



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

# **General Aviation Airworthiness Alerts**

**AC No. 43-16**

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A large, stylized graphic of a wing or tail section, composed of several black, pointed shapes that taper to the right, creating a sense of motion and speed.

# **ALERTS**

**ALERT NO. 239  
JUNE 1998**

**Improve Reliability-  
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**U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION  
WASHINGTON, DC 20590**

**GENERAL AVIATION AIRWORTHINESS ALERTS**

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The General Aviation Airworthiness Alerts provide a common communication channel through which the aviation community can economically interchange service experience and thereby cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those of you who operate and maintain civil aeronautical products. The contents include items that have been reported as significant, but which have not been evaluated fully by the time the material went to press. As additional facts such as cause and corrective action are identified, the data will be published in subsequent issues of the Alerts. This procedure gives Alerts' readers prompt notice of conditions reported via Malfunction or Defect Reports. Your comments and suggestions for improvement are always welcome. Send to: FAA; ATTN: Designee Standardization Branch (AFS-640); P.O. Box 25082; Oklahoma City, OK 73125-5029.

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**AIRPLANES**

**BEECH**

**Beech; Model BE-76; Duchess; Propeller Lever Detent Malfunction; ATA 7603**

During a training flight, the left propeller was feathered. Initially, the pilot was unable to return the propeller lever (P/N 105-940000-11) to the forward position. Extra force was required to move the lever, and when it moved, the pilot heard a loud snap. The propeller came out of feather, and a safe, uneventful landing was made.

Upon investigation, it was found that both propeller levers could ride up and over the feather detent spring (P/N 105-940021-3). The instrument panel cross-brace assembly that the detent spring attaches to was deformed. This allowed the spring position to shift and the propeller levers to ride over the spring. The levers would then jam in the feathered position.

To ensure that this does not occur, special attention should be given during routine inspections. The propeller levers should be pulled back into the feather position and checked for proper detent position.

Part total time was not reported.

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**Beech; Model BE36TC; Bonanza; Fuel Gauge Transmitter Error; ATA 2842**

The owner of the aircraft reported fuel quantity indication fluctuation during cruise at 9,000 feet.

The aircraft was inspected and a "ground run" conducted, but no problem was discovered. When the aircraft was flown again, a preflight inspection of the gauges showed 35 gallons of fuel in the right tank and 15 gallons in the left tank.

The runup, takeoff, and climb to 10,000 feet were normal, and the problem could not be duplicated. The pilot made a spiraling, steep descent to the left. After ten 360-degree turns, the pilot made a shallow descent; and within 30 seconds the engine quit. The emergency boost pump was turned on, and the left tank was selected along with the high boost pump setting. The pilot switched back to the right tank which still showed 35 gallons, and the best glide speed was attained. With this noseup attitude, the engine power resumed for 4 to 5 seconds, and then it quit again. Intermittent power suggested a fuel problem with the right tank. The left tank was selected again; the engine was restarted and ran normally.

After landing, the aircraft was taxied to maintenance, the fuel valve was turned to the right tank, and the engine quit. Maintenance began defueling the right tank and found only 1 quart of fuel remaining. An incorrect fuel quantity transmitter (P/N 58-380001-13) installed in the right wing was replaced with the correct transmitter (P/N 58-380001-15). Maintenance also discovered the sight gauge (P/N 002-381002-15) was stuck on 35 gallons.

In many cases, quantity indicators prove less than dependable. In this instance, the electric transmitter was incorrect and inoperative; and the mechanical sight gauge was stuck on 35 gallons.

Since inadvertent fuel starvation is frequently the cause of aircraft accidents, pilot/owner education and extra precaution is paramount. The best instrumentation is no substitute for properly-maintained fueling logs, an intimate knowledge of your aircraft's hourly fuel consumption, and a visual check down the filler neck before each flight.

Part total time-1,900.9 hours.

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**Beech; Model B-100; King Air; Combustion Chamber Failure; ATA 7240**

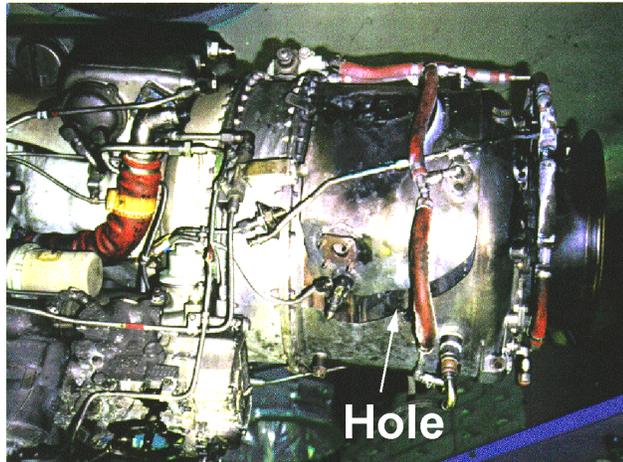
During a normal takeoff while passing through approximately 80 knots, the pilot of a King Air B-100 heard a "poof" sound. The pilot looked at the left engine nacelle and noticed the cowling paint was discolored, and the oil filler door was open. The pilot reduced the engine power, aborted the takeoff, and accomplished engine-emergency shutdown procedures.

Investigation of the aircraft determined that the left engine combustion case (plenum) had failed. The plenum (P/N 893973-5) had failed near the P-3 fitting boss and caused minor damage to the engine compartment's surrounding area. (Refer to the following illustration.)

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The submitter recommends that the P-3 fitting boss/customer air-pad area of the combustion

Part total time was not reported.



