Redline Shift Warning Module

Overview

Description

The Redline Shift Warning Module is an ***audible*** shift indicator designed specifically for the Honda S2000, although it can be used on most modern automobiles regardless of make. As long as there is an ECU-generated tachometer signal it will work great. Do NOT install it on vehicles with mechanical distributors, points, and ignition coils. Damage may occur to the Redline module.

Vehicles with other than 4-cylinder engines will require a custom version of the module (no extra charge, see web site for details), and non-S2000 vehicles will have to add separate push button switches to take advantage of the High RPM Memory and Optional Output features. Installation of the basic shift indicator requires only 3 connections to your car: +12v, ground, and the tachometer signal.

Shift Beeper function

The Shift Beeper provides 3 equally spaced warning beeps, followed by a steady beep to indicate your shift point. The steady beep occurs exactly at your Shift RPM, which is programmed by you via dip switches on the module. The warning beeps occur at intervals of 100, 200 or 300 rpm (again your choice) and occur prior to the Shift RPM. The warning beeps are equally-spaced, so it's easy to judge when that crucial "4th beep" will occur and time your shift exactly at redline. Simply count "one, two, three, shift" and with a little practice you'll find yourself comfortably winding every gear to redline while never taking your eyes off the road.

High RPM Memory

The module remembers the highest rpm the engine reaches, and will 'play it back' by beeping the sounder. The playback is initiated by pressing a separately wired button, and can be erased, if you choose, by pressing the same button again. The High RPM is retained in memory even if power is disconnected. This function is useful for 'Dealer Service' or 'Valet' occasions when you want to know how your car has been treated.

Optional Output function

There is a separate output terminal on the module that can be connected to a light, sounder, or other device of your choosing, and will be activated when engine rpm is between two programmed set points. This feature can be turned ON and OFF with a separately wired switch. This function can be used for anything you can dream up, such as a 'downshift indicator', a 'Valet Mode' function, or a NOS 'window' switch.

Test Mode

This is a special mode to confirm the module is wired correctly and has a useable tachometer input signal. When powered up in this mode, the beeper will beep about once a second at idle rpm. As you rev the engine, the beeping will speed up in proportion to rpm. In addition, Test Mode is used to program the Optional Output settings.

In-depth Feature Description

Shift Beeper Function

The Shift Beeper provides 3 equally spaced warning beeps, followed by a steady beep to indicate your shift point. The steady beep occurs at your Shift RPM, which is programmed by you and must be between 3000 and 9300 rpm. The warning beeps occur at intervals of 100, 200 or 300 rpm (again your choice) and occur prior to the Shift RPM.

The Shift RPM will usually be your intended shift point, either right at redline or just before your rev-limiter kicks in, if you have one. You can choose any rpm between 3,000 and 9,300 in increments of 100 rpm. When the engine reaches the Shift RPM, the beeper will sound continuously, and will continue to sound as long as engine rpm is above the set rpm.

The Interval setting determines how far apart the warning beeps will occur, and you can choose 100, 200, or 300 rpm Intervals. The warning beeps will always be at evenly spaced intervals subtracted from the Shift RPM setting. To make it easy to understand, here's an example:

Let's say you have set a Shift RPM of 8900, and you set the Interval to 200 (recommended setting for S2000). You will get warning beeps at 8300, 8500 and 8700 rpm, then a steady beep at 8900 rpm. If you change the Interval to 300, your warning beeps will be at 8000, 8300, and 8600, *but the steady beep will still be at 8900.* The Interval setting does not affect your Shift RPM, only how much warning you get.

The Shift Beeper operates all the time, and other than programming the Shift RPM and Interval settings, requires no attention, unless you want to change the settings.

The Shift RPM and Interval settings are read from the switches every time the module is powered up, so it's easy to change the settings. Just turn OFF the ignition, change the switches, and re-start the car. Your new settings will be in effect.

You can even change the settings while the car is running, *but they won't take effect till the ignition is turned OFF and back ON.* This feature makes it easy to test two different settings back-to-back.

Try this experiment to see how it works:

Set up the module for your Shift RPM, and Interval 100. Start the engine. Before driving off, and with the engine running, change the switches for Interval 200. Since the ignition is still ON, the module will not use the new settings; it will still be using 100 RPM as the Interval.

Now drive the car and get a feel for how the beeper works with an Interval of 100 rpm. When you are ready, turn the engine OFF, then start it up again and test the new settings. When you cycle the ignition OFF and ON, the module loads the new settings (Interval 200) without you having to play with the switches, so there's less time between tests, and it's easier to compare the two settings. Of course, now you're stuck with the new setting, unless you change the switches and cycle ignition power again.

Optional Output Function

The Optional Output function is like a second Shift Beeper and can be used for anything you dream up, such as a 'downshift indicator' or a 'Valet Mode' function. The module has a screw terminal (labeled OPT) that provides a ground output to activate a relay, sounder, or indicator of your choosing. The Optional Output function operates independently from the regular Shift Beeper and has some special features:

- It can use both a LOW RPM and a HIGH RPM set point
- The Output screw terminal is grounded only when engine rpm is *between* the Low and High rpm set points
- The Low and High rpm set points are programmed while in a special Test Mode, and are therefore not intended to be changed frequently
- The Optional Output function can be toggled ON and OFF via the Cruise buttons on a Honda S2000 or an external switch on other vehicles
- The Optional Output has 2 modes of operation – Valet Mode and NOS mode.

