

Main Relay

Fixing your PGM-Fi Main Relay.

Symptoms

Problems starting the car, usually after a short run (when the interior is warm), though in bad cases the car may fail to start at any time. A classic time for the problem to occur is at the petrol station, or if you park for a minute to get something from a shop. If the car is parked for a long period, the interior usually has cooled enough for the joint to make contact again, and you won't notice a problem. As the cabin temperature is a major feature of this problem, it might appear worse on cold or rainy days when you have the heater running to clear the windows etc. Extremely cold temperatures can also cause the problem to be more apparent.

The engine will usually fire, run for a split second and then stall, as the remaining fuel under pressure is used up. Continual cranking will only make the situation worse, with the engine not firing at all in the end. When you turn the ignition key to position II (ignition on) you should see the PGM-FI indicator on the dash light up and extinguish. Exactly timed with this lamp, you should hear a click and the fuel pump turn on and off. If you do not hear a click and the fuel pump, then the main relay is likely to be at fault.

The main relay is usually located near the fuse box, mounted on a bracket. If you thump this part of the dash, it is likely that the car will spring into life again as the joint is disturbed, unless the problem is severe.

Please take note - a similar, and often confused problem can be caused by a failed ignition coil igniter (or amplifier).

The Cause

A dry joint in the PGM-FI main relay, causing an intermittent or no connection. This relay controls power to the ECU, and the fuel pump. With no power to the rest of the fuel-injection system, or fuel pump, you won't be going anywhere!

The above pictures show two main relays, the grey one from a UK Civic VTi (left), and the black one from a JDM CRX-Si (right). *[picture missing]*

Below is a diagram *[diagram missing]* of the PGM-FI system fitted to Honda's first 12v fuel injected engines, like the MK1 CRX, MK3 Civic GT, Ballade EXi etc. PGM-FI has constantly evolved, but this diagram shows you basically what the main relay does. Its function is the same in all Honda cars - to supply power to the fuel pump, and fuel-injection components.

The Repair:

The repair is very simple, and is performed as follows:

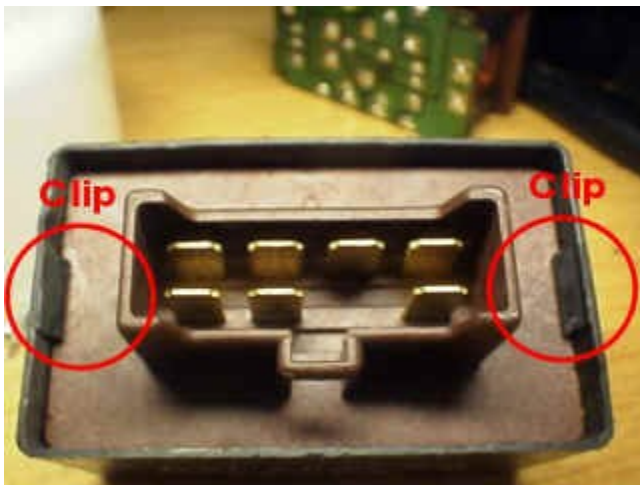
- Remove the relay
- Remove the cover
- Remove solder from ALL joints
- Re-solder all joints
- Clean the flux residue from the PCB
- Spray on conformal coating
- Replace the cover
- Re-Install in vehicle



The main relay is usually located in the fuse box area, and you basically can't miss it. The picture above shows the location in a Civic VTi saloon. In the MK2 CRX and MK4 Civic, it is in a more restricted location, [click here](#) to get a more detailed view. Remove the 10mm mounting bolt, and then depress the latch on the connector, and pull to remove.



Here is a shot of where the main relay is mounted in the MK3 CRX and MK4 Civic. I took this picture when had the dashboard out for another reason - note you do not have to remove the dashboard to get to the relay, just remove the bonnet release lever and the coin holder.



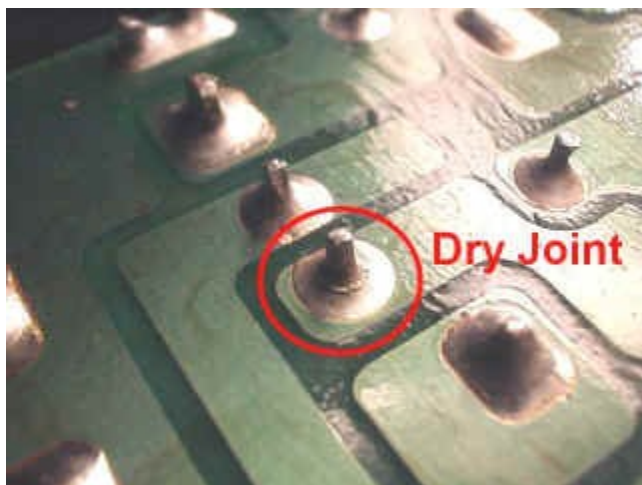
To remove the cover from the relay, you need to bend back the clips on the cover that hold it in place. This can be done with gentle pressure without any tools at all, though it is sometimes easier to unclip one side at a time with a fine screwdriver.



Here are the tools that you'll need

- Soldering iron
- IPA Solvent (or equivalent to remove flux)
- Brush to help remove the flux with the above
- Good quality 60/40 solder
- Soldering iron

As it is only the soldering at fault, you just have to re-solder the faulty joints, but would strongly recommend that ALL of the joints on the PCB be re-soldered. I won't tell you how to solder here, as if you can't then get someone that knows to do it, otherwise you could end up damaging the PCB. One thing I will say that the most common problem many people encounter when soldering is using too much heat. This repair job can easily be performed with a 15 watt iron, and certainly don't use a soldering gun. Use a light, electronic duty soldering iron, of no more than 25 watts. Also use a good quality electronic grade solder.



Here is what a dry joint looks like. You can see the crack in the solder between the pin and PCB track. Notice the others are OK. Most of the time it is the same joints that fail in the relay, but de-solder and re-make every joint in the relay when you are repairing it. Dry joints are caused by vibration and changes in temperature cracking the solder round a joint which has not flowed correctly. They have a characteristic look, and sometimes are very hard to spot, even to a trained eye. Remember, it is not the actual relay itself that is at fault, just the soldering.

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