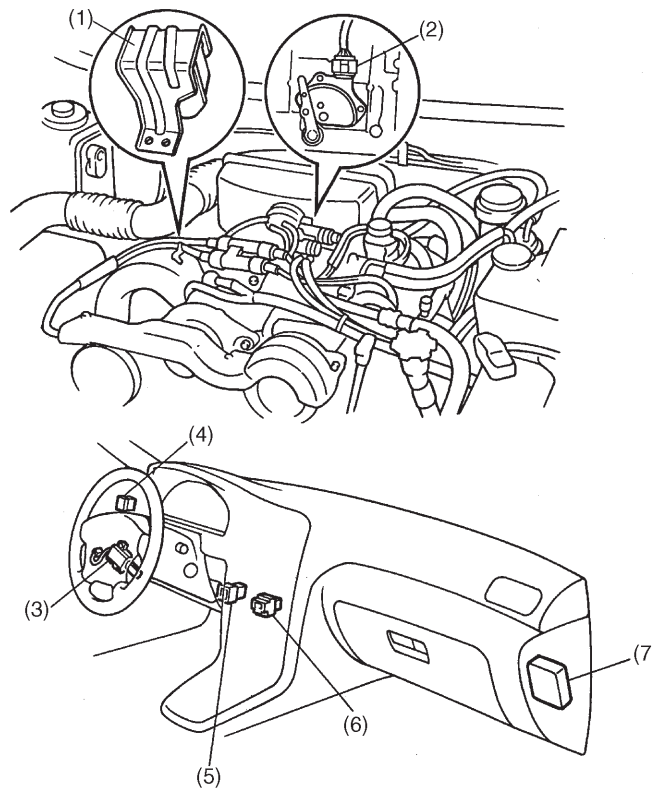


10. Cruise Control

A: OPERATION

- The cruise control automatically controls vehicle speed and allows the vehicle to run at a constant speed without depressing the accelerator pedal.
- The cruise control module compares the actual vehicle speed detected by the speed sensor (MT) or TCM (AT) with the speed preset in the memory when the set switch was turned on, then generates a signal according to the difference between the two speeds. This signal is transmitted to the actuator located at the engine compartment. The actuator operates the throttle cam, keeping the vehicle speed constant.

B: COMPONENT LOCATION



- | | |
|---------------------------|---------------------------|
| (1) Actuator | (5) Clutch switch (MT) |
| (2) Inhibitor switch (AT) | (6) Stop and brake switch |
| (3) Command switch | (7) Control module |
| (4) Main switch | |

