

**SUBARU**

**SVX**

**1992**

	Page
1. Foreword .....	2
2. Ignition Timing .....	2
3. Engine Idle Speed .....	2
4. Engine Compression .....	2
5. Intake Manifold Vacuum .....	3
6. Cylinder Head Cover .....	4
7. Fuel Injector .....	5
8. Collector and Intake Manifold ASSY .....	5
9. Oxygen (O <sub>2</sub> ) Sensor .....	7



## 1. Foreword

This chapter describes major inspection and service procedures for the engine mounted on the body. For procedures not found in this chapter, refer to the service procedure section in the applicable chapter.

## 2. Ignition Timing

### A: INSPECTION

- 1) Warm up the engine (A/C switch "OFF").
- 2) Connect "Select Monitor" and measure ignition timing. (Function mode "07")

If the timing is not correct, check the ignition control system. (Refer to "2-7 Fuel Injection System".)

Ignition timing [BTDC/rpm]:  
 $20^{\circ} \pm 8^{\circ}/610$

## 3. Engine Idle Speed

### A: INSPECTION

- 1) Before checking idle speed, check the following:
  - (1) Ensure that air cleaner element is free from clogging, ignition timing is correct, spark plugs are in good condition, and that hoses are connected properly.
  - (2) Ensure that CHECK ENGINE light is off.
- 2) Warm up the engine.
- 3) Connect "Select Monitor" and measure engine rpm. (Function model "04")
- 4) Check idle speed when unloaded (with headlights, heater fan, rear defroster, radiator fan, air conditioner, etc. OFF).

Idle speed (No load and gears in N or D position)  
 $610 \pm 100$  rpm

- 5) Check idle speed when loaded. (Turn air conditioner switch "ON" and operate compressor for at least one minute before measurement.)

Idle speed (A/C switch "ON" and gears in N position)  
 $800 \pm 50$  rpm  
 (A/C switch "ON" and gears in D position)  
 $700 \pm 50$  rpm

If idle speed is outside specifications, refer to General Troubleshooting chart under "2-7 Fuel Injection System".

## 4. Engine Compression

### A: MEASUREMENT

- 1) After warming up the engine, turn off the ignition switch.
- 2) Make sure that the battery is fully charged.
- 3) Remove all the spark plugs.  
 (Refer to "6-1 Spark plug [W4A0]").
- 4) Disconnect connectors from fuel injector.
- 5) Fully open the throttle valve.
- 6) Check the starter motor for satisfactory performance and operation.
- 7) Connect compression gauge to spark plug hole.
- 8) Crank the engine by means of the starter motor, and read the maximum value on the gauge when the pointer is steady.
- 9) Perform at least two measurements per cylinder, and make sure that the values are correct.

Compression (200 — 300 rpm and fully open throttle):

#### Standard

$1,177 - 1,422$  kPa  
 ( $12.0 - 14.5$  kg/cm<sup>2</sup>,  $171 - 206$  psi)

#### Limit

$981$  kPa ( $10.0$  kg/cm<sup>2</sup>,  $142$  psi)

#### Difference between cylinders

$196$  kPa ( $2.0$  kg/cm<sup>2</sup>,  $28$  psi)

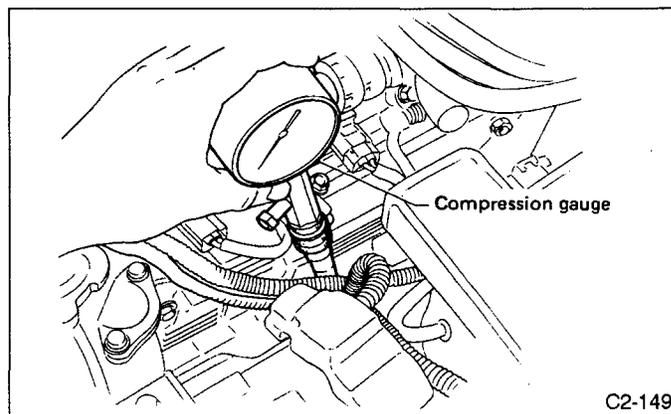


Fig. 1

C2-149

## 5. Intake Manifold Vacuum

### A: MEASUREMENT

- 1) Warm up the engine.
- 2) Disconnect the vacuum hose and install the vacuum gauge to the hose fitting on the manifold.
- 3) Keep the engine at the idle speed and read the vacuum gauge indication.

By observing the gauge needle movement, the internal condition of the engine can be diagnosed as described in Table below.

