CONSTANT SPEED CRUISE SYSTEM

GENERAL INFORMATION

Overview

Description

Turn on the constant speed cruise control switch after vehicle reaches a certain speed, and the set vehicle speed can be maintained by constant speed cruise control, without accelerator depressed. When active speed limit function is turned on, vehicle speed does not exceed the speed limit set. Cruise control system consists of the following components:

- Constant speed cruise control switch (multi-function switch)
- Instrument cluster (ICM)
- Engine control module (ECM)
- Transmission Control Unit (TCU)
- ABS/ESP Control Module
- Accelerator pedal
- Brake switch
- Clutch Switch

Do not use cruise control in the following situations. Otherwise, it may result in a loss of vehicle control and cause an accident, resulting in serious injury or even death.

- In traffic congestion areas.
- On roads with sharp bends.
- On winding roads.
- On wet and slippery roads, such as those covered with rain, ice or snow.
- On steep hills. Vehicle speed may be higher (or lower) than the set speed. This will cause engine speed to rise sharply and briefly to increase vehicle speed to set speed range.

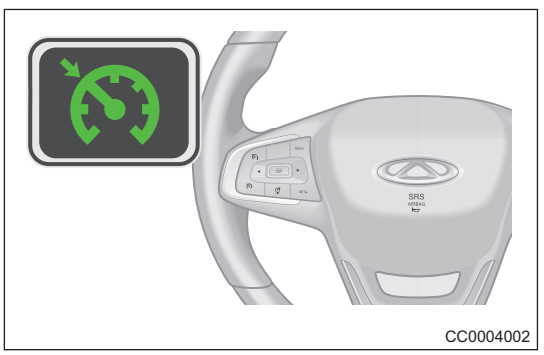
Operation

Engine control module (ECM) receives button signal from constant speed cruise control switch (multi-function switch), and then engine control module (ECM) turns on the indicator on the meter via CAN net. According to speed signal, brake signal, clutch signal, acceleration and deceleration signal and current working conditions, ECM determines whether to enter or cancel cruise state. After entering state, ECM controls throttle opening angle to stabilize the vehicle within the set vehicle speed range.

Description of Constant Speed Cruise Function

1. Cruise ON inspection

- With ignition switch ON, press cruise main switch, cruise indicator on the meter turns on and blinks (pre-cruise state, it is normal). If the meter is color screen, it will be displayed on upper left of the screen.
- When vehicle is driving at speed range of 40 - 150 km/h, for example, when the vehicle speed is 110 km/h, press SET/- button to cruise at a constant speed of 110 km/h (the speed when the SET/- button is pressed). Meanwhile, cruise indicator on the meter remains ON. If the meter is color screen, it will be displayed on upper left of the screen.



2. Cruise OFF

- In cruise state (e.g. 110 km/h):
  (a) Press the cruise main switch to cancel the cruise state and cruise indicator on the meter turns off.
  (b) Press the CANCEL button to cancel the cruise state and cruise indicator on the meter blinks (pre-cruise state). If the meter is color screen, it will be displayed on upper left of the screen.
  (c) When pull up the EPB button, depress brake and clutch pedals, engine speed exceeds set range (600 - 6240), gear shift exceeds set range (1 - 6), and vehicle speed exceeds set range (35 - 155), the cruise state is canceled, and indicator on the cruise indicator blinks. If the meter is color screen, it will be displayed on upper left of the screen.

3. Cruise setting

- Under the cruise state, depress the accelerator pedal or brake pedal to increase or decrease vehicle speed. Press SET/- button of cruise system while releasing the accelerator pedal or brake pedal, vehicle is cruising at new vehicle speed, and indicator on the meter remains on. If the meter is color screen, the new set speed will be displayed on the screen.

4. Cruise short press / long press acceleration

- In the cruise state, short press RES/+ button once (over 0.02 seconds) to decrease vehicle speed by 1 km/h. Cruise indicator on the meter remains on. If the meter is color screen, the target cruise speed displayed on left bottom will increases by 1 km/h.
- Under the cruise state, long press the RES/+ button (over 0.4 second) to accelerate vehicle continuously. Release the RES/+ button to stop acceleration, and vehicle is cruising under the speed when the RES/+ button is released. Cruise indicator on the meter remains on. If the meter is color screen, the target cruise speed displayed on left bottom changes simultaneously with actual speed.

