TECHNICAL BULLETIN

JAGUAR SERVICE	DTCs P1176, P1177, P1178, P1179 – Adaptive Fuelling System – Diagnostic Procedure MODEL 1995-96 XJS (4.0L) Range DATE 11/97	18-53

ISSUE:

The adaptive fuelling system operates within predefined adaption limits to maintain an optimum performance level. Both the Fuel Mass Flow Rate (FMFR) and the Air Mass Flow Rate (AMFR) are monitored by the ECM to ensure they stay within the adaption limits. However, if a fuelling system problem occurs and the adaption limits are exceeded, a Diagnostic Trouble Code (DTC) is then stored in the ECM. The engine Malfunction Indicator Lamp (MIL) will illuminate to report the presence of the DTC. The MIL will stay illuminated until the DTC has been cleared using the PDU.

The flow charts which accompany this bulletin are provided to assist in diagnosing the above DTCs. Each DTC is represented by an individual flow chart which is used in conjunction with PDU.

ACTION:

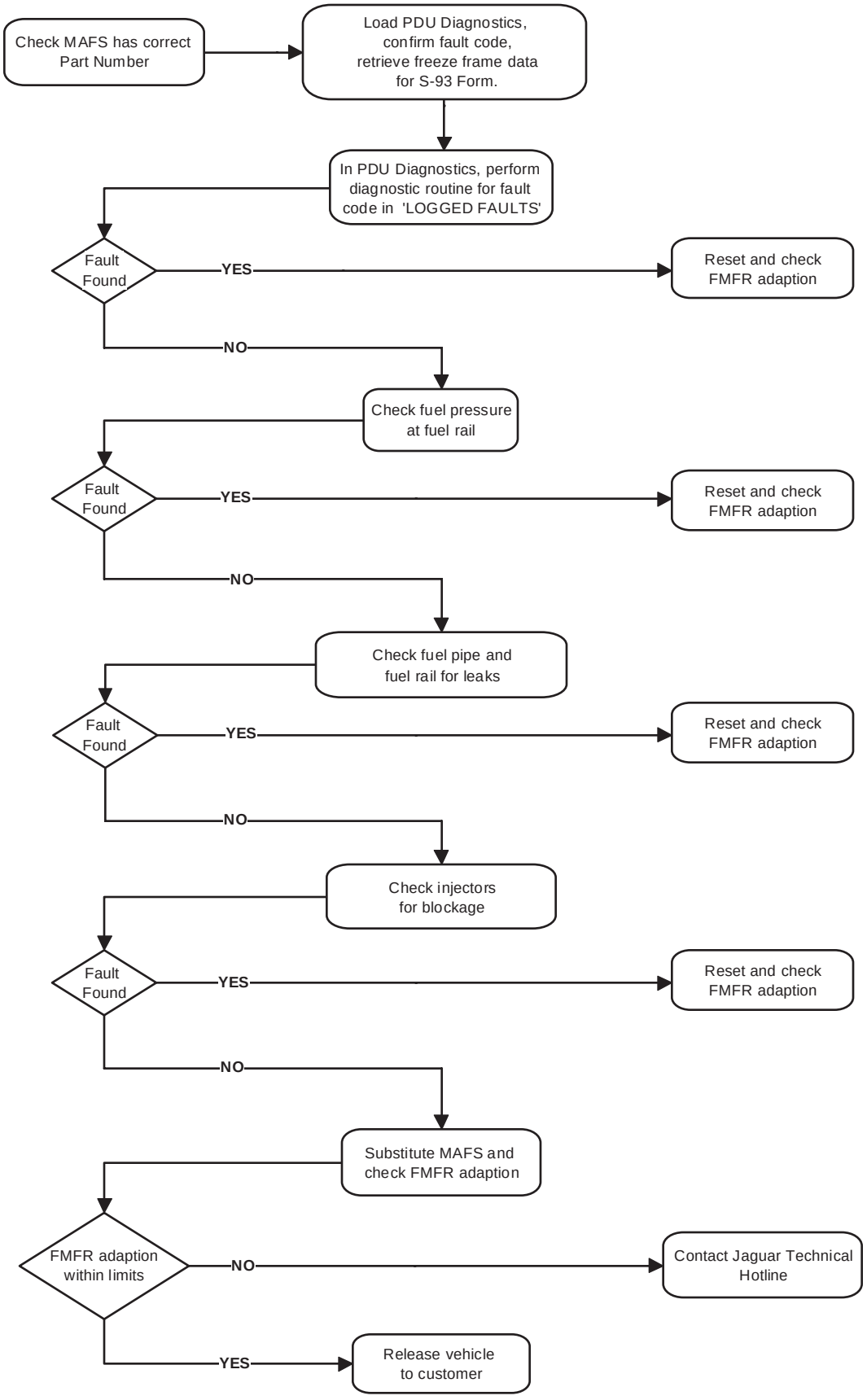
> **Note**: It is unlikely that replacing the mass air flow sensor (MAFS) will rectify the above DTC problems.

