

CRUISE CONTROL - V8 ENGINES

DESCRIPTION

General

The cruise control is selected from a switch located on the fascia. The cruise control operation is governed by a cruise control ECU located on the RH 'A' post behind the trim panel. Operation is controlled from two switches located on the steering wheel, a set/accelerate switch (SET+) and a resume/suspend switch (RES.).

A speed signal is supplied from the SLABS ECU to the cruise control ECU, the cruise control ECU monitors the signal for use in its control logic circuits. The cruise control system ECU supplies outputs to operate a vacuum pump and its internal control/dump valves.

The vacuum acting within a pneumatic throttle actuator moves the actuator to the required position.

Cruise suspend/resume - manual gearbox

Inputs to the cruise control ECU from a switch on the brake pedal mechanism or the clutch pedal mechanism can disengage the cruise control by interrupting a feed into the cruise control ECU. The feed is used by the ECU to power the cruise control pump. When the feed is interrupted the ECU logic circuits stop the operation of the cruise control pump, open an internal dump valve, and close an internal control valve. This action stops the actuator and suspends the cruise control function.

In addition to the feed removal to the ECU when the brake pedal is pressed, a low voltage 'brakelight' signal is also sent via the Body Control Unit (BCU) to the cruise control ECU. The 'brakelight' signal is also used by the logic circuits in the cruise control ECU, to control the operation of the throttle actuator and control valves when the brake pedal has been pressed.

Operation of the resume/suspend switch after a braking event, can restore the operation of the cruise control system if the vehicles speed is acceptable to the cruise control ECU.

Cruise suspend/resume - automatic gearbox

A gearbox selector lever position sensor sends an input via the BCU to the cruise control ECU if the selector lever is in park, neutral or reverse. An input to the cruise control ECU from a switch on the brake pedal mechanism will also disengage the cruise control by interrupting a feed to the cruise control ECU. The feed is used by the ECU to power the cruise control pump. When the feed is interrupted the ECU logic circuits stop the operation of the cruise control pump, open an internal dump valve, and close an internal control valve. This action stops the throttle actuator and suspends the cruise control function.

DESCRIPTION AND OPERATION

In addition to the feed removal to the ECU when the brake pedal is pressed, a low voltage 'brakelight' signal is also sent via the BCU to the cruise control ECU. The 'brakelight' signal is also used by the logic circuits in the cruise control ECU, to control the operation of the throttle actuator and control/dump valves when the brake pedal has been pressed.

Operation of the resume/suspend switch after a braking event, can restore the operation of the cruise control system if the vehicles speed and gearbox selector position is acceptable to the cruise control ECU.

OPERATION

Cruise Control Supply

Circuit supply

A feed from the battery positive terminal is connected by a R wire to the engine compartment fusebox, where it passes through fuse 16 and fusible link 8.

A feed from fuse 16 passes to the coil of the horn relay. From the coil of the horn relay, the feed is connected to the set/accel and res/suspend switches on a PO wire, via header C0291 LHD/C0286 RHD and the rotary coupler.

A feed from fusible link 8 is connected to the passenger compartment fusebox on a NW wire and from the fusebox to the ignition switch on a N wire.

Ignition switch supply

With the ignition switch in position II, the feed from fusible link 8 flows from the ignition switch to the passenger compartment fusebox on a W wire. The feed continues through fuse 30 in the passenger compartment fusebox and is connected by a GLG wire to the cruise control switch.

With the ignition switch in position II, a second feed from fusible link 8 flows from the ignition switch to the passenger compartment fusebox on a Y wire. The feed continues through fuse 25 in the passenger compartment fusebox and is connected to the brake pedal switch by a GO wire.

Cruise Control Operation

When the cruise control switch is on, the feed from fuse 30 in the passenger compartment fusebox, passes through the cruise control switch contacts to provide power input to the cruise control ECU pin C0239-8 on a WY wire.

Simultaneously, the feed also passes through the cruise control switch indicator lamp which illuminates. The indicator lamp is connected to earth on a black wire via header C0760 to earth header C0017 LHD/C0018 RHD. The cruise control ECU is earthed on a B wire from pin C0239-18, via header C0286 LHD/C0291 RHD to earth header C0018 LHD/C0017 RHD.

When the brake or clutch pedal or is not depressed, the feed from fuse 25 in the passenger compartment fusebox flows to a pair of contacts in the brake pedal switch on a GO wire.

Manual transmission

The feed passes from the contacts of the brake pedal switch and is connected to the clutch pedal switch by an OG wire. The feed passes through the closed contacts of the clutch pedal switch to a PG wire that is connected to pin C0239-1 on the cruise control ECU. This feed provides the power source to the cruise control pump via the cruise control ECU.

