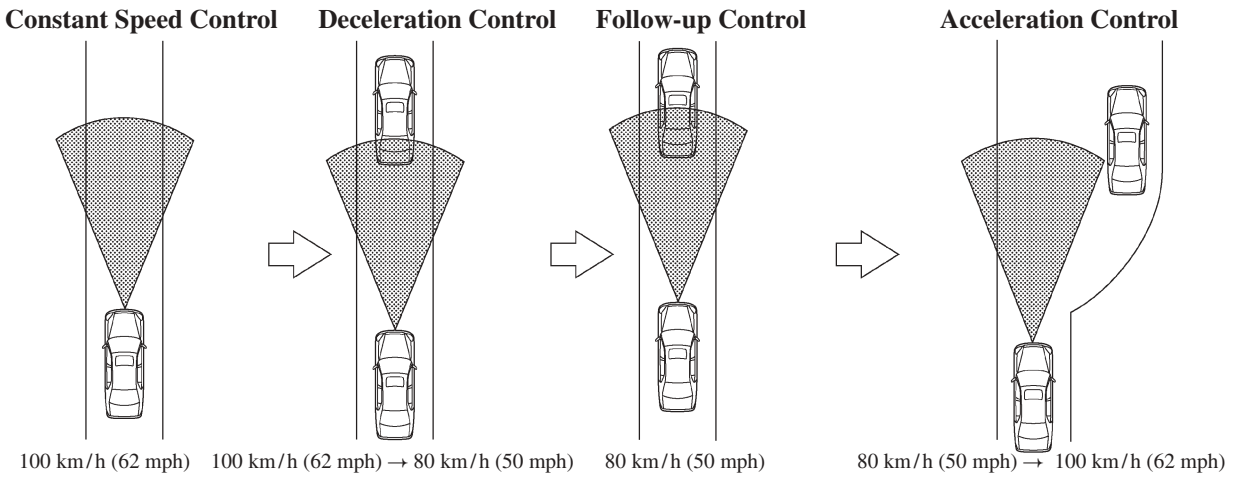
## ■DYNAMIC RADAR TYPE CRUISE CONTROL SYSTEM

### 1. General

The dynamic radar type cruise control system has two cruise control modes: constant speed control mode, and vehicle-to-vehicle distance control mode.

- The cruise control switch is used for switching between the two modes. The mode in which the cruise control system starts is the vehicle-to-vehicle distance control mode.
- The distance control ECU, millimeter wave radar sensor and the engine ECU control this system.
- The combination meter informs the driver of the control conditions.

| Mode | Outline |
|---|---|
| Constant Speed Control Mode | The constant speed control mode is the same as in the conventional type cruise control system. However, differences are as follows:<br>● Set speed: 40 km/h (25 mph) → 45 km/h (27 mph) |
| Vehicle-to-Vehicle Distance Control Mode | In the vehicle-to-vehicle distance control mode, the system recognizes and determines the lane in which the driver's own vehicle and the vehicle ahead are traveling. Thus, the system is able to maintain the proper vehicle-to-vehicle distance in accordance with the vehicle speed, and allows the vehicle to be driven under follow-up control.<br>● The driver can operate the distance control switch on the steering wheel to select the vehicle-to-vehicle distance in three stages: long, middle, and short.<br>● This mode consists mainly of four controls: constant speed control, deceleration control, follow-up control, and acceleration control.<br>● The illustrations below show control examples while the driver's own vehicle is operating at 100 km/h (62 mph), and the vehicle ahead is operating at 80 km/h (50 mph).<br>● Throttle control and brake control achieve smooth deceleration. |

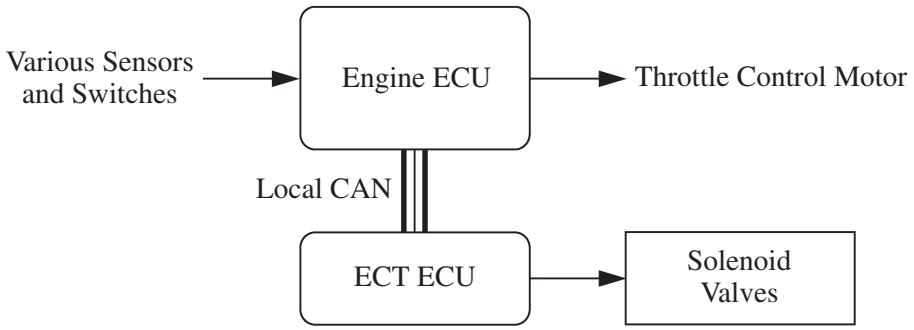



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**Service Tip**

When either the distance control ECU or the engine ECU is replaced, the radar sensor information stored in the distance control ECU must be initialized. For details, see Camry Repair Manual.

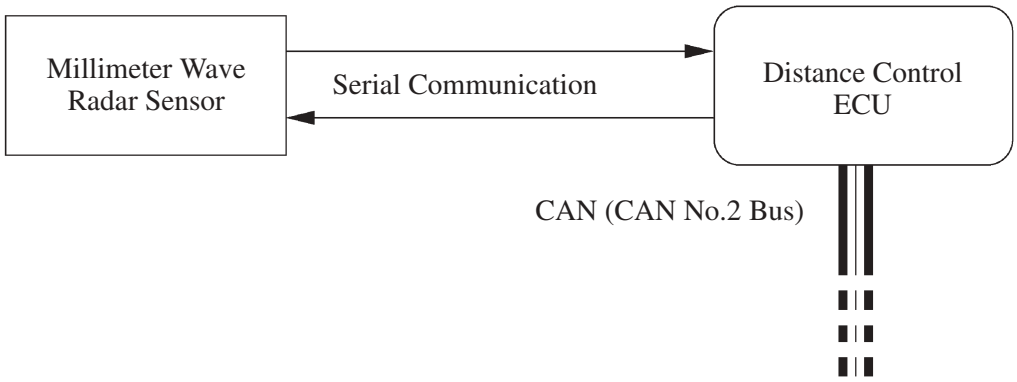
- As in the conventional type cruise control system, the constant speed control mode is controlled by the engine ECU, which outputs signals to the actuators and the engine ECU.