Valet Mode is intended for use where someone else will be driving your car and you want to make sure they treat it gently. While you can't limit engine horsepower or lower the rev limiter point, you can make it uncomfortable for someone to rev the engine above what you consider to be reasonable. You do that by programming a Low rpm set point only, and connecting a very annoying siren (or a relay to activate the horn) to the output screw terminal, which will activate if engine rpm exceeds your programmed rpm.

NOS Mode is designed for use with a Nitrous Oxide system, and can be installed and programmed to prevent NOS activation until a specified rpm is reached, and then to cut off NOS at a higher rpm just prior to your redline. You program both a Low rpm and a High rpm setting, and the Optional Output will only activate if engine rpm is between these two points. NOS mode can also be used for a 'downshift indicator' if you connect the output to a light and set the High rpm setting appropriately.

Functionally, Valet Mode and NOS Mode are very similar. The difference is that Valet Mode does not use a High rpm setting, so the output will never turn off, no matter how high the engine revs. NOS Mode uses a High rpm setting to turn the output OFF when engine rpm exceeds the High setting. When you program the Redline module, if you select the same rpm for Low and High, the Module will operate in Valet Mode. If you program a higher rpm for the High setting, it operates in NOS Mode.

If you decide to use the Optional Output and have a Honda S2000, you may want to run wires (included in the kit) to the Cruise Control switches to allow easy ON/OFF control of this feature. If you do, the buttons will still work for Cruise Control (with minor limitations) but will also operate the Redline module. If you have a car other than the S2000, you can wire a momentary pushbutton to the module instead of using the Cruise switches (see installation instructions).

Once you have wired the module to the Cruise Control buttons you can activate the Optional Output by pressing the SET button for 3 seconds. When you do, the beeper will sound twice to confirm the function is active. To turn it OFF, simply press the SET button again for 3 seconds, and you will hear 3 beeps indicating it is OFF. It's easy to remember which beep pattern indicates ON or OFF, if you think of how many letters are in the words ON and OFF. Two letters are in the word 'ON', so two beeps indicates the function is ON.

The Optional Output function will stay ON until you turn it OFF. If it was active when you turned your car off, it will still be active when you come back and re-start the car. As a reminder, the module will beep twice when you turn ignition power back on with the Optional Output still active. That's just so you don't forget it is still ON, since it may have been several days since you last drove the car.

If you connected the Optional Output to a siren or horn for use as a "Valet Mode" and you activate Valet Mode by pressing the SET button, the siren will sound anytime the engine is above the Low RPM set point. When engine rpm drops below your set point, the siren will turn OFF. To disable Valet Mode, press the SET button again for 3 seconds. The beeper will sound 3 times to confirm the function is OFF. When Valet Mode is OFF, the siren will never sound, regardless of engine rpm.

If you are using the Optional Output to activate another device, like a downshift indicator light or your NOS system, you will need to program both a Low RPM and a High RPM setting during Test/Program mode. In NOS Mode, the Optional Output works in a range bounded by the LOW and HIGH set points. When you press the SET button for 3 seconds to activate the Optional Output, your connected device will only be activated if engine rpm is above the Low RPM setting, *and* below the High RPM setting. This is different than the Valet Mode operation, where the Output is activated anytime engine rpm is above the Low RPM setting. When you use 'NOS' mode your connected device will turn OFF again at the High RPM point.

Pressing the SET button again for 3 seconds will toggle the NOS mode OFF, just like it does for Valet Mode.

High RPM Memory

The module remembers the highest rpm the engine reaches, and will 'play it back' by beeping the sounder. If you have wired the module to the Cruise Control Buttons, pressing the RESUME button for 3 seconds will begin the playback sequence. When playback is initiated, the beeper will sound out a pattern of beeps indicating the maximum rpm since the last time the memory was reset. You will hear one series of beeps representing thousands, a short pause, and then another series of beeps representing hundreds. Then there will be a 3 second pause and the playback will repeat, in case you missed it the first time.

As an example, let's say you initiate playback and hear 5 beeps, a pause, and then 2 beeps. After 3 seconds, the pattern repeats. This indicates the module recorded an rpm of 5200. If you don't erase the memory, this reading will be retained until a higher engine rpm is recorded.

If you want to erase the memory, just initiate playback by pressing the RESUME button for 3 seconds, and during the playback tap the RESUME button again. The module will finish sounding out the pattern, and then it will give you 4 rapid beeps to indicate the memory has been reset. When the memory is erased, it always returns to a factory setting of 2200 rpm, which is the lowest rpm the module can record.

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Installation Instructions

Skills and tools required to install:

- Remove one interior trim panel.
- Run one zip cord under dash to connect to Cruise Control buttons (optional if you want to use the High RPM Memory or switch the Optional Output on and off)
- Pair of regular pliers to attach the T-tap connectors to wires behind the passenger dash
- Wire strippers and pocket screwdriver to attach wires to Redline module

Installation Procedure:

Average installation times should be about an hour, more or less depending on your experience with automotive wiring. Note that these instructions assume you are installing the full kit, using the wires, connectors, and parts supplied by me. If you are doing your own wiring or something custom, you should refer to the Wiring Diagram at the end of this document.

