Instructions for
WiP Relay Block Kit

So you're working on a larger-than-normal electrical project? That's what this relay kit is offered for (it's also for use with the regular project that you may add to later – like auxiliary lighting and suchlike. That's why this relay block is gangable – you can put them together as you install them, and it looks better than relays all over the place...)

You should have gotten each kit you ordered as a plastic baggie with five crimp-on terminals and the plastic body – it would have looked something like this, save for the tools (we're not big enough of an outfit to keep them in stock, and you should have them anyhow if you're going to do electrical work...)

The bits down the middle are what you should have gotten in the bag. The stripper is pretty much a standard stripper (it's what I had on hand when I sat down to take the pictures for this,) and the crimper – right side of the pic – isn't what is typically used. However, it *is* the preferred style of crimper for use with this sort of terminal, although it does cost a bit more than the regular crimper (it does a better job on uninsulated terminals than the typical stripper/crimper could ever *hope* to do, and it does both crimps per terminal quite well. Keep reading, you'll see what I'm talking about.)

After you've checked your parts (I pack these by hand. I try to pack them accurately, but it's not inconceivable that I miscounted terminals, and please let me know if I have!) and I'm assuming you've already got your wiring laid out, you will want to see just how to crimp these terminals on. But first – convention for wiring up a DIN relay is as follows:

Pin 30 – Power feed from source (battery or key-operated)

Pin 85 – Relay "trip" signal from remote switch (switched power.) Take this (low-current, ~150mA) signal from any convenient source. Take it from battery if you want the circuit available at all times, or from "Hot in ACC" if you want to have to use the key to make it work. "Hot in RUN" for use only when the engine is running. Your service manual should help you locate the lead you need.

Pin 86 – Ground for relay coil. Pick any convenient ground point close to the relay.

Pin 87 – Typically, this is the relay's power OUT lead, going to the device.

Pin 87a – This one could go a couple of ways:

SPST Relay – it's just not there. The relay is either ON or OFF.

SPDT Relay – this contact is ON when the relay coil isn't powered, and OFF when it is. It's in the opposite state as Pin 87.

DPST Relay – while the description isn't technically correct, a "DPST" relay would power *two* circuits when the relay coil is energised. Pin 87a (sometimes called "Pin 87" as well in this case) would follow Pin 87 in state.

For what the pins themselves do, refer to the internal electrical schematic of the relay – which should be either printed or moulded into the top or side of the housing. The corresponding pin numbers should be moulded into the base plate of the relay, next to the pin base. The numbers are the same colour as the base plate, so you may have to look under a strong light (I usually do...)

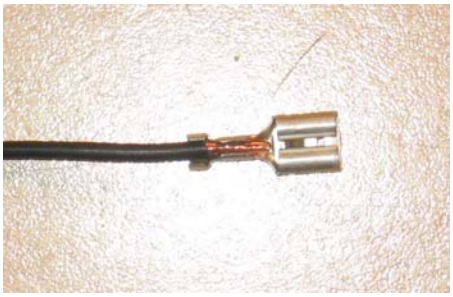
What colours to use for the wiring? I typically use black for any ground, white is a "signal" colour, red indicates power feed, and other colours are used for power leads in a bundle (this lets me know that black wires are "safe", white wires are low-current circuits, and other colours are going to carry all they can handle. It's an effective mnemonic that I've used for years with good results.)

Decide where you want the relay, and lay out the wiring accordingly. If you cut it as you lay it out, leave yourself a couple of extra inches to work with where the relay block will be – it won't harm anything, you can tie it out of the way later, and you'll want the room to work (believe me!)

