ERA EXCHANGE

YOUR GUIDE TO ELECTRICAL REBUILDING

January 2020 $12.95

AUTO ELECTRIC CORNER

Customer Perceptions, Blower Resistors and Lucas A127

ELECTRONIC BATTERY TESTERS

Replacing the Load Test

2020 TRADE SHOW SCHEDULE & REGISTRATION

See Pages 14 & 15

COMMON SENSE

On the Way to Being Right

A WORD FROM THE PRESIDENT
It Was A Very Good Year



Well, the year 2019 is behind us now and overall, this past year's business climate was good in our country. Despite the implementation of tariffs on imported goods, our industry has adapted to the challenge and has overall managed to make the adjustments needed to limit the hardships.

Our nation now has the lowest unemployment rate in 50 years and a GNP that is at record growth, thanks to the USA's entrepreneurs and not the elected ladies and gentlemen in Washington DC. Looking into the future, providing our elected senators & representatives can settle all of the recent distractions that have put our country's governing body at a standstill, I believe that our nation's business climate will float at the current level or hopefully continue to prosper in 2020.

On the topic of prospering in 2020, let us not forget that ERA Expo in Cincinnati is only a few months away. If you look on page 14 of this issue, you will find the complete schedule with seminar titles and presenter names. Our show committee tried very hard to offer topics that were suggested by members. You will see a few familiar names there and a few new ones presenting topics that have not been covered before to my knowledge.

You will also notice that seminars are scheduled as part of the J&N tour. The exact topics are yet to be announced, but they will include some OE representatives explaining their newest products. This will be your chance to ask questions or present any concerns.

On behalf of the entire ERA Board of Directors and yours truly we wish you, your employees, and your families a very happy and prosperous 2020.

Ken Plourde

NEW ERA MEMBERS

Lippert Enterprises
Ashland, Ohio

Glastonbury Rebuilding Service
Glastonbury, Connecticut

ABOUT THE COVER

Motorola Electronic Battery Tester from the 1980's

ERA EXCHANGE

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Electrical Rebuilder's ERA ASSOCIATION FOUNDED 2001

Rebuilding is Recycling!

INDUSTRY NEWS
& ANNOUNCEMENTS

Barsanco Now a Part of IAT

International Automotive Trading, Inc has announced that it and Barsanco, Inc, a wholesale supplier of automotive electrical units and parts in Michigan since 1978, have come together at a new location in Southfield, Michigan.

IAT has moved all of their inventory from Woodside, NY to a state-of-the-art 19,000 sq. ft. warehouse in Southfield. Barsanco, already well-established in the Detroit area, joins IAT there under the IAT banner.

Barsanco's large inventory of both complete units and component parts will complement IAT's extensive OEM product lines, that include Bosch, Valeo, Mahle, Lucas, Marelli, Magneton, Litens and INA. Both companies have a reputation of supplying quality parts at competitive pricing. This move will allow them to better serve the rebuilding industry.

ERA EXPO 2020 in Cincinnati is A Coming Together

ERA Expo 2020 is now less than three months away. Mark the date on your calendar now – March 26 thru 29! This year's event includes an impressive lineup of seminars and a tour of J&N, a full line supplier of both OEM and aftermarket units, component parts and accessories.

The exposition on Friday evening and Saturday provides a chance for you to meet our industry's most trusted suppliers face-to-face. A few of the scheduled seminar topics are: Challenges in Heavy Duty Rebuilding, Golf Cart Repair, Latest Information on Regulators and Lathes, Cutting Tools and Shop Practices. You will find a complete schedule and list of the seminars on page 14.

Make plans now to attend, listen, learn, exchange ideas and share information with other ERA members. It only happens once each year.

ERA EXPO 2020 Registration on Page 15

ERA EXPO 2020 Hotel Information on Page 17

AUTO ELECTRIC CORNER — Customer Perceptions, Blower Resistors and Lucas A127



BY MOHAMMAD SAMII

Customers' perception and reality!

A customer of ours who owns a clean 1996 Lexus CS300 shows up repeatedly every other year for an alternator change. The reason for the repeated alternator failure is accumulation of oil from a leaking valve cover gasket and perhaps other hoses and such. That oil builds up inside the alternator, and invariably destroys the brushes, brush-holder and the slip ring of this robust Denso 13552 alternator. Our repeated request to have the oil leak fixed has fallen on the deaf ears due to the possible high cost involved…!

The last time a couple of months ago was a little different. She claimed after spending big money to fix the leak based on our suggestion, the alternator has failed again and she wanted us to look into it as the oil leak excuse would no longer work! That was a good point and we decided to investigate.

Upon removing the alternator, we noticed the heavy amount of sludge accumulated on the alternator (*see Figure 1*). It was indeed the cause of the failure and the engine compartment around the alternator was again drenched in oil. Additionally, the alternator on this car had come from an auto part store and was definitely not our unit. We found out later that the shop that fixed her oil leak, had replaced the alternator also, which she had conveniently forgotten. (*see Figure 2*).



Figure 1 – Oil-damaged Lexus 13522 alternator



Figure 2 – Another view of the same alternator

So again, another alternator was installed and when she arrived to pick the car up, I shared with her some of the pictures you see (and many more) to prove to her that the leaking oil was still an issue. She paid our bill, and said she is going to talk to the people who supposedly fixed her leaks!

The point is all customer claims need to be investigated fully to verify and determine the real cause of the failure. I am not a firm believer of the adage, *"The customer is always right…!"* and frankly, I think they rarely are…!

Blower Motor Resistors…!

I am aware that many of our members and rebuilders do not perform any on-vehicle service, but since the term *Auto Electric* is the name of my business, we do have a rather large service shop (8 bays), and there is no reason to shy away from the electrical on-vehicle work that comes through the door. One type of repair that we perform a lot of is the blower system that is necessary in hot weather and a must have in the cold due to frost and defogging issues that are an everyday necessity in the winter months.

DC blower motors that have also been modernized in newer applications (more about that later) have been around a long time. They obviously wear out and fail due to age but there are mitigating circumstances that can speed up their failure, such as water intrusion through a leaking windshield seals, being blocked by leaves or

debris, and at times burned up due to a gradual build-up of mice nests that can cause serious problems.

The control for the motor's speed has also evolved from the simple resistor blocks that had a +B input where the driver selected the desired speed by selecting the desired resistance value in line with the blower motor. There are still some of them around in the older cars but the newer systems use a transistorized controller, some of which may also include the necessary power relay encapsulated within a sealed package. Some also have external cooling fins, then mounted in the plenum's air stream to keep the power transistors cool and prevent burning up. Figures 3 and 4 show some of these resistor block and their plug-in configuration.



Figure 3 – A collection of the blower resistor modules



Figure 4 – Resistor module terminals that are subject to overheating



Aftermarket versions of most types are available with varying quality level but for some cars only OE is available that is purchased through the dealer at higher prices but generally with better quality.

