■SYSTEM OPERATION

1. General

The cruise control has the following control functions.

Function	Outline
Constant Speed Control	The ECM compares the actual vehicle speed and the set speed and if the vehicle speed is lower than the set speed, it uses the throttle control motor to increase the throttle opening.
Set Control	When the vehicle has met the following condition, and the cruise control main switch is pressed to the -/SET side and released when the ON-OFF button on the cruise control main switch has been pressed to turn the system on, the ECM will store the vehicle speed and then maintain the vehicle constantly at that speed. • The vehicle is running at a vehicle speed of about 25 mph (40 km/h) or more.
Low Speed Limit Control	The low speed limit is the lowest speed that cruise control can be set at and it is designed to be approx. 25 mph (40 km/h). The cruise control cannot be set below that speed. If the vehicle speed drops below that speed while running in the cruise control, the cruise control will be cancelled automatically. However the set speed in the memory is kept.
COAST Switch Control	While the cruise control main switch is held to the -/SET side, the vehicle speed and the set vehicle speed change as follows. • The vehicle will decelerate. • The set vehicle speed changes to the speed that the vehicle is traveling at when the COAST switch (-/SET side operation) is released.
Tap Down Control	When the cruise control main switch is pushed momentarily (approx. 0.6 sec.) to the -/SET side, the vehicle speed and the vehicle set speed change as follows. • The vehicle will decelerate in increments of approx. 1 mph (1.6 km/h) for each time the switch was pressed. • However, if the difference between the actual vehicle speed and the set vehicle speed is greater than 3.1 mph (5 km/h), the set vehicle speed will change to the speed at which the vehicle was being driven at the time the switch was released.
ACC Switch Control	When the cruise control main switch is held to the +/RES side, the vehicle speed and the set vehicle speed change as follows. • The vehicle accelerates. • The set vehicle speed changes to the speed at which the switch is released.
Tap Up Control	When the cruise control main switch is pushed momentarily (approx. 0.6 sec.) to the +/RES side, the vehicle speed and the setting vehicle speed change as follows. • The vehicle will accelerate in increments of approx. 1 mph (1.6 km/h) for each time the switch was pressed. • However, if the difference between the actual vehicle speed and the vehicle set speed is greater than 3.1 mph (5 km/h), the set vehicle speed does not change.
RES Switch Control	If cruise control is cancelled for any reason other than a malfunction or cruise control main switch operation and vehicle speed is more than the low speed limit, the vehicle speed is returned to the speed before the cancellation of cruise operation by setting the cruise control main switch to the +/RES side. The cruise control mode can be resumed even if the vehicle speed drops the low speed limit, because the speed in the memory is not cleared.

(Continued)

Control	Outline
Automatic Transmission Control	When the vehicle is cruising uphill, there is a case where the overdrive may turn off depending on the ECT (Electronic Control Transmission) control. After that the ECM judges the end of cruising uphill based on the throttle valve angle, the overdrive function will turn on again. There may be cases where the overdrive turns off when ACC or RES switch is used.
Manual Cancel Control	If any of the following signals are sent to the ECM, the cruise control is cancelled accordingly. • Shift lever is shifted from D to N. • When 1st, 2nd or 3rd range is selected in S mode position. • Stop light switch ON signal/The brake pedal is depressed. • CANCEL switch ON signal (cruise control main switch is moved to the CANCEL side) • Cruise control switch (ON-OFF button) OFF signal
Automatic Cancel Control	When any of the following conditions occur during cruise control operation, the speed that is set in the memory is cleared and the cruise control is cancelled. • Stop light switch open or short circuit • The vehicle speed signal is not input for a predetermined period of time (approx. 140 msec). • ETCS-i malfunction Furthermore, the CRUISE main indicator light will blink until the ON-OFF button on the cruise control main switch is used to turn the system off, and the operation of the cruise control will be disabled until the ON-OFF button is turned ON again.
	When any of the following conditions occur during cruise control operation, the speed that is set in the memory is cleared and the cruise control is cancelled. • Stop light switch input signal is abnormal. • Cruise control switch input signal is abnormal. Furthermore, the CRUISE main indicator light will blink until the ON-OFF button on the cruise control main switch is used to turn the system off, and the operation of the cruise control will be disabled until the power source is turned IG-ON again.
	When any of the following conditions occur during cruise control driving, the speed that is set in the memory is cleared and the cruise control is cancelled. • Vehicle speed decreases by 10 mph (16 km/h) or more below the speed at which the cruise control was set.
	When any of the following conditions occur during cruise control driving, the cruise control is cancelled. • Vehicle speed is below the low speed limit [approx. 25 mph (40 km/h)] or less. • During VSC operation.
Diagnosis	When the ECM does not receive a vehicle speed signal for a predetermined period of time during cruising, or when cruise control is cancelled (automatic cancel) due to a malfunction of the cruise control, stop light switch or vehicle speed signal, the ECM immediately blinks the CRUISE main indicator light due to the malfunction. The information relating to the malfunction will be stored in the ECM.

2. Diagnosis

If a malfunction occurs in the cruise control system during cruise control operation, the ECM actuates the automatic cancel control and blinks the CRUISE main indicator light to inform the driver of the malfunction. At this time, the ECM memorizes the malfunction in the form of 5-digit and 2-digit DTCs (Diagnostic Trouble Codes).

- The 5-digit DTCs can be read by connecting an intelligent tester or Techstream* to DLC3.
- The 2-digit DTCs are output to the CRUISE main indicator light when the TC and CG terminals of the DLC3 connector are connected through the use of the SST (09843-18040). Thus, these DTCs can be obtained by counting the number of blinks of the CRUISE main indicator light.

Service Tip

When using an intelligent tester or Techstream*, a dedicated adapter [CAN VIM (Vehicle Interface Module)] must be connected between the DLC3 and the intelligent tester or Techstream*. For details, see the 2008 HIGHLANDER Repair Manual (Pub. No. RM06J0U).

*: Techstream is the name for the diagnostic tester in North America, but other countries will continue to use the intelligent tester.