ARMATURE GROWLER TESTING

By Richard Vensel

Section 1: Basic Testing using:

Crown 2501/3 Growlers

Section 2: Dick's Additional Testing Notes

Section 3: Lap and Wave Windings

Section 4: Crown 2501 Schematic

VENSEL ENTERPRISES

RICHARD & BARBARA
VENSEL

(815) 459-0355
(800) 662-6099
Website: www.reman.com/vensel
E-mail: www.vensel7@aol.com

3710 RIVERSIDE DRIVE
CRYSTAL LAKE, ILLINOIS
60014 USA
FAX (815) 459-0442

AUTO ELECTRIC
EQUIPMENT SUPPLIER

INSTRUCTIONS
FOR
CROWN EXTERNAL GROWLER
Catalog No. 2501 & 2503

MODEL: 2501 -------- 115V.A.C. 50/60 HZ

MODEL: 2503 -------- 230V.A.C. 50/60 HZ

The Crown Model No. 2501 & 2503 External Growler is a handy, all-purpose instrument that offers you a wide variety of tests on armature sizes from 1\2" diameter through 8" diameter.

ATTENTION:
Use only on power supply of correct voltage and frequency as indicated on nameplate.

PURPOSE:
The CROWN MODEL NO. 2501 & 2503 GROWLERS are used to test for "short" or "open" circuits and "grounds in armatures".

The Growler consists essentially of a primary coil and a portion of the iron of a transformer. The iron of the armature under test completes the magnetic circuit.

When an alternating current is passed through the Growler primary circuit, it sets up an alternating magnetic field around the armature, reproducing the approximate magnetic affect under which the armature operates when assembled in a motor.

The standard Growler tests armatures 2" in diameter and larger. For smaller armatures (down to 1\2" in diameter) the small iron block is merely placed between the Growler laminations to reduce the space, and also cut down the power so that small armatures can be suitably tested.

OPERATION:
An armature should be placed on the growler before turning on the current. Failure to do so may cause current to rise above the capacity of the coil and cause overheating.

THE "SHORT" TEST

The most common way of using the Growler is the so-called "feeler method", in which the feeler is a hacksaw blade. Turn the selector switch to "SHORT" position. The armature should be placed in the Growler and slowly rotated by hand with the feeler held just above the top slot of the armature. If the coil is short circuited, the feeler will stick and vibrate. If coils are not shorted, no pull will be felt on the feeler.This action is quite evident and positive, so that with a little practice, short circuits are recognized quickly.

Always turn selector switch "OFF" when armature is removed from the growler.

THE "OPEN" TEST

Place the armature on the Growler *and* turn selector switch to "Volts Hi" and rotate the armature slowly. As each coil comes in position between the pole pieces, touch the

Electrical Rebuilder's ERA FOUNDED 2001 ASSOCIATION

corresponding commutator bar with one test prod and the adjacent bar with the other prod.
Watch the meter and if it reads, low turn the selector switch to "Volts low". No readings on the meter indicates broken windings or an open coil. If coils are OK the meter readings should remain the same for each coil as the commutator is rotated.

Assuming the first coil tested is OK, a lower meter reading while testing the other coils, would indicate an insufficient number of turns. A higher reading indicates there are too many turns in the coil.

THE "GROUND" TEST

To perform this test, which is really a circuit continuity check, turn the selector switch to "Grnd. Test". Place one test prod on the rotor shaft and trace around the commutator with the other. A grounded coil or commutator bar will be indicated by the glow of the lamp.

CAUTION: DURING THIS TEST THE PRODS HAVE A VOLTAGE POTENTIAL APPLIED WHICH COULD CAUSE A SHOCK.

DEMAGNETIZING:

These growlers may be used for either demagnetizing or magnetizing.

To DEMAGNETIZE tools or other objects, turn selector switch to "SHORT" position, place the object between the jaws of the Growler and raise object slowly.

To MAGNETIZE, connect the parallel blades of the power cord to a 12 volt DC, 6 amp battery charger. Place the object across the jaws, turn on power and strike the object sharply with a hammer or mallet.

WARRRANTY

Crown's MOTOR REPAIR EQUIPMENT is warranted to the original owner against defects in materials and workmanship for ninety (90) days from the date of purchase. Any part found to be defective (except by overloading, misuse, neglect, fire, accident, tampering by unauthorized serviceman, or other cause beyond the manufacturer's control), will be replaced or repaired free of charge.

