Tricks & Tips

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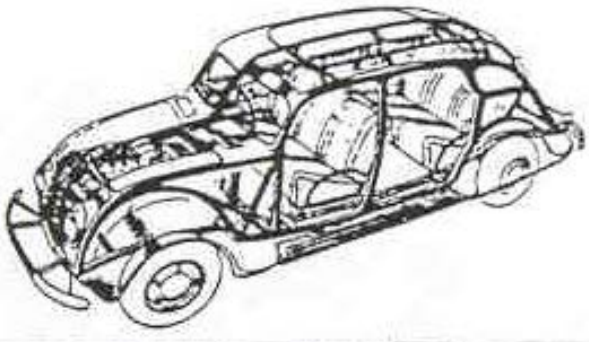
VOLTAGE REGULATOR - Look for Autolight #TC4301A when you are "treasure hunting". This voltage regulator will fit all Airflow models and years. An "Electra Brand" #VR-303 regulator will also fit. Remember, the old rule: "Buy it when you see it - it won't be there when you go back." If you don't need it, it may be a good trading item.



The Auto-Lite Voltage Regulator

Auto-Lite Voltage Regulator for Chrysler, DeSoto, Dodge, Plymouth –1935, 1936–This third brush type of generator is fitted with a cutout relay and a voltage regulator mounted on top of the generator.

Two adjustments are provided for the generator, that for changing the rate of charge and for setting the generator cutout relay.

Before attempting to set the charge rate connect a jumper wire from the fuse cup to the ground. This cuts out the voltage control unit, which is necessary while adjusting the charge rate. Be sure to remove the wire after the charge rate is set.

When adjusting the generator charge rate the generator should be removed from the engine and the commutator band removed so that the exact space between the third brush and the main brush can be observed. The third brush rocker ring can then be rotated and should be adjusted so that there are four commutator bars exposed between the third brush and the main brush nearest the third brush In no case should the brushes be set closer together than this.

The cutout relay points close at 6.5 to 7.3 volts and open at 0 to 3 amperes discharge current. Align the points and set the point opening between .015' and .025' by bending the armature stop. Adjust the spring post to obtain the correct voltage for closing the contact points. Bending the post to increase tension will increase the voltage at which the points close.

Normally the voltage control relay points are closed and they remain closed when the generator starts to charge the battery. When the battery becomes fully charged and the generator terminal voltage reaches a predetermined high value, the contact points open, thereby automatically connecting a resistance into the field circuit of the generator which decreases the generator charging rate. When the voltage has decreased to its predetermined low value, the contact points will close, shorting out the resistance in the field circuit, causing the generator to again charge at the higher rate. This unit prevents the generator voltage from becoming abnormally high after the battery has reached its fully charged condition, provided the generator third brush is properly set and all connections are clean and tight.

This voltage regulator also regulates the charging rate according to temperature. It permits the generator to charge at higher rates when the temperatures are low and a lower rate when the temperatures are high.

Editor's Note: By the time you read this newsletter, Phyllis and I will be speeding back home from the Hershey Meet. I went for the parts and Phyllis went for the chocolate! But we both had fun with our Eastern Region members at Mt. Joy and the Annual Airflow Feast!

The compensation for temperature is accomplished by the use of a magnetic shunt which bypasses part of the magnetic flow when cold and to a lesser degree when hot. In other words, the resistance in the field circuit which weakens the generator charging rate, is included in the circuit for longer periods during warm weather and shorter periods during cold weather.

The voltage regulator also compensates the charging rate for increases in load. If the generator is operating on a low rate and a load slightly greater than the low rate is placed on the circuits, the regulator will immediately go to the higher rate because of the drop in voltage occasioned by the increase in electrical load.

To make adjustments, remove the generator and check it on a test bench with the armature in the extreme downward position, the contact point opening should be set at .008" to .013".

