

Technical Update 36

How to Keep Stator Leads from Grounding out in Ford 3G Alternators

WHEN YOU REBUILD FORD 3G alternators, keeping stator leads from grounding out against the S.R.E. frame and/or the rectifier frame has been a problem since day one. When these alternators were first introduced, Ford used insulating sleeves that protected the stator leads all the way around (*Figure 1*). Later they used a black epoxy to keep them from grounding out against the rectifier frame, and simply bent them so they wouldn't touch the S.R.E. frame (*Figure 2*).

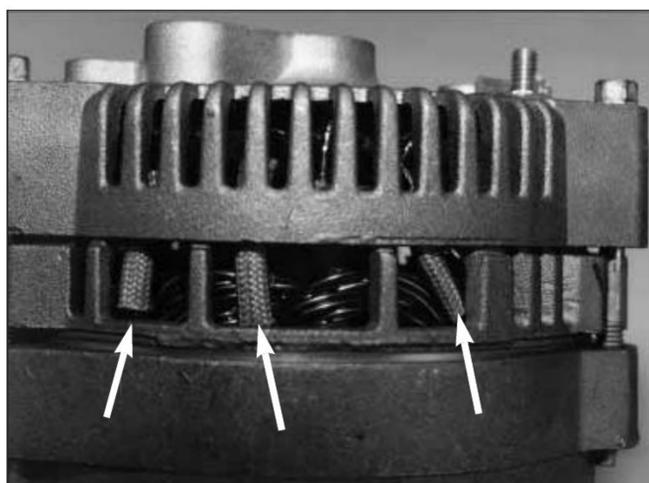


Figure 1.
Insulating sleeves



Figure 2.
Rectifier frame with black epoxy

WAI recently introduced a third method for protecting these leads -- the 42-2310 and 42-2311 insulators that snap inside the rectifier frame and keep the leads from touching the frame (*Figure 3*). Installing a snap-in insulator is quicker than sliding insulating sleeves over each of the leads and provides more protection than epoxy.

As an aside to all this: Even though the stator leads for these units are varnished, varnish alone will

not prevent chafing, so you must use additional insulation if you want to assure a reliable unit.

Installation tips that can prevent aggravation

Whatever type of insulation you are using for the stator leads in these alternators, your life will be a lot easier if you keep a few basic rules in mind. Note that these rules apply whether you are completely replacing the rectifier assembly or simply reconnecting the stator to the rectifier.

First, if you are using a WAI 42-2310 or 42-2311 insulator, you must make sure the stator leads are running side-by-side where they pass through the insulator. In rectifier frames with black epoxy, the leads must also be running in this same side-by-side configuration. Then you need to twist the leads 90 degrees so they connect to the rectifier one behind the

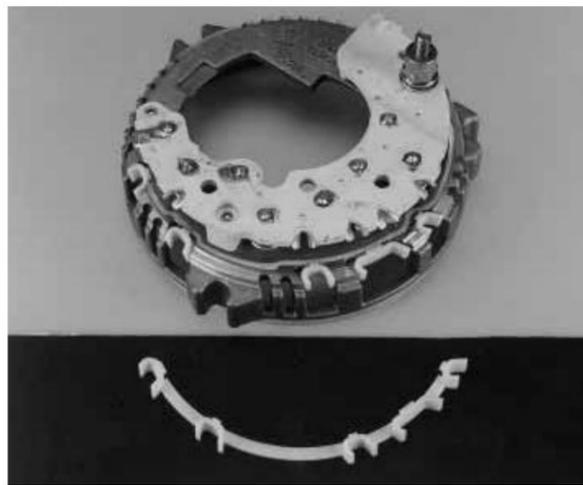


Figure 3. Top: A 3G rectifier with WAI's 42-2310 installed. Insulator itself appears below.

other (*Figure 4, next page*). Otherwise they are more likely to ground out.

Second, if you are using either a WAI insulator or an epoxied rectifier, take care that you bend the stator lead wires inward so they cannot touch the S.R.E. frame. Be sure to do this before you solder the connections because if you wait until after you solder, you could break the solder connections when you bend the leads.

Third, if you are using insulating sleeves, be sure



the insulation covers the leads anywhere they might chafe on either the rectifier assembly or S.R.E. frame.

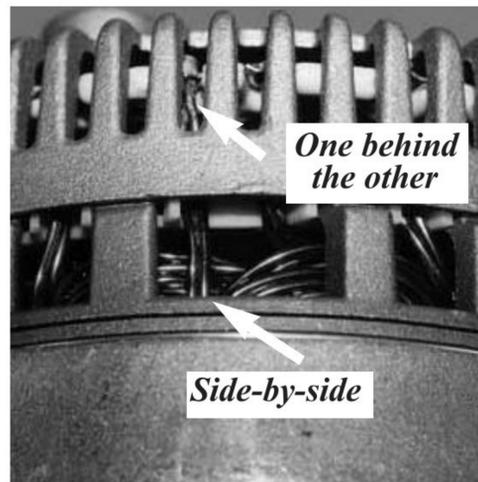


Figure 4. Run stator leads side-by-side as they come up through the rectifier frame, then twist them 90 degrees so they connect to the rectifier one behind the other.

Soldering tips

After you crimp the stator leads in place but before you begin to solder them to the rectifier, be sure to bend down the wing tabs that protrude from the rectifier. This will keep the tabs from grounding out against the S.R.E. frame (*Figure 5*).