If one or more of the above DTCs are stored in the ECM, then the PDU should be used to identify and clear the DTC(s). After identifying the DTC(s) use the appropriate diagnostic flow chart to diagnose the fault.

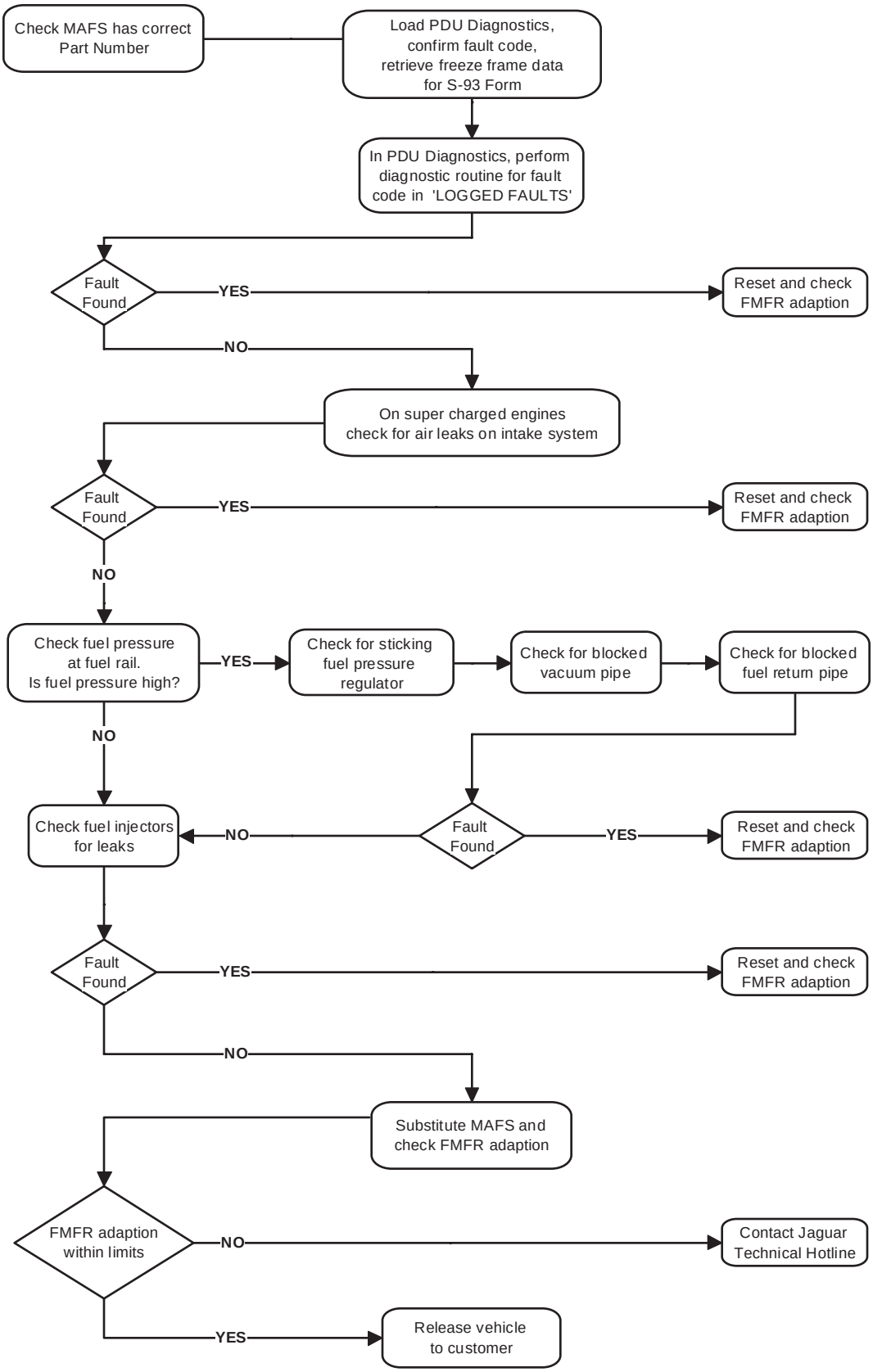
After repairing a fault described in the flow chart, complete the next flow chart instruction to 'Reset and Check AMFR adaption' or 'Reset and Check FMFR adaption' to determine if the fault has or has not been successfully repaired. It is not necessary to check or reset adaptions if no faults are identified. Resetting and checking the AMFR and FMFR adaptions is achieved by following the procedure on page 6.

