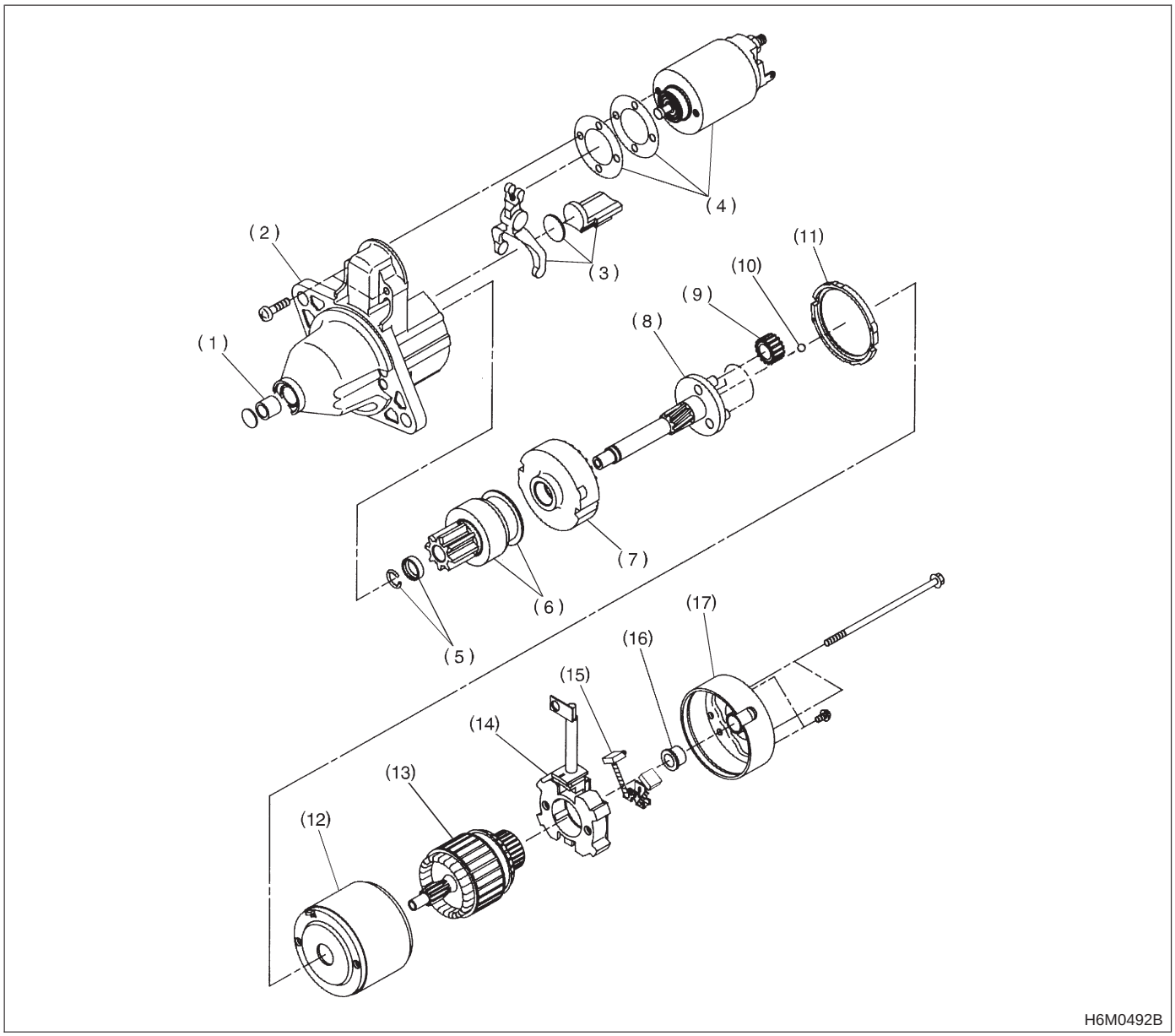
1. Specifications

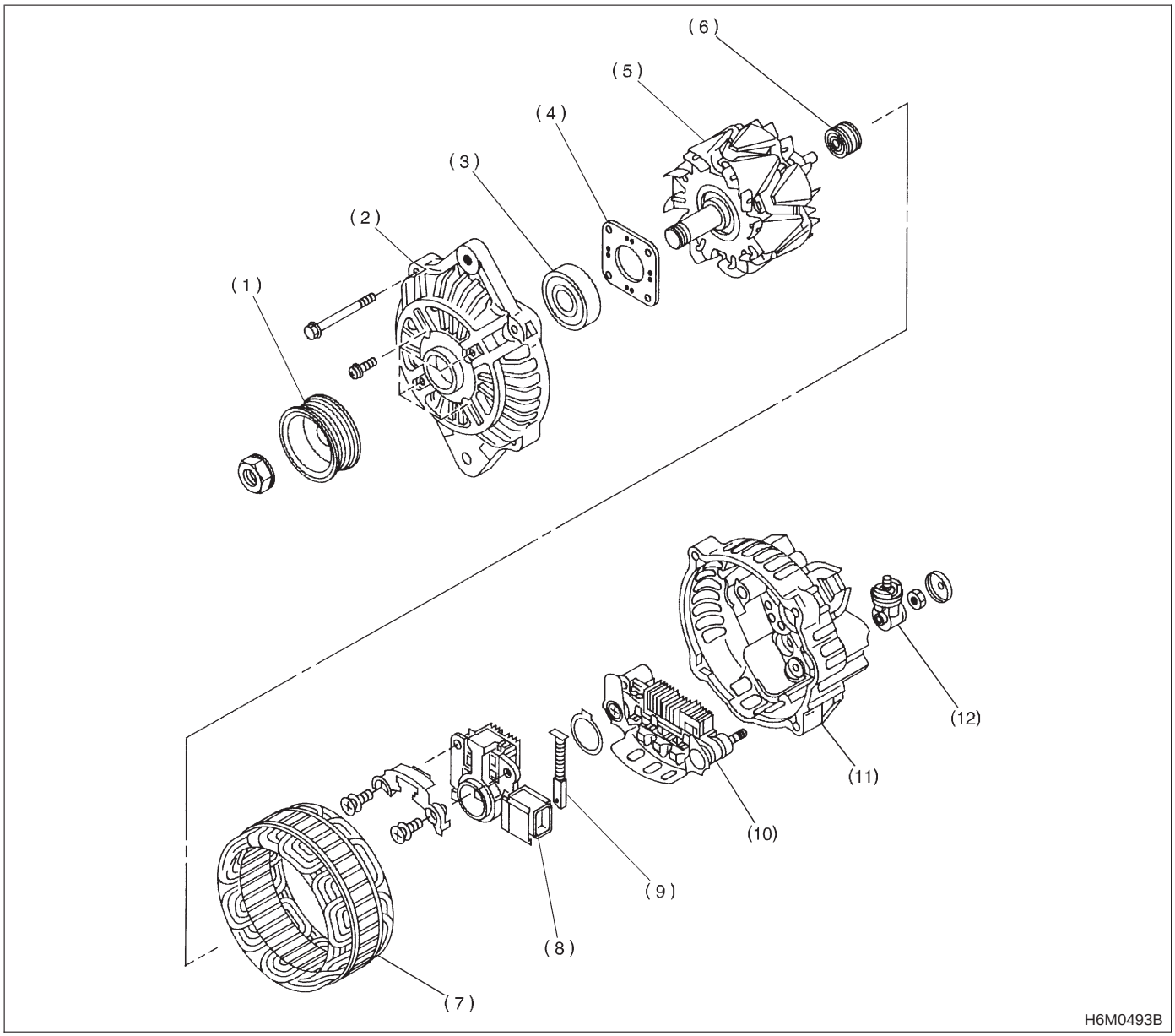
Item			Designation	
Starter	Type		Reduction type	
	Vehicle type		MT vehicles	AT vehicles
	Model		M000T81681	M000T84481, M001T84481
	Manufacturer		Mitsubishi Electric	
	Voltage and output		12 V — 1.0 kW	12 V — 1.4 kW
	Direction of rotation		Counterclockwise (when observed from pinion)	
	Number of pinion teeth		8	9
	No-load characteristics	Voltage	11 V	
		Current	90 A or less	
		Rotating speed	2,800 rpm or more	2,400 rpm or more
	Load characteristics	Voltage	7.5 V	7.7 V
		Current	300 A	400 A
		Torque	8.73 N·m (0.89 kg-m, 6.4 ft-lb) or more	16.0 N·m (1.63 kg-m, 11.8 ft-lb) or more
		Rotating speed	890 rpm or more	740 rpm or more
	Lock characteristics	Voltage	4 V	3.5 V
		Current	780 A or less	940 A or less
		Torque	15.7 N·m (1.60 kg-m, 11.6 ft-lb) or more	28.9 N·m (2.95 kg-m, 21.3 ft-lb) or more
Generator	Type		Rotating-field three-phase type, Voltage regulator built-in type, with load response control system	Rotating-field three-phase type, Voltage regulator built-in type, without load response control system
	Model		A2TA7691	
	Manufacturer		Mitsubishi Electric	
	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		14.1 — 14.8 V [20°C (68°F)]	
Ignition coil	Model		F-569-01R	
	Manufacturer		Diamond	
	Primary coil resistance		0.69 Ω±10%	
	Secondary coil resistance		21.0 Ω±15%	
	Insulation resistance between primary terminal and case		More than 10 MΩ	
Spark plug	Type and manufacturer		PFR5B-11 ..... NGK, RC10PYP4A ..... Champion	
	Thread size	mm	14, P = 1.25	
	Spark gap	mm (in)	1.0 — 1.1 (0.039 — 0.043)	

1. Starter



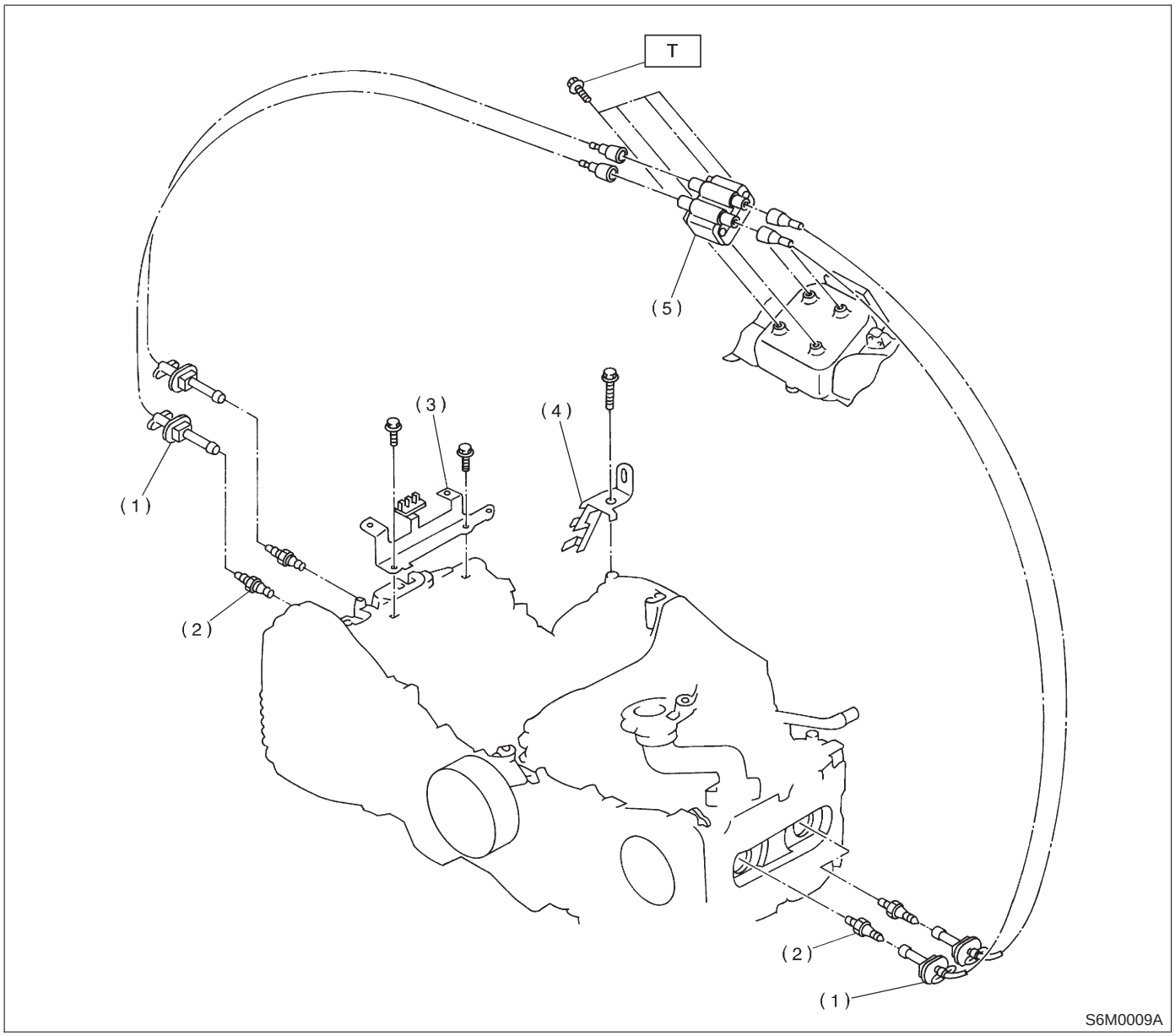
(1) Sleeve bearing
(2) Front bracket
(3) Lever set
(4) Magnet switch ASSY
(5) Stopper set
(6) Over running clutch
(7) Internal gear ASSY
(8) Shaft ASSY
(9) Gear ASSY
(10) Ball
(11) Packing
(12) Yoke
(13) Armature
(14) Brush holder
(15) Brush
(16) Sleeve bearing
(17) Rear bracket

2. Generator



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

3. Ignition System



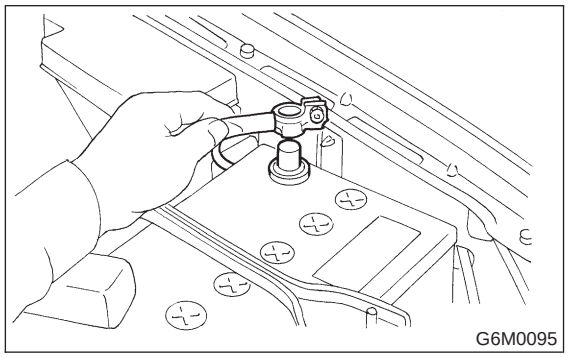
(1) Spark plug cord
(2) Spark plug
(3) Spark plug cord guide
(4) Engine harness guide
(5) Ignition coil

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

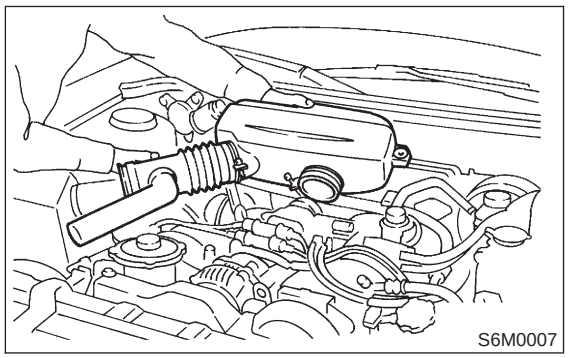
1. Starter

A: REMOVAL AND INSTALLATION

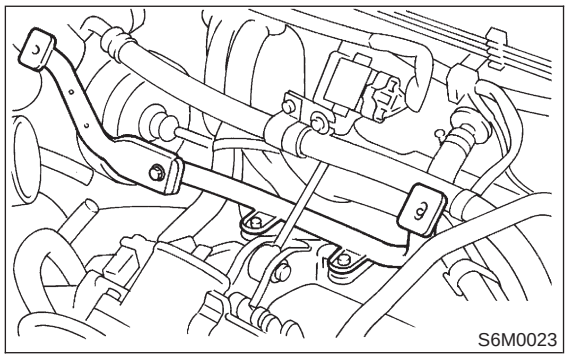
1) Disconnect battery ground cable.


G6M0095

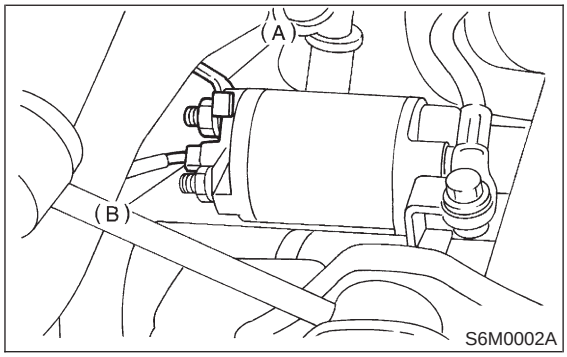
2) Remove air intake chamber. <Ref. to 2-7 [W19A0].>


S6M0007

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


S6M0023

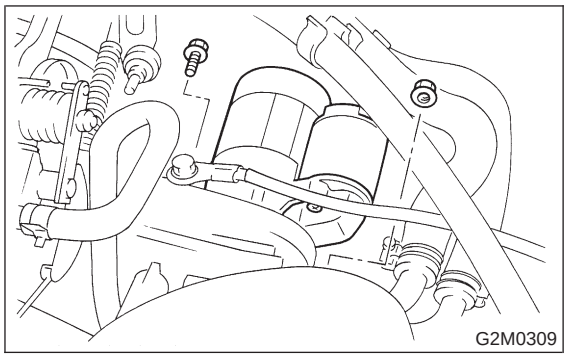
4) Disconnect connector and terminal from starter.



S6M0002A

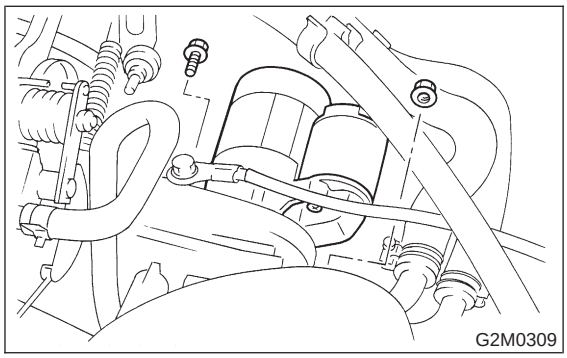
(A) Terminal
(B) Connector

5) Remove starter from transmission.


G2M0309

6) Installation is in the reverse order of removal.

Tightening torque:
50±4 N·m (5.1±0.4 kg-m, 37±2.9 ft-lb)


G2M0309

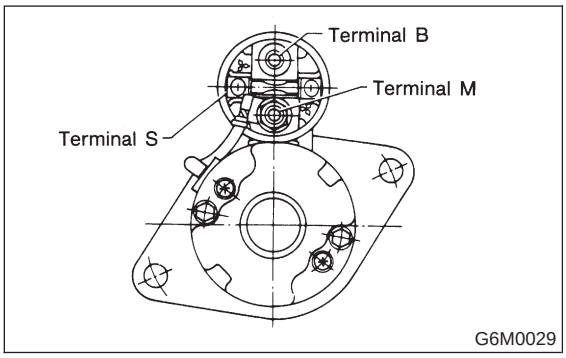
B: TEST

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.

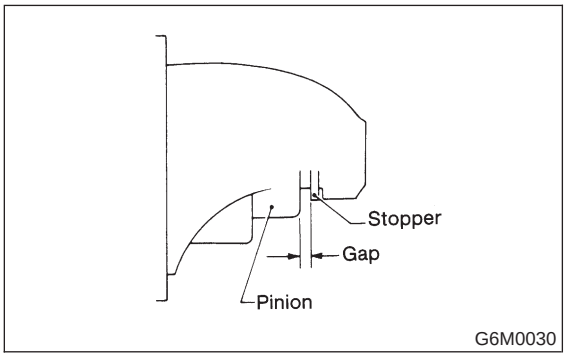
2) Disconnect connector from terminal M, and connect positive terminal of battery and terminal M using a lead wire and ground terminal to starter body.
In this test set up, pinion should return to its original position even when it is pulled out with a screwdriver.



2. PINION GAP

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

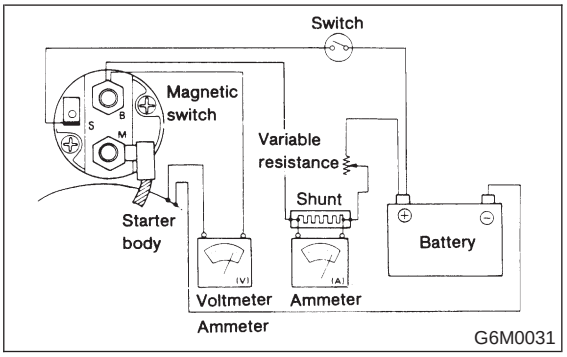
Pinion gap:
0.5 — 2.0 mm (0.020 — 0.079 in)



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):

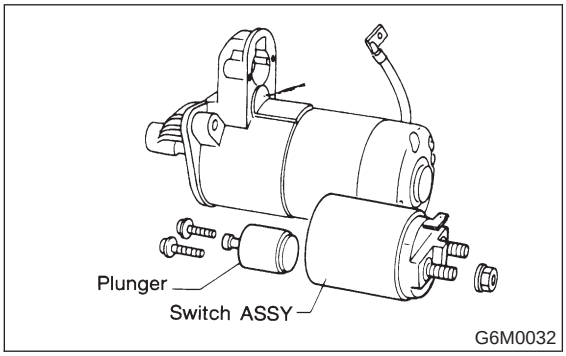
- ***MT vehicles***
  Voltage / Load
  4 V / 780 A or less
  Torque
  15.7 N·m (1.60 kg-m, 11.6 ft-lb) or more
- ***AT vehicles***
  Voltage / Current
  3.5 V / 940 A or less
  Torque
  28.9 N·m (2.95 kg-m, 21.3 ft-lb) or more

C: DISASSEMBLY

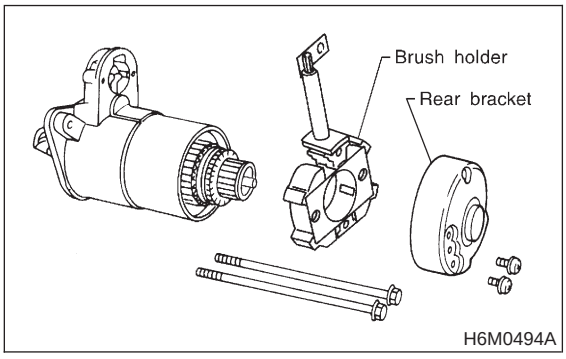
1. STARTER ASSEMBLY

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.

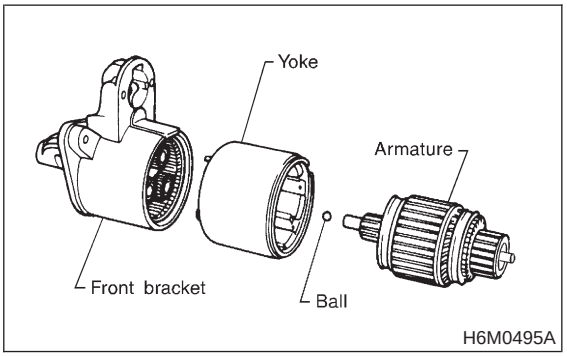


3) Remove both through-bolts and brush holder screws, and detach rear bracket and brush holder.

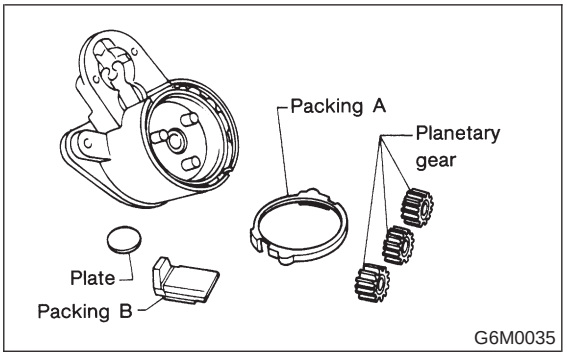


4) Remove armature and yoke. Ball used as a bearing will then be removed from the end of armature.

