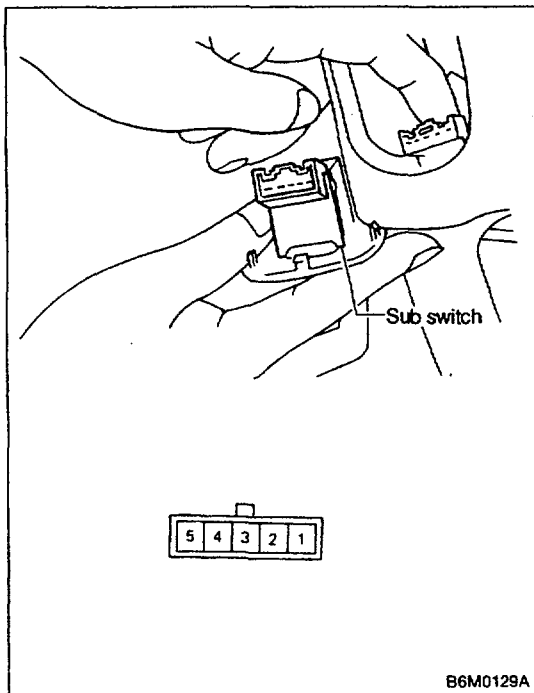
A: 375 mm (14.76 in)

B: 150 mm (5.91 in)

C: 380 mm (14.96 in)



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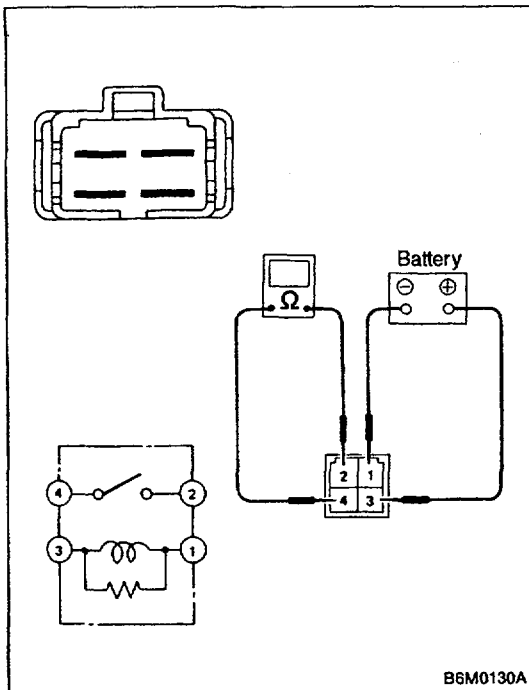
2. SUB SWITCH

Set power window sub switch to each position and check continuity between terminals as indicated in table below:

Terminal Switch position	5	1	3	4	2
UP	○		○	○	○
↓					
OFF		○	○	○	○
↓					
DOWN	○	○		○	○

3. POWER WINDOW MOTOR

- 1) Make sure that power window motor rotates properly when battery voltage is applied to terminals of motor connector.
- 2) Change polarity of battery connections to terminals to ensure that motor rotates in reverse direction.



4. POWER WINDOW RELAY

Check continuity between terminals as indicated in table below, when connecting the battery to terminal No. 1 and No. 3.

When current flows.	Between terminals No. 2 and No. 4	Continuity exists.
When current does not flow.	Between terminals No. 2 and No. 4	Continuity does not exist.
	Between terminals No. 1 and No. 3	Continuity exists.

17. Power Door Lock

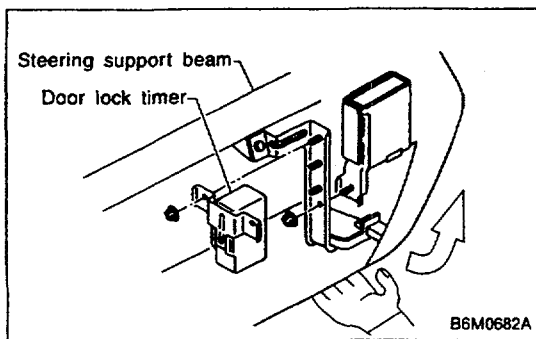
A: REMOVAL AND INSTALLATION

1. FRONT AND REAR DOOR, AND REAR GATE LOCK ACTUATOR

Refer to 5-2 [W2A7] as for removal and installation of front door lock actuator, rear door lock actuators, and rear gate lock actuator.

NOTE:

To remove and install the actuators, it is necessary to disassemble the door component parts.



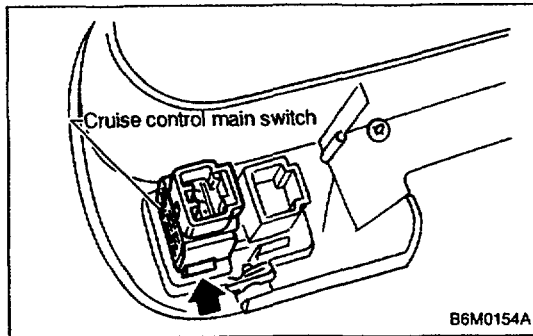
2. DOOR LOCK TIMER

- 1) Remove glove box.
- 2) Remove back pocket cover.
- 3) Remove two bolts located at the rear of back pocket cover.
- 4) Remove instrument panel side right cover and bolt.
- 5) Remove clip located at the inside end of instrument panel.
- 6) Remove nut which secures door lock timer, and remove door lock timer from bracket while pulling right side lower end of instrument panel.

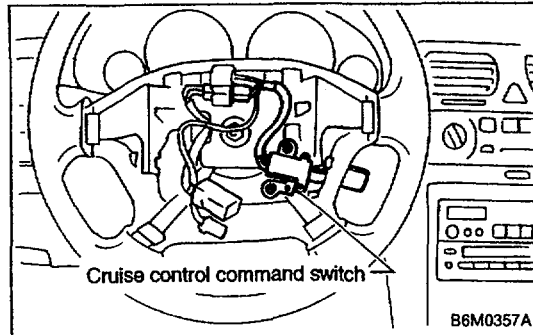
CAUTION:

Be careful not to damage instrument panel while pulling its right side lower end.

- 7) Disconnect connector from door lock timer.
- 8) Installation is in the reverse order of removal.

**B: REMOVAL AND INSTALLATION****1. CRUISE CONTROL MAIN SWITCH**

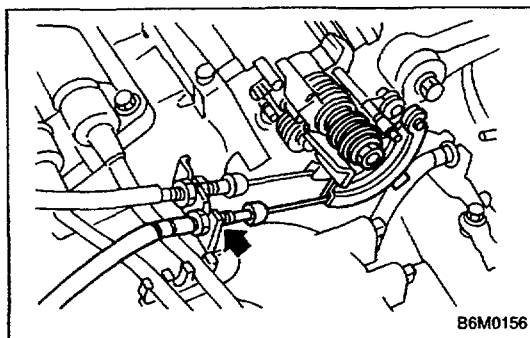
- 1) Remove screws which secure meter visor.
- 2) Remove meter visor from instrument panel while disconnecting connectors.
- 3) Remove cruise control main switch from meter visor.

**2. CRUISE CONTROL COMMAND SWITCH**

- 1) Remove screw which secures horn pad to the base of steering wheel.
- 2) Remove horn pad from steering wheel while disconnecting connector.
- 3) Disconnect connector of cruise control command switch.
- 4) Remove screws which secure cruise control command switch to steering wheel, and then remove command switch.

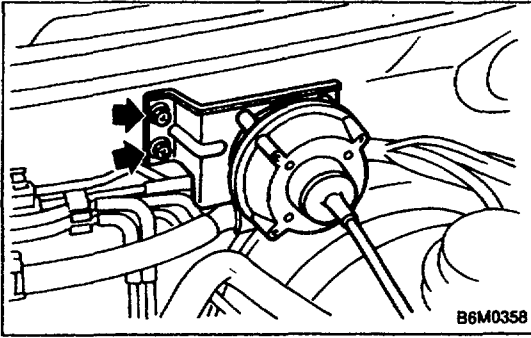
WARNING:

Refer to 5-5 when removing or installing the module from the airbag equipped model.

**3. ACTUATOR****CAUTION:**

- Be careful not to apply excessive load to the wire cable when adjusting and/or installing; otherwise, the actuator may be deformed or damaged.
- Do not bend cable sharply with a radius less than 100 mm (3.94 in); otherwise, cable may bend permanently, resulting in poor performance.
- When installing cable, be careful not to sharply bend or pinch the inner cable; otherwise, the cable may break.

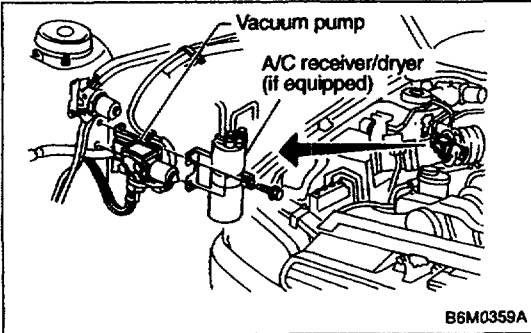
- 1) Loosen nut which secures cruise control cable end to throttle cam, and then remove cable from engine throttle cam.
- 2) Remove clip bands from cruise control cable.



- 3) Remove nuts which secure actuator.
- 4) Remove actuator while disconnecting vacuum hose.

Tightening torque:

$7.4 \pm 1.5 \text{ N}\cdot\text{m}$ ($0.75 \pm 0.15 \text{ kg}\cdot\text{m}$, $5.4 \pm 1.1 \text{ ft}\cdot\text{lb}$)



4. VACUUM PUMP AND VALVES

- 1) Disconnect connector from vacuum pump.
- 2) Remove bolts which secure vacuum pump.
- 3) Remove A/C receiver/drier bracket.
- 4) Remove vacuum pump while disconnecting vacuum hose.

Tightening torque:

$7.4 \pm 1.5 \text{ N}\cdot\text{m}$ ($0.75 \pm 0.15 \text{ kg}\cdot\text{m}$, $5.4 \pm 1.1 \text{ ft}\cdot\text{lb}$)

5. STOP AND BRAKE SWITCH

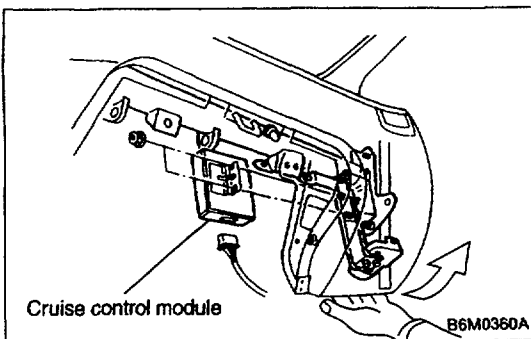
Refer to 4-5 [C101 (MT) or C201 (AT)] as for removal and installation of stop and brake switch.

6. CLUTCH SWITCH (MT)

Refer to 4-5 [C101] as for removal and installation of clutch switch.

7. INHIBITOR SWITCH (AT)

Refer to 3-2 [W4A4] as for removal and installation of inhibitor switch.