> **Note:** After completing Form S-93 send it to:
> Product Investigation
> Fax Number (201) 818-9763.

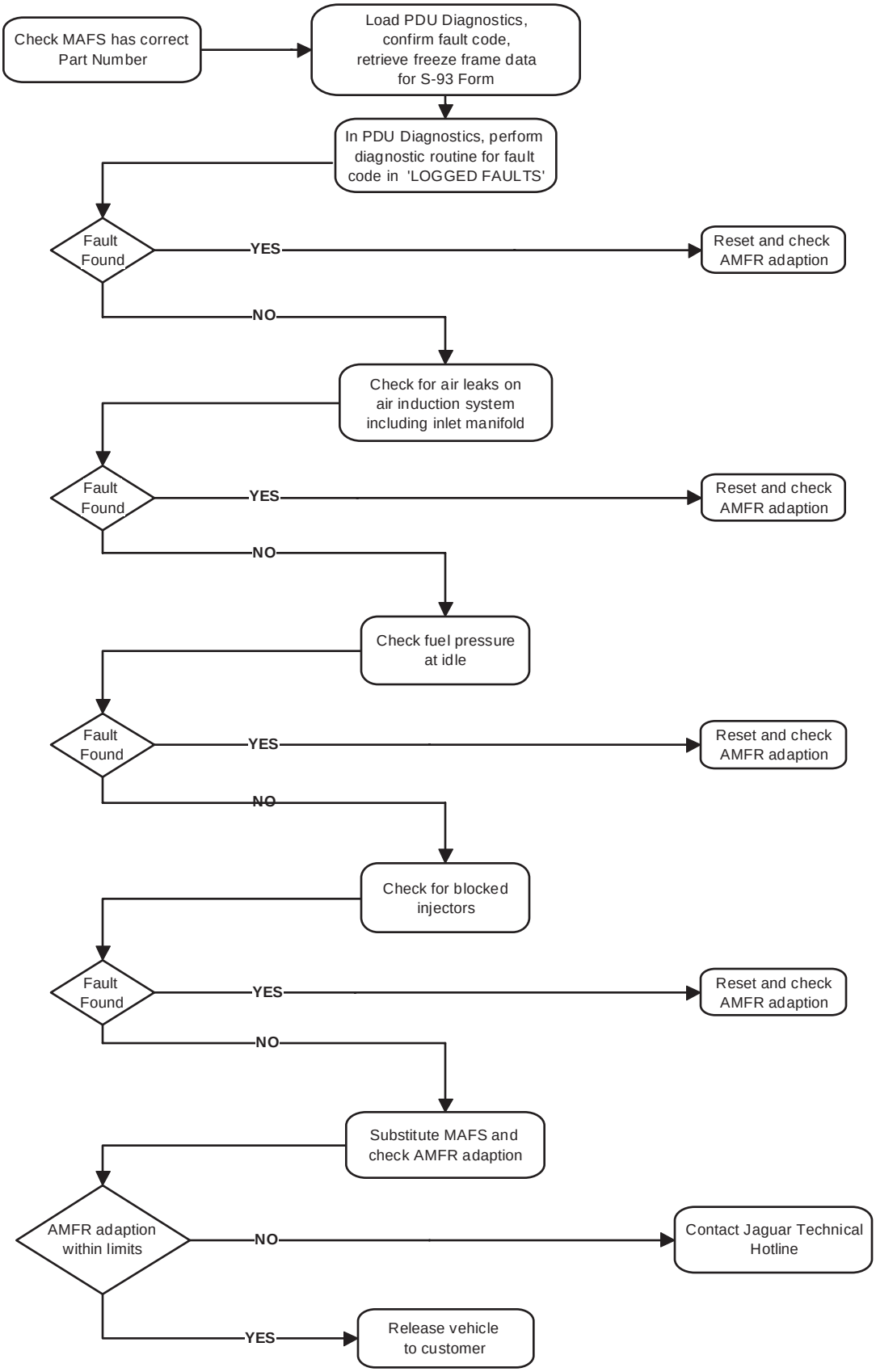
OBD II - DTC **P1176** - lean fuelling trim - long term (FMFR)