If either the clutch pedal or the brake pedal is depressed, the respective switch contacts will be opened, removing power from the cruise control ECU and disengaging cruise control. If the cruise control switch remains on, the previous speed will be retained in the cruise control ECU memory.

The previous speed can be resumed by operation of the resume/suspend switch. The cruise control ECU will engage the cruise control if:

- The vehicle is travelling at over 28 mph (45 km/h)
- The cruise control switch is still on and has not been turned off
- The brake pedal is not depressed.
- The clutch pedal is not depressed.

Automatic transmission

The feed from the contacts of the brake pedal switch is connected by an OG wire to connector interface C0712-2/C0667-1. From the connector interface the feed continues on a PG wire to the cruise control ECU. The feed from the brake pedal switch provides the power source to the cruise control pump via the cruise control ECU.

The cruise control ECU will engage the cruise control if:

- The vehicle is travelling at over 28 mph (45 km/h)
- The gearbox selector position is acceptable to the cruise control ECU
- The cruise control switch is still on and has not been turned off
- The brake pedal is not depressed.

DESCRIPTION AND OPERATION

Speed signal

The cruise control ECU receives a speed signal input on a KG wire via header C0290 to pin C0239-15, from pin C0504-3 on the SLABS ECU.

Cruise set/accelerate

When the set/accel switch is operated, the switch contacts close and connect the feed from the horn relay to cruise control ECU pin C0239-4, via the rotary coupler and an RW wire. This signal initiates the cruise control ECU to activate the cruise control pump functions, providing all other parameters are correct.

Cruise resume/suspend

When the res/suspend switch is operated, the switch contacts close and connect the feed from the horn relay to cruise control ECU pin C0239-2, via the rotary coupler and a UW wire. If cruise control is engaged, this signal suspends cruise control operation. If cruise control is suspended, the signal will initiate the cruise control ECU to engage cruise control at the speed retained in the ECU's memory.

Cruise control pump

The cruise control pump has three connections to the cruise control ECU. One connection on a WU wire from pin C0239-11 supplies power directly to the pump. The control valve solenoid and dump valve solenoid are connected to pin C0239-17 of the cruise control ECU on a BY wire. The pump is earthed via pin C0239-7 of the cruise control ECU on a BR wire.

The dump valve solenoid is connected via header C0287 LHD/C0290 RHD on a GP wire to the contacts of the brake pedal switch. In normal operation the coil of the dump valve is earthed by the brake light circuit, via the contacts of the the brake pedal switch. When the brake pedal is pressed power is supplied on the earth path of the dump valve solenoid. When the voltage on each side of the coil of the dump valve solenoid is equalised, there is no voltage drop across the solenoid. With no current flowing through the coil of the dump valve solenoid, the solenoid is de-energised and the dump valve opens.

When the cruise control switch is on and vehicle speed is more than 28 mph (45km/h) and less than 125 mph (201 km/h), the cruise control ECU supplies power to the pump and valve solenoids. The earth paths for the pump and the control valve solenoid are switched as required by the cruise control ECU to set and maintain vehicle speed.

Other Body Control Unit (BCU) inputs/outputs

'Brakelight' Signal

If the brake pedal is depressed a pair of contacts in the brake pedal switch allow a feed to flow on a GP wire via header C0287 LHD/C0290 RHD to pin C0661-7 on the BCU. The BCU sends a 'brakelight' signal output from pin C0661-16 on a GS wire, to pin C0239-5 on the cruise control ECU.

The logic circuits in the cruise control ECU use this 'brakelight' signal to lock out the cruise control. The internal logic of the ECU uses the 'brakelight' signal to cancel cruise control by interrupting the earth path to the pump, and activating the dump valve solenoid. The dump valve opens the vacuum chamber to ambient air pressure, the vacuum is dissipated and the throttle actuator no longer has an effect on the throttle position.

Gearbox inputs - automatic transmission

An Input for Park, Neutral and Reverse positions are passed from the gearbox position selector on a BG wire via splice joint A31 and connectors C0668-5, C0681-5 to pin C0663-11 of the BCU.

If an input from the gearbox position selector or the brake pedal switch is received by the BCU, a 'brakelight' signal is sent from the BCU to the cruise control ECU, This signal will cancel or inhibit cruise control operation.

Gearbox inputs - manual transmission

There are no signals from the manual gearbox to the BCU. The BCU is permanently connected to earth header C0552, via a BG wire from pin C0663-11 through connectors C0668-5 and C0661-5 to splice joint A33. From splice joint A33 the earth continues on a B wire through connectors C0681-8 and C0668-8 to earth header C0552.

Diagnostic socket - all models

Diagnostic information can be retrieved on a K wire from cruise control ECU pin C0239-16, through header C0286, to the diagnostic socket. The information can be retrieved using TestBook/T4 or other suitable scantool.