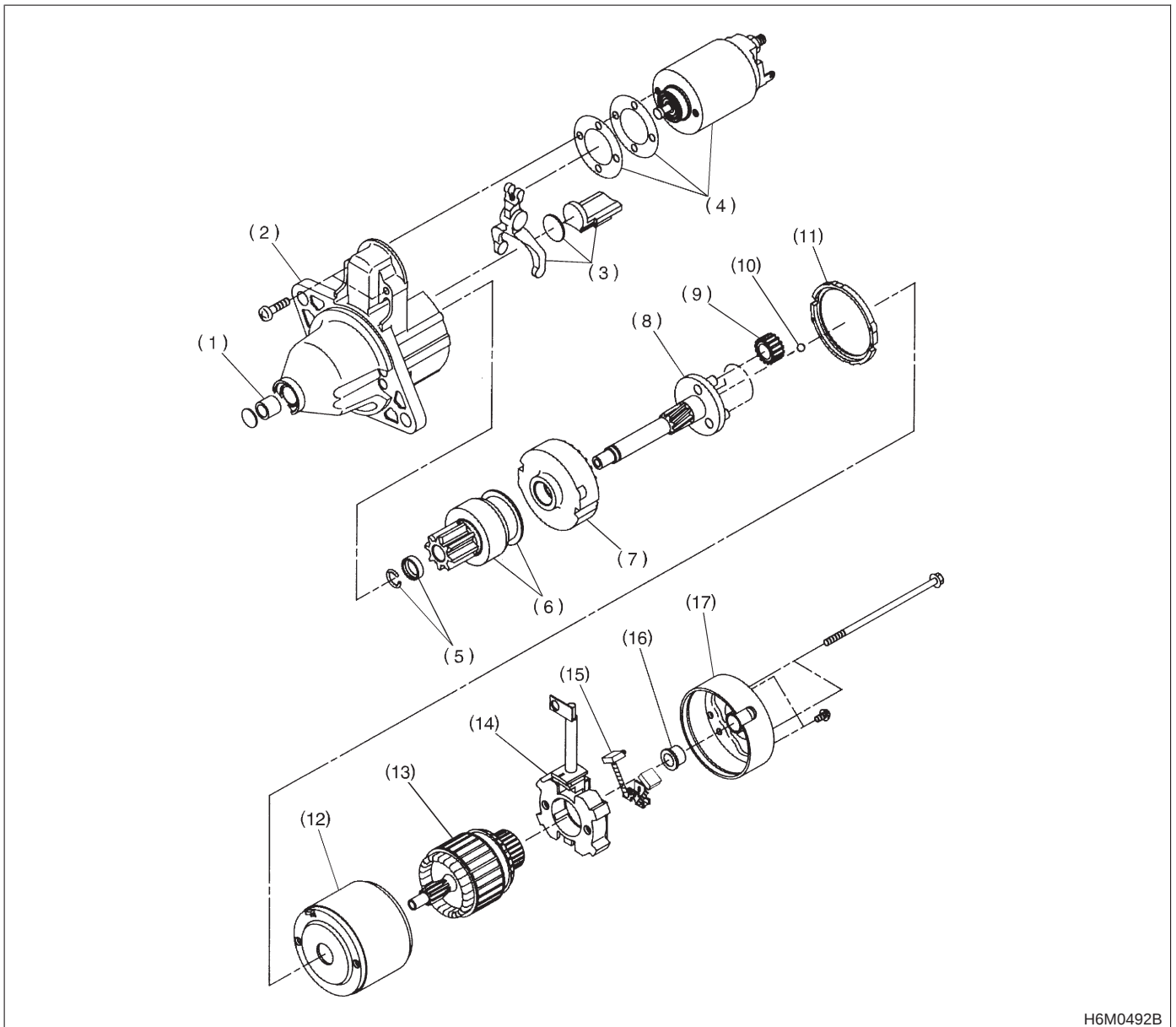


1. Specifications

1. Specifications

Item			Designation	
Starter	Type		Reduction type	
	Model		MT M000T81681	AT M001T84481
	Manufacturer		MITSUBISHI	
	Voltage and output		12 V — 1.0 kW	12 V — 1.4 kW
	Direction of rotation		Counterclockwise (when observed from pinion)	
	Number of pinion teeth		8	9
	No-load characteristics	Voltage	11 V	
		Current	90 A or less	
		Rotating speed	3,000 rpm or more	
	Load characteristics	Voltage	8 V	7.7 V
		Current	280 A or less	300 A or less
		Torque	8.5 N·m (0.87 kg-m, 6.27 ft-lb)	9.8 N·m (1.00 kg-m, 7.24 ft-lb)
		Rotating speed	980 rpm or more	1,000 rpm or more
	Lock characteristics	Voltage	4 V	
		Current	780 A or less	980 A or less
		Torque	17.6 N·m (1.80 kg-m, 13.0 ft-lb) or more	23 N·m (2.3 kg-m, 17 ft-lb) or more
Generator	Type		Rotating-field three-phase type, Voltage regulator built-in type	
	Model		A2TB2991	
	Manufacturer		MITSUBISHI	
	Voltage and output		12 V — 75 A	
	Polarity on ground side		Negative	
	Rotating direction		Clockwise (when observed from pulley side)	
	Armature connection		3-phase Y-type	
	Output current		1,500 rpm — 30 A or more 2,500 rpm — 64 A or more 5,000 rpm — 76 A or more	
	Regulated voltage		14.5 ^{+0.3} / _{-0.4} V [20°C (68°F)]	
Ignition coil and ignitor assembly	Model		FH0137-01R	
	Manufacturer		DEMCO	
	Primary coil resistance		0.73 Ω±10%	
	Secondary coil resistance		12.8 kΩ±15%	
	Insulation resistance between primary terminal and case		More than 10 MΩ	
Spark plug	Type and manufacturer	Standard	RC10YC4 CHAMPION	
		Alternate	BKR5E-11 NGK	
	Thread size		mm 14, P = 1.25	
	Spark gap		mm (in) 1.0 — 1.1 (0.039 — 0.043)	

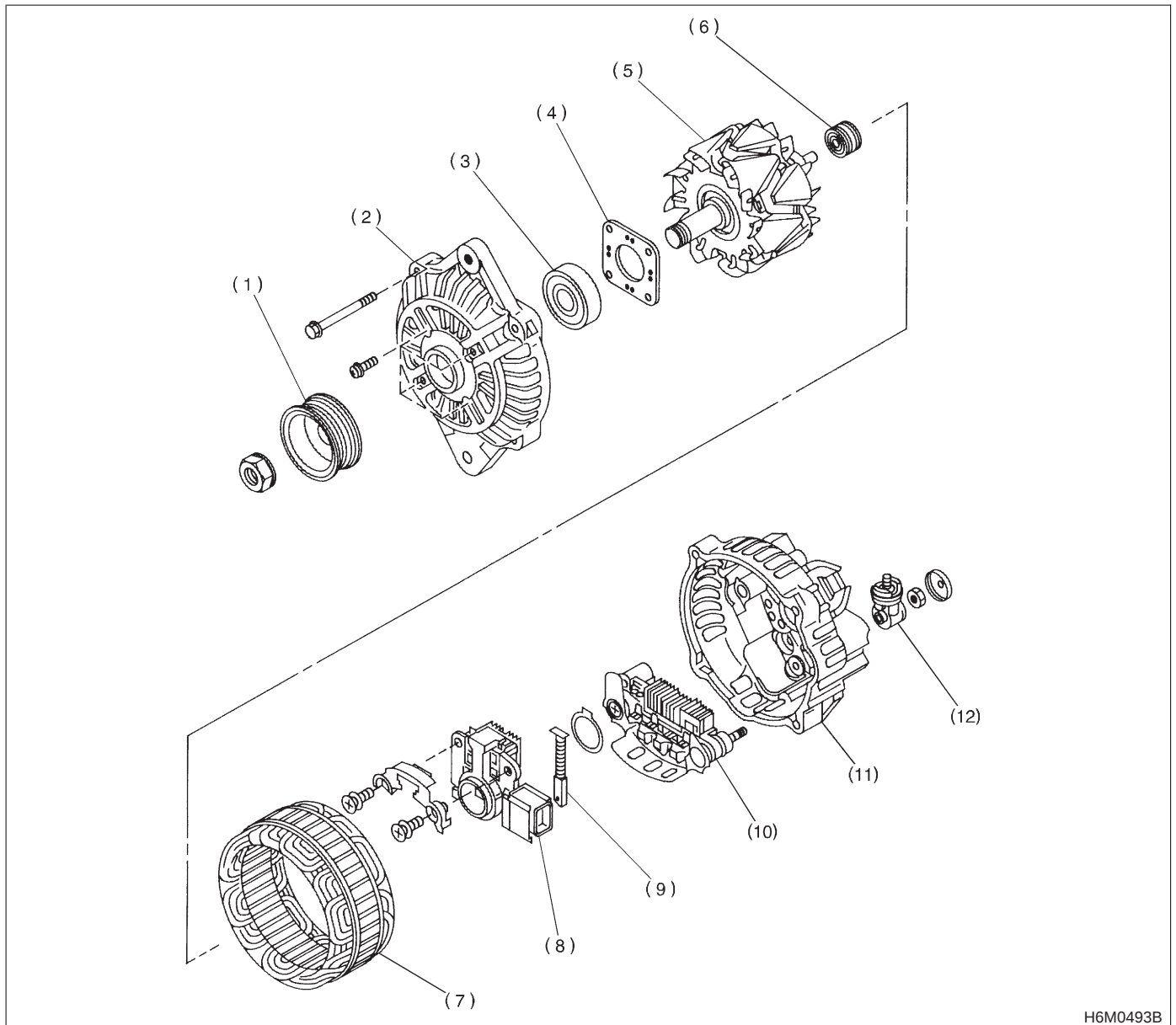
1. Starter



H6M0492B

- | | | |
|-------------------------|------------------------|---------------------|
| (1) Sleeve bearing | (7) Internal gear ASSY | (13) Armature |
| (2) Front bracket | (8) Shaft ASSY | (14) Brush holder |
| (3) Lever set | (9) Gear ASSY | (15) Brush |
| (4) Magnet switch ASSY | (10) Ball | (16) Sleeve bearing |
| (5) Stopper set | (11) Packing | (17) Rear bracket |
| (6) Over running clutch | (12) Yoke | |

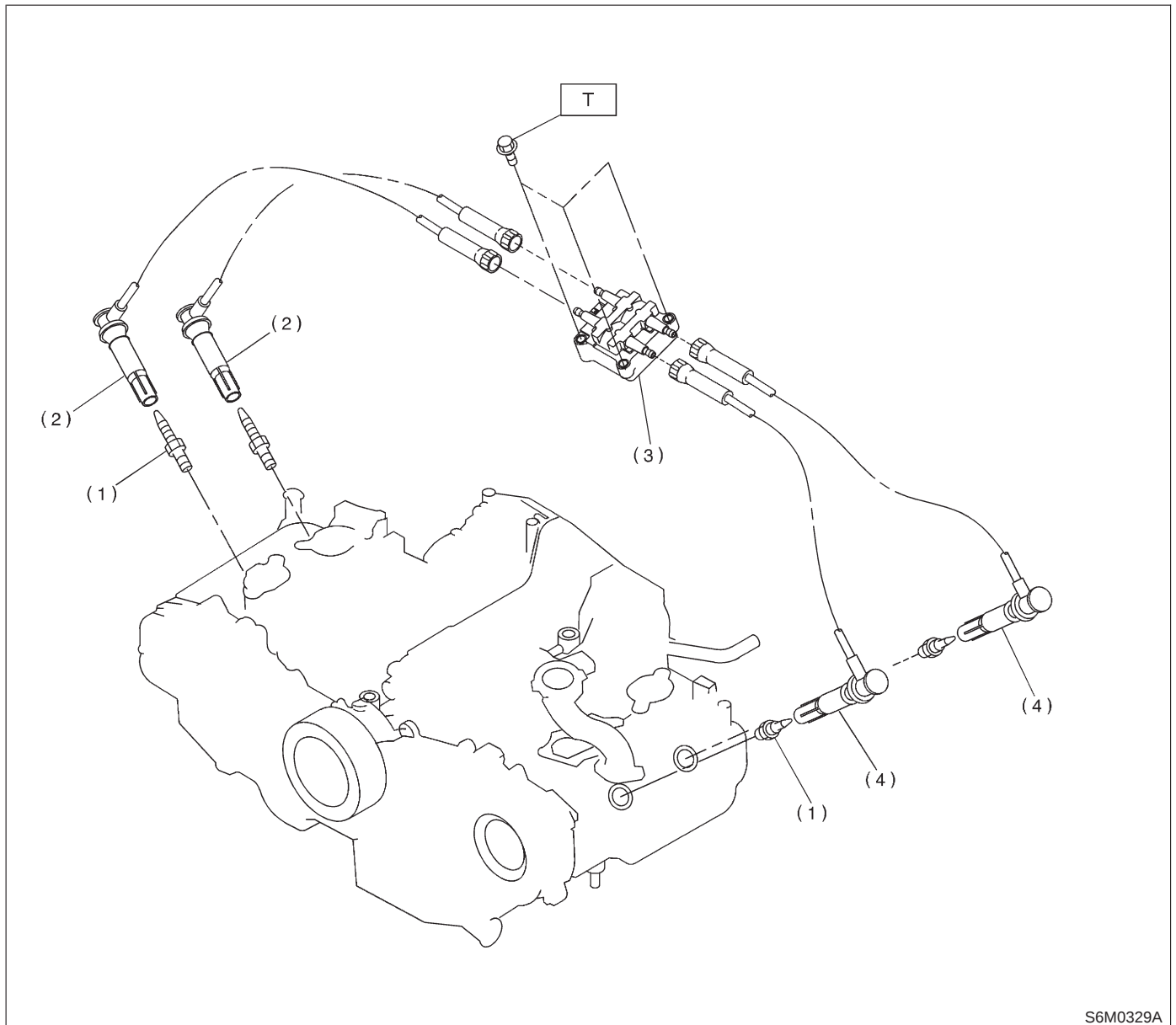
2. Generator



H6M0493B

- | | | |
|----------------------|-----------------------------|-----------------|
| (1) Pulley | (5) Rotor | (9) Brush |
| (2) Front cover | (6) Bearing | (10) Rectifier |
| (3) Ball bearing | (7) Stator coil | (11) Rear cover |
| (4) Bearing retainer | (8) IC regulator with brush | (12) Terminal |

3. Ignition System



S6M0329A

- (1) Spark plug
- (2) Spark plug cord (#1, #3)
- (3) Ignition coil and ignitor ASSY
- (4) Spark plug cord (#2, #4)

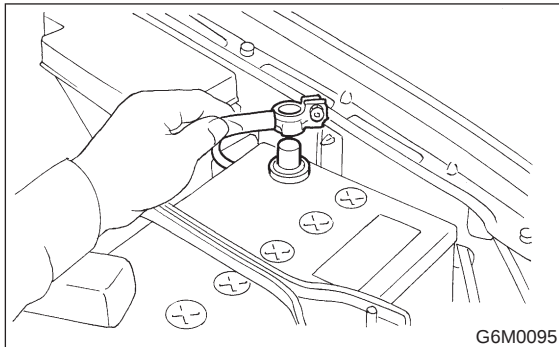
Tightening torque: N·m (kg·m, ft·lb)
T: 22±2 (2.2±0.2, 15.9±1.4)

1. Starter

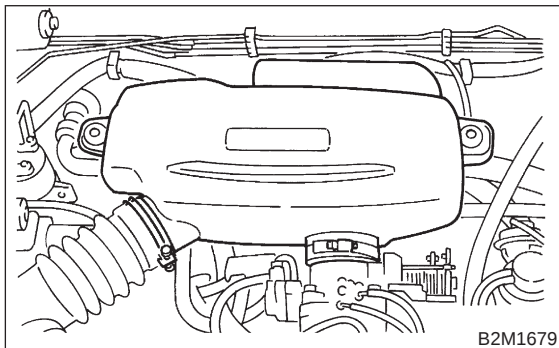
A: REMOVAL AND INSTALLATION

1. 2200 cc MODEL

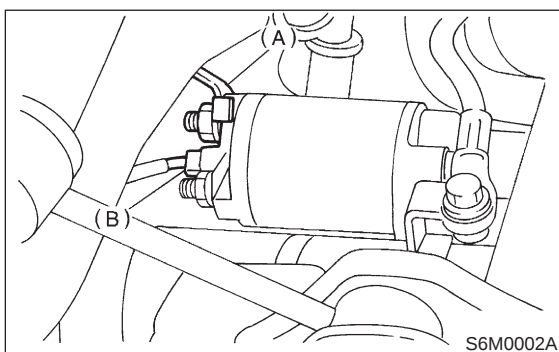
- 1) Disconnect battery ground cable.



- 2) Remove air intake chamber. <Ref. to 2-7 [W18A0].>

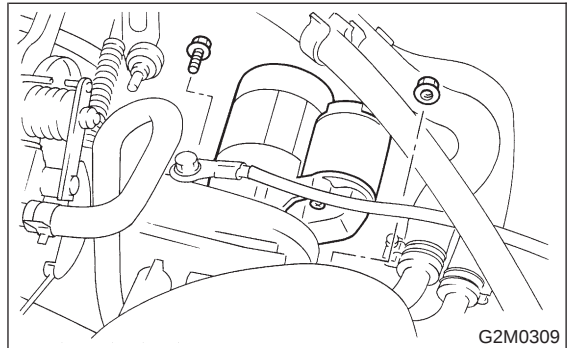


- 3) Disconnect connector and terminal from starter.



- (A) Terminal
(B) Connector

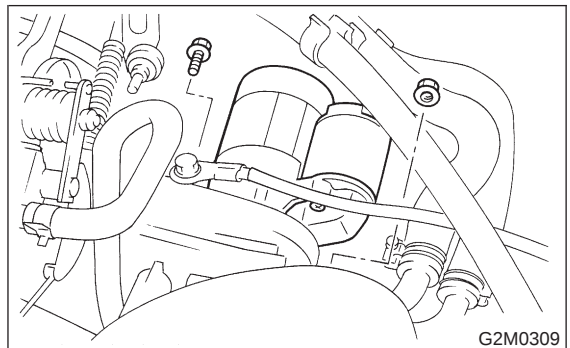
- 4) Remove starter from transmission.



- 5) Installation is in the reverse order of removal.

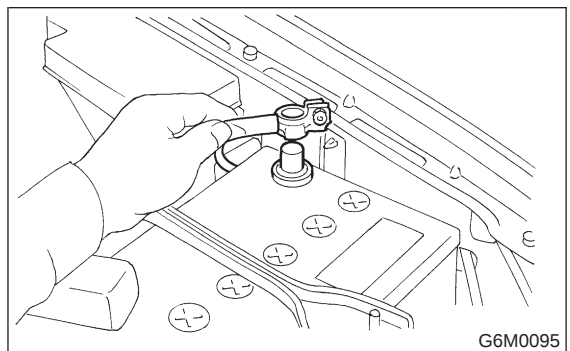
Tightening torque:

$50 \pm 4 \text{ N}\cdot\text{m}$ ($5.1 \pm 0.4 \text{ kg}\cdot\text{m}$, $36.9 \pm 2.9 \text{ ft}\cdot\text{lb}$)

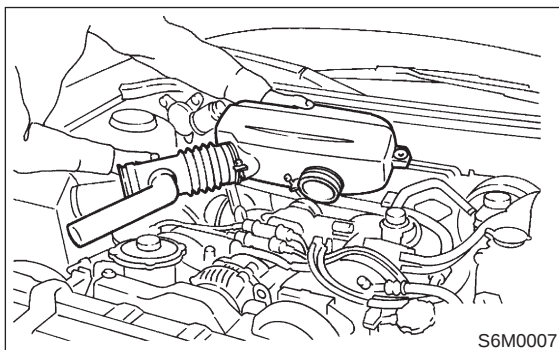


2. 2500 cc MODEL

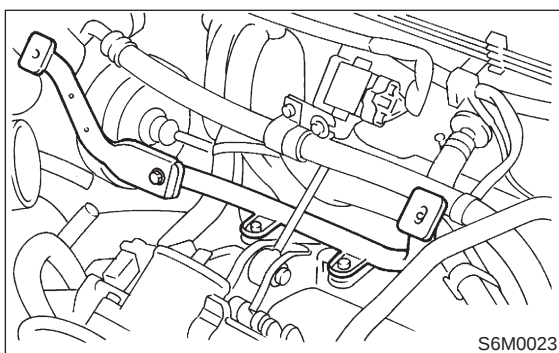
- 1) Disconnect battery ground cable.



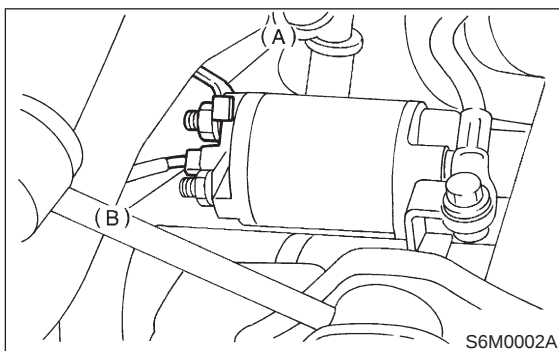
- 2) Remove air intake chamber. <Ref. to 2-7 [W18A0].>



- 3) Remove air intake chamber stay. (AT vehicles only)

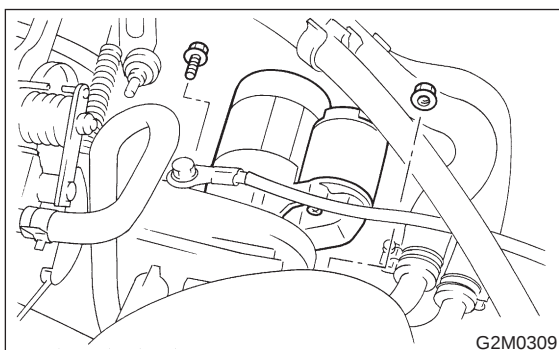


- 4) Disconnect connector and terminal from starter.



- (A) Terminal
(B) Connector

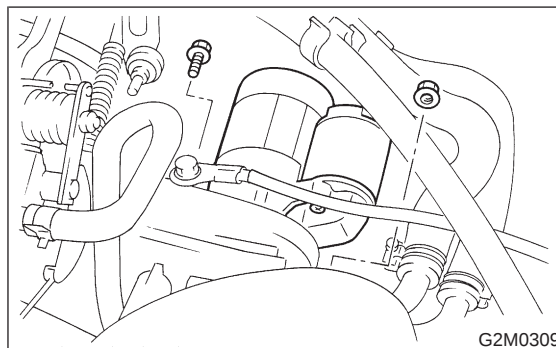
- 5) Remove starter from transmission.



- 6) Installation is in the reverse order of removal.

Tightening torque:

$50 \pm 4 \text{ N}\cdot\text{m}$ ($5.1 \pm 0.4 \text{ kg}\cdot\text{m}$, $36.9 \pm 2.9 \text{ ft}\cdot\text{lb}$)



B: TEST

1. SWITCH ASSEMBLY OPERATION

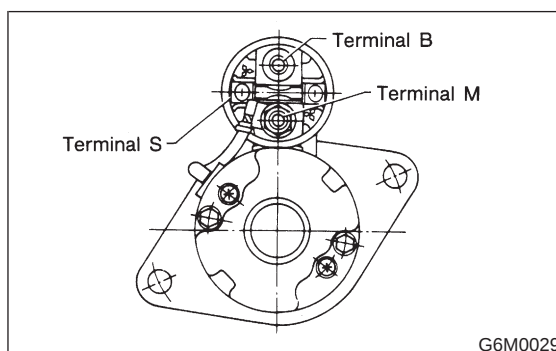
- 1) Connect terminal S of switch assembly to positive terminal of battery with a lead wire, and starter body to ground terminal of battery. Pinion should be forced endwise on shaft.

CAUTION:

With pinion forced endwise on shaft, starter motor can sometimes rotate because current flows, through pull-in coil, to motor. This is not a problem.

- 2) Disconnect connector from terminal M, and connect positive terminal of battery and terminal M using a lead wire and ground terminal to starter body.

In this test set up, pinion should return to its original position even when it is pulled out with a screwdriver.



6-1 [W1B2]

1. Starter

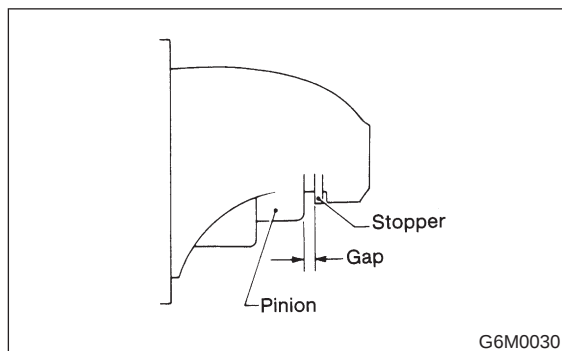
SERVICE PROCEDURE

2. PINION GAP

1) With pinion forced endwise on shaft, as outlined in step 1) before <Ref. to 6-1 [W1B1].>, measure pinion gap.

Pinion gap:

0.5 — 2.0 mm (0.020 — 0.079 in)



2) If motor is running with the pinion forced endwise on the shaft, disconnect connector from terminal M of switch assembly and connect terminal M to ground terminal (–) of battery with a lead wire. Next, gently push pinion back with your fingertips and measure pinion gap.

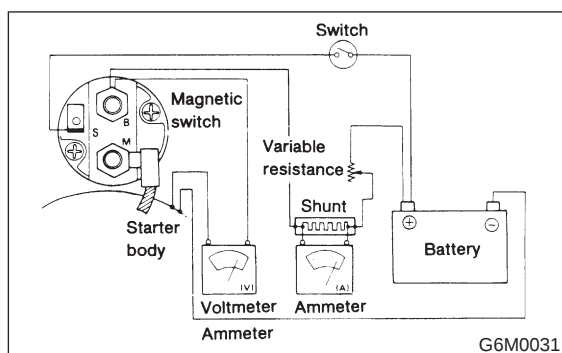
3) If pinion gap is outside specified range, remove or add number of adjustment washers used on the mounting surface of switch assembly until correct pinion gap is obtained.

3. PERFORMANCE TEST

The starter should be submitted to performance tests whenever it has been overhauled, to assure its satisfactory performance when installed on the engine.

Three performance tests, no-load test, load test, and lock test, are presented here; however, if the load test and lock test cannot be performed, carry out at least the no-load test.

For these performance tests, use the circuit shown in figure.



1) No-load test

With switch on, adjust the variable resistance to obtain 11 V, take the ammeter reading and measure the starter speed. Compare these values with the specifications.

No-load test (Standard):

Voltage / Current

11 V / 90 A or less

Rotating speed

• **MT vehicles 2,800 rpm or more**

• **AT vehicles 2,400 rpm or more**

2) Load test

Apply the specified braking torque to starter. The condition is satisfactory if the current draw and starter speed are within specifications.

