

ENGINE ELECTRICAL SYSTEM

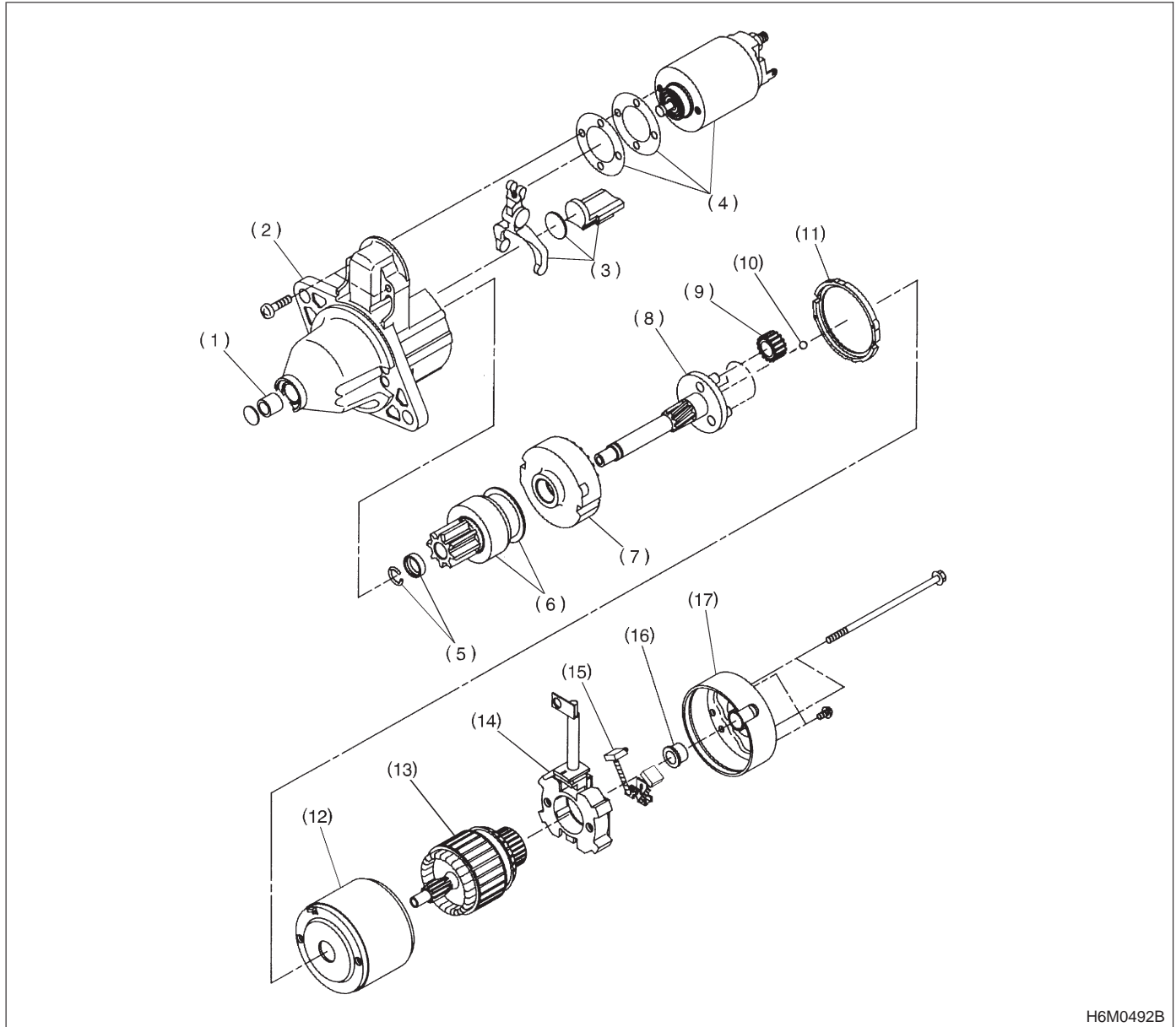
6-1

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1. Specifications

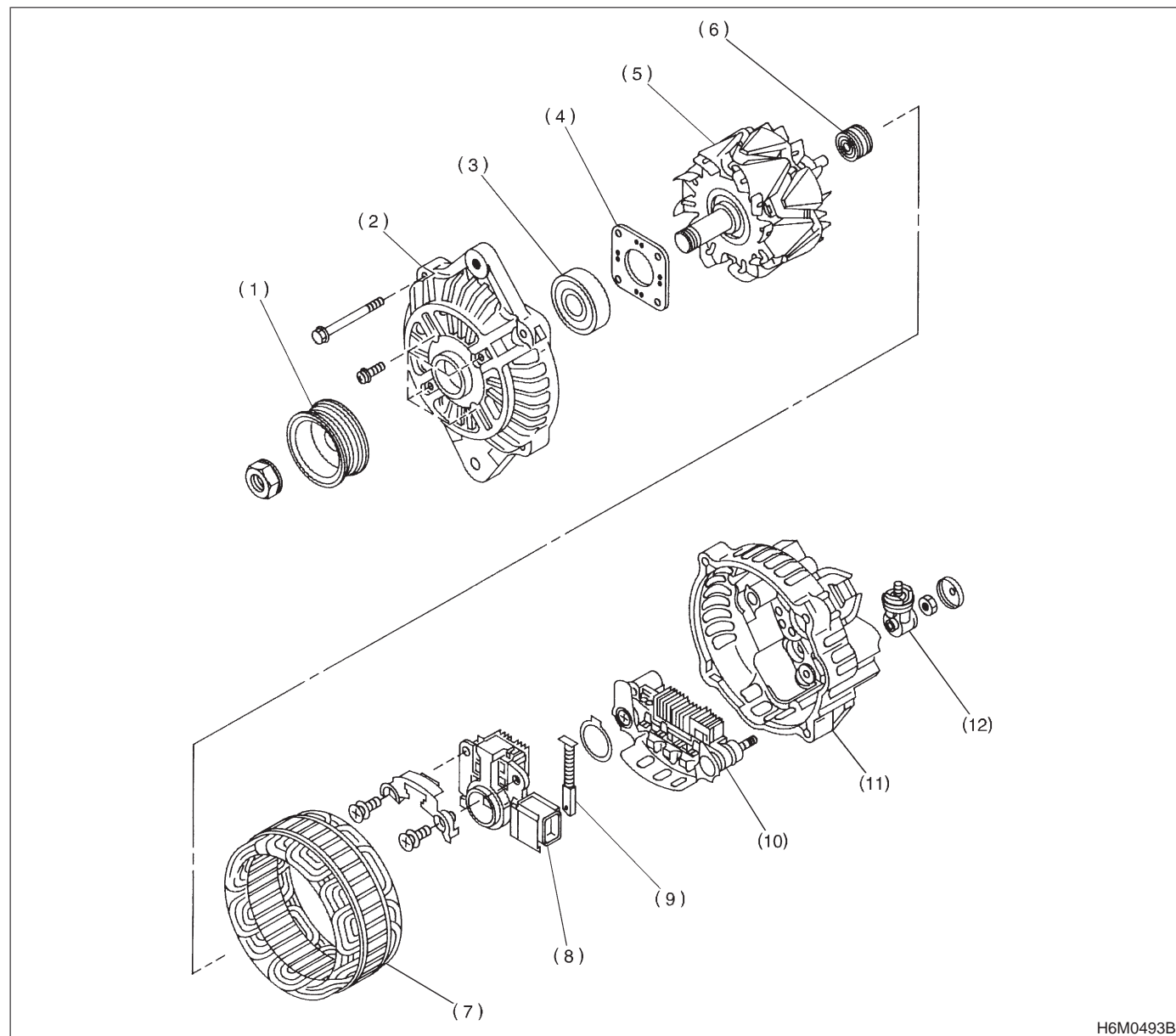
Item			Designation	
Starter	Type		Reduction type	
	Model		MT M000T81681	AT M001T84481
	Manufacturer		MITSUBISHI	
	Voltage and output		12 V — 1.0 kW	12 V — 1.4 kW
	Direction of rotation		Counterclockwise (when observed from pinion)	
	Number of pinion teeth		8	9
	No-load characteristics	Voltage	11 V	
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

