CRUISE CONTROL SYSTEM

■DESCRIPTION

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

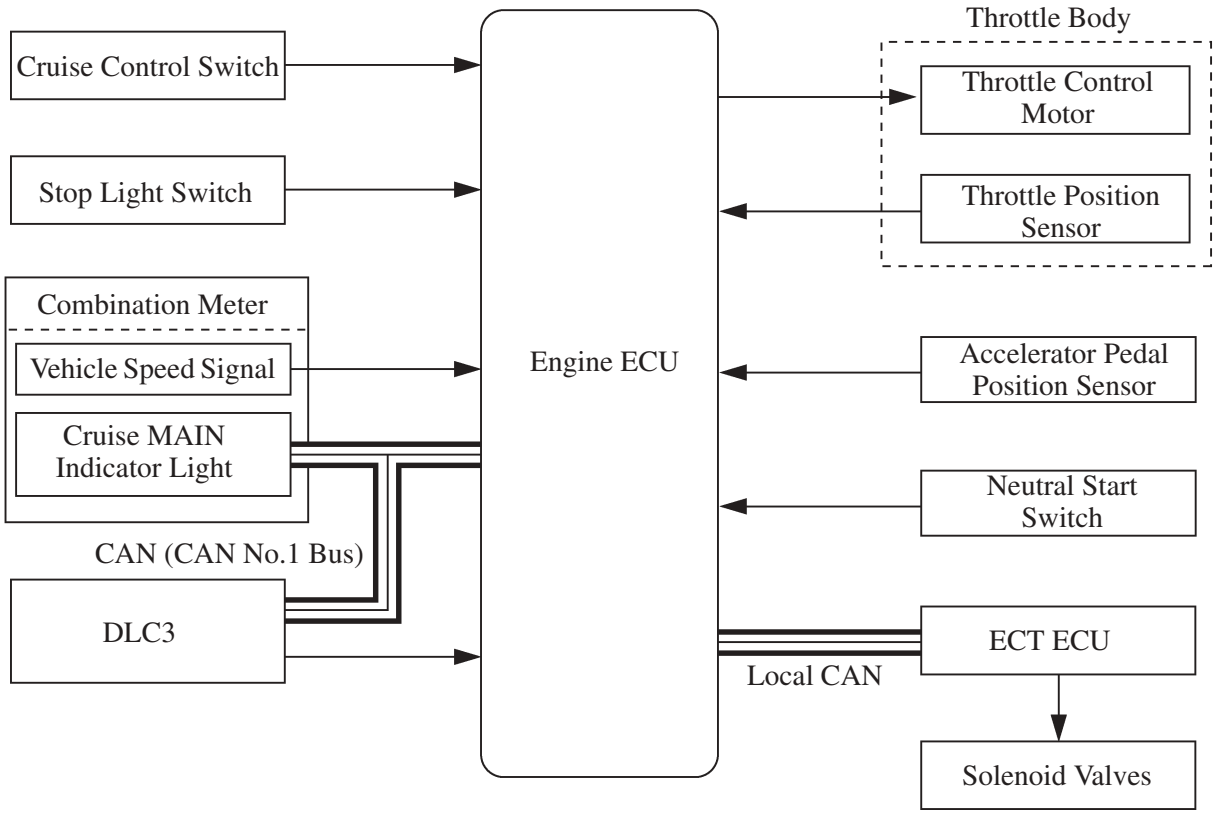
- The conventional type is standard equipment. It maintains the vehicle speed set by the driver. For details, see page BE-218.
- The dynamic radar type is the set option with pre-crash system. In addition to the conventional type of constant speed control, it uses vehicle-to-vehicle distance control. For details, see page BE-224.

■CONVENTIONAL TYPE CRUISE CONTROL SYSTEM

1. General

When the 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).

