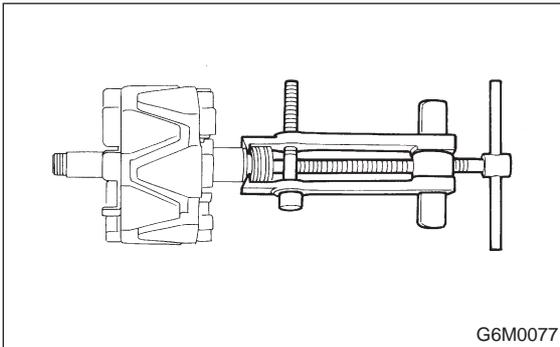


D: ASSEMBLY

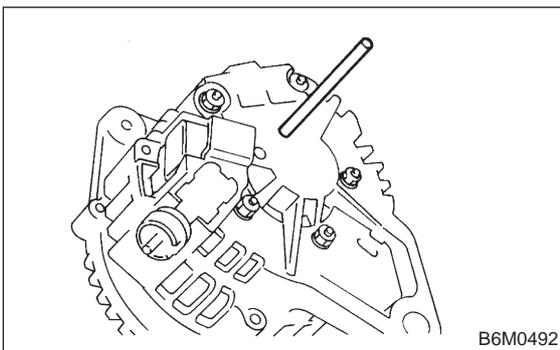
Assembly is in the reverse order of disassembly procedures.

CAUTION:

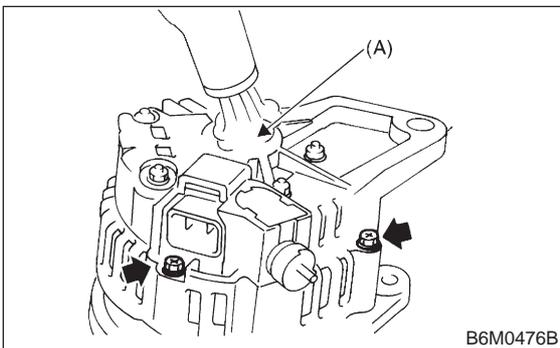
- When disassembling generator, replace rear ball bearing.



- When soldering starter coil to diode, do not touch lead wire with solder for more than 5 seconds.
- Before installing rear cover, insert pin from outside of rear cover so that holds brush. After installing rear cover, remove pin.



- When installing rear cover, heat portion (A) to 50°C (122°F) with heater drier.



3. Spark Plug

A: REMOVAL AND INSTALLATION (2200 cc MODEL)

CAUTION:

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

Spark plug:

CHAMPION: RC10YC4

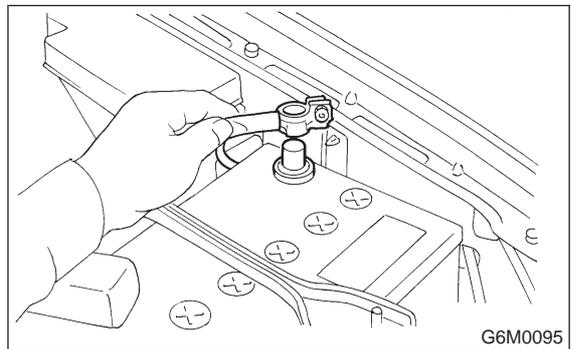
(Alternate)

NGK: BKR6E-11

NIPPONDENSO: K20PR-U11

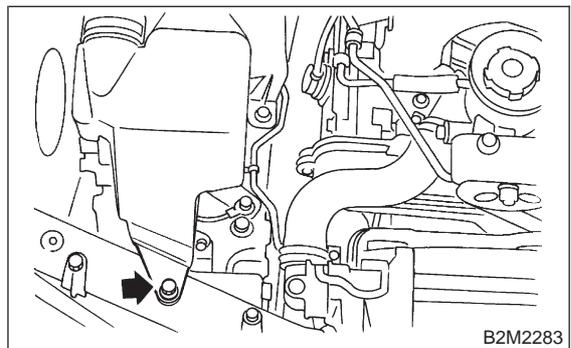
1. #1 SPARK PLUG

- 1) Disconnect battery ground cable.

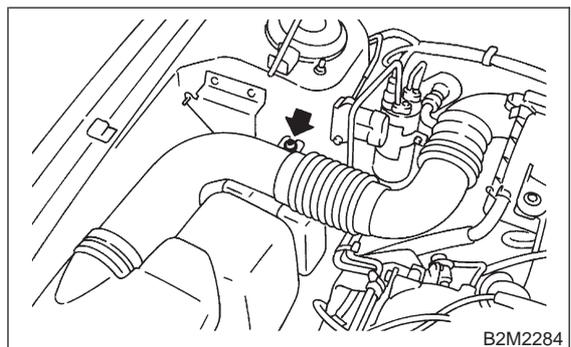


- 2) Remove air intake duct and resonator chamber. (California SPEC. vehicle)

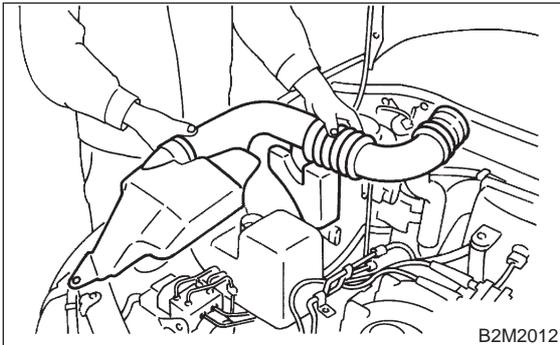
- (1) Remove bolt which installs air intake duct (A) on the front side of body.



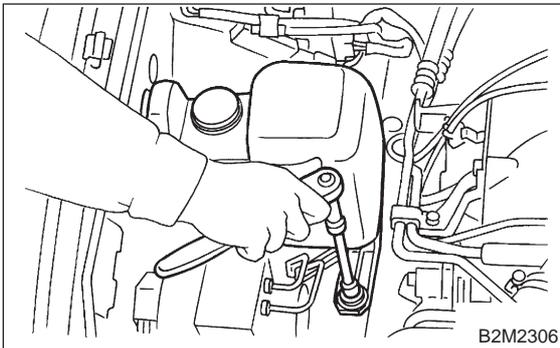
- (2) Remove bolt which installs air intake duct (B) on body.



(3) Remove air intake duct (A) and (B) as a unit.

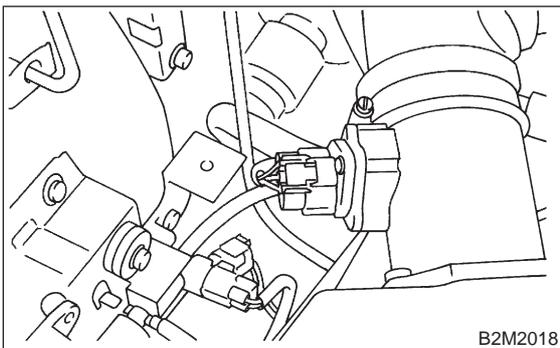


(4) Remove resonator chamber.



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

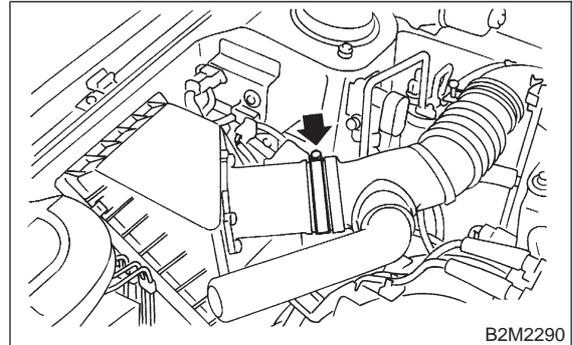
(1) Disconnect mass air flow sensor connector.



