GASTEC

FUEL PROCESSOR MODEL FP30 (Australian Specifications)

Suitable for 1.3 to 6.2 litre vehicles

Thankyou for purchasing the latest fuel processing equipment from Gastec. The FP30 is sold in many countries of the world as its performance outstrips that of other manufacturers. Fuel Processors are required by law in all states of Australia to ensure that the exhaust emissions comply with ADR37/00 (or later) and AS 1425. Fuel Processors can generally only be fitted to EFI vehicles that run on unleaded fuel. These vehicles must contain an oxygen sensor in the exhaust.

The FP30 is a full closed loop (lambda) processor requiring both oxygen sensor and throttle position sensor inputs (an interface is available for connection to vehicles with NO TPS sensor). The installer has the option of allowing the Fuel Processor to run in either closed or open loop mode at idle. The Processor is designed to meet later ADR requirements, and therefore operates in full closed loop mode even under full load conditions. The Processor has oxygen analysis on board to indicate to the installer when the vehicle is running rich or lean.

The processor incorporates a high quality stepper motor (CV30) to control the gas mixture accurately via a 90 degree rotational barrel. This valve operates continually whilst driving on LPG or CNG. It rotates slowly unless it receives an increased load signal from the throttle position sensor (in which case it opens very much faster).

WIRING CONNECTIONS

The FP30 comes with two looms with snap connectors.

The first loom is a four core one metre loom. It has a four way square connector which plugs directly into the CV30 (mixture control valve). The CV30 should be installed in the vapour line in place of the manual high speed adjuster (or power valve). Install it close to the gas mixer for performance reasons. Do not install it near large amounts of radiated heat, particularly around the exhaust manifold.

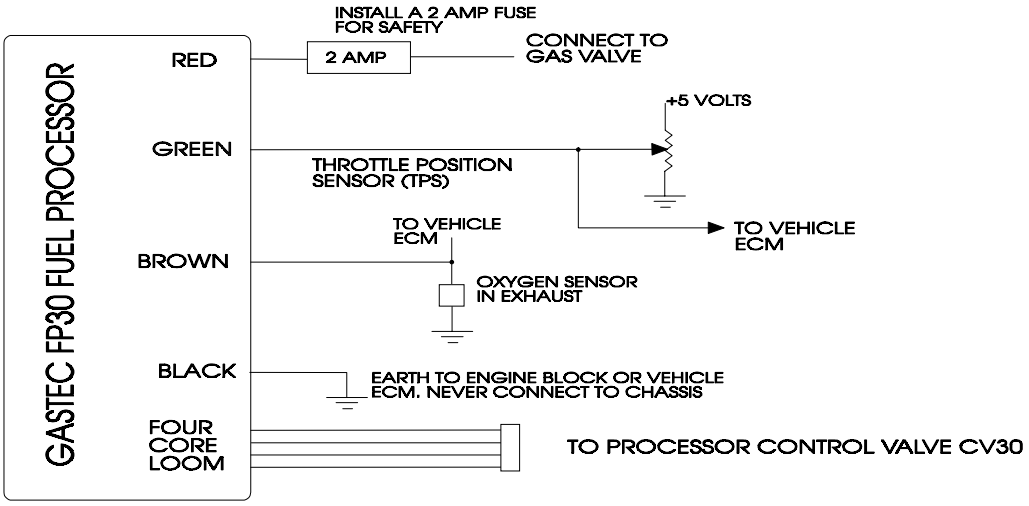
The second loom is longer with four wires for connection to the vehicles wiring loom as described below.

Red wire
This wire should be connected to the +12 volt side of the gas switch (or the wire which drives the gas valves if an automatic change-over switch is fitted). This wire should only be powered up when the driver wishes to run the vehicle on gas. The power supplying the gas/petrol switch should come from a "clean" power source (ie the ignition switch) **NEVER** from the positive side of the coil. This red wire should be protected with a 2 Amp fuse (not supplied) to comply with automotive safety requirements.

Black wire
This should either be connected to the vehicles OEM computer earth (preferable) or to the engine earth. The vehicle CHASSIS MUST NOT BE USED as the FP30 must be referenced to the oxygen sensor correctly. Do not earth this wire close to electrical noise generators such as high tension wires or alternators.

Green wire
This should be connected to the throttle position **sensor** (NOT the throttle position **switch**). This sensor should, with the throttle at idle, read approximately 0.4 to 1.1 volts. When the throttle is slowly depressed the voltage should slowly increase to around 3.5-4.5 volts. If the vehicle does not contain a suitable sensor as described, contact your authorised Gastec distributor for further information on the NTPS throttle interface unit before proceeding.

Brown wire
This wire should be connected to the oxygen sensor output wire (not the earth or the +12 volt heater winding).



