ERA EXCHANGE

YOUR GUIDE TO ELECTRICAL REBUILDING

August 2018 $12.95

AUTO ELECTRIC CORNER
Denso Tool, Dual Alternator and Fan Relay

AN OPPORTUNITY IN DISGUISE
Massey Ferguson, AGCO, Prestolite Alternator

COMMON SENSE | YOUR BUYERS ARE LOOKING ONLINE: Will They Find You?

A WORD FROM THE TECH COMMITTEE
We Need Your Help!

This month I am hanging up my 1st Vice President hat and putting on my Technical Training Committee Chairperson hat. I am putting together the schedule for the ERA Technical Committee conference call meeting to discuss ideas for the seminars for the 2019 ERA Trade Show Expo that will be held in the spring in Springfield, Missouri.

The Technical Committee wants to hear from you, the general membership. What are your wants or needs in the way of seminar topics. The ERA Trade Show Expos are not for the Trade Show Committee or the Technical Training Committee. They are for you, the complete (whole) general membership. Please let us know what you would like for us to put together for educational topics related to but not limited to our industry or future industry ventures.

Such examples could include: business management, on-vehicle diagnosis, shop layout, updated equipment, suggestions for better productivity, navigation and review of our own ERA website or how or what you need to build your own company website. These examples have all have been presented at past ERA Trade Show Expos, but can still be revisited if the need is there.

Again we want your input to put us, the Technical Training Committee, in the direction that will not only benefit you but also your fellow members. Please don't hesitate to call or email me or any other Technical Committee members with your thoughts or ideas for technical seminars at the 2019 ERA Trade Show Expo. My phone number is: 860-528-8174. My email is K2H24P@cox.net.

A complete list of all members of the Technical Committee is available on the ERA Website. From home page, left hand menu, under "Association", click on "Contacts", then click on "Committees" just below the heading "Structure and Officers of the Electrical Rebuilder's Association". Again this is your Trade Show!!

Ken Plourde

NEW ERA MEMBERS

CoolCat Express
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Zimmerman Farm Services
Tipton, Missouri

Tri County Battery Sales
Anderson, South Carolina

JT's Starter & Alternator Repair
Madison, North Carolina

Howees Machine Shop
Fairbanks, Alaska

Metropolitan Distributors
Garfield, New Jersey

ABOUT THE COVER

AGCO-Prestolite Alternator for Massey Ferguson



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EDITORIAL ASSISTANT / Bob Thomas

DESIGN & PRODUCTION / Stephanie Schroeder

CONTRIBUTING WRITERS / Larry Hagemeister, Mohammad Samii, Bob Thomas, Ken Plourde

CONTENTS

2 A WORD FROM THE TECH COMMITTEE
2 NEW ERA MEMBERS
3 INDUSTRY NEWS
4 AUTO ELECTRIC CORNER — Denso Tool, Dual Alternators and Fan Relay
7 COMMON SENSE — YOUR BUYERS ARE LOOKING ONLINE: Will They Find You?
9 AN OPPORTUNITY IN DISGUISE Massey Ferguson, AGCO, Prestolite Alternator
12 TECH TIP: BEWARE OF 19SI LOOK-ALIKES Only 3mm Makes Them Different
15 CLASSIFIED ADS

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Rebuilding is Recycling!

INDUSTRY NEWS
& ANNOUNCEMENTS

6v Ford Positive Ground Solenoid

Turbo Supply now offers a fender mount solenoid for 6 volt positive ground systems, used primarily but not limited to Ford applications that require a positive ignition terminal to bypass the ignition resistors during cranking. This solenoid has an extra terminal that supplies positive (ground) voltage to the coil when activated. The purpose is to supply a hotter spark during cranking for those vehicles.



"This has been a real problem for us for many years," explained Larry Hagemeister of HEI in Lebanon, OR. "Even the old Ford tractors had coil resistors behind the dash. This solenoid can solve many hard-to-start problems on those machines, which are caused by a weak spark during cranking. These solenoids have been unavailable anywhere, except as new old stock if you could find one. I am really glad that we now once again have this part to offer our customers who own vehicles with 6 volt positive ground systems,"

A New ERA Label Is Now Available!

NEW!

In response to requests for a label to help members identify their alternators and starters, this new ERA Unit ID label is now available. The 1.5" x 3" tough waterproof vinyl label provides space to write or stamp a unit number, your invoice number or date, the units voltage and the unit's amperage. This 2-part label comes with a self-adhesive cover sheet to preserve your unit info. It has been designed to work with both rebuilt and new units and is manufactured to last many years in the field.

These attractive labels are affordably priced and can be ordered today by calling the ERA office at **(636) 584-7400.**

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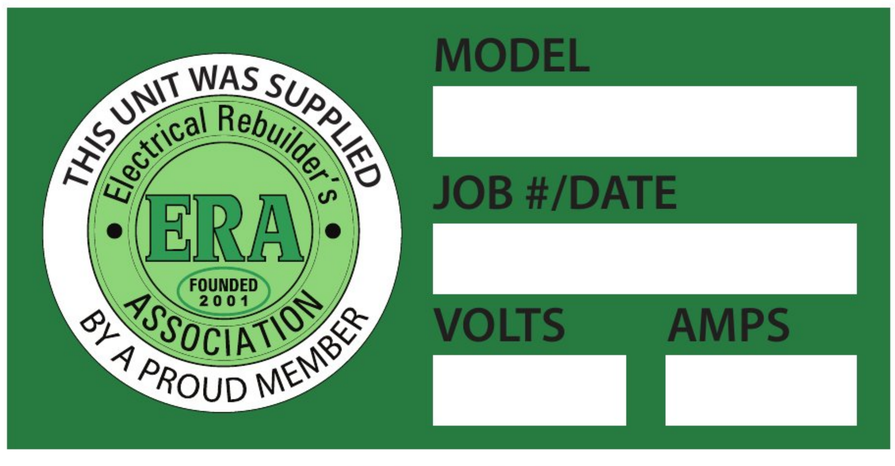

ACTUAL SIZE

AUTO ELECTRIC CORNER —
Denso Tool, Dual Alternators and Fan Relay



BY MOHAMMAD SAMII

Denso Starter Drive Tool…!

One of the great opportunities of the ERA Show was seeing exhibitors' parts, tools and equipment, giving attendees the chance to see the latest, but also enabling us to take advantage of special pricing that is usually offered during each show.

That is how I came across this clever little tool and bought it during last April's ERA Show (*see Figures 1 and 2*). It is made and sold by CAE Pullers and is a real time-saver for replacing the snap-ring, collar, and pinion used on Denso reduction gear starters. The tool presses and holds the pinion gear down, thus freeing both hands for snap-ring removal using whatever suitable tool that you may have. It is also fully adjustable to accommodate all of the different sizes of Denso drive assemblies.

The manufacturers' website (www.caepullers.com) lists the details of this and a full line of sophisticated pullers that the company has made for the electrical rebuilding industry.

