

# Factory Cruise Control Installation

By John Minor

(Editor's note: Also see this article)

I would like to share my installation of a junk-yard factory cruise control and indicator light into my '97. A friend of mine has also installed this system into his '94, so I have confidence it will work with all 1.8 L cars. An existing air induction kit may cause installation problems for the servo unit. The whole installation should take only approximately two hours to complete because everything plugs into the existing wiring harness, and all bolt-holes, connectors and attachments are right at hand. This system should cost less than \$200, including shipping, and the end product is a factory integrated cruise control which looks better and adds more value than any after market unit. I'll divide the project into two parts, the cruise control system installation, and an indicator circuit installation.

(Editor's note: We've been informed that some 1997's do not have the wiring connectors in the harness for factory cruise control.)

I purchased the cruise components from TREASURE COAST MIATA who shipped me the parts. There are obviously other suitable resources. There are 6 required components, and 3 small parts as follows: servo unit with accelerator cable attachment and vacuum hose; computer module; steering column clockspring/stalk assembly; brake switch; accelerator pedal assembly; main on-off switch; 2 retaining or "E" clips to secure the pedal assembly; 1 bushing which attaches to the accelerator pedal.

The servo unit bolts under the hood to the driver's side, top inner fender. The two bolts and one nut are already in place. Once it's secured in place, connect the white electric plug from the chassis harness at that location to the servo unit. The vacuum hose meanders to the intake manifold by way of several hold-down "clamps" molded onto the air intake passage, and ends at a vacuum port originally covered with a rubber cap, near the front, engine side of the intake. Remove the rubber plug in the firewall, next to the brake servo unit, and feed through the vacuum servo cable which attaches to the accelerator pedal assembly. There is a clip attached to the cable which snaps into the bracket near the brake fluid reservoir.

Install the main on-off switch into the dashboard facia, to the left of the dash-light potentiometer (the position nearest the door). Remove the cover plate by compressing either or both plastic clips at each end, and press the plate out. This can only be done with your hand behind the dash. Remove the plug connected to the dummy plate and connect it to the on-off switch.

Replace the original brake switch with the cruise one, and attach the double wire connector (pink and yellow) near the switch along with the original connector. This switch may need adjustment so the brake light comes on appropriately and the cruise also works.

Install the computer module into its position on the driver's left footwell wall, near the firewall, close to its 18 wire connector. The plug-wires are taped to restrict its mobility. For an easier installation the tape should be cut. The rubber alignment prong of the computer is then installed upward into an

opening which will allow a 6mm bolt (with 10mm head) to be installed below the unit. (For HOLD indicator circuit, proceed to those instructions now.)

The original accelerator pedal must be removed by removing a retaining washer or "E" clip from the end of the shaft on which the pedal pivots, and the cable must be carefully disconnected. Before installing the cruise pedal "system", both cables must be connected. The accelerator pedal is installed partially first, then the cruise arm, then the pedal completely. A plastic bushing should be included which surrounds the short, protruding shaft on the accelerator pedal, and is assembled into the orifice in the cruise arm.

The most difficult part is replacing the steering column stalk-switch assembly. One can either replace the whole unit, or replace just the cruise actuating stalk. To accomplish either choice, the air bag and steering wheel must be removed. See web site <http://www.miata.net/garage/strngwhl.html> for instructions, or use the following instructions which are a modified version of the Miata Steering Wheel Replacement article by Lester Seal at that site.

## DISCLAIMER

An air bag is an explosive device, and should be given the respect of one.

These directions are for information only. Removal of the steering wheel involves working with the airbag. This procedure should only be performed by a qualified mechanic.

