Kawasaki SERVICE

Date: 12-5-72 N

BULLETIN SER 73 H-4

Title: H1 AC GENERATOR ROTOR

H SERIES

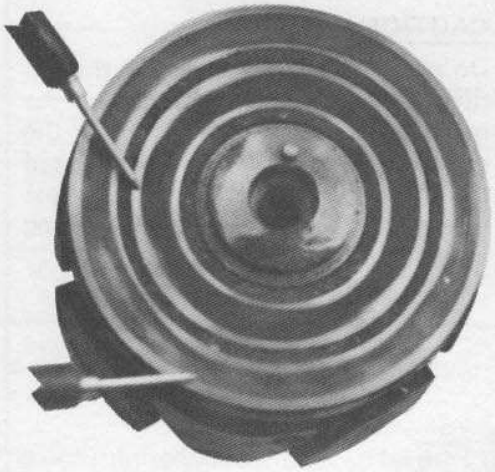
PROBLEM:

The alternator rotor, being mounted on the end of the crankshaft, turns at the same speed as the engine. At high engine rpm, the centrifugal force on the rotor winding is considerable. Failure of the rotor can result because the winding is stretched and either shorted or snapped by the tremendous force.

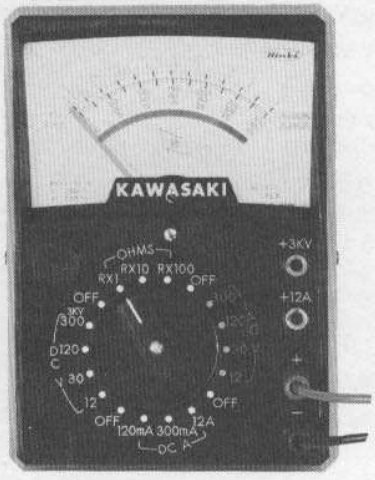
DIAGNOSIS:

Resistance Tests.

The rotor may be checked by testing the resistance between the inner and outer slip of the rotor with a multimeter set in the RXI position. Touch one lead to each slip ring as illustrated; the resistance should be between 3.5 and 5.5 ohms. If the resistance is greater than 5.5 ohms, the windings have been snapped (open circuit). If the resistance is less than 3.5 ohms, the windings have shorted (short circuit). Now touch one lead to the core (center) of the rotor and the other to each slip ring in turn. The resistance for both should be infinite. Any other reading indicates that the slip ring is grounded.



3.5 to 5.5 OHMS



OPEN CIRCUIT

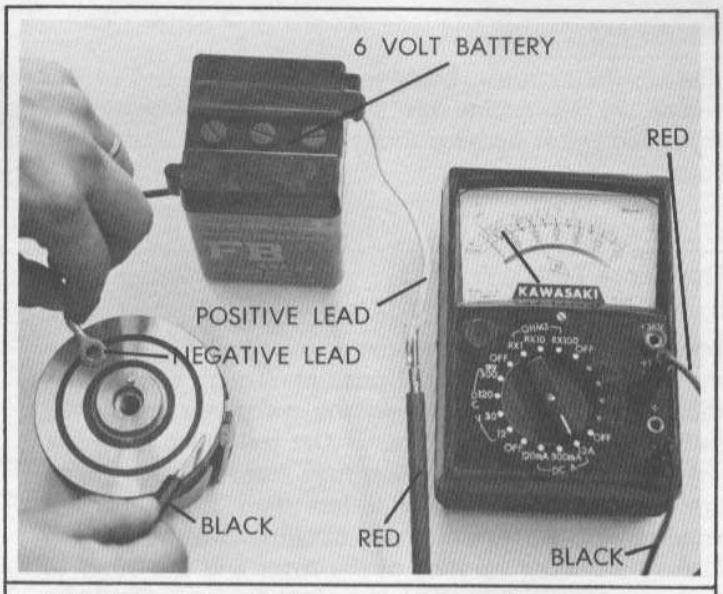
SHORT CIRCUIT

Load Tests.

A defect which shows up only under load may be detected as follows. Set the selector switch to the "12 A" position and plug the red lead into the "+12 A" hole. Connect the red lead to the positive lead from a six volt test battery. **CAUTION:** Don't use a 12V battery or you could ruin the rotor windings. Touch the negative lead from the battery to one of the rotor slip rings. **Momentarily,** tap the black lead from the multimeter on the other slip ring. If the needle swings wildly across the face of the meter the rotor is shorted.

