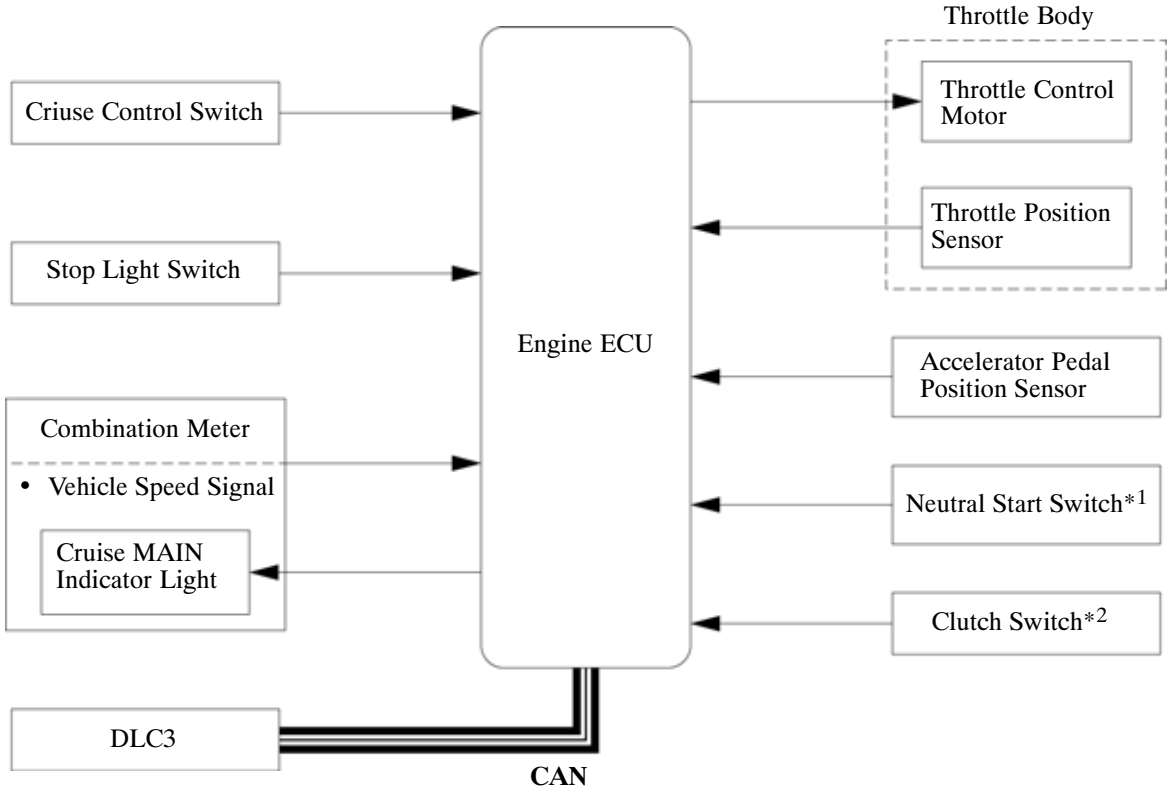
■CONVENTIONAL TYPE CRUISE CONTROL SYSTEM

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).

