ENGINE

CONTENTS

GENERAL

OUTLINE OF CHANGE

A high altitude compensation system has been added to vehicles with 4G1 carburettor engine. The service points which are different from the previous procedures have been established to correspond to this.

SPECIFICATIONS

SERVICE SPECIFICATIONS

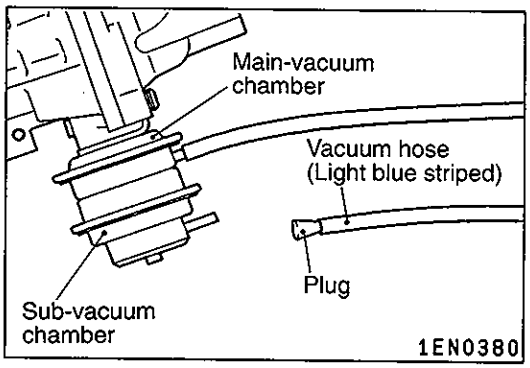
4G1-Carburettor <with high altitude compensation system>

Items			Specifications
Ignition timing	4G13		4°BTDC ± 2°
	4G15		2°BTDC ± 2°
Idle speed r/min	At 0–500 m above sea level	M/T	850 ± 50
		A/T	900 ± 50
	At 2,600–3,700 m above sea level	M/T	750 ± 50
		A/T	800 ± 50
Idle mixture %	At 0–500 m above sea level		1.5 ± 0.5
	At 2,600–3,700 m above sea level		6.5 ± 0.5

ENGINE <4G1>

SERVICE ADJUSTMENT PROCEDURES <Carburettor>

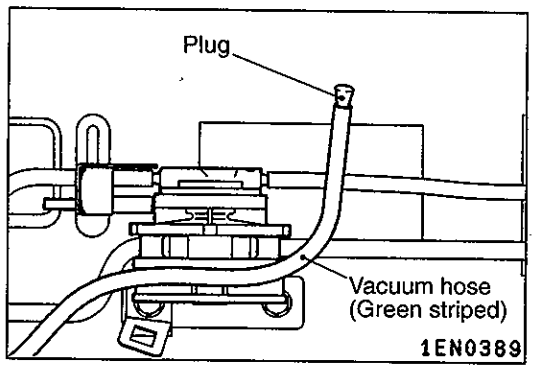
IGNITION TIMING INSPECTION AND ADJUSTMENT <Carburettor with high altitude compensation system>



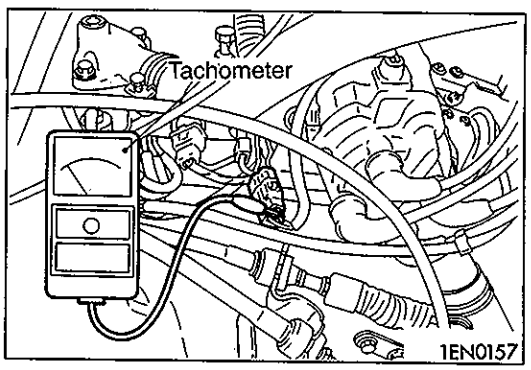
NOTE
The altitude will not have any effect on ignition timing inspection and adjustment procedures.

(1) Before inspection and adjustment set vehicle in the following condition.
- Engine conlant termperature: 80 – 95°C
- Lamps, electric cooling fan and all accessories: OFF
- Transmission: Neutral (P range on vehicles with A/T)

(2) Disconnect the vacuum hose (light blue striped) from the sub-vacuum chamber of the distributor, and then plug the end of the vacuum hose.



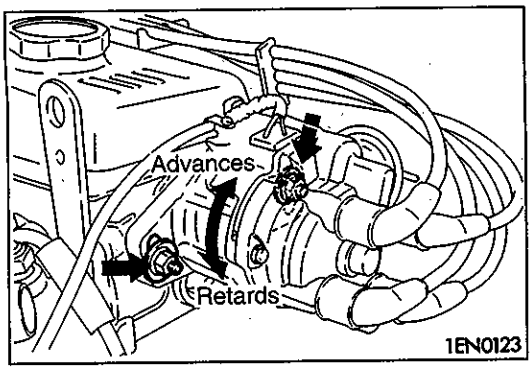
(3) Disconnect the vacuum hose (green striped) from the high altitude compensator and plug the hose end.



