THE EXCHANGE

AN ELECTRICAL REBUILDER'S ASSOCIATION PUBLICATION

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The 31st Annual

Buyer's Guide

SOURCES 2014

See pages 4 to 10

The Who's Who of Electrical Rebuilding since 1984

What Is A Trade Show?

BY THE EXCHANGE STAFF

What is a trade show? That is an easy question, right? If you believe that, you probably believe that all trade shows are the same, too.

A trade show is a gathering of two groups of people, buyers and sellers, who work in the same field. That is the simple answer. That is also where all of the similarities to the ERA Trade show end.

The first trade shows in North America were probably held by fur traders, who realized that they could buy the best and freshest furs if they went straight to the trappers. It was known as the "rendezvous", a meeting at an agreed upon place at an agreed upon time. The word is French, as it sounds, because French fur traders in Canada originated this annual ritual.

If you have ever watched the film "The Mountain Men", staring Charlton Heston and Brian Keith, you know exactly what happened at those events. The northwest frontier was a wild place, and the trappers who worked the western Rockies had to be resourceful to survive. But once a year, they let down their guard to sell their furs, have one heck of a good time and spend most of the money they made for the year, all in a few days. Not only did the buyers bring cash to purchase those precious furs, they also brought supplies and services to sell, and that included every vice known to man at the time. When it was over, the merchants left with all of the furs and most of the money that they brought to the rendezvous to buy them. Once the trappers recovered, they returned to the wilderness to start all over again. How times have changed.

Most trade shows today are basically put on by the sellers through a trade organization. The sellers carry the financial burden of putting on the show, in exchange for the opportunity to

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Atlanta, Georgia



MARCH 21–23, 2014

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ERA Trade Show

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Shop Profile George Lemieux— 56 Years And Still Rebuilding

BY THE EXCHANGE STAFF

When George Lemieux mustered out of the Army in 1957 after serving in Korea, and started an apprenticeship with a starter and generator rebuilder, he was unaware of where it would eventually lead him. Fifty-six years have passed since then, and at the age of 78, he is still working in the industry, rebuilding starter drives.



Figure 1—George Lemieux rebuilds starter drives for stock when he's not busy rebuilding special drives.

"The apprenticeship took me five years to complete," Lemieux remembered. "On March 1, 1963, I incorporated my own rebuilding business in Pawtucket, RI and called it Gemco Enterprises." The new business grew rapidly throughout the 60s and 70s, based on a philosophy of providing quality reliable alternators, generators and starters. "We had trucks on the road, picking up cores and delivering product for customers in several states. At one time, I had 50 employees, and we were rebuilding 400 to 500 units a day. We also started a specialty department, rebuilding import alternators, generators and starters."

After 17 years in business for himself, Lemieux sold Gemco in 1979, with the agreement to stay on and manage the business for three years for the buyer. "It turned out to be more like a sentence than a job," he admitted. The new owner's business philosophies clashed head on with Lemieux's. "All he was interested in was cutting costs to sell in volume to large parts warehouses. I always rebuilt or replaced every drive and solenoid in every starter," he said. But the new owner wouldn't allow that. "I came to regret that decision to sell out, as the quality of the units diminished."

Once the three years passed, Lemieux left the business that he had founded, to open, what is now, North Atlantic Starter Drive, in 1982. They rebuilt starter drives and solenoids for other rebuilding shops, concentrating on domestic drives sold in bulk and Delco solenoids. At the time, General Motors, Ford and Chrysler products represented the lion's share of the auto parts market. "We concentrated mostly on the high volume automotive starter drives and solenoids," he said. His customers were rebuilders in the New England area. He also sold armatures and stators, which were subcontracted out for rewinding. "I had eight employees working for me at the peak of our production, just rebuilding drives and solenoids."

As the Japanese car market grew in the US, the demand for import drives increased. Lemieux saw that coming and filled the need by rebuilding import drives. At the same time, the demand for Delco solenoids and the bulk sale of domestic drives slowly faded away. He

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Serving the automotive electrical aftermarket

SINCE • 1983

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Quality Control
OEM vs. Aftermarket

BY BOB THOMAS

An all too common complaint I hear from rebuilders is that some replacement parts which they buy do not fit or work properly. This is not a new problem, but it seems to be a lot more prevalent today. The questions are: Why does this happen? ... and ... What can we as rebuilders do about it?

There was a time, not so long ago, that if you were rebuilding any Delco Remy starter you could buy any part of it, down to brush screws and terminal nuts. Those service parts were widely available from independent Delco Remy warehouse distributors, and there were many of them all across the country. Most of those same warehouses also sold service parts for other brands, like Motorola, Leece-Neville, Prestolite, Denso, Bosch and Lucas. All of those original equipment (OE) service parts were identical to the originals. They all fit and worked properly.

Some of the OE parts were actually reasonably priced, but others carried what seemed like exorbitantly high margins—perhaps justified or maybe not. However, that does not really matter at this point in time. What does matter is that it opened the door for aftermarket component parts and competition based on price.

Aftermarket suppliers manufactured their own versions of some replacement parts, specifically the best sellers. It was relatively easy for them to make a part of equal quality to OE, be competitive in pricing and still maintain a healthy margin. Some of the original manufacturers lowered their prices to compete with the aftermarket, while others slowly phased out the selling of component parts altogether, because rebuilders stopped buying them. Today, some OE manufacturers of alternators and starters focus on selling complete units at lower margins instead of supplying a line of service parts. They have basically given up on selling parts to the rebuilding industry. They view rebuilding as the competition to their new units.

Our aftermarket suppliers have put a lot of effort into filling the gap. But today, there are so many different makes and models of vehicles and equipment, with literally thousands of different alternators and starters, that it is virtually impossible for anyone to supply service parts for all of them. As an alternative, some of our aftermarket suppliers offer complete units instead of parts, but that's another story for another time. This is about quality control of aftermarket component parts and how we got to where we are.

From the rebuilder's perspective, it appears that it should be easy enough to simply copy an OE part in every respect. In other words, use exactly the same materials and identical physical dimensions. But reverse-engineering a part is not always as easy as it seems. Figuring out the exact metallurgy or composition of a component part's individual pieces can be time consuming, less-than-exact and expensive. Spending the time and the money to get it right drives up initial costs. That can, from a manufacturer's or supplier's perspective, prevent some component parts from ever being made. It also causes compromise in the quality-control process for those that do.

Cost pressure begins at the bottom, not the top. It begins with our customer's demands. We pass their cost demands on to our suppliers, and many of them pass these demands on to the manufacturers who are making the aftermarket parts. What quality control there is today has been placed in the hands of the manufacturer of those parts, who, in many cases, also happens to be the lowest bidder. In a nutshell, there is little to no quality control when that happens. Price

(See QUALITY, pg. 9)

THE LOWEST BIDDER

There is hardly anything in the world that someone cannot make a little worse and sell a little cheaper, and the people who consider price alone are that person's lawful prey. It is unwise to pay too much, but it is worse to pay too little. When you pay too much, you lose a little money. When you pay too little, you sometimes lose everything, because the thing you bought was incapable of doing the thing it was bought to do. The common law of business balance prohibits paying a little and getting a lot. If you deal with the lowest bidder, it is well to add something for the risk, and if you do that you will have enough to pay for something better.

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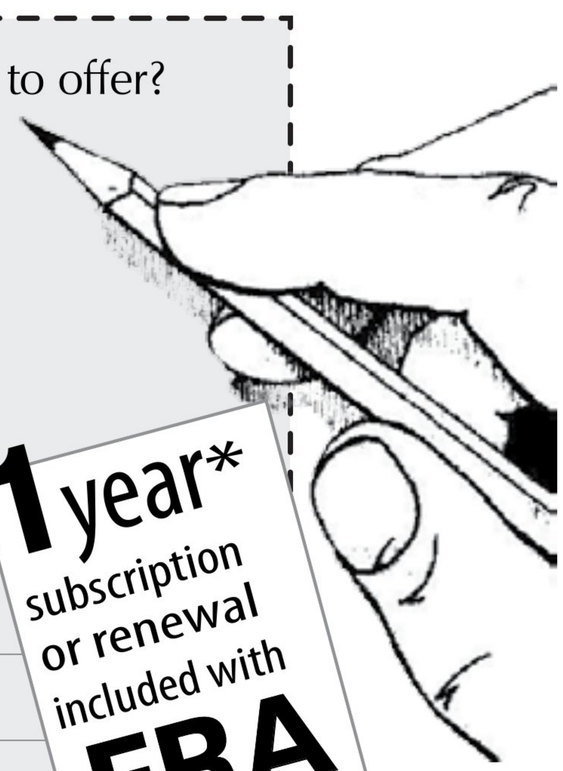
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Churubusco, Ind.

"I am an ERA member because it pays dividends.

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From The President's Desk
Come To Atlanta

COLUMN BY HANK HENKE



When a group of ERA members sat around a table in Indianapolis last spring to decide where to hold the 2014 show, the first show we would be organizing on our own, several cities were suggested. As pros and cons of various locations were discussed, Atlanta emerged as simply the best choice.

First, Atlanta is centrally located in the southeastern US. Since the ERA Trade Show's inception over 25 years ago, it has been held in the southeast only twice before—at Atlanta in 1998 and at Charlotte in 2006. Both of those shows had good attendance. One of our goals going in was to increase the opportunity for rebuilders' participation.

Second, Atlanta has the most flights of any airport in the US—with over 46 million passenger boardings last year. You can fly there non-stop from almost anywhere. Three major Interstate Highways (I-20, I-75 and I-85) intersect in Atlanta. You can drive there in less than a day from almost any town in the southeast. Atlanta is accessible.

Third, Boles Parts Supply offered us a plant tour that was simply too good to turn down!

The fourth reason, the real closer, was an endorsement from Polly Shea, who sold the show and this newspaper to the ERA that very weekend in the spring of 2013. She said that her plan, had she not sold the show, was to hold the next one in Atlanta!

It was an easy choice for us to make. And now the choice is up to you. We have planned this event to make it as easy and as inexpensive as possible for you to attend. We moved it to an earlier date, so that it will be easier for rebuilders, who are in agricultural markets, to take advantage of the show without missing their busiest time of the year. We have reduced prices to make it even more affordable.

We have planned a series of seminars focused on topics and speakers that rebuilders have asked us for. We have gone to great lengths to ensure that this will be the best show that our industry has ever had. I'm sure that you have heard the saying, "You can lead a horse to water, but you can't make him drink." I say to all of you who read this—we can offer you great things, but we can't force you to come. Only you can make that decision.

The ball is in your court now. You can decide to "be in the game" or just sit at home on the couch and complain that the economy is bad and there is nothing you can do to improve your business. I can tell you that there is a lot to be learned beyond the seminars and the exposition hall at an ERA show. Sitting in the hotel lobby or in the hotel bar or restaurant—anywhere you go in the area, you will find a sharing group of people—who, for three days, will lower the walls around themselves and look at what is good for the rebuilding industry—not just their own companies. Please make an investment in yourself and your company that will last you a lifetime. Attend the ERA show March 21–23, 2014. Fill out a registration form and mail it in—make your reservations today!

Hank Henke, ERA president, is owner of United Starter & Alternator, Lowell, Ind.

ERA

Electrical Rebuilder's ERA 26th Annual EXPO 2014

ATLANTA, GEORGIA
MARCH 21–23

NEW ERA MEMBERS

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Electrical Rebuilders Inc.
Saukville, Wis.

OBITUARY

Jerome Mariam passed away on December 1, 2013 after a long battle with cancer. Known to rebuilders by his nickname, Jerry, he was the owner of several automotive related businesses including Quality Equipment Sales in Gardena, Calif. Jerry and his company provided a valuable service to the rebuilding industry by salvaging and selling used rebuilding equipment. He was 71 years old and is survived by his younger brother Joseph and two cousins.

OBITUARY

Dennis John Tobin, Director of Training for Remy International passed away on December 4 at the Medical College of Virginia from injuries sustained in a traffic accident on December 2. He was struck by a passing SUV while standing outside his car. Dennis was known throughout the rebuilding industry for his many seminars, including the 2012 ERA Show in Allentown, Pa. about the 44MT starter and the 40SI alternator. He was 65 years old and left behind a loving family and many friends.

31st Annual Buyer's Guide
SOURCES 2014
The Who's Who of Electrical Rebuilding

ABS PRODUCTS, INC.
591 Apollo Street
Brea, CA 92821
714-671-0728
Website: abs-products.com
Parts/Products: Abrasive blasting cabinets using baking soda media, polishing lathes for racks, axles and armatures.

ACCUMAX AUTO PARTS, INC.
1808 Roosevelt
Joplin, MO 64801
417-624-8886 • 866-624-8886
Website: accumaxparts.com
Parts/Products: Starter drives and solenoids, small switches.

AIM
3920 Security Park Drive
Rancho Cordova, CA 95742
916-985-8505 • 800-366-3246
Website: aimpartsonline.com
Parts/Products: Alternators, starters, component parts, import and domestic.

AIR STARTERS AND PARTS (ASAP)
110 Rose Lane
Frisco, TX 75034
972-377-9911 • 866-305-2727
Website: asapstarters.com
Parts/Products: Aftermarket parts for air starters. Manufactured to meet or exceed OEM standards. We sell factory genuine parts/units as a dealer for other manufacturers of air starters. Including Ingersoll-Rand, TSI, Startmaster, Pow-R-Quik, Caterpillar, Solar, Switzer, Trust, Thor and Austart specifications. Parts include vanes, cylinders, rotors, end plates, drives, pinions, seals, gaskets, o-rings, and repair/tune-up kits. Hard-to-find parts.

ALFA AUTO ELECTRIC, INC.
6021 Boulevard Thimens
Saint-Laurent, Que., H4S 1V8, Canada
514-343-9201 • 888-646-2532
Website: alfastator.com
Parts/Products: Manufacture stators and rotors.

ALLTECH DISTRIBUTION, INC.
3611 Rue Jarry E
Montreal, Que., H1Z 2G1, Canada
514-328-1101 • 800-606-6181
Website: dcalltech.com
Parts/Products: New starters and alternators.

ALTERNATOR & STARTER PARTS DISTRIBUTORS (ASPD)
530 National Drive
Gallatin, TN 37066
615-452-2313 • 800-338-2099
Website: aspdasap.com
Parts/Products: Specialize in rewinding rotors and armatures for starter and generators, and rewind our own stationary rotor coils for brushless alternators. We also carry components such as solenoids, regulators, rectifiers, drives, etc.
Services: R&R services on armatures and rotors that we do not stock or are hard to find.

ALTERNATORS STARTERS & PARTS (ASAP)
2859 Lexington Ave. South, Suite 200
Eagan, MN 55121
651-688-7161 • 800-833-9096
Website: tomsasap.com
Equipment: Transpo and JIMCO test equipment.
Parts/Products: Distributor for WAI/Transpo, Zen drives, Wilson, Dixie, Bosch, and Iskra; complete line of starter and alternator units; wide selection of component parts (many hard-to-find pieces); comprehensive line of rewound armatures, stators and rotors; broad range of remanufactured drives and solenoids.
Supplies: Paints, lubricants, cleaning media.
Services: Same day shipping until 5:30 p.m. CST.

AMBOSS CORP.
427 Honeyspot Road
Stratford, CT 06615
203-380-2466
Website: ambosscorp.com
Equipment: KB starters, alternators and repair parts.
Parts/Products: Repair parts for starters and alternators.

AMCAN BEARING COMPANY
943 Matheson Boulevard East
Mississauga, Ont., L4W 2R7, Canada
905-624-9948
Website: amcanbearing.com
Equipment: Material handling equipment.
Products: Bearings and industrial products.

AMSCO VALLEY FORGE
90-L Plant Avenue
Hauppauge, NY 11788
631-435-1400 • 800-645-5604
Website: amscovf.com
Parts/Products: Manufacturer and full line distributors of alternators, starters and component parts.
Supplies: Full line of shop supplies including paints, lubricants, boxes.
Services: Warehouses in New York and Illinois.

API MARINE
1311 NW 65 Place
Ft. Lauderdale, FL 33309
954-975-7373 • 800-327-6086
Website: apimarine.com
Parts/Products: Manufacture marine Trim 'n Tilt motors and pumps, starters and alternators, hydraulic cylinders and control valves.

APPTRAK
2021 Toledo Street
Bellingham, WA 98229
360-676-9431 • 800-999-0094
Parts/Products: A computer database information system designed specifically for the professional electrical rebuilder or distributor, in an easy-to-use and easy-to-learn format, featuring all industry part number systems.

ARCO STARTING & CHARGING SPECIALISTS
3921 West Navy Blvd.
Pensacola, FL 32507
850-455-5476 • 800-722-2720
Website: arcomarine.com
Parts/Products: Manufacturer/supplier of marine electrical units and components.