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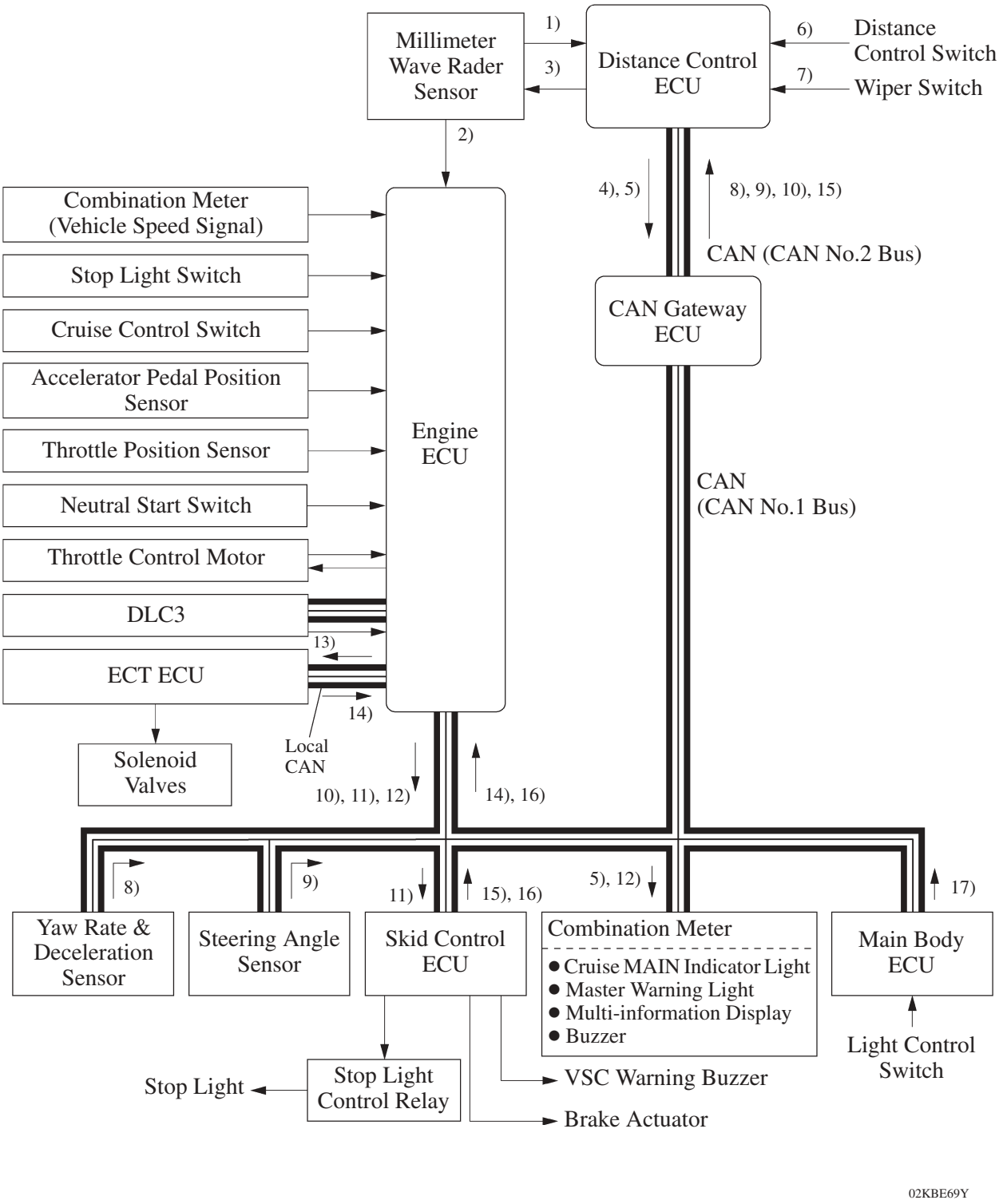
- The vehicle-to-vehicle distance control mode is controlled by the millimeter wave radar sensor and distance control ECU. Thus, the signals are output to the actuators and the ECU while exchanging data as indicated below.






