

CHAPTER 16**TURBINE/GENERATOR ENCLOSURES AND ENVIRONS**

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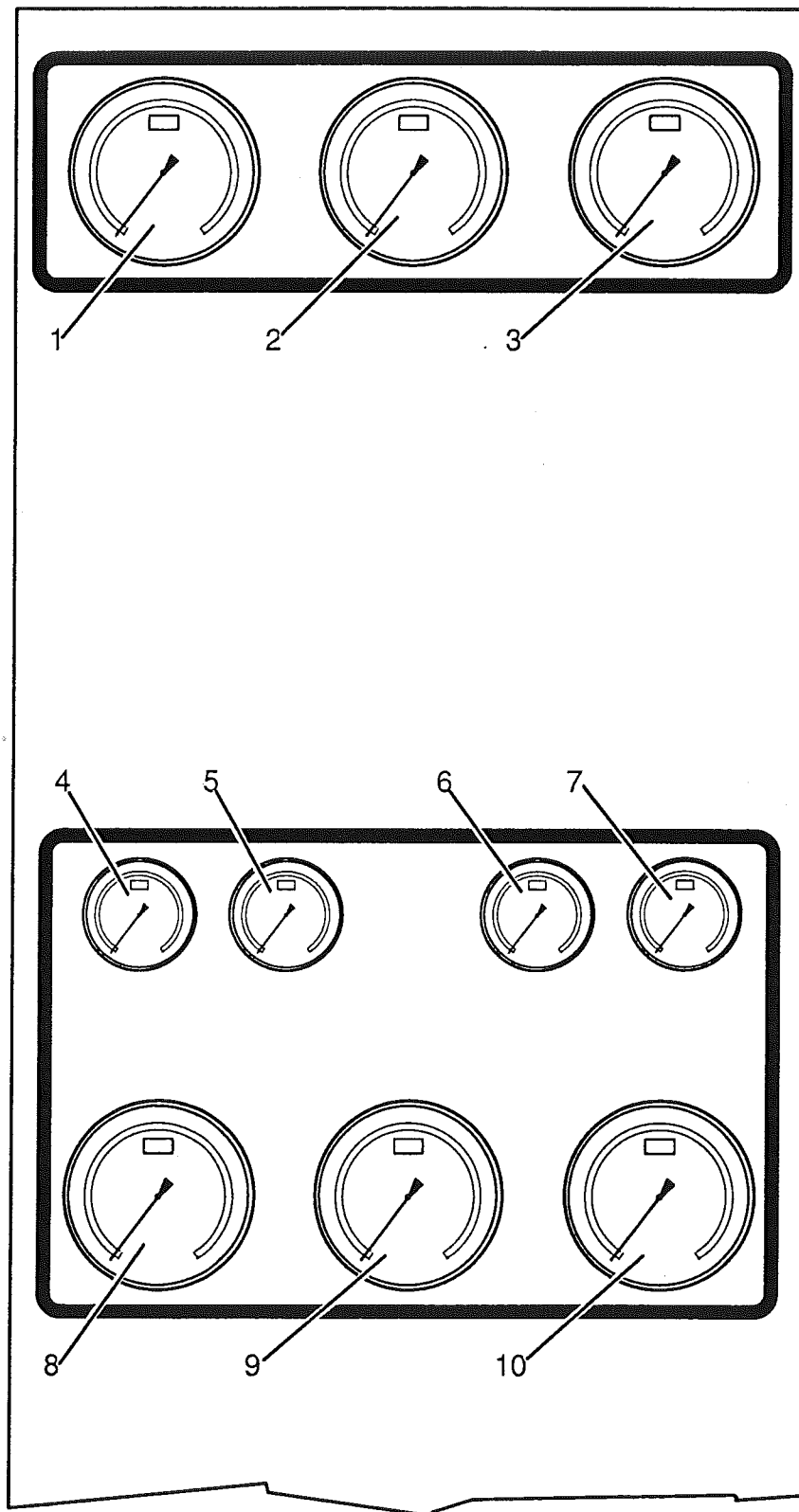


Figure 16.1 - Main Gauge Panel

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1 GENERAL

Mounted on and in the Gas Turbine and Generator Enclosures are Gauge Panels. These Panels enable analogue gauge readings of operating conditions to be made by the Operator or Service technician. Also contained within the Gauge Panels are the pressure and temperature sensors for that system. The gauges provide for observations for pressure, pressure differential and temperature for the Turbine Lubricating and Hydraulic Control Oil; Generator Lubricating and Hydraulic Start Oil; Gaseous Fuel; Air and Ventilation Systems.