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## BELLANCA

### **Bellanca; Model Super Viking; Main Landing Gear Part Cracked; ATA 3213**

After major landing gear repairs in which all components of the landing gear assembly were inspected, it was noted that the nutcracker bushings were excessively worn. The owner requested that the bushings not be repaired at that time. After 44 hours of additional flight time, the right lower nutcracker half was discovered to be cracked at the weld joint on the outboard lower mounting ear.

This condition could have been caused by worn bushings causing a shimmy or by incorrect landing procedures. Proper maintenance and careful preflight landing gear inspections can help prevent recurrence.

Part total time-2,495 hours.

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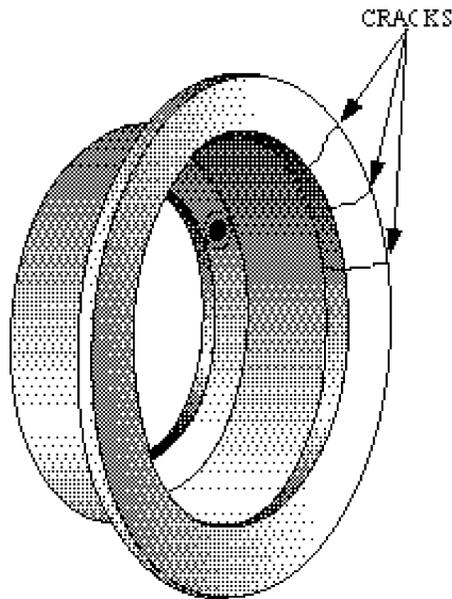
## CESSNA

### Cessna; Model 172N; Skyhawk; Brake Disc Cracks; ATA 3242

Three cracks were discovered by visual inspection of the main landing gear brake disc (Cleveland Brakes, S/N not provided). The cracks radiated across the disc and extended completely through the disc. (Refer to the following illustration.)

The submitter stated that this is the third cracked disc that he has found this year.

Part total time was not reported.



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### Cessna; Model 172R; Skyhawk; Loose Rocker Shaft; ATA 8530

Due to a rough running engine, the pilot made a precautionary landing. A technician inspected the aircraft and discovered that the number 3 cylinder was dead. The valve cover was removed to find the intake and exhaust rocker shaft loose and one retaining nut inside the valve cover. The aircraft had been returned to service approximately 2 hours earlier. The log book showed that all of the push rod seals were replaced due to oil leaks. The oil seals were all replaced; but upon reinstallation of the rocker shaft, the mechanic used star washers to secure the plain nuts in place. The Continental engine manuals call for a nut lock (P/N 50186). Twenty-four new locks were installed on all rocker shaft retaining nuts and "crimp locked" as required.

In this case, the problem was found and corrected with no harm done. However, this is a good example of why substitution of parts should not be done. Under different circumstances, this same failure could have resulted in a very serious situation.

Part total time was not reported.

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**Cessna; Model 182N; Skylane; Missing Carburetor Drain Plug; ATA 7322**

A few minutes after takeoff, on an instrument flight rule (IFR) training flight, the engine began running very rough.

The pilot tried adjusting the mixture, carburetor heat, and throttle but the roughness continued. Shortly thereafter, the pilot noticed that a fire had erupted in the engine compartment. While the fire was still burning, the pilot returned to the airport and made a safe landing. After touchdown, the fuel valve was closed. With the aid of airport security, the fire was extinguished with a portable fire extinguisher.

The engine was allowed to cool, the cowling was removed, and an inspection revealed that the drain plug for the carburetor bowl was missing. No evidence of safety wire was found on the drilled safety wire hole next to the drain plug. Apparently the plug had not been properly torqued or safety wired.

Part total time-1,752 hours.

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**Cessna; Model T206; Horizontal Stabilizer Rib Cracks; ATA 5511**

During an annual inspection a clicking noise was heard while pressing the leading edge of the horizontal stabilizer.

Closer inspection revealed that several ribs were cracked on both the left and right sides of the stabilizer (P/N 1232600-29). This aircraft also had a bent rib (P/N 1232105-1).

The submitter stated that this is the third Cessna T206 he has seen with cracked leading edge ribs and suggested that years of pushing on the tail section during ground handling may have contributed to this condition.

Part total time-3,197 hours.

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**Cessna; Model 335; Exhaust Stack Damage; ATA 7800**

During a routine engine change, two large holes were found in the left engine inboard exhaust stack. This was apparently caused by contact with the heat shields that were mounted above the elbow because the heat shields also had holes in them and were burned by the escaping exhaust gases.

The main wire bundle containing all necessary wiring for the left engine is routed directly above the heat shields. Several wires showed signs of heat damage to the insulation, and one wire was burned completely in half.

If this condition were allowed to continue, control of all electrical components (starter, magnetos, alternator, etc.) on the left engine could have been lost. Quite possibly an engine fire could have resulted, and with nacelle fuel tanks located behind the engine, the results could have been catastrophic.

Close attention should be paid to this area on both engines due to the routing and construction of the exhaust system. This area is difficult to inspect; however, removal of the induction air canister should provide enough access to perform an inspection using a light and mirror.

Part total time-2,780 hours.

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**Cessna; Model 414; Chancellor; Worn Structural Parts; ATA 5300**

During an inspection of the nosewheel well substructure, a number of bulkhead cracks, loose bolts, and sheared rivets were found on the stiffeners and T-angles. Doublers (P/N 5213045-3LH and P/N 5213045-2RH) were found cracked at the upper aft corner radius relief cutouts.

