

INSTALLING A CRUISE CONTROL ON A PRIUS 2010 (GEN III)

1. FOREWORD

This guide describes how to install the cruise control switch to a Toyota Prius 2010 (GEN III). Operation takes max 20 mins. All included information is not certified and might be wrong or incomplete: follow it at your own risk. Turn back while there is sill time! If you are not certain that this document is within your skill level, I would urge you to not proceed.

2. CRUISE CONTROL SYSTEM DESCRIPTION

The cruise control system controls constant speed driving. It enables the driver to adjust vehicle speed by operating the cruise control main switch without using the accelerator pedal.

Receiving signals from each switch and sensor, the hybrid vehicle control ECU controls constant speed driving by optimizing the use of the engine and motor driving force.

2.1. LIMIT CONTROL

(a) Low speed limit

The lowest possible limit of the speed setting range is approximately 40 km/h (25 mph). The cruise control system cannot be set when the driving speed is below the low speed limit. Constant speed control will be automatically canceled and the stored vehicle speed will be erased when the vehicle speed goes below the low speed limit while the constant speed control is in operation.

(b) High speed limit

The highest possible limit of the speed setting range is approximately 180 km/h (112 mph). The cruise control system cannot be set when the driving speed is over the high speed limit. Speed up using RESUME/+ with the cruise control main switch assembly also cannot be set beyond the high speed limit.

2.2. CRUISE CONTROL OPERATION

(a) Cruise control main switch

The cruise control main switch operates 7 functions: SET, COAST, TAP-DOWN, RESUME, ACCEL, TAP-UP, and CANCEL. The SET, TAP-DOWN and COAST functions, and the RESUME, TAP-UP and ACCEL functions share the same switch. Each function can be controlled by moving the switch in the directions of the arrows on the cruise control main switch assembly. The switch will return automatically after it is released.

(b) Set control (main switch on; push down)

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

(c) Coast control (push down and hold)

The hybrid vehicle control ECU decreases the cruise control demand speed and controls the engine and motor driving force to decelerate the vehicle when -/SET on the cruise control main switch is pressed and held while the cruise control system is in operation. Vehicle speed, when the cruise control main switch is released from -/SET, is stored and constant speed control is maintained.

(d) Tap-down control (tap down)

When tapping down on the cruise control main switch to -/SET (for approx. 0.5 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). However, when the difference between the driving and the stored vehicle speed is more than 5 km/h (3.1 mph) and the cruise control main switch is released from -/SET, the vehicle speed will be stored and constant speed control is maintained.

(e) Acceleration control (push up and hold)

The hybrid vehicle control ECU increases the cruise control demand speed and controls the engine and motor driving force to accelerate the vehicle when +/- RES on the cruise control main switch is pressed and held while the cruise control system is in operation. Vehicle speed, when the cruise control main switch is released from +/-RES, is stored and constant speed control is maintained.

(f) Tap-up control (tap up)

When tapping up on the cruise control main switch to +/-RES (for approx. 0.5 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 speed is more than 5 km/h (3.1 mph), the stored vehicle speed will not be changed.

(g) Resume control (push up)

If constant speed control was canceled with the stop light switch or the CANCEL switch, and if driving speed is within the limit range, pushing the cruise control main switch to -/RES restores vehicle speed memorized at the time of cancellation, and restarts constant speed control.

(h) Manual cancel control (pull towards the steering wheel)

Doing any of the following cancels the cruise control system while in operation. (The stored vehicle speed in the hybrid vehicle ECU is maintained).

- Depressing the brake pedal
- Shifting into any position except D
- Pushing the cruise control main switch to CANCEL
- Pushing the cruise control main switch ON-OFF button "off" (The stored vehicle speed in the hybrid vehicle control ECU is not maintained).

