DTC	P0 171/25	Fuel Trim System too Lean (Air–Fuel Ratio Lean Malfunction, Bank 1)

DTC	P0 172/26	System too Rich (A/F Rich Malfunction, Bank 1)

DTC	P0 174/25	Fuel Trim System too Lean (Air–Fuel Ratio Lean Malfunction, Bank 2)

DTC	P0 175/26	System too Rich (A/F Rich Malfunction, Bank 2)

CIRCUIT DESCRIPTION

Fuel trim refers to the feedback compensation value compared against the basic injection time. Fuel trim includes short –term fuel trim and long –term fuel trim.

Short–term fuel trim is the short –term fuel compensation used to maintain the air –fuel ratio at its ideal theoretical value. The signal from the heated oxygen sensor indicates whether the air –fuel ratio is RICH or LEAN compared to the ideal theoretical value, triggering a reduction in fuel volume if the air –fuel ratio is rich, and an increase in fuel volume if it is lean.

Long–term fuel trim is overall fuel compensation carried out long –term to compensate for continual deviation of the short –term fuel trim form the central value due to individual engine differences, wear over time and changes in the usage environment.

If both the short –term fuel trim and long –term fuel trim are LEAN or RICH beyond a certain value, it is detected as a malfunction.

DTC No.	DTC Detecting Condition	Trouble Area
P0171/25 P0174/25	When the air fuel ratio feedback is stable after engine warming up, the fuel trim is considerably in error on the LEAN side (2 trip detection logic)	• Gas leakage on exhaust system • Air intake (hose loose) • Fuel line pressure • Injector blockage • Oxygen sensor (bank 1 sensor 1) malfunction • Air flow meter • Water temp. sensor
P0172/26 P0175/26	When the air fuel ratio feedback is stable after engine warming up, the fuel trim is considerably in error on the RICH side (2 trip detection logic)	• Gas leakage on exhaust system • Fuel line pressure • Injector leak, blockage • Oxygen sensor (bank 2 sensor 1) malfunction • Air flow meter • Water temp. sensor

HINT:

- When DTC P0 171 or P0 174 is recorded, the actual air –fuel ratio is on the LEAN side. When DTC P0172 or P0 175 is recorded, the actual air –fuel ratio is on the RICH side.
- If the vehicle runs out of fuel, the air –fuel ratio is LEAN and DTC P0 171/25 and DTC P0 174/25 is recorded.
- If the total of the short –term fuel trim value and long –term fuel trim value is within ± 25 %, the system is functioning normally.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand –held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air –fuel ratio lean or rich, etc. at the time of the malfunction.

When using hand –held tester

1	**Ask customer whether vehicles runs out of fuel.**

YES → **DTC P0 171/25 was recorded because the vehicle runs out of fuel.**

NO

2	**Check air induction system (See Pub. No. RM630E on page FI –1).**

NG → **Repair or replace.**

OK

3	**Check for oxygen sensor (bank 1, 2 sensor 1) data.**

PREPARATION:

(a) Connect the hand –held tester to the DLC3.

(b) Warm up the engine to normal operating temperature.

CHECK:

Read the oxygen sensor (bank 1, 2 sensor 1) output voltage and short –term fuel trim.

HINT:

Read the values for the same bank.

RESULT:

Pattern	Oxygen sensor output voltage	Short–term fuel trim
1	Lean condition (Changes at 0.55 V or less)	Changes at about +20 %
2	Rich condition (Changes at 0.35 V or more)	Changes at about –20 %
3	Except 1 and 2	

3 → **Check for oxygen sensor (bank 1, 2 sensor 1) (See Pub. No. RM630E on page DI –51).**

1, 2

4	**Check fuel pressure (See Pub. No. RM6330e on page FI –1).**

NG → **Check and repair fuel pump, pressure regulator, fuel pipe line and filter (See Pub. No. RM630E on page FI –1).**

OK

5	**Check injector injection (See Pub. No. RM630E on page FI –29).**

NG → **Replace injector.**

OK

6	Check air flow meter and water temp. sensor (See Pub. No. RM630E on page DI–27 and DI–39).

NG → Repair or replace.

OK

7	Check for spark and ignition (See Pub. No. RM630E on page IG–1).

NG → Repair or replace.

OK

8	Check gas leakage on exhaust system.

NG → Repair or replace.

OK

Check and replace engine ECU (See page IN–19).

When not using hand –held tester

1	Check air induction system (See Pub. No. RM6330e on page FI –1).

NG → Repair or replace.

OK

2	Check fuel pressure (See Pub. No. RM6330e on page FI−1).

NG → Check and repair fuel pump, pressure regulator, fuel pipe line and filter (See Pub. No. RM630E on page FI−1).

OK

3	Check injector injection (See Pub. No. RM630E on page FI−29).

NG → Replace injector.

OK

4	Check air flow meter (See Pub. No. RM630E on page DI−27).

NG → Repair or replace.

OK

5	Check water temp. sensor (See Pub. No. RM630E on page DI−39).

NG → Repair or replace.

OK

6	Check for spark and ignition (See Pub. No. RM630E on page IG−1).

NG → Repair or replace.

OK

7	**Check gas leakage on exhaust system.**

NG → **Repair or replace.**

OK

8	**Does malfunction disappear when a good oxygen sensor installed?**

YES → **Repair oxygen sensor.**

NO

Check and replace engine ECU (See page IN−19).