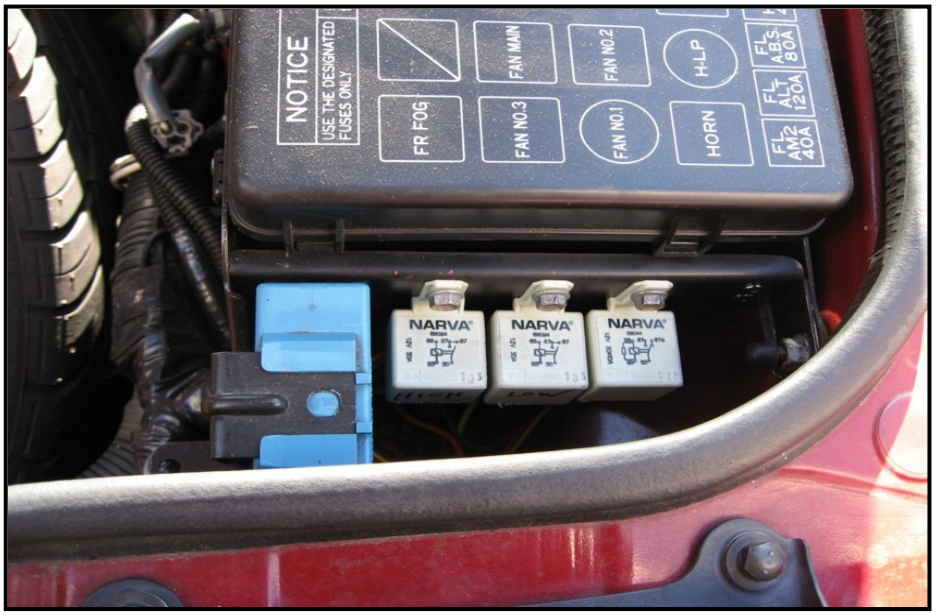
SW 20 dipper switch problems, and fitting headlamp relays.

It is understood that anyone using this article as a guide will take full responsibility for modifications done to their own cars.

Only people who have some wiring experience and fully understand how the system works, fuse protection, insulation etc should carry out car wiring modification; otherwise it should not be attempted.



Soon after I bought my '90 model SW20, I found a problem with my headlamp dipper switch that I later discovered is very common on early SW20's.

The high beam flasher (lever fully back) works ok, however when the lights are switched on, the high beam, (lever moved fully forward) will not work, but the low beam (lever in the middle) will work ok.

After taking the switch apart. I found that the copper contacts appeared burned and pitted. Cleaning the contacts fixed the problem for a while, but it didn't last. (The dipper switch housing is very fragile so care is needed if taking it apart) After having to do this several times I wanted a more permanent solution, so I had a look at the H/lamp circuit diagram.

Stock circuit

As can be seen from the stock circuit, the OEM headlamp relay turns the system on, and the dipper switch earths either the high or the low beam with all the current to power the headlamps going through the switch (over 10 amps on high beam). I assume Toyota had their reasons for doing it this way, rather than use more relays.

Modified circuit.

Rather than fitting an expensive new switch, I decided that a better solution was to fit separate dedicated headlamp relays as shown in the modified circuit diagram. Now with the relays fitted, only a very small current

(approx 30 milliamps) to power the relay coils now goes through the switch, and I've had no column switch problems for about 5 years after fitting them. There should also be less voltage drop in the shorter/heavier wires to the headlamps = brighter lights.

The stock circuit and the modified one with the dedicated relays are shown at the end of the article.
The circuit on the left is for the stock USDM and on the right is for my modified ADM.

I mounted the stock automotive 30 amp relays on a metal channel in front of the fuse-box, (see first pic) leaving enough room to access the headlamp pop-up control. On my car the third relay in the picture does a separate job, and is not needed for the mod described here.

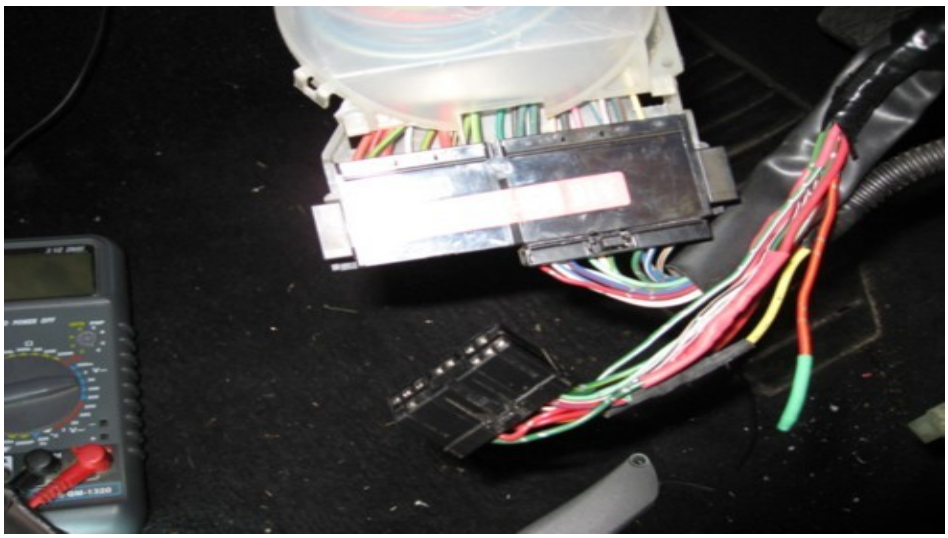
The whole fuse box had to be carefully removed to fit the metal channel and to access the wires underneath to wire up the relays

Wiring, dipper switch to relays

I cut the high and low beam wires coming from the column switch just **after** the multi-connector, to which I connected 2 new wires and ran them through the bulkhead at the speedo grommet, out to the relays, using split conduit and cable ties to protect them. The original wires **post the cut** were insulated and left in place.

Care needed to be taken to **identify the correct wires before cutting** and I used a multitester on the connector to double-check the wires going back the dipper switch to be sure I had the right ones.

Although mostly the same, I found the color-coding on my ADM car did vary slightly from the USDM service manual that is commonly available.



The 12 volts to power the relay coils I got from patching into the W-R wire, (post h/lamp relay and pre h/lamp fuses) underneath the fuse box.

Wiring, relays to the h/lamps

I had to remove the insulation from the loom running alongside, and forward of the fuse-box to get at the low beam and high beam wires going out to the headlamps, and splice in the new wires from the relays.
I just spliced in using wire of the same rating with adequate insulation and did not want to cut these wires, especially the low beam. The current that works the high beam indicator light and the driving light relay (ADM), has to flow through the low beam filaments when the high beams are switched on.

Replacing headlamp lens reflectors

Shorter wiring between the battery and the headlamps with less voltage drop together and longer switch life make the relay mod well worthwhile, but in addition to that I would also strongly recommend updating the headlamp lens/reflectors as well, especially for the early models.

Early SW20's had **sealed beam** units fitted that deteriorate over time, and are now very inferior to the modern high quality semi-sealed lens/ reflector units now available that can take high performance globes.

But only bother with high quality gear like Hella, and forget about anything with cheap plastic lenses.

On my own car, at the same time as I fitted the relays I also replaced the original sealed beams with new Hella lens/reflector units (Part No: 1043 - HEADLAMP INSERT QH 200x142MM), together with Phillips Vision Plus globes.

With these fitted **the difference was absolutely stunning!!** And unlike the old sealed beams, the new lenses also gave the modern beam pattern with a sharp cutoff on dipped beam, and a higher illumination on the left side of the road. Far better night-time vision and much safer.

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