5. Cruise short press / long press deceleration

- In the cruise state, short press SET/- button once (over 0.02 seconds) to decrease vehicle speed by 1 km/h. Cruise indicator on the meter remains on. If the meter is color screen, the target cruise speed displayed on left bottom will decrease by 1 km/h.
- Under the cruise state, long press the SET/- button (over 0.4 second) to decelerate vehicle continuously. Release the SET/- button to stop acceleration, and vehicle is cruising at speed when the SET/- button is released. Cruise indicator on the meter remains on. If the meter is color screen, the target cruise speed displayed on left bottom changes simultaneously with actual speed.

6. Cruise recovery

- In the cruise state, depress the brake pedal to flash the cruise indicator on the meter (pre-cruise state, normal condition), and the vehicle speed decreases.
  (a) When vehicle speed is over 40 km/h, release the brake pedal and press RES/+ button, then the vehicle accelerates until the cruise state before depressing the brake pedal is returned. Cruise indicator on the meter remains on.
  (b) When vehicle speed is below 40 km/h, release the brake pedal and press RES+ button, the vehicle can not return to the cruise state before depressing the brake pedal. However, further depress the accelerator until vehicle speed is over 40 km/h, release the brake pedal and press RES+ button, the vehicle accelerates until the cruise state before depressing the brake pedal is returned. Cruise indicator on the meter remains on.

7. Active speed limit cruise OFF function

- During cruising, if active speed limit LIM button is pressed, cruise function is canceled and cruise indicator on the meter turns off, and active speed limit indicator "30 km/h" blinks indicating pre-limit state is entered.

Description of Active Speed Limit Function

1. Active speed limit ON

- With ignition switch is ON, when active speed limit LIM button is pressed, active speed limit indicator on the meter (left bottom of middle color screen) illuminates and sends default target limit vehicle speed "30 km/h" and blinks indicating pre-limit state is entered.
- Vehicle does not start or vehicle speed is below 30 km/h while driving, press SET- button of the active speed limit function to set the target limit vehicle speed to 30 km/h. Meanwhile, active speed limit on the meter displays ON.
- When vehicle is driving at speed range of 30 - 200 km/h, for example, press SET/- button of active speed limit function when vehicle speed is 110 km/h, vehicle performs speed limit function at the target speed when SET/- button is pressed. Meanwhile, active speed limit on the meter displays ON.

2. Active speed limit OFF

- press active speed limit LIM button.
- Press the CANCEL button to cancel the speed limit state and active speed limit indicator on the meter displays.
- When KD is canceled, voltage is too low (ub < 7 V), engine speed exceeds specified range (600 - 6240), active speed limit is canceled, active speed limit indicator on the meter blinks.

3. Cancel active speed limit KD

- In the active speed limit state, when driver fully depresses the accelerator pedal for overtaking or others, speed limit state is canceled temporarily. Active speed limit indicator on the meter blinks.
- When actual vehicle speed is higher than the limited speed set previously after KD, speed limit state or overtaking state is not entered. Vehicle speed can be increased or decreased regardless of accelerator depressing level. Active speed limit indicator on the meter blinks. When actual speed is lower than the limited speed set previously, speed limit state is entered again and active speed limit on the meter displays ON.

4. Active speed limit over speed state

- During the active speed limit, if target limit speed is lower than actual vehicle speed through short press or long press, vehicle enters over speed state and active speed limit indicator on the meter blinks and buzzer sounds for 3 times until the actual speed is lower than new limit speed again. Vehicle enters speed limit state again and active speed limit on the meter displays ON.

5. Active speed limit short press/long press acceleration

- In the active speed limit state, short press RES/+ button once (over 0.02 second) to increase target limit speed by 1 km/h. Active speed limit indicator on the meter displays ON.
- In the active speed limit state, long press RES/+ button (over 0.4 second) to increase target limit speed from current speed to 5 times of current speed and then increases by unit of 5 km/h. Active speed limit on the meter displays ON.