**Vacuum pressure (at idling, A/C "OFF"):**  
**More than 68.0 kPa (510 mmHg, 20.08 inHg)**

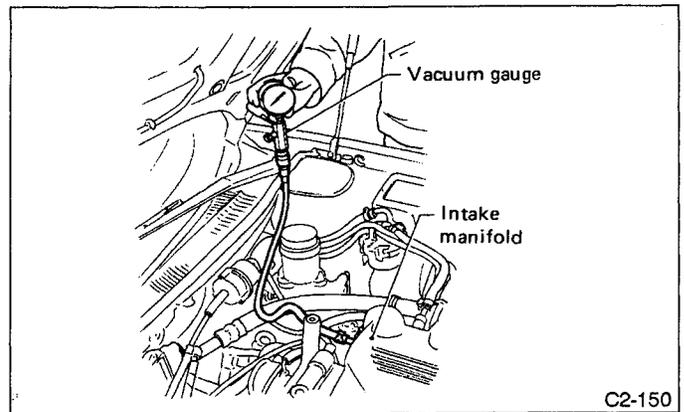


Fig. 2

Diagnosis of engine condition by measurement of manifold vacuum	
Vacuum gauge indication	Possible engine condition
1. Needle is steady but lower than normal position. This tendency becomes more evident as engine temperature rises.	Leakage around air intake system.
2. When engine speed is reduced slowly from higher speed, needle stops temporarily when it is lowering or becomes steady above normal position.	Back pressure too high, or exhaust muffler clogged.
3. Needle intermittently drops to position lower than normal position.	Leakage around cylinder.
4. Needle drops suddenly and intermittently from normal position.	Sticky valves.
5. When engine speed is gradually increased, needle begins to vibrate rapidly at certain speed, and then vibration increases as engine speed increases.	Weak or broken valve springs.
6. Needle vibrates above and below normal position in narrow range.	Defective ignition system or throttle chamber idle adjustment.

## 6. Cylinder Head Cover

### A: REMOVAL

#### 1. CYLINDER HEAD COVER LH

- 1) Disconnect battery cables and remove battery.
- 2) Disconnect blow-by hose from cylinder head cover.
- 3) Remove harness clamps.

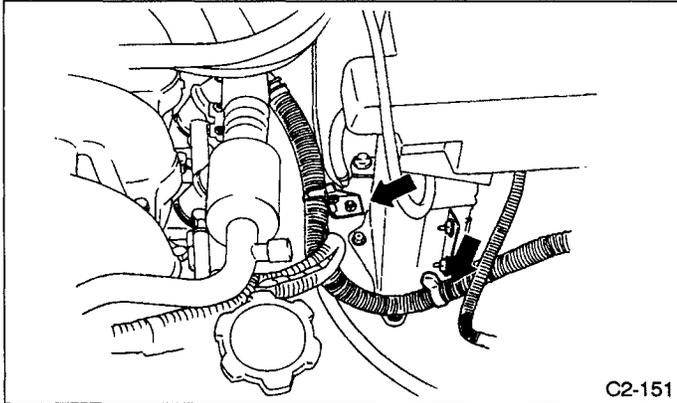


Fig. 3

- 4) Remove ignition coils.  
(Refer to 6-1 "Ignition coil [W3A0]".)
- 5) Disconnect connectors from fuel injectors.
- 6) Raise the vehicle.
- 7) Remove under cover.
- 8) Remove cylinder head cover.
  - (1) Remove bolts ① through ④ while getting under the car.

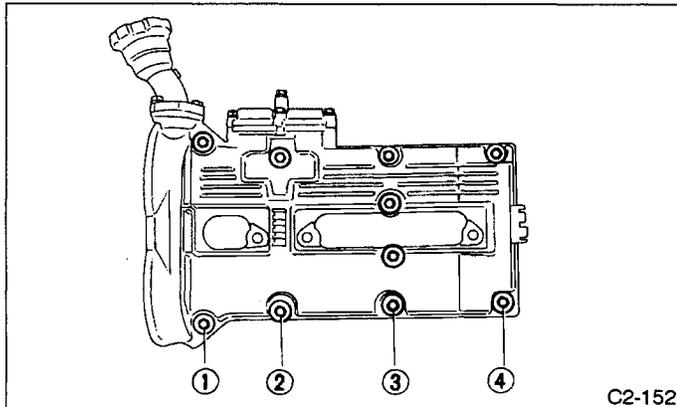


Fig. 4

- (2) Lower the vehicle.
- (3) Remove the remaining bolts and the cylinder head cover.
- 9) Remove cylinder head cover gasket.

