



SERVICE DEPARTMENT

ELECTRO-MOTIVE DIVISION • GENERAL MOTORS CORPORATION

MAINTENANCE INSTRUCTION

AR10 TRACTION GENERATOR OVERHAUL – ROTOR INSPECTION AND RECONDITIONING

INSPECTION

To ensure satisfactory performance, the traction generator rotor should be subjected to a thorough mechanical and electrical inspection and reconditioned as necessary. This bulletin outlines the procedure to be followed in making such an inspection and for performing the required reconditioning. Upon completion of these procedures, the rotor will qualify for return to service.

CLEANING

Prior to making any inspections, the rotor should be thoroughly cleaned and dried. Cleaning should be performed as outlined below.

The rotor may be cleaned by blowing off all loose dirt and carbon dust, both from the outside and inside of the rotor with high volume, low pressure, dry air, and by using a fiber brush and Stoddard solvent (ASTM-D474-40). This solvent is non-toxic and has a flash point of 115° F. It also has a fairly fast rate of evaporation.

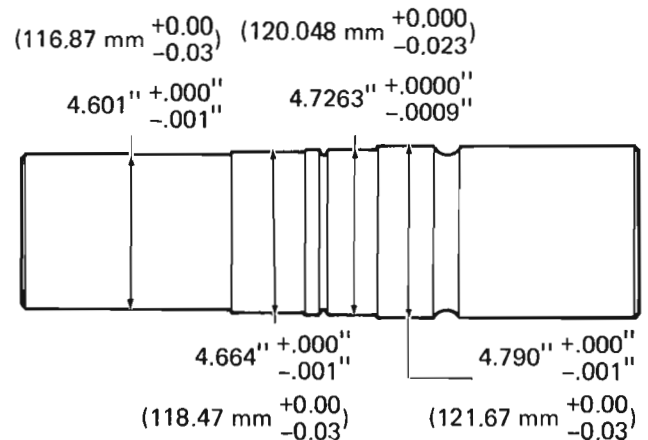
WARNING: The usual safety precautions that apply to inflammable fluids should be observed. Provide adequate ventilation when any type of solvent is being used.

After the rotor has been cleaned, blow off as much of the solvent as possible using high volume, low pressure, dry air. Let the rotor stand until all remaining solvent has evaporated before making any electrical checks.

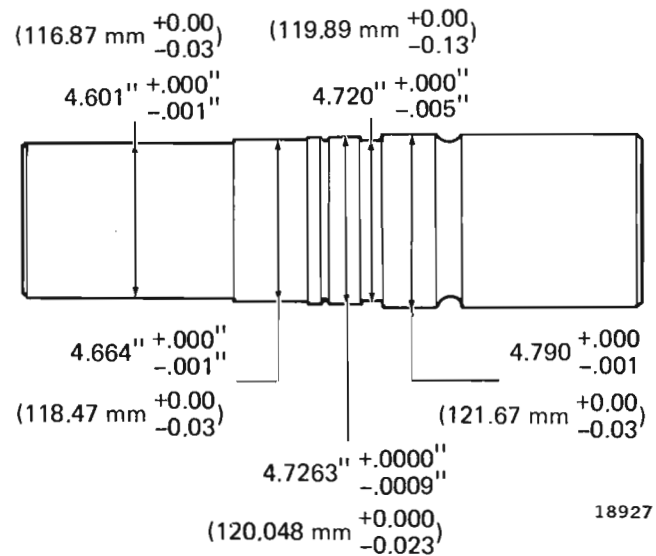
Mechanical inspection can be made on the shaft and rotor during the period when the remaining solvent is evaporating.

SHAFT INSPECTION

Inspect the exposed shaft diameters for size as shown in Fig. 1. Inspect bearing seat surface for



Small Bearing Shaft



Large Bearing Shaft

Fig. 1 – Shaft Dimensions

damage, fretting, corrosion, or roughness. This surface may be "cleaned up" by light rubbing with crocus cloth.

NOTE: When cleaning up the surface, do not rub or polish axially or work below the normal surface. If the surface is heavily damaged, the shaft should be replaced.

COIL INSPECTION

1. Check rotor coils for loose or shifted windings. This will be evident by cracks in the epoxy on the long side of the coil assemblies. Replace any coils found in this condition.
2. Check connection between coils for loose bolts or damaged connectors, and repair or replace connectors as required.

COIL REPLACEMENT

1. On units equipped with wedges, remove wedges by breaking tack welds between wedge screws and coil tabs. Turn screws clockwise to relieve pressure on wedge. Slide wedge out between coils.
2. Remove coil mounting bolts and lift coil from spider assembly.
3. Mounting surface on the rotor spider and coil laminations must be free of rust, paint, or other foreign material. High spots or protrusions above the surface caused by handling damage are not permitted.
4. Remove any epoxy insulating compound which may have been baked on the coil assembly mounting surface.
5. Coil bolts must be discarded and new bolts used for replacement coil.
6. Washers must fit freely on bolt and lie tightly against the face of bolt head without interference with head radius.
7. Replacement coil must be same configuration as coil being replaced.