6. Active speed limit short press/long press deceleration

- In the active speed limit state, short press SET- button once (over 0.02 second) to decrease target limit speed by 1 km/h. Active speed limit on the meter displays ON.
- In the active speed limit state, long press SET- button (over 0.4 second) to decrease target limit speed from current speed to 5 times of current speed and then decreases by unit of 5 km/h. Active speed limit on the meter displays ON.

7. Cruise OFF and active speed limit function inspection

- In the active speed limit process, if cruise main switch is pressed, active speed limit is canceled, active speed limit indicator turns off, cruise indicator on the meter flashes, pre-cruise state is entered.

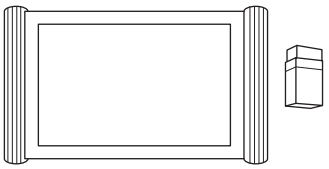
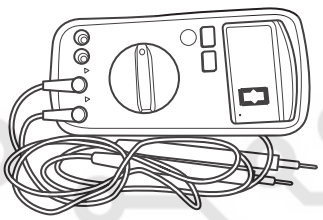
Specifications

Torque Specifications

Description	Torque (N·m)
Steering Wheel Quick Button	0.7 ± 0.2

Tools

General Tools

Diagnostic Tester	 001
Digital Multimeter	 002

Diagnosis Tools

Diagnostic Tester

When connecting the diagnostic tester:

- Connect diagnostic tester (the latest software) to diagnostic interface for communication with vehicle.
- Diagnostic interface is located on instrument panel lower left protector.
- Diagnostic interface uses a trapezoidal design which can hold 16 terminals.

Digital Multimeter

When using digital multimeter:

- Troubleshoot electrical malfunctions and wire harness system.
- Look for basic malfunction.
- Measure voltage, current and resistance.

Intermittent DTC Troubleshooting

If malfunction is intermittent, perform the followings:

- If malfunction is intermittent, perform the followings:
- Check if connector is loose.
- Check if wire harness is worn, pierced, pinched or partially broken.
- Wiggle related wire harness and connector and observe if signal in related circuit is interrupted.
- If possible, try to duplicate the conditions under which DTC was set.
- Look for data that has changed or DTC to reset during wiggle test.
- Look for broken, bent, protruded or corroded terminals.
- Check and clean all wire harness connectors and ground parts related to DTC.
- If multiple trouble codes were set, refer to circuit diagrams to look for any common ground circuit or power supply circuit applied to DTC.
- Refer to any Technical Bulletin that may apply to this malfunction.

Ground Inspection

Ground points are very important to the proper operation of circuits. Ground points are often exposed to moisture, dirt and other corrosive environments. Corrosion (rust) may increase load resistance. This situation may change the way in which a circuit works. Circuits are very sensitive to proper grounding. A loose or corroded ground can affect the control circuit. Check the ground points as follows:

1. Remove ground bolt or nut.
2. Check all contact surfaces for tarnish, dirt and rust, etc.
3. Clean as necessary to ensure that contacting is in good condition.
4. Reinstall ground bolt or nut securely.
5. Check if add-on accessories interfere with ground circuit.
6. If several wire harnesses are crimped into one ground terminal, check for proper crimps. Make sure all wire harnesses are clean, securely fastened with providing a good ground path.

DIAGNOSIS & TESTING

Diagnosis Content

Problem Symptoms Table

Hint:

Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair or adjust faulty components, or replace as necessary.

Symptom	Suspected Area
Vehicle speed can not be set (Meter indicator does not illuminate)	Wire harness or connector
	Engine control module (ECM)
	Instrument cluster
Vehicle speed can not be set (Cruise/speed limit indicator illuminates normally)	Constant speed cruise control switch
	Wire harness or connector
	Brake switch
	ESP and EPB
	Clutch switch (for MT model)
	Body Control Module (BCM)
	Engine control module (ECM)

Diagnosis Procedure

Hint:

Use following procedure to troubleshoot the constant speed cruise system.