#### 2. CYLINDER HEAD COVER RH

- 1) Disconnect ground cable of battery.
- 2) Remove air intake boots and air cleaner case.
- 3) Disconnect blow-by hose from cylinder head cover.
- 4) Remove ignition coil harness clamp from cylinder head cover.
- 5) For subsequent removal operation, follow the same procedures [steps 5) through 10)] that are outlined under the "CYLINDER HEAD COVER LH."

### B: INSTALLATION

Installation is in the reverse order of removal procedures.

#### Tightening torque:

Cylinder head cover bolts:

4.4 — 5.4 N·m (0.45 — 0.55 kg-m, 3.3 — 4.0 ft-lb)

## 7. Fuel Injector

### A: REMOVAL

- 1) Fuel pressure elimination
  - (1) Disconnect fuel pump connector.
  - (2) Start engine.
  - (3) Run engine until it stalls.
  - (4) After it stalls, crank starter for approximately 5 seconds and turn ignition switch to "OFF".
- 2) Disconnect connector from fuel injector.
- 3) Remove fuel injector cover.

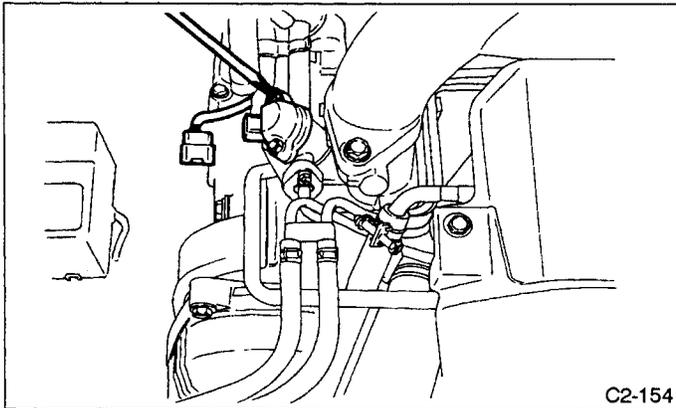


Fig. 5

- 4) Extract while turning fuel injectors.
  - a. Do not attempt to pry injectors with a screwdriver or similar tool. Do not pinch injector pin with pliers.
  - b. Be careful not to damage O-ring.
  - c. If injector is difficult to remove with your hand, remove injector and fuel pipe as a unit, and push injector out from the back side.
- 5) To install, reverse order of removal procedures.

## 8. Collector and Intake Manifold ASSY

### A: REMOVAL

- 1) Fuel pressure elimination
  - (1) Disconnect fuel pump connector.
  - (2) Start engine.
  - (3) Run engine until it stalls.
  - (4) After it stalls, crank starter for approximately 5 seconds and turn ignition switch to "OFF".
- 2) Remove corrector cover.
- 3) Disconnect throttle cable and cruise control cable from throttle lever.
- 4) Remove air intake boots.
- 5) Disconnect engine harness connectors.
- 6) Disconnect female connectors of engine harness from bracket.

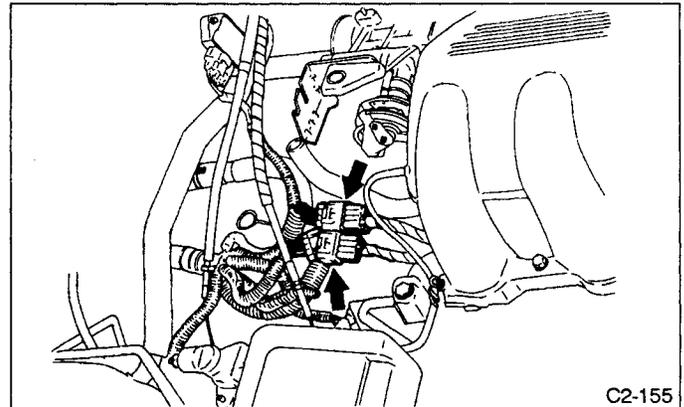
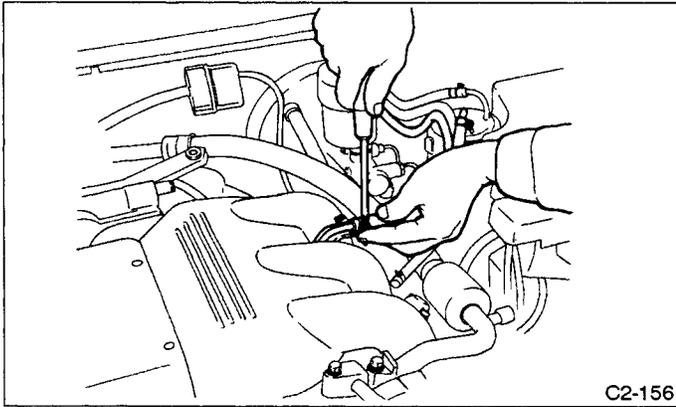


