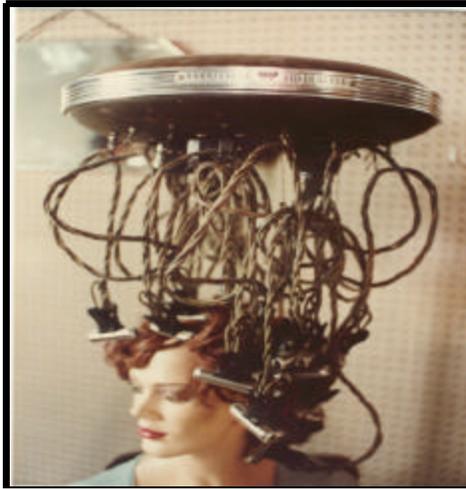


TACKLING YOUR ISETTA'S ELECTRICAL SYSTEM / PART 1

By Bruce Fullerton



If your Isetta's electrical system looks something like this, read on. We'll try to take some of the guesswork out of it for you.

Ernie won't let me quit his literary guild so here we go again. Last issue, installing the glass in your Isetta sliding window coupe was on the table for discussion.

This time, let's take a look at your car's electrical system. The context of this article is to shed some light on a subject that may be intimidating to a new Isetta owner who is having to sort out a mess of wires and/or a box full of parts and has no idea where to start or what-connects-to-what.

To put things into perspective, my car was a rolling junkyard when I bought it, had a hacked, french-fried ignition circuit (complete with 25 amp fuse) and I didn't know what worked and what didn't. To compound the issue, I'm no electrical genius.

With a few exceptions, the Isetta system is fairly straightforward and John Jensen's excellent wiring schematic and corresponding color code chart was a life saver. Every wire in the car matched John's chart, color for color. Although a

seemingly trivial issue, what BMW called tan may be what someone else calls brown. What's referred to as white is actually gray, etc. Some of your wiring with green striping may look more like light blue or gray due to weathering. Use your good judgment and perhaps a little imagination if you're sorting through a harness that's seen better days. If you're bamboozled, let the process-of-elimination prevail. The Isetta harness is broken up into four different "networks". First, there's the main harness that connects everything in your instrument panel on one end to Terminal Block 1 on the driver's side wheel well on the other. Second, you have the main harness that runs down the driver's side and across the floorboard in front of the firewall to Terminal Block 2 behind the seat on the passenger side. One bundle of wires continues around and up to the front turn signal pod and headlight on the right side. Third, you have a small harness that runs from your voltage regulator back to the engine and supplies the ignition piece of the equation. Literally heading up the rear is the harness that runs from Terminal Block 2 on the firewall to the taillights and license plate light. Three small subsets of this network are the two plug-in harnesses for your headlights and one that is comprised of only two wires that runs down to your horn from Terminal Block 1.

BMW used a black plastic tubing-like material to neatly bundle the wiring. This tubing is probably dirty, greasy, deteriorating and hacked up in spots. Cleanup is a snap. Before you do anything, put a tie wrap on the ends of the harness to keep the wires in their correct positions in relation to how long they need to be to reconnect to the terminal blocks. Put a new blade in your Exacto knife and carefully cut that old shrink off. You'll probably see some nice, new-looking wiring underneath. Once you have the old shrink tubing removed, put that harness in a small tub of warm, soapy water and let it set for a while to loosen up all of the vile smut. Grab an old tooth brush and give it a good scrubbing. Towel it off and set it aside until you've gone through your other

harnesses and given them the same treatment.

Now is a good time to replace any burned and generally farkled wiring. The ignition circuit is just about always going to be the one that takes the hit. If there's anything good to be said about it, new wiring is off-the-shelf stuff in regards to color and gauge. You want to keep those color codes the same. We're talking red, black, blue and green. In regards to the multicolored or striped wiring, it seems to be non-existent in the retail channel here in Austin, Texas. Here's where a trip to a junkyard can come in handy. Take your wire cutters and get after it. Just about every color combo under the sun is out there. Yards that specialize in European cars would be your first choice here but with wiring harnesses being much more complex these days, just about any yard should yield the color combo(s) that you're looking for.