Load test (Standard):

• MT vehicles

Voltage / Load

7.5 V / 8.73 N·m (0.89 kg-m, 6.4 ft-lb)

Current / Speed

300 A / 890 rpm or more

• AT vehicles

Voltage / Load

7.7 V / 16.00 N·m (1.63 kg-m, 11.8 ft-lb)

Current / Speed

400 A max. / 740 rpm or more

3) Lock test

With starter stalled, or not rotating, measure the torque developed and current draw when the voltage is adjusted to the specified voltage.

Lock test (Standard):

• MT vehicles

Voltage / Load

4 V / 780 A or less

Torque

15.7 N·m (1.60 kg-m, 11.6 ft-lb) or more

• AT vehicles

Voltage / Current

3.5 V / 940 A or less

Torque

28.9 N·m (2.95 kg-m, 21.3 ft-lb) or more

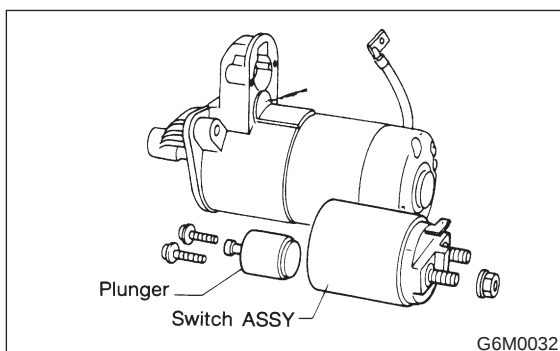
C: DISASSEMBLY

1. STARTER ASSEMBLY

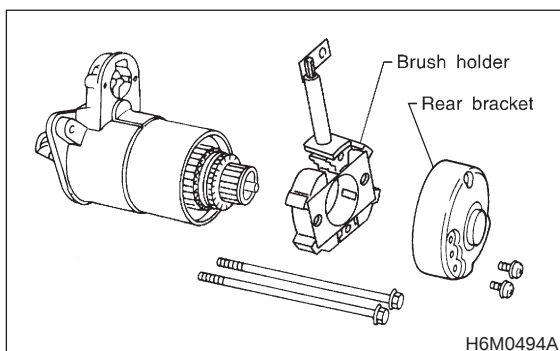
- 1) Loosen nut which holds terminal M of switch assembly, and disconnect connector.
- 2) Remove bolts which hold switch assembly, and remove switch assembly, plunger and plunger spring from starter as a unit.

CAUTION:

Be careful because pinion gap adjustment washer may sometimes be used on the mounting surface of switch assembly.



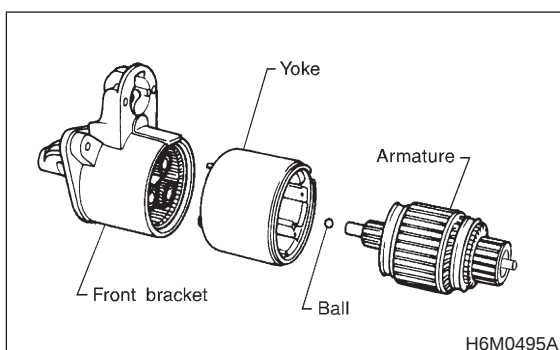
- 3) Remove both through-bolts and brush holder screws, and detach rear bracket and brush holder.



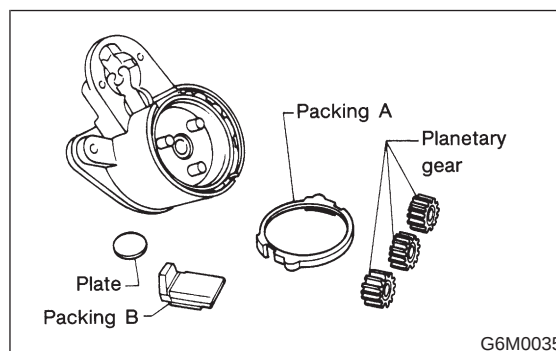
- 4) Remove armature and yoke. Ball used as a bearing will then be removed from the end of armature.

CAUTION:

Be sure to mark an alignment mark on yoke and front bracket before removing yoke.



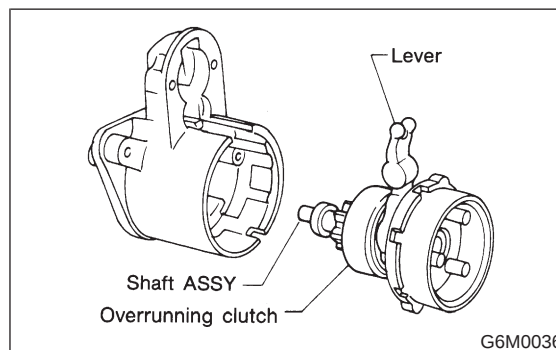
- 5) Remove packing A, three planetary gears, packing B and plate.



- 6) Remove shaft assembly and overrunning clutch as a unit.

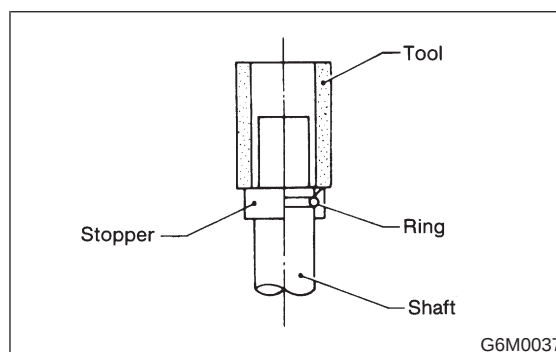
CAUTION:

Record the direction of lever before removing.



- 7) Remove overrunning clutch from shaft assembly as follows:

- (1) Remove stopper from ring by lightly tapping a fit tool placed on stopper.
- (2) Remove ring, stopper and clutch from shaft.



6-1 [W1C2]

1. Starter

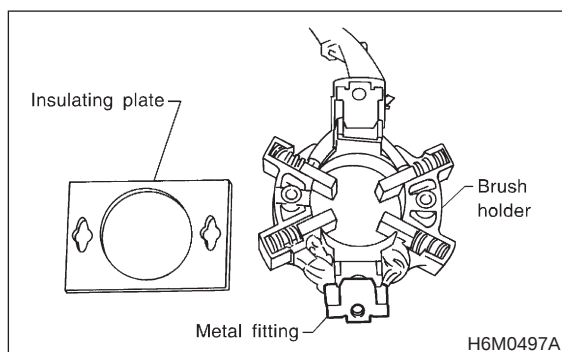
SERVICE PROCEDURE

2. BRUSH HOLDER

Slightly open the metal fitting holding the insulating plate to the brush holder. Remove the insulating plate.

NOTE:

The brush and spring can be easily removed from the brush holder at this time.



D: INSPECTION

1. ARMATURE

1) Check commutator for any sign of burns or rough surfaces or stepped wear. If wear is of a minor nature, correct it by using sand paper.

2) Run-out test

Check the commutator run-out and replace if it exceeds the limit.

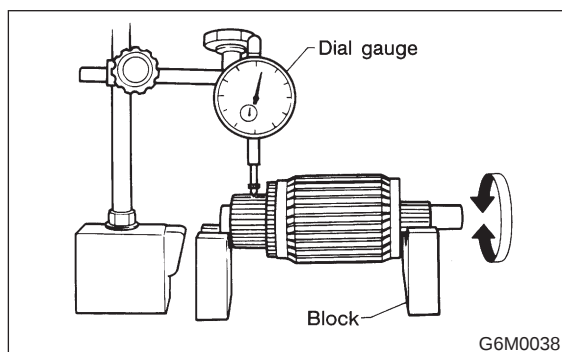
Commutator run-out:

Standard

0.05 mm (0.0020 in)

Service limit

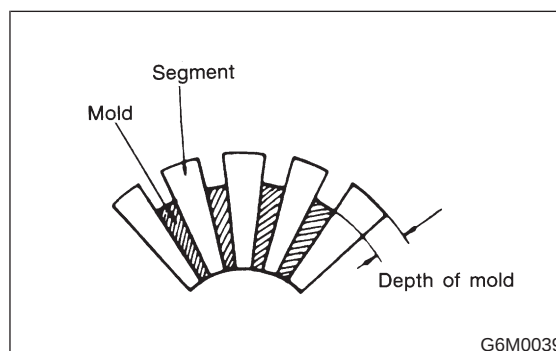
Less than 0.10 mm (0.0039 in)



3) Depth of segment mold
Check the depth of segment mold.

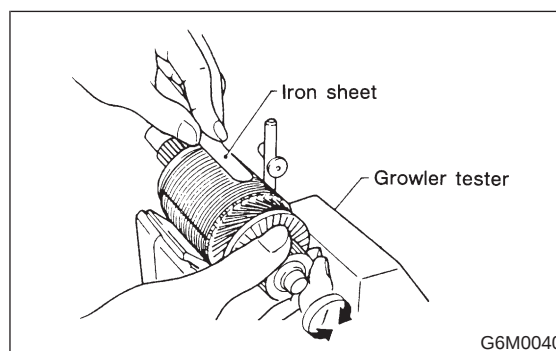
Depth of segment mold:

0.5 mm (0.020 in)



4) Armature short-circuit test

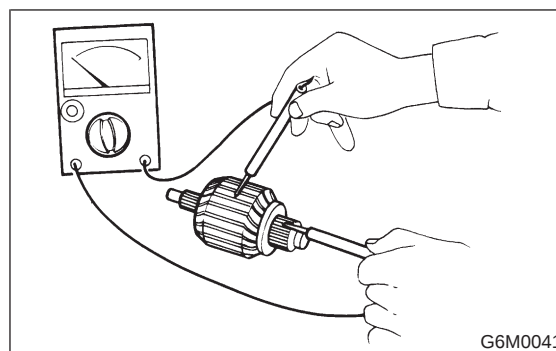
Check armature for short-circuit by placing it on growler tester. Hold a hacksaw blade against armature core while slowly rotating armature. A short-circuited armature will cause the blade to vibrate and to be attracted to core. If the hacksaw blade is attracted or vibrates, the armature, which is short-circuited, must be replaced or repaired.



5) Armature ground test

Using circuit tester, touch one probe to the commutator segment and the other to shaft. There should be no continuity. If there is a continuity, armature is grounded.

Replace armature if it is grounded.



2. YOKE

Make sure pole is set in position.

3. OVERRUNNING CLUTCH

Inspect teeth of pinion for wear and damage. Replace if it damaged. Rotate pinion in direction of rotation (clockwise). It should rotate smoothly. But in opposite direction, it should be locked.

CAUTION:

Do not clean overrunning clutch with oil to prevent grease from flowing out.

4. BRUSH AND BRUSH HOLDER

1) Brush length

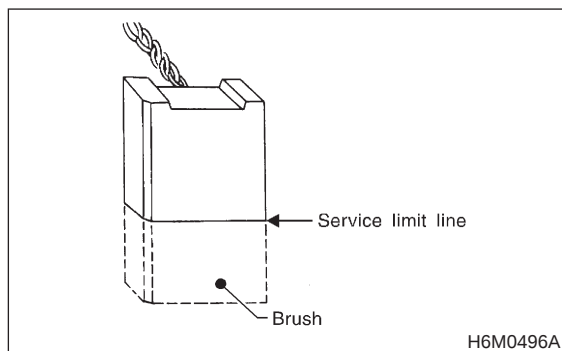
Measure the brush length and replace if it exceeds the service limit.

Replace if abnormal wear or cracks are noticed.

Brush length:

Standard 17.0 mm (0.669 in)

Service limit 11.5 mm (0.453 in)



2) Brush movement

Be sure brush moves smoothly inside brush holder.

3) Brush spring force

Measure brush spring force with a spring scale. If it is less than the service limit, replace brush spring.

Brush spring force:

Standard

21.6 N (2.2 kg, 4.9 lb) (when new)

Service limit

5.9 N (0.6 kg, 1.3 lb)

5. SWITCH ASSEMBLY

Be sure there is continuity between terminals S and M, and between terminal S and ground. Use a circuit tester (set in "ohm").

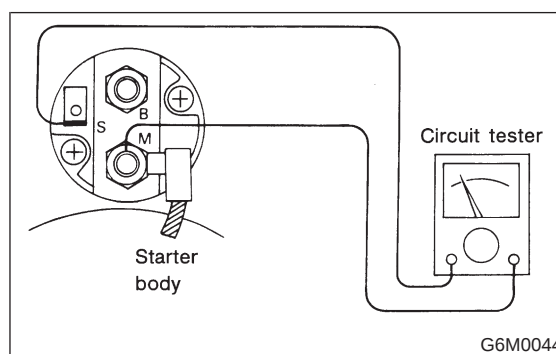
Also check to be sure there is no continuity between terminal M and B.

Terminal / Specified resistance:

S—M / Continuity

S—Ground / Continuity

M—B / No continuity



E: ASSEMBLY

Assembly is in the reverse order of disassembly procedures. Observe the following:

1) Carefully assemble all parts in the order of assembly and occasionally inspect nothing has been overlooked.

2) Apply grease to the following parts during assembly.

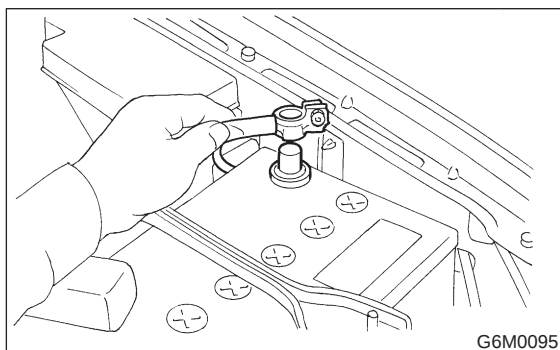
- Front bracket sleeve bearing
- Armature shaft gear
- Outer periphery of plunger
- Mating surface of plunger and lever
- Gear shaft splines
- Mating surface of lever and clutch
- Ball at the armature shaft end
- Internal and planetary gears

3) After assembling parts correctly, check to be sure starter operates properly.

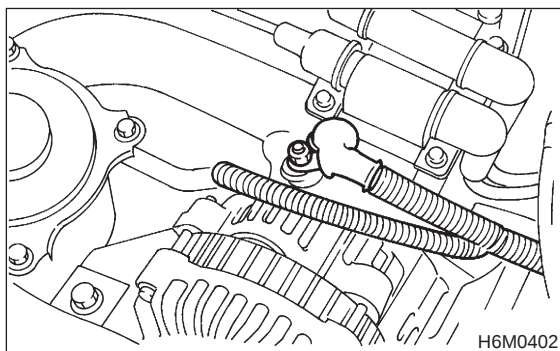
2. Generator

A: REMOVAL AND INSTALLATION

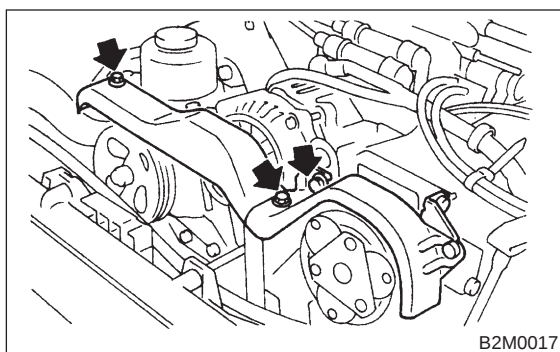
- 1) Disconnect battery ground cable.



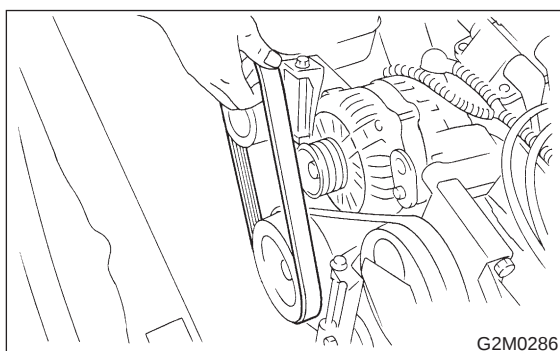
- 2) Disconnect connector and terminal from generator.



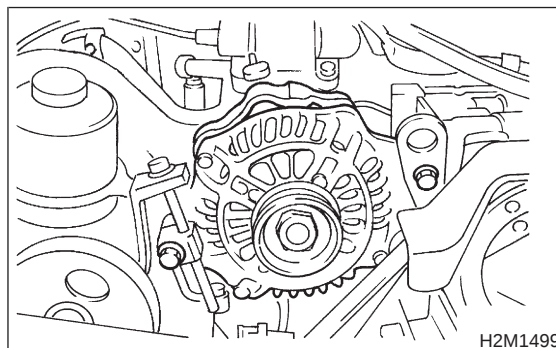
- 3) Remove V-belt cover.



- 4) Remove front side V-belt.



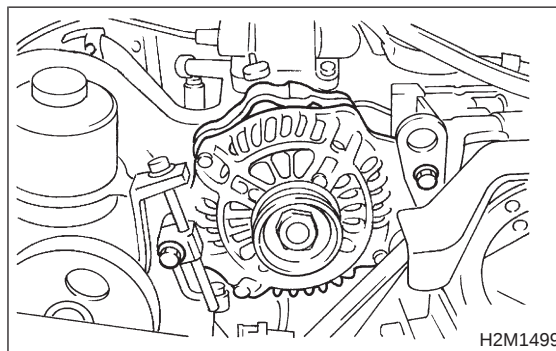
- 5) Remove bolts which install generator onto bracket.



- 6) Installation is in the reverse order of removal.

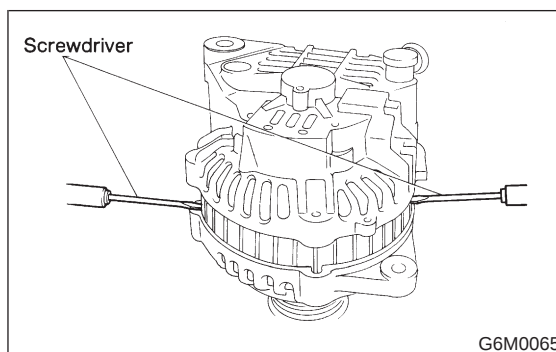
CAUTION:

Check and adjust V-belt tension. <Ref. to 1-5 [G2A0].>

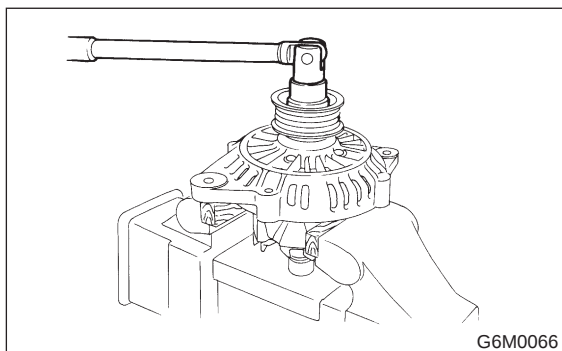


B: DISASSEMBLY

- 1) Remove the four through bolts. Then insert the tip of a flat-head screwdriver into the gap between the stator core and front bracket. Pry then apart to disassemble.

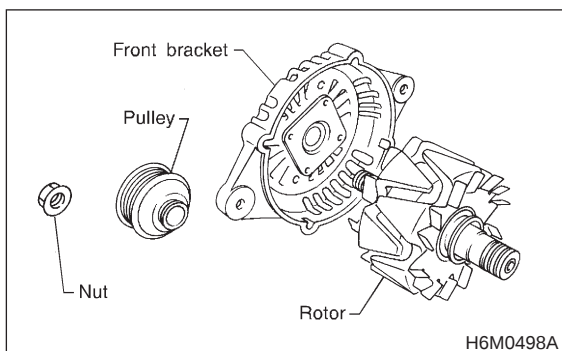


- 2) Hold rotor with a vise and remove pulley nut.



CAUTION:

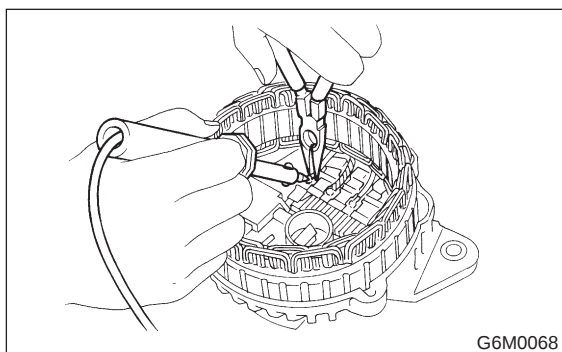
When holding rotor with vise, insert aluminum plates or wood pieces on the contact surfaces of the vise to prevent rotor from damage.



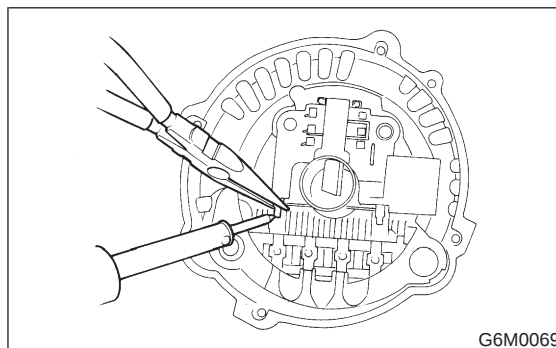
- 3) Unsolder connection between rectifier and stator coil to remove stator coil.

CAUTION:

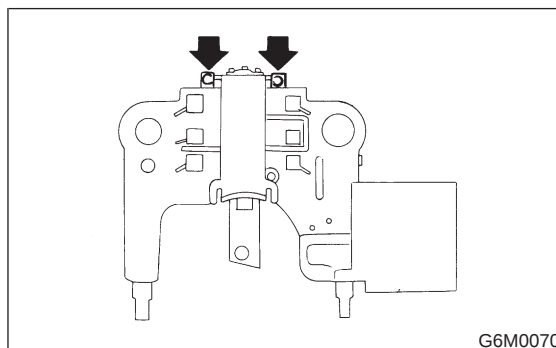
Finish the work rapidly (less than three seconds) because the rectifier cannot withstand heat very well.



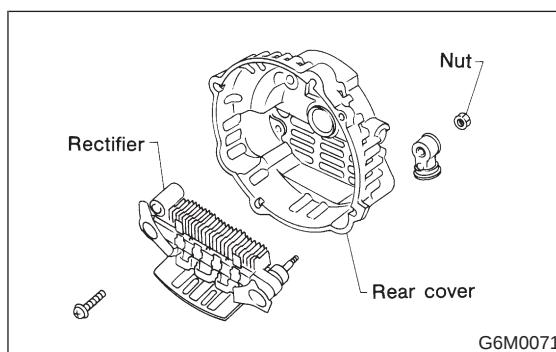
- 4) Remove screws which secure IC regulator to rear cover, and unsolder connection between IC regulator and rectifier to remove IC regulator.



- 5) Remove the brushes by unsoldering at the pig-tails.



- 6) Remove the nut and insulating bushing at terminal B. Remove rectifier.

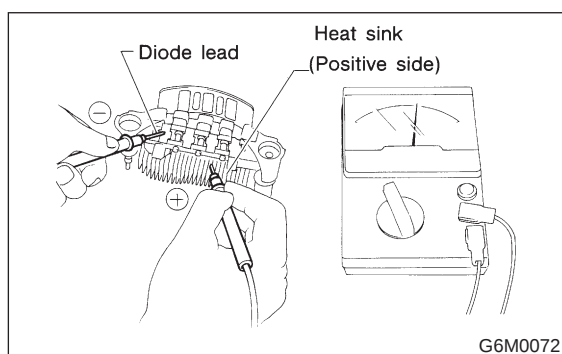


C: INSPECTION AND REPAIR**1. DIODE****CAUTION:**

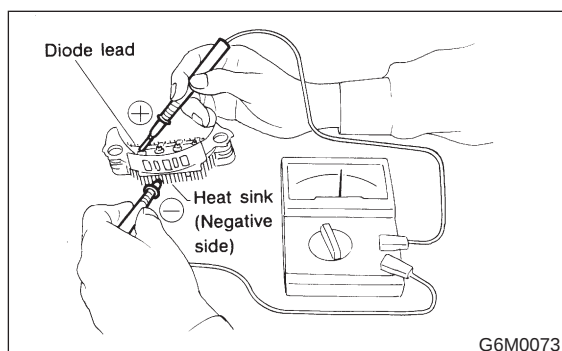
Never use a megger tester (measuring use for high voltage) or any other similar measure for this test; otherwise, the diodes may be damaged.

1) Checking positive diode

Check for continuity between the diode lead and the positive side heat sink. The positive diode is in good condition if continuity exists only in the direction from the diode lead to the heat sink.

**2) Checking negative diode**

Check for continuity between the negative side heat sink and diode lead. The negative diode is in good condition if continuity exists only in the direction from the heat sink to the diode lead.

**2. ROTOR****1) Slip ring surface**

Inspect slip rings for contamination or any roughness of the sliding surface. Repair slip ring surface using a lathe or sand paper.

2) Slip ring outer diameter

Measure slip ring outer diameter. If slip ring is worn replace rotor assembly.

Slip ring outer diameter:**Standard**

22.7 mm (0.894 in)

Limit

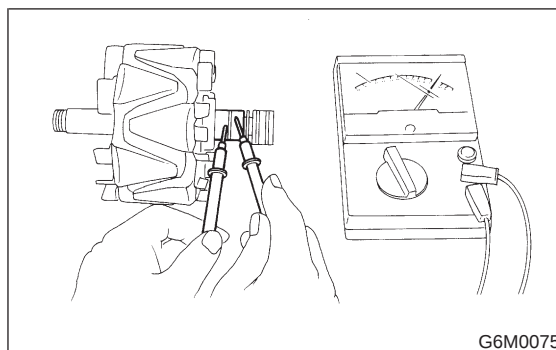
22.1 mm (0.870 in)

3) Continuity test

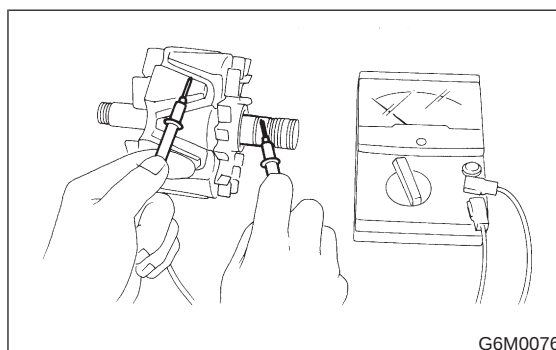
Check resistance between slip rings using circuit tester. If the resistance is not within specification, replace rotor assembly.

Specified resistance:

Approx. 2.7 — 3.2 Ω

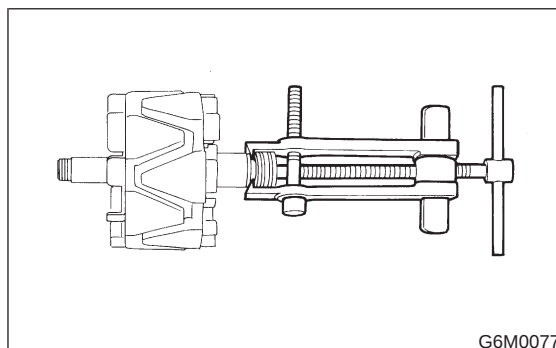
**4) Insulation test**

Check continuity between slip ring and rotor core or shaft. If continuity exists, the rotor coil is short-circuited, and so replace rotor assembly.

**5) Ball bearing (rear side)**

(1) Check rear ball bearing. Replace if it is noisy or if rotor does not turn smoothly.

