

24 70

P0300

62 Misfire Detection (Sum Total)

P0301

508 Misfiring, Cylinder 1

P0302

509 Misfiring, Cylinder 2

P0303

510 Misfiring, Cylinder 3

P0304

511 Misfiring, Cylinder 4

P0305

512 Misfiring, Cylinder 5

P0306

513 Misfiring, Cylinder 6

Function

To detect misfiring, the drop in engine speed which results when there is a partial lack of combustion at one or more cylinders is evaluated.

A distinction is made between emission relevant misfiring after start-up, emission relevant misfiring during the journey and misfiring which is damaging to the TWC. (See fault text table on page P - 3).

The engine speed is measured with an inductive sensor that is located above the ring gear on the flywheel. The ring gear is divided into three segments. For detection, the time between two segments is measured and the difference calculated. This difference is corrected by a mean value that is developed over several segments, to compensate for engine speed fluctuations caused by driving conditions. If the corrected value is above a specified threshold value which is dependent on engine speed and engine load, a misfire is detected.

(See also Misfire detection description on pages B - 1 to B - 2).

Diagnosis conditions

A cycle of 1,000 crankshaft revolutions is evaluated (for misfire damaging to the TWC, 200 crankshaft revolutions). The misfire rates are compared with a threshold value. If the misfire rate is greater than the threshold value, a fault is recorded in the memory.

The Check Engine Malfunction Indicator Lamp (MIL) is switched on and stays on when the misfire rate lies above the threshold value at which the emission limit values are exceeded during two consecutive driving cycles.

If the misfire rate may lead to permanent damage to the TWC, the Check Engine MIL flashes. If this misfire rate is subsequently no longer reached, the MIL changes to a continuous light.

Note

When the fuel tank is driven to empty, misfiring can occur. For this reason the fuel level in the tank is also stored in the memory when misfiring occurs. If the tank was empty, there was probably no fault. Erase fault memory and road test vehicle.

In the event of a short circuit to B+ or ground of the oxygen sensors ahead of the TWC, the mixture becomes too lean or too rich. This can cause misfiring. If, in addition, an oxygen sensor signal fault ahead of the TWC is stored in memory, first correct this fault and then road test the vehicle.

DTC No.	Fault conditions	Fault area
P0300	Misfiring in several cylinders	<ul style="list-style-type: none"> - Mechanical causes - Fault in ignition system - Fault in injection system
P0301	Misfiring, cylinder 1	
P0302	Misfiring, cylinder 2	
P0303	Misfiring, cylinder 3	
P0304	Misfiring, cylinder 4	
P0305	Misfiring, cylinder 5	
P0306	Misfiring, cylinder 6	
	Combustion miss	<ul style="list-style-type: none"> - Mixture too rich - Mixture too lean

Note

If the battery was disconnected, at least range 1 must be adapted before troubleshooting is carried out. (See page B - 2 and page E - 6).

Possible mechanical causes of faults**Valve lifter chattering.**

This is caused by dirt in the valve lifter.

When the Check Engine MIL lights up, a chattering valve lifter may also occur for a certain time. The DME control module registers (sporadic) misfiring at one or more cylinders. The mixture adaptation values are normal.

Remedy

1. Remove lifter bores, check for damage and blow out oil passages.
2. Replace all valve lifters (engine installed).
3. During the test drive, listen for valve lifter noises.

Camshaft control badly adjusted.

The camshaft control has changed. No chattering noises occur. The DME control unit indicates misfiring for the entire cylinder bank 1 or 2. The mixture adaptation values in the idle speed range differ in bank 1 and bank 2, the mixture adaptation values in the upper and lower load ranges are generally normal.

Remedy

Carry out raw emission measurement:

- Reset mixture adaptation values (disconnect battery)
- Disconnect oxygen sensors

If the difference between bank 1 and bank 2 is greater than approx. 0.8 %, then

1. Reset camshaft control.
2. Road test vehicle. The mixture adaptation values must be normal.

VarioCam does not switch over completely.

The VarioCam does not switch over completely from power to torque valve timing.