▶ System Diagram ◀

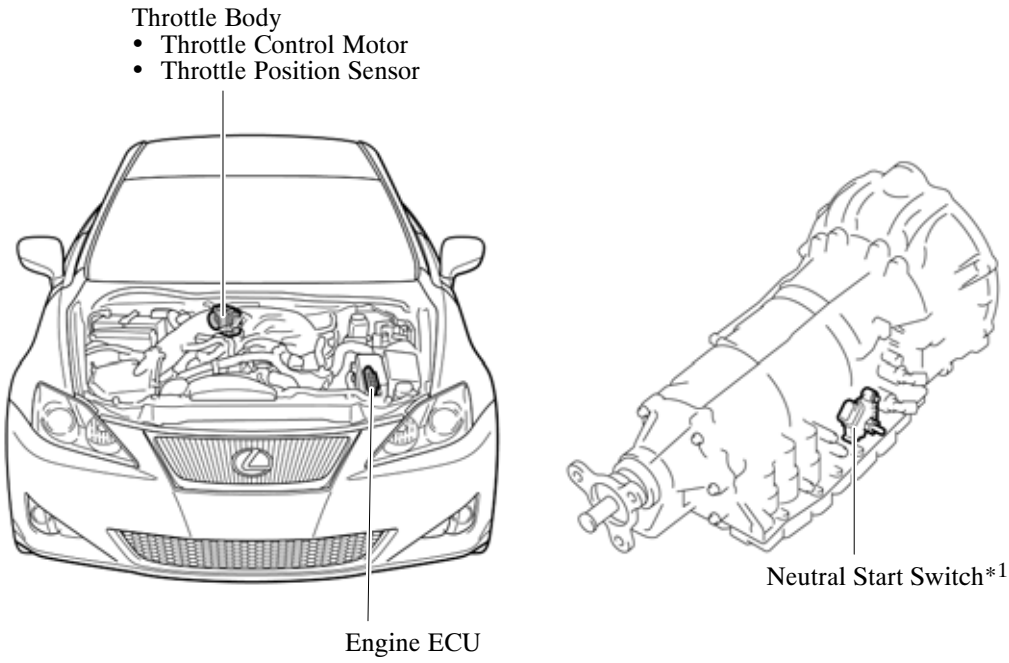


*1: Automatic Transmission
*2: Manual Transmission

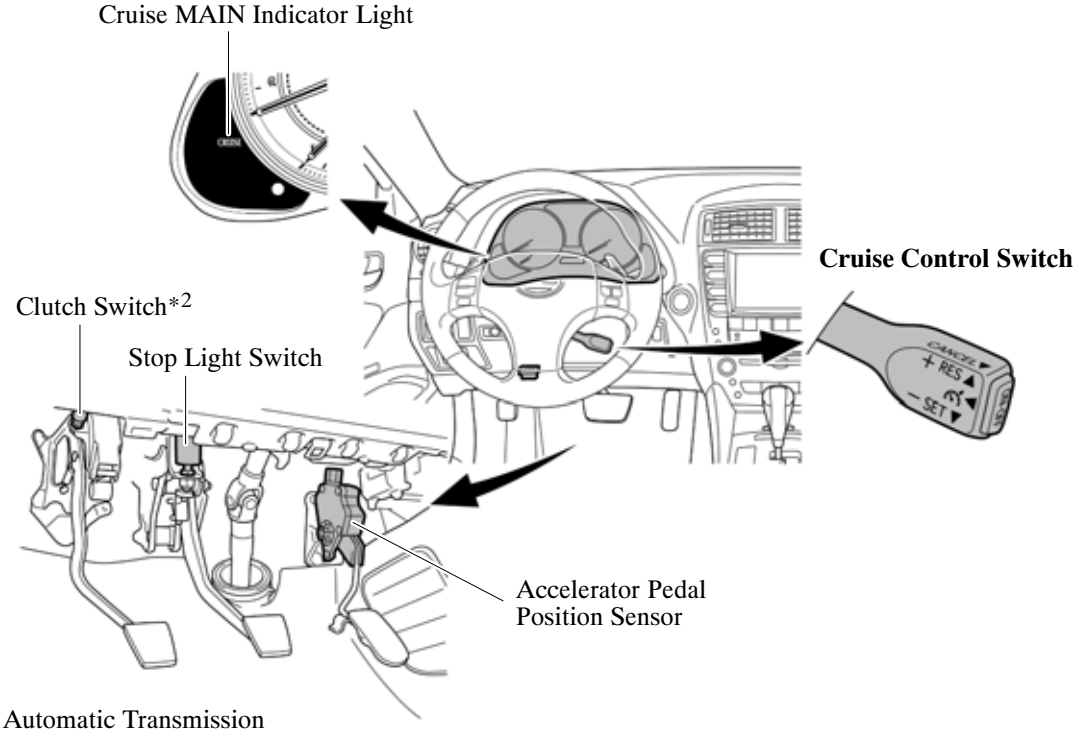
0140BE80C

BE

2. Layout of Main Component



0140BE81Z



*1: Automatic Transmission
*2: Manual Transmission

0140BE230Z

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 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 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 will decelerate 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. 0.5 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 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 operated.
ACC Switch Control	When the cruise control switch is kept to push to the RES/+ side, the vehicle speed and the set vehicle 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. 0.5 sec.) to the RES/+ side, the vehicle speed and the setting vehicle speed change as follows. • The vehicle will accelerate in increments of approx. 1.6 km/h (1 mph) for each time the switch was pressed. • However, if the difference between the actual vehicle speed and the vehicle set speed is greater than 5 km/h (3.1 mph), the set vehicle speed changes to the speed as which the vehicle was being driven at the time the switch was operated.
RES Switch Control	If cruise control is canceled for any reason other than a malfunction or main switch operation, pressing the cruise control switch to the RES/+ side will return the vehicle to the speed that was set before the cruise operation was canceled. However, the vehicle speed cannot be resumed if it decreases by 16 km/h (10 mph) or more below the speed the cruise control was set at.

(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 Engine ECU judges the end of cruising uphill based on the throttle valve angle, the overdrive function will turn on again. There is a case where the overdrive turns off during ACC or RES switch control.
Manual Cancel Control	If any of the following signals is sent to the Engine ECU, the cruise control is cancelled accordingly. • Clutch switch ON signal/Depress the clutch pedal (only for MT) • Shift lever is shifted from D to N. (only for AT) • When 1st, 2nd or 3rd range is selected in S mode position. (only for AT) • Stop light switch ON signal/Depress the brake pedal • CANCEL switch ON signal (cruise control switch moved to 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 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 the cruise control driving, the speed that is set in the memory is cleared to cancel the cruise control. • Stop light switch input signal abnormal • Cruise control switch input signal 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 power source is turned IG-ON again.
	When any of the following conditions occur during the cruise control driving, the cruise control is cancelled. • Vehicle speed is the 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 at.
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 MAN indicator light due to the malfunction. The contents relating to the malfunction will be stored in the Engine ECU.

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 DTCs (Diagnostic Trouble Codes).

- The 5-digit DTCs can be read by connecting an intelligent tester II to the 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.