1. Remove the passenger side dash access cover - 6 clips. Photo below shows the back side of the access panel so you can see where the clips are. Take your time if you've never had this panel off before, the clips are tight but will come off with careful pulling and prying and cursing. If you get in a hurry you can crack the panel (more cursing). A replacement panel costs $9. Don't ask me how I know.

   You can reach behind the dash to help pop the clips out, or carefully use a small pry bar to pry the panel out. Slide and wiggle the pry bar into the crack at the top right of the panel, until it's about 3/8" into the crack, and then gently pop the clip loose. Move the pry bar to the center of the panel and repeat. Then do the clip at the top left. Tilt the panel outward to help you locate and pop the bottom clips off.

2. Locate the wires you'll be connecting to by referring to the photos on page 5. Connect the 3 T-tap connectors, using pliers to squeeze the connector around each wire. You do not need to strip the wires; the connectors will make contact through the insulation. Connect as follows:
   - 1st connector - to the yellow wire on the Convertible Top Module (ignition power).
   - 2nd connector - tap into one of the black ground wires on the Convertible Top Module. There are 3 black wires on bottom left of the module: you can connect to any of the three.
   - 3rd connector - to the blue wire on connector C204, pin 5. It's easiest to first find the brown wire because it's the only one on this connector. Then look right below it for the blue tach wire. Make sure you get the correct blue wire. There are several blue wires in this connector, but the wrong ones all have colored stripes, and there's a light blue wire too. The one you want is medium blue with no stripes down the length of the wire.

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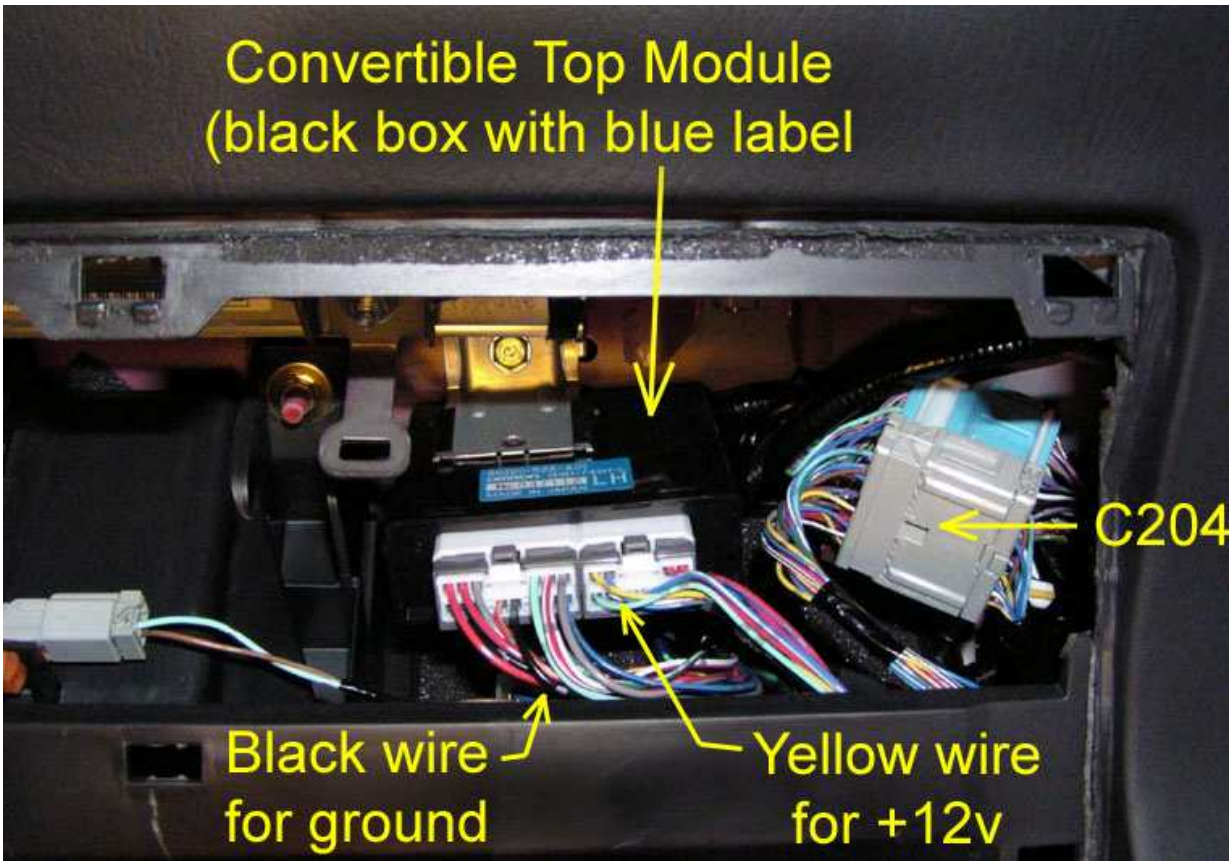
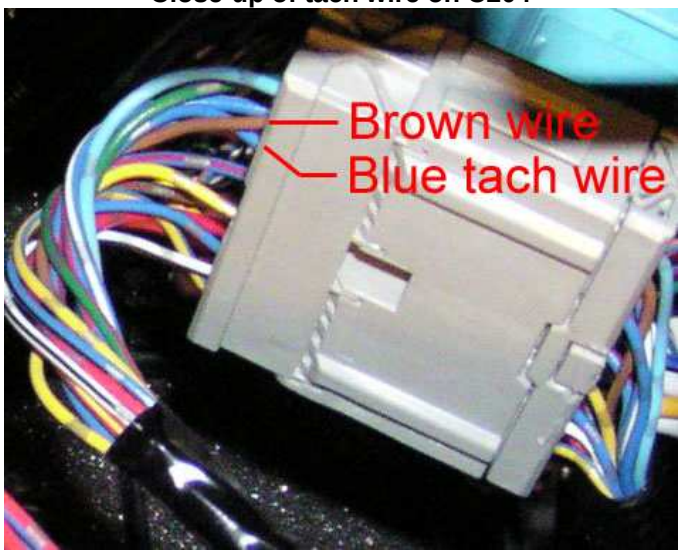
Here's what you'll see behind the passenger dash access panel