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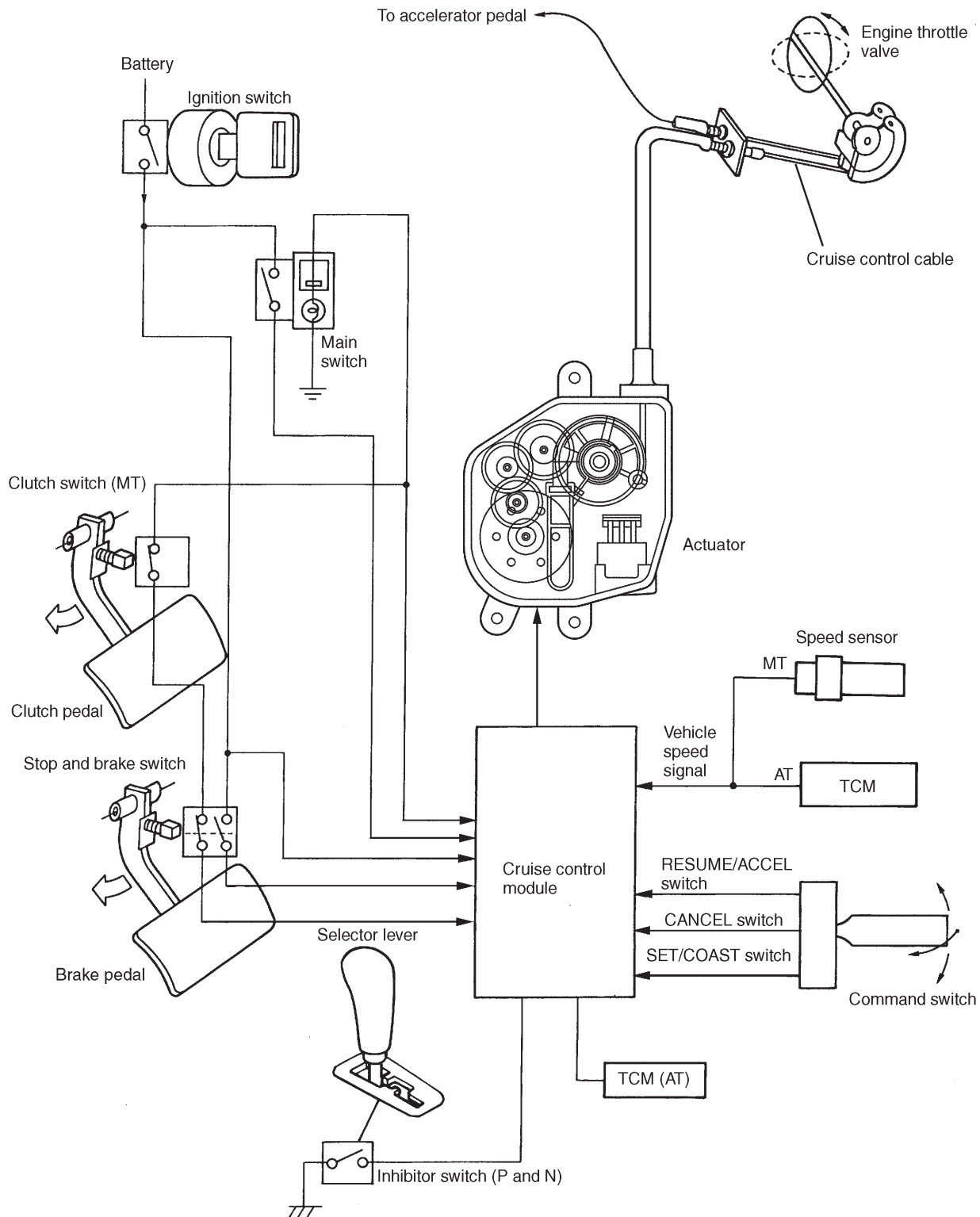
MECHANISM AND FUNCTION**[M10C0] 6-2**
10. Cruise Control**C: CONTROL AND OPERATION**

| | |
|-------------------------|---|
| Constant speed control | When actual driving speed is higher than “set” speed, the motor in the actuator operates to move the throttle valve toward the close position by the amount corresponding to the difference between two speeds. When actual driving speed is lower than “set” speed, the motor operates to move the throttle valve toward the “open” direction according to the difference. |
| “Set” control | When SET/COAST switch is pressed with main switch ON while vehicle is being driven at a speed greater than 40 km/h (25 MPH), current flows to the actuator. This then causes the clutch in the actuator to engage, operating the motor. The motor moves the throttle valve to the position corresponding to accelerator pedal depression. Thus, vehicle is being driven at constant speed. |
| Deceleration control | When SET/COAST switch is turned ON while vehicle is cruising, the motor in the actuator rotates to move the throttle valve toward the “close” direction. This causes the vehicle to decelerate. When the switch is turned OFF, vehicle speed is stored in memory and vehicle is constantly driven at that speed. |
| Acceleration control | When RESUME/ACCEL switch is turned ON while vehicle is cruising, the motor in the actuator rotates to move the throttle valve toward the “open” direction. This causes vehicle to accelerate. When the switch is turned OFF, vehicle speed is stored in memory and vehicle is constantly driven at that speed. |
| Resume control | When RESUME/ACCEL switch is turned ON after cruise control is released, vehicle speed returns to that speed which was stored in memory just before cruise control was released. However, this occurs only when vehicle is being driven at a speed greater than 32 km/h (20 MPH). In the following cases, however, the set vehicle speed is cleared. Therefore, no resume operation is performed. (1) Ignition switch is turned OFF (2) Main switch is turned OFF |
| Manual cancel control | When any of the following signals is entered, the clutch disengages, cancelling the cruise control. (1) Stop light switch ON signal (Brake pedal depressed) (2) Brake switch OFF signal (Brake pedal depressed) (3) Clutch switch OFF signal (Clutch pedal depressed – MT) (4) Inhibitor switch ON signal (Selector lever set to “N” – AT) (5) CANCEL switch ON signal (Command switch pulled) (6) Ignition switch OFF signal (7) Main switch OFF signal |
| Low speed limit control | When vehicle speed drops below 32 km/h (20 MPH), cruise control is automatically cancelled. Cruise control at speed lower than 40 km/h (25 MPH) cannot be effected. |
| Motor control | When vehicle speed increases 10 km/h (6 MPH) greater than memorized speed while vehicle is cruising (downgrade, etc.), actuator’s clutch is turned OFF so that vehicle decelerates. When vehicle decelerates by more than 8 km/h (5.0 MPH) from the memorized speed, the clutch is turned ON so that cruise control resumes. |