A.R.E. INDUSTRIES, INC.
520 S. Holland Suite 501A
Wichita, KS 67209
800-782-6456
Website: areindustries.com
Equipment: Steel shot blasters, vibratory degreasers, aqueous washers, flo-thru washers and electric presses.
Parts/Products: Blades, steel shot, ceramic media, aluminum media, shaker springs, soap and press tooling.
Services: We carry a wide selection of refurbished equipment.

ARMATURE SALES & REBUILDERS
2403 N. Texas Ave.
Bryan, TX 77803
979-775-9800 • 800-657-2004
Equipment: Refurbished and used blasters, shakers, alternator testers, voltage regulator testers, rectifier testers, growlers and more.
Parts/Products: Armatures, rotors, stators, field coils, solenoids, starter drives, bushings, brushes, DE and SRE frames, and 30,000-plus new and rebuilt units.
Supplies: Sand and glass bead blasters.

ARROWHEAD ELECTRICAL PRODUCTS
3787 95th Ave N E
Blaine, MN 55014
763-255-2555 • 800-328-5454
Website: arrowheadep.com
Parts/Products: Replacement alternators, generators, starters and components for automotive, light and heavy-duty truck, agricultural, marine, ATV and power sports, lawn and garden, small engine, and other industrial and heavy-duty applications.

ASE SUPPLY, INC/THERMO BY PRODUCTS
7710 NE 17th Ave
Portland, OR 97211
503-288-0100 • 800-289-2737
Website: asesupply.com
Equipment: Digital Meter, AMFOR Electronics, Midtronic Battery and Systems Testers.
Parts/Products: ISKRA; Denso; Robert Bosch; Arrowhead; Unipoint; Mitsubishi; Hitachi; Western Motors; Leece-Neville; Delco; RCP; Transpo; Sure Power; Balmar; Xantrex inverters and repair; Magnum inverters and repair; Aervoe paint and products; Valeo; Magneto parts; Nikko; Klixon circuit breakers; small engine parts (OEM and aftermarket); and Thermo King reefer parts.
Services: Xantrex and Magnum inverter repair. Complete rebuild services.

AUTO METER PRODUCTS, INC.
413 West Elm St
Sycamore, IL 60178
815-899-0800 • 866-248-6356
Website: autometer.com
Parts/Products: Test equipment for alternators, starters and batteries.

AUTOMOTIVE COMPONENTS COMPANY
747 Spradley Road
Van Buren, AR 72956
479-474-4400 • 800-327-6946
Website: autocompco.com
Parts/Products: All small parts—specializing in foreign and domestic starters, alternators, heavy duty (cores). We have 225,000 sq. ft. full of cores.

AUTOMOTIVE ELECTRONICS SERVICES (AES)
5465 E Hedges Ave
Fresno, CA 93727
559-292-7851 • 877-351-9573
Website: aeswave.com
Equipment: Fluke scopes and multimeters; UEI scopes and multimeters; insulated hand tools, high voltage gloves; shielded leads for scopes and adapters for scopes and multimeters; various automotive scan tools and other automotive diagnostic equipment.

AUTOMOTIVE PARTS REMANUFACTURERS ASSOC
4460 Brookfield Corp. Dr., Suite H
Chantilly, VA 20151
703-968-2772
Websites: apra.org / BigRShow.com
Services: APRA is a full-service trade association dedicated to the automotive aftermarket.

AUTOMOTIVE PRODUCT RESEARCH, INC
P.O. Box 72067
Roselle, IL 60172
630-539-7683
Parts/Products: OEQ (original equivalent) alternator and starter components and new assemblies.
Supplies: Silver solder, heat transfer compound.

AUTOSEM, INC
1701 S Main St
South Bend, IN 46613
574-288-8866 • 888-6-DIODES
Website: autosem.com
Parts/Products: New and remanufactured rectifiers and regulators produced in our facility in Indiana. OEM rectifiers, regulators, starters and alternators. High output rectifiers.

BARSANCO, INC
26674 Liberal St
Centerline, MI 48015
586-755-1491 • 800-421-3374
Website: barsanco.com
Parts/Products: Full line of parts and units, foreign, domestic, passenger, agriculture, heavy duty. Specializing in replacement units.
Services: Extremely fast shipping. Nearly all orders shipped same day.

BAYCO INDUSTRIES DBA KDOW, INC
4790 Caughlin Pky #445
Reno, NV 89509
775-746-1359
Website: kdowinc.com
Equipment: Burnoff, thermal stripping and heat cleaning ovens.
Parts/Products: Parts, technical support and service of stripping ovens.
Services: Technical support and field service available to repair, rebuild, update or service.

BEARINGS & MOTIVE SPECIALTIES CO, INC
90 Westmoreland Ave
White Plains, NY 10606
800-431-2518
Website: bmsbearing.com
Parts/Products: Ball and roller bearings.

BPS CORES, INC
1122 Milledge St
East Point, GA 30344
404-559-8571 • 800-241-7370
Website: bpsparts.com
Parts/Products: Full line core supplier. Sorted cores, domestic, import and heavy duty. Rewound and refurbished electrical components.

BPS CORES INC, REMAN DIVISION
1020 Milledge St
East Point, GA 30344
404-696-7773 • 800-241-7370
Website: bpsparts.com
Parts/Products: New, rewound, refurbished, domestic, import and HD armatures, stators, rotors and more
Services: 5-day turnaround on most R&R

C & S BEARING, INC
585 Yorbita Rd
LaPuente, CA 91744
626-964-4058 • 800-475-5832
Website: csbearings.com
Parts/Products: Automotive bearings.

C.C. BATTERY CO., INC
3513 Agnes St
Corpus Christi, TX 78405
361-882-5561 • 800-531-1038
Website: ccbattery.com
Parts/Products: Rewound and new armatures, rotors, stators, drives, solenoids. R&R service. Rebuilt and new starters, alternators, generators and DC motors. Hard to find and obsolete drive end housings and complete units. Eagleline starter and alternator conversions from gasoline to electric-start. Inverters—DC to AC. Warehouse for Cole-Hersee, Iskra, Niehoff, Powerline, QuickCable, Lester, Transpo, Cooper-Bussman, Loadhandler, Leece-Neville, Prestolite, CPC, Johnson Electric (formerly U.T.), Lucas, CAV, RCP, Mitsubishi, Nikko. Air starters and components, battery chargers, AGM, gel and wet cell batteries, NOCO.

C. E. NIEHOFF & COMPANY
2021 Lee Street
Evanston, IL 60202
847-866-6030 • 800-643-4633
Website: ceniehoff.com
Parts/Products: Heavy duty alternators for high output demand at idle, and extreme operating conditions.

CHAPMAN ELECTRIC CO, INC
3131 S Haskell Ave
Dallas, TX 75223
214-824-8095 • 800-647-2812
Website: forkliftmotors.com
Parts/Products: Brushes, brush holders, armatures, brush springs, field coils, any parts related to forklift motors.
Services: AC/DC electric motors. New and remanufactured armature rewinding. Forklift and Servo motor specialists.

COSMOS INTERNATIONAL, INC
501 Industrial Dr Suite 101
Richardson, TX 75081
972-699-1683 • 800-627-5600
Website: cosmosus.com
Parts/Products: Auto parts.
Services: Major distributor of starter, alternator and generator components and complete units to manufacturers.

COYOTE ENTERPRISES, INC
27301 East 121st Street
Coweta, OK 74429
918-486-8411 • 877-659-8040
Website: coyoteparts.com
Equipment: Airless and air abrasive shot blast equipment and replacement parts.

CRUMBLISS TEST EQUIPMENT
P O Box 3201
Collegedale, TN 37315-3201
239-693-8588
Website: crumbliss.com
Equipment: HD Alternator testers, 5hp–20hp. 20hp tests alternators up to 300 amps at 24 volts. HD starter-load tester tests starters up to 50MT. Solenoid tester

CSD DIV OF CANADIAN STARTER DRIVES, INC
176 Milvan Drive
North York, ON, M9L 1Z9, Canada
416-748-1458 • 800-268-0531
Website: 4csd.net
Parts/Products: Drives, solenoids, wiper motors, and window lift motors.
Services: Remanufacture automotive parts.

CUSTOM REWINDING
3037 Quarry St
Brook Park, MN 55007
320-679-4739

Website: www.custom-rewinding.com
Parts/Products: Starter and generator armatures, both new and rewound, custom rewinding of any starter or generator armature, new and rewound stators and custom rewinding of stators

CYCLETRONICS
2669 Old 280 Rd
Camp Hill, AL 36850
800-524-2252
Parts/Products: Stators, rotors starters, brushes, armatures, and alternators for motorcycles/ATV
Services: Rebuild and repair

D & V ELECTRONICS, LTD
130 Zenway Boulevard
Woodbridge, ON, L4H 2Y7, Canada
905-264-7646 • 888-979-1919
Website: dvelectronics.com
Equipment: Alternator and starter testers.

DANE RECYCLING & CORE, LLC
109 Hotel St
Brooklyn, WI 53521
608-455-4444
Equipment: Used equipment of all types available.
Parts/Products: Cores—starter, alternator, and generator.
Services: We purchase shop assets, cores, parts, and scrap.

DAVID SALES, INC
1354 S Claudina St
Anaheim, CA 92805
714-635-8411 • 800-321-7253
Parts/Products: Alternators, starters, and parts for the repair of both.

DAYER, INC
115 St-Remi Boul.
St. Remi, QC, J0L 2L0, Canada
450-454-4750 • 800-561-2832
Website: dayerinc.com
Parts/Products: Stators, rotors, armatures, alternators, starters, regulators, rectifiers, frames.

DIXIE ELECTRIC, INC
17100 Medina Road, Suite 100
Minneapolis, MN 55447
800-478-0608
Website: dixie-electric.com
Parts/Products: New and remanufactured starters, alternators and major components for automotive, ag/industrial, truck and bus applications. This includes 50DNs and a new range of high amperage alternators suitable for fire, ambulance, school bus, military and other unique applications.

DS USA, LTD
222 J Admiral Byrd Drive
Winchester, VA 22602
540-665-6425
Website: dsusaltd.com
Parts/Products: Starters, alternators and component parts.

DUBOIS MARKETING, INC
11670 46th Ave
Allendale, MI 49401
616-895-6650 • 800-253-5654
Website: duboismarketing.com
Parts/Products: Quality components and units for many North American applications.
7000 SKUs, Including 2500 complete units of starters and alternators

EAST PENN MANUFACTURING CO INC
Deka Road
Lyon Station, PA 19536
610-682-6361
Website: dekabatteries.com
Parts/Products: DEKA brand car, truck marine and small engine batteries.

EGI COMPONENTS
560 Brook Avenue
Deer Park, NY 11729
631-242-5454 • 800-247-5141
Website: egicomponents.com
Equipment: Equipment needed to rebuild alternators and starters.
Parts/Products: Alternators, starters, refurbished parts, rewind, new parts.

ELECTRIC MOTOR SERVICE (EMS)
70 River Road
Logan, WV 25601
304-752-6070 • 800-697-6070
Websites: electricmotorsvc.com / stockers.com
Parts/Products: New OE and aftermarket units and repair parts. Small engine starters and parts.

ELPAR INDUSTRIES, INC
1580 NW 27th Ave #5
Pompano Beach, FL 33069
954-974-1111 • 877-885-8854
Website: elpar.com
Parts/Products: Industrial/diesel/marine starters, alternators and component parts. OE Iskra, Leece-Neville. Large coverage of complete units in stock for immediate shipping.
Supplies: Full range of shop supplies from sand to field coil wrapping tape.
Services: Supply/match/replace/R & R many difficult and expensive OE units with Denso-style replacements. More than fifty different Denso-style replacements in stock.

ELREG DISTRIBUTORS LTD
1175 Corporate Dr Unit 3
Burlington, ON, L7L 5V5, Canada
905-336-8830 • 800-387-4078
Website: elreg.com
Parts/Products: Warehouse distributor for starters, alternators, DC motors, component parts and customized repair kits. Supply OEM, Delco, Leece-Neville, Prestolite, Bosch, Niehoff, Iskra and Nikko as well as aftermarket products.

ENNIS PRODUCTS
649A Hardy Ave
Corsicana, TX 75110
903-872-2118 • 877-872-2118
Website: ennisproducts.com
Equipment: Alternators, starters, stators, rotors, armatures, etc. Cleaning and manufacturing equipment.
Parts/Products: Alternators, starters, A/C compressors,
stators, rotors, armatures, rectifiers, regulators, field coils, frames, brushes, brush holders, screws, bolts, nuts, fans, etc.
Supplies: Copper wire, insulation, etc.
Services: Engineer high amp alternators and stators to meet specific specification.

ESICO-TRITON INTERNATIONAL
2 Esico Lane
Deep River, CT 06417
860-526-5361 • 800-526-8661
Website: esicotriton.com
Equipment: Soldering equipment.
Supplies: Soldering tools, solder pots, resistance tools, soldering irons.

EURTON ELECTRIC
9920 Painter Ave.
Santa Fe, CA 90670
800-423-4789
Website: www.eurtonelectric.com
Parts/Products: Electric motor repair and rewinding, armature rewinding and field coil rewinding.

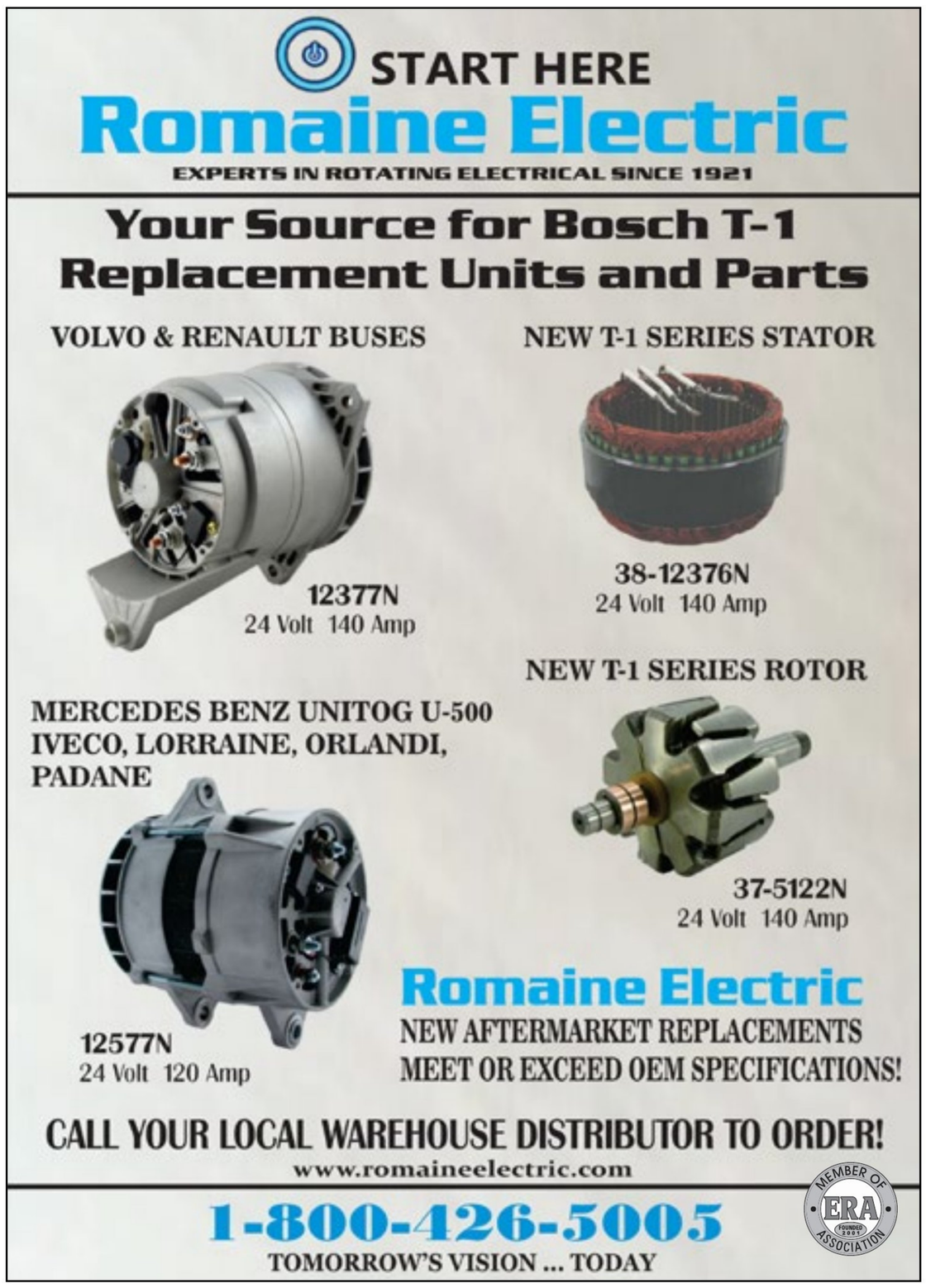
EXIDE TECHNOLOGIES
13000 Deerfield Parkway, Bldg 200
Milton, GA 30004
602-363-2009 • 800-523-4622
Website: exide.com
Parts/Products: Transportation, motive and network power battery manufacturer and recycler. Product lines include AGM (flat plate and spiral), conventional flooded and gel types. Transportation products include auto, heavy duty, commercial, lawn and garden, marine, golf cart and powersport.