Isetta parts suppliers also offer new harnesses. You can purchase an entire harness or just the section that you need. Expect to pay around \$225 for the whole shootin' match. My car's instrument panel harness was a disaster area and was replaced with a new unit from Hans Rothkegel. The color coding was 100% correct and the wiring leading from the panel over to Terminal Block 1 was longer than the stock unit it replaced. It's a good thing, too. The wiring lengths were backwards. In another words, the shortest wire on the stock harness was the longest wire on the new one and vice-versa. That extra length made it possible to hook everything up without having to tap dance around the problem.

After you've gotten the factory-installed wiring shined up and damaged wires replaced, give some thought to adding additional circuits. Good candidates might be a power receptacle for a cell phone or emergency light, a dome light or brake-activated gorilla with illuminated eyes for your parcel shelf. You've probably already noticed that Terminal Block 1 and 2 are fully populated with wiring. Just jump over to Radio Shack and buy one of their Euro style terminal

blocks for around \$3.00 and add a few more slots. If you don't wire them up today, you might at some point down the road or a future owner may thank you for having had the foresight to provide additional connecting points.

Mr. Jensen's restoration manual makes note of the fact that BMW was very stingy with their wiring. They installed just enough to do the job with very little left over. The rear harness to the taillights is proof-positive of that observation. The reason for mentioning this is that you want to pay attention to wiring length before you put your new heat shrink tubing on.

As far as your shrink tubing goes, 3M offers a very nice product line here. It goes under their part number FP-301. This single number covers all sizes and colors that are available. All of their tubing comes in four-foot lengths. If you're new at this, like I was, stand advised that standard-issue tubing shrinks 2-to-1 so plan accordingly when making your purchase. A well-stocked electronics store would be a good place to start looking. Radio Shack also has some nice stuff, a bit thicker and shinier, but only comes in short, pre-cut lengths. You might check and see if it can be ordered in longer rolls. Take the time to measure your harness and avoid multiple trips to the store.

It is highly recommended that you connect your harness back up to the terminal blocks with loose heat shrink tubing already in place and make sure your wires will all reach their destination before you crank up your heat gun and shrink it down. Once you've verified that the lengths are OK, go ahead and apply heat to the tubing. If you're using a heat gun (as opposed to a hair dryer) use care not to melt anything down. As most of you already know, those guns can change the weather forecast at your house pretty quickly if you're not careful. Partly cloudy and 1200 degrees doesn't cut it.

I added a center light on my car as did my partner-in-crime, Bubba "Just Got A

Velam Isetta” Mace. In order to accommodate this light as a running light, a single wire was added to the rear harness prior to shrinking it. It runs from the left taillight to the center light, about two feet long. Wire the taillight end to position 46 and the other end to the hot side of the center light. That light is controlled by your light switch on the instrument panel. It will not function as a brake light in this scheme.



Here`s that center light, wired up and fired up. As long as you`re the lead dog, this is the view all those Excursions, Hummers and Z06 Vette`s will be lookin` at.

If you`re doing a frame off job, be sure to put that rear harness in before you install your rear air intake assembly. You`ll find that it is much easier to thread the center part of that harness through the intake sheet metal than after it`s on the car. The wires have a couple of holes they need to snake through and at an odd angle. Make sure you have good rubber grommets installed in these holes to protect your harness, too.

As long as you`re in shrink-tubing mode go ahead and place a small piece on each of your metal tabs back there in the engine compartment. It just takes a few minutes and will soften the sharp edges of the tabs that your harness passes through. You might do well to do the same with the respective metal tabs that secure the speedo cable and your choke, heater and accelerator cables under the parcel shelf. Isettass vibrate like ... well,

they vibrate a lot. Make sure that you have installed rubber grommets in the three holes in the firewall by Terminal Block 2 where your wiring passes through to the rear of the car.

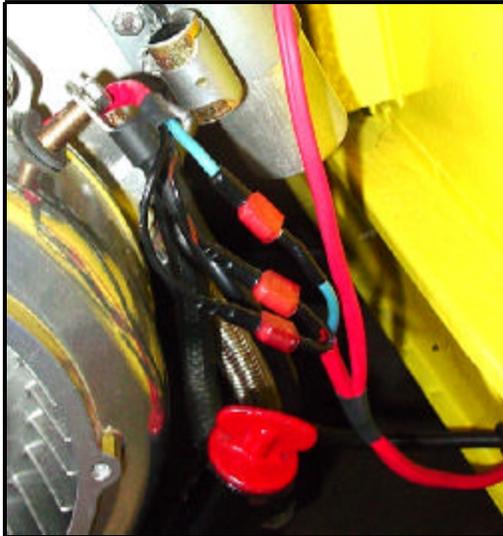
Moving slightly forward, your ignition harness, the smallest of the four, provides wiring back to your Dynastart and coil. You might want to consider installing some quick connect spade lugs between the Dynastart and the harness that continues up into the car. If your Dynastart ever needs servicing or if you ever have to pull your motor and transmission, just disconnect the three wires at the lugs and, electrically, you`re done. The two wires going to the brake light switch got the same treatment. This allowed wiring the switch prior to putting the body back on the chassis. Once the body was in place, the wires were fed up through the hole in the floor and plugged into their respective big brothers that run on up to Terminal Block 1.

