

FD HARNESS HOOKUP INSTRUCTIONS

INSTRUCTIONS

If the OBD2 connector is missing, the best source is a junkyard. Any 1996 & up car is fine. Your harness wire is labeled.

The obd 2 connector, is a black or gray female connector. it is trapezoidal. 2 rows of 8 slots. Only 4 are used. Looking at the open end of the connector. The upper left pin, is 12 volts constant. The 4th & 5th pins in the bottom row are ground. The 7th pin is serial data. That is the dark green wire. These connectors are easily available from any junkyard. They are standard on all 1996 & up cars in the USA.

For new connectors:

<http://currentperformance.com/Connectors/connectors.html>

There are other methods used by folks to get the same results. My personal opinion is the following instructions, are the most straightforward & bulletproof way to accomplish the task.

The website that has all years PCM pinouts

<http://www.ls2.com/forums/showthread.php?s=&threaded=19273> has the LS1 PCM pinouts, if you are interested in knowing this info.

You will need wire strippers, a soldering iron, flux & solder.

You will need either a multimeter, or a voltage tester, & continuity checker. To verify that you have identified the correct Mazda wires to hook up the various harness wires.

You will need the Dakota Digital SG-5 signal conditioner (\$85) to get the speedometer working, unless you have a smart aftermarket speedometer.

You can save the Mazda relays that are mounted on the passenger side fender, for the fan & A/C control. You will need two or three of them. One or two, for the fans, & one for the A/C. Use relay #1 for the A/C. It usually has a violet wire on

it. Leave this wire attached. If you do not find a violet wire, the A/C section at the end of this document, explains how to do the hookup. It is better to buy new 30 amp, 12 volt, N.O. relays that to use the very old stock relays

Each loose wire coming out of the harness is color coded & labeled for identification.

Main power: Run one #4 AWG cable from battery - to chassis ground. Run one #4 AWG cable from battery + to the alternator, and then to the starter. You may reverse the order of hookup. All lugs should be soldered on to the wires. All grounding points should be sanded down to bare metal.

The engine block should be grounded on both sides with a #4 AWG cable. The strut tower bolts are a good place.

You need to remove the A/C evaporator, which is on the firewall, under the glove compartment, so that you can get the harness connectors through the firewall. You do not have to remove the ABS. Leave the evaporator out until you finish the wiring connections in that area.

Ground the brown/white low coolant wire to keep the dash from beeping at you. This wire went to the overflow coolant tank and is located in the engine bay on the driver's side on one of the two grey connectors. **(Image 1)**

I recommend that you run your harness voltages from the ignition switch. Switched 12 volts is black/white. **(Image 2)** If you use that wire, I recommend a 25 amp in-line fuse. 12 volt constant is blue/black. **(Image 3)** A 5 amp fuse will suffice there.

PCM & harness power: Orange wire to 12 volts constant. **(Image 4)** Pink wire to 12 volts ignition-on.

Fuel Pump Relay: Connect the dark green/white wire coming from the LS1 harness to the coil of a N.O. relay. Ground the other side of the coil. Run battery constant to one of the relay contact terminals. **(Image 5)** Connect the other contact terminal to the + wire coming from the fuel pump. Make sure the other fuel pump wire is grounded. **(Image 6)** Use #10 minimum for the fuel pump power wires. #14 will do for the coil wire. **(Image 7)**

Check engine light: Connect brown/white coming from the harness to the to the orange/black wire at the EL unit. The EL unit is a small silver box attached to the side of the car in the passenger foot well. You will have no need for this box. Removing it will leave more room for mounting the PCM.

Tachometer: B1-01 yellow/blue. It can be found at the smaller of the two yellow plugs (12 pin) that plug into the Mazda ECU. Connect this wire to the white wire coming out of the harness. **(Image 8)** You must ground the black wire on B-101.

Under the dash, up under the glove box, there is a jumper harness with white connectors on each end. Leave it connected to the dash harness and cut off the loose end. A couple of the wires will be used for the next two connections.



Water Temperature Gauge: Connect one yellow/black harness wire to the temperature sender & the other yellow/black wire to the yellow/white.

Speedometer: Using the Dakota Digital, connect the dark green wire to “output 1”. Connect the orange to the ground location along with a section of wire to be grounded to the chassis. Connect the dark green/yellow to the power lug. Connect the harness purple/white wire to the input of the Dakota unit. The switch should be set to “signal in”. Use application #3, in the Dakota Digital instructions.

If you have a smart aftermarket speedometer, follow the manufacturers directions. You will not need the Dakota digital.

