Ack's LED Headlight Harness Installation Manual

For installation of *Headlights Only*

and *Headlights plus Auxillary Relay*

Read and understand this installation before installing the harness

Tools Needed for installation:

Hand drill

1/8" drill bit (or a center punch)

3/8" drill bit

medium Philips- or flat-blade screwdriver

7/16" wrench or socket

Dremel(tm) tool with cutting wheel (for modifying the headlamp "bucket")

felt-tip marker

Harness parts list:

1 Harness with mounting board complete with connectorized headlamp cable and OEM headlight harness adapter plug.

1 Mounting plate

2 automotive style 14V 30 A relays (Headlight-only product version)

3 automotive style 14V 30 A relays (Aux product version)

2 mounting bolts

2 Mounting nuts

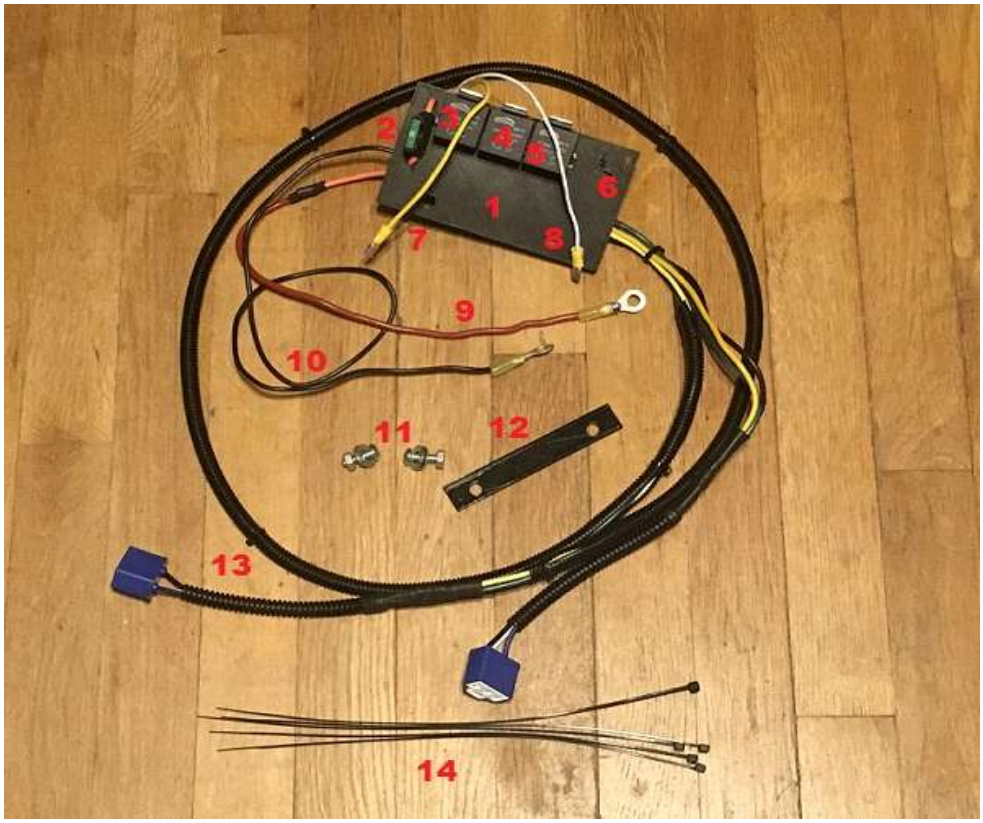
4 flat washers

1 Instructions

5 Baker-style wire ties

1 set of instructions

Harness components:



1 Relay Mounting Board

2 Main Fuse 30 amps.

3 Aux relay

4 High Beam Relay

5 Low Beam Relay

6 OEM Harness Plug

7 Aux Relay DC Out Connector (Yellow)

8 Aux Relay Coil input Connector (White)

9 12V DC Input Wire (To Positive Connector On Battery)

10 12V DC Ground Wire (To Negative Connector On Battery)

11 Mounting Hardware

12 Relay Mounting Board Backing Plate

13 Headlamp Harness

14 Wire Ties

Thank you for purchasing Ack's Samurai(tm) Plug-N-Play LED Headlight wiring harness!