(4) Insert a paper clip into distributor connector terminal 1 from the wire side.
The connector should not be disconnected.
(5) Connect a primary-voltage-detection type of tachometer to the paper clip.
(6) Set up a timing light.
(7) Start engine and run at idle.
(8) Check that engine speed is at 600 – 1,000 r/min.
(9) Check that basic ignition timing is within the standard value.

Standard value:

4G13 4°BTDC ± 2°
4G15 2°BTDC ± 2°

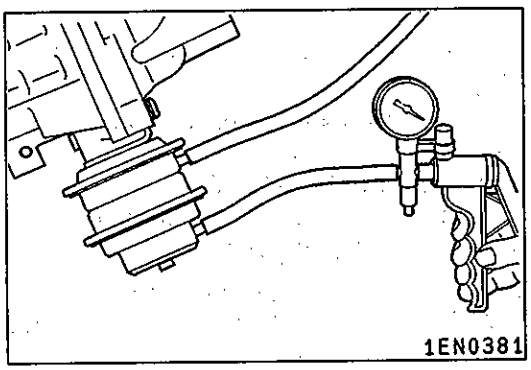


(10) If the timing is not within the standard value range, loosen the distributor mounting bolt and adjust by rotating the distributor body.

Caution
If the problem for knocking occurs when gasoline with an octane rating of 87 – 89 RON is used, it can be handled by retarding the basic ignition timing by about 2 degrees.

(11) Tighten the mounting bolt after performing the adjustment.

Tightening torque: 13 Nm



(12) Connect a hand vacuum pump to the nipple of the sub-vacuum chamber, and then apply a negative pressure of more than 27 kPa. Check that the ignition timing is at the standard value at this time.

Standard value:

4G13	**12°BTDC ± 4°**
4G15	**10°BTDC ± 4°**

(13) Re-connect the vacuum hoses.

IDLE SPEED AND MIXTURE INSPECTION AND ADJUSTMENT <Carburettor with high altitude compensation system>

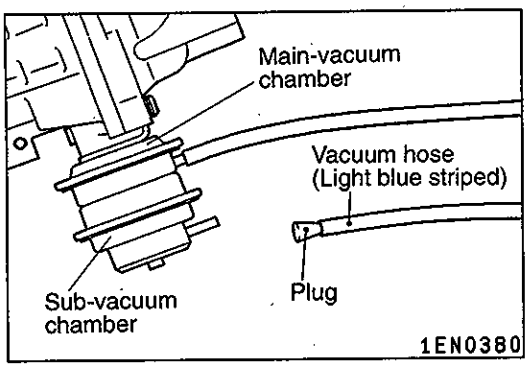
NOTE

1. The main jet has been set accurately at factory and sealed using a plug plate. Do not disturb the setting unnecessarily.
2. If the carburettor has been overhauled or the suction piston, suction chamber sub assembly, etc. including the metering needle have been replaced, or if the main jet has been moved, adjust the idle speed and CO contents by the procedure given on P.11-6.

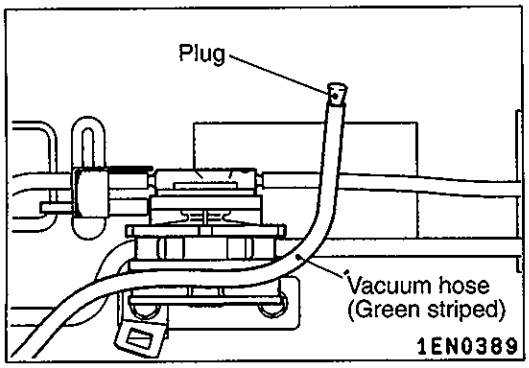
Caution
Inspect and adjust with the air cleaner in position.

