February 22, 1982

TITLE: VACUUM SYSTEM MAINTENANCE PROCEDURES

EFFECTIVITY: All Single Engine Aircraft Utilizing Dry Vacuum Pump Systems

PURPOSE: To review vacuum system maintenance procedures which are important factors in preserving and extending the service life of dry vacuum pumps. Detailed information is provided with this letter.

COMPLIANCE: Recommended maintenance procedures included with this letter are to be followed whenever vacuum systems of affected aircraft require replacement of the vacuum pump, vacuum hoses, or other system components.

MAN-HOURS REQUIRED: Not applicable.

MATERIAL: Reference appropriate aircraft Parts Catalog for replacement vacuum system parts as required.

ACCOMPLISHMENT INSTRUCTIONS: Reference the maintenance recommendations included with this letter and the appropriate aircraft Service Manual procedures on vacuum system servicing and component replacement.

CREDIT INFORMATION: Not applicable.

OWNER NOTIFICATION: Dealers use Owner Notification System Card - No. 1.

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To obtain satisfactory results, procedures specified in this service information letter must be accomplished in accordance with accepted methods and prevailing government regulations. Cessna Aircraft Company cannot be responsible for the quality of the work performed in accomplishing this service information letter.

Where applicable, FAA approval has been obtained on technical data in this publication that affects airplane type design.

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MAINTENANCE PROCEDURES

DRY VACUUM PUMP SYSTEMS

In the event of vacuum system maintenance requiring replacement of the vacuum pump and/or vacuum hoses, the following procedures should be used.

A. REMOVAL OF VACUUM PUMP

1. Remove pump from engine and discard old mounting gasket.

2. Remove fittings from pump. Retain fittings if they are serviceable. Discard twisted fittings and nuts with rounded corners.

B. MOUNTING PAD INSPECTION (Whenever Pump is Removed)

1. Check the condition of the AND 20000 pad seal. If the seal shows any signs of oil leakage, replace the seal. Replace seal if there is any doubt as to its serviceability.

C. INSTALLATION OF NEW PUMP

CAUTION: NEVER INSTALL A PUMP THAT HAS BEEN DROPPED.

1. Preparation for Pump Installation.

   a. Consult the applicable Parts Catalog, the pump vendor's application list, or the PMA label on the pump box to verify that the pump is the correct model for the engine and/or system.

   b. Place the pump mounting flange in a jaw-protected vise, with the drive coupling downward. Protect the pump mounting flange with soft metal or wood.

   CAUTION: PUMP HOUSING SHOULD NEVER BE PLACED DIRECTLY IN A VISE SINCE CLAMPING ACROSS THE CENTER HOUSING WILL CAUSE AN INTERNAL FAILURE OF THE CARBON ROTOR.

   c. Install fittings in the pump. Hand tighten.

   d. Use only a box wrench to tighten fittings to desired position. DO NOT make more than one and one-half (1 1/2) turns beyond hand-tight position.
2. Pump Installation.
   a. Install new pump mounting gasket (supplied with new pump).
   b. Always replace ALL locking washers when installing a new pump. Tighten all four (4) mounting nuts to approximately 50 to 70 in. lbs. These requirements are particularly important on large pumps.

D. VACUUM HOSES
   1. Inspection—Hoses which have been disconnected or removed should be inspected as shown below prior to reinstallation.
      a. Examine hoses for condition—hard, cracked, or brittle hoses, particularly at the pump inlet end are to be replaced. Sections of the inner layers of such hoses may separate causing pump failure.
      b. Inspect each hose carefully to make sure it is clean and free of all debris, oils, or solvents. Use vacuum or air pressure to clean the lines. Remove the hoses from the aircraft, if necessary.
      c. Clean the pump inlet line. This step is particularly important in pressure systems. After a pump failure, carbon particles can pass in either direction, down-stream as well as upstream.

2. Hose Installation
   a. Where hose clearance is tight making it difficult to reinstall the hose on the pump fitting, apply a light film of petrolatum to the fitting, then install the hose by pushing it straight on.

NOTE: DO NOT wiggle hose from side to side. This could cause particles to be cut from hose ID, and such particles could damage the pump.

   b. Make certain that hoses are connected to the correct fittings. Incorrect installation will cause damage to the gyro system.

E. VACUUM SYSTEM FILTERS

   CAUTION: CHANGE ALL THE FILTERS IN THE SYSTEM WHEN REPLACING A VACUUM PUMP. THIS MUST BE DONE OR PUMP WARRANTY MAY BE VOIDED.

1. CLOGGED FILTERS WILL RESTRICT THE FLOW OF AIR REQUIRED FOR PROPER PUMP OPERATION AND COOLING. PREMATURE PUMP FAILURE OR SHORTENED PUMP LIFE MAY RESULT.

(continued)
2. REFER TO THE SERVICE MANUAL FOR SCHEDULED INSPECTION AND REPLACEMENT INTERVALS.

F. MAINTENANCE PRECAUTIONS--DRY VACUUM PUMPS

1. Engine Cleaning.

   a. Engine cleaning procedures, normally associated with routine annual and/or 100-hour inspections, may cause harmful agents such as Stoddard solvent to be ingested and cause premature failure. Because solvents of this type rapidly attack the carbon bearing, vanes, and rotor used in dry vacuum pumps, the damage can take place quickly and with little or no warning. To prevent such occurrences, the following protective actions are recommended when cleaning aircraft engines:

   b. Carefully cover the coupling area between the pump and the engine drive shaft so that no cleaning solvent can reach the coupling or seal.

   c. Vacuum pumps with an open discharge tube are to have the tube opening covered to prevent entry of solvent spray into the pump body.

   d. Cover or replace the vacuum relief valve filter after cleaning the equipment in the engine compartment BEFORE starting the engine.