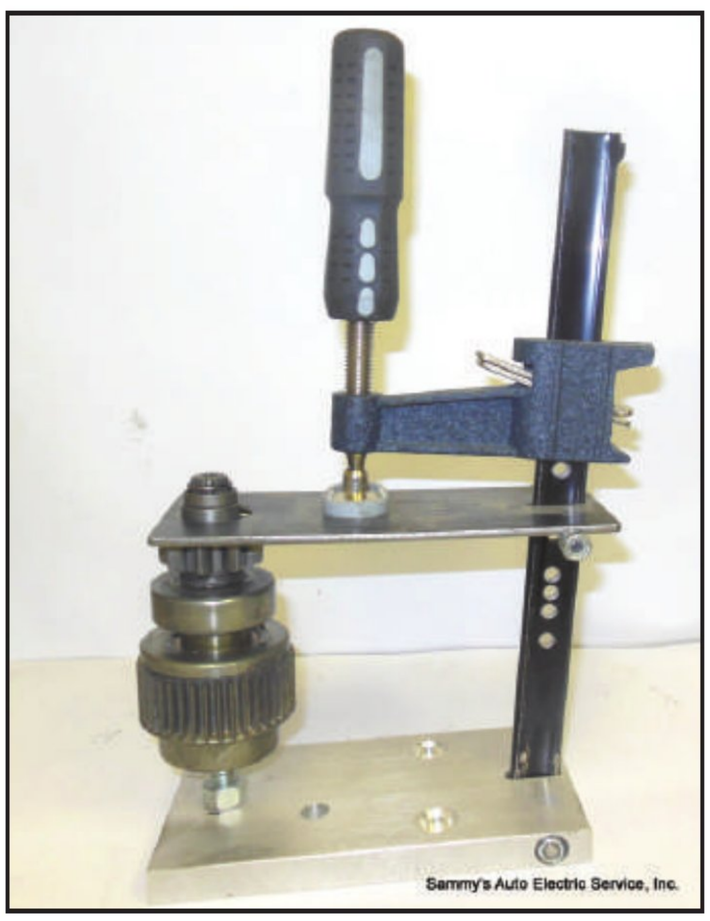

Figure 1 – CAE Pullers #7400 Drive Compression Fixture Kit

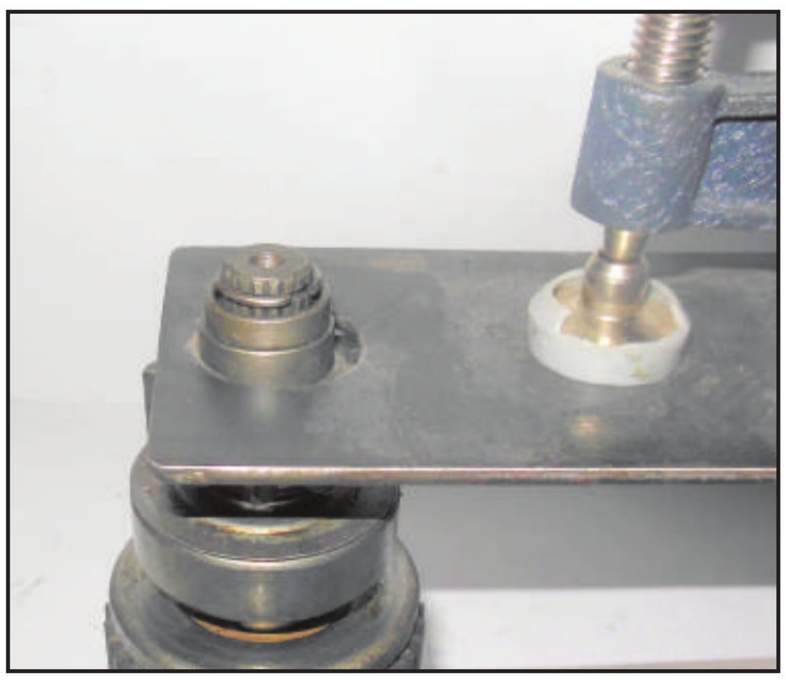

Figure 2 – Holding down the pinion gear for snap-ring removal

The designer/manufacturer, Fred Colson who owned Colson Auto Electric in Clearwater, Florida (thus the name, CAE) is no stranger to electrical rebuilders. In addition to being a first class working machinist for the last 20-25 years or so, he has concentrated on making specialty tools for electrical rebuilders. His products have been long known and used by many rebuilding shops. He also told me that now that he is working in a machine shop, he is more apt to getting tool ideas from rebuilders and see to it that viable concepts are put into making actual prototypes, working samples, and finished tools for us to use.

The point is that we must support such small businesses who devote their time and effort to make parts or tools to help us make the rebuilding process faster, safer and easier. This should be a priority for rebuilders. Such companies need our full financial support to keep going.

Dual Alternators…!

In responding to a thread of discussion on the ERA Forums regarding modification for dual alternators, I would like to share some of my experience and thoughts with readers.

With the exception of the some factory dual alternator system equipped vehicles, designed and built by automakers such as Ford and GM or their authorized subsidiaries, modifying a single alternator system to accept dual alternators is a rather tricky business to say the least.

There are a few aftermarket companies who specialize in providing modification kits for this purpose. Some of them are well engineered and manufactured, but others are mediocre at best. It seems that some makers of these kits are not aware of the importance of belt and pulley surface contact area. A belt that barely touches an alternator pulley with very low surface contact area cannot provide very much additional output, not to mention that the heat generated by slippage rapidly increases belt wear and overheats alternator bearings.

A good example of this can be seen in this picture (*see Figure 3*) that was provided by our esteemed colleague Nathan Unger of A.S.I. Rebuilders of Abbotsford, British Colombia in Canada. I believe that the minimal contact area between belt and pulley on this vehicle could never provide enough grip to generate any significant amount of amperage.

Another important issue is how the load is being divided and shared between the two alternators. Load-sharing is an important issue if the two alternators are not identical which obviously means they do not share the same voltage setting (Vset) by their respective voltage regulators.

Just to clarify this point, let's assume the Vset of first alternator is 14.0V, and the second one is 14.3V, and both share the same sense voltage and load. As the system voltage gets closer to 14.0V, the first alternator will stop charging or charge at a much lower rate while the second one is looking



Figure 3 – Minimal contact between the belt and alternator pulley (Picture by Nathan Unger)



Figure 4 – A rather well made dual alternator kit on a Hummer limousine

for 14.3V and ends up carrying the majority of the load. This usually causes the premature failure of the one with a higher setting.

This problem is not as prominent if the alternators are of the same brand and family. But even having identical alternators sharing the same "sense voltage" is not a bullet-proof answer. You can still have uneven charge rates for different battery sets, often located at opposite ends of the limousine.

One of the ways that we have experimented with and found to be more viable, is to divide the load into 2 separate systems: Main and Auxiliary. The main load being the engine compartment batteries and the auxiliary being the bank of batteries used to operate the coach accessories that are common in limousine applications for passenger comfort and entertainment.