The wiring, especially connector to the modules are also a big problem area. They overheat, burn, and make the system inoperative which requires to be replaced. For some unknown reasons, there are connectors that cost more than the modules they connect to but nevertheless, they need to be repaired and replaced if necessary.

The current trend toward blower motors and radiator cooling fan motors is their move into the DC motor designs. These motors only have three terminals: a +B, Ground, and signal (driver) that is sent in the form of a pulse-train from HVAC module or the control panel which sets the desired RPM based on the driver's choice, or from the automatic controller. Widening and narrowing the pulse-width is what controls the motor's speed. These motors that can cost up to few hundreds of dollars are very efficient and work well, but obviously expensive to troubleshoot and replace.

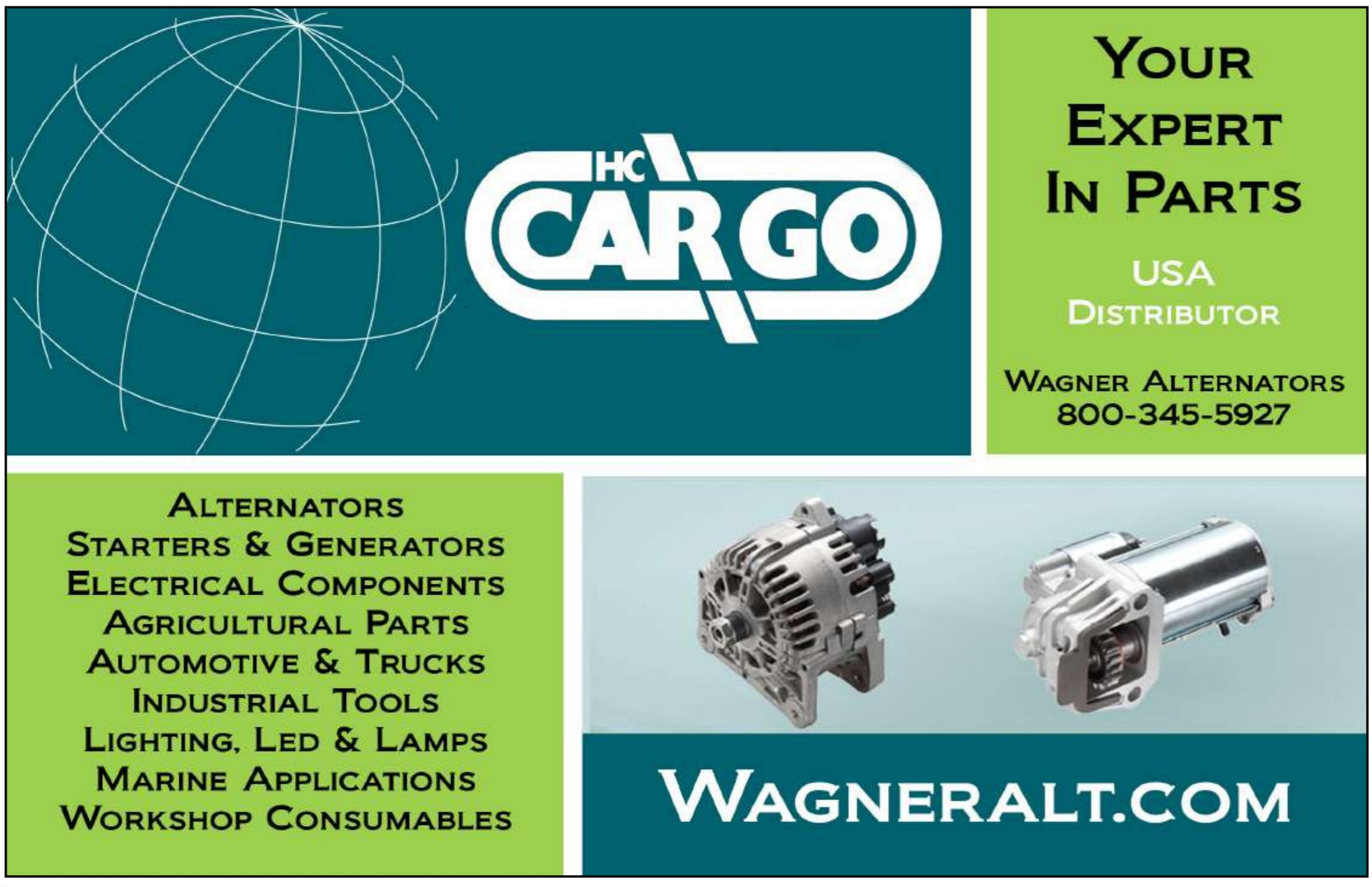
For the shops who do some on-vehicle service and have access to detailed diagrams and schematics, diagnosing the blower system, replacing motors and modules along with associated wiring repair is a good area to look into. It can be highly profitable.

Lucas A127 Alternator

Lucas/Marelli A127 series of alternators (12096 as an example) still have a large presence in the market and a lot of Ford, New-Holland and Perkins-equipped machinery use this versatile unit. Rebuilding the alternator is straight forward and most parts are with the exception of the stator that is rare and hard to come by. In case you needed one, buying a complete unit could possibly be the only option.

There are 2 versions of the regulator for this series used, one standard (IL223) and one with an input for a battery temperate sensor (IL224). Testing the latter type has been the subject of a few calls on the ERA Help-Line. For proper testing of this alternator on the test bench, a 205 Ω resistor is required to be attached to the "Sense" terminal of the regulator (*Figure-5*) to provide the right input for testing. A 200 Ω resistor will also do, and if you don't have one, you can string five 10-SI resistors together to get the required resistance…!

The slip ring change is rather easy and can be done effectively in a short time. I recently came across a very reasonably priced version of this slip ring (WAI's 28-92852-1…¢51) that worked quite well (*Figure-6*). Distance between edges of the slip ring to the end of the shaft is important in any slip ring change, and this rotor's measure 15.5 mm as you see in Figure-7. This facilitates the installation of the new slip ring to the correct position on the rotor.