VENSEL ENTERPRISES

RICHARD & BARBARA VENSEL

(815) 459-0355
(800) 662-6099
Website: www.reman.com/vensel
E-mail: www.vensel7@aol.com

3710 RIVERSIDE DRIVE
CRYSTAL LAKE, ILLINOIS
60014 USA
FAX (815) 459-0442

AUTO ELECTRIC
EQUIPMENT SUPPLIER

Electrical Rebuilder's ERA FOUNDED 2001 ASSOCIATION

DICK'S NOTES: Additional Growler Instructions

The ground light can sometimes be deceiving:

- If it glows bright there is a ground.
- If it just glows weak there is a leak (see special notes).

Some armatures are wound different (see the *Armature Lap and Wave Winding* section) and the hacksaw blade will not vibrate on the top of the armature. The location of the short is near where the lamination sits on the growler. This can only be found using an Armature Analyzer.

To find an open use the two test leads connected to the meter—usually these two are tied together:

- Put them on two bars, side by side, and rotate the armature until you get the highest reading.
- Keep the leads at that location and rotate the armature 360 degrees.
- The reading must be the same on all bars sets.

SPECIAL NOTES:
Always clean the CE on the comm before testing:

1. When in doubt wash of the armature with Alcohol especially behind the com and dry with dry shop air.
2. Always test after the armature is turned.
3. The best Ground Test is with a Ground Fault Analyzer
4. The best Armature test is with a Armature Analyzer

Call or e-mail with any questions

Thanks in advance,
Dick Vensel
Vensel Enterprises

VENSEL ENTERPRISES

RICHARD & BARBARA VENSEL

(815) 459-0355
(800) 662-6099
Website: www.reman.com/vensel
E-mail: www.vensel7@aol.com

3710 RIVERSIDE DRIVE
CRYSTAL LAKE, ILLINOIS
60014 USA
FAX (815) 459-0442

AUTO ELECTRIC
EQUIPMENT SUPPLIER

Electrical Rebuilder's ERA FOUNDED 2001 ASSOCIATION

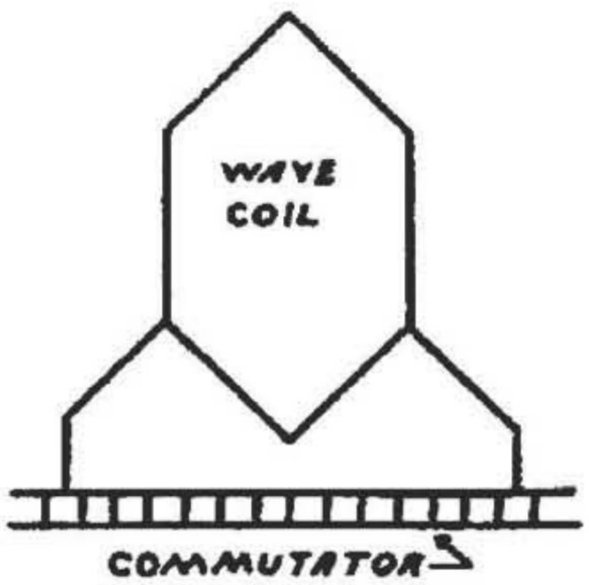
VENSEL
ENTERPRISES
3710 Riverside Drive
Crystal Lake, IL
60014
800-662-6099

Armature Lap and Wave Windings

The basic difference between a Lap and a Wave Winding can be found where the leads are connected to the commutator.

Please see below:

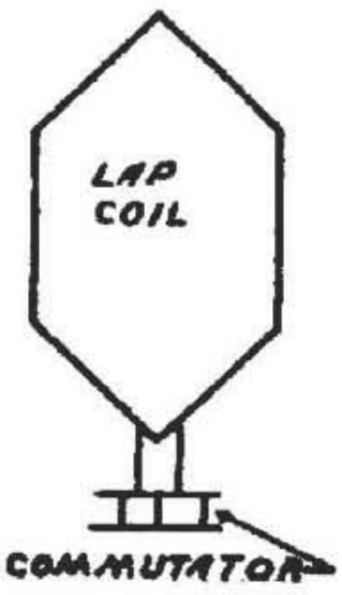
WAVE WINDING



Features of Wave Windings:

1 The coils are connected in a series.
2 Wave windings are most popular windings found in automobiles.
3 Shorts located on the top of the lamination are easy to locate with a growler.