The Air Intake Filter has a Gauge Panel mounted on the unit's exterior.

WARNINGS: The Turbine/Generator Enclosure is protected by a Carbon Dioxide Gas Fire Extinguishing System. Therefore before any personnel gain entry to the Enclosure or any other area protected by the Carbon Dioxide Gas system the extinguishing system should be isolated for that area.

Due to the high-frequency sounds generated by the gas turbine, when operating, it should be mandatory for all personnel in the proximity of the turbine unit to wear ear protection. Continued exposure to high-frequency noise, without ear protection, can result in partial deafness and loss of balance.

2 TURBINE ENCLOSURE GAUGES

The Gauge Panels are located on the exterior and interior of the Gas Turbine Enclosure and may be observed through transparent panels during Turbine/Generator Operation; whilst maintaining the integrity of noise attenuation.

2.1 MAIN GAUGE PANEL**OIL PRESSURE TURBINE SCAVENGE (1)**

This continuous-scale pressure gauge indicates the turbine return oil pressure in the range 0 - 10 barg.

OIL PRESSURE TURBINE SUPPLY (2)

This continuous-scale pressure gauge indicates the turbine supply oil pressure, at its entry point into the gas turbine accessory gearbox. The gauge has the range 0 - 4 barg. This gauge also incorporates the pressure transmitter to supply the monitoring information to the Turbine Control System.

ACTUATOR OIL SUPPLY PRESSURE (3)

This continuous-scale pressure gauge indicates the actuator supply oil pressure in the range 0 - 60 barg. This gauge also incorporates the pressure transmitter to supply the monitoring information to the Turbine Control System.

OIL RESERVOIR TEMPERATURE (4)

This continuous-scale temperature gauge indicates the temperature in the synthetic oil reservoir in the range 0 - 120°C.

OIL SUPPLY PRESSURE (5)

This continuous-scale pressure gauge indicates the turbine supply oil pressure, at the exit from the supply filter. The gauge has the range 0 - 10 barg.

WATER WASH RESERVOIR PRESSURE (6)

This continuous-scale pressure gauge indicates the pressure within the water wash reservoir. The gauge has the scale of 0 - 10 barg.