An indication of this problem is misfiring detected by the DME control module in the range of 1200 - 1500 rpm occurring in an entire bank.

The mixture adaptation values are normal.

Remedy

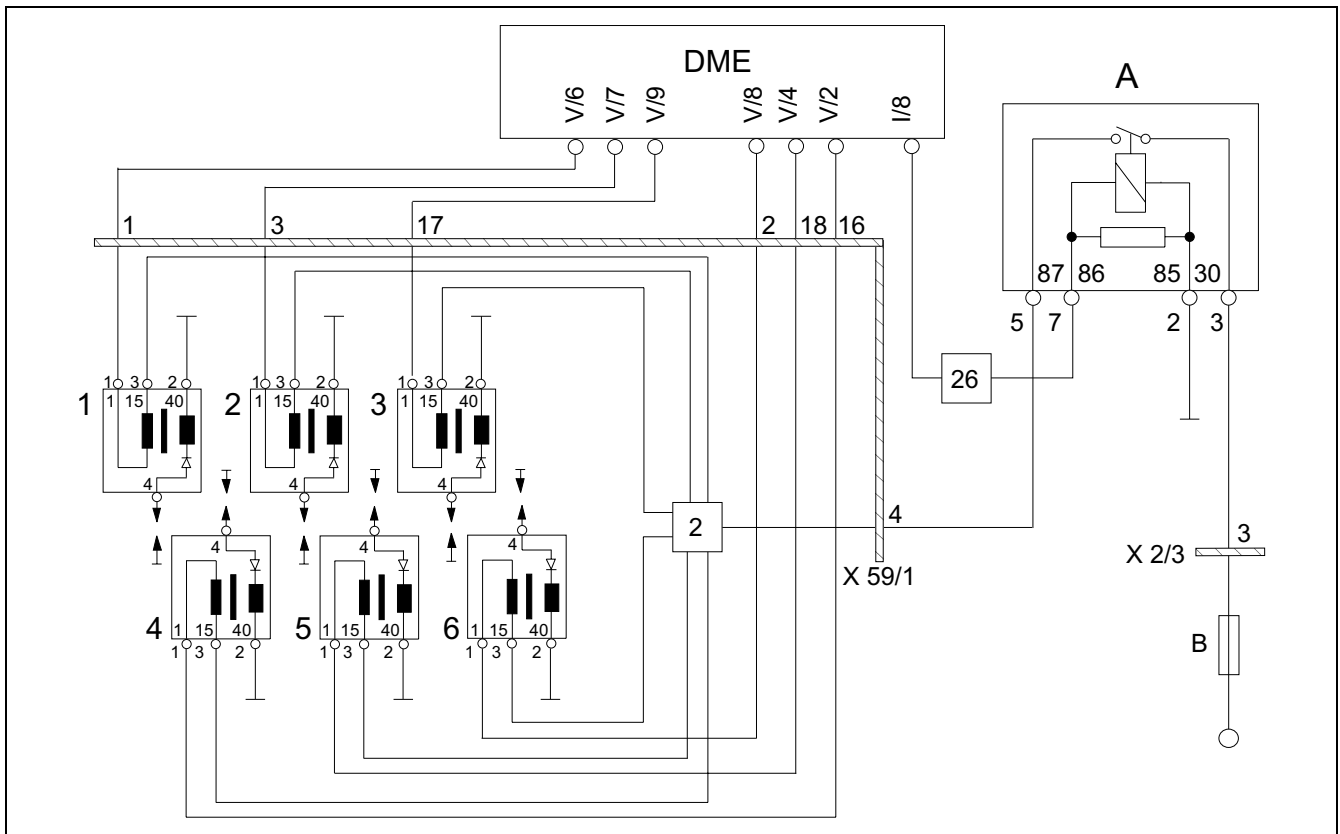
1. Replace VarioCam.
2. Road test vehicle.

Other possible fault causes

- worn camshafts
- leaking valves
- faulty piston rings

If opposing cylinders have misfiring, the cause could be the sensor wheel.