## Procedure

1. Remove the negative cable from the battery (10mm wrench).
2. Remove the panel under the steering wheel (2 Phillips screws on the bottom edge).
3. Remove the 4 Phillips screws from the clam shell which surrounds the steering column, and remove the housing. There is a snap-type connector on each side which must be compressed to release.
4. Disconnect the clockspring connector plugs (large blue and orange connector) and the stalk assembly connector plug. First the orange connector has to be disconnected (there is a clip on the side), then the blue connector is disconnected (the clip is in the middle and is covered by the orange connector when connected). Then simply disconnect the remaining plug.
5. Put the key into the ignition switch and unlock the steering column so the steering wheel can turn. Locate and remove the 4, 10mm nuts on the back side of the steering wheel (these nuts hold the air bag to the steering wheel). Lift the air bag off the wheel. Pull the orange and blue connector from the clip in the wheel and disconnect the same way as the clockspring connector was. When you get the air bag out, put it down somewhere safe, and don't play with it.

Caution: When carrying a live air bag module, make sure the trim cover is pointed away from your body to prevent personal injury in the event of an accidental deployment. When placing a live air bag module on any surface, always face the trim cover upward to reduce the motion of the module if it is accidentally deployed.

6. Center the steering wheel, and mark the stud of the shaft (inside of the nut), and the wheel with a marker so you know where the straight ahead position is when the wheel is removed (I place a mark from the dimple in the center of the shaft, vertically to the edge of the shaft). Remove the 21mm nut. Remove the wheel (a rocking motion with one hand opposite the other on the wheel, pulling toward you at the same time should get it loose). Remove the 3 Phillips screws securing the clockspring/stalk assembly. Note the position of the clockspring; there are 2 pointer protrusions, they fit into the steering wheel, and should be in a vertical (up and down) position. There is also a marker at the 12 o'clock position. Try not to move the clock spring around or it will have to be reset (centered). The directions for centering the clock spring are located on the unit. Remove this whole assembly.

7. The cruise clockspring/stalk assembly may now be installed in place of the original unit, or the windshield wiper/cruise stalk may be installed in place of the wiper-only original one. If one chooses to replace the single stalk, first remove the one from your car's assembly to get the feel of the procedure before removing the cruise/wiper stalk. To remove the individual stalk, unscrew the two Phillips screws which secure the small circuit card and translucent cover. Be sure the wiper stalk is in the full up (off) position, and carefully remove this circuit card assembly. To remove the stalk, rock the assembly rearward enough to dislodge the spring-loaded arm from the channel in which it operates. With a small screwdriver unlatch the small clip from the front side of the stalk assembly to free it from its path. The stalk should lift out easily. To remove this stalk from the cruise assembly, repeat this procedure. The wiring can be taken from its secured path and removed from the assembly unit after the stalk is free. At least one wire tie must be cut. Three screws securing the clockspring assembly to the larger assembly must be removed to raise the clockspring far enough to remove the cruise switch wires from underneath. To install this cruise stalk, reverse the order.

8. Reinstall the whole stalk/clockspring assembly, carefully noting the clockspring orientation. Reconnect the main harness connectors, including the new 3 wire connector for the cruise control (red w/white; red w/blue; black)

9. Now it is just a matter of reinstalling the steering wheel and the air bag, being sure the clockspring protrusions line up with the holes in the wheel, and the wheel is centered with your mark on the shaft. The torque specification is 29-36 ft-lbs. Reverse the removal directions for installation. Do not forget to attach the cord on the air bag to the steering wheel.

10. Replace the clam shell surround, the panel under the steering column, and reconnect the battery cable.

The cruise control system is now completely installed. The brake switch may still require adjustment if the cruise does not actuate and hold speed.

## **HOLD Indicator Circuit Installation**

On cars 94 and newer, there is a "HOLD" indicator in the dash pod module which I connected into my cruise control system to give me a visual indication when the system is actuated. These innovations can only be applied to cars without automatic transmissions, and cars that do not have ABS. This procedure is easiest to accomplish before the cruise control computer is connected. Basically this procedure monitors the servo unit and indicates when the cruise is actuated. The

following is the procedure to install this indicator circuit.