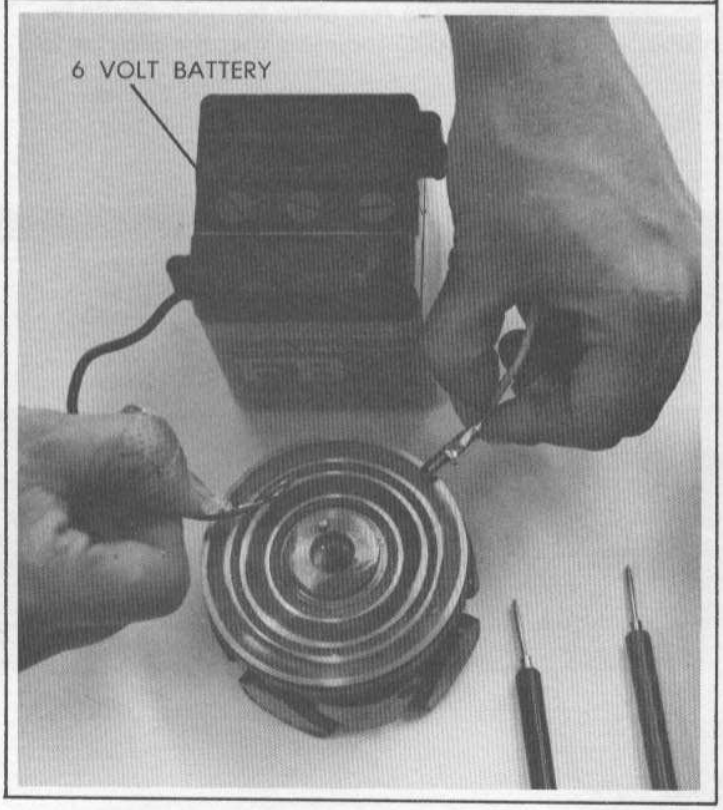
CAUTION:

Do not hold the black lead to the slip ring under these conditions or the multimeter will be damaged. If the needle rises to 1.1 to 1.7 amps (read the 0 to 120 scale as 0 to 12.0 amps) the rotor is good. A lower reading indicates an open circuit.



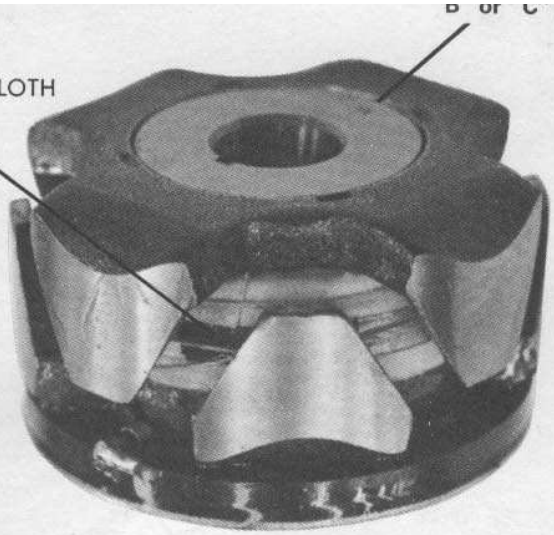
Alternate Load Test.

Connect the 6 volt battery to the rotor as shown with one lead to each slip ring. Remove the battery after thirty seconds and measure the resistance as before. If the reading is out of the acceptable range after this 6 volt load, the rotor is defective.



REPAIR:

With any of these types of failure, the rotor must be replaced.



PARTS MODIFICATION:

There have been two changes in the rotor (part no. unchanged) to counter-measure this tendency toward high rpm failure. These rotors may be identified by square holes in the insulating cloth on the windings. The "B" type rotor is used in production from engine number KAE-43491 to KAE-69531. The latest modification, marked "C", changes the rubber based resin to plastic based. This rotor is used on engines KAE-69532 and up.

	OLD PARTS		NEW PARTS		INTER-CHANGE	EFFECTIVE
DESCRIPTION	OLD P/N	REMARKS	NEW P/N	REMARKS	OLD↔NEW	I.D.
Alternator Rotor	21007-012		Same	Marked "B"	—□→ ←O—	KAE-43491 to KAE-69531
			Same	Marked "C"	—□→ ←O—	KAE-69532

O = interchangeable X = not interchangeable □ = not available

OTHER PROBLEMS:

Other rotor problems which have caused battery discharging occur infrequently, but can be difficult to trace.