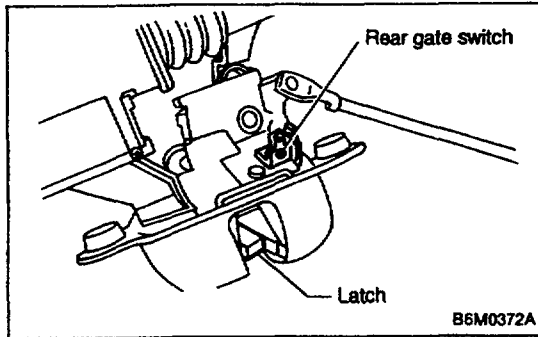
8. CRUISE CONTROL MODULE

- 1) Follow the same preparatory procedures when removing door lock timer. <Ref. to 6-2 [W17A2].☆1>
- 2) Remove nuts which secure cruise control module, and remove cruise control module from bracket while pulling right side lower end of instrument panel.

CAUTION:

Be careful not to damage instrument panel while pulling its right side lower end.

- 3) Disconnect connector from cruise control module.
- 4) Installation is the reverse order of removal.

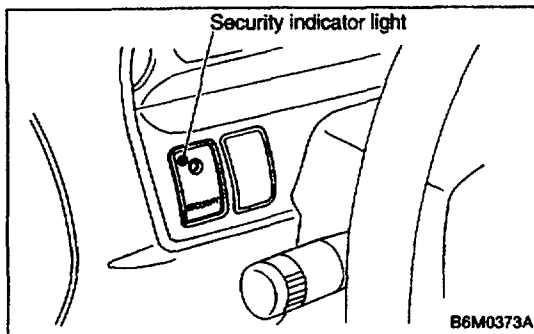


8. REAR GATE SWITCH (WAGON)

NOTE:

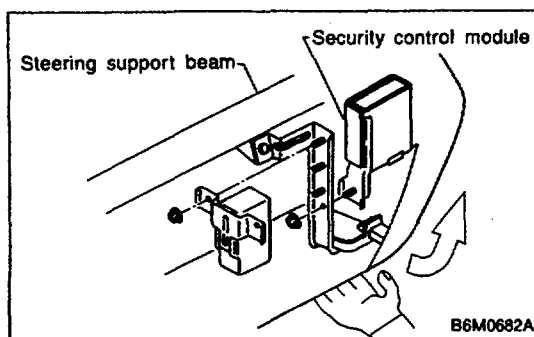
The rear gate switch is united with the rear gate latch assembly.

- 1) Remove rear gate trim panel.
- 2) Disconnect rod from rear gate latch assembly.
- 3) Disconnect rear gate switch (combined with luggage room light switch) connector and power door lock actuator connector.
- 4) Remove bolts which secure power door lock actuator.
- 5) Remove bolts which secure latch.
- 6) Remove latch and actuator assembly.
- 7) Installation is in the reverse order of removal.



9. SECURITY INDICATOR LIGHT

- 1) Remove screws which secure meter visor.
- 2) Remove meter visor from instrument panel while disconnecting connectors.
- 3) Remove security indicator light from meter visor.
- 4) Installation is in the reverse order of removal.



10. SECURITY CONTROL MODULE

- 1) Follow the same preparatory procedures when removing door lock timer. <Ref. to 6-2 [W17A2].☆1>
- 2) Remove nut which secures security control module, and remove security control module from bracket while pulling right side lower end of instrument panel.

CAUTION:

Be careful not to damage instrument panel while pulling its right side lower end.

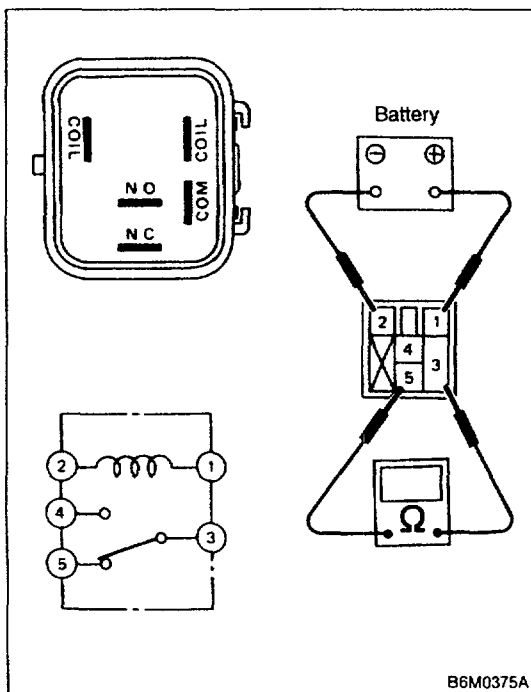
- 3) Disconnect connector from security control module.
- 4) Installation is in the reverse order of removal.

B: INSPECTION

1. STARTER INTERRUPT RELAY

- 1) Disconnect connector of starter interrupt relay.
- 2) Connect battery to terminal No.1 and ground terminal No. 2.
- 3) Check continuity between terminals as indicated in table below:

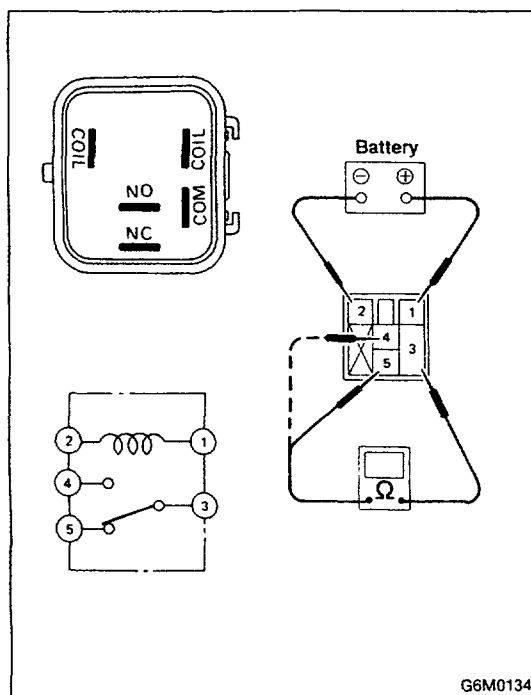
When current flows.	Between terminals No. 3 and No. 5	Continuity does not exist.
When current does not flow.	Between terminals No. 3 and No. 5	Continuity exists.
	Between terminals No. 1 and No. 2	Continuity exists.



2. HEADLIGHT ALARM RELAY

- 1) Disconnect connector of headlight alarm relay.
- 2) Connect battery to terminal No. 1 and ground terminal No. 2.
- 3) Check continuity between terminals as indicated in table below:

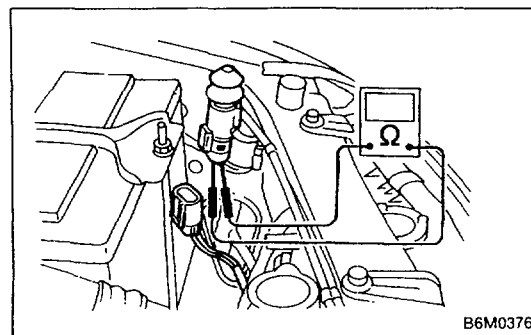
When current flows.	Between terminals No. 3 and No. 5	Continuity does not exist.
	Between terminals No. 3 and No. 4	Continuity exists.
When current does not flow.	Between terminals No. 3 and No. 5	Continuity exists.
	Between terminals No. 3 and No. 4	Continuity does not exist.
	Between terminals No. 1 and No. 2	Continuity exists.



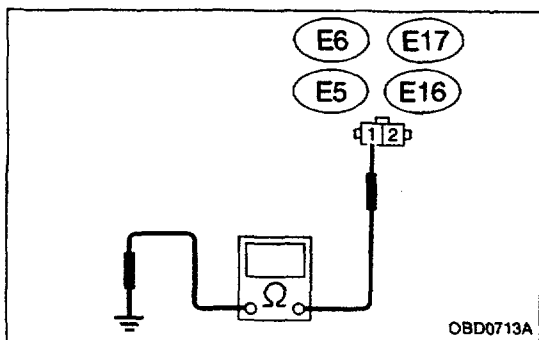
3. ENGINE HOOD SWITCH

- 1) Disconnect connector of engine hood switch.
- 2) Check continuity between terminals when push rod is pushed in 1.5 mm (0.059 in) of its stroke.

Terminal	1	2
Switch position		
When push rod is pushed in.		
When push rod is released.	○	○



- CHECK** : Is there poor contact in ECM connector?
- YES** : Repair poor contact in ECM connector.
- NO** : Replace ECM.

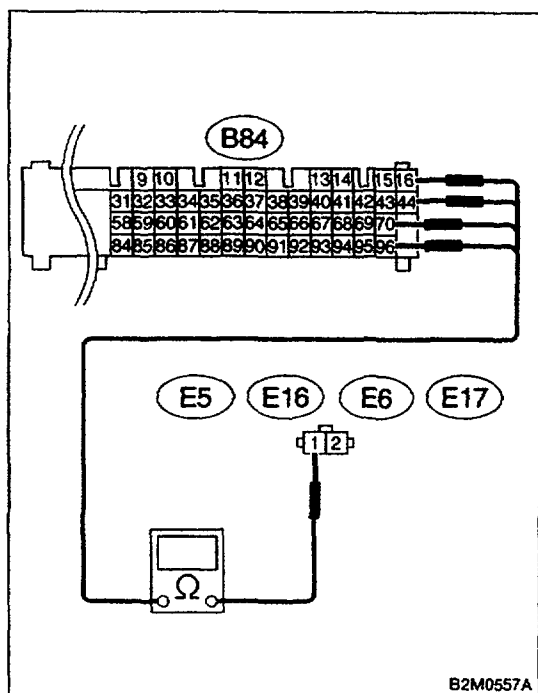


10T3 CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from fuel injector on faulty cylinders.
- 3) Measure resistance between ECM connector and engine ground on faulty cylinders.

- CHECK** : **Connector & terminal**
 #1 (E5) No. 1 — Engine ground:
 #2 (E16) No. 1 — Engine ground:
 #3 (E6) No. 1 — Engine ground:
 #4 (E17) No. 1 — Engine ground:
 Is the resistance less than 10 Ω?

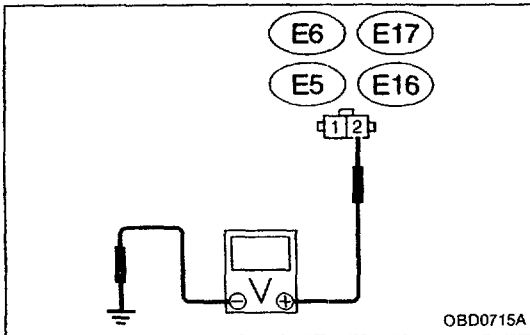
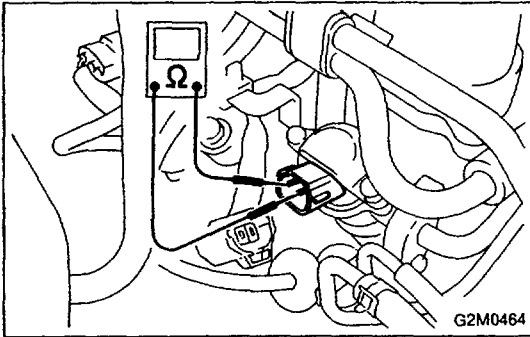
- YES** : Repair short circuit in harness between fuel injector and ECM connector.
- NO** : Go to next step 4).