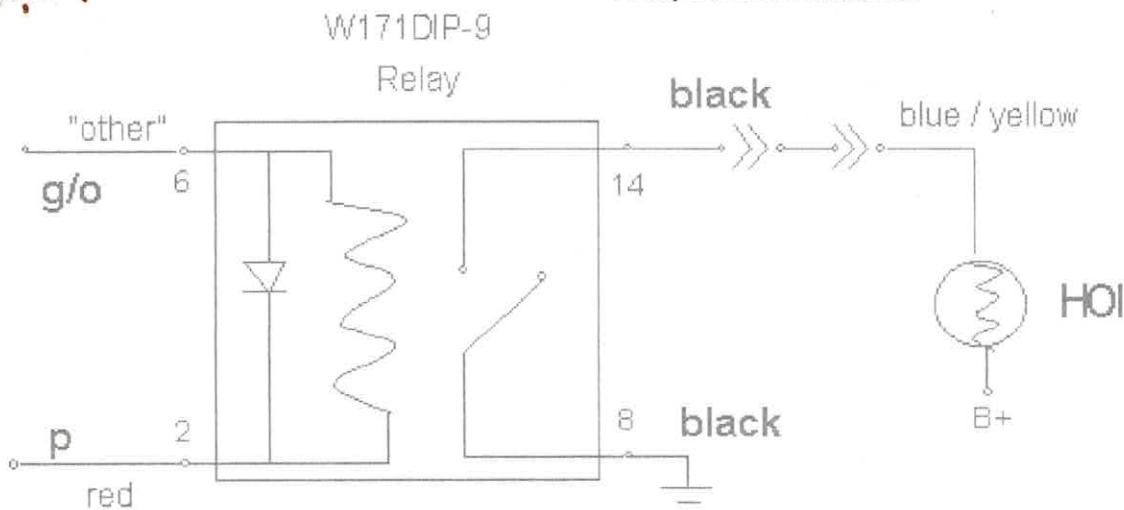
## Procedure

I connected two Reusable Quick Connectors to the cruise control computer plug wires (ones which will accept bullet connectors, i.e. Radio Shack p/n 64-3089 @ \$1.50). Before these are installed, mark one with red nail polish or paint. Connect this one to the pink wire. Connect the other Reusable Quick Connectors to the green w/ orange wire. Choose this wire carefully because there is also a green w/ yellow wire. Loosely connect a tie rap around the engine side of the computer attachment bracket for use later. The cruise control computer and plug can now be installed. I felt it was easier to remove the fuse box and its supporting bracket to accomplish the connections. This is done by removing 2 Phillips screws holding the fuse box, then a 10mm bolt holding the bracket.

With the clam shell housing removed from the steering column area, drop the steering column down by removing 2 12mm bolts. Remove the two Phillips screws which secure the lower edges of the plastic instrument shroud to the dash. Grab the shroud near the top with both hands and pull hard straight toward the steering wheel. It will release. Disconnect the white connector attached to the left side of the instrument pod. After releasing both sides of the rear of the connector, rotate (on its hinge) the restraining portion of the connector. With a small pointed tool, press the release snap that holds the second wire connector (blue w/yellow). Remove this connector pin and wire from its socket. Cut this wire about 1 1/2" from the pin, and splice a 3 foot, 18 gauge, flexible black wire to the end. Reinstall this wire to the third position which is also currently empty, and reconnect the connector to the instrument pod. Snake the wire to the area of the cruise control computer, securing it in several places along the way using tie wraps. Once in that area, attach a covered spade lug connector to this wire. The length of the wire may be reduced, but keep long enough to attach near the cruise computer plug. At this point, snap the instrument shroud back into place, and replace the two screws securing it. Obtain a small micro reed relay (Newark Electronics is a good source for a Magnecraft (p/n W171DIP-9) brand 12 volt, .5 amp relay with a clamping diode). Solder a black wire with the opposite type spade connector to one side of the open contact (pin 7 or 8 of W171DIP-9). Solder a 5" black wire with a 6mm ring terminal to the opposite side of the relay contact (pin 1 or 14). Solder a red, 5" wire with a bullet connector on one end to the positive relay coil (pin 2), and connect another wire (not black or red) to the negative end of the coil (pin 6). Tape or cover the relay and all of the soldered connections. Connect the red wire to the red-marked Reusable Quick Connector, the "other" wire to the remaining Reusable Quick Connector, the ring connector to the bolt securing the cruise control computer, and connect the black wire together using the spade lugs. Secure the relay and all the wires to the cruise control computer using the tie wrap.