You'll also see that the stator-connection area is bent upward at the connection edges. These bent edges assure a better solder connection when the rectifiers are wave soldered. Wave soldering involves turning the rectifier/stator assembly upside down and passing it over a tray of molten solder, to solder all the stator leads at one time.

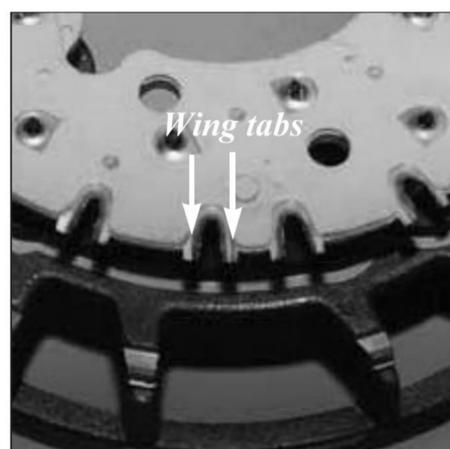


Figure 5. Bend down the wing tabs after you crimp the stator leads in place.

When you hand solder these connections, we recommend that you turn the rectifier-stator assembly upside down. That way the solder will puddle on the bottom side of the connection and won't run down the stator leads.

Finally, make sure you trim the leads after you solder them. If they extend too high above

the rectifier bridge they can ground out on the S.R.E. frame.

Installing the S.R.E. frame

When you're installing a rectifier, it's important to note what style S.R.E. frame you have (early- or late-style) because this will affect the way you reassemble the alternator.

On early-style S.R.E. frames, the hole for the battery-terminal insulator is flat on two sides. If you are using one of these S.R.E. frames, the battery-terminal insulator is installed after the alternator is assembled.

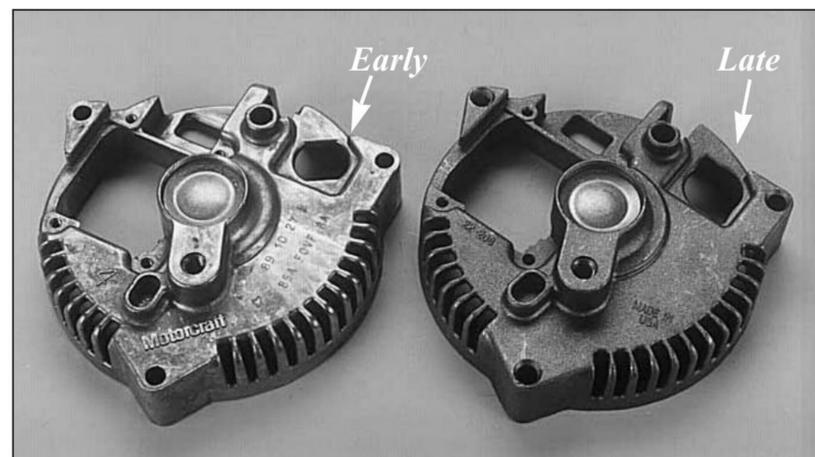


Figure 6. Early-style S.R.E. frame on left. Late-style on right.

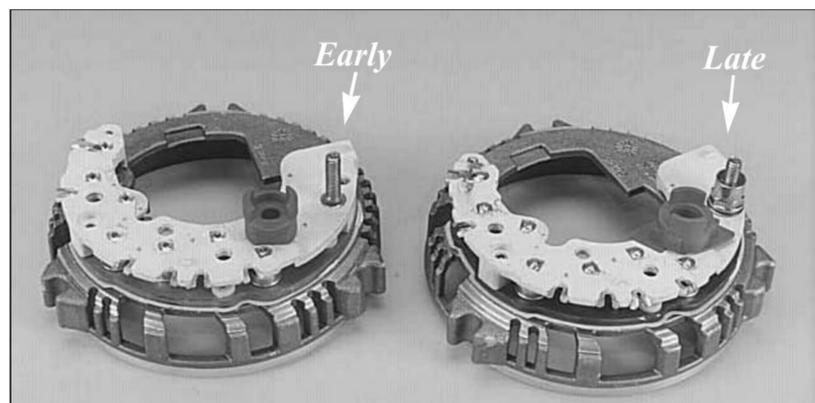


Figure 7. Battery-terminal insulator on left is used with early-style S.R.E. frame. Insulator and battery-terminal nut on right are used with late-style S.R.E. frame.

However, if you are using a late-style S.R.E. frame (hole for the battery-terminal insulator has a point on two sides), the insulator must be snapped into the S.R.E. frame before the alternator is assembled **and** you must install a battery-terminal extended hex nut on the rectifier before you install the S.R.E. frame (*Figures 6 & 7*).

A note on diodes

As a final note on these rectifiers: You may notice that most 3G rectifiers have four positive and four negative diodes, but a few OE rectifiers have only three positive and three negative diodes. The rectifiers with only three of each do not rectify the “Y” connection. You can use replacement rectifiers with four diodes to replace the three-diode style. You will then be rectifying the “Y” connection, offering about 10% more output.

WAI No.	Description
31-207	Rectifier, 133mm OD heat sink
31-208	Rectifier, 146mm OD heat sink
42-2310	Insulator for 133mm heat sink
42-2311	Insulator for 146mm heat sink
85-2305	Extended hex nut
42-2306	B+ insulator - early
42-2308	B+ insulator - late
42-2700	Insulating sleeve



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