- 4) Measure resistance of harness connector between ECM connector and fuel injector on faulty cylinders.

- CHECK** : **Connector & terminal**
 #1 (B84) No. 96 — (E5) No. 1:
 #2 (B84) No. 70 — (E16) No. 1:
 #3 (B84) No. 44 — (E6) No. 1:
 #4 (B84) No. 16 — (E17) No. 1:
 Is the resistance less than 1 Ω?

- YES** : Go to step 10T4.
- NO** : Repair open circuit in harness between ECM and fuel injector connector.

**10T4 CHECK FUEL INJECTOR.**

Measure resistance between fuel injector terminals on faulty cylinder.

CHECK : **Terminals**

No. 1 — No. 2:

Is the resistance between 5 and 20 Ω ?

NO : Replace faulty fuel injector.

YES : Go to step **10T5**.

10T5 CHECK POWER SUPPLY LINE.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between fuel injector and engine ground on faulty cylinders.

CHECK : **Connector & terminal**

#1 (E5) No. 2 (+) — Engine ground (-):

#2 (E16) No. 2 (+) — Engine ground (-):

#3 (E6) No. 2 (+) — Engine ground (-):

#4 (E17) No. 2 (+) — Engine ground (-):

Is the voltage more than 10 V?

YES : Repair poor contact in all connectors in fuel injector circuit.

NO : Repair harness and connector.

NOTE:

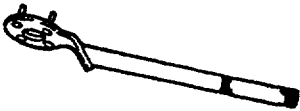
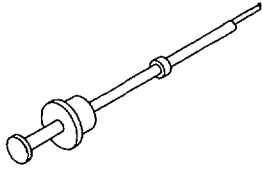
In this case, repair the following:

- Open circuit in harness between main relay and fuel injector connector on faulty cylinders
- Poor contact in main relay connector
- Poor contact in fuel injector connector on faulty cylinders

SPECIAL TOOLS *1-6*

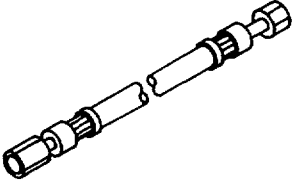
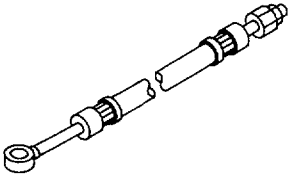
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1. Engine Tools

499977100*	499097700*
CRANK PULLEY WRENCH CP	PISTON PIN REMOVER ASSY
<ul style="list-style-type: none"> • Used to stop rotation of crankshaft pulley when loosening and tightening crankshaft pulley bolts. • For 2500 cc engine. 	<ul style="list-style-type: none"> • Used to remove piston pin. • For 2500 cc engine.
 <p style="text-align: right;">G1H0147</p>	 <p style="text-align: right;">B1H0200</p>

*Newly adopted tool

7. Steering System Tools

34099AC010*	34099AC020*
ADAPTER HOSE A	ADAPTER HOSE B
Used with PRESSURE GAUGE (925711000).	Used with PRESSURE GAUGE (925711000).
<p style="text-align: center;">To Gauge</p>  <p style="text-align: right;">B1H0172A</p>	<p style="text-align: center;">To Gauge</p>  <p style="text-align: right;">B1H0185A</p>

*Newly adopted tool

ENGINE (DOHC) 2-3b

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1. Engine

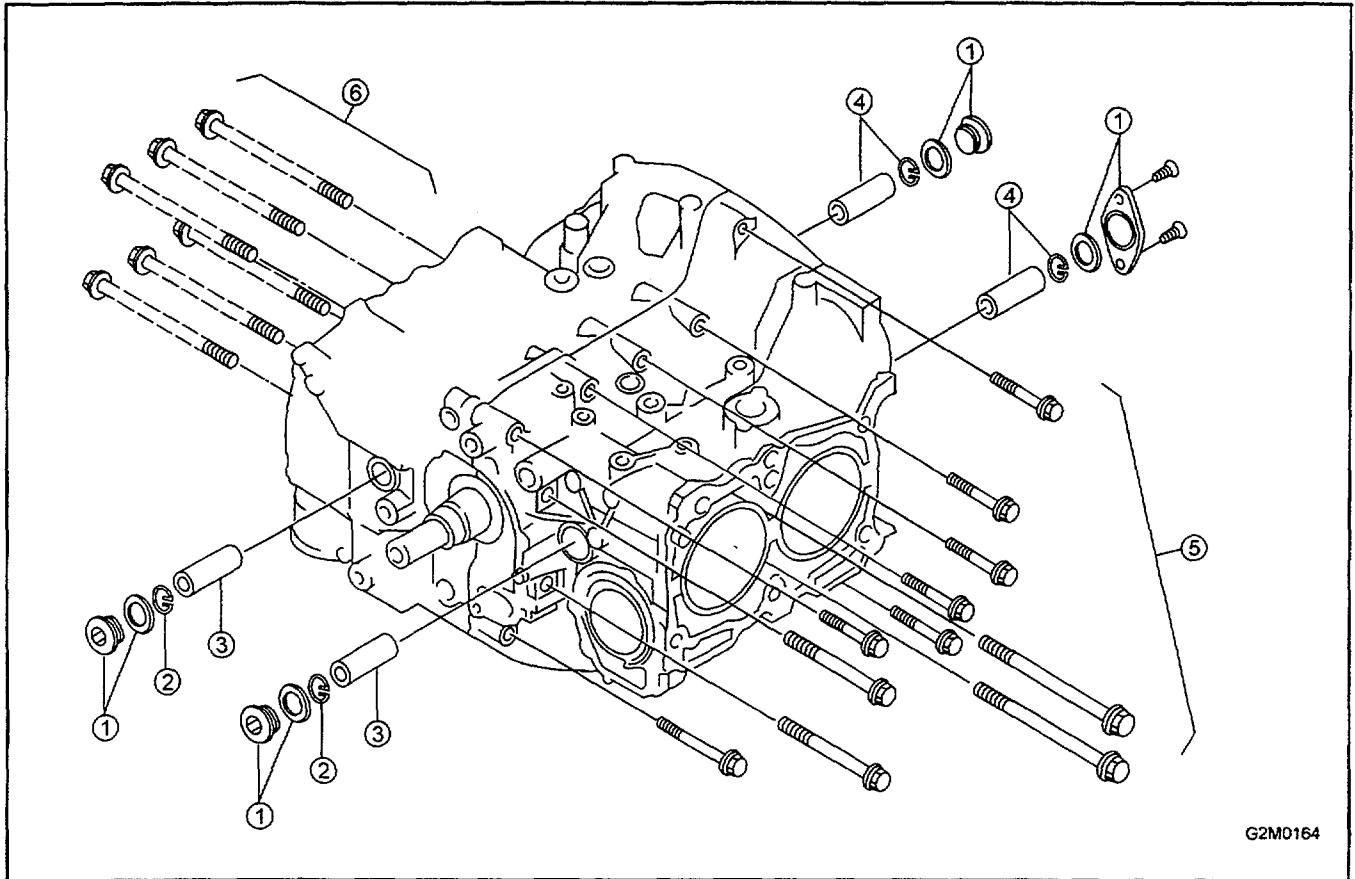
A: SPECIFICATIONS

Engine	Model		2500 cc	
	Type		Horizontally opposed, liquid cooled, 4-cylinder, 4-stroke gasoline engine	
	Valve arrangement		Belt driven, double over-head camshaft, 4-valve/cylinder	
	Bore x Stroke		mm (in) 99.5 x 79.0 (3.917 x 3.110)	
	Displacement		cm ³ (cu in) 2,457 (149.93)	
	Compression ratio		9.5	
	Compression pressure (at 200 — 300 rpm) kPa (kg/cm ² , psi) — rpm		Standard	1,216 (12.4, 176) — 350
			Limit	941 (9.6, 137) — 350
	Number of piston rings		Pressure ring: 2, Oil ring: 1	
	Intake valve timing		Opening	6° BTDC
			Closing	50° ABDC
	Exhaust valve timing		Opening	Front: 54° BBDC, Rear: 30° BBDC (Position in degrees)
			Closing	Front: 10° ATDC, Rear: 10° ATDC (Position in degrees)
	Valve clearance		Intake	mm (in) 0.20 ± 0.02 (0.0079 ± 0.0008)
			Exhaust	mm (in) 0.25 ± 0.02 (0.0098 ± 0.0008)
Idling speed [At neutral position on MT, or "P" or "N" position on AT]		rpm	700 ± 100 (No load) 850 ± 50 (A/C switch ON)	
Firing order			1 → 3 → 2 → 4	
Ignition timing		BTDC/rpm	15° ± 8°/700 rpm	

5. Cylinder Block

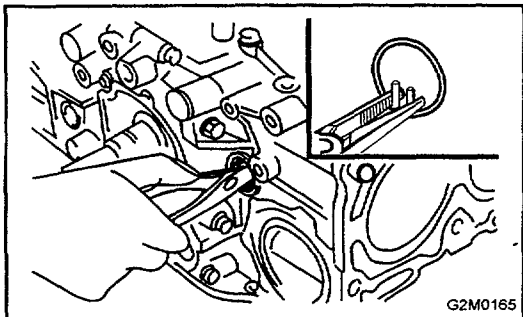
B: DISASSEMBLY

1. PISTON PIN AND CYLINDER BLOCK CONNECTING BOLT



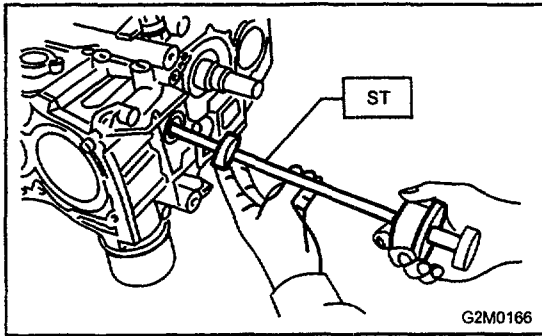
G2M0164

1) Remove service hole cover and service hole plugs using hexagon wrench (14 mm).



G2M0165

2) Rotate crankshaft to bring #1 and #2 pistons to bottom dead center position, then remove piston circlip through service hole of #1 and #2 cylinders.



3) Draw out pin from #1 and #2 pistons by using ST.