A. **Loose slip ring.** If one of the slip rings (usually the outer ring) loosens on the rotor face, an intermittent open circuit results. To check for this, connect the multimeter leads to the slip rings as in the first resistance test above, and try to move the rings, watching the multimeter needle for fluctuation.

B. **Dented slip ring.** If one of the slip rings is dented or has excessive run-out, that brush will float and bounce at high engine speeds, resulting in arcing of the brush, accelerated brush wear, and reduced charging capacity. Maximum slip ring run-out is 0.012" (0.3mm).

C. **Overlong stator screw touching rotor.** If an overlong screw is used in the stator face, it may protrude enough to contact the outer slip ring, resulting in a short-circuit. On one unit, this happened only when the engine was warm and the crankshaft expanded to push the rotor in contact with the screw.

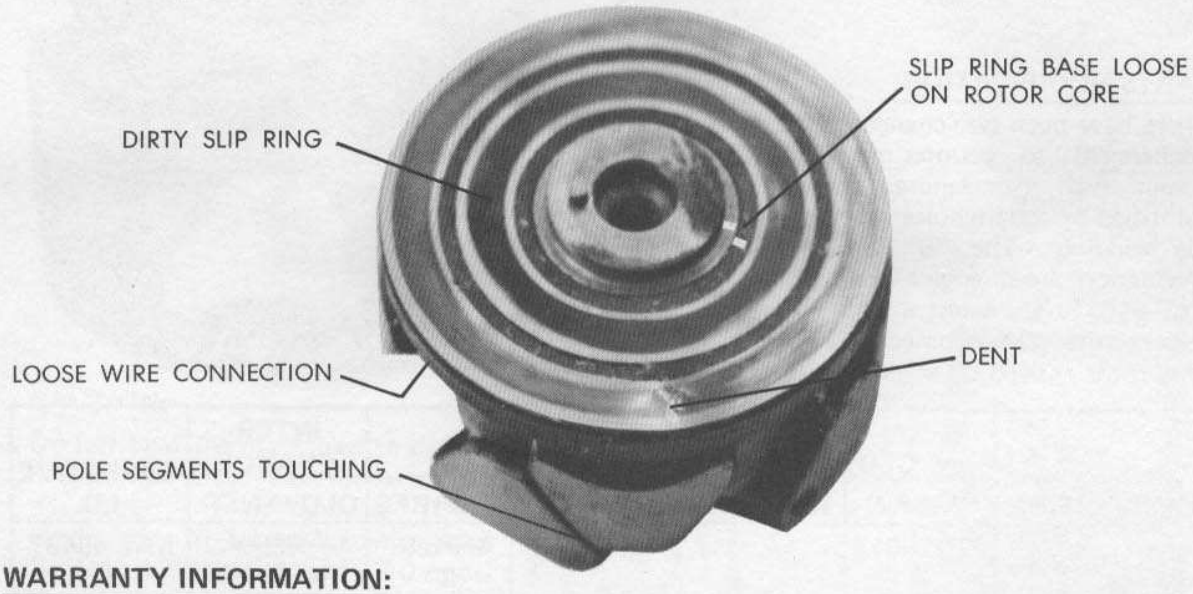
D. **Rotor pole pieces twisted and touching.** If one of the pole pieces (finger-shaped rings) twists on the rotor shaft, there will be a magnetic short circuit between the North and South pole pieces from contact. **CAUTION:** Never insert a screwdriver into the rotor poles to keep the crankshaft from turning.

E. **Dirty Slip Ring.** If the slip rings are dirty, there may not be a proper connection to the brushes. This will result in inconsistent charging. Clean dirty slip rings with trichloroethylene and #000 steel wool.

F. **Loose Wire Connection.** If either of the wires from the windows to the slip rings is loose, the alternator will not charge.

G. **Worn Brushes.** Brushes must be replaced when they are worn to less than 0.38" (9mm) in length.

Please see reverse side for additional information.



WARRANTY INFORMATION:

This is a factory production change for routine product improvement. This bulletin is for notification of modification only, not for warranty authorization. ■