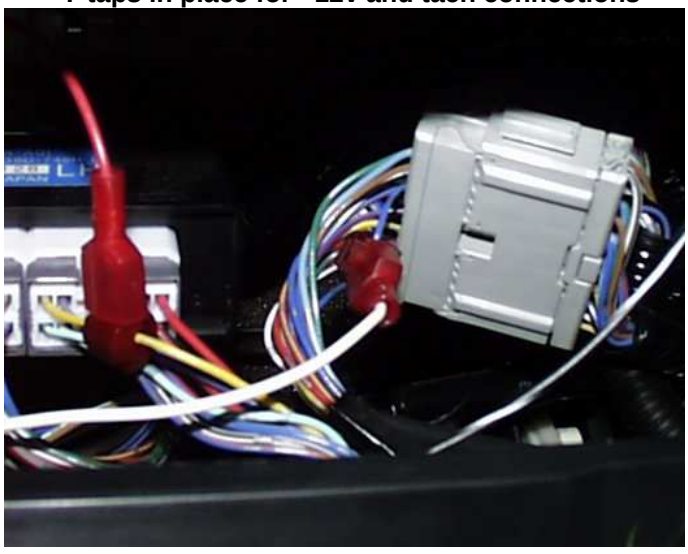


3. Plug the Redline module wires into the T-tap connectors as follows. Photo shows the +12v and tach connections.
   - Red or orange (+12v power) - to the 1st T-tap connector (yellow wire on the Convertible Top Module)
   - Black (ground wire) - to the 2nd connector (black wire on Convertible Top Module)
   - White - to the 3rd connector (blue wire on connector 204)

Close-up of tach wire on C204



T-taps in place for +12v and tach connections



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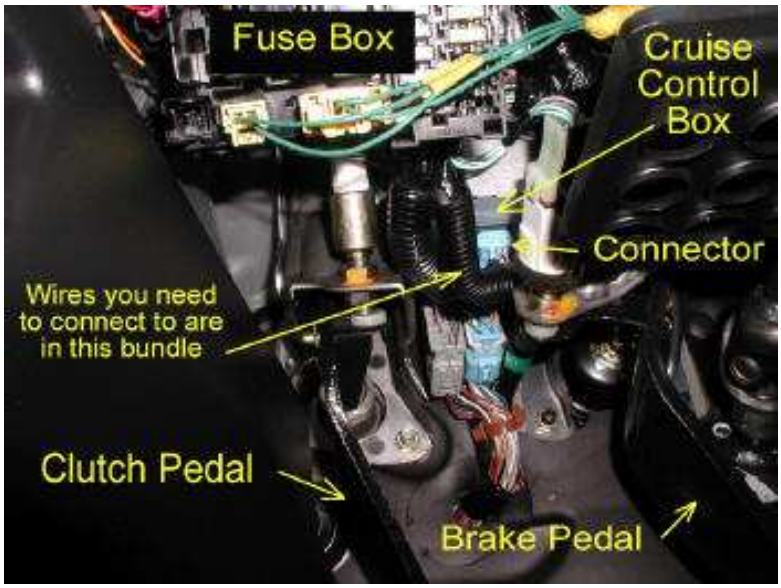
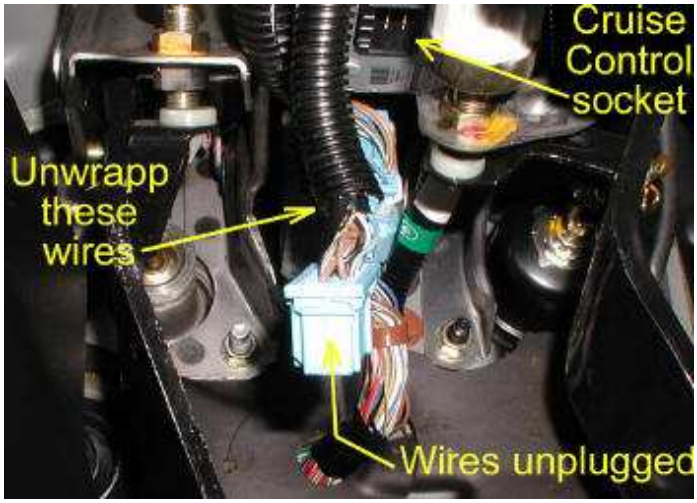
Steps 4 to 8 are only if you are using the Optional Output or High RPM Playback and are installing in a Honda S2000.