1. Starter



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

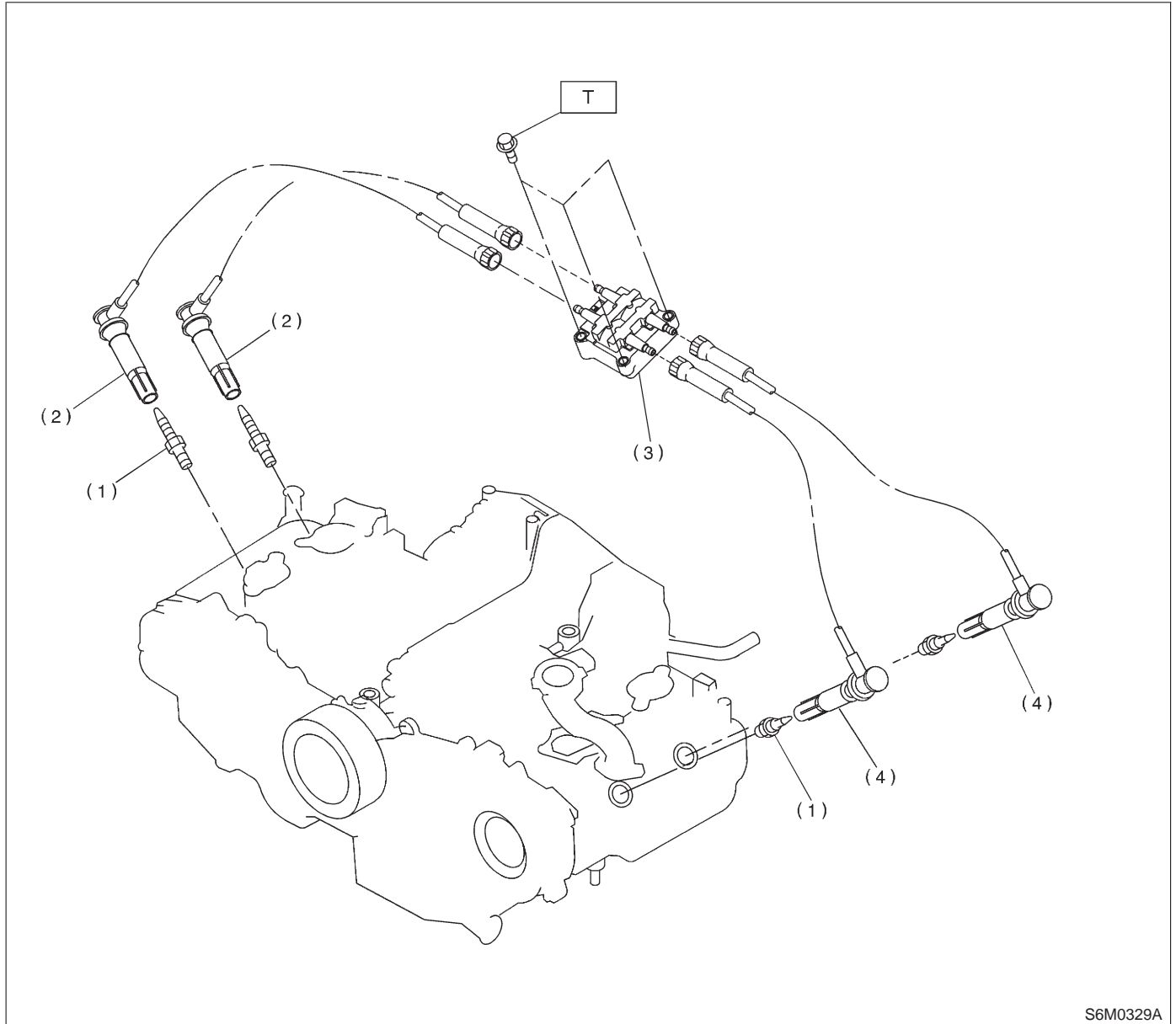
2. Generator



H6M0493B

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

3. Ignition System



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

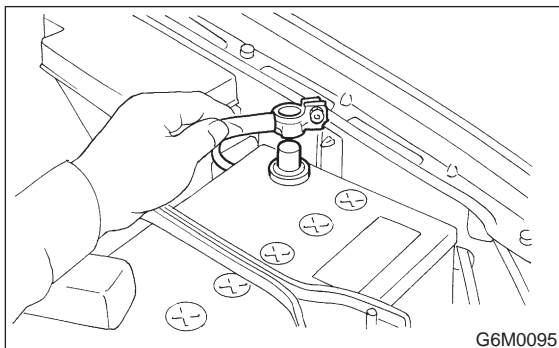
Tightening torque: N-m (kg-m, ft-lb)
T: 22±2 (2.2±0.2, 15.9±1.4)

1. Starter

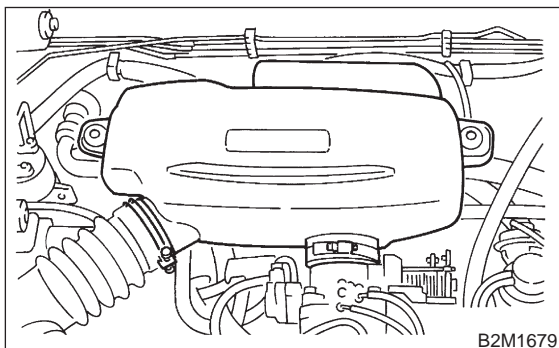
A: REMOVAL AND INSTALLATION

1. 2200 cc MODEL

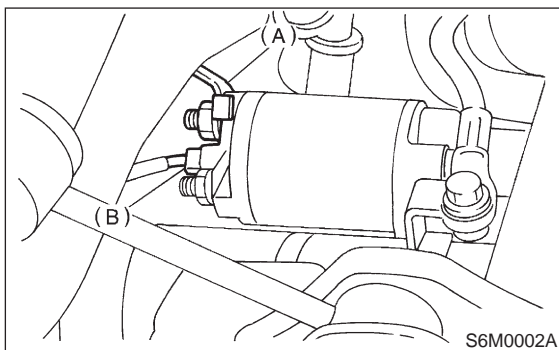
- 1) Disconnect battery ground cable.



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

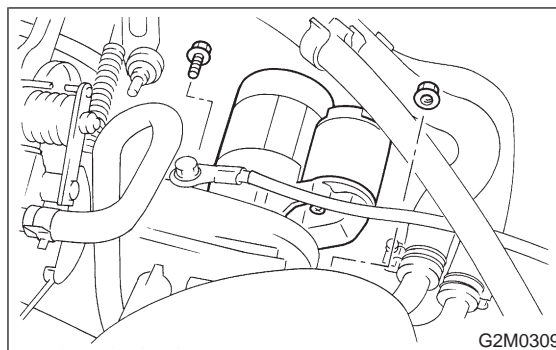


- 3) Disconnect connector and terminal from starter.



- (A) Terminal
(B) Connector

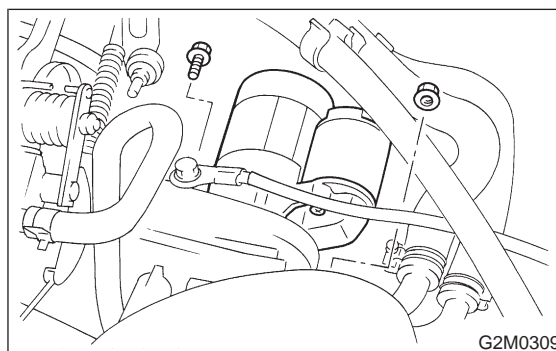
- 4) Remove starter from transmission.



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

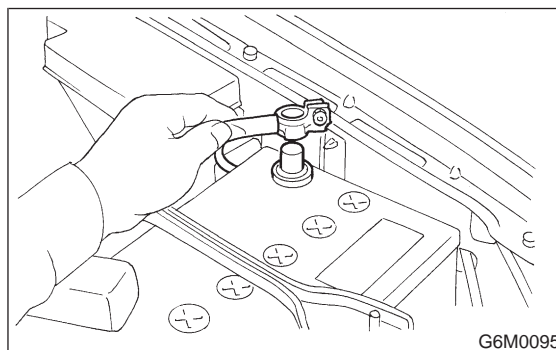
Tightening torque:

50 ± 4 N·m (5.1 ± 0.4 kg·m, 36.9 ± 2.9 ft·lb)

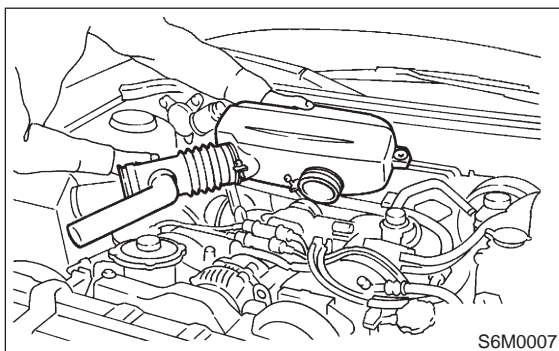


2. 2500 cc MODEL

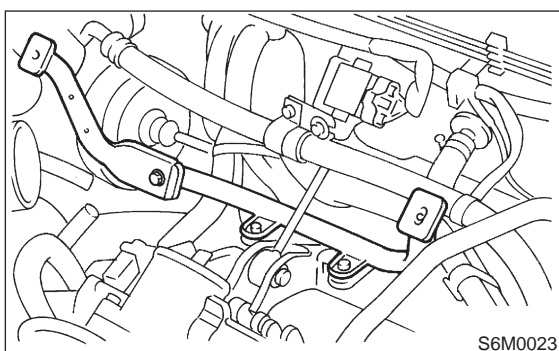
- 1) Disconnect battery ground cable.



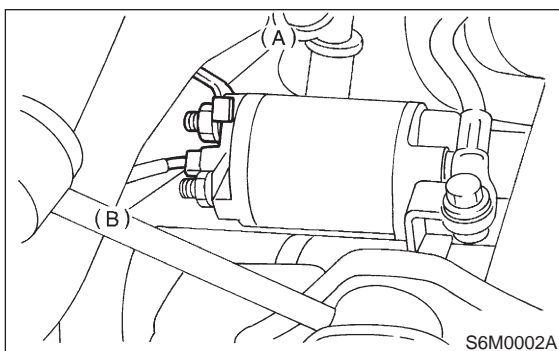
2) Remove air intake chamber. <Ref. to 2-7 [W18A0].>



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

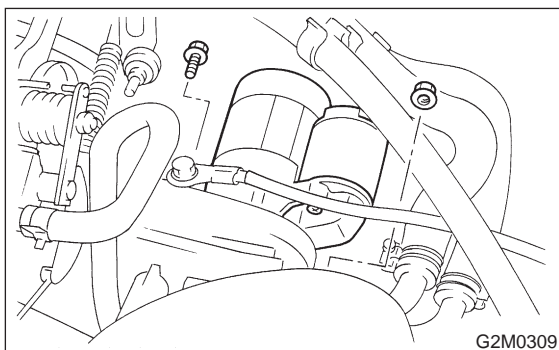


4) Disconnect connector and terminal from starter.



- (A) Terminal
- (B) Connector

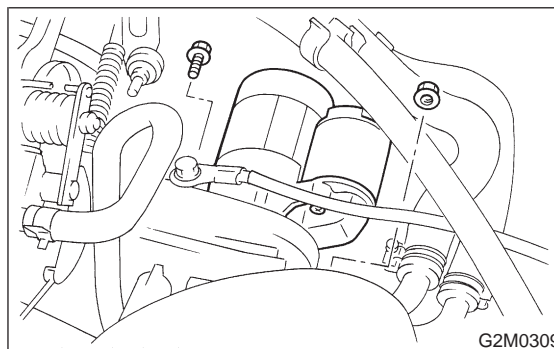
5) Remove starter from transmission.



6) Installation is in the reverse order of removal.

Tightening torque:

50 ± 4 N·m (5.1 ± 0.4 kg·m, 36.9 ± 2.9 ft·lb)



B: TEST

1. SWITCH ASSEMBLY OPERATION

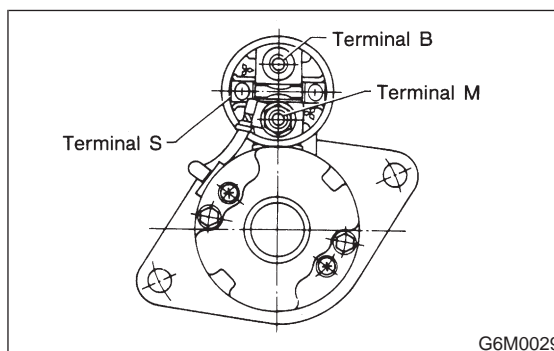
1) Connect terminal S of switch assembly to positive terminal of battery with a lead wire, and starter body to ground terminal of battery. Pinion should be forced endwise on shaft.