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

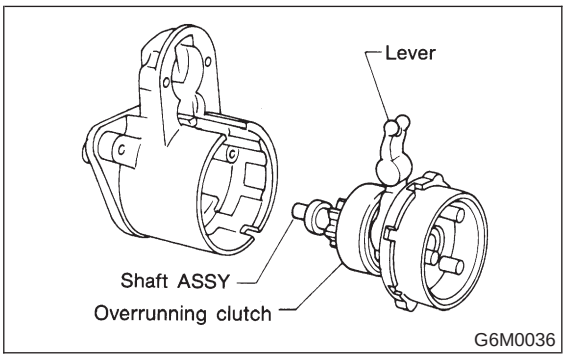


5) Remove packing A, three planetary gears, packing B and plate.

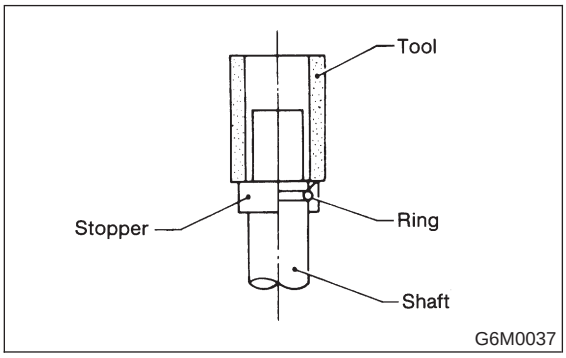


6) Remove shaft assembly and overrunning clutch as a unit.

CAUTION:
Record the direction of lever before removing.



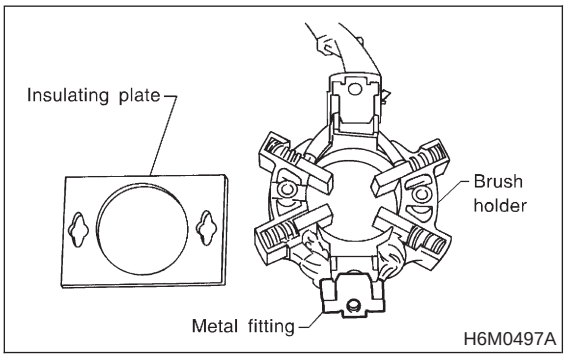
7) Remove overrunning clutch from shaft assembly as follows:
(1) Remove stopper from ring by lightly tapping a fit tool placed on stopper.
(2) Remove ring, stopper and clutch from shaft.



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.



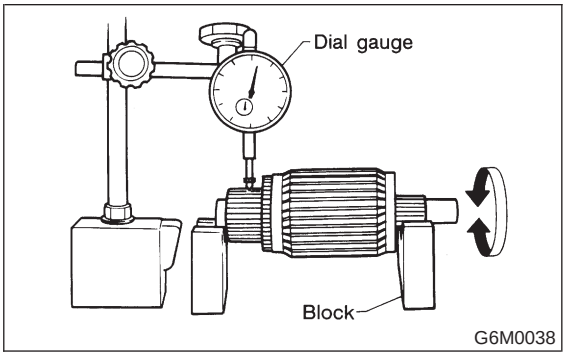
D: INSPECTION

1. ARMATURE

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

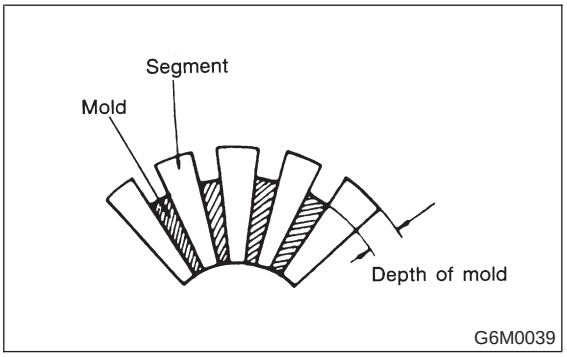
2) Run-out test
Check the commutator run-out and replace if it exceeds the limit.

Commutator run-out:
Standard
0.05 mm (0.0020 in)
Service limit
Less than 0.10 mm (0.0039 in)

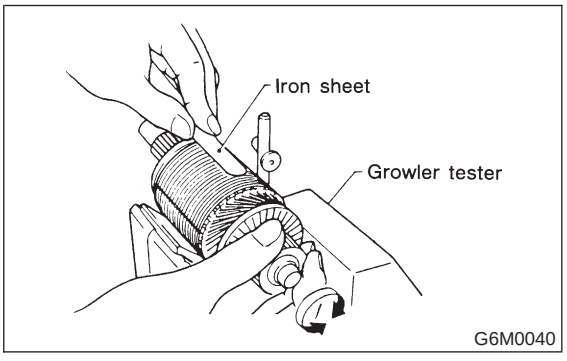


3) Depth of segment mold
Check the depth of segment mold.

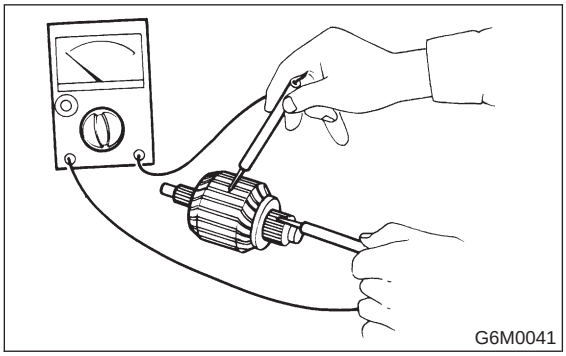
Depth of segment mold:
0.5 mm (0.020 in)



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

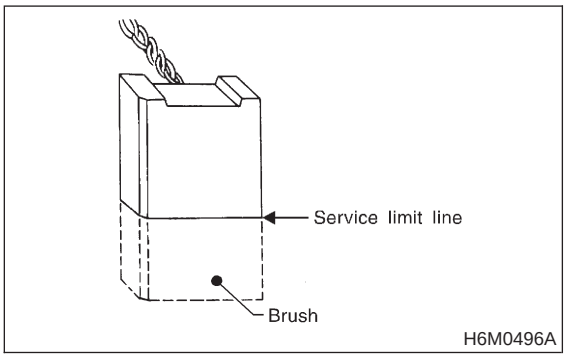
Inspect teeth of pinion for wear and damage. Replace if it damaged. Rotate pinion in direction of rotation (clockwise). It should rotate smoothly. But in opposite direction, it should be locked.

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)



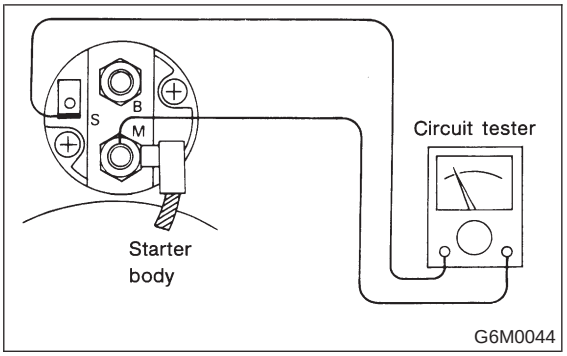
2) Brush movement
Be sure brush moves smoothly inside brush holder.
3) Brush spring force
Measure brush spring force with a spring scale. If it is less than the service limit, replace brush spring.

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

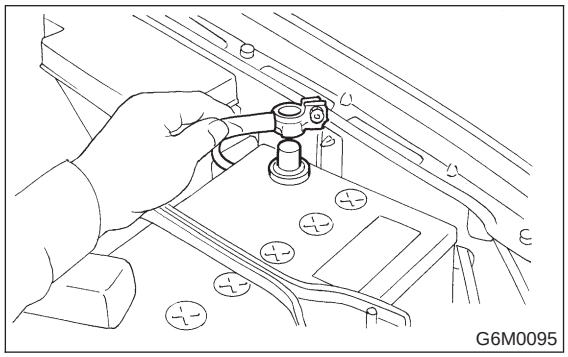
Assembly is in the reverse order of disassembly procedures. Observe the following:
1) Carefully assemble all parts in the order of assembly and occasionally inspect nothing has been overlooked.
2) Apply grease to the following parts during assembly.
- Front bracket sleeve bearing
- Armature shaft gear
- 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.

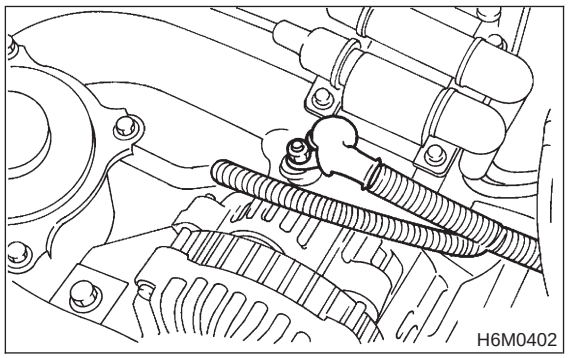
2. Generator

A: REMOVAL AND INSTALLATION

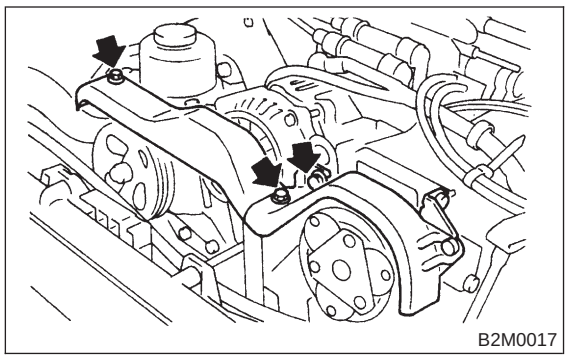
1) Disconnect battery ground cable.


G6M0095

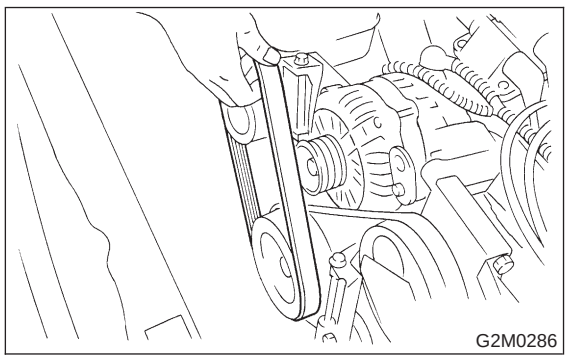
2) Disconnect connector and terminal from generator.


H6M0402

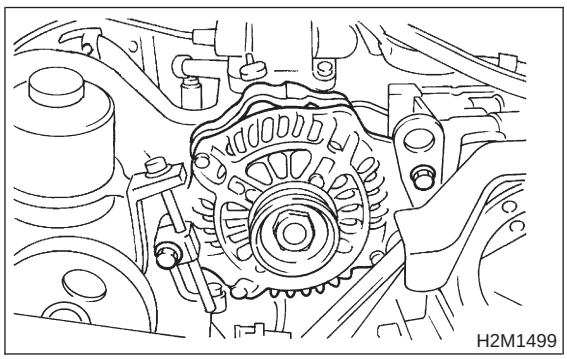
3) Remove V-belt cover.


B2M0017

4) Remove front side V-belt.

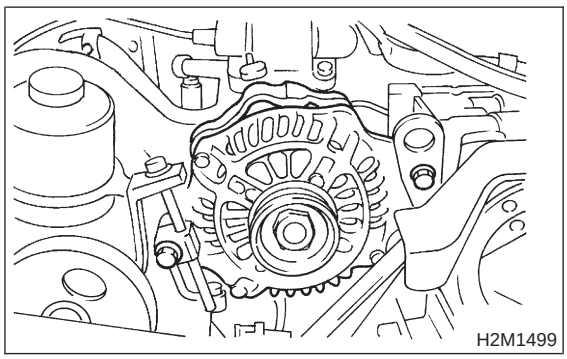

G2M0286

5) Remove bolts which install generator onto bracket.


H2M1499

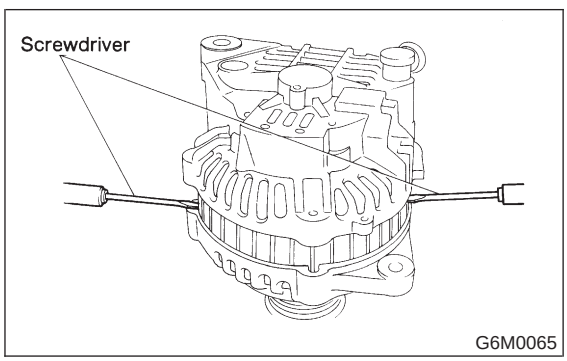
6) Installation is in the reverse order of removal.

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


H2M1499

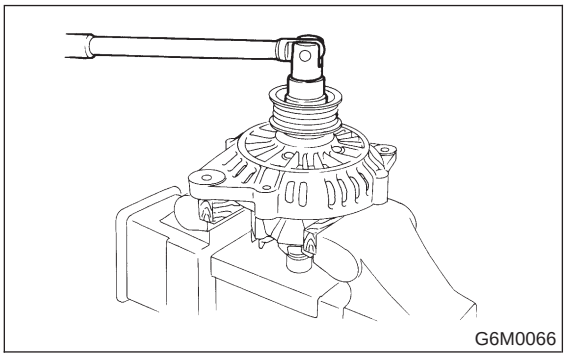
B: DISASSEMBLY

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.

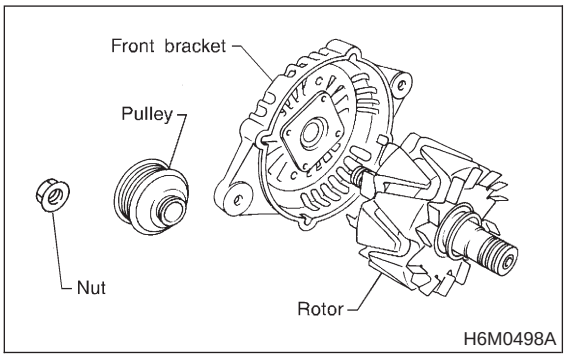


G6M0065

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


G6M0066

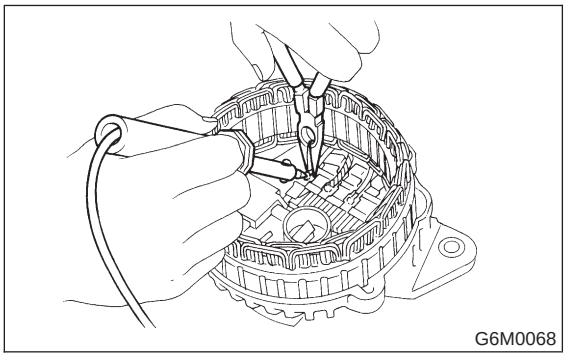
CAUTION:
When holding rotor with vise, insert aluminum plates or wood pieces on the contact surfaces of the vise to prevent rotor from damage.



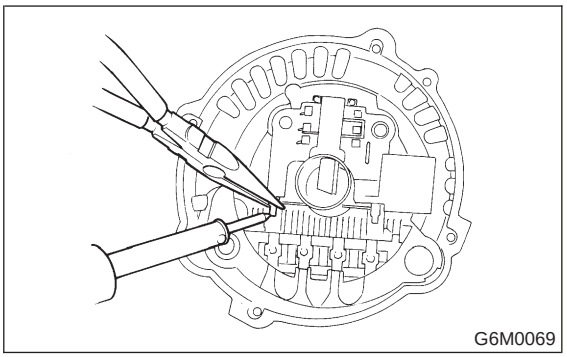
H6M0498A

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

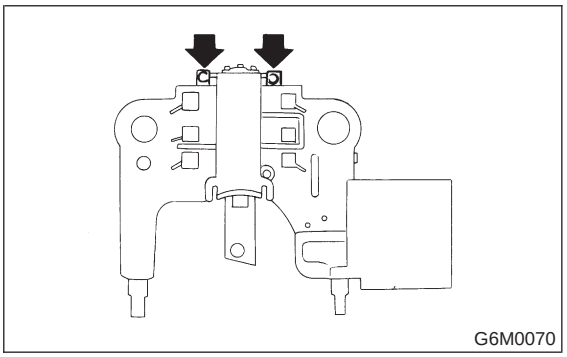
CAUTION:
Finish the work rapidly (less than three seconds) because the rectifier cannot withstand heat very well.


G6M0068

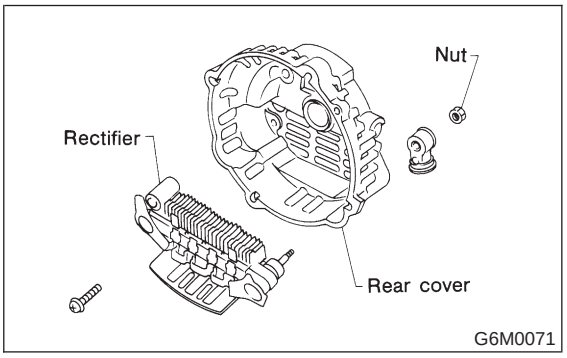
4) Remove screws which secure IC regulator to rear cover, and unsolder connection between IC regulator and rectifier to remove IC regulator.


G6M0069

5) Remove the brushes by unsoldering at the pigtails.


G6M0070

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



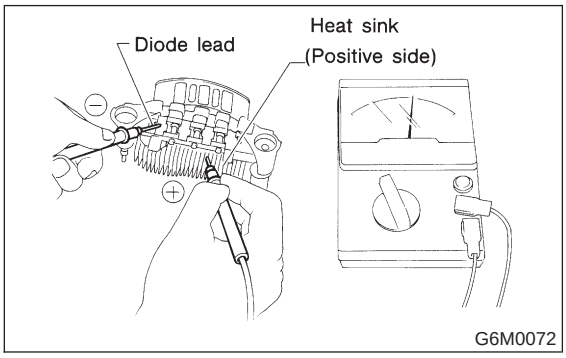
G6M0071

C: INSPECTION AND REPAIR

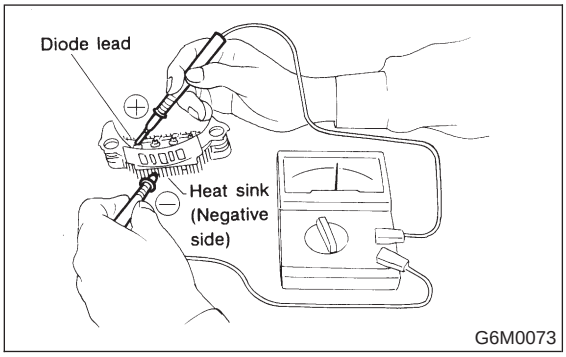
1. DIODE

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.



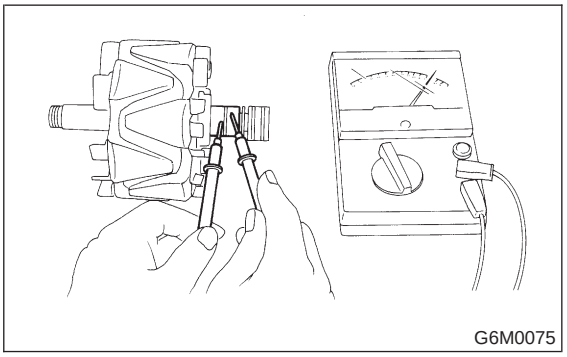
2. ROTOR

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.

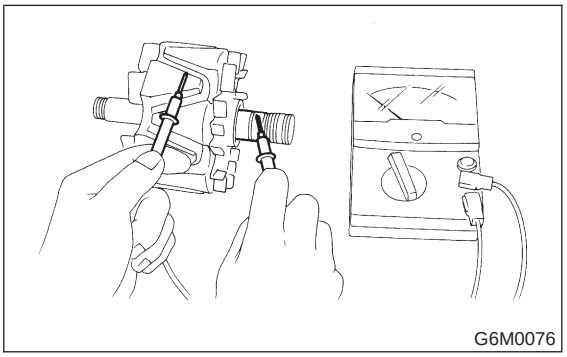
Slip ring outer diameter:
Standard
22.7 mm (0.894 in)
Limit
22.1 mm (0.870 in)

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

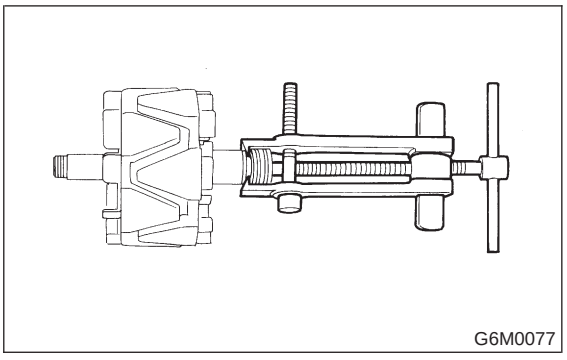
Specified resistance:
Approx. 2.7 — 3.2 Ω



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.

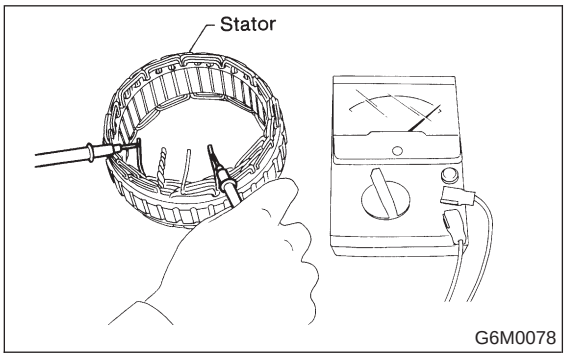


5) Ball bearing (rear side)
(1) Check rear ball bearing. Replace if it is noisy or if rotor does not turn smoothly.
(2) The rear bearing can be removed by using common bearing puller.

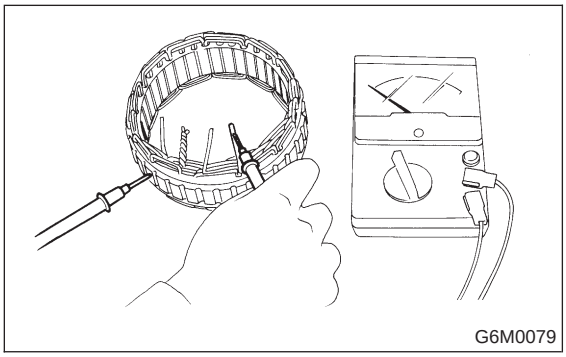


3. STATOR

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.



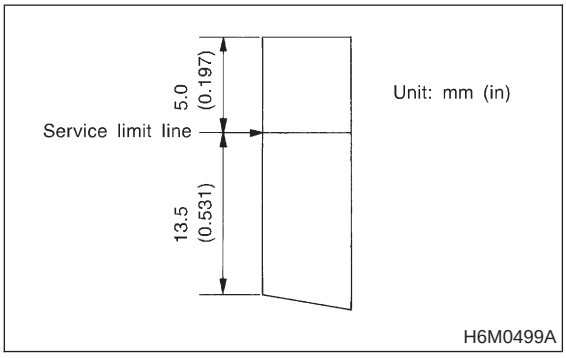
2) Insulation test
Inspect stator coil for continuity between stator core and each end of the lead wire. If there is continuity, the stator coil is short-circuited, and so replace stator assembly.



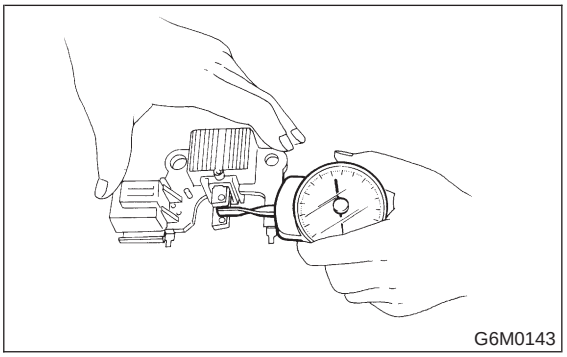
4. BRUSH

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)

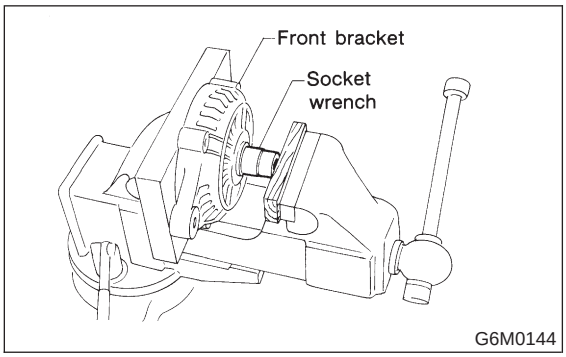


2) Checking brush spring for proper pressure
Using a spring pressure indicator, push the brush into the brush holder until its tip protrudes 2 mm (0.08 in). Then measure the pressure of the brush spring. If the pressure is less than 2.648 N (270 g, 9.52 oz), replace the brush spring with a new one. The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

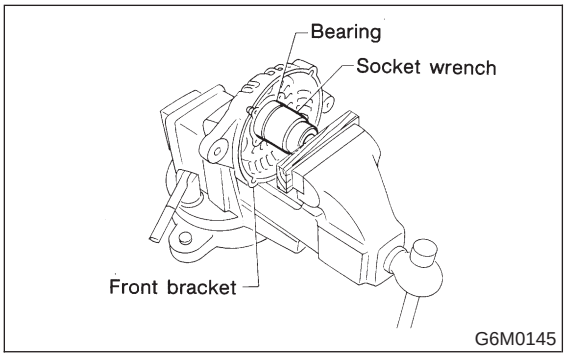


5. BEARING (FRONT SIDE)

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.