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## 2. System Diagram



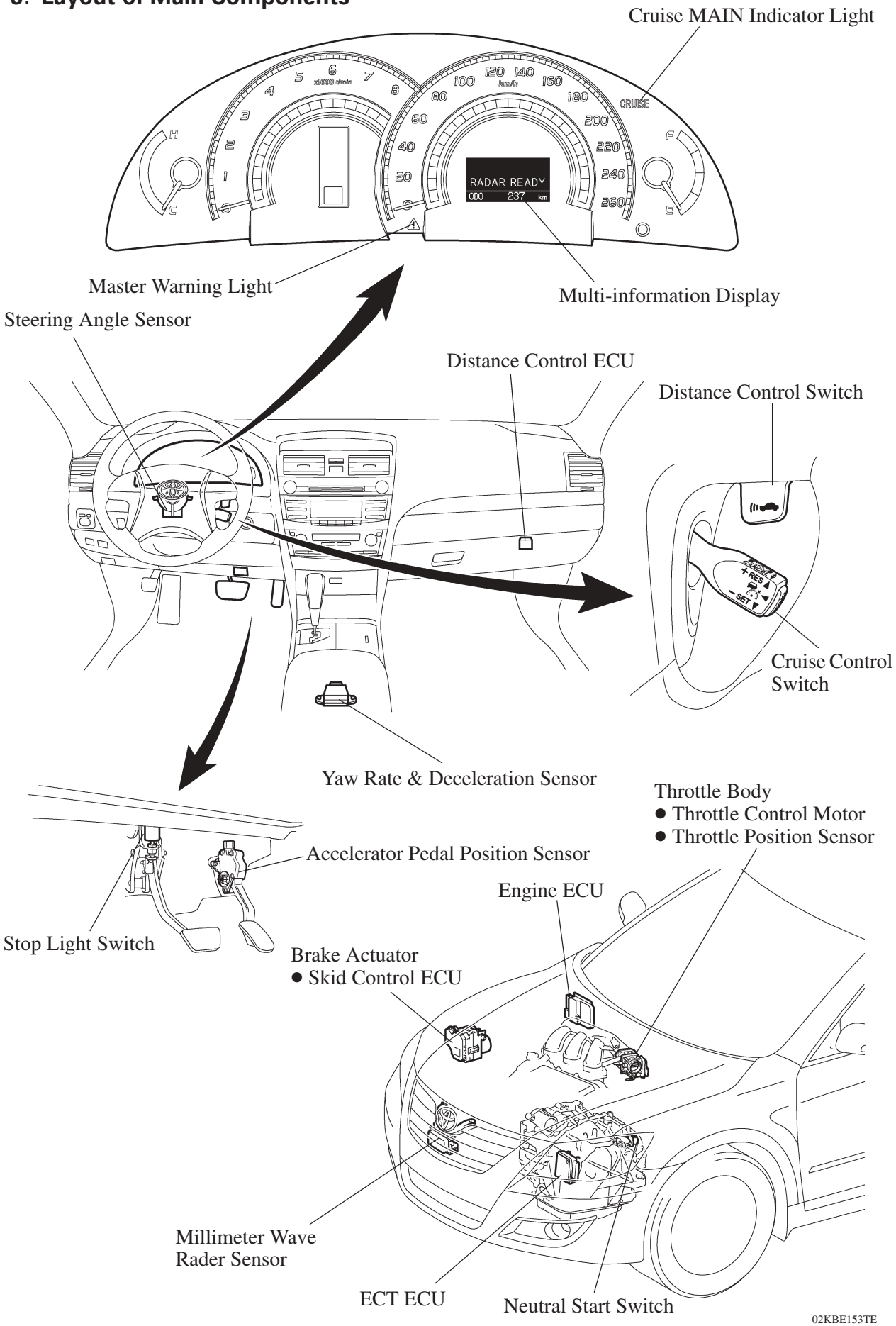

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| No. | Transmit | Receive | Data List | Communication |
|---|---|---|---|---|
| 1) | Millimeter Wave Radar Sensor | Distance Control ECU | ● Vehicle-to-Vehicle Distance<br>● Presence of Vehicle Ahead<br>● Relative Acceleration Rate<br>● Relative Vehicle Speed<br>● Width and Position of Object Ahead<br>● Diagnostic Data | Serial |
| 2) | | Engine ECU | Millimeter Wave Radar Sensor Operation Signal | Wire |
| 3) | Distance Control ECU | Millimeter Wave Radar Sensor | ● Actual Vehicle Speed<br>● Estimated Curve Radius<br>● Wiper Condition<br>● Light Control Switch<br>● Set Distance<br>● Beam Axis Adjustment Data | Serial |
| 4) | | Engine ECU | ● Target Acceleration Rate<br>● Target Deceleration Rate<br>● Vehicle-to-Vehicle Distance<br>● Presence of Vehicle Ahead<br>● Brake Request<br>● Beam Axis Deviation<br>● Millimeter Wave Radar Sensor Dirtiness Detection<br>● Poor Weather Detection<br>● Proximity Warning<br>● Gear Request<br>● Diagnosis Data | CAN |
| 5) | | Combination Meter | ● Display Data<br>● Warning | CAN |
| 6) | Distance Control Switch | Distance Control ECU | Distance Control Switch | Wire |
| 7) | Wiper Switch | | Wiper Switch | |
| 8) | Yaw Rate & Deceleration Sensor | | Yaw Rate | CAN |
| 9) | Steering Angle Sensor | | Steering Angle | |
| 10) | Engine ECU | | ● Set Vehicle Speed<br>● Actual Vehicle Speed<br>● Cruise Control Switch (MAIN Switch)<br>● Set Distance<br>● Brake Request Response<br>● Accelerator Pedal Idle<br>● Stop Light Signal<br>● Transmission Information | |
| 11) | | Skid Control ECU | ● Target Deceleration Rate<br>● Target Deceleration Rate Gradient<br>● Brake Request | |

(Continued)

| No. | Transmit | Receive | Data List | Communication |
|---|---|---|---|---|
| 12) | Engine ECU | Combination Meter | ● Cruise Control Switch<br>● Set Vehicle Speed | CAN |
| 13) | | ECT ECU | Shift Up Request Signal | CAN |
| 14) | ECT ECU | Engine ECU | Shift Up Response | CAN |
| 15) | Skid Control ECU | Distance Control ECU | Zero Point Information of Yaw Rate | CAN |
| 16) | | Engine ECU | ● Cruise Control Cancel Request<br>● Brake Request Response<br>● Brake Control Operation (VSC) | |
| 17) | Combination Switch (Main Body ECU) | Distance Control ECU | Light Control Switch | CAN |

### 3. Layout of Main Components




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## 4. Function of Main Components

| Item | | Outline |
|---|---|---|
| Cruise Control Switch | ON-OFF Button | Turns ON/OFF the power to the cruise control system. |
| | MODE Switch | Switches the control mode, between the constant speed control mode and vehicle-to-vehicle distance mode. |
| | CANCEL Switch | A cancel signal can be output to the engine ECU through the operation of this switch. |
| | RES/+ Switch | The accelerate function and resumption of a preset speed can be performed by operating this switch. A signal is output to the engine ECU when this switch is operated. |
| | SET/– Switch | The decelerate function and vehicle speed setting resume signals are output to the engine ECU due to operation of this switch. |
| Distance Control Switch | | While the system is in the vehicle-to-vehicle distance control mode, the driver can operate the distance control switch to select the vehicle-to-vehicle distance in three stages: long, middle, and short. |
| Stop Light Switch | | Detects the pressing of the brake pedal and transmits a signal to the engine ECU. |
| Combination Switch | Wiper Switch | Transmits wiper switch information to the distance control ECU. |
| | Light Control Switch | Switches to the beam axis adjustment mode for the millimeter wave radar sensor. |
| Millimeter Wave Radar Sensor | | Radiates radar waves forward, uses the reflected waves to detect the presence of a vehicle being driven ahead, the vehicle-to-vehicle distance, and the relative speed, and transmits this information to the distance control ECU. |
| Distance Control ECU | | While the system is in the vehicle-to-vehicle distance control mode, the distance control ECU detects the vehicle being followed based on signals from the millimeter wave radar sensor. Then, the distance control ECU calculates the acceleration or deceleration rate required in order to attain the target vehicle-to-vehicle distance, and outputs a request signal to the engine ECU and or skid control ECU. |
| Combination Meter | | Transmits the vehicle speed signal to the engine ECU. |
| | Cruise MAIN Indicator Light | ● Illuminates when the ON-OFF button on the cruise control switch has been pressed to turn the system on.<br>● If the distance control ECU detects a malfunction, this light flashes to warn the driver. |
| | Master Warning Light | Illuminates when there is a malfunction in the system. |
| | Buzzer | If the engine ECU or distance control ECU detects automatic cancel or warning signals while the vehicle is operating under cruise control, this buzzer sounds to inform the driver. |
| | Multi-information Display | During the dynamic radar cruise control, the multi-information display receives signals from distance control ECU, in order to display the system conditions. |
| Steering Angle Sensor | | Detects the angle and direction of steering and transmits signals to the skid control ECU and distance control ECU. |

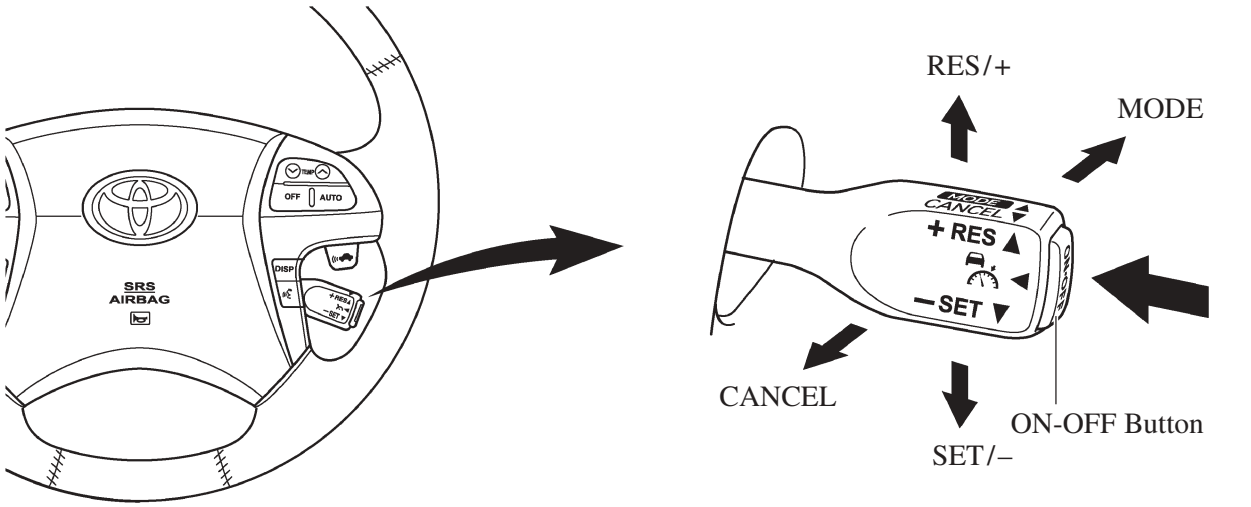
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| Item | Outline |
|---|---|
| Yaw Rate & Deceleration Sensor | Detects the yaw rate of the vehicle and transmits signals to skid control ECU and distance control ECU. |
| Skid Control ECU | While the system is operating in vehicle-to-vehicle distance control mode, the skid control ECU actuates the brake actuator in accordance with the brake request signal received from the distance control ECU. |
| Brake Actuator | Actuates the brakes in accordance with the signals from the skid control ECU. |
| Stop Light Control Relay | Illuminates the stop light in accordance with the stop light illumination request signal from the skid control ECU. |
| Engine ECU | ● Controls the cruise control system in accordance with signals from the switches, sensors, skid control ECU and distance control ECU.<br>● If the engine ECU detects a malfunction in the cruise control system, it will store DTC (Diagnostic Trouble Code). |