ST 499097700 PISTON PIN REMOVER

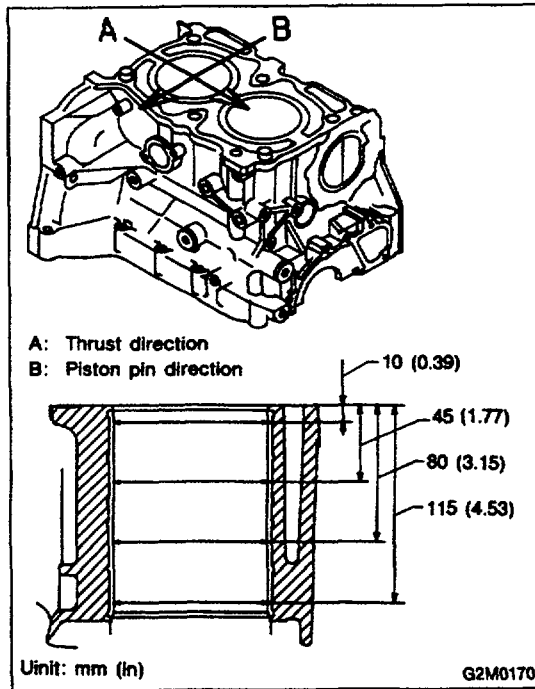
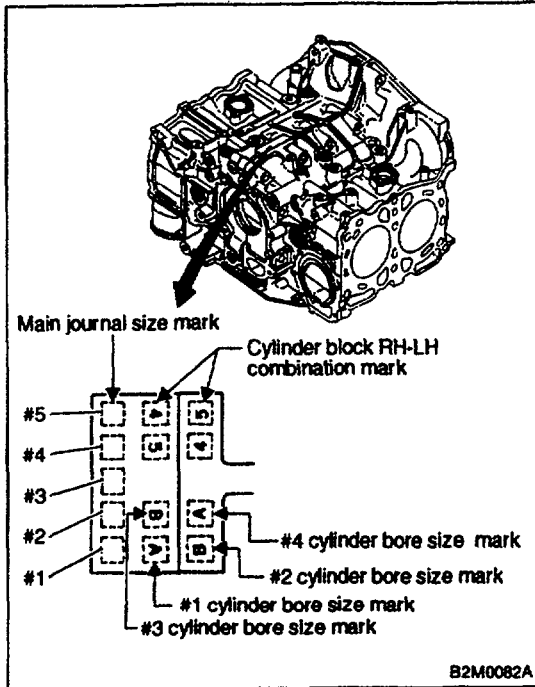
CAUTION:

Be careful not to confuse original combination of piston, piston pin and cylinder.

4) Similarly remove piston pins from #3 and #4 pistons by using ST.

5) Remove bolts which connect cylinder block on the side of #2 and #4 cylinders.

6) Back off bolts which connect cylinder block on the side of #1 and #3 cylinders two or three turns.



C: INSPECTION

2. CYLINDER AND PISTON

1) The cylinder bore size is stamped on the cylinder block's front upper surface.

NOTE:

Standard sized pistons are classified into two grades, "A" and "B". These grades should be used as a guide line in selecting a standard piston.

Standard diameter:

A: 99.505 — 99.515 mm (3.9175 — 3.9179 in)

B: 99.495 — 99.505 mm (3.9171 — 3.9175 in)

2) How to measure the inner diameter of each cylinder
Measure the inner diameter of each cylinder in both the thrust and piston pin directions at the heights shown in the Figure, using a cylinder bore gauge.

CAUTION:

Measurement should be performed at a temperature 20°C (68°F).

Taper:

Standard

0.015 mm (0.0006 in)

Limit

0.050 mm (0.0020 in)

Out-of-roundness:

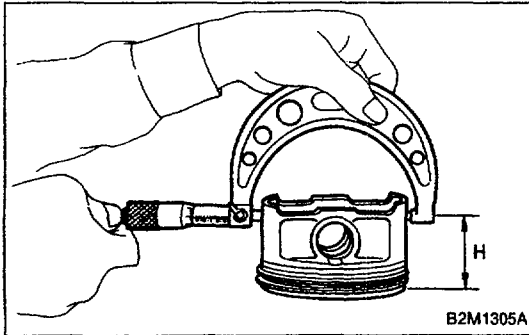
Standard

0.010 mm (0.0004 in)

Limit

0.050 mm (0.0020 in)

3) When piston is to be replaced due to general or cylinder wear, determine a suitable sized piston by measuring the piston clearance.



4) How to measure the outer diameter of each piston
Measure the outer diameter of each piston at the height shown in the Figure. (Thrust direction)

CAUTION:

Measurement should be performed at a temperature of 20°C (68°F).

Piston grade point H:
37.0 mm (1.457 in)

Piston outer diameter:
Standard

A: 99.485 — 99.495 mm (3.9167 — 3.9171 in)

B: 99.475 — 99.485 mm (3.9163 — 3.9167 in)

0.25 mm (0.0098 in) oversize

99.725 — 99.735 mm (3.9262 — 3.9266 in)

0.50 mm (0.0197 in) oversize

99.975 — 99.985 mm (3.9360 — 3.9364 in)

5) Calculate the clearance between cylinder and piston.

CAUTION:

Measurement should be performed at a temperature of 20°C (68°F).

Cylinder to piston clearance at 20°C (68°F):

Standard

0.010 — 0.030 mm (0.0004 — 0.0012 in)

Limit

0.050 mm (0.0020 in)

6) Boring and honing

(1) If the value of taper, out-of-roundness, or cylinder-to-piston clearance measured exceeds the specified limit or if there is any damage on the cylinder wall, rebore it to use an oversize piston.

CAUTION:

When any of the cylinders needs reboring, all other cylinders must be bored at the same time, and use oversize pistons. Do not perform boring on one cylinder only, nor use an oversize piston for one cylinder only.

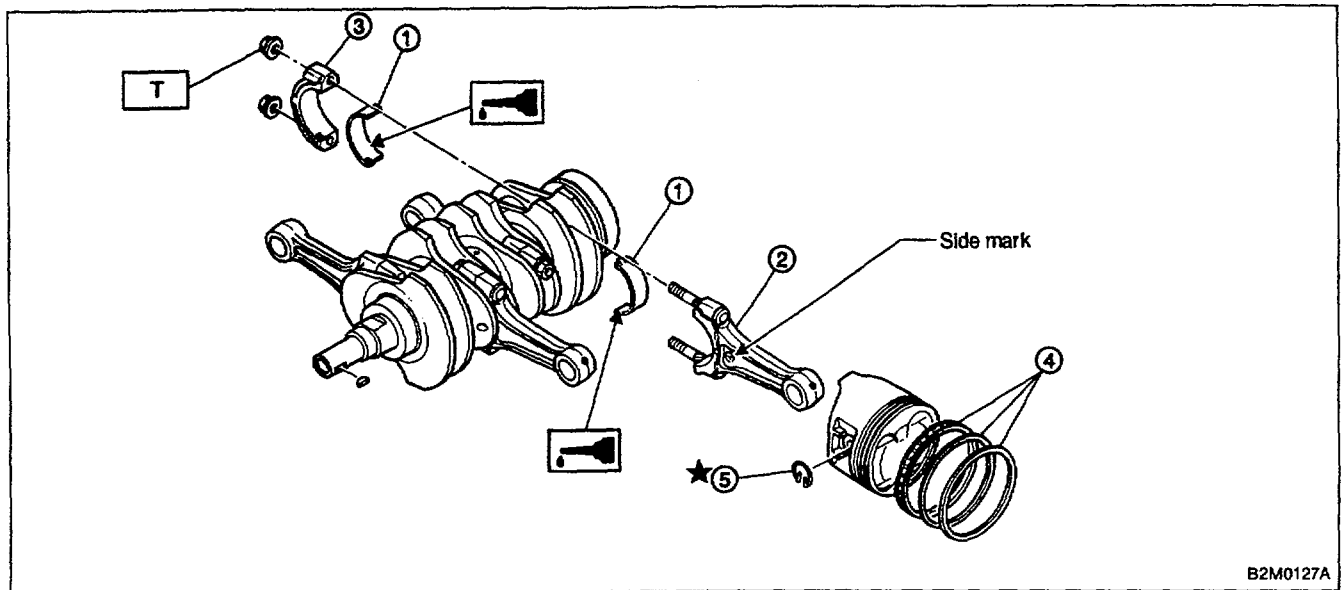
(2) If the cylinder inner diameter exceeds the limit after boring and honing, replace the crankcase.

CAUTION:

Immediately after reboring, the cylinder diameter may differ from its real diameter due to temperature rise. Thus, pay attention to this when measuring the cylinder diameter.

Limit of cylinder enlarging (boring):

0.5 mm (0.020 in)

D: ASSEMBLY**1. CRANKSHAFT AND PISTON**

Tightening torque: N·m (kg·m, ft·lb)
T: 44 ± 2 (4.5 ± 0.2, 32.5 ± 1.4)

1) Install connecting rod bearings on connecting rods and connecting rod caps.

CAUTION:

Apply oil to the surfaces of the connecting rod bearings.

2) Install connecting rod on crankshaft.

CAUTION:

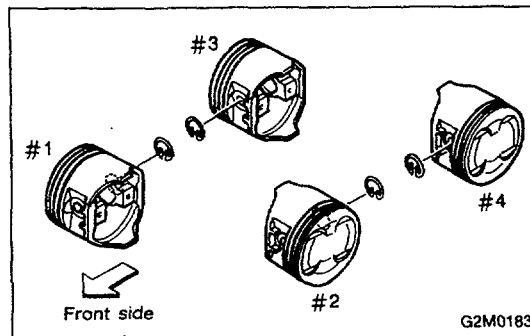
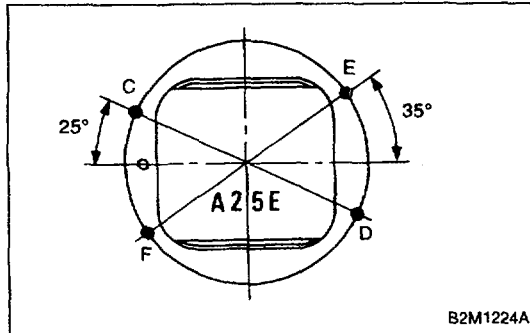
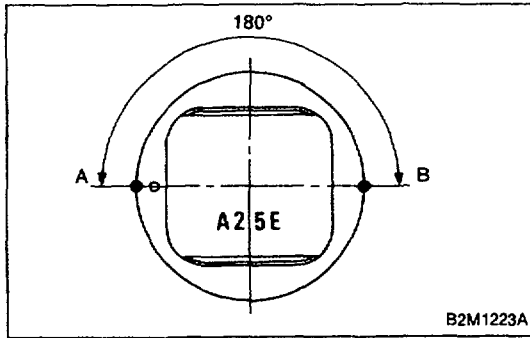
Position each connecting rod with the side marked facing forward.

3) Install connecting rod cap with connecting rod nut. Ensure the arrow on connecting rod cap faces the front during installation.

CAUTION:

● Each connecting rod has its own mating cap. Make sure that they are assembled correctly by checking their matching number.

● When tightening the connecting rod nuts, apply oil on the threads.



4) Installation of piston rings and oil ring

- (1) Install oil ring spacer, upper rail and lower rail in this order by hand. Then install second ring and top ring with a piston ring expander.
- (2) Position the top ring gap at A or B in the Figure.
- (3) Position the second ring gap at 180° on the reverse side for the top ring gap.

- (4) Position the upper rail gap at C or D in the Figure.
- (5) Position the expander gap the at 180° of the reverse side for the upper rail gap.
- (6) Position the lower rail gap at E or F in the Figure.

CAUTION:

- Ensure ring gaps do not face the same direction.
- Ensure ring gaps are not within the piston skirt area.

5) Install circlip.

Install circlips in piston holes located opposite service holes in cylinder block, when positioning all pistons in the corresponding cylinders.

CAUTION:

Use new circlips.

NOTE:

Piston front mark "○" faces toward front of engine.

