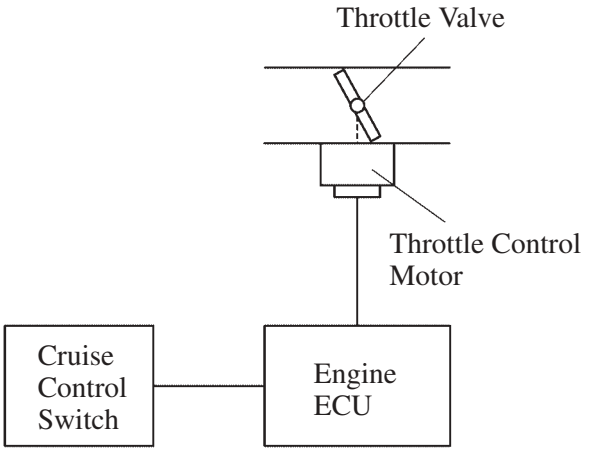
■CRUISE CONTROL SYSTEM

1. General

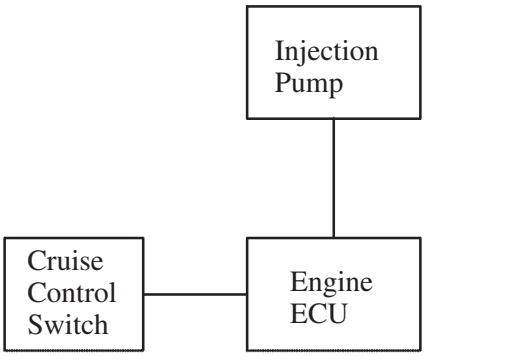
Once the system is set to a desired vehicle speed, the engine throttle position is adjusted automatically to maintain the vehicle speed at that speed without depressing the accelerator pedal.
This system in the Land Cruiser has the following features:

- On the 2UZ-FE engine models, in conjunction with the adoption of the ETCS-i in the engine, a cruise control system that uses the throttle control motor, which is a part of the ETCS-i, has been adopted. Also, the cruise control ECU has been integrated with the engine ECU.
- On the 1HD-FTE engine models, a cruise control system that controls the speed through the use of fuel injection control has been adopted. Also, as in the 2UZ-FE engine models, the cruise control ECU has been integrated with the engine ECU.
- On the 1HD-T engines models, a new motor type actuator that is both lightweight and simple in construction has been adopted. Also, the cruise control ECU has been made more compact.

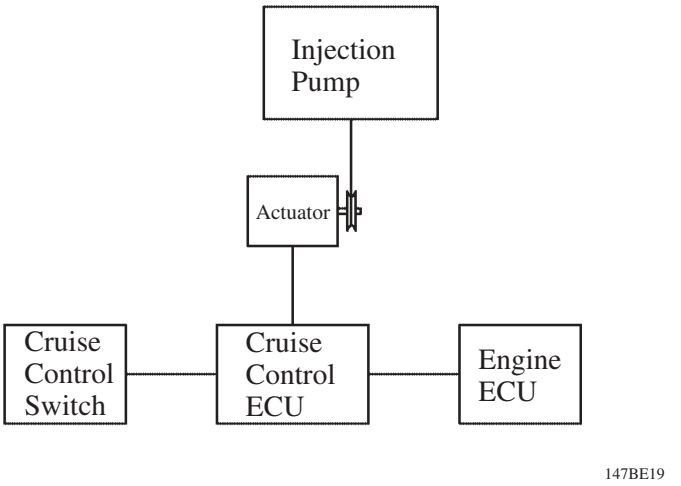
▶ System Diagram ◀



2UZ-FE Engine Model



1HD-FTE Engine Model



1HD-T Engine Model

2. Construction and Operation

2UZ-FE Engine Model

1) Actuator (Throttle Control Motor)

The 2UZ-FE engine model uses a throttle control motor, which is a part of the ETCS-i (Electronic Throttle Control System-intelligent). Based on the signals received from the engine ECU, the throttle control motor controls the throttle valve opening so that the current vehicle speed matches the desired vehicle speed that is set in the system.
For details of construction and operation of throttle control motor, see page 94.

2) Engine ECU

The cruise control ECU has been integrated with the engine ECU. The engine ECU receives the signals from the sensors and controls all cruise control functions.