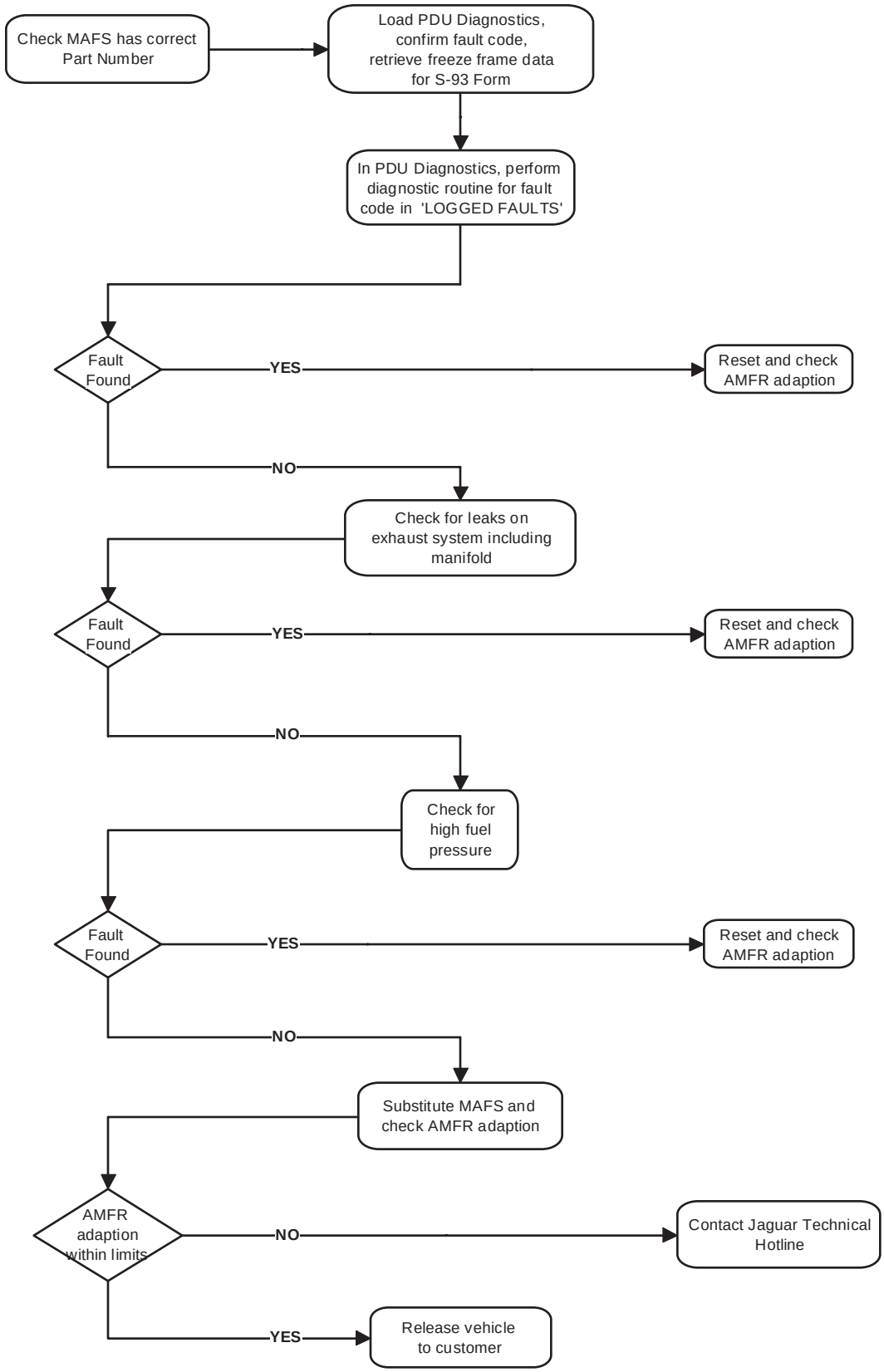
OBD II - DTC **P1177** - rich fuelling trim - long term (FMFR)



