

ENGINE SECTION 3

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

This manual includes the procedures for maintenance, disassembling, reassembling, inspection and adjustment of components and diagnostics for guidance of experienced mechanics.

Please peruse and utilize this manual fully to ensure complete repair work for satisfying our customers by keeping their vehicle in optimum condition. When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

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

FUEL INJECTION (FUEL SYSTEMS) FU(H4DOSTC)

**EMISSION CONTROL
(AUX. EMISSION CONTROL DEVICES) EC(H4DOSTC)**

INTAKE (INDUCTION) IN(H4DOSTC)

MECHANICAL ME(H4DOSTC)

EXHAUST EX(H4DOSTC)

COOLING CO(H4DOSTC)

LUBRICATION LU(H4DOSTC)

SPEED CONTROL SYSTEMS SP(H4DOSTC)

IGNITION IG(H4DOSTC)

STARTING/CHARGING SYSTEMS SC(H4DOSTC)

ENGINE (DIAGNOSTICS) EN(H4DOSTC)

IGNITION

IG(H4DOSTC)

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GENERAL DESCRIPTION

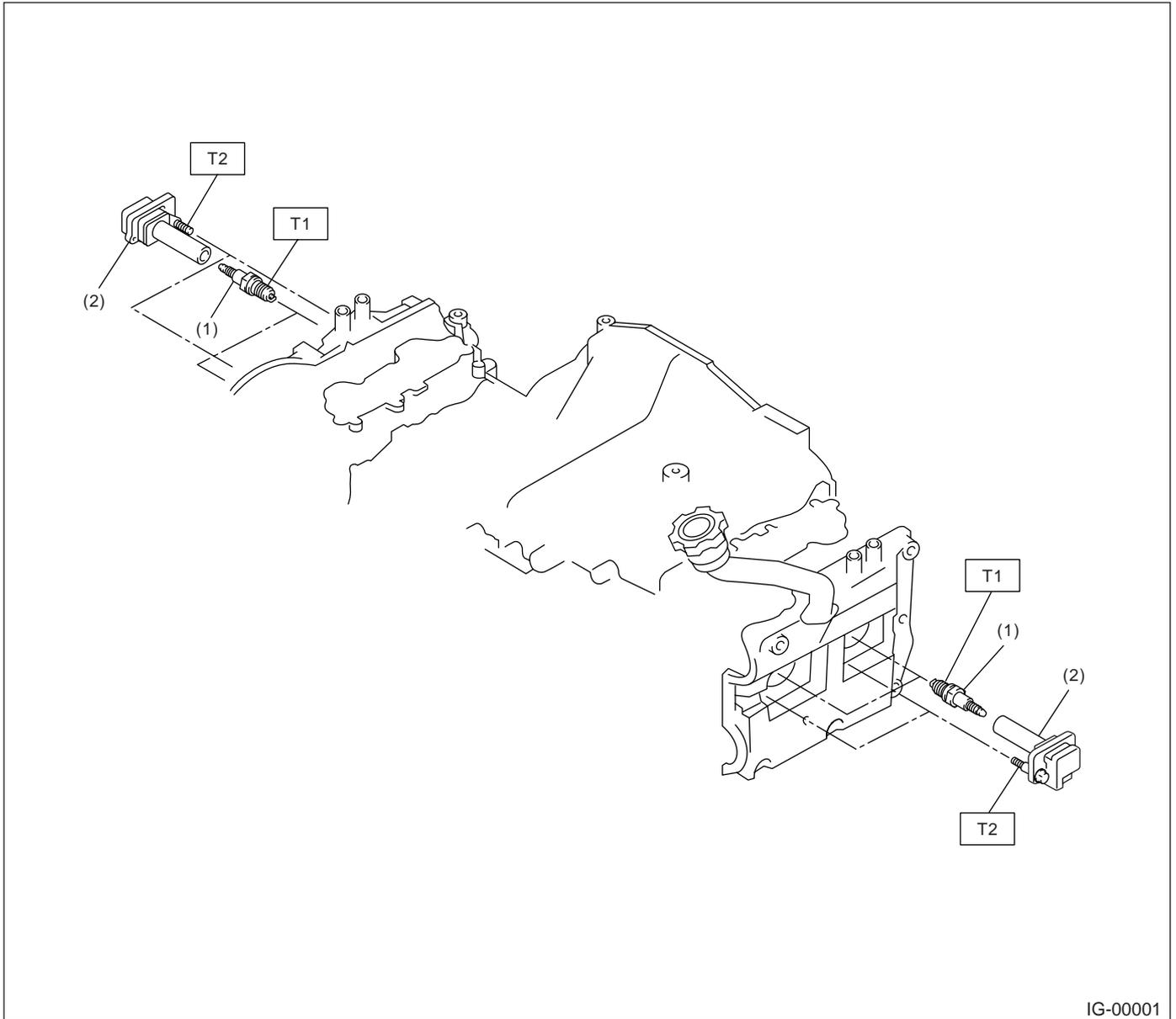
IGNITION

1. General Description

A: SPECIFICATIONS

Item		Designation