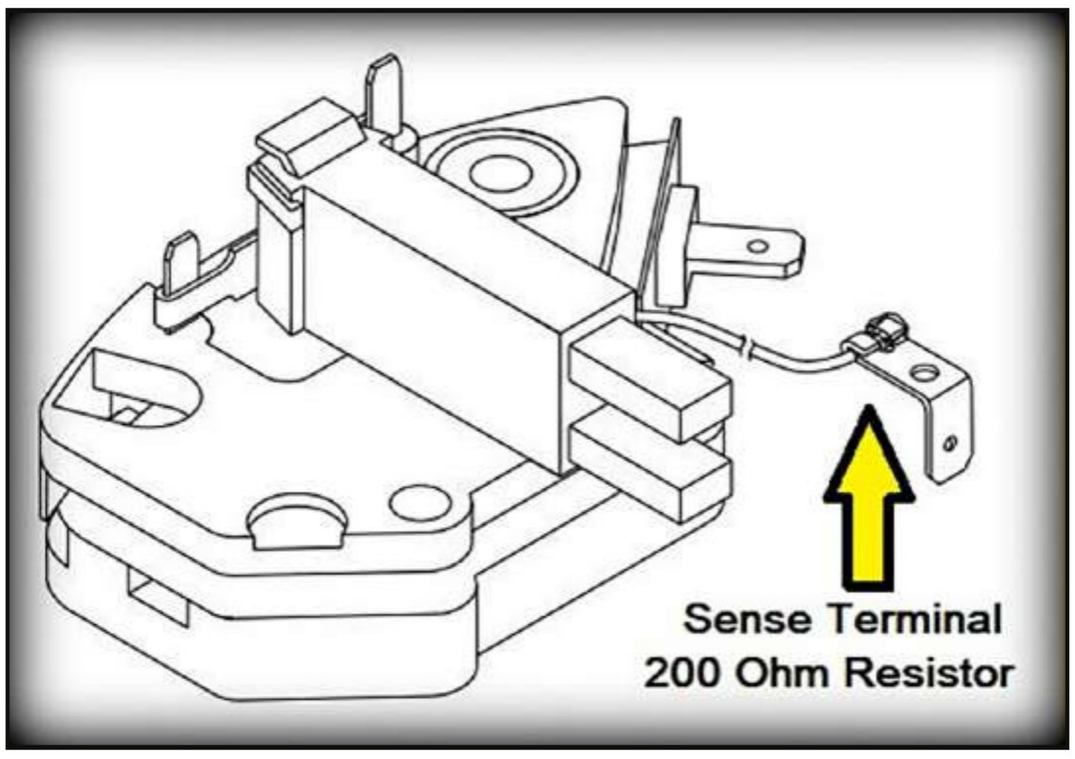


Figure 5 – WAI's IL224 regulator and its "Sense" terminal



Figure 6 – A127 rotor and its slip ring

Once the old slip ring is removed, the core can be prepped and the new slip ring can now be installed, its leads soldered, and turned on the lathe. The rotor draw as measured by a Jimco's SR-200 is 3.5 amps (*Figure-8*). As far as the measurements go, in my opinion, to the best I could come up with, any old slip ring that measures 1.015 -1.020" or lower is marginal and needs to be replaced.

In closing, I like to mentions that great effort has been put forward by many ERA staff, Committees and their members to make the 2020 ERA Show a great success. We are actively recruiting speakers and are working out the details of the show, ensuring this be an event that should not be missed by the members. So please mark your calendar for the weekend of March 26-28, 2020. I am looking forward to see many of you there.

That's all for this issue. Until I see you again, keep up the good work.

You can contact Mohammad Samii by email at: sammyselectric@sbcglobal.net, or by calling the ERA Tech Help Line at 636-584-8324.

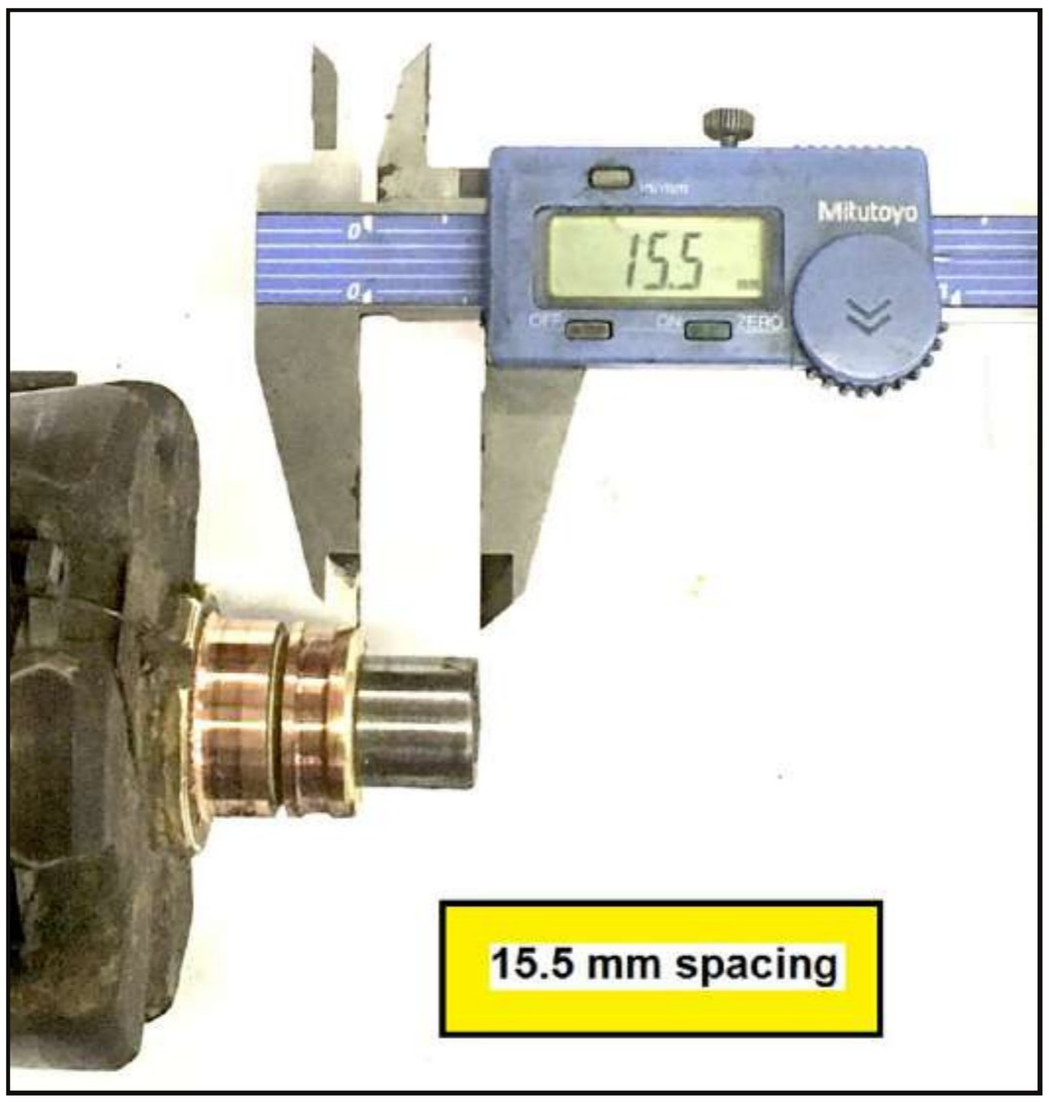


Figure 7 – Slip ring spacing, critical in any rotor



Figure 8 – Finished rotor and measured amp-draw

COMMON SENSE —
On the Way to Being Right



BY BOB THOMAS

Whether we like to admit it or not, we all make mistakes. Nobody is perfect, no matter what we may think. Once we accept that fact, we can benefit from our failures. But in order to do that, we have to treat each one of them as a learning experience.