One small blurb about the voltage regulator before we move on the front part of your car. Virtually all regulators` terminals will be clearly marked or stamped with the circuit number. Original Bosch regulators were held in place by two 5mm machine screws that threaded into two small brackets on the floorboard, just behind the battery box. This is an automatic grounding point. If you`ve had to switch regulators or have mounted yours differently, you might want to make a short ground wire just to be safe.

Just attach one end to your regulator and the other to a good grounding point like the stud directly under the middle of the front of the seat or one of the passenger side rear body mounting bolts at the base of the firewall. If you wire everything up, turn the key and nothing happens, check to make sure the regulator is grounded.

Speaking of grounding, make sure you have a good frame to engine grounding strap installed. This should run between the top of the front motor mount post and

the rear of the transmission where the top front motor mount fastens. The factory straps were flat, braided copper mesh and are available from parts suppliers. You can also cruise over to the auto parts store and buy a short battery cable and accomplish the same purpose. Your engine must be grounded for your ignition system to do its job.



This gravure shows the small ignition harness that feeds the Dynastart and coil. Those quick connect spade lugs sit just above the dipstick. Two lugs were added to the coil wires as well.

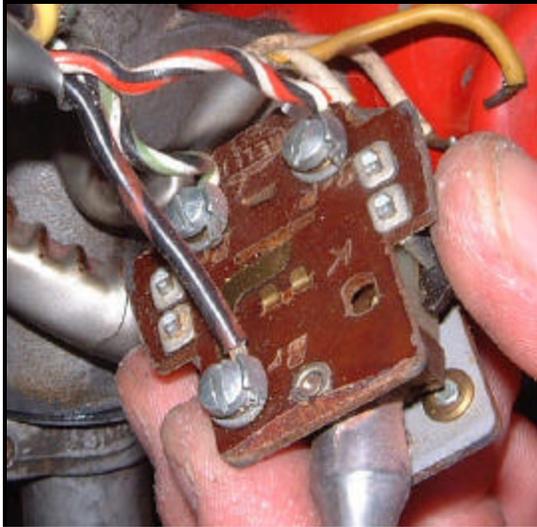
Continuing in a forward manner, your turn signal and headlights are pretty straightforward to hook up ... sort of. The headlight harness simply matches yellow, tan and white wires with the main harness at the small terminal block on the passenger side wheel well. That three-pronged plug that connects to the headlight itself is an industry-standard plug and any conventional 7" sealed beam headlight will work fine with it. I decided to go with Sylvania Cool Blue halogens. They're brighter but not "blue" as the name implies. If you're looking for the blue Euro look, you might want to check out Auto Zone's branded halogens. In all cases, these new halogens are legal in all 50 states.

The term "sort of" was mentioned in the last paragraph and that was in regards to

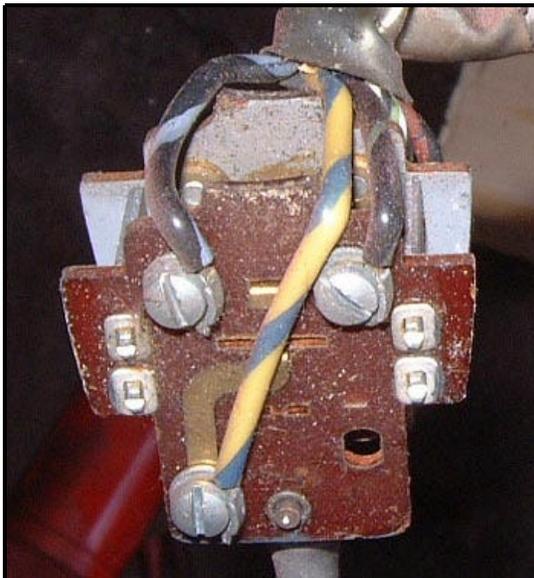
the turn signals. Both right and left front units have a tan ground wire that is fastened to a ring under the nut that hold the bulb socket/reflector in place. Pretty hard to mess that one up. Even with the diagram I drew up when the car was dismantled, it didn't really point me to which wire went to which terminal on the bulb socket though. In another words, a 50/50 chance of getting it right ... sort of. Don't fret though, you're not going to burn your car to the ground if it's backwards. The signals just won't work. Don't bolt anything down until you've tried them and verified that you have it wired correctly! By trying them, I mean with no lights on at all, with just the parking lights on and then with the headlights on. We'll touch on this again in a minute.