Wiring Diagram



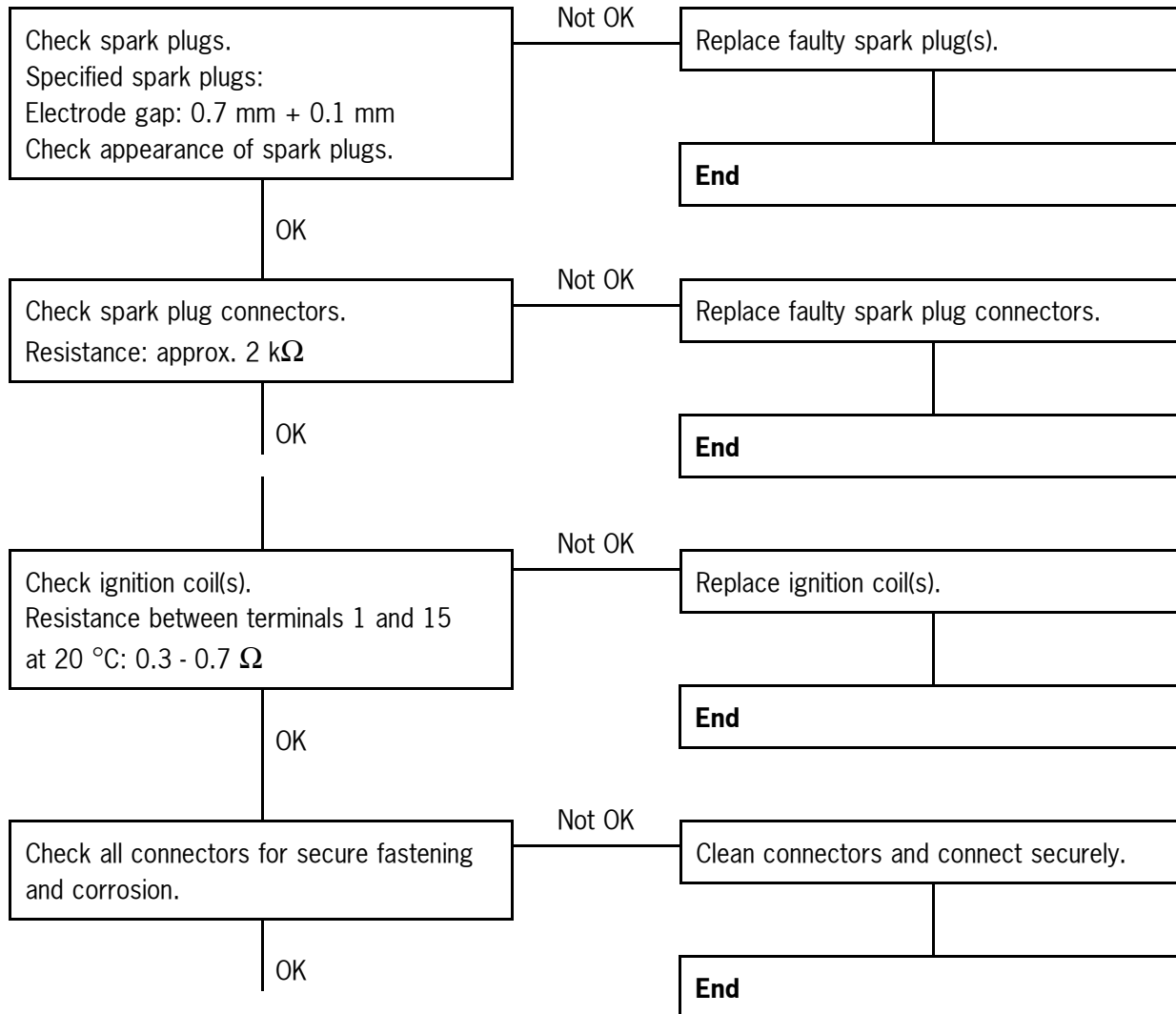
A – Relay for ignition, injection and oxygen sensor heating