The exact cause of the failures could not be determined; however, they may have been caused by landing or ground handling (or both). The submitter recommends close visual inspection for loose bolts, sheared rivets, and cracks in the substructure every 100 hours.

Part total time-3,709 hours.

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**Cessna; Model C-550; Citation II; Cabin Door Hinge Assembly Corrosion; ATA 5210**

The cabin door was removed to change the bearing assemblies in the door hinge, and corrosion damage was discovered in the hinge assembly (P/N 5511235-16). Since the hinge was made of magnesium, the damaged area could not be removed without compromising the strength of the hinge; therefore, a new assembly was required.

The submitter suspects that the contributing factor to the corrosion was the lack of lubrication in the bearing assembly. Lubrication of this specific part is not listed in the inspection guide (e.g., the lubrication of the landing gear torque links).

Since not having this item listed caused the lubrication to be overlooked, the submitter included this item in the guide for lubrication at regular intervals. This should minimize costly part replacements.

Part total time-4,137 hours.

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**Cessna; Model 560; Citation V; Starter-Generator Bearing Failure; ATA 2435**

The pilot reported the aircraft was vibrating and asked the technician to troubleshoot the problem.

The technician was in the process of eliminating items that rotate, and was listening to the rundown after motoring the engine to 10 percent with the starter. The right starter generator made an unusual noise upon engine rotation. When the starter was removed, inspection revealed that the brush and bearing had failed, and there was excessive play in the shaft. Part of the bearing cage fell out when the starter was turned up on end. An operational check after installing a new starter generator (P/N 9912125-2) confirmed the source of the vibration was the old starter generator.

Cessna Aircraft Service Bulletin 560-80-03 provides information on service which may be needed on this model starter generator.

Part total time-182 hours.

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**Cessna; Model 560; Citation V; Main Gear Axle Corrosion; ATA 3213**

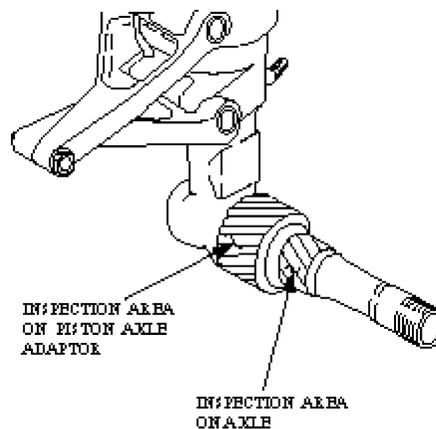
While performing Phase 1 and Phase 2 inspections on the aircraft, it was discovered that both main landing gear axles had corrosion. Item code number A324040 in the Phase 2 inspection requires the axle be inspected for presence of primer on the axle and axle adapter where the brake and brake adapter are located. (Refer to the following illustration.) The axle and axle

adapter did not have the required primer on them. As a result, light corrosion had already started forming. The corrosion was removed and corrosion-resistant epoxy primer was applied per the Citation Component Maintenance Manual.

The aircraft was delivered in September 1997 and had 151.8 hours at the time of inspection. The first 150 hours had accumulated rather quickly. If it had taken longer to accumulate that time, the corrosion could have possibly been beyond repairable limits.

This is the second time the submitter has found axles without the required primer. The first time was on February 5, 1993. This was before the corrosion inspection was required in the Phase 2 inspection. At that time, the submitter found the corrosion while performing a brake change. Shortly after that, the inspection was added to the Phase 2 inspection. The submitter adds: "The axle should have had the primer applied at the factory. Somehow these main gear assemblies slipped through quality control without the required primer being applied."

Obviously, quality control should have caught these errors before the aircraft left the factory; however, like all things involving humans, there is a need for redundancy. The watchful eye and technical "know how" of properly trained technicians doing their job well (as in this case) makes the overall system work well.



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#### **Cessna; Model C-560; Citation V; Generators Would Not Parallel; ATA 2435**

The pilot reported that the generators would not share the electrical load evenly (parallel).

Inspection revealed that both the starter/generator grounding connections were loose where the ground lead attaches to the airframe grounding point on the main engine mount. Minor arcing was noted on the left-hand ground. Both connectors were cleaned and resealed.

This condition apparently resulted from improper torque of the attaching hardware, since this aircraft was delivered new from the factory in June 1997. Operators of this make and model aircraft should inspect the ground connectors for proper torque.

Part total time-514 hours.

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## MOONEY

### **Mooney; Model M20C; Ranger; Seat Track Problem; ATA 5347**

The seat adjustment tracks (both left and right seats) were found impacted with dust and cabin debris combined with track lubricant filling the blind holes so that the seat locking pins had very little penetration into the seat track. This potential problem was compounded by the fact that seat track holes had begun to show signs of ramp and funnel wear at the top.

The owner-pilot of this aircraft did not experience a seat locking failure, but it was apparent that half of the holes were close to malfunctioning. The submitter recommends that the holes be checked and cleaned (if necessary) during every annual inspection.

Part total time-3,289 hours.

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### **Mooney; Model M20J; Broken Steering Horn Shaft; ATA 3251**

During a landing roll, the pilot was not able to maintain control of the aircraft. The aircraft exited the side of the runway, hit a runway light, and the nose gear collapsed after passing through a drainage ditch.

When repairs were made, the technician discovered that the nose gear and the steering horn shaft (P/N 720095-017) had been broken before this flight. This problem caused the pilot to lose control of the nosewheel steering.

The submitter speculates that the failure of the steering horn shaft was caused by exceeding the nose gear travel limits during towing of the aircraft with a tug in ground operation.

Part total time-955 hours.

