SYSTEM DESCRIPTION

1. CRUISE CONTROL SYSTEM

This system is controlled by the ECM, and is activated by the throttle position sensor and motor. The ECM controls the following functions: ON-OFF, - (COAST)/SET, + (ACCEL)/RES (RESUME), CANCEL, vehicle speed operation, motor output control, and overdrive control.

- The ECM compares the driving vehicle speed from the speed sensor with the stored vehicle speed set through the cruise control main switch. The ECM instructs the throttle valve motor of the throttle body assembly to close the valve when the driving speed is greater than the stored speed, and instructs it to open the valve when the driving speed is less than the stored speed.
- The ECM receives signals such as ON-OFF, - (COAST)/SET, + (ACCEL)/RES (RESUME), and CANCEL from the cruise control main switch and executes the command.
- The ECM illuminates the combination meter's CRUISE main indicator light when it receives a cruise control main switch ON signal.
- The ECM cancels the cruise control system when the brake pedal is depressed and the ECM receives a stop light switch signal.
- The ECM cancels the cruise control system when the shift lever is moved from the D or 4 to the N, 3, 2 or L position, and the ECM receives a park/neutral position switch signal.

2. LIMIT CONTROL

(a) Low speed limit

The lowest possible limit of the speed setting range is set at approximately 40 km/h (25 mph). The cruise control system cannot be set when the driving vehicle speed is below the low speed limit. Cruise control operation will be automatically canceled but the stored vehicle speed will be retained when the vehicle speed drops below the low speed limit 40 km/h (25 mph) while the cruise control is in operation.

(b) High speed limit

The highest possible limit of the speed setting range is set at approximately 200 km/h (125 mph). The cruise control system cannot be set when the driving vehicle speed is over the high speed limit. Also, + (ACCEL)/RES (RESUME) cannot be used to increase speed beyond the high speed limit.

3. OPERATION OF CRUISE CONTROL

The cruise control main switch operates 7 functions: SET, - (COAST), TAP-DOWN, RES (RESUME), + (ACCEL), TAP-UP, and CANCEL. The SET, TAP-DOWN, and - (COAST) functions, and the RES (RESUME), TAP-UP, and + (ACCEL) functions are operated with the same switch. The cruise control main switch is an automatic return type switch which turns on only while operating it in the direction of each arrow and turns off after releasing it.

(a) SET CONTROL

Vehicle speed is stored and constant speed control is maintained when pushing the cruise control main switch to - (COAST)/SET while driving with the main switch on (the CRUISE main indicator light is on), and the vehicle speed is within the set speed range (between the low and high speed limits).

(b) - (COAST) CONTROL

When the cruise control main switch is set to - (COAST)/SET and held in that position while the cruise control system is operating, the ECM sends a "throttle valve opening angle 0°" demand signal to the cruise control system. Then the vehicle speed, when the cruise control main switch is released, is stored and maintained.

HINT:

An actual throttle valve opening angle of 0° is not possible due to the idle speed control, etc.

(c) TAP-DOWN CONTROL

When tapping down the cruise control main switch to - (COAST)/SET (for approximately 0.6 seconds) while the cruise control system is in operation, the stored vehicle speed decreases each time by approximately 1.6 km/h (1.0 mph). When the cruise control main switch is released from - (COAST)/SET and the difference between the driving and stored vehicle speeds is more than 5 km/h (3 mph), the driving vehicle speed is stored and constant speed control is maintained.

(d) ACCELERATION CONTROL

The throttle valve motor of the throttle body assembly is instructed by the ECM to open the throttle valve when + (ACCEL)/RES (RESUME) on the cruise control main switch is pressed and held while the cruise control system is in operation. When the cruise control main switch is released from + (ACCEL)/RES (RESUME), the vehicle speed is stored and the vehicle is controlled at a constant speed.

(e) TAP-UP CONTROL
When tapping up the cruise control main switch to + (ACCEL)/RES (RESUME) (for approximately 0.6 seconds) while the cruise control system is in operation, the stored vehicle speed increases each time by approximately 1.6 km/h (1.0 mph). However, when the difference between the driving and the stored vehicle speeds is more than 5 km/h (approximately 3 mph), the stored vehicle speed will not be changed.

(f) RESUME CONTROL
If cruise control operation was canceled with the stop light switch or the CANCEL switch, and even if driving speed is less than the lower speed control limit, pushing the cruise control main switch to + (ACCEL)/RES (RESUME) restores vehicle speed memorized at the time of cancellation, and maintains constant speed control. This resume operation will occur after the vehicle speed has risen higher than the lower speed control limit.