Trial and error is a method of problem solving in which multiple attempts are made to find a solution. It is the most basic form of learning. There are no books, no classes and no you-tube videos. It can be most simply described as trying a method, observing it to see if it is successful, and if it is not successful, trying something different. Humans should be able to make educated choices as opposed to randomly trying something different.

When I was younger, it was sometimes called the School of Hard Knocks. But today, this way of learning from your errors is referred to as the scientific approach to failure.

When a scientist conducts an experiment, he or she is generally looking for a specific result to prove a hypothesis. If the expected result fails to happen, the experiment is not seen as a failure. It is a disappointment, yes, but failure, no. To the contrary, it is seen as learning a new piece of evidence that will lead to a new hypothesis and eventually result in finding the correct solution.

Over the years that I have been in this business, I learned many-a-lesson from my own failures, mistakes and errors in judgment. Some of those lessons were hard earned. Perhaps none proved more difficult to solve than those involving generators.

By the time that I ventured into this trade in the late 1970's, there were few generators left on the road. My niche market specialty was import units, mainly because some of the other shops in town were turning "foreign car" customers away. Those that were not, were buying and selling factory reman units from Lucas or Bosch or both. I knew what those shops were paying, making it easy to compete with them on price, yet still make a nice profit. So the vast majority of generators that I saw then were Lucas for British cars or the Bosch generators that fit mostly Volkswagen.

As the years rolled by, some of the competition closed, and I began to get more domestic generator business, mostly for antique cars. One in particular taught me a valuable lesson that I have never forgotten since. The car was a 1922 Mercer Raceabout and its generator was a three-brush type using a cutout. It was chain driven off of the flywheel end of the crankshaft, making it a particularly difficult R&R. The owner brought me the generator with cutout to see if it could be rebuilt.

Once apart, I quickly discovered that the armature would have to be rewound. It was shipped off to Holcombe Armature in Villa Rica, Georgia, and it took would have to be rewound. It was shipped off to Holcombe Armature in Villa Rica, Georgia, and it took about three weeks to locate a new commutator to complete the armature. During this time I did all of the normal prep work. The field coils were checked and carefully re-wrapped. All parts were cleaned and I modified a set of brushes to fit the generator's brush holders.

When the armature finally arrived, I put it all together with new bearings and tested it using a method that I had used countless times before. It passed the test and the customer picked it up. A few days later he called to tell me that it was installed on the car but still not charging. We both assumed a problem in the wiring of the 80-year-old car, so he drove it over for me to check that out (see photo).

The wiring was in exceptional condition for its



age. The cutout was getting battery voltage on the battery side but only minimal voltage from the generator. I had definitely missed something inside the generator. He removed the generator again and brought it back. After taking it apart and finding nothing wrong that "I could see". I took a step back to look at all of the known facts. Among those, the generator was not producing any significant voltage when measured between the armature post and the case (ground).

But before condemning the freshly rewound armature, I decided to run a test that would prove it to be good or bad, by checking for output at the point closest to the commutator – the brushes. When I connected a digital voltmeter directly to the brush leads and spun the generator, I had plenty of voltage. That proved that the armature was good.

A voltage drop test between the positive brush and the output terminal showed no lost voltage. But a reading between the ground brush lead and the aluminum CE housing showed plenty of voltage being lost there. While the aluminum housing showed no outside signs of corrosion, it was there, where a brass rivet attached the steel brush holder to the aluminum housing.

I learned three valuable lessons that day. The first is to beware of bi-metal connections that are riveted. The second is to always test a generator the way that it is connected on the vehicle – through a cutout relay. The third is that failure is a cost that you have to pay on the way to being right.

You can contact Bob Thomas by email: ere.bobt@gmail.com or by phone: 904-673-7301.



Figure 1 – Testing the generator wiring on a 1922 Mercer Raceabout

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ELECTRONIC BATTERY TESTERS
Replacing the Load Test



BY BOB THOMAS

For nearly 100 years, the most trusted test used to determine the performance capability of an automotive battery has been the load test. To pass a load test, the battery must first be fully charged. A 12 volt battery must maintain at least 9.6 volts under a load of one-half of its CCA rating for 15 seconds when battery temperatures are 70°F or above. When the test is conducted at lower temperatures, the minimum voltage drops accordingly. The chart on the next page shows the minimum voltage at various temperatures (*see Figure 1*).

The main drawback of the load test is that it is dependent upon the battery being fully charged. All too often, that is not the case when a battery is suspect. If a battery is recharged but then fails a load test, all of the time and effort spent recharging a bad battery was wasted. If on the other hand a load test is conducted without it being fully charged, the battery will likely fail the test, even though it may only need recharging. A newer technology has replaced the load test and it has been with us for decades.

In the mid-to-late 1980's, Motorola introduced what was probably the first electronic battery tester (*see Figure 2*), capable of testing a battery that was partially discharged. This tester estimated a battery's amperage capability based on its internal resistance, even if it was not fully charged. Internal resistance is a factor within the battery related to the condition of the plates and the electrolyte. It can be thought of as the resistance within the battery that restricts its ability to release stored energy in it.

A healthy lead acid battery's internal resistance is inherently low and thus has to be measured in milliohms (1/1,000th of one ohm). It is impossible to measure resistance that low with any standard volt-ohm meter. The resistance in your meter's leads and connections would throw the reading off by a factor in the hundreds.

Ohm meters capable of accurately reading resistance down to a few milliohms must use a method called **Kelvin sensing,** which requires four connection leads. A controlled amount of current is passed through the battery using two of the leads while the other two measure the drop in voltage across the connections. Getting an accurate reading requires that the leads be carefully placed and secured, with each side of both clamps making a good connection. Using this method, both amperage and voltage can be accurately measured, making it easy to calculate the resistance value down to a fraction of a milliohm.



ELECTRONIC BATTERY TESTERS

ERA member and Exchange contributor Nathan Unger of ASI Rebuilders in Abbottsford, British Columbia wrote an article describing how he built his own low-ohm tester for testing suspect connections. You can find it on the ERA website by searching for "Lord Kelvin".

General MacArthur once said, "Old solders never die, they simply fade away." You could say the same for most lead acid batteries. As any battery ages, its internal resistance slowly increases and its cold cranking amperage capability fades away accordingly.

Having owned and used a Motorola battery tester back in the day, I can testify that it was a helpful tool, capable of testing both 6 and 12 volt batteries. A large analog display provided voltage, CCA, kilowatts and "good" or "replace" in relation to CCA (*see Figure 3*). You dialed in the battery's CCA to get that reading. If the needle fell in the red, you could slowly dial the CCA knob back until the needle fell into the "good" range. That would give you the available CCA, which might be helpful information. This tester had a temperature select switch for testing batteries in sub-freezing weather conditions and a setting to estimate the amount of usable energy (in kilowatts) stored in the battery. The meter even told you if the battery was too low to test and needed a charge before testing.