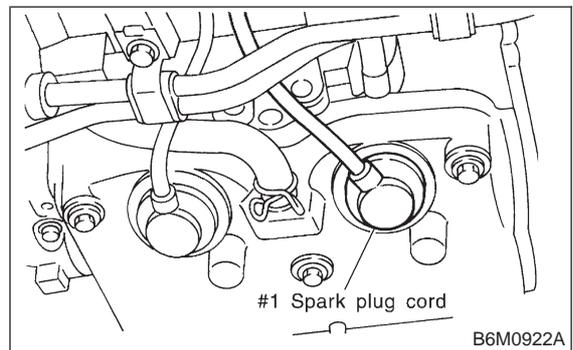
(2) Remove two clips securing air cleaner upper cover.

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

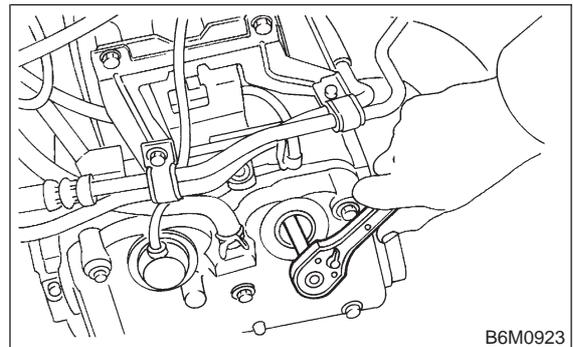
(4) Remove air cleaner element.



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



5) Remove spark plug with the spark plug socket.



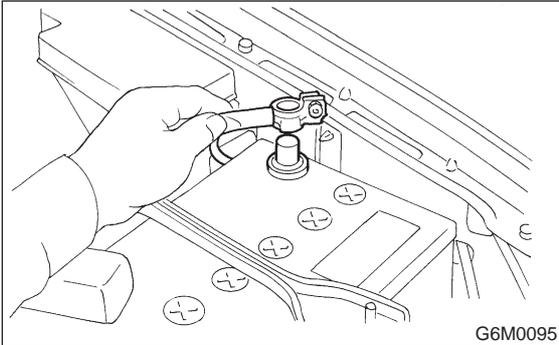
6) Installation is in the reverse order of removal.

Tightening torque (Spark plug):

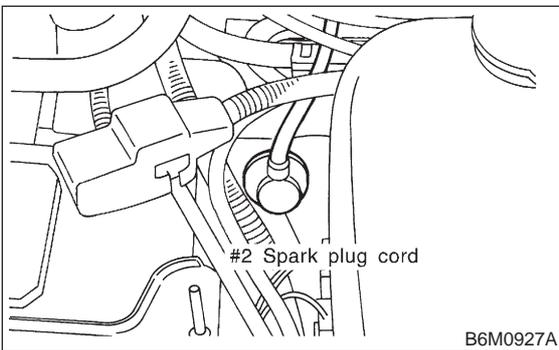
20.6 ± 2.9 N·m (2.10 ± 0.30 kg·m, 15.19 ± 2.14 ft·lb)

2. #2 SPARK PLUG

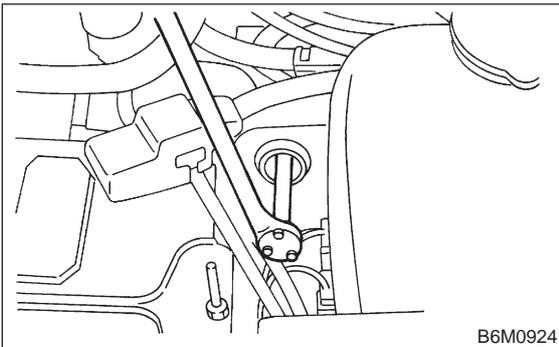
- 1) Disconnect battery ground cable.



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



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

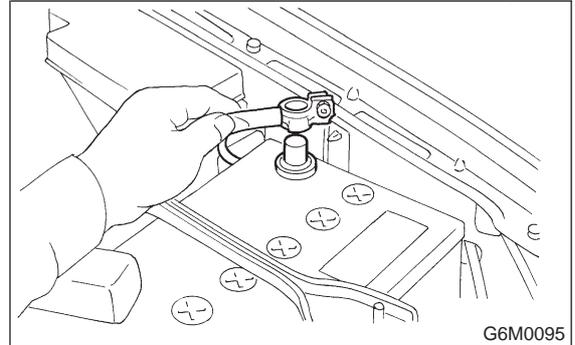


- 4) Installation is in the reverse order of removal.

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

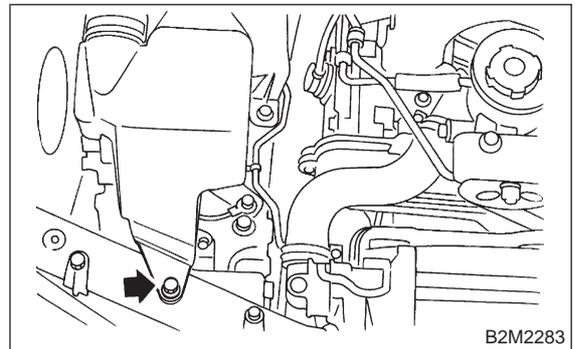
3. #3 SPARK PLUG

- 1) Disconnect battery ground cable.

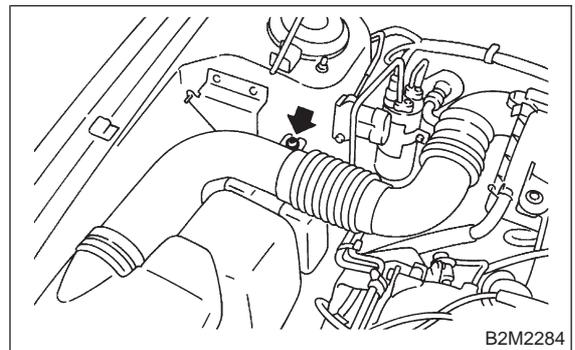


- 2) Remove air intake duct and air chamber. (California SPEC. vehicle)

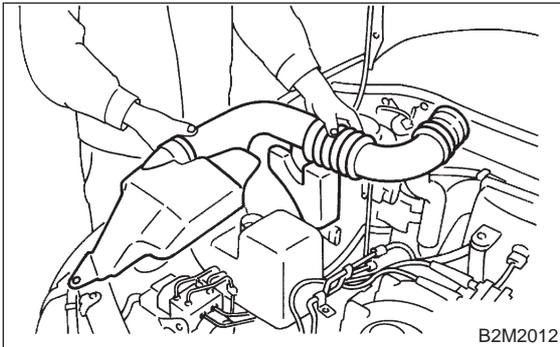
- (1) Remove bolt which installs air intake duct (A) on the front side of body.



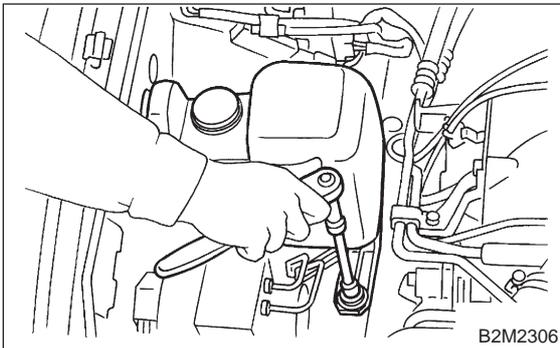
- (2) Remove bolt which installs air intake duct (B) on body.



(3) Remove air intake duct (A) and (B) as a unit.

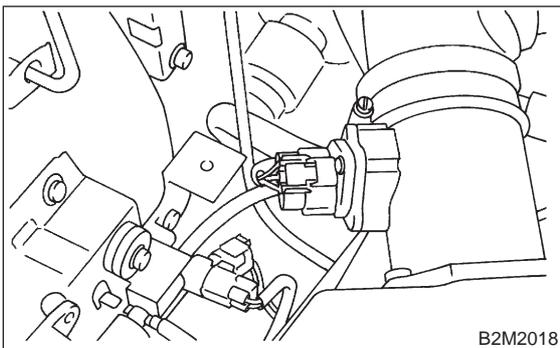


(4) Remove resonator chamber.