Believe it or not, they're really quite simple to put together – here's how you do it:

Lead Termination

Once you've got the leads laid out where you want them, strip them about ¼"-3/8" and gently twist the strands together (you should be using stranded wire – it's much easier to handle than solid.) You should be able to lay the stripped wire end into the terminal and have it look something like this:

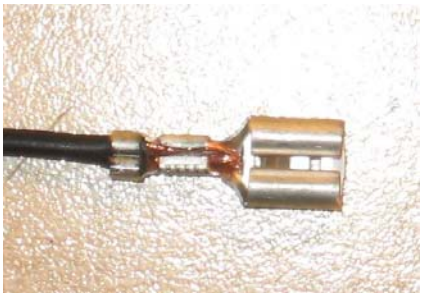


Note how there are two sets of "crimp ears" on the terminal – the smaller, longer set should overlay the stripped portion of the wire, and the narrower set at the end should be over the insulated section of wire. *This is on purpose* – you're going to crimp over the bare wire to make a solid electrical connection, and the crimp the ears over the insulated bit to make a "pull-out-proof" mechanical connection (it's cheap insurance, and cheap insurance is always best.)

First crimp:

Note how the wire is now positively attached to the terminal. Next thing we're going to do is make sure it stays that way...

Second crimp:



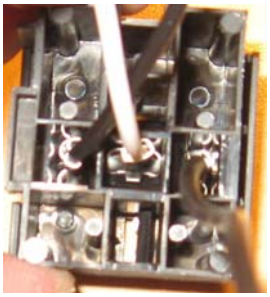
You can see the crimp ears digging into the insulation – that's what you want to have happen. This relieves the electrical connection of any need for mechanical strength, and lets the insulation of the wire do the work of holding the thing together (which is, indeed, better.)

Repeat this process for each of the four or five leads you will be using (even if the ground for the relay's internal coil is nothing but a short pigtail, you'll need a lead there as well.)

The leads are inserted into the block from the bottom. Direction is important – if you look at the lugs you're crimping on, you'll see there is an "open" side (it's the side you see in the pictures above, to show the crimps) and a "closed" side. The closed side will have a small tang near the bottom of the widest part – this is what locks it into place.

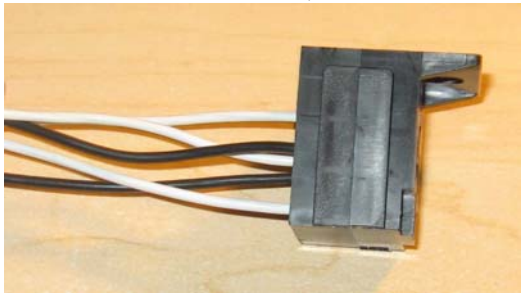
If you examine the relay block, you'll see that there is a slight notch on one side of each terminal slot. This is where you would insert a pick to *release* the lock to remove a terminal.

As you've probably already guessed, the closed side of the lug must be on the same side as the notch above it – you'll insert the lead like this:



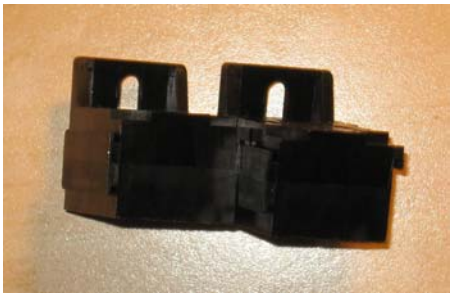
And press it in until you hear and feel a slight *click*. This means that the lug has fully seated and the locking tang has engaged. If you use only four leads on your relay, you'll not be putting anything in the centre hole (where the white wire is in the picture above. If you're using only four poles, that slot will be empty.)

After you've gotten all of the leads in, you'll end up with something like this:



NB: All wires are black or white – and the same size – because that is what I had available. Normally, the two black wires would be one black and one white, and the three white wires would be other colours and somewhat larger.

Recall how I said these were "gangable?" As you may have already guessed, they slide together on a tongue-and-groove arrangement like so:



And you can chain as many together as you like. Note that, in the image above, they are offset for clarity. On assembly, you'll be able to slip them flush with each other.

See? That wasn't so bad after all, was it?

J. Kelley
Kelley's Works in Progress