Another part of getting those signals working properly is their connection to the switch on your steering column. This is a tight fit and the wires must be positioned correctly so the switch housing will rest snugly against the cast aluminum column and not pinch any wires. Like the front turn signal pods, don't bolt your turn signal/high-low beam switches on until you know they're functioning properly.

The following two pix indicate the proper wiring positions for your signal switch, top and bottom. Note that the ends of the wires are stripped and tinned ... no terminals. There is a tab to the side the wire should be on in reference to the securing screw in the center of each terminal. Also, in referring to top and bottom, you're looking at the top of the switch when the lever is angled upwards. Ditto for the headlight high/low switch.



Here's a shot of the factory hookup looking at the top side of the turn signal switch. Clockwise from the bottom: blue/yellow, black/white and black/green. Photo by Jim Janecek.



And this would be the bottom side of the switch. Once again, clockwise from the bottom: red/black, green/black/white and red/black/white. Photo by Jim Janecek.

One other curious thing that happens to some folks (happened to me, too) is getting the correct turn signal flasher. In Part 8 of Two Guys From Texas (Volume

12, Number 1), this writer made a misleading statement about same. That comment referred to poaching an off-the-shelf unit from your auto parts store in your car. Now it will work OK ... sort of ... but you might expect the following to happen when you're testing your turn signal wiring as mentioned a couple of paragraphs ago. First, when you turn the ignition key to ON, your green, center turn signal light on the dash will illuminate in dim mode and stay on constantly. The signals will work fine. Now, when you turn your light switch to the parking light setting, only the rear turn signals will work although the front parking lights will be on. With the headlights turned on, everything works fine again. In all three instances, that green bulb on your instrument panel will always correctly flash when either signal is on. This phenomenon was observed using two different flashers.

I am now the proud owner of a new Bosch flasher. It's part number 0 336 102 022 and carries an additional description of 12V (1+1) x 18W. Personally speaking, you can't afford to not have your Isetta's turn signals working improperly. Go for the correct flasher, pay the money and be done with it. We're talking \$25-\$30 here.

One other detail you need to know is that the Bosch flasher has three screw terminals that will require those C-shaped terminals to connect properly. It is also possible to remove those screws and use female spade connectors but you'll have to spread the sides of the connectors out a bit to fit the blades coming out of the flasher. One thing's for sure, if you use those spade connectors, it's gonna be a secure, tight fit.

As a wrap up, you might want to make a copy of the wiring diagram and color code chart. Note any changes you have made, put it in a Ziploc bag and fasten it to the back of your driver's side interior panel or in the map pocket on your door. You'll always have it handy and if some future Isetta owner out there ends up with your car, they'll have one more thing to thank you for.

Next issue, we'll talk about installing power windows, seat and sunroof/ejection seat option. Just kidding! We'll go over the horn circuitry and troubleshooting, external lighting and a few other goodies as well. If you need a quick reference for the wiring diagram and don't own a copy of John Jensen's restoration book, you can find it at www.outerorbital.com/issetta. Click on "Restoration", then click on "E" to be taken down to the "Electrical System" section. You'll see the link for John's diagram and a wiring circuit/number matrix under "Color Codes & Wiring Schematic".

This isn't what we had in mind when discussing adding an additional circuit or two but it seems to work for this owner.

Thanks to Jim Janecek for the use of those two turn signal switch photos and to John Jensen for graciously permitting the use of his schematic on the Isetta Tech Web site.

As always, please forward any suggestions or corrections to what's been discussed here to the email address below or the "Feedback" link on the Web site. I do my best to get it right and not step into uncharted territory but you know how that goes.

If you see me, I'll be there ... BF

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Photos by Bruce Fullerton except where noted.