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

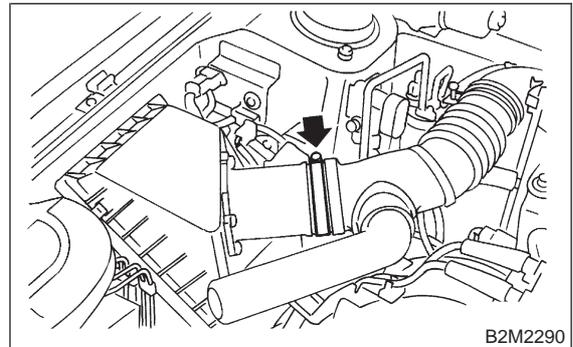
(1) Disconnect mass air flow sensor connector.



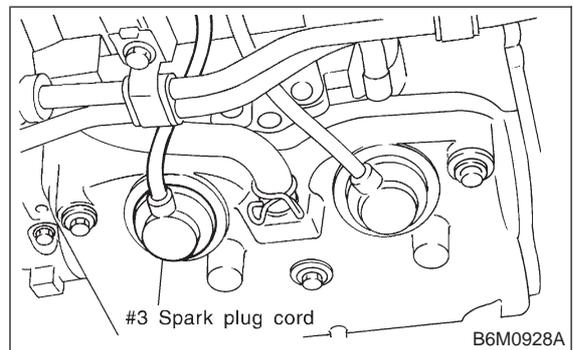
(2) Remove two clips securing air cleaner upper cover.

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

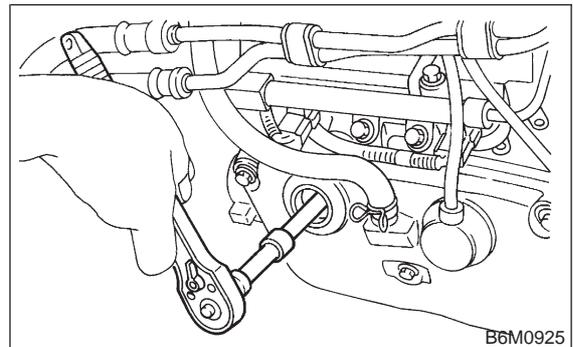
(4) Remove air cleaner element.



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)

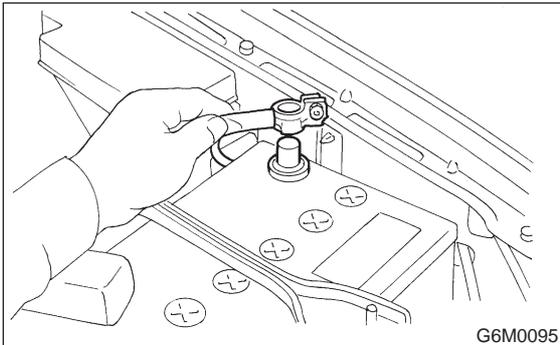
6-1 [W3A4]

3. Spark Plug

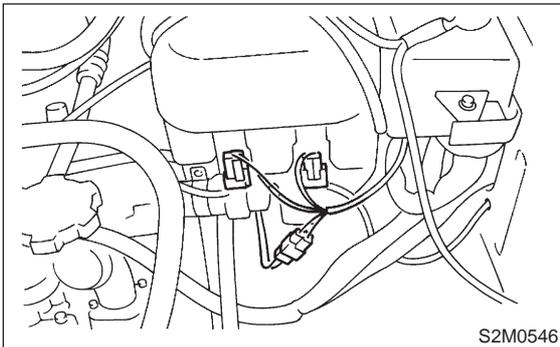
SERVICE PROCEDURE

4. #4 SPARK PLUG

- 1) Disconnect battery ground cable.

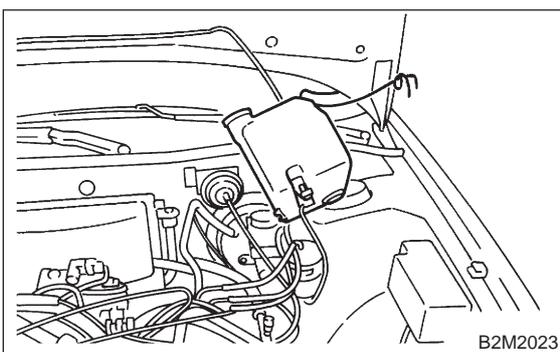


- 2) Disconnect washer motor connector.

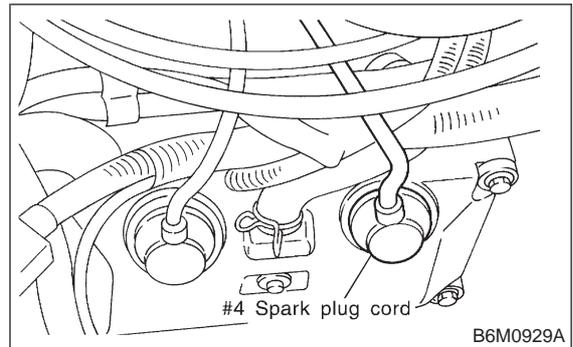


- 3) Disconnect rear window glass washer hose from washer motor, then plug connection with a suitable cap.

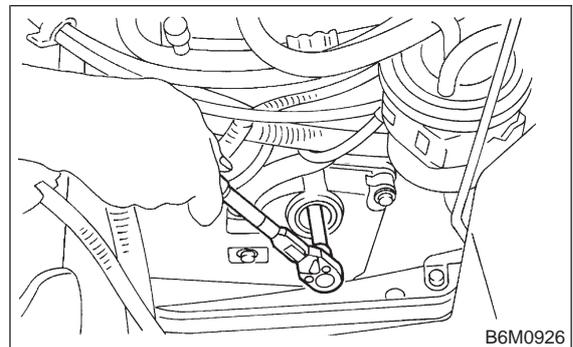
- 4) Remove the two bolts which hold the washer tank, then take the tank away from the working area.



- 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: REMOVAL AND INSTALLATION
(2500 cc EXCEPT OUTBACK
MODEL)**

CAUTION:

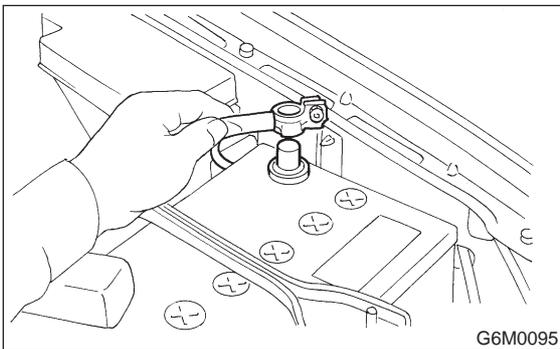
All spark plugs installed on an engine, must be of the same heat range.

Spark plug:

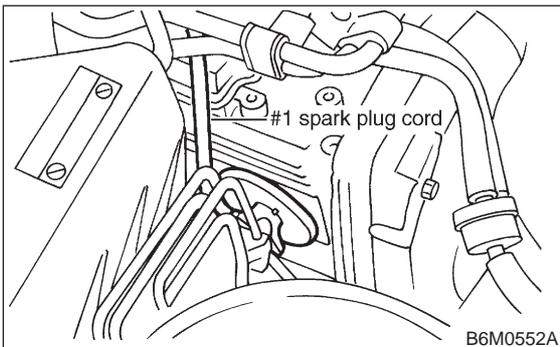
NGK: PFR5B-11

1. #1 SPARK PLUG

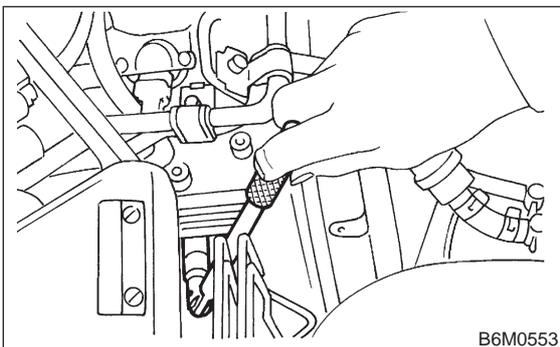
- 1) Disconnect battery ground cable.