1. Engine Trouble in General

Numbers shown in the chart refer to the possibility of reason for the trouble in order ("Very often" to "Rarely")

- 1 — Very often
- 2 — Sometimes
- 3 — Rarely

TROUBLE												POSSIBLE CAUSE		
Starter does not turn.	Initial combustion does not occur.	Initial combustion occurs.	Engine stalls after initial combustion.	Rough idle and engine stall	Low output, hesitation and poor acceleration	Surging	Engine does not return to idle.	Dieseling (Run-on)	After burning in exhaust system	Knocking	Excessive engine oil consumption		Excessive fuel consumption	
														STARTER
														● Defective battery-to-starter harness
														● Defective starter switch
														● Defective inhibitor switch
														● Defective starter
														BATTERY
														● Poor terminal connection
														● Run-down battery
														● Defective charging system
	1	1	1	1	1	1	1	1	1	1		1		Fuel injection system < Ref. to 2-7 On-Board Diagnostics II System. >

1. Engine Trouble in General

TROUBLE													
Engine will not start.													
Starter does not turn.	Initial combustion does not occur.	Initial combustion occurs.	Engine stalls after initial combustion.	Rough idle and engine stall	Low output, hesitation and poor acceleration	Surging	Engine does not return to idle.	Dieseling (Run-on)	After burning in exhaust system	Knocking	Excessive engine oil consumption	Excessive fuel consumption	
			2	1	1	1			3				INTAKE SYSTEM
			3	1	1	1			3		1		● Loosened or cracked intake air pipe
			3	1	2	1	1		2				● Loosened or cracked blow-by hose
		2	2	2	2	2							● Loosened or cracked vacuum hose
		2	2	2	2	2							● Defective intake manifold gasket
				3	2	2			2		2		● Defective throttle body gasket
				2	2	2			2		2		● Defective PCV valve
				2	2	2			3	2	3		● Loosened oil filler cap
			3	3	1	2						1	● Dirty air cleaner element
													FUEL LINE
	1	3		3	2	2							● Defective fuel pump and relay
		3	3	3	2	2							● Clogged fuel line
	2	2	2	2	3	3							● Lack of or insufficient fuel
													BELT
	2	2	2										● Defective
	2	2	2	3	2	2			2	2		2	● Defective timing
													FRICTION
3													● Seizure of crankshaft and connecting rod bearing
3													● Seized camshaft
3													● Seized or stuck piston and cylinder
													COMPRESSION
	3	3	3	2	2	2			2	3		2	● Incorrect valve clearance
	3	3	3	2	2	3			3			3	● Loosened spark plugs or defective gasket
	3	3	3	2	2	3			3			3	● Loosened cylinder head bolts or defective gasket
	3	3	3	2	2	3			2			2	● Improper valve seating
	3	3	3	3	3	3			3		1	3	● Defective valve stem
	2	2	2	2	2	3			3			3	● Worn or broken valve spring
	3	3	3	2	3	3			3		1	2	● Worn or stuck piston rings, cylinder and piston
	2	2	2	1	1	1			1	2		2	● Incorrect valve timing
	2	2	2	2	2	2							● Improper engine oil (low viscosity)

TROUBLE													
Engine will not start.													
Starter does not turn.	Initial combustion does not occur.	Initial combustion occurs.	Engine stalls after initial combustion.	Rough idle and engine stall	Low output, hesitation and poor acceleration	Surging	Engine does not return to idle.	Dieseling (Run-on)	After burning in exhaust system	Knocking	Excessive engine oil consumption	Excessive fuel consumption	
													LUBRICATION SYSTEM
				2	2				3			3	● Incorrect oil pressure
											2		● Loosened oil pump attaching bolts and defective gasket
											2		● Defective oil filter seal
											2		● Defective crankshaft oil seal
				3							2		● Defective rocker cover gasket
											2		● Loosened oil drain plug or defective gasket
											2		● Loosened oil pan fitting bolts or defective oil pan
													COOLING SYSTEM
				3	3	2		2		1			● Overheating
					3				3			3	● Over cooling
													OTHERS
				1	1	3			3				● Malfunction of Evaporative Emission Control System
				2			1						● Stuck or damaged throttle valve
				3			2	2				2	● Accelerator cable out of adjustment

2. Engine Noise

Type of sound	Condition	Possible cause
Regular clicking sound	Sound increases as engine speed increases.	Valve mechanism is defective. ● Incorrect valve clearance ● Worn camshaft ● Broken valve spring
Heavy and dull clank	Oil pressure is low.	● Worn crankshaft main bearing ● Worn connecting rod bearing (big end)
	Oil pressure is normal.	● Loose flywheel mounting bolts ● Damaged engine mounting
High-pitched clank (Spark knock)	Sound is noticeable when accelerating with an overload.	● Ignition timing advanced ● Accumulation of carbon inside combustion chamber ● Wrong spark plug ● Improper gasoline
Clank when engine speed is medium (1,000 to 2,000 rpm).	Sound is reduced when fuel injector connector of noisy cylinder is disconnected. (NOTE*)	● Worn crankshaft main bearing ● Worn bearing at crankshaft end of connecting rod
Knocking sound when engine is operating under idling speed and engine is warm.	Sound is reduced when fuel injector connector of noisy cylinder is disconnected. (NOTE*)	● Worn cylinder liner and piston ring ● Broken or stuck piston ring ● Worn piston pin and hole at piston end of connecting rod
	Sound is not reduced if each fuel injector connector is disconnected in turn. (NOTE*)	● Unusually worn valve lifter ● Worn camshaft journal bore in crankcase
Squeaky sound	—	● Insufficient generator lubrication
Rubbing sound	—	● Defective generator brush and rotor contact
Gear scream when starting engine	—	● Defective ignition starter switch ● Worn gear and starter pinion
Sound like polishing glass with a dry cloth	—	● Loose drive belt ● Defective engine coolant pump shaft
Hissing sound	—	● Loss of compression ● Air leakage in air intake system, hoses, connections or manifolds
Timing belt noise	—	● Loose timing belt ● Belt contacting case/adjacent part
Valve tappet noise	—	● Incorrect valve clearance

NOTE*:

When disconnecting fuel injector connector, Malfunction Indicator Light (CHECK ENGINE light) illuminates and trouble code is stored in ECM memory.

Therefore, carry out the CLEAR MEMORY MODE and INSPECTION MODE after connecting fuel injector connector. (Ref. to 2-7 On-Board Diagnostics II System.)

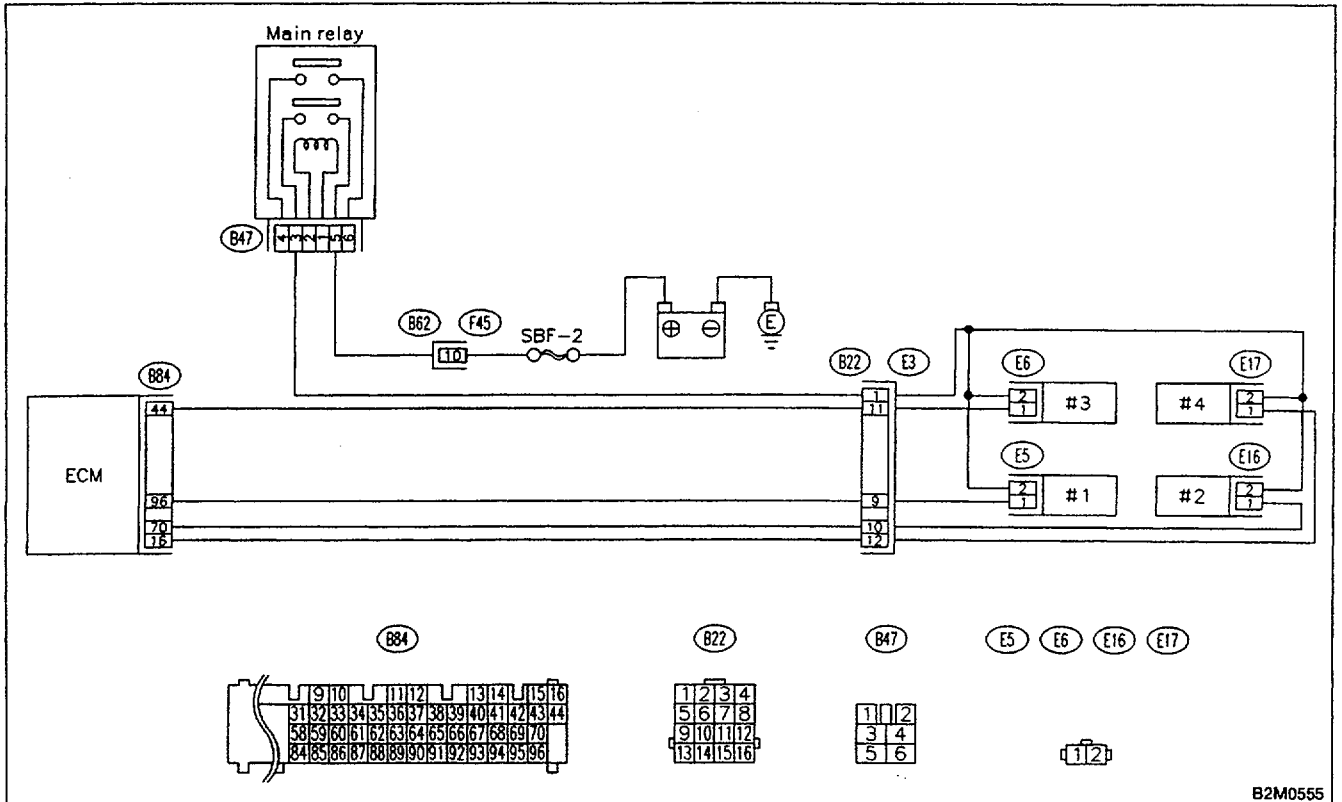
DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

- Failure of engine to start
- Engine stalls.
- Erroneous idling
- Rough driving

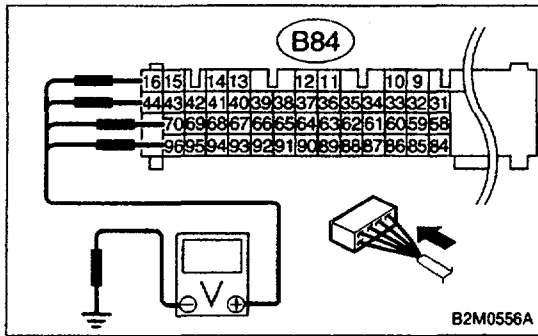
WIRING DIAGRAM:



B2M0555

CAUTION:

- Check or repair only faulty cylinders.
 - After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
- <Ref. to 2-7 [T3D0] and [T3E0].☆8 >

**10AA1 CHECK OUTPUT SIGNAL FROM ECM.**

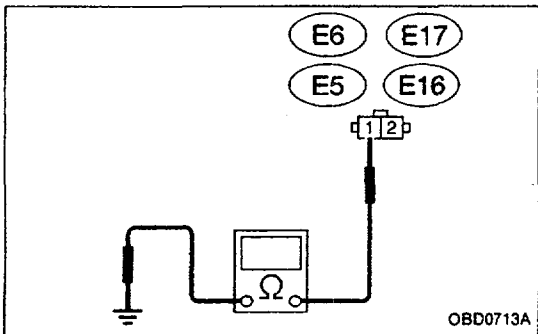
- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM connector and chassis ground on faulty cylinders.