The unit comes with a 180 day warranty against all manufacturing defects, excluding those caused by improper installation as determined by the manufacturer upon warranty return shipment of the harness.

This product is ***specifically*** designed to adapt the Samurai negatively-switched wiring to LED Headlights manufactured specifically for automotive headlight use. There is **no guarantee** that this harness will work on any type of vehicle other than the Suzuki Samurai (SJ410, SJ413 or similar Suzuki SJ products sold in the USA or internationally) that is equipped with a **POSITIVELY-switched headlight system.** There may be some 1995 or newer international Suzuki Samurai/SJ 413 models with positive headlight switching. The purchaser is responsible for determining the polarity of the switching system on his/her vehicle.

From our experiences with aftermarket LED headlight installation, you will need to modify your Samurai headlight "bucket" mounts to accept most LED headlights. As the mounting design/method may vary from manufacturer to manufacturer, it is the responsibility of the purchaser to make whatever modifications necessary to the Samurai mounting 'bucket"

to fit the aftermarket LED headlamp..

Usually this process requires removal of the old headlamps then the mounting buckets from the vehicle after examining the bucket's mounting orientation. Taking a picture of the backside of the bucket assemblies with a cellphone will help.

Trim buckets to fit

Mark the parts of the inside edge of the bucket for trimming then using metal shears or a Dremel(tm) tool to cut the inner edge for proper fit of the LED headlight units. Remember - measure several times, cut only once.

Installation Instructions

Use the backing plate (14) to locate where the relay board mounting holes are to be drilled.Measure and mark a point on the Battery-side fender 4-3/4" back from the inside lip of the fender (picture 1).

Picture 1

Orient the backing plate (14) so that it lays in the stamped groove on the top of the fender with the right edge of the backing plate against the mark you made.

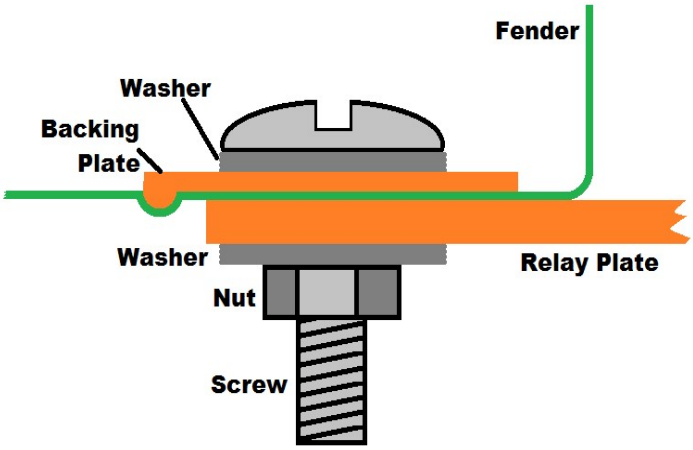
Mark the center of the backing plate's mounting holes onto the fender with the felt-tipped pen.

Warning: DO NOT USE THE BACKING PLATE AS A DRILL GUIDE! A 3/8" drill can damage the backing plate hole which can weaken the backing plate structure.

Using the 1/8" drill or a centerpunch, create a guide depression to keep the 3/8" drill from wandering when drilling the finished hole. Use the 3/8" bit to drill holes using the location marks that you made. If there are any burrs on the backside edge of the new holes, use a flat file to remove the burrs. (Picture 2)

Picture 2

Using the bolts, washer and nuts, Mount the relay panel on the inside lip of the fender as pictured. (picture 3)