## 5. Construction and Operation

### Cruise Control Switch

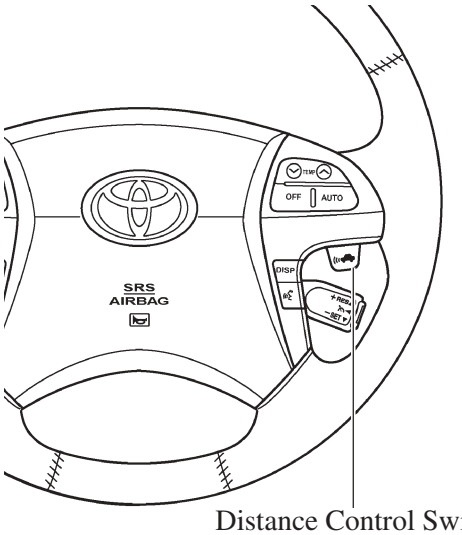
- Cruise control switch consists of the ON-OFF button, RES/+, MODE, SET/– and CANCEL switches. RES/+, MODE, SET/– and CANCEL switches are a lever that operates in four directions.
- The cruise control switch is an automatic reset (normally open) type that turns ON only when the switch is being operated and turns OFF as soon as the driver releases the switch. Furthermore, the functions of the control switch are active only when the cruise control system has been turned on using the ON-OFF button on the cruise control switch.




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### Distance Control Switch

- While the vehicle is being driven in vehicle-to-vehicle distance control mode, the vehicle-to-vehicle distance setting can be changed each time the distance control switch is pressed, as follows; long → middle → short.
- If the power source is switched OFF and back to ON, the system will default to “long”.
- The vehicle-to-vehicle distance is set as follows:




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| Mode | Vehicle-to-Vehicle Distance* |
|---|---|
| Long | Approx. 50 m (164 ft.) |
| Middle | Approx. 40 m (131 ft.) |
| Short | Approx. 30 m (98 ft.) |

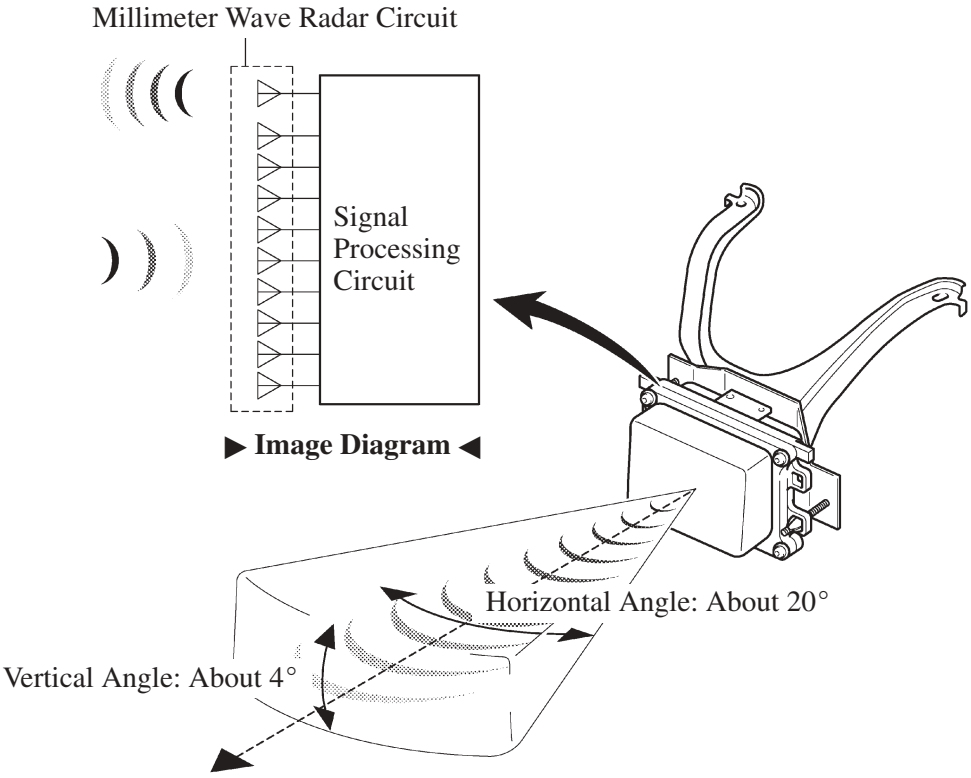
*: While driving at a vehicle speed of 80 km/h (50 mph).

## Millimeter Wave Radar Sensor

### 1) General

The millimeter wave radar sensor consists of a millimeter wave radar circuit, signal processing circuit, and CPU.

- The millimeter wave radar circuit consists of one transmission antenna and nine reception antennas.
- The millimeter wave radar outputs waves when the vehicle speed is above 0, and not when the vehicle speed is at 0. The millimeter wave radar uses frequencies in the 76 GHz band.
- The reception antennas receive the millimeter wave radar waves that have been reflected.
- The signal processing circuit detects the distance, relative speed, and the direction of the object by generating millimeter wave radar waves and calculating the signals received by the reception antennas.
  Then, it transmits this information to the distance control ECU.



