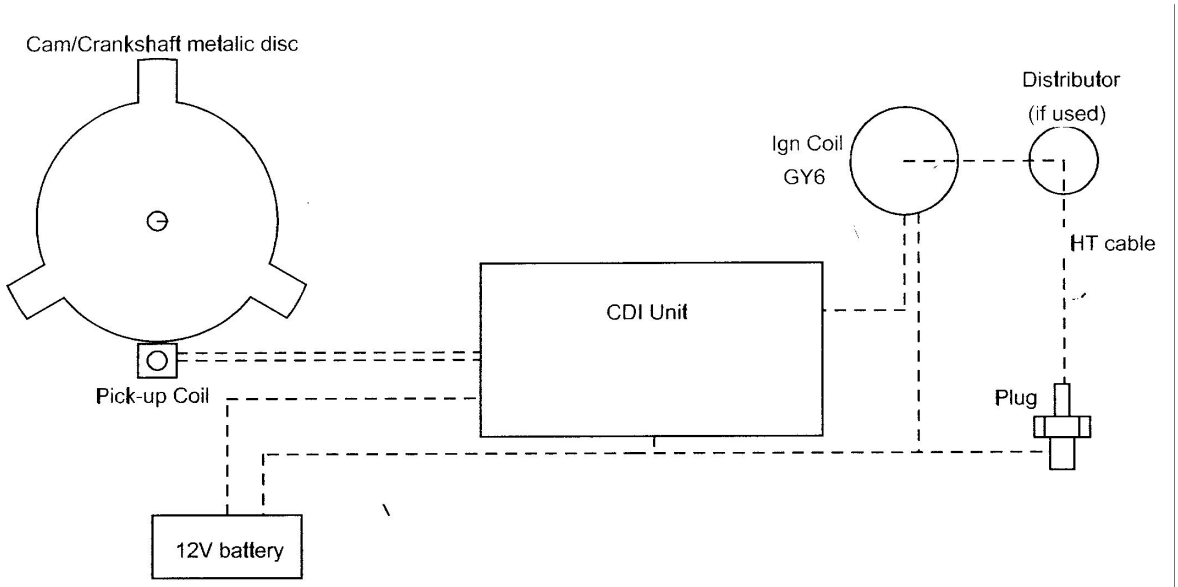
Basic Layout using a pickup coil



Coil Mods...,The following instructions are how to strip the coil out of a **particular** 240v relay and modify it to get the unit operating. It can be a little bit fiddly in some respects so those without any electronics knowledge or have problems handling small items may need to get some assistance from others.

Operation is....

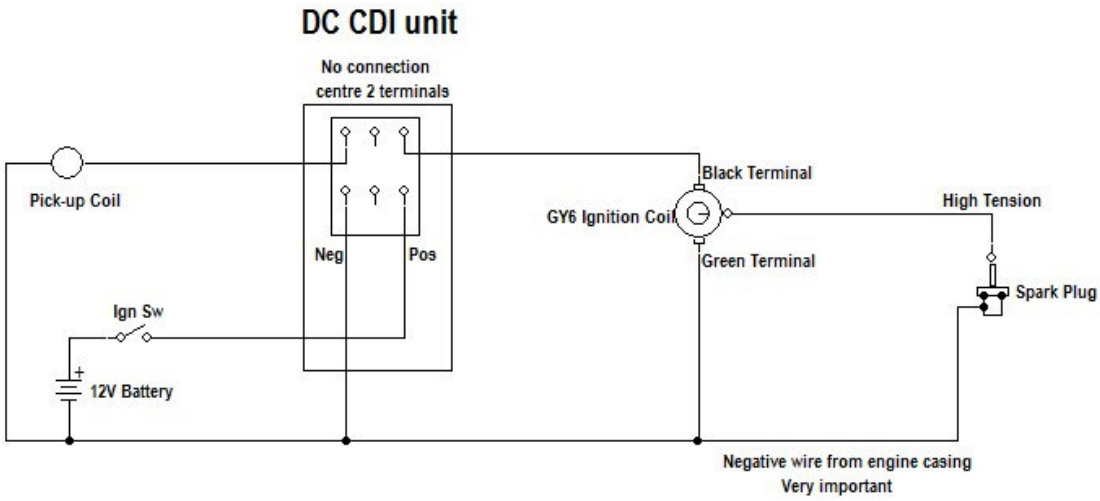
1. Remove the clear cover.
2. Remove the contacts and spring.
3. Strip the coil assembly from the relay.
4. Drill out the riveted section of the metal core and remove the steel bracket.
5. Solder new wires and arrange some type of strain relief for the wires.
6. Make a new metal core, add a magnet and encase the coil.

Below are photos of the actual relay I used and the Ebay web site. There are others so as long as the relay is the same, the instructions will match. The relay cost was around AU$1.85 including delivery.