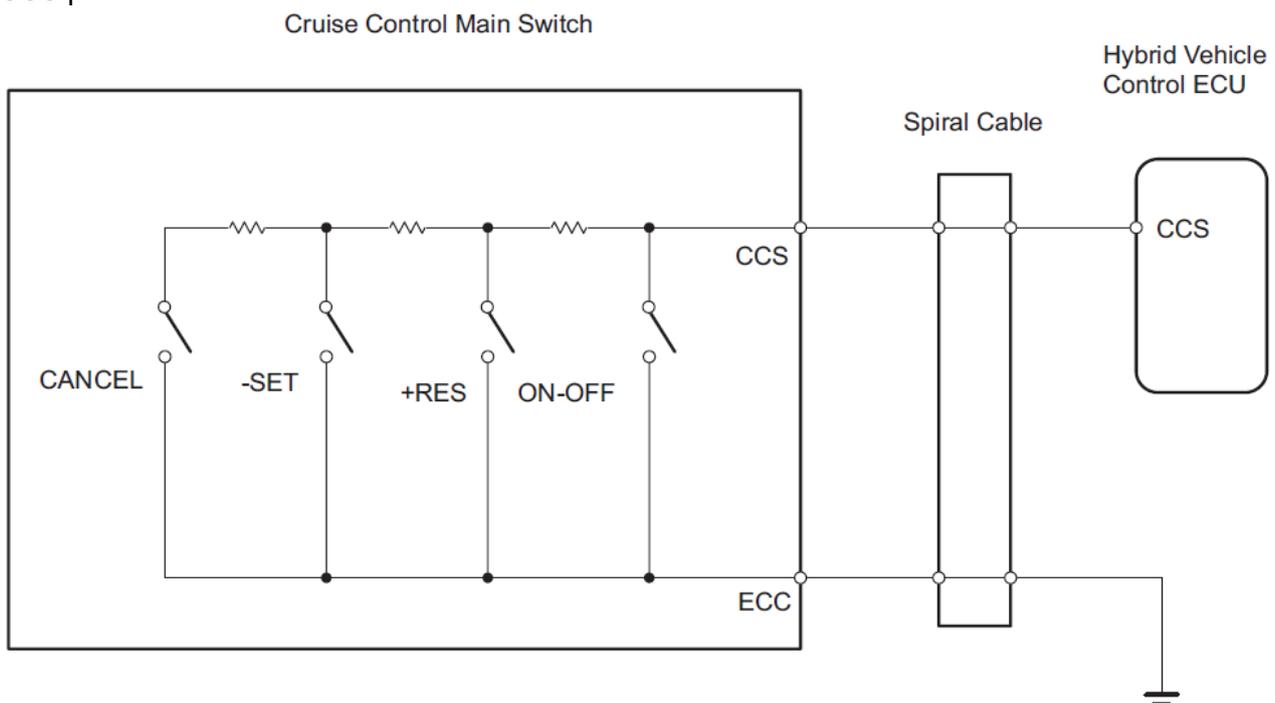
(i) Auto cancel (fail-safe)

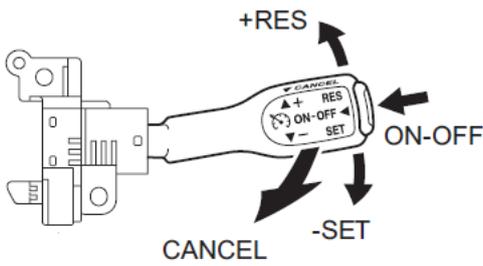
This system has an automatic cancellation function (fail-safe)

3. SCHEMATIC DIAGRAM

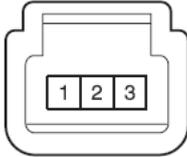
The cruise control switch connects through two wires: CCS and ECC. CCS is connected to the CCS input of the Hybrid Vehicle Control ECU. ECC is connected to the negative ground.

The cruise control main switch consists of buttons applying impulsive discrete resistors to the ECU CSS pin.

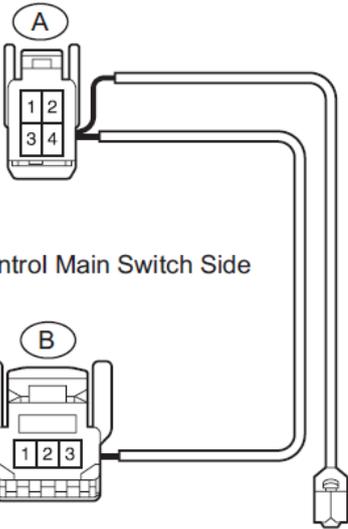




Standard resistance

Tester Connection	Switch Condition	Specified Condition
 1 - 3	+ /RES	210 to 270 Ω
	- /SET	560 to 700 Ω
	CANCEL	1,380 to 1,700 Ω
	Cruise control main switch on	Below 1 Ω
	Cruise control main switch off	10 kΩ or higher

