

# Preventive maintenance for synchronous generators for diesel and gas engines, AMG 710-1600



SM005 EN REV G 2005



ABB has been manufacturing and maintaining generators for more than 100 years. This extensive experience provides a solid basis for the company's preventive maintenance services. In addition, preventive maintenance is planned to take environmental and operating conditions into account, and the on-site work is performed by qualified and certified service specialists.

## Service Notes

ABB recommends regular preventive maintenance over the entire lifetime of AMG 710-1600 synchronous generators for diesel and gas engines. This ensures maximum availability while minimizing unplanned repair costs.

Preventive maintenance aims to increase the reliability and extend the lifetime of generators by providing appropriate servicing at the right time. It consists of annual system inspections and component replacements based on a generator-specific maintenance schedule. The formation of defects in large synchronous machines is normally a long process, so systematic preventive maintenance can prevent unplanned shutdowns.

### Benefits

- Increased generator reliability
- Optimized maintenance costs and minimized repair costs
- Easy-to-plan maintenance budget
- Extended generator lifetime
- Genuine, factory-certified ABB parts
- PM kits based on extensive experience of requirements

### Comprehensive maintenance

Preventive maintenance includes the labor and parts needed to perform on-site work as specified by the maintenance schedule:

- Visual inspection of the generator and its operating environment
- Inspection of the connections
- Checking of the generator mounting bolts and alignment
- Inspection, testing and cleaning of the stator and rotor
- Inspection of the bearings and lubrication
- Inspection of the exciter and rectifier bridge
- Cleaning of the cooling system
- Inspection and / or testing of the transformers and accessories
- Inspection of the generator spare part inventory

Once the maintenance work has been completed and the inspection data fully analyzed, a detailed service report is provided. This includes recommendations for service actions (such as “excitation system requires upgrading”), and for spare parts, and special tools for future actions. On-site training can be undertaken, with maintenance work performed by an ABB supervisor.

Preventive maintenance kits are available at [aftersales.machines@fi.abb.com](mailto:aftersales.machines@fi.abb.com) for component replacements marked “R” on the maintenance schedule.





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## Service Notes

## Preparations for preventive maintenance

The effectiveness of the preventive maintenance work depends on the quality of the information provided by the system owner in service reports. In general, preventive maintenance is more effective when the information provided is as comprehensive as possible. If the information available is not sufficient, it is recommended that a site survey is performed on the generator before the preventive maintenance is carried out. During the shutdown ABB must have free access to the generator for maintenance purposes as agreed. Preventive maintenance must be planned well in advance in order to ensure that the required resources and service parts are available.

## Maintenance schedule

Experience indicates that generators become more likely to fail after a number of years in operation. In the case of synchronous generators this typically occurs after 5-10 years. The main reason is ageing of the

components, but operating conditions also play a major role. Failure of a component may result in damage to other parts of the machine, including the stator and rotor.

The maintenance schedules are based on extensive know-how and they provide an effective and systematic means of maintaining a specific type of generator. The maintenance intervals are planned according to those of the diesel engine to avoid unnecessary shutdown time. The maintenance schedules comply with any specifications issued by the component suppliers.

Environmental and operating conditions are also taken into account. Tough conditions - such as high ambient temperatures, high vibration levels, humidity, dirt, or heavy loads - can significantly shorten component lifetimes and reduce maintenance and component replacement intervals.

In order to ensure optimum performance over the entire lifetime of a generator, ABB recommends that annual inspections are carried out in addition to regular maintenance.

## Recommendations for Diesel Generators Preventive Maintenance

### Maintenance activities

Inspection Performance of the on Site Work	I P	Replacement or reconditioning Cleaning				R C
Recommended Maintenance Intervals	4000 h 1/2 year	8000 h 1 year	16000 h 2 years	32000 h 4 years	64000 h 8 years	
<b>1. Mounting and Foundation</b>	I	I, P	I, P	I, P	I, P	
<b>2. Stator</b>	I	I, P	I, P, C	I, P, C	I, P, C	
2.1 Stator Core						
2.2 Stator Windings						
2.3 Mounting and Supports						
<b>3. Rotor</b>	I	I, P	I, P, C	I, P, C	I, P, C	
3.1 Pole Windings						
3.2 Damper Windings						
3.3 Supports						
3.4 Air Gap						
<b>4. Exciter</b>	I	I, P, C	I, P, C	I, P, C, R	I, P, C, R	
4.1 Exciter Windings						
4.2 Rectifier Bridge						
4.3 Semiconductors						
4.4 Mounting and Supports						
<b>5. High Voltage Connections</b>	I	I, P	I, P	I, P, C	I, P, C	
<b>6. AVR &amp; Excitation System</b>	I	I, P	I, P	I, P, R	I, P, R	
6.1 AVR Unit						
6.2 Control and Protection						
<b>7. Transformers</b>	I	I, P	I, P	I, P	I, P, R	
<b>8. Bearings &amp; Lubrication System</b>	I, R	I, P, R	I, P, R	I, P, R	I, P, R	
<b>9. Cooling System</b>	I, C	I, C	I, C, R	I, C, R	I, C, R	
<b>10. Accessories</b>	I	I, P	I, P	I, P, R	I, P, R	
<b>11. Measurements and Tests</b>	P	P	P	P	P	



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