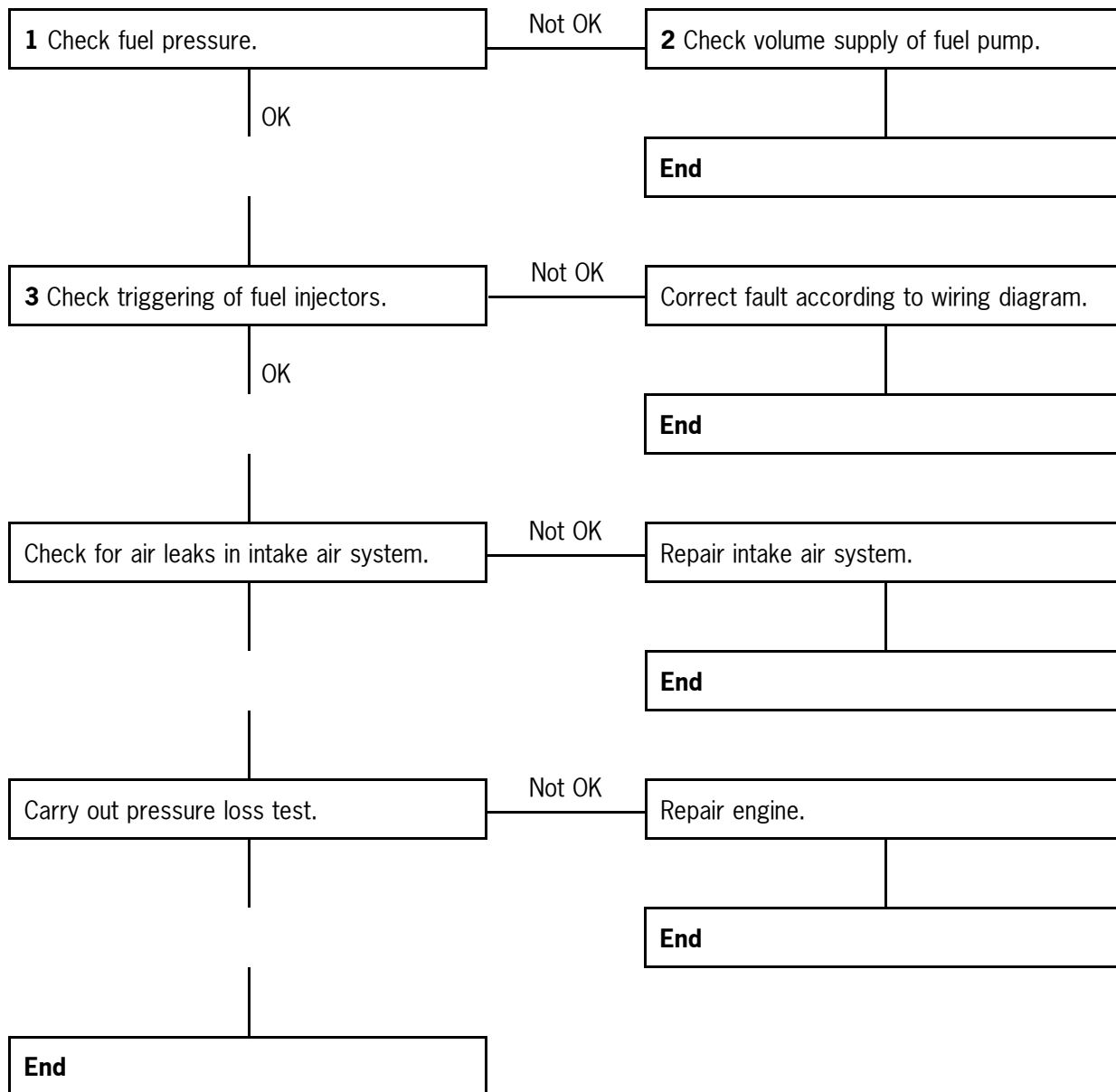
B – Fuse C 2

Note

If there is a lot of oil in the engine, check that the oil filler tube and cap are tight.