1	**Vehicle brought to workshop**

Result

Proceed to
Next

Next

2	**Check battery voltage**

Check if battery voltage is normal.

Normal

Standard voltage: Not less than 12 V.

Result

Proceed to
Normal
NG

NG → **Replace the battery**

Normal

3	Customer problem analysis

Result

Proceed to
Next

Next

4	Check for DTCs (current DTC and history DTC)

Result

Proceed to
No DTC
Current DTC
History DTC

History DTC

5	Problem repair (no DTC), then go to step 8

Result

Proceed to
Next

Next → Go to step 8

6	Troubleshoot according to Diagnostic Trouble Code (DTC) chart, then go to step 8

Result

Proceed to
Next

Next → Go to step 8

7	Troubleshoot according to Problem Symptoms Table, then go to step 8

Result

Proceed to
Next

Next

8	Adjust, repair or replace

Result

Proceed to
Next

Next

9	Conduct test and confirm malfunction has been repaired

Result

Proceed to
Next

Next → End

ON-VEHICLE SERVICE

Steering Wheel Quick Button

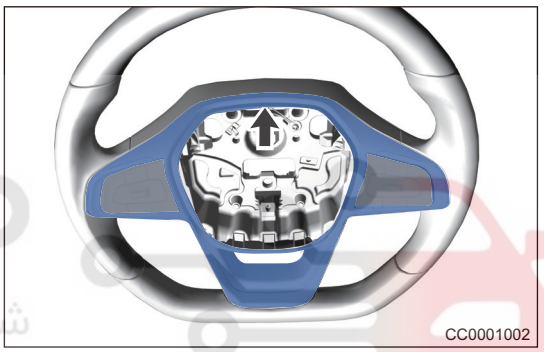
Removal

Warning:

- Be sure to read the precautions for SRS airbag before removing steering wheel quick button. (See page 26-4).
- Be sure to wear necessary safety equipment to prevent accidents when removing constant speed cruise switch.
- DO NOT damage the clips on steering wheel quick button trim cover when removing constant speed cruise switch.

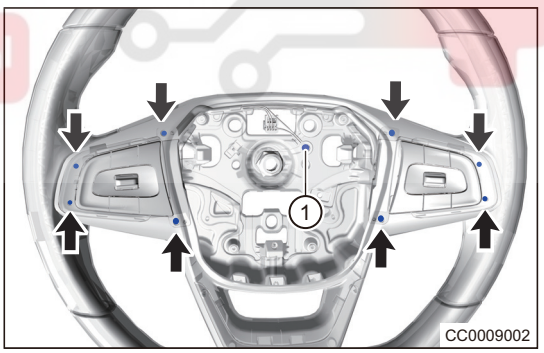
1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable for more than 1 minute.
3. Remove the driver airbag.
4. Remove the steering wheel quick button.

(a) Using an interior crow plate, pry off steering wheel quick button trim cover (arrow).

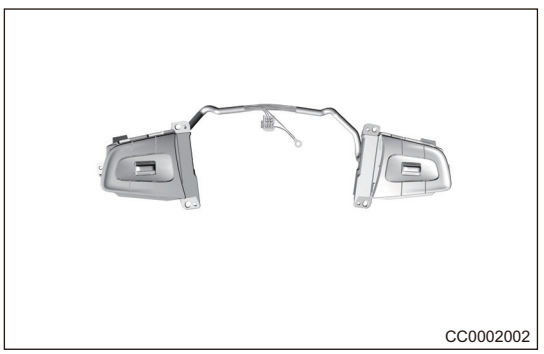


(b) Remove 8 fixing screws (arrow) and ground fixing screw (1) from steering wheel quick button with screwdriver.

Tightening torque
0.7 ± 0.2 N·m



(c) Remove the steering wheel quick button.



Installation

1. Installation is in the reverse order of removal.

Caution:

- Operate carefully to prevent other components from being damaged, when installing steering wheel quick button.
- When installing steering wheel quick button, install each connector in place.
- Tighten fixing screw to the specified torque when installing steering wheel quick button.
- Check steering wheel quick button for proper operation, after installing steering wheel quick button.