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



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



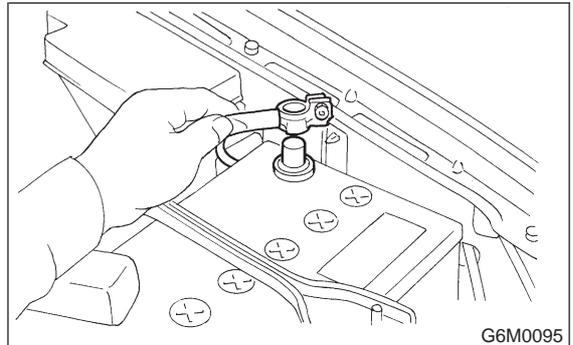
- 4) Installation is in the reverse order of removal.

Tightening torque (Spark plug):

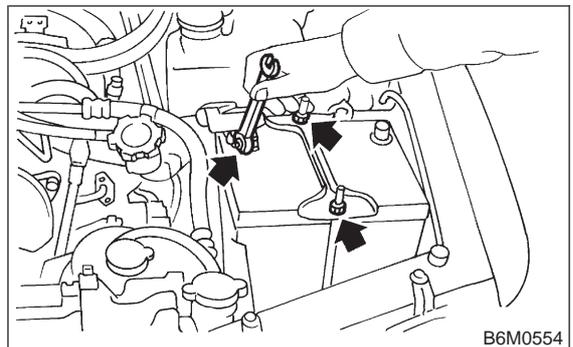
20.6±2.9 N·m (2.10±0.30 kg·m, 15.19±2.14 ft·lb)

2. #2 SPARK PLUG

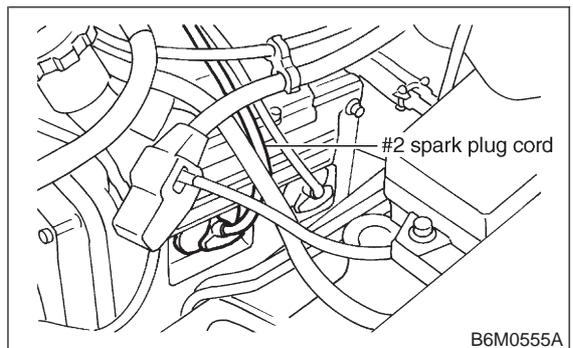
- 1) Disconnect battery ground cable.



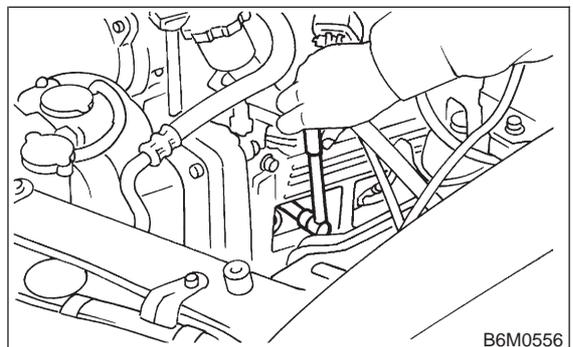
- 2) Remove battery.



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



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



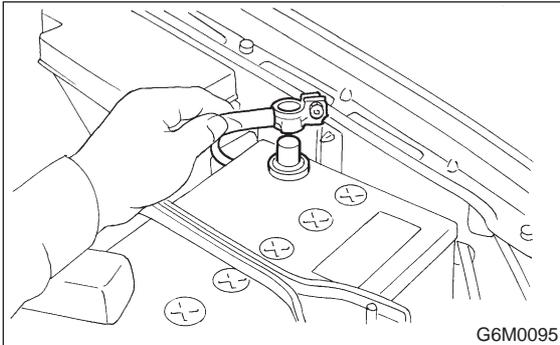
- 5) Installation is in the reverse order of removal.

Tightening torque (Spark plug):

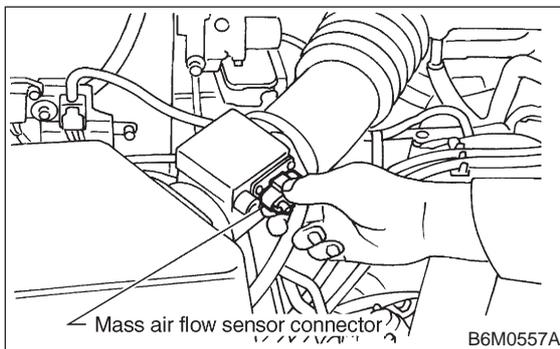
20.6 ± 2.9 N·m (2.10 ± 0.30 kg·m, 15.19 ± 2.14 ft·lb)

3. #3 SPARK PLUG

- 1) Disconnect battery ground cable.

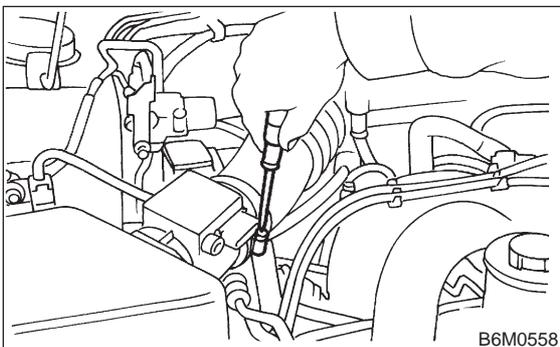


- 2) Disconnect mass air flow sensor connector.



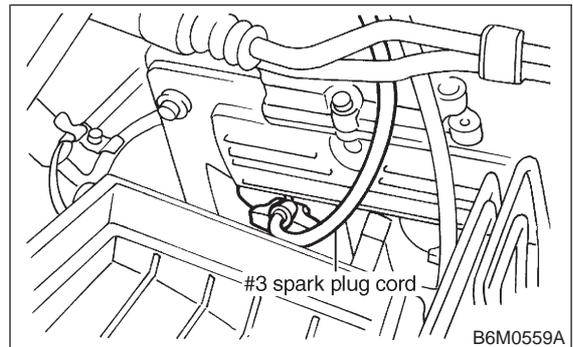
- 3) Remove four clips securing air cleaner upper cover.

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

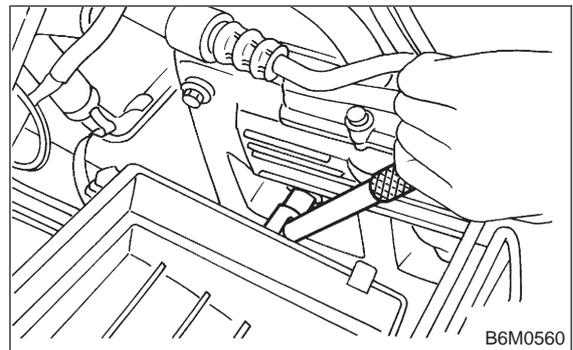


- 5) Remove air cleaner element.

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



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



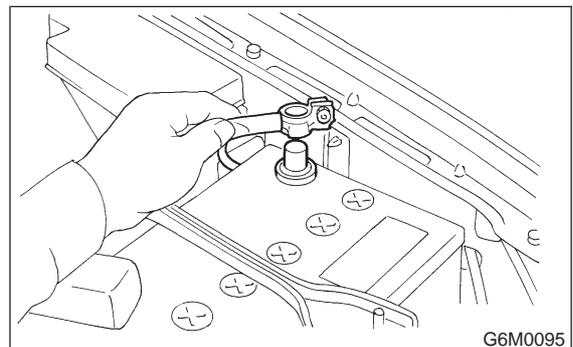
- 8) Installation is in the reverse order of removal.