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## PIPER

### **Piper; Model PA18; Super Cub; Frame Corrosion; ATA 5310**

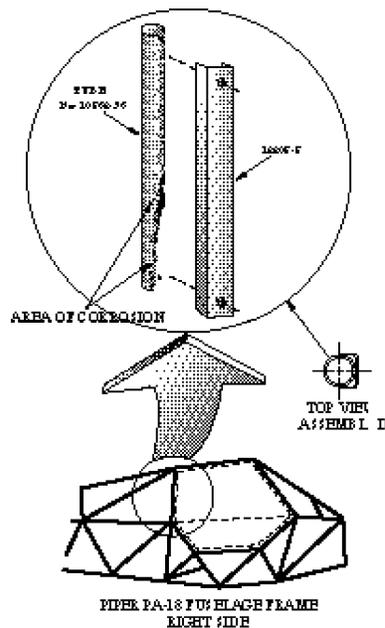
An FAA-approved repair station, which rebuilds and repairs Piper PA-18 fuselage frames, has found severe corrosion on approximately 35 percent of the fuselages. One problem area is on the 5/8-inch vertical tube (P/N 10562-36) that extends from the top longeron, up to the rear wing attach fitting, on the right side at the aft upper door. (Refer to the following illustration.) The channel (P/N 12205-5) which is tack welded to this tube, is placed to provide proper clearance of the rear upper door. Apparently, trapped moisture behind the channel corrodes the 5/8-inch tube. This is a nearly impossible area to inspect unless the channel is removed. The area, not covered by the channel, generally remains relatively free of corrosion. The most prevalent area for corrosion is at the lower end; however, tubes are often corroded the entire length to the rear wing attach fitting.

The tube in question is the only vertical, load-carrying member to the right rear wing attach fitting. If indications of corrosion are found on this tube, the submitter recommends further inspection of tubes with like channel-covered surfaces for signs of corrosion.

Piper Service Bulletin (SB) No. 819, dated February 1986, pertains to similar problems with Piper Models J-4, J-5, PA-12, and PA-14; however, the Piper Model PA-18 is omitted from this bulletin.

Recommendation: The channel is a nonstructural part and at replacement of this, or other channels, proper breathing and ventilation should be provided. A channel replacement should include a 3/8-inch hole near the top and bottom. If these channels are to be covered with fabric, the fabric should be patterned and cut to provide ventilation.

Part total time was not reported.



### Piper; Model PA22; Colt; Severe Wing Strut Rust; ATA 5700

In December 1996, the struts were inspected in accordance with Airworthiness Directive (AD) 93-10-06 and Service Bulletin (SB) 528D. The aircraft was in compliance with the AD and the SB.

During the 1997 annual inspection, the owner decided to have all four struts (P/N 85559-2) inspected and modified in accordance with Supplemental Type Certificate (STC) SA 4635NM. The old fork barrel was cut off, and two of the struts were found rusted severely on the inside at the point where the door catches were mounted. The door catches are mounted nearly halfway up the length of the strut and are secured with two screws.

The struts had to be condemned, and two new struts were used. The owner, also a holder of an Inspection Authorization (IA), stated: "AD 93-10-06 does not specifically address this area of struts for inspection. The AD references SB 528D which does not inspect for rust defects around the door catches on the right hand front strut and left hand rear strut."

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The submitter suggests that the AD be revised to direct removal of the forks. The interior should be cleaned and inspected (using a Borescope) through the entire inside length of the strut. After the struts are modified, they should be sealed and the door catches secured without drilling holes in the strut.

Part total time-2,500 hours.

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**Piper; Model PA23-250; Aztec; Main Landing Gear Drag Link Bolt Hole Cracks; ATA 3200**

During an annual inspection, cracks were found on the main landing gear drag link fitting support tube assemblies. The cracks were located on the right hand inboard and the left and right hand outboard aft mounting bolt holes. Two tube assemblies required replacement and one was repairable.

The aft mounting bolt nuts are inaccessible on the outboard bolts, and the submitter recommends that the access holes be fabricated, using approved data, to allow access to check the aft bolts' torque. This should be accomplished at landing gear maintenance, 100-hour inspections, and annual inspections.

Part total time-4,122 hours.

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**Piper; Model PA30; Twin Comanche; Nosewheel Axle Nut Fell Off; ATA 3222**

During normal aircraft operation, the nose gear axle nut (P/N 752-482) worked loose and fell off the tie bolt (P/N 20854-00). This nut is not torqued to a specific amount, but is torqued just tight enough to remove free play on the bearings. When the nut fell off, the tie bolt was allowed to slide to the side of the nose gear casting. During the next gear cycle, the tie bolt jammed in the wheel well, and the nose gear stuck in the retracted position. The pilot tried to lower the landing gear without success, and the pilot landed the aircraft with the wheels in the "up" position. No one was injured, and the aircraft sustained minor damage.

The submitter recommends that when the axle tie bolt displays thread wear, it should be replaced and new lock nuts should be installed.

Part total time-7,300 hours.

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**Piper; Model PA31; Navajo; Defective Fuel Line; ATA 7310**

Fuel stains were discovered on the bottom of the right wing near the wing root. Further inspection revealed a leaking fuel line in the right wing root area. The cure date on the fuel line was the third quarter of 1977. The technician replaced the defective fuel line with a new one and tested it with the pump on.

The technician recommended that a closer and more frequent inspection of these fuel lines be conducted.

Part total time-5,326 hours.