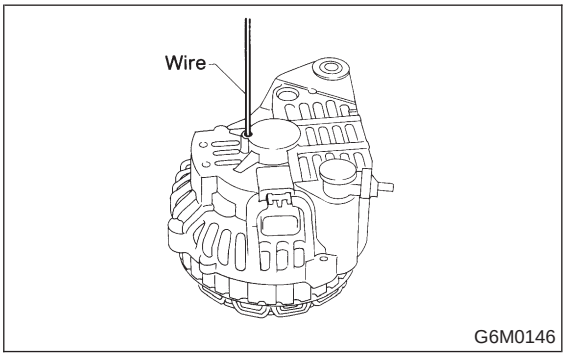
   (3) Set a new bearing and closely install a fit tool on the bearing outer race. Press the bearing down into place with a hand press or vise. A socket wrench can serve as the tool.
   (4) Install front bearing retainer.



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

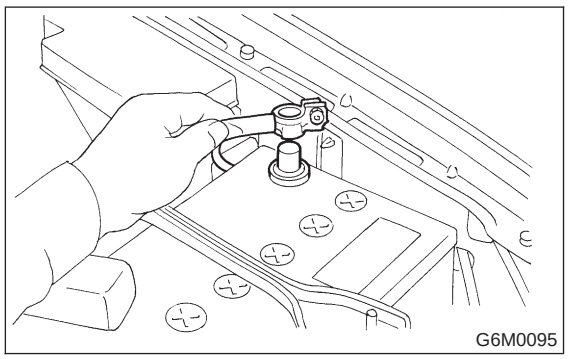
A: REMOVAL

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

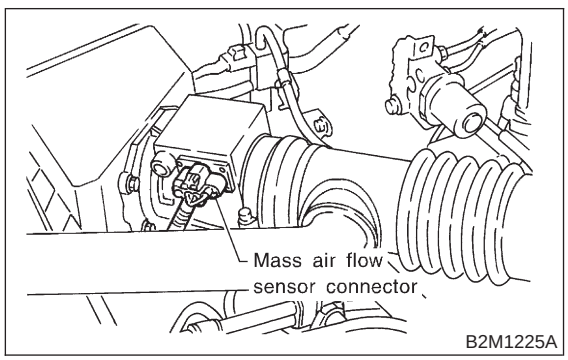
Spark plug:
NGK: PFR5B-11
Champion: RC10PYP4A

1. #1 SPARK PLUG

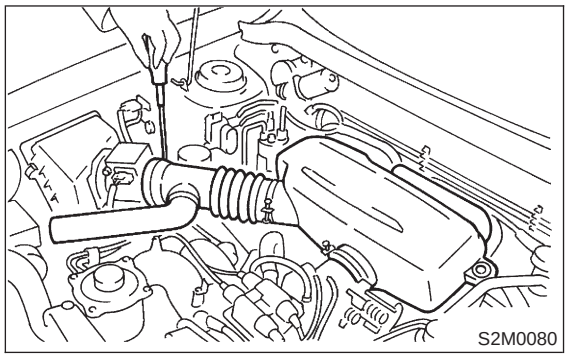
1) Disconnect battery ground cable.



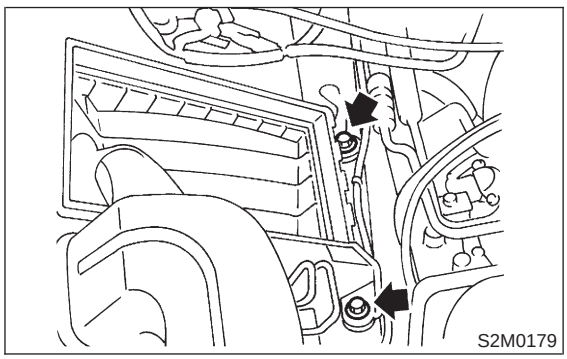
2) Disconnect mass air flow sensor connector.



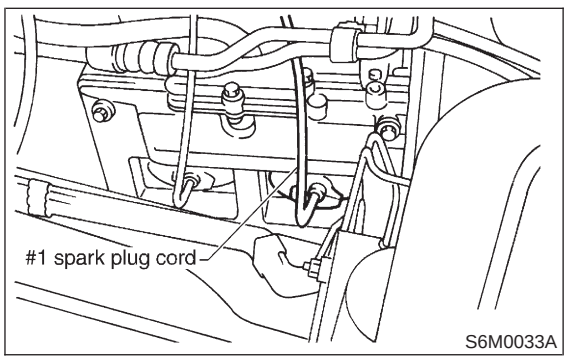
3) Remove four clips securing air cleaner upper cover.
4) Loosen the clamp screw and separate air cleaner upper cover from air intake duct.



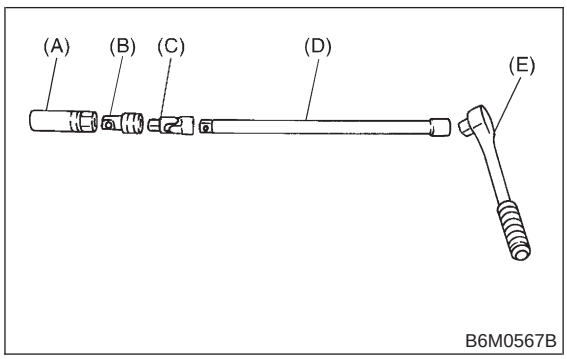
5) Remove air cleaner element and air cleaner case.



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



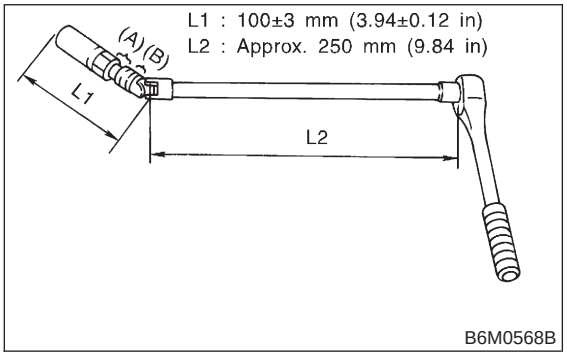
7) After connecting (A) spark plug socket, (B) extension and (C) Universal Joint to each other, securely set them over the spark plug in cylinder head.



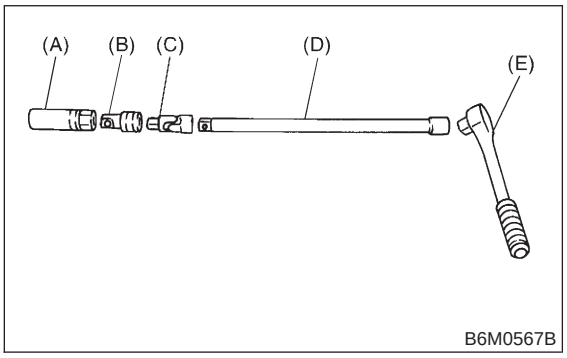
(A) Spark plug socket 16 mm (5/8 in)
(B) Extension
(C) Universal Joint
(D) Extension
(E) Ratchet

8) Cover ABS pipes with a rag to prevent damage.

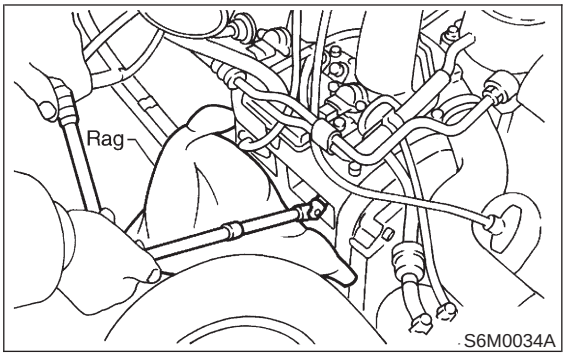
NOTE:
● Length L1 is important in making for easy removal.
● It may be necessary to wrap points (A) and (B) with vinyl tape to prevent them separating while working.
If they do separate, spark plug socket is left on the spark plug and it is very difficult to remove.
● An approximately 250 mm (9.84 in) long extension is recommended to be connected to ratchet.
● For spark plug socket, extension and Universal Joint, it is recommended to use the following tools.
Spark plug socket : PROTO 5020-50
Extension : SNAP-ON FX1
Universal Joint : SNAP-ON FU80B



9) Set (D) extension and (E) ratchet in turn onto the connected tools in plug hole, and remove spark plug using them.

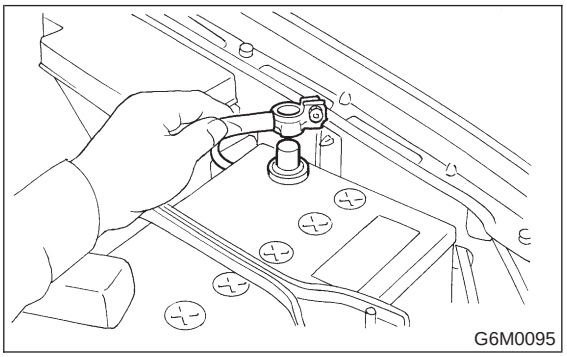


(A) Spark plug socket 16 mm (5/8 in)
(B) Extension
(C) Universal Joint
(D) Extension
(E) Ratchet

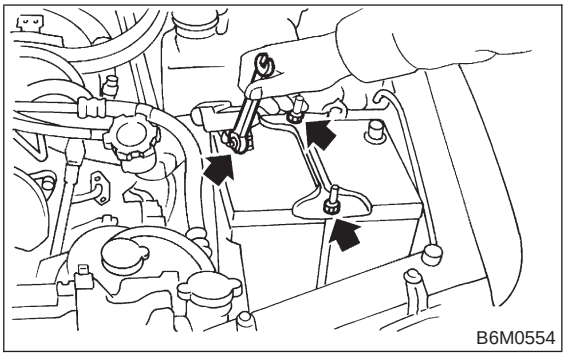


2. #2 SPARK PLUG

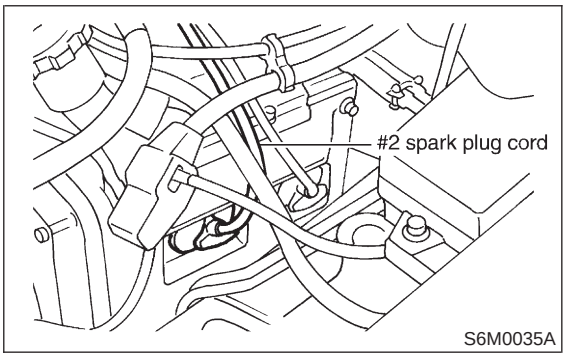
1) Disconnect battery ground cable.



2) Remove battery.



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

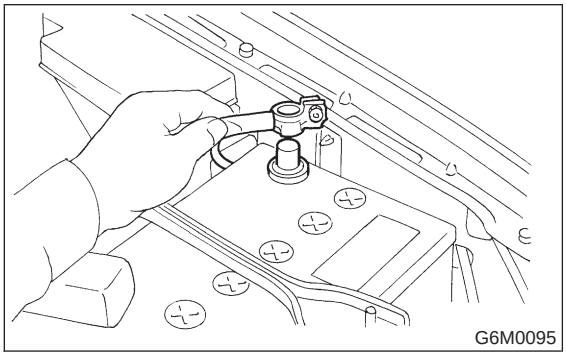


4) For subsequent procedures, refer to the procedure for #1 spark plug. <Ref. to 6-1 [W3A1].>

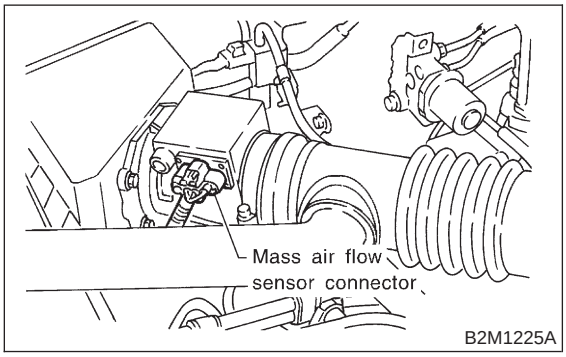
CAUTION:
When removing spark plug, cover the ATF cooling pipes with a rag to prevent damage.

3. #3 SPARK PLUG

1) Disconnect battery ground cable.

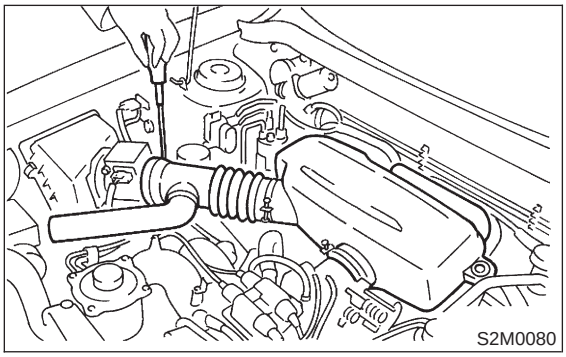

G6M0095

2) Disconnect mass air flow sensor connector.

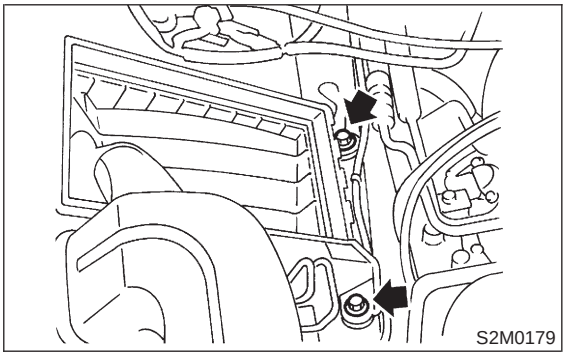


B2M1225A

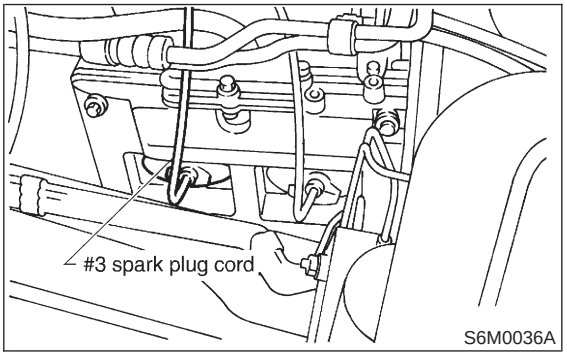
3) Remove four clips securing air cleaner upper cover.
4) Loosen the clamp screw and separate air cleaner upper cover from air intake duct.


S2M0080

5) Remove air cleaner element and air cleaner case.


S2M0179

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

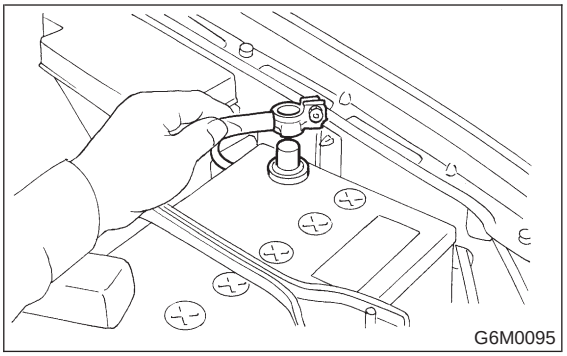


S6M0036A

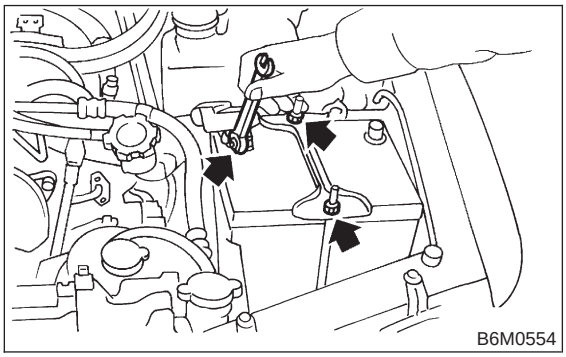
7) For subsequent procedures, refer to the procedure for #1 spark plug. <Ref. to 6-1 [W3A1].>

4. #4 SPARK PLUG

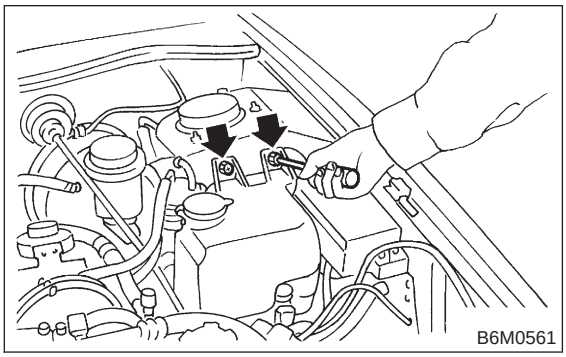
1) Disconnect battery ground cable.


G6M0095

2) Remove battery.

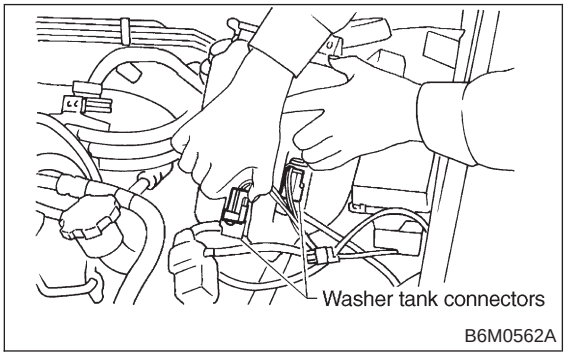


3) Remove washer tank mounting bolts.



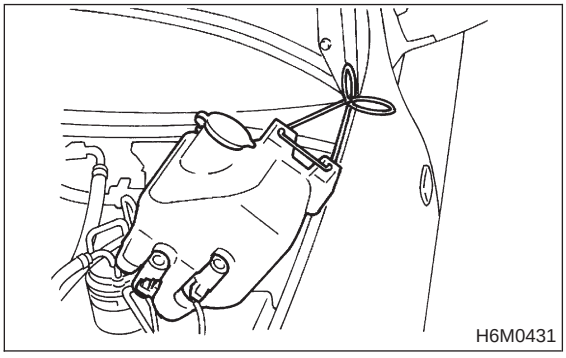
4) Disconnect washer tank connectors.

CAUTION:
Do not disconnect washer tank hoses as washer fluid will leak out from washer tank.

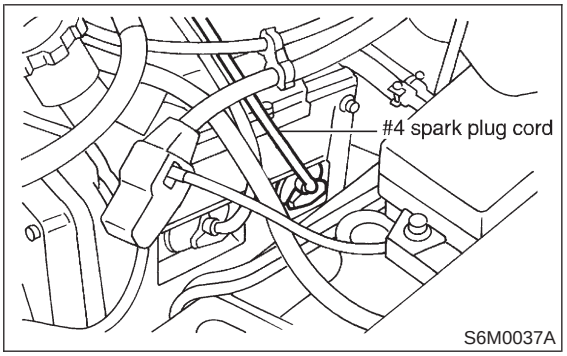


5) Move washer tank upward.

CAUTION:
Secure the washer tank with wire.



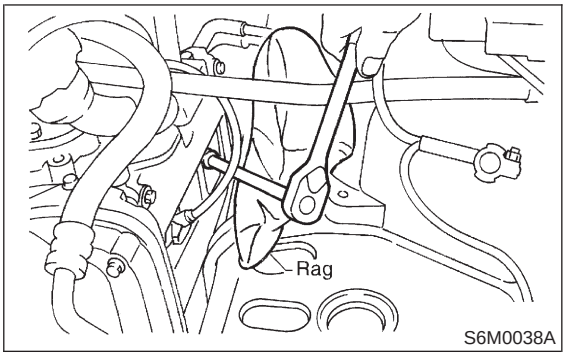
6) Remove #4 spark plug cord by pulling boot, not cord itself.



7) For subsequent procedures, refer to the procedure for #1 spark plug. <Ref. to 6-1 [W3A1].>

CAUTION:
When removing spark plug, cover the ATF coolig pipes with a rag to prevent damage.

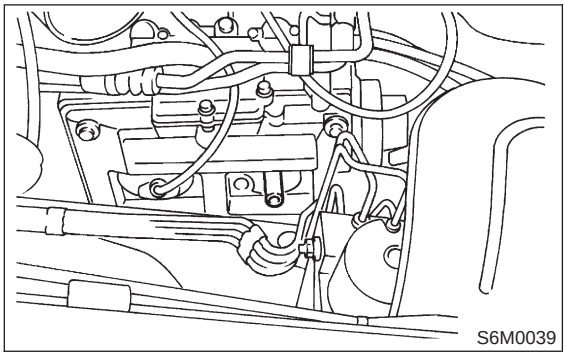
NOTE:
For easier removal of spark plug, diagonally insert the tools from the direction of battery stand into plug hole as shown in figure.



B: INSTALLATION

1. #1 SPARK PLUG

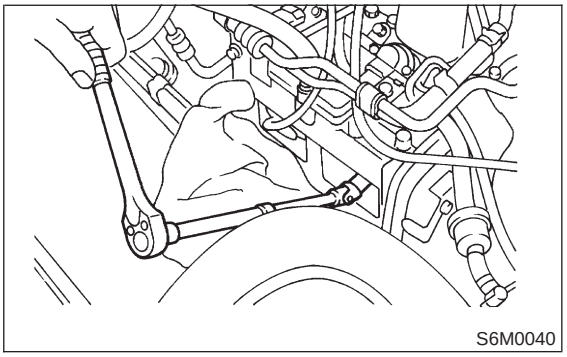
1) After setting spark plug in spark plug socket, connect the spark plug socket, extension and Universal Joint to each other. <Ref. to 6-1 [W3A1].>
2) Screw spark plug into cylinder head using the connected tools above mentioned. At this point, it is necessary to support the rear end of the tools with fingertips.


S6M0039

3) When spark plug is screwed in two or three turns, temporarily disconnect the tools connected in the first step.
4) Confirm that spark plug is screwed into the cylinder head properly by touching it with finger. If it is difficult to reach it by hand, confirm its condition by using mirror and suchlike.
5) Cover ABS pipes with rag to prevent damage.
6) Re-insert the tools disconnected in three steps before into plug hole, and set them again over the spark plug.
7) Set extension and ratchet in turn onto the connected tools in plug hole, and tighten spark plug to the specified torque.

Tightening torque (spark plug):
20.6±2.9 N·m (2.10±0.30 kg-m, 15.19±2.14 ft-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.


S6M0040

8) The subsequent procedures are in reverse order of #1 spark plug removal. <Ref. to 6-1 [W3A1].>

2. #2 SPARK PLUG

CAUTION:
When installing spark plug, cover the ATF cooling pipes with a rag to prevent damage.

1) Carry out #1 spark plug installation procedure. <Ref. to 6-1 [W3B1].>
2) Proceed in reverse order of #2 spark plug removal. <Ref. to 6-1 [W3A2].>

3. #3 SPARK PLUG

1) Carry out #1 spark plug installation procedure. <Ref. to 6-1 [W3B1].>
2) Proceed in reverse order of #3 spark plug removal. <Ref. to 6-1 [W3A3].>

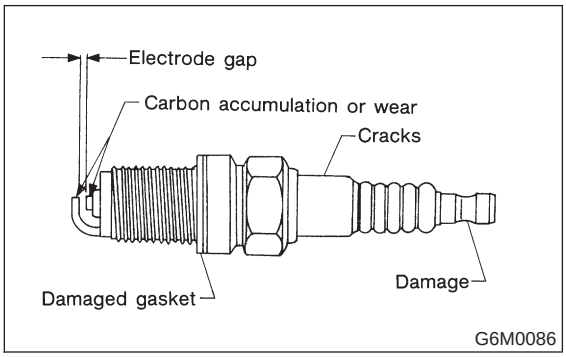
4. #4 SPARK PLUG

CAUTION:
When installing spark plug, cover the ATF cooling pipes with a rag to prevent damage.