CHECK : Connector & terminal

- #1 (B84) No. 96 (+) — Chassis ground (-):
 #2 (B84) No. 70 (+) — Chassis ground (-):
 #3 (B84) No. 44 (+) — Chassis ground (-):
 #4 (B84) No. 16 (+) — Chassis ground (-):
Is the voltage more than 10 V?

YES : Go to next **CHECK****NO** : Go to step **10AA2**.**CHECK : Is there poor contact in ECM connector?****YES** : Repair poor contact in ECM connector.**NO** : Contact with SOA service.**NOTE:**

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

**10AA2 CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from fuel injector on faulty cylinders.
- 3) Measure resistance between ECM connector and engine ground on faulty cylinders.

CHECK : Connector & terminal

- #1 (E5) No. 1 — Engine ground:
 #2 (E16) No. 1 — Engine ground:
 #3 (E6) No. 1 — Engine ground:
 #4 (E17) No. 1 — Engine ground:
Is the resistance less than 10 Ω?

YES : Repair ground short circuit in harness between fuel injector and ECM connector.**NO** : Go to next step 4).

GENERAL INFORMATION SECTION

FOREWORD

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

Please study and then utilize this supplement together with LEGACY SERVICE MANUAL and SERVICE MANUAL SUPPLEMENTS published already.

When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

The star marks for referred title indexes represent:

- ☆1: Refer to 95MY Service Manual.
- ☆2: Refer to 96MY Service Manual Supplement.
- ☆3: Refer to 95MY Right Hand Drive Service Manual Supplement.
- ☆4: Refer to 96MY Right Hand Drive Service Manual Supplement.
- ☆5: Refer to 96MY Service Manual Supplement ABS 5.3 equipped model.
- ☆6: Refer to 96MY Service Manual Supplement enhanced evaporative emission control system equipped model.
- ☆7: Refer to 96MY Service Manual Supplement right hand drive vehicle enhanced evaporative emission control system equipped model.
- ☆8: Refer to 97MY Service Manual Supplement.
- ☆9: Refer to 97MY Service Manual Supplement sports utility sedan.

NOTE:
For the articles not covered in this SERVICE MANUAL SUPPLEMENT, refer to the OUT-BACK MODEL sections in LEGACY SERVICE MANUAL and SERVICE MANUAL SUPPLEMENTS published already.

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

FUJI HEAVY INDUSTRIES LTD.

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4. SUS (Sports Utility Sedan)

1. DIMENSIONS

Model				2500
				AWD
				4AT
Overall length		mm (in)		4,635 (182.5)
Overall width		mm (in)		1,715 (67.5)
Overall height (at CW)		mm (in)		1,470 (57.9)
Compartment	Leg room	Front Max.	mm (in)	1,101 (43.3)
		Rear Min.	mm (in)	880 (34.6)
	Head room	Front Max.	mm (in)	987 (38.9)
		Rear Min.	mm (in)	933 (36.7)
	Shoulder room	Front Max.	mm (in)	1,373 (54.1)
		Rear Min.	mm (in)	1,361 (53.6)
Wheelbase		mm (in)		2,630 (103.5)
Tread	Front	mm (in)		1,455 (57.3)
	Rear	mm (in)		1,450 (57.1)
Minimum road clearance	M.L.V.W.	mm (in)		150 (5.9)
	C.W.	mm (in)		185 (7.3)

2. ENGINE

Model				2500
Engine type		Horizontally opposed, liquid cooled, 4-cylinder, 4-stroke gasoline engine		
Valve arrangement		Overhead camshaft type		
Bore x Stroke		mm (in)		99.5 x 79.0 (3.917 x 3.110)
Displacement		cm ³ (cu in)		2,457 (149.9)
Compression ratio		9.5		
Firing order		1 — 3 — 2 — 4		
Idle speed at Park/Neutral position		rpm		700
Maximum output		kW (HP)/rpm		123 (165)/5,600
Maximum torque		N.m (kg-m, ft-lb)/rpm		220 (22.4, 162)/4,000

3. ELECTRICAL

Model				2500
Ignition timing at idling speed		BTDC/rpm		15°/700
Spark plug	Type and manufacturer			NGK: PFR5B-11
Generator		12V — 85A		
Battery	Reserve capacity	min		100
	Cold cranking amperes	amp.		490

4. TRANSMISSION

Model		2500	
		AWD	
Transmission type		4AT	
Clutch type		TCC	
Gear ratio	1st	3.027	
	2nd	1.619	
	3rd	1.000	
	4th	0.694	
	5th	—	
	Reverse	2.272	
Reduction gear (Front drive)	1st reduction	Type of gear	Helical
		Gear ratio	1.000
	Final reduction	Type of gear	Hypoid
		Gear ratio	4.444
Reduction gear (Rear drive)	Transfer reduction	Type of gear	—
		Gear ratio	—
	Final reduction	Type of gear	Hypoid
		Gear ratio	4.444

4AT: Electronically controlled fully-automatic, 4-forward speeds and 1-reverse – with hydraulically controlled transfer clutch
 TCC: Torque Converter Clutch

5. STEERING

Type	Rack and Pinion	
Turns, lock to lock	3.4	
Minimum turning circle	m (ft)	Curb to curb: 11.2 (36.7), Wall to wall: 11.4 (37.4)

6. SUSPENSION

Front	Macpherson strut type, Independent, Coil spring
Rear	Dual link strut type, Independent, Coil spring

7. BRAKE

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

8. TIRE

Model	15 inch wheel
Size	P205/70R15 95S
Type	Steel belted radial, Tubeless

SPECIFICATIONS

9. CAPACITY

		2500
		AWD
		4AT
Fuel tank	ℓ (US gal, Imp gal)	60 (15.9, 13.2)
Engine oil	Upper level ℓ (US qt, Imp qt)	4.5 (4.7, 3.9)
	Lower level ℓ (US qt, Imp qt)	3.5 (3.7, 3.1)
Transmission gear oil	ℓ (US qt, Imp qt)	—
Automatic transmission fluid	ℓ (US qt, Imp qt)	9.5 (10, 8.4)
AT differential gear oil	ℓ (US qt, Imp qt)	1.2 (1.3, 1.1)
AWD rear differential gear oil	ℓ (US qt, Imp qt)	0.8 (0.8, 0.6)
Power steering fluid	ℓ (US qt, Imp qt)	0.7 (0.7, 0.6)
Engine coolant	ℓ (US qt, Imp qt)	6.0 (6.3, 5.3)

10. WEIGHT

Model		2500
— America spec. vehicle —		AWD
		SUS
		4AT**1
Curb weight (C.W.)	Front kg (lb)	800 (1,770)
	Rear kg (lb)	615 (1,355)
	Total kg (lb)	1,415 (3,125)
Gross vehicle weight (G.V.W.)	Front kg (lb)	950 (2,095)
	Rear kg (lb)	925 (2,045)
	Total kg (lb)	1,875 (4,140)

NOTE:
 When any of the following optional parts are installed, add the weight to the curb weight.

Weight of optional parts	Power window (P/W)	Power door lock (P/D)	ABS	Air conditioning (A/C)	Cruise control (C/C)	Cold weather pack (C/W)
Front kg (lb)	1.4 (3.1)	0.1 (0.2)	12.0 (26.4)	21.2 (46.7)	1.0 (2.2)	1.2 (2.6)
Rear kg (lb)	1.7 (3.7)	0.4 (0.9)	10.2 (22.4)	-2.0 (-4.4)	0.1 (0.2)	0.7 (1.5)
Total kg (lb)	3.1 (6.8)	0.5 (1.1)	22.2 (48.8)	19.2 (42.3)	1.1 (2.4)	1.9 (4.1)

**1: Includes the weights of P/W, P/D, A/C, C/C, and ABS.

GENERAL INFORMATION

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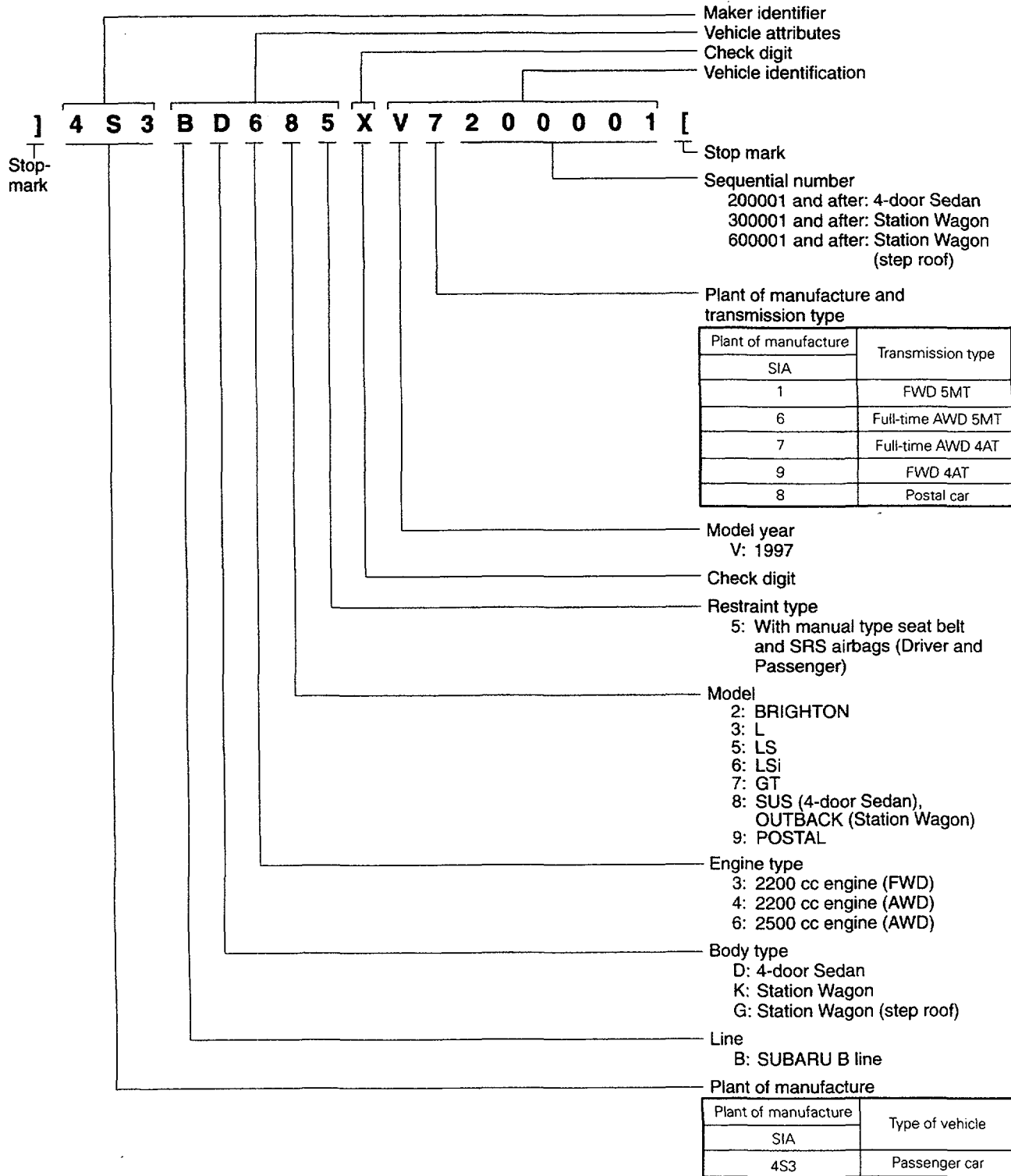
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2. Precaution for Supplemental Restraint System (Airbag)
3. Vehicle Identification Numbers (V.I.N.) 2
4. Identification Number and Label Locations
5. Recommended Fuel, Lubricants, Sealants and Adhesives
6. Tightening Torque of Standard Bolts and Nuts
7. Lifting, Towing and Tie-down Points
8. Front Hood Stay Installation

3. Vehicle Identification Numbers (V.I.N)

1. APPLICABLE V.I.N. IN THIS MANUAL

4-door Sedan	2500 cc engine	AWD SUS	4AT	4	S	3	B	D	6	8	5	X	V	7	2	0	0	0	0	1	and after
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2. THE MEANING OF V.I.N.