FACET
4900 Hopyard Road Suite 100
Pleasanton, CA 94588
925-216-3127
Website: positork.com
Parts/Products: Full line manufacturer of brand new, field proven Reactiv™ clutch and decoupler alternator pulleys. Over 50 clutch pulley SKUs featuring applications incorporating Facet's proprietary self-sealed one-way clutch. Also available are the top seven decoupler pulley SKUs featuring frequency tuned, patent pending designs to endure high torque lugging conditions and controlled overrun to silence belt chirp during rapid engine speed change events.

FACTORY WAREHOUSE
38 Pacific Place
Longview, WA 98632
360-636-5950 • 800-282-6992
Equipment: Industrial Bosch starters, CAV starters, Marelli starters.

FIFTH AVENUE ANTIQUE AUTO PARTS
415 Court St
Clay Center, KS 67432





785-632-3450
Website: fifthaveinternetgarage.com
Parts/Products: Specializing in upgrading 6-volt electrical systems to 12-volt. Alternator brackets available for Chevrolet applications from 1937 to 1962. Ford and Mercury applications from 1932 to 1964 and most everything else. Six and 12-volt electric radiator cooling fans, and 6 and 12-volt gear driven electric fuel pumps for most any vintage application. Also a complete line of electrical parts for the Borg-Warner overdrive transmissions manufactured between 1940 and 1973. Wholesale to qualified accounts.

FONDY AUTO ELECTRIC, INC
765 Sullivan Drive
Fond du Lac, WI 54935
920-922-9130 • 800-236-2701
Website: fondyautoelectric.com
Parts/Products: Buzzanator alternators for equipment in demanding conditions.

GOFF, INC
12216 NS 3520
Seminole, OK 74868
405-382-6900 • 800-654-4633
Website: goff-inc.com
Equipment: Abrasive shot blast cleaning and aqueous degreasing equipment, replacement parts and service.

GUYSON CORPORATION
13 Grande Blvd
Saratoga Springs, NY 12866
518-587-7894 • 800-633-6677
Website: guyson.com
Equipment: Blast cabinets, auto blasting systems.

HC/CARGO, INC
6555 Fulton Industrial Blvd Suite 200
Atlanta, GA 30336
770-236-0033 • 800-303-3170
Website: hcdk.com
Equipment: Test equipment for alternators, starters and components.
Parts/Products: Alternators, generators, starters and components, diesel pump parts, a/c compressors and parts switches, sensors, relays, ignition modules.
Supplies: Workshop supplies, connectors, fuses and terminals.

HI-TORQUE IMI PERFORMANCE PRODUCTS
13432 Lambert Road
Whittier, CA 90605
888-244-8675
Website: hitorque.com
Parts/Products: Custom designed starters.

HOOSIER ELECTRIC CO
7041 W. 21st Ave
Gary, IN 46406
219-844-8389 • 800-543-5292
Parts/Products: Rewound armatures, rotors, stators, coils.
Services: R&R special, odd or antique armatures, rotors, stators, high amp upgrades on stators.

INTERNATIONAL AUTOMOTIVE TRADING INC
61-12 32nd Avenue
Woodside, NY 11377
718-956-4248 • 800-872-8890
Website: iat-usa.com
Products: Comprehensive line of OEM and high quality aftermarket alternators, starters, and component parts for automotive, industrial, agricultural, and marine applications. OEM brands such as Bosch, Lucas, Marelli, Magneton and Mitsubishi. We are a Master Distributor for Valeo of North America, Europe, North America, Korea. Large inventory of INA clutch pulleys (OAP) and Litens decoupler pulleys (IDP).
Services: Same day shipping is available through our knowledgeable, friendly sales staff.

INTERNATIONAL WINDING
729 N. Harvard Ave
Villa Park, IL 60181
630-823-8264
Website: www.iwico.com
Parts/Products: Rewinding of any starter or generator armature to include new shaft if required, winding of any starter or generator field coil (requires old coils, field case and pole shoes).

IVO AUTOMOTIVE CORP
312 Garyray Drive
Weston, ON, M9L 1P4, Canada
416-745-9166 • 800-665-9387
Website: ivoautomotive.ca
Parts/Products: Full line electrical distributor.

J. J. CORES INTERNATIONAL
1826 Dawns Way
Fullerton, CA 92831
714-991-9017
Website: jjcores.ca
Supplies: Used starter and alternator cores

J. J. CORES
16 Commerce Ct
Stoney Creek, ON L8E 4G3 Canada
905-643-4219
Website: jjcores.ca
Supplies: Import and domestic electrical cores

J & N AUTO ELECTRIC INC
10995 Canal Rd
Cincinnati, OH 45241
800-366-7100
Website: jnelectric.com
Parts/Products: OEM and aftermarket alternator, starter and DC motor units, service parts, accessories and shop supplies.

JIMCO INC
611 East Walnut
Raymore, MO 64083
816-331-1917 • 800-821-7137
Websites: jimcotest.com / jimcomanuals.com
Equipment: Alternator, generator, starter test benches from 5hp to 25hp. Component testers for voltage regulators, diodes, stators, rotors.
Parts/Products: Rectifier regulators, repair connectors and wiring harness adapters, alternator mounting brackets, alternator and voltage regulator test leads, manuals.
Services: Outstanding after-the-sale technical and engineering support.

JUST PARTS INC
121 West Elm Avenue
Cortland, IL 60112
815-756-2184 • 800-553-4776
Website: justpartsinc.com
Parts/Products: Full line supplier of alternator and starter electrical rebuilding parts. Diesel solenoid manufacturer.

KAR INDUSTRIES CORP
7910 NW 66th St
Miami, FL 33166
305-594-0790 • 800-332-0790
Website: karindustries.com
Equipment: Alternator and starter testing equipment, cleaning and blasting equipment.

KARCHER CUDA SERIES PARTS WASHERS
4275 NW Pacific Rim Blvd
Camas, WA 98607
888-319-0882
Website: cudausa.com
Equipment: Automatic parts washers.

KNOPF AUTOMOTIVE
93 Shrewsbury Ave
Red Bank, NJ 07701
732-212-0444
Website: mmknopf.com
Parts/Products: Regulators, rectifiers, brushes, bushings, bearings, brush holders, armatures, starter drives, solenoids, hardware, fans, pulleys, grease, etc.

KOMAR SCREW CORP
7790 N Merrimac Avenue
Niles, IL 60714
847-965-9090
Website: komarscrew.com
Parts/Products: Komar supplies virtually all fastener related hardware and class "C" items. From standards to specials, steel to nylon all materials and products used to today's manufacturing world.
Services: Manufacturing application support—part consolidation recommendations, new fastening technology introduction.

LETRIKA INC
4814 American Rd
Rockford, IL 61109
815-874-4022 • 800-474-1996
Website: iskra-ae.com
Parts/Products: Starters, alternators, spare parts, DC electric motors, heater plugs and glow plugs.

LESTER CATALOG CO INC
9850 Hillview Road
Newcastle, CA 95658
530-823-0963
Website: lestercatalog.com
Parts/Products: Catalog software on DVD, printed catalogs and Web catalogs.
Services: Custom catalogs and Websites.

LEWIS TOOL & DIE INC
6690 State Hwy 173
Cape Fair, MO 65624
417-538-2999



Equipment: Starter drive rebuilding equipment.
Parts/Products: Starter drive component parts.

LKQ AUTOMOTIVE CORE SERVICES
1710 W. Mount Houston Road
Houston, TX 77038
281-820-9184 • 800-865-6740
Website: lkqcorp.com
Parts/Products: Full line foreign and domestic rebuildable core supply including electrical, small parts and complete assemblies. Quality recycled OEM auto parts from the nation's leading national recycling network.

LOCK-N-STITCH INC
1015 S Soderquist Road
Turlock, CA 95380
209-632-2345 • 800-736-8261
Website: locknstitch.com
Parts/Products: Manufacture and service repair of broken and damaged castings—patented crack and thread repair.

LONG ISLAND AUTO ELECTRIC SUPPLY
76 Academy St
Patchogue, NY 11772
631-687-3550 • 866-486-8100
Parts/Products: Starter and alternator components for passenger car and heavy duty applications. Full line of shop supplies for the electrical rebuilder.
Services: Delivery to New York metro area.
Parts/Products: Full line core supplier specializing in both foreign and domestic: alternators, electronic control modules, generators, head light motors, starters, window motors, wiper motors and more.

LS INDUSTRIES
710 E 17th St N
Wichita, KS 67214
316-265-7997 • 800-835-0218
Website: lsindustries.com
Equipment: Metal cleaning equipment, blasters, washers, shakers, oven dust collectors, material handling.
Parts/Products: Wheels, blades, wear plates, liners, springs, nozzles, motors, shafts, augers, buckets, belts.
Supplies: Shot, grit, glass bead, plastic shot, medias, soaps and compounds.
Services: Design, engineering, support, rebuilds.

LUNA INDUSTRIES INC
425 E Grant Rd
Tucson, AZ 85705
520-792-3080
Website: lunaindustriesinc.com
Parts/Products: DC motors (new and rebuilt) and parts, including rewound armatures, field coils, brushes and bearings. New and rebuilt brush holders. Aftermarket parts for all models of golf carts.
Services: Rebuild golf cart motors and starter generators. Rewind armatures.

M&T-2001 LIMITED
270 Pennsylvania Ave Unit 2
Concord, ON, L4K 3Z7, Canada
905-761-7770
Website: mt2001.com
Equipment: Technological design and development of custom equipment and large scale machinery, including complete automatic lines for the automotive rebuilding industry.
Parts/Products: Automatic armature/rotor polishing machine, lathe for commutator and slip ring turning, 2-brush ID/OD stator cleaner, commutator removal machine, undercutting machine, armature spot welding machine, armature shaft straightening machine, all automatic.

MARC'S ONE
304 E Pioneer St
Phoenix, AZ 85040
602-340-9246 • 800-845-0056
Website: marcsone.com
Parts/Products: Starter drives, solenoids, armatures, rotors, stators, bearings, regulators, rectifiers.
Supplies: RCP line starter and alternator supplies.
Services: Custom build drives, solenoids, hand wound armatures, rotor, stators, custom hi-amp.

MAXWELL PRODUCTS INTERNATIONAL (MPI)
618 Little Creek Drive
Duncanville, TX 75116
972-780-0072 • 800-886-8224
Equipment: Supplier of test, cleaning, production equipment as well as small tools and supplies.
Parts/Products: Manufacturer of Vital alternators, high amperage for fire, EMS, police and other vehicles.
Supplies: Replacement parts for AMP, Hehr, Powerline, Penntex, as well as our Vital units.
Services: We can help you spec out a unit as to what alternator the vehicle needs to solve charging problems.

MCI CORES
6346 Plymouth Ave
Saint Louis, MO 63133
314-725-2673 • 800-878-7414
Website: mcicores.com
Parts/Products: Core supplier specializing in foreign and domestic starters, alternators, wiper motors, window lift motors and more. Se Habla Espanol.

METRO AUTO INDUSTRIAL
2128 Pomona Blvd
Pomona, CA 91768
909-629-2700 • 800-263-8761
Website: metroautoinc.com
Parts/Products: Alternator and starter component parts and units.

METROPOLITAN DISTRIBUTORS
60 Columbus Ave
Garfield, NJ 07026
973-772-3320 • 800-562-6975
Website: metrodist.com
Equipment: Associated battery chargers, Goodall equipment.
Parts/Products: Full line rebuilder supply warehouse—WAI, Transpo, OEM components, aftermarket, OEM units.

MIDTRONICS INC
7000 Monroe Street
Willowbrook, IL 60527
630-323-2800 • 800-776-1995
Website: midtronics.com
Equipment: Midtronics battery-starting-charging system testers and diagnostic chargers.

MILLIGAN DIESEL AND ELECTRIC
9495 Aerospace Drive
St. Louis, MO 63134
314-890-2003 • 800-275-1925
Website: milligandieselandelectric.com
Equipment: Electrical rebuilding shop equipment, diesel shop equipment.
Parts/Products: AC/Delco, AIM, Ametek, Associated Equipment, Bosch, Cole Hersee, Delphi, Denso, Dixie, Hitachi, Hehr International, Iskra, Johnson Electric, Leece-Neville, Magnetos, Maxima Technologies, Mitsubishi, Motorcraft, Motorola, C. E. Niehoff, Nikko, Noco, Prestolite, Penntex, Racor, Remy International, Seymour, Stewart Warner, Sure Power, Tomco, Turbos, Vanner, Western Motors, Wilson U.S.A., Zenith.
Services: Sell electrical starter and alternator parts, a rebuilding shop. Distributor of aftermarket units and parts to the rebuilder industry.

NORTH ATLANTIC STARTER DRIVE INC
741 Broadway
Pawtucket, RI 02861
401-726-2801
Website: www.northatlan.com
Parts/Products: Rebuilt starter drives and custom rebuilding of any starter drives

NORTHWEST RECYCLER CORE CO INC
2815 29th Ave SW
Turnwater, WA 98512
360-943-0491
Website: nwrccauto.com
Parts/Products: Full line core supplier.

ONTIN NORTH AMERICA CORP
8405 NW 53rd Street, Suite A100
Miami, FL 33166
334-730-4467
Website: zensa.com.br
Parts/Products: ZEN starter drives, pinions, clutch pulleys.

PDQ PRECISION INC
1433 Roosevelt Ave
National City, CA 91950
858-581-6370
Website: minimaxcleaner.com
Equipment: Super-heated high pressure steam vapor cleaning 100% clean technology
Parts/Products: Min-max cleaners and accessories
Supplies: Arma-Sol Rust Inhibitor, brushes

PEER BEARING COMPANY
2200 Norman Drive
Waukegan, IL 60085
847-578-1000 • 800-433-7337
Website: peerbearing.com
Parts/Products: Bearings.

PENNTEX INDUSTRIES INC
202 Plaza Drive
Manchester, PA 17345
717-266-8762 • 877-590-7366
Website: penntexusa.com
Equipment: Heavy duty, high amp alternators, voltage regulators, fully automatic high idler devices, etc., for transportation and specialty vehicles. All products are new manufactured products.

PETERSON WASH & BLAST SYSTEMS
1100 N Union St
Council Grove, KS 66846
316-634-6699 • 800-835-3528
Website: petersonwashandblast.com
Equipment: Engine rebuilding equipment, parts washers.
Parts/Products: Replacement parts and consumables for engine rebuilding equipment and parts washers.

PHOENIX AUTOMOTIVE CORES
422 S 33rd Ave
Phoenix, AZ 85009
602-415-9166 • 877-749-2673
Website: phxautocores.com
Parts/Products: Full line automotive core supplier. Including alternators, starters, generators, window lift and wiper motors.

P M T CORES INC
4222 Montee Gagnon
Terrebonne, QC, J6Y 1K9, Canada
450-971-6660 • 866-971-6660
Website: pmtcores.com
Parts/Products: Full line core supplier specializing in ECM, starters, alternators and more.

PRECISION BEARING OF AMERICA INC
PO Box 790
Germantown, MD 20875
301-515-6736 • 800-333-3127
Website: pai.com.my
Parts/Products: Ball bearings, alternators, starters, armatures, generators, rotors, solenoids, starter drives and voltage regulators.

PRO ULTRASONICS INC
PO Box 999
Nebo, NC. 28761
828-584-1005
Website: proultrasonics.com
Equipment: Fast and effective, high performance ultrasonic cleaning equipment designed for electrical rebuilders, manufacturers, starter/alternator shops, a/c rebuilders, for precision-clean parts. This equipment will save you time and money

QUALITY EQUIPMENT SALES
13609 S Normandie Ave
Gardena, CA 90249
800-528-4371
Website: qequipment.com
Equipment: Crozier speed lathes, armature lathes. Full line equipment for the rebuilding industry, new, rebuilt and used.