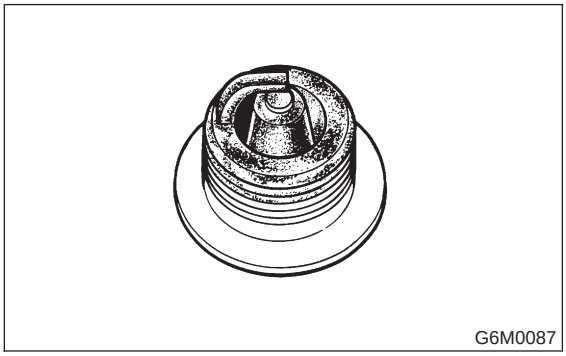
1) Carry out #1 spark plug installation procedure. <Ref. to 6-1 [W3B1].>
2) Proceed in reverse order of #4 spark plug removal. <Ref. to 6-1 [W3A4].>

C: INSPECTION

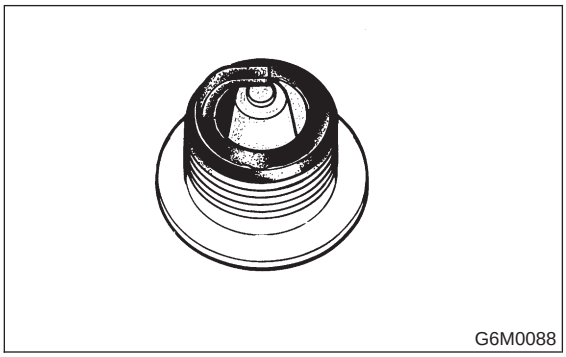
Check electrodes and inner and outer porcelain of plugs, noting the type of deposits and the degree of electrode erosion.



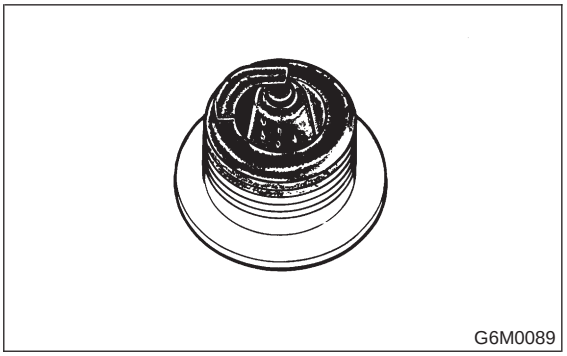
1) Normal
Brown to grayish-tan deposits and slight electrode wear indicate correct spark plug heat range.



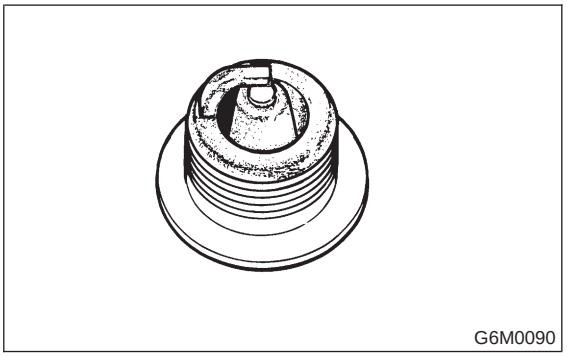
2) Carbon fouled
Dry fluffy carbon deposits on insulator and electrode are mostly caused by slow speed driving in city, weak ignition, too rich fuel mixture, dirty air cleaner, etc.
It is advisable to replace with plugs having hotter heat range.



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.



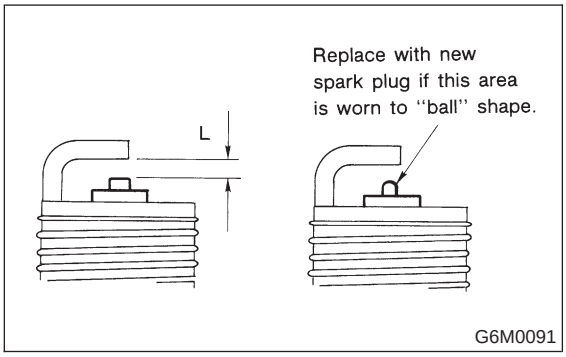
4) Overheating
White or light gray insulator with black or gray brown spots and bluish burnt electrodes indicate engine overheating. Moreover, the appearance results from incorrect ignition timing, loose spark plugs, wrong selection of fuel, hotter range plug, etc. It is advisable to replace with plugs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



D: 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.

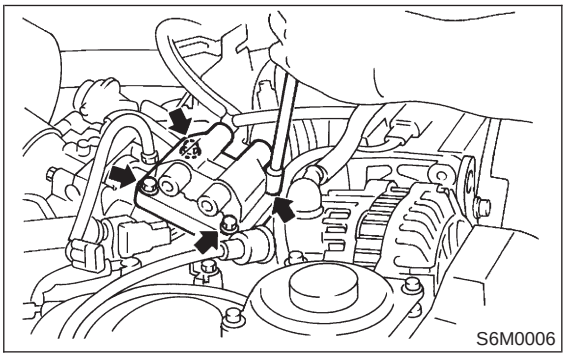
Spark plug gap: L
1.0 — 1.1 mm (0.039 — 0.043 in)



4. Ignition Coil

A: REMOVAL AND INSTALLATION

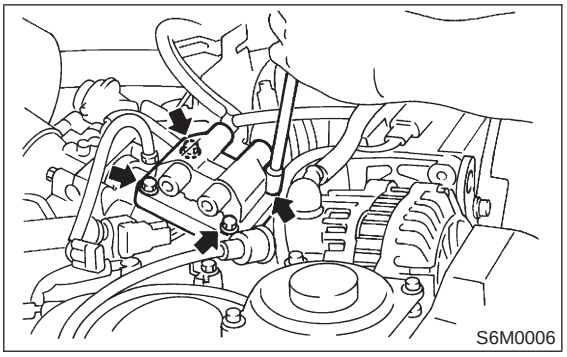
1) Disconnect battery ground cable.
2) Disconnect connector from ignition coil.
3) Remove ignition coil.



4) Installation is in the reverse order of removal.

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

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



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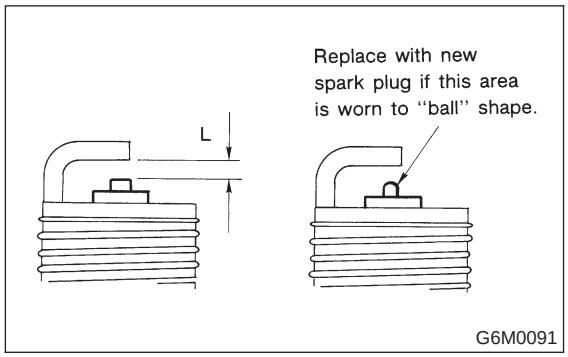

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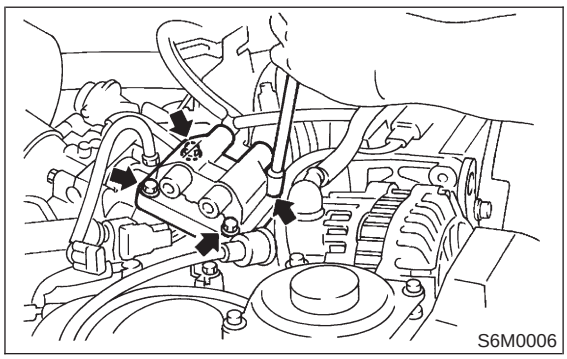

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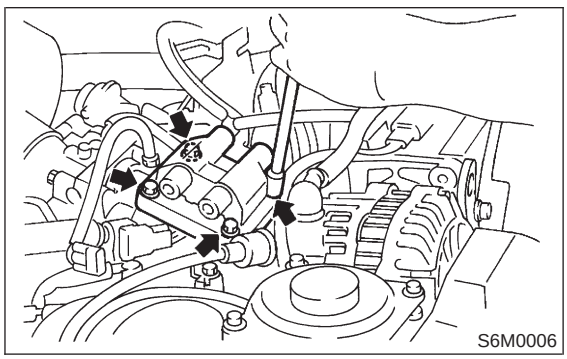


B: INSPECTION

Using accurate tester, inspect the following items, and replace if defective.
1) Primary resistance
2) Secondary coil resistance

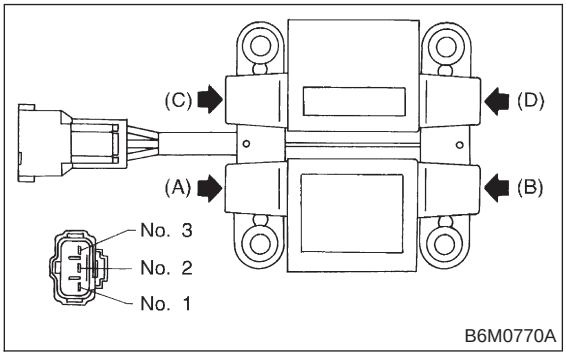
CAUTION:
If the resistance is extremely low, this indicates the presence of a short-circuit.

Specified resistance:

[Primary side]
Between No. 1 and No. 2
0.69 Ω±10%
Between No. 2 and No. 3
0.69 Ω±10%

[Secondary side]
Between terminal (A) and (B)
21.0 kΩ±15%
Between terminal (C) and (D)
21.0 kΩ±15%

[Insulation]
Between primary terminal and case
10 MΩ or more

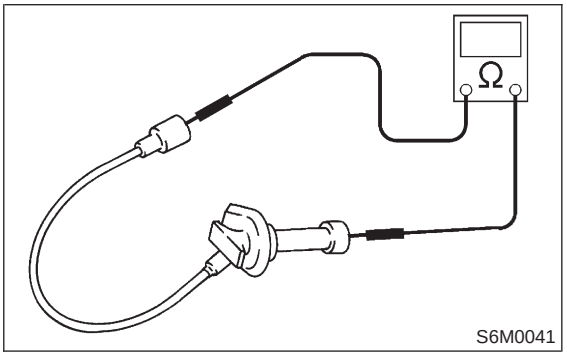


5. Spark Plug Cord

A: INSPECTION

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

Resistance value:
#1 and #3
6.43 — 15.01 kΩ
#2 and #4
6.67 — 15.57 kΩ



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Between No. 2 and No. 3
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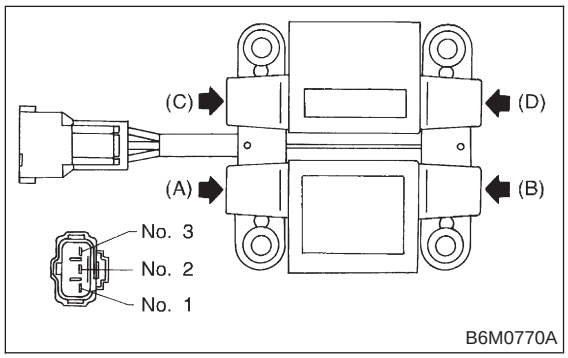
[Secondary side]
Between terminal (A) and (B)
21.0 kΩ±15%
Between terminal (C) and (D)
21.0 kΩ±15%

[Insulation]
Between primary terminal and case
10 MΩ or more



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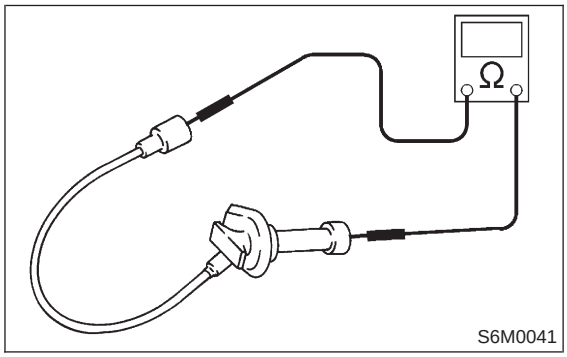
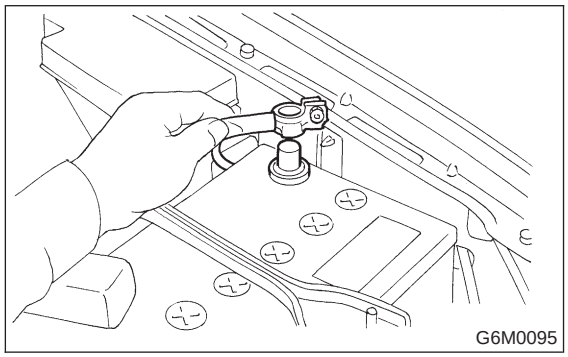


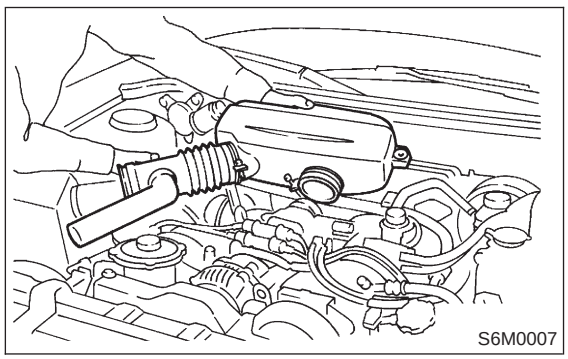
6. Ignitor

A: REMOVAL AND INSTALLATION

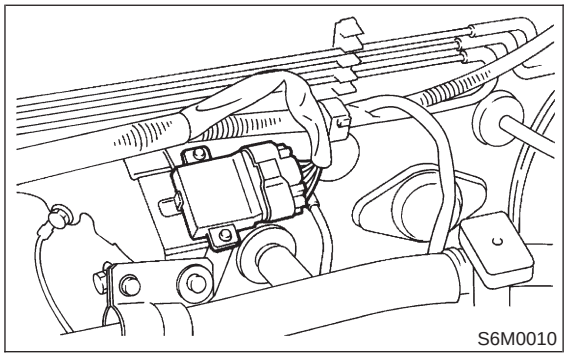
1) Disconnect battery ground cable.



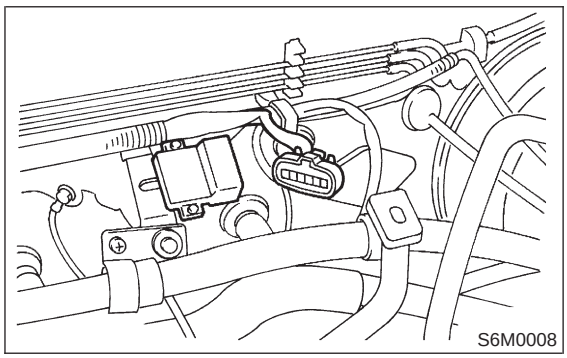
2) Remove air intake chamber. <Ref. to 2-7 [W19A0].>



3) Disconnect connector from ignitor.



4) Remove screws which hold ignitor onto body.

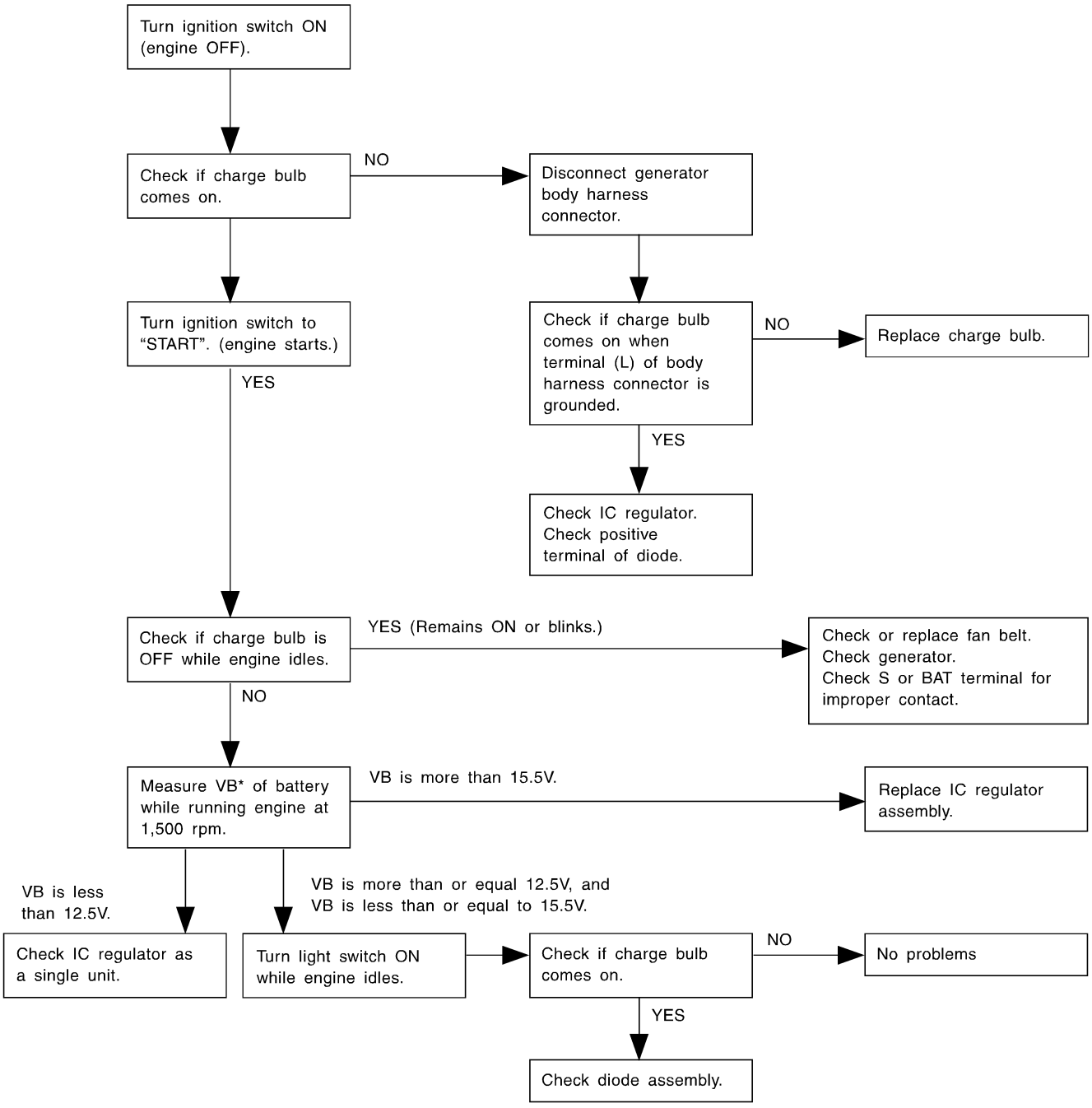


5) Installation is in the reverse order of removal.

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
		Abnormal brush wear
Starter overruns.		Magnet switch coil is a layer short.

2. Generator



*: Terminal voltage

B6M0771

1. Body Electrical

Battery	Type		MT model: 55D23L (MF)	AT model: 75D23L (MF)
	Capacity	Reverse capacity	MT model: 99 minutes	AT model: 118 minutes
		Cold cranking ampere	MT model: 356 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 — 1.4 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 — 1.4 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 turn signal light/side marker, parking light			12 V — 27 W/8 W	
Front fog light			12 V — 55 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 — 5 W	
High-mount stop light			12 V — 13 W	
Room light			12 V — 8 W	
Spot light			12 V — 8 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

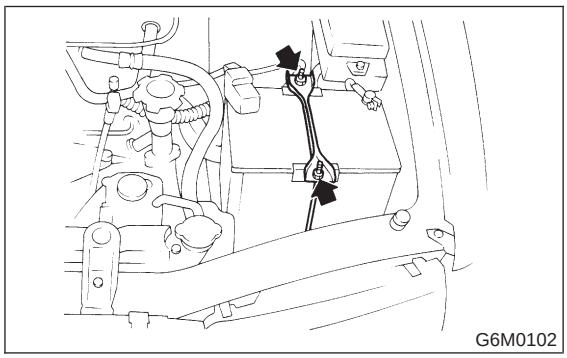
● Before disassembling or reassembling parts, always disconnect battery ground cable. When repairing radio, control modules, etc. which are provided with memory functions, record memory contents before disconnecting battery ground cable. Otherwise, these contents are cancelled upon disconnection.
● Reassemble 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 circuit.
● 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±1.0 N·m (0.35±0.1 kg-m, 2.5±0.7 ft-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, blush 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.

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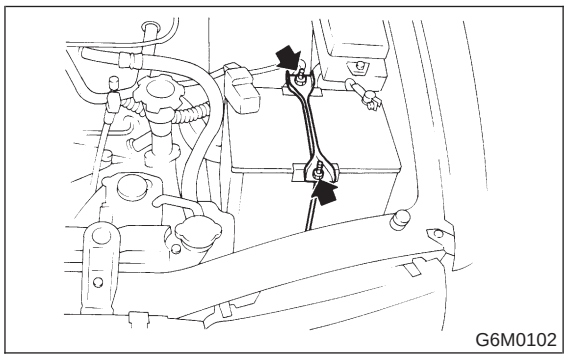

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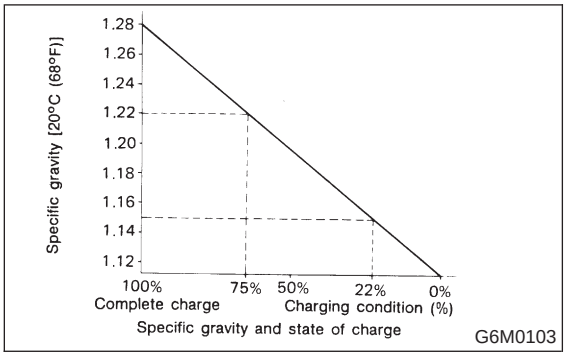
1. BATTERY

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} = St + 0.0007 x (t − 20)
S_{20}: Specific gravity corrected at electrolyte temperature of 20°C
St : 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.

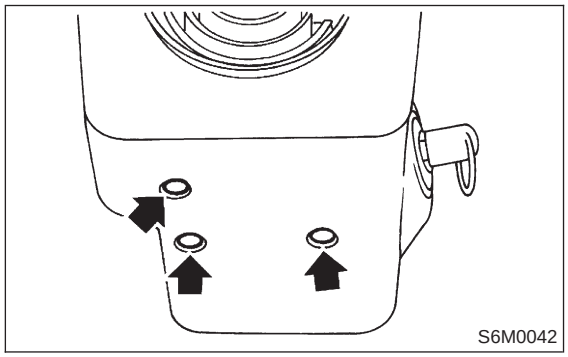
4. CHECK HYDROMETER FOR STATE OF CHARGE

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.		

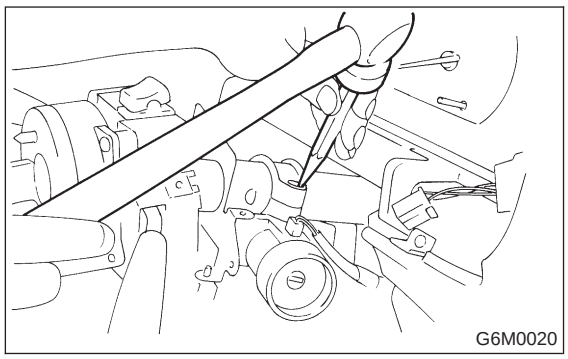
3. Ignition Switch

A: REMOVAL AND INSTALLATION

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

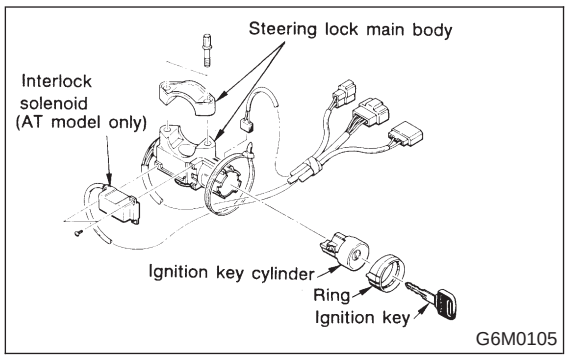


3) Remove knee protector.
4) Remove meter visor.
5) Disconnect ignition switch connector from body harness.
6) Using a drift and hammer, hit the torn bolt head to loosen and remove the ignition switch.



7) Installation is in the reverse order of removal.