Fig. 6

- 7) Disconnect connector from auxiliary air control valve.
  - 8) Disconnect two coolant hoses from throttle body. (They are located under the throttle body.)
  - 9) Disconnect auxiliary air control valve hose from throttle body.
  - 10) Disconnect PCV hose from connector PCV.
  - 11) Remove blow-by hose from cylinder head cover RH.
  - 12) Disconnect EGR control hoses from intake manifold.
  - 13) Remove EGR pipe and cover.
  - 14) Disconnect power steering pump SW connector.
  - 15) Disconnect brake booster hose from intake manifold.
  - 16) Disconnect fuel hoses (delivery, return and evaporation lines) from fuel pipes.
- Place a container to catch fuel from fuel hose.**

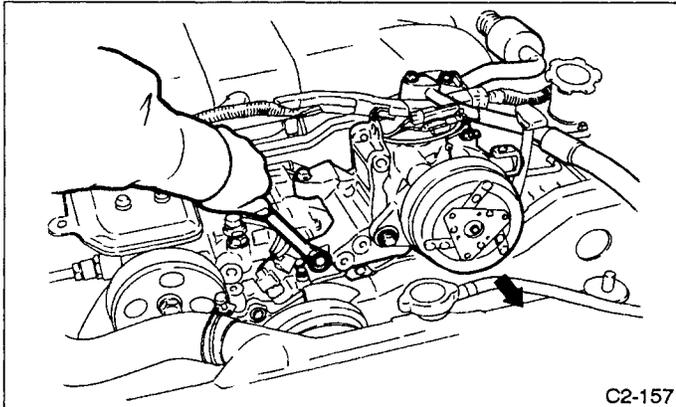


C2-156

Fig. 7

- 17) Remove drive belt cover and drive belts. (Refer to 1-5 "Drive Belts [01A0]").
- 18) Disconnect alternator B terminal and connector.
- 19) Remove bolt securing the alternator harness cover.
- 20) Remove alternator.
- 21) Remove A/C belt idler pulley ASSY.
- 22) Remove all bolts securing the A/C compressor bracket. Move the A/C compressor and bracket forward as a unit to facilitate removal of intake manifold mounting bolts.

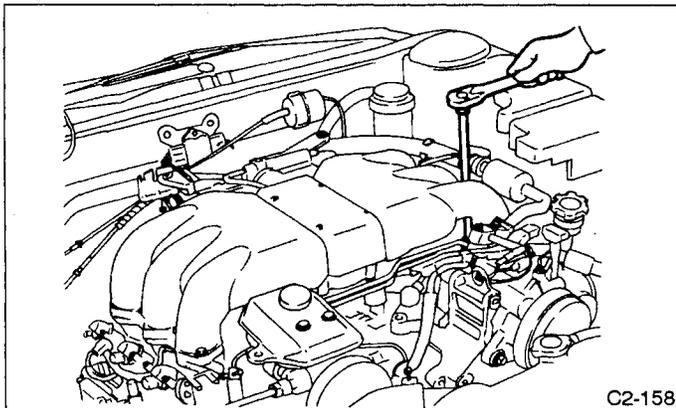
**When moving the compressor and bracket, take care not to over-stretch the pipes and hoses.**