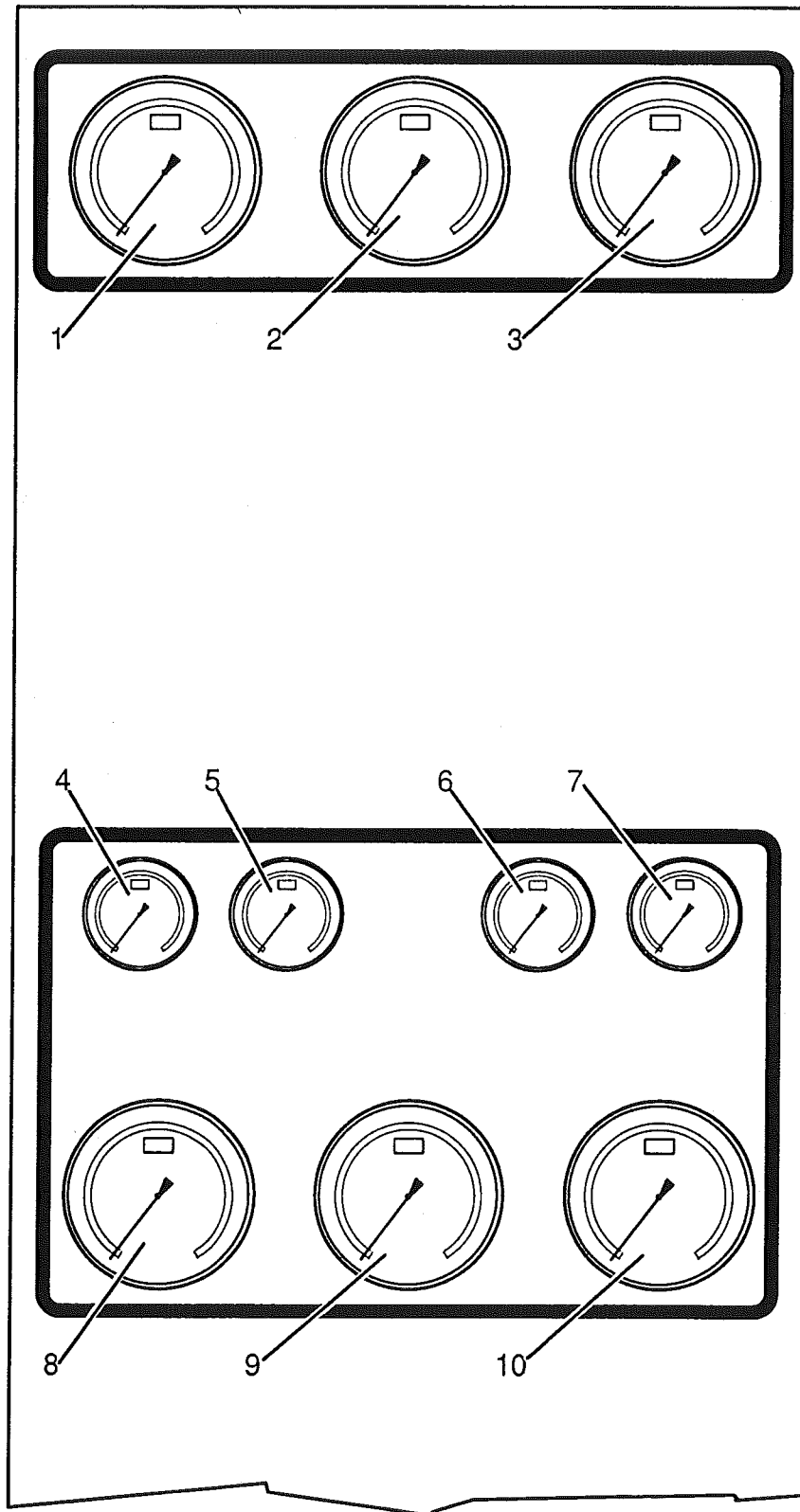


Figure 16.1 - Main Gauge Panel

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HYDRAULIC CONTROL OIL ACCUMULATOR PRESSURE (7)

This continuous-scale pressure gauge indicates the pressure in the hydraulic control oil accumulator. The gauge has the scale of 0 - 60 barg.

DIFFERENTIAL PRESSURE OIL SUPPLY FILTER (8)

This continuous-scale pressure gauge indicates the differential pressure in the range 0 - 4 bar across the oil feed filter.

DIFFERENTIAL PRESSURE OIL SCAVENGE FILTER (9)

This continuous-scale pressure gauge indicates the differential pressure in the range 0 - 4 bar across the oil return filter.

HYDRAULIC CONTROL OIL SYSTEM FILTER DIFFERENTIAL PRESSURE (10)

This continuous-scale pressure gauge indicates the differential pressure in the range 0 - 6 bar across the 10µm Hydraulic Control Oil System Filter.

2.2 GAS TURBINE LUBRICATING OIL SYSTEM**OIL COOLER INLET TEMPERATURE**

This continuous-scale temperature gauge indicates the temperature of the oil entering the oil cooler. The gauge has the scale of 0 - 200°C.

OIL COOLER OUTLET TEMPERATURE

This continuous-scale temperature gauge indicates the temperature of the oil returned from the Oil Cooler. The gauge has the scale of 0 - 200°C.

RESERVOIR OIL LEVEL INDICATOR

This level indicator utilises two-colour rollers arranged in a vertical column to indicate the level of the oil in the Reservoir. A magnetic float on the oil will rotate the indicator rollers to display their red side. The rollers above the level of the float will display the white side. This enables the level in the reservoir to be observed clearly, from some distance, in comparison to conventional sight glasses.

FLOW GLASS

A flow glass is installed in the return line from the cooler bleed to the Oil Reservoir Tank. This enables the flow of oil to be observed.

2.3 HYDRAULIC CONTROL OIL**FLOW GLASS**

A flow glass is installed in the return line from the filter bleed to the Oil Reservoir Tank. This enables the flow of oil to be observed.

