

Procedure for adding helium gas to the alternator

The alternator uses helium gas as a cooling medium to help remove heat from the interior surfaces of the alternator. The gas is circulated inside the interior of the alternator by large fan blades mounted on each end of the alternator rotor. The fans spin at 1700 rpm and circulate a tremendous amount of helium inside the alternator. The circulating gas is heated by friction resulting from wind resistance and also by current flowing in the copper windings of both the alternator field and the stator windings. The heated gas is cooled as it passes thru the cooling fins of 4 water cooled heat exchangers that are part of the alternator housing. The gas temperature is controlled by limiting the amount of water flow thru the heat exchangers via a regulating water valve on the return line of the heat exchangers. Over time, usually a few weeks the gas inside the alternator starts to become contaminated, and the purity as measured by the core monitor starts to decay. When the gas purity falls below 80%, a gas change needs to be considered.

If the purity starts to slowly decay and is a level (90%) that does not require one to consider a complete gas change, gas may be added to increase the purity while at full speed operation. This approach does increase the purity but requires more gas as would normally be required by adding gas from a dead stop and end with the same result..

- 1. Close so#70 valve between helium and make up tank in seal oil pit.
- 2. Close valves on gas bottles in gas shack
- 3. Close HE valves # 69, 70 and 72 located in the gas shack
- 4. Open HE valve #74 (bypass valve) in gas shack
- 5. Open gas bottle valve in gas shack.
- 6. Regulate gas pressure in alternator between 1-2psi using HE valve #82 and HE #84. He valve #82 is the gas supply to the mavnine and HE valve#84 is the vent to atmosphere.