CRUISE CONTROL SYSTEM

■DESCRIPTION

There are two cruise control systems, a conventional type and a dynamic laser type.

- The conventional type is standard equipment. It maintains the vehicle speed set by the driver. For details, see page BE-165.
- The dynamic laser type is optional equipment for the Limited grade and the Platinum grade. In addition to the conventional type of constant speed control, it uses vehicle-to-vehicle distance control. For details, see page BE-170.

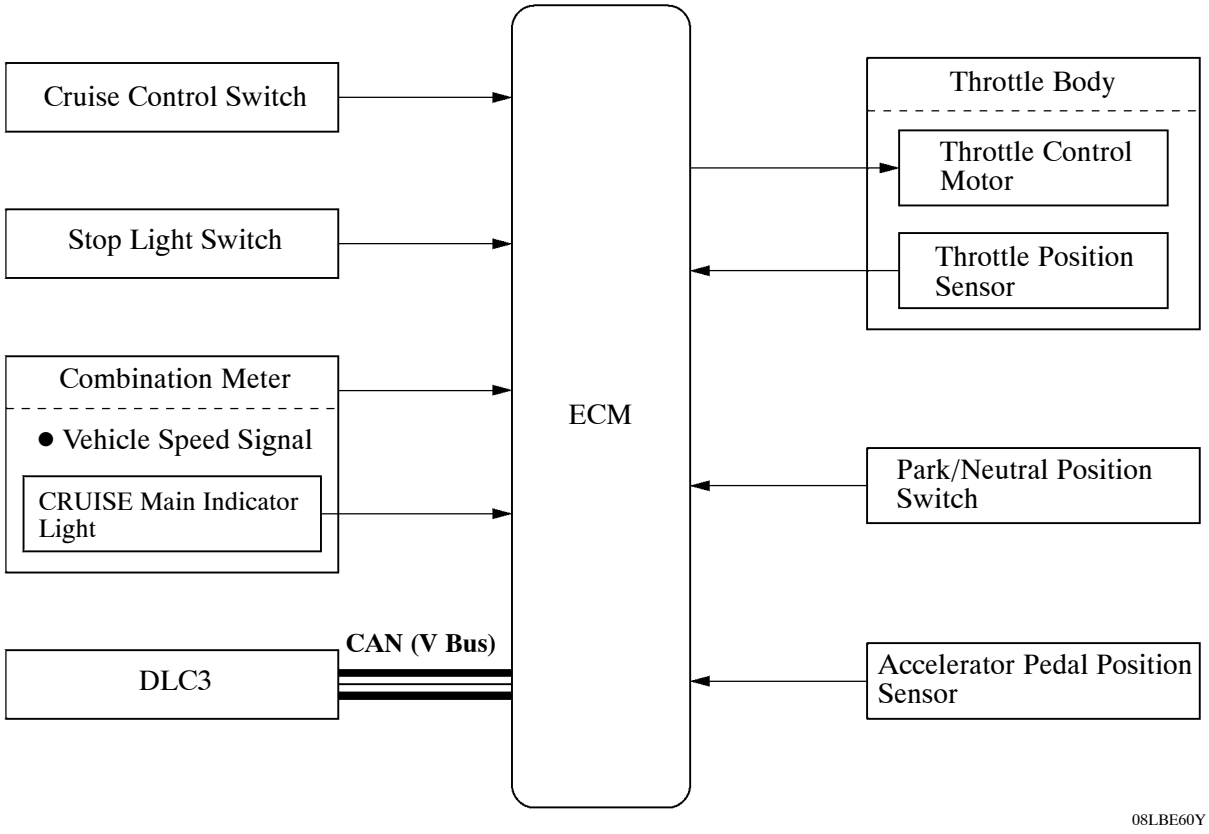
■CRUISE CONTROL SYSTEM

1. General

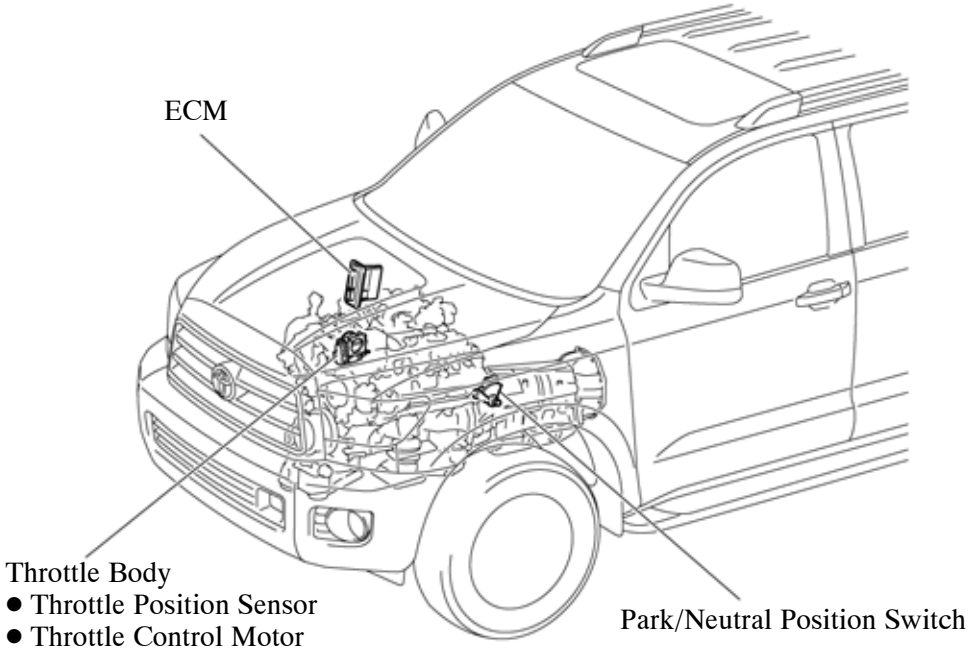
When the cruise control system is set to a desired vehicle speed, the throttle valve position is adjusted automatically to maintain the vehicle speed without the driver having to depress the accelerator pedal.

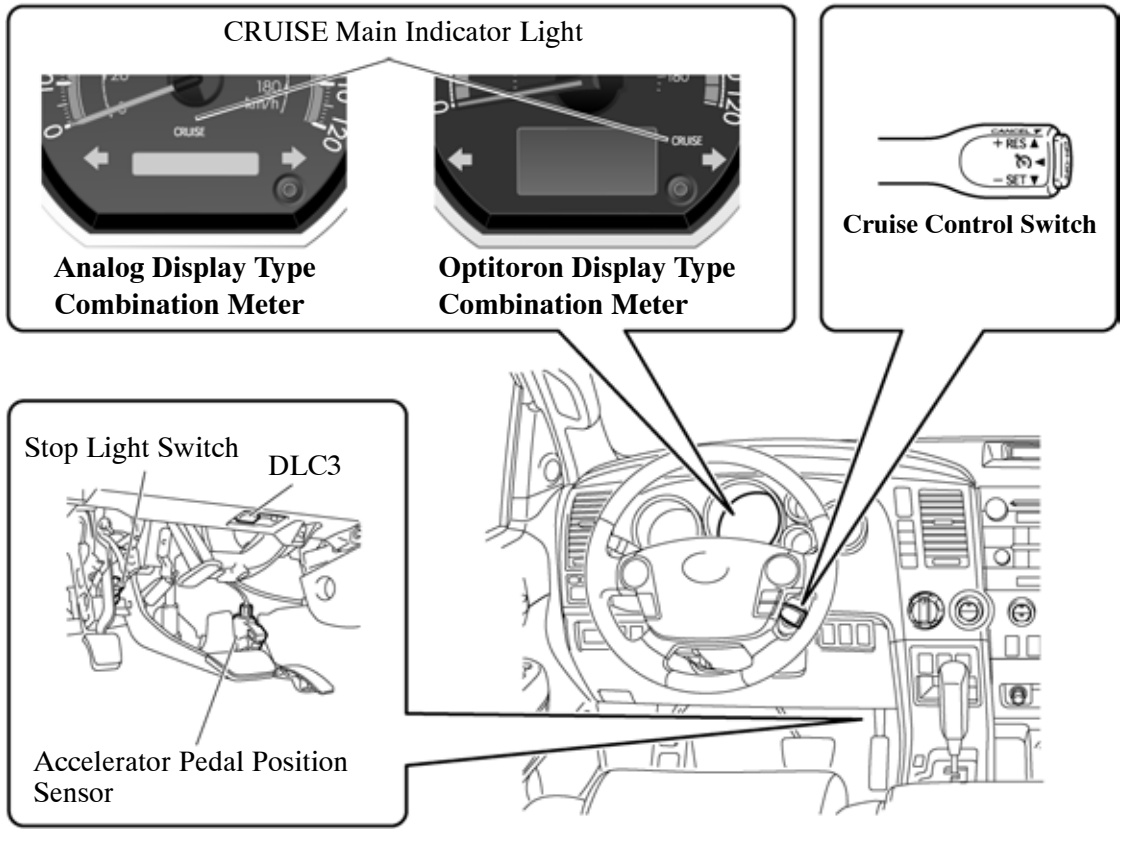
- This system effects control through the ETCS-i (Electronic Throttle Control System-intelligent).