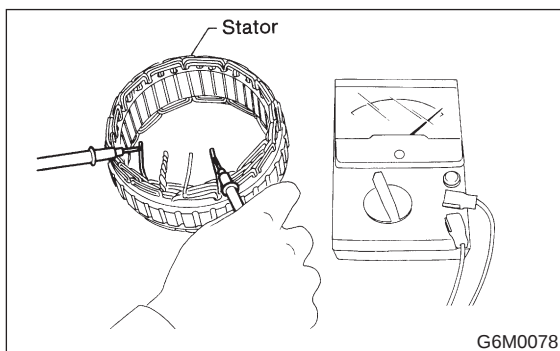
(2) The rear bearing can be removed by using common bearing puller.



3. STATOR

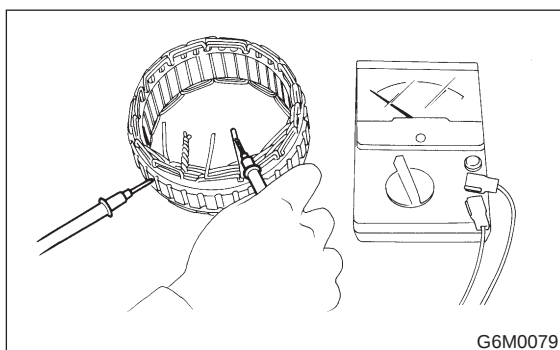
1) Continuity test

Inspect stator coil for continuity between each end of the lead wires. If there is no continuity between individual lead wires, the lead wire is broken, and so replace stator assembly.



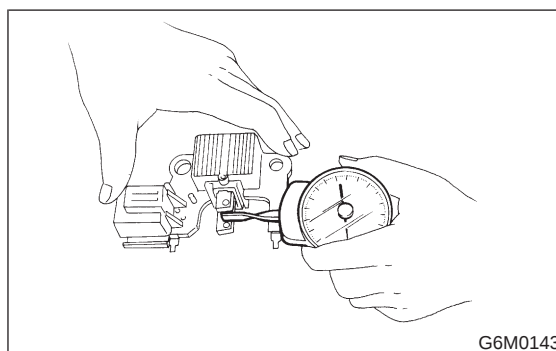
2) Insulation test

Inspect stator coil for continuity between stator core and each end of the lead wire. If there is continuity, the stator coil is short-circuited, and so replace stator assembly.



2) Checking brush spring for proper pressure

Using a spring pressure indicator, push the brush into the brush holder until its tip protrudes 2 mm (0.08 in). Then measure the pressure of the brush spring. If the pressure is less than 2.648 N (270 g, 9.52 oz), replace the brush spring with a new one. The new spring must have a pressure of 4.609 to 5.786 N (470 to 590 g, 16.58 to 20.81 oz).



4. BRUSH

1) Measure the length of each brush. If wear exceeds the service limit, replace the brush. Each brush has the service limit mark on it.

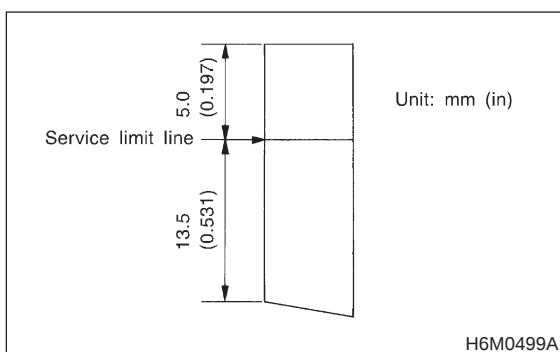
Brush length:

Standard

18.5 mm (0.728 in)

Service limit

5.0 mm (0.197 in)



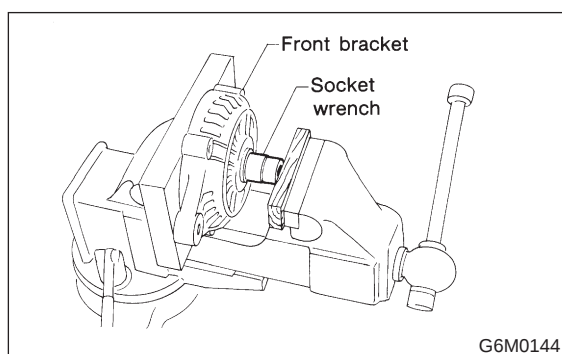
5. BEARING (FRONT SIDE)

1) Check front ball bearing. If resistance is felt while rotating, or if abnormal noise is heard, replace the ball bearing.

2) Replacing front bearing

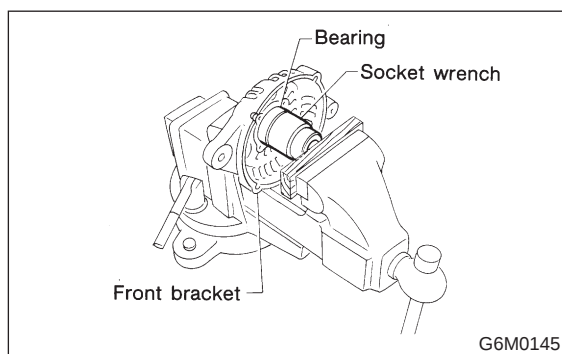
(1) Remove front bearing retainer.

(2) Closely install a fit tool on the bearing inner race. Press the bearing down out of front bracket with a hand press or vise. A socket wrench can serve as the tool.



(3) Set a new bearing and closely install a fit tool on the bearing outer race. Press the bearing down into place with a hand press or vise. A socket wrench can serve as the tool.

(4) Install front bearing retainer.

**D: ASSEMBLY**

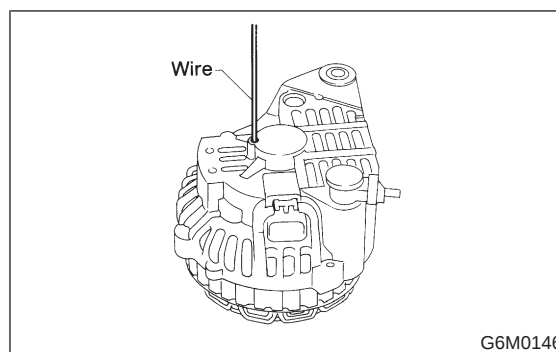
To assemble, reverse order of disassembly.

1) Pulling up brush

Before assembling, press the brush down into the brush holder with your finger and secure in that position by passing a [2 mm (0.08 in) dia. length 4 to 5 cm (1.6 to 2.0 in)] wire through the hole shown in the figure.

CAUTION:

Be sure to remove the wire after reassembly.



2) Heat the rear bracket [50 to 60°C (122 to 140°F)] and press the rear bearing into the rear bracket. Then lubricate the rear bracket.

CAUTION:

Grease should not be applied for the rear bearing.

Remove oil completely if it is found on the bearing box.

3) After reassembly, turn the pulley by hand to check that the rotor turns smoothly.

3. Spark Plug

A: REMOVAL AND INSTALLATION

CAUTION:

All spark plugs installed on an engine, must be of the same heat range.

Spark plug:

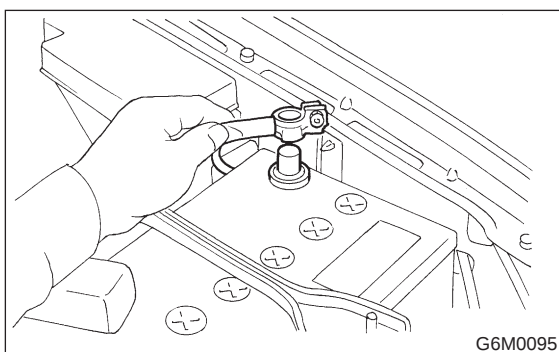
NGK: BKR5E-11

(Alternate)

CHAMPION: RC10YC4

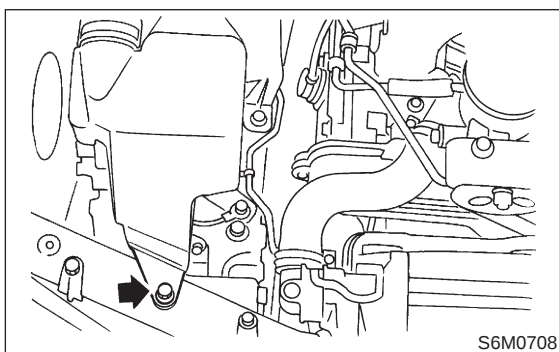
1. #1 SPARK PLUG

- 1) Disconnect battery ground cable.

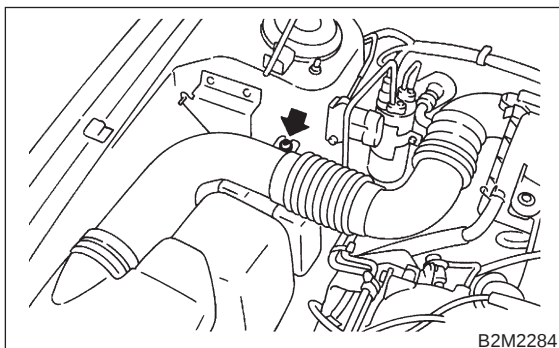


- 2) Remove air intake duct and resonator chamber. (2200 cc California SPEC. vehicle)

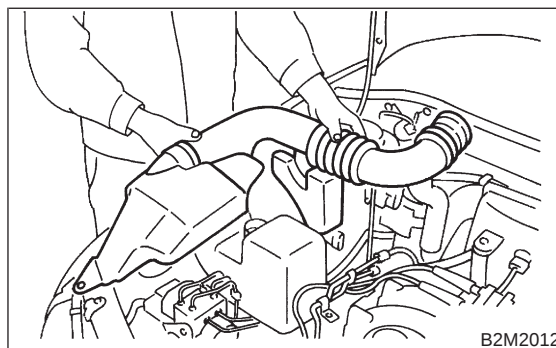
- (1) Remove bolt which installs air intake duct on the front side of body.



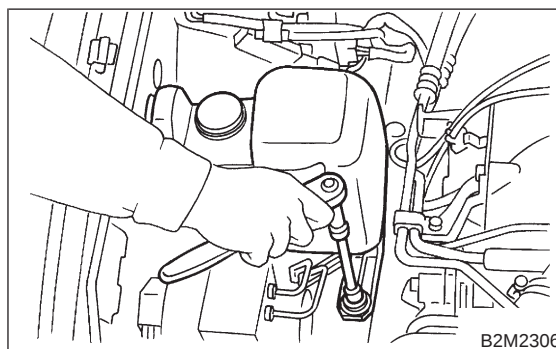
- (2) Remove bolt which installs air intake duct on body.



- (3) Remove air intake duct as a unit.

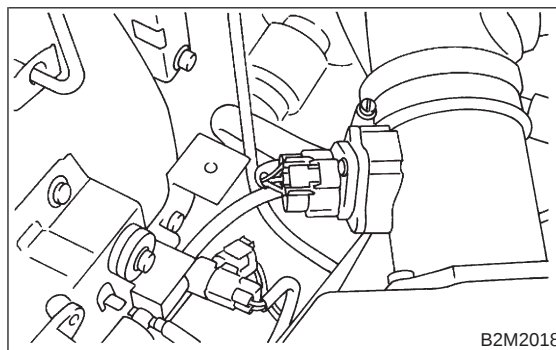


- (4) Remove resonator chamber.



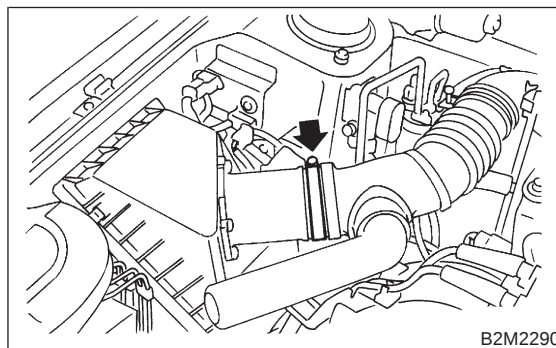
- 3) Remove air cleaner upper case and air cleaner element. (Except 2200 cc California SPEC. vehicle)

- (1) Disconnect mass air flow sensor connector.



- (2) Remove two clips securing air cleaner upper cover.

- (3) Loosen the clamp screw and separate air cleaner upper cover from air intake duct.



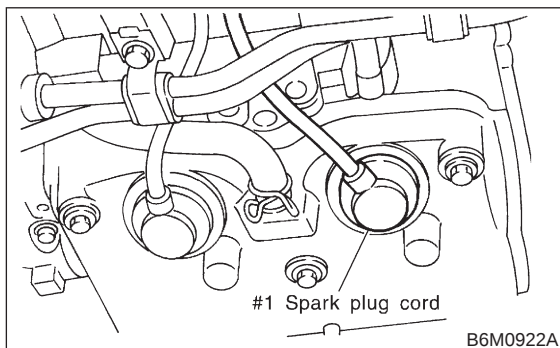
6-1 [W3A2]

3. Spark Plug

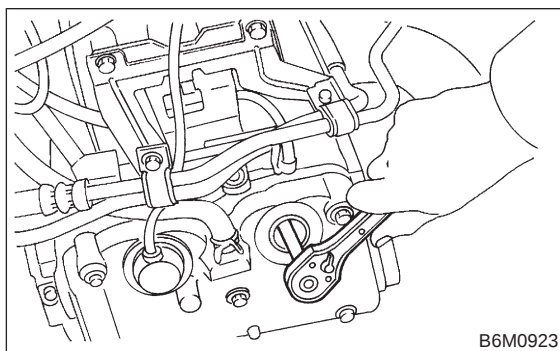
SERVICE PROCEDURE

(4) Remove air cleaner element.

4) Remove #1 spark plug cord by pulling boot, not cord itself.



5) Remove spark plug with the spark plug socket.



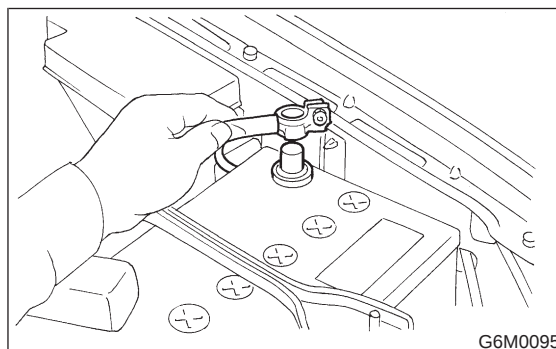
6) Installation is in the reverse order of removal.

Tightening torque (Spark plug):

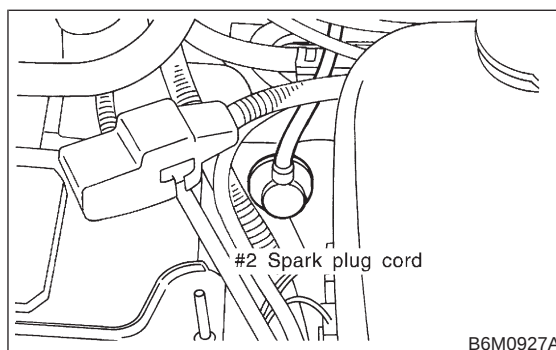
20.6 ± 2.9 N·m (2.10 ± 0.30 kg-m, 15.19 ± 2.14 ft-lb)

2. #2 SPARK PLUG

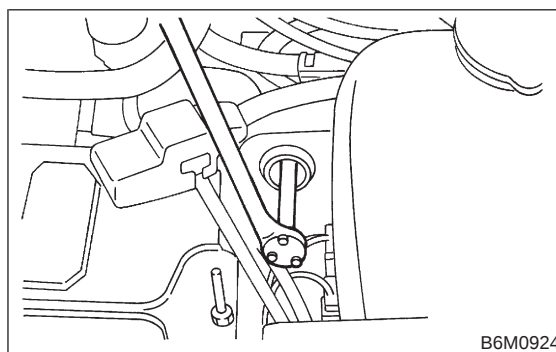
1) Disconnect battery ground cable.



2) Remove #2 spark plug cord by pulling boot, not cord itself.



3) Remove spark plug with the spark plug socket.



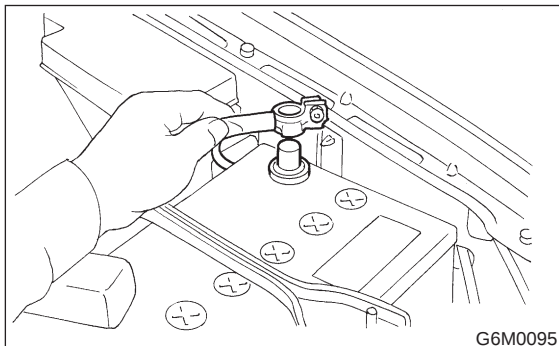
4) Installation is in the reverse order of removal.

Tightening torque (Spark plug):

20.6 ± 2.9 N·m (2.10 ± 0.30 kg-m, 15.19 ± 2.14 ft-lb)

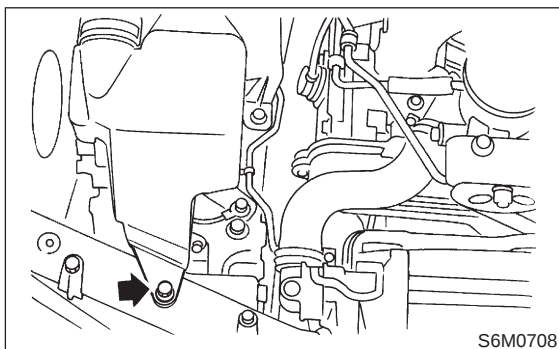
3. #3 SPARK PLUG

- 1) Disconnect battery ground cable.

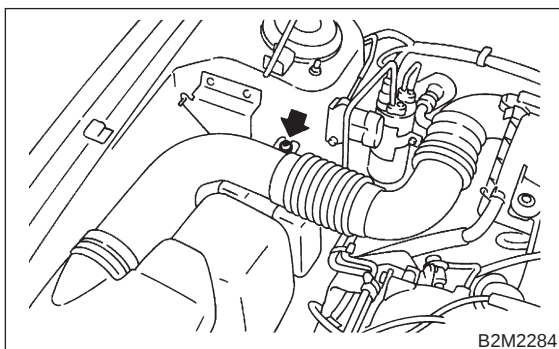


- 2) Remove air intake duct and air chamber. (2200 cc California SPEC. vehicle)

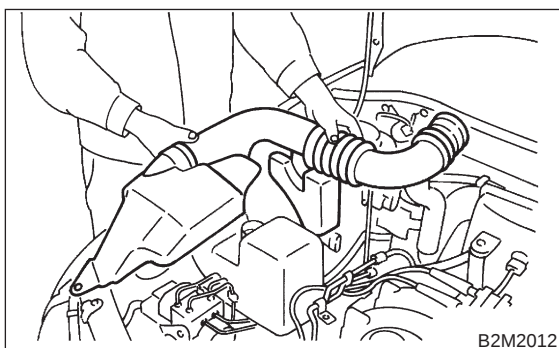
- (1) Remove bolt which installs air intake duct on the front side of body.



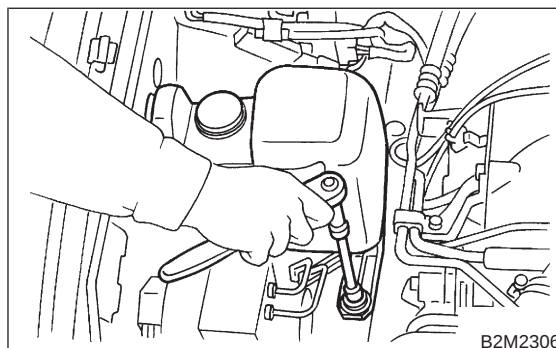
- (2) Remove bolt which installs air intake duct on body.



- (3) Remove air intake duct as a unit.

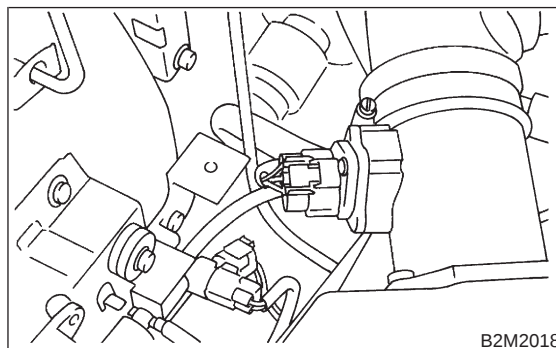


- (4) Remove resonator chamber.



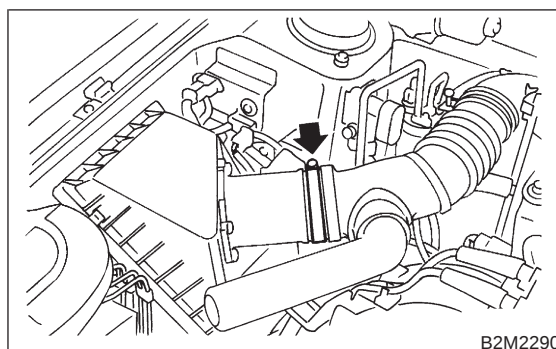
- 3) Remove air cleaner upper case and air cleaner element. (Except 2200 cc California SPEC. vehicle)

- (1) Disconnect mass air flow sensor connector.



- (2) Remove two clips securing air cleaner upper cover.

- (3) Loosen the clamp screw and separate air cleaner upper cover from air intake duct.



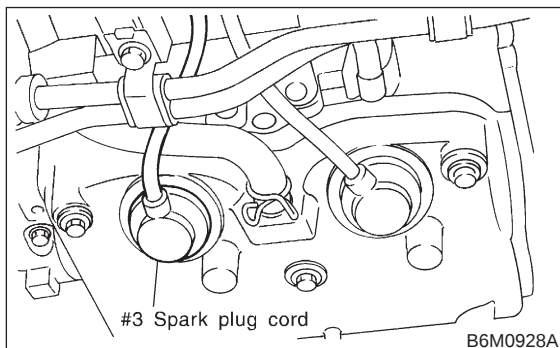
- (4) Remove air cleaner element.

6-1 [W3A4]

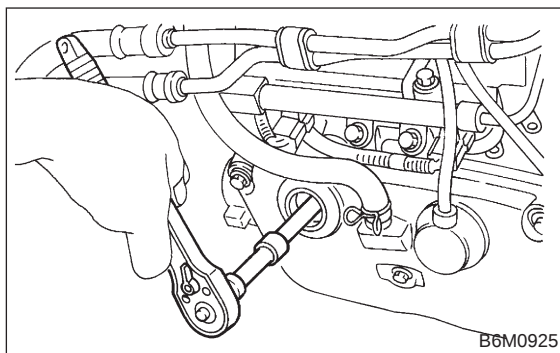
3. Spark Plug

SERVICE PROCEDURE

- 4) Remove #3 spark plug cord by pulling boot, not cord itself.



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



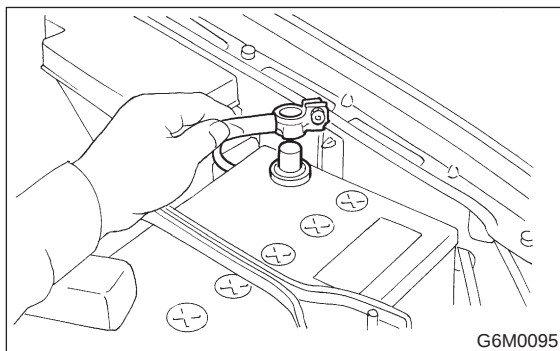
- 6) Installation is in the reverse order of removal.

Tightening torque (Spark plug):

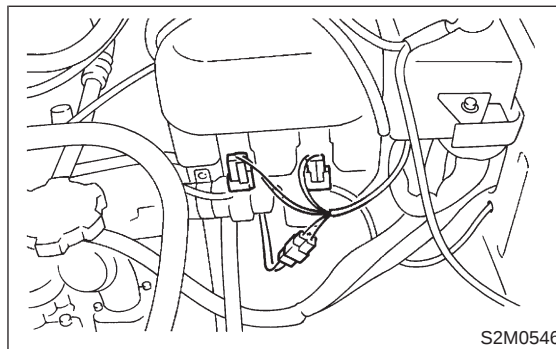
20.6 ± 2.9 N·m (2.10 ± 0.30 kg-m, 15.19 ± 2.14 ft-lb)

4. #4 SPARK PLUG

- 1) Disconnect battery ground cable.

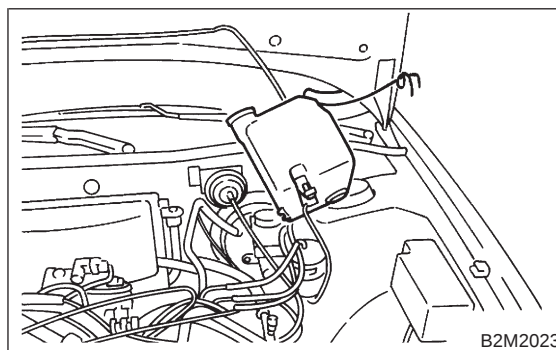


- 2) Disconnect washer motor connector.

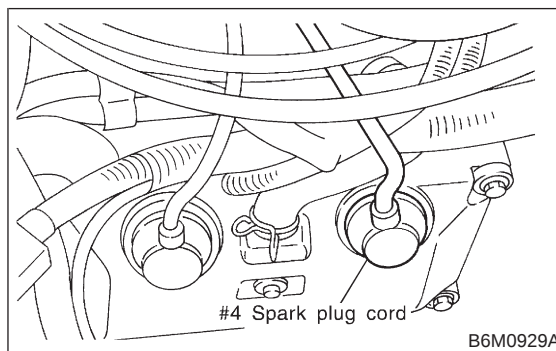


- 3) Disconnect rear window glass washer hose from washer motor, then plug connection with a suitable cap.

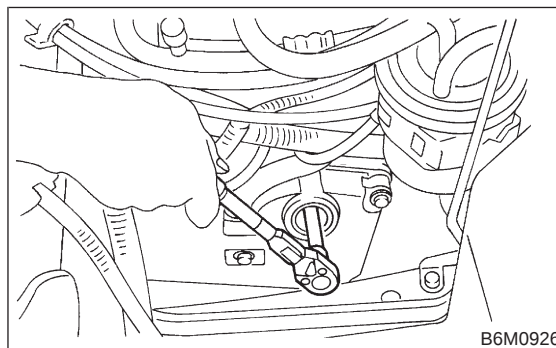
- 4) Remove the two bolts which hold the washer tank, then take the tank away from the working area.



- 5) Remove #4 spark plug cord by pulling boot, not cord itself.



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



7) Installation is in the reverse order of removal.

Tightening torque (Spark plug):

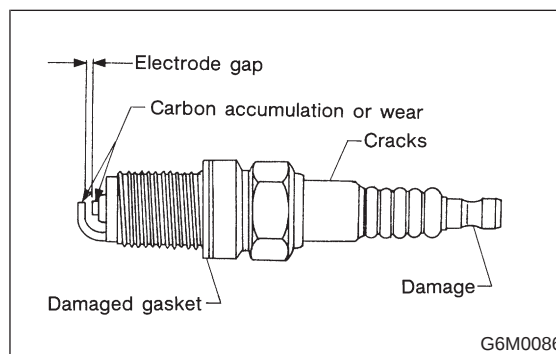
$20.6 \pm 2.9 \text{ N}\cdot\text{m}$ ($2.10 \pm 0.30 \text{ kg}\cdot\text{m}$, $15.19 \pm 2.14 \text{ ft}\cdot\text{lb}$)

CAUTION:

The above torque should be only applied to new spark plugs without oil on their threads. In case their threads are lubricated, the torque should be reduced by approximately 1/3 of the specified torque in order to avoid over-stressing.