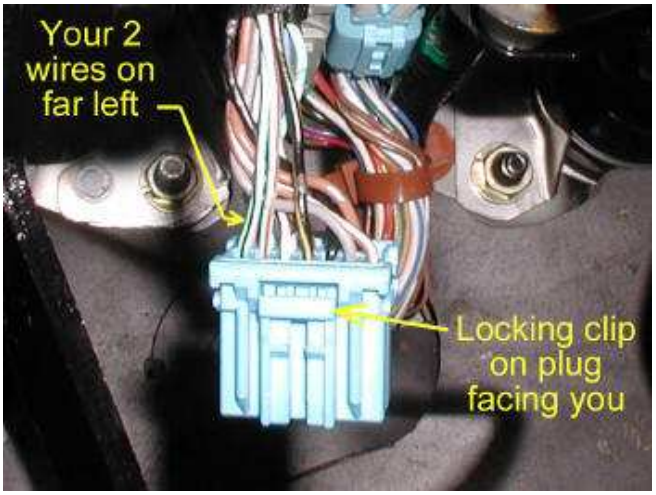
4. Run the supplied zip cord from behind the passenger dash to under the driver's side dash. You can route the wire above the radio by taping the wire to a stiff piece of wire or a long ty-rap and pushing it through the dash. Make sure the end with the pre-attached connectors ends up under the driver's side to connect to the Cruise Control wires.

5. Locate the Cruise Control module. It's under the driver's dash, between the clutch and brake assemblies, and just forward of the fuse box. It's a metal box about 3" x 3" x 1", and has one blue connector plugged into it from the bottom, right up against the brake light switch. If you look at the photo below, you should be able to find it by looking up under the dash from just in front of the driver's seat.



6. Unplug the connector from the Cruise Control Module, and remove the electrical tape and plastic loom to expose a few inches of the harness. You will need to depress the connector's locking clip in order to unplug the connector. Photo below left shows the connector unplugged, and below right shows a close-up of the connector with the wires you need to connect to.





7. Connect two T-tap connectors to the Cruise Control wires, using your pliers.
   First connector goes to the light green wire with a black stripe (far left wire in photo).
   Second connector goes to the light green wire with a red stripe (second from left wire).

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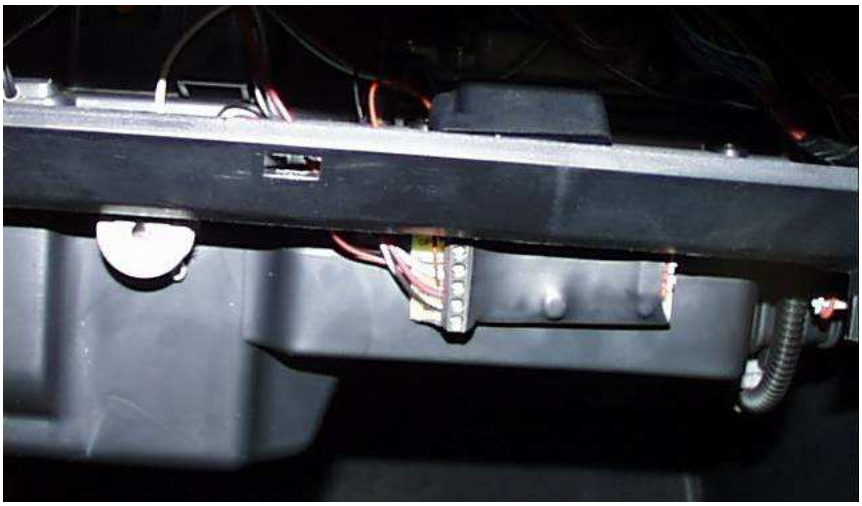
8. Plug in the zip cord connectors like this:
   Plug the solid black side of the zip cord to the first connector (light green/black).
   Plug the white stripe side of the zip cord into the second connector (light green/red).
   Now, plug the wire harness connector back into the Cruise Control module.

9. Connect the wires to the Redline module screw terminals as follows:

   - Black from the ground wire - to the **GND** screw terminal
   - Red - to the **+12V** terminal. This screw terminal also gets the red wire from the beeper and the mini-siren (3 red wires total).
   - White - to the **Tach** terminal
   - Black wire from Shift beeper - to the **Beep** terminal
   - Black wire from mini-siren - to the **OPT** terminal
   - Solid black side of Cruise Control zip cord - to the **RES** terminal
   - White stripe side of Cruise Control zip cord - to the **SET** terminal

10. Attach the Redline Module to the front of the fan housing, about 1/2 inch from the bottom edge, using the larger piece of Velcro supplied. Using the smaller piece of Velcro, attach the beeper to the front of the fan housing as shown in photo below. Do not install any lower, as the module may be visible after replacing the access cover. Mounted in this position, you should be able to reach under the dash and remove the module (for re-programming) without having to remove the access cover.

