



RENAULT CLIO

This month I intent to focus on the Renault Clio utilising the Bosch monopoint injection system incorporating the siemens controller.

There are several variants across the production range so expect some small differences. The variant chosen is compatible with the 1.2-1.4 series Clio E7F/ E7J engine codes. The throttle body injection is a low-pressure system, delivering fuel at atmospheric pressure into the manifold, not dissimilar to the carburettor

The fuel pressure is maintained at a constant 1 Bar. The injector is triggered with every ignition dwell control pulse. It's opening is the only variable factor in maintaining the correct air fuel ratio.

Sykes Pickavant offer an excellent pressure kit with comprehensive adapters.

The key sensor input to the siemens ECM are: - speed and position via an inductive crank sensor producing a modified sine wave located at the rear of the block. The output should exceed 5 volts peak to peak cranking, and will increase proportional to engine speed. This signal is modified to a digital signal by the ECM and sent to the composite ignition module assembly see waveform (1)

When the trigger voltage goes high (A) the coil dwell commences (B) when the trigger voltage returns to the Ov (A) the coil is switched off and induction determines the ignition point (TZ). Note the effects of current control on waveform (B) just before the TZ points, this is an internal function of the ignition module not the ECM. The effects of current control can be seen in waveform (2). The commencement of dwell is symmetrical with a constant rise in current (B) from 0 amps to 6 amps at which point current control clips the flow at 6 amps peak, until the induction point where it falls sharply back to 0 amps, at which point the ignition spark process begins (A) note the rounding off of current at 0 amps this is often a premature warning of ignition module failure, the slower the collapse in the induction process the weaker the ignition energy.

Engine temperature is monitored via an NTC sensor at the rear of the cylinder head. These often suffer internal corrosion; it might be worth removing to inspect. Voltage will vary from 2.5 volts cold to 0.5 hot.

Manifold pressure is monitored via a vacuum hose to a map sensor; its voltage output is linear with pressure drop. Atmospheric pressure voltage is 4.7 dropping to 1.1-1.3 @20inmg. Take care the pipe is in no way restricted and that manifold vacuum is correct.

Throttle angle is monitored via a potentiometer in the throttle body (some monopoint variants employ two potentiometers in the throttle body) The potentiometer consists of a resistive track and a collector track in parallel. Their manufacture is thick film technology this method ensures a very clean signal for accurate fuel mapping. The output should be 0.7-0.9 @ idle it can be adjusted and will effect both fuel mixture and idle motor response. The output should be carefully monitored for glitches see waveform (3).

The lambda sensor is a three-wire variant and can be replaced with a 4-wire type. Wire the extra grey wire directly to battery neg.the frequency and amplitude are not uncommon min 1hz 200mv-800mv.

The injector is a current controlled variety employing PWM pulse width modulation see waveform (4) the initial saturation period has a current flow of 4 amps (B) which is rapidly dropped to 1.5 amps during the variable PWM phase it is the phase only which extends to provide extra fuel enhancement. The sample shown is correct for hot idle/cruise.

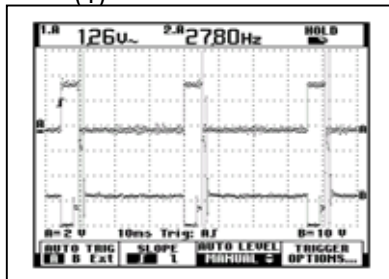
The idle control is established via a DC motor incorporating an idle contact switch, which must be functional if idle and acceleration enhancement are to operate normally. The motor uses a pinion and gear set to move a plunger directly on the throttle linkage. The ECM to extend or retract the motor see waveform (5) switches the current. The reversal of voltage polarity (A) is Mirrored with the flow of current (B). Look for poor voltage amplitude and ensure 2amp flow for correct operation. Faulty or sluggish idle control is often due to a motor fault not the ECM.

The system is supported by serial capability, and the ECM is easily accessed via the jack housing o/s bulkhead. The Sykes Pickavant ACR 4 Code reader allows full access to DTCs and serial data. This enables full detailed analysis of actual circuit voltage against the serial value as calculated by the ECM.

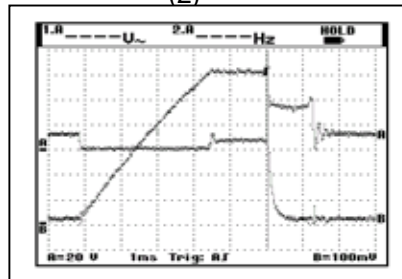
This technique is vital to establish if an input or ECM error is responsible for the errors. Remember to check power and ground circuits before condemning components. Distributors and rotas are serviced as a set via the Renault dealership.

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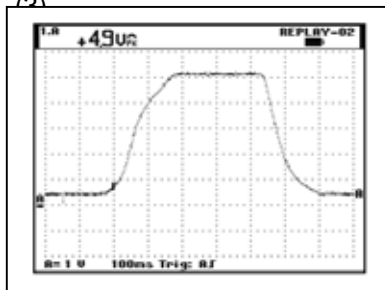
(1)



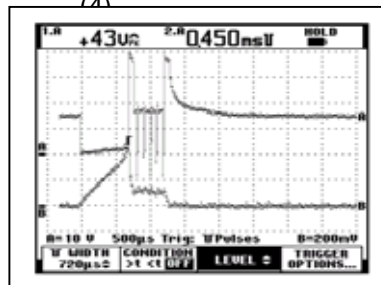
(2)



(3)



(4)



(5)

