

Engineered Quality Alternate Fuel Equipment

Dual Start Fuel Control
(Model DS100)

Installation Instructions

Features :

- Provides petrol start and automatic changeover.
- Provides prime of both petrol and gas systems.
- Fail-safe – petrol system enabled with no power on device.
- Safety cut-out incorporated.
- Disables starting with foot on throttle, avoiding backfires.
- Cycles petrol pump periodically to keep injectors clean.
- Tacho input compatible with ECU tacho output (recommended), HT pickup, or coil (-ve) pickup.
- Microprocessor controlled.
- LED indicators for gas valve operation (green), petrol system enable (yellow) , and diagnostics (red).



DS100 Package Contents

Overview of Operation :

When the changeover switch is set to gas :

Turning the ignition to "ON" will provide a 2 second prime of the petrol system by enabling the fuel pump, and a 0 - 3 second prime (depending on DIP switch settings) of the gas system. As soon as the ignition is turned to "START", the DS100 will check the position of the throttle, and disable the starter if the throttle is depressed past the set point (see setup instructions). The gas and petrol systems are enabled as soon as pulses are detected on the tacho input. The petrol hold on will continue for the programmed time (as set on DIP switches), and the gas will stay on as long as pulses are detected on the tacho input. The gas system will be shut off approximately half a second after pulses on the tacho input stop. Note that the petrol start only begins when pulses are detected, so the petrol start is not lost if the engine is not started immediately after ignition is turned on. The DS100 can also be set (using DIP switch 5) to enable the petrol pump for two minutes, every fifteen minutes, to keep the injectors clean.

When the changeover switch is set to petrol :

If the DS100 has power when the changeover switch is set to petrol, the gas system is disabled, the starter motor is enabled (regardless of throttle position), and the fuel pump and injectors are also enabled.

In addition, when changing from petrol to gas whilst running, the petrol hold on will occur to smooth out the transition.

Installation and Setup :

Table 1 shows the connections to the DS100 in the loom provided.

Pin Number	Wire Colour	Function	Comments/Description
1	Red	+12V (Ignition)	Power for DS100
2	White/Blue	TPS	Taken from ECU input
3	Black	Chassis Ground	Power Ground. Must be separate to pin 14
5	Green	Gas Valve	Drives the gas lockoff solenoid(s) (up to 8).
6	Grey	Tacho input	Connect to tacho output of ECU
7	Brown	Fuel Pump Relay NC	Use these connections to disable the fuel pump. See wiring diagram for suggested circuit.
8	Purple	Fuel Pump Relay COM	
9	White	Fuel Pump Relay NO	
10	Red/Blue	+12V (Gas)	Petrol/Gas selector input. Connect to Gas side of changeover switch
14	Black	Chassis Ground	Signal Ground (see pin 3)
16	Yellow/Black	Starter Motor Relay	This relay is used to disable the starter motor relay. Do not use to disable the starter motor itself.
17	Yellow	Starter Position of Ignition Switch	
18	Pink	Injector Relay NO	This relay can either switch the injector power supply, or power relays to disable each injector.
19	Blue	Injector Relay COM	
20	Orange	Injector Relay NC	

Table 1

Notes on wiring installation :

1. Whilst the tacho pickup is compatible with HT and direct coil pickups, it is recommended that the tacho input be taken from the ECU's tacho signal.
2. If using a HT or direct coil pickup for the tacho input, avoid running the tacho (grey) wire in a bundle with the other wires to the DS100.
3. There are two ground wires in the loom provided. These must both be connected directly to the chassis ground, and NOT connected together. If they are connected together there will be errors in reading the TPS and this will result in inconsistent operation of the starter motor disabling function of the DS100. The ground wires may however be shortened.

Setting the DIP switches (Petrol Hold-On, Gas Prime Times, and Fuel Pump Cycle) :

Petrol hold-on and gas prime times are set on four of the six DIP switches on the base of the DS100. Petrol hold-on can be set to 0, ½, 1, and 1½ seconds, and gas prime time can be set to 0, 1, 2, or 3 seconds. Switches 1 and 2 set the gas prime time. Switches 3 and 4 set the petrol hold-on time. Setting switch 5 to the "ON" position enables to fuel pump cycle feature of the DS100. The settings are shown in Table 2 below :

Switch 1	Switch 2	Gas Prime Time
ON	ON	0 seconds
OFF	ON	1 second
ON	OFF	2 seconds
OFF	OFF	3 seconds
Switch 3	Switch 4	Petrol Hold-On Time
ON	ON	0 seconds
OFF	ON	½ second
ON	OFF	1 second
OFF	OFF	1½ seconds
Switch 5		Fuel Pump Cycle Function
OFF		Disabled
ON		Enabled

Table 2

Setting the Throttle Position :

Before the DS100 can be used, the throttle position must be set. This is the position above which the starter motor will be disabled when attempting to start. The procedure takes approximately 20 seconds and is outlined below.