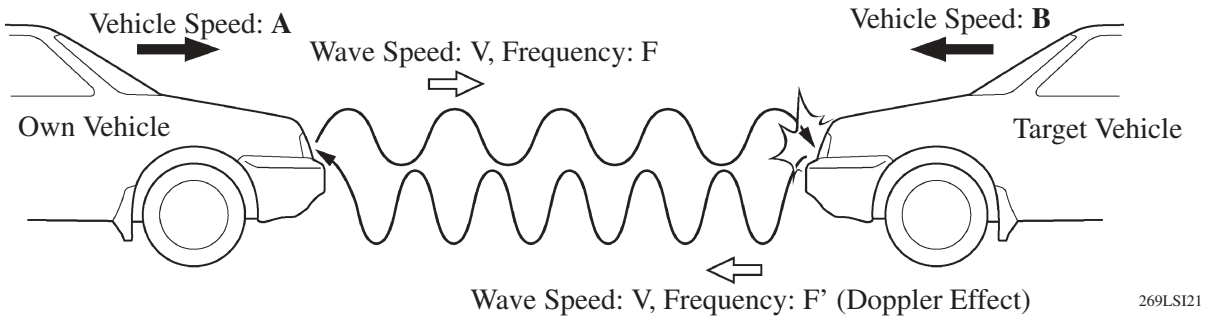

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**2) Calculation Method**

The distance to the object, azimuth (horizontal angle), and relative speed are calculated from the information that is provided by the reflection millimeter wave radar as described below.

| | |
|---|---|
| Distance | Calculated from the length of time that elapse the waves of the millimeter wave radar are emitted, until the waves reflected by the millimeter wave radar are received. |
| Azimuth | Calculated from the angle of the waves reflected by the millimeter wave radar that are received. |
| Relative Speed | Calculated by utilizing the changes (Doppler effect*) that occur in the frequencies of the reflected millimeter wave radar waves. |

*: The Doppler effect causes the observer to perceive the radio waves emitted by a moving object to be at higher frequencies as it approaches, and to be at lower frequencies at it recedes. This phenomenon is created because when an object is located far away, the radio waves are perceived at higher frequencies than they are at the radio source.

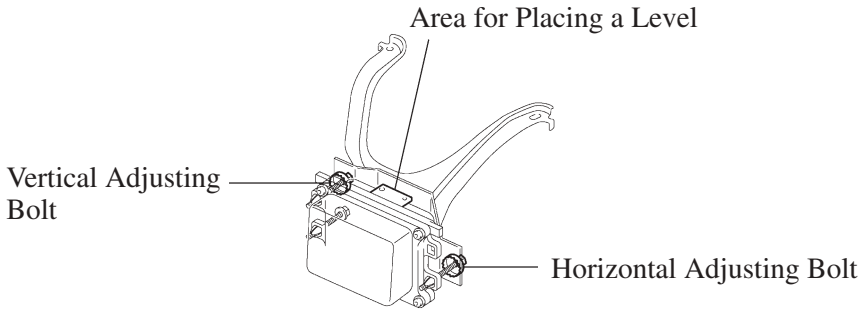



By applying the following formula, the vehicle speed **B** of the target vehicle can be calculated.

Doppler Effect: $F' = \frac{V + \mathbf{B}}{V - \mathbf{A}} F$

**Service Tip**

After a millimeter wave radar sensor has been replaced or removed and reinstalled, the SST (09870-60000) and a hand-held tester must be used to adjust the sensor angle. To ensure the proper precision, the sensor must be adjusted in the horizontal state. For this reason, the sensor is provided with an area for placing a level, as well as a horizontal adjusting bolt and a vertical adjusting bolt. For details, see the Camry Repair Manual.




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- Turn vertical adjusting bolt to adjust the vertical direction of the millimeter wave radar sensor.
  *Reference: One turn of the bolt moves the sensor by approximately 1.0°.*

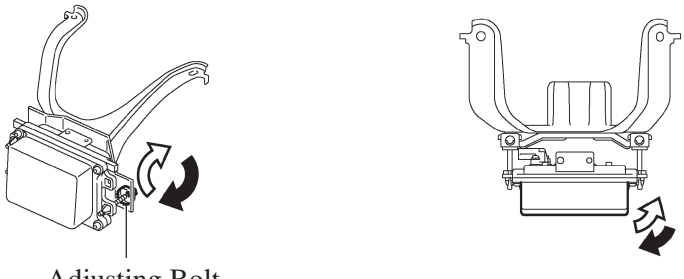



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- Turn the horizontal adjusting bolt to adjust the horizontal direction of the millimeter wave radar sensor.
  *Reference: One turn of the bolt moves the sensor by approximately 0.33°.*




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### Combination Meter

The combination meter provides a master warning light, cruise MAIN indicator light, buzzer, and multi-information display to warn and indicate in the dynamic radar cruise control system.

- The multi-information display displays the set vehicle speed, constant speed mode mark, vehicle-to-vehicle distance mark, vehicle ahead mark, and warning message.
- Examples of the illumination or display of each indicator light, warning light or multi-information display are shown below.

| Mode | Condition | Multi-information Display | CRUISE 02KBE192TE | ⚠ 0150BE35C | Buzzer |
|---|---|---|---|---|---|
| Constant Speed Control | Being Controlled |  02KBE181TE | Illuminate | — | — |
| Vehicle-to-Vehicle Distance Control | Set Standby |  02KBE182TE | Illuminate | — | — |
| | Under Constant Speed Control (No Vehicle Ahead) |  **Long** **Middle** **Short** 02KBE184TE | Illuminate | — | — |
| | Under Follow-up Control, Deceleration Control (Vehicle Ahead) |  **Long** **Middle** **Short** 02KBE185TE | Illuminate | — | — |
| | Approach Warning (Vehicle Ahead) |  02KBE186TE The vehicles in the display are highlighted at 0.5-second intervals. | Illuminate | — | Sounds Continu-ously |
| System Failure | Millimeter wave radar sensor is dirty. |  02KBE187TE | Flash | Illuminate | Sound Once |
| | Poor Weather Condition |  02KBE188TE | Flash | Illuminate | Sound Once |
| | System Check* |  02KBE189TE | Flash | Illuminate | Sound Once |
| Beam Axis Adjustment | |  02KBE190TE | Flash | — | — |

*: When a DTC (Diagnostic Trouble Code) is memorized.

## 6. System Control

### General

The control of the dynamic radar cruise control system varies depending on the mode:
A: Constant Speed Control Mode
B: Vehicle-to-vehicle Distance Control Mode.

| Control | Outline | Mode | |
|---|---|---|---|
| | | A | B |
| Constant Speed Control (See page BE-240) | 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. | ○ | ○ |
| Deceleration Control (See page BE-241) | Effects throttle control and brake control in order to decelerate the vehicle so that the vehicle-to-vehicle distance between this vehicle and the vehicle ahead equals the set distance. | — | ○ |
| Follow-up Control (See page BE-242) | After effecting deceleration control, the vehicle follows the vehicle ahead in order to maintain the proper vehicle-to-vehicle distance in accordance with the vehicle speed. | — | ○ |
| Acceleration Control (See page BE-243) | Accelerates the vehicle in order to attain the set vehicle speed if the vehicle ahead or this vehicle has changed lanes. | — | ○ |
| 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.<br>● The shift lever is in D position<br>● The shift lever is shifted in the S mode, and shift range is 4th, 5th or 6th. | ○ | ○ |
| | The vehicle is running above a speed of about 45 km/h (27 mph) or more. | ○ | — |
| | The vehicle is running within a vehicle speed range about 45 to 135 km/h (27 to 85 mph). | — | ○ |
| 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 vehicle speed in the memory is kept. | ○ | ○ |