Ignition coil and ignitor assembly	Model	FK0186
	Ignition type	Direct ignition
	Manufacturer	DIAMOND
Spark plug	Type and manufacturer	NGK : PFR6G
	Thread size	mm 14, P = 1.25
	Spark gap	mm (in) 0.7 — 0.8 (0.028 — 0.031)
	Electrode	Platinum

B: COMPONENT



IG-00001

- (1) Spark plug
- (2) Ignition coil and ignitor ASSY

Tightening torque: N-m (kgf-m, ft-lb)
T1: 21 (2.1, 15.2)
T2: 16 (1.6, 11.7)

GENERAL DESCRIPTION

IGNITION

C: CAUTION

- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly, and replacement.
- Be careful not to burn your hands, because each part on the vehicle is hot after running.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or safety stands at the specified points.
- Before disconnecting electrical connectors of sensors or units, be sure to disconnect the ground cable from battery.

2. Spark Plug

A: REMOVAL

CAUTION:

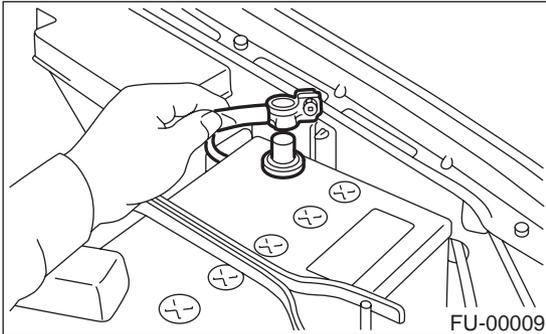
All spark plugs installed on an engine, must be of the same heat range.

Spark plug:

NGK: PFR6G

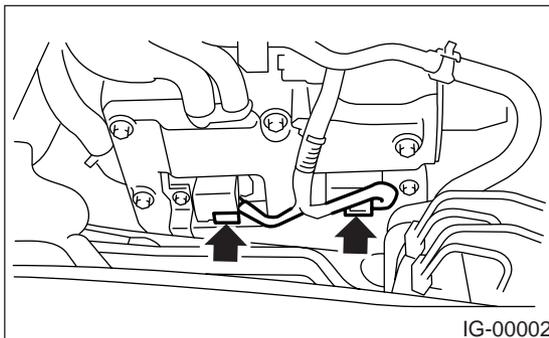
1. RH SIDE

- 1) Disconnect the ground cable from battery.