This installation will now light the HOLD light when the cruise control is holding speed.

To continue with the cruise control installation proceed to the step which installs the different accelerator pedal.



### Addendum by Don Miller - [alcarina@cs.com](mailto:alcarina@cs.com)

True, the airbag and steering wheel must be removed to add the "combination switch" to the steering column to do this installation, but actually not much has to be added. I got all of the "combination switch" I needed for the install from a severely wrecked car. The only part which must be changed out is the cruise/wiper 'switch actuator' arm for the non-cruise arm. The cruise arm has a little twist switch on the end of it, and it has a cord with a 3 prong switch running down the inside of the arm which mates up to a previously unused plug in the factory harness. When you get the wheel off, carefully disassemble the wiper switch far enough to get the switch actuating arm out, and replace it with the cruise arm, and carefully route the new cruise wiring around all the molded in clips which restrain the wire, and reassemble everything.

The reason Mazda (and everyone else) wants so much for the 'combination switch' is because it contains the turn signal, headlights, and wiper switches, along with the clockspring assembly. All these parts are identical on cruise AND non-cruise cars, and do not need to be swapped out. Try to get just the wiper switch arm from a damaged car for a few dollars - It can be very cheap, especially if a portion of the combination switch was damaged in the accident. (Mine had a destroyed left half [the headlight/turn signal side] and I paid just \$30 for the portion I needed.)

The most difficult and time consuming part of the install is the wiring associated with the little relay to make the 'hold' light within the dash ('94 and later cars) light up when the cruise is engaged. The cruise computer mounts in a nearly impossible place to get at, and doing any wiring in there is very difficult. It is not necessary to do this portion of the install to have a functioning cruise control - The cruise equipped cars from the factory do not have this feature. If you want the 'hold' light to work with the cruise, as described in the article, you can make things MUCH easier by mounting the little reed relay INSIDE the computer box, instead of trying to modify the car wiring. The box is easy to pop open, and there is plenty of room inside for the relay. I used a Radio Shack relay (P/N 275-233 @ \$2.49 ea.) and hooked up the relay coil between the connector plug pins 2 and 6, and grounded one end of the relay contact to the printed circuit board ground. This relay does not feature a clamping diode, so there is no concern for connection polarity. Drill a small hole in the metal case near the plug, to snake a wire connected to the other relay contact through. This wire will later be connected to the wire you added to the dash plug, as per the instructions in the article. This gives

you just one wire to connect down there when you install the cruise computer box onto the drivers kickpanel.

When you read through the installation procedure, it sounds very complicated, and difficult to do, but the article is very well written, and the procedure is much simpler than you would guess. It will take you several hours, but it is not at all difficult. I don't believe the original author of the article is still available, so if anyone has any questions with this install, feel free to E-mail me.

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### **Addendum by Ryan Cumpston - [scoobywrx@comcast.net](mailto:scoobywrx@comcast.net)**

The airbag assembly/clockspring does NOT need to be removed to install the cruise stalk. As noted already, you do not need the whole combination switch assembly. Just the cruise control/wiper stalk. A brand new cruise stalk is only \$45 from the dealer. To swap it out, remove the metal panel under the steering column. It is secured by two phillips head screws. Next remove the plastic trim around the steering column by taking out the four screws. Crawl under the column and remove the two 12mm bolts securing the steering column. This will free up the column enough to move around a bit. On the back side of the stalk assembly, on the column itself, you will see two phillips head screws securing a small PCB. Unscrew those two screws. You may have to shift the column around a bit to gain access. Once those are removed, the old stalk should pull right out. Make sure to scavenge the spring/probe assembly off the end of the old stalk and insert it in your new stalk. This actuates the windshield washer. Push the new stalk in and reinstall the two screws securing the PCB. Run the cruise harness back along the PCB in the OEM wire stays. You'll find the OEM connector after the large bundle of wires secured by the zip tie. At this point, I would suggest making sure your stalk still moves freely. If everything is set, button everything everything back up. Total time to swap the stalk is roughly 10 minutes and you don't have to disturb the airbag/clockspring assembly.

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