QUALITY REBUILDERS INC
607 Business Park Lane
Knoxville, TN 37932
865-777-0711 • 800-342-4651
Website: qualityrebuilders.net
Parts/Products: Delco Remy, Prestolite Electric, Leece-Neville, Cole Hersee, Dixie Electric, Ametek, Taditel, Delphi.

QUICK CABLE CORPORATION
3700 Quick Drive
Franksville, WI 53126
800-558-8667
Website: quickcable.com
Parts/Products: Battery lugs, terminals, bulk cable, custom cable assemblies, battery accessories, tools and chemicals.

R & R REGULATORS INC
24545 Country Rd 45
Elkhart, IN 46516
574-532-3500 • 800-433-6683
Website: randrregulators.com
Parts/Products: Reclaimed and new regulators, rectifiers, stators and rotors. We also carry pulleys, bearings, solenoids, alternators and starters.
Services: R & R Regulators can rebuild/repair most rectifiers. We can also reclaim your 3, 4, and 6G OEM regulators.

RAND GROUP INC
2537 NW 74th Ave
Miami, FL 33122
305-463-8088 • 866-450-7263
Website: randgroupinc.com
Parts/Products: Rectifiers, regulators, diodes, alternator covers, plastics.

DRIVE DOCTOR X

Let Our Doctor Rebuild That Special Starter Drive or Solenoid



STANDARD STARTER DRIVE

Same Day Service
Most Drives

STANDARD STARTER DRIVE INC.
26211 W. Seven Mile Road,
Redford, Michigan USA 48240

800-229-8758 • 800-662-2159 • 313-255-2300
Fax: 313-255-2277 • Fax: 765-457-4119
www.standardstarterdrive.com

RBI BEARING INC
1055 Stevenson Ct, Suite 102W
Roselle, IL 60172
630-376-0600 • 800-708-2128
Website: rbibearing.com
Parts/Products: Ball bearings, water pump, roller and tapered roller bearings.

RC COIL SPRING MFG CO
490 Mitchell Rd
Glendale Heights, IL 60139
630-790-3500
Website: rccoilspring.com
Parts/Products: Manufacturers of rectangular roller springs for starter drives, also solenoid parts, alternator springs, punch press parts.

RCP INC
2891 Langstaff Road
Concord, ON, L4K 4Z2, Canada
905-660-7274
Website: rcpcanada.com
Parts/Products: Starter motors, alternators, pump motors, armatures, field coils, solenoids, drives, stators, rotors, regulators, rectifiers and all other component parts.

REBUILDERS AUTOMOTIVE SUPPLY COMPANY
1650 Flat River Rd
Coventry, RI 02816
401-822-3030 • 800-633-0162
Website: coresupply.com
Parts/Products: Worldwide supplier specializing in domestic and import electrical, window lift motors, wiper motors, Chrysler, Ford, GM, import ECM boxes and much more.

REGITAR U.S.A. INC
2575 Container Drive
Montgomery, AL 36109
334-244-1885 • 877-734-4827
Website: regitar.com
Equipment: Testing equipment.
Parts/Products: Voltage regulators, rectifiers, diodes/trios, stators, brush holders, ignition modules and coils, caps, rotors, pick up coils, resistors, camshaft and crankshaft sensors, oxygen sensors, solenoids, power tools, sensors, TPMS
Services: Technical support line, Repair of power tools

REMAN FORUMS
586-777-6900
Website: remanforums.com
Services: Free forums for the rebuilders.

RIVERA PARTS SUPPLIER INC
407 Industrial Road
Barnesville, GA 30204
770-872-3701
Website: rpsupplierinc.com
Parts/Products: Specializing in domestic and foreign electric, starters and alternators by part number.

ROMAINE ELECTRIC CORP
8811 S 208th Street
Kent, WA 98031
425-264-1700 • 800-426-5005
Website: romaineelectric.com
Parts/Products: Full-line supplier nationally distributing one of the largest and most diversified aftermarket and OEM inventories in the United States including new and remanufactured alternators, generators, starters, components and sub-assemblies for automotive, truck, heavy-duty, industrial, marine, agricultural, PWC, motorcycle, lawn/outdoor power equipment, aircraft and military applications.
Services: Access to the largest armature/rotor rewinding facilities in the United States. Custom remanufacturing and repair facilities with a one to three day turnaround. Same day shipping for orders received by 4:30 p.m. PST with next day service available nationwide.

ROTEK EQUIPMENTS
9252 Lacordaire
Montreal, QC, H1R 2B7, Canada
514-326-4649 • 855-301-4649
Website: rotekequipments.com
Equipment: New software package for Crumbliss starter load tester 2495.

RTA ELECTRIC MOTOR CORP
100 St. Regis Crescent S, Unit 1
Toronto, ON, M3J 1Y8, Canada
416-636-9546
Website: rtaelectric.com
Parts/Products: Alternator and starter components, remanufactured stators, rotors and armatures.
Services: Rewinding high output stators and rotors, winding armatures.

S & N® MANUFACTURING INC
455 Stevens Street
Geneva, IL 60134
630-232-0275
Website: snmfg.com
Parts/Products: Heavy-duty solenoids; custom coil winding. ISO9002 registered.

SAILON AUTO ELECTRIC INC
61 Richmond St
Syosset, NY 11791
516-921-3074
Parts/Products: Starters and alternators for automotive, commercial, marine, emergency vehicles, industrial, foreign, domestic, including Eco-Tech alternators rated at 325 amps, 255 amps at idle.

SCHUNK GRAPHITE TECHNOLOGY
W146 N9300 Held Drive
Menomonee Falls, WI 53051
262-253-8720 • 888-560-7744
Website: schunkgraphite.com
Parts/Products: Brushes and brush holder assemblies for starters and alternators.
Contact: Christine Moore

SEYMOUR OF SYCAMORE
917 Crosby Ave
Sycamore, IL 60178
815-895-9101 • 800-435-4482
Website: seymourpaint.com
Equipment: Aerosol filling machines, stripe wands and stripe machines.
Supplies: Auto electric paints and chemicals.

SJS ENTERPRISES INC
451 Hwy 52N
Moncks Corner, SC 29461
843-899-0850 • 800-640-0747
Products: Wiring harness repair ends, wiring supplies, fuses, tools.
Contact: Steven Head

STANDARD STARTER DRIVE INC
26211 West Seven Mile Road
Redford, MI 48240
313-255-2300 • 800-229-8758
Website: standardstarterdrive.com
Parts/Products: Remanufactured and new starter drives. New solenoids.
Supplies: Paint
Services: Drive Doctor® repair and return service for difficult to find starter drives. Same day turnaround.

STC AUTOMOTIVE INC
9312 East Rush Street
South El Monte, CA 91733
626-582-8505
Supplies: Alternators, starters and their component parts such as armatures, bearings, brushes, drives, field coils, rotors, stators, solenoids, housings, etc.

STELLAR TECHNICAL PRODUCTS
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Website: stmaryscarbon.com
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STM HEAVY DUTY ELECTRIC
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610-967-3810
Website: stmhd.com
Parts/Products: Solenoids and solenoid coils.

SURE POWER INDUSTRIES INC
10189 SW Avery Street
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503-692-5360 • 800-845-6269
Website: surepower.com
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(See SOURCES, pg. 10)

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DO THE NUMBERS WORK FOR YOU?

BY ROB BUKSAR



I hope that you all had a great Thanksgiving!

Speaking for myself, it became very apparent just how much I have to be thankful for.

I'm all beat up on lots of levels, but I'm sure glad that I'm alive and kicking!

Last month, I said that I'd share a few thoughts or lessons learned from my ordeal.

First: As small business folks, I know most of you out there (small guys) have a hard enough time covering overhead. These days, there's more days in the month than dollars to cover them.

Health insurance is usually a luxury that just isn't in the budget. If you're lucky, your spouse has a good full-time job with benefits, and you're covered under her policy.

If you're not so lucky, you may have what's referred to as a disaster policy. That's a major medical policy with a 10-20 thousand dollar deductible. It's a brutal way to go. It leaves major debt, but it will usually prevent medical bankruptcy. Then, there are those who have no insurance at all, because the budget just won't allow it.

If you're still active in this business, there's a darn good chance that you qualify for senior citizen's discounts. If not, you're awfully close. It doesn't matter how good you feel or what kind of shape you think that you're in. Bottom line is simply this—if you're pushing 60 or older, you have an old worn-out body, subject to all sorts of calamity. That's why your premium payment for crummy insurance is about 10 times more than that of a 30 year-old. So here's my first suggestion. You have already worked a lifetime for the little that you have accumulated. If you're smart, you had better figure out some way to protect your assets. One medical mishap will clean your clock! A couple weeks in a hospital will not only wipe-out 30 years of hard work, it'll very well leave you so financially damaged that there will be no way to recoup. Keep in mind that working hard at 60-plus is like playing a daily game of Russian roulette. You are continually praying that every day the hammer lands on an empty chamber. Sadly (and we all know this) everyday, somewhere, someone "catches the bullet." In light of that, a good policy is to prepare for the worst and hope for the best.

Second: Along with halfway decent health insurance, have your agent build in some kind of disability policy. In other words, if you become hospitalized, disabled or unable to work for a certain amount of time, this policy will kick in and pay you something. Few can afford a "Cadillac policy." Buy one that will cover your personal overhead if nothing else—mortgage, rent, utilities, water, fuel, food, etc. If you stay conservative, it is not as expensive as you might think. The Internet makes all of this easy to shop for.

These are incredibly hard times for many American businesses. The small ones seem to be bearing the brunt of our flea-market economy. Our little industry is one of the few survivors. The butchers, bakers and candlestick makers, for the large part, are all gone.

So, what does all of this have to do with the price of putty? Simply this—it might be time to re-evaluate what you're doing and especially why you're doing it.

If your little business won't pay you a dignified income that includes some health care benefits, you just might be wasting your time. Find an alternative while you're still able.

Remember that old saying *Love is blind*? If you have a love affair with rebuilding starters, alternators and generators to the degree that the actual activity over-shadows why you're doing it, you may need professional help to reclaim clarity.

What we do is not a dress rehearsal! The game we play is as real as it gets! Time waits for no one, and no one is guaranteed a tomorrow. If your business is able to cover all of the expenses necessary to sustain and protect you and your family, continue to march. If it doesn't, no one would think any less of you if you moved in a more profitable direction. It could be working for yourself or working for someone else. It really doesn't make a difference, as long as the numbers work for you.

May God bless all of you and help sustain our little industry.

Rob Buksar is owner of Hoosier Electric Co., Gary, Ind.

ERA

QUALITY *(Cont. from page 2)*

competition that began as a good thing for rebuilders and their customers, has turned around to hurt us. Everyone in the parts chain, from the end user to the manufacturer, is now focused on cost. Cost has become the driving force. Cost is the root of this problem that too few rebuilders seem to understand or admit that they play a part in. That is why you find yourself with parts that do not fit properly, do not work the way they should or do not last long enough to satisfy you or your customer.

What can you do about it? For one thing, you can relieve some of the cost pressure that begins with your customers. Take the time to explain to them that all parts are not equal. Show them the difference between a good part and a cheaper one, and give them the opportunity to choose. OK, if you happen to be dealing with a used car lot there is no sense wasting your breath. But most installers, professional or do-it-yourself, will listen. Most vehicle owners will listen, too, if you present your case well.

A good example is the Denso solenoid that Wes Grueninger wrote about in the last issue of The Exchange. I have those two solenoids, disassembled and on a shelf near my front counter. When a customer tells me that they can buy a "new" starter cheaper online or from a parts chain store, I take a few minutes to explain what they can expect, if they go with the lowest bidder. Show your customers something that they can see. Print a copy of "The Lowest Bidder" and put it where your customers can see it.

In turn, relieve some of that cost pressure that you place on your suppliers. Let them know that you are willing to pay more for parts that work. If you beat up your suppliers on price, then you deserve what you get. Support those suppliers who have the best quality control, understanding that it comes at an increased cost to them. You can't expect to get something if you are not willing to pay for it. Buy from suppliers who do their own engineering in-house or operate their own rebuilding shops. They are more likely to offer quality parts and listen when something is not quite right.

Then go one step further and become a participant in the quality control process. Believe it or not, you are more capable of doing some quality control work than most of your suppliers. You have the unit and the part in question in your possession. Sometimes you may even have access to the entire vehicle. Don't just tell your supplier that their part does not work. Take the time to figure out why it does not work, and share that information. If you are an ERA member, you can and should share that information on the ERA's Quality Control Forum on the website. The ERA also provides a warranty return form that anyone, ERA member or not, can download and use. It provides plenty of space to explain the problem with the part being returned. Is that going to cost you time? You bet it is. That time is part of your overall cost. Not taking that time hurts you more than anyone else. If a supplier rejects your warranty claims, who is to blame and who pays the cost of that?

Just so this is not misunderstood, I point out that the vast majority of parts that are available in our industry do not contribute to this problem. In fact, some parts that the aftermarket has produced, have improved the quality over and above the original parts they replaced. When that happens, be sure to let your supplier know that, too. We are all in this industry together, and we can all do a better job on this important quality control issue.

ERA



SOURCES *(Cont. from page 8)*

Anderson, IN 46016
765-644-0713 • 866-327-6228
Website: taditel.com
Parts/Products: Electronic components: GM (OE and aftermarket), Ford and Bosch voltage regulators, and Delco, Delphi, Ford and Hitachi rectifiers.

TENDECO—LITENS AFTERMARKET NETWORK
5650 Blazer Parkway
Dublin, OH 43017
614-734-8385
Website: decouplerpulley.com
Parts/Products: Overrunning Alternator Decoupler pulleys by Litens Automotive.
Contact: ron.maltarich@tendeco.com

TETRA-CHEM INTERNATIONAL INC
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Website: tetra-chem.com
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Supplies: Cleaning fluids to meet every possible need.

TIERRA TECH
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Alvarado, TX 76009
214-662-3692
Website: tierratech.com
Parts/Products: Full line of ultrasonic cleaning machines.

TOLEDO CORE SUPPLY INC
136 Hamilton St
Toledo, OH 43604
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Website: toledocoresupply.com
Parts/Products: Full line, specializing in ABS, BCMs, cruise control, ECMs, ECUs, LCMs, MAFs, PCMs, TCCMs, TCMs and other electronic parts.

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Website: transmet.com
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TSA
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Website: Coming first quarter of 2012.
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Supplies: Component parts coming soon.

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714-522-6688 • 888-963-9888
Website: genera.com
Parts/Products: 100 percent new starters and alternators, no core charges, comprehensive coverage of most popular domestic and import applications.
Services: Sales, marketing and order fulfillment support via our five branch warehouse locations.

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877-307-8767
Website: upnsinc.com
Parts/Products: A complete line of white, brown HD and four distinct lines of generic printed boxes for electrical auto parts. Private label boxes, including custom sizes, inserts, polybags and clamshell or blister pack packaging.
Services: Product fulfillment including receiving, repacking and distribution of your overseas purchases. Package development, art design and photography.

VAN BERGEN & GREENER INC
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708-343-4700 • 800-621-3889
Website: starterdrives.com
Parts/Products: New and rebuilt starter drives and starter drive components, New and rebuilt clutch pulleys, Rebuilt solenoids
Supplies: Grease, Boxes for drives and solenoids
Services: Quick turnaround on R&R for drives and solenoids

VEEJER ENTERPRISES
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Website: veejer.com
Parts/Products: Vehicle electrical-electronic troubleshooting training programs and products.

VENSEL ENTERPRISES
3710 Riverside Drive
Crystal Lake, IL 60014
815-459-0355 • 800-662-6099
Website: venselenterprises.com
Equipment/Products: Tools and equipment to test, clean, weld, turn, undercut, solder, wind, rewind. Shop supplies for alternators, starters, armatures, rotors, stators, field coils, permanent magnets, solenoids, bearings and water pumps.

VIKING BLAST & WASH SYSTEMS
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316-634-6699 • 800-835-1096
Website: vikingcorporation.com
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Services: Rebuilding services for airless shot blast equipment.

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Website: wagneralt.com
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WAIGLOBAL
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Website: waiglobal.com
Parts/Products: Alternators, starters, motors, starter drives, pulleys, solenoids, armatures, brush, brush holders, rotors, stators, voltage regulators, rectifiers, diodes, trios, ignition distributors, wiper motors, ignition coils and additional products for rotating electric industry.

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Atlanta, GA 30331
404-349-4712
Parts/Products: Full line core supplier

YALETRON, LLC
284B Quarry Rd
Milford, CT 06460
203-747-9363
Website: yaletron.com
Parts/Products: Regulators and rectifiers.