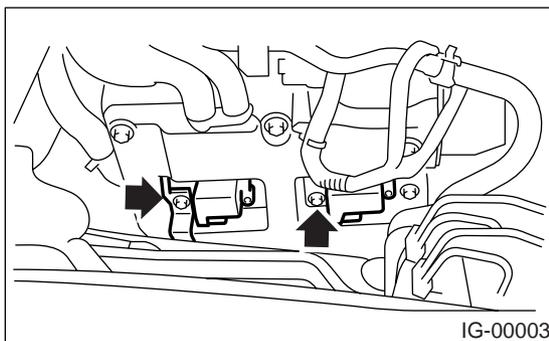


- 2) Remove the air cleaner lower case. <Ref. to IN(H4DOSTC)-10, REMOVAL, Air Cleaner.>

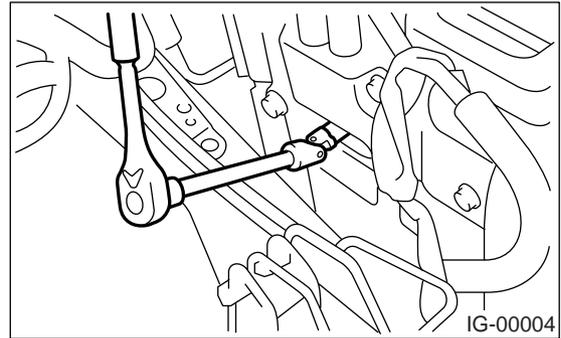
- 3) Disconnect the connector from ignition coil.



- 4) Remove the ignition coil.

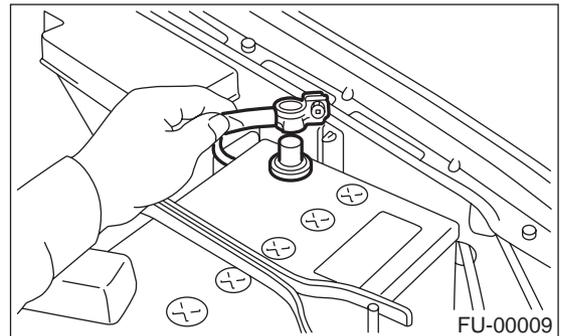


- 5) Remove the spark plugs with the spark plug sockets.

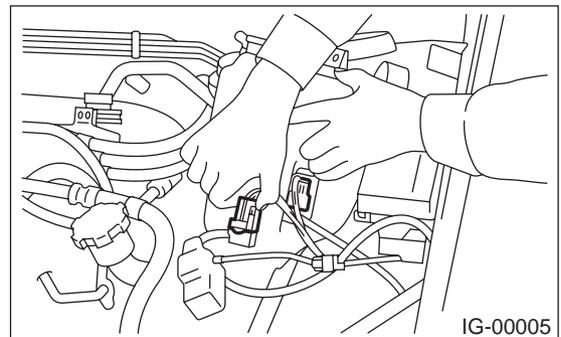


2. LH SIDE

- 1) Disconnect the battery cables, and then remove the battery and battery carrier.

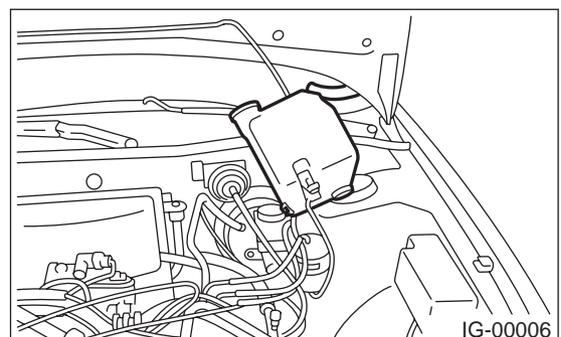


- 2) Disconnect the washer motor connector.



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

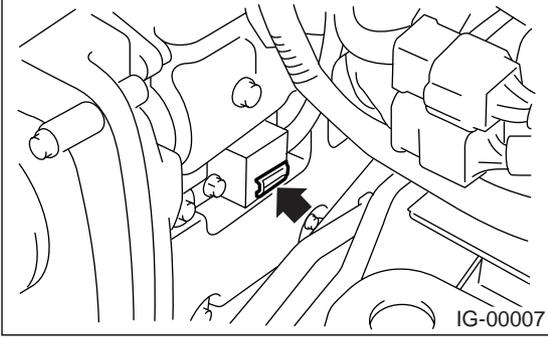
- 4) Remove the two bolts which hold washer tank, then take the tank away from working area.