OPERATION

Through the top lexan screen you should observe 4 lights (5 lights for the FP30 with petrol start operation). You will need to gently peel this screen up using a small screwdriver. A notch is located on the left hand side of the screen for this purpose. This will allow you to carry out the adjustments as described below.

Red light
The processor contains a potentiometer on the **left hand side** (under the screen). If you wish to operate the vehicle in **open loop mode at idle** rotate the potentiometer slowly clockwise (with the vehicle idling on gas) until the red light **just comes fully on.** This will then hold the CV30 fully open at idle. This will reduce the likelihood of backfire on hard acceleration from idle and will increase the performance when accelerating from idle. Some vehicles will show the engine management light when coasting down hills. These vehicles must have the potentiometer rotated fully anti-clockwise (ie red light off at idle) to ensure the engine runs in closed loop mode at all times. The red light must not flicker when the vehicle is above idle with a constant throttle.

Green light
The green light should come on when the accelerator is depressed quickly. This indicates an increasing load condition to the processor. The processor will now open the CV30 at a much faster rate than normal to ensure excellent performance. The green light will stay on for varying times depending on how far and how fast the accelerator is depressed. The green light must not flicker when the vehicle is above idle with a constant throttle.

Left orange light

The left orange light indicates that the engine is running LEAN (ie not enough gas).

Right orange light
The right orange light indicates that the engine is running RICH (ie too much gas).

When the **RED or GREEN lights are lit**, the orange **rich light** should be **predominantly on** also (ie the CV30 is being held open). **When above idle, with no GREEN or RED lights on, the two orange lights should toggle back and forth.** This indicates that Lambda (or stoichiometric) region is being maintained.

TUNING THE GASTEC FP30 FUEL PROCESSOR

PLEASE FOLLOW THESE EASY TUNING INSTRUCTIONS TO ENSURE MAXIMUM PERFORMANCE AND ECONOMY IS ACHIEVED

1. Before starting the vehicle, disconnect the CV30 loom from the processor. Leave this loom disconnected and ensure the terminals do not touch any other wires or the chassis. The CV30 is shipped from the factory fully open allowing correct adjustment of the power valve and the idle adjustment screw on the convertor. If the vehicle has previously been started, operate the vehicle on gas and allow to idle. While idling, rotate the potentiometer on the left-hand side of the FP30 (under the lexan screen) until the red light just comes fully on. Wait for the valve to fully open, which may take up to 10 seconds. Turn off the engine and then disconnect the CV30 loom as described above.

2. Now start the vehicle and changeover to run on gas. Follow the tuning instructions set out below, still with the CV30 disconnected.

3. AFTER DETERMINING THAT THE ENGINE IS IN GOOD CONDITION, rev the motor to approximately 2500 rpm with no load being applied (ie in neutral). Now adjust the power valve (the large screw adjustment on the CV30) until the mixture is CONSTANTLY JUST RICH. Now allow the engine to fall back to idle before unscrewing the power valve 1/4 of a turn further. Rev the vehicle several times from idle and observe the processor lights. The lean light should not come on at all or should only come on for 1/4 of a second or less (while accelerating). If the lean light comes on for more than 1/4 of a second then unscrew the power valve another 1/4 of a turn and test again. Continue this process until the lean light is lit for 1/4 of a second or less. Now tighten the locking ring on the power valve. This then sets the maximum richness point. The CV30 will then lean the mixtures from this point.

4. Now adjust the idle mixture (still with the CV30 disconnected) to obtain a JUST RICH reading (the rich light on the processor should be on). Ensure the engine runs smoothly with the air-conditioning on, lights on, the wheels turned to the full lock position (if power steering is fitted) and with the automatic transmission (if fitted) in DRIVE (obviously with your foot securely on the brake).

5. Turn of the engine. Reconnect the CV30.

6. Restart the engine again and operate on gas. To check that the CV30 is operating correctly, rev the vehicle to approximately 2000 rpm and observe the rich and lean lights. The two orange lights should toggle back and forth.

7. Now adjust the potentiometer on the left-hand side of the processor as described earlier in the section titled RED LIGHT, and then confirm the GREEN light operation as described in the section titled GREEN LIGHT.

8. Check that the vehicle idles smoothly, if not, check the status of the mixture lights on the FP30. If the idle becomes "lumpy" while either the rich or the lean lights are lit, then readjust the idle mixture screw on the convertor.

NOTES

For **EA to EL Ford Falcon**, adjust the LHS red light to just come on at idle.
For **VN to VS Holden Commodore**, adjust the LHS red light to the off position or the engine management light will come on when coasting down hills.

LPG contains only 26 Megajoules of energy per litre compared with 32 Megajoules for Unleaded Petrol. To ensure maximum power while accelerating the FP30 will allow the engine to run richer on LPG. This is governed by the TPS sensor. Note that the continual stabbing of the accelerator may cause the engine management light to come on in some vehicles.