Tightening torque (Spark plug):

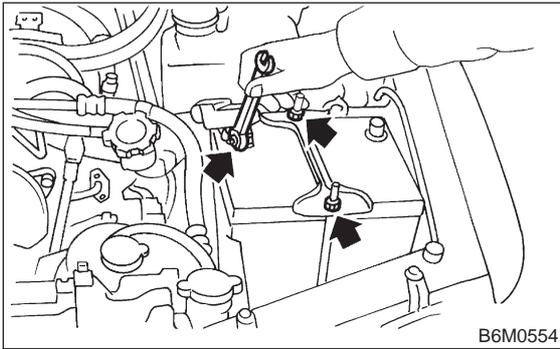
20.6 ± 2.9 N·m (2.10 ± 0.30 kg·m, 15.19 ± 2.14 ft·lb)

4. #4 SPARK PLUG

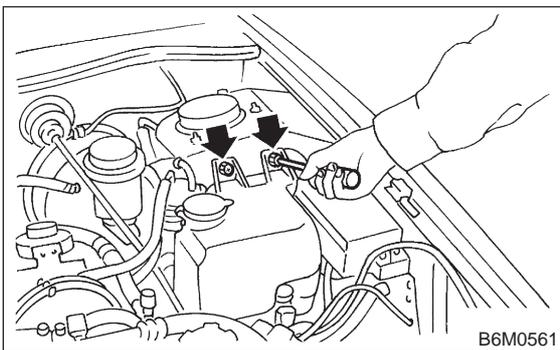
- 1) Disconnect battery ground cable.



2) Remove battery.

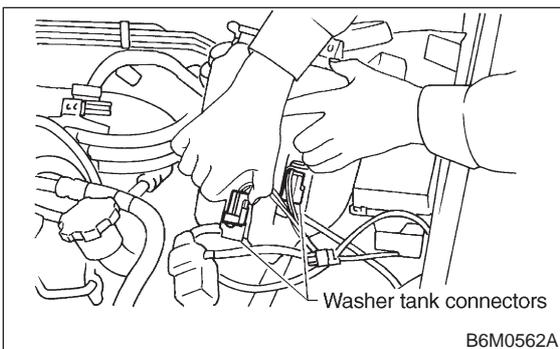


3) Remove washer tank mounting bolts.

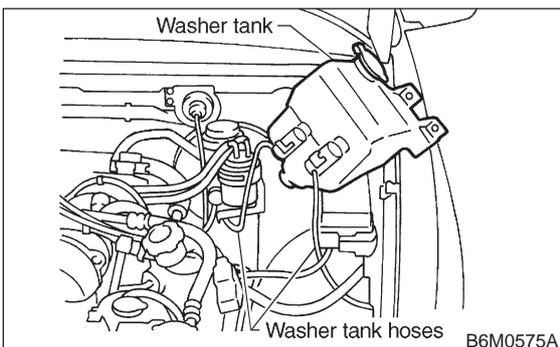


4) Disconnect washer tank connectors.

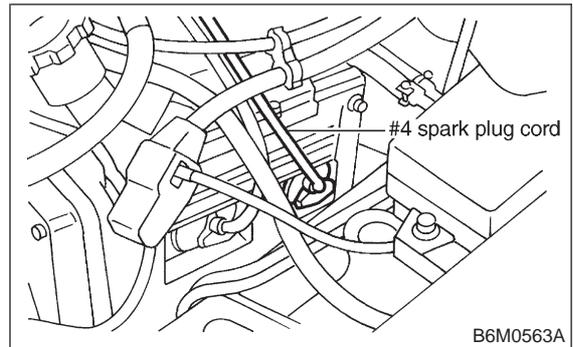
CAUTION:
Do not disconnect washer tank hoses as washer fluid will leak out from washer tank.



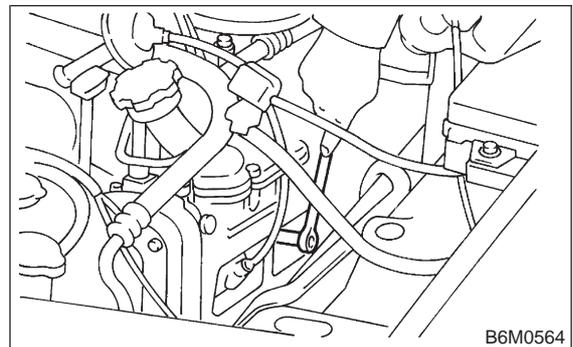
5) Move washer tank upward.



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



7) Remove spark plug with the spark plug socket.



8) Installation is in the reverse order of removal.

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

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

C: REMOVAL (2500 cc OUTBACK MODEL)

CAUTION:

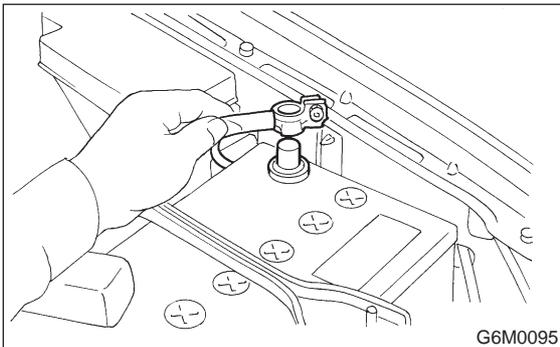
All spark plugs installed on an engine, must be of the same heat range.

Spark plug:

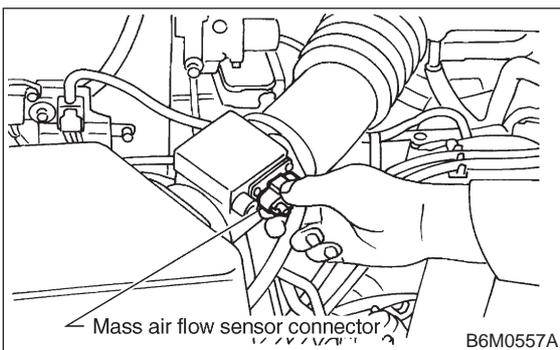
NGK: PFR5B-11

1. #1 SPARK PLUG

- 1) Disconnect battery ground cable.

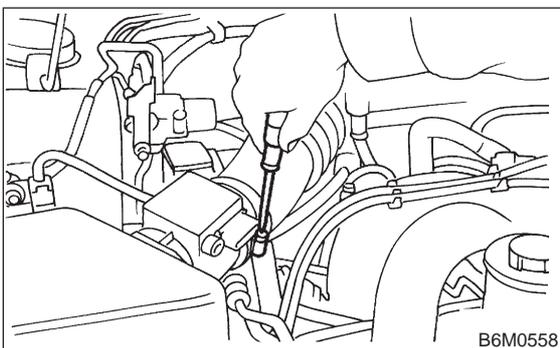


- 2) Disconnect mass air flow sensor connector.

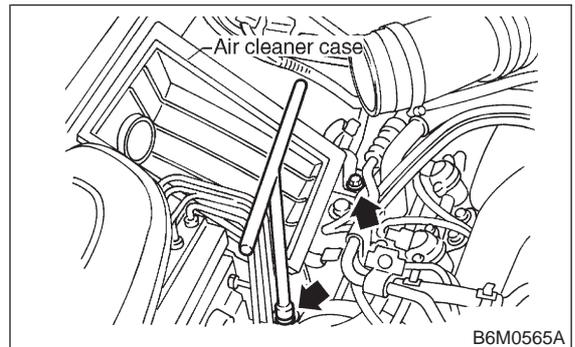


- 3) Remove four clips securing air cleaner upper cover.

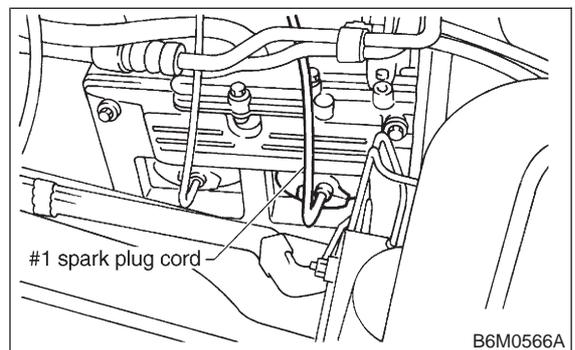
- 4) Loosen the clamp screw and separate air cleaner upper cover from air intake duct.