(g) MANUAL CANCEL CONTROL
Performing any of the following cancels the cruise control system while in operation (the stored vehicle speed in the ECM is maintained).
- Depressing the brake pedal
- Moving the shift lever from the D or 4 to the N, 3, 2 or L position
- Pulling the cruise control main switch to CANCEL
- Turning the cruise control main switch off (the stored vehicle speed in the ECM is not maintained.)

4. AUTO CANCEL (FAIL-SAFE)
This system has an automatic cancellation function (fail-safe) (See page CC-14).

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the following procedures to troubleshoot the cruise control system.
- *: Use the intelligent tester.

1	VEHICLE BROUGHT TO WORKSHOP

NEXT

2	PROBLEM SYMPTOM CONFIRMATION

NEXT

CC

3	CHECK MULTIPLEX COMMUNICATION SYSTEM*

Refer to HOW TO PROCEED WITH TROUBLESHOOTING (See page MP-4).

(a) Check for output DTCs.

Result

Result	Proceed to
MPX DTC is not output	A
MPX DTC is output	B

HINT:

The ECM of this system is connected to the multiplex communication system. Therefore, before starting troubleshooting, make sure to check that there is no trouble in the multiplex communication system.

B → **PROCEED TO "MULTIPLEX COMMUNICATION SYSTEM"**

A

4	CHECK CAN COMMUNICATION SYSTEM*

Refer to PRECAUTION (See page CA-1).

(a) Check for output DTCs.

Result

Result	Proceed to
CAN DTC is not output	A
CAN DTC is output	B

HINT:

The ECM of this system is connected to the CAN communication system. Therefore, before starting troubleshooting, make sure to check that there is no trouble in the CAN communication system.

B → PROCEED TO "CAN COMMUNICATION SYSTEM"

A

5	DTC CHECK AND CLEAR*

Refer to DTC CHECK / CLEAR (See page CC-14).

NEXT

6	DTC CHECK (OTHER THAN MPX AND CAN SYSTEM DTC)*

Result

Result	Proceed to
DTC is not output	A
DTC is output	B

A → GO TO STEP 8

B

7	DTC CHART

Refer to DIAGNOSTIC TROUBLE CODE CHART (See page CC-16).

NEXT

GO TO STEP 11

8	PROBLEM SYMPTOM CONFIRMATION

Result

Result	Proceed to
Symptom occurs	A
Symptom does not occur	B

A → GO TO STEP 10

B

9	SYMPTOM SIMULATION

Refer to ELECTRONIC CIRCUIT INSPECTION PROCEDURE (See page IN-30).

NEXT

GO TO STEP 8

10	PROBLEM SYMPTOMS TABLE

Refer to PROBLEM SYMPTOMS TABLE (See page CC-10).

NEXT

11	CIRCUIT INSPECTION

NEXT

CC

12	TERMINALS OF ECM

Refer to TERMINALS OF ECM (See page CC-12).

NEXT

13	IDENTIFICATION OF PROBLEM

NEXT

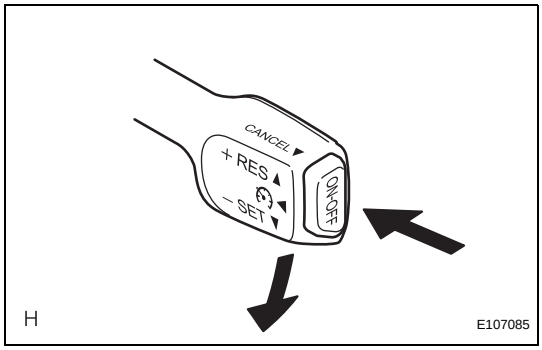
14	REPAIR OR REPLACE

NEXT

15	CONFIRMATION TEST

NEXT

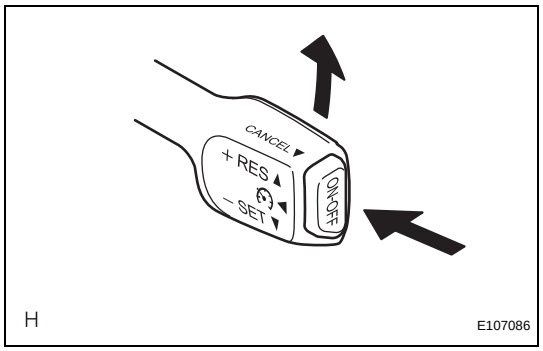
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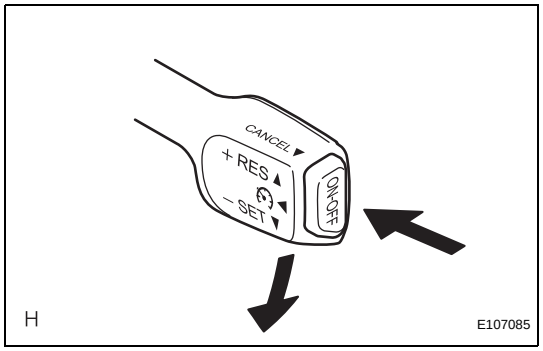
ROAD TEST