Starter: The heavy purple wire goes to the starter solenoid terminal. The other end goes to the start position of the ignition switch. The ignition switch wire to connect to is the black/blue. You cut the black blue and hook the purple wire to the ignition switch side. If you do it this way, you eliminate the clutch cut out switch. If you want to retain the clutch switch, you can connect it to the wire coming from that switch.

Oil pressure: The easiest way is if you can find the gray/red wire that runs along the driver side fender. Just cut it and connect it to the sender terminal. The other end of the wire goes directly to the oil pressure gauge.

If that wire is gone, find the grey/red wire, located on connector X-6, a 20 pin, two row, blue connector which is mounted under the driver side dash, on the left side, against the firewall.

The sender needs to be tapped into the LS1, near the oil filter, or the stock LS1 location can be used, with an adaptor.

Radiator fan: The radiator fan relay can be energized using one or two of the original fan control relays, mounted on the passenger side fender. Do not use relay #1. It is for the A/C. The dark green harness wire goes through the relay coil to 12 volts, ignition-on. Use that for your single speed fan. 12 volt constant goes through the relay contacts, to the fan. The other fan wire goes to ground. Use the blue wire for the high temperature fan relay.

Check the fan rotation before permanently attaching the fan wires. The fan turn on temperature is set in the PCM and can be modified with a program such as LS1edit, or by www.wait4mepformance.com.

Your fan turn on temperature is controlled by the temperature settings in the PCM.

If you want to set the turn on temperature yourself, you can wire the fan through a thermoswitch, then through the normally open contacts of the fan relay. Summit, sells a variable thermoswitch for ~\$25, that mounts through the radiator fins. This method will not use the harness wire.

Ground the lugs to hard chassis ground points, such as the strut tower bolts. It is also important to ground the block to the chassis on both sides. The battery should also be grounded to the chassis. Use #2AWG cable. Sand the paint off to ensure a good contact.

Reverse Lights: The reverse lights are not controlled by the PCM, so the wiring is not part of the harness. There are two wires on the plug. The plug is the only one on the passenger side of the transmission case. There are two wires on the plug. Connect one wire to ignition-on power; connect the other wire to the red wire that goes to the backup lights. The easiest place to find this wire is at the rear of the car, behind the trunk trim. It does not matter which of the plug wires you use for power or lights. If your harness was for an automatic, you will have to buy the plug.

A/C

Several of us are successful & happy with this method.

The mazda A/C relay already has the A/C clutch wire, it is the B/R wire that hooks to the mazda A/C compressor. The GM A/C clutch wire is dk grn and is on the compressor plug. Cut the GM wire (compressor side) & hook it to the B/R mazda wire. The GM compressor is already grounded thru the G/M harness. Make sure that the A/C relay coil is wired in series with the pressure sensor.

You should use an A/C pusher fan. Leave the #1 fan relay hooked up and use it to power the A/C fan.

If you have an A/C shop do the plumbing, electrical hookup, pump down and charge, they will convert the Mazda system to refrigerant 134A.

If you choose to do the job yourself, please note that the Mazda pressure switch is a two pressure switch which closes if the suction side pressure is between approximately 196 and 30 PSI. These values are not ideal for R134A. The LS1 system was designed for R134A and uses a separate sensor for low and high pressure cut off.

The solution is to use Freeze12. it is EPA authorized, is non flammable, & cools better than either R12, or R134. It is also far less expensive.

You will also need a condensor pusher fan.

Take your condensor, drier, & The aluminum tubing that connects to the firewall fittings, drier & condensor to a hose shop. Also take the LS1 compressor manifold.

You need 1 hose to go from the compressor discharge to the condensor high side. 1 hose to go from the condensor low site to the drier. 1 hose from the drier to the firewall inlet. 1 hose to go from the firewall outlet (large fitting) to the compressor suction port. Leave the schrader fittings on the firewall tubing, & the pressure switch on the drier outlet tubing.

Wiring: violet, to pressure switch, to the A/C relay coil, to ground. 12 volt constant, to relay contact, to clutch, to ground & to pusher fan, to ground There are 2 wires on the clutch. The black is ground & the green/black goes to the relay contact. if you do not have the violet, have someone stand on the passenger side, turn the ignition & blower on & press the A/C button. the light should go on & a relay, in the engine compartment will click. this is the relay to use. The relay will have two thick wires & two thin wires. one of the thin wires goes directly to ground. the other wire is the "violet" substitute. follow the above instructions, using the substitute wire.

Then have the hose shop pump the system down. Leave it under vacuum for at least 24 hours to make sure there are no leaks, & to de moisturize the drier desiccant.

Then charge the system, using the freeze12 instructions & fittings.

Referenced images, courtesy of Brent Strong

Image 1 – Shows grey connectors, one containing the low coolant wire that must be grounded. Also shows one way to route the power to the fuse boxes. From here, you can use the other screw terminal of the small box to go to the alternator and then across to the starter.