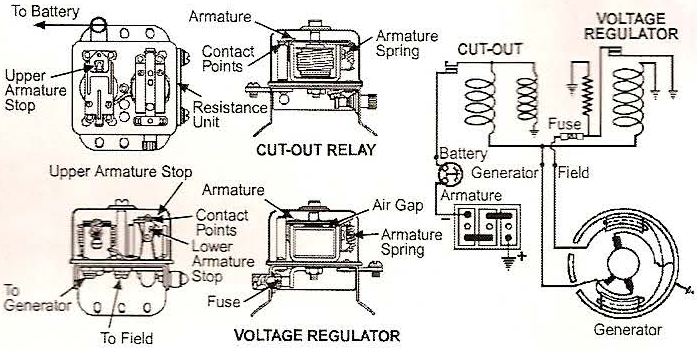
Adjustment is made by bending the upper contact support legs. Connect an accurate voltmeter between the terminal marked "BAT" and the ground. With the generator at room temperature, the control relay points should open at 8.3 volts and close at 7.3 volts. Because this control unit is overcompensated for temperature change, the hot opening and closing voltages will be lower than the cold opening and closing voltages. When checking the opening and closing voltages, cycle the regulator before arriving at a true reading.

To cycle the regulator, increase the speed of the generator until the voltage is reached at which the points just open, then decrease the speed until the points just close. After making this cycle, obtain the true voltage readings at the instant the points open and close.

The cover must be in place when checking voltage readings. In addition, do not overrun the voltages reached at each point. If specified voltages cannot be reached, insert a resistance in the charging circuit. A variable resistance of sufficient current carrying capacity that will make it possible to obtain approximately .25 ohm resistance can be used. The lowest possible resistance to attain voltage should be used to prevent vibrating of contact. Re sure to remove the resistance after setting has been obtained.

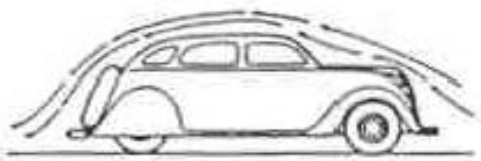
Increase or decrease the opening voltage by increasing or decreasing the armature spring tension. This is done by bending the lower spring hook. Closing voltage is increased by increasing the armature air gap and decreased by decreasing the armature air gap.

It is only necessary to turn the lower armature stop slightly to obtain the closing voltage adjustment.



Submitted by Jim Lightfoot from MoToR magazine, February 1936 issue

Tricks & Tips



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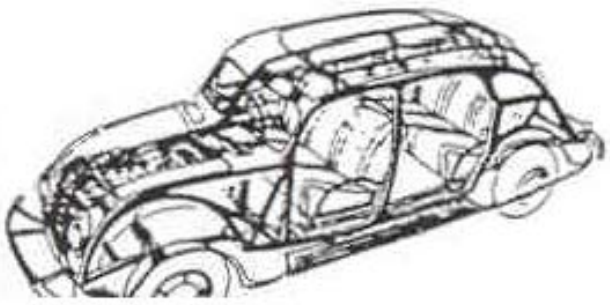

VOLTAGE AND CURRENT REGULATOR TEST SPECIFICATIONS

Two Step, Voltage Controlled, Current Regulators

Make	Model	Points Open	Points Close	Test Connections
Autolite	TC4100 (Entire Series)	8.4 to 8.9 Volts	6.8 to 7.1 Volts	Figure 10, Page 9
Autolite	TC4200 (Entire Series)	8.4 to 8.9 Volts	6.8 to 7.1 Volts	Figure 10, Page 9
Autolite	TC4304	8.0 to 8.5 Volts	6.9 to 7.2 Volts	Figure 10, Page 9
Autolite	TC4304A	8.0 to 8.5 Volts	6.9 to 7.2 Volts	Figure 10, Page 9
Autolite	TC4300 (All Others)	8.4 to 8.9 Volts	7.3 to 7.6 Volts	Figure 10, Page 9
Delco Remy	5539	8.5 to 8.9 Volts	7.0 to 7.5 Volts	Figure 10, Page 9
Delco Remy	5540	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5542	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5544	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5546	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5548	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5549	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5550	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5551	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5552	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5554	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5555	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5556	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5558	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5581	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5582	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5583	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5584	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5585	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5589	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5590	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5593	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5594	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5595	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9
Delco Remy	5800	7.7 to 8.0 Volts	6.7 to 7.1 Volts	Figure 10, Page 9
Delco Remy	5804	8.1 to 8.5 Volts	7.2 to 7.5 Volts	Figure 10, Page 9
Delco Remy	5805	8.3 to 8.6 Volts	7.3 to 7.7 Volts	Figure 10, Page 9