CAUTION:

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

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

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



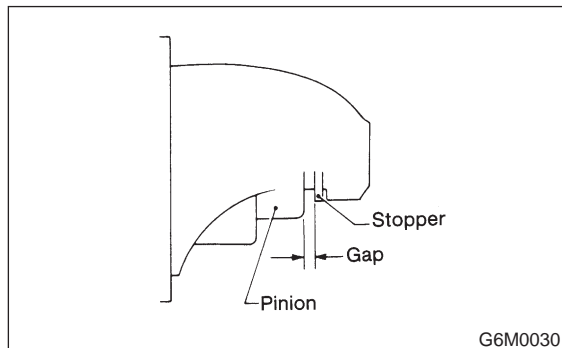
1. Starter

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.

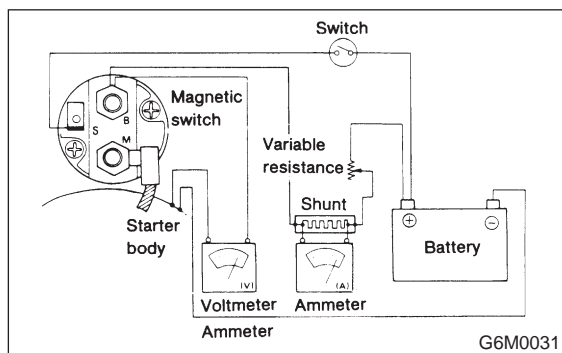
3) If pinion gap is outside specified range, remove or add number of adjustment washers used on the mounting surface of switch assembly until correct pinion gap is obtained.

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

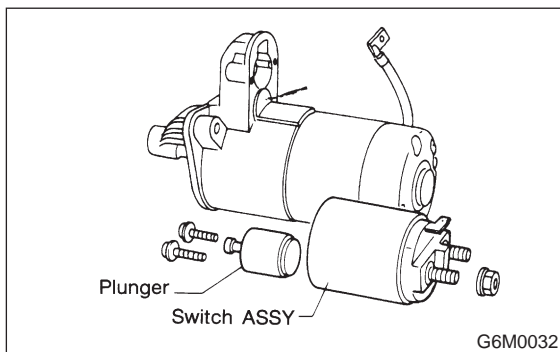
C: DISASSEMBLY

1. STARTER ASSEMBLY

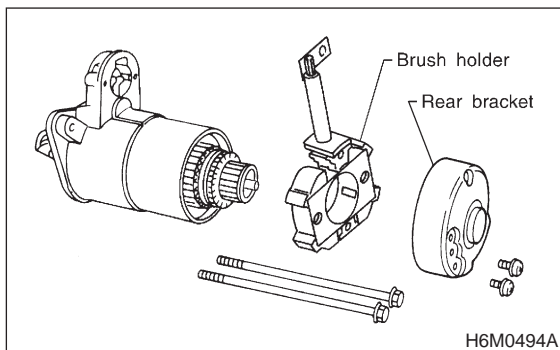
- 1) Loosen nut which holds terminal M of switch assembly, and disconnect connector.
- 2) Remove bolts which hold switch assembly, and remove switch assembly, plunger and plunger spring from starter as a unit.

CAUTION:

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



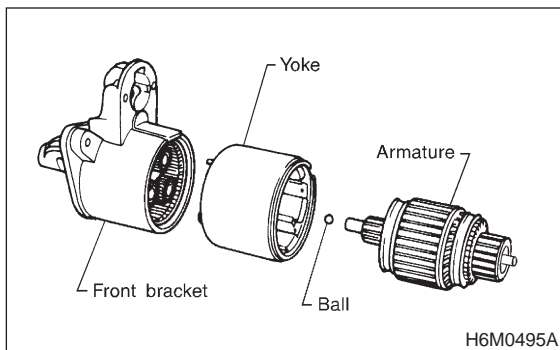
- 3) Remove both through-bolts and brush holder screws, and detach rear bracket and brush holder.



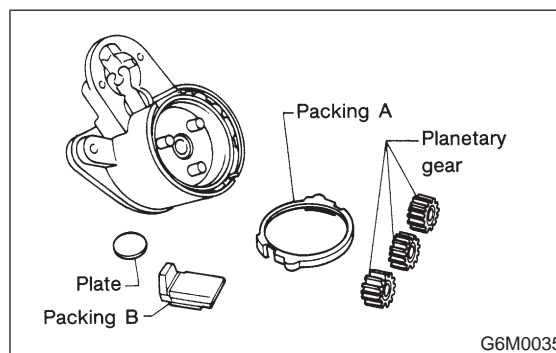
- 4) Remove armature and yoke. Ball used as a bearing will then be removed from the end of armature.

CAUTION:

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



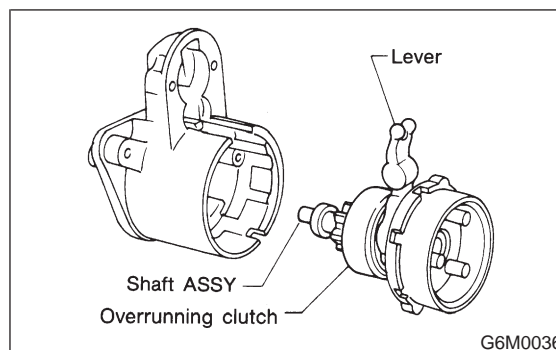
- 5) Remove packing A, three planetary gears, packing B and plate.



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

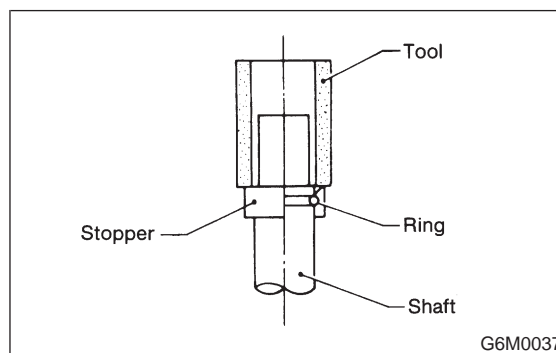
CAUTION:

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.



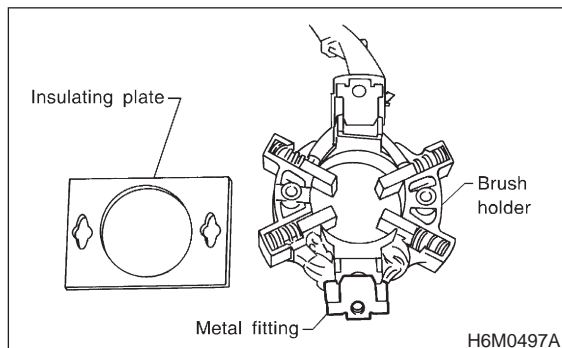
1. Starter

2. BRUSH HOLDER

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

NOTE:

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



D: INSPECTION

1. ARMATURE

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

2) Run-out test

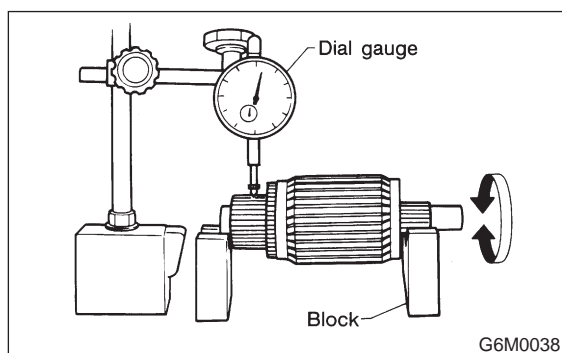
Check the commutator run-out and replace if it exceeds the limit.

Commutator run-out:**Standard**

0.05 mm (0.0020 in)

Service limit

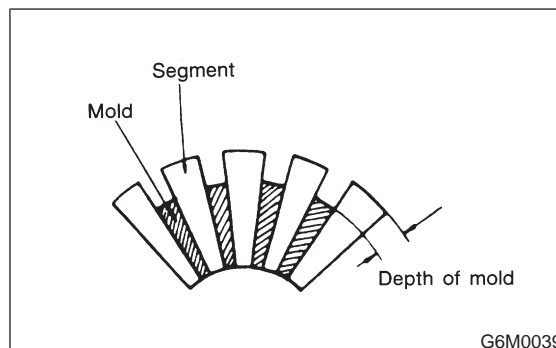
Less than 0.10 mm (0.0039 in)



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

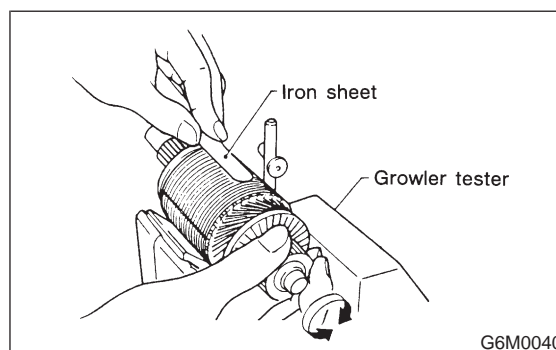
Depth of segment mold:

0.5 mm (0.020 in)



4) Armature short-circuit test

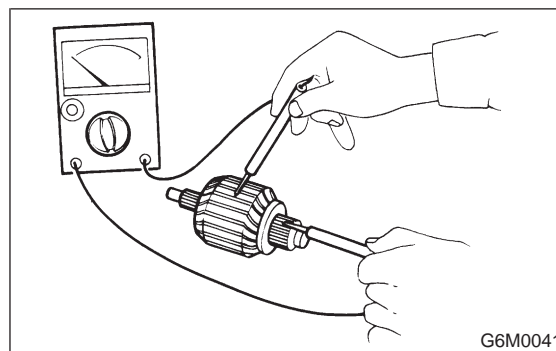
Check armature for short-circuit by placing it on growler tester. Hold a hacksaw blade against armature core while slowly rotating armature. A short-circuited armature will cause the blade to vibrate and to be attracted to core. If the hacksaw blade is attracted or vibrates, the armature, which is short-circuited,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



5) Armature ground test

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

Replace armature if it is grounded.



2. YOKE

Make sure pole is set in position.

3. OVERRUNNING CLUTCH

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

CAUTION:

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

4. BRUSH AND BRUSH HOLDER

1) Brush length

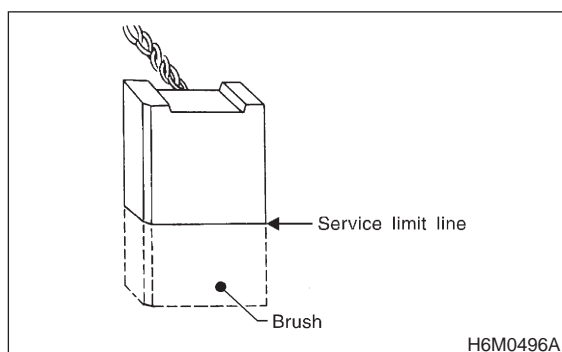
Measure the brush length and replace if it exceeds the service limit.

