

NOTE #1:

The 74-XXHP3 LED (3 LED) series is the brightest and most visually correct bulb, especially for MAZDA vehicles, and most any other time you are replacing a 74 wedge based bulb.

You should use this high power, 3 LED package to obtain the best visual results, but due to a design flaw these will typically fall out of a 74 bulb socket and/or make poor electrical contact, rendering the dashboard indicator permanently un-lit, and therefore useless.

ALTERNATE SUGGESTION: *You may use a 74 LED Bulb - 1 SMD LED (74-xHP) Wedge Base package without modification, but the dashboard indicators will likely appear dim and/or dimmer than other lit areas of the dashboard. Furthermore, the indicators may appear to light with a hotspot rather than an evenly lit appearance like the stock bulb appears.*

A minor modification on your part is required to obtain good fit and proper electrical contact.

(PLEASE DO NOT ATTEMPT TO MODIFY YOUR WEDGE BASE LIGHT SOCKETS)

The 74-XXHP3 LED series built is on a thin circuit board and is why it will not fit tightly in the socket without modification.

USING THE 3 LED, "74-xxHP3" LED SERIES BULBS WITHOUT THIS MODIFICATION MAY RESULT IN FAILURE OF YOUR WARNING INDICATOR(S) AND/OR LOSS OF THE BULB DEEP IN THE DASHBOARD<<<

To obtain the most proper results, you must epoxy a small rectangular pad of material next to the solder pads on each led base to allow the bulbs to fit snugly and allow the solder pad on the opposite side to make proper electrical contact.

This may sound like a lot of work, but it isn't that hard, and takes only about 1-2 hours to complete.

When you are done, this will be the LAST time anyone should ever have to go into the dash to replace a light, and the dash will appear well lit forever – just as you planned.

Here are the steps to the modification, read all of the steps before you proceed...

You will need:

- 1 hour (or 30 minute) epoxy.
(Do not use faster setting epoxies than this; otherwise you won't have time to work with it. Super glue also doesn't appear to work (Don't ask me why), but feel free to experiment, just know that epoxy is the only thing that worked after my tests.
 - Toothpicks
 - Hobby knife with several new blades (x-acto, etc.)
 - Sandpaper
 - Hard plastic packaging
*(The kind that is hard to open and you typically have to open with a knife or scissors)
DO NOT USE FLIMSY, THIN PLASTICS, they are not thick enough - If you can't find this, find a plastic material no thicker than the thickness of the solder pad on the LED.*
 - Soldering iron with precision tip and very thin rosin core solder
(You also must be familiar with soldering and know how to solder well - it's not hard)
 - Isopropyl Alcohol – (Used to clean off uncured epoxy from tools, hands, parts, etc.)
 - Wax paper (or other epoxy proof surface)
- 1) Using a hobby knife, scrape & roughen the surface next to the solder pad contact on each side of each LED. Note that each LED has some amount of hard clear rosin on it and it will flake off before you get to the green circuit board coating, this is normal and fine to remove, once it's gone, just roughen the green coating on the circuit board to give the glue a rough surface to attach to.
 - 2) Using sandpaper, roughen BOTH SIDES of a large flat section of hard plastic packaging (likely found on something you bought in a store, but DO NOT USE CD CASE PLASTIC - it is too thick)
 - 3) Cut the plastic into strips approximately 2-3 millimeters wide (no wider than the green area next to each solder pad on the LED.
 - 4) Now carefully cut the 2-3 Millimeter plastic strips from the previous step into lengths approximately as long as the solder pad on the bulbs. (You will need at least 40 of these little rectangles to ensure you have enough if you are replacing all dash lights)
 - 5) Lay all your plastic strips side by side (no overlapping) on a surface that allows you to see them well, (dark paper, etc) and lay out the prepared bulbs, all within easy reach.
 - 6) Dispense about a silver dollar sized amount of epoxy into a shallow cup, and mix it.
 - 7) Using a toothpick, apply a VERY THIN amount of epoxy on the rough area of a LED bulb - just enough to wet the area, DO NOT allow it to touch the solder pad, or bead up on the surface of the board - this would be too much epoxy.
 - 8) Ensure there is a sharp point on your hobby knife and using the tip of your knife, getly stab a plastic rectangle and pick it up
 - 9) Apply the plastic rectangle to the area you applied epoxy to. You should see the plastic appears clear or green on its whole contact surface (assuming you used a clear plastic as suggested)
 - 10) Pull the knife away from the bulb - the plastic should remain attached to the bulb.
 - 11) Ensure no epoxy oozed out from the edges by more than 1 millimeter and non got onto the solder pad. If it did, use a separate toothpick to remove the excess. (You may use the alcohol to clean all the epoxy off if you must)
 - 12) Roll the bulb over in your fingers and repeat epoxy and plastic application from step 7 above.
 - 13) Lay the bulb on you wax paper or epoxy proof surface and let cure OVERNIGHT.
(Failure to allow for proper time to cure will result in a bulb that doesn't fit or work, and likely will be glue permanently into place in the car)
 - 14) Repeat this for all bulbs until complete.

HIGHLY RECOMMENDED TIPS:

- Keep your cup of mixed epoxy and all the toothpicks. Use these to test if the epoxy is cured RATHER than disturbing the bulbs. Note that large amounts of epoxy can cure faster than the tiny amount you applied on the bulbs, so they may take a few hours longer.
Allowing 12 hours will ensure that a full cure has taken place and will avoid disaster.
- After the glue is fully cured, RE-SOLDER the solder pads, to ensure no glue is on them. The solder will burn off any epoxy that is present and can also allow you to build up the pad slightly if desired. This will help to ensure good contact.
 - Make sure the solder pad is smooth when you're done.
 - Drawing the tip of the iron smoothly and evenly iron down each solder pad will do it.
 - Remove "peaks or "spikes" in the solder using fresh solder on a clean soldering iron tip.

NOTE #2:

These bulbs are only available "polarized".

Failure to observe polarity on your installation will result in a bulb that doesn't light.

However it's good to note that putting them in backwards will NOT damage the LED, so you may use trial and error to get it right.

On the other hand, the instrument cluster is hard to remove and re-install over and over, so trial and error is not usually very useful here.

To make matters even MORE difficult, Mazda uses a common positive (+) system rather than a common negative (-) system in their circuits, so assuming that bulbs connected using common traces is not always an indication of having found a common ground circuit. (i.e. the reason you need a relay to operate the motorized radio antenna up and down in aftermarket radio refits.)

It may be simpler to pre-mark and note polarity prior to installing the cluster.

Until an appropriate non-polarized LED package can be found for this application, this is the reality.

I will provide pictures to assist you in pre-determining polarity of the gauge cluster.

NOTE #3:

Using Cool White bulbs behind blue tinted lenses avoids an overpowering blue light that typically obscures the silkscreen text used in many High Beam indicators, while enhancing it slightly more than a warm white LED would.

Brilliant blue lighting at night usually appears blurry around edges when observed at night.

(i.e. This is the reason that a red taillight lens, with a small blue lens in the center appears purple to the eye.)