(Continued)

| Control | Outline | Mode | |
|---|---|---|---|
| | | A | B |
| COAST Switch Control | While the cruise control switch is held to the SET/– side, the vehicle speed and the vehicle setting speed changes as follows, according to the mode: | ○ | ○ |
| | ● The vehicle decelerates constantly.<br>● The vehicle setting speed changes to the speed at which the switch was turned OFF. | ○ | — |
| | ● The vehicle setting speed decreases in increments 5 km/h or 5 mph. [Example: 103 → 100 → 95 km/h, 62 → 60 → 55 mph]<br>● The vehicle decelerates rapidly due to ETCS-i. | — | ○ |
| 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, according to the mode:<br>● The vehicle will decelerate in increments of approximately 1 mph (1.6 km/h) for each time the switch was pressed.<br>● However, if the difference between the actual vehicle speed and the vehicle setting speed is greater than 5 km/h or 5 mph, 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 pushed to the RES/+ side and held, the vehicle speed and the vehicle setting speed change as follows, according to the mode: | ○ | ○ |
| | ● The vehicle will accelerate constantly.<br>● The vehicle setting speed changes to the speed at which the switch was turned OFF. | ○ | — |
| | ● The vehicle setting speed increases in increments 5 km/h or 5 mph. [Example: 93 → 95 → 100 km/h, 52 → 55 → 60 mph]<br>● The vehicle will accelerate to the speed that is set at the time the switch is released.<br>However, only the vehicle setting speed will change during follow-up control. | — | ○ |
| RES Switch Control | If the vehicle speed is above the low speed limit, the cruise control resumes operation (subsequently pushes the cruise control switch to the RES/+ side) to reach the vehicle speed that was set at the time the driver canceled cruise control. | ○ | ○ |
| | Even if the vehicle speed drops below the low speed limit, resume can be performed when the vehicle speed increases to above the low speed limit. | ○ | ○ |
| | If the vehicle ahead changes driving lanes during follow-up control, the vehicle speed is gradually increased to the set vehicle speed. At this time, the vehicle speed can be increased promptly by pushing the cruise control switch to the RES/+ side. | — | ○ |
| 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.<br>● The vehicle will accelerate in increments of approx. 1.6 km/h (1 mph) for each time the switch was pressed.<br>● However, if the difference between the actual vehicle speed and the vehicle setting speed is greater than 5 km/h or 5 mph, the vehicle setting speed changes to the speed as which the vehicle was being driven at the time the switch was operated. | ○ | — |

(Continued)

| Control | Outline | Mode | |
|---|---|---|---|
| | | A | B |
| Shift Down Control | 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. | ○ | ○ |
| Manual Cancel Control | If any of the following signals are sent to the engine ECU, the cruise control is cancelled accordingly.<br>● Stop light switch ON signal/brake pedal depressed.<br>● Shift lever is shifted from D to N.<br>● When 1st, 2nd and 3rd range is selected in S mode position.<br>● CANCEL switch ON signal (cruise control switch moved to CANCEL side)<br>● Cruise control switch (ON-OFF button) OFF signal<br>● VSC operation signal | ○ | ○ |
| Automatic Cancel Control (See page BE-244) | When an automatic cancel signal is sent to the engine ECU, the cruise control operation is canceled. At this time, the style of the warning to the driver and the control resumption condition varies according to the cancel signal. | ○ | ○ |
| Mode Switching Control | The following operations switch the modes:<br>1) ON-OFF button on the cruise control switch is ON. (Starts in the vehicle-to-vehicle distance control mode)<br>2) Cruise control switch is held to the MODE side. (Approx. 1 second or more)<br>If the switch is pushed to any other side before switching modes, switch the cruise control system OFF; then, perform steps 1) and 2) again. | ○ | ○ |
| Diagnosis (See page BE-245) | If a malfunction occurs in the dynamic radar cruise control system during cruise control operation, the engine ECU cancels cruise control and diagnoses and memorizes the faults related to the malfunction. | ○ | ○ |

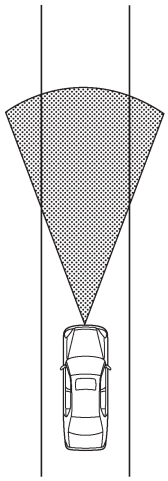
## Constant Speed Control

### 1) General

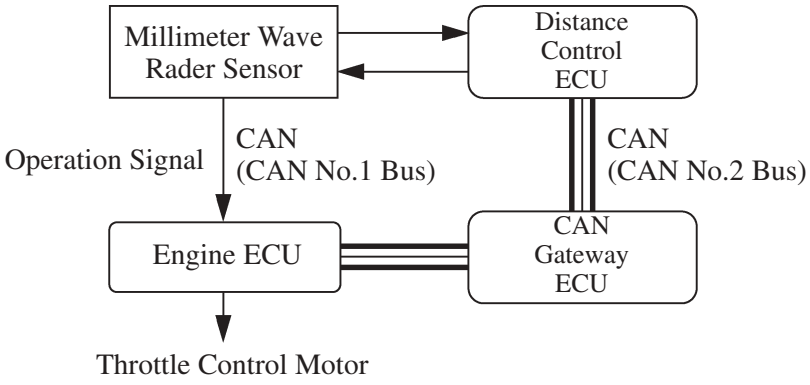
- In the constant speed control mode, the constant speed control is effected by the engine ECU in the same way as the conventional cruise control.
- In the vehicle-to-vehicle distance control mode, the constant speed control is effected by the millimeter wave radar sensor and distance control ECU.

### 2) Constant Speed Control in Vehicle-to-Vehicle Distance Control Mode

The millimeter wave radar sensor transmits the information about the vehicle ahead to the distance control ECU and also transmits a millimeter wave radar sensor operation signal to the engine ECU. The distance control ECU transmits this signal to the engine ECU. The engine ECU compares the vehicle setting speed and the actual vehicle speed, and effects constant speed control by regulating the throttle control in order to attain the set vehicle speed.



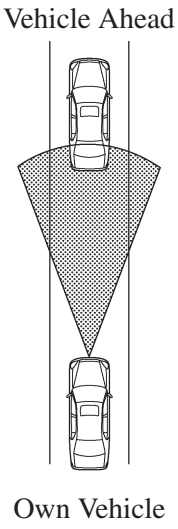

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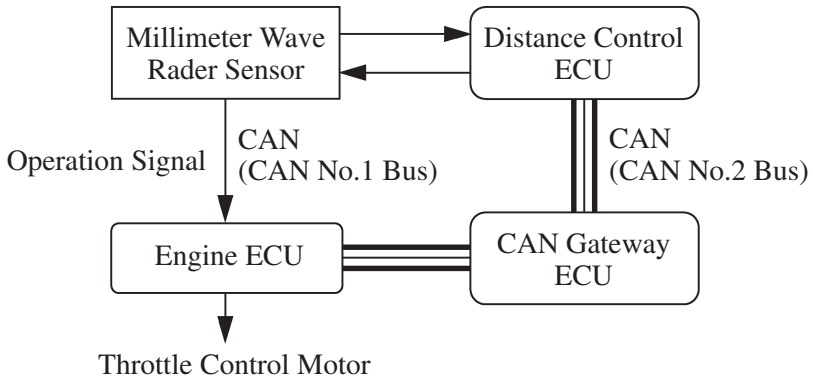

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### Deceleration Control

- The distance control ECU calculates the target deceleration rate in accordance with signals from the millimeter wave radar sensor, and transmits a deceleration request signal to the engine ECU. Upon receiving this signal, the engine ECU closes the throttle valve in order to cause the vehicle to decelerate.
- This control is not effected in the presence of a parked vehicle or object, or below the settable vehicle speed range.