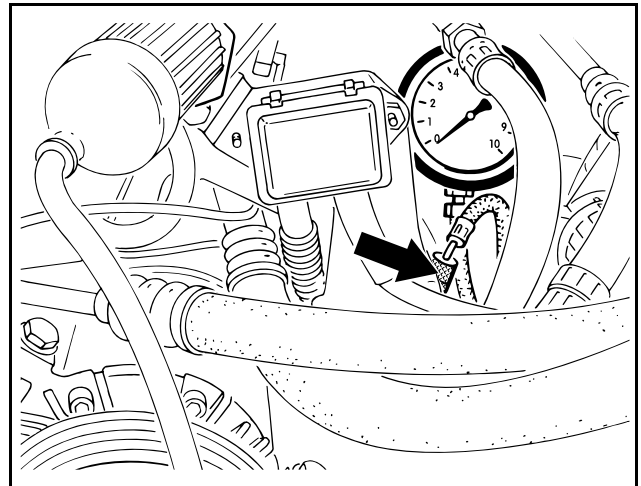
Diagnosis Procedure





1 Check fuel pressure.

1. Undo and remove the closure cap of the fuel collection pipe test connection (A/F 13 mm).
2. Connect pressure gauge (special tool P 378a) to connecting line (special tool 9559) and connect to test connection.

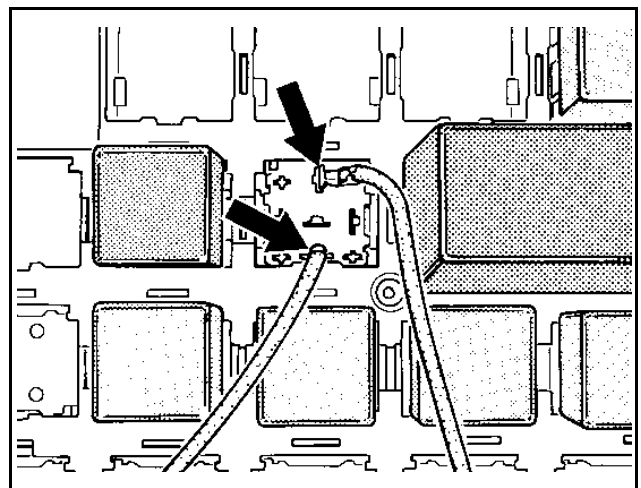


393_97

3. Actuate fuel pump, either
 - **with Porsche System Tester 2**
The fuel pump can be actuated with the Porsche System Tester 2 or by jumpering the fuel pump relay.

or

- **via fuel pump relay without tester**
Disconnect the fuel pump relay from the central electrical system and jumper plug-in contacts 30 and 87 (identification 3 and 5 on central electrical system) with a fused shop-made cable. The fuel pump must now operate or deliver fuel.



366_96

4. Nominal test values

Stationary engine 3.8 ± 0.2 bar

Engine idling 3.3 ± 0.2 bar

Note

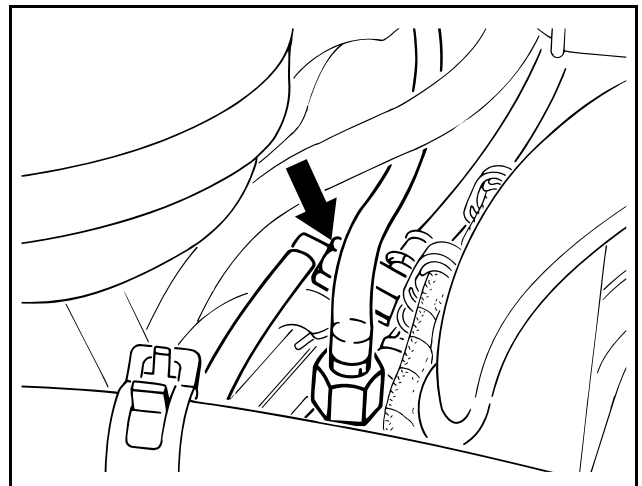
The seal or sealing ring in the brass closure cap is **not** exchangeable. It must therefore be used only **once**.

Tightening torque of new brass closure cap 2.5 ± 0.5 Nm (2.0 ± 0.5 ftlb.).

2 Check volume supply of fuel pump.**Precondition:**

Fuel filter and electrical supply OK.