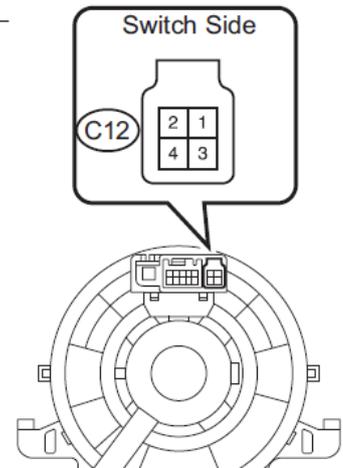
Spiral Cable Side



Cruise Control Main Switch Side

Standard resistance

Tester Connection	Specified Condition
A-3 - B-1	Below 1 Ω
A-4 - B-3	



A-4 and B3 are grounded. A3 and B1 are connected to the CSS gate of the ECU.

4. BILL OF MATERIALS

In order to install a cruise control on a 2010 Toyota Prius, the following parts are needed:

The stalk switch:

- 84632-34011 cruise control switch

The cable connecting the stalk switch to the related socket on the steering wheel; you can select either:

- 84633-48020 cruise control cable (this cable is correct for base vehicles), or alternatively
- 84633-48010 cruise control cable including also connection to the dynamic radar cruise keyboard (needed in case of upgraded steering wheel keyboard including vehicle-to-vehicle distance and LKA buttons).



Two screws to fasten the switch:

- 90159-50199 screws (but also two standard flanged-hex/Phillips-head steel M5x10 screws can be used, possibly including lock washers; they are generally available at any hardware store)

The new right cover hubcap, with appropriate hole:

- 45186-47030 C0 (black ornamental hubcap)
- 45186-47030 B0 (gray ornamental hubcap)

Notice that Prius 2010 does not require installing/replacing the brake switch (which is needed for previous Prius models).



5. HOW TO ORDER

There are three alternative options:

- Option A: go to a Toyota accessory shop like <http://www.toyotapartszone.com> or <http://www.trademotion.com/partlocator/index.cfm?siteid=214631> and order all components. This is a rather expensive option in comparison with the other two ones.
- Option B: at the time of writing, the following Ebay item can be purchased: <http://cgi.ebay.com/ebaymotors/ws/eBayISAPI.dll?ViewItem&item=170566489478&ssPageName=ADME:X:RTQ:MOTORS:1123>
It includes both the 84632-34011 cruise control switch and the 84633-48020 cruise control cable. In addition, two standard M5x10 screws are needed and they can be found at any hardware store.
The only missing component is the cover hubcap, which can be purchased on-line as in option A: either 45186-47030 C0 (black ornamental hubcap) or 45186-47030 B0 (gray ornamental hubcap).
- Option C (the cheapest one): same as option B, by mounting back the 45186-47020 right standard cover after cutting an appropriate hole.

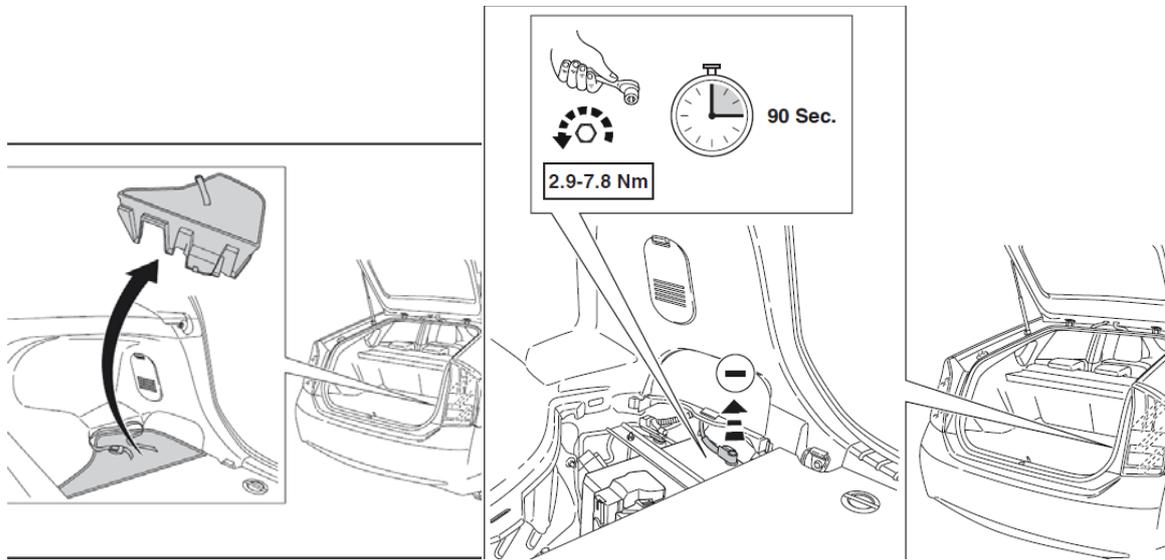
6. INSTALLATION PROCEDURE

Connect the cable to the switch:



For each switch position, test the resistive values of the switch with an ohmmeter (or multimeter), following the resistive figures previously shown and verify that the purchased unit produces compatible values.

Disconnect the battery terminal of the vehicle following the instructions in the owner's manual.

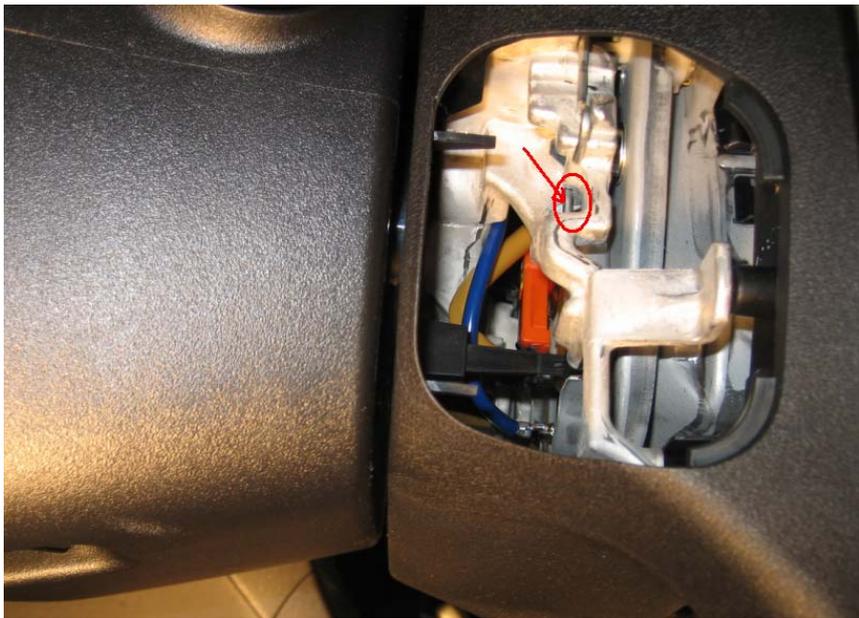
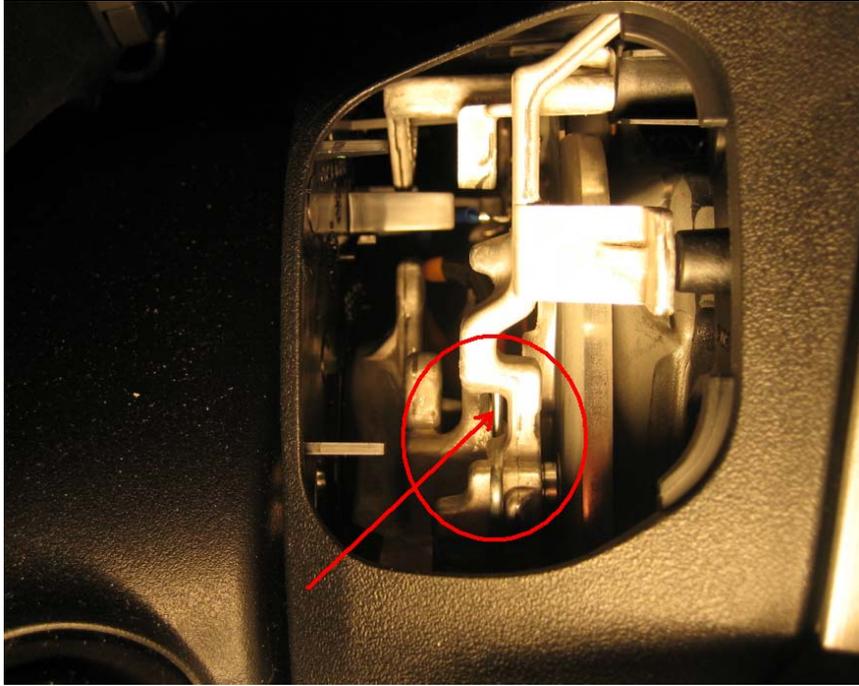


