

## HOW TO PROCEED WITH TROUBLESHOOTING

The Engine Control System broadly consists of the sensors, Engine Control Module (ECM) and actuators. The ECM receives signals from various sensors, judges the operating conditions and determines the optimum injection duration, timing, ignition timing and idle speed.

In general, the Engine Control System is considered to be a very intricate system to troubleshoot. But, the fact is that if you proceed to inspect the circuit one by one following the procedures directed in this manual, troubleshooting of this system is not complex.

This section explains the most ideal method of troubleshooting and tells how to carry out the necessary repairs.

### 1. CUSTOMER PROBLEM ANALYSIS

Using the customer problem analysis check sheet for reference, ask the customer in as much details as possible about the problem.

### 2. CHECK AND CLEAR DIAGNOSTIC TROUBLE CODE (PRECHECK)

Before confirming the problem symptom, first check the diagnostic trouble code and make a note of any malfunction code which is output, then clear the code.

HINT: Output of the malfunction code indicates that there is a malfunction in the circuit indicated.

However, it does not indicate whether the malfunction is still occurring or occurred in the past and returned to normal. In order to determine this, the problem symptoms should be confirmed in step 4 first and the diagnostic trouble code be rechecked in step [6].

Accordingly, if troubleshooting is begun based on the malfunction code only in diagnostic trouble code check in step [2], it could result in a misdiagnosis, leading to troubleshooting of circuits which are normal and making it more difficult to locate the cause of the problem.

### 3. SETTING THE TEST MODE DIAGNOSIS, [4] PROBLEM SYMPTOM CONFIRMATION, [5] SYMPTOM SIMULATION

In order to find out the trouble more quickly, set the diagnosis check in test mode and with higher sensing ability of the ECM, confirm the problem symptoms. If the trouble does not reappear, use the symptom simulation method to make sure the trouble is reproduced.

### 6. DIAGNOSTIC TROUBLE CODE CHECK IN TEST MODE

Check the diagnostic trouble code in test mode. If the malfunction code is output, proceed to step. If the normal code is output, proceed to step [7].

### 7. BASIC INSPECTION

Carry out basic inspection such as the spark check and fuel pressure check, etc.

### 8. DIAGNOSTIC TROUBLE CODE CHART

If the malfunction code is displayed, proceed to inspect the circuit indicated by the chart for each code.

### 9. MATRIX CHART OF PROBLEM SYMPTOMS

If the normal code is displayed in the diagnosis in test mode, perform troubleshooting according to the inspection order in the Matrix Chart of Problem Symptoms.

### 10. PARTS INSPECTION

When the Matrix Chart of Problem Symptoms instructs to check the parts, proceed to parts inspection section included in this manual.

### 11. CIRCUIT INSPECTION

Determine if the malfunction is the sensor, actuator, wire harness, connector or the ECM.

**12 CHECK FOR MOMENTARY INTERRUPTION**

By performing the check for momentary interruption, the place where momentary interruptions or momentary shorts are occurring due to poor contacts can be isolated.

**13 ADJUSTMENT, REPAIR**

After the cause of the problem is located, perform adjustment or repairs by following the inspection and replacement procedures in this manual.

**14 CONFIRMATION TEST**

After completing adjustment or repairs, confirm not only that the malfunction is eliminated, but also conduct a test drive, etc., to make sure the entire Engine Control System is operating normally.

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**5S-FE ENGINE - HOW TO PROCEED WITH TROUBLESHOOTING**