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**Piper; Model PA31-112; Tomahawk; Water In Fuel; ATA 2810**

After takeoff on a training flight, the flight instructor noted a loss of engine power in the climb out. He immediately took control of the aircraft and proceeded to make an emergency landing.

Initiating the emergency procedure at approximately 100 feet above ground level (AGL), the flight instructor directed his student to notify the airport tower that they were making an emergency landing. Total engine power was lost while making the turn to land. Attempting to avoid injury to ground personnel and property, the flight instructor targeted a grassy area to land the aircraft which resulted in the left wingtip touching the ground and receiving minor damage.

On examination, the mechanic discovered water in the left wing fuel tank. Aircraft records revealed that this aircraft had not been operated for 3 days prior to the flight and had been exposed to heavy rains. It is believed that the fuel caps may not have been completely sealed resulting in rain water seeping into the left wing fuel tank. The left wing fuel tank was selected for use during this intended flight.

The aircraft fuel system was purged by the mechanic and returned to service after a hard-landing inspection was accomplished. A followup ramp inspection and a records inspection were also conducted.

It can never be emphasized enough as to the importance of sumping the fuel tanks for any presence of water or condensation in the preflight phase of a flight; especially after the aircraft is exposed to heavy rains. Had the airport environment been less forgiving this may not have had such a happy ending.

Part total time not reported.

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**Piper; Model PA31-350; Chieftain; Propeller Governor Failure; ATA 6122**

While climbing out after takeoff, the propeller governor failed, and the propeller feathered. The pilot made an emergency landing, and the aircraft was not damaged.

The governor (Model No. F-8-48L) was inspected, and the technician discovered that an internal oil plug had become loose, jammed the oil pump gears, sheared the governor shaft, and caused total failure.

Part total time-1,088 hours.

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**Piper; PA31-350; Chieftain; Electrical System Defect; ATA 2460**

While servicing the aircraft battery, the battery relay was found burned and broken.

The battery system still functioned; however, failure was imminent. Even though the battery relay contactor (P/N 455-211) "ear" was broken, it was still able to make contact. Poor contact caused high resistance which produced enough heat to burn the contactor and the attached wires. The contactor was manufactured in 1975, and the submitter speculated the failure was due to age.

Part total time-4,680 hours.

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**Piper; PA32R-301; Saratoga; Improper Alternator Belt; ATA 2410**

After the alternator drive belt broke, it was replaced with an improper belt.

The replacement alternator belt was longer than the proper belt. The extra belt length was compensated for by adjusting the idler pulley 180 degrees from the correct position. When adjusted to this position, the idler pulley and the belt can chaff on the lower engine cowling. In this case, a hole was chaffed through the cowling skin. Piper is in the process of revising the maintenance manual to clarify the correct alternator belt and idler pulley position. In the meantime, maintenance personnel should be aware of the potential dangers this problem presents. Use only the correct replacement belt by part number. Also, after installation, check for proper clearance between the belt/idler pulley and the lower cowling. The subject of this article applies to PA32R-301 aircraft, serial numbers 3246001 through 3246087.

Part total time not reported.

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**Piper; PA34-200; Seneca; Pitch Trim Failure; ATA 2731**

Information for the following article was submitted by the FAA Aircraft Certification Office located in Wichita, Kansas. The information resulted from FAA Safety Recommendation 97.058.

The pilot reported that during a normal landing approach, the stabilator trim became inoperative. After an uneventful landing, maintenance personnel were summoned.

An investigation revealed that the stabilator trim cable was severely frayed and off of the pulleys at the autopilot electric trim servos. This problem was discussed with Allied Signal, Inc., the manufacturer of the KFC 200 autopilot system. Allied Signal, Inc., proposed a maintenance check of the trim system in accordance with Installation Bulletin (IB) 416, dated January 1998, (P/N 600-19416-0000). This check provided coverage for PA34-200 aircraft which had the KFC 200 system installed. It was further suggested that stabilator trim cable slippage and fraying may not be isolated to the KFC 200 system. It was recommended an inspection of all PA34-200 aircraft stabilator trim systems be conducted regardless of the electric trim system installed.

Part total time not reported.

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**Piper; Model PA46-350P; Malibu Mirage; Improper Trunnion Pin to Bushing Clearance; ATA 3213**

During an annual inspection, vertical free play of the right main landing gear trunnion pin to bushing clearance measured .025 inches greater than the left main landing gear.

No tolerance for vertical movement could be found in the aircraft manufacturer's service manual. A new forward and aft bushing was ordered and received from the manufacturer. When the service manual was again consulted for a bushing replacement procedure, none was found.

The aircraft manufacturer's engineering department was consulted for a procedure. Engineering informed the submitter that they had not anticipated the replacement of the bushing; therefore, no procedure was available. They did say that the bushings were installed with Loctite 290. The Loctite Corporation was then consulted, and the submitter was told it would require a temperature of 550 degrees to loosen the Loctite 290 product. The aircraft

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manufacturer's engineering department was again consulted for maximum temperature application to the aluminum casting. Engineering personnel approved a maximum temperature of 350 degrees be applied to the aluminum casting.

Using a digital thermometer and a high temperature heat gun, the casting was heated while maintaining a temperature below 350 degrees. An internal jaw puller was used to remove the bushing along with wood blocks to protect the casting. It took two men over 10 hours to accomplish what would seem to be a simple bushing replacement.

The bushings were obviously made of a softer material than the hardened trunnion pins. The submitter consulted other repair shops, and some of the repair shops stated "peel shims" are used to eliminate this play.

The submitter strongly suggests that the manufacturer develop and publish a method of repair for this area.

Part total time-330 hours.