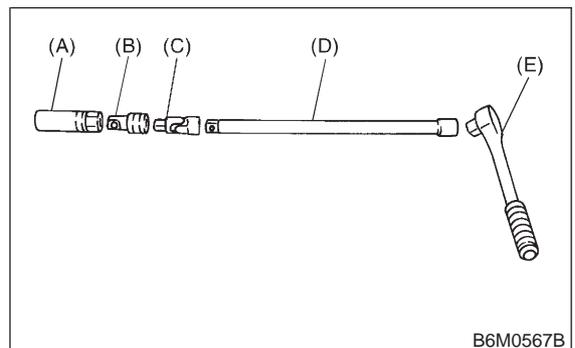
- 5) Remove air cleaner element and air cleaner case.



- 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.

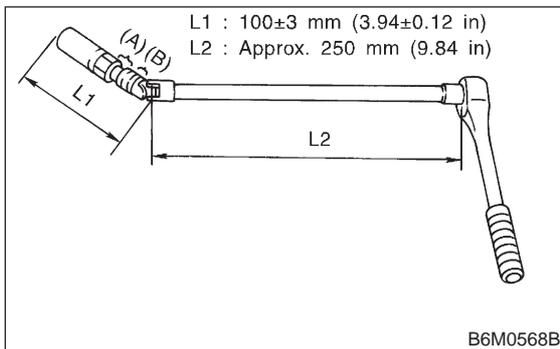
- An approximately 250 mm (9.84 in) long extension is recommended to be connected to ratchet.

- For spark plug socket, extension and Universal Joint, it is recommended to use the following tools.

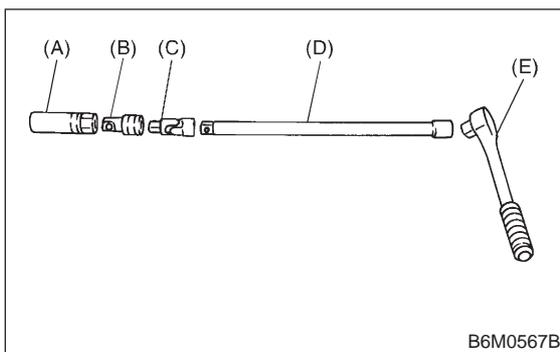
Spark plug socket : PROTO 5020-50

Extension : SNAP-ON FX1

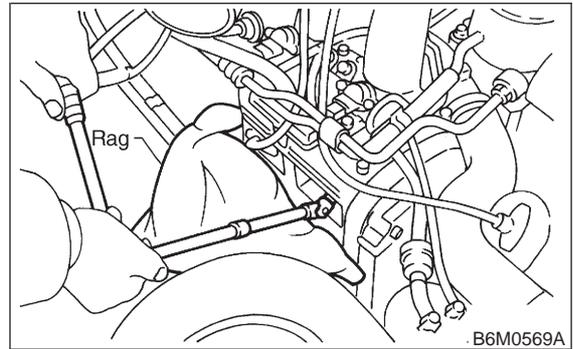
Universal Joint : SNAP-ON FU80B



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

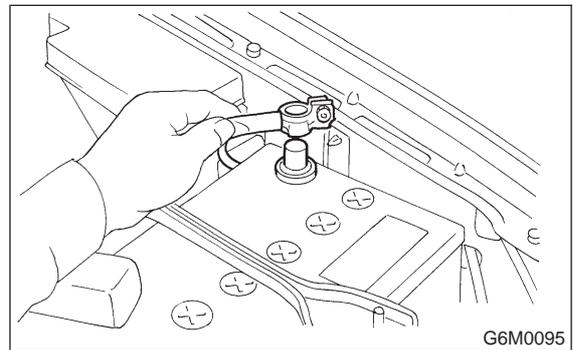


- (A) Spark plug socket 16 mm (5/8 in)
- (B) Extension
- (C) Universal Joint
- (D) Extension
- (E) Ratchet

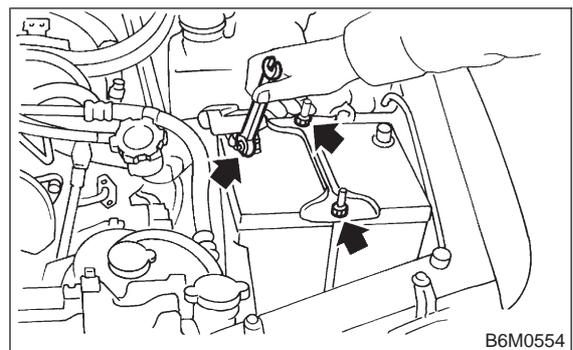


2. #2 SPARK PLUG

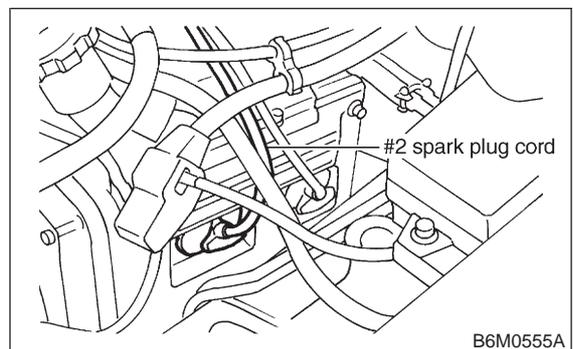
1) Disconnect battery ground cable.



2) Remove battery.



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

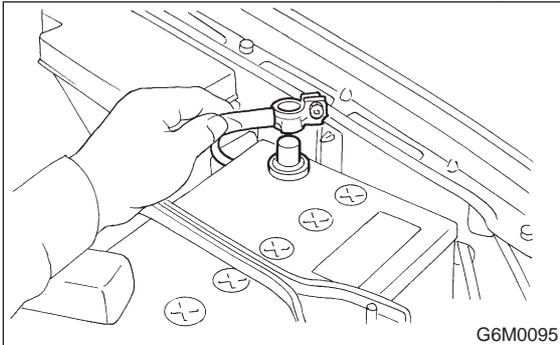


4) For subsequent procedures, refer to the procedure for #1 spark plug. <Ref. to 6-1 [W3C1].>

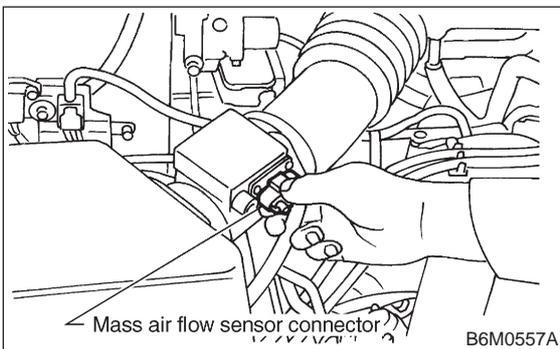
CAUTION:
When removing spark plug, cover the ATF cooling pipes with a rag to prevent damage.

3. #3 SPARK PLUG

- 1) Disconnect battery ground cable.

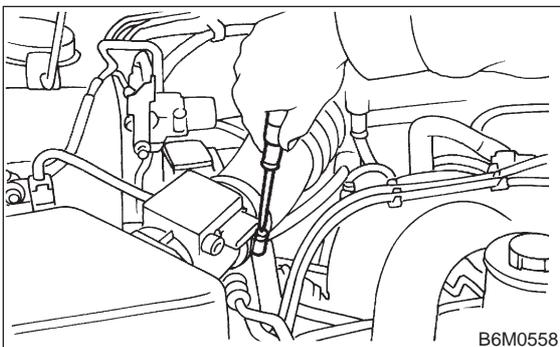


- 2) Disconnect mass air flow sensor connector.