Once the systems are isolated from one another, each alternator can be assigned to carry the load of its respective battery bank, without interfering with each other or handling more load than they are assigned. Depending on the calculated electrical load, the alternators must be sized and chosen for each function. The next photo (*see Figure 4*) shows a pair of 160-amp 8292 alternators mounted securely by a well-designed dual alternator mounting kit on a Hummer stretch limousine.

For redundancy or back-up, a continuous-duty power relay can be installed to bridge the two independent systems together in the case if an alternator failure. This way the one working alternator can be used with some load moderation to make it through a trip until the system can be repaired.

One point that is important to remember is that the majority of the limos that we work on are ten years old or more and have been used, abused, rigged, and modified by various operators over that time. We are tasked to get them going by whatever means necessary and do the work within the anemic financial confines of the current owners, which somehow limits our options.

Above is of course my opinion based on our experience repairing such vehicles. I am sure there are newer system configurations and designs that are highly workable, especially with the availability of the many 250-plus amp alternators that abound these days. We can perhaps discuss this at a future ERA training event.



Toyota Power Relay

The ISO-type Bosch 4 or 5-pin relay has been around for a long time and most of us are well familiar with them. But there are certain vehicles and applications that use other types of relays for operating various systems. One of those that is used extensively in the Toyota/Lexus line of cars as an ignition relay, blower relay, cooling fan relay, fuel pump relay…etc. is shown here (*see Figures 5 and 6*).

While they are well designed and robust, they can fail in various modes and render the related circuit inoperative. We had a recent case with a 2001 Lexus ES-300 with a radiator cooling fan that stayed on all the time, running the battery down due to relay contact points stuck in the closed position. The system was traced and the defective relay identified and replaced to restore the cooling fan to normal operation. (*see Figure 7*).