Vibrating Current Control Regulators

Make	Model	Current Setting—No Load	Current Setting—With Load	Test Connections
Delco Remy	5541	13 to 16 Amperes	19 to 22 Amperes with 11 Ampere Lamp Load	Figure 15, Page 12
Delco Remy	5543	7.5 to 8.5 Amperes	11 to 13 Amperes with 7 Ampere Lamp Load	Figure 15, Page 12
Delco Remy	5545	6.5 to 7.5 Amperes	10 to 12 Amperes with 7 Ampere Lamp Load	Figure 15, Page 12

Vibrating Voltage Regulators

Make	Model	Voltage Setting with Generator Charging at 8 to 10 Amperes	Test Connections
Autolite	VRD-4002A	7.4 to 7.9 Volts	Figure 12, Page 10
Delco Remy	5557	7.5 to 7.8 Volts	Figure 12, Page 10
Delco Remy	5558	7.5 to 7.8 Volts	Figure 12, Page 10
Delco Remy	5591	7.7 to 8.0 Volts	Figure 12, Page 10
Delco Remy	5592	7.7 to 8.0 Volts	Figure 12, Page 10
Delco Remy	5600	7.3 to 7.6 Volts	Figure 12, Page 10
Delco Remy	5803	7.3 to 7.6 Volts	Figure 12, Page 10

Combination Vibrating Voltage and Current Regulators

Make	Model	Voltage Setting with Generator Charging at 8 to 10 Amperes	Current Setting	Test Connections
Autolite	VRB-4004B	7.4 to 7.9 Volts	26 to 28 Amperes	Figure 14, Page 11
Autolite	VRB-4005A	7.4 to 7.9 Volts	20 to 22 Amperes	Figure 14, Page 11
Delco Remy	5559	7.5 to 7.8 Volts	20 to 22 Amperes	Figure 14, Page 11
Delco Remy	5587	7.3 to 7.6 Volts	20 to 22 Amperes	Figure 14, Page 11
Delco Remy	5596	7.3 to 7.6 Volts	20 to 22 Amperes	Figure 14, Page 11
Delco Remy	5597	7.3 to 7.6 Volts	26 to 28 Amperes	Figure 14, Page 11
Delco Remy	5599	7.3 to 7.6 Volts	26 to 28 Amperes	Figure 14, Page 11
Delco Remy	5809	7.3 to 7.6 Volts	24 to 26 Amperes	Figure 14, Page 11
Delco Remy	5810	7.3 to 7.6 Volts	24 to 26 Amperes	Figure 14, Page 11

IMPORTANT NOTE — All of the specifications given above are for a COLD regulator (70 degrees). If the regulator is hot (150 degrees — very warm to the touch) the settings will read about 5% lower than those given herein.

Technical Tip

While on our trip east to Hershey in October, Paula and I were pleased to be able to stop for lunch with Bob Schofield in Erie, Pennsylvania. Bob met us at the freeway off ramp in his DeSoto S-2 so I had a chance to look it over. I noticed, in the engine compartment, what appeared to be a brand new voltage regulator. I have had some trouble finding one that looked exactly like the original but Bob told me that his local electrical guy had ordered that one and he was sure he could order one for me. A week after we got home, a small package arrived with a lovely brand new voltage regulator which looks exactly like the drawing in my maintenance manual, complete with the notation of "6V POS" on the side and the screw-in fuse on the base. It is the same for the 1935 and 1936 SF, SG, S-1, and S-2 model DeSotos. The drawing for the SE appears to be slightly different but should work. This unit is made by the **Ace Electric Company** and is noted as part number VR - 1407. Bob's source is Briggs - Hagenlocher, 1110 Chestnut St., Erie PA 16501 and their phone number is (814) 453-4864.