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



4. Lighting

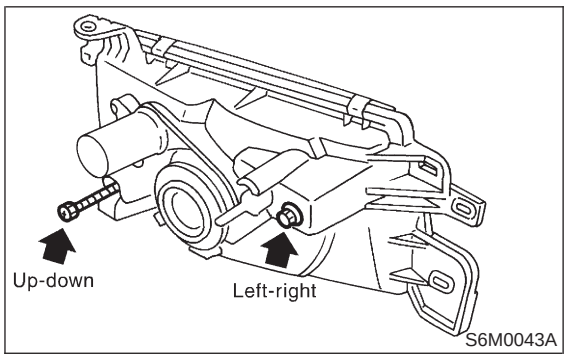
A: ADJUSTMENT

1. HEADLIGHT AIMING

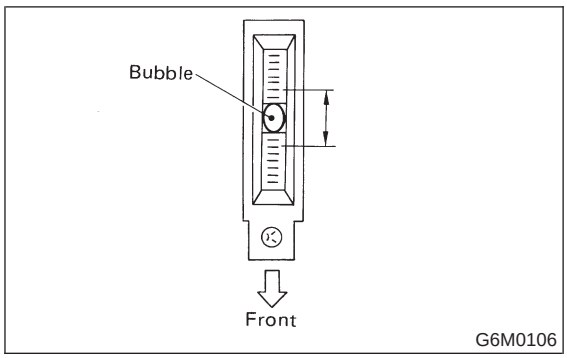
1) Adjust the headlight aiming by turning the adjusting screws.

CAUTION:
Before checking the headlight aiming, be sure of the following:
- **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.**
- **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.**

NOTE:
Adjust vertical aim first, then horizontal aim.



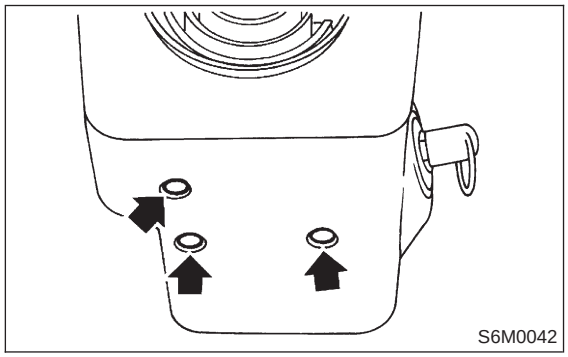
2) Look at the beam angle gauge (vertical movement). The bubble on the gauge should not deviate from the center of the gauge.



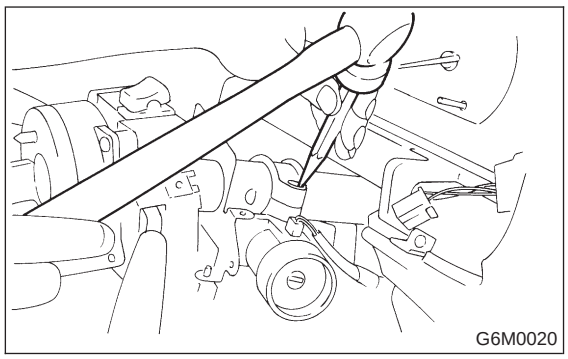
3. Ignition Switch

A: REMOVAL AND INSTALLATION

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

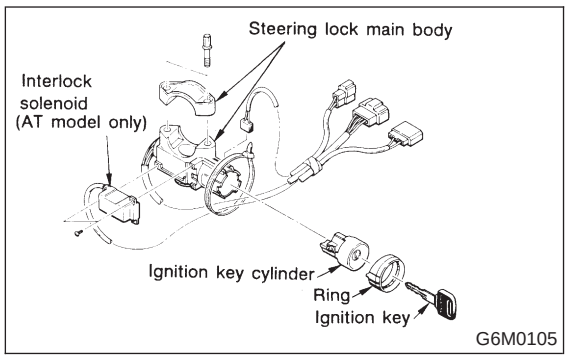


3) Remove knee protector.
4) Remove meter visor.
5) Disconnect ignition switch connector from body harness.
6) Using a drift and hammer, hit the torn bolt head to loosen and remove the ignition switch.



7) Installation is in the reverse order of removal.

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



4. Lighting

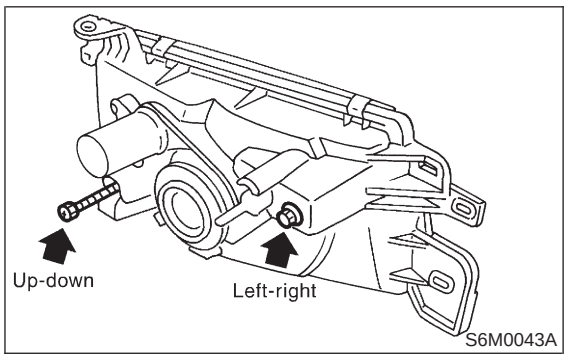
A: ADJUSTMENT

1. HEADLIGHT AIMING

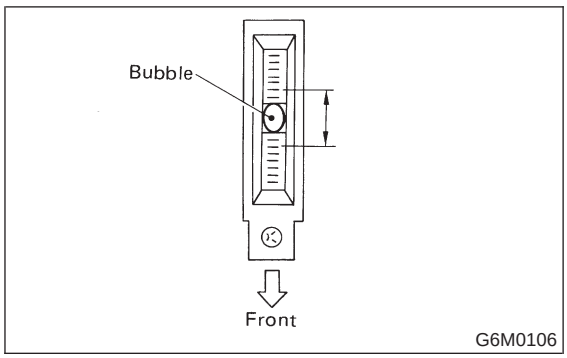
1) Adjust the headlight aiming by turning the adjusting screws.

CAUTION:
Before checking the headlight aiming, be sure of the following:
- **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.**
- **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.**

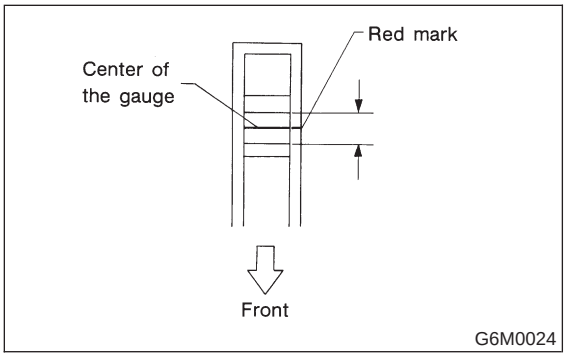
NOTE:
Adjust vertical aim first, then horizontal aim.



2) Look at the beam angle gauge (vertical movement). The bubble on the gauge should not deviate from the center of the gauge.



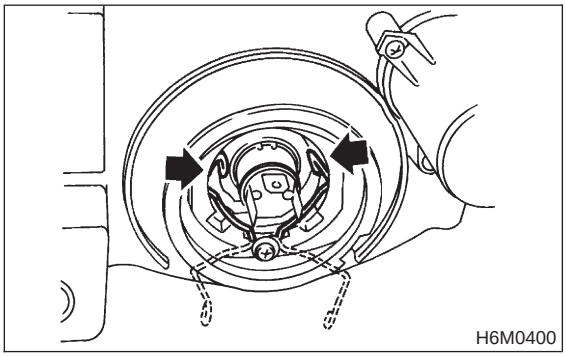
3) Look at the beam angle gauge (horizontal movement). The center mark (the red line on the inner scale) should not deviate from the red line on the outer case.



B: REMOVAL AND INSTALLATION

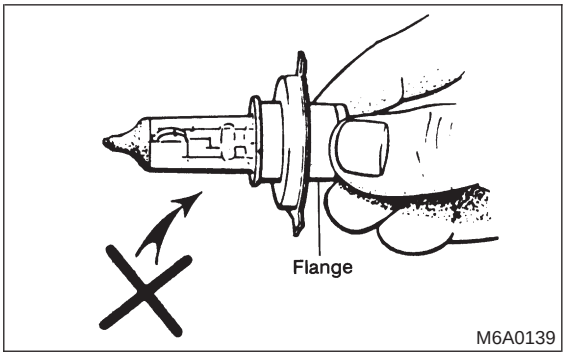
1. HEADLIGHT BULB

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.

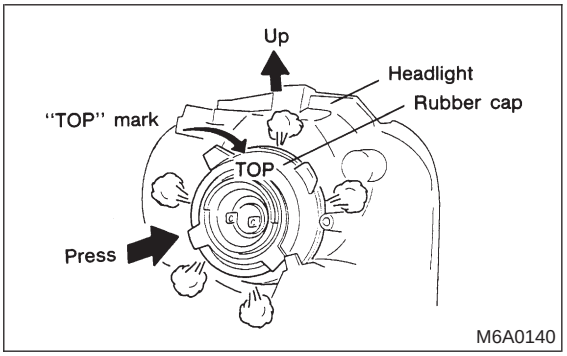


4) Replace the bulb with a new one and hook the spring.
5) Attach the rubber cap and connect the connector.

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.



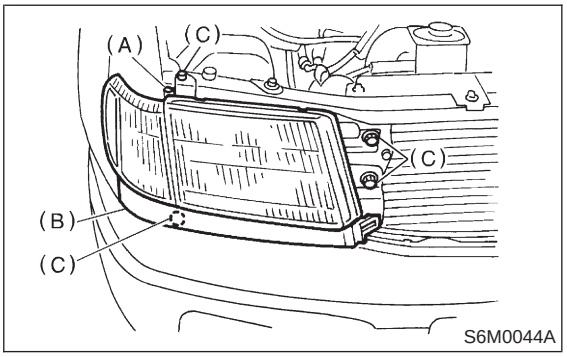
● Attach the rubber cap with letters TOP on the top so that the drain hole will be on the lower side.



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

2. HEADLIGHT AND SIDE MARKER LIGHT

1) Remove front grille <Ref. to 5-1 [W12A0].> and disconnect connector from headlight.
2) Remove screw (A) then remove side marker light while disconnecting connector.
3) Remove extension (B) <Ref. to 5-1 [W3A0].>
4) Remove bolts (C) which secure headlight and remove headlight.



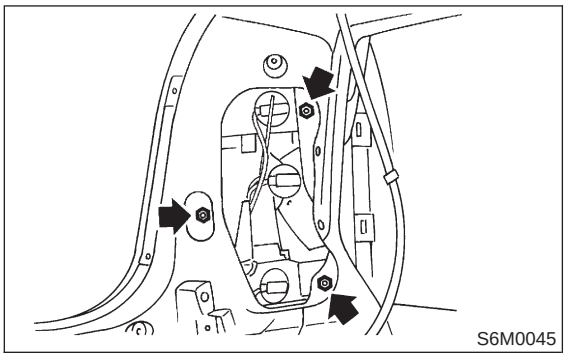
5) Installation is in the reverse order of removal.

Tightening torque:
6.4±0.5 N·m (0.65±0.05 kg-m, 4.7±0.4 ft-lb)

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

3. REAR COMBINATION LIGHT

1) Remove rear quarter upper and lower trim.
2) Remove nuts and disconnect connector.


S6M0045

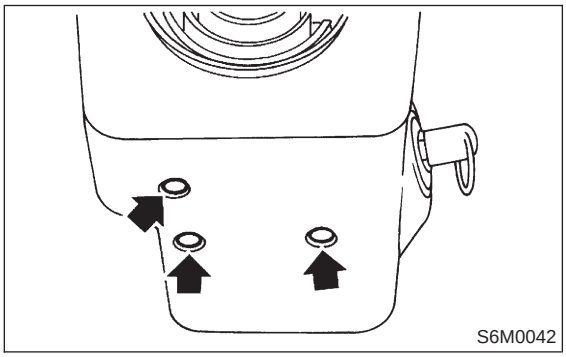
3) Attach adhesive cloth tape to body area around rear combination light.
4) Using a standard screwdriver, carefully pry rear combination light off and away from the front of vehicle.
5) Installation is in the reverse order of removal.

Tightening torque:
6.4±0.5 N·m (0.65±0.05 kg-m, 4.7±0.4 ft-lb)

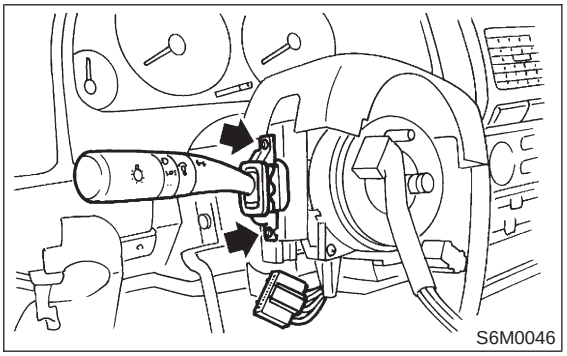
CAUTION:
● Do not pry rear combination light forcefully as this may scratch vehicle body.
● Remove all traces of adhesive tape from body before installation.
● Attach butyl rubber tape to back of rear combination light before installing rear combination light on body for sealing purposes.

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.


S6M0042

3) Disconnect connector from combination switch.
4) Remove screws which secure switch and remove switch.


S6M0046

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	○	○	○

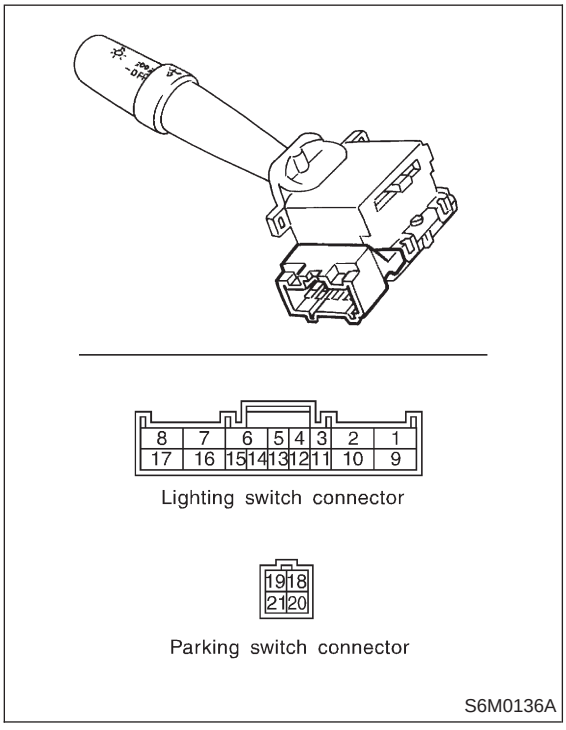
• PARKING SWITCH

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

• DIMMER AND PASSING SWITCH

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

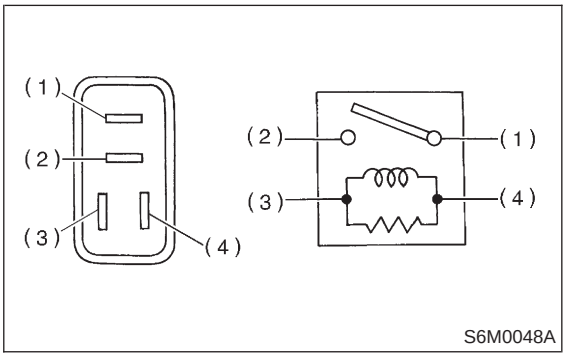
H6M0500B



2. HEADLIGHT RELAY

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

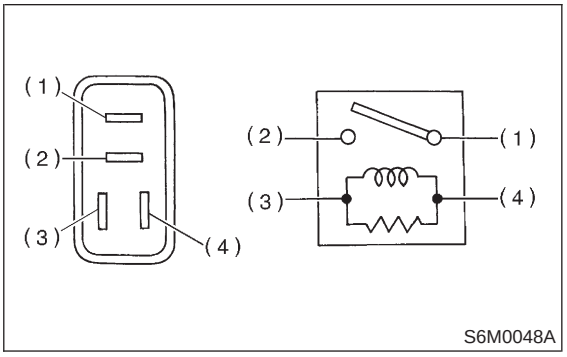
When current flows.	Between terminals No. 1 and No. 2	Continuity exists.
When current does not flow.	Between terminals No. 1 and No. 2	Continuity does not exist.
	Between terminals No. 3 and No. 4	Continuity exists.



3. TAIL AND ILLUMINATION RELAY

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

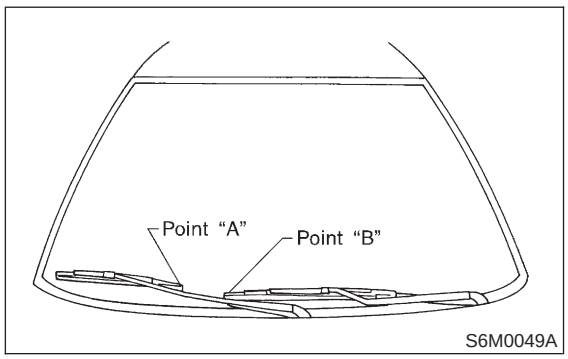
When current flows.	Between terminals No. 1 and No. 2	Continuity exists.
When current does not flow.	Between terminals No. 1 and No. 2	Continuity does not exist.
	Between terminals No. 3 and No. 4	Continuity exists.



5. Front Wiper and Washer

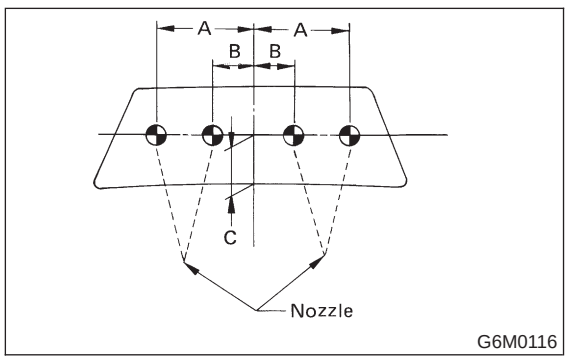
A: ADJUSTMENT

1) Turn the wiper switch to OFF position.
2) Adjust so that points “A” and “B” of the blades meet the upper end of ceramic print.



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

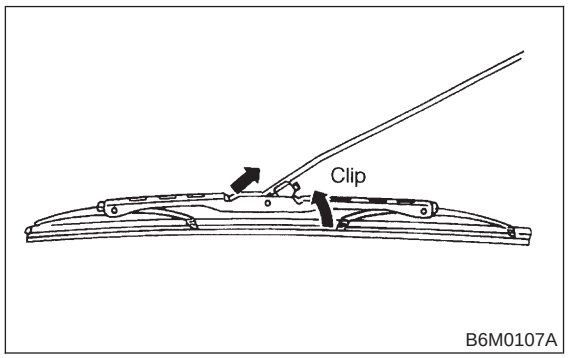
Ejecting point:
A: 400 mm (15.75 in)
B: 150 mm (5.91 in)
C: 450 mm (17.72 in)



B: REMOVAL AND INSTALLATION

1. BLADE

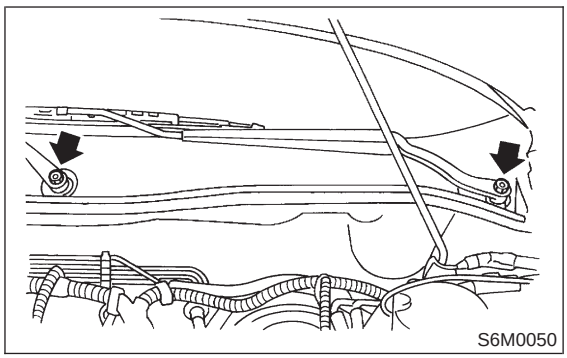
1) Pull out blade following the arrow direction, from arm while pushing up locking clip.



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±2N·m (1.4±0.2 kg-m, 10.1±1.4 ft-lb)

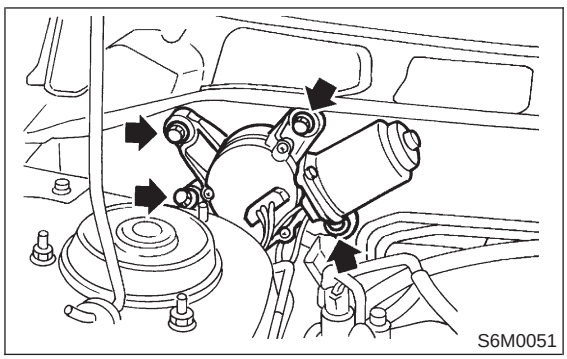
3. WIPER MOTOR AND LINK

1) Detach cowl panel. <Ref. to 5-1 [W10A0].>

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

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

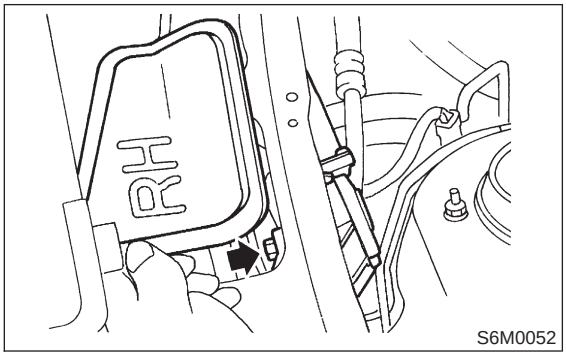
Tightening torque:
5.9±1.5 N·m (0.6±0.15 kg-m, 4.3±1.1 ft-lb)



3) Remove cowl cover.

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

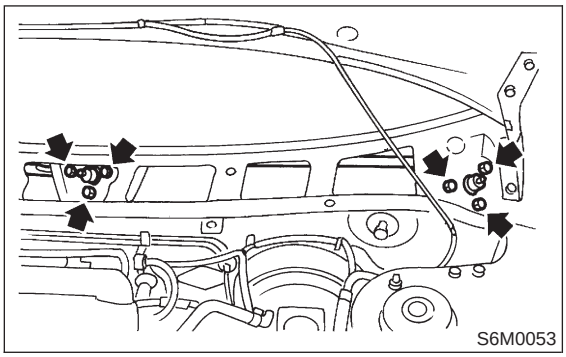
Tightening torque:
15±3 N·m (1.5±0.3 kg-m, 11±2.2 ft-lb)



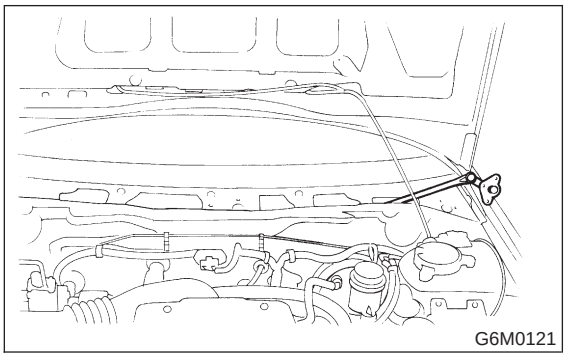
S6M0052

5) Remove bolts which secure sleeve unit.

Tightening torque:
5.9±1.5 N·m (0.6±0.15 kg-m, 4.3±1.1 ft-lb)


S6M0053

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


G6M0121

7) Installation is in the reverse order of removal.