ZORKO'S
241 Wells Road
Home, PA 15747
727- 397-2611 • 800-341-5050
Website: websurplussales.com
Parts/Products: Armatures, rotors and stators, new, rewound and salvage. Drives, rectifiers, regulators, solenoids and more.
Services: Agricultural, emergency, marine, antique, forklift, mining, ATV, industrial, racing, bus, RV, lawn and garden, rescue, commercial, locomotive, super winch and winch repair. We buy armature, stator, rotor and unit cores.

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VRH2009-98, VRH2009-102, VRH2009-140



D755, VRB314, V0441
VRH2005-101, VRH2005-163



VRH2005-95
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VRH2000-51, VRH2009-66, VRH2009-95,
VRH2009-100, VRH2009-114, VRH2009-126
**P-D Regulator need VRH2009-66TF Module Test Plug*



VRH2005-142, VRH2005-150
**Needs RRT001-142*



VRH2000-73 , VRH2009-130,
VRH2009-145
**Needs RRT001-130*

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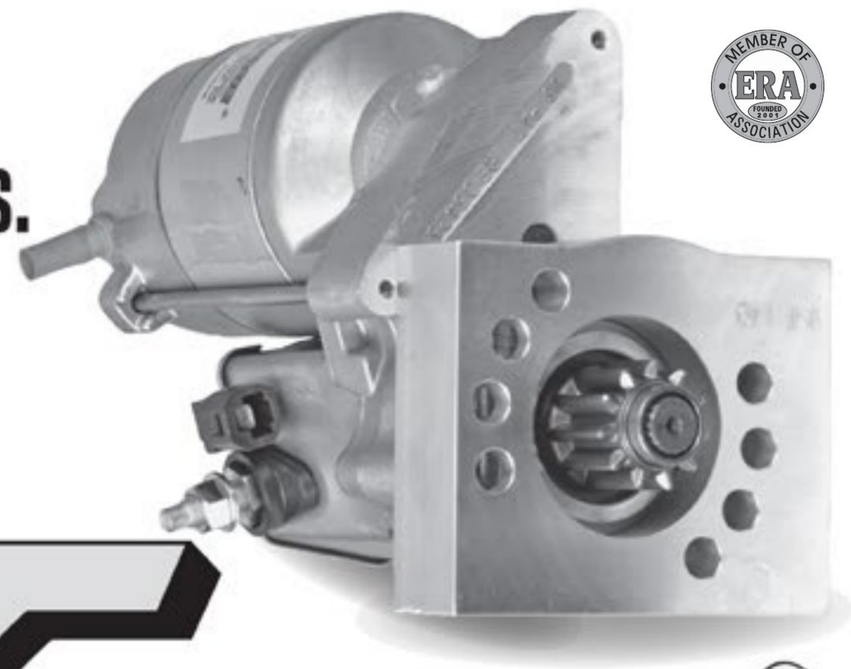
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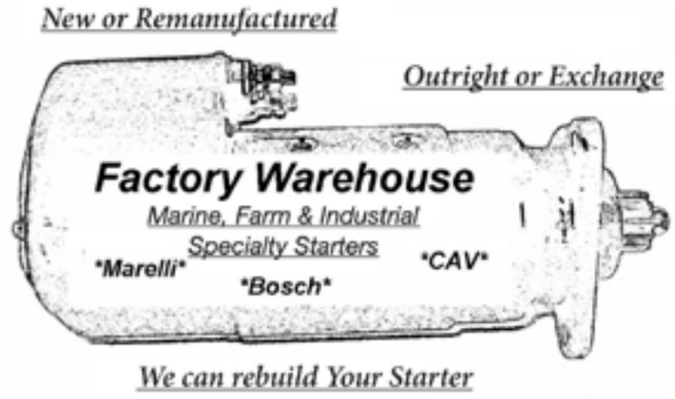
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TRADE SHOW

(Continued from page 1)

exhibit their products to buyers. Some shows today are totally controlled by the sellers and designed to attract attention and buyers for their products.

With the ERA Trade Show in Atlanta just a few months away, we thought this would be a good time to point out what makes this particular trade show different, not just different from the rendezvous, but different from most other trade shows today and even the ERA trade shows of the past.

This upcoming show has been planned and put together entirely by rebuilders. Most of them are owners of one-person or two-person shops. Having been involved in the planning process ourselves, we know that we had the benefit of input from dozens if not hundreds of other rebuilders from all over the US and Canada. This show was planned from the beginning by rebuilders and for rebuilders. You'll find information about attending on page 16–17. Register early to take advantage of the discounts.

Prices for booths have been reduced from those of previous years. We expect all 40 spaces to sell out—10 booths were taken within the first week of being offered. If you happen to be thinking about exhibiting, don't wait too long. If you are a rebuilder and have never been to an ERA show before, we guarantee that you'll find a supplier that you didn't know about.

Rebuilder admission to the exhibition is free for ERA members and is minimal for non-members. The cost of the tour of Boles Parts Supply is less than a meal at a fast-food restaurant—and a Southern BBQ lunch is included, compliments of BPS. The focus for planning the seminars for this show has been on quality, not quantity. Many of the speakers are names that you will recognize, well known and respected in the industry. The seminar topics all came from ideas submitted by rebuilders. These sessions should prove to be educational and very helpful.

If you are a rebuilder, this show was planned with you in mind.

ERA

Rebuilding Tip
Kohler Brush Pins

FROM VONNIE COKE

The commutator end housing shown in Figures 1 and 2 was used on several United Technologies starter applications on Kohler engines in the 9–27hp range that were found mostly on both garden tractors and small generators. Lester numbers 5801 and 5802 are two of the more popular starters using this type of housing. As shown in the photos, the plastic brush holder is riveted to the steel housing. There are holes for brush pins, but they are so large that it is almost impossible to use a standard size brush pin to hold all four brushes in place at the same time.

I discovered that a 1/8" diameter pop rivet fits tightly into the brush pin holes in this housing (*see Figure 1*). A long rivet of 1/2" or greater will easily hold the brushes back, leaving your hands free for assembly (*see Figure 2*). You may have to ream out the brush pin holes slightly with a 1/8" drill bit to allow the rivets to slide in and out easily. This has saved me a lot of time rebuilding these starters.

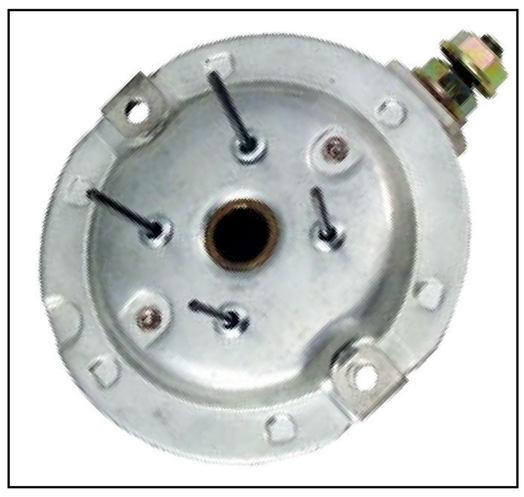


Figure 1—Outside view of comm. end.

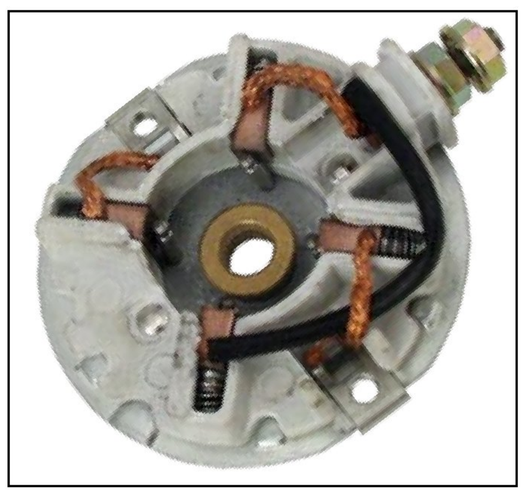


Figure 2—Inside view of comm. end.

ERA

Testing Leece-Neville Batteryless Alternators

BY BOB THOMAS

Leece-Neville 8SC Series Batteryless Alternators (*see Figure 1*) are, as the name implies, designed to provide power to electrical systems that do not include a battery. This sounded strange to us, too, but they are out there on the road, installed primarily to power refrigeration systems for trucks and air conditioning units on large buses and motor homes.

Some rebuilders have begun to see these alternators in their shops. While they look just like other 8SC series alternators, the regulator is different. For this reason, Leece-Neville recommends that they not be connected to a battery for testing. This poses a small problem, because most alternator test benches depend on a battery. Confusion about these Batteryless alternators is compounded by the fact that there is an ignition terminal, which obviously must be battery powered.

How They Work

As you can see in the diagram taken from Prestolite Technical Service Bulletin 1031 (*see Figure 2*), the positive side of the Batteryless System is isolated from the vehicle's normal electrical system, except for the excitation terminal and, of course, the vehicle ground. The excitation terminal is used to switch the regulator on and off, but it is not connected to the vehicle's ignition switch. Instead, it is connected to the master A/C switch. The output terminal is connected directly to the load, but, as you can see in the diagram, there is also a parallel circuit to ground through a 100 ohm 50 watt resistor. A capacitor is connected across the resistor to help it clamp stray voltage from load dumps. Normally, the battery in a charging system would do this.

When the regulator is turned on by voltage from the master A/C switch, the alternator supplies all of the power needed to operate the air conditioning or refrigeration system.

How to Test

If you find yourself working on one of these units, it would be prudent to follow Leece-Neville's suggestion, and do not connect it to a battery. It would also be wise not to operate the alternator open circuit, because this could cause high voltage with nowhere to go but inside the regulator. All of the alternator part numbers that we have found at the time of this writing, have been 24 volt 150 amp output. However, the regulators seem to have come with 12 volt or 24 volt excitation, depending upon the vehicle on which it is being installed. A revised regulator that replaces both types, can be excited using either voltage. Before you attempt to test one of these alternators, make sure that you know which type of regulator you have.

The best way to test this unit would be to operate it attached to a load of some kind. To get full output, you would need a load of 150 amps at 24 volts, which is about 3.6 kilowatts! However, for a basic operational test, you could connect it to one 24v DC motor or two 12v DC motors connected in series (*see Figure 3*). In a previous article, published in the October 2012 issue of The Exchange, we demonstrated testing a 48 volt alternator (also for a Batteryless System) using four Mercury outboard starters connected in series. A carbon pile connected in parallel with the "load" motor or motors would allow you to increase the load on the alternator beyond the demand of the motors

E R A



Figure 1—An 8SC alternator

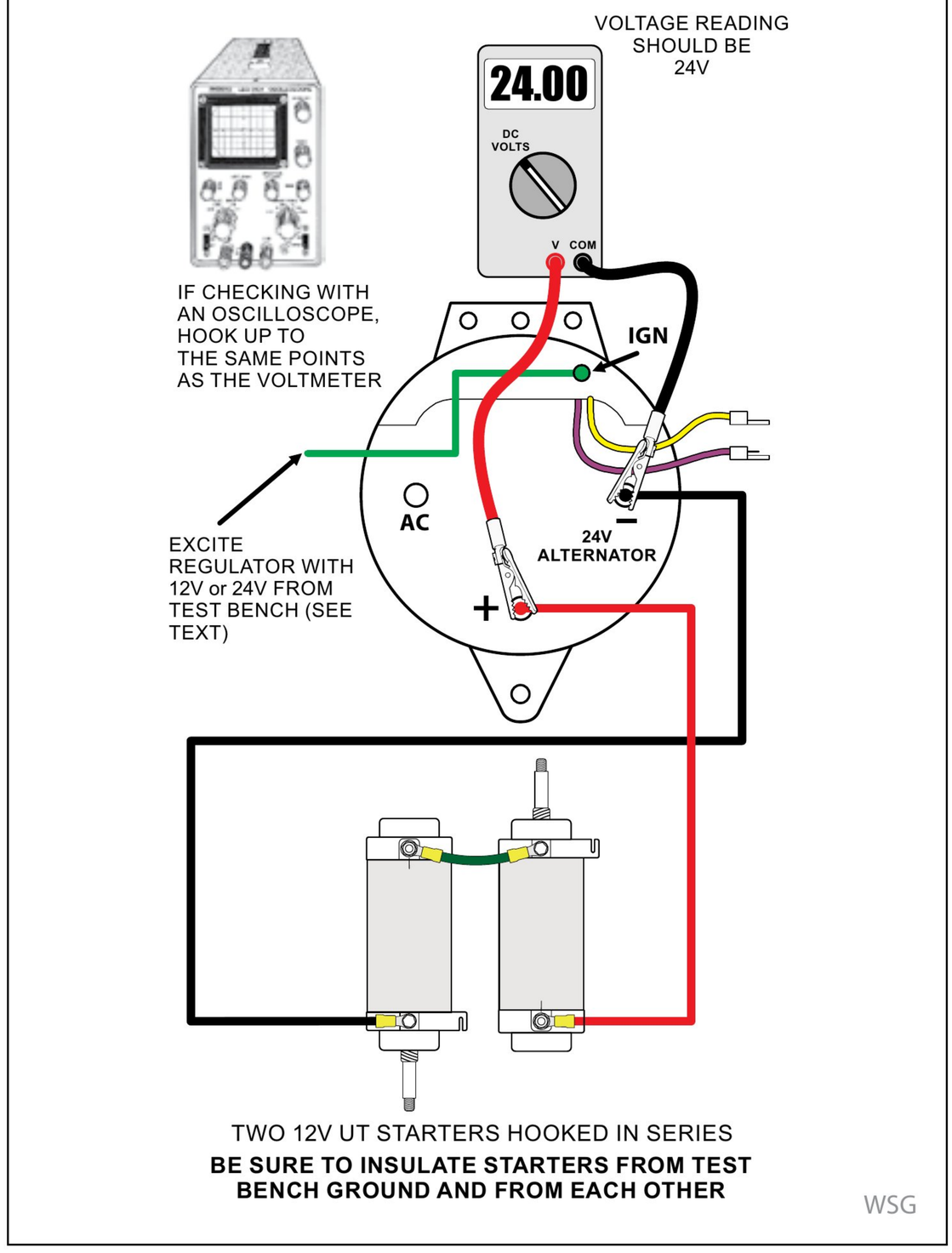


Figure 3—Batteryless alternator testing diagram

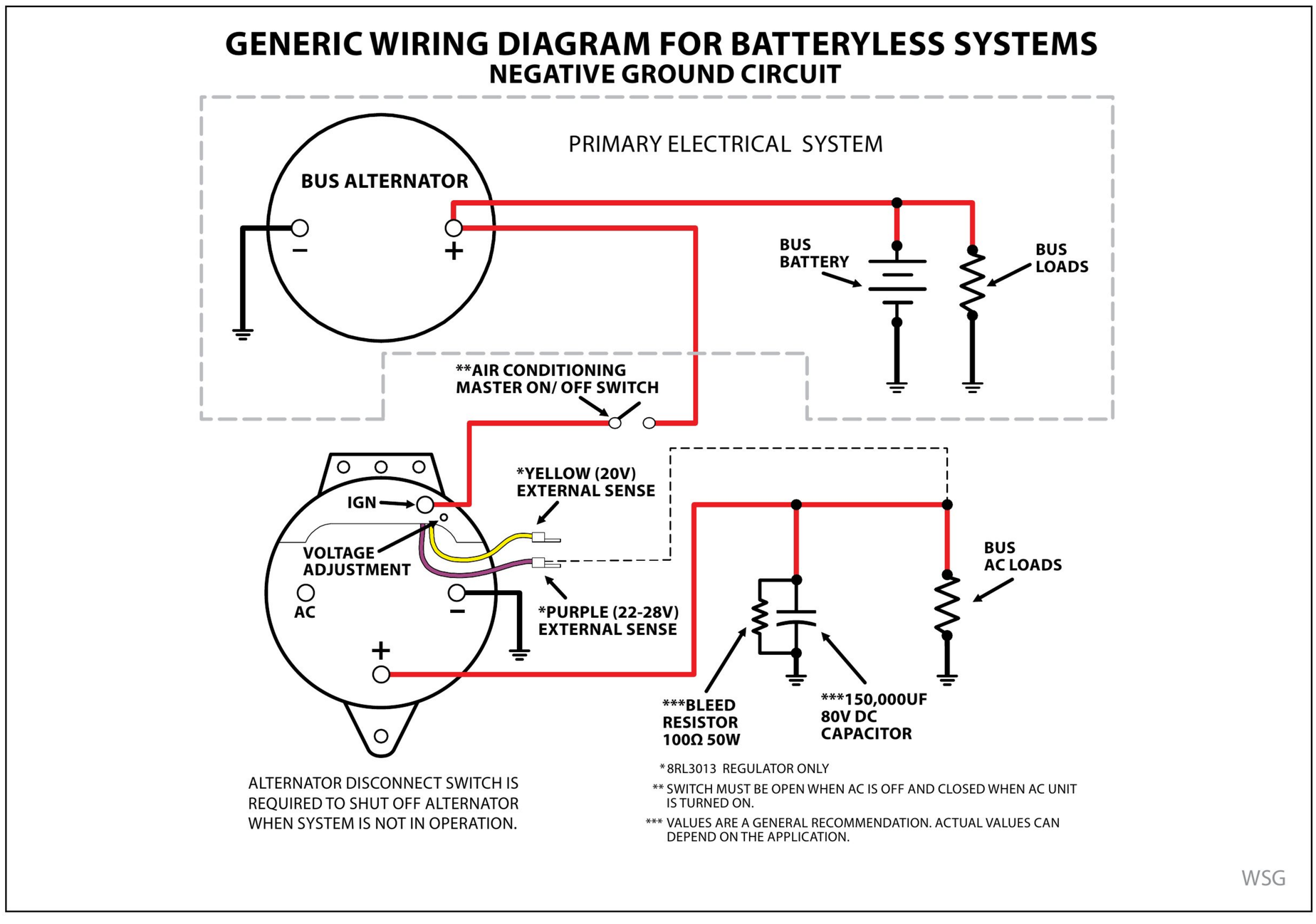


Figure 2—Batteryless alternator system wiring diagram

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Tool Tip

Use Valve-Guide Brushes To Clean Threads

BY THE EXCHANGE STAFF

From an installer's perspective, nothing is as frustrating as finding a mounting hole in a freshly rebuilt alternator that won't easily accept the fastener. This can happen when a heavily corroded housing is cleaned in a shot blaster, and the mounting holes look clean, but are in fact, still partially restricted. Both threaded and unthreaded holes are susceptible to this, especially when you are dealing with an aluminum housing.