Jim Lightfoot

Those attending the David Askey Memorial Meet with cars were:

Don & Lois Bigler	1934 DeSoto Brougham	Dayton, Ohio
Chuck & Char Cochran	1934 DeSoto Coupe	Indianapolis, Indiana
Dick & Joan Ford	1934 Chrysler CV	Grand Blanc, Michigan
Sam & Toby Haberman	1934 Chrysler CU	Birmingham, Michigan
Bob & Marge Mantel	1934 Chrysler CU	Rochester, Michigan
Ed & Linda Patterson	1935 Chrysler C1	Beavercreek, Ohio
Doug & Arlene Conran	1936 DeSoto S-2	Benton Harbor, Michigan
Octie & Joan Ham	1936 Chrysler C-10	Lake Orion, Michigan
Ron Thomann	1936 DeSoto S-2	Westerville, Ohio
Frank & Roby Kleptz	1937 Chrysler CW	Terre Haute, Indiana
Wayne & Susan Simonson	1937 Chrysler C-17	Ray, Michigan
Brent Rosenbusch	1939 Dodge Tanker	Auburn Hills, Michigan

Other attendees:

George Birner	Hadlyme, Connecticut
Bill & Corinne Breer	Bloomfield, Michigan.
Bill & Durlene Butler	Midlothian, Texas
Ellis & Gerrie Claar	Greensburg, Pennsylvania
Bob & Linda Cranston	Binbrook, Ontario
Matt Elgart	Hadlyme, Connecticut
George & Pauline Evoy	Bright, Ontario
John & Lynn Heimerl	Suffolk, Virginia
Ray Jackson	Alsip, Illinois
Bernie & Charlotte Kieffer	Wilmington, Delaware
Dick & Alice Kwandras	Cheektowaga, New York
Ken & Joan Mack	Auburn Hills, Michigan
Dana & Diana Markey	Birmingham, Michigan
Richard McFadden	South Haven, Michigan
Bob & Mae Milbrand	Harrisburg, Pennsylvania
Mike & Ginny Patterson	Laura, Ohio
Bruce Thomas	Bloomfield Hills, Michigan
Hardy Trolander	Yellow Springs, Ohio
John & Julia Tuthill	Golden, Colorado
Kevin Williamson	Limehouse, Ontario

Airflow Basics

by John Heimerl, Club Historian

The Eastern Regional was an amazing meet! Two outstanding events in one year is really wonderful, and makes up for the fact that I will have to miss Hershey this year due to work at the TV station.

But back to the meet, we had two CU's there, **Bob Mantel's** *(now outfitted with overdrive – there's a story for another article!)* and **Sam Haberman's** newly acquired CU, which needed a few things tweaked. The overdrive cable was stuck, so while we were are Bob and Marge's for a wonderful 4th of July picnic, a bunch of us took the cable out (of course). What is a car club picnic without a bunch of people working on a car? Once the cable was un-stuck, we all piled in for a test run and sure enough, the O/D worked!

Later, **Ray Jackson** and I snuck over to his house and assisted in getting the voltage regulator adjusted. Most folks are a bit hesitant to work on a Step-Voltage Control or Two-Charge Voltage Regulator (as they were called), but the bottom line is that if the generator is charging at all, VR's are pretty easy to make behave.

One coil is the cut-out (in one position it charges, the other there is no connection to the battery) and the other is the rate, and sets the output at either high or low charge. So effectively, you have three rates - high, low and no charge.

