If you install a new pump, always replace the old gasket with the new one that is provided. Used seals have been compressed and are not designed to be reused. The gasket seals the pump to the accessory-drive-pad oil hole and also serves as a heat shield. A leaking seal will cause the system and pump to be contaminated with oil. A new pump also warrants a check of the system and change of all filters. This should include cleaning the pressure lines from the pump to the instruments because carbon particles may find their way through the filter and begin to collect there. Also clean the inlet lines.

If there is any drawback to the dry-pump system, it is the potential for carbon contamination. While this problem may be obvious in the pressure system, some mechanics think the vacuum system, with its pump downstream from the gyros, also may be vulnerable to carbon contamination. They hypothesize that as the pump shuts down, the instrument cases momentarily have a lower pressure than the pump, causing a reverse airflow that could pull carbon dust back into the instrument case. Whether or not this actually happens, the best safeguard is to change filters regularly and keep the system clean.

The lining of deteriorated hoses may break away and flow through the system until it clogs a filter, lodges in a valve, or jams the pump. The effect of a collapsed, kinked, or twisted hose is similar to that of a clogged filter. The restricted airflow raises pump operating temperatures, which results in a shorter pump life. Damaged or loose fittings, in addition to acting as another air source that may bypass gyros, also can allow engine cleaning solvents to enter the pneumatic system. When this happens, the solvent can mix with carbon particles to form sludge. In the pump, sludge will cause the coupling to shear! As a precaution, never direct high-pressure solvents on a pneumatic system component when cleaning an engine. In fact, it is a good operating practice to encase these components in plastic bags before using solvent cleaners. A word of caution, however: The bigger the bag, the less likely you will be to miss it on a preflight, if you forget to remove it.

Another problem associated with loose fittings or leaking hoses is the reduced pressure, which results in decreased gyro airflow. The pilot, noticing a change in gauge reading, may have a mechanic adjust the regulator. This makes the pump work harder and run hotter to compensate for the air loss, leading to shorter pump life. It is cheaper in the long run to replace bad fittings and hoses than to buy a new pump.

TROUBLESHOOTING

Any of the following trouble signs warrant checking the entire pneumatic system:

1. The pump fails soon after installation.
2. The aircraft has a history of short pump life.
3. The vacuum (or pressure) indication is above or below proper level.
4. Gyro performance is erratic.
5. The de-ice system malfunctions.
6. A door-seal system malfunctions.
7. An autopilot system malfunctions.