It is true that threaded holes can be checked with a bolt and cleaned with taps or thread chasers when it is required. But the downside of taps is that they will unnecessarily remove some good aluminum from the hole and increase the chances of its being stripped by the installer.

A faster, easier and safer way to clean all mounting holes without removing good aluminum is by using a modified set of valve-guide brushes and a drill. Valve-guide brushes are sold individually or can be purchased as a set, with sizes varying from ¼ inch to ½ inch (*see Figure 1*). They are made of twisted wire with a handle on the end and are constructed to be turned by hand. If the handle portion is removed, these brushes can be easily chucked into any variable speed drill. A set of these brushes can be purchased from most tool vendors for $15 to $40, depending on how long you would like them to last. All you have to do is cut off the handles, and they are ready to clean mounting holes.

Use the smallest size possible for the hole that you are cleaning. Run the drill slowly, and the spiral turns of the wire will move the brush into the hole (*see Figure 2*). Go half way in and back out by reversing the drill. This is enough to clean most mounting holes. Going through twice will clean even the most corroded holes. Keep in mind that if the brush binds up in the hole, it will grab with all of the force that the drill can offer. Go slowly, especially the first few times you use it.

This method cannot fix damaged threads, but these brushes will clean metal dust, aluminum oxide and other debris from good threads and can clean unthreaded holes just as well. This will save your installers time by making it easy to turn mounting bolts in by hand. Happy installers make for repeat customers. It is a sure and quick way to make any rebuilt unit look better and install easier.

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Figure 1—An assortment of valve guide brushes.

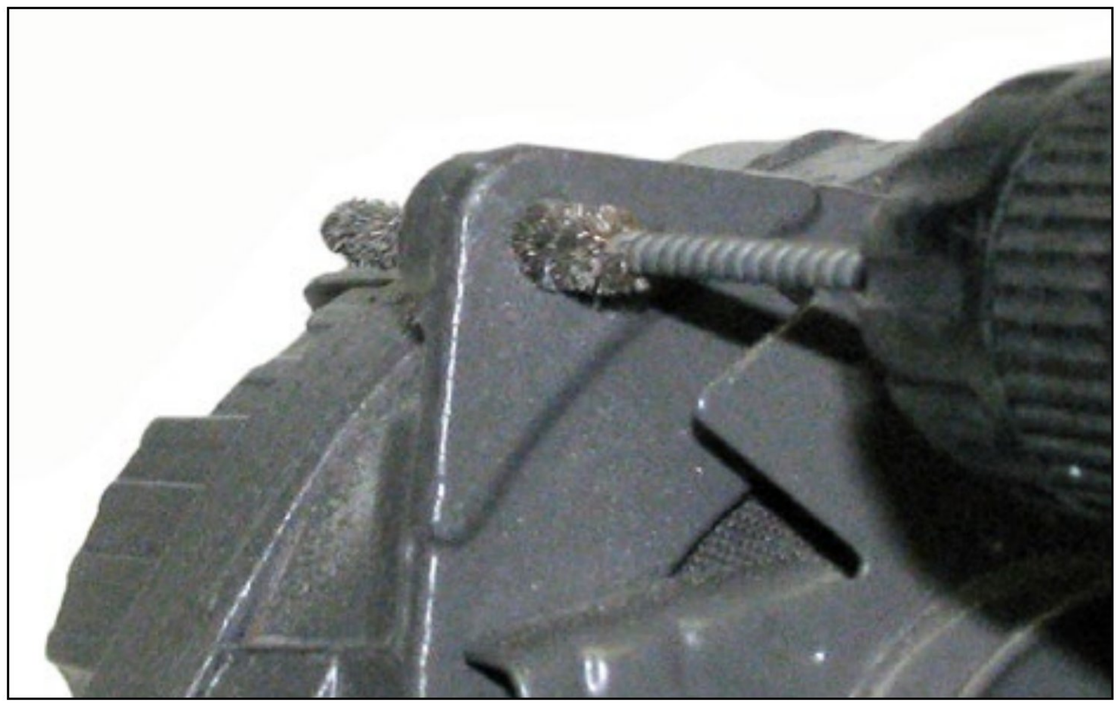
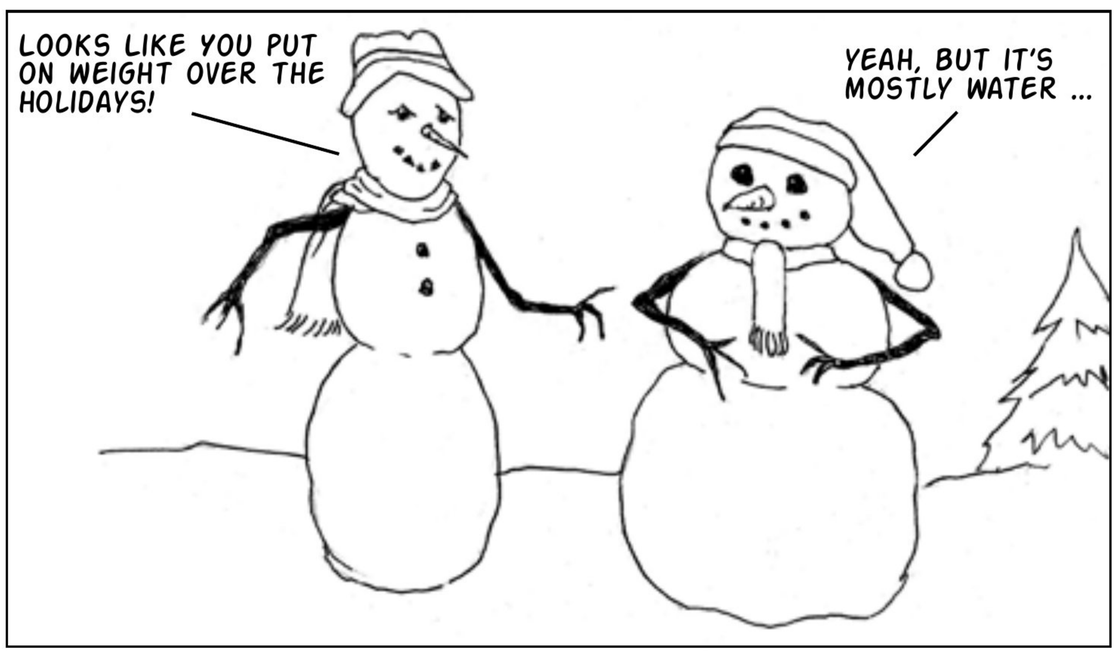


Figure 2—Cleaning a threaded hole

FIELD DAY—by Betsy Grueninger



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Testing Regulators With an Alternator

BY MOHAMMAD SAMII

In this month's column, I will share with you an alternator that I have tweaked to use for regulator testing. I will also revisit an antique Chevy starter that I found interesting for its design and the technology of those bygone years.

Test Alternator

Most small rebuilders are not financially able to afford the latest test equipment, and I am aware of many who do not even own a voltage regulator tester. Even for the shops who own the most up to date equipment, it becomes necessary at times to run a regulator with an alternator to see it in actual operation to detect problems that may be missed by the regulator tester. In this way, a dynamic test of the regulator's electronics ensures that the regulator is indeed able to perform its function.

Over the years, I have used a few alternators, modified to perform special tests on various families of regulators, for testing, graphing, and data collection. But the main one that I use these days, to make a dynamic test of a regulator, is a Denso 13578 alternator (any similar alternator would do). This family of alternators does not have a built-in regulator, and with their brushes being insulated from the case, they make a suitable test platform.

Since this type of alternator does not have a diode trio, I have glued a 10SI diode trio to the back of it. I have run wires to each of the three phases of the alternator to have a D+ (trio output), and also have brought out a fourth wire from the stator's neutral point (center of the Y) to give me the N (neutral). An appropriate connector can also reach the insulated field brushes (F1 and F2), thus providing the entire range of terminals such as F1, F2, D+, N, and more. With the help of a jumper wire, it can also provide P (Phase) input if desired. (*see Figure 1*)

For testing a regulator that includes brushes and a protective ring around them, like most Mitsubishi, Ford, and such, I use a slip ring that fits inside of the protective ring. This makes it easier to make a connection to the F1 and F2 pins. Otherwise, alligator clips on the field leads can be used. It does not make any difference to which brush they are connected, since the Denso alternator's slip-ring is isolated from the case.

A stand-alone socket with a 194 bulb and two alligator clips can also be made to function as an alternator warning light indicator. (*see Figure 2*)

This simple inexpensive alternator can become a very solid test bed for actual and dynamic testing of almost any regulator, particularly under high load. The nearly 6-amp current draw of the field coil can really stress-test the electronics of the regulator to catch weak solder joints and shaky semi-conductors which can sometimes pass the test with a typical regulator tester. (*see Figure 3*)

Testing a regulator with this homemade contraption may take a little time to set up, but if your shop does not own a regulator tester and your method of testing is to assemble the alternator to see if it works or not, then this may become a viable option until a real regulator tester can be obtained.

Old Technology...but Interesting!

We had this 1946 Chevrolet starter (1107061) to rebuild, where I noticed there is a switch attached to the field case. It toggled and clicked any time the starter was operated. Since the starter had a foot-operated ignition switch, this could not have been any sort of a neutral safety switch …but what was it? (*see Figure 4*)

Looking back at some old books and scratching my head to remember things from bygone years, it came to me that this was a sort of novelty, designed by GM and used during most of the 1940s. It was called a Polarity-Reversing Switch. (*see Figure 5*)

In those days, pitting of the contact points in the distributor was an issue

(See SAMII, pg. 18)

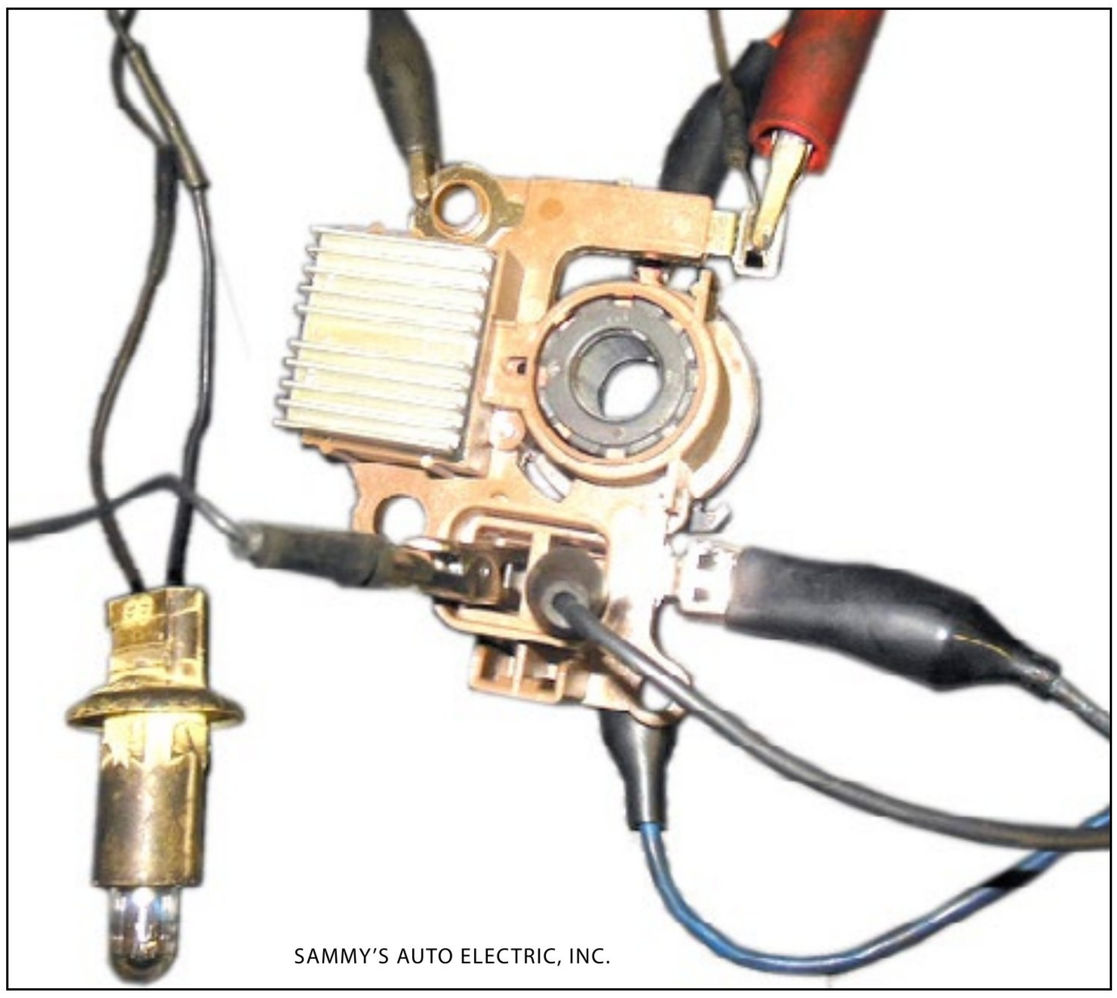
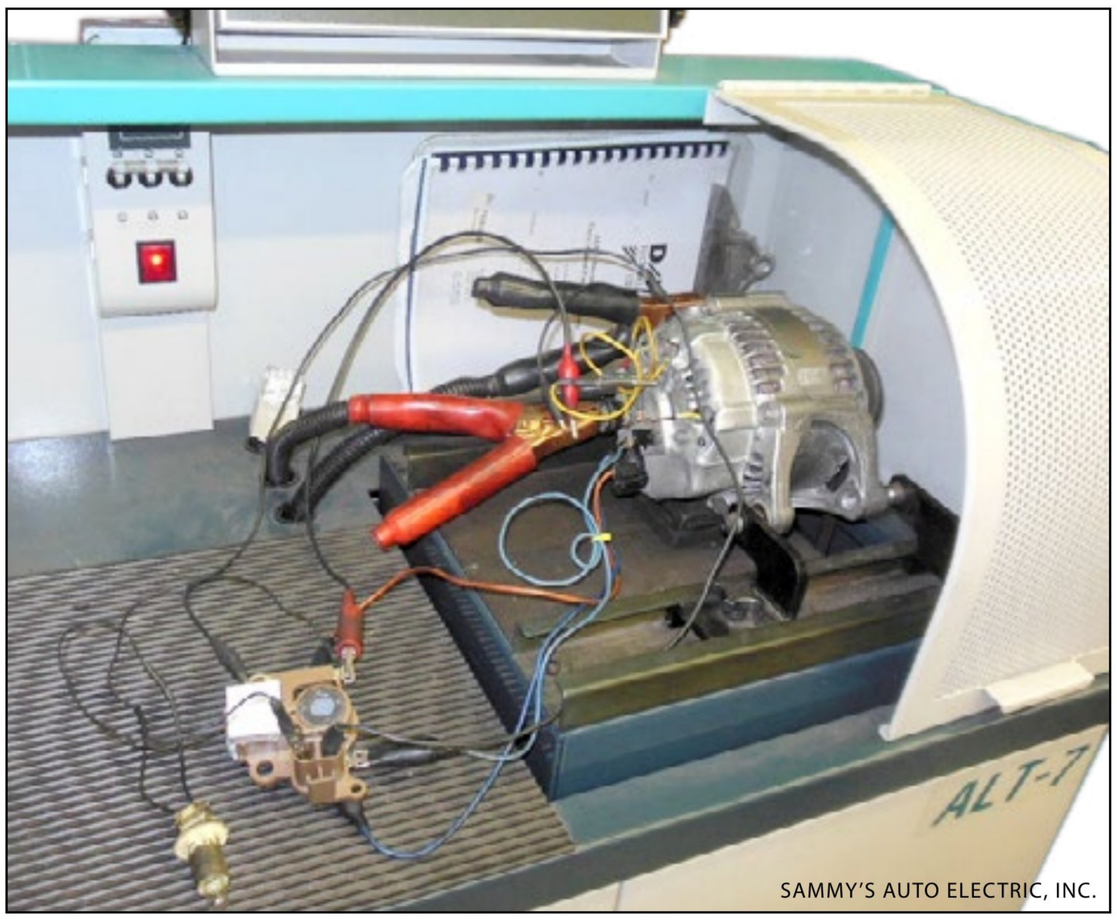

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Figure 2—Using a slip-ring for brush connection to run an IM-832 Mitsubishi regulator



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Figure 3— A typical set-up on the test bench.