6-2 [M10D0]
10. Cruise Control

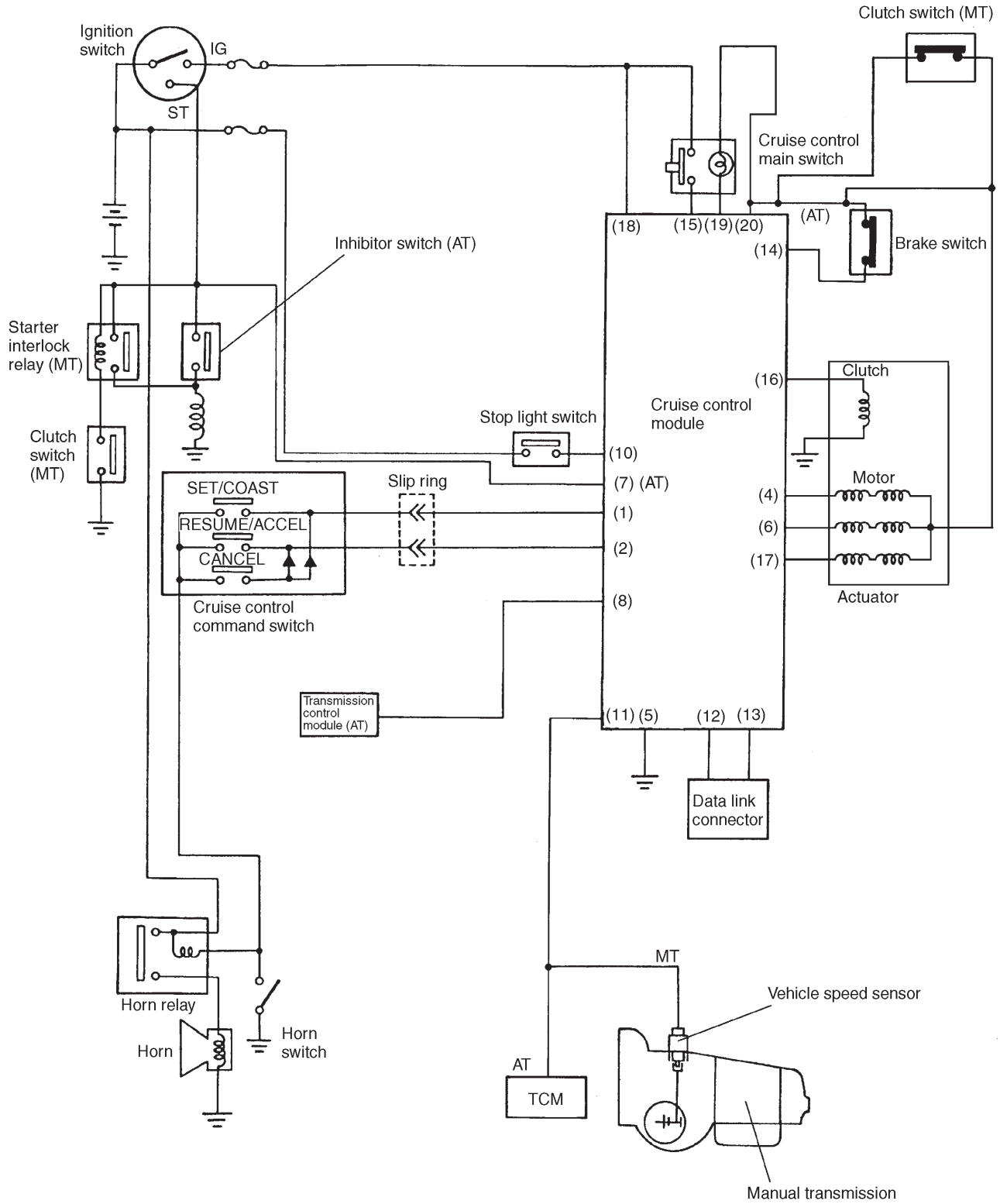
MECHANISM AND FUNCTION

D: SCHEMATIC



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E: CIRCUIT DIAGRAM



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6-2 [M10F0]