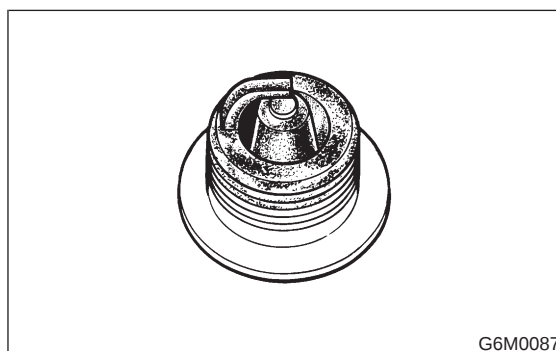
B: INSPECTION

Check electrodes and inner and outer porcelain of plugs, noting the type of deposits and the degree of electrode erosion.



1) Normal

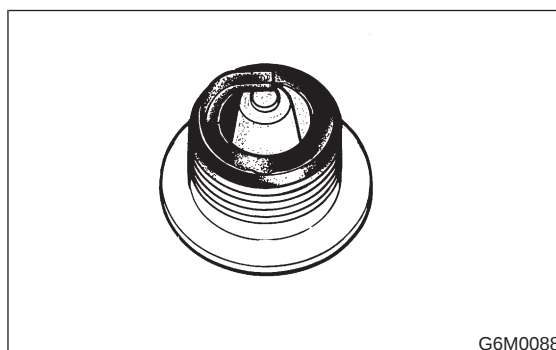
Brown to grayish-tan deposits and slight electrode wear indicate correct spark plug heat range.



2) Carbon fouled

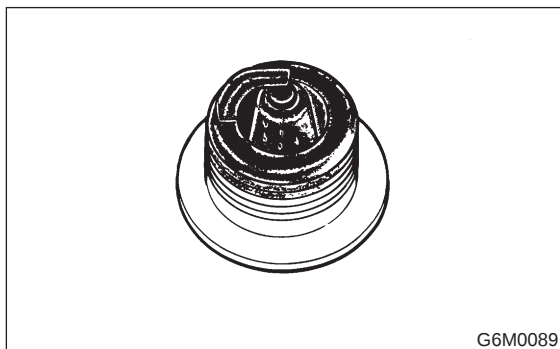
Dry fluffy carbon deposits on insulator and electrode are mostly caused by slow speed driving in city, weak ignition, too rich fuel mixture, dirty air cleaner, etc.

It is advisable to replace with plugs having hotter heat range.



3) Oil fouled

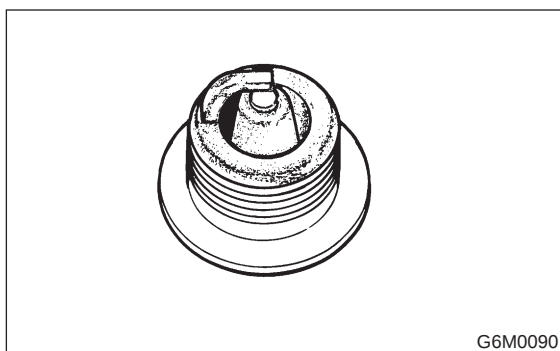
Wet black deposits show excessive oil entrance into combustion chamber through worn rings and pistons or excessive clearance between valve guides and stems. If same condition remains after repair, use a hotter plug.



G6M0089

4) Overheating

White or light gray insulator with black or gray brown spots and bluish burnt electrodes indicate engine overheating. Moreover, the appearance results from incorrect ignition timing, loose spark plugs, wrong selection of fuel, hotter range plug, etc. It is advisable to replace with plugs having colder heat range.



G6M0090

C: CLEANING AND REGAPPING

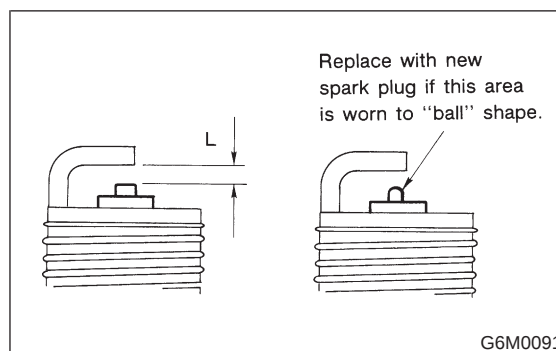
Clean spark plugs in a sand blast type cleaner. Avoid excessive blasting. Clean and remove carbon or oxide deposits, but do not wear away porcelain.

If deposits are too stubborn, discard plugs.

After cleaning spark plugs, recondition firing surface of electrodes with file. Then correct the spark plug gap using a gap gauge.

Spark plug gap: L

1.0 — 1.1 mm (0.039 — 0.043 in)

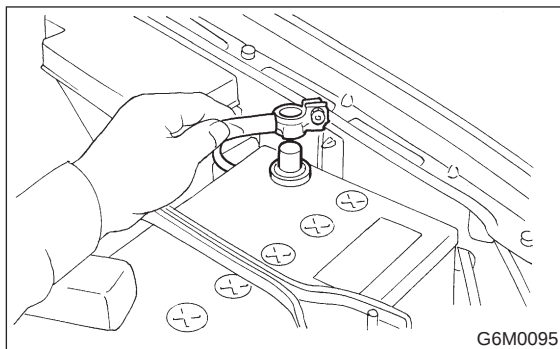


G6M0091

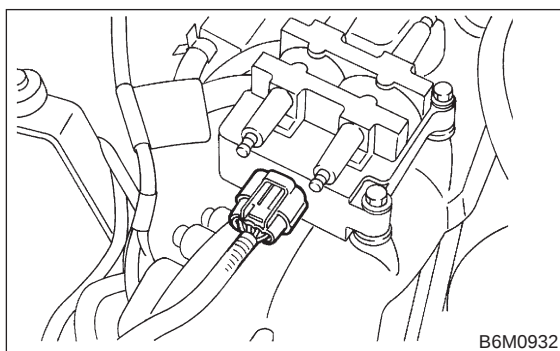
4. Ignition Coil and Ignitor Assembly

A: REMOVAL AND INSTALLATION

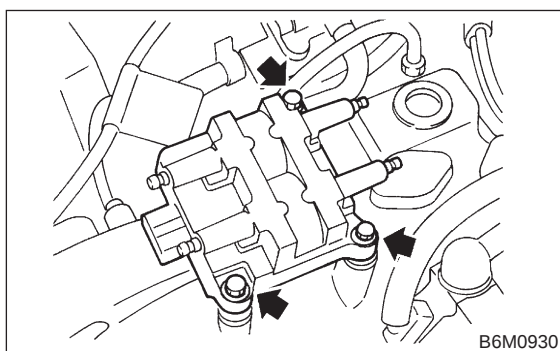
- 1) Disconnect battery ground cable.



- 2) Disconnect spark plug cords from ignition coil and ignitor assembly.
- 3) Disconnect connector from ignition coil and ignitor assembly.



- 4) Remove ignition coil and ignitor assembly.



- 5) Installation is in the reverse order of removal.

CAUTION:

Be sure to connect wires to their proper positions. Failure to do so will damage unit.

B: INSPECTION

Using accurate tester, inspect the following items, and replace if defective.

- 1) Primary resistance
- 2) Secondary coil resistance

CAUTION:

If the resistance is extremely low, this indicates the presence of a short-circuit.

Specified resistance:

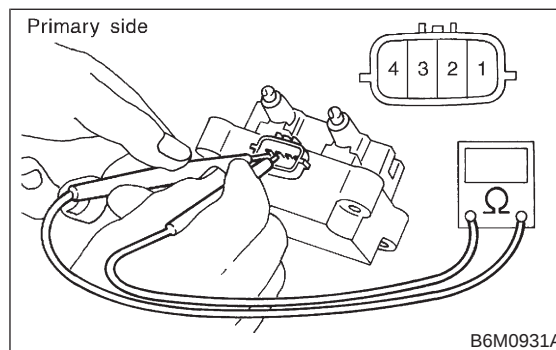
[Primary side]

Between terminal No. 1 and No. 2

$0.73 \Omega \pm 10\%$

Between terminal No. 2 and No. 4

$0.73 \Omega \pm 10\%$



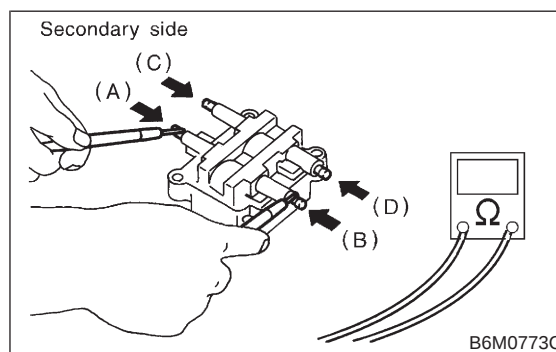
[Secondary side]

Between (A) and (B)

$12.8 \text{ k}\Omega \pm 15\%$

Between (C) and (D)

$12.8 \text{ k}\Omega \pm 15\%$



- 3) Insulation between primary terminal and case: 10 M Ω or more.

5. Spark Plug Cord

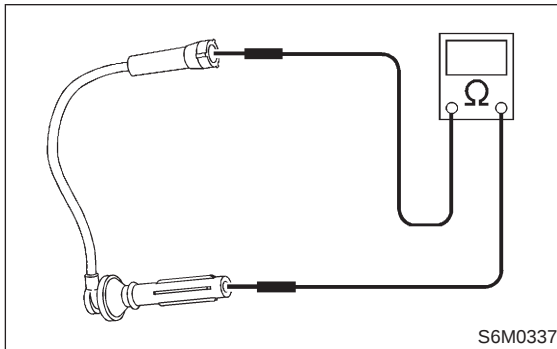
A: INSPECTION

Check for:

- 1) Damage to cords, deformation, burning or rust formation of terminals
- 2) Resistance values of cords

Resistance value:

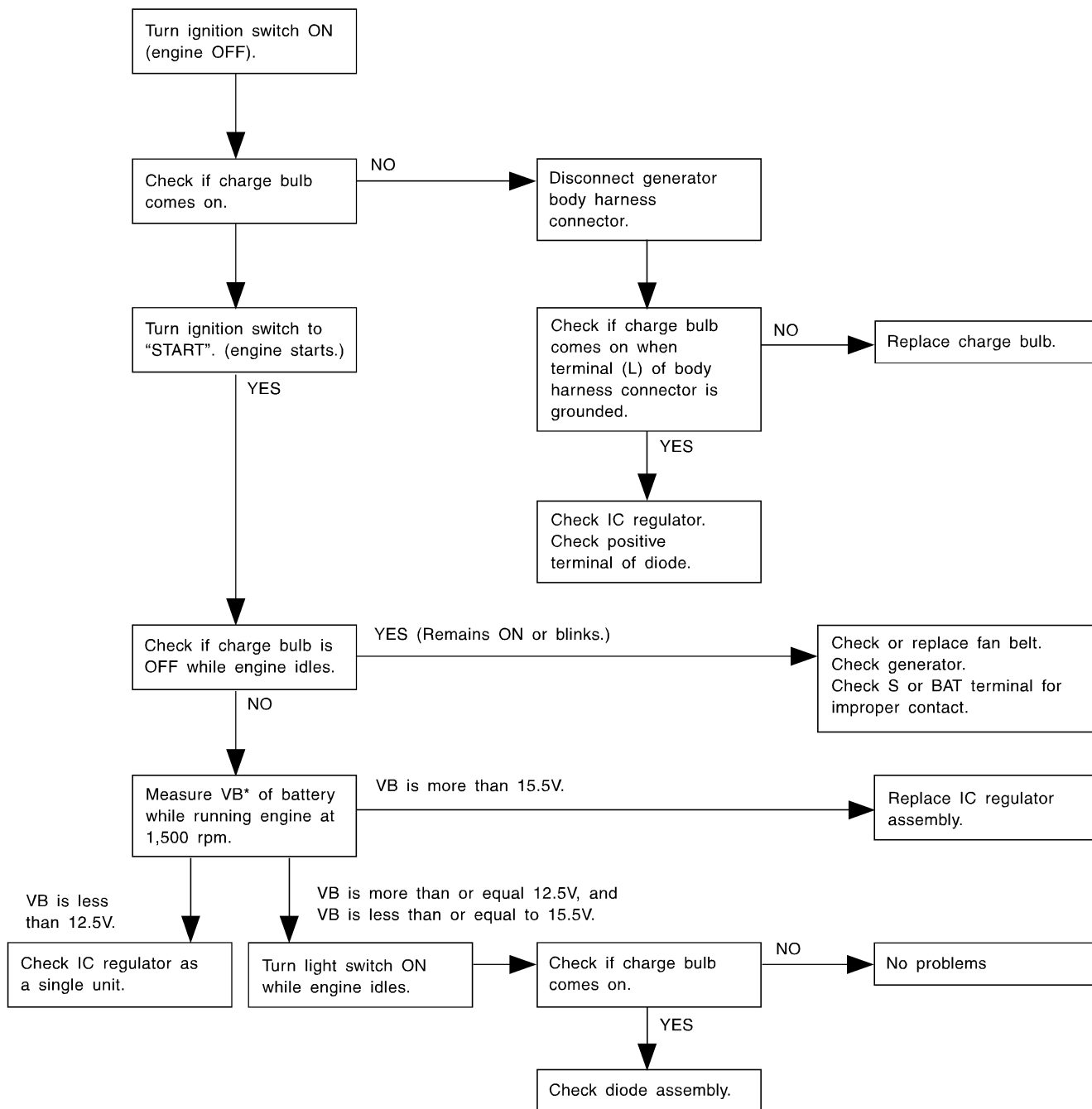
5.12 — 12.34 k Ω



1. Starter

Trouble		Probable cause
Starter does not start.	Magnet switch does not operate. (no clicks are heard.)	Magnet switch poor contact or discontinuity of pull-in coil circuit
		Improper sliding of magnet switch plunger
	Magnet switch operates. (clicks are issued.)	Poor contact of magnet switch's main contact point
		Layer short of armature
		Contaminants on armature commutator
		High armature mica
		Improper grounding of yoke field coil
		Insufficient carbon brush length
		Insufficient brush spring pressure
Starter starts but does not crank engine.	Failure of pinion gear to engage ring gear	Worn pinion teeth
		Improper sliding of overrunning clutch
		Improper adjustment of stud bolt
	Clutch slippage	Faulty clutch roller spring
Starter starts but engine cranks too slowly.		Poor contact of magnet switch's main contact point
		Layer short of armature
		Discontinuity, burning or wear of armature commutator
		Poor grounding of yoke field coil
		Insufficient brush length
		Insufficient brush spring pressure
Starter overruns.		Abnormal brush wear
		Magnet switch coil is a layer short.

2. Generator



*: Terminal voltage

1. Body Electrical

Battery	Type		MT model: 55D23L (MF)	AT model: 75D23L (MF)
	Capacity	Reverse capacity	MT model: 100 minutes	AT model: 120 minutes
		Cold cranking ampere	MT model: 430 amperes	AT model: 520 amperes
Combination meter	Speedometer		Electric pulse type	
	Temperature gauge		Thermistor cross coil type	
	Fuel gauge		Resistance cross coil type	
	Tachometer		Electric impulse type	
	Turn signal indicator light		12 V — 1.4 W	
	Charge indicator light		12 V — 1.4 W	
	Oil pressure indicator light		12 V — 1.4 W	
	ABS warning light		12 V — 1.4 W	
	CHECK ENGINE warning light (Malfunction indicator light)		12 V — 1.4 W	
	HI-beam indicator light		12 V — 3.4 W	
	Door open warning light		12 V — 1.4 W	
	Seat belt warning light		12 V — 1.4 W	
	Brake fluid and parking brake warning light		12 V — 3.4 W	
	FWD indicator light		12 V — 1.4 W	
	AIRBAG warning light		12 V — 1.4 W	
	Meter illumination light		12 V — 3.4 W	
	AT OIL TEMP. warning light		12 V — 1.4 W	
Headlight			12 V — 60/55 W (Halogen)	
Front fog light			12 V — 55 W	
Front turn signal light			12 V — 27 W	
Side turn signal light			12 V — 3.8 W	
Side marker/Parking light			12 V — 3.8 W	
Rear combination light		Tail/Stop light	12 V — 8/27 W	
		Turn signal light	12 V — 27 W	
		Back-up light	12 V — 27 W	
License plate light			12 V — 3.8 W	
High-mount stop light			Sedan: 12 V — 18 W	Wagon: 12 V — 13 W
Room light			12 V — 8 W	
Spot light			12 V — 8 W	
Trunk room light			12 V — 5 W	
Luggage room light			12 V — 5 W	
Front wiper motor	Input		12 V — 54 W or less	
Rear wiper motor	Input		12 V — 42 W or less	
Front washer motor	Pump type		Centrifugal	
	Input		12 V — 36 W or less	
Rear washer motor	Pump type		Centrifugal	
	Input		12 V — 36 W or less	
Horn			12 V — 350 Hz	
Accessory socket	Input		12 V — 120 W	
Rear window defogger	Input		12 V — 160 W	
	Indicator light		12 V — 50 mA	
Cargo socket	Input		12 V — 120 W	

1. Precautions

- Before disassembling or reassembling parts, always disconnect battery ground cable. When repairing radio, control units, etc. which are provided with memory functions, record memory contents before disconnecting battery ground cable. Otherwise, these contents are cancelled upon disconnection.
- Reassemble parts in reverse order of disassembly procedure unless otherwise indicated.
- Adjust parts to specifications contained in this manual if so designated.
- Connect connectors and hoses securely during reassembly.
- After reassembly, ensure functional parts operate smoothly.

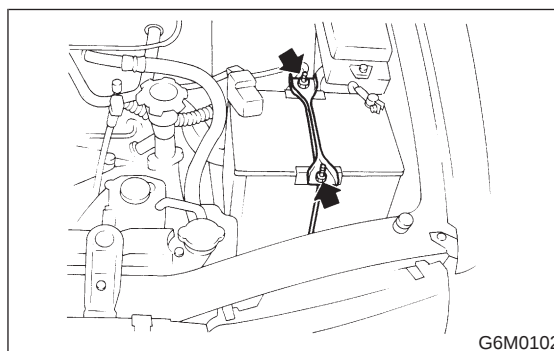
CAUTION:

- Airbag system wiring harness is routed near the electrical parts and switch.
- All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuits.
- Be careful not to damage Airbag system wiring harness when servicing the ignition key cylinder.

2. Battery

A: REMOVAL AND INSTALLATION

- 1) Disconnect the positive (+) terminal after disconnecting the negative (–) terminal of battery.
- 2) Remove flange nuts from battery rods and take off battery holder.



- 3) Remove battery.
- 4) Installation is in the reverse order of removal.

Tightening torque:

$3.4 \pm 1.0 \text{ N}\cdot\text{m}$ ($0.35 \pm 0.1 \text{ kg}\cdot\text{m}$, $2.5 \pm 0.7 \text{ ft}\cdot\text{lb}$)

NOTE:

- Clean battery cable terminals and apply grease to retard the formation of corrosion.
- Connect the positive (+) terminal of battery and then the negative (–) terminal of the battery.

B: INSPECTION

WARNING:

- Electrolyte has toxicity; be careful handling the fluid.
- Avoid contact with skin, eyes or clothing. Especially at contact with eyes, flush with water for 15 minutes and get prompt medical attention.
- Batteries produce explosive gasses. Keep sparks, flame, cigarettes away.
- Ventilate when charging or using in enclosed space.
- For safety, in case an explosion does occur, wear eye protection or shield your eyes when working near any battery. Never lean over a battery.
- Do not let battery fluid contact eyes, skin, fabrics, or paint-work because battery fluid is corrosive acid.
- To lessen the risk of sparks, remove rings, metal watch-bands, and other metal jewelry. Never allow metal tools to contact the positive battery terminal and anything connected to it while you are at the same time in contact with any other metallic portion of the vehicle because a short circuit will be caused.

1. Precautions

- Before disassembling or reassembling parts, always disconnect battery ground cable. When repairing radio, control units, etc. which are provided with memory functions, record memory contents before disconnecting battery ground cable. Otherwise, these contents are cancelled upon disconnection.
- Reassemble parts in reverse order of disassembly procedure unless otherwise indicated.
- Adjust parts to specifications contained in this manual if so designated.
- Connect connectors and hoses securely during reassembly.
- After reassembly, ensure functional parts operate smoothly.

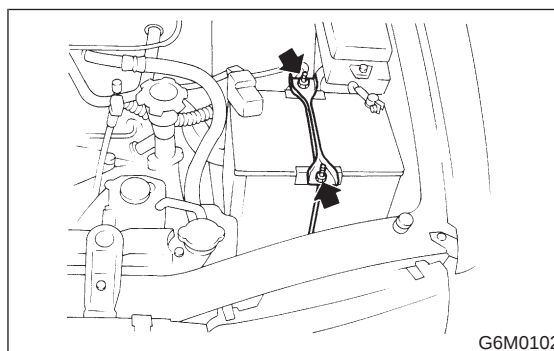
CAUTION:

- Airbag system wiring harness is routed near the electrical parts and switch.
- All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuits.
- Be careful not to damage Airbag system wiring harness when servicing the ignition key cylinder.

2. Battery

A: REMOVAL AND INSTALLATION

- 1) Disconnect the positive (+) terminal after disconnecting the negative (–) terminal of battery.
- 2) Remove flange nuts from battery rods and take off battery holder.



- 3) Remove battery.
- 4) Installation is in the reverse order of removal.

Tightening torque:

$3.4 \pm 1.0 \text{ N} \cdot \text{m}$ ($0.35 \pm 0.1 \text{ kg} \cdot \text{m}$, $2.5 \pm 0.7 \text{ ft} \cdot \text{lb}$)

NOTE:

- Clean battery cable terminals and apply grease to retard the formation of corrosion.
- Connect the positive (+) terminal of battery and then the negative (–) terminal of the battery.

B: INSPECTION

WARNING:

- Electrolyte has toxicity; be careful handling the fluid.
- Avoid contact with skin, eyes or clothing. Especially at contact with eyes, flush with water for 15 minutes and get prompt medical attention.
- Batteries produce explosive gasses. Keep sparks, flame, cigarettes away.
- Ventilate when charging or using in enclosed space.
- For safety, in case an explosion does occur, wear eye protection or shield your eyes when working near any battery. Never lean over a battery.
- Do not let battery fluid contact eyes, skin, fabrics, or paint-work because battery fluid is corrosive acid.
- To lessen the risk of sparks, remove rings, metal watch-bands, and other metal jewelry. Never allow metal tools to contact the positive battery terminal and anything connected to it while you are at the same time in contact with any other metallic portion of the vehicle because a short circuit will be caused.

1. BATTERY

1) External parts:

Check for the existence of dirt or cracks on the battery case, top cover, vent plugs, and terminal posts. If necessary, clean with water and wipe with a dry cloth. Apply a thin coat of grease on the terminal posts to prevent corrosion.

2) Electrolyte level:

Check the electrolyte level in each cell. If the level is below MIN LEVEL, bring the level to MAX LEVEL by pouring distilled water into the battery cell. Do not fill beyond MAX LEVEL.

3) Specific gravity of electrolyte:

(1) Measure specific gravity of electrolyte using a hydrometer and a thermometer. Specific gravity varies with temperature of electrolyte so that it must be corrected at 20°C (68°F) using the following Equation:

$$S_{20} = S_t + 0.0007 \times (t - 20)$$

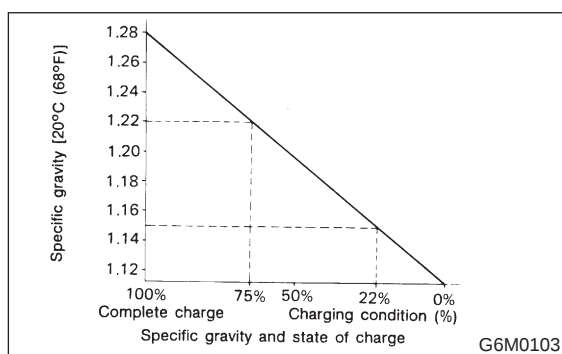
S_{20} : Specific gravity corrected at electrolyte temperature of 20°C

S_t : Measured specific gravity

t : Measured temperature (°C)

Determine whether or not battery must be charged, according to corrected specific gravity.

Standard specific gravity: 1.220 — 1.290 [at 20°C (68°F)]



(2) Measuring the specific gravity of the electrolyte in the battery will disclose the state of charge of the battery. The relation between the specific gravity and the state of charge is as shown in figure.

C: CHARGING

WARNING:

● Do not bring an open flame close to the battery at this time.

CAUTION:

● Prior to charging, corroded terminals should be cleaned with a brush and common baking soda solution.

● Be careful since battery electrolyte overflows while charging the battery.

● Observe instructions when handling battery charger.

● Before charging the battery on vehicle, disconnect battery ground terminal. Failure to follow this rule may damage alternator's diodes or other electrical units.

1. NORMAL CHARGING

Charge the battery at current value specified by manufacturer or at approximately 1/10 of battery's ampere-hour rating.

2. QUICK CHARGING

Quick charging is a method in which the battery is charged in a short period of time with a relatively large current by using a quick charger. Since a large current flow raises electrolyte temperature, the battery is subject to damage if the large current is used for prolonged time. For this reason, the quick charging must be carried out within a current range that will not increase the electrolyte temperature above 40°C (104°F). It should be also remembered that the quick charging is a temporary means to bring battery voltage up to a fair value and, as a rule, a battery should be charged slowly with a low current.

CAUTION:

● Observe the items in 1. NORMAL CHARGING.

● Never use more than 10 amperes when charging the battery because that will shorten battery life.

3. JUDGMENT OF BATTERY IN CHARGED CONDITION

1) Specific gravity of electrolyte is held at a specific value in a range from 1.250 to 1.290 for more than one hour.

2) Voltage per battery cell is held at a specific value in a range from 2.5 to 2.8 volts for more than one hour.

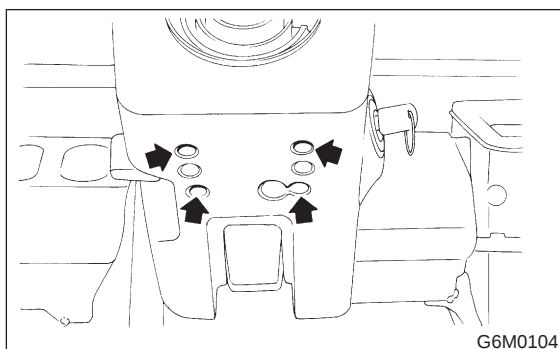
4. CHECK HYDROMETER FOR STATE OF CHARGE

Hydrometer indicator	State of charge	Required action
Green dot	Above 65%	Load test
Dark dot	Below 65%	Charge battery
Clear dot	Low electrolyte	Replace battery* (If cranking complaint)
*: Check electrical system before replacement.		