LAP WINDING



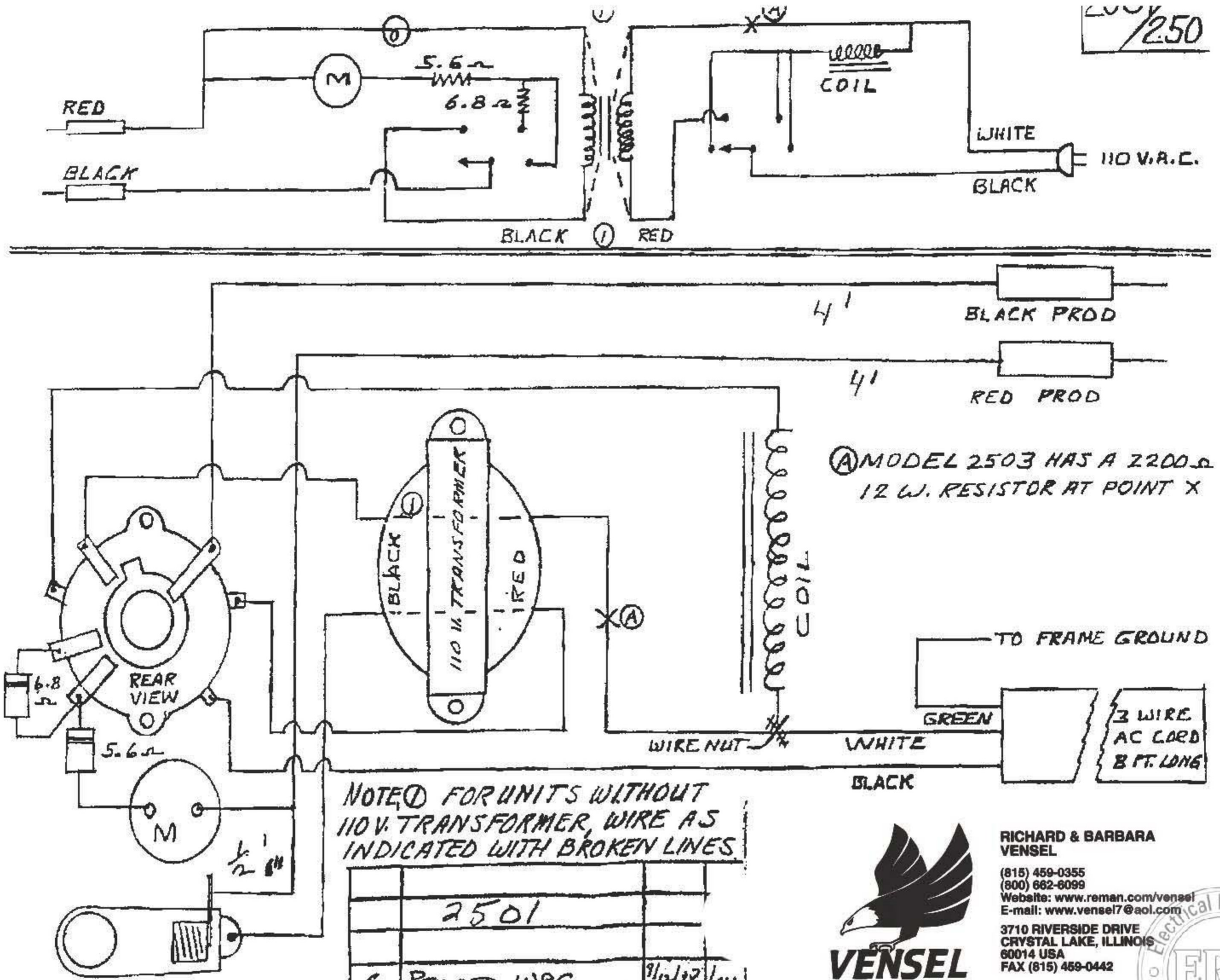
Feature of Lap Windings:

1 The coils are connected in parallel
2 Most commonly found in older armatures and some farm and industrial armatures
3 Internal Jumpers are used to interconnect coil groups.
4 Shorts are most often located on the side of the armature and are almost impossible to find with a growler.

Our K101-0914 Armature Analyzer can be used to find faults.
See the testing section of the On-line Catalog.

Email: vensel7@comcast.net Web Site: venselenterprises.com

Electrical Rebuilder's ERA FOUNDED 2001 ASSOCIATION



NOTE ① FOR UNITS WITHOUT 110 V. TRANSFORMER, WIRE AS INDICATED WITH BROKEN LINES

REV	DESCRIPTION	DATE	BY
	2501		
C	REVISED WRG	9/12/98	[illegible]
B	SINGLE DECK SWITCH	4/9/80	MB

VENSEL ENTERPRISES

RICHARD & BARBARA VENSEL
(815) 459-0355
(800) 662-6099
Website: www.reman.com/vensel
E-mail: www.vensel7@aol.com
3710 RIVERSIDE DRIVE
CRYSTAL LAKE, ILLINOIS
60014 USA
FAX (815) 459-0442

AUTO ELECTRIC EQUIPMENT SUPPLIER

Electrical Rebuilder's ERA FOUNDED 2001 ASSOCIATION