2.4 GASEOUS FUEL SYSTEM**GASEOUS FUEL SUPPLY PRESSURE**

This continuous-scale pressure gauge indicates the gaseous fuel supply pressure. The gauge has the scale of 0 - 40 barg.

2.5 AIR INTAKE FILTER

Mounted on the side of the Air Intake Filter alongside the access door are two meters. These meters provide a visual indication of the condition of the air filters and should be checked regularly whilst the turbine is operating under similar loads to enable the service interval requirements of the filters to be determined.

A pressure transmitter will cause a high alarm to be displayed by the Turbine Control System when the differential pressure exceeds 9 mbar.

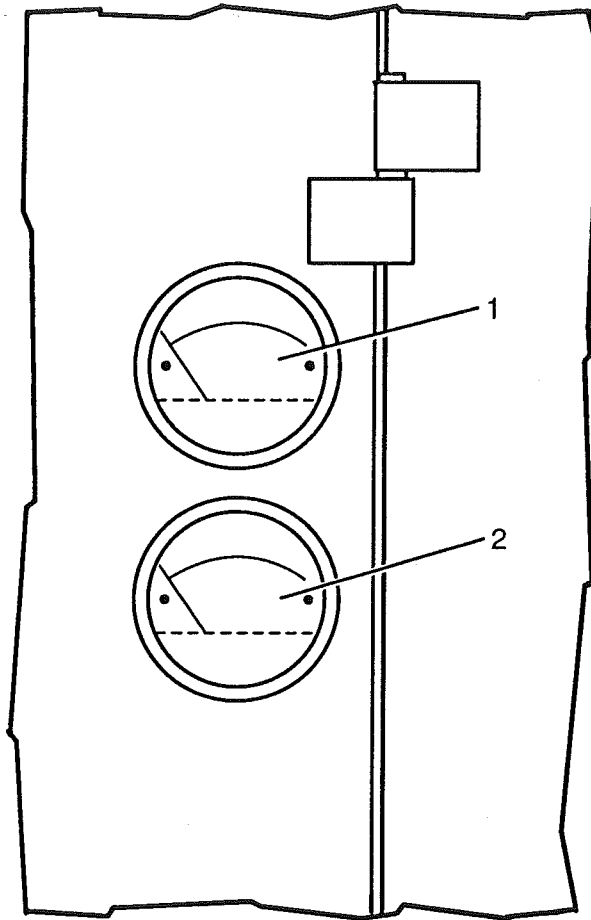


Figure 16.2 - Air Intake Filter Gauges

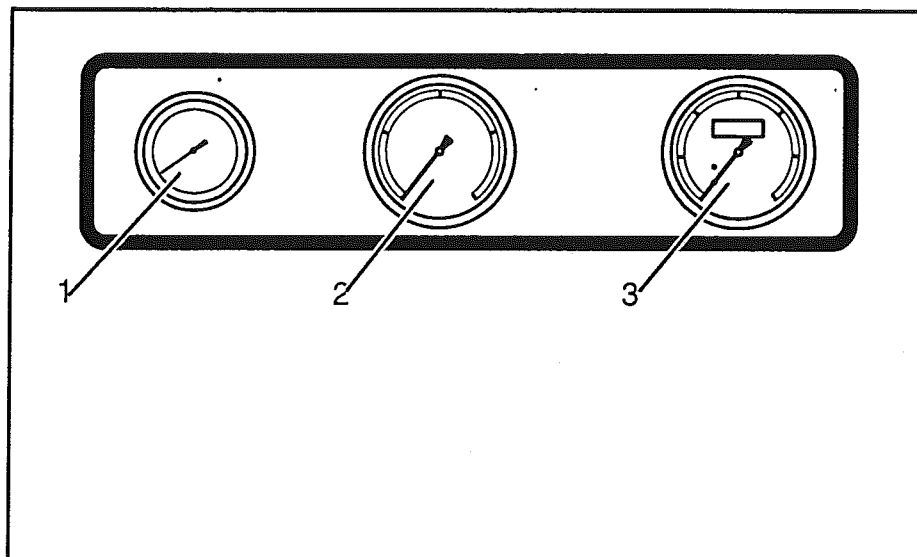


Figure 16.3 - Generator Lubricating System Gauge Panel

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FIRST STAGE AIR FILTER DIFFERENTIAL PRESSURE (1)

This continuous-scale differential pressure gauge indicates the pressure drop across the first stage air filter. The gauge has the scale of 0 - 500 pascals.