Replace if abnormal wear or cracks are noticed.

Brush length:

Standard 17.0 mm (0.669 in)

Service limit 11.5 mm (0.453 in)



2) Brush movement

Be sure brush moves smoothly inside brush holder.

3) Brush spring force

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

Brush spring force:

Standard

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

Service limit

5.9 N (0.6 kg, 1.3 lb)

5. SWITCH ASSEMBLY

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

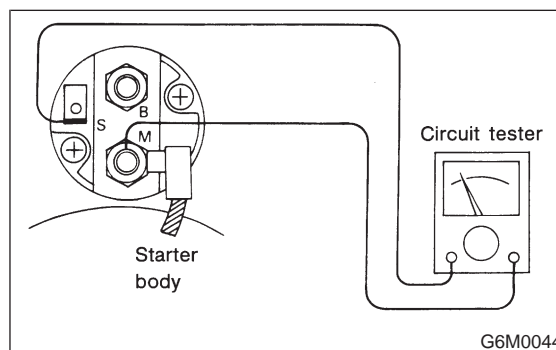
Also check to be sure there is no continuity between terminal M and B.

Terminal / Specified resistance:

S—M / Continuity

S—Ground / Continuity

M—B / No continuity



E: ASSEMBLY

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

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

2) Apply grease to the following parts during assembly.

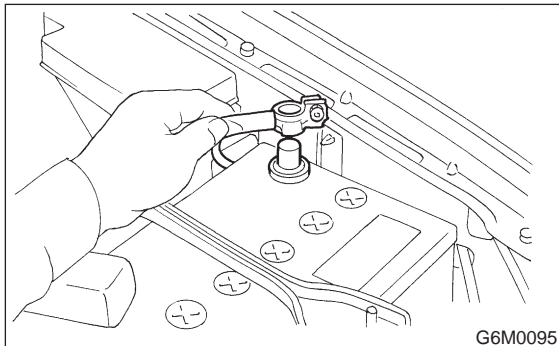
- Front bracket sleeve bearing
- Armature shaft gear
- Outer periphery of plunger
- Mating surface of plunger and lever
- Gear shaft splines
- Mating surface of lever and clutch
- Ball at the armature shaft end
- Internal and planetary gears

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

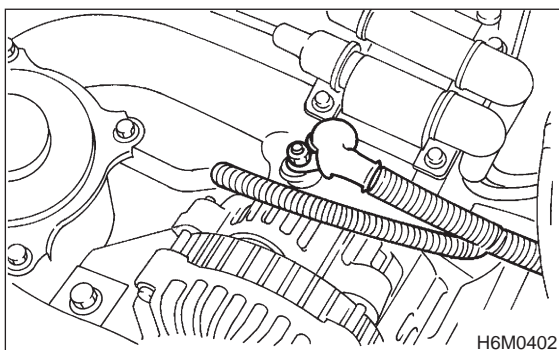
2. Generator

A: REMOVAL AND INSTALLATION

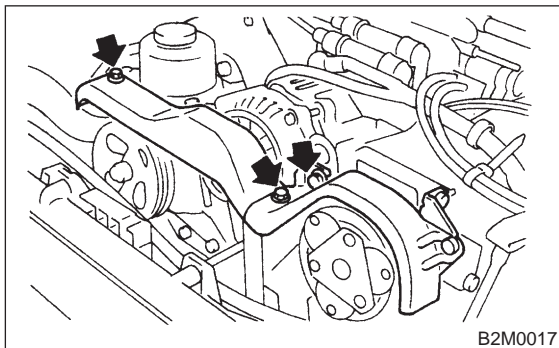
- 1) Disconnect battery ground cable.



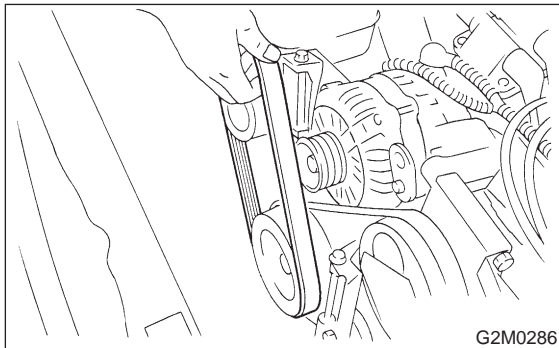
- 2) Disconnect connector and terminal from generator.



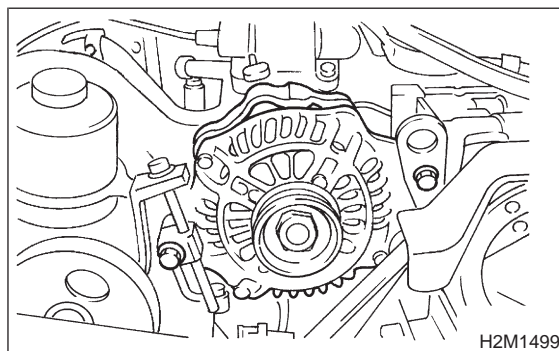
- 3) Remove V-belt cover.



- 4) Remove front side V-belt.



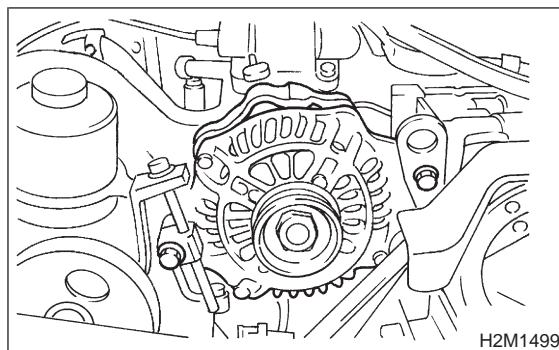
- 5) Remove bolts which install generator onto bracket.



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

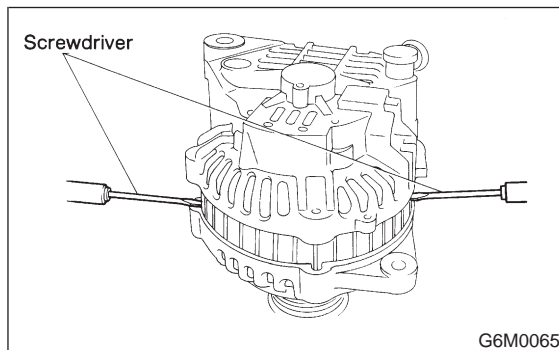
CAUTION:

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

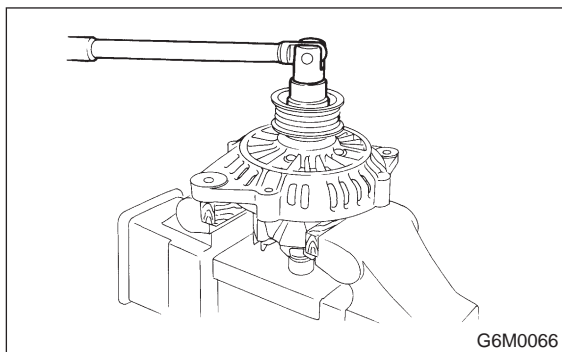


B: DISASSEMBLY

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

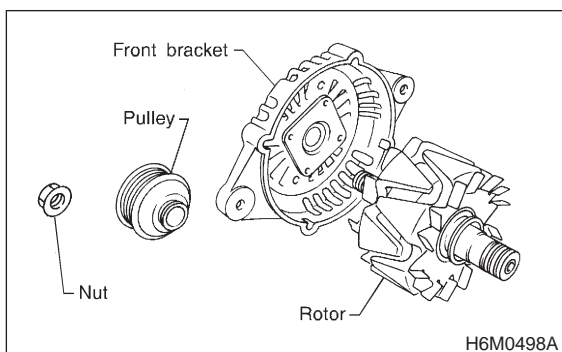


- 2) Hold rotor with a vise and remove pulley nut.



CAUTION:

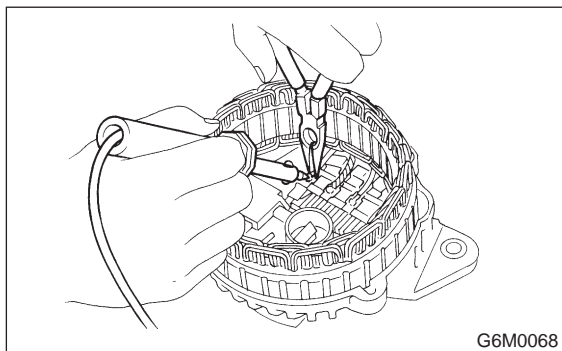
When holding rotor with vise, insert aluminum plates or wood pieces on the contact surfaces of the vise to prevent rotor from damage.



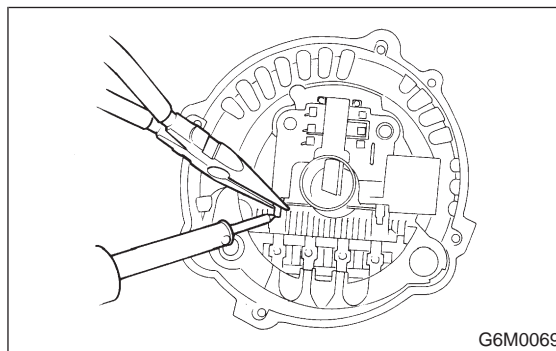
- 3) Unsolder connection between rectifier and stator coil to remove stator coil.

CAUTION:

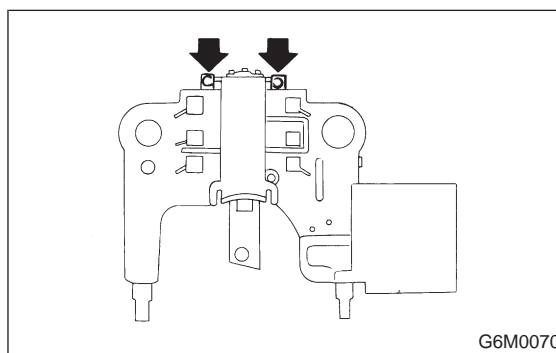
Finish the work rapidly (less than three seconds) because the rectifier cannot withstand heat very well.