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## HELICOPTERS

### BELL

#### **Bell; Model 407; Installation of Cargo Hook Kit; ATA 5345**

Information for the following article was furnished by the FAA Rotorcraft Certification Office located in Fort Worth, Texas.

Bell Helicopter Textron has issued Alert Service Bulletin (ASB) 407-98-16, dated January 30, 1998. This ASB is applicable to helicopters with the following serial numbers: 53000 through 53152 and 53154 through 53165. This ASB authorizes the installation of a cargo hook kit (P/N 206-706-341-109-111). The kit changes the position of the manual cargo release mechanism to provide clearance between the cargo release handle and the copilot seat bottom cushion. Also, this ASB increases the electrical amperage rating of the system circuit breaker.

Part total time not applicable.

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#### **Bell; Model 407; Vertical Fin Damage; ATA 5533**

Information for the following article was furnished by the FAA Rotorcraft Certification Office located in Fort Worth, Texas.

Bell Helicopter Textron has issued Alert Service Bulletin (ASB) 407-98-17, dated April 3, 1998. This ASB is applicable to helicopters with the following serial numbers: 53000, 53003 through 53066, 53068 through 53138, 53140 through 53173, 53175 through 53178, 53181 through 53192, and 53194 through 53196. Bell Helicopter has found that some vertical fin assemblies (P/N's 206-020-113-221 and -229) may have damage on the inboard skin caused during

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production. Such damage reduces skin thickness and can decrease the strength of the vertical fin. Part I of ASB 407-98-17 provides inspection procedures. If damage is found, Part II provides the corrective actions required.

Part total time not applicable.

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## McDONNELL DOUGLAS

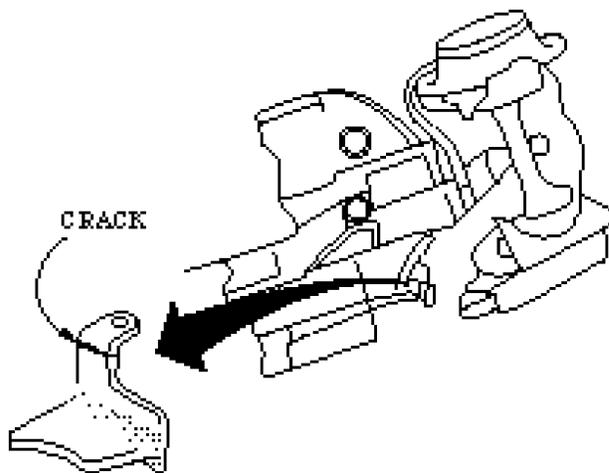
### McDonnell Douglas; Model MD 900; Main Rotor Droop Stop Support Bracket Failure; ATA 6220

During a scheduled inspection, all four of the main rotor head droop stop support brackets (P/N 900R2100001-103) were found broken.

It appeared that the droop stop support brackets cracked and ultimately failed. The brackets were broken at the bolt attachment point which secures the bracket to the main rotor head. (Refer to the following illustration.) This condition could cause the main rotor blades to contact the tail boom which could result in severe and possibly catastrophic damage.

The manufacturer was contacted and offered the following two possible reasons for failure of the droop stop support brackets: **1.** The pilot may have failed to center the cyclic stick prior to shutdown which can cause uneven loading of the main rotor system. **2.** The pilot may have made a hard landing.

Part total time-778 hours.



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## ROBINSON

### **Robinson; Model R-22; Mariner; Inspection Requirements; No ATA**

The following information was furnished by the Robinson Helicopter Company.

The manufacturer, as well as several FAA Flight Standards District Offices (FSDO's), have recently received numerous questions concerning the manufacturer's "10-year inspection and limited overhaul requirements."

Title 14 of the Code of Federal Regulations (14 CFR) part 43, section 43.13(a) requires each person performing maintenance on an aircraft to use the current manufacturer's maintenance manual or instructions for continued airworthiness prepared by its manufacturer, or other practices acceptable to the Administrator.

Sections 43.15(b)(3) and 43.15(b)(4) mandate inspectors of rotorcraft to check specific components and systems in accordance with the maintenance manual or instructions for continued airworthiness of the manufacturer concerned.

Therefore, unless otherwise approved by the FAA, an R-22 model helicopter that has been in service more than 10 years since it was new or since last overhauled is considered unairworthy until compliance with the manufacturer's 10-year requirements have been accomplished.

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## AMATEUR, EXPERIMENTAL, AND SPORT AIRCRAFT

### LONG EZ

#### **Long EZ; Improper Engine Operation; ATA 7322**

It was reported that the engine ran rough at lower power settings. The engine used in this aircraft was a Textron Lycoming, Model O-320.

With the throttle off, the mixture control in idle cutoff, and the fuel boost pump on, fuel poured from the carburetor (P/N MA-45PA). The submitter believed that the carburetor float had failed. Instead of disassembling the carburetor, it was sent to an overhaul shop.

Part total time not reported.

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## PITTS

### **Pitts; Model S-2A; Engine Failure; ATA 8011**

While maneuvering in a flat spin, the engine failed. All attempts to restart the engine failed, and the aircraft crashed.

During the accident investigation, it was found that the starter bendix would not engage, and the fuel filter had accumulated numerous metal particles. The submitter speculated that placing a "Teflon" ring around the "flop tube" (P/N 2-6502-013) would prevent the "flop tube" from scraping the metal and would eliminate metal particles from entering the fuel filter.

Part total time not reported.