Until I see you again, keep up the good work.
sammyselectric@sbcglobal.net



Figure 5 – A commonly used Toyota/Lexus relay

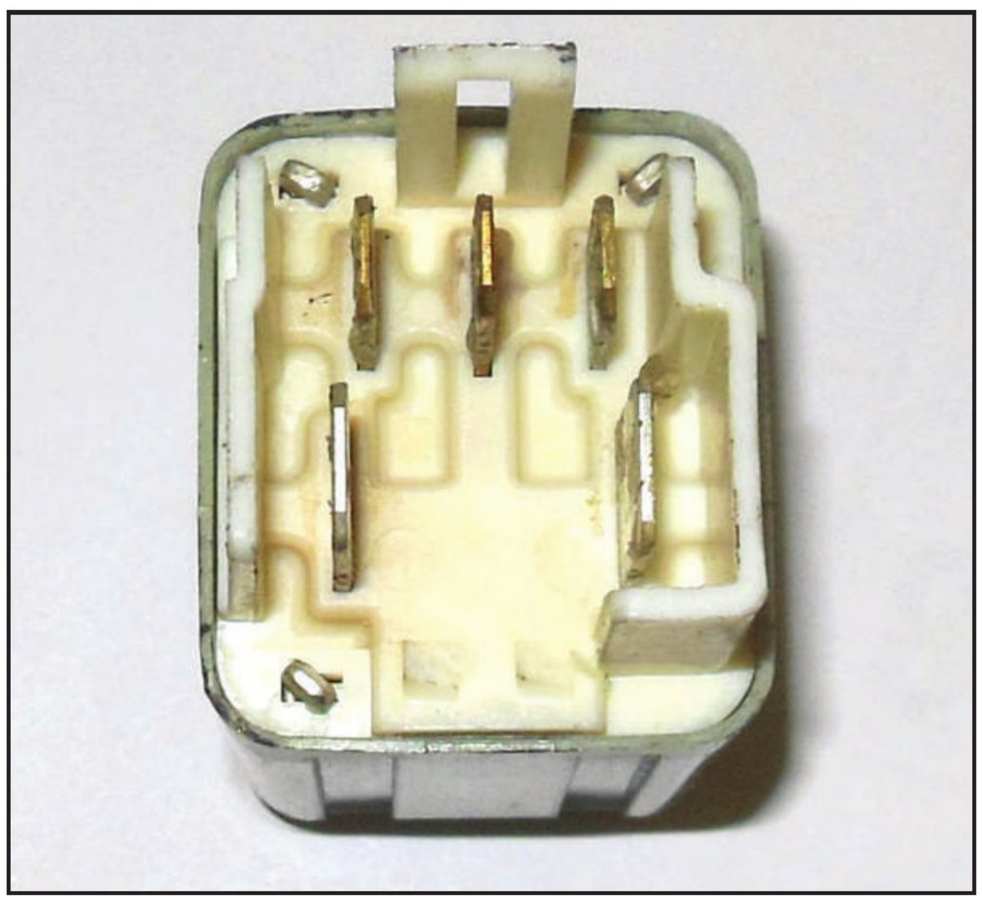

Figure 6 – The pin side of this popular Toyota/ Lexus relay

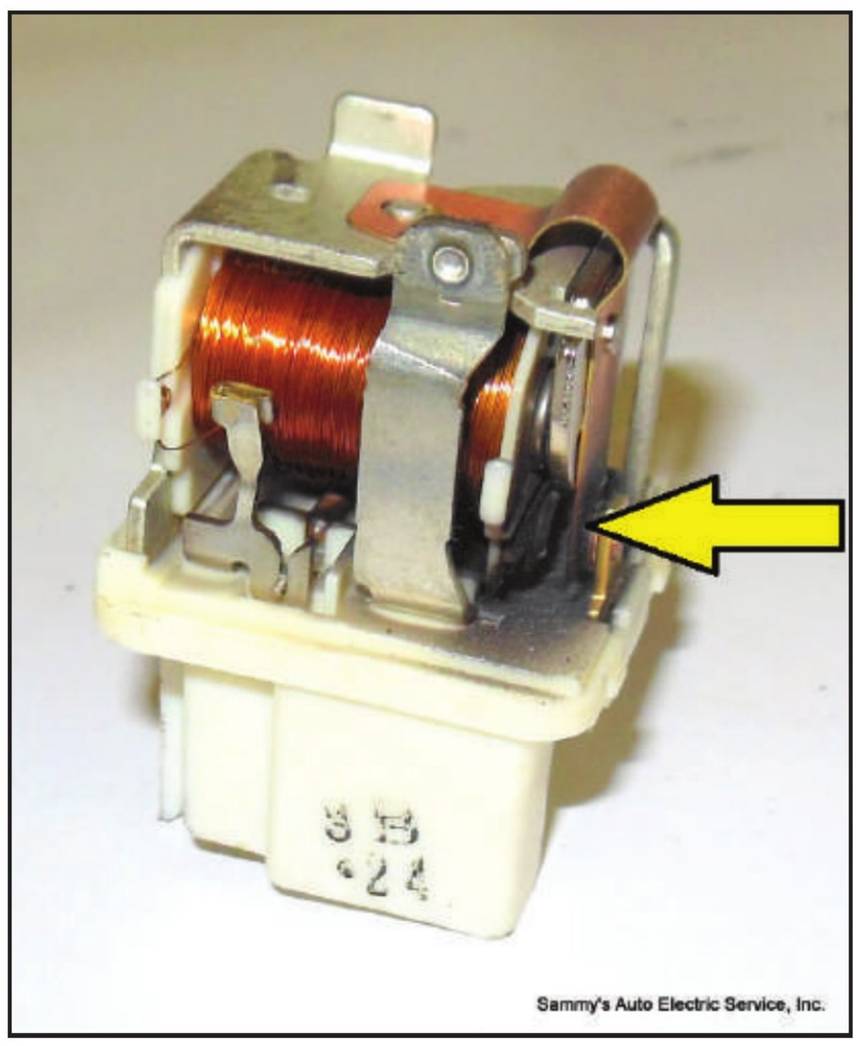

Figure 7 – Fused contacts of this relay caused cooling fan run on

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COMMON SENSE — YOUR BUYERS ARE LOOKING ONLINE: Will They Find You?



BY BOB THOMAS

Buyers have been wary of sellers for centuries. The phrase "caveat emptor" is a Latin legal term that means "let the buyer beware", often used as a disclaimer of warranty. It is true that a buyer almost always has less knowledge of the product or service than the seller has. This has been the case for probably as long as man has been using currencies. The advantage or power has been in the hands of the sellers for hundreds if not thousands of years. That is until recently.

Things began to change when a personal computer was connected to the WordWideWeb or what we now call the internet. As the technology advanced and the web expanded, the flow of information increased exponentially. While both buyers and sellers have had access to the same technology and information from the get-go, it was the buyers that jumped on that bandwagon first and from there gained an advantage.

Most traditional sellers ignored the internet in the beginning. Maybe they thought it was just a fad or were unable to see it for what it would eventually become. Very few sellers saw the potential of the internet as a selling tool. However there were a few farsighted entrepreneurs who did realize a rare opportunity and they seized it.

Amazon started out selling books from the founder's home garage to compete with giant bookstore chains. I bought a few titles from Amazon myself back in those early days. Business boomed for many of those early internet sellers, largely because buyers searched and found the online offers and recognized an opportunity to save time and money.

Today this tool gives buyers access to information that would have seemed unfathomable just 20 years ago. Computers connected to the internet allow buyers to price check and compare nearly any product across an array of sellers within minutes without moving 10 feet. No longer are buyers restricted to just the sellers within their immediate area. With a smart-phone a buyer can shop from nearly anywhere at anytime of day and purchase products from literally anywhere in the world in a matter of minutes.

As a business, you must face the fact that we now live in a world in which the buyer has more power than any of



us could have ever imagined possible. It is you, the seller that must now beware. Large retail sellers who have not made the most of the internet are falling behind quickly. Some of them may never recover. Many have already closed locations or shut down altogether.

If you want to sell in this environment you had better be ready to compete and you will need to use the internet to do that. What worked well for you 15 or 20 years ago will not work well today and it will get harder the longer you wait to get aboard. If you think of the internet as your competition because you are loosing some sales to it, you are fighting a loosing battle. You must use the internet to your advantage. Opportunities to do that still exist and you do not have to sell goods online. That market is already overcrowded anyway.

What you can do is sell yourself and your business to buyers in your immediate area. Most consumers, more than anything else, what to deal with someone they can trust. They want a product that will last and most are willing to pay a little more for those two things. Most people would rather buy local, especially if you can assure them that you are on their side. Those buyers are your target.

Today, consumer expectations are at an all time high. By that, I mean that the perception of what a quality product is, how long it should last and how much abuse it should be able to take without failing are at an all time high. Many products being sold today do last a whole lot longer than they used to.

What that means is that your customers expect your products to last a long time too. Meeting your customer's expectations is essential in today's marketplace. Buyers use the internet for a lot more than price checking. They also like to share their buying experiences, whether good or bad, with their friends, family and anyone else who happens to see it. Savvy buyers take the time to read reviews before spending their hard earned money.

A dedicated website to sell your business is no longer just an option – it is essential. You should also take advantage of the free listings on Google My Business, Facebook, Yellow Pages Online, Yelp and Angie's List. Free listings make it easy for people to find you by name if they are already looking for you. But the dedicated business website, if well planned, can sell buyers on the quality of your products, which is what most buyers want and expect today.

If you have an idea that you'd like to share here with other ERA members, please email me at ere.bobt@gmail.com or call me on my cell phone at 904-673-7301.

ERA REBUILDER UNIT LABELS

All labels are printed in bright color on a heavy heat-resistant stock with high-bond adhesive backing. They are laminated with a clear layer that is resistant to oil, gas and water. They will give your products a professional look that will set them apart from the competition. Labels are affordably priced and can be ordered right off of the ERA website or by calling the ERA office at: 636-584-7400. All prices include free shipping.



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AN OPPORTUNITY IN DISGUISE
Massey Ferguson, AGCO, Prestolite Alternator



BY BOB THOMAS

It happens to all of us on occasion. A customer brings you an alternator that you have never seen before. After investing time in the unit to find out what you need to fix it, you discover that service parts are non-existent. Such was the case of this AGCO-Prestolite alternator (*see Figures 1 and 2*), Massey-Ferguson part number 6205 039 M91.



Figure 1 – Notice the presence of two adjustment ears, allowing it to be mounted on either side of the engine on other model tractors.