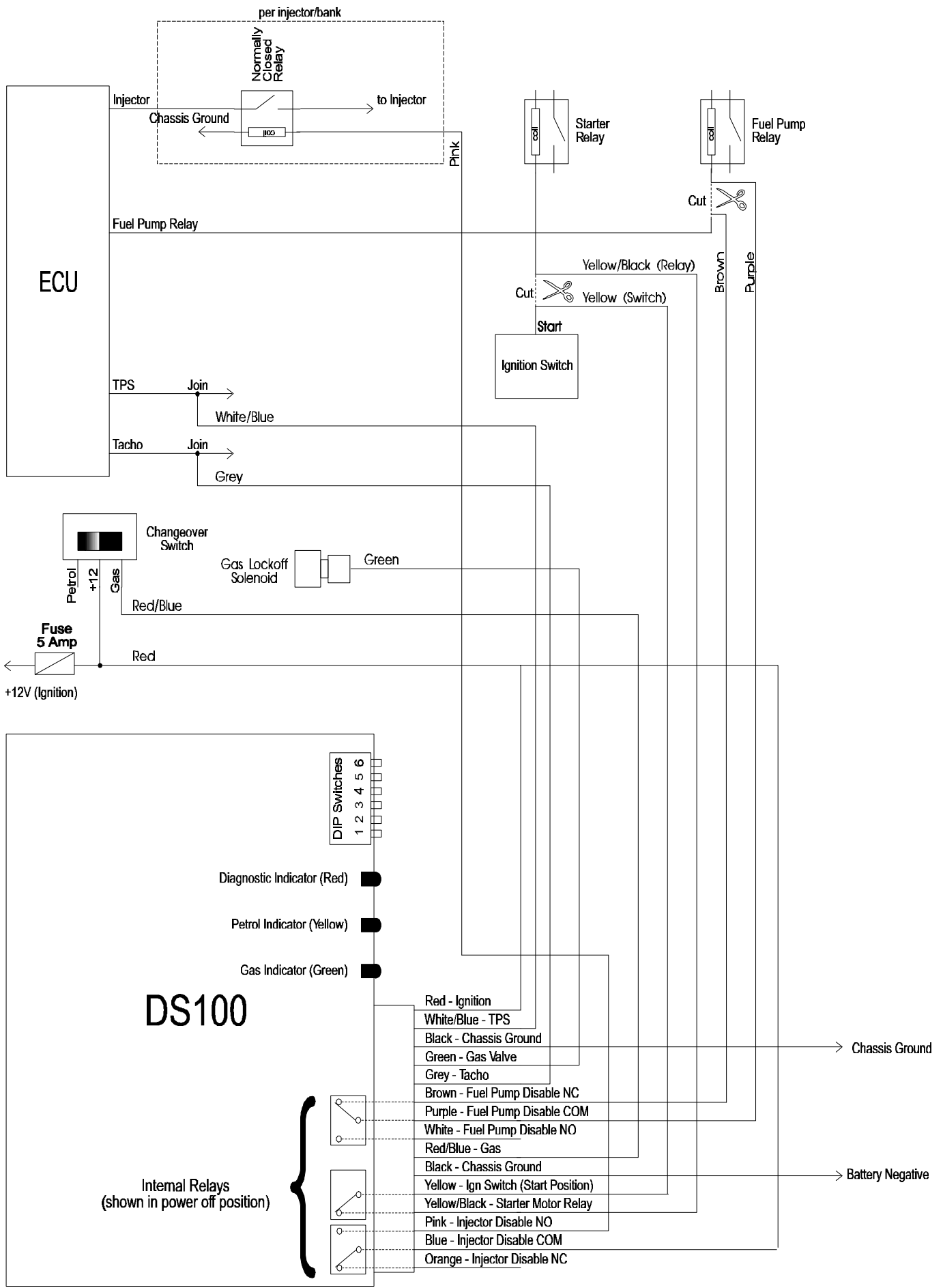
1. With ignition OFF, set switch 6 on the DS100 to ON (down)
2. Turn ignition ON – the RED light on the base of the DS100 will flash slowly
3. Hold throttle in the position at which cranking should be disabled – the RED light will continue to flash slowly. After 12 seconds the light will flash faster, and after about 19 seconds the light will flash even faster. After 20 seconds the position will be stored.
4. Once stored, the RED light will indicate the position of the throttle. The light will be ON when the throttle is BELOW the stored position, and OFF when the throttle is ABOVE the stored position.
5. Set switch 6 to the OFF (up)
6. Turn the ignition OFF – the DS100 is now ready to run.
7. If the position stored is not satisfactory, simply repeat steps 1 to 7.

Warranty :

The APEXUS DS100 is warranted against faults in manufacture and components for the life of the vehicle it is originally fitted to. Upon receipt of a faulty device Apexus Pty. Ltd. will repair or replace the device at no cost to the owner. All freight charges for shipping returned devices to or from Apexus Pty. Ltd. remain the responsibility of the owner. As Apexus Pty. Ltd. has no control over the installation this warranty does not extend to consequential or subsequent damage.

Apexus Pty. Ltd. has a policy of continuous product improvement. We welcome feedback on our products.

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DS100 Typical Wiring