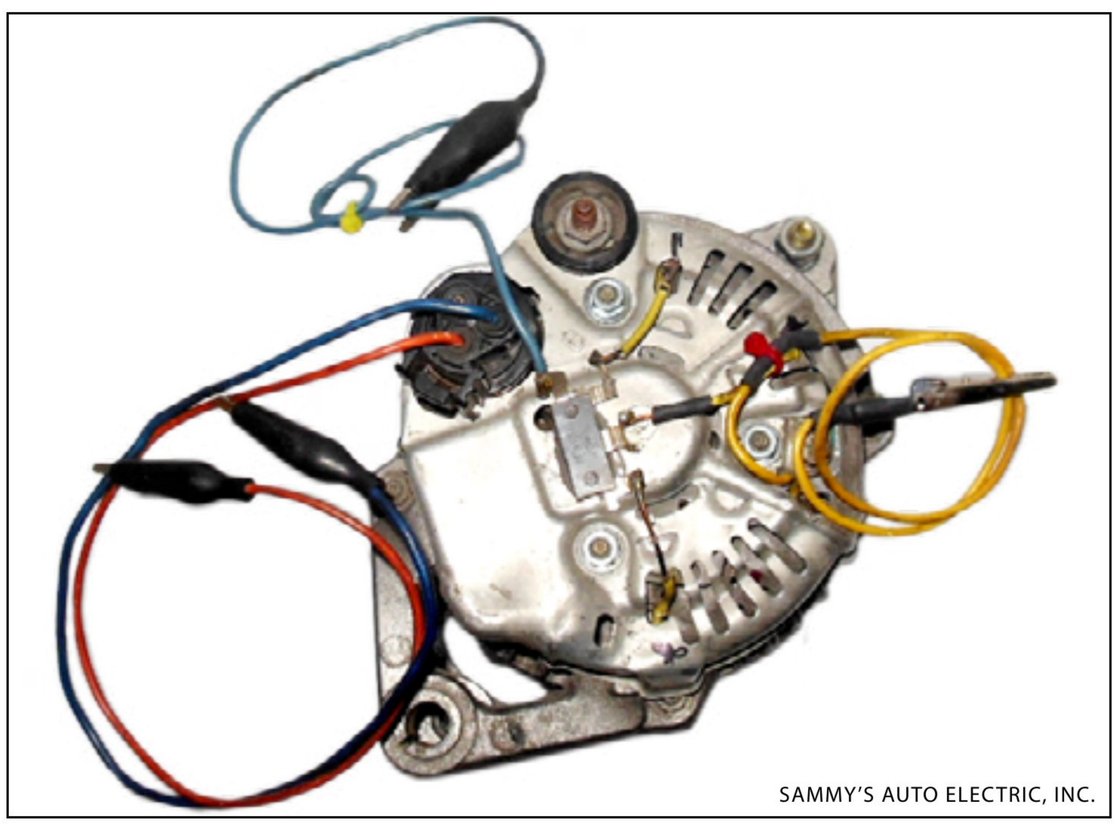

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Figure 1—Our Denso 13578 alternator modified for regulator testing

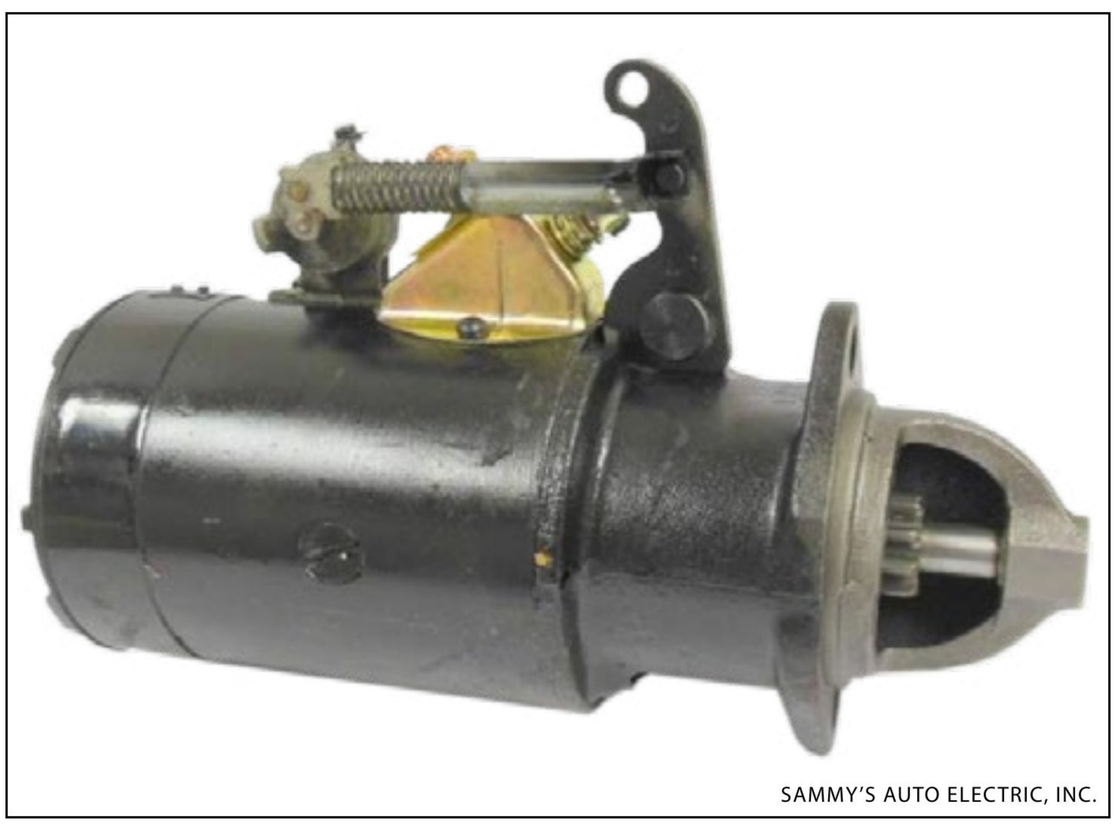

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Figure 4—1107061 Chevrolet starter

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Plant tour—8:30 a.m. to 12:30 p.m., BPS tour and BBQ lunch

Seminar—12:30 to 2:15 p.m., Joe Davis—"*What I've Learned Since I Retired—About Rebuilding, Business and Life*"

Seminar—2:30 to 4 p.m., Marshall Townsend—Bosch Technical Sales Specialist, "*Flash Reprogramming—Your New Profit Center*"

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Seminar—8 to 9:30 p.m., Shawn Bray—Romaine Electric, "*How to Price Yourself Into or Out of the Market*"

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Seminar—7 to 8:30 a.m., Dan Bell—Apptrak, "*Understanding Battery Technologies and Their Effects on the Charging System*"

Seminar—8:30 to 10 a.m., Gene Kaiser and Dave Kaplan—Regitar, "*Testing COM Terminal Alternators—On And Off The Vehicle*"

Seminar—10 a.m. to 11 a.m., John Kaiser—Ryder Rebuild Center, "*Rebuilding 39MT Starters*"

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Rebuilder's Roundtable—5:30 to 7 p.m., Dan Smith—Arrowhead Electrical Products, Inc. will moderate an open discussion about rebuilding topics

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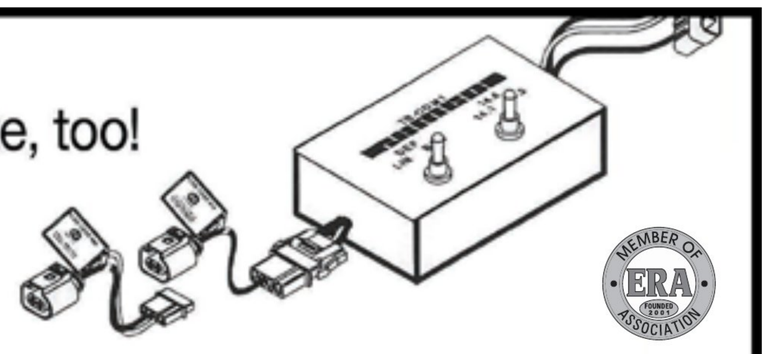
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(Continued from page 1)

downsized to adjust.

Today, working alone most of the time, Lemieux rebuilds only starter drives, and he will rebuild **any** starter drive. "I have never turned any drive away," he stated. Recently, a customer sent him a drive from a starter on a 1925 fire truck. The spring was twisted, and he immediately noticed why. Someone had used the wrong spring. "I found the correct spring in inventory and finished rebuilding it the same day. There is always a way of handling any problem." Lemieux specializes in rebuilding drives that are hard to find or simply not available at a reasonable price. He brings in part-time help when he gets behind.

His only full-time employee is Mary Conlon, who answers the phone and does just about everything else that needs to be done except rebuilding drives. "George and I have been working together for over 40 years," Conlon said. "That is when I started working for him, when he had Gemco Enterprises. I managed the office. And then with North Atlantic Starter Drive, I do the same." If you call about a drive, you'll be greeted by Conlon's pleasant voice.

Lemieux's friends sometimes ask him why he doesn't retire. "I like my work," he said. "It's a challenge sometimes, and that makes me think. It also keeps me busy." To put it simply, Lemieux still enjoys rebuilding.

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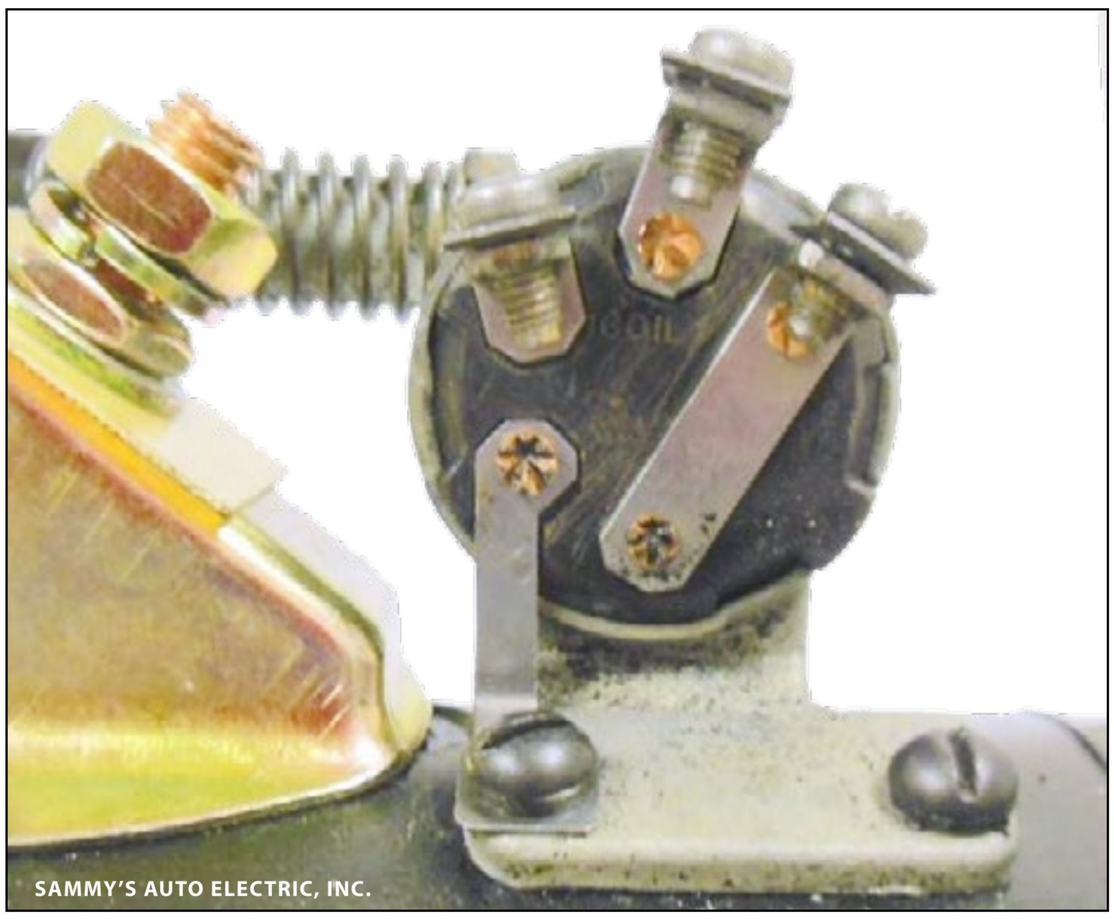


Figure 6—Close-up view of the polarity-reversing switch.

SAMII

(Continued from page 15)

that affected the longevity of the points, causing them not to last as long. To partially overcome the problem, they invented this polarity-reversing switch. The distributor's plate was insulated from ground and was routed through the switch. At every start attempt, the current path would reverse through the contact points to promote even wear and to minimize and even out the pitting, thus making the points last longer!

I suppose the added complexity to the system was the reason that they stopped using it in 1948. I guess using harder metals such as tungsten alloys in the design of the ignition points also helped them to do without this switch. (*see Figure 6*)

Seeing this old stuff reminds us of the progress in automotive technology and how far we have come—from the old ignition-points-and-condenser system to the modern electronic ignition, distributorless ignition system (DIS) with no moving parts, the latest coil-on plug (COP), and exotic plasma ignition. These newer systems all require proper syncing of cam and crank sensors to determine which cylinder is up next for ignition, and require a dedicated processor of their own to control the spark intensity and to fire the plugs. What's up next? ... All Electric cars?!!

Happy rebuilding!