C: INSPECTION

1. COMBINATION SWITCH (FRONT WIPER)

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

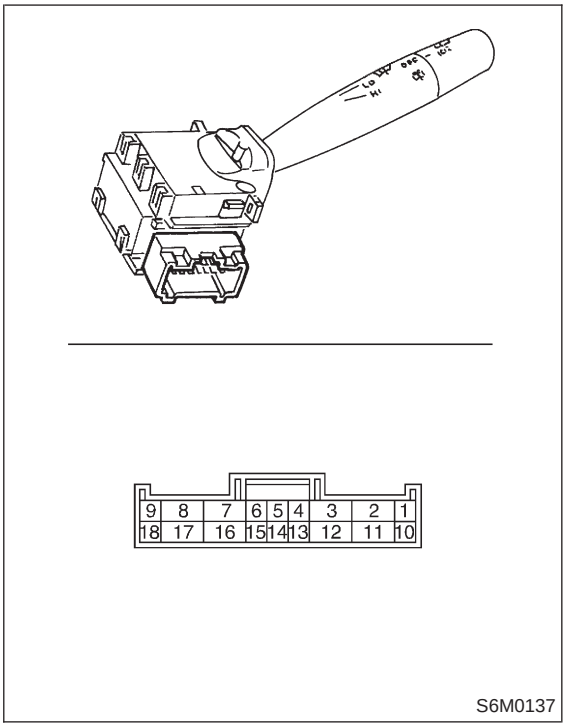
• Wiper switch

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

• Washer switch

Terminal / Switch position	11	2
OFF		
ON	○	○

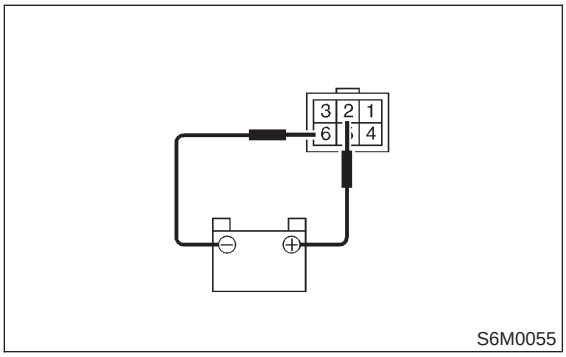
H6M0501B



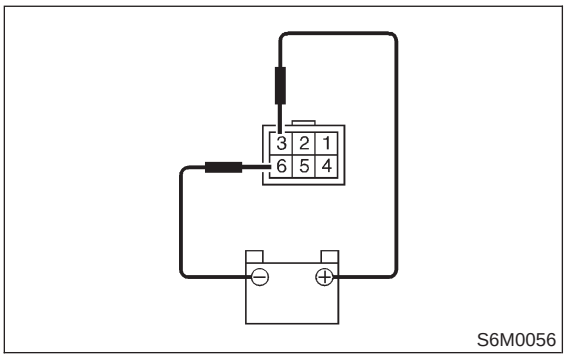
S6M0137

2. WIPER MOTOR

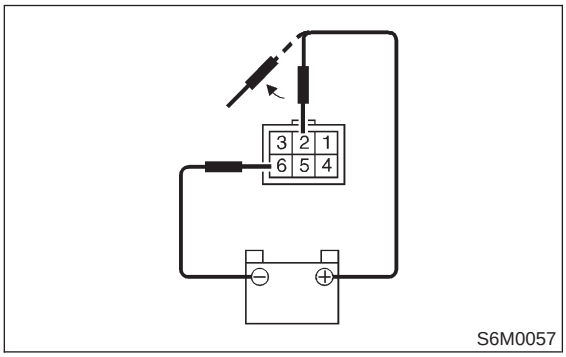
1) Check wiper motor operation at low speed: Connect battery to wiper motor. Check wiper motor for proper operation at low speed.



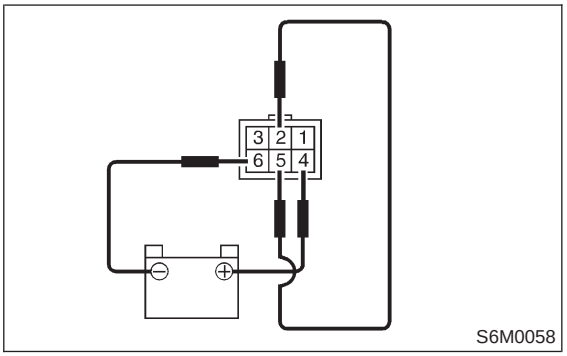
2) Check wiper motor operation at high speed: Connect battery wiper motor. Check wiper motor for proper operation at high speed.



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.

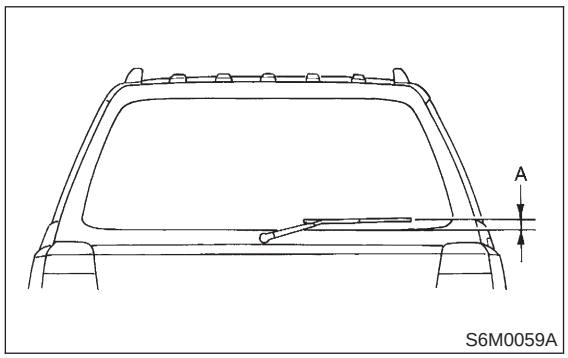


6. Rear Wiper and Washer

A: ADJUSTMENT

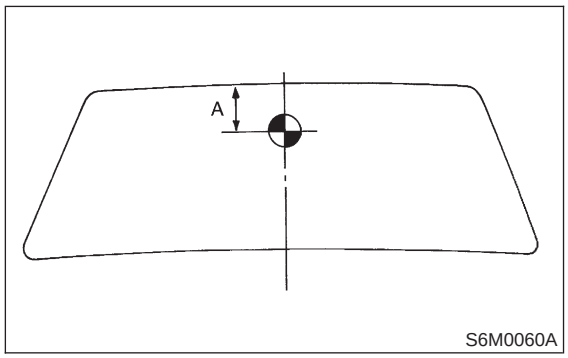
1) Adjust wiper blade in original position as shown in figure by changing wiper arm installation.

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.

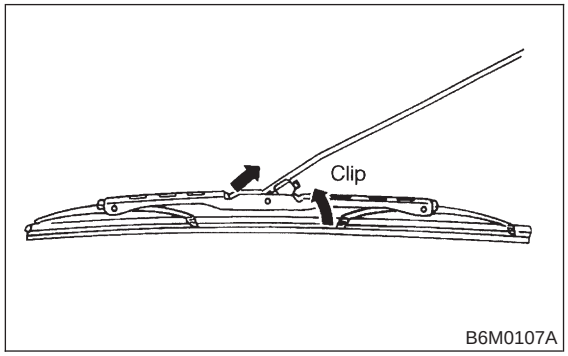
Ejecting point:
A: 60 mm (2.36 in)



B: REMOVAL AND INSTALLATION

1. BLADE

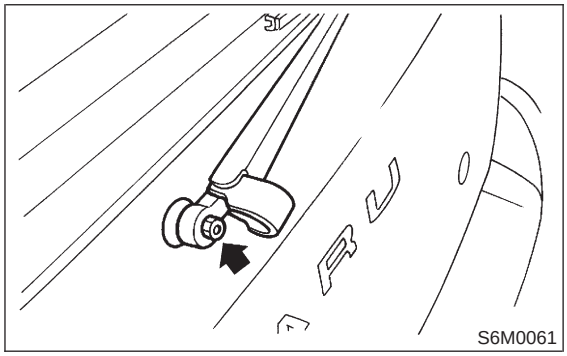
1) Pull out blade following the arrow direction, from arm while pushing up locking clip.



2) Installation is in the reverse order of removal.

2. WIPER ARM

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



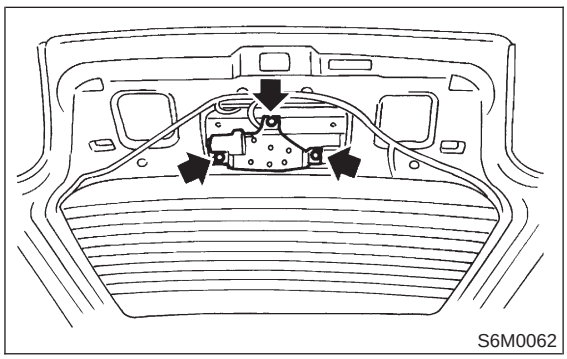
3) Installation is in the reverse order of removal.

Tightening torque:
5.9±1.5 N·m (0.6±0.15 kg-m, 4.3±1.1 ft-lb)

3. WIPER MOTOR

1) Remove wiper arm.
2) Remove rear gate trim.
3) Undo clips which secure harness, and disconnect connector of wiper motor.
4) Remove attaching screws and take out wiper motor assembly.

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



5) Installation is in the reverse order of removal.

Tightening torque:
5.9±1.5 N·m (0.6±0.15 kg-m, 4.3±1.1 ft-lb)

C: INSPECTION

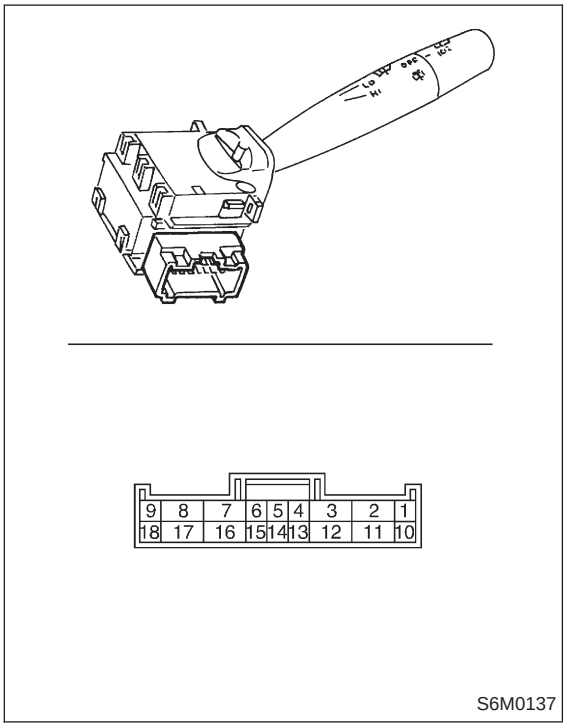
1. COMBINATION SWITCH (REAR WIPER)

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	○	○		○

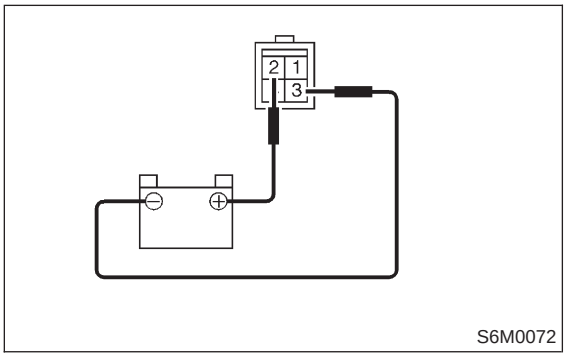
H6M0502B



S6M0137

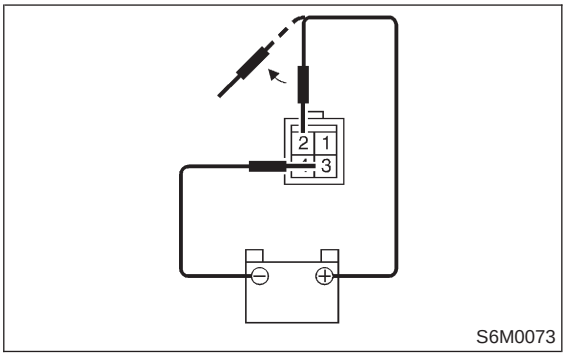
2. WIPER MOTOR

1) Operational check:
Connect battery to wiper motor and check operation of wiper motor.



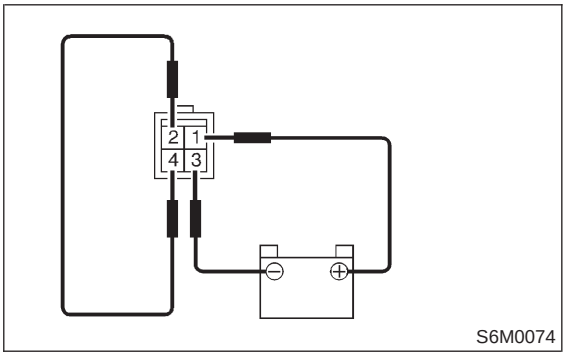
S6M0072

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



S6M0073

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

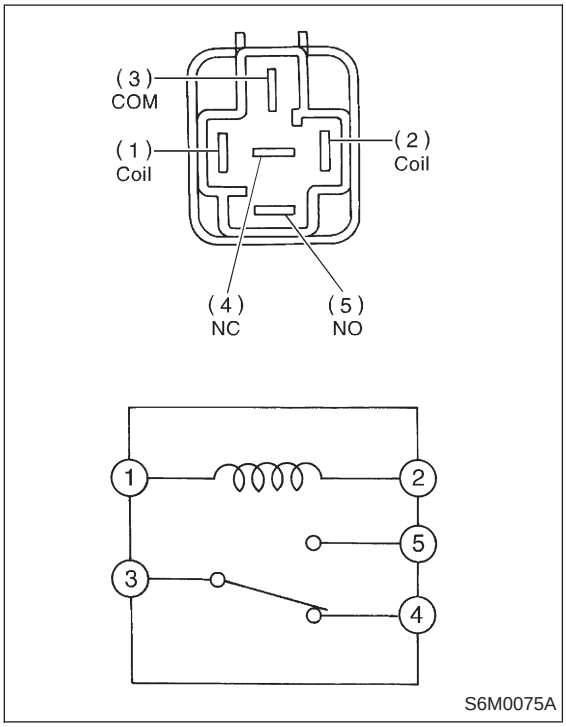


S6M0074

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.



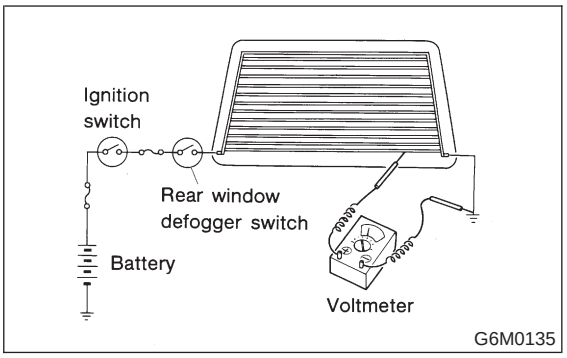
7. Rear Window Defogger

A: INSPECTION

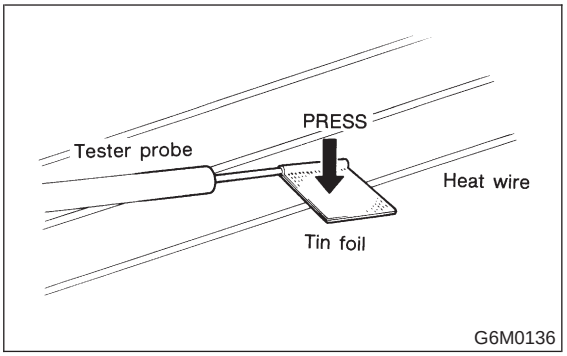
1. HEAT WIRES

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.



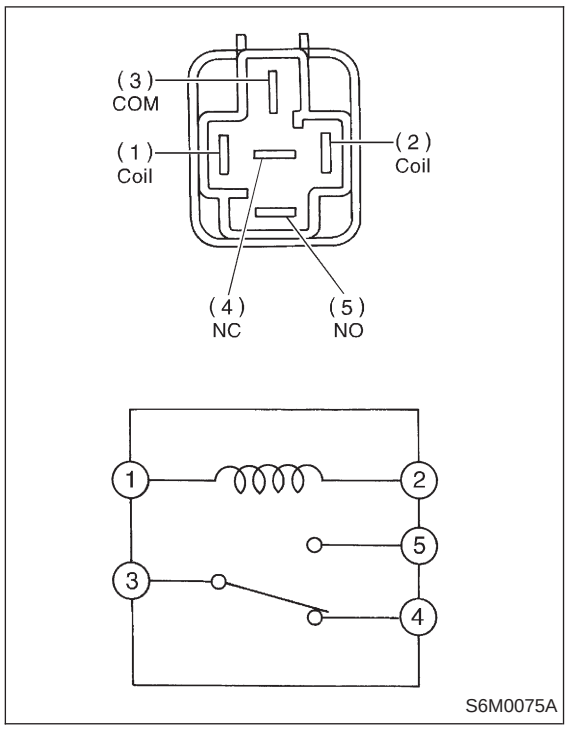
- When measuring voltage, wind a piece of tin foil around the tip of the tester probe and press the foil against the wire with your finger.



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.



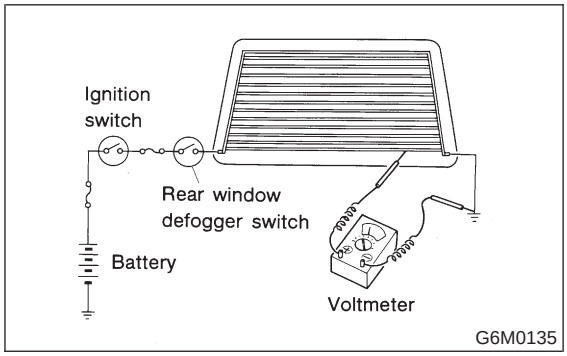
7. Rear Window Defogger

A: INSPECTION

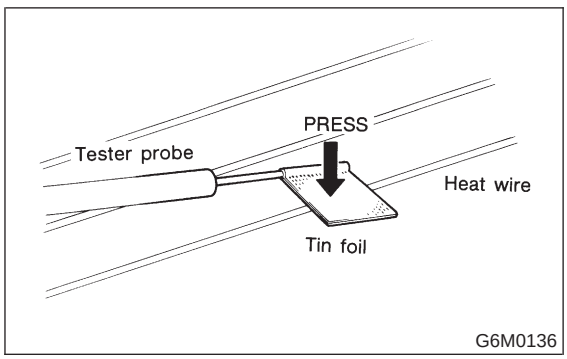
1. HEAT WIRES

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.

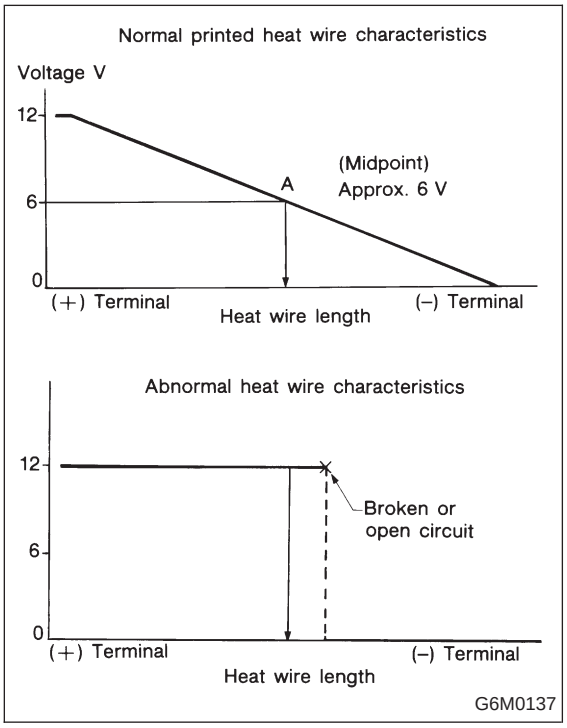
NOTE:
- Normal indication is about 6 volts.



- 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.

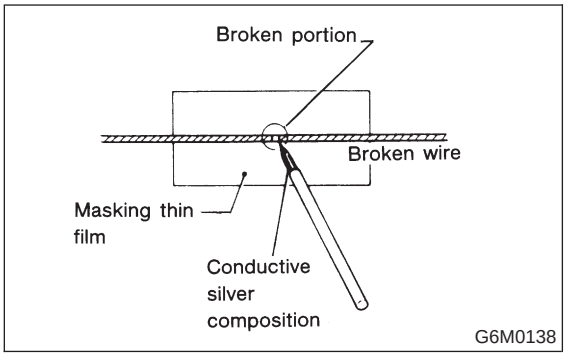


4) When tester indicates 12 volts when its probe reaches point “A”, a broken circuit occurs between point “A” and the negative terminal. Slowly move tester probe toward the negative terminal while contacting it on heat wire to locate point where tester indication changes abruptly (0 volts). This is the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

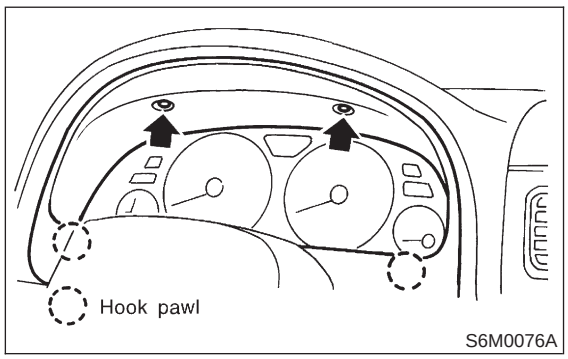


4) Dry out the deposited portion.
5) Inspect the repaired wire for continuity.

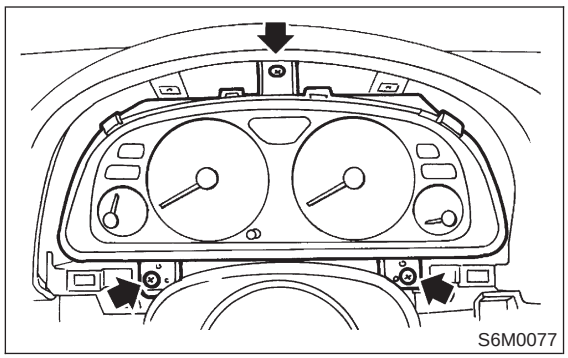
8. Combination Meter

A: REMOVAL AND INSTALLATION

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



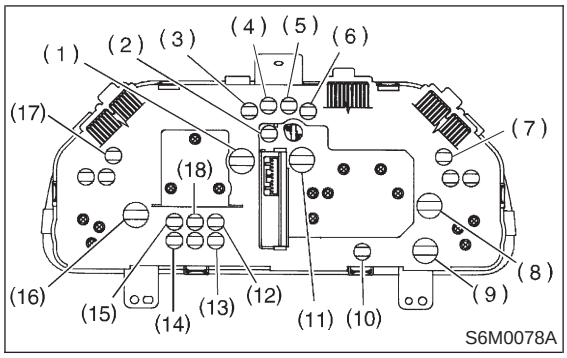
3) Remove screws which secure combination meter, and pull combination meter out.



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



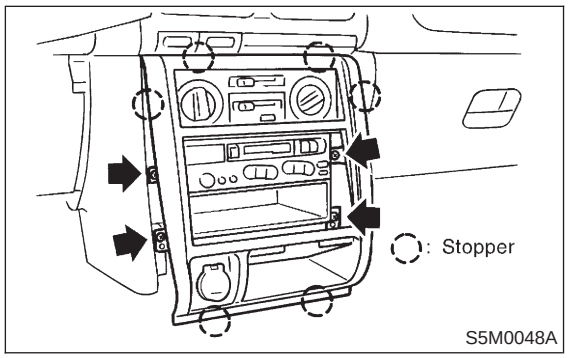
(1) Tachometer
(2) Door open
(3) Turn RH
(4) Airbag
(5) HI-beam
(6) Turn LH
(7) ABS
(8) Speedometer and fuel gauge
(9) Low fuel
(10) Seat belt
(11) Speedometer
(12) Oil pressure
(13) Brake
(14) FWD
(15) Check engine
(16) Tachometer and temperature gauge
(17) AT oil temp.
(18) Charge

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.

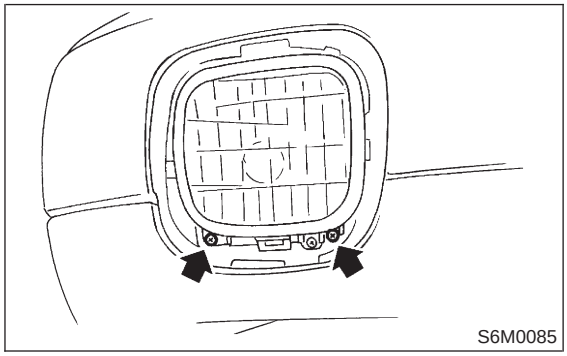
3. REAR SPEAKER

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 the two screws, then draw out the front fog light from front bumper.



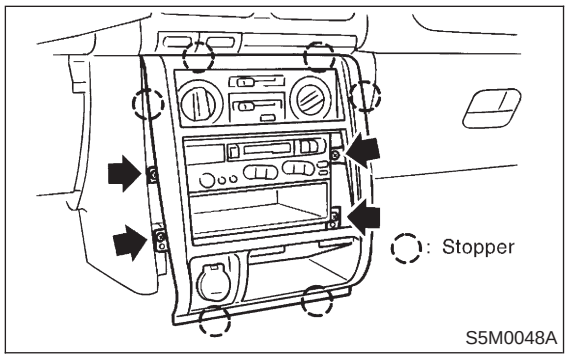
3) Disconnect the connector.
4) Installation is in the reverse order of removal.

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.

