TECHNICAL ARTICLE

General Care in Alternators

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Abstract - This article aims to present the basic maintenance of WEG alternators, lines G, AG10, and GT10.

1 INTRODUCTION

Among the regular maintenance inspections, it is important to be aware of any signs of problems, since over the years all and any equipment end up wearing out.
Maintenance procedures must be observed to ensure proper performance of the equipment. The frequency of inspections mainly depends on the local implementation conditions and the working regime.
Failure to comply with the main topics listed below could result in a reduction of the alternator's service life, unnecessary downtime or damage to the installations.

2 MAINTENANCE AND ITS TOPICS

ATTENTION

Before any operation on the alternator, make sure that the equipment is turned off and avoid the risk of accidents.

2.1 Cleaning

The internal and external components must be kept clean, with no oil or dust accumulation, in order to ease the heat exchange of the alternator with the environment.
If the dust is not abrasive, compressed air can be used for cleaning. Therefore, all dust accumulation found in the deflector cover, housing, and fan blades must be eliminated.
Oil-impregnated or moisture-impregnated components can be cleaned with cloth moistened with suitable solvents.
The junction box must have its terminals clean, free of oxidation, in perfect mechanical condition and without grease or zinc deposits.
This cleaning may be scheduled every 1500 hours of operation, but inspection of the ventilation has to be on a daily basis.

2.2 Noise

Noise should be observed at regular intervals of 1 to 4 months. In the event of a malfunction, the alternator must be stopped and the reasons must be investigated and corrected.

2.3 Vibration

According to ISO 8528-9, the maximum vibration level for the alternator under load is 20 mm/s (RMS).

2.4 Bearings

Controlling the bearing temperature is also part of the alternator's routine maintenance.
The temperature rise during operation must not exceed 60 °C. The measurement must be carried out on the outer ring of the bearing.
The temperature can be permanently controlled with thermometers, placed outside the bearing, or with built-in thermoelements.
The alarm and shutdown temperatures for the bearings can be set to 110 °C and 120 °C, respectively.
Shielded and sealed bearings are used in WEG alternators. Thus, they cannot be re-lubricated and must be replaced after reaching 20,000 hours of operation or 30 months of use of the generator, whichever occurs first.
Bearings that can be lubricated must be re-lubricated according to the intervals specified on the dimensional, plate, or bearing label.
Special bearing replacement or re-lubrication conditions are stated on the bearing dimensional, plate or label.

ATTENTION

The bearings must always be re-lubricated with original grease, specified on the bearing plate or label, and in the alternator documentation.

2.5 Exciter

For the good performance of its components, the exciter of the alternator must be kept clean.
Check the insulation resistance of the main and auxiliary exciter windings (if any) periodically.

2.6 Diodes

Diodes are components that have great durability and do not require frequent testing. If the alternator has a defect that indicates a diode failure or an increase in field current for the same load condition, these must be tested according to the following procedure:

- Loosen the connections of all diodes with the exciter rotor winding;
- Using an ohmmeter, the resistance of each diode in both directions must be measured, as shown in Figure 1;
- When testing diodes, observe the polarity of the terminals being tested in relation to the polarity of the diode. Diode polarity is indicated by an arrow on the housing.

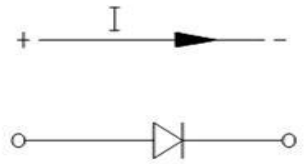

Image 1: Anodo-cathode diode current conduction

The current conduction should only take place in the anodo-cathode direction, i.e. in the direct polarization condition.
A diode is considered good when it has low ohmic resistance (up to ±100 Ω) in its direct direction and high resistance (approximately 1MΩ) in the opposite direction. Defective diodes will have ohmic resistance of 0 Ω or greater than 1 MΩ in both measured directions.
In most cases, the ohmmeter method for testing diodes is enough to identify diode faults. However, in some extreme cases, the application of nominal blocking voltage and/or current circulation may be necessary to detect diode failure. Due to the efforts required for these tests, in case of doubt, it is recommended to replace the diodes.

ATTENTION

It is extremely important that the specified tightening torques are observed so that the diodes are not damaged during replacement and assembly. According to the torque values provided by the diode manufacturers.

Table 1: Diode torque

Diode base thread (mm)	Torque wrench (mm)	Tightening torque (Nm)
M6	11	2
M8	17	4
M12	24	10
M16	32	30

2.7 Air flow

The alternator air inlets and outlets must be kept unobstructed in order for the heat exchange to be efficient. If there is a deficiency in the heat exchange, the alternator will overheat and may damage the winding and lead to alternator burning.
If filters are installed in the air inlet, they should be inspected daily, cleaned or replaced, if necessary.

3 FINAL CONSIDERATIONS

Proper maintenance application will ensure the reliability and good performance of the alternator.
The frequency of inspections will depend mainly on the local conditions of application and the working regime of the alternator.
This article does not replace the need to observe the instructions of the WEG alternator's installation, operation, and maintenance manual.