Mohammad Samii

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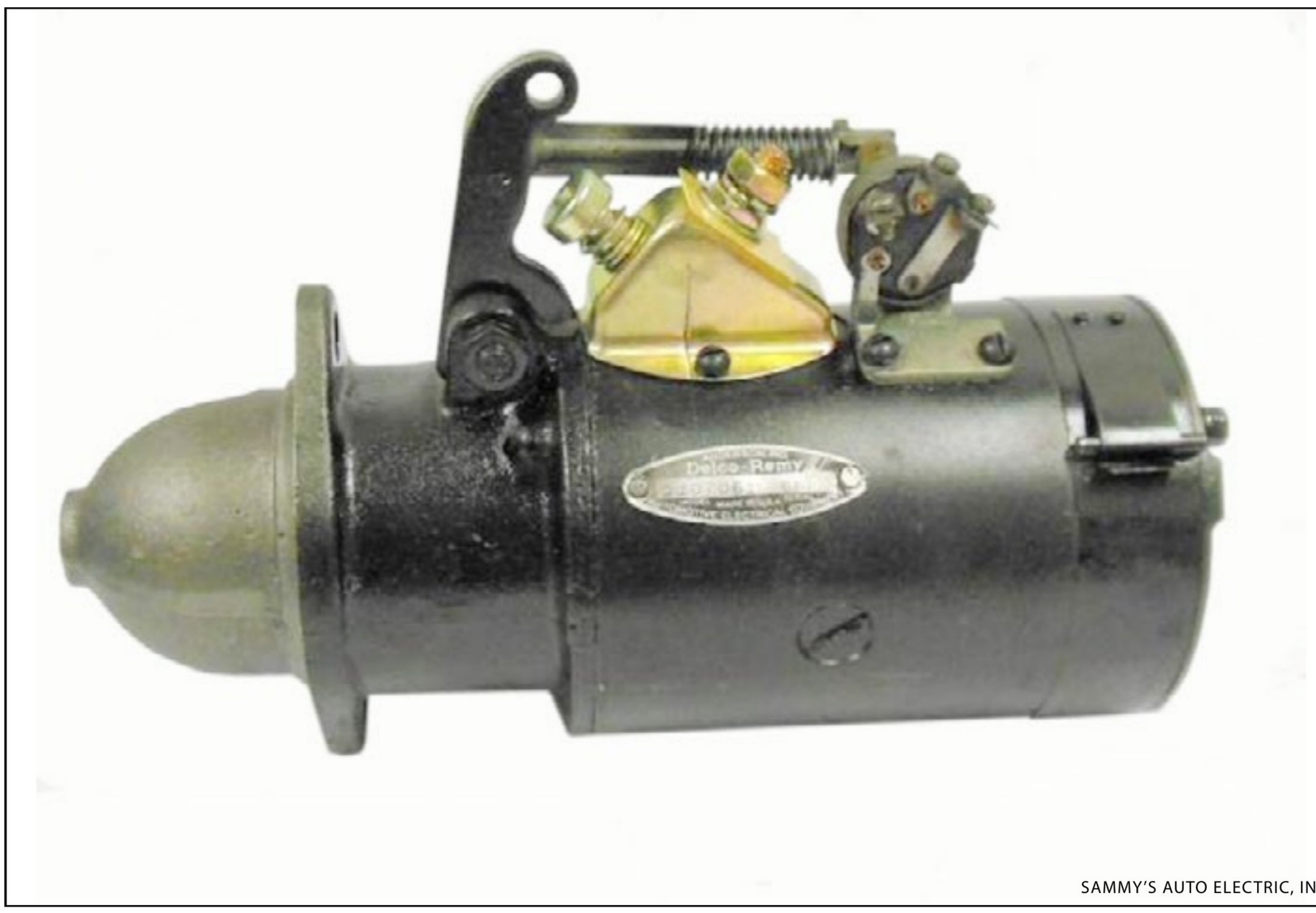


Figure 5—Another view of the Chevrolet starter showing the linkage.

Rebuilding Tip:
Reclaiming Mitsubishi Rectifiers

BY BOB THOMAS

One of the most common failure points in Mitsubishi rectifiers has nothing to do with the diodes. It is a poor or failed positive heat-sink-to-B+ connection. When you test the diodes in this type of rectifier, test from the diode stems to the heat sink. If they all test good and you plan to reuse it, you must inspect and clean the heat-sink-to-B+ connection. Mitsubishi rectifiers differ in that some have a B+ stud pressed through the heat sink (*see Figure 1*) while others have a B+ tab in the lead frame, as in this case (*see Figures 2 and 3*). The B+ tab is held against the positive heat sink and is soldered to a strap that connects it to the B+ terminal (*see Figure 3*) There is a small contact area on the back of the lead frame to make the connection between the B+ tab and the heat sink (*see Figure 4*). Here you have an aluminum heat sink pressed against a tinned copper tab. This is an invitation to galvanic corrosion, especially when exposed to moisture and road salts which combine to form an electrolyte. We will explain galvanic corrosion further in a future issue, but for now, lets just say that it takes place when dissimilar metals or alloys are fastened together.

The repair for this rectifier is quite simple and low cost. First, you have to clean both parts to ensure a good electrical connection, assuming that the surfaces are not pitted. Remember that the entire output of this alternator has to pass through this connection. Second, re-assemble it using dielectric grease, which will inhibit future corrosion by sealing out air, moisture and other contamination (*see Figure 5*).

Mitsubishi rectifiers with B+ terminals press-fitted through the positive heat sink, as in the first photo, are just as susceptible to corrosion. To re-establish a good connection in this type of rectifier, the terminal must be removed and cleaned, along with the hole in the positive heat sink.

Like any weak point in an alternator's design, Mitsubishi rectifiers with bad connections are a money-saving opportunity for rebuilders who are wise enough to repair and reclaim them.

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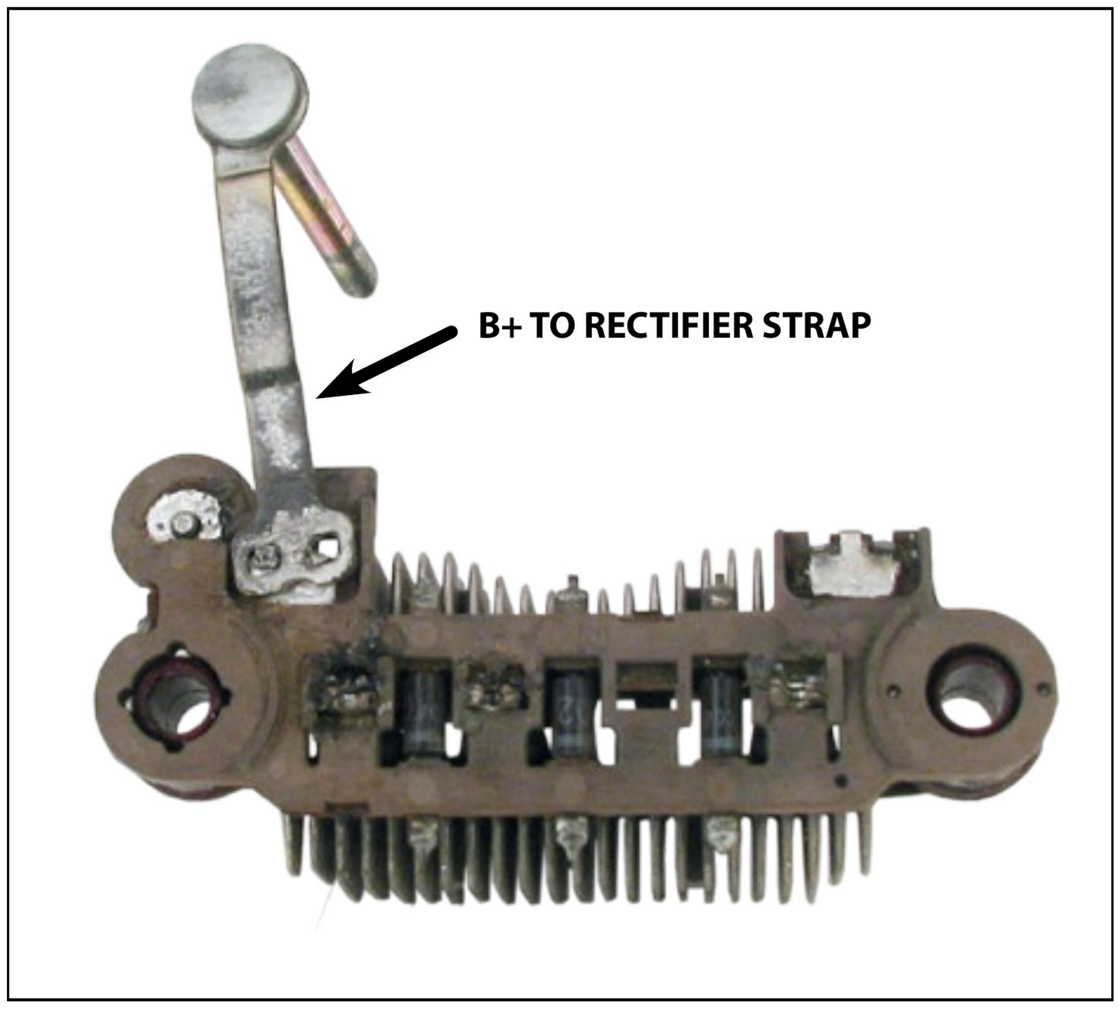


Figure 3—The "strap-style" rectifier from the alternator in Figure 2.

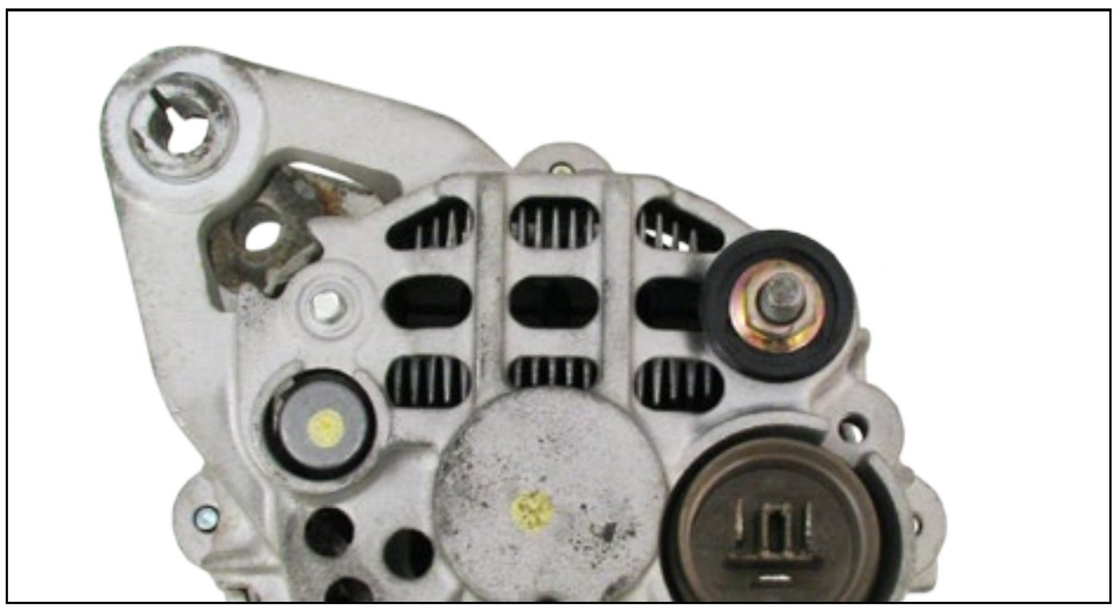


Figure 1—This rectifier has the B+ stud pressed through the positive heat sink

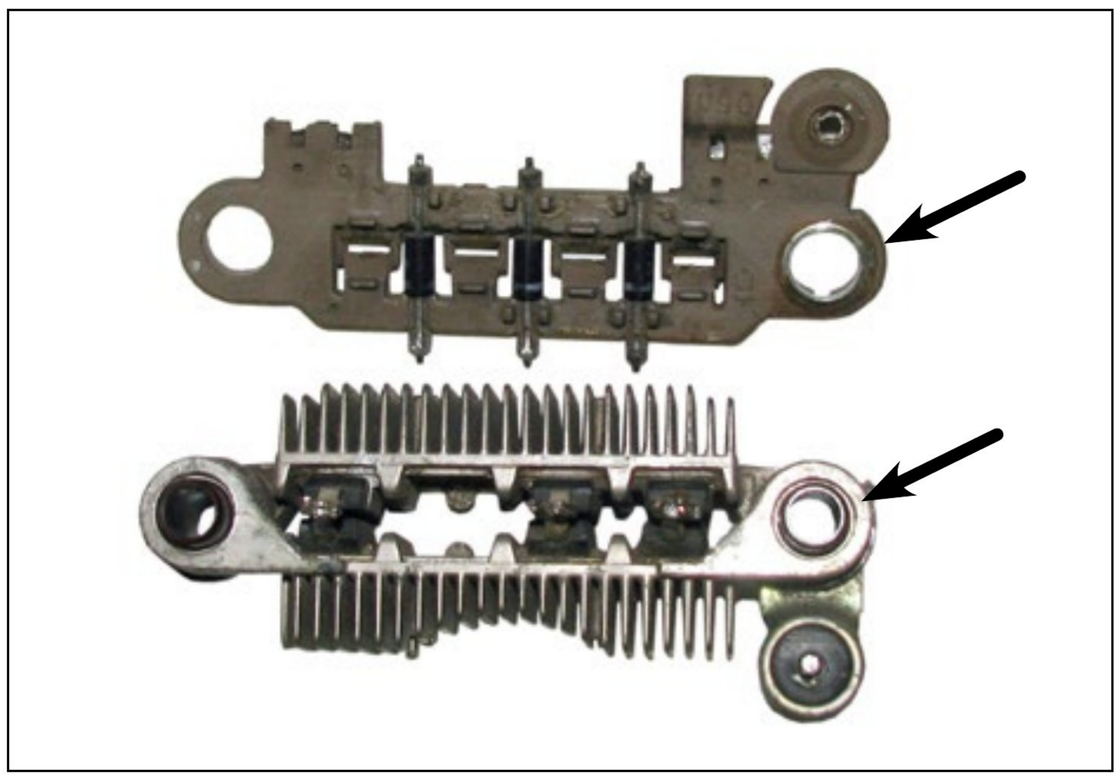


Figure 4—Disassembled rectifier showing trouble spots.



Figure 2—This rectifier has the B+ stud attached to a strap.

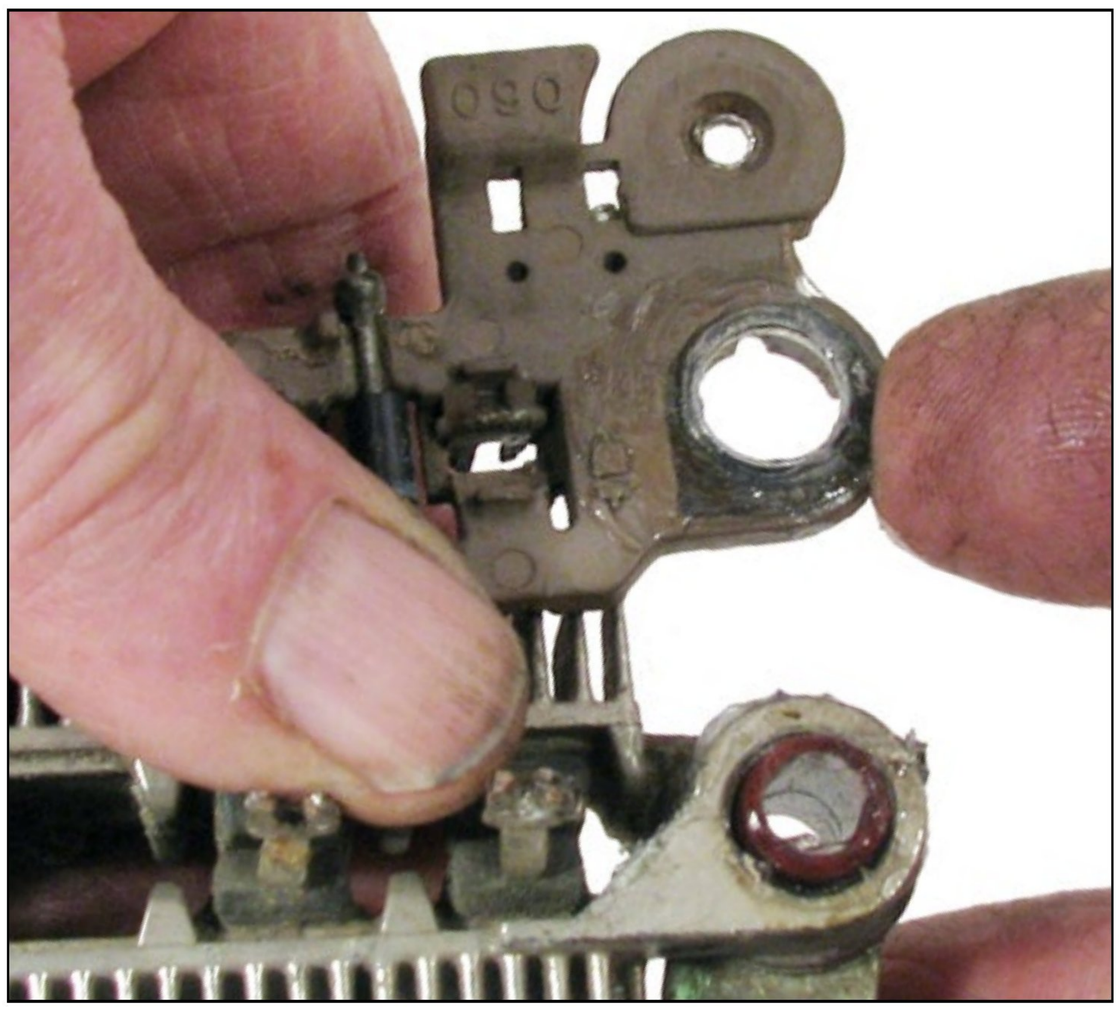


Figure 5—Apply dielectric grease to slow down future corrosion.

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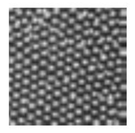






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