

# Installation Instructions for Works in Progress Mains Cable Kit

## Tools

Combination Wrench, ½"  
Combination Wrench, 13<sup>m</sup>/<sub>m</sub>  
Combination Wrench or Socket Wrench, 10<sup>m</sup>/<sub>m</sub>  
Nutdriver or Socket Wrench for Start Relay Lead on Start Motor Solenoid (DNR)  
Socket Wrench or Nutdriver, 13<sup>m</sup>/<sub>m</sub>  
Socket Wrench for Engine end of Engine to Firewall Ground Strap (DNR)  
Combination Wrench, 9<sup>o</sup>/<sub>16</sub>" (for ANL fuse Block)  
Hex Key, 9<sup>o</sup>/<sub>32</sub>" (for ANL fuse block)  
(DNR - Do Not Recall size. I'll have to look these up...)

## **Before you Start**

Your new mains kit (if you purchased a full kit) should replace all the mains cables from the battery and the engine on your rig. If you have purchased an individual cable, you should recall which cable you are replacing (and we've probably called it out on the invoice - or at least given you a part number you can match up,) but a full kit might require some sorting...

First order of business - lay out your kit of new cables, and sort them. It helps to be looking at our website while you're doing this - at least, until we come up with a good way to tag cables individually... Measure your cables from ring butt to ring butt (or from ring centre to ring centre, and then subtract about two inches) and match the lengths up to those listed on the site. Some cables can be readily identified - for instance, only one ½" ring lug is used, and that on the engine ground strap to the firewall. You should have one red cable with a ¼" ring lug (1987-1990 XJ/MJ) or two red cables (1991-up XJ/MJ.) If there is only one, it will go from the alternator to the battery or the start relay. If you have two, the longer one is for the alternator output (in both cases, you'll put the ¼" ring on the back of the alternator) and the shorter one will go from the battery to the Power Distribution Centre (PDC.)

Note - you will lose all of your radio "presets" doing this job - and any other settings that depend upon "keep alive" current from the battery - and 1991-up XJ/MJ (with OnBoard Diagnostics) will set a "soft code" showing that the battery has been disconnected recently. This code will *not* illuminate the Check Engine light, and will reset after a given number of drive cycles. However, if you have to go for a "Smog Check" and they discover the code, point out that you have replaced the mains cables - the tech should then allow your vehicle to pass. Also, any OBD-I or OBD-II code reader should allow you to "clear" the code once you are finished.

## **Work Notes**

There are a couple places where one or more cables are likely to be pre-arranged with a moulded rubber block - at the starter solenoid, and at the back of the alternator. This can be handled simply - for the starter, trim the light-gage lead (for the start relay lead) flush with the backside of the rubber block, then strip the lead and reterminate it by crimping a new ring lug onto the cable.

If you have a moulded rubber block on the back of the alternator, it's a little more involved to deal with. You'll want to at least trim the positive cable (between the alternator output post and the rubber block) flush with the block to eliminate the lead. If you want to be thorough, you can also disconnect the other end of the lead, trace it into the moulded rubber block, and then trim it flush on both ends of the block.

*Choose carefully* when trimming alternator leads - some variants also have a ground to the alternator, which is (visually) the same size as the output lead. Trace the lead carefully before cutting - if you have a multimeter with a continuity test function, that would be the best way to go.

A good idea - when you're attaching a ground lead to the chassis, it's a good idea (not necessary, but it should be done) to take a wire brush in a drill motor and clean a spot about the size of a postage stamp (centred on the screw hole) down to bare metal, and get a new screw (or brush the old one clean.) Coat with some sort of electrical corrosion inhibitor - we like Gardner-Bender Ox-Gard, which can be had at most hardware stores. However, you should be able to find a comparable product at your local hardware store, in the electrical section. If the screw head is small (like a sheet metal screw,) the use of a washer won't go amiss, either - make sure it's also clean. Ox-Gard also helps when used on battery posts...

## Now, To Work!

Start by removing the battery clamp from the negative post on your battery. This will disable the entire vehicle's electrical system - and help keep you from managing to weld a wrench to the chassis while you're working! Any time you're about to do any electrical work - or work that otherwise involved working near a mains lead - you'll want to remove the negative battery cable so that no components (or cables!) are energized while you're working. When replacing all cables, you'll want to remove the negative cables *first*, and install them *last*. The negative cable should be disconnected when working on a positive cable as well - for instance, when changing a starter or an alternator.

Go ahead and remove the positive clamp after you've removed the negative one - you're going to be pulling those cables off anyhow.

Take a 1/2" wrench and check to make sure the head of the binding post is tight against the base of the clamp - we try to check them all here, but it doesn't hurt to make sure. No need to get silly here - just make sure it's tight and won't move on you. *DO NOT* connect any wires at this time, but you can go ahead and install the battery clamps now, if you like.

Next, in any order, you can remove the OEM lead from the starter post (treat moulded rubber blocks as above in "Work Notes" - a 1/4" ring with a "blue" sleeve should work for reterminating the Start Relay lead to the Start Motor Solenoid) and attach the new mains lead. Remove the alternator output lead (again, handle the moulded rubber block as above,) and attach the new mains lead. Remove the PDC screwpost lead (1991 and up) or Start Relay screwpost lead (1990 and older) and attach the new mains lead, likewise the ground lead to the engine and to the fenderwell (on 1991-up XJ and MJ.)

Once you get all the "far ends" of the mains leads installed, pull the battery ends close to the battery. Gather all of the red leads (there should be three - one from the alternator or ANL fuse block, one from the start motor, and one from power distribution - either the Start Relay (1990 and older) or PDC (1991 and up.)) Then, remove the nut from the battery clamp binding post, set all three of the rings over the binding post (the should be only slightly larger - the rings are 3/8", and the binding post is 5/16") and put the nut on. You can use either a hex nut or a wing nut (we usually provide both - but we sometimes slip. If you prefer a hex nut, and we didn't supply one, use a 5/16"-18 hex nut in stainless steel or brass. If you can't find one at the hardware store, check a local marina supply house.)

Once you have all two (no alternator output) or three (alternator output/ANL fuse block) of the positive mains leads connected to the battery, then you are free to gather the black (ground) leads together and connect them to the negative battery post in the same manner. If you need to replace the nut on the binding post, it's also 5/16"-18.

The engine-to-firewall cable can be done with or without disconnecting the battery mains leads - I've done it both ways without any ill effects. Remove either end first - and then the other - and replace it with the new lead in your kit. The larger (1/2") ring lug will go on the stud from the cylinder head. It's a good idea to clean a spot of the firewall down to bare metal (again, as outlined in "Work Notes") and coat with corrosion inhibitor when you install the lead.

Kelley's Works in Progress