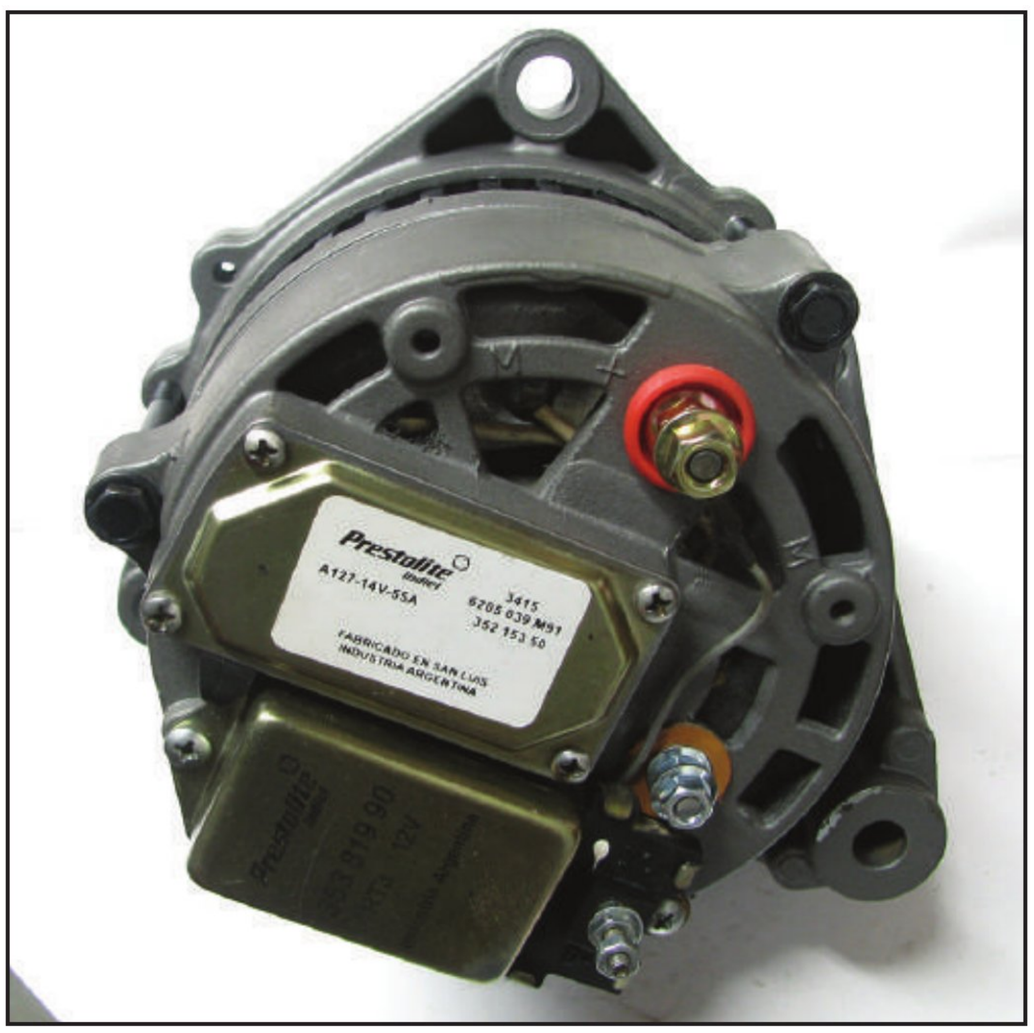

Figure 2 – The ignition terminal on the regulator, bottom of the photo, is used for excitation.



Figure 3 – This Massey-Ferguson 451 tractor used the AGCO-Prestolite alternator

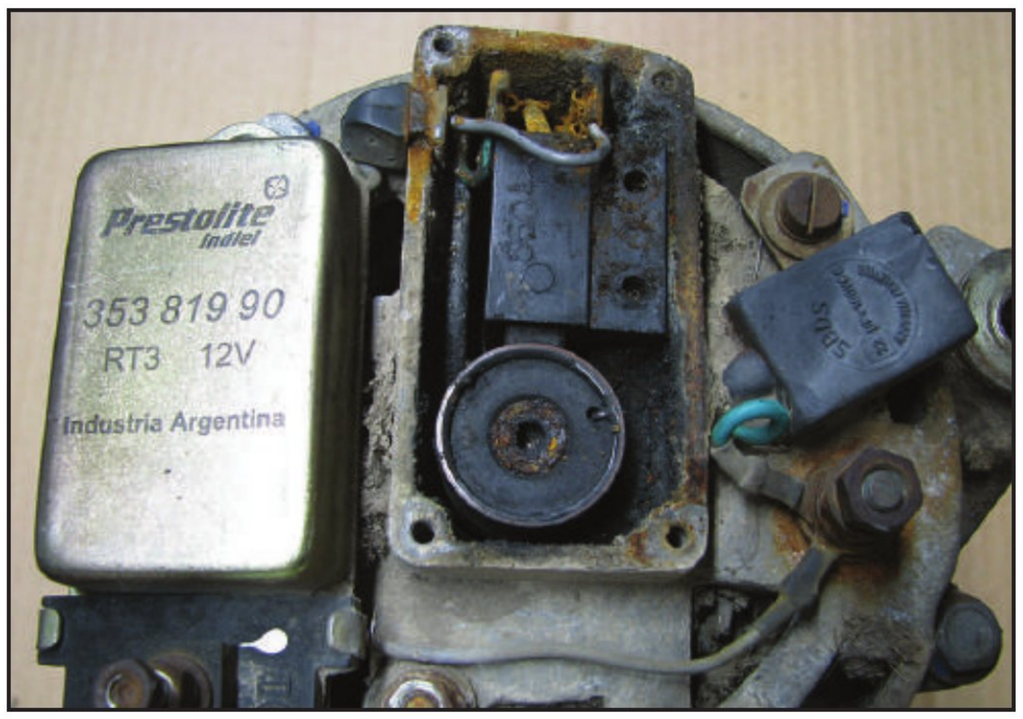

Figure 4 – With the brush cover removed, you can plainly see the water damage.

The application is a Massey-Ferguson 451 tractor (*see Figure 3*). This one was used to aerate soil at a nearby county's waste water treatment plant. It is a four wheel drive machine powered by a 3.3L, 3-cylinder Perkins diesel. The 451 model was manufactured from 2002 to 2006. Its 14 volt, 55 amp alternator was used on at least some other models with the same engine. Note that it has three mounting ears while only two are actually used. That allows this alternator to be mounted on either side of an engine, making it easier to use on multiple applications.

What caused this particular alternator to quit charging was a relatively simple and all too common problem when equipment is left outside, exposed to the weather day and night. Long periods of idle time between usage of this particular tractor was also likely a contributing factor. As you can see, water got into the brush holder area and literally rusted the brush springs away in addition to destroying the brush lead wires (*see Figure 4*). The brush cavity was actually half full of water when I took the cover off. In addition, one of the two screws holding the brush holder in place was badly

AN OPPORTUNITY IN DISGUISE

rusted, seized and broke off in the rear housing during disassembly.

I suspect that Prestolite manufactured this alternator for AGCO outside the US with no intention of ever offering any support or service parts. That could even have been part of their agreement with AGCO, making it basically a throw-away alternator. The dealer wanted in the neighborhood of $400 for a new replacement. Letrika/MAHLE manufactures a more affordable replacement and some of our supplier's offer a China-made Bosch look-alike that will replace it.

However the rest of this alternator was actually in very good condition, aside for some surface rust and mild corrosion. The regulator was still fully functional. Well-sealed with epoxy and undamaged in any way, it was obviously reusable. If the brush holder could be salvaged, I believed that this alternator could be rebuilt. So I provided the plant manager with the options, expecting him to choose rebuilding the original. But he chose the new Bosch look-alike instead, leaving me with the Prestolite core to discard or keep if I wanted it.

I found the challenge of restoring the original brush holder to full usefulness to be irresistible, even though the plant manager made it clear that he had no interest in keeping a spare. Within minutes I successfully removed the voltage regulator's connection wires without damaging anything (*see Figures 5*). That left the only part that needed to be restored (*see Figure 6*). It took less than 10 minutes to remove what remained of the old brushes and springs and clean the brush holder's connections using a wire brush (*see Figure 7*).