In last month's article on how a battery affects charging voltage, I mentioned that battery conductivity is a better indicator of its condition than internal resistance, although they share an inverse relationship. Motorola sold all rights to their battery tester to Midtronics at some point. Midtronics has since continued to produce and market a line of high quality battery testers. Today they are making use of a newer technology that measures the battery's conductivity.

I wore out two of the old Motorola testers long ago and have since discarded them. But searching online, I found a used one on eBay for $25 with shipping. I also searched the internet for 'battery testers", and found dozens of different electronic devices, ranging in price from around $20 to more than $2,000!

Midtonics offers a full line of battery testers, all using their patented conductivity testing. I ordered the least expensive one, a Midtronics MPPBT-100 for $135 (*see Figure 4*) to see how well it would work. MPPBT-100 uses an LED display for voltage and LED lights for "OK", "Low" battery or "X" not OK. You set the CCA rating using up and down buttons, hit the test button and it displays the outcome almost instantly. "Low" indicates that the battery must be charged before testing.

Voltage vs Temperature		
Electrolyte Temperature F	Electrolyte Temperature C	Minimum Voltage Under LOAD
100°	37.8°	9.9
90°	32.2°	9.8
80°	26.7°	9.7
70°	21.1°	9.6
60°	15.6°	9.5
50°	10.0°	9.4
40°	4.4°	9.3
30°	-1.1°	9.1
20°	-6.7°	8.9
10°	-12.2°	8.7
0°	-17.8°	8.5

Figure 1 – Battery temperature compensation chart for load testing batteries



Figure 2 – Motorola Electronic Battery Tester with analog meters from the 1980's.

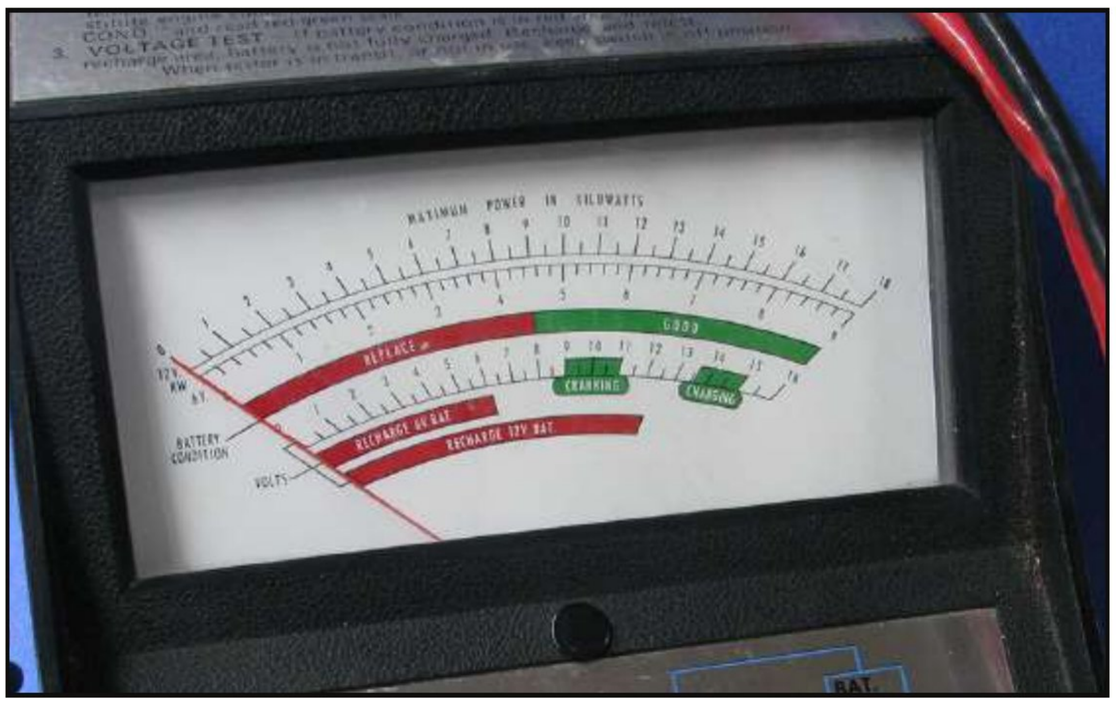

Figure 3 – A close view of the Motorola's meter displays a wide array of information

ELECTRONIC BATTERY TESTERS

I also purchased a less expensive tester made in China, the Suner Power digital battery analyzer, which uses Kelvin sensing leads to measure internal resistance (*see Figure 5*). You set the CCA rating, hit the OK button and the LCD screen displays the results (*see Figure 6*).

Each tester was used to check three different batteries. The Deka battery was less than a year old and known to be good. An Interstate battery was over five years old and would not hold a charge for more than a week. A third battery was in an old garden tractor. It had been sitting unused since May, when I bought a new mower, but I charged it before testing it. Here's what I found:

The Motorola tester performed exactly like I remembered it. It passed the year-old Deka battery when set at 500 CCA (*see Figure 7*) and showed over 7 kW of energy available. It's only downside is its bulky size. It failed both of the questionable batteries, but provided the amount of amperage that each one still had available. In the case of the garden tractor, it was enough to crank the Kohler engine without any problems.

The Midtronics tester came to the same conclusions, a good Deka battery (*see Figure 8*) and two batteries that should be replaced. This tester would make a good tool for selling batteries, especially if using it in front of a customer. But personally, I would prefer more information, especially when a battery is a borderline case. I was



Figure 4 – Midtronics MPPBT-100 battery tester



Figure 5 – Suner Power battery tester



Figure 6 – Suner Power tester's illuminated LCD display screen

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expecting more from Midtronics, and could have probably gotten more had I purchased one of their more expensive models. I will say that the Midtronics tester is assembled in the USA.

I was not expecting much from the Suner Power tester because of its low price. It too came to the same conclusion with each battery, but it provided a lot more information that I thought was interesting and might be useful in some instances. For one, it provides the internal resistance value of the battery. The Deka battery's resistance was 4.35 milliohms and 100% of the 500 CCA that I set it at (*see Figure 9*). By contrast, the Interstate battery had an internal resistance value of 9.86 milliohms (*see Figure 10*). You can see from the bar graph that its CCA is shown as OK at about 75%.

I confess to doing two things that skewed those results. First, the battery had just been taken off a charger which explains the surface charge voltage of 13.3v. Second, I had adjusted the CCA down to 300 to find out how much was actually left in the battery – about 225 CCA. I have no way of knowing how long this tester will last in a shop environment. But it is now my favorite battery testing tool.

You can make your own conclusions on which one is best for you, but all three of these testers are a lot quicker than a proper load test and two of them provide you with a lot more information.

Bob Thomas can be reached by email at bob@electricb.com or by phone at 904-673-7301.