FP30 OPERATIONAL PROBLEMS AND HOW YOU MIGHT CURE THEM

FP30 LEAN LIGHT IS ON ALL THE TIME

Firstly ensure the oxygen sensor is hot and operational. Then unscrew the power valve almost all the way. Confirm that the lean light is still on. Now confirm that the CV30 is in fact fully open. To do this allow the vehicle to run on gas at approximately 1500 rpm for 10 seconds. After 10 seconds have elapsed turn the engine off immediately (do not allow the engine to return to idle before switching off) and remove the power valve (CV30) completely. Check that the rotational barrel in the valve is fully open (so the gas can pass through the slot in the middle).

IF THE PISTON IS IN THE FULLY OPEN POSITION the problem lies with the mechanical gas system, not the FP30. Areas to examine would be: A/ the correct mixer is fitted to the vehicle, B/ no air leaks exist in the vehicle's intake system, including around the mixer, C/ the vapour hose has not collapsed inside or is kinked, D/ the convertor is delivering gas without fault, E/ the tank has a useable amount of gas and the excess flow valve has not triggered..

IF THE BARREL IS NOT IN THE FULLY OPEN POSITION the problem is likely to be a wiring fault or the processor or valve itself. Check the following: A/ the fuel processor is earthed to the engine or the vehicles ECM and not the vehicle chassis, B/ the loom connector to the CV30 is fully plugged in, C/ ensure you have connected the brown wire to the oxygen sensor output wire, D/ check that the oxygen sensor is operational. If the above areas have been checked carefully, change the CV30. If the problem remains change the FP30.

FP30 RICH LIGHT IS ON ALL THE TIME

Check that the FP30 is earthed to the engine or ECM not the chassis. Ensure that the oxygen sensor wire is not connected to the oxygen sensor heater wire. This will give a constant rich reading while the oxygen sensor is being electrically heated. On some vehicles the heater wire will contain +12 volts for several minutes. If the heater is turned off when the sensor is hot the FP30 will then read a constant lean signal from this time on.

Check that the red idle light on the processor is not on (unless you require the vehicle to run open loop at idle). If the red light is on above idle, rotate the potentiometer on the left hand side of the FP30 (under the lexan screen) until the red light just goes out. If you are unable to turn the red light off, the throttle position sensor may be worn or you may have chosen an incorrect TPS wire.

Check that the green "accel" light is not on, and that it is not flashing while at idle or while at constant revs. If so, check that you have the correct TPS output wire. You may have connected up to the TPS earth wire or to a throttle position **switch** (which does not give a slow rising voltage on acceleration). If the vehicle does not contain a suitable TPS sensor then an optional device, the NTPS should be fitted. Contact your GASTEC distributor for further advice on the NTPS. The minimum TPS voltage at idle (to operate the FP30 correctly) is 0.35 volts and at maximum TPS voltage with the accelerator fully depressed (to operate the FP30 correctly) is 7.95 volts. If the voltage lies outside this region then you will need to fit the NTPS device.

Finally check the CV30. At revs ensure that you can lean the mixture by screwing in the power valve. Check that the CV30 is actually fully closed. To do this, run the vehicle at 1500 rpm for 10 seconds (operating on gas). Immediately stop the engine and remove the CV30 power valve. If the rotational barrel is fully closed then problem does not lie with the fuel processor. Check the convertor. If the rotational barrel is in the fully open position then replace the CV30. If the rotational barrel remains fully open replace the FP30.

PETROL START OPTION (model FP30-PS)

If the processor has the **petrol start** option built in please follow the instructions below to ensure easy starting. To determine if the petrol start option is fitted, gently lift the lexan screen. A second potentiometer has been installed on all **PS** optioned processors.

The FP30-PS has an injector relay built in. Connect the +12 volt injector feed to the left-hand terminal. Connect the injectors to the right-hand terminal (viewed when reading the lettering on the lexan screen the correct way).

The actual **injection time** is indicated by the **red LED** on the **right hand side** of the processor. This red LED operates when the gas valves open (or when the vehicle is being operated on petrol). The injection time is fully adjustable via a potentiometer located immediately adjacent to this led.

To increase to amount of injection turn the pot clockwise. To decrease the injection time turn the pot anticlockwise.

NOTE:- the injectors may be connected either way through the relay however if they are not connected as described above the red led may not be a true indication of injection time.

If vehicle flooding is experienced when the engine is warm, please advise the customer to wait for half a second after turning on the ignition before commencing to crank the engine. This will in effect, reduce the amount of petrol injection by approximately half a second. Advise the customer to crank immediately after turning on the ignition when the engine is cold to ensure full petrol start occurs.