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## REVOLUTION

### **Revolution; Model Mini 500; Pitch Control Failure; ATA 6710**

The pilot intended to make a runway "fly by"; however, as he entered the traffic pattern and made a base turn, he experienced a 1-to-1 vertical vibration. The pilot notified the control tower that he intended to land. While decelerating at an altitude of approximately 50 feet, the helicopter started to veer to the right, and the pilot applied the antitorque pedal. The nose of the helicopter went to approximately 50 degrees nosedown, and ground contact was made in a nosedown attitude. The pilot was not injured, but the helicopter sustained substantial damage.

During an investigation, it was discovered that a flight control push-pull rod (P/N BA16) had become disconnected from the control yoke "teeter" block (P/N 0026). The attaching hardware (bolt, nut, bushing, and antichafe washer) was found loose inside the lower fuselage skin. An inspection of the bolt (P/N 0470) and nut (P/N 0434) revealed no evident defects. The self-locking nut exhibited a lower than usual "drag torque." The submitter stated: "I was able to run the nut down on the bolt past the locking feature with my fingers."

A review of the maintenance records indicated that no maintenance had been performed on this assembly since original installation.

Part total time-106 hours.

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## SONERAI

### **Sonerai; Model II-L; In-Flight Engine Failure; ATA 7414**

The engine failed during flight, and all attempts to restart the engine were futile. This condition resulted in an accident which destroyed the aircraft and seriously injured the pilot.

An investigation revealed that the magneto drive coupler, which was keyed to the flywheel, had broken. It appeared the coupler broke at the point where it was keyed to the flywheel. Also, the coupler displayed evidence of a pre-existing crack, or possible casting flaws, at this location. The pilot/owner stated this is a repeat discrepancy, and the aluminum magneto drive coupling

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usually last about 200 hours of operation. The engine installed in this aircraft was a Volkswagon, Model 2020. The submitter recommended the manufacturer construct this coupling by milling it from high grade aluminum instead of casting the part.

Part total time-130 hours.

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## POWERPLANTS AND PROPELLERS

### McCAULEY

**McCauley; Models 71093, 72415, 761101, 780630, and 810915; Possible Incorrect Oil Viscosity; ATA 6114**

In accordance with Airworthiness Directive (AD) 91-15-04, all affected systems that have a two-bladed constant speed propeller with a threaded retention hub are required to be inspected for cracks and modified by filling the hub with "dyed" oil. This includes propellers with feathering capabilities.

It has been discovered that since 1993, a propeller overhaul shop has been filling all McCauley oil-filled propeller hubs that are installed on reciprocating engines with the wrong weight of oil. An FAA safety recommendation stated that the propeller shop had been misinterpreting the instructions given in the McCauley service information referenced in AD 91-15-04. Since this discovery, there have been reports of other propeller shops misinterpreting the appropriate oil weight.

It is recommended that all owners and operators of suspect propeller hubs verify that each hub is filled in accordance with McCauley Service Letter 1998-2, dated January 23, 1998. This should be accomplished during the next scheduled maintenance and/or inspection.

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## ACCESSORIES

### AEROBATIC CABIN DOOR HINGE

During postflight inspection, the lower hinge pin on the quick release cabin door assembly on a 1978 Aerobatic Bonanza F33C was noted to be out of normal alignment.

Close inspection revealed the 3/16 inch x 1-3/4 inch hinge pin (P/N 33-420020-1) had fractured at the machined groove in the middle of the pin and the lower half of the pin had fallen out of the hinge onto the hangar floor. The upper half remained in the hinge.

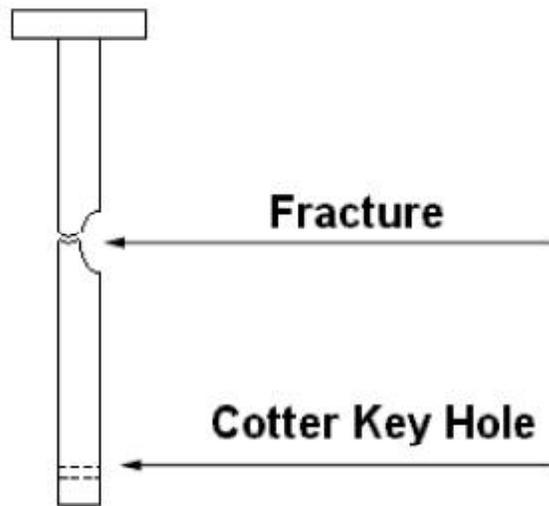
The pin had failed in flight, but did not fall out in flight due to the side load on both halves. A ground test showed the failed pin did not affect the door release capability. The pin showed no noticeable wear despite being original equipment.

The door release pin is fitted horizontally and passes the vertical hinge pin at the machined groove. (Refer to the following illustration.) The inflatable door seal, pumped tight at sea level, expands much more at altitude. This expansion presses the door away from the cabin causing the release pin to bear a side load against the hinge pin, thereby causing the pin to fail.

The inflatable door seal is an after-market product and was installed 253 flight hours ago. The door seal representative said that the door seal had been pumped too tight prior to takeoff.

The submitter has ordered two new pins and will use less pressure in the future.

Part total time-2,302 hours.



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# AIR NOTES

## SAFETY RECOMMENDATION 97.149

### Cessna Models 172RG, R182, and 210 Series Aircraft; Nose Gear Actuator Downlock Pin Failures; ATA 3230

Several incidents have been reported of nose gear collapses on the noted Cessna aircraft which have been attributed to failures of the nose landing gear actuator downlock pins. The downlock pins, which are press fit into the actuator bearing end and retained with a roll pin, become loose and crack and/or break at the retaining groove internal to the actuator bearing end. Cracks or breaks in this location are difficult to detect.