OBD II - DTC **P1178** - lean fuelling trim - long term (AMFR)



OBD II - DTC **P1179** - rich fuelling trim - long term (AMFR)



PROCEDURE TO CHECK AND RESET ADAPTIONS

- Run engine at normal operating temperature.
- Load disc PDU 1055 into the PDU at the base station.

  (PDU Disc 1055 has the capability of reading the long term fuelling trim adaptions.This facility will confirm whether AMFR and / or FMFR are running at mixture that is too lean or too rich.These values are found in the PDU data-logger facility.)
- Select DIAGNOSTICS from the main menu.
- Enter VEHICLE DETAILS.
- Select TOOLBOX from the DIAGNOSTICS MAIN MENU.
- Select POWERTRAIN from theTOOLBOX MAIN MENU screen. The information screen will request that the PDU is connected to the vehicle.
- Select DATALOGGER from the PDU tools function.
- In DATALOGGER clear the default parameters and then select 'AMFR', 'FMFR', 'CLV' (Calculated engine Load Value), and RPM (Illustration 1).
- Select bar chart form, this will enable viewing of the adaption values, and act as an accurate monitor of the RPM.
- Note and record the AMFR adaption and FMFR adaption displayed values.
- Return to the PDU base station and load RESET ADAPTIVE VALUES from the TOOLBOX menu screen.
- Connect the PDU to the vehicle and reset the adaptive values.
- Return to the PDU base station and reload DATALOGGER from the POWERTRAIN option of the toolbox menu screen.
- Continue with the procedure in 'Drive Cycle' on the next page.