Ebay site for relays....

http://www.ebay.com.au/itm/1Pc-8Pin-5A-220-240V-AC-MY2NJ-Led-LampCoil-DPDT-Power-Relay-/311718785554?hash=item4893e33212:g:1FMAAOSwPCVX-20F

Original pickup coil circuit that started it all



240v relay mods to make a new pickup coil

First remove the top plastic case via the small clips on either side. A spring from the contacts is removed.

I found there are 2 types of coil supplied. The difference being the way in which the coil wires are connected to the base.

Type A have tabs on the plastic coil former to which the coil wires are soldered. Then there are connection strips that run to the main plastic base pins. Easy removal here is to snip the strips near the base pins leaving the original solder joints in place on the coil.

Type B run the coil wires directly to the base pins so first thing to do here is to unsolder them. Do **NOT** cut the wires as you need the length for an additional step in this instance that I will cover later.

Note:- These relays have 2 windings. One is the main (240V) winding and the other is the much smaller winding to drive an indicator LED. This initially comes on when the coil is energised by 240V via transformer action. In this instance though, the pickup coil will use the 240V winding.

Cut the wires leading to the LED as they are no longer required. The LED white plastic assembly can now be unclipped and removed.

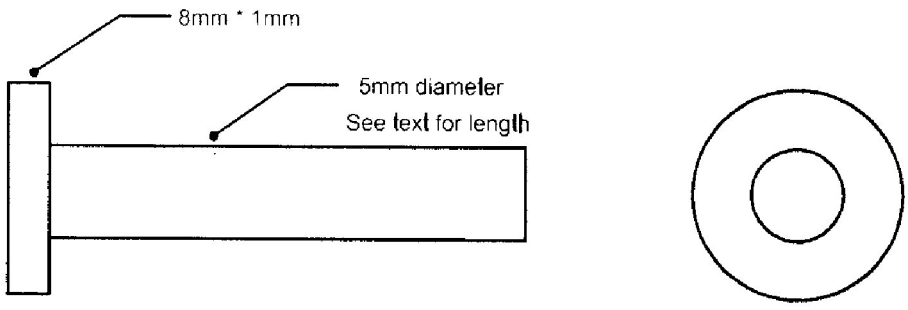
A bottom view here shows the screw which must then be removed to release the base from the contacts mounting frame. It is rather tight so careful here not to destroy the whole thing. I found that holding the metal frame in a vice and supporting the coil top end allowed for a fair bit of force to be applied to the screw.

By carefully dismantling the unit and once again holding the metal frame in a vice, drill out the centre core where it rivets to the mounting bracket. I used a 3mm drill to start a small centre hole and then progressed to a 6mm drill for the final part. This drilling does not have to be very much, just enough to remove the “riveted” section of the metal core. By rolling the coil assembly 90 degrees in the vice and reclamping the metal frame, the core can then be removed by a gentle tap with a punch.

The coil now requires a new “core” to be made and fitted as the old one that was previously drilled will now be too short for the job. I made the initial one a “tee section” being as shown below, 8mm top 1mm thick, reducing to 5mm to fit inside the coil plastic body. An alternative would be simply a piece of 5mm mild steel approx 4-5mm longer than the coil plastic body. Use epoxy to secure in place with the top end flush or slightly proud of the plastic body.

An 8mm x 3mm magnet is secured to the top of the newly fitted metal “core”with epoxy as well. Two small cables are soldered to the 240v coil terminals, arrange some form of strain relief for them and then all that remains is some form of mounting bracket to suit whatever your installation allows. A finishing note is to test your coil at the end of your 2 wires. Measured resistance should be somewhere around 16.8K ohm.

New Mild Steel Core



Note that there is no measurement on the length of the new core. This ideally should be about 3-5mm past the end of the coil former but it depends on how you make your coil enclosure. My friend George Punter will be making his by using a 3D printer. In this instance the plan is to have the coil assy. slip into the new casing which will incorporate the mounting lugs. Note:- not a good idea to use a steel bracket, rather use plastic or aluminium etc.

In use, the protruding 3-5mm end of the finished pickup coil should be mounted close to the metal vane, somewhere around 20 to 30thou gap.

Above I mentioned two type of coil that came from the same supplier. If you have received **type B** then there is a small additional job to do.

Get some 20thou shim brass and cut a strip 1.5mm wide and maybe 20mm long. Clean up so nice and shiny to take solder easily.

Bend one end at 90 degrees 2 mm in from the end. Now cut remainder 8mm long.

There is a slot along the bottom of the coil former where the coil wire originally was placed. Make sure the wire is still in the slot and fit the new terminal also in the slot. There is a step in the former where the bent end of the new terminal will sit. Now very carefully wind the coil wire around the new terminal using a toothpick or whatever and solder in place. Repeat for other terminal. A small amount of epoxy along the side of the slot will hold the terminal in place. Now solder your two cables to go to the CDI unit and arrange some type of strain relief. Test coil as per other type A at around 16.8K ohm.

Type B Mods.