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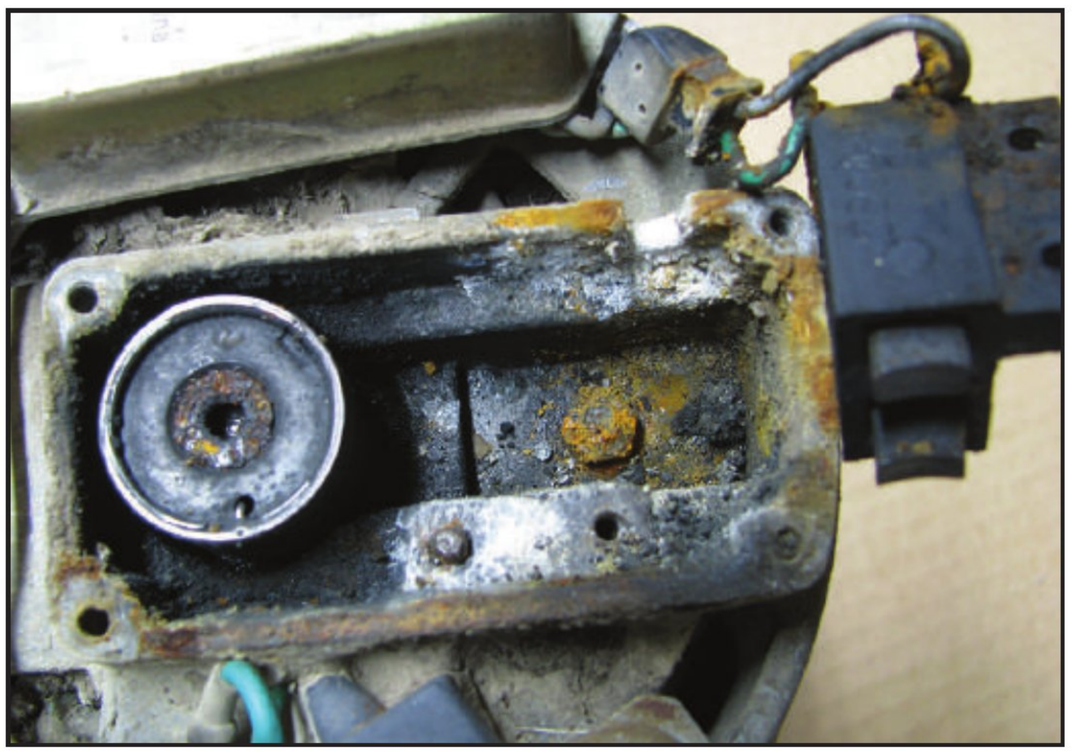

Figure 5 – One of the brush holder screws broke during disassembly and the springs were completely rusted away.

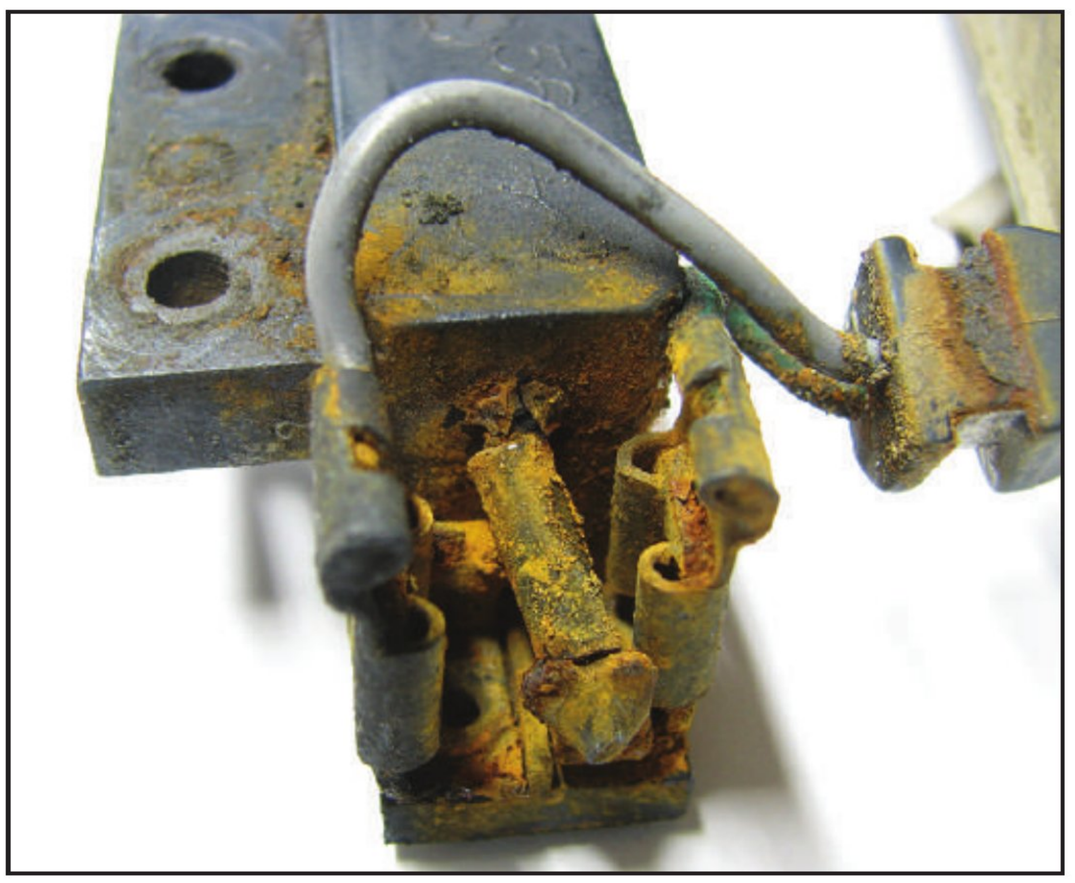

Figure 6 – The brush holder looked hopeless.