SECOND STAGE AIR FILTER DIFFERENTIAL PRESSURE (2)

This continuous-scale differential pressure gauge indicates the pressure drop across the second stage air filter. The gauge has the scale of 0 - 1.0 kilopascals.

2.6 WATER WASH**FLOW GLASS**

A flow glass is installed in the feed line from the reservoir tank to the water wash nozzles to enable a visual check on the flow of the water.

3 GENERATOR LUBRICATING OIL SYSTEM

The Generator Lubricating Oil System has a separate free standing module that contains the Reservoir for the mineral oil that is shared by the hydraulic start system. The visual indicators on the module can be viewed through transparent panels.

Those items mounted on the Generator are within the Generator Enclosure. To observe these items it is necessary to gain access to the Generator Enclosure to make observations.

3.1 GENERATOR LUBRICATING OIL MODULE**RESERVOIR TANK OIL TEMPERATURE (1)**

This continuous-scale temperature gauge indicates the temperature of the oil in the Generator Lubricating Oil Reservoir Tank. The gauge has the scale of 0 - 120°C.

DIFFERENTIAL PRESSURE OIL FILTER (2)

This continuous-scale pressure gauge indicates the differential pressure in the range 0 - 4 bar across the 10µm Oil Filter.

GENERATOR SUPPLY OIL PRESSURE (3)

This continuous-scale pressure gauge indicates the pressure of the oil supplied to the Generator. The gauge has the scale of 0 - 10 bar. This gauge also incorporates the pressure transmitter to the Control System.

COOLER INLET OIL TEMPERATURE

This continuous-scale temperature gauge indicates the temperature of the oil supplied to the Heat Exchanger. The gauge has the scale of 0 - 120°C.

GENERATOR SUPPLY OIL TEMPERATURE

This continuous-scale temperature gauge indicates the temperature of the oil supplied to the Generator. The gauge has the scale of 0 - 120°C.

RESERVOIR OIL LEVEL INDICATOR

This level indicator utilises rollers, coloured red one side - white the other, arranged in a vertical column to indicate the level of the oil in the Reservoir. A magnetic float on the oil will rotate the indicator rollers to display their red side. The rollers above the level of the float will display the white side. This enables the level in the reservoir to be observed clearly, from some distance, in comparison to conventional sight glasses.

FLOW GLASS

A flow glass is installed in the return line from the cooler bleed to the Oil Reservoir Tank. This enables the flow of oil to be observed.

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3.2 GENERATOR ENCLOSURE

It is necessary to gain access to the Enclosure to observe the following indicators.

GENERATOR COOLER INLET WATER TEMPERATURE

This continuous-scale temperature gauge indicates the temperature of the water supplied to the Generator Enclosure Heat Exchanger. The gauge has the scale of 0 - 120°C.

GENERATOR COOLER RETURN WATER TEMPERATURE

This continuous-scale temperature gauge indicates the temperature of the oil in the return from the Generator Enclosure Heat Exchanger. The gauge has the scale of 0 - 100°C.

GENERATOR DRIVE END BEARING OUTLET TEMPERATURE

This continuous-scale temperature gauge indicates the temperature of the lubricating oil returned from the Generator Drive End Bearing. The gauge has the scale of 0 - 100°C.

GENERATOR NON-DRIVEN END BEARING OUTLET TEMPERATURE

This continuous-scale temperature gauge indicates the temperature of the lubricating oil return from the Generator Non-drive End Bearing. The gauge has the scale of 0 - 100°C.

FLOW GLASSES

Flow glasses are installed in the return lines from the Generator Bearings to the Oil Reservoir Tank. This enables the flow of oil to be observed.

4 HYDRAULIC START CONSOLE

Close by the Gas Turbine/Generator Unit is the Hydraulic Start Console. The Console supplies the hydraulic oil at the correct flow and pressure for the operation of the Gas Turbine Start Motor during crank and starting procedures.

The following gauge is mounted on a gauge panel on this unit:

HYDRAULIC START OIL SUPPLY PRESSURE

This continuous-scale pressure gauge indicates the pressure of the oil supply from the Console to the starter motor circuit. This gauge has the range 0 - 400 barg.