5. Control System

6. RADIATOR FAN CONTROL

● The ON-OFF control of the radiator fan is governed by the ECM which receives signals sent from the engine coolant temperature sensor.

Engine coolant temperature signal *1	ECM output signal	Operation of radiator fan
	Radiator fan relay 1	Main
ON	ON	ON (HI)
OFF	OFF	OFF

● On models which are equipped with an air conditioning system, the ECM receives signals sent from the engine coolant temperature sensor, vehicle speed sensor 2 and A/C switch. These signals simultaneously turn ON or OFF the radiator main fan and radiator sub fan as well as setting them at "HI" or "LO" speed.

Vehicle speed	A/C compressor	Engine coolant temperature					
		Less than 95°C (Less than 203°F)		Between 95 and 99°C (Between 203 and 210°F)		More than 100°C (More than 212°F)	
		Operation of radiator fan		Operation of radiator fan		Operation of radiator fan	
		Main	Sub	Main	Sub	Main	Sub
Less than 19 km/h (Less than 12 MPH)	OFF	OFF	OFF	Low	OFF	Low	Low
	ON	Low	Low	Hi	Hi	Hi	Hi
Between 20 and 69 km/h (Between 12 and 43 MPH)	OFF	OFF	OFF	Low	OFF	Hi	Hi
	ON	Hi	Hi	Hi	Hi	Hi	Hi
Between 70 and 104 km/h (Between 43 and 65 MPH)	OFF	OFF	OFF	OFF	OFF	Hi	Hi
	ON	Low	Low	Low	Low	Hi	Hi
More than 105 km/h (More than 65 MPH)	OFF	OFF	OFF	OFF	OFF	Hi	Hi
	ON	OFF	OFF	Low	OFF	Hi	Hi

7. FUEL PUMP CONTROL

The ECM receives a signal emitted from the crankshaft position sensor and turns the fuel pump relay ON or OFF to control fuel pump operation. To improve safety, the fuel pump will stop if the engine stalls with the ignition switch ON.

Ignition switch ON	Fuel pump relay	Fuel pump
A certain period of time (after ignition switch is turned ON)	ON	Operates
While cranking the engine	ON	Operates
While engine is operating	ON	Operates
When engine stops	OFF	Does not operate

2. FUNCTION

The operation of the internal equalizer type is as follows.

The expansion valve opening is automatically controlled by the functions of three force: the pressure of the temperature-sensing bulb (P_1) containing a liquid or vapor, the pressure at the expansion valve outlet (P_2), and the force of the spring (F).

Temperature-sensing bulb pressure (P_1)
..... Forces the diaphragm downward (opens the valve).

Pressure at the expansion valve outlet (P_2)
..... Forces the diaphragm upward (closes the valve).

Force of the spring (F)
..... Forces the ball upward (closes the valve).

A: Condition of the valve with the compressor in off.

Since the temperature around the evaporator is constant, the pressure in the evaporator is equal to that of the temperature-sensing bulb. Therefore, the force of the spring is greater than these pressures and the pressures are in the following condition:

$$P_1 = P_2$$

$$P_1 < P_2 + F$$

That means, the valve is closed with the ball pushed upward.

B: Operation of the valve with the sensing bulb at low temperatures

(When the temperature is low at evaporator outlet)

As the temperature of the compartment decreases, the heat load applied to the evaporator becomes less, and the temperatures at the evaporator outlet, and the sensing bulb drop. Accordingly, the valve tends to close, reducing the amount of refrigerant.

$$P_1 < P_2 + F$$

The amount of refrigerant is reduced.

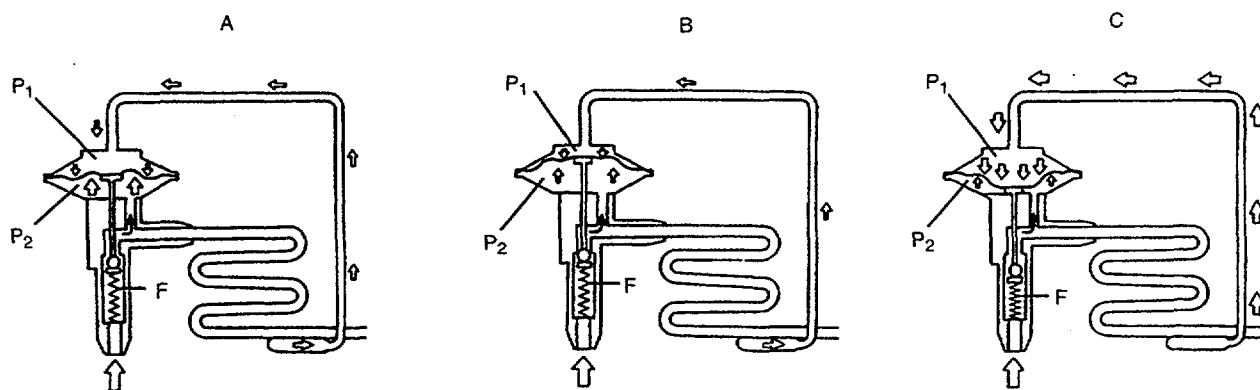
C: Operation of valve with the sensing bulb at high temperatures

(When the temperature is high at evaporator outlet)

As the temperature of the compartment rises, the heat load applied to the evaporator becomes greater, and the temperatures at the evaporator outlet, and the sensing bulb increase. Therefore, the valve tends to open, allowing more refrigerant to flow.

$$P_1 > P_2 + F$$

The amount of refrigerant is increased.



8. Compressor Control System

5. FAN CONTROL

The main fan and sub fan are switched between two stages, Hi and Low, according to the operating modes shown in the following table.

Vehicle speed	A/C compressor	Engine coolant temperature					
		Less than 95°C (Less than 203°F)		Between 95 and 99°C (Between 203 and 210°F)		More than 100°C (More than 212°F)	
		Operation of radiator fan		Operation of radiator fan		Operation of radiator fan	
		Main	Sub	Main	Sub	Main	Sub
Less than 19 km/h (Less than 12 MPH)	OFF	OFF	OFF	Low	OFF	Low	Low
	ON	Low	Low	Hi	Hi	Hi	Hi
Between 20 and 69 km/h (Between 12 and 43 MPH)	OFF	OFF	OFF	Low	OFF	Hi	Hi
	ON	Hi	Hi	Hi	Hi	Hi	Hi
Between 70 and 104 km/h (Between 43 and 65 MPH)	OFF	OFF	OFF	OFF	OFF	Hi	Hi
	ON	Low	Low	Low	Low	Hi	Hi
More than 105 km/h (More than 65 MPH)	OFF	OFF	OFF	OFF	OFF	Hi	Hi
	ON	OFF	OFF	Low	OFF	Hi	Hi

WIRING DIAGRAM SECTION

FOREWORD

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

Please study and then utilize this supplement together with LEGACY SERVICE MANUAL and SERVICE MANUAL SUPPLEMENTS published already.

When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

The star marks for title indexes referred to represent:

- ☆1: Refer to 95MY Service Manual.
- ☆2: Refer to 96MY Service Manual Supplement.
- ☆3: Refer to 95MY Service Manual Supplement for right-hand drive vehicle model.
- ☆4: Refer to 96MY Service Manual Supplement for right-hand drive vehicle model.
- ☆5: Refer to 96MY Service Manual Supplement for ABS 5.3 equipped model.
- ☆6: Refer to 96MY Service Manual Supplement for enhanced evaporative emission control system equipped model.
- ☆7: Refer to 96MY Service Manual Supplement for enhanced evaporative emission control system equipped right-hand vehicle model.
- ☆8: Refer to 97MY Service Manual Supplement.
- ☆9: Refer to 97MY Service Manual Supplement for SUS model.
- ☆10: Refer to 97MY Service Manual Supplement for ABS 5.3i equipped model.
- ☆11: Refer to 97MY Service Manual Supplement for rear window defogger timer equipped model.

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

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WIRING DIAGRAM

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1. Important Safety Notice

- Providing appropriate service and repair is a matter of great importance in the serviceman's safety maintenance and safe operation, function and performance which the SUBARU vehicle possesses.
- In case the replacement of parts or replenishment of consumables is required, genuine SUBARU parts whose parts numbers are designated or their equivalents must be utilized.
- It must be made well known that the safety of the serviceman and the safe operation of the vehicle would be jeopardized if he used any service parts, consumables, special tools and work procedure manuals which are not approved or designated by SUBARU.

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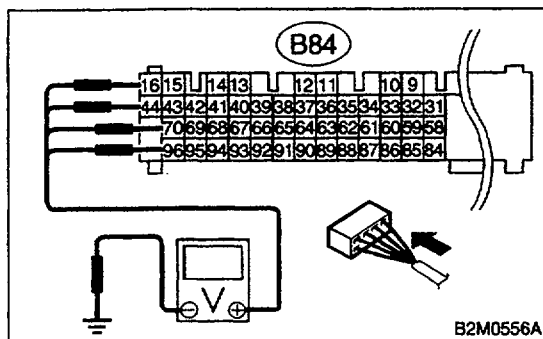
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10AA1 : CHECK OUTPUT SIGNAL FROM ECM.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM connector and chassis ground on faulty cylinders.

Connector & terminal

- #1 (B84) No. 96 (+) — Chassis ground (-):
- #2 (B84) No. 70 (+) — Chassis ground (-):
- #3 (B84) No. 44 (+) — Chassis ground (-):
- #4 (B84) No. 16 (+) — Chassis ground (-):



- CHECK** : *Is the voltage more than 10 V?*
- YES** : Go to step 10AA2.
- NO** : Go to step 10AA3.

10AA2 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1]. ☆12>

- CHECK** : *Is there poor contact in ECM connector?*
- YES** : Repair poor contact in ECM connector.
- NO** : Contact with SOA service.