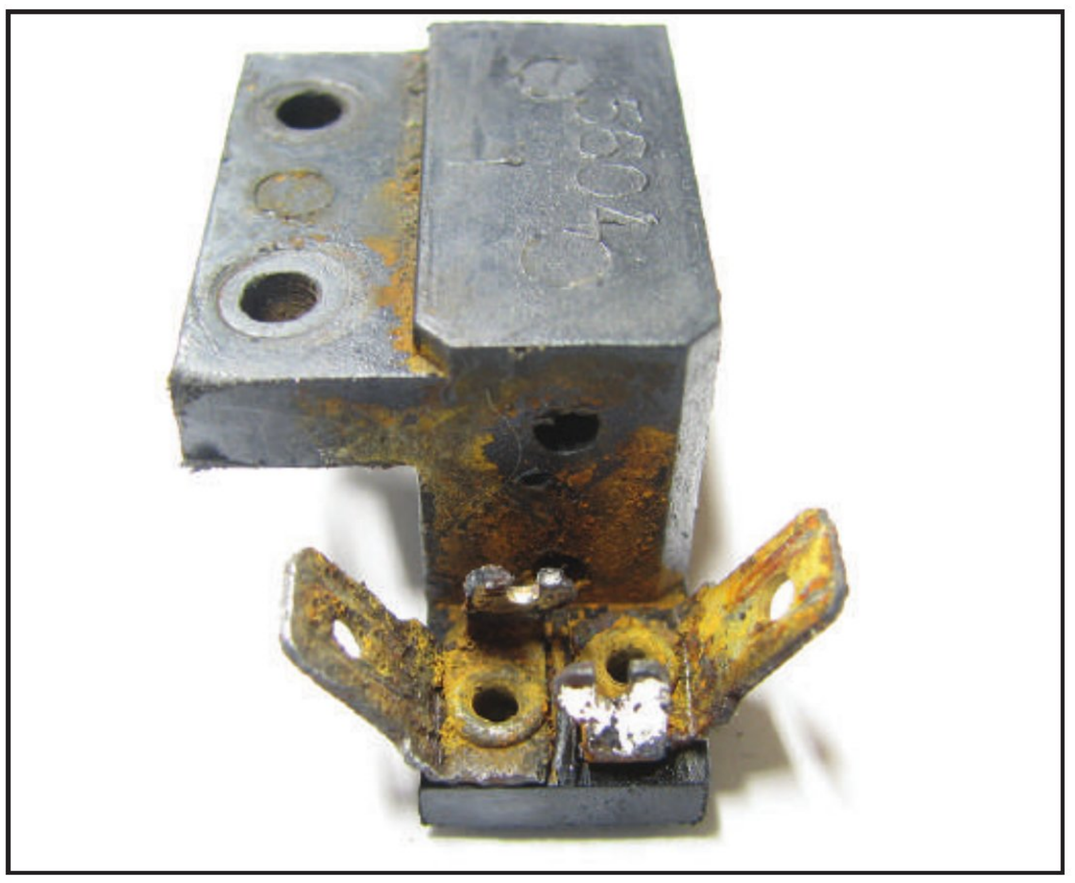

Figure 7 – Once the brushes were removed it looked possible.

AN OPPORTUNITY IN DISGUISE

I had some 1970's vintage import alternator brushes that were a perfect fit to the brush holder and a pair of 1G Ford brush springs that could be shortened slightly to provide the right tension and travel. Once assembled, the brush holder was good as new and ready to be re-installed (*see Figure 8*). The remaining end of the broken screw helped to position the brush holder and prevent movement while the undamaged screw was used to secure it in place using a flat washer for added security (*see Figure 9*).

My original hunch that this alternator was economically rebuildable proved to be correct. The only parts that it required were two common bearings, a pair of brushes and some used springs which cost on the lesser side of $10 altogether. What looked like a lost cause was in fact an opportunity in disguise.

If you have a need for this alternator, please give me a call on my cell number 904-673-7301. Any ERA member can have it at cost plus freight.

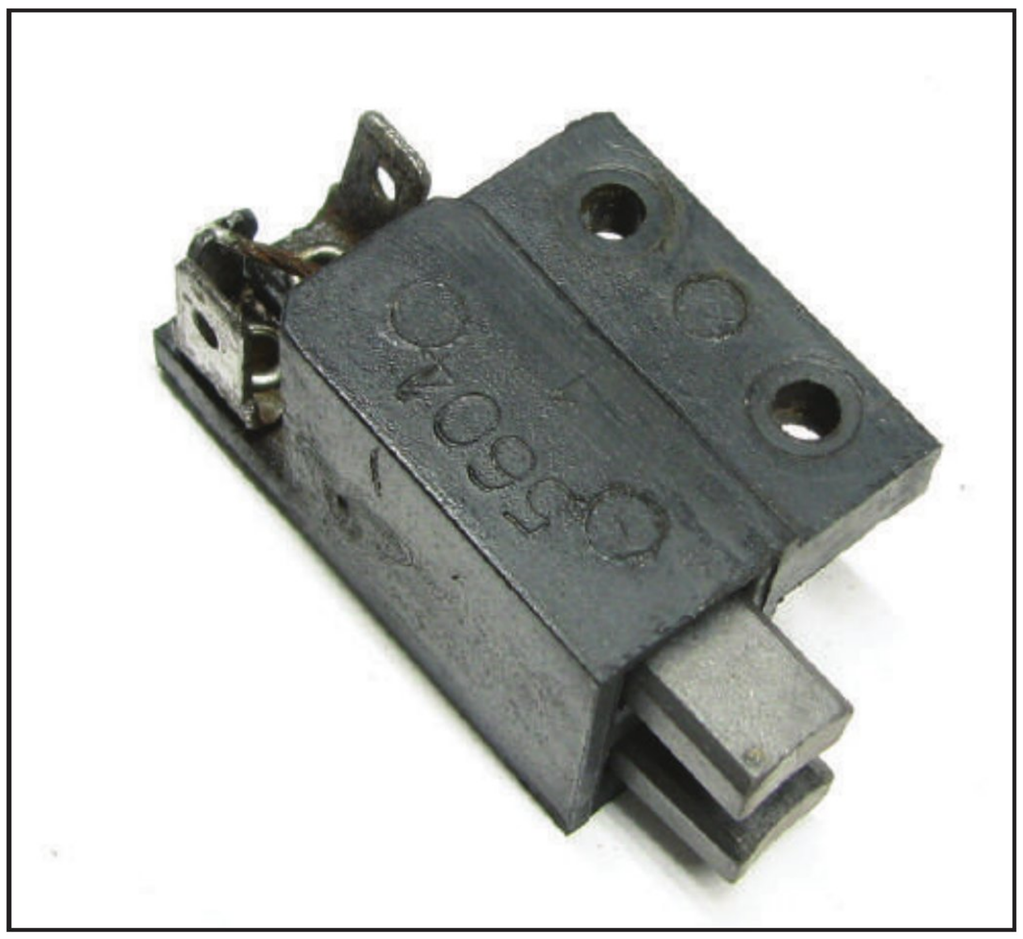

Figure 8 – Here is the same brush holder with new springs and brushes.