10. Cruise Control

MECHANISM AND FUNCTION

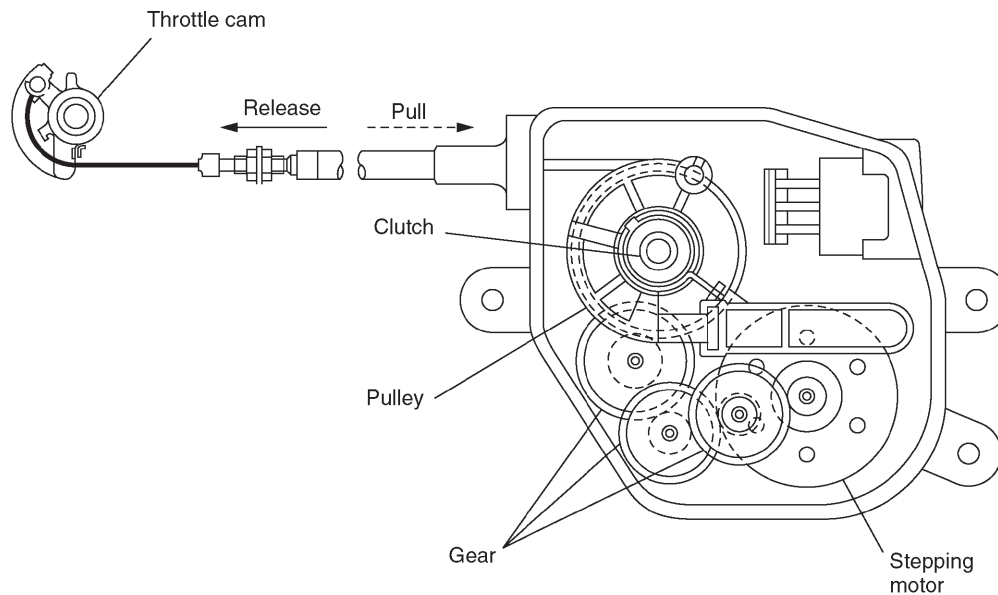
F: SYSTEM CONSTRUCTION

| Unit | Name | Function | Set | Cancel | Resume | Coast | Vehicle speed |
|------------------------|---|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Input signal (sensors) | Main switch | Supplies battery voltage to control module after main switch is turned ON (with ignition switch ON). | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | SET/COAST switch | Sends a SET/COAST signal to control module. | <input type="radio"/> | | | <input type="radio"/> | |
| | RESUME/ACCEL switch | Sends a RESUME/ACCEL signal to control module. | | | <input type="radio"/> | | |
| | CANCEL switch | Simultaneously sends SET/COAST and RESUME/ACCEL signals to control module. | | <input type="radio"/> | | | |
| | Brake switch (NC) | Disconnects power supply to clutch and stepping motor. | <input type="radio"/> | <input type="radio"/> | | | |
| | Stop light switch (NO) | Sends a cancel signal to control module. | <input type="radio"/> | <input type="radio"/> | | | |
| | Clutch switch (NC) or inhibitor switch (NO) | Sends a cancel signal to control module. | <input type="radio"/> | <input type="radio"/> | | | |
| | Vehicle speed sensor | Detects vehicle speed. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Control section | Built-in relay | A safety device to protect system from damage. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Output signal | Stepping motor (PULL) | Controls vehicle speed. | <input type="radio"/> | | <input type="radio"/> | | <input type="radio"/> |
| | Stepping motor (RELEASE) | Controls vehicle speed. | | <input type="radio"/> | | <input type="radio"/> | <input type="radio"/> |
| | Clutch | Cruise control set cancel. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

NC:Normal close
NO:Normal open

G: ACTUATOR

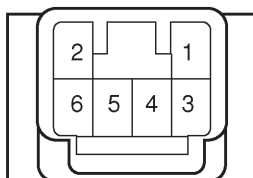
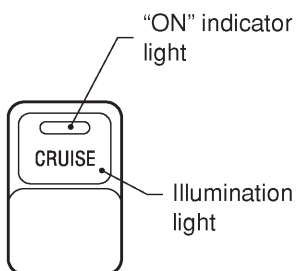
When receiving a signal from the cruise control module, the clutch in the actuator is turned ON. This causes the stepping motor to operate, pulling the throttle cam for speed control.