A review by the responsible FAA Aircraft Certification Office revealed the actuator bearing end and downlock pin designs meet the current criteria for expected loads, and the observed failure mode of the pin is inconsistent with design loads applied to an assembly in serviceable condition. Investigation determined that the probable cause is improper ground handling during towing and continued use of the actuator after damage has incurred. Cessna has issued Recommended Service Bulletin (SEB) 95-20 which details inspection procedures and provides a more robust downlock pin which is less susceptible to failure caused by exceeding the landing, towing, or taxi loads.

The aircraft should be in compliance with this SEB, especially aircraft that are regularly operated on rough surfaces or towed by a tug or a tractor. Make sure the nose gear actuator downlock pins are not loose in the bearing end and the actuator bearing end is not damaged.

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## INSPECTION AND CARE OF LANDING GEAR SYSTEMS

Recent accidents and incidents have indicated an increase in landing gear problems. These problems include landing gear that would not retract or extend, landing gear collapsing on landing, and part failures causing landing gear to not perform properly. Many factors affect the scope and frequency of landing gear system inspection and maintenance. However, the most important inspection starts with the preflight inspection. Visual inspections of the landing gear are very important whether the landing gear is fixed or retractable. In most cases there are fewer problems with the fixed landing gear, but inspection of the landing gear is still important.

The possibility of system malfunction increases with severe operating conditions such as pilot training, agricultural operations, and environmental conditions. These conditions may warrant inspections to be performed more frequently to include lubrication and servicing.

Cracks are the foremost area of concern and are very hard to detect. Some indicators could include: chipped paint, soot residue, and corrosion.

Landing gear bolts are an area of concern due to the fact the bolts become worn and bent. Bolts can shear and bolt holes can become worn to allow improper adjustments and alignment of the landing gear.

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Improper adjustment or lubrication can also cause malfunctioning, especially in the landing gear retracting mechanisms. Excessive lubrication or the wrong type of lubricant can often be as bad or worse than none at all.

Inspection of the landing gear and all associated hardware is very important. During preflight inspections, it may be necessary to gently rock up and down on the wingtips of the aircraft and observe the landing gear areas for excessive motion which would indicate excessive wear and security of attachment.

It may be necessary to inspect the aircraft structure surrounding the landing gear area to insure that no damage remains undetected. Forces can be transmitted along affected structure members to remote areas where subsequent normal loads can cause failure at a later date.

Landing gear component inspections should include shock absorbers, shock struts, steering dampers, nose gear assembly, main gear assembly, tailwheel assembly, gear doors, floats, skis, brakes, and wheel assemblies.

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## AIRWORTHINESS DIRECTIVES (AD'S) ISSUED IN APRIL 1998

**98-08-04;** Aermacchi S.P.A. Models S.208 and S.208A airplanes - requires inspecting landing gear rod springs.

**98-08-06;** Aermacchi S.P.A. S.205 Series and Models S.208 and S.208A airplanes - requires inspecting flight control cables.

**98-09-09;** Alexander Schleicher ASH-26E sailplanes - requires replacing internal cooling air fan.

**98-09-13;** Alexander Schleicher ASK21 sailplanes - requires inspecting S-shaped rudder pedal tube.

**98-08-29;** Alexander Schleicher ASK21 sailplanes - requires removing pages from flight manual and replacing pages concerning spin and stall recovery.

**98-08-20;** AlliedSignal Bendix/King Model KSA 470 autopilot servo actuators - requires replacing autopilot servo actuators.

**98-09-08;** Avions Pierre Robin Model R3000/160 airplanes - requires inspecting flap control shaft.

**98-08-28;** Avions Pierre Robin Model R3000/160 airplanes - requires replacing top bolts in front wheel fork assembly.

**98-09-24;** Diamond Aircraft H-36 "Dimona" and HK36R "Super Dimona" sailplanes - requires inspecting elevator rib area.

**98-09-14;** Diamond Aircraft HK36TTS and HK36TTC sailplanes - requires inspecting engine turbocharger oil-pressure line for correct banjo joint.

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- 98-06-13;** Dornier Luftfahrt Models 228 Series airplanes - requires replacing MLG axle assembly.
- 98-09-10;** Extra Flugzeugbau GmbH Models EA-300 and EA-300S airplanes - requires inspecting rudder control cables.
- 98-08-05;** Industrie Aeronautiche Meccaniche Model Piaggio P-180 airplanes - requires inspecting main landing gear.
- 98-08-26;** Pilatus Aircraft Models PC-12 and PC-12/45 - requires installing aluminum bonding bushings.
- 98-05-06;** Pilatus PC-12 airplanes - requires inspecting the elevator for incorrect rivet lengths.
- 98-07-18;** Pilatus PC-12 and PC-12/45 airplanes - requires replacing propeller deicing controllers.
- 98-08-22;** Pilatus PC-7 airplanes - requires inspecting elevator and rudder attachment brackets.
- 98-08-07;** Pilatus PC-7 airplanes - requires replacing rudder and elevator pivot arms.
- 98-08-18;** Piper PA-31 Series airplanes - requires inspecting elevator bungee spring for cracks.
- 98-09-25;** Piper PA-31 Series airplanes - requires replacing lower spar splice plate.
- 98-09-12;** Raytheon (Beech) 1900D airplanes - requires inspecting radio switching panel relay PCB.
- 98-08-21;** SOCATA - Groupe Aerospatiale TB10 and TB200 airplanes - requires inspecting wing rear attachment fitting for cracks.
- 98-