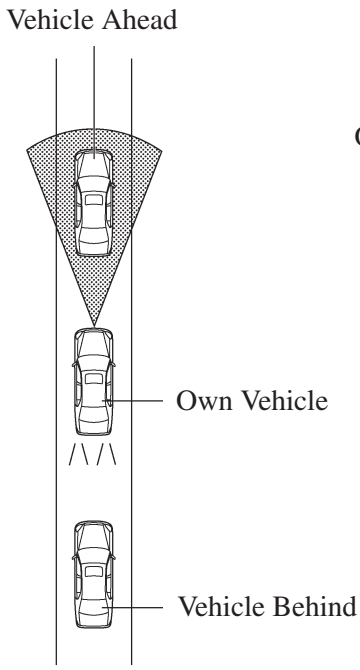



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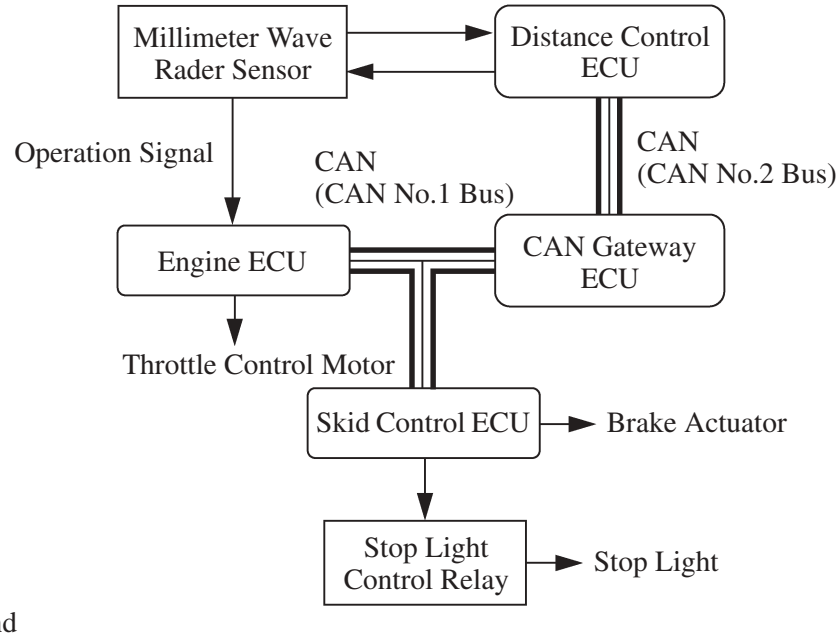



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- If distance control ECU determines that further deceleration is necessary, it transmits a brake request signal to the engine ECU. Upon receiving this signal, the engine ECU transmits a brake request signal to skid control ECU. Skid control ECU then controls the brake actuator to apply the brakes.
- At this time, if the deceleration rate is higher than a predetermined value, the skid control ECU outputs a stop light illumination request signal to the stop light control relay, in order to inform anyone who might be following the vehicle.