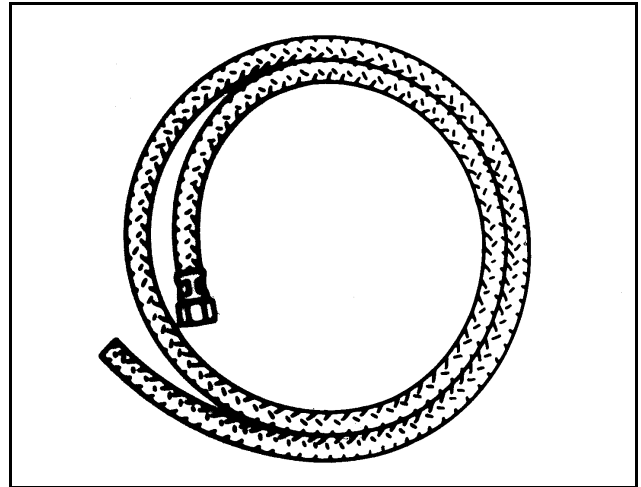
1. Relieve pressure in fuel tank by opening tank cap.
2. Connect Porsche System Tester 2.
3. Remove complete air filter system.
4. Detach fuel return line (A/F 17 mm) from the engine compartment (left), taking care to **hold it fast** (A/F 17 mm). Collect residual fuel. Observe safety regulations.



394_97

5. Connect fuel hose (shop-made, approx. 1.5 meters long) to the fitting and hold in a measuring container.
6. Actuate fuel pump with the Porsche System Tester 2 and allow fuel to flow into the measuring container for 30 seconds.

Quantity supplied must be at least 850 cm³/30 s, i.e. after 30 seconds at least 850 cm³ of fuel must be in the measuring container.



1742_20

Note

It is essential to observe safety regulations for handling fuel.

3 Check triggering of fuel injectors.

The fuel injectors can be individually suppressed with the Porsche System Tester 2 in the menu "Drive link active". The engine idle speed decreases if triggering is OK.

If no drop in rpm can be detected, check triggering as follows:

a) B+ supply

1. Remove connector of fuel injector to be checked.
2. Connect voltmeter to the valve plug contact, terminal 1, and ground using an auxiliary cable.
3. Switch on the ignition.
 Display: battery voltage

If meter does not read battery voltage, check wiring according to wiring diagram for continuity or short circuit.

b) Coil resistance of fuel injectors

1. Remove connector of fuel injector to be checked.
2. With an ohmmeter, measure resistance between terminals of fuel injector.

Display: 11 - 13 Ω

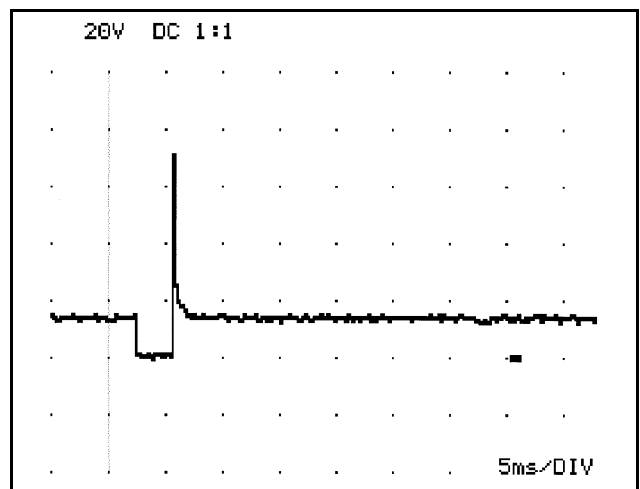
c) Injection output stage (negative supply)

1. Connect special tool V.A.G 1315 A/1 between fuel injector and connector.
2. Connect engine tester according to manufacturer's instructions. Connect cable for special input to special tool.

Caution

Tester cables must not be connected to ground.

3. Start the engine. For a perfectly working injector output stage, the following display must be shown at starting rpm.



77_98

Note

If the engine does not start, or if the idling speed drops, replace tester cable connected to special tool.