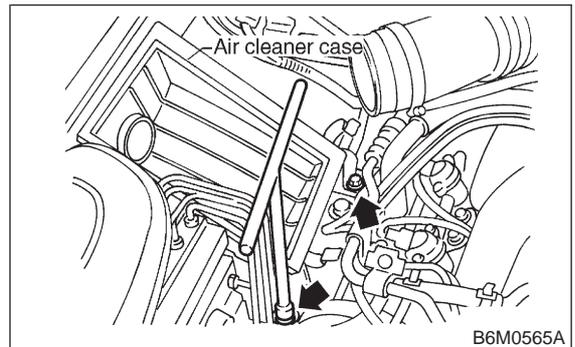


- 3) Remove four clips securing air cleaner upper cover.

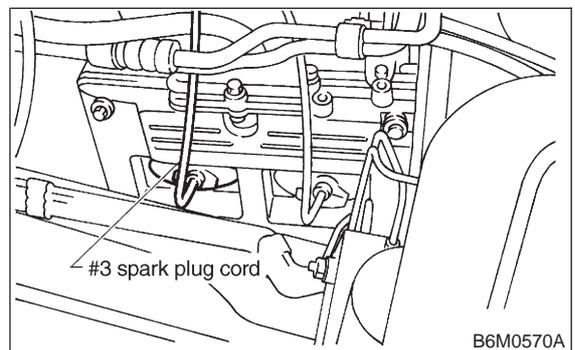
- 4) Loosen the clamp screw and separate air cleaner upper cover from air intake duct.



- 5) Remove air cleaner element and air cleaner case.



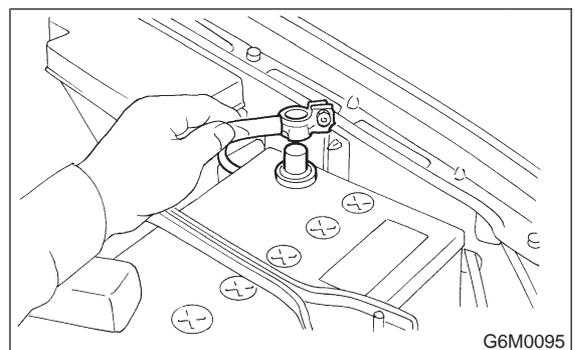
- 6) Remove #3 spark plug cord by pulling boot, not cord itself.



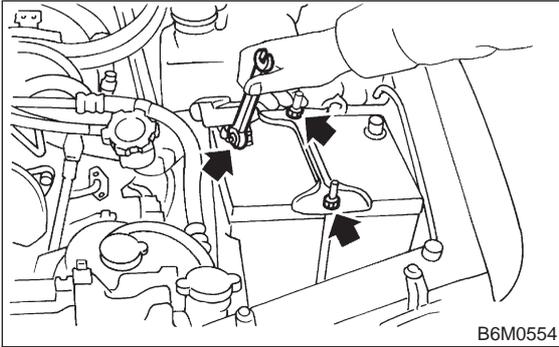
- 7) For subsequent procedures, refer to the procedure for #1 spark plug. <Ref. to 6-1 [W3C1].>

4. #4 SPARK PLUG

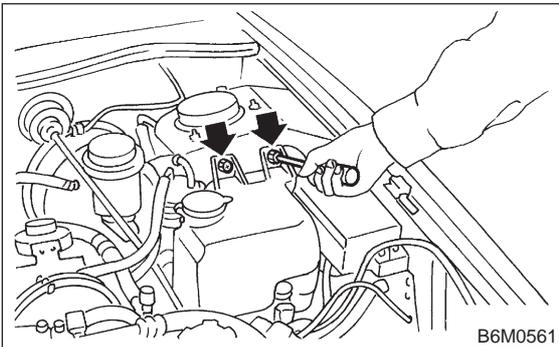
- 1) Disconnect battery ground cable.



2) Remove battery.

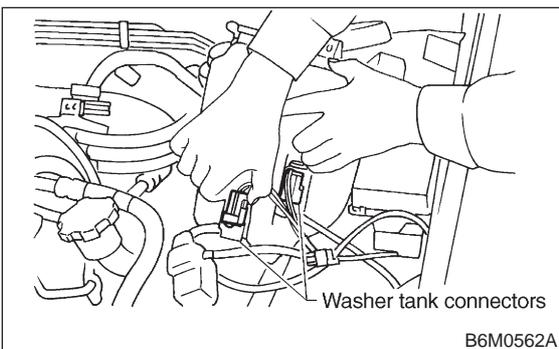


3) Remove washer tank mounting bolts.

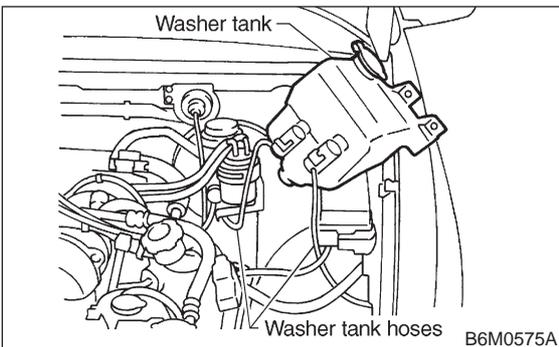


4) Disconnect washer tank connectors.

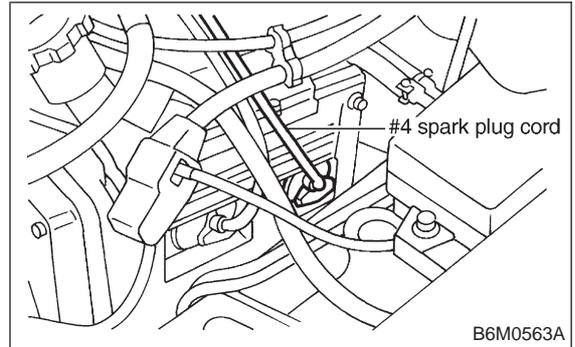
CAUTION:
Do not disconnect washer tank hoses as washer fluid will leak out from washer tank.



5) Move washer tank upward.



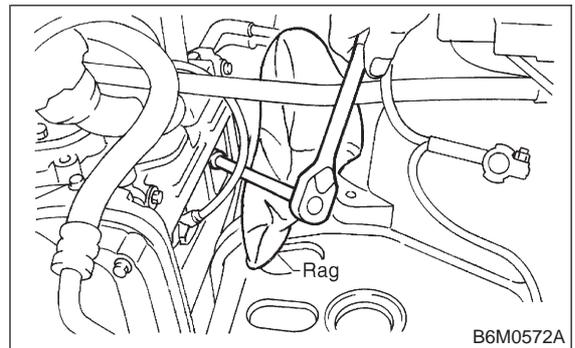
6) Remove #4 spark plug cord by pulling boot, not cord itself.



7) For subsequent procedures, refer to the procedure for #1 spark plug. <Ref. to 6-1 [W3C1].>

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

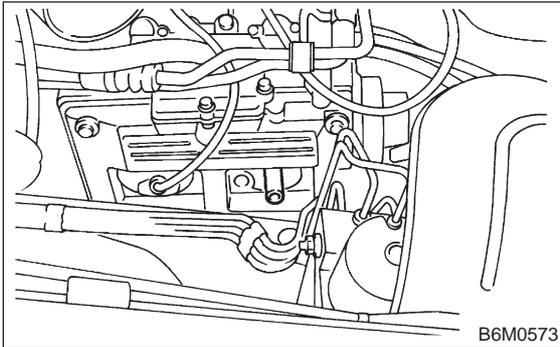
NOTE:
For easier removal of spark plug, diagonally insert the tools from the direction of battery stand into plug hole as shown in figure.



D: INSTALLATION (2500 cc OUTBACK MODEL)

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 [W3C1].>
- 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.



- 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.

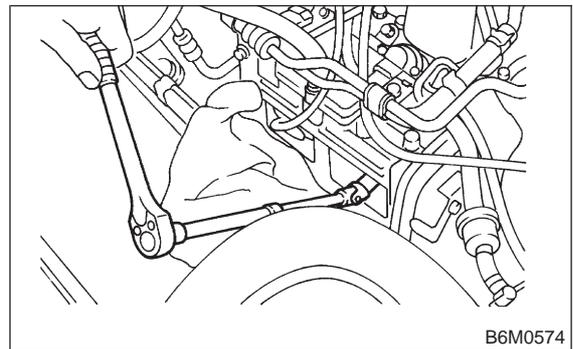
- 7) Set extension and ratchet in turn onto the connected tools in plug hole, and tighten spark plug to the specified torque.