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H: MAIN SWITCH

- The main switch is the main power supply switch of the cruise control module and has a built-in power indicator and night illumination light.
- When the ignition switch is placed in the OFF position with the main switch at ON, the main switch is also simultaneously forced to OFF. In this condition, even if the ignition switch is placed in the ON position again, the main switch will stay in the OFF state.



| | | | | | | |
|-----|-------|----------------|----------------|----------------|--------------------|----------------------|
| | 3 | 5 | 1 | 6 | 4 | 2 |
| ON | ○ | ○ | ○ | ○ | ○ | ○ |
| OFF | | | ○ | ○ | ○ | ○ |
| | IG SW | Control module | Control module | Control module | Illumination power | Illumination control |

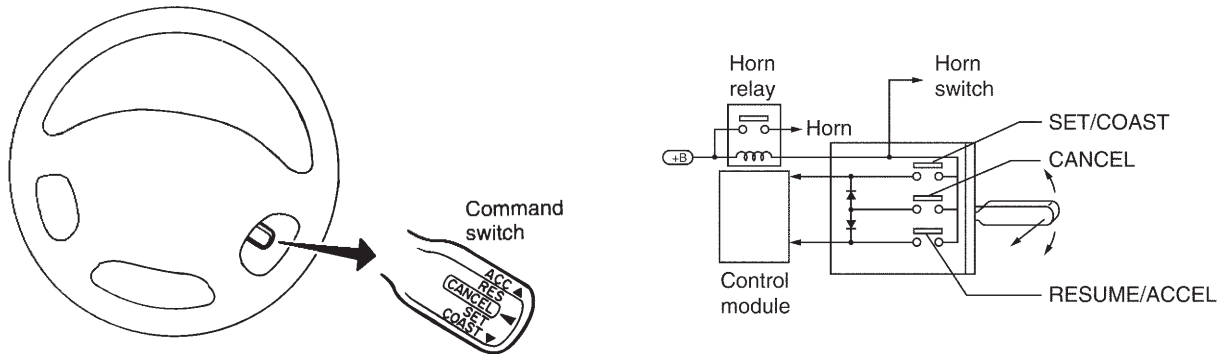
B6H1173B

6-2 [M10I0] 10. Cruise Control

MECHANISM AND FUNCTION

I: COMMAND SWITCH

- When the vehicle is in the cruise control mode, the command switch controls its operation. It inputs SET/COAST signal, ACCEL/RESUME signal or CANCEL signal to the cruise control module.



B6H1310A

- The command switch is located on the right side of the steering wheel and can be operated without releasing your hand from the steering wheel.
- The command switch is an auto return lever type.

1. RESUME/ACCEL AND SET/COAST SWITCH

The switch is caused to be ON as long as the lever is kept pressed in any of the positions, and outputs it as a signal to the control module.

2. CANCEL SWITCH

The switch is caused to be ON as long as the lever is pulled toward CANCEL (toward you), and outputs RESUME/ACCEL and SET/COAST ON signals simultaneously.

J: CANCEL SIGNALS

The cancel signal cancels the cruise mode. When any of the following switches is operated, the cruise control module cancels the cruise mode.

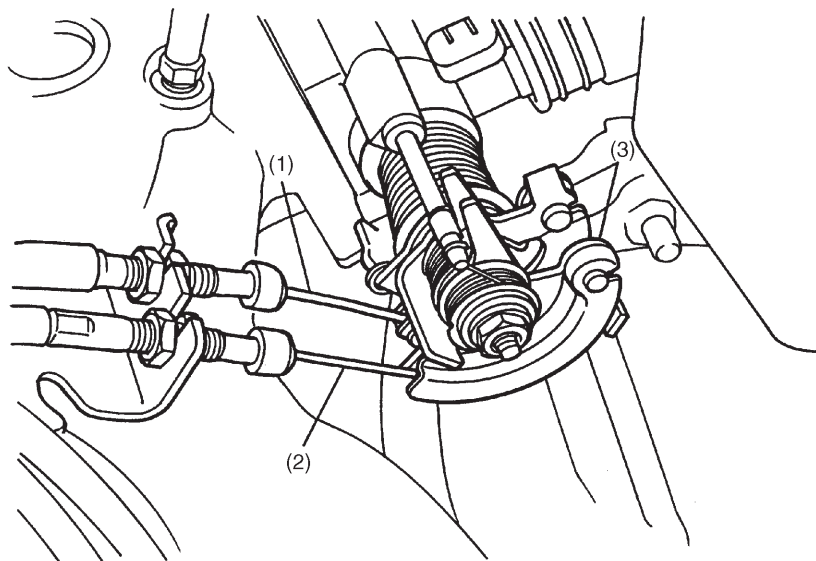
- Stop light switch
- Brake switch
- Clutch switch (MT model)
- Inhibitor switch (AT model)
- Main switch
- Command switch (CANCEL position)

K: VEHICLE SPEED SENSOR

Vehicle speed sensor is installed on the transmission, and sends signal to the cruise control module (MT model).