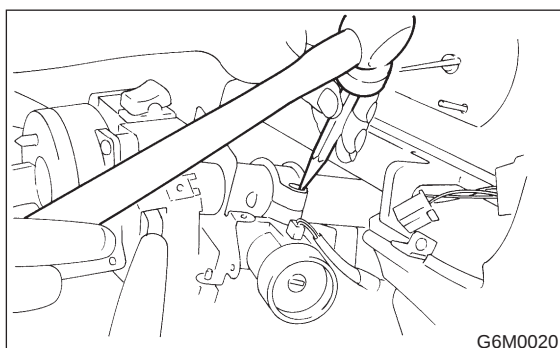
3. Ignition Switch

A: REMOVAL AND INSTALLATION

1) Remove screws, separate upper column cover and lower column cover.



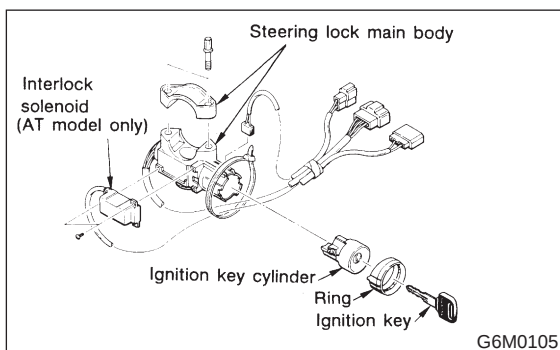
- 2) Remove knee protector.
- 3) Remove meter visor.
- 4) Disconnect ignition switch connector from body harness.
- 5) Using a drift and hammer, hit the torn bolt head to loosen and remove the ignition switch.



6) Installation is in the reverse order of removal.

NOTE:

When installing, tighten the connecting bolt until its head twists off.



4. Lighting

A: ADJUSTMENT

1. HEADLIGHT AIMING

CAUTION:

Turn off the light before adjusting headlight aiming. If the light is necessary to check aiming, do not turn on for more than two minutes.

NOTE:

Before checking the headlight aiming, be sure of the following:

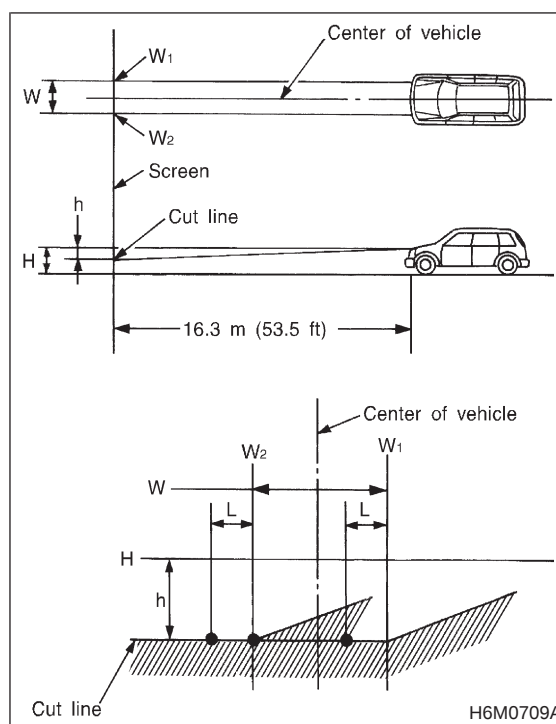
- The area around the headlight has not sustained any accident, damage or other type of deformation.
- Vehicle is parked on level ground.
- The inflation pressure of tires is correct.
- Vehicle's gas tank is fully charged.
- Bounce the vehicle several times to normalize the suspension.
- Make certain that someone is seated in the driver's seat.

1) Place a cloth over the headlight that does not require aiming adjustment.

2) Turn the headlights on. Perform the aiming adjustment for the other headlight as follows:

CAUTION:

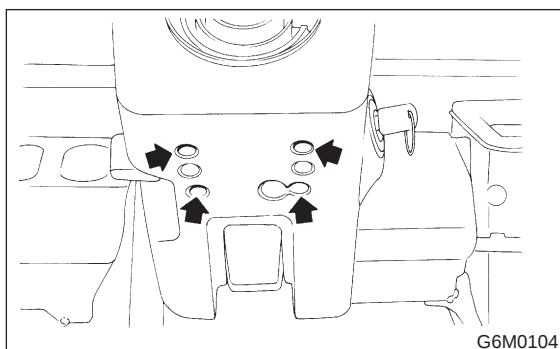
Do not perform lateral headlight aiming adjustment.



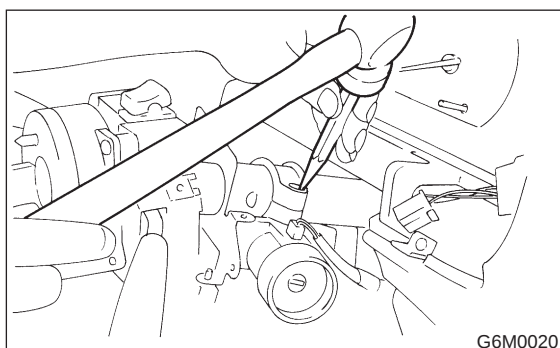
3. Ignition Switch

A: REMOVAL AND INSTALLATION

1) Remove screws, separate upper column cover and lower column cover.



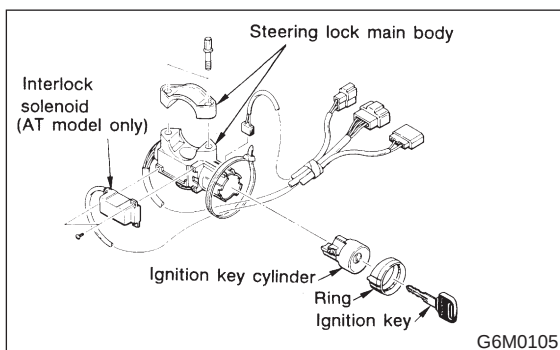
- 2) Remove knee protector.
- 3) Remove meter visor.
- 4) Disconnect ignition switch connector from body harness.
- 5) Using a drift and hammer, hit the torn bolt head to loosen and remove the ignition switch.



6) Installation is in the reverse order of removal.

NOTE:

When installing, tighten the connecting bolt until its head twists off.



4. Lighting

A: ADJUSTMENT

1. HEADLIGHT AIMING

CAUTION:

Turn off the light before adjusting headlight aiming. If the light is necessary to check aiming, do not turn on for more than two minutes.

NOTE:

Before checking the headlight aiming, be sure of the following:

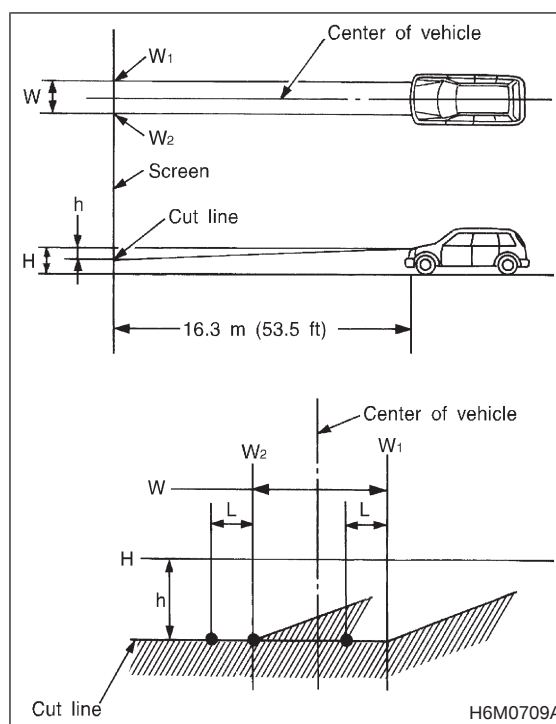
- The area around the headlight has not sustained any accident, damage or other type of deformation.
- Vehicle is parked on level ground.
- The inflation pressure of tires is correct.
- Vehicle's gas tank is fully charged.
- Bounce the vehicle several times to normalize the suspension.
- Make certain that someone is seated in the driver's seat.

1) Place a cloth over the headlight that does not require aiming adjustment.

2) Turn the headlights on. Perform the aiming adjustment for the other headlight as follows:

CAUTION:

Do not perform lateral headlight aiming adjustment.



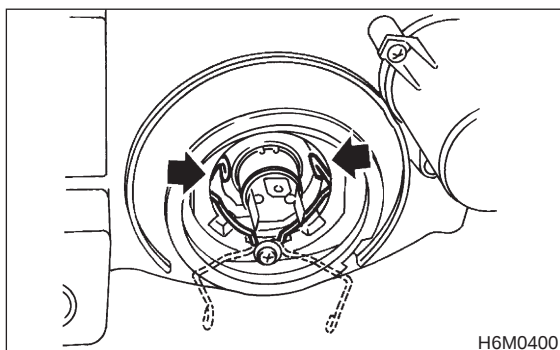
	W	H	L	h
Except OUTBACK	1,070 (42.13)	630 (24.80)	569 (22.40)	114 (4.49)
OUTBACK	1,070 (42.13)	650 (25.59)	569 (22.40)	114 (4.49)

Unit: mm (in)

B: REMOVAL AND INSTALLATION

1. HEADLIGHT BULB

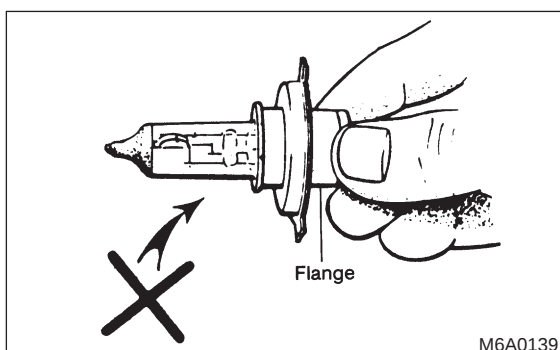
- 1) Disconnect the connector from inside of the engine compartment.
- 2) Remove rubber cap.
- 3) Remove the light bulb retaining spring to remove the bulb.



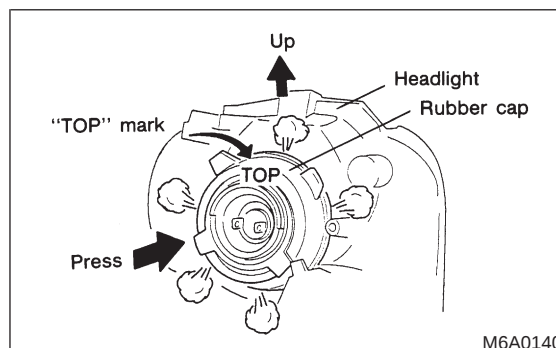
- 4) Replace the bulb with a new one and hook the spring.
- 5) Attach the rubber cap and connect the connector.

CAUTION:

- Since the tungsten halogen bulb operates at high temperature, dirt and oil on the bulb surface decreases the bulb's useful life. When replacing the bulb, hold the flange portion and do not touch the glass portion.



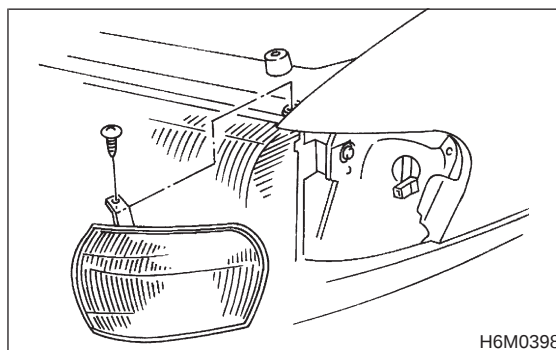
- Attach the rubber cap with letters TOP on the top so that the drain hole will be on the lower side.



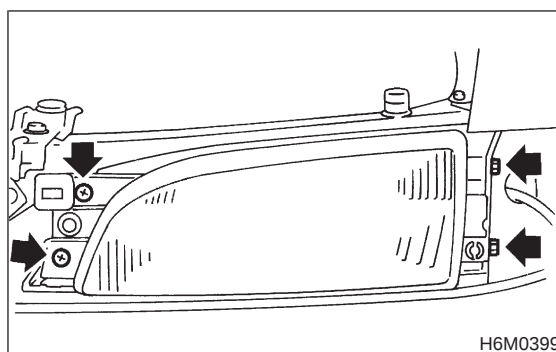
- To keep water out, correctly engage the groove portion of the rubber cap.

2. HEADLIGHT AND SIDE MARKER LIGHT

- 1) Remove front grille and disconnect connector from headlight.
- 2) Remove screw then remove side marker light while disconnecting connector.



- 3) Remove screws and bolts which secure headlight and remove headlight.



- 4) Installation is in the reverse order of removal.

Tightening torque:

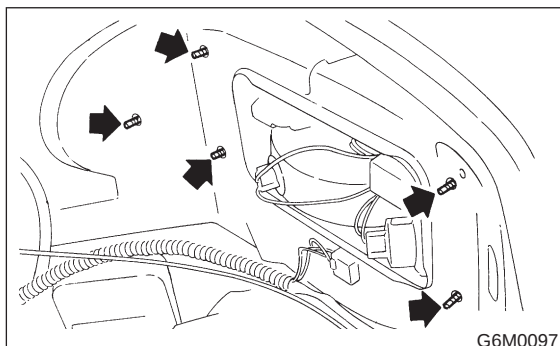
$6.4 \pm 0.5 \text{ N}\cdot\text{m}$ ($0.65 \pm 0.05 \text{ kg}\cdot\text{m}$, $4.7 \pm 0.4 \text{ ft}\cdot\text{lb}$)

NOTE:

When installing, securely fit clip (on fender side) into locating (on side marker light side).

3. REAR COMBINATION LIGHT

- 1) Remove rear trim.
- 2) Remove nuts and disconnect connector.



- 3) Attach adhesive cloth tape to body area around rear combination light.
- 4) Using a standard screwdriver, carefully pry rear combination light off and away from the front of vehicle.
- 5) Installation is in the reverse order of removal.

Tightening torque:

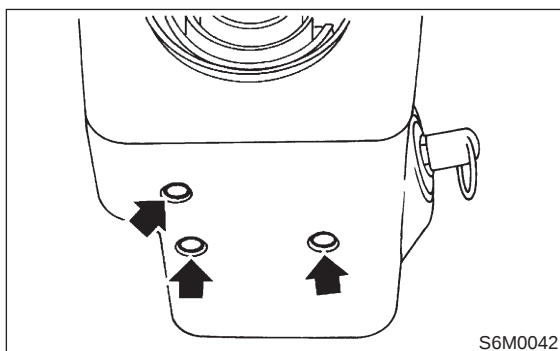
$6.4 \pm 0.5 \text{ N}\cdot\text{m}$ ($0.65 \pm 0.05 \text{ kg}\cdot\text{m}$, $4.7 \pm 0.4 \text{ ft}\cdot\text{lb}$)

CAUTION:

- Do not pry rear combination light forcefully as this may scratch vehicle body.
- Remove all traces of adhesive tape from body before installation.
- Attach butyl rubber tape to back of rear combination light before installing rear combination light on body for sealing purposes.

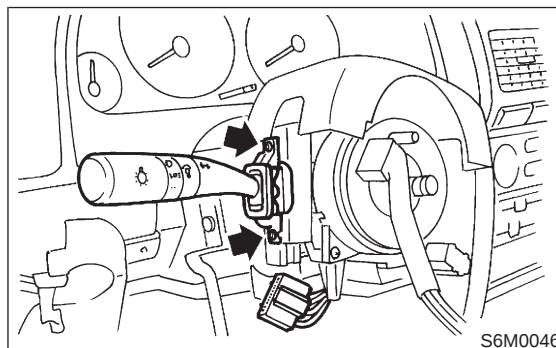
4. COMBINATION SWITCH

- 1) Remove instrument panel lower cover. <Ref. to 5-4 [W1A0].>
- 2) Remove screws which secure upper column cover to lower column cover.



- 3) Disconnect connector from combination switch.

- 4) Remove screws which secure switch and remove switch.



- 5) Installation is in the reverse order of removal.

C: INSPECTION**1. COMBINATION SWITCH (LIGHTING)**

Move combination switch to respective positions and check continuity between terminals.

• LIGHTING SWITCH

Terminal Switch position	16	14	13
OFF			
Tail	○	○	
Head	○	○	○

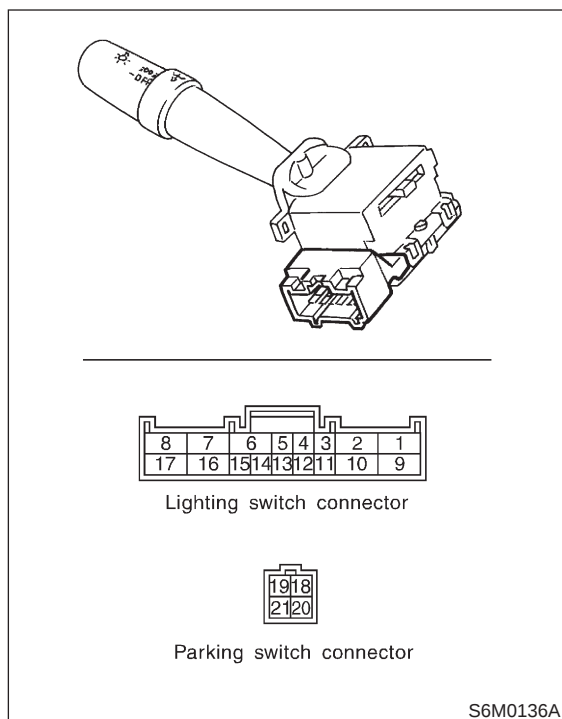
• PARKING SWITCH

Terminal Switch position	19	21	18
OFF	○	○	
ON		○	○

• DIMMER AND PASSING SWITCH

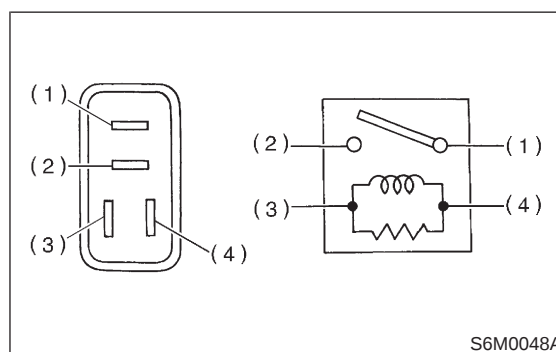
Terminal Switch position	16	17	7	8
Flash	○		○	○
Low beam	○	○		
HI-beam	○		○	

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**2. HEADLIGHT RELAY**

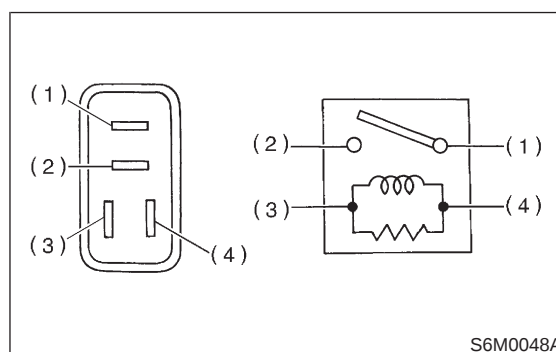
Check continuity between terminals when terminal No. 4 is connected to battery and terminal No. 3 is grounded.

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

**3. TAIL AND ILLUMINATION RELAY**

Check continuity between terminals (indicated in table) when terminal No. 4 is connected to battery and terminal No. 3 is grounded.

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



5. Front Wiper and Washer

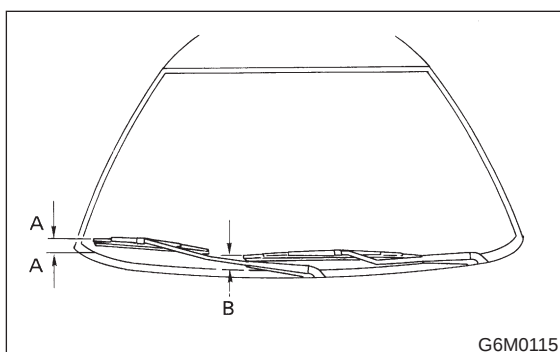
A: ADJUSTMENT

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

Original position:

A: 22.5 ± 7.5 mm (0.886 ± 0.295 in)

B: 32.5 ± 7.5 mm (1.280 ± 0.295 in)



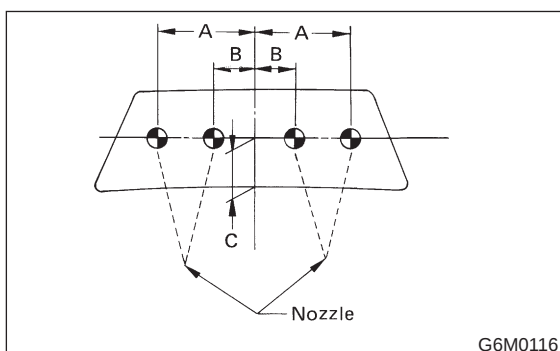
- 3) Adjust washer ejecting point on windshield glass as shown in figure when vehicle stops.

Ejecting point:

A: 375 mm (14.76 in)

B: 150 mm (5.91 in)

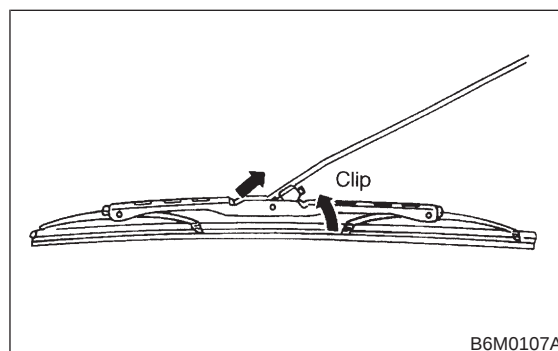
C: 350 mm (13.78 in)



B: REMOVAL AND INSTALLATION

1. BLADE

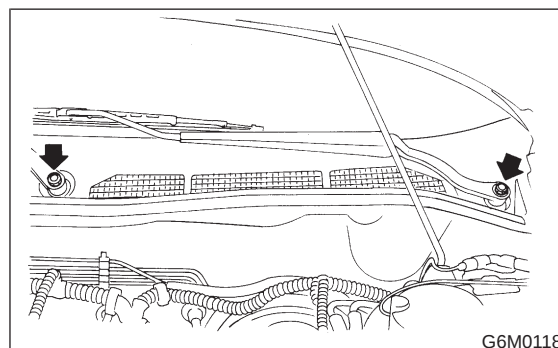
- 1) Pull out blade following the arrow direction, from arm while pushing up locking clip.



- 2) Installation is in the reverse order of removal.

2. WIPER ARM

- 1) Open front hood.
- 2) Remove cap. Remove the nut which secure wiper arm, and remove wiper arm.



- 3) Installation is in the reverse order of removal.

Tightening torque:

14 ± 2 N·m (1.4 ± 0.2 kg·m, 10.1 ± 1.4 ft·lb)

3. WIPER MOTOR AND LINK

- 1) Detach weatherstrip and cowl panel. <Ref. to 5-1 [W11A0].>

NOTE:

Apply silicone oil or soap water to both sides of cowl net to facilitate removal.

6-2 [W5B3]

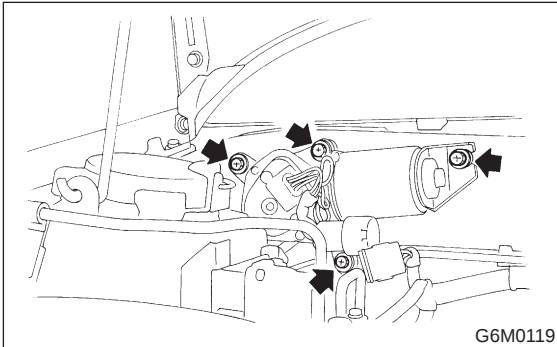
5. Front Wiper and Washer

SERVICE PROCEDURE

2) Disconnect electric connector, and remove motor attaching bolts.

Tightening torque:

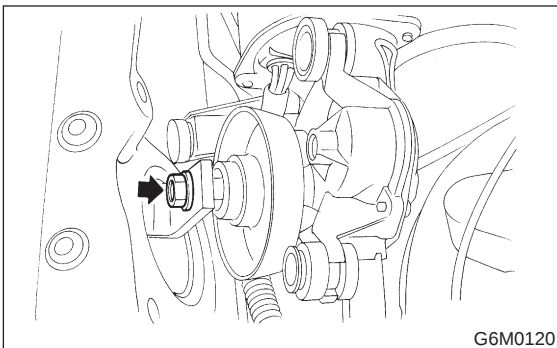
$5.9 \pm 1.5 \text{ N}\cdot\text{m}$ ($0.6 \pm 0.15 \text{ kg}\cdot\text{m}$, $4.3 \pm 1.1 \text{ ft}\cdot\text{lb}$)



3) Remove nut securing motor link on the back side of motor.

Tightening torque:

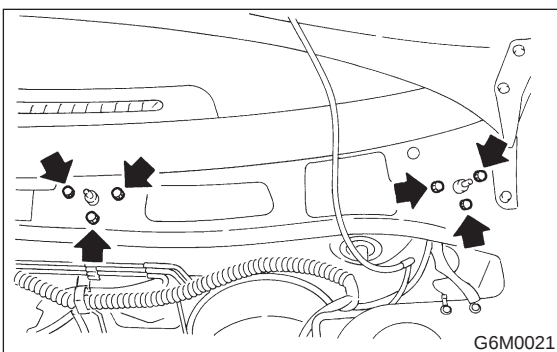
$15 \pm 3 \text{ N}\cdot\text{m}$ ($1.5 \pm 0.3 \text{ kg}\cdot\text{m}$, $10.8 \pm 2.2 \text{ ft}\cdot\text{lb}$)



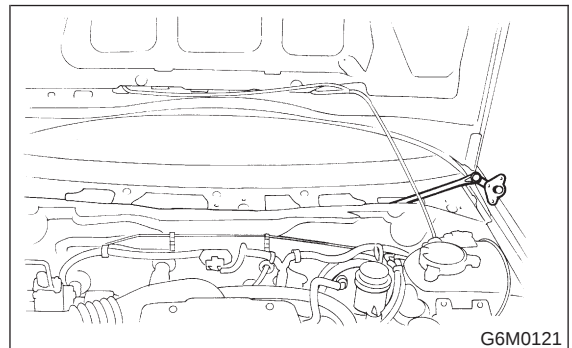
4) Remove nuts which secure sleeve unit.

Tightening torque:

$5.9 \pm 1.5 \text{ N}\cdot\text{m}$ ($0.6 \pm 0.15 \text{ kg}\cdot\text{m}$, $4.3 \pm 1.1 \text{ ft}\cdot\text{lb}$)



5) Remove wiper link from service hole in front panel.



6) Installation is in the reverse order of removal.

C: INSPECTION

1. COMBINATION SWITCH (ON-CAR)

Set wiper switch to each position and check continuity between terminals.