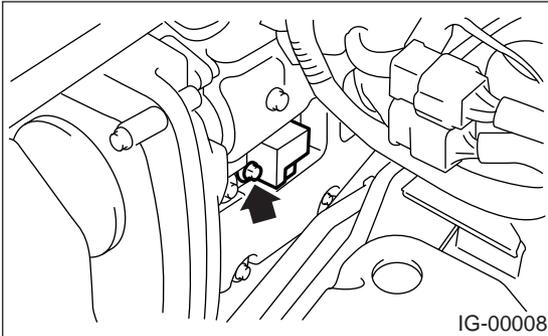
SPARK PLUG

IGNITION

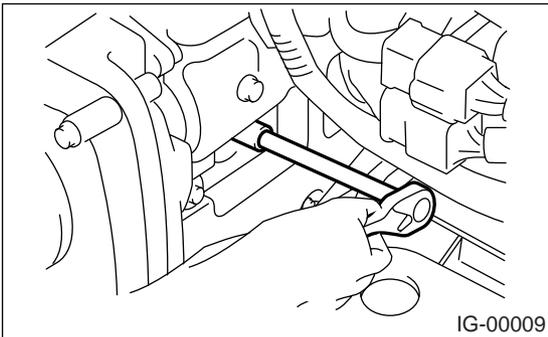
5) Disconnect the connector from ignition coil.



6) Remove the ignition coil.



7) Remove the spark plugs with the spark plug sockets.



B: INSTALLATION

1. RH SIDE

1) Install in the reverse order of removal.

Tightening torque (Spark plug):
21 N·m (2.1 kgf-m, 15.2 ft-lb)

Tightening torque (Ignition coil):
16 N·m (1.6 kgf-m, 11.7 ft-lb)

NOTE:

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 approx. 1/3 of the specified torque in order to avoid over-stressing.

2. LH SIDE

1) Install in the reverse order of removal.

Tightening torque (Spark plug):
21 N·m (2.1 kgf-m, 15.2 ft-lb)

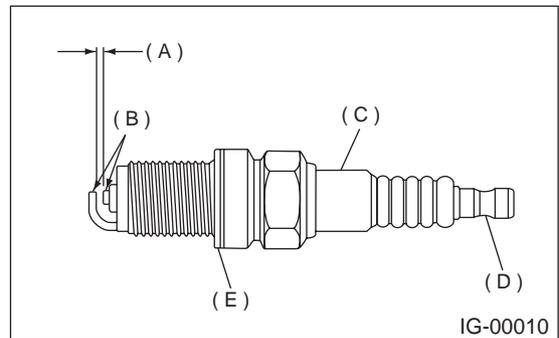
Tightening torque (Ignition coil):
16 N·m (1.6 kgf-m, 11.7 ft-lb)

NOTE:

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 approx. 1/3 of the specified torque in order to avoid over-stressing.

C: INSPECTION

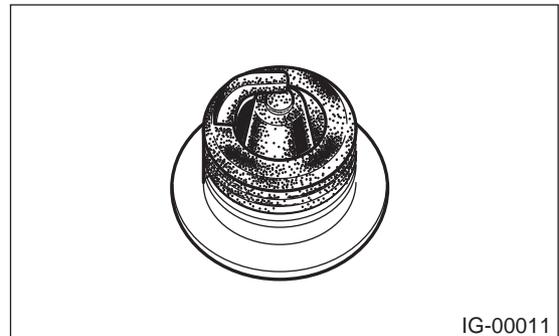
Check the electrodes and inner and outer porcelain of plugs, noting the type of deposits and the degree of electrode erosion.



