SAE INTERNATIONAL

AEROSPACE RECOMMENDED PRACTICE

ARP4150™ REV. A

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Superseding ARP4150

(R) Procedure for Inspection of In-Service Airborne Accumulators for Corrosion and Damage

RATIONALE

ARP4150 has been updated to Revision A to delete reference to ultrasonic testing and to incorporate other technical and editorial improvements.

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1. SCOPE

This SAE Aerospace Recommended Practice (ARP) is a guide in establishing inspection procedures to determine the condition of in-service accumulators. Recommendations are also provided for corrective action if it is determined that the environment is contributing to the deterioration of the surface protection system treatments.

2. REFERENCES

There are no referenced publications specified herein.

3. REVIEW OF SERVICE HISTORY

3.1 Background

Accumulators are designed for the service life of the aircraft; however, under certain environmental conditions the surface protection system can deteriorate and allow corrosion, which in turn can lead to early stress corrosion type failures. Since the accumulator is charged with a high pressure gas, the results of such failure can be extremely violent. The failure of an accumulator can result in aircraft structural damage and may result in injury to nearby personnel.

3.2 Potential Causes of Accumulator Structural Failures

Accumulators are usually very reliable, and it is not unusual for them to remain installed on an aircraft throughout the aircraft's lifetime. There are, however, certain conditions that can lead to early failures. The most obvious of these are described in the following subsections.

3.2.1 Installation and Environment Causes

Cavities or fluid traps in the end caps or under the mounting clamps can retain moisture which will adversely act on the corrosion protective system. The rate of corrosion will be greater on some installations than on others due to their more severe operating environment.

Those accumulators that are exposed to moist salty air, waste water, or corrosive cleaning solvents could lose their protective finish much faster than those operating under clean dry conditions.

3.2.2 Use of Poor Quality Gas

The inadvertent use of moist nitrogen to service the accumulator can cause loss of the internal corrosion protection system. Some configurations, such as those with permanently closed gas chambers, are especially susceptible to this problem since the air chambers are not necessarily inspected during normal refurbishment activities.

3.2.3 Damage Caused During Normal Maintenance

Damage to the protective coating will allow corrosion pitting, which will allow early failure due to stress corrosion action.

Nicks or scratches can induce high localized stress levels, which will appreciably reduce the structural life.

3.2.4 Improperly Manufactured or Installed Parts

Sharp internal corners from improper machining cause high stress concentrations and reduce life. Deficient plating/coating processes allow early corrosion pitting, which in turn allows failures due to stress corrosion. Improper material heat treating can reduce the material fatigue life. Improper installation of parts can cause high stress concentrations and reduce life.