1HD-FTE Engine Model

1) Injection Pump

The 1HD-FTE engine model uses a electronically controlled distributor type injection pump.
Based on the signals received from the engine ECU, the injection pump controls the fuel injection volume so that the current vehicle speed matches the desired vehicle speed that is set in the system.
For details of construction and operation of injection pump, see page 128.

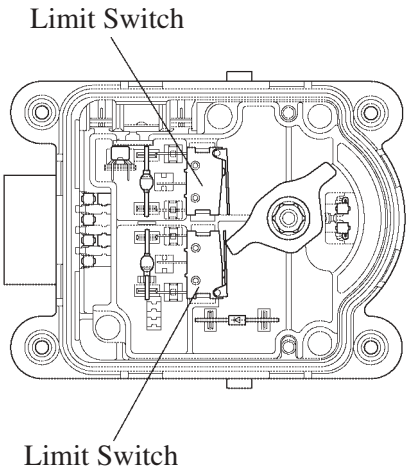
2) Engine ECU

The cruise control ECU has been integrated with the engine ECU. The engine ECU receives the signals from the sensors and controls all cruise control functions.

1HD-T Engine Model

1) Actuator

The 1HD-T engine model uses a new motor type actuator.
The potentiometer that measured the opening angle of the control link and transmitted the signals to the cruise control ECU has been discontinued in the new actuator. The new actuator is equipped it with a compact motor. As a result, the new actuator is made both lightweight and simple in construction.
Without the potentiometer, the new actuator continuously regulates the opening angle of the control link. This is made possible by the ECU, which compares the current vehicle speed input with the desired vehicle speed that is stored in memory, and the result of that comparison is transmitted to the actuator.



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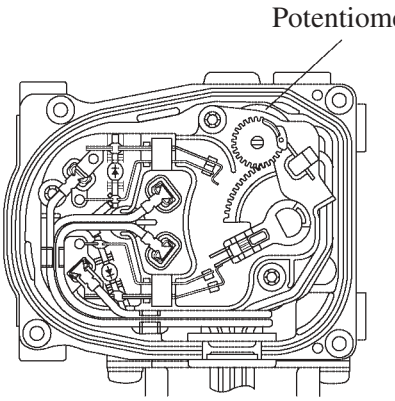
New



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Previous

2) Cruise Control ECU

The cruise control ECU has been made more compact by changing its internal circuits into an IC and by reducing the number of connector terminals by revising the functions.
Also, the backup power source has been discontinued with the adoption of the EEPROM (Electrical Erasable Programmable ROM).

3. Function

The functions of the cruise control system are basically the same as those of the previous model, except for the functions listed below.

Constant Speed Control Function

As in the previous model, the constant speed control function of the 2UZ-FE engine model and 1HD-T engine model controls the vehicle speed through the use of an actuator that regulates the throttle valve opening. The vehicle speed of the 1HD-FTE engine model is controlled by enabling the injection pump to regulate the fuel injection volume.

Manual Cancel Function

The following manual cancel has been changed.

New	Previous
Transmission shifted to positions other than “D”	● Transmission shifted to “N” position ● Pull up the parking brake lever

Auto Cancel Function

When the vehicle is being driven under cruise control, if any of the following conditions is present, the vehicle speed stored in memory is deleted, the control is lifted, the current to the actuator is disrupted, and the power indicator light is made to flash.

Engine Type	Condition	How to Reactivate
2UZ-FE	An abnormal condition in the ETCS-i components.	Turn off the ignition switch, and turn it back on. Then turn on the main switch.
1HD-FTE	An abnormal condition in the fuel injection pump.	
1HD-T	● Continuous current applied to the motor’s acceleration output. ● The motor did not move.	
2UZ-FE and 1HD-FTE	● An open or short circuit in the stop light switch. ● An abnormal condition of the vehicle speed signal.	Turn the main switch back on.
1HD-T	● Excessive current flowed to the motor or magnetic clutch drive transistor. ● Open circuit in magnetic clutch. ● The vehicle speed signal is not sent for a predetermined period of time (approx. 140 msec.)	

Diagnosis Function

Among the conditions in which the cruise control becomes canceled, a diagnosis function which uses a power indicator light, is implemented for some of the conditions.
For details of inspection, diagnostic trouble codes and repair procedures, see Land Cruiser Chassis and Body Repair Manual (Pub. No. RM616E).