C2-157

Fig. 8

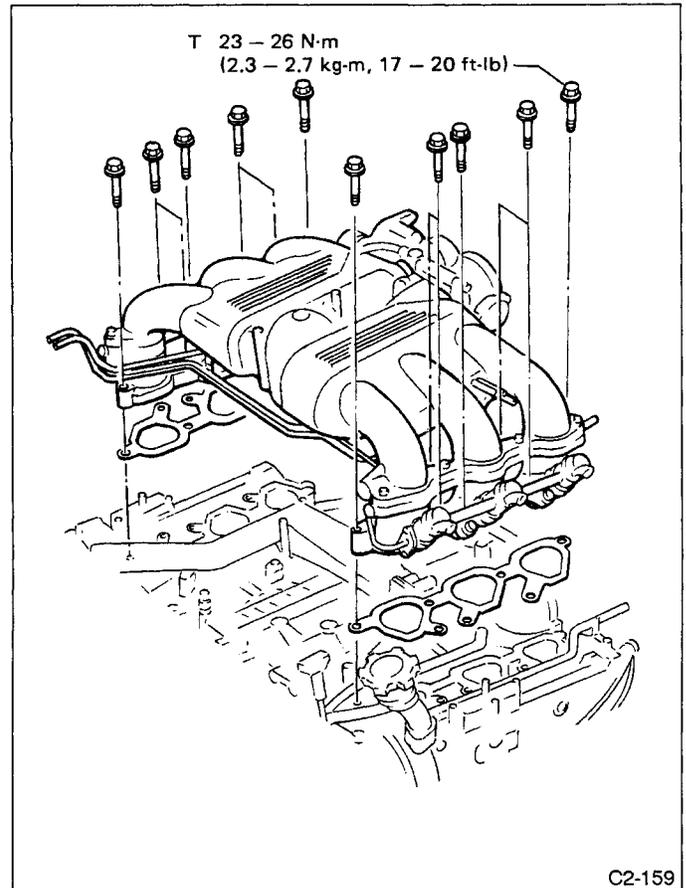
- 23) Remove collector and intake manifold ASSY.



C2-158

Fig. 9

## B: INSTALLATION



C2-159

Fig. 10

Installation is in the reverse order of removal procedure. Observe the following.

- 1) Remove traces of gasket from the mating surfaces of the intake manifold and cylinder head before installation.
- 2) Be sure to use new gaskets.
- 3) Be careful not to catch hoses or harnesses between intake manifold and cylinder head.
- 4) Before installing A/C compressor bracket, apply fluid packing to thread portion of bolt which indicating arrow mark in Figure.

### Fluid packing

**Three bond 1344 or equivalent**

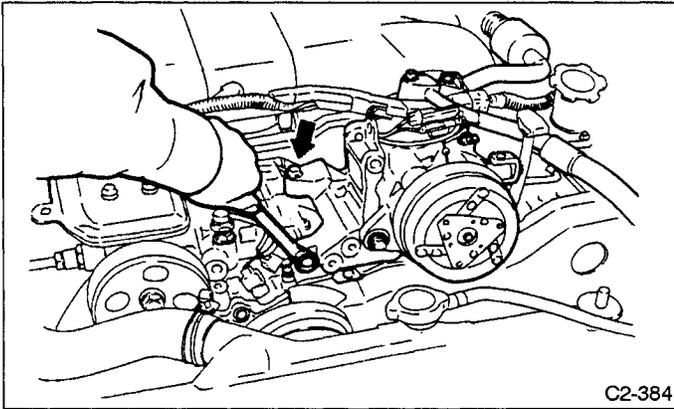


Fig. 11

## 9. Oxygen (O<sub>2</sub>) Sensor

### A: REPLACEMENT

Oxygen (O<sub>2</sub>) sensor is one of the important emission control parts. Therefore, replace it as follows only when it is damaged by external force, or if it seems to be out of order according to troubleshooting etc.

#### 1. REMOVAL

- 1) Disconnect O<sub>2</sub> sensor cord.
- 2) Apply SUBARU CRC (004301003) or its equivalent to threaded portion of oxygen (O<sub>2</sub>) sensor, and leave it for one minute or more.
- 3) Loosen oxygen (O<sub>2</sub>) sensor by turning it 10 to 40 degrees with special tool (SOCKET: 499990110) and wrench.

4) Apply SUBARU CRC (004301003) to threaded portion of oxygen (O<sub>2</sub>) sensor again, and leave it for one minute or more.

5) Remove oxygen (O<sub>2</sub>) sensor by using socket and wrench.

**When removing, do not force oxygen (O<sub>2</sub>) sensor especially when exhaust pipe is cold; otherwise it will damage the exhaust pipe.**

#### 2. INSTALLATION

1) Apply anti-seize compound ("SS-30" made by JET-LUBE Inc. in U.S.A. or its equivalent) only to threaded portion of oxygen (O<sub>2</sub>) sensor to make the next removal easier.

**Never apply anti-seize compound to protector of oxygen (O<sub>2</sub>) sensor.**

2) By using socket and torque wrench, install oxygen (O<sub>2</sub>) sensor onto front exhaust pipe by tightening it to the specified torque.

---

**Torque [oxygen (O<sub>2</sub>) sensor]:**

**25 — 34 N·m (2.5 — 3.5 kg-m, 18 — 25 ft-lb)**

---

3) Securely connect oxygen (O<sub>2</sub>) sensor cord.