- (A) Electrode gap
- (B) Carbon accumulation or wear
- (C) Cracks
- (D) Damage
- (E) Damaged gasket

1) Normal:

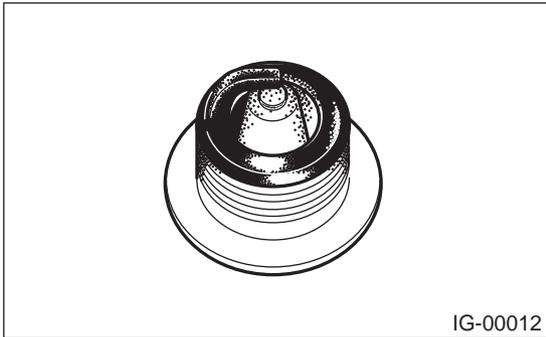
Brown to grayish-tan deposits and slight electrode wear indicates correct spark plug heat range.



2) Carbon fouled:

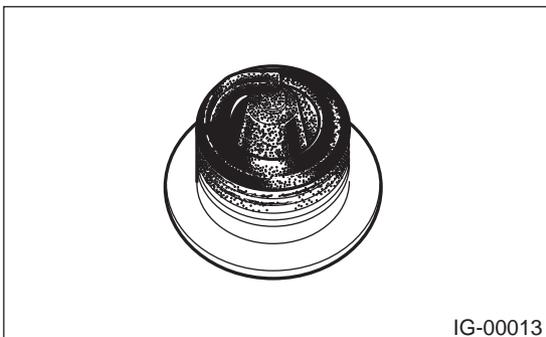
Dry fluffy carbon deposits on insulator and electrode are mostly caused by slow speed driving in city, weak ignition, too rich fuel mixture, dirty air cleaner, etc.

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



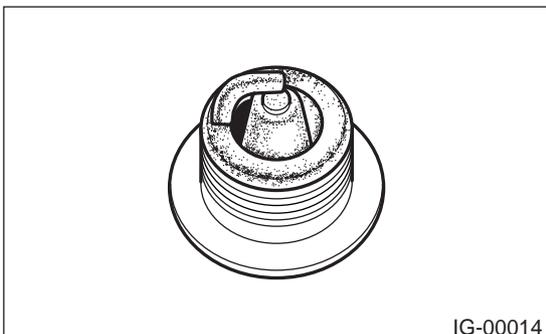
3) Oil fouled:

Wet black deposits show excessive oil entrance into combustion chamber through worn rings and pistons or excessive clearance between valve guides and stems. If the 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 indicates 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: ADJUSTMENT

Clean the spark plugs with a wire brush. Clean and remove the carbon or oxide deposits, but do not wear away porcelain.

If deposits are too stubborn, replace the plugs.

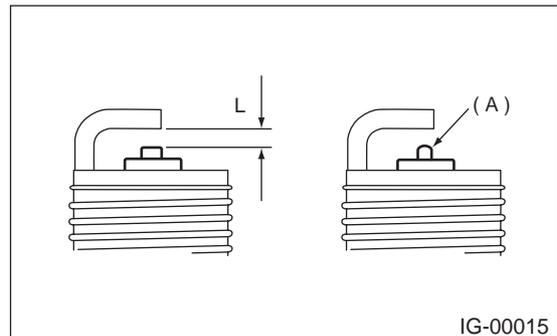
After cleaning the spark plugs, correct the spark plug gap using a gap gauge.

NOTE:

Do not use spark plug cleaners, because the spark plugs are applied with platinum tips.

Spark plug gap: L

0.7 — 0.8 mm (0.028 — 0.031 in)



NOTE:

Replace with a new spark plug if this area (A) is worn to "ball" shape.

3. Ignition Coil and Ignitor Assembly

A: REMOVAL

Direct ignition type has been adopted.
Refer to the "Spark Plug Removal" for removal procedure. <Ref. to IG(H4DOSTC)-5, REMOVAL, Spark Plug.>

B: INSTALLATION

Install in the reverse order of removal.

Tightening torque:

16 N·m (1.6 kgf-m, 11.7 ft-lb)

C: INSPECTION

Ignitor is integrated with the coil. Therefore resistance cannot be measured.

For inspection procedure of ignition system, refer to the following.

<Ref. to EN(H4DOSTC)-144, DTC P0350 — IGNITION COIL PRIMARY/SECONDARY CIRCUIT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>