1. PROBLEM SYMPTOM CONFIRMATION

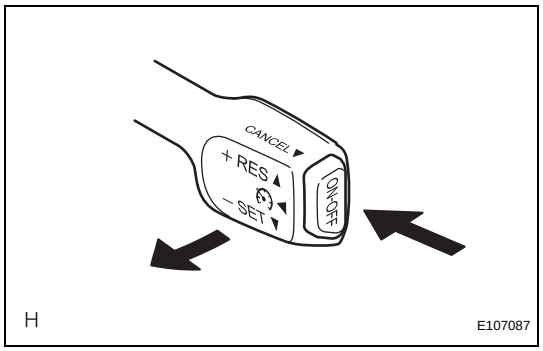
(a) Inspect the SET function.
  (1) Turn the cruise control main switch on.
  (2) Drive at the required speed between 40 km/h (25 mph) and 200 km/h (125 mph).
  (3) Push the cruise control main switch to - (COAST)/SET.
  (4) After releasing the switch, check that the vehicle cruises at the set speed.



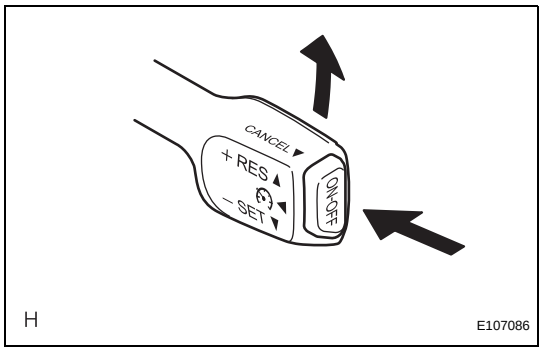
(b) Inspect the + (ACCEL) function.
(1) Turn the cruise control main switch on.
(2) Drive at the required speed between 40 km/h (25 mph) and 200 km/h (125 mph).
(3) Push the cruise control main switch to - (COAST)/SET.
(4) Check that vehicle speed increases while the cruise control main switch is pushed to + (ACCEL)/RES (RESUME), and that the vehicle cruises at the newly set speed when the switch is released.
(5) Push the cruise control main switch to + (ACCEL)/RES (RESUME) and then release it immediately. Check that vehicle speed increases by approximately 1.6 km/h (1.0 mph) (tap-up control).



(c) Inspect the - (COAST) function.
(1) Turn the cruise control main switch on.
(2) Drive at the required speed between 40 km/h (25 mph) and 200 km/h (125 mph).
(3) Push the cruise control main switch to - (COAST)/SET.
(4) Check that vehicle speed decreases while the cruise control main switch is pushed to - (COAST)/SET, and that the vehicle cruises at the newly set speed when the switch is released.
(5) Push the cruise control main switch to - (COAST)/SET, and then release it immediately. Check that vehicle speed decreases by approximately 1.6 km/h (1.0 mph) (tap-down control).



(d) Inspect the CANCEL function.
(1) Turn the cruise control main switch on.
(2) Drive at the required speed between 40 km/h (25 mph) and 200 km/h (125 mph).
(3) Push the cruise control main switch to - (COAST)/SET.
(4) When performing any one of the following, check that the cruise control system is canceled and that the normal driving mode is reset.
- Depressing the brake pedal
- Moving the shift lever from the D or 4 to the N, 3, 2 or L position
- Turning the cruise control main switch off
- Pulling the cruise control main switch to CANCEL



(e) Inspect the RES (RESUME) function.
(1) Turn the cruise control main switch on.
(2) Drive at the required speed between 40 km/h (25 mph) and 200 km/h (125 mph).
(3) Push the cruise control main switch to - (COAST)/SET.
(4) Cancel the cruise control system by performing any of the above operations (other than turning the main switch off).
(5) After pushing the cruise control main switch to + (ACCEL)/RES (RESUME) at a driving speed of more than 40 km/h (25 mph), check that the vehicle resumes the speed set prior to the cancellation.