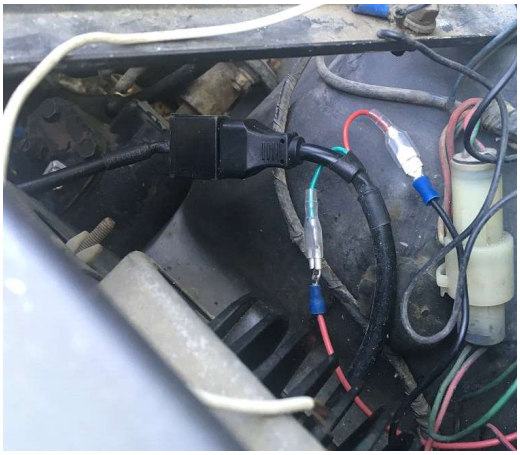
Picture 3

Using the wire ties, run and secure the long part of the harness across the front of the Samurai so that the end can connect to the LED headlight at it's mounting location (picture 4). Attaching the cable harness to the tubular

front crossmember is suggested. (picture 5)

Picture 4 Picture 5

Plug the harness connectors (equipped with H4 plugs as found on the original harness) into the LED headlights (picture 6).



Picture 6

Run the Red Positive cable to the positive terminal on the battery. Run the black negative cable to the negative terminal on the battery. The provided cables are cut to length for a battery in the stock location. If your battery is in another location, you may need to extend the length of these cables.

Make sure that you use 12-gage wire for the extension. Do not cross-connect your extended cables to the battery or the harness will not work!

Take the OEM plug for the original passenger-side headlamp and thoroughly clean the connectors removing accumulated dirt from the base of the plug and the slots containing the individual connectors (picture 7).

Picture 7

Take the cleaned plug and insert it onto the two connector prongs located on the corner of the relay board as shown in picture 8.

Picture 8

This completes the LED Harness installation.

You should be able to turn the low and high beams on using the control stalk. If not, go back and double check the wiring that connects the board to the battery for a reversed connection.

Make sure that the OEM headlight connector has been thoroughly cleaned and is firmly seated as in Picture 8, above. If a headlight does not light up properly, double-check that the headlight plugs are firmly seated in the H4 connectors on the ends of the harness.

In case of further problems, email me at jcambron@sbcglobal.net for further troubleshooting help or warranty service.

Using the Aux Relay (three relay version)

There are two wire pigtails that are attached to the Aux relay.

The white wire is used to connect to the control circuit like a light switch in the case of a light bar or to the small Black-Yellow wire that connects to the starter solenoid when you use this relay as a "Clicky Starter" fix.

The thicker yellow wire provides a 12 volt feed to the driven device which can be a light bar or an electircal feed to the starter where the original Black-Yellow wire was connected.

IMPORTANT NOTE:

The harness is protected by a 30 amp fuse that drives both the LED headlights AND whatever is connected to the Aux relay.

In order to avoid blowing the fuse, you need to calculate the Maximum load of the LED headlights AND the device attached to the Aux relay.

Here is how to calulate your power loads using Ohm's Law:

Given that the electrical system can generate 13.8 volts when the engine is running, the amount of load (expressed in Watts) the 30 Amp fuse will carry is