ASSEMBLY

1. Place rotor spider in approved assembly fixture with open end up. Weigh each pole and select them for assembly so that crossed and open coils alternate and so that coils of approximately the same weight are opposite each other, to facilitate balancing.
2. Lift coil to be installed, with an approved lifting fixture and with leads located at lower end. Be careful to prevent damage to coil winding or contact face.
3. Position coil against spider so that holes line up and split sleeve at each end of coil will enter counterbored holes in spider.

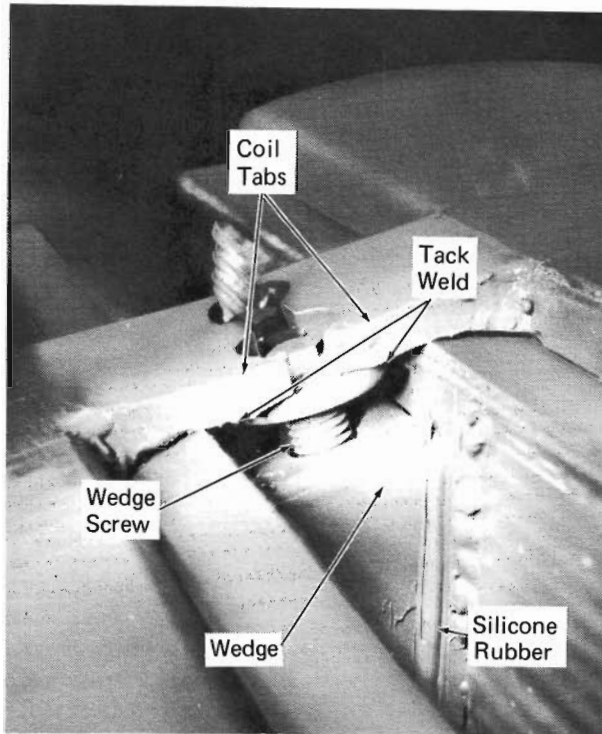
4. Apply Molykote lubricant to mounting bolt threads, washer contact surface of bolt heads, and both faces of hardened washers.
5. Place one bolt and washer in center mounting hole and start threads by hand. Tighten bolt until upper and lower split sleeves are in contact and weight of coil is supported, then remove lifting fixture.
6. Place bolt and washer in upper and lower mounting holes and start threads by hand. Tighten upper and lower bolts evenly until split sleeves are fully engaged and coil is seated.
7. Assemble remaining bolts and washers in mounting holes and tighten bolts until fully engaged. All bolts must turn freely by hand without use of a wrench until fully engaged.
8. Tightening sequence should be to tighten the two inboard bolts first, and then the outboard bolts.
9. Tighten the bolts to 1050 ft-lbs torque, using the preceding sequence, then loosen the bolt to below 500 ft-lbs and retighten to 1050 ft-lbs.
10. Install wedges, where used, as follows:
 - a. Thread wedge screws into wedge far enough to allow wedge to be placed in position between coils with screws below coil tabs, Fig. 2.
 - b. Back out wedge screws until firm contact is made with coil tabs.
 - c. Torque wedge screws in counterclockwise direction to 20-25 ft-lbs.
 - d. Tack weld each wedge screw flange to coil tabs in two places.
 - e. Apply 3/16" fillet of silicone rubber between four wedge edges and coil insulation pads.
11. Remove all balance weights from rotor and dynamically balance complete AR10-D14 rotor assembly to 8 in.-oz.

ELECTRICAL TESTS

INSULATION RESISTANCE

Perform insulation resistance test as follows:

1. Connect the positive lead of the megohmmeter to either lead of the rotor cable.



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Fig. 2 - Wedge Installation

2. Connect the remaining lead to the frame of the rotor.
3. Make insulation resistance check with 500 volt DC constant potential. Megger must indicate 100 megohms minimum after one minute. (Individual coils must indicate 1000 megohms after one minute.)

HIGH-POTENTIAL TEST

Perform high-potential test as follows:

1. Jumper both rotor leads together and connect to red lead of tester.
2. Connect black tester lead to rotor spider.
3. Test unit at 1500 volts for one minute.
4. Discharge circuit under test to ground before removing tester leads. (Individual coils should be tested at 1600 volts for one minute, if required.)
5. Repeat insulation resistance test.

TURN-TO-TURN TEST

Shorted turns in a rotor field coil can be detected by measuring the watts input across a coil as follows:

1. Test each coil individually. It is not necessary to open coil connections to perform this test.
2. Connect a wattmeter across the terminals of a field coil energized with a 110 volt 60 Hz source.
3. Wattmeter should indicate approximately 110 watts. If a coil has one turn shorted, the indication will be approximately 570 watts.

NOTE: Values between good coils may vary as much as 30%, and between a shorted coil and a good coil by as much as 300%.

4. Upon successful completion of all electrical tests and dynamic balancing, paint the entire rotor assembly with red air drying enamel.

SERVICE DATA

EQUIPMENT LIST

Megohmmeter tester	8306539
High-potential tester	8324253, 8212404, 8212405, 8212406

MATERIAL LIST

Red air drying enamel (1 qt)	8061130
Molykote lubricant (1 qt)	8168822