Normally, when the generator is turning, and battery voltage is applied to the field terminal of the generator, a generated higher voltage appears at the main terminal, which engages the cut-out relay which connects that voltage to the battery. If the voltage from the generator drops off, the cut-out disconnects the generator from the battery so the battery won't discharge through the generator coils.

First, the carbon resistor under or on the side of the VR has to be OK (on DelcoRemy 5544 it was a wire-wound item, and on the Auto-Lite TC-4301-A there are carbon blocks; they generally are 1-2 ohms and marked with the actual amount, such as 1.85 for 1.85 ohms. The two relay coils should not be open or shorted, and there should be an air gap of .045 on the rate relay and .015 on the cut-out, meaning, when the contacts are closed, you should be able to get a feeler gauge between the contact arm and the top of the coil.

If these are OK, the only thing that can go wrong is dirty or burned contact points or mis-adjusted contact point spring tension. Bumping one set of contacts stops charging altogether (cut-out) and the other changes the amount of charge (puts the resistor in the field circuit). Judicious bending on the contact tension spring arm can reduce rate on a system that is always wide-open, or increase rate on a system that hardly charges. Take it in very small steps so you don't loose your place! You also need to be sure that your battery is fully charged (minimum 6.3 V), and your generator does charge (8.5 V max). You can adjust the generator output by moving the third brush, but I don't suggest a change unless you believe it was incorrectly set in the past- 20 to 25 amps is the maximum safe on these old units. The more you try to draw from the generator, the greater the chance that it will heat up, throw the solder on its winding, and *poof*, no output at all! This often happens on 8-V conversions. Of course on 12-V conversions, you have to change the generator, VR, battery, some of the gauges, bulbs, etc., etc. For authentic cars, a 6-V system can be made to perform decently, but the wiring size, and battery cables must be correct. Headlights will be pretty dim if you have re-wired with 12-gauge; ten is a minimum and many Airflowers have later headlamp relays added so the loss of the trip through the ignition switch and the dimmer switch is no longer an issue. Lots of these were put on in the 40's as the cars aged and paled in comparison to the sealed beams on newer cars *(pun intended)*.

BTW, did you know that Airflow headlamps were the first attempt at sealed beams? Check out what **Carl Breer** says about that in his book, still available from the SAE (sae.org).

On the high current items, the starter will just grind slowly if you do not have BIG gauge battery cables and have the + lead nailed to the bell-housing right behind the starter, and of course, make sure you bond the engine back to the frame with a braided ground somewhere.

So anyway, seeing two CU's was inspirational, and this winter we are going to crank up our CU for the first time in, oh, 55 years.

Now, on the meet, if you get to Detroit anytime soon, you must make it by the Walter P. Chrysler Museum. Their coverage of the Airflow is superb, and **Bruce Thomas** will be glad to see you down at the Historian's Office in Boss Chrysler's garage. Bruce gave us a spirited set of stories relating back to his experiences with **Carl Breer**, and how the Trifon was saved. **Ed Patterson** joined in with recollections from the earliest Michigan meet, and **Octie Hamm** introduced us to **Ken Mack**, retired D/C executive engineer and think-tank participant, who treated us to many highlights of forward-thinking in Daimler-Chrysler's future engineering.

Now, what did I say about over-heating last time? Well, I'm not quite ready. We are using the C-2 as a guinea pig of sorts. Things that will be discussed include by-pass blockage, thermostat removal, radiator re-coring, anti-freeze percentage, pressurized systems, block flushing and water pump impellors, placement of the vanes in the block, and pulley size.

These and other concepts are being tried by various Airflowers who have found their straight 8's running 190 and over (and for some, I mean boiling over!). Funny, those six cylinder engines seem to be much less prone to run hot. Another reason to own a CY or a DeSoto. And another thing, we can't find too many stories of these engines running hot way back then, compared to now…..Hmmmmm. Global warming?

Basically, it's the Airflow that makes the difference! (or, is that the Waterflow?)

Till next time!

John Heimerl