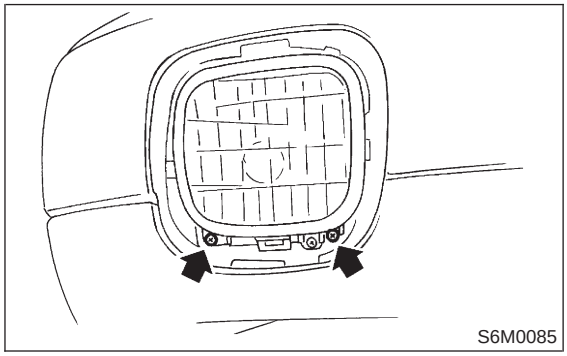
3. REAR SPEAKER

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

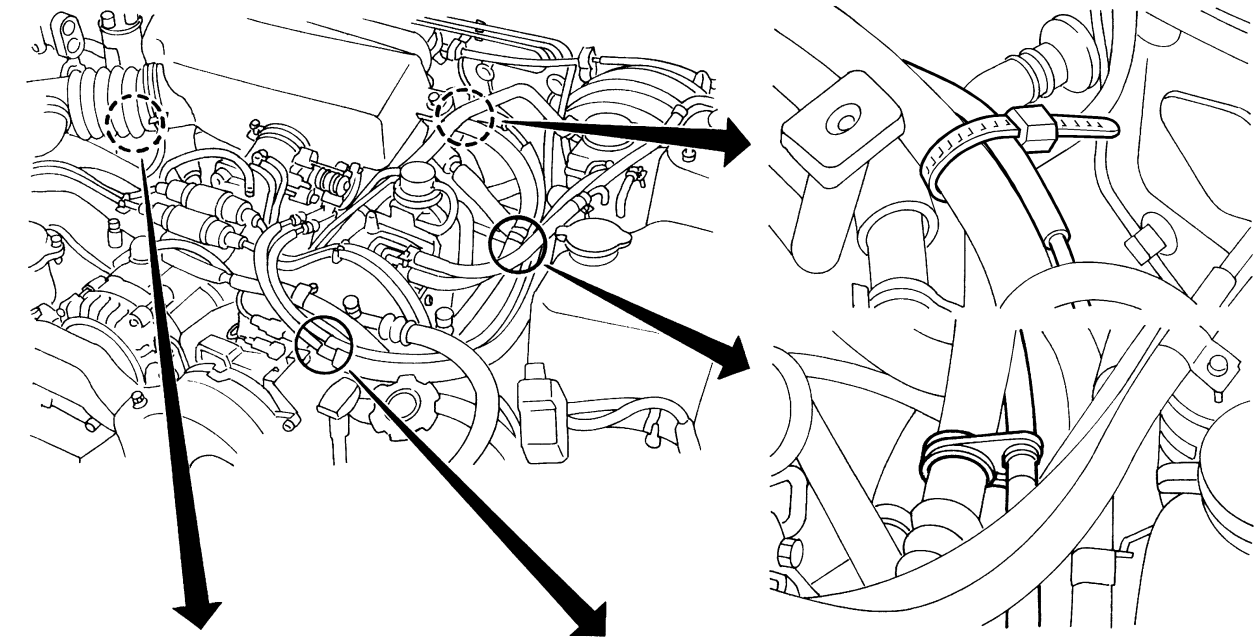
1) Disconnect ground cable from battery.
2) Remove the two screws, then draw out the front fog light from front bumper.

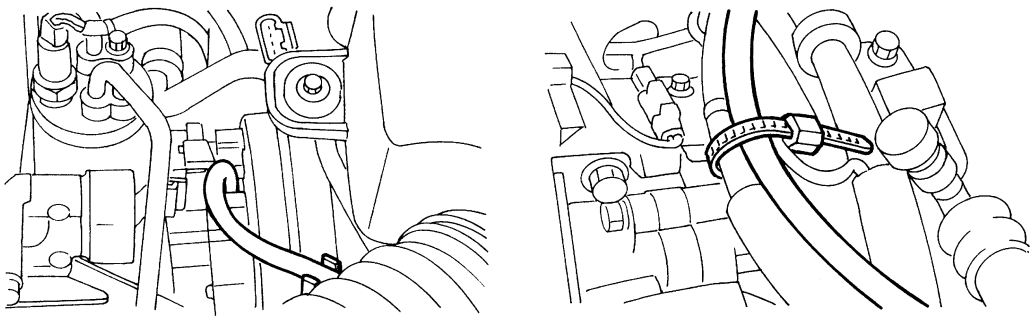


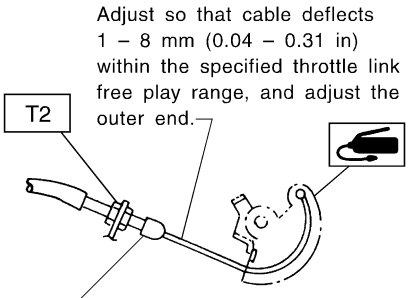
3) Disconnect the connector.
4) Installation is in the reverse order of removal.

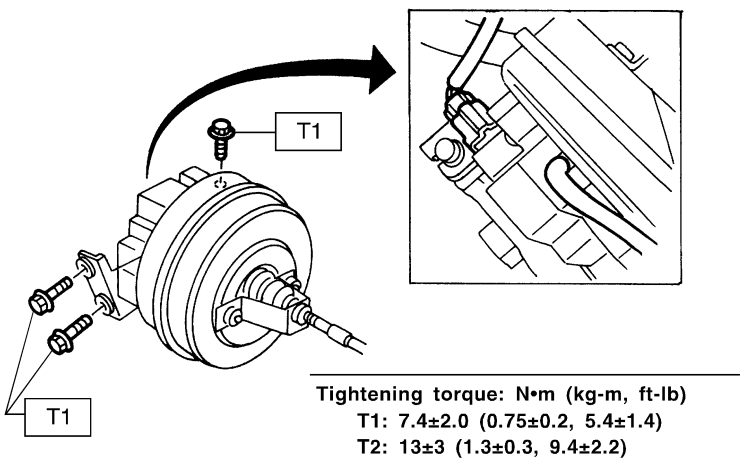
11. Cruise Control

A: ADJUSTMENT









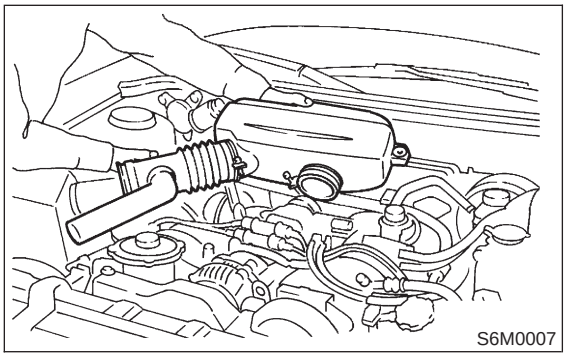
Tightening torque: N•m (kg-m, ft-lb)
T1: 7.4±2.0 (0.75±0.2, 5.4±1.4)
T2: 13±3 (1.3±0.3, 9.4±2.2)

S6M0138A

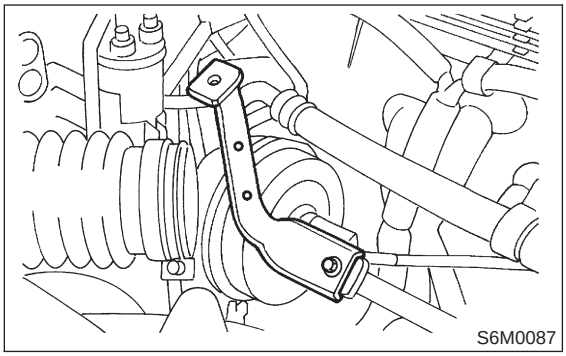
B: REMOVAL AND INSTALLATION

1. ACTUATOR

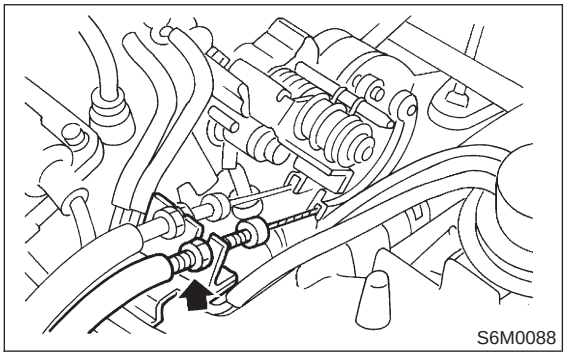
1) Remove air intake chamber.


S6M0007

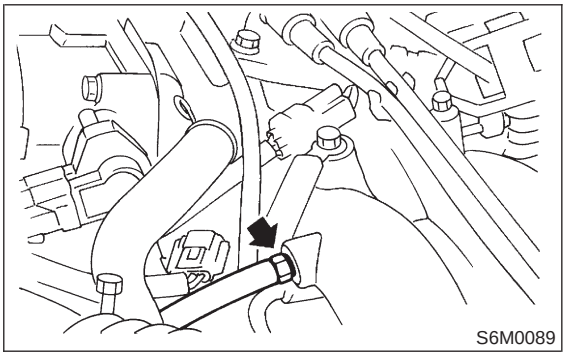
2) Remove air intake chamber stay.
3) Remove clip bands from cruise control cable.


S6M0087

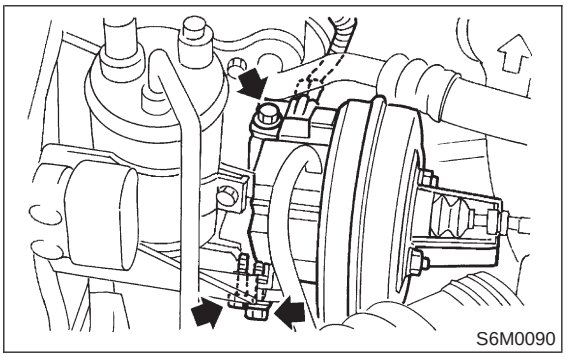
4) Remove cruise control cable end from throttle cam.


S6M0088

5) Disconnect cruise control vacuum hose from intake manifold.


S6M0089

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


S6M0090

8) Installation is in the reverse order of removal.

Tightening torque:
7.4±2.0 N·m (0.75±0.2 kg-m, 5.4±1.4 ft-lb)

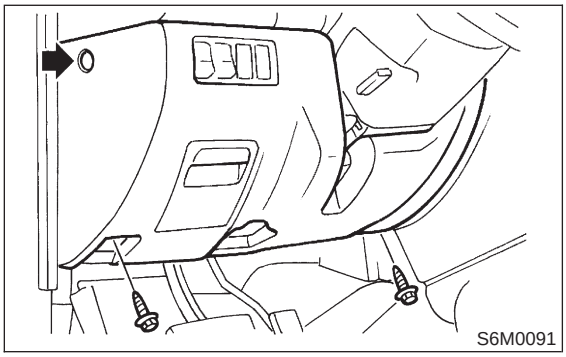
CAUTION:
When inserting vacuum hose to intake manifold, apply sealant to the fitting hose.

Fluid packing:
THREE BOND 1105 or equivalent

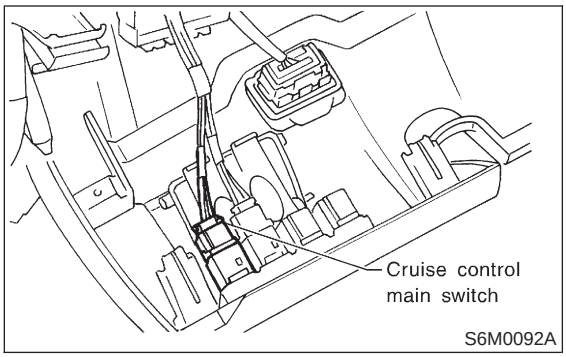
CAUTION:
● Be careful not to apply excessive load to the wire cable when adjusting and/or installing; otherwise, the actuator may be deformed or damaged.
● Do not bend cable sharply with a radius less than 100 mm (3.94 in); otherwise, cable may bend permanently, resulting in poor performance.
● When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

2. CRUISE CONTROL MAIN SWITCH

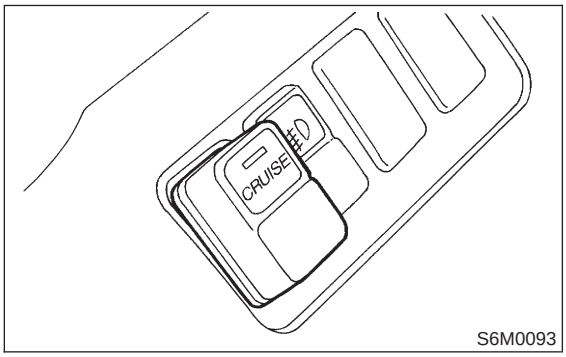
1) Remove screws and clip from instrument panel lower cover.
2) Remove panel lower cover.



3) Disconnect connector from cruise control main switch.



4) Remove main switch by pushing it outward.

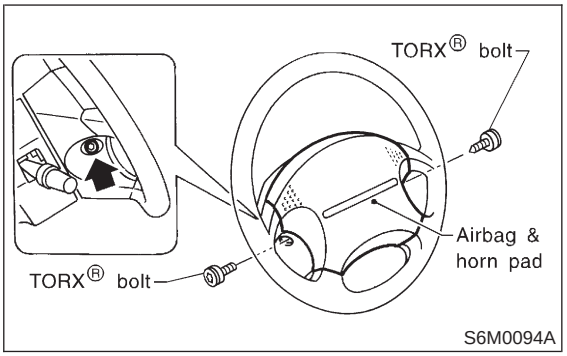


5) Installation is in the reverse order of removal.

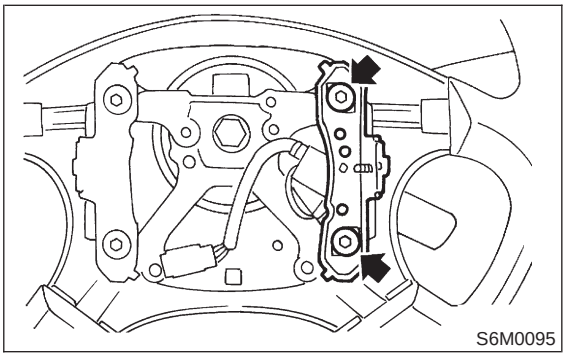
3. CRUISE CONTROL COMMAND SWITCH

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].>

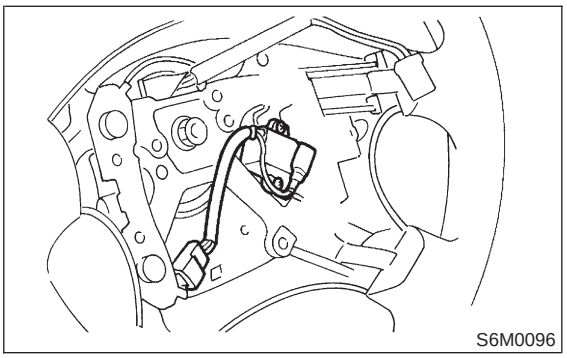
1) Set front wheels in straight ahead position.
2) Turn ignition switch OFF.
3) Disconnect battery ground cable from battery and wait for at least 20 seconds before starting work.
4) Using TORX® BIT T30 (Tamper resistant type), remove two TORX® bolts which secure driver's airbag module.



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



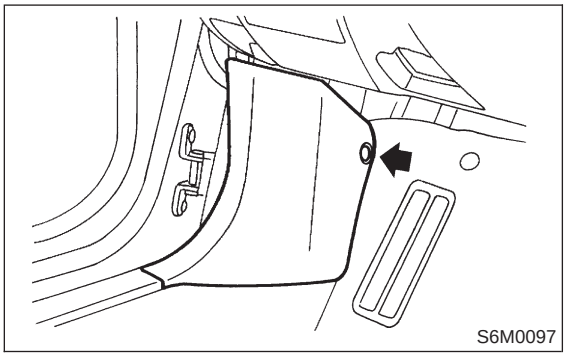
7) Disconnect horn and cruise control command switch connector, then remove cruise control command switch.



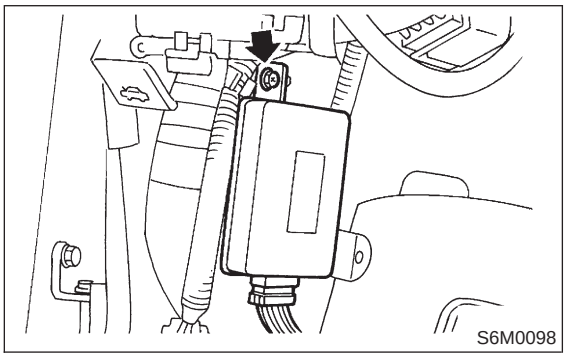
8) Installation is in the reverse order of removal.

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

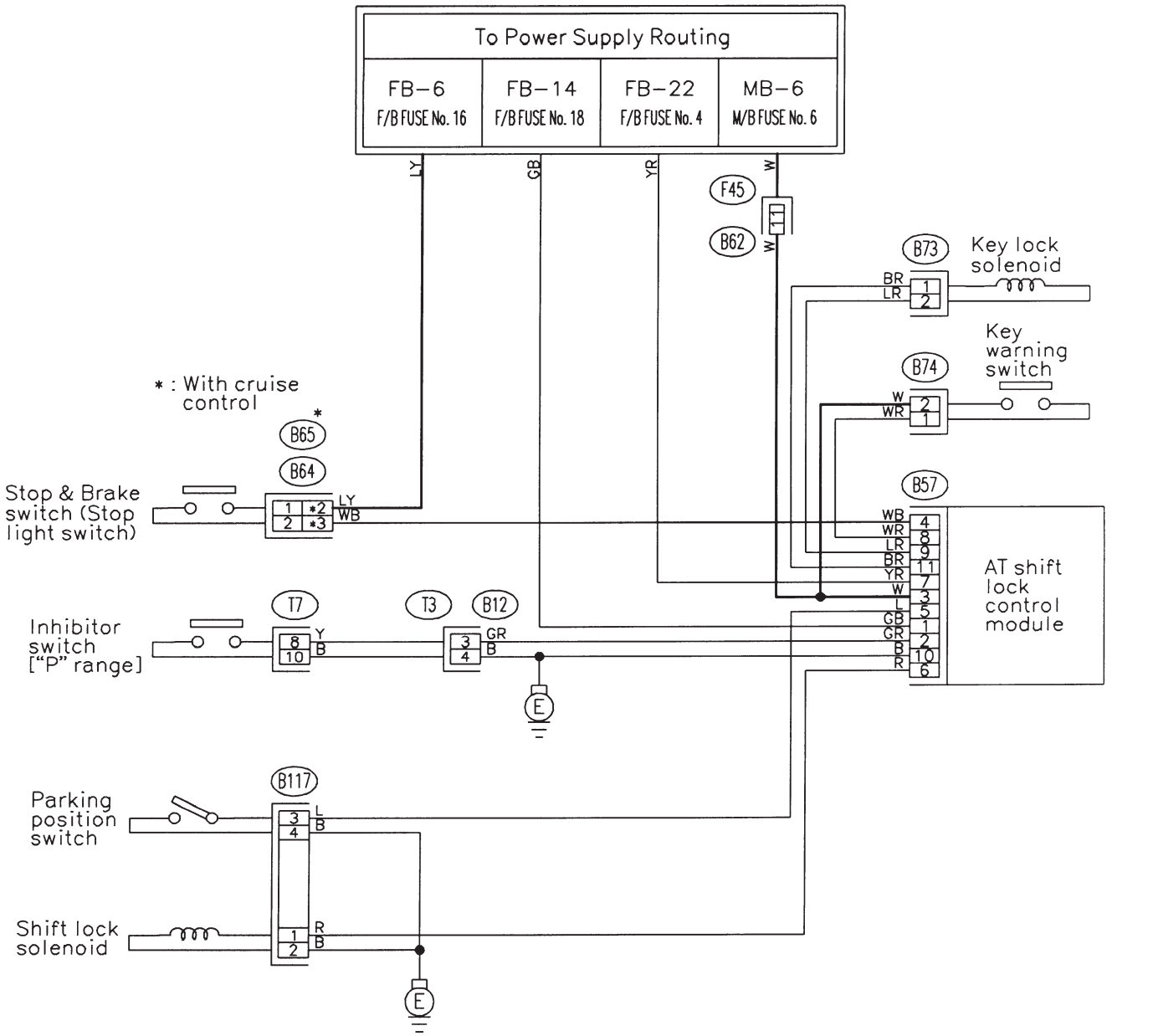
Disconnect connector from switch, then remove the switch. <Ref. to 4-5 [C1A0].>

