Description and Operation

The speed control system fitted to both petrol and diesel vehicles, is designed to control the vehicle's road speed automatically within prescribed limits, enabling the driver to remove his foot from the accelerator pedal whilst maintaining a constant vehicle speed. This may be done at any driver selected speed between 19 mph (30km/h) and approximately 125 mph (200 km/h).

The system fitted to petrol vehicles comprises a electronic actuator (throttle actuator with integrated control electronics), driver control switches, stop lamp switch, brake pedal switch, clutch pedal switch for manual transmission applications, status indicator lamp and a vehicle speed sensor, all providing system electrical signals direct to the electronic actuator.

The system fitted to diesel vehicles comprises a fuel injection pump (with electronic controls) a powertrain control module, driver control switches, brake and stop lamp switches, clutch pedal switch for manual transmission applications, status indicator lamp and accelerator pedal position sensor. This system removes the need for a mechanical throttle link.

Electronic Actuator Assembly (Petrol Vehicles)

The speed control actuator is a single assembly, mounted in the engine compartment, which comprises four basic components:

Control Electronics:

The control electronics consist of a micro-processor (integral watchdog timer), motor drivers, electric clutch driver and interface circuits for brake and clutch status inputs, vehicle speed, indicator lamp and driver command inputs status.

Stepper Motor:

The control electronics cause the stepper motor to rotate by turning the three phases of the stepper motor on and off in a precise sequence. The motor direction (open throttle, close throttle) is determined by what sequence the motor phases are turned on or off.

Geartrain:

The geartrain converts low torque stepper motor output to high torque at the output spool of the actuator.

Electric Clutch:

The electric clutch, when powered, connects the geartrain/stepper motor to the output spool. The electric clutch is connected to the battery through the brake pedal-operated (de-activator) switch, the contacts of which are closed until the brakes are applied. The electric clutch is also connected to ground through an electronic switch (part of the control electronics). In order for the internal power to be supplied to the electric clutch, the electronics must be in the 'on' state and the brake pedal (de-activator) switch must be closed (brakes not applied).

Driver-Operated Switches (Petrol and Diesel Vehicles)

Five switches are mounted on the steering wheel to allow the driver to control the following functions:

Function	Symbol
ON	●
OFF	○
Accelerate/Set/Tap-up	+
Cancel/Resume	=
Decelerate/Set/Tap-down	–

The switches are momentary contact type. The output from the five switches is fed to the electronic actuator (petrol vehicles) or the powertrain control module (diesel vehicles) through the clockspring mounted on the steering column below the steering wheel.

Stop Lamp Switch (Petrol and Diesel vehicles)

The stop lamp switch is connected to the electronic actuator (petrol vehicles) or the powertrain control module (diesel vehicles) and is activated by the brake pedal. On the detection of a signal, (petrol vehicles) the stepper motor will drive the actuator output back allowing the throttle to return to idle. The electric clutch is then turned off, disengaging the throttle from the stepper motor, and the system will then revert to the 'stand-by' mode. On detection of a signal (diesel vehicles) the powertrain control module sends a signal to the fuel pump control electronics. the fuel supply to the injectors is reduced and the system will revert to 'stand-by' mode.

NOTE: This is the normal brake pedal activated system cancel and requires only slight depression of the brake pedal.

Brake Pedal (De-Activator) Switch (Petrol and Diesel Vehicles)

The brake pedal (De-activator) switch provides a normally-closed brake input into the electronic actuator switch (petrol vehicles) or the powertrain control module (diesel vehicles) which directly controls the current applied to the electric clutch (petrol vehicles) or provides an input signal to the powertrain control module (diesel vehicles). The brake pedal switch contacts are opened by applying the vehicle brakes under a moderate to heavy braking condition, the current is disconnected from the electric clutch, (petrol vehicles) or the powertrain control module (diesel vehicles) causing the output to return to idle, regardless of what the stepper motor is commanding the output spool to do (petrol vehicles) or powertrain control module (diesel vehicles). The system will then revert to the ‘stand-by’ mode.

Under most braking conditions the control electronics sense the stop lamp switch first, returning the system to idle position before the brake pedal switch.

Clutch Pedal (De-Activator) Switch (Manual Transmission, Petrol and Diesel Vehicles)

The clutch pedal switch electrical contacts are held closed by the clutch pedal arm in the non-depressed position. Depression of the clutch pedal will open circuit the switch disabling the speed control system, having the same response as the stop lamp switch.

Vehicle Speed Sensor (Petrol and Diesel Vehicles)

The vehicle speed sensor is a mounted to the transmission housing. The speed control system, when engaged, uses the speed sensor output to determine and control the vehicle road speed.

Status Indicator Lamp (Petrol and Diesel Vehicles)

The speed control status indicator lamp will remain extinguished until the system is in the engaged mode (i.e. ‘set’, when the speed control system is controlling the vehicle speed). The lamp is illuminated by the electronic actuator (petrol variants) and by the powertrain control module (diesel variants).

NOTE: The engaged mode takes place when either of the driver-controlled ‘set’ switches is momentarily or continuously depressed, or the ‘resume’ switch is depressed to return to the previous ‘set’ speed, within the prescribed operating speed limits.

Interface Module (Petrol Vehicles)

The interface module performs various tasks in different systems. For the speed control system, the module controls the status indicator lamp.

The status indicator lamp output from the electronic actuator is connected through the interface module which provides the external dimming facility required for night time driving (i.e. when side lights are switched on).

Accelerator Pedal Position Sensor (Diesel Vehicles)

The accelerator pedal position sensor provide a signal to the powertrain control module of the precise position of the accelerator pedal. This information is used by the powertrain control module for engine management and speed control purposes. This system removes the need for a mechanical throttle link and provides closer control of fuelling requirements and speed control functions.