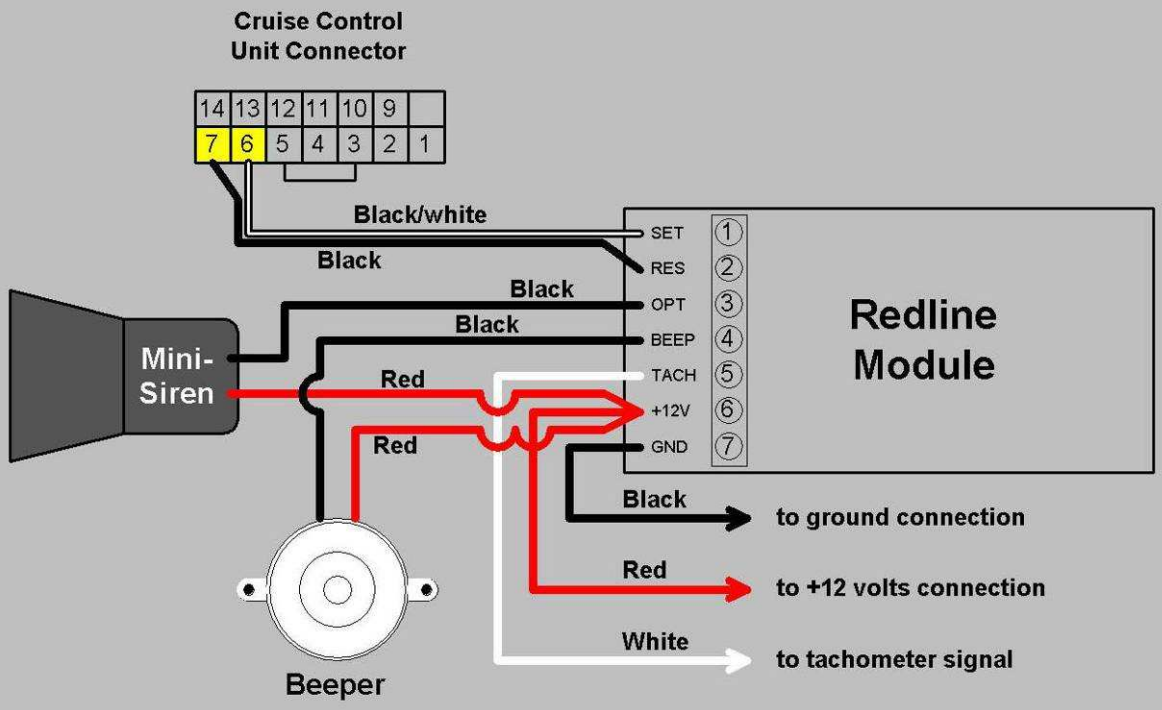


11. If you are connecting a siren or sounder to the Optional Output, wire the negative side to the OPT terminal on the module and the positive side to the +12v terminal. Only use devices that draw 1/2 amp or less as higher currents may damage the module. If you need to operate a device that uses more current, use the module to operate a relay and the relay to activate the device.

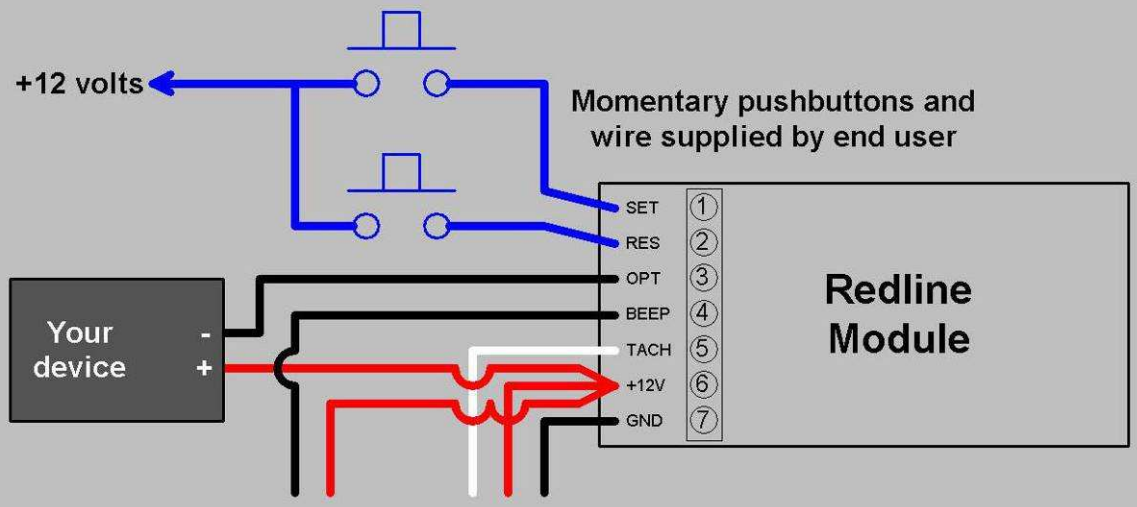
12. Use your Redline module as-is, or follow the Programming Instructions to load your own settings. The module comes pre-programmed with the following settings:

    - Shift Point - 8800 RPM
    - Interval - 200 RPM
    - Optional Output Low RPM - 5000
    - Optional Output High RPM - 5000 (for Valet mode operation)

Redline Module Wiring Diagram using theCruise Control Buttons



Using your own switches or powering other indicators



Redline Shift Warning Module

Programming the Redline Module

Programming of the module is accomplished by setting Dip Switches. There is one set of 8 switches on the right end of the module.