Remove the two standard covers form the steering wheel:

- 45186-47020 standard cover (Right)
- 45187-47010 standard cover (Left)

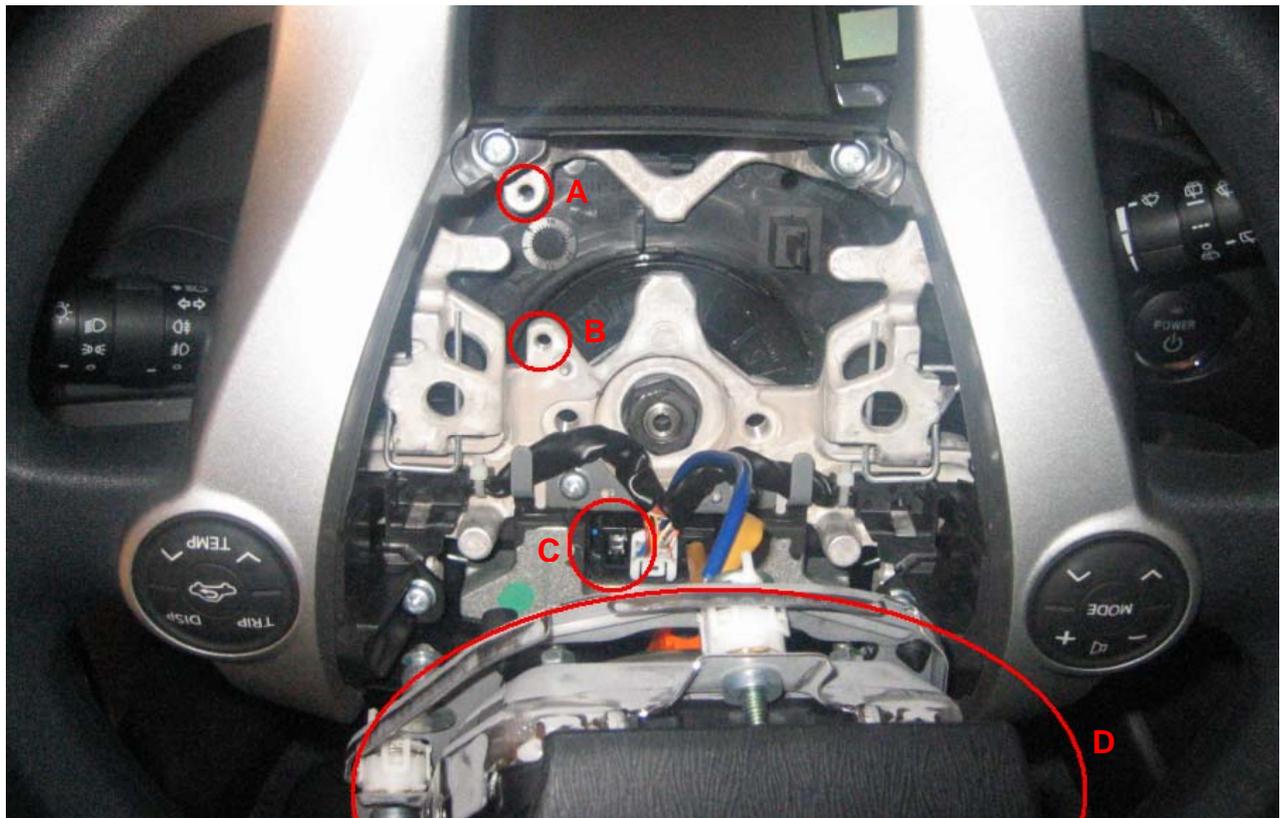


With a screwdriver, press the two right and left springs highlighted in the following two pictures on both left and right holes and in parallel pull the steering wheel center section in order to remove it.



It is suggested to rotate the steering wheel before removing the front block including the airbag.

The following picture shows the internals of the steering wheel after removing the front block. Notice the thread holes A and B, to be used to fasten the cruise control stalk through the screws. Notice also the socket C, to connect the cable. The D part is the removed steering wheel center section, temporarily leaned inside the steering wheel (reason for rotating it).