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.



- 8) The subsequent procedures are in reverse order of #1 spark plug removal. <Ref. to 6-1 [W3C1].>

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 [W3D1].>
- 2) Proceed in reverse order of #2 spark plug removal. <Ref. to 6-1 [W3C2].>

3. #3 SPARK PLUG

- 1) Carry out #1 spark plug installation procedure. <Ref. to 6-1 [W3D1].>
- 2) Proceed in reverse order of #3 spark plug removal. <Ref. to 6-1 [W3C3].>

4. #4 SPARK PLUG

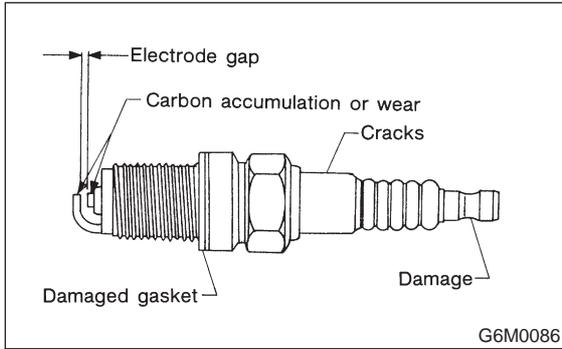
CAUTION:

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 [W3D1].>
- 2) Proceed in reverse order of #4 spark plug removal. <Ref. to 6-1 [W3C4].>

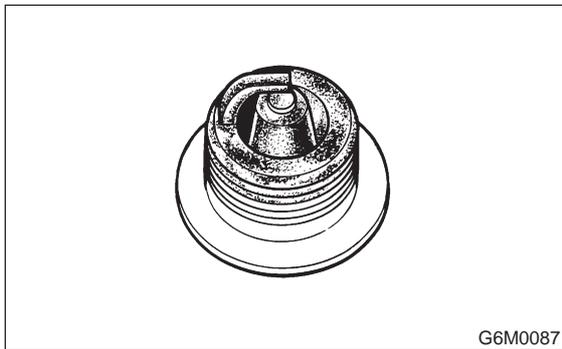
E: INSPECTION

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



1) Normal

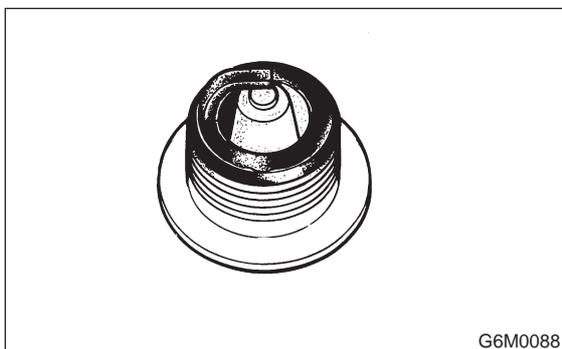
Brown to grayish-tan deposits and slight electrode wear indicate correct spark plug heat range.



2) Carbon fouled

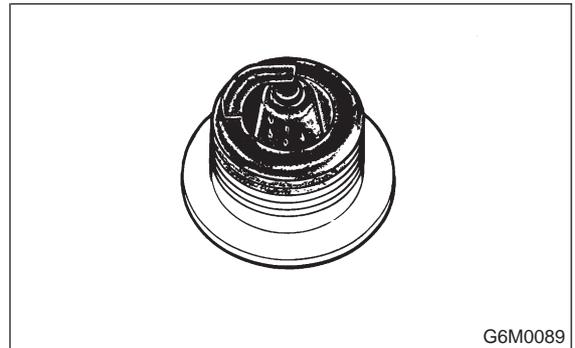
Dry fluffy carbon deposits on insulator and electrode are mostly caused by slow speed driving in city, weak ignition, too rich fuel mixture, dirty air cleaner, etc.

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



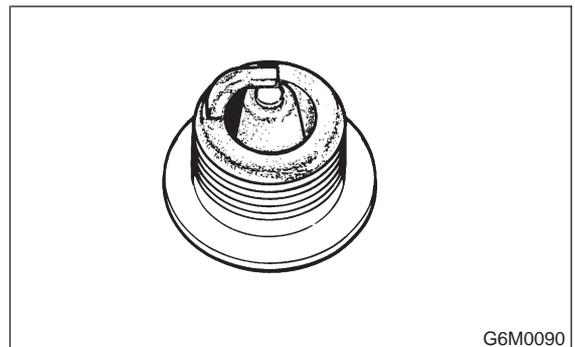
3) Oil fouled

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.



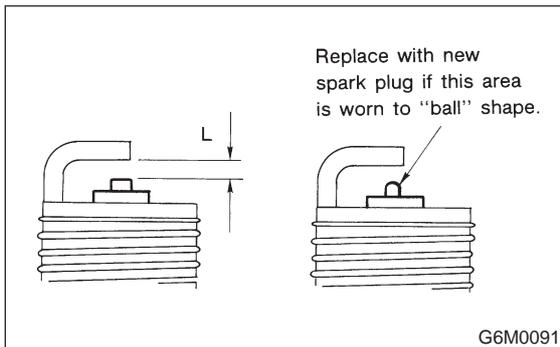
F: CLEANING AND REGAPPING

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.

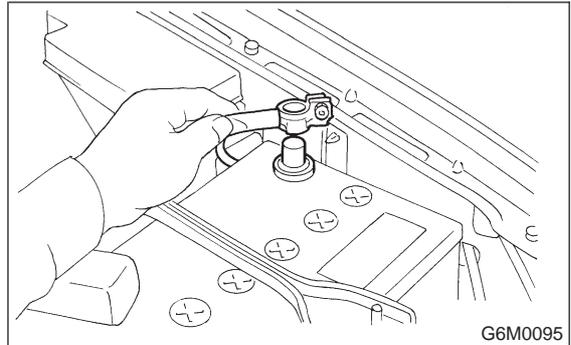
If deposits are too stubborn, discard plugs. After cleaning spark plugs, recondition firing surface of electrodes with file. Then correct the spark plug gap using a gap gauge.

Spark plug gap: L

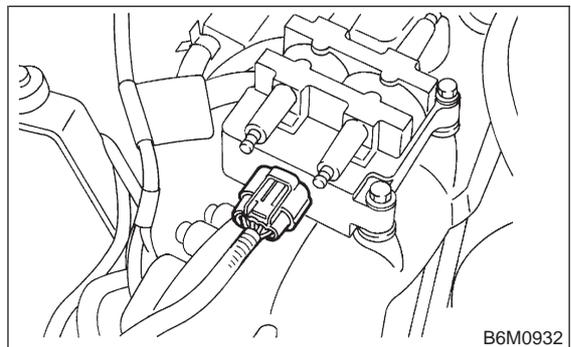
1.0 — 1.1 mm (0.039 — 0.043 in)

**4. Ignition Coil and Ignitor Assembly (2200 cc Model)****A: REMOVAL AND INSTALLATION**

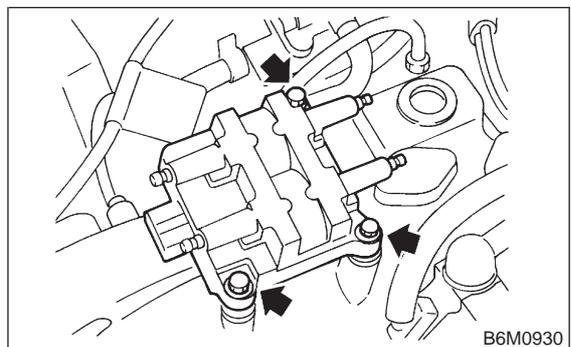
- 1) Disconnect battery ground cable.



- 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.