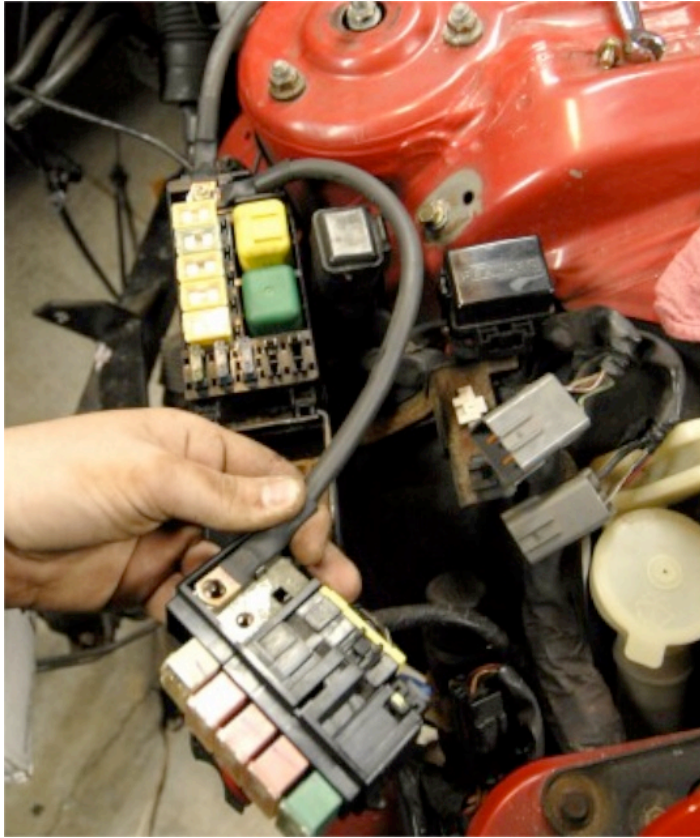


Image 2 – Black/white switched 12v wire under steering column. 12ga wire to 25 amp fuse then to the pink LS1 harness wire.



Image 3 – Blue/black constant 12v under steering column. 14-16ga wire to 5 amp fuse then to the orange LS1 harness wire (shown in **Image 4**).



Image 4 – Constant 12v source for the LS1 PCM. Red wire is from **Image 3**, orange is from LS1 harness.

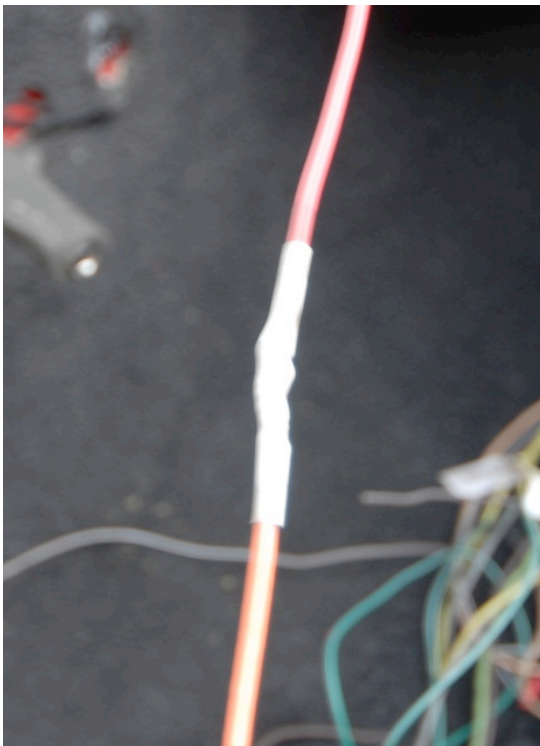


Image 5 – Shows the direct battery connection for one side of the fuel pump relay contact terminal. Don't mind the messy heatshrink on the + lead for the battery, it is temporary.



Image 6 – FD fuel pump connector. Red wire is 12ga and goes to the fuel pump relay contact terminal, black is also 12ga and is grounded to the chassis. Thicker wire may be used, per Dan's recommendations.



Image 7 – A convenient spot for me to mount the fuel pump relay. This is the driver’s side in the hatch, where spare tire tools went. The red wire exiting to the right is the 12ga wire directly to the battery, the red wire exiting to the left is the 12ga wire to the fuel pump connector. The black wire exiting to the left is the relay coil ground, which is grounded to the chassis. Not shown is the turn on lead coming from the PCM.



Image 8 – This shows the white tach wire from the LS1 harness connected to the yellow/blue wire found at B101, the smaller of the two yellow connectors.