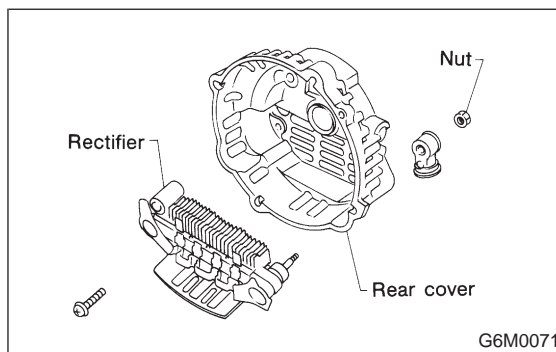
- 4) Remove screws which secure IC regulator to rear cover, and unsolder connection between IC regulator and rectifier to remove IC regulator.



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



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



C: INSPECTION AND REPAIR

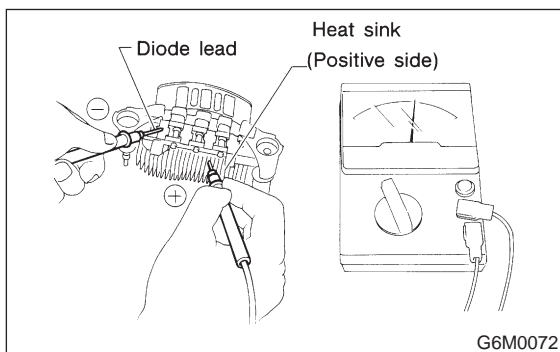
1. DIODE

CAUTION:

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

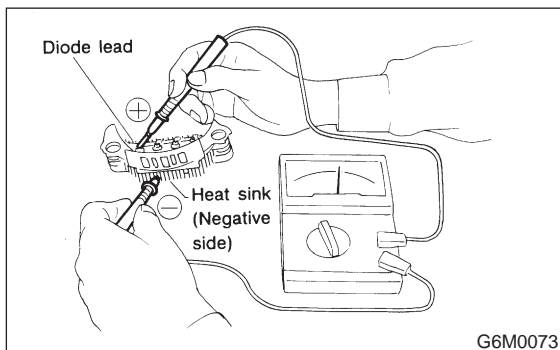
1) Checking positive diode

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



2) Checking negative diode

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



2. ROTOR

1) Slip ring surface

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

2) Slip ring outer diameter

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

Slip ring outer diameter:

Standard

22.7 mm (0.894 in)

Limit

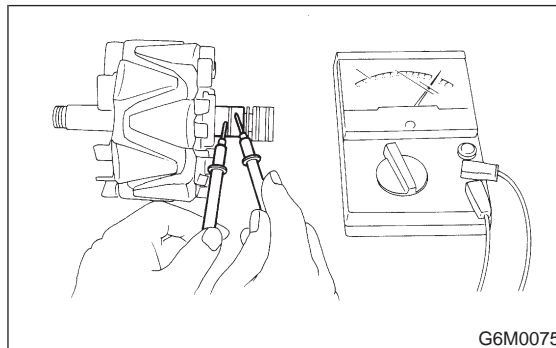
22.1 mm (0.870 in)

3) Continuity test

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

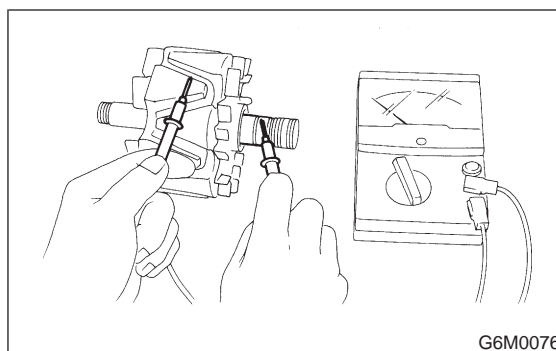
Specified resistance:

Approx. 2.7 — 3.2 Ω



4) Insulation test

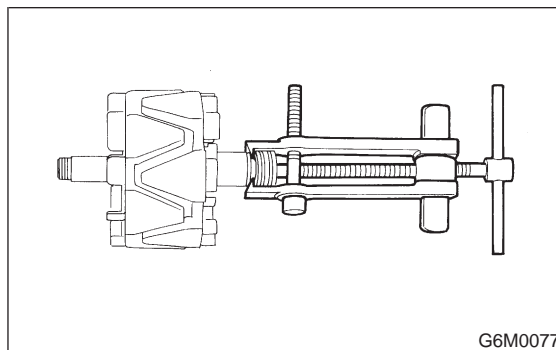
Check continuity between slip ring and rotor core or shaft. If continuity exists, the rotor coil is short-circuited, and so replace rotor assembly.



5) Ball bearing (rear side)

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

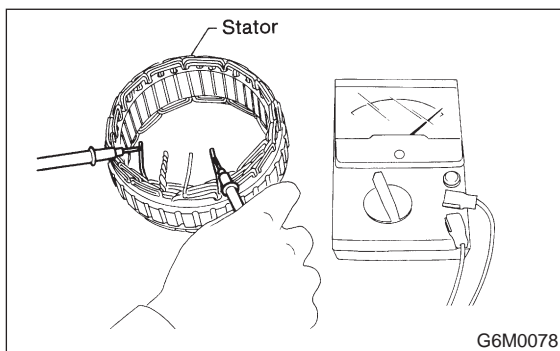
(2) The rear bearing can be removed by using common bearing puller.



3. STATOR

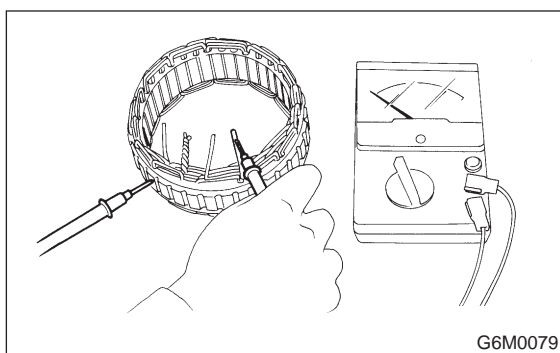
1) Continuity test

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



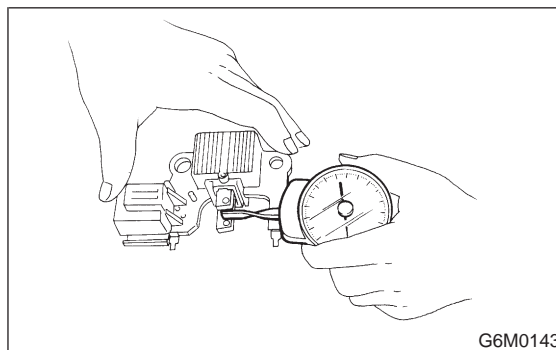
2) Insulation test

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



2) Checking brush spring for proper pressure

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



4. BRUSH

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

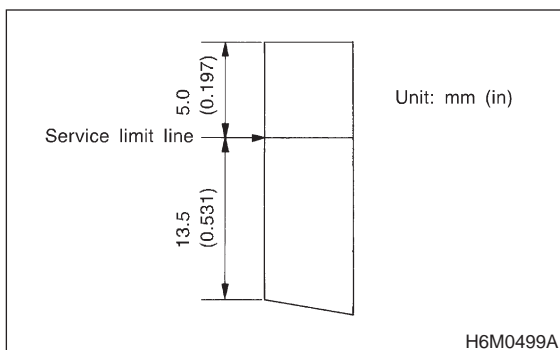
Brush length:

Standard

18.5 mm (0.728 in)

Service limit

5.0 mm (0.197 in)



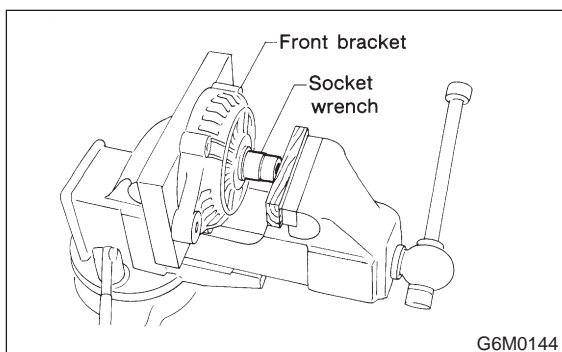
5. BEARING (FRONT SIDE)

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

2) Replacing front bearing

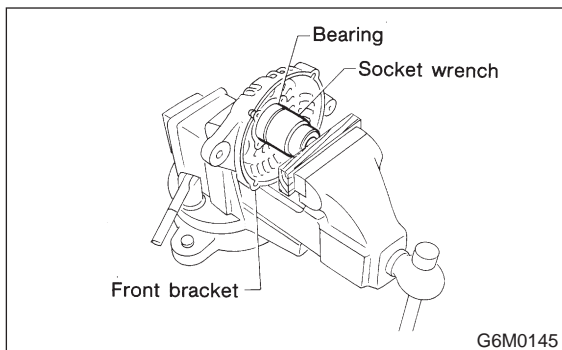
(1) Remove front bearing retainer.

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



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

(4) Install front bearing retainer.



D: ASSEMBLY

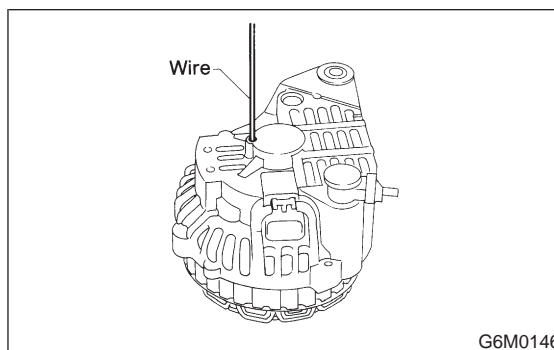
To assemble, reverse order of disassembly.

1) Pulling up brush

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

CAUTION:

Be sure to remove the wire after reassembly.



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

CAUTION:

Grease should not be applied for the rear bearing.

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

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

3. Spark Plug

A: REMOVAL AND INSTALLATION

CAUTION:

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

Spark plug:

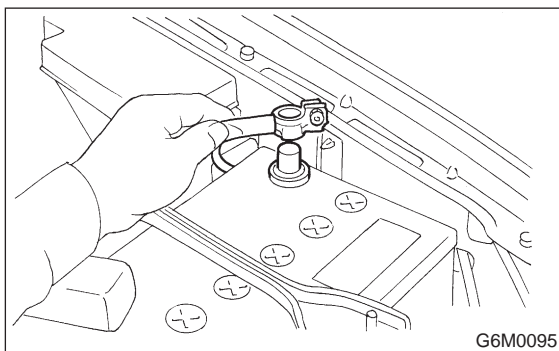
NGK: BKR5E-11

(Alternate)

CHAMPION: RC10YC4

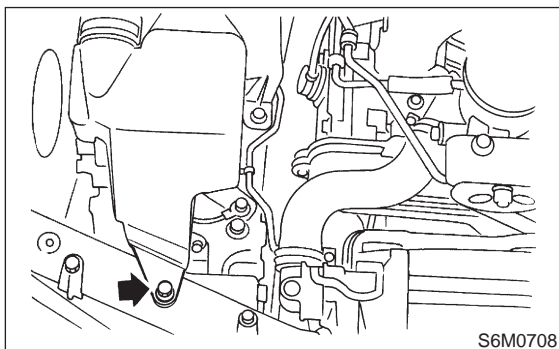
1. #1 SPARK PLUG

- 1) Disconnect battery ground cable.