Figure 9 – Suner Power tester display for the Deka battery



Figure 10 – Suner Power display for the 5-year old Interstate battery immediately after charging

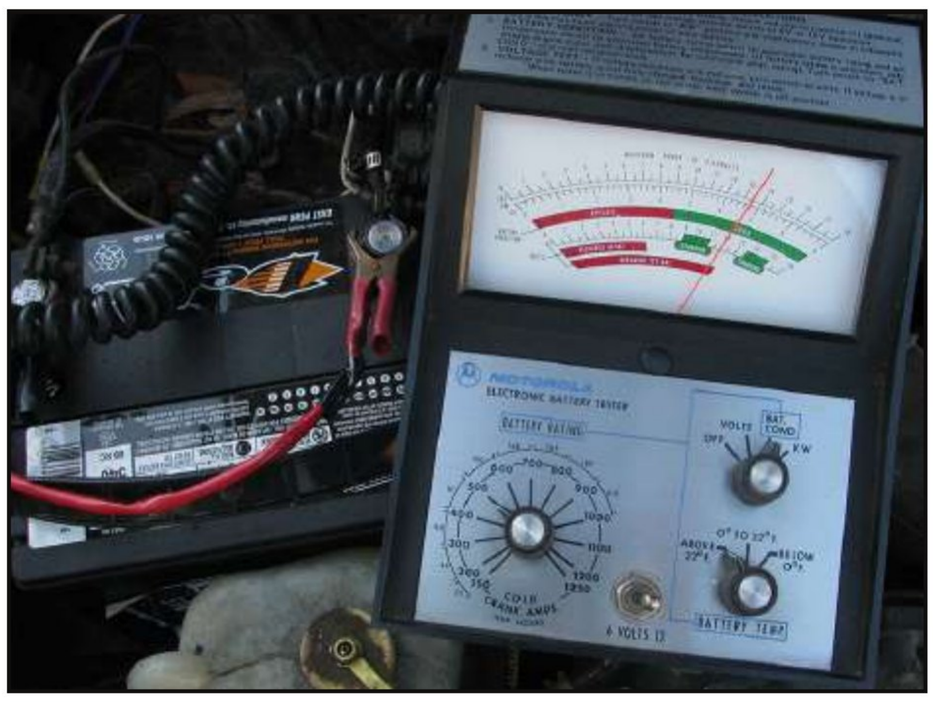

Figure 7 – Motorola tester passing the Deka battery



Figure 8 – Midtronics tester passing the Deka battery

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Schedule of Events
2020 ERA Expo – Cincinnati, OH
Holiday Inn Airport Hotel

THURSDAY, MARCH 26

8:00
Load Buses to J&N Electric

9:00
Arrive at J&N
Begin tours & seminars

11:30 - 12:30
Lunch

12:30 – 3:00
Seminars continue

3:00
Load Buses Back to Hotel

4:30 – 5:30
Seminar: Measuring/Effects of Voltage Drop in Charging/Starting Systems
with Dan Marinucci of Communique

5:30 – 7:00
Dinner Break

7:00 – 7:45
Seminar: Farm Tractor Electrical Systems Old & New
with Jim Guarino of Agri-Services

8:00 – 10:00
Roundtable Open Discussion
with Dan Smith of J&N Electric & Bob Thomas, ERA Exchange Editor

FRIDAY, MARCH 27

8:00 – 9:30
Seminar: Update on Voltage Regulators, LIN, and Test Boxes
with Gene Kaiser of Regitar USA

9:45 – 10:45
Seminar: Challenges in Heavy Duty Rebuilding
with Paul Sailon of Sailon Auto Electric

11:00 – 12:00
Seminar: Clutch Pulleys and IDP
with Allen Steadman of Litens Automotive

12:00 – 1:00
Luncheon Buffet

1:00 – 7:00
ERA EXPO
Raffles start at 5:00

SATURDAY, MARCH 28

8:00 – 9:00
Seminar: Market Outlook, Rebuilding, Buy vs. Rebuild Decisions
with Nick Staub of Romaine Electric

9:00 - 12:00
ERA EXPO
Raffles begin at 10:30

12:00 – 1:00
Luncheon Buffet

SATURDAY, MARCH 28 (CONT.)

1:00 – 2:00
Seminar: Golf Carts and Motor-Generators
with Jerry & David Kieffer of All Start Auto Electric

2:00 - 3:00
Seminar: Lathes, Cutting Tools, and Shop Practices
with Mike Dietrich of Action Alternator

3:15 – 4:30
Seminar: Updates, Rebuilding Techniques, Pictorials, etc.
with Mohammad Samii, ERA Tech Advisor

5:15
Load Buses to Sign Museum

6:00 - 10:00
Happy Hour & Dinner, Tour Museum, Tour Neon Sign Workshop, Performance by Ventriloquist

10:00
Return to Hotel

SUNDAY, MARCH 29

8:00 – 9:00
Annual ERA Board of Directors Meeting
(All Members Welcome)

REBUILDER REGISTRATION FORM

PLEASE NOTE:
THE J&N ELECTRIC TOUR IS ONLY AVAILABLE WITH THE ENTIRE SHOW BUNDLE

Cincinnati, OH
March 26-29, 2020



COMPANY NAME _____

ADDRESS _____

CITY _____

STATE/PROVINCE _____ ZIP/POSTAL CODE _____

PHONE _____ FAX _____

EMAIL _____

SEND THIS FORM WITH A CHECK OR CREDIT CARD INFO TO:

ELECTRICAL REBUILDER'S ASSOCIATION
PO BOX 906
UNION, MO 63084

OR FAX TO: 636-584-7401

OR EMAIL TO: office@electricalrebuilders.org

TO PAY BY CREDIT CARD: (circle one) MC VISA DISCOVER AMEX

CARD NUMBER _____

NAME ON CARD _____

EXPIRATION DATE _____

ATTENDEES NAMES (Please print clearly) **EVERYONE MUST REGISTER**	**REGISTRATION** INCLUDES: EXPO FLOOR ACCESS, FRIDAY AND SATURDAY LUNCHEONS & THE AMERICAN SIGN MUSEUM ADMISSION WITH DINNER & ENTERTAINMENT		**ENTIRE SHOW BUNDLE** INCLUDES: EXPO FLOOR ACCESS, FRIDAY & SATURDAY LUNCHEONS, **ALL SEMINARS, J&N ELECTRIC TOUR WITH LUNCH** & THE AMERICAN SIGN MUSEUM ADMISSION WITH DINNER & ENTERAINMENT		SUB TOTAL
	MEMBER BEFORE 2/28 **$195** AFTER 2/28 **$245**	**NON-MEMBER** BEFORE 2/28 **$295** AFTER 2/28 **$345**	**MEMBER** BEFORE 2/28 **$325** AFTER 2/28 **$375**	**NON-MEMBER** BEFORE 2/28 **$425** AFTER 2/28 **$475**	
1)					
2)					
3)					
4)					
5)					
6)					
7)					

Cancellation Policy: Cancellations are subject to a 15% processing fee. **NO REFUNDS** will be made after February 28th.