NOTE:

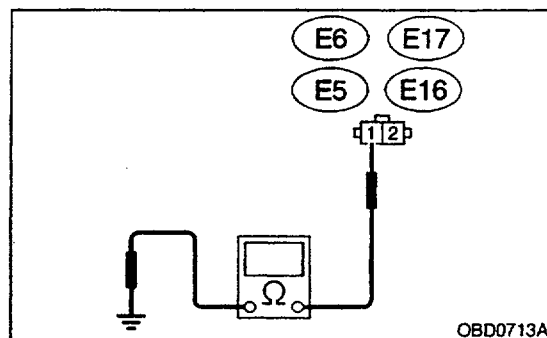
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

10AA3 : CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from fuel injector on faulty cylinders.
- 3) Measure resistance between ECM connector and engine ground on faulty cylinders.

Connector & terminal

- #1 (E5) No. 1 — Engine ground:
- #2 (E16) No. 1 — Engine ground:
- #3 (E6) No. 1 — Engine ground:
- #4 (E17) No. 1 — Engine ground:



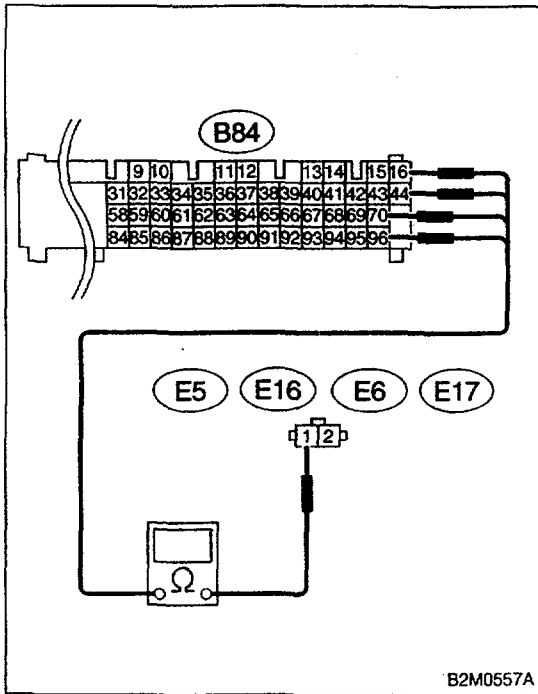
- CHECK** : *Is the resistance less than 10 Ω?*
- YES** : Repair ground short circuit in harness between fuel injector and ECM connector.
- NO** : Go to step 10AA4.

10AA4 : CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.

Measure resistance of harness connector between ECM connector and fuel injector on faulty cylinders.

Connector & terminal

- #1 (B84) No. 96 — (E5) No. 1:
- #2 (B84) No. 70 — (E16) No. 1:
- #3 (B84) No. 44 — (E6) No. 1:
- #4 (B84) No. 16 — (E17) No. 1:

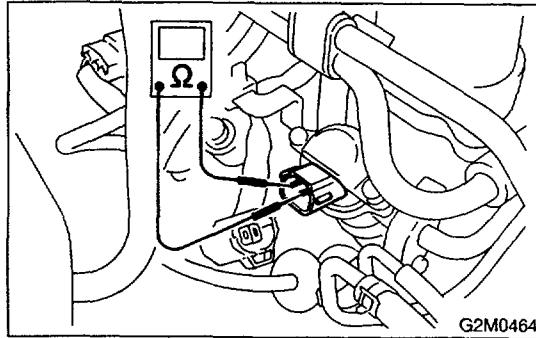


10AA5 : CHECK FUEL INJECTOR.

Measure resistance between fuel injector terminals on faulty cylinder.

Terminals

No. 1 — No. 2:



- CHECK** : Is the resistance between 5 and 20 Ω?
- YES** : Go to step 10AA6.
- NO** : Replace faulty fuel injector.

- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 10AA5.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

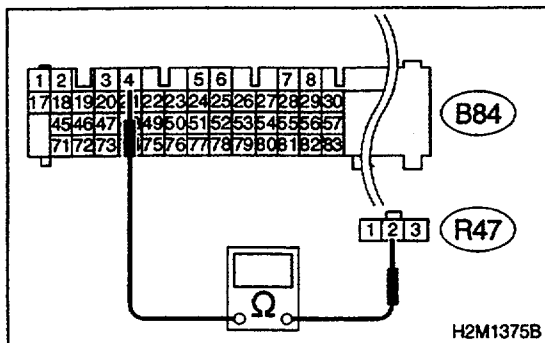
- Open circuit in harness between ECM and fuel injector connector
- Poor contact in coupling connector (B22)

10AY8 : CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM and pressure sensor connector.

Connector & terminal

(B84) No. 4 — (R47) No. 2:



- CHECK** : *Is the resistance less than 1 Ω?*
- YES** : Go to step 10AY9.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

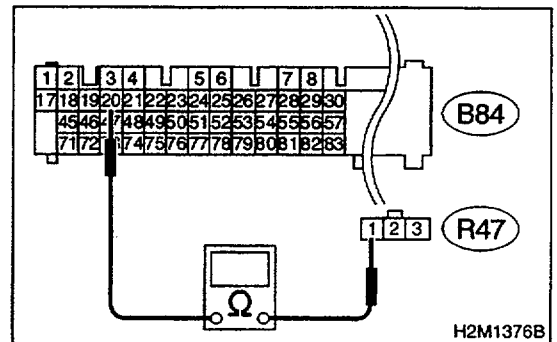
- Open circuit in harness between ECM and fuel tank pressure sensor connector
- Poor contact in coupling connector (B98)

10AY9 : CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.

Measure resistance of harness between ECM and fuel tank pressure sensor connector.

Connector & terminal

(B84) No. 20 — (R47) No. 1:



- CHECK** : *Is the resistance less than 1 Ω?*
- YES** : Go to step 10AY15.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

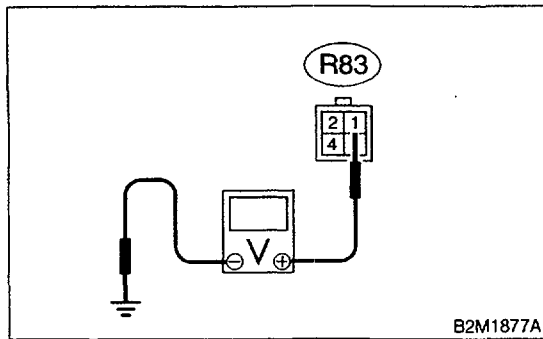
- Open circuit in harness between ECM and fuel tank pressure sensor connector
- Poor contact in coupling connector (B98)

10AY10 : CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Remove rear seat cushion (Sedan) or move rear seat cushion (Wagon).
- 3) Separate rear wiring harness and fuel tank cord.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between rear wiring harness connector and chassis ground.

Connector & terminal

(R83) No. 1 (+) — Chassis ground (-):



CHECK : *Is the voltage more than 4.5 V?*

YES : Go to step 10AY11.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

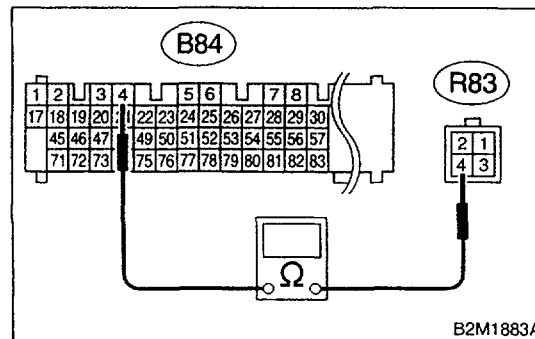
- Open circuit in harness between ECM and rear wiring harness connector (R83)
- Poor contact in coupling connector (B97)

10AY11 : CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM and rear wiring harness connector.

Connector & terminal

(B84) No. 4 — (R83) No. 4:



CHECK : *Is the resistance less than 1 Ω?*

YES : Go to step 10AY12.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and rear wiring harness connector (R83)
- Poor contact in coupling connector (B98)

1999 LEGACY SERVICE MANUAL SUPPLEMENT FOR SUS PRECEDENCE PRODUCTION VEHICLE QUICK REFERENCE INDEX

GENERAL INFORMATION SECTION

FOREWORD

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- ☆4: Refer to 96MY Right Hand Drive Service Manual Supplement.
- ☆5: Refer to 96MY Service Manual Supplement ABS 5.3 equipped model.
- ☆6: Refer to 96MY Service Manual Supplement enhanced evaporative emission control system equipped model.
- ☆7: Refer to 96MY Service Manual Supplement right hand drive vehicle enhanced evaporative emission control system equipped model.
- ☆8: Refer to 97MY Service Manual Supplement.
- ☆9: Refer to 97MY Service Manual Supplement for SUS model.
- ☆10: Refer to 97MY Service Manual Supplement for ABS 5.3i equipped model.
- ☆11: Refer to 97MY Service Manual Supplement for rear window defogger timer equipment model.
- ☆12: Refer to 98MY Service Manual Supplement.
- ☆13: Refer to 99MY Service Manual Supplement for SUS precedence production vehicle.

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

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4. SUS (Sports Utility Sedan)	2

4. SUS (Sports Utility Sedan)

J: WEIGHT

1. AMERICA SPEC. VEHICLE

Model			2500
			AWD
			SUS
			4AT**1
Curb weight (C.W.)	Front	kg (lb)	810 (1,785)
	Rear	kg (lb)	625 (1,375)
	Total	kg (lb)	1,435 (3,160)
Gross vehicle weight (G.V.W.)	Front	kg (lb)	950 (2,095)
	Rear	kg (lb)	925 (2,045)
	Total	kg (lb)	1,875 (4,140)

**1: Includes the weights of P/W, P/D, A/C, C/C, and ABS.

NOTE:

When any of the following optional parts are installed, add the weight to the curb weight.

Weight of optional parts	Power window (P/W)	Power door lock (P/D)	ABS	Air conditioning (A/C)	Cruise control (C/C)	Cold weather pack (C/W)	Sun roof (S/R)	Leather seat and security (L/S)
Front kg (lb)	1.4 (3.1)	0.1 (0.2)	12.0 (26.4)	21.2 (46.6)	1.0 (2.2)	1.2 (2.7)	6.5 (14.3)	1.1 (2.4)
Rear kg (lb)	1.7 (3.7)	0.4 (0.9)	10.2 (22.4)	-2.0 (-4.4)	0.1 (0.2)	0.7 (1.5)	9.3 (20.5)	1.6 (3.6)
Total kg (lb)	3.1 (6.8)	0.5 (1.1)	22.2 (48.8)	19.2 (42.2)	1.1 (2.4)	1.9 (4.2)	15.8 (34.8)	2.7 (6.0)

GENERAL INFORMATION

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2. Precaution for Supplemental Restraint System (Airbag)
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4. Identification Number and Label Locations
5. Recommended Fuel, Lubricants, Sealants and Adhesives
6. Tightening Torque of Standard Bolts and Nuts
7. Lifting, Towing and Tie-down Points
8. Front Hood Stay Installation

3. Vehicle Identification Numbers (V.I.N.)

3. Vehicle Identification Numbers (V.I.N.)

A. APPLICABLE V.I.N. IN THIS MANUAL

4-door Sedan	2500 cc engine	AWD SUS	4AT	4	S	3	B	D	6	8	5	X	X	7	2	4	0	0	0	1	and after
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B. THE MEANING OF V.I.N.