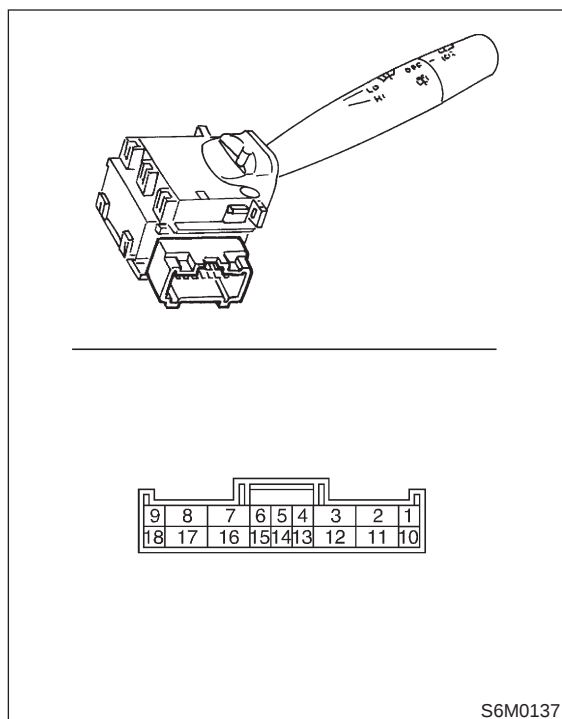
• Wiper switch

Terminal Switch position	16	7	17	8	INT1	INT2
OFF	○—○					
	×	×	×			
MIST	○—○					
	×	×	×			
INT	○—○				○—○	
	×	×	×			
MIST	○—○				○—○	
	×	×	×			
LO	○—○					
	×	×	×			
HI	○—○					
	×	×	×			

• Washer switch

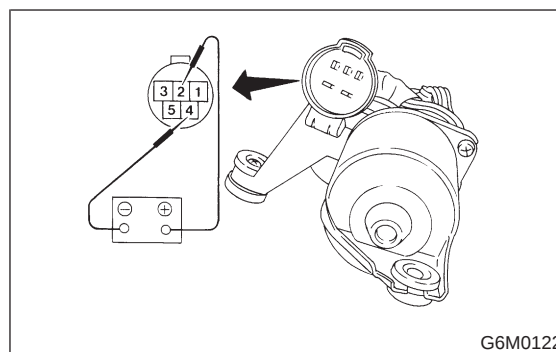
Terminal Switch position	11	2
OFF		
ON	○—○	○—○

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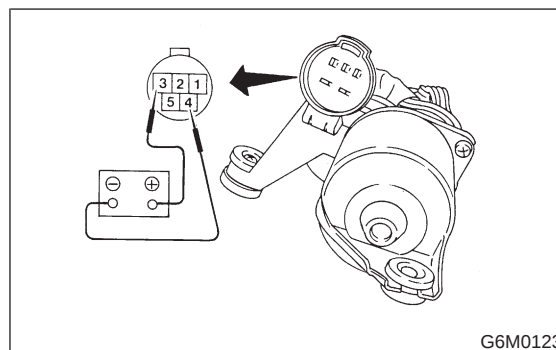


2. WIPER MOTOR

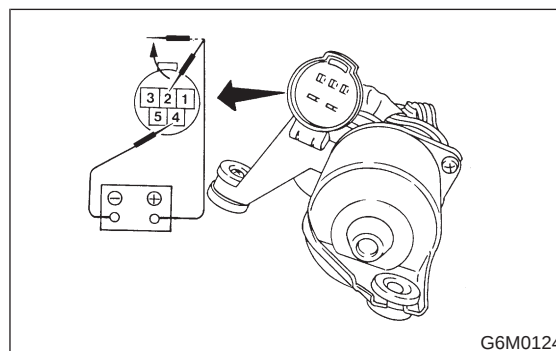
1) Check wiper motor operation at low speed: Connect battery to wiper motor. Check wiper motor for proper operation at low speed.



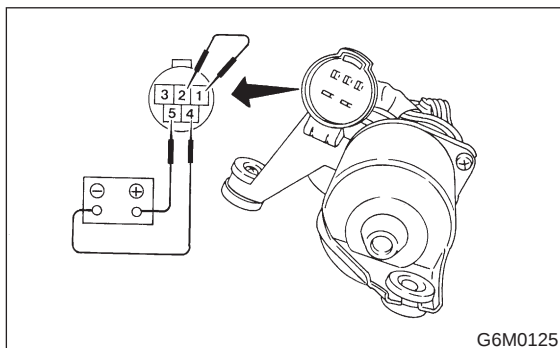
2) Check wiper motor operation at high speed: Connect battery wiper motor. Check wiper motor for proper operation at high speed.



3) Check wiper motor for proper stoppage: Connect battery to wiper motor. After operating wiper motor at low speed, disconnect battery to stop it.



- 4) Reconnect battery and ensure that wiper motor stops at "AUTO STOP" after operating at low speed.



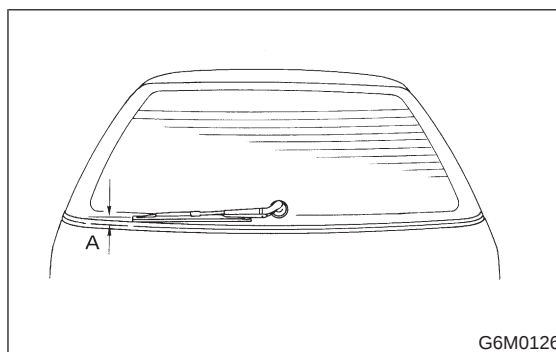
6. Rear Wiper and Washer

A: ADJUSTMENT

- 1) Adjust wiper blade in original position as shown in figure by changing wiper arm installation.

Original position:

A: 30 ± 5 mm (1.18 ± 0.20 in)

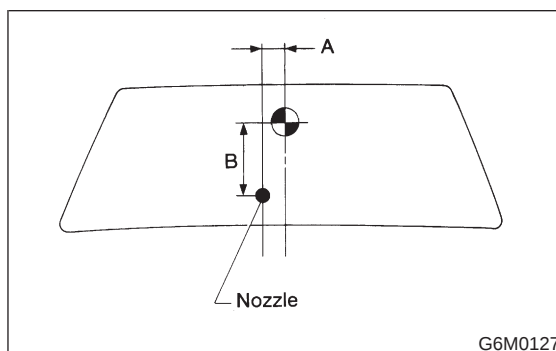


- 2) Adjust washer ejecting point on rear gate window as shown in figure when the vehicle stops.

Ejecting point:

A: 25 mm (0.98 in)

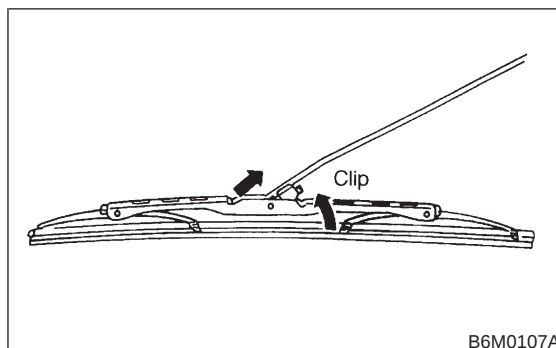
B: 200 — 300 mm (7.87 — 11.81 in)



B: REMOVAL AND INSTALLATION

1. BLADE

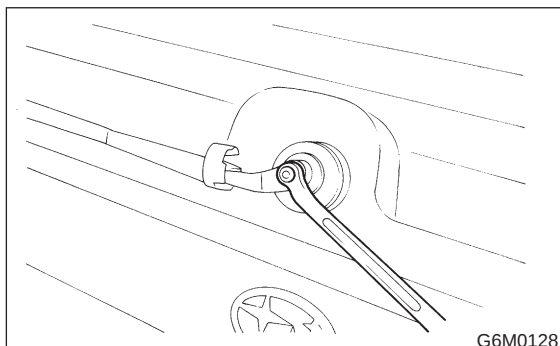
- 1) Pull out blade following the arrow direction, from arm while pushing up locking clip.



- 2) Installation is in the reverse order of removal.

2. WIPER ARM

- 1) Remove head cover.
- 2) Remove nut and wiper arm.



- 3) Installation is in the reverse order of removal.

Tightening torque:

$5.9 \pm 1.5 \text{ N}\cdot\text{m}$ ($0.6 \pm 0.15 \text{ kg}\cdot\text{m}$, $4.3 \pm 1.1 \text{ ft}\cdot\text{lb}$)

3. WIPER MOTOR

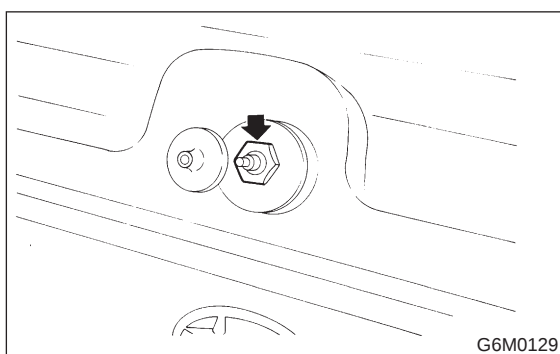
- 1) Remove cap and special nut.

CAUTION:

Be careful not to strike service tool against nozzle during removal.

Tightening torque:

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

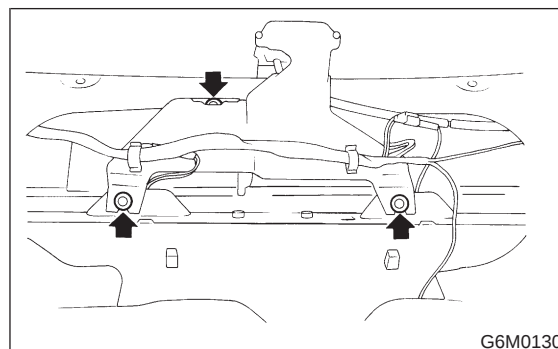


- 2) Remove rear gate trim. <Ref. to 5-2 [W3A0].>
- 3) Undo clips which secure harness, and disconnect connector of wiper motor.
- 4) Separate washer hoses at joint.

- 5) Remove attaching screws and take out wiper motor assembly.

CAUTION:

Be careful not to damage O-ring when removing wiper motor assembly.



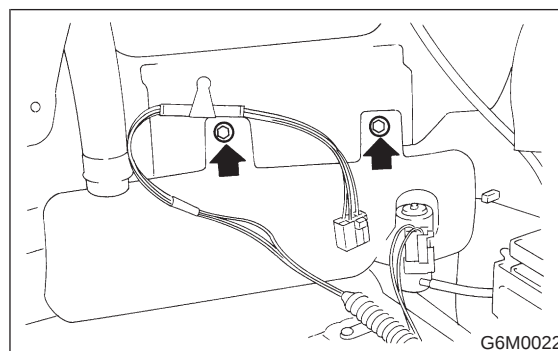
- 6) Installation is in the reverse order of removal.

Tightening torque:

$5.9 \pm 1.5 \text{ N}\cdot\text{m}$ ($0.6 \pm 0.15 \text{ kg}\cdot\text{m}$, $4.3 \pm 1.1 \text{ ft}\cdot\text{lb}$)

4. WASHER TANK

- 1) Remove rear quarter trim.
- 2) Disconnect washer hose and connector.
- 3) Remove attaching bolts.



- 4) Installation is in the reverse order of removal.

Tightening torque:

$5.9 \pm 1.5 \text{ N}\cdot\text{m}$ ($0.6 \pm 0.15 \text{ kg}\cdot\text{m}$, $4.3 \pm 1.1 \text{ ft}\cdot\text{lb}$)

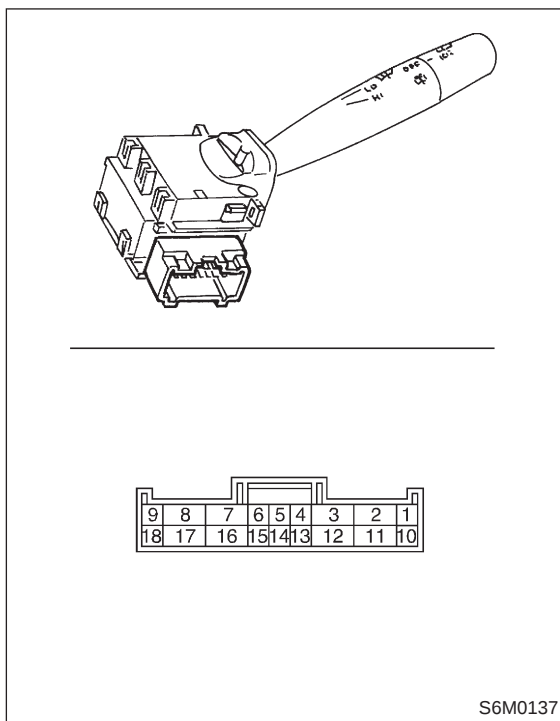
C: INSPECTION**1. COMBINATION SWITCH (ON-CAR)**

Set rear wiper and washer switch to each position and check continuity between terminals.

• WITHOUT INTERMITTENT REAR WIPER

Terminal Switch position	10	12		2
WASH	○	○		○
OFF				
ON	○			○
WASH	○	○		○

H6M0502B

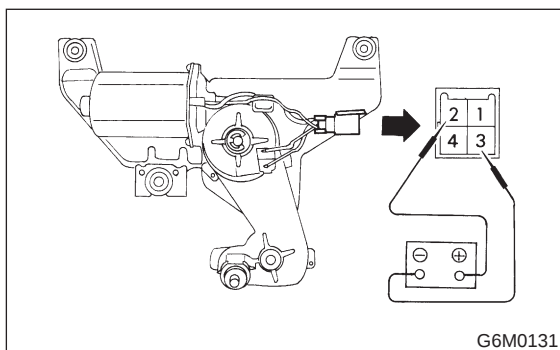


S6M0137

2. WIPER MOTOR

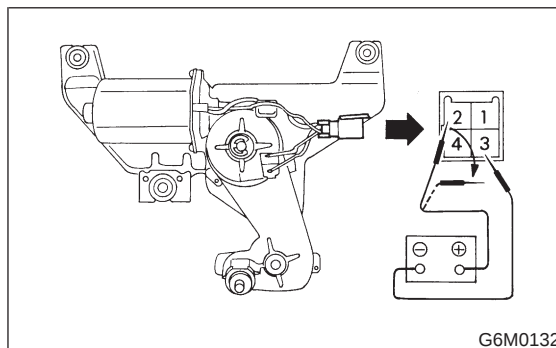
1) Operational check:

Connect battery to wiper motor and check operation of wiper motor.



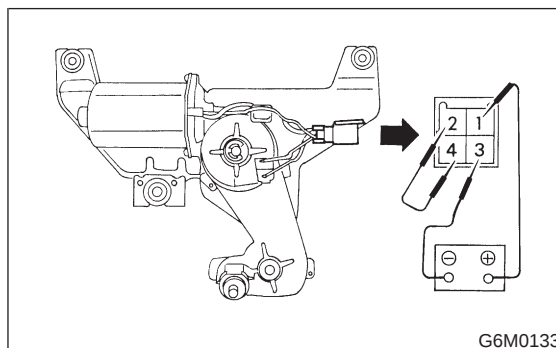
G6M0131

2) Check wiper motor for proper stoppage:
After operating wiper motor, disconnect battery from wiper motor.



G6M0132

3) Reconnect battery and ensure that wiper motor stops at "AUTO STOP" after it has been operated.

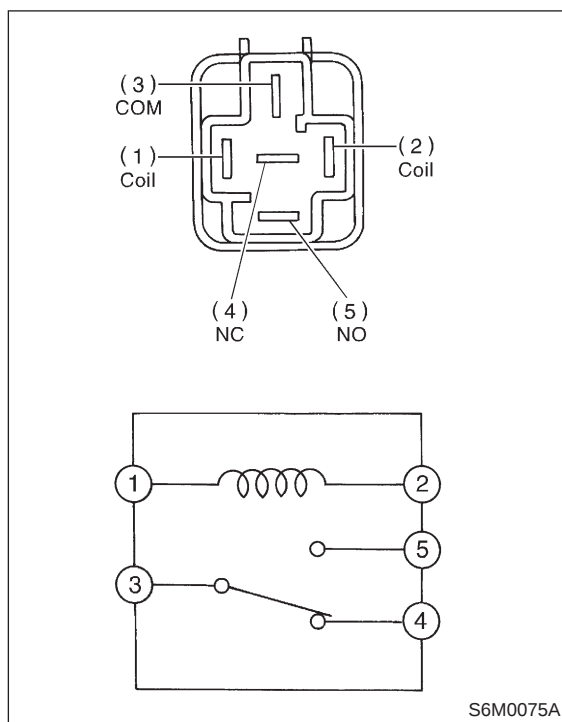


G6M0133

3. REAR WIPER RELAY

- 1) Connect battery to terminal No. 1 and ground terminal No. 2.
- 2) Check continuity between terminals.

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



7. Rear Window Defogger

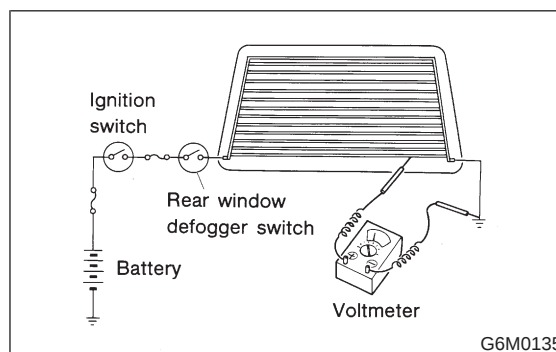
A: INSPECTION

1. HEAT WIRES

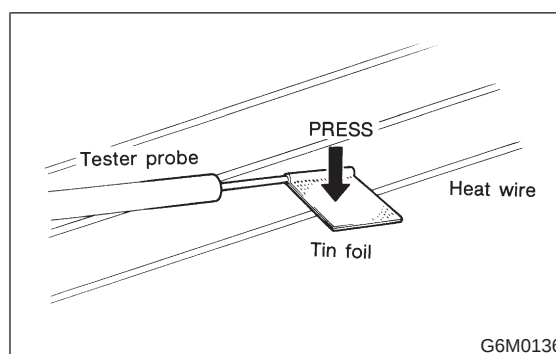
- 1) Start the engine so that battery is being charged.
- 2) Turn defogger switch ON.
- 3) Check each heat wire at its center position for discontinuity by setting direct current voltmeter.

NOTE:

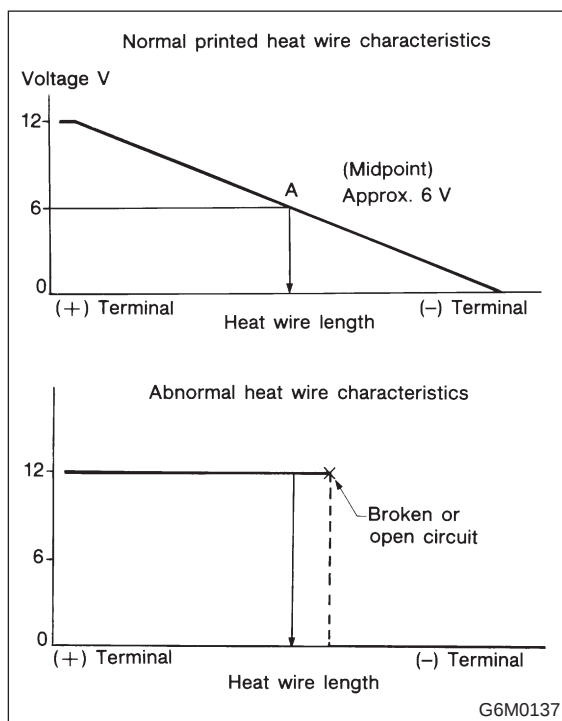
- Normal indication is about 6 volts.



- When measuring voltage, wind a piece of tin foil around the tip of the tester probe and press the foil against the wire with your finger.

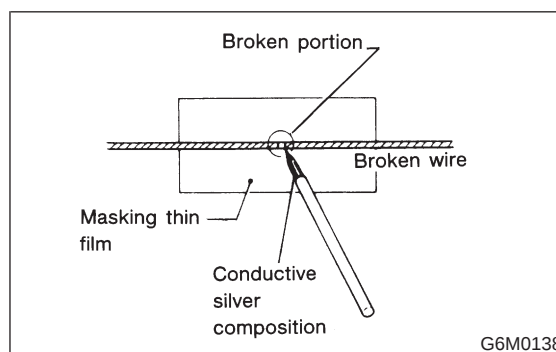


4) When tester indicates 12 volts when its probe reaches point "A", a broken circuit occurs between point "A" and the negative terminal. Slowly move tester probe toward the negative terminal while contacting it on heat wire to locate point where tester indication changes abruptly (0 volts). This is the point where a broken circuit occurs. When tester indicates 0 volts when its probe reaches point "A", a broken circuit occurs between point "A" and the positive terminal. Locate a point where tester indication changes abruptly (12 volts) while slowly moving tester probe toward the positive terminal.



B: REPAIR

- 1) Clean broken wire and its surrounding area.
- 2) Cut off slit on (used) thin film by 0.5 mm (0.020 in) width and 10 mm (0.39 in) length.
- 3) Place the slit on glass along the broken wire, and deposit conductive silver composition (DUPONT No. 4817) on the broken portion.

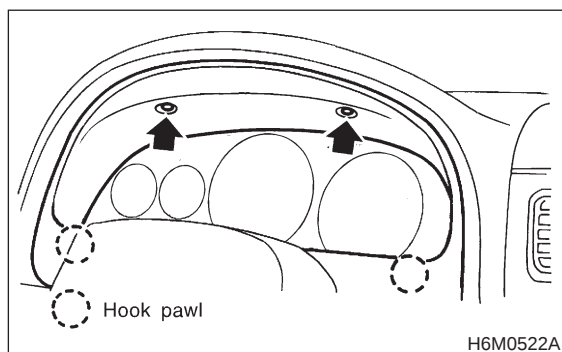


- 4) Dry out the deposited portion.
- 5) Inspect the repaired wire for continuity.

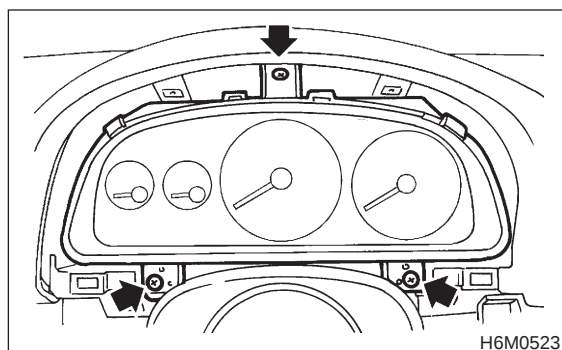
8. Combination Meter

A: REMOVAL AND INSTALLATION

- 1) Move steering wheel most down.
- 2) Remove screws which secure visor and remove visor.



- 3) Remove screws which secure combination meter, and pull combination meter out.

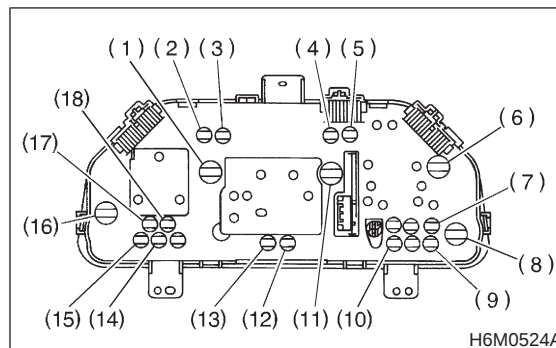


- 4) Disconnect connector from back of combination meter.
- 5) Installation is in the reverse order of removal.

CAUTION:

When installing combination meter, be sure to connect connectors to backside of combination meter.

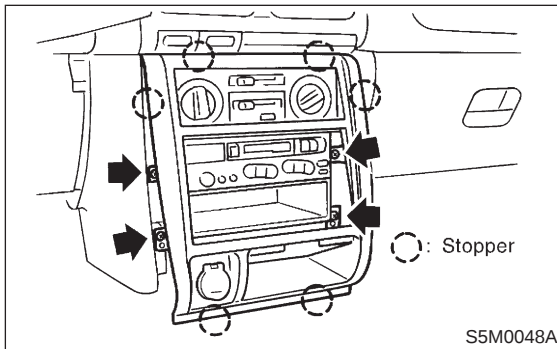
B: BULB REPLACEMENT



- (1) Speedometer and tachometer
- (2) HI-beam
- (3) Turn RH
- (4) Turn LH
- (5) Airbag
- (6) Temperature gauge
- (7) ABS
- (8) Low fuel
- (9) FWD
- (10) AT oil temp.
- (11) Speedometer and temperature gauge
- (12) Seat belt
- (13) Door open
- (14) Check engine
- (15) Charge
- (16) Tachometer
- (17) Brake
- (18) Oil pressure

9. Radio, Speaker and Antenna**A: REMOVAL AND INSTALLATION****1. RADIO BODY**

- 1) Remove console box. <Ref. to 5-4 [W1A0].>
- 2) Remove AT cover (AT model).
- 3) Remove center panel.
- 4) Remove fitting screws, and slightly pull radio out from center console.



- 5) Disconnect electric connectors and antenna feeder cord.
- 6) Installation is in the reverse order of removal.

2. FRONT SPEAKER

- 1) Remove front door trim and disconnect connector. <Ref. to 5-2 [W2A2].>
- 2) Remove screws which secure front speaker.
- 3) Remove speaker and disconnect connector.
- 4) Installation is in the reverse order of removal.

3. REAR SPEAKER (SEDAN)

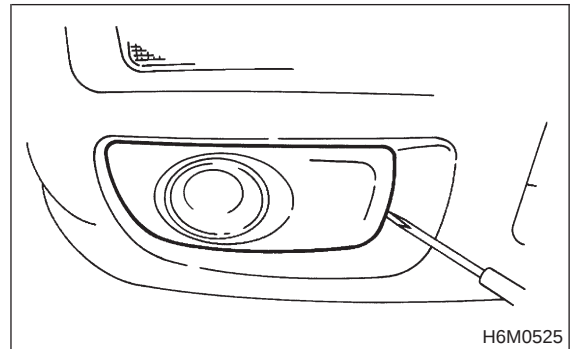
- 1) Remove rear shelf trim panels.
- 2) Remove screws which secure rear speakers.
- 3) Disconnect connector and remove speakers.
- 4) Installation is in the reverse order of removal.

4. REAR SPEAKER (WAGON)

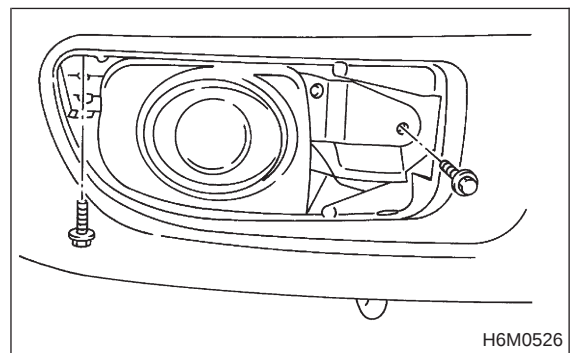
- 1) Remove rear door trim and disconnect connector. <Ref. to 5-2 [W2A2].>
- 2) Remove screws which secure rear speaker.
- 3) Remove speaker and disconnect connector.
- 4) Installation is in the reverse order of removal.

10. Front Fog Light**A: REMOVAL AND INSTALLATION**

- 1) Disconnect ground cable from battery.
- 2) Remove front fog light cover.