TOTAL ⇨

Make Plans to Spend the Day at J&N Electric

Mark your calendars now for March 26th, 2020. The ERA Tradeshow kicks off in high gear on Thursday. We will arrive at J&N at 9:00 a.m. to begin an exciting day of information, tours and a delicious meal. The tours will include a trip through one of the most sophisticated, high tech warehouse and shipping facilities in our industry and we will also get a look at what's going on in J&N's rebuilding shop.

As most of you are aware, J&N Electric carries many non-rotating electrical products. They want you to be up to date on all of the product lines that they carry. Various manufacturers will present the very latest information on their products, such as:

- Learn all about the latest in LED lighting and what is candlepower vs. lumens?
- Did you know that there are now vehicle specific fuses?
- What is the real difference between an intermittent vs. continuous duty solenoid?

Stay ahead of your competition! Learn all of this valuable information! Increase your sales and your bottom line! Come and spend the day with us at J&N Electric!

BARSANCO, INC.
+
IAT INC.

We are pleased to announce that Barsanco is now part of IAT.

Coming together to create an industry-leading global supplier of starters, alternators and component parts.

~ Now located in Southfield, Michigan ~

EXPECT GREAT THINGS:

- New, 19,000 square foot, state-of-the-art warehouse
- More than 6000 new part numbers
- Worldwide shipping
- Top-quality parts, including OEM units
- Full line of aftermarket units & parts
- Knowledgeable, experienced sales team
- Friendly, exceptional service
- Outstanding prices & warranty

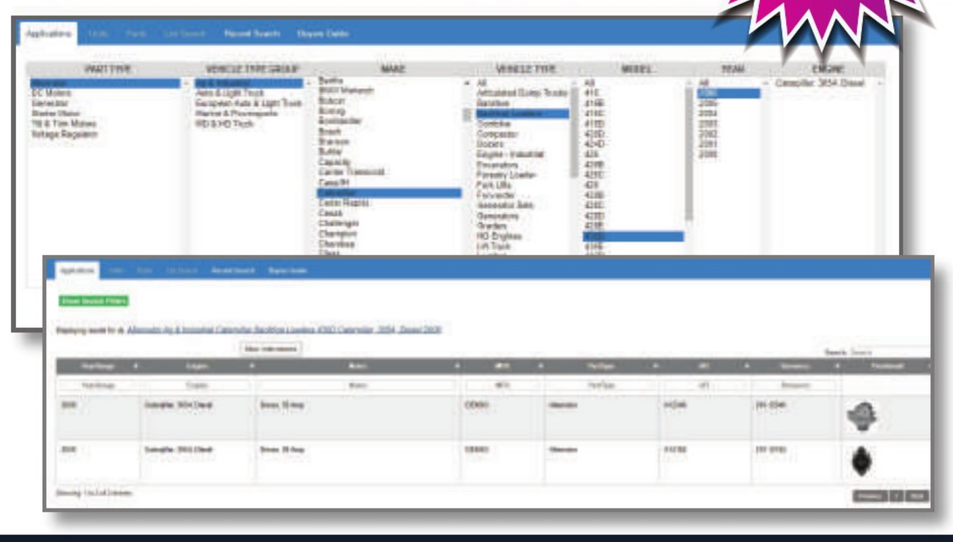
Valeo · Letrika · Litens · Lucas · INA · Magneti Marelli · Bosch · Mahle · Magneton

POWERFUL NEW WEBSITE:

Online lookup by application, manufacturer and part number. Part breakdowns too!

www.iat-usa.com

COMING SOON!



Check out our new website at **www.iat-usa.com**
Features online look-up by application & part number as well as comprehensive unit breakdowns.

IAT INC.
22218 Telegraph Road
Southfield, MI 48033

Call Toll-Free
1.800.872.8890

Don't Forget to Book Your Stay!

Holiday Inn Cincinnati
Airport Hotel
Erlanger, Kentucky 41018

(888) 294-5067
Group Code: ERA



Rooms are $99 per night + tax

Hotel rooms must be booked by February 28, 2020 to obtain the group discount. After February 28th, prices will return to standard rates.



Spend Saturday Evening at the American Sign Museum

What is the American Sign Museum?



The American Sign Museum is dedicated to the art and history of commercial signs and sign making. The American Sign Museum is proud to be the largest public museum dedicated to signs in the United States! Covering more than 100 years of American sign history in 20,000 square feet of indoor space, the museum is a walk through the ages of technology and design.

The storefront-laden Signs on Main Street display recreates a typical "Main Street USA", with shop windows full of sign-related objects, curiosities, and samples.

Guided tours or an audio tour on your phone are great ways to explore the Museum. Explaining the larger topics, as well as surprising stories about the signs themselves, paints a clearer picture of the collection and is highly recommended. At the end of guided tours, don't forget to check out Neonworks of Cincinnati, the full-time neon workshop located inside of the museum! You can see tube-benders working their craft making signs for sign companies today.

NEED HELP? It's Just A Phone Call Away

1-636-584-TECH (8324)

Tech Help from Mohammad Samii



Do you need help testing an alternator or getting it to work as it should on a vehicle? Call the ERA Tech Help Line and talk to an industry veteran that has over 40 years of rebuilding and on-car experience. Mohammad Samii can help you to find the answers that you need to solve any rebuilding problem. No question is too difficult. "Sammy" has a formidable list of resources at his disposal and is backed up by a line of regular ERA Forum contributors. The ERA is there to help when you need it.

Have you seen this ERA label that's available?

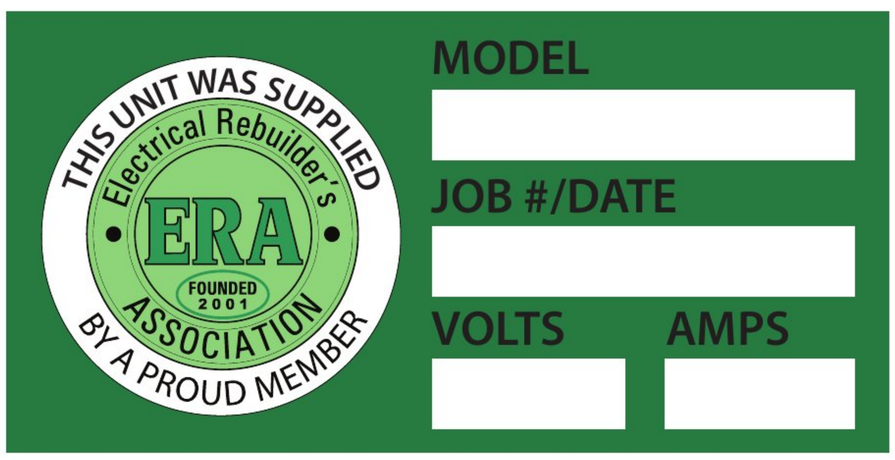
In response to requests for a label to help members identify their alternators and starters, this new ERA Unit ID label is now available. The 1.5" x 3" tough waterproof vinyl label provides space to write or stamp a unit number, your invoice number or date, the units voltage and the unit's amperage. 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.**

18 labels per sheet

1 sheet: $14.00 each
6 or more sheets: $12.00 each

Price includes postage within the U.S.