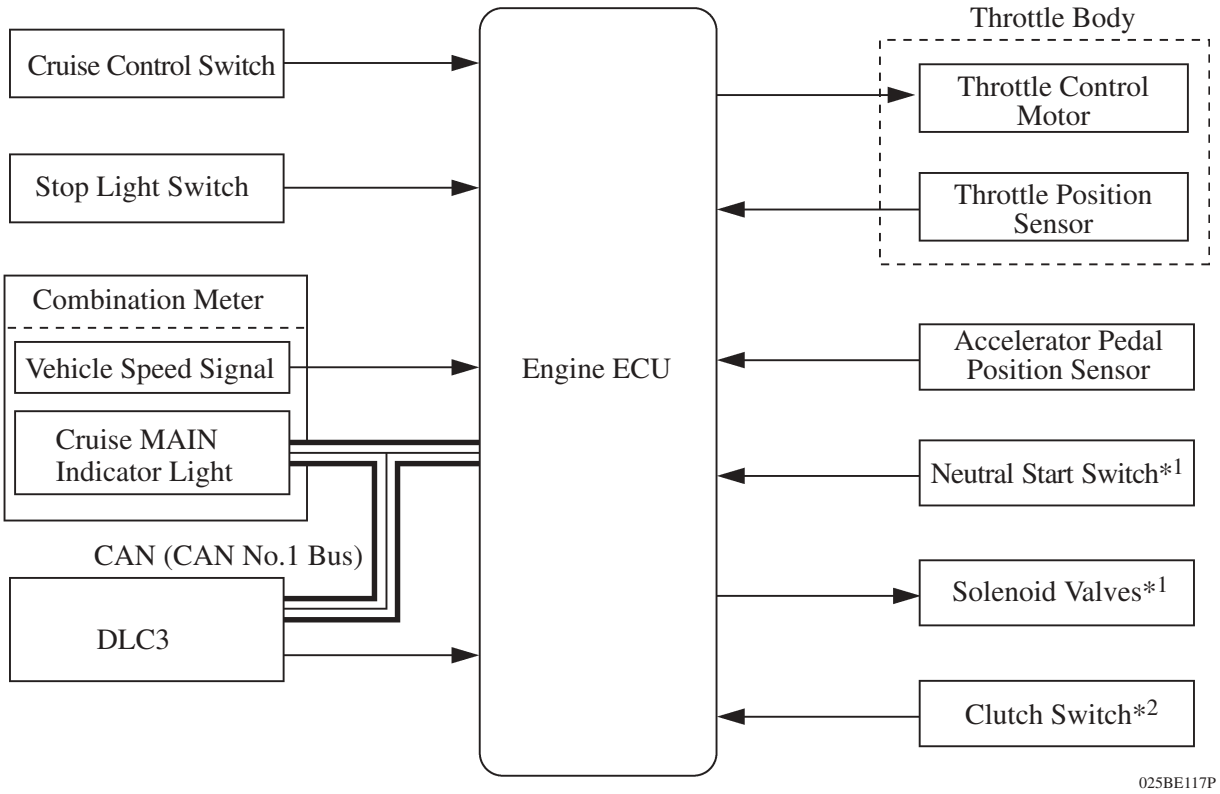
▶ Models With U660E Automatic Transaxle ◀