2. System Diagram



3. Layout of Main Components





4. System Operation

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. If the vehicle speed is lower than the set speed, the ECM operates uses the throttle control motor to increase the throttle opening.
Set Control	Under the following conditions, when the cruise control switch is pressed to the SET/– side and released with the main switch ON, the ECM will store the vehicle speed and then maintain the vehicle constantly at that speed. ● The vehicle is running at approximately 45 km/h (27 mph) or more. ● The shift lever is in D.
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. 40 km/h (25 mph). The cruise control mode cannot be set below that speed. If the vehicle speed drops below that speed while running in the cruise control mode, the cruise control mode will be cancelled automatically. However, the set speed in the memory is kept.
High Speed Limit Control	The high speed limit is the highest speed that cruise control mode can be set and is designed at approximately 200 km/h (125 mph). ● The cruise control mode cannot be set if the vehicle speed exceeds the high speed limit. The vehicle will not accelerate when the RES/+ switch is operated if the vehicle speed exceeds the high speed limit.
Coast Control	While the cruise control switch is held to the SET/– side, the vehicle speed and the set speed change as follows. ● The vehicle will decelerate. ● The set 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 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. 1.6 km/h (1 mph) for each time the switch was pressed. ● However, if the difference between the actual vehicle speed and the set speed is greater than 5 km/h (3 mph), the set speed will change to the speed at which the vehicle was being driven at the time the switch was released.
Accelerator Control	When the cruise control switch is held to the RES/+ side, the vehicle speed and the set speed change as follows. ● The vehicle accelerates. ● The set speed changes to the speed at which the switch is released.
Tap-up Control	When the cruise control switch is pushed momentarily (approx. 0.6 sec.) to the RES/+ side, the vehicle speed and the set speed change as follows. ● The vehicle will accelerate in increments of approx. 1.6 km/h (1 mph) for each time the switch was pressed. ● However, if the difference between the actual vehicle speed and the set speed is greater than 5 km/h (3 mph), the set speed changes to the speed at which the vehicle was being driven at the time the switch was released.

(Continued)

Control	Outline
Resume Control	If cruise control mode is cancelled for any reason other than a malfunction or 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 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.
Automatic Transmission Control	When the vehicle is cruising uphill, there is a case where the overdrive function may turns 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 function turns off when ACC or RES switch is used.
Manual Cancel Control	If any of the following signals is sent to the ECM, the cruise control mode is cancelled accordingly. ● A signal to indicate that the shift lever is moved from D to N ● A signal to indicate that the 1st, 2nd or 3rd range is selected in S mode position ● A stop light switch ON signal (The brake pedal is depressed.) ● A CANCEL switch ON signal (The cruise control switch is moved to the CANCEL side.) ● A cruise control switch (main switch) OFF signal
Automatic Cancel Control	When any of the following conditions occurs during cruise control operation, the speed that is set in the memory is cleared and the cruise control mode is cancelled. ● The stop light switch has open or short circuit ● The vehicle speed signal is not input for a predetermined period of time (approx. 140 msec). ● ETCS-i malfunctions Furthermore, the CRUISE main indicator light will blink until the main switch on the cruise control switch is used to turn the system OFF, and the operation of the cruise control will be disabled until the main switch is turned ON again.
	When any of the following conditions occurs during cruise control operation, the speed that is set in the memory is cleared and the cruise control mode 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 main switch on the cruise control switch is used to turn the system OFF, and the operation of the cruise control will be disabled until the ignition switch is turned ON again.
	When the following condition occurs during cruise control driving, the speed that is set in the memory is cleared and the cruise control mode is cancelled. ● Vehicle speed decreases by 16 km/h (10 mph) or more below the speed at which the cruise control was set.
	When any of the following conditions occurs during cruise control driving, the cruise control mode is cancelled. ● Vehicle speed is below the low speed limit [approx. 40 km/h (25 mph)]. ● VSC is operating.
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 an abnormality in the cruise control, stop light switch or vehicle speed signal, the ECM immediately blinks the CRUISE main indicator light due to the abnormality. The information relating to the abnormality will be stored in the ECM.

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 DTCs (Diagnostic Trouble Codes).

- The 5-digit DTCs can be read by connecting Techstream to DLC3.

For details, see the 2008 Sequoia Repair Manual (Pub. No. RM08L0U).