Shift Beeper settings:

The **Interval** is set using switches 1 & 2. You can choose 100, 200, or 300 rpm Intervals, as shown in the programming charts.

The **Shift RPM** is set using switches 3 – 8, and covers a range of 3,000 to 9,300 rpm. Refer to the programming chart to see how to set the switches.

Optional Output settings:

The Optional Output uses a Low RPM setting and a High RPM setting, which are programmed with switches 3 – 8 when the module is in Test Mode. Use the same programming charts for the Optional Output rpm values as for the Shift Beeper rpm values. Interval values are not used for the Optional Output.

Recommended Programming Procedure

Decide how you will use the Optional Output (either Valet Mode or NOS Mode), and determine the low and high rpm settings you want. If you don't intend to use it you can skip steps 2 through 5. Next decide what your intended Shift RPM will be and what Warning Interval you will use. Then follow this procedure and have the Programming Charts handy:

1) Set switches 1 & 2 OFF (down).
2) Set switches 3 - 8 for the Low RPM value to be used with the Optional Output.
3) Turn the Ignition ON – this puts the module in Test / Program Mode. **Do not start the car**.
   a) When the module powers up in Test Mode, it automatically loads the RPM setting from switches 3 - 8 into memory, to be used as the Optional Output Low RPM value.
4) Change switches 3 - 8 to reflect the High RPM value to be used for the Optional Output.
   a) If you are not going to use a High RPM setting (as in 'Valet Mode'), leave the switches set the same as for the Low RPM setting.
5) Press the SET button once (or your momentary button if not a Honda S2000).
   a) When you press the SET button, you will hear 4 quick beeps, indicating the module is programmed for NOS Mode and has stored the switch settings as the High RPM value.
   b) If you did not change the switches, when you press SET you will hear 6 quick beeps, indicating the module is programmed for Valet Mode, and has no High RPM setting.
6) Now start the car. You should hear a beep about every second, and it will beep more frequently as engine rpm is increased. This verifies your tachometer connection is good.
7) Turn the ignition OFF.
8) Change the dipswitches to set the Interval and Shift RPM values for the Shift Beeper.

You're done. Next time you start the car the module will load the Shift RPM and Interval settings into memory. These settings will be in effect until you change them, and then power the ignition OFF and back ON. To change the Optional Output settings, you must put the unit back into Test / Program Mode.

Customizing the installation:

The beeper I supply is a 12 volt piezo sounder and can be relocated by extending the wires with 22 or 24-gauge speaker wire. You can even add additional sounders or a light as long as the total current drain is less than 1/2 amp. Remember that both the Beeper output and the Optional Output provide a GROUND when they are activated, so you need to connect the negative wire of your device to the module's output screw terminal, and the positive wire of your device to a +12 volt source.

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Dip Switch Setting Charts

Use the charts below to determine how to set the switches for the **Shift RPM** and **Interval** values you want.

Dip Switch 1 - 2

	1	2
Test/Program Mode	↓	↓
100 RPM Interval	↑	↓
200 RPM Interval	↓	↑
300 RPM Interval	↑	↑

↓ = dip switch down ↑ = dip switch up

Dip Switch 3 - 8

RPM	3	4	5	6	7	8
3000	↓	↓	↓	↓	↓	↓
3100	↑	↓	↓	↓	↓	↓
3200	↓	↑	↓	↓	↓	↓
3300	↑	↑	↓	↓	↓	↓
3400	↓	↓	↑	↓	↓	↓
3500	↑	↓	↑	↓	↓	↓
3600	↓	↑	↑	↓	↓	↓
3700	↑	↑	↑	↓	↓	↓
3800	↓	↓	↓	↑	↓	↓
3900	↑	↓	↓	↑	↓	↓
4000	↓	↑	↓	↑	↓	↓
4100	↑	↑	↓	↑	↓	↓
4200	↓	↓	↑	↑	↓	↓
4300	↑	↓	↑	↑	↓	↓
4400	↓	↑	↑	↑	↓	↓
4500	↑	↑	↑	↑	↓	↓
4600	↓	↓	↓	↓	↑	↓
4700	↑	↓	↓	↓	↑	↓
4800	↓	↑	↓	↓	↑	↓
4900	↑	↑	↓	↓	↑	↓
5000	↓	↓	↑	↓	↑	↓
5100	↑	↓	↑	↓	↑	↓