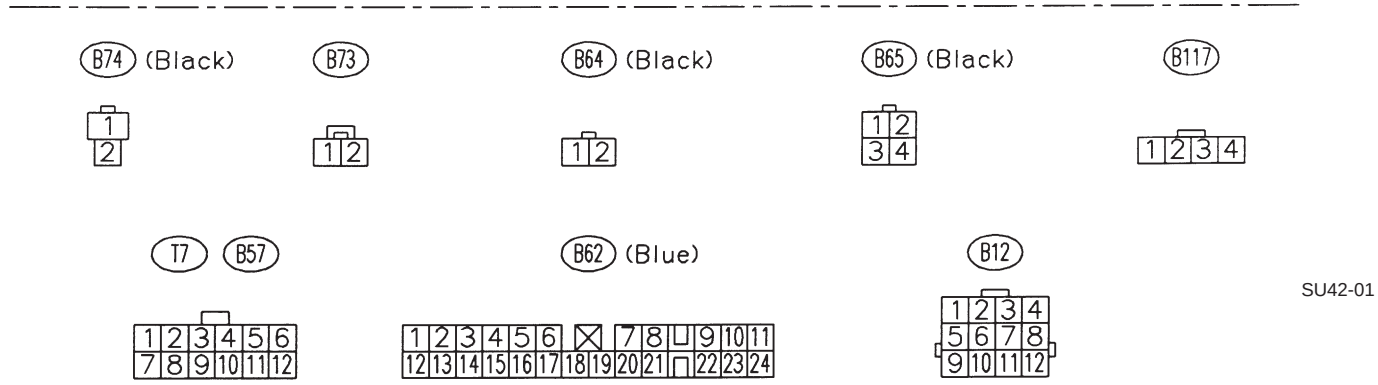
6. CLUTCH SWITCH

Disconnect connector from switch, then remove the switch. <Ref. to 4-5 [C1A0].>

1. AT Shift Lock System

A: WIRING DIAGRAM

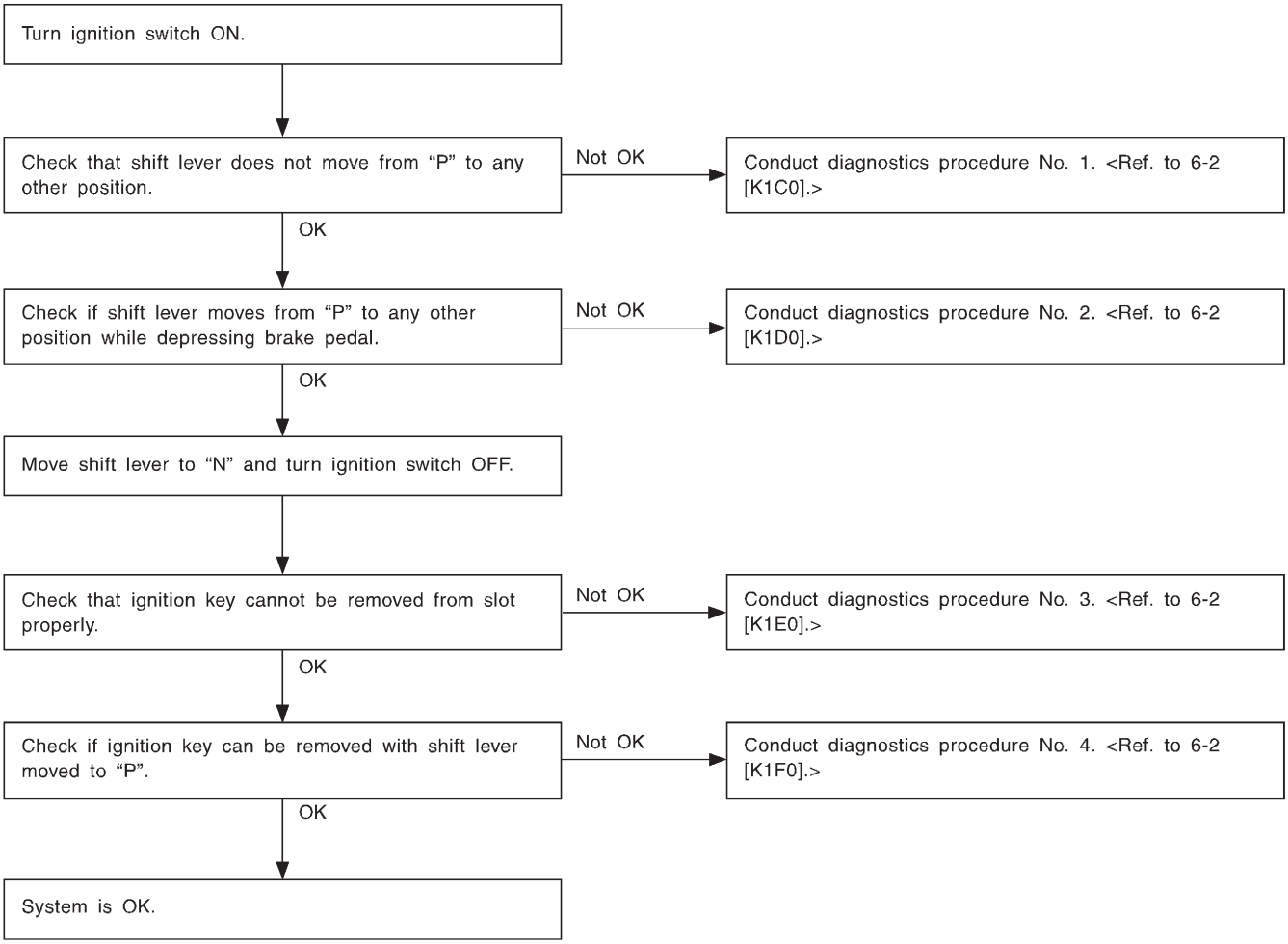




SU42-01

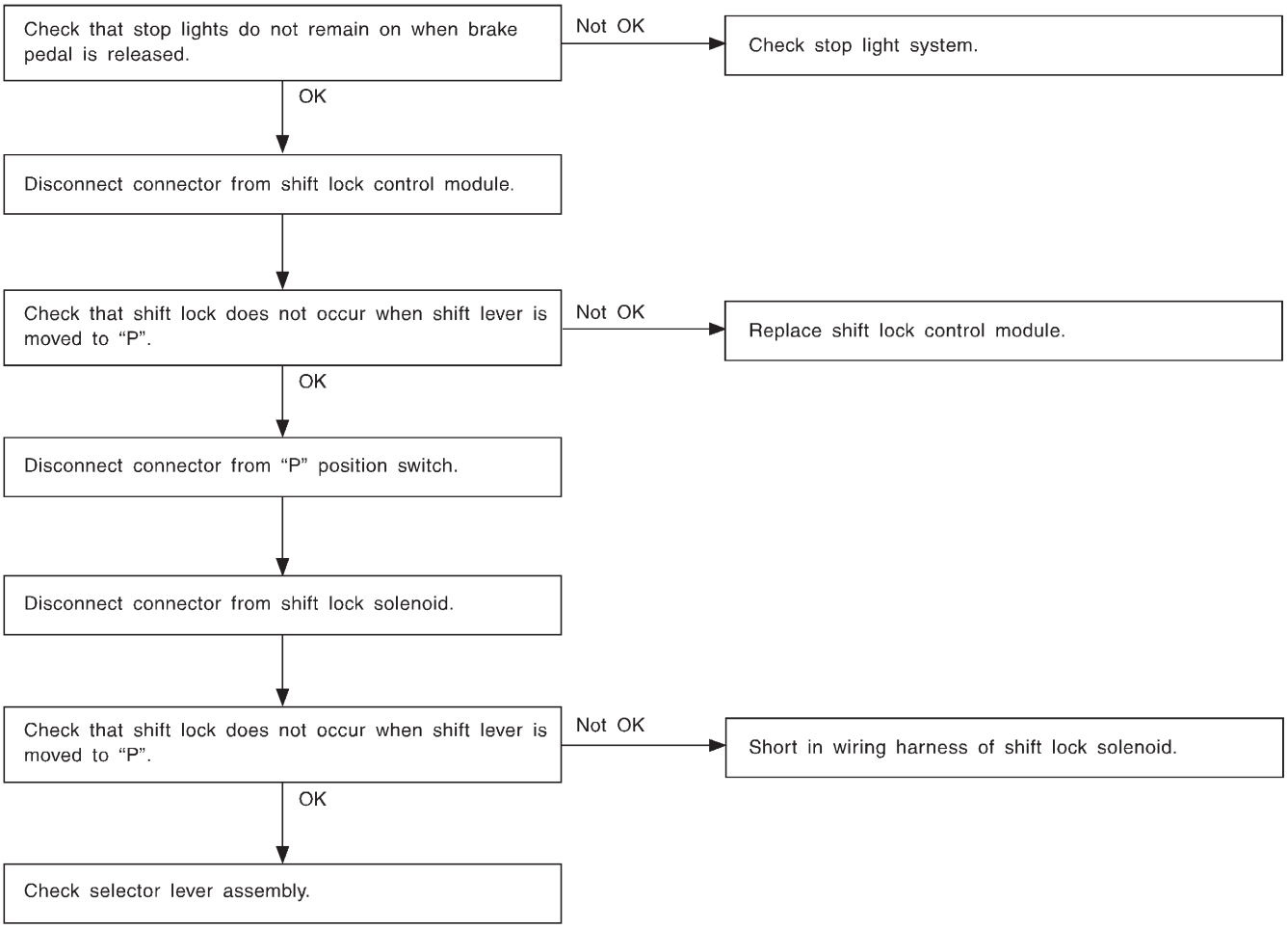
SU42−01

B: BASIC DIAGNOSTICS CHART



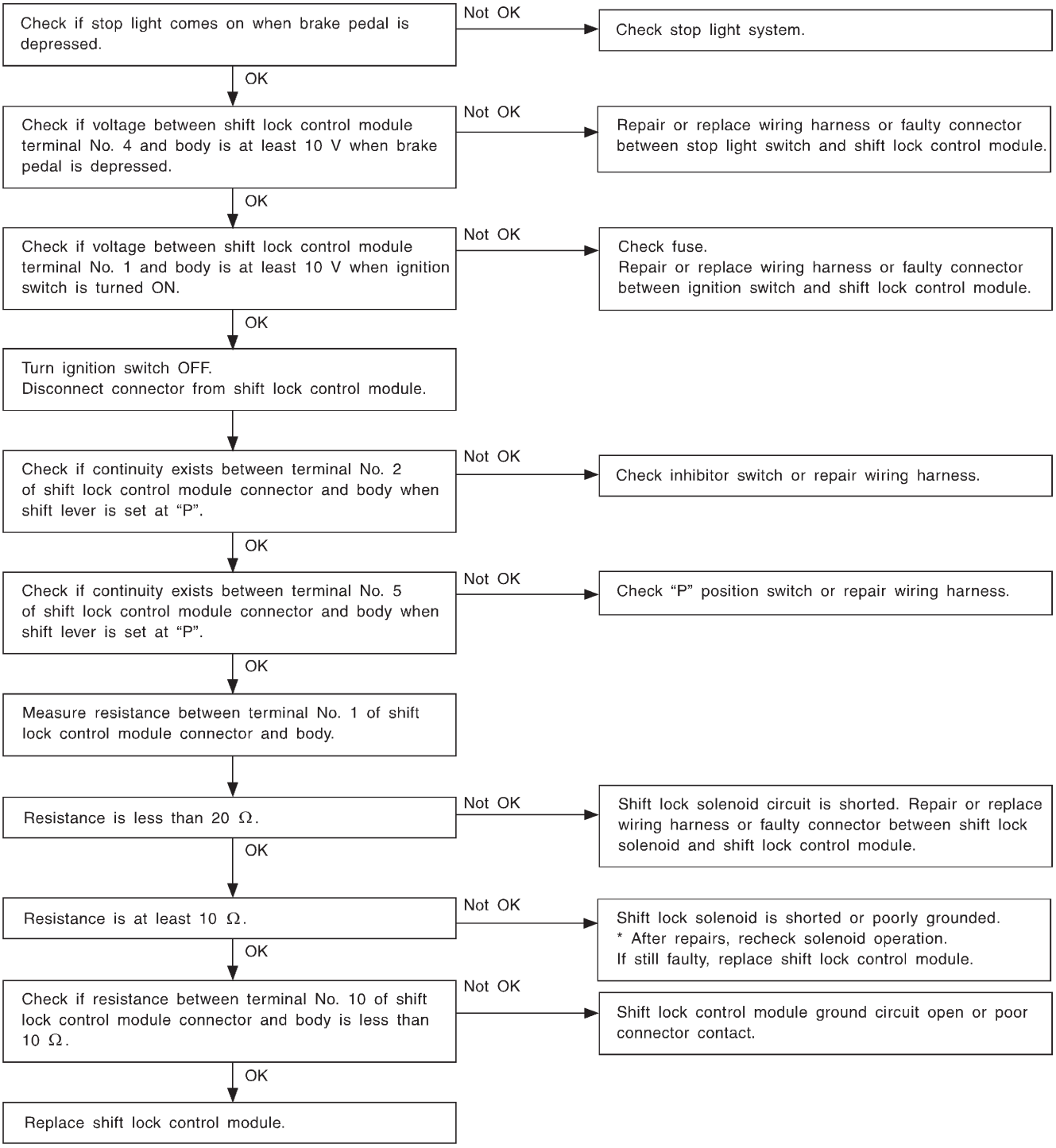
H6M0504A

C: DIAGNOSTICS PROCEDURE NO. 1



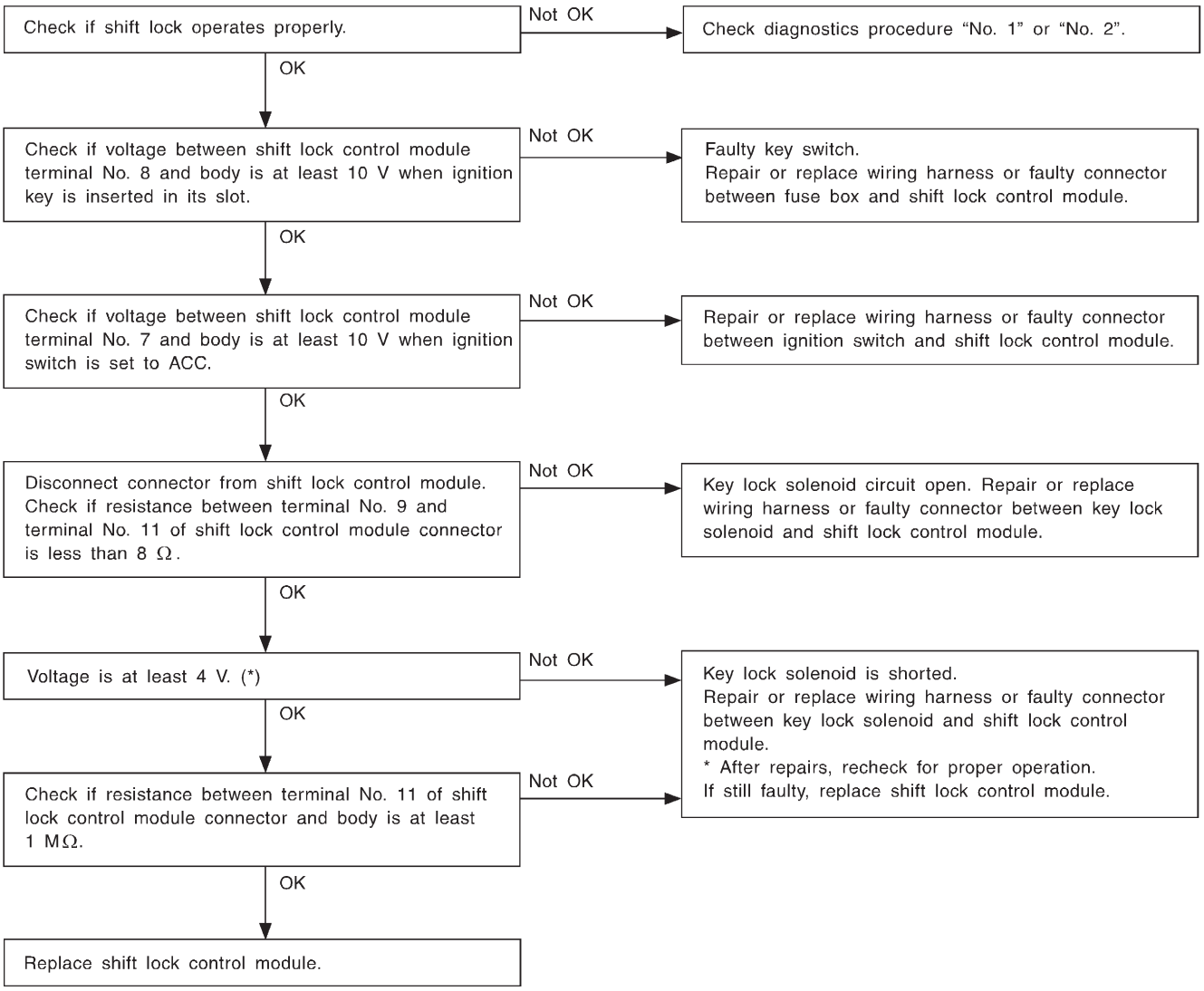
H6M0505

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



H6M0506

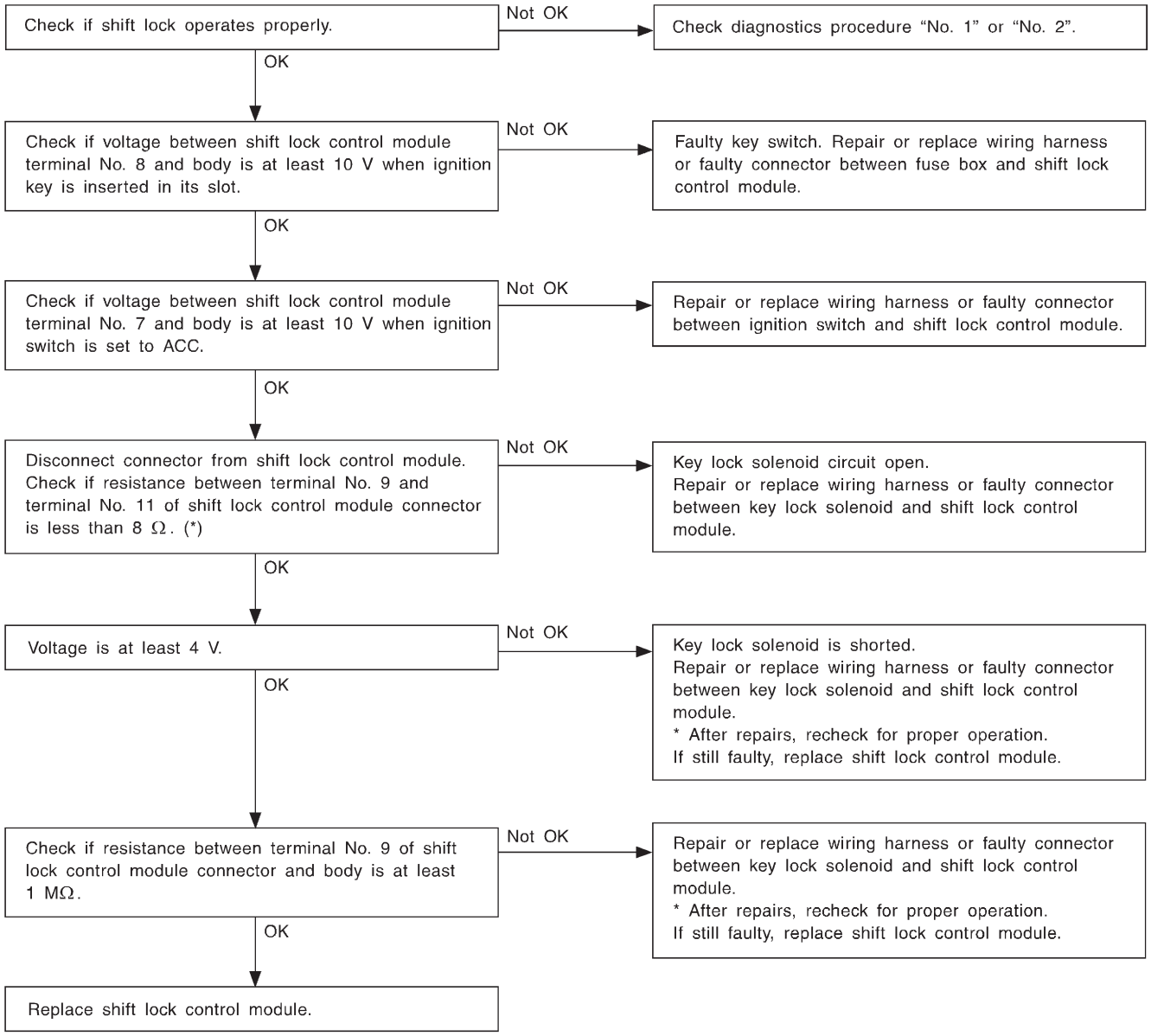
E: DIAGNOSTICS PROCEDURE NO. 3 (KEY INTERLOCK DOES NOT OPERATE.)



***: 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.**

H6M0507

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.**

H6M0508

2. Combination Meter

A: DIAGNOSTICS PROCEDURE

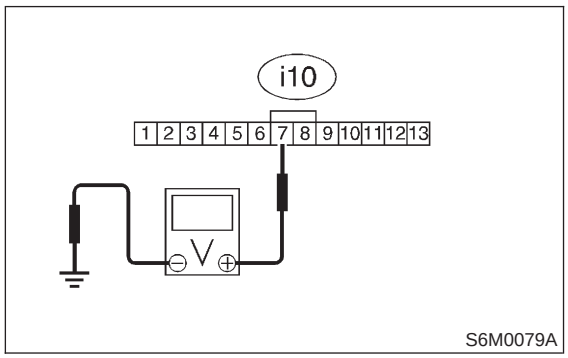
If speedometer does not operate, or operates abnormally, check combination meter circuit.

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
(i10) No. 7 (+) — Chassis ground (−):



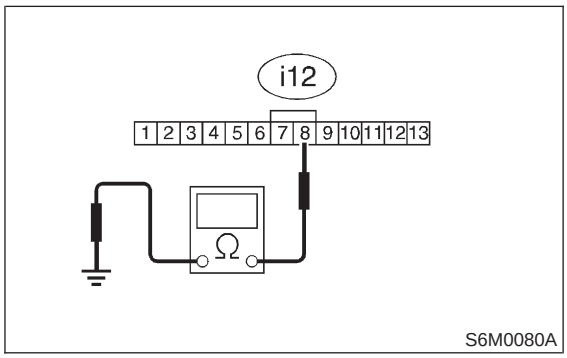
CHECK : ***Is the voltage more than 10 V?***
YES : Go to step **2A2**.
NO : Repair harness and connector.

NOTE:
In this case, repair the following:
● Open circuit in harness between combination meter and battery.
● Poor contact in coupling connectors (i10) 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. 8 (+) — Chassis ground (−):

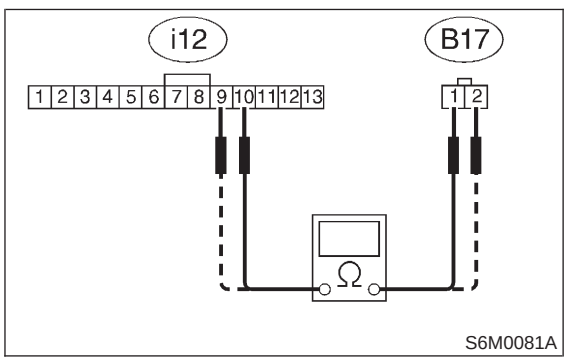


CHECK : ***Is the resistance less than 10 Ω?***
YES : Go to step **2A3**.
NO : Repair harness and connector.

2A3 : CHECK HARNESS CONNECTOR BETWEEN COMBINATION METER AND VEHICLE SPEED SENSOR 2.

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

Connector & terminal
(B17) No. 1 — (i12) No. 10:

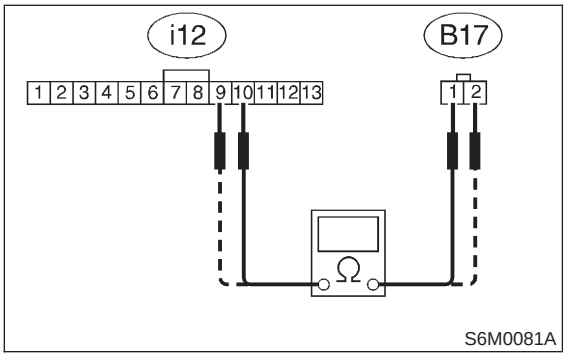


CHECK : ***Is the resistance less than 10 Ω?***
YES : Go to step **2A4**.
NO : Repair or replace wiring harness between combination meter and vehicle speed sensor 2.

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

Measure resistance between vehicle speed sensor 2 connector and combination meter connector.

Connector & terminal
(B17) No. 2 — (i12) No. 9:



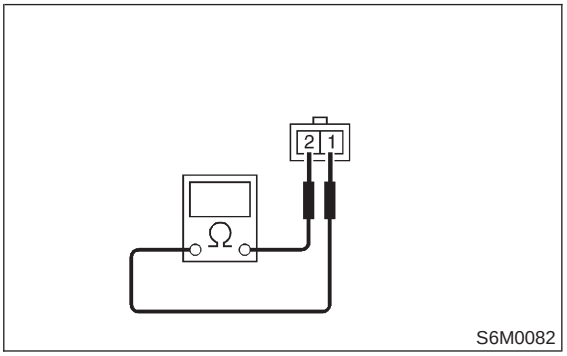
CHECK : ***Is the resistance less than 10 Ω?***
YES : Go to step **2A5**.
NO : Repair or replace wiring harness between combination meter and vehicle speed sensor 2.

2A5 : 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.

1) Disconnect connector from vehicle speed sensor 2.
2) Measure resistance between terminals of vehicle speed sensor 2.

Terminals
No. 1 — No. 2:



CHECK : ***Is the resistance between 350 Ω and 450 Ω?***
YES : Go to step **2A6**.
NO : Replace vehicle speed sensor 2.

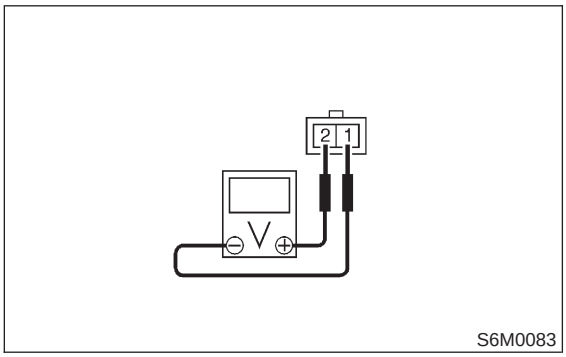
2A6 : CHECK VEHICLE SPEED SENSOR 2.

1) 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.

2) Drive the vehicle at speed greater than 20 km/h (12 MPH).
3) Measure voltage between terminals of vehicle speed sensor 2.

Terminals
No. 1 — No. 2:



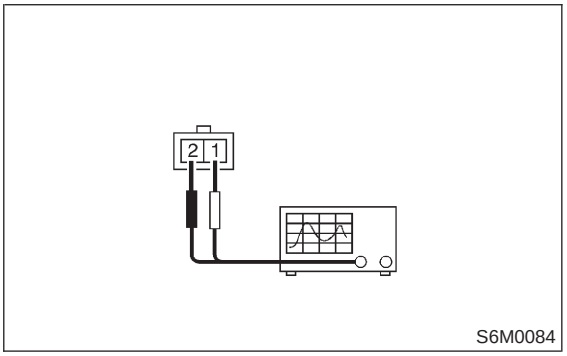
CHECK : ***Is the voltage more than 5 V? (AC range)***
YES : Repair or replace speedometer.
NO : Replace vehicle speed sensor 2.

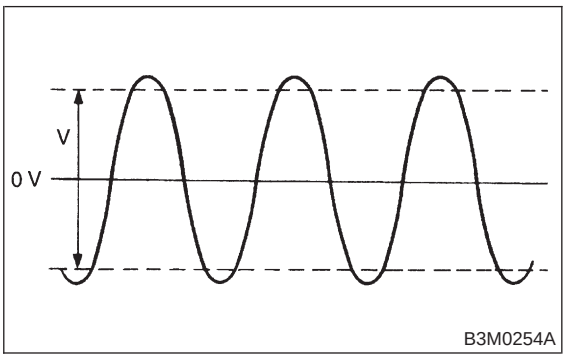
2A7 : CHECK VEHICLE SPEED SENSOR 2.

NOTE:
Using an oscilloscope:

1) Turn ignition switch to OFF.
2) Set oscilloscope to vehicle speed sensor 2.
3) Drive the vehicle at speed greater than 20 km/h (12 MPH).
4) Measure signal voltage.

Terminals
No. 1 — No. 2:





CHECK : ***Is the voltage more than 5 V?***
YES : Repair or replace speedometer.
NO : Replace vehicle speed sensor 2.