Volts times Current = Watts

13.8V x 30A = 414W

Realistically, your Samurai's electrical system will generate 12.3 to 13.5

Volts. Let's use a smaller voltage value just to be safe -

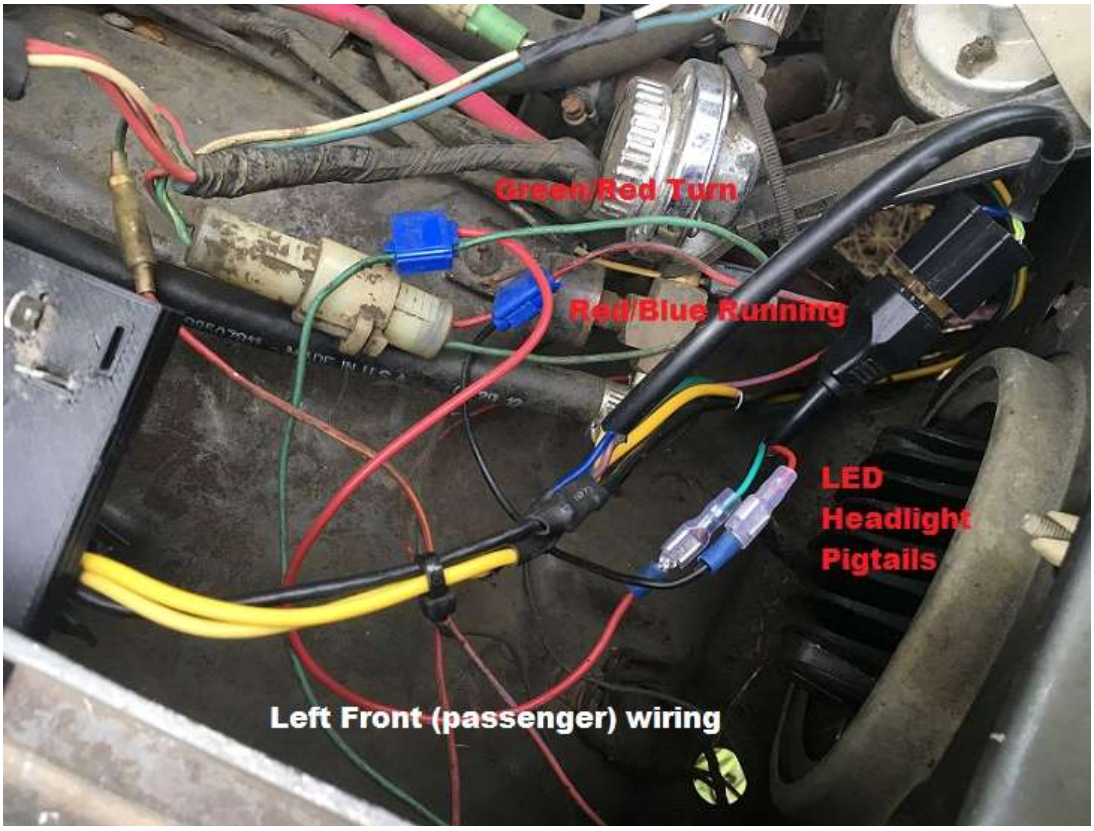
12.5V x 30A = 375W

Your LED headlights should have documentation that indicates the maximum amount of power used by the headlights. Take that number and subtract it from 375 to get the amount of power in Watts that will be available for the Aux relay. Most likely, there will be plenty of power available for the Clicky Starter use, but you ***may*** not have enough power to drive a big light bar AND the LED headlights ***at the same time***. If you somehow accidently happen to exceed the rating of the 30 amp fuse, it will blow. In this situation, remember not to run the LED headlights and whatever you have conected to the Aux relay at the same time without having a spare fuse available. Just sayin'...

Turn signal and "running lights" connections on Headlamps equipped with these lighting features

Some LED headlights have extra built in LEDs that work as internal turn signals (yellow) and internal "running lights "(white). These are driven by other lighting circuits on your Samurai and **NOT** by Ack's LED Headlight Harness.

To make these lights work, you must splice into the appropriate lighting circuit. Picture 9 shows two splice wires installed on the left (passenger) front side of the engine compartment



Picture 9

Turn Signals

Splice a 12" pigtail with a 1/4" spade connector as follows:

The Green-Yellow wire on the right front corner of the Samurai at the bumper is the right turn signal wire.

The Green-Red wire on the left front corner of the Samurai at the bumper is the left turn signal wire.

Connect these pigtails to the turn signal wire as documented in the LED Headlamp instructions. If there are no instructions, simply plug the connector in then test connectivity by running the turn signal. If the yellow turn signal light in the Headlight assmbly work, you are done. If not, try the

other connector.

Internal Running lights

Use the same process as the Turn signals, above, to connect the LED Headlamp internal running lights using these wires in the Samurai wiring harness:

The Red-Green wire on the right front corner of the Samurai at the bumper is the right running light wire.

The Red-Blue wire on the left front corner of the Samurai at the bumper is the left running light wire.

Warranty Information:

For warranty service during the first 180 days of ownership - or for help on problems after the warranty expires, email me at jcambron@sbcglobal.net.