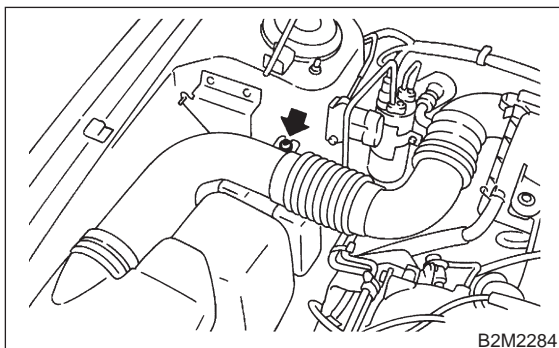


- 2) Remove air intake duct and resonator chamber. (2200 cc California SPEC. vehicle)

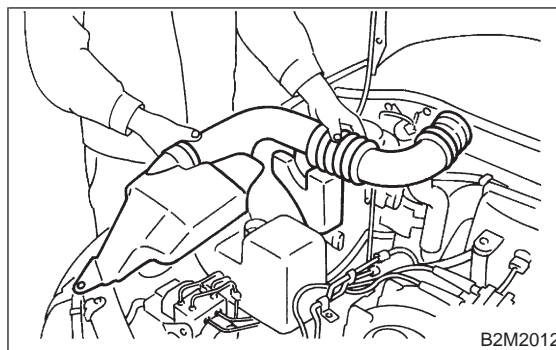
- (1) Remove bolt which installs air intake duct on the front side of body.



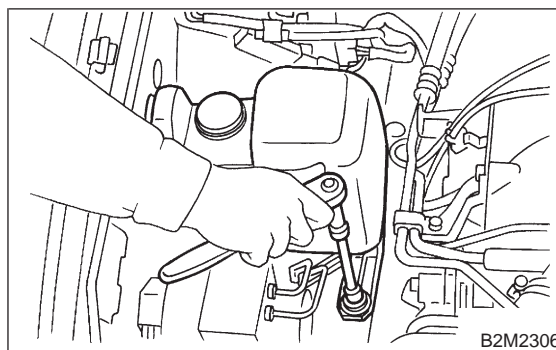
- (2) Remove bolt which installs air intake duct on body.



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

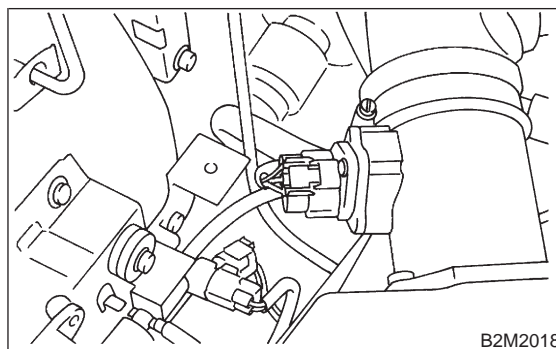


- (4) Remove resonator chamber.



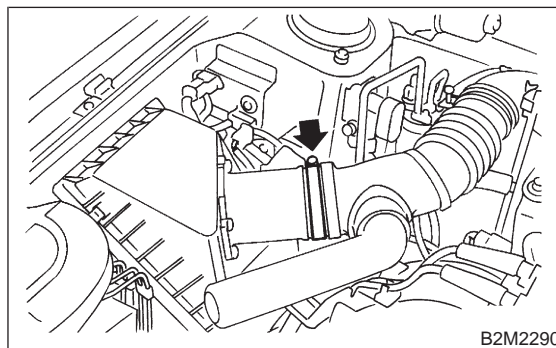
- 3) Remove air cleaner upper case and air cleaner element. (Except 2200 cc California SPEC. vehicle)

- (1) Disconnect mass air flow sensor connector.

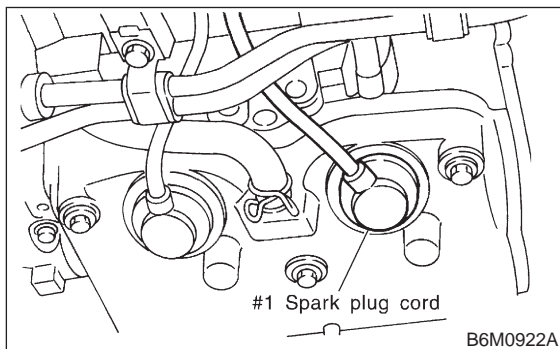


- (2) Remove two clips securing air cleaner upper cover.

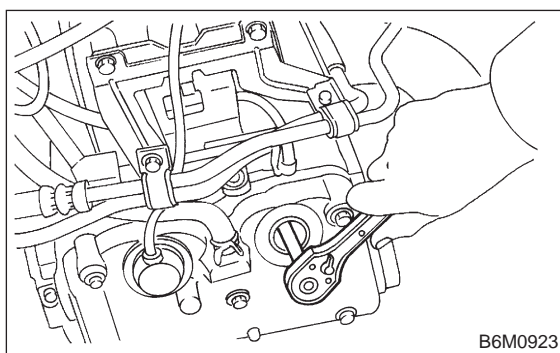
- (3) Loosen the clamp screw and separate air cleaner upper cover from air intake duct.



- (4) Remove air cleaner element.
4) Remove #1 spark plug cord by pulling boot, not cord itself.



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

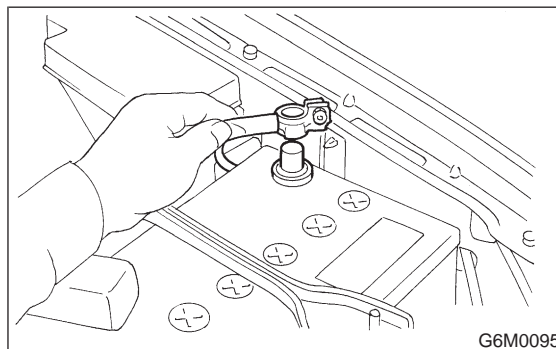


- 6) Installation is in the reverse order of removal.

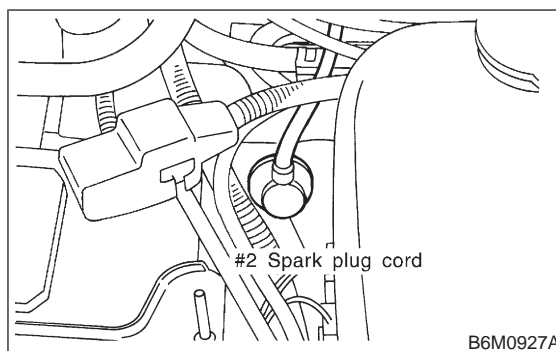
Tightening torque (Spark plug):
 20.6 ± 2.9 N·m (2.10 ± 0.30 kg-m, 15.19 ± 2.14 ft-lb)

2. #2 SPARK PLUG

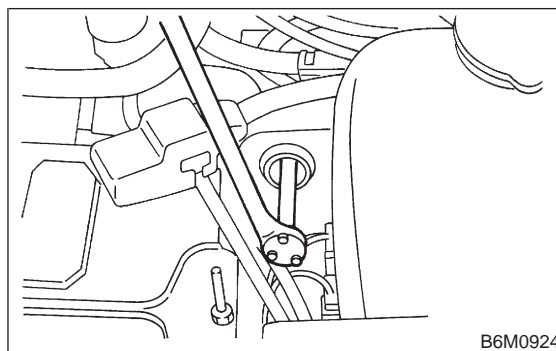
- 1) Disconnect battery ground cable.



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



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

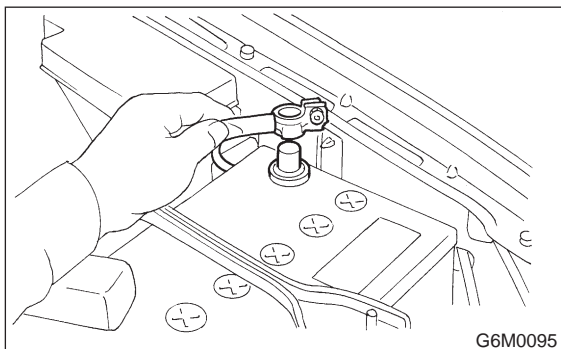


- 4) Installation is in the reverse order of removal.

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

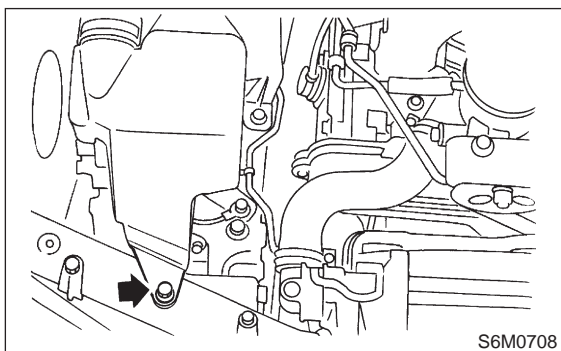
3. #3 SPARK PLUG

- 1) Disconnect battery ground cable.

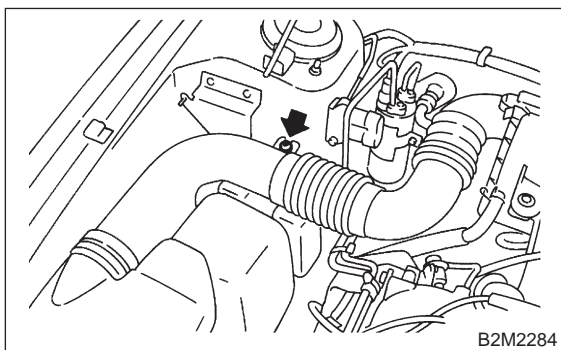


- 2) Remove air intake duct and air chamber. (2200 cc California SPEC. vehicle)

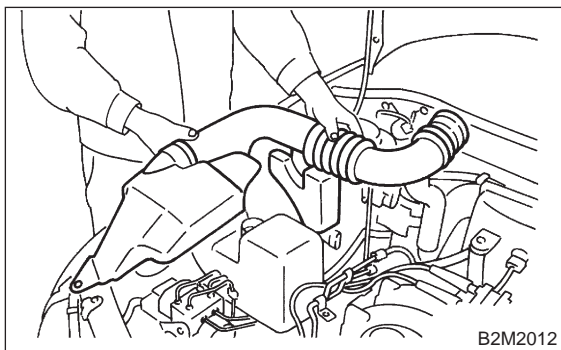
- (1) Remove bolt which installs air intake duct on the front side of body.