L: ENGINE THROTTLE

- The throttle body is equipped with two throttle cams. One cam is used during acceleration and the other during cruising, in order to open or close the throttle valve.
- These cams operate independently of each other. In other words, while one cam operates, the other does not.

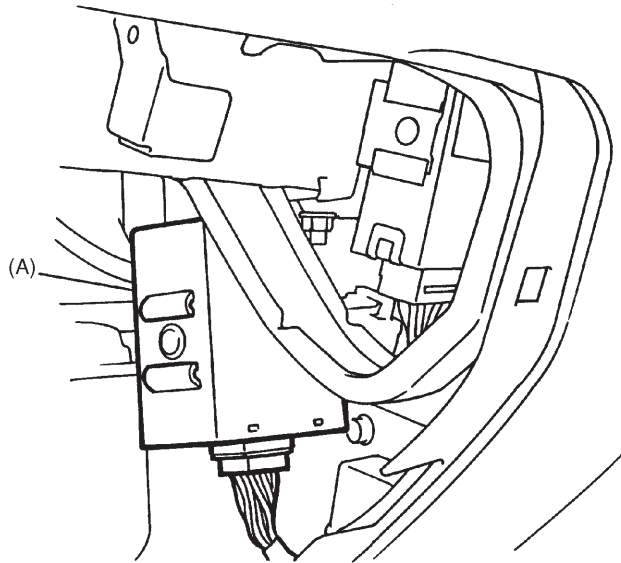


B6H1300A

- (1) Accelerator cable
- (2) Cruise control cable
- (3) Throttle cam

6-2 [M10M0]
10. Cruise Control**MECHANISM AND FUNCTION****M: CONTROL MODULE**

- Based on the signals from the individual switches, sensors, etc., the control module controls all of the cruise control functions described below.
(Constant speed control, set control, deceleration control, acceleration control, resume control, manual cancel control, low speed limiter control, stepping motor control, clutch control)
- The control module (A) is installed at inside of front pillar lower (Passenger side).



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N: FAIL-SAFE FUNCTION**1. CANCELLING FUNCTION WHEN CANCEL SWITCH (SIGNALS) ARE IN ABNORMAL CONDITION**

- Group 1 switches: SET/COAST switch ON, RESUME/ACCEL switch ON and CANCEL switch ON
- Group 2 switches: Brake switch OFF, Stop Light switch ON, Clutch switch OFF and Inhibitor switch ON

1) When at least one of the group 1 switches and one of the group 2 switches are operated simultaneously, the system is cancelled and held in the non-operating state. When the switches in groups 1 and 2 are turned from ON to OFF (except brake and clutch switches which are turned from OFF to ON) and then the switches in group 1 are turned ON, the system starts operation.

2) If the cruise main switch is turned ON with at least one switch in group 1 turned ON, the system does not operate and remains in that state until the cruise main switch is turned OFF.

2. CANCELLING FUNCTION WHEN THE SYSTEM CIRCUIT IS IN ABNORMAL CONDITION

In the following states, the system is cancelled and the memorized speed is also cancelled. After cancellation of the system, the cancelling function is held until the IG switch or cruise main switch is turned OFF.

- 1) The stepping motor terminal is grounded or opened.
Or the stepping motor driving circuit is shorted or opened.
- 2) The stepping motor clutch driving circuit is grounded.
- 3) The vehicle speed signal varies more than ± 10 km/h (6 MPH) per 360 m sec.
- 4) The fused internal relay is detected while the vehicle is not in cruise control operation.
- 5) The internal circuit of the cruise control module stops its operation in an abnormal condition.
- 6) There is a discrepancy between the values stored in RAM inside the cruise control module.
- 7) An abnormal condition is detected by self-diagnosis of the cruise control module which is performed when ignition switch is turned ON.

3. CANCELLING FUNCTION WHEN THE STEPPING MOTOR IS IN ABNORMAL CONDITION

- 1) The cruise control is cancelled when an improper stepping motor is detected.
- 2) The cruise control is cancelled when unduly long and frequent energization of stepping motor is detected.

The system is held in this state for 2 to 20 minutes.