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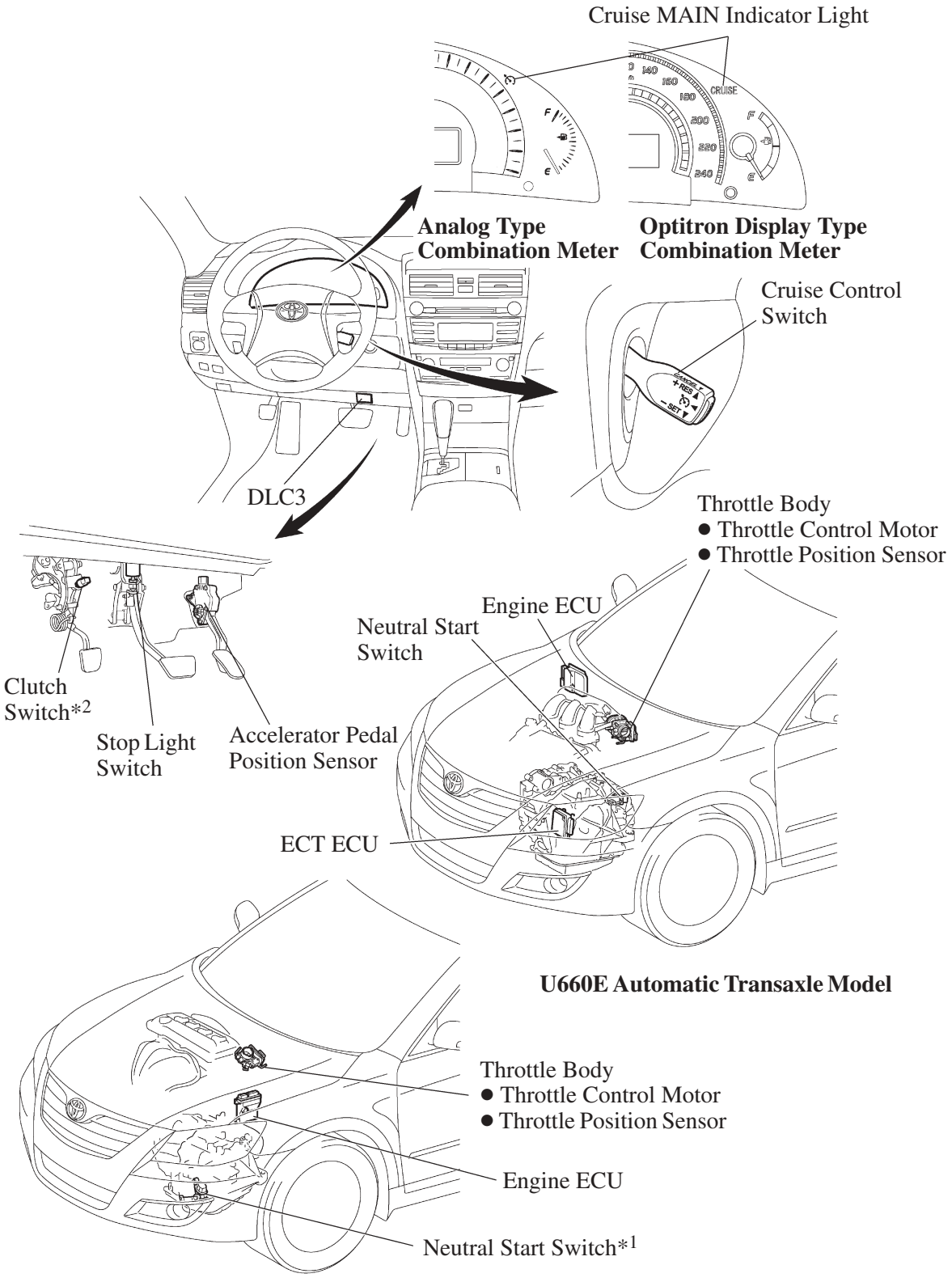
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▶ Models With U241E, U250E Automatic Transaxle and E354 Manual Transaxle ◀



*1: Models for U241E and U250E automatic transaxle
*2: Only for E354 manual transaxle

2. Layout of Main Components



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*1: Models for U241E and U250E Automatic Transaxle Model
*2: Only for E354 Manual Transaxle Model

3. System Control

General

The cruise control has the following control.