DATALOGGER SCREEN SET TO NEEDED PARAMETERS

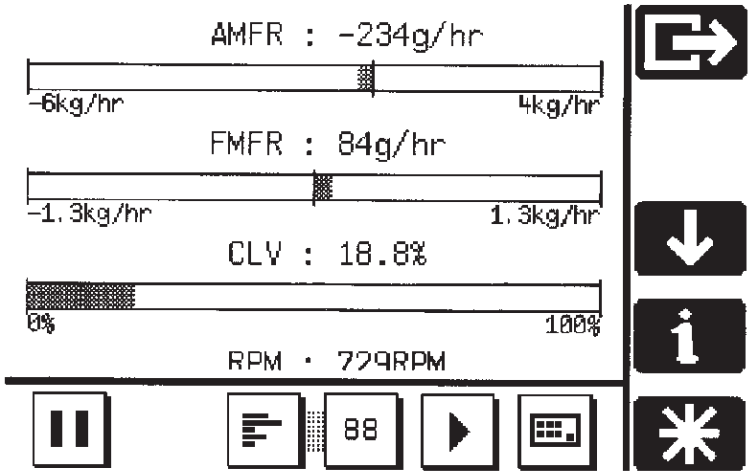


ILLUSTRATION 1

DRIVE CYCLE

To enable the AMFR adaption and/or FMFR adaption to reset, the following preconditions must first be obtained:

- Air intake temperature must be between, 10 deg C and 55 deg C.
- Engine coolant temperature must be between, 80 deg C and 100 deg C.

Illustration 1 shows a view of the PDU screen in bar chart form with the relevant conditions and typical values for an engine in good fuelling order.

> **Note:** Where values are less than 1 kg/hr, the PDU display will show the values as g/hr, for example, 500 g/hr rather than 0.5 Kg/hr. (Illustration 1).

Air Mass Flow Rate (AMFR) adaption

The AMFR adaption value should be no lower than -4.2 kg/hr and no greater than +2.8 kg/hr for both normally aspirated and super charged engines.

> **Note:** Where values are less than 1 kg/hr, the PDU display will show the values as g/hr, for example 500 g/hr rather than 0.5 Kg/hr. (Illustration 1).

Allow the vehicle to idle until the AMFR adaption value changes and then stabilizes; if the adaption is within the above values then the previous flow chart repair has been successful. If the adaption is still outside of the above values then continue to follow the flow chart until the fault is found.

After the completion of each flow chart repair, dump the trace snapshot into the trace buffer; which can then be printed out and be used for Warranty Audit Purposes.

Fuel Mass Flow Rate (FMFR) adaption

> **Note:** For accurate results the FMFR adaption must be performed immediately after AMFR adaption; do not switch engine off, or disconnect the PDU.

The FMFR adaption should be between +700 g/hr and -700 g/hr for normally aspirated engines, and between +1.4 kg/hr and -1.4 kg/hr for super charged engines.

> **Note:** Where values are less than 1kg/hr, the PDU display will show the values as g/hour, for example 500 g/hr rather than 0.5 Kg/hr. (Illustration 1).

Drive the vehicle at a steady speed, between the RPM and the engine load values for the model year stated below, until the FMFR adaption value changes and then stabilizes. Obtain the correct engine load and RPM balance by driving on a highway with 3rd gear (manual) selected at the stated RPM, while applying slight pressure to the foot-brake to maintain engine load.

> ⚠ **Warning**: For safety reasons the FMFR adaption process must be performed by two persons: Driver, and Passenger - to monitor the PDU and advise the driver of when the engine is being driven between the RPM and engine load values stated below.

1995 MY: engine speed 1500 to 3000 RPM; engine load 27.3% to 40%.
1996 MY: engine speed 2000 to 3000 RPM; engine load 23.4% to 40%.

When performing the FMFR adaption drive cycle, the stated RPM and engine load values must be adhered to, otherwise the adaption will stabilize at the incorrect value.

When the FMFR adaption value has changed and stabilized, and the adaption is within the above stated adaption values, then the previous flow chart repair has been successful. If the adaption is still outside of these values then continue to follow the flow chart until the fault is found.

After the completion of each flow chart repair, dump the trace snapshot into the trace buffer, which can then be printed out and be used for Warranty Audit Purposes.