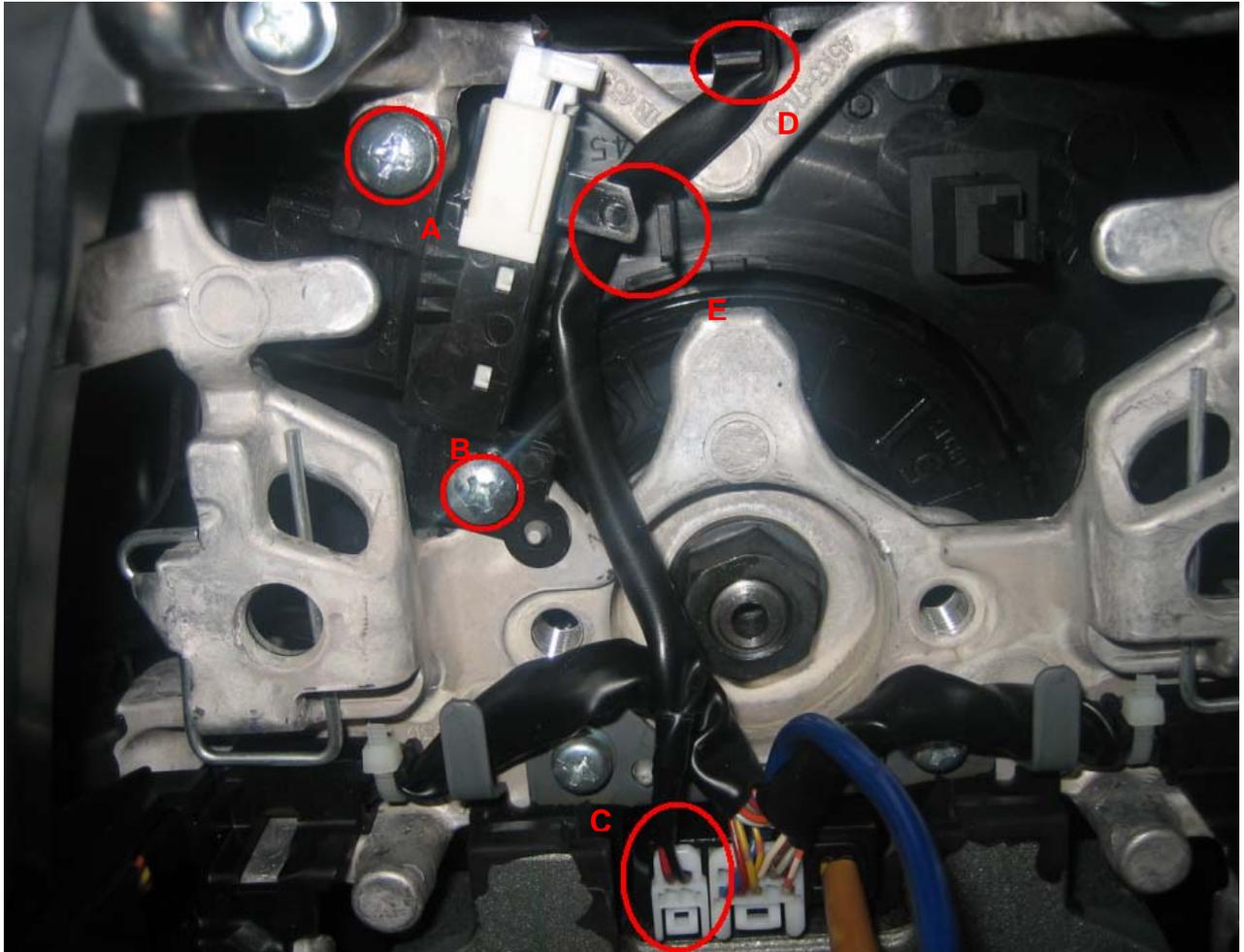
Insert the cruise control stalk from inside and through the access hole, like in the following two figures.



Fasten the cruise control stalk with the two M5x10mm screws (A and B in the picture below). (Alternatively, M5x8, or M5x15 screws can be used).

Connect the switch wire to the C socket.

Insert the wire in the D and E cable clasps as it is shown on the picture below.



After it's done, just put everything back as it was.

Put the steering wheel center section back on. Insert the left access cover back into the steering wheel. Insert the new right cover.



Reconnect the battery.

Turn on the ignition and push the "ON/OFF" button of the cruise stalk. Check that the cruise main indicator light switches on. Check correct operation of the horn.

Follow the Owner's Manual for the cruise control usage.