Control	Outline
Constant Speed Control	The engine ECU compares the actual vehicle speed and the set speed and if the vehicle speed is higher than the set speed, it uses the throttle control motor to decrease the throttle opening. If the actual vehicle speed is lower than the set speed, it uses the throttle control motor to increase the throttle opening.
Set Control	While this system fulfils the following conditions, and the cruise control switch is pressed to the SET/– side and released when the ON-OFF button on the cruise control switch has been pressed to turn the system on, the engine ECU stores the vehicle speed and maintains the vehicle constantly at that speed. ● The vehicle is running at a vehicle speed of about 40 km/h (25 mph) 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. 40 km/h (25 mph). 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 switch is held to the SET/– side, the vehicle speed and the set vehicle speed change as follows. ● The vehicle decelerates constantly. ● The set vehicle speed changes to the speed that the vehicle is traveling at when the COAST switch 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 setting 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 vehicle setting speed is greater than 5 km/h (3.1 mph), the vehicle setting 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 switch is pushed to the RES/+ side and held, the vehicle speed and the vehicle setting speed change as follows. ● The vehicle accelerates constantly. ● The set vehicle speed changes to the speed as which the switch is releases.
Tap Up Control	When the cruise control switch is pushed momentarily (approx. 0.6 sec.) to the RES/+ side, the vehicle speed and the vehicle setting speed change as follows. ● The vehicle accelerates 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 vehicle setting speed is greater than 5 km/h (3.1 mph), the vehicle setting speed does not change.
RES Switch Control	If cruise control is canceled 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 below the low speed limit, because the speed in the memory is not cleared.

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Control	Outline
Shift Down Control	**ECT ECU incorporated into engine ECU (U241E and U250E Automatic Transaxle):** When the vehicle is cruising uphill, shift-down control may be performed by the ECT (Electronic Control Transmission). When the engine ECU judges the end of cruising uphill based on the throttle valve angle, the shift-down control will turn on again. There is a case where the shift-down control turns off during ACC or RES switch control.
	ECT ECU isolated from engine ECU (U660E Automatic Transaxle): When the vehicle is cruising uphill, shift-down control may be performed by the ECT (Electronic Control Transmission). The engine ECU transmits the shift up request signal to the ECT ECU when the engine ECU judges the end of cruising uphill based on the throttle valve angle. If shift-down control is performed during ACC or RES switch control, the engine ECU transmits the shift up request signal to the ECT ECU after ACC or RES switch control is completed.
Manual Cancel Control	When any of the following conditions occur during cruise control driving, the cruise control is cancelled. ● The clutch switch ON signal is sent to the engine ECU when the clutch pedal is depressed (only for M/T). ● The stop light switch ON signal is sent to the engine ECU when the brake pedal is depressed. ● The CANCEL switch ON signal is sent to engine ECU when the cruise control switch moved to CANCEL side. ● The cruise control OFF signal is sent to the engine ECU when the cruise control switch ON-OFF button is pushed off. ● The shift lever is moved from the D position to the N position (for U250E and U660E Automatic Transaxles). ● The 3rd, 2nd or 1st gear is selected when the shift lever is in the S position (for U250E and U660E Automatic Transaxles). ● The shift lever is moved from the D position to any of the N, 2nd or 1st positions (for U241E Automatic Transaxle). ● The shift lever is moved from the 3rd position to any of the N, 2nd and 1st positions (for U241E Automatic Transaxle).
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. ● ETCS-i malfunction Furthermore, the cruise MAIN indicator light will blink until the ON-OFF button on the cruise control 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 driving, 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 switch is used to turn the system off, and the operation of the cruise control will be disabled until the ignition*1/engine*2 switch is turned ON again.

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Control	Outline
Automatic Cancel Control	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. 40 km/h [25 mph]) or less. ● Vehicle speed decreases by 16 km/h (10 mph) or more below the speed at which the cruise control was set. ● The VSC is activated.
Diagnosis	When the engine ECU 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 engine ECU immediately blinks the cruise MAIN indicator light due to the malfunction. The contents relating to the malfunction will be stored in the engine ECU.

*1: Models without smart entry and start system
*2: Models with smart entry and start system

Diagnosis

If a malfunction occurs in the cruise control system, during cruise control operation, the engine ECU actuates the automatic cancel control and blinks the cruise MAIN indicator light to inform the driver of a malfunction. At this time, the engine ECU memorizes the malfunction in the form of 5-digit and 2-digit DTC (Diagnostic Trouble Code).

- The 5-digit DTC can be read by connecting an intelligent tester II to the DLC3.
- The 2-digit DTC is 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 DTC can be obtained by counting the number of blinks of the cruise MAIN indicator light.