ACTUAL SIZE

REBUILDER'S MARKETPLACE

PARTS, SUPPLIES, EQUIPMENT FOR SALE

Vintage starter and generator field coils. Ace, Autolite, IPM, Preferred Electric and Vulcan part numbers. Listed in Excel spread sheet to send via email. Call 860-528-8174 or email ken@guyselectric.com

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Battery charger repair parts for all brands, batteries and battery chargers for all applications. PLP Battery Supply 800-642-3451 www.plpbattery.com

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WANTED rebuildable Military electrical cores, any quantity, Prestolite 60 amp alts, Leece Neville 24V starters, CE Niehoff 24V alternators, Bendix 650 amp oil cooled alts, 300 amp Teledyne generators, any quantity, send your list or if not sure send pictures, and we can identify. 305-633-1524 or hy@cmearma.com

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Selling a used Jimco brand test bench for starters, alternators and generators. Call 815-747-6110

3500 AND 3599 CORES. Contact Larry at Hagemeister Enterprises. 800-944-0494

For sale lots of cores heavy duty, industrial, agricultural and import. Call with OE or Lester numbers 314-664-2101

Do you have any surplus tools, equipment or parts that you don't need and would like to sell? As an ERA member, you can list up to 25 words for free right here. It is just one of many ERA membership benefits.

BUSINESS FOR SALE

Complete starter and alternator rebuilding business w/house, shop and barn on two acres in the country. Well established with loyal clientele. $210k (920-566-2723)

Need technical help with an alternator that won't charge or a starter that won't crank? Call **Mohammad Samii** at the ERA Tech Help Line - **636-584-TECH (8324).**

Alternator and starter shop for sale in central Oregon good clientele. Main focus is battery sales, new and rebuilt alternator's and starters appx 1500 units in stock. Has been in business sense 1985 located in Redmond Oregon. Bend is 18 miles away Redmond and bend are the fastest growing city's in Oregon. There is also a 2 bedroom apartment above the shop. Larry H 541-401 3881

Have you had an experience or learned something new that you'd like to share with other members? Call **Bob Thomas** at: **904-673-7301.**

SERVICES

R&R ALL STARTER DRIVES. North Atlantic Starter Drive, 741 Broadway, Pawtucket, RI 02861 800-822-2735 Email: popsy26@verizon.net

MISCELLANEOUS

United Battery Systems in Portland, Oregon is seeking an experienced Rotating Electrical Rebuilder. Qualified Applicants will have 3 to 5 years' experience rebuilding Alternators, Starter Motors and Generators. Please email a resume to susan@unitedbattery.net to apply for this position.

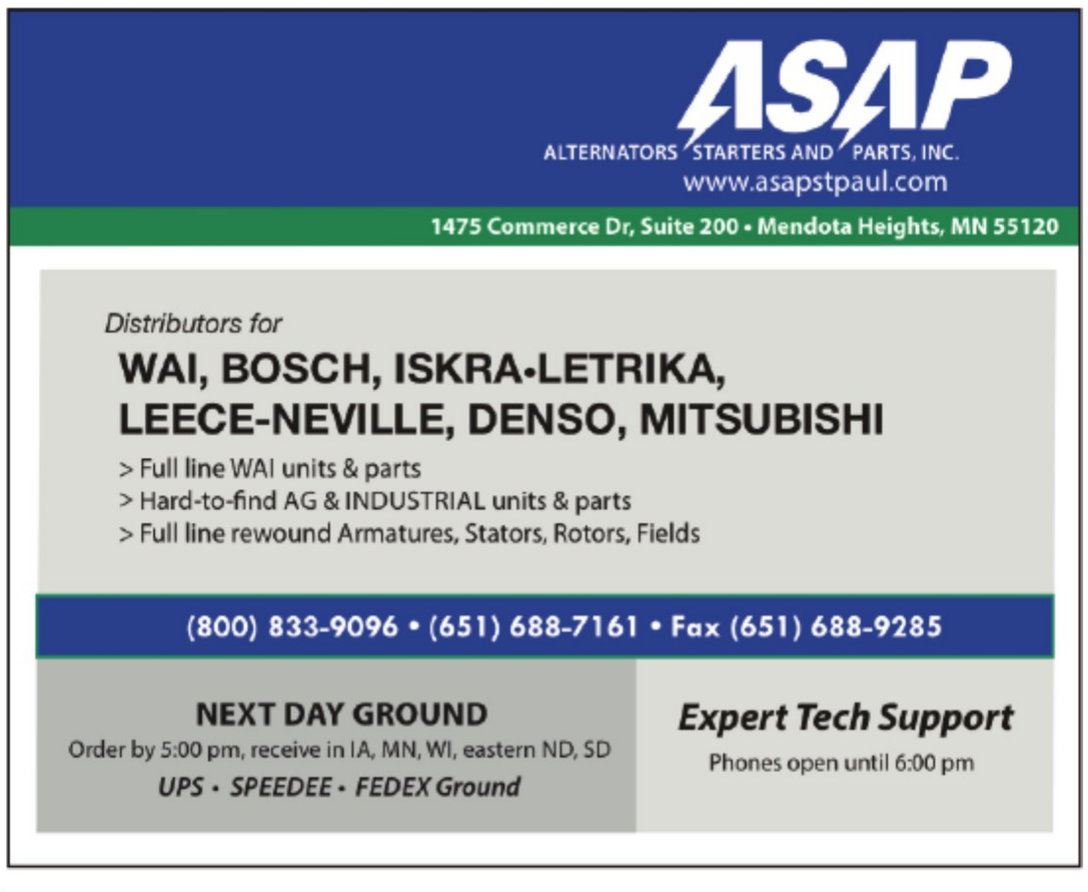
Partner wanted in great weather Myrtle Beach. Bring your shop or stock too much work here for just me. 50-50 deal 843-455-8062

HIRING: Looking for a change but want to stay in the industry? Join our growing Sales team! Please email info@regitar.com for more information.

Would you like to know what other members think about a particular issue related to your rebuilding business? Go the the ERA's website – **electricalrebuilders.org** and check out the ERA Forums.

ADVERTISING: If you'd like to submit a classified ad, email Stephanie at smsdesigns@hotmail.com. ERA members receive the first 25 words free. It's an ERA benefit!







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NEED HELP? It's just a phone call away. 1-636-584-TECH (8324)



The ERA ... We've Got It All Online For You!

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Equipment Manuals • Forms • ERA Exchange

WE'RE HERE FOR YOU 24/7
www.electricalrebuilders.org

J&N®

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PRODUCTS



PROUDLY SERVING
REBUILDERS
Over 65 Years!

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