- 3) Remove the two screws, then draw out the front fog light from front bumper.



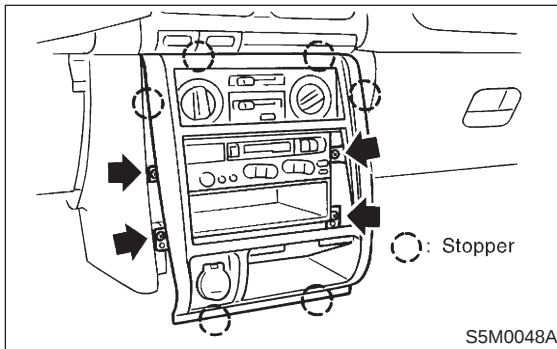
- 4) Disconnect the connector.
- 5) Installation is in the reverse order of removal.

9. Radio, Speaker and Antenna

A: REMOVAL AND INSTALLATION

1. RADIO BODY

- 1) Remove console box. <Ref. to 5-4 [W1A0].>
- 2) Remove AT cover (AT model).
- 3) Remove center panel.
- 4) Remove fitting screws, and slightly pull radio out from center console.



- 5) Disconnect electric connectors and antenna feeder cord.
- 6) Installation is in the reverse order of removal.

2. FRONT SPEAKER

- 1) Remove front door trim and disconnect connector. <Ref. to 5-2 [W2A2].>
- 2) Remove screws which secure front speaker.
- 3) Remove speaker and disconnect connector.
- 4) Installation is in the reverse order of removal.

3. REAR SPEAKER (SEDAN)

- 1) Remove rear shelf trim panels.
- 2) Remove screws which secure rear speakers.
- 3) Disconnect connector and remove speakers.
- 4) Installation is in the reverse order of removal.

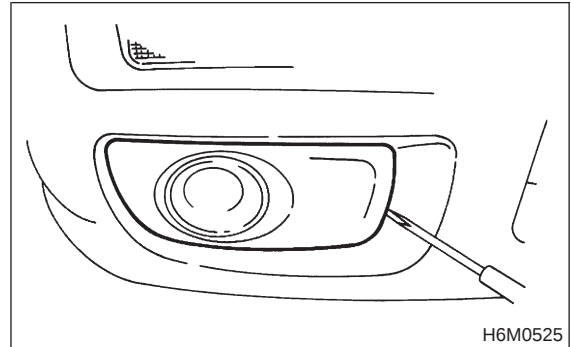
4. REAR SPEAKER (WAGON)

- 1) Remove rear door trim and disconnect connector. <Ref. to 5-2 [W2A2].>
- 2) Remove screws which secure rear speaker.
- 3) Remove speaker and disconnect connector.
- 4) Installation is in the reverse order of removal.

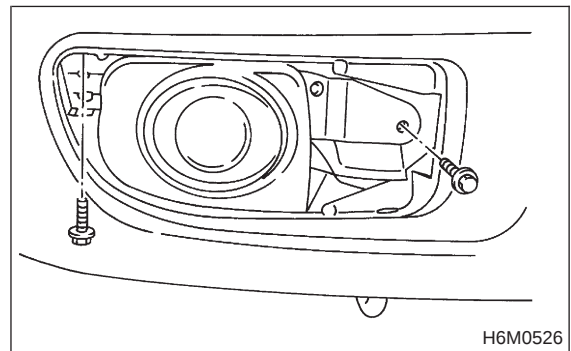
10. Front Fog Light

A: REMOVAL AND INSTALLATION

- 1) Disconnect ground cable from battery.
- 2) Remove front fog light cover.



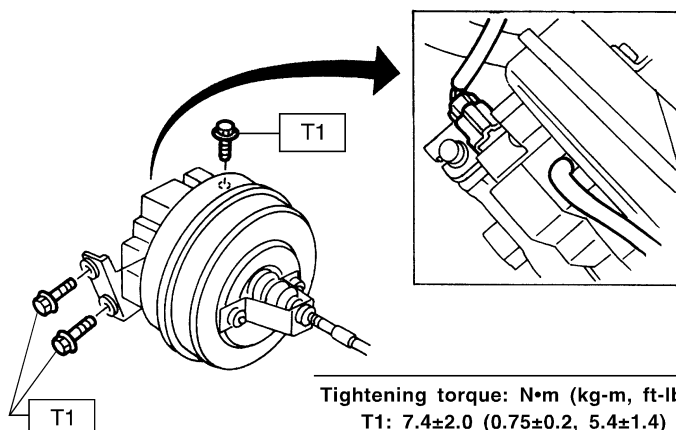
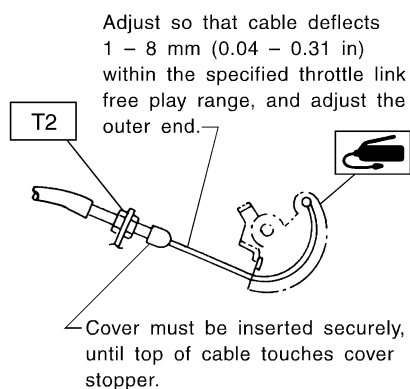
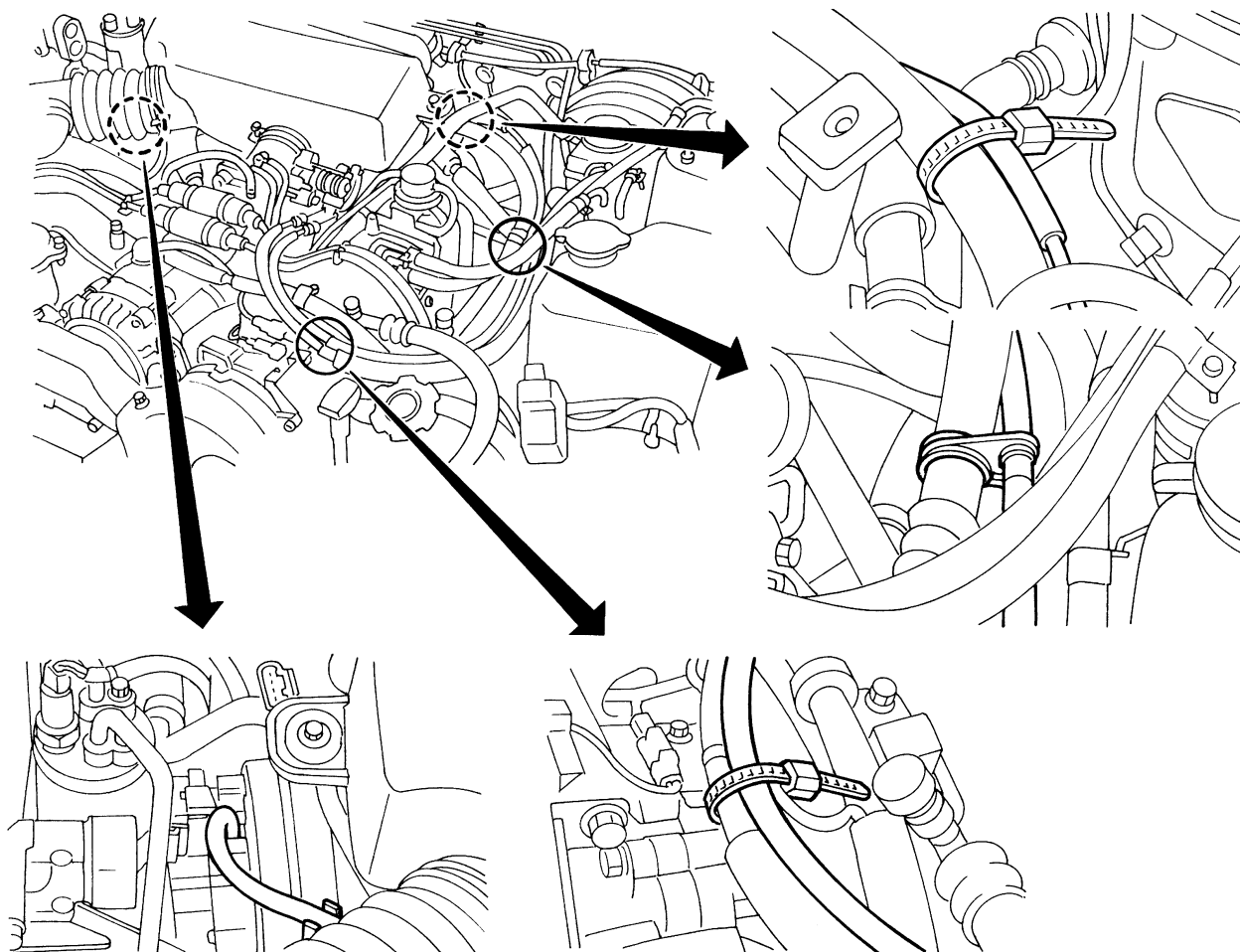
- 3) Remove the two screws, then draw out the front fog light from front bumper.



- 4) Disconnect the connector.
- 5) Installation is in the reverse order of removal.

11. Cruise Control

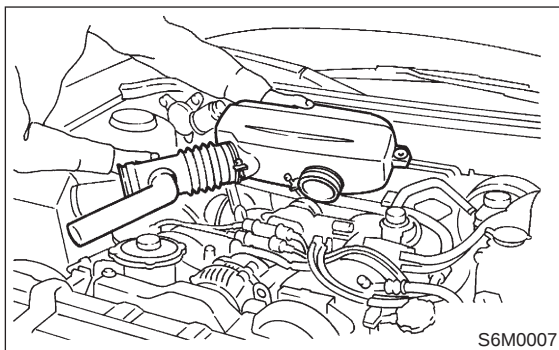
A: ADJUSTMENT



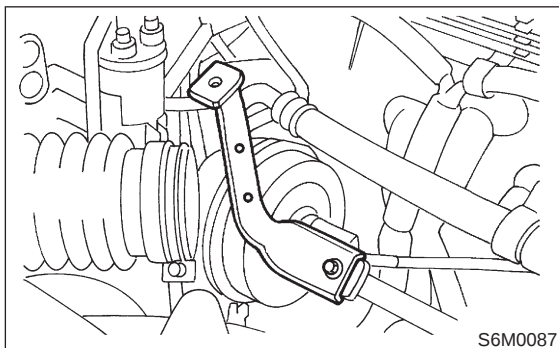
B: REMOVAL AND INSTALLATION

1. ACTUATOR

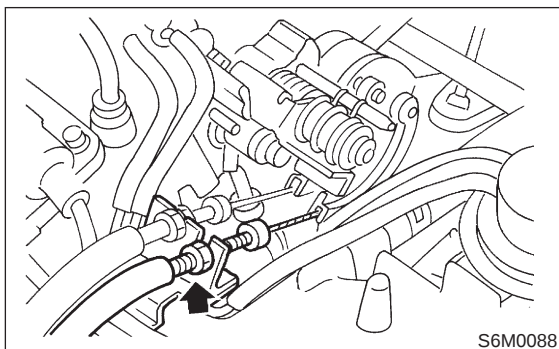
- 1) Remove air intake chamber.



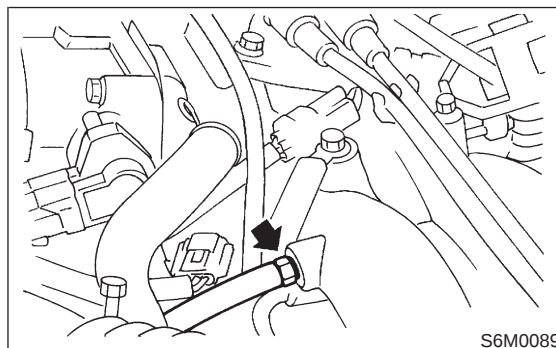
- 2) Remove air intake chamber stay.
3) Remove clip bands from cruise control cable.



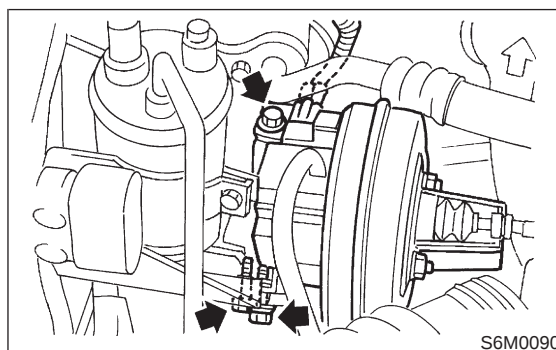
- 4) Remove cruise control cable end from throttle cam.



- 5) Disconnect cruise control vacuum hose from intake manifold.



- 6) Remove actuator attaching bolts.
7) Disconnect connector from actuator, then remove the actuator.



- 8) Installation is in the reverse order of removal.

Tightening torque:

$7.4 \pm 2.0 \text{ N}\cdot\text{m}$ ($0.75 \pm 0.2 \text{ kg}\cdot\text{m}$, $5.4 \pm 1.4 \text{ ft}\cdot\text{lb}$)

CAUTION:

When inserting vacuum hose to intake manifold, apply sealant to the fitting hose.

Fluid packing:

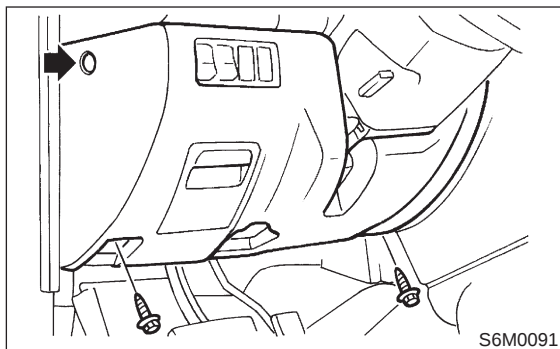
THREE BOND 1105 or equivalent

CAUTION:

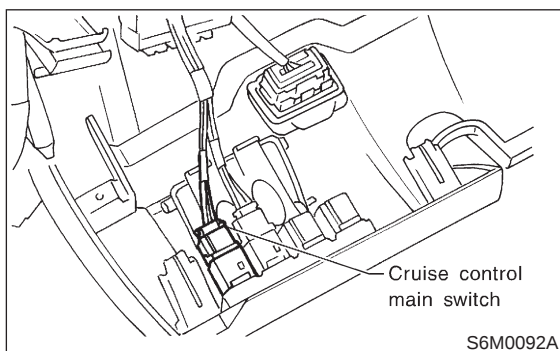
- Be careful not to apply excessive load to the wire cable when adjusting and/or installing; otherwise, the actuator may be deformed or damaged.
- Do not bend cable sharply with a radius less than 100 mm (3.94 in); otherwise, cable may bend permanently, resulting in poor performance.
- When installing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

2. CRUISE CONTROL MAIN SWITCH

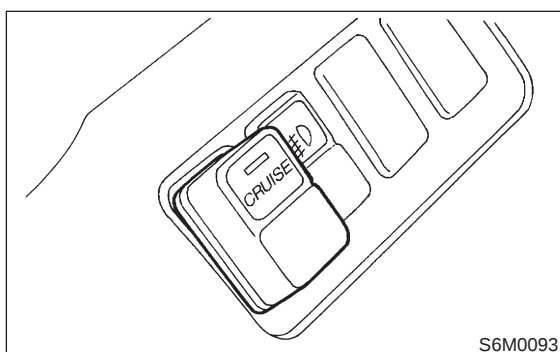
- 1) Remove screws and clip from instrument panel lower cover.
- 2) Remove panel lower cover.



- 3) Disconnect connector from cruise control main switch.



- 4) Remove main switch by pushing it outward.



- 5) Installation is in the reverse order of removal.

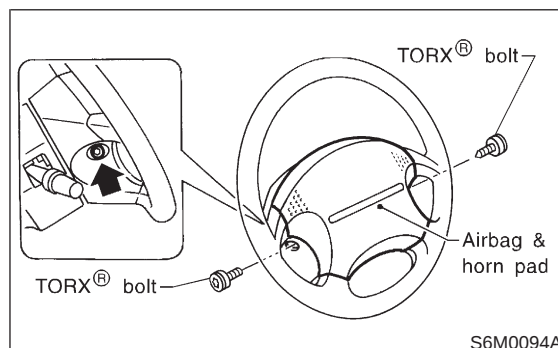
3. CRUISE CONTROL COMMAND SWITCH

CAUTION:

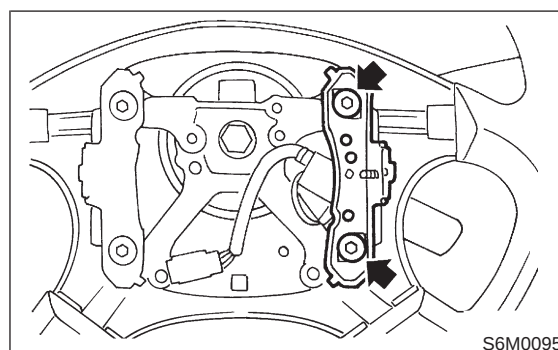
Before starting operation carefully read the notes given in Chapter 5-5 for proper handling of the airbag module. <Ref. to 5-5 [W3A0].>

- 1) Set front wheels in straight ahead position.
- 2) Turn ignition switch OFF.
- 3) Disconnect battery ground cable from battery and wait for at least 20 seconds before starting work.

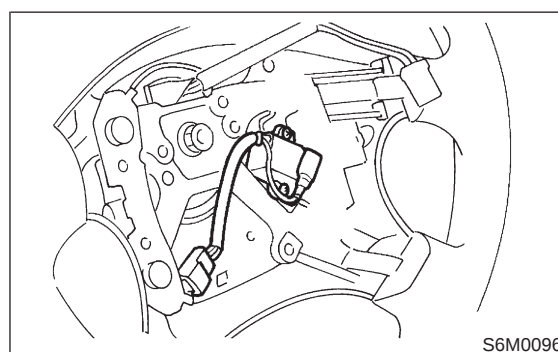
- 4) Using TORX® BIT T30 (Tamper resistant type), remove two TORX® bolts which secure driver's airbag module.



- 5) Disconnect airbag module connector on back of airbag module.
- 6) Remove horn switch from steering wheel as shown.



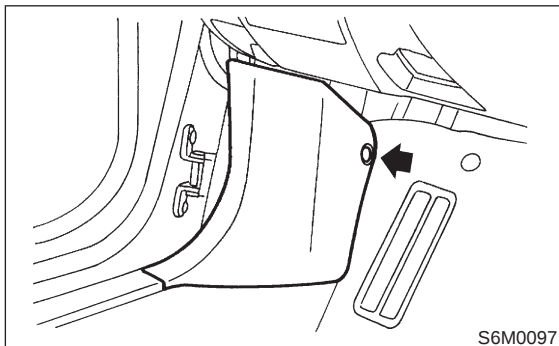
- 7) Disconnect horn and cruise control command switch connector, then remove cruise control command switch.



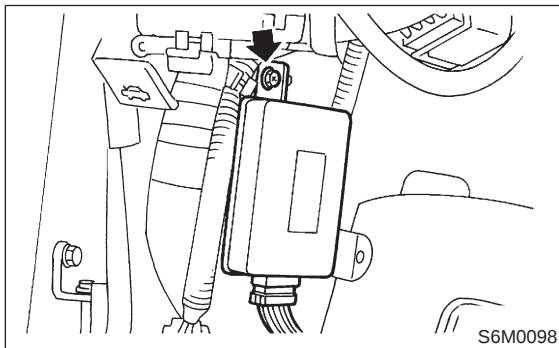
- 8) Installation is in the reverse order of removal.

4. CRUISE CONTROL MODULE

- 1) Remove front pillar lower trim.



- 2) Disconnect connector from cruise control module.
3) Remove bolt, then remove cruise control module.



- 4) Installation is in the reverse order of removal.

5. STOP AND BRAKE SWITCH

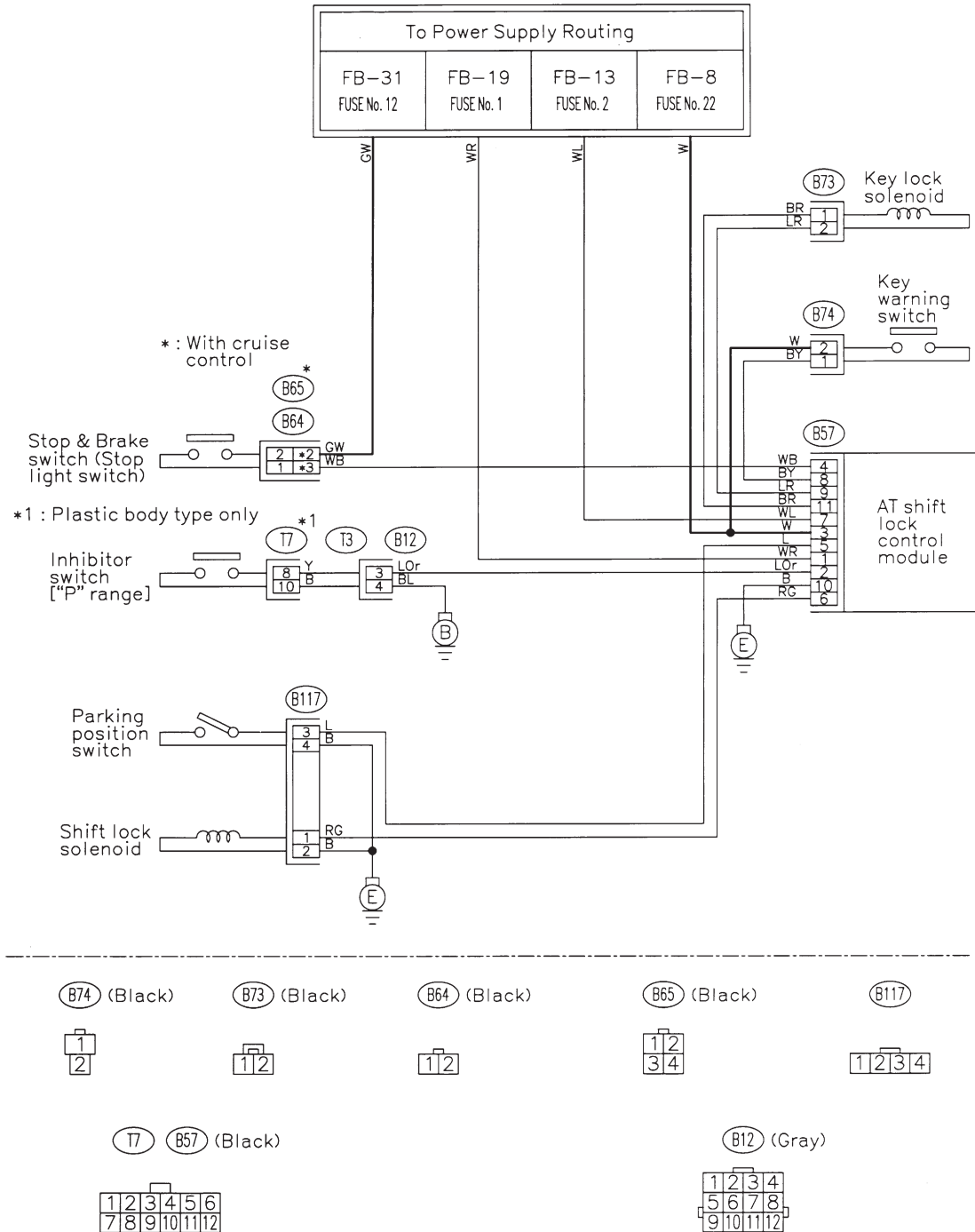
Disconnect connector from switch, then remove the switch. <Ref. to 4-5 [C100].>

6. CLUTCH SWITCH

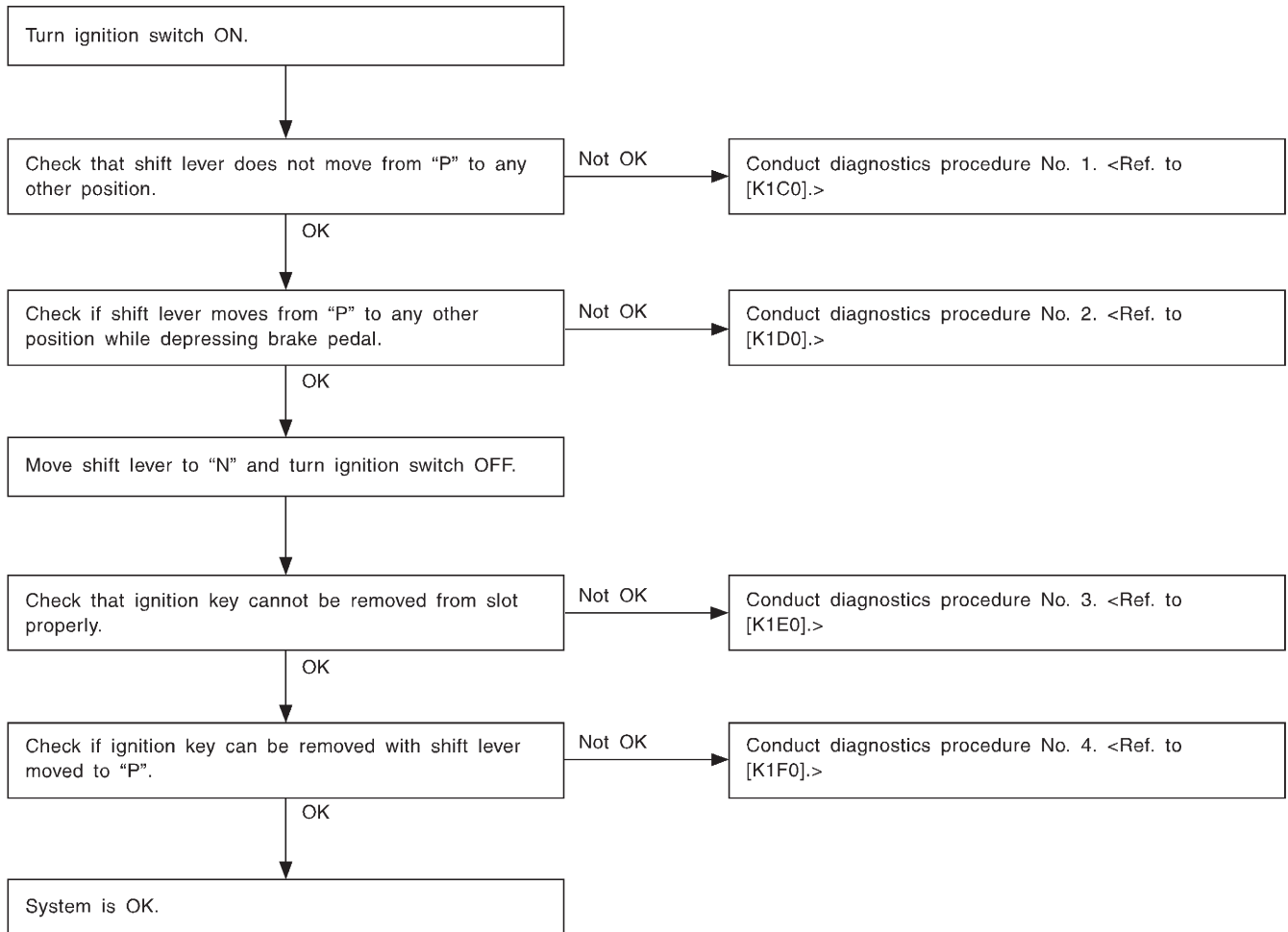
Disconnect connector from switch, then remove the switch. <Ref. to 4-5 [C100].>