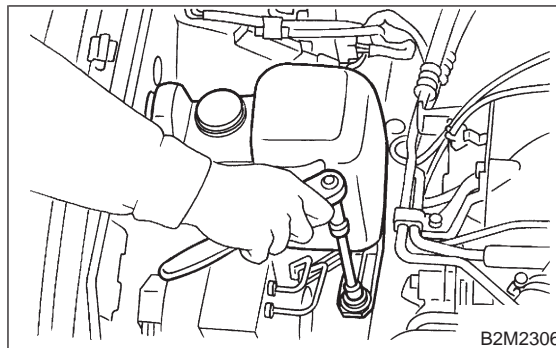
- (2) Remove bolt which installs air intake duct on body.



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

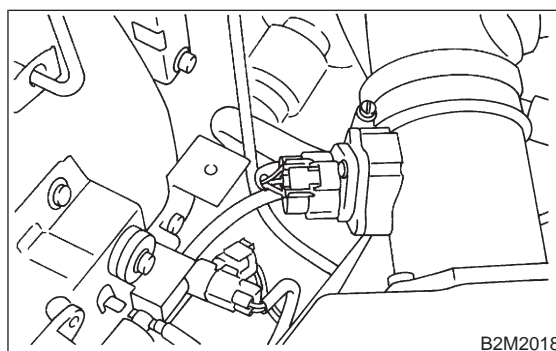


- (4) Remove resonator chamber.



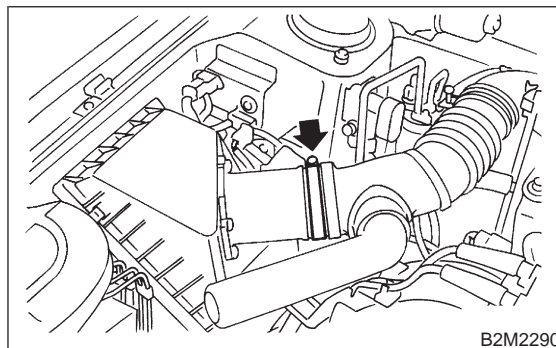
- 3) Remove air cleaner upper case and air cleaner element. (Except 2200 cc California SPEC. vehicle)

- (1) Disconnect mass air flow sensor connector.



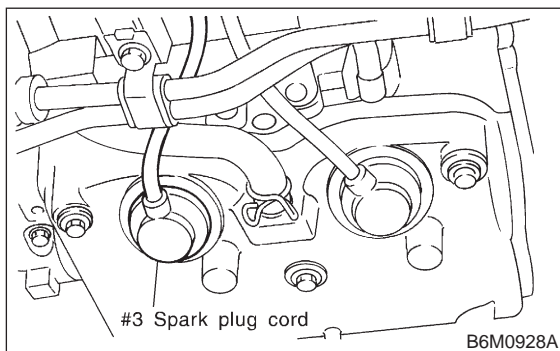
- (2) Remove two clips securing air cleaner upper cover.

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

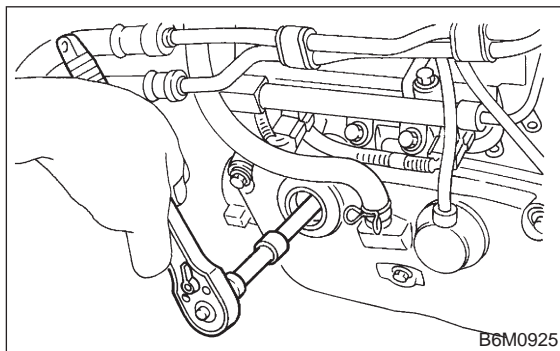


- (4) Remove air cleaner element.

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



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



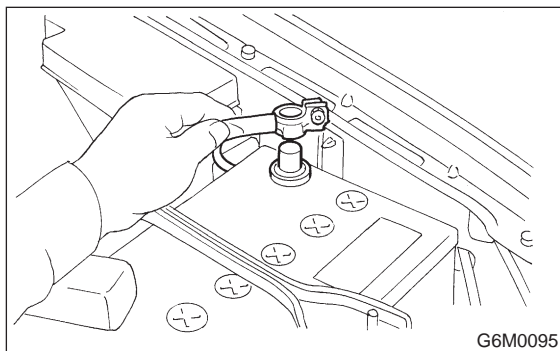
- 6) Installation is in the reverse order of removal.

Tightening torque (Spark plug):

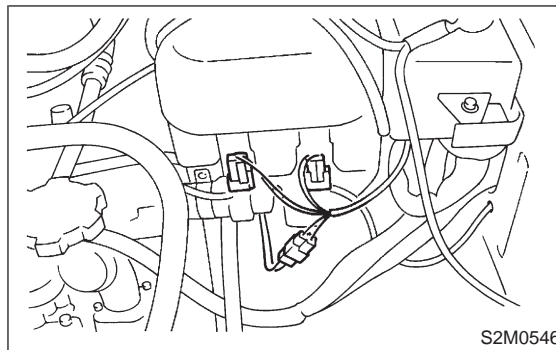
20.6 ± 2.9 N·m (2.10 ± 0.30 kg·m, 15.19 ± 2.14 ft·lb)

4. #4 SPARK PLUG

- 1) Disconnect battery ground cable.

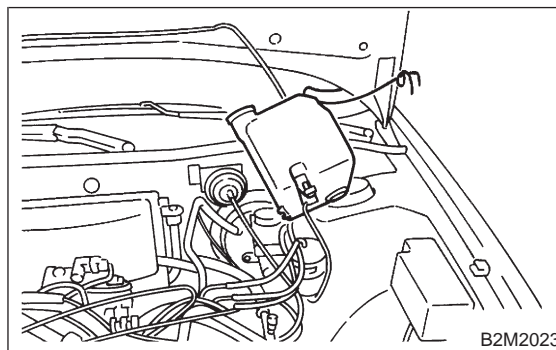


- 2) Disconnect washer motor connector.

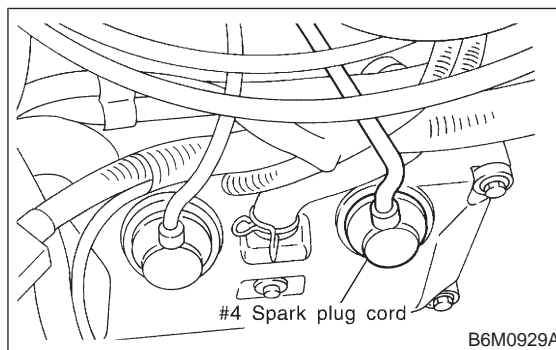


- 3) Disconnect rear window glass washer hose from washer motor, then plug connection with a suitable cap.

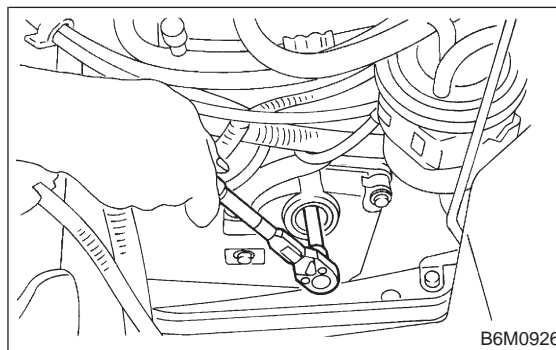
- 4) Remove the two bolts which hold the washer tank, then take the tank away from the working area.



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



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



7) Installation is in the reverse order of removal.

Tightening torque (Spark plug):

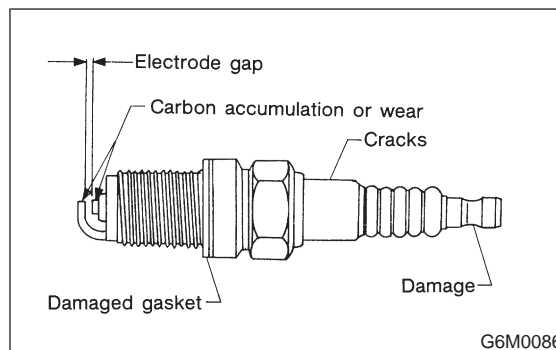
20.6 ± 2.9 N·m (2.10 ± 0.30 kg-m, 15.19 ± 2.14 ft-lb)

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.

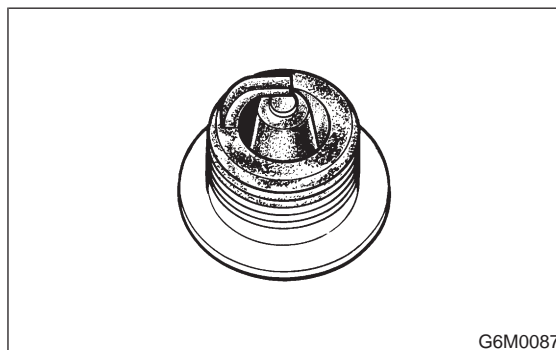
B: INSPECTION

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



1) Normal

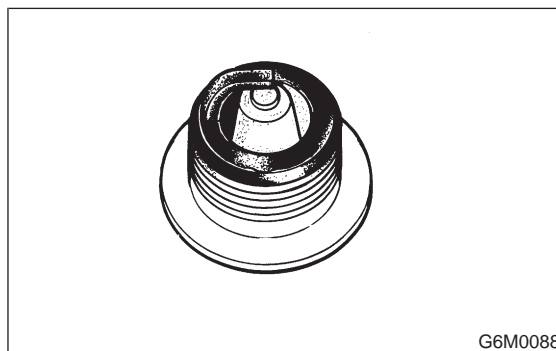
Brown to grayish-tan deposits and slight electrode wear indicate correct spark plug heat range.



2) Carbon fouled

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

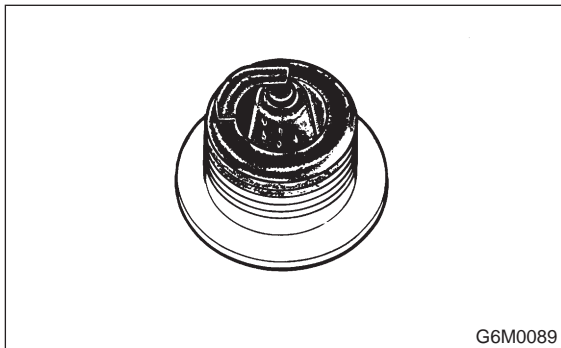
It is advisable to replace with plugs having hotter heat range.