(1) Before inspection and adjustment set vehicle in the following condition.
- Engine coolant temperature: 80 – 95°C
- Lamps, electric cooling fan and all accessories: OFF
- Transmission: Neutral (P range on vehicles with A/T)

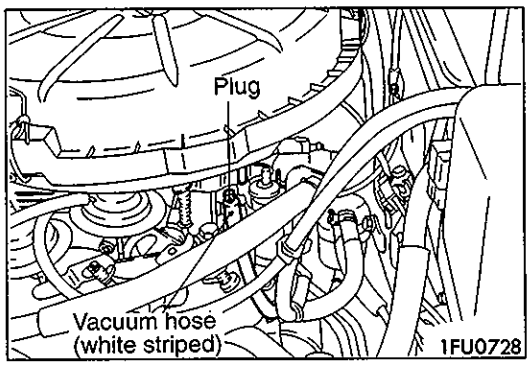
(2) Set up a timing light and tachometer. For information regarding the techometer installation method, refer to P.11-3.



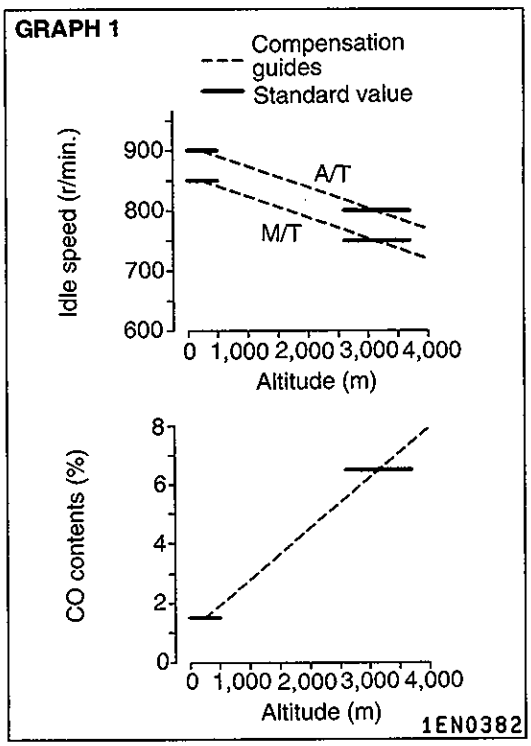
(3) Disconnect the vacuum hose (light blue striped) from the sub-vacuum chamber of the distributor, and then plug the end of the vacuum hose.



(4) Disconnect the vacuum hose (green striped) from the high altitude compensator and plug the hose end.
(5) Start the engine and run at idle.
(6) Check the basic ignition timing. If outside the standard value, adjust it.
Standard value:
4G13 4°BTDC ± 2°
4G15 2°BTDC ± 2°
(7) Set up a CO tester.



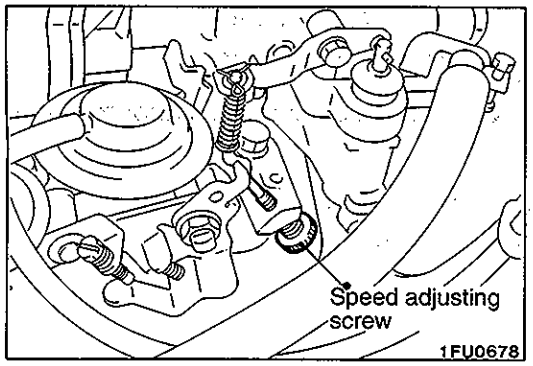
(8) Disconnect the vacuum hose (white striped) from the idle compensator and plug the hose end.
(9) Allow to idle for three minutes or more.