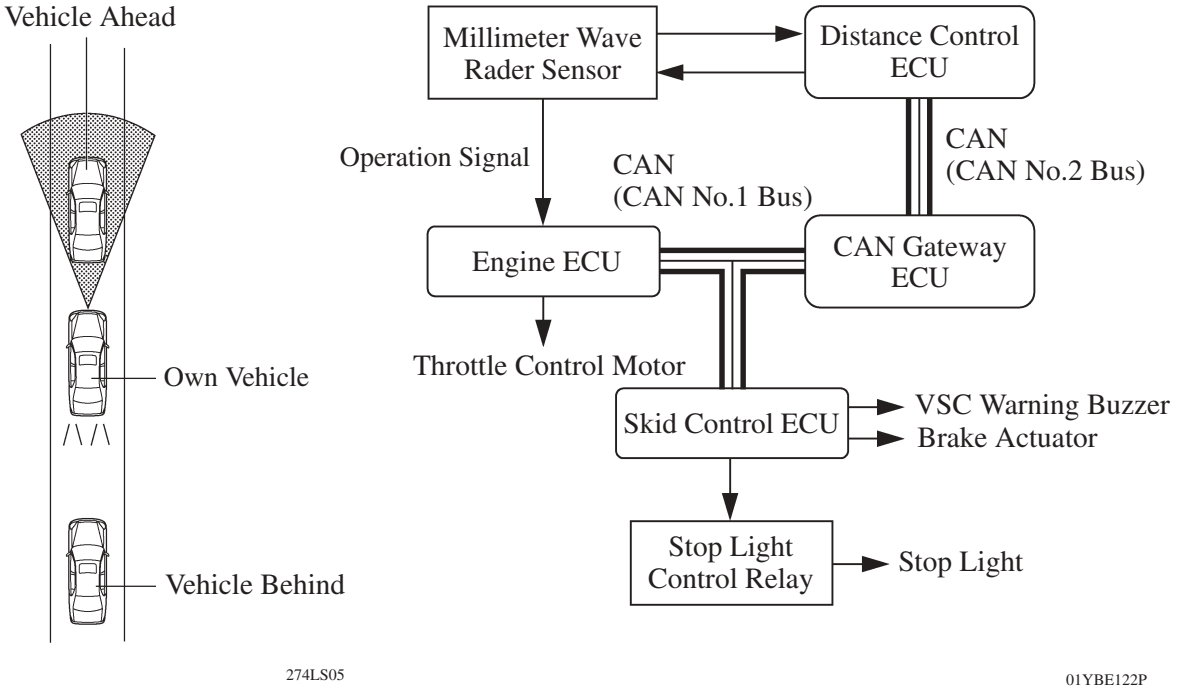

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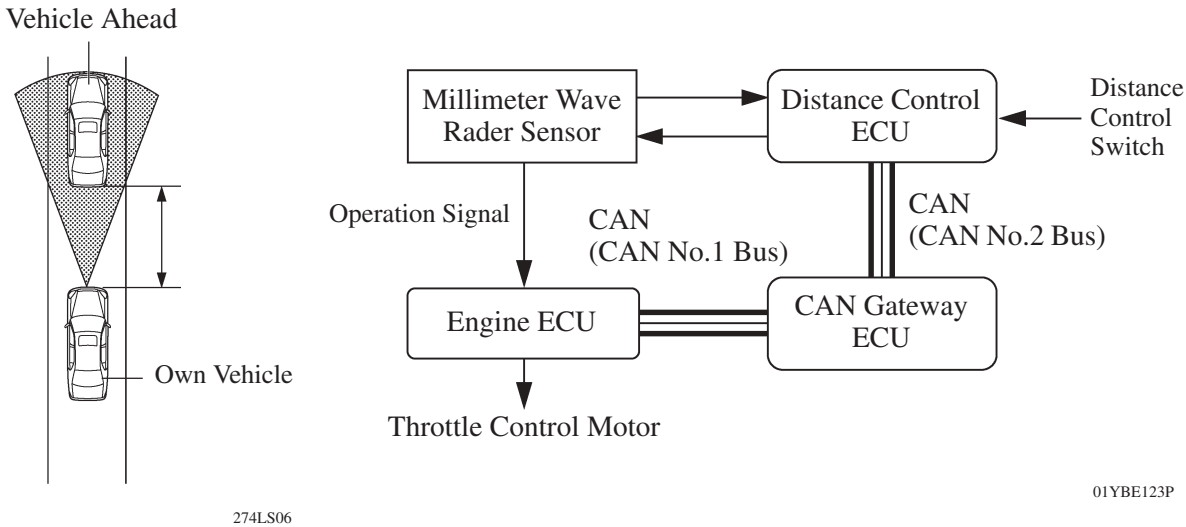
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- If further deceleration is necessary after the stop light is illuminated, the skid control ECU sounds the VSC warning buzzer based on the request signal from the distance control ECU to urge the driver to depress the brake pedal.



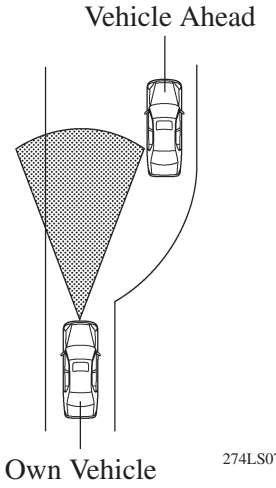

## Follow-up Control

- After effecting deceleration control, distance control ECU transmits a request signal to the engine ECU so that the vehicle can follow the vehicle ahead while maintaining the proper vehicle-to-vehicle distance according to the vehicle speed. Upon receiving this signal, the engine ECU regulates the throttle in order to effect follow-up control.
- Three stages (long, middle, and short) of vehicle-to-vehicle distance can be selected by operating the distance control switch.

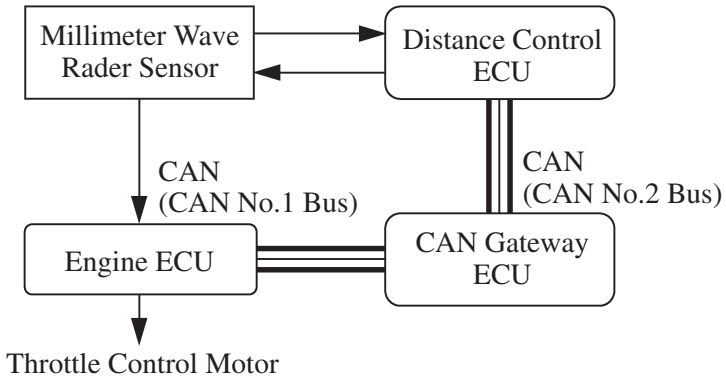


### Acceleration Control

If the distance control ECU detects (based on the millimeter wave radar sensor) that either the vehicle ahead or own vehicle has changed lanes, an acceleration request signal is transmitted to the engine ECU in order to attain the set vehicle speed. Upon receiving this signal, the engine ECU regulates the throttle in order to effect acceleration control.




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### Automatic Cancel Control

If any of the conditions listed below occur while the vehicle is in cruise control (A: constant speed control mode; B: vehicle-to-vehicle distance control mode), the cruise control will be canceled. Then, the following warning items will appear for the driver.

1) Warning message is displayed on the multi-information display.
2) Master warning light illuminates.
3) Buzzer sounds.
4) Cruise MAIN indicator light flashes.

| Mode | Description of Malfunction | Warning |
|---|---|---|
| A and B | If any of the conditions listed below occur, the engine ECU clears the vehicle setting speed and cancels the cruise control.<br>● Malfunction of the vehicle speed signal.<br>● Malfunction in the ETCS-i.<br>● An open or short circuit in the stop light switch.<br>The cruise control is prohibited until the conditions are remedied or the cruise control system is turned off and back on again using the ON-OFF button on the cruise control switch. | 1) "CHECK CRUISE SYSTEM"<br>2) Illuminate<br>3) Sound Once<br>4) Flash |
| | If any of the conditions listed below occur, the engine ECU cancels the cruise control while retaining the vehicle setting speed in its memory.<br>● The vehicle speed drops below low speed limit [approx. 40 km/h (25 mph)]. | 1) —<br>2) —<br>3) —<br>4) — |
| A | If any of the conditions listed below occur, the engine ECU cancels the cruise control.<br>● The vehicle speed drops more than 16 km/h (10 mph) below the vehicle setting speed. | 1) —<br>2) —<br>3) —<br>4) — |
| B | If any of the conditions listed below occur, the engine ECU clears the vehicle setting speed and cancels the cruise control.<br>● Malfunction of the millimeter wave radar sensor.<br>● Displacement of the axis of the millimeter wave radar sensor.<br>● Malfunction in the dynamic radar cruise control system other than those given above.<br>The cruise control is prohibited until the engine switch is turned on again. | 1) "CHECK CRUISE SYSTEM"<br>2) Illuminate<br>3) Sound Once<br>4) Flash |
| | If any of the conditions listed below occur, the engine ECU cancels the cruise control while retaining the setting vehicle speed in its memory.<br>● The millimeter wave radar sensor is dirty.<br>The cruise control is prohibited until the conditions are remedied or the ON-OFF button on the cruise control switch is turned on again. | 1) "CLEAN RADAR SENSOR"<br>2) Illuminate<br>3) Sound Once<br>4) Flash |
| | If any of the conditions listed below occur, the engine ECU cancels the cruise control while retaining the set vehicle speed in its memory.<br>● The wipers operate at HI speed (including AUTO mode).<br>● The measurement becomes extremely unstable due to poor weather conditions.<br>The cruise control is prohibited until the conditions are remedied or the cruise control system is turned off and back on again using the ON-OFF button on the cruise control switch. | 1) "CRUISE NOT AVAILABLE"<br>2) Illuminate<br>3) Sound Once<br>4) Flash |

## Diagnosis

If a malfunction occurs in the dynamic radar cruise control system during cruise control, the engine ECU cancels the cruise control, flashes the cruise MAIN indicator light and the master warning light, and sounds the buzzer to inform the driver of the malfunction. At the same time, the malfunction is stored in memory as a DTC (Diagnostic Trouble Code).

- When an intelligent tester II connects to DLC3 or SST (09843-18040) is connected between the Tc and CG terminals of DLC3, DTC can be read.
- An intelligent tester II can be used to read the 5-digit codes. If the SST is used, 2-digit codes can be read based on the number of blinks of the cruise MAIN indicator light.