1. AT Shift Lock System

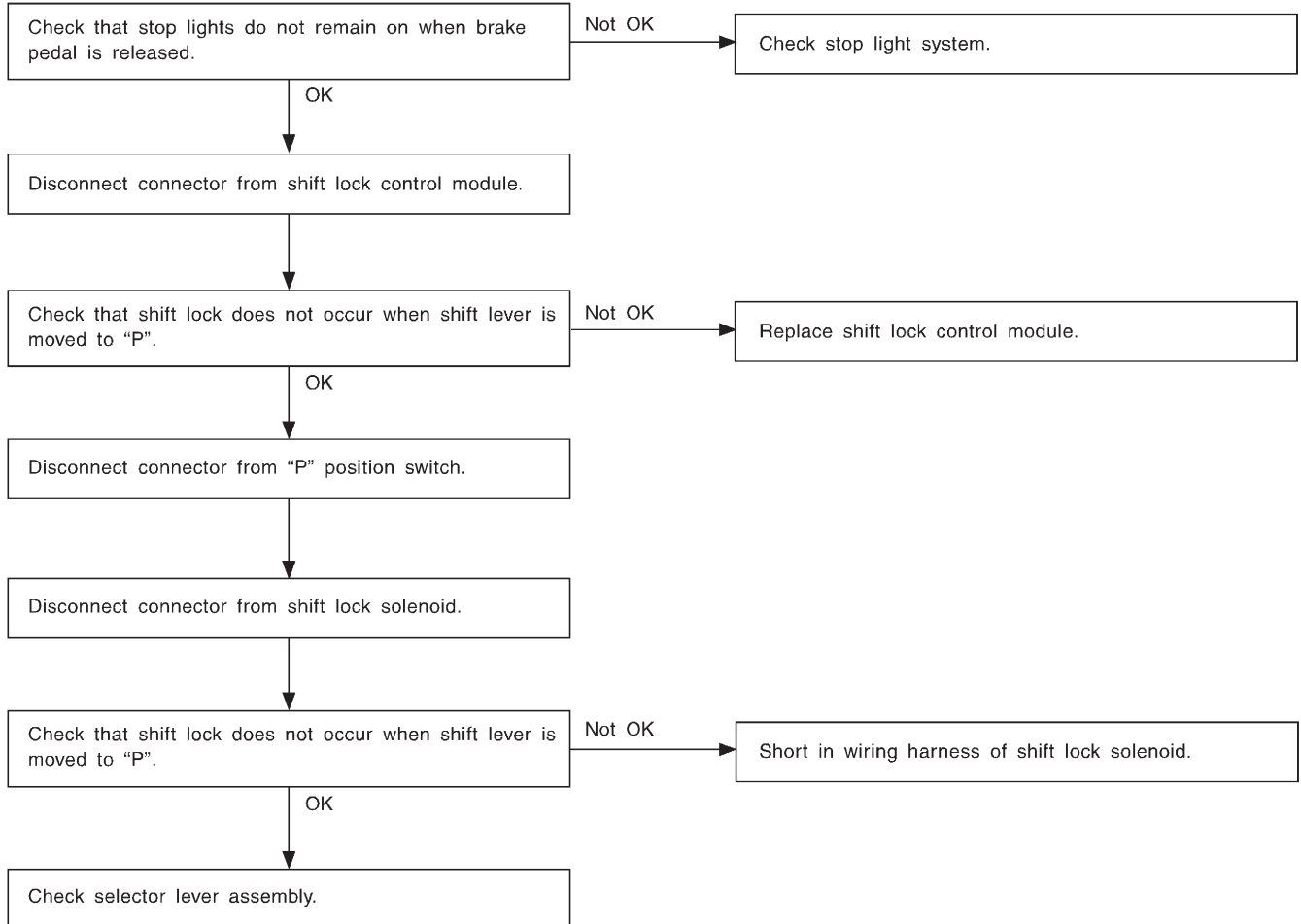
A: WIRING DIAGRAM



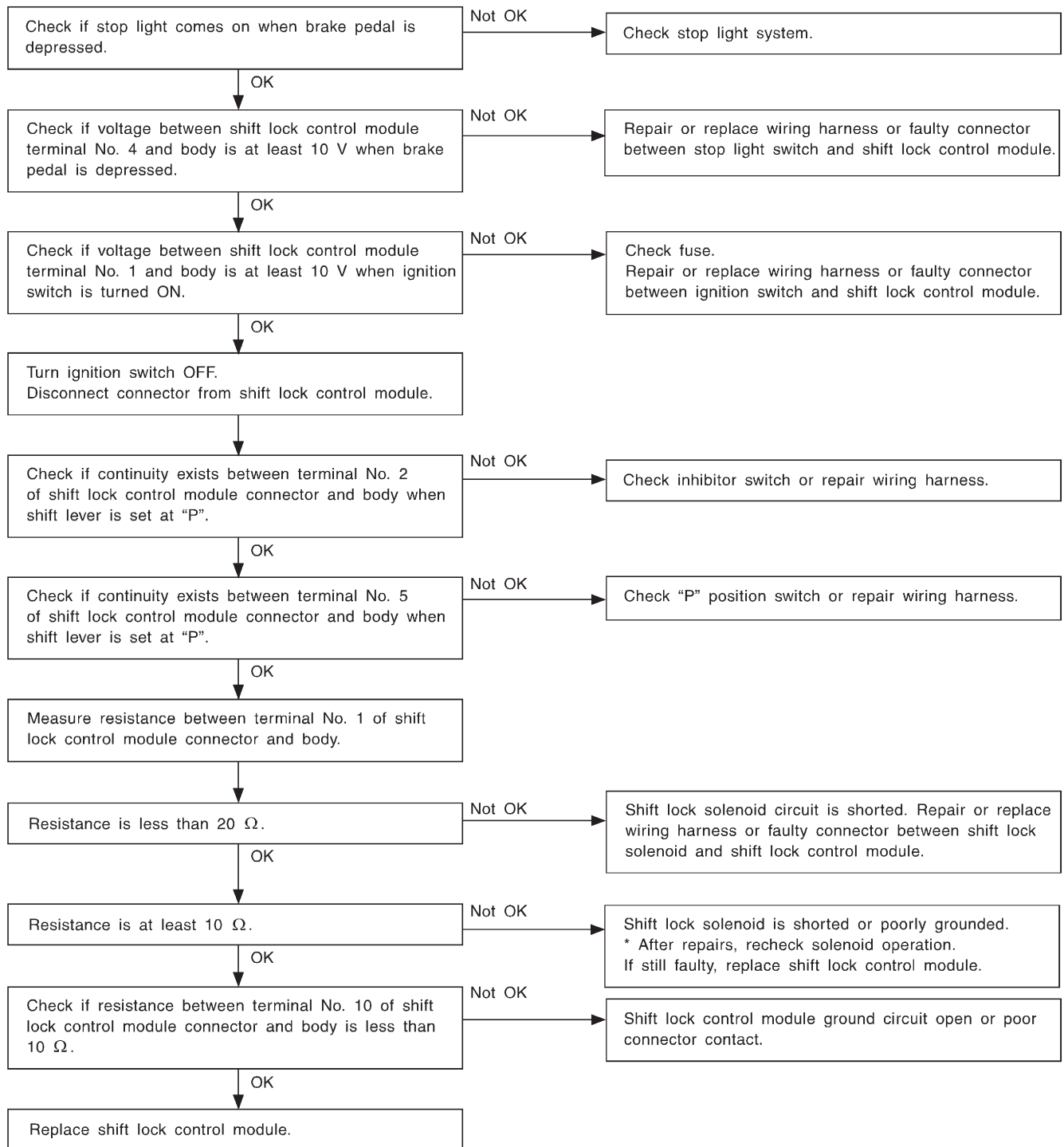
B: BASIC DIAGNOSTICS CHART



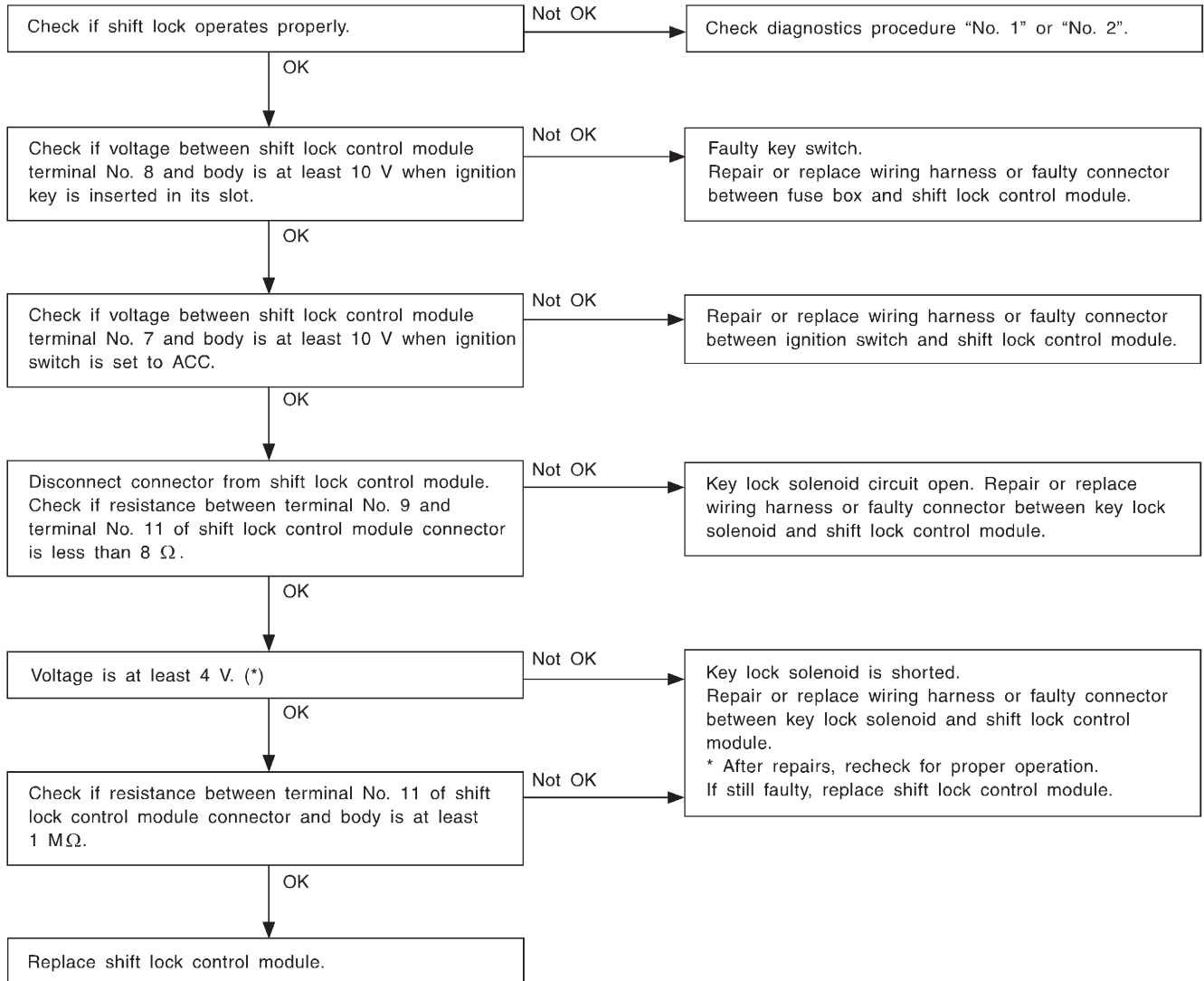
C: DIAGNOSTICS PROCEDURE NO. 1



H6M0505

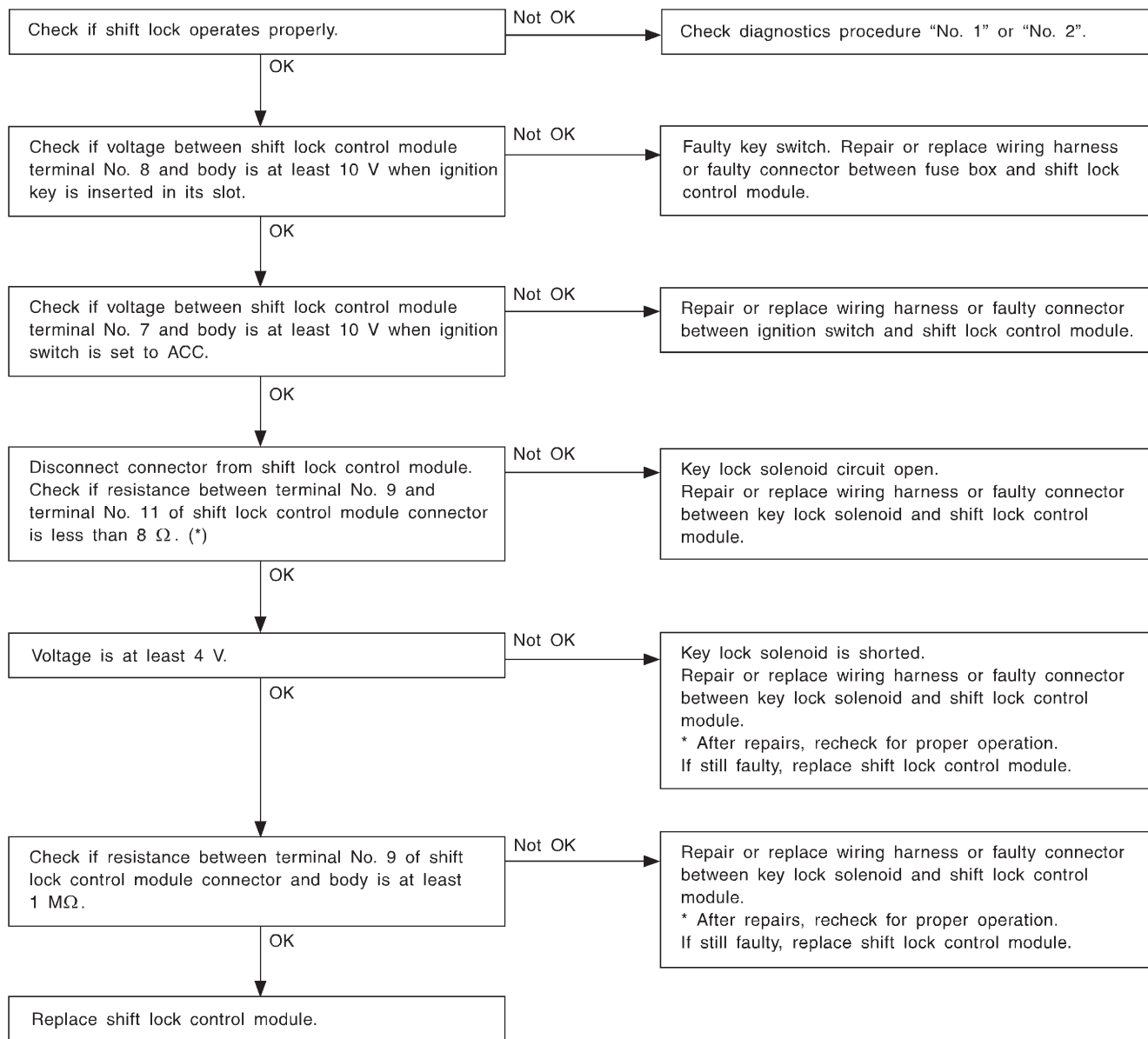
D: DIAGNOSTICS PROCEDURE NO. 2 (SHIFT LOCK DOES NOT RELEASE.)

E: DIAGNOSTICS PROCEDURE NO. 3 (KEY INTERLOCK DOES NOT OPERATE.)



*: When conducting operational checks of the key lock solenoid, do not apply 12 V to solenoid for more than one second, since this may break solenoid circuit.

F: DIAGNOSTICS PROCEDURE NO. 4 (KEY INTERLOCK DOES NOT RELEASE.)



*: When conducting operational checks of the key lock solenoid, do not apply 12 V to solenoid for more than one second, since this may break solenoid circuit.

2. Combination Meter

A: DIAGNOSTICS PROCEDURE

If speedometer does not operate, or operates abnormally, check combination meter circuit.

CAUTION:

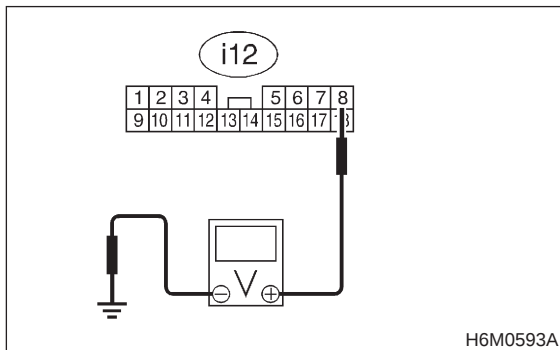
Make sure that trouble code of vehicle speed sensor 2 system appears in electrical system on-board diagnosis.

2A1 : CHECK POWER SUPPLY FOR COMBINATION METER.

- 1) Remove combination meter.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between combination meter connector and chassis ground.

Connector & terminal

(i12) No. 8 (+) — Chassis ground (-):



- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step 2A2.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

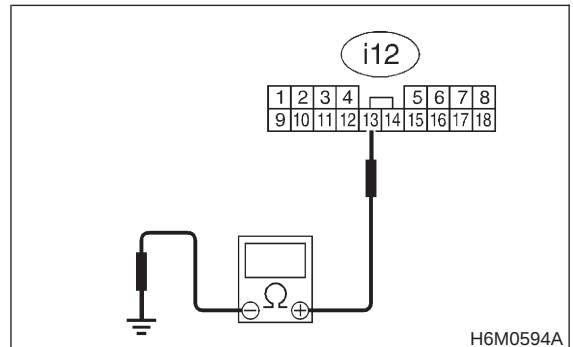
- Open circuit in harness between combination meter and battery.
- Poor contact in coupling connectors (i12) and combination meter connector. <Ref. to FOREWORD [T3C0].>

2A2 : CHECK GROUND CIRCUIT OF COMBINATION METER.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance of harness between combination meter connector and chassis ground.

Connector & terminal

(i12) No. 13 (+) — Chassis ground (-):



- CHECK** : Is the resistance less than 10 Ω?
- YES** : Go to step 2A3.
- NO** : Repair harness and connector.

2A3 : CHECK TRANSMISSION TYPE.

- CHECK** : Is the transmission type MT?
- YES** : Go to step 2A4.
- NO** : Go to step 2A9.

6-2 [K2A4]

2. Combination Meter

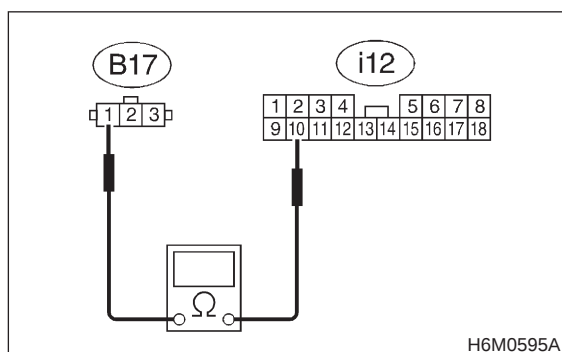
DIAGNOSTICS

2A4 : CHECK HARNESS CONNECTOR BETWEEN COMBINATION METER AND VEHICLE SPEED SENSOR 2.

- 1) Disconnect connector from vehicle speed sensor 2.
- 2) Measure resistance of harness connector between vehicle speed sensor 2 and combination meter.

Connector & terminal

(B17) No. 1 — (i12) No. 10:



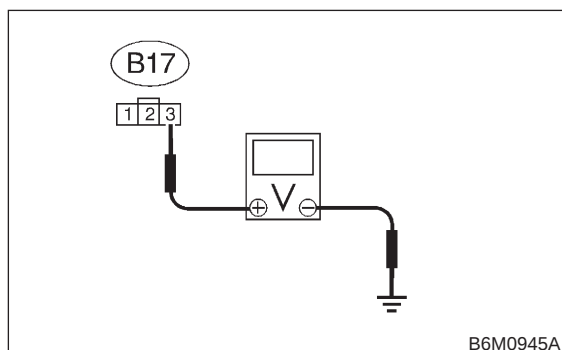
- CHECK** : Is the resistance less than 10 Ω?
- YES** : Go to step 2A5.
- NO** : Repair wiring harness.

2A5 : CHECK HARNESS CONNECTOR BETWEEN BATTERY AND VEHICLE SPEED SENSOR 2.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between vehicle speed sensor 2 connector (B17) and chassis ground.

Connector & terminal

(B17) No. 3 (+) — Chassis ground (-):



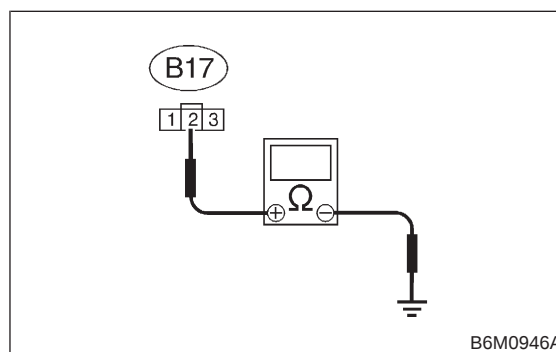
- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step 2A6.
- NO** : Repair harness connector between battery and vehicle speed sensor 2.

2A6 : CHECK HARNESS CONNECTOR BETWEEN VEHICLE SPEED SENSOR 2 AND ENGINE GROUND.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between vehicle speed sensor 2 connector (B17) and engine ground.

Connector & terminal

(B17) No. 2 (+) — Engine ground (-):



- CHECK** : Is the resistance less than 10 Ω?
- YES** : Go to step 2A7.
- NO** : Repair harness connector between vehicle speed sensor 2 and engine ground.

2A7 : CHECK VEHICLE SPEED SENSOR 2.

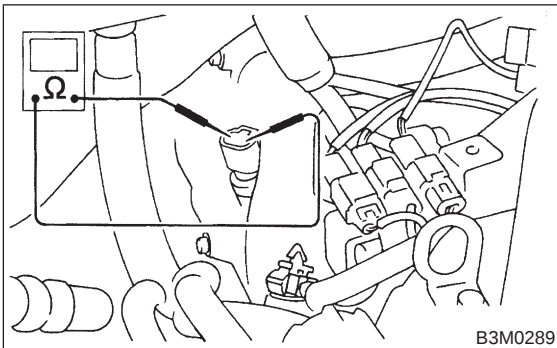
NOTE:

- If resistance between terminals of vehicle speed sensor 2 is out of specification, the sensor may have a failure.
- If resistance is OK and voltage between terminals of vehicle speed sensor 2 is out of specification, mechanical trouble may be present between vehicle speed sensor 2 and speedometer shaft in transmission.

Measure resistance between terminals of vehicle speed sensor 2.

Terminals

No. 2 — No. 3:



CHECK : Is the resistance between 350 and 450 Ω ?

YES : Go to step 2A8.

NO : Replace vehicle speed sensor 2.

2A8 : CHECK VEHICLE SPEED SENSOR 2.

- 1) Connect connector to vehicle speed sensor 2.
- 2) Set the vehicle on free roller, or lift-up the vehicle and support with safety stands.

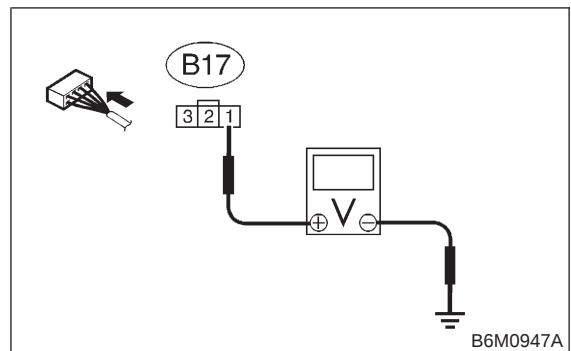
WARNING:

Be careful not to be caught up by the running wheels.

- 3) Drive the vehicle at speed greater than 20 km/h (12 MPH).
- 4) Measure voltage between vehicle speed sensor 2 connector (B17) and chassis ground.

Connector & terminal

(B17) No. 1 (+) — Chassis ground (-):



CHECK : Is the voltage more than 4 V?

YES : Repair or replace speedometer.

NO : Replace vehicle speed sensor 2.

2A9 : CHECK HARNESS CONNECTOR BETWEEN COMBINATION METER AND AUTOMATIC TRANSMISSION CONTROL MODULE.

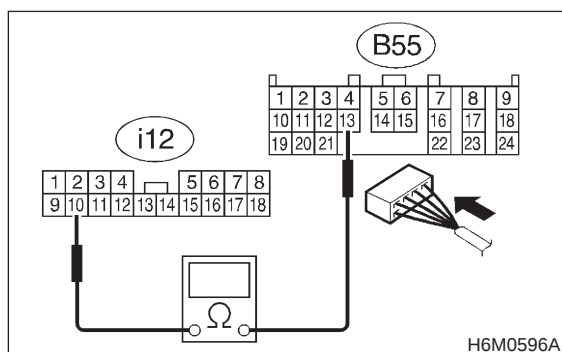
- 1) Disconnect connector from automatic transmission control module.
- 2) Measure resistance between combination meter connector (i12) and automatic transmission control module connector (B55).

CAUTION:

To measure the voltage and/or resistance, use a tapered pin with a diameter of less than 0.64 mm (0.025 in). Do not insert the pin more than 5 mm (0.20 in).

Connector & terminal

(i12) No. 10 — (B55) No. 13:



CHECK : Is the resistance less than 10 Ω?

YES : Go to step 2A10.

NO : Repair harness connector between combination meter and automatic transmission control module.

2A10 : CHECK AUTOMATIC TRANSMISSION CONTROL MODULE.

- 1) Connect connector to automatic transmission control module.
- 2) Set the vehicle on free roller, or lift-up the vehicle and support with safety stands.

WARNING:

Be careful not to be caught by the running wheels.

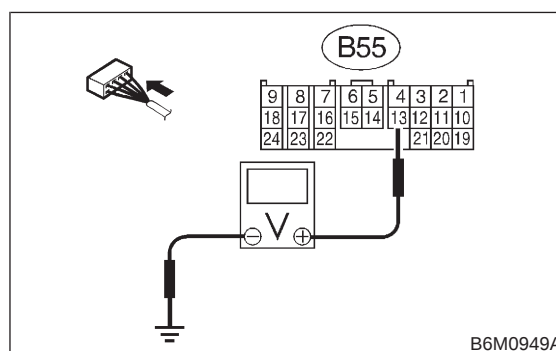
- 3) Drive the vehicle faster than 20 km/h (12 MPH).
- 4) Measure voltage between automatic transmission control module connector (B55) and chassis ground.

CAUTION:

To measure the voltage and/or resistance, use a tapered pin with a diameter of less than 0.64 mm (0.025 in). Do not insert the pin more than 5 mm (0.20 in).

Connector & terminal

(B55) No. 13 (+) — Chassis ground (-):



CHECK : Is the voltage more than 4 V?

YES : Repair or replace speedometer.

NO : Replace automatic transmission control module. <Ref. to 3-2 [W22A0].>