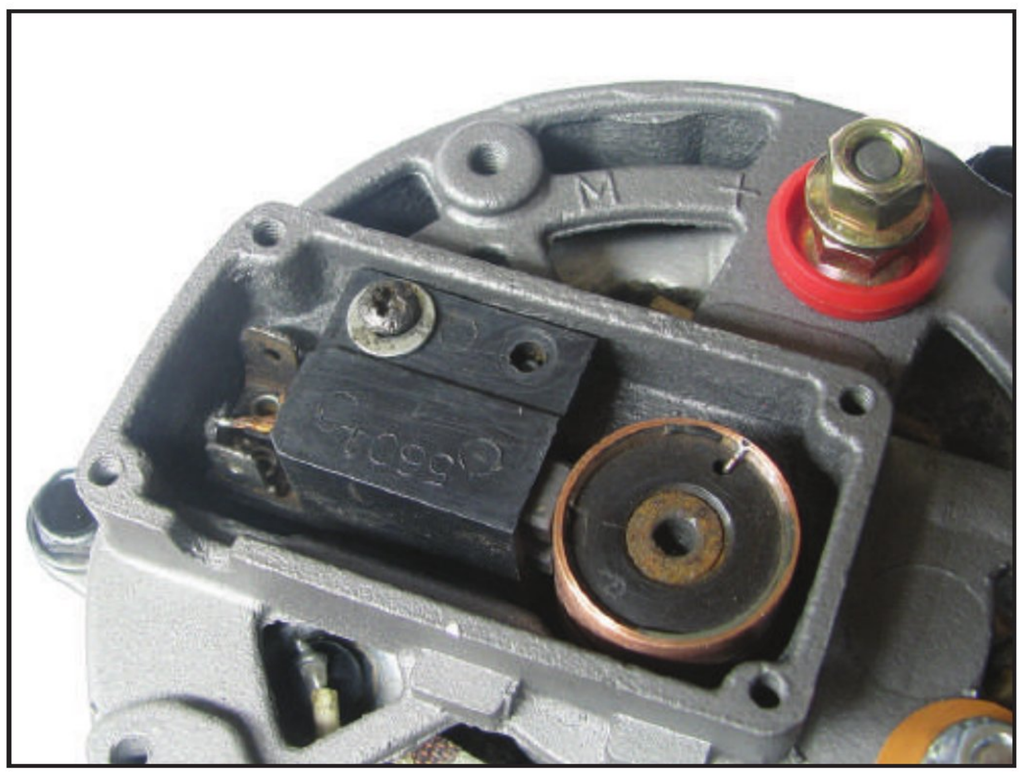

Figure 9 – Re-installed here using the broken screw for alignment and the good screw to hold it in place.



TECH TIP: BEWARE OF 19SI LOOK-ALIKES
Only 3mm Makes Them Different



BY LARRY HAGEMEISTER

I recently ran into two different 19SI alternators that could very easily be confuse or mismatched. They are identical except for their drive end housings. As you can see in the photo (*see Figure 1*), the difference is in the offset of the spool mount on the pivot end of the drive end housing . While you can easily tell these housings apart looking closely when held side by side, they could easily be confuse. The three millimeter difference will throw the belt alignment off by that much.

To make matters worse, some vendors are showing the same drive end housing for both alternators.

The application for both alternators is the same tractor, a MacDon 9250 4-wheel drive self-propelled windrower with Cummins engine from 1999 to 2005. MacDon is a Canadian manufacturer based in Winnipeg, Manitoba but they have dealerships in the US. We have them in Oregon and checking the internet, used ones are for sale all across the northern farm belt.

Lester 8098
Delco 19009952 or 19009951
Delco DE housing – 10483258

Lester 8099
Delco 19009957 or 10459316
Delco DE housing - 10484612





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Tech Help from Mohammad Samii



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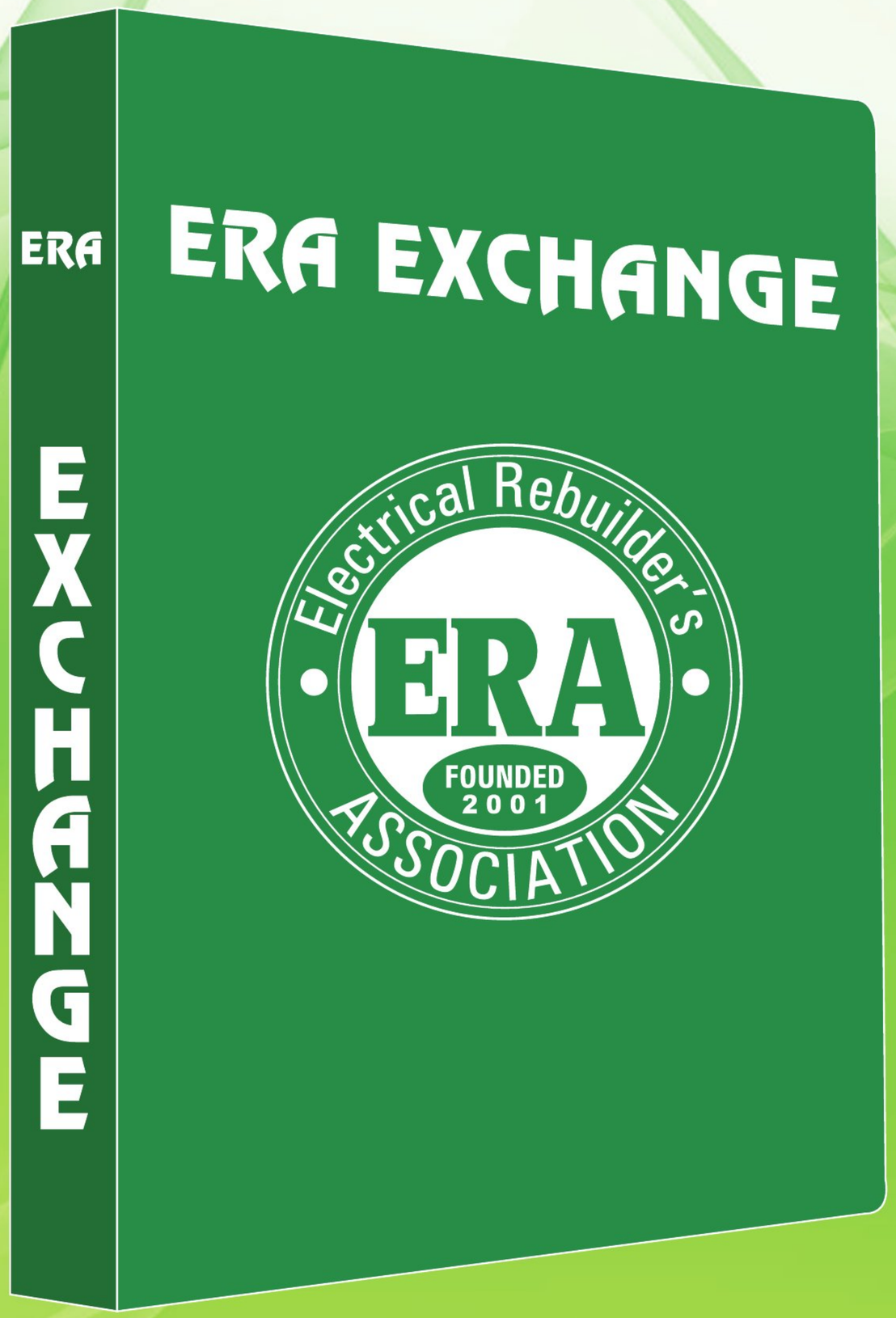

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