3. Spark Plug

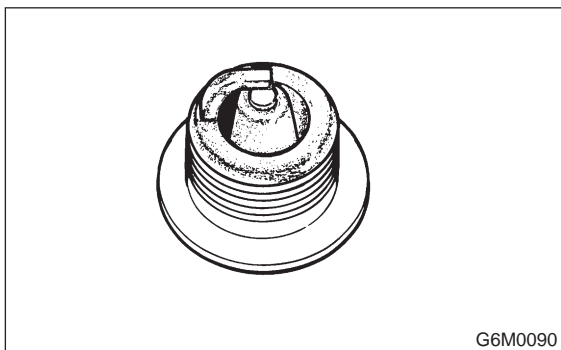
3) Oil fouled

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.



C: CLEANING AND REGAPPING

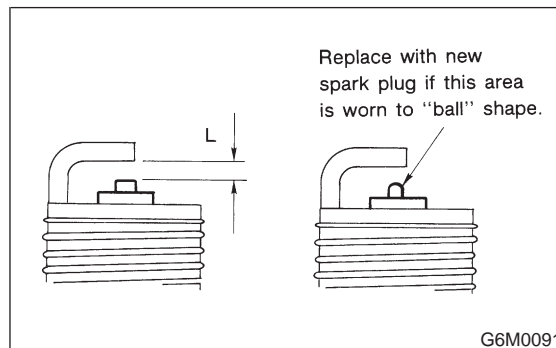
Clean spark plugs in a sand blast type cleaner. Avoid excessive blasting. Clean and remove carbon or oxide deposits, but do not wear away porcelain.

If deposits are too stubborn, discard plugs.

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

Spark plug gap: L

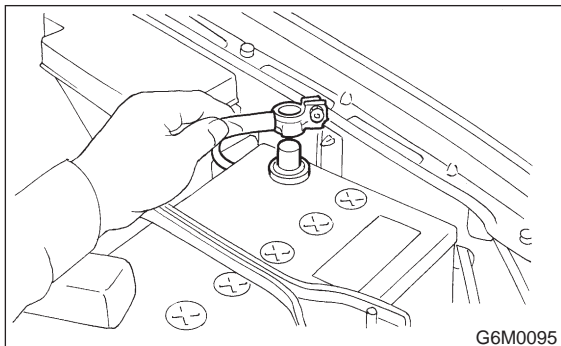
1.0 — 1.1 mm (0.039 — 0.043 in)



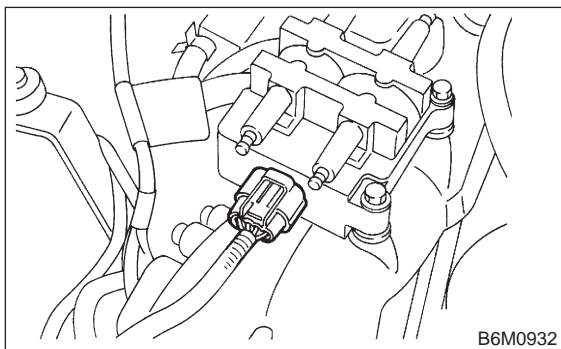
4. Ignition Coil and Ignitor Assembly

A: REMOVAL AND INSTALLATION

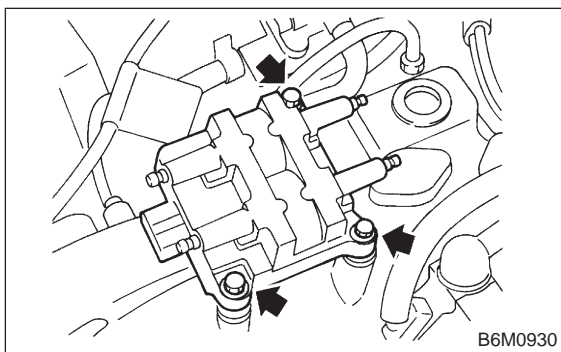
- 1) Disconnect battery ground cable.



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



- 4) Remove ignition coil and ignitor assembly.



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

CAUTION:

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

B: INSPECTION

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

- 1) Primary resistance
- 2) Secondary coil resistance

CAUTION:

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

Specified resistance:

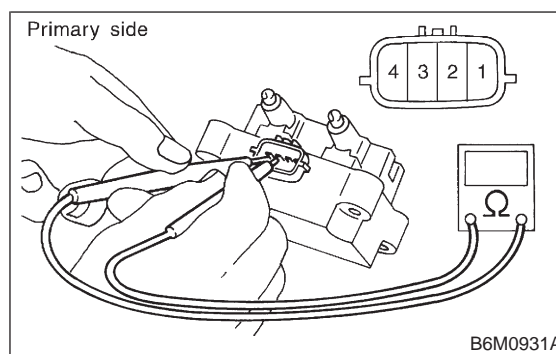
[Primary side]

Between terminal No. 1 and No. 2

$0.73 \Omega \pm 10\%$

Between terminal No. 2 and No. 4

$0.73 \Omega \pm 10\%$



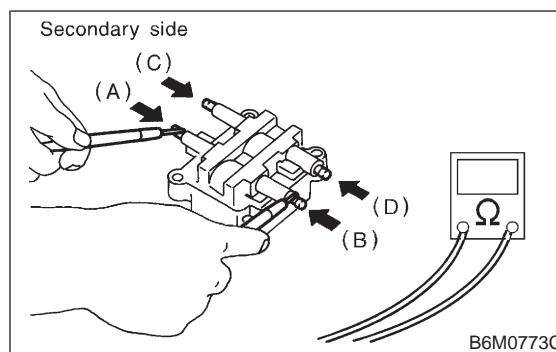
[Secondary side]

Between (A) and (B)

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

Between (C) and (D)

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



- 3) Insulation between primary terminal and case: $10 \text{ M}\Omega$ or more.

5. Spark Plug Cord

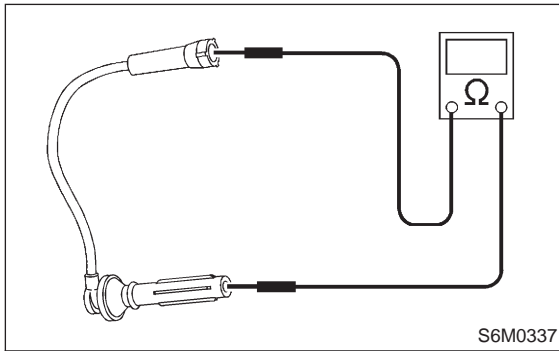
A: INSPECTION

Check for:

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

Resistance value:

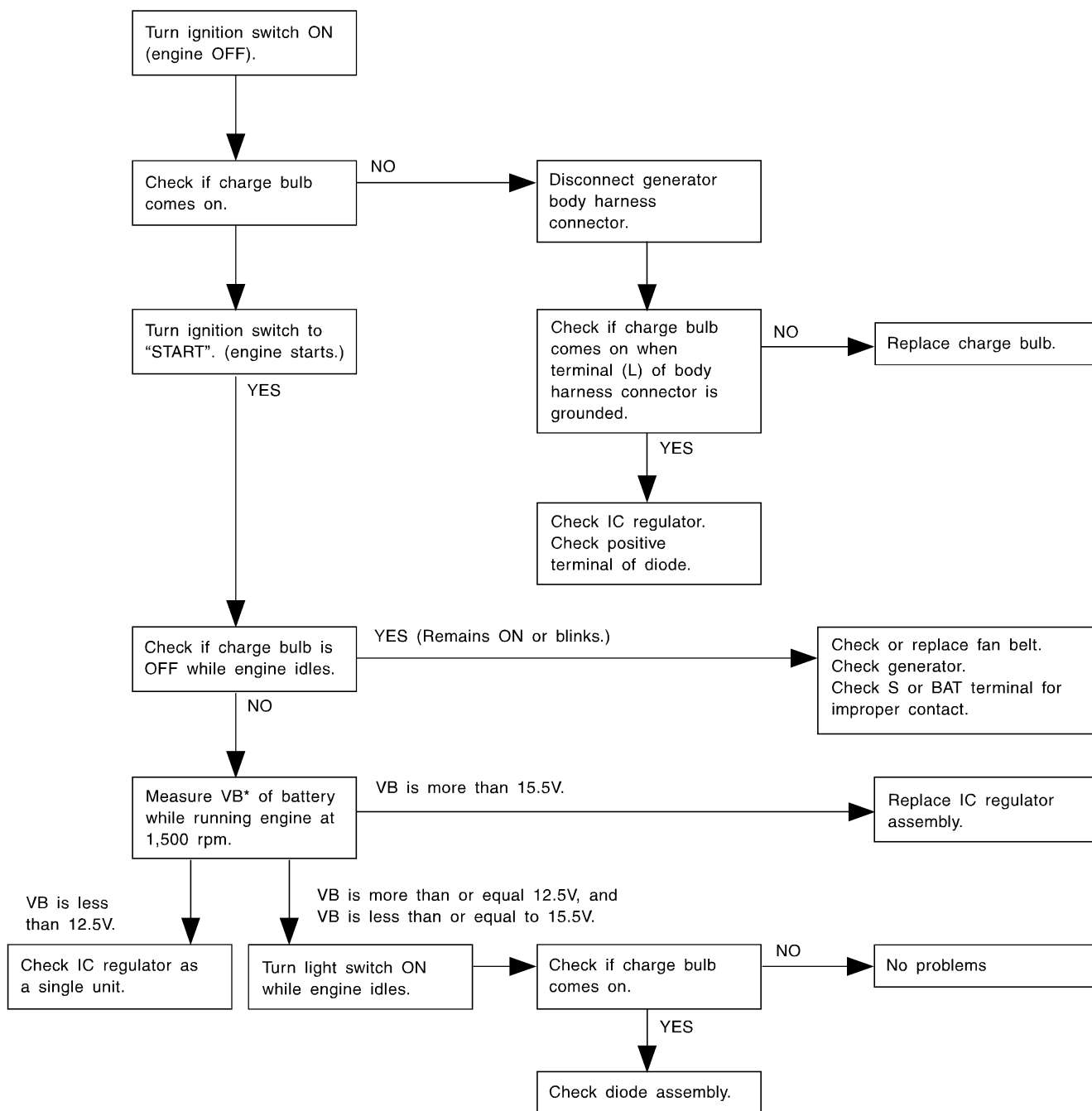
5.12 — 12.34 k Ω



1. Starter

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

2. Generator



*: Terminal voltage