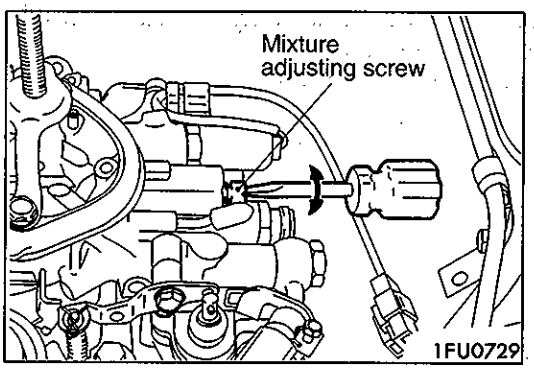
(10) When the CO tester reading has stabilized, check the idle speed and CO contents.

Standard value:
Idle speed
At 0–500 m above sea level
M/T: 850 ± 50 r/min
A/T: 900 ± 50 r/min
At 2,600–3,700 m above sea level
M/T: 750 ± 50 r/min
A/T: 800 ± 50 r/min
CO contents (%)
At 0–500 m above sea level
1.5 ± 0.5%
At 2,600–3,700 m above sea level
6.5 ± 0.5%

NOTE
When the idle speed and CO contents are inspected and adjusted in places which are not at altitudes listed above, compensation will be necessary so that they are within the standard value range when measuring them at specified altitude. Refer to the graph 1 at left for a guide to how much compensation to add.



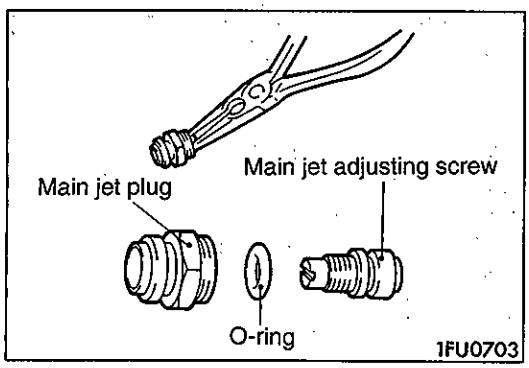
(11)If outside the standard values, adjust the idle speed and CO contents by turning the speed adjusting screw (SAS) and the mixture adjusting screw (MAS).



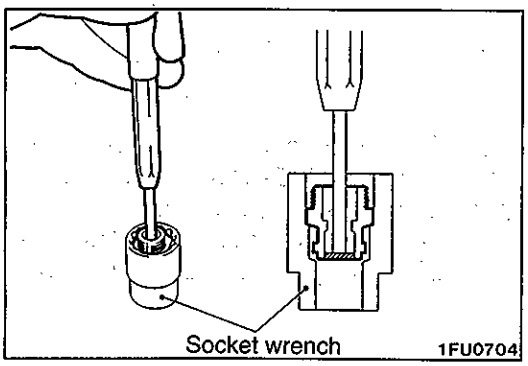
<Adjustment procedures when the main jet requires adjustment>

NOTE
The main jet adjusting screw has been sealed using a plug plate. Remove it as described below before adjustment.

- Hold the main jet adjusting screw with pliers and remove the screw by turning it counterclockwise.



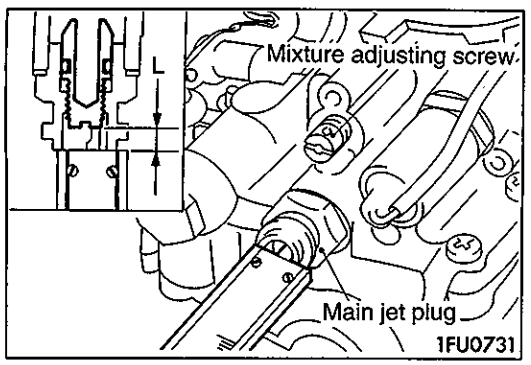
- Insert the main jet plug into a socket wrench (21mm) as illustrated.
- Using a pin punch (diameter of 5 mm), drive out the plug plate.

