

Hydraulic Systems

check the fluid for proper quantity and type, especially if it has been changed recently. The wrong fluid will lead to disaster.

It is also a good idea, when in flight, to press the brake pedals as you near your destination airport. If you find they offer no resistance and go all the way back, you might want to check out the availability of the long runway.

PREVENTIVE MAINTENANCE

Hydraulic fluid not only allows the system to do its work, but it also acts as a lubricant to protect it. I cannot overstate the importance that should be attached to the quality of hydraulic fluid. Seventy-five percent of all hydraulic problems are traceable to fluid problems, and most often contamination! Keep hydraulic lines properly secured; they should not be loose in the clamps. Be especially watchful for chafing of the lines where they pass through the bulkheads or near other components. Where accessible, fittings should be hand checked for tightness during preflight.

Hydraulic fluid has four primary enemies: water, air, heat, and dirt. There are two approaches to dealing with these problems. Airframe manufacturers try to engineer the system to prevent or at least minimize their occurrence. The second method is for fluid manufacturers to try to make the fluids themselves resistant to them. Some of the best preventive maintenance you can perform is to try to minimize as much as possible these major hydraulic fluid enemies.

Water

In larger aircraft that use phosphate esters, water mixed in will produce acid, which causes problems for the system. But even in aircraft that use mineral-based hydraulic fluids, water can lead to corrosion of system parts. Care must be taken to keep water out of the system, and be especially watchful with aircraft that operate in humid climates. The manufacturers, for their part, mix additives into the fluid that help to counteract acids and make the fluid resistant to problems.

Air

Air in the system will result in oxidation of the fluid. Fluid is nonfoaming to reduce the potential for air to get into the system, but it is important to check the system periodically to assure that there is no buildup of air. This is commonly done during routine scheduled maintenance such as during a 100-hour inspection.

Heat

The chance of fluid oxidation as the result of air in the system increases as the working temperature of the fluid increases. In general, heat degrades hydraulic fluid. Under normal conditions the system is able to handle heat, but constantly working a high-load hydraulic system such as the gear can cause long-term problems.