Dip Switch 3 - 8

RPM	3	4	5	6	7	8
5200	↓	↑	↑	↓	↑	↓
5300	↑	↑	↑	↓	↑	↓
5400	↓	↓	↓	↑	↑	↓
5500	↑	↓	↓	↑	↑	↓
5600	↓	↑	↓	↑	↑	↓
5700	↑	↑	↓	↑	↑	↓
5800	↓	↓	↑	↑	↑	↓
5900	↑	↓	↑	↑	↑	↓
6000	↓	↑	↑	↑	↑	↓
6100	↑	↑	↑	↑	↑	↓
6200	↓	↓	↓	↓	↓	↑
6300	↑	↓	↓	↓	↓	↑
6400	↓	↑	↓	↓	↓	↑
6500	↑	↑	↓	↓	↓	↑
6600	↓	↓	↑	↓	↓	↑
6700	↑	↓	↑	↓	↓	↑
6800	↓	↑	↑	↓	↓	↑
6900	↑	↑	↑	↓	↓	↑
7000	↓	↓	↓	↑	↓	↑
7100	↑	↓	↓	↑	↓	↑
7200	↓	↑	↓	↑	↓	↑
7300	↑	↑	↓	↑	↓	↑

Dip Switch 3 - 8

RPM	3	4	5	6	7	8
7400	↓	↓	↑	↑	↓	↑
7500	↑	↓	↑	↑	↓	↑
7600	↓	↑	↑	↑	↓	↑
7700	↑	↑	↑	↑	↓	↑
7800	↓	↓	↓	↓	↑	↑
7900	↑	↓	↓	↓	↑	↑
8000	↓	↑	↓	↓	↑	↑
8100	↑	↑	↓	↓	↑	↑
8200	↓	↓	↑	↓	↑	↑
8300	↑	↓	↑	↓	↑	↑
8400	↓	↑	↑	↓	↑	↑
8500	↑	↑	↑	↓	↑	↑
8600	↓	↓	↓	↑	↑	↑
8700	↑	↓	↓	↑	↑	↑
8800	↓	↑	↓	↑	↑	↑
8900	↑	↑	↓	↑	↑	↑
9000	↓	↓	↑	↑	↑	↑
9100	↑	↓	↑	↑	↑	↑
9200	↓	↑	↑	↑	↑	↑
9300	↑	↑	↑	↑	↑	↑

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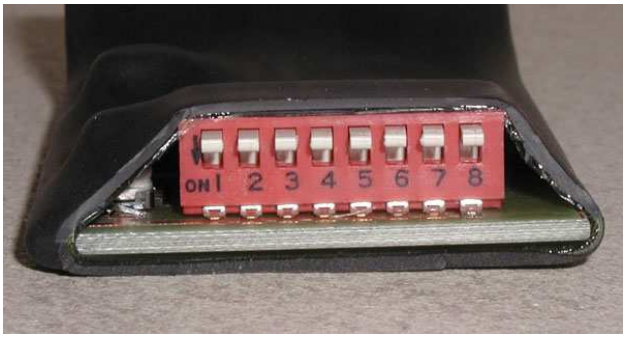
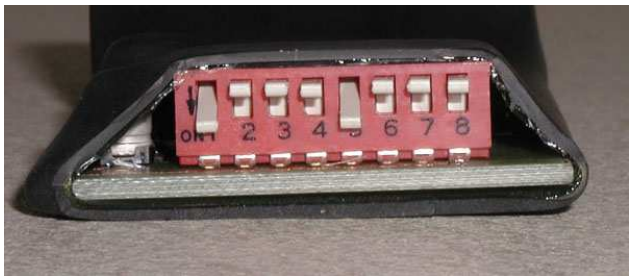
Programming Examples

The photo on the right shows the programming dipswitches on the right side of the module. The switches are numbered 1 through 8, and there is an arrow pointing down, indicating the down position is ON. Ignore the arrow; in this case the switches are ON if they are UP. It's not mandatory you remember that, but it helps if you are going to program without using the charts, as shown at the bottom of this page.





The picture at left shows the switches set for an Interval of 200 rpm, and a shift rpm of 8900. Compare the switch positions with the programming charts on the previous page to understand how this is determined.

Programming without using the charts:

If you are familiar with binary numbers you will be able to program the module without using the charts, assuming some simple addition is not a problem for you. The Interval chart at right uses 2 switches. Switch 1 has a value of 1, and switch 2 has a value of 2. If the switch is UP, it is turned ON, and you count its value, then multiply by 100. So if switch 1 us UP and 2 is DOWN, the value is 1, (or 100). If both switches are UP, the value is 300 (1+2=3, then 3x100=300).

Dip Switch 1 - 2

	1	2
Test/Program Mode	↓	↓
100 RPM Interval	↑	↓
200 RPM Interval	↓	↑
300 RPM Interval	↑	↑

The RPM switches work the same way, as shown below. The only tricky part is that the number represented by the switches must be added to a 'base rpm' of 3000. With only 6 switches available we are limited to 64 different settings, so to reach the disgustingly high rpm range of the S2000, I had to use 3000 rpm as the 'zero' setting. An rpm of 7500 is shown.

Dip Switch 3 - 8

RPM	3	4	5	6	7	8
7400	↓	↓	↑	↑	↓	↑
7500 ← You select 7500 rpm	↑	↓	↑	↑	↓	↑
7600	↓	↑	↑	↑	↓	↑

Dip Switch 3 - 8

3	4	5	6	7	8	
1	2	4	8	16	32	← Switch 'value'
↑	↓	↑	↑	↓	↑	← Your switch settings
1		4	8		32	← Your values total 45

1 + 4 + 8 + 32 = 45

3000 + 4500 = 7500