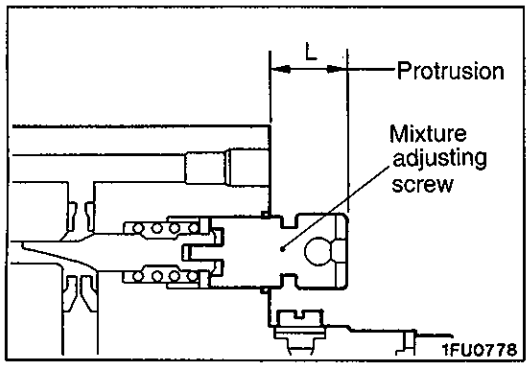


(1) Set the main jet adjusting screw at a position corresponding to the specified dimension (L) below the main jet plug end face.

Standard value (L):

4G13	**3.7 ± 0.7 mm**
4G15	**3.9 ± 0.7 mm**

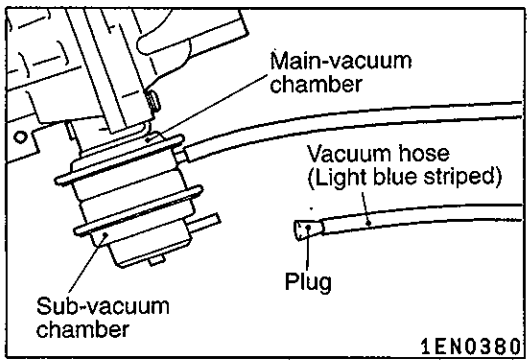




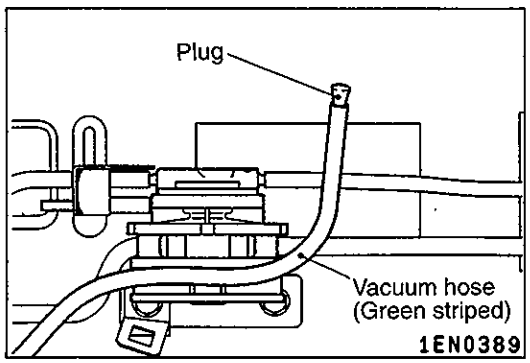
(2) Set the mixture adjusting screw to the specified position.
Standard value (L): 8.5 ± 0.7 mm

(3) Before inspection and adjustment set vehicle in the following condition.
- Engine coolant temperature: 80 – 95°C
- Lamps, electric cooling fan and all accessories: OFF
- Transmission: Neutral (P range on vehicles with A/T)

(4) Set up a timing light and tachometer.
For information regarding the tachometer set up method, refer to P.11-3.

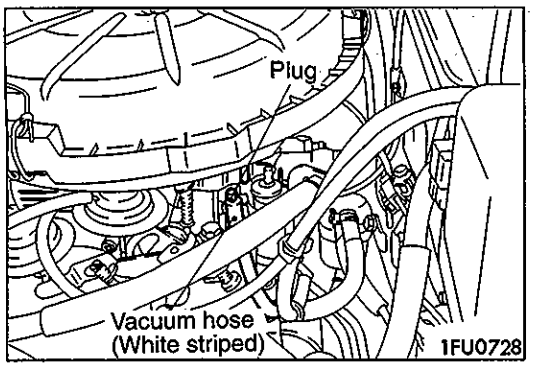


(5) Disconnect the vacuum hose (light blue striped) from the sub-vacuum chamber of the distributor, and then plug the end of the vacuum hose.

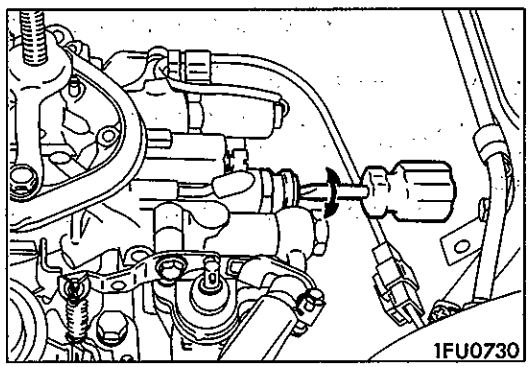


(6) Disconnect the vacuum hose (green striped) from the high altitude compensator and plug the hose end.

(7) Start the engine and run at idle.
(8) Check the ignition timing. If outside the standard value, adjust it.
(9) Set up a CO tester.



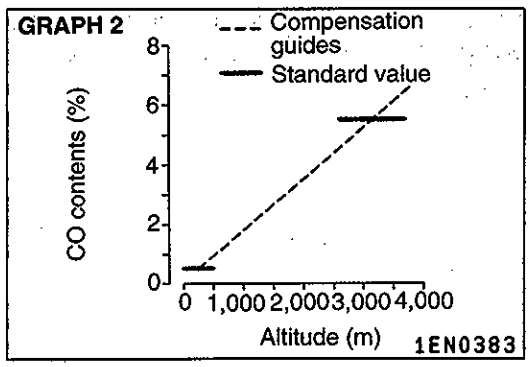
(10)Disconnect the vacuum hose (white striped) from the idle compensator and plug the hose end.
(11)Operate the throttle to adjust the engine speed to 3,500 r/min.



(12)Turn the main jet adjusting screw to adjust CO contents to the standard value.

Standard value:
At 0–500 m above sea level
0.5 ± 0.2%
At 2,600–3,700 m above sea level
5.5 ± 0.2%

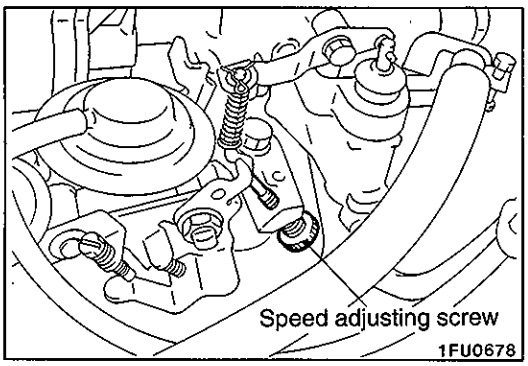
NOTE
1. CO contents decreases by turning the main jet adjusting screw clockwise. CO contents increases by turning the main jet adjusting screw counterclockwise.
2. When the adjustement is performed in places which are not at altitudes listed above, compensation will be necessary. Refer to the graph 2 at left for a guide to how much compensation to add.

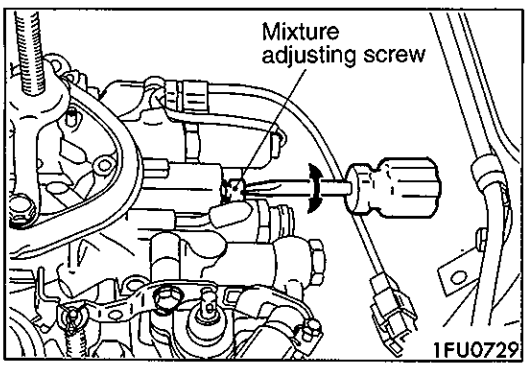


(13)Allow to idle for three minutes or more.
(14)When the CO tester reading has stabilized, check the idle speed and CO contents.

Standard value:
Idle speed
At 0–500 m above sea level
M/T: 850 ± 50 r/min
A/T: 900 ± 50 r/min
At 2,600–3,700 m above sea level
M/T: 750 ± 50 r/min
A/T: 800 ± 50 r/min
CO contents
At 0–500 m above sea level
1.5 ± 0.5%
At 2,600–3,700 m above sea level
6.5 ± 0.5%

NOTE
When the idle speed and CO contents are inspected and adjusted in places which are not at altitudes listed above, compensation will be necessary so that they are within the standard value range when measuring them at specified altitude. Refer to the graph 1 at page 11-5 for a guide to how much compensation to add.





(15)If outside the standard values, adjust the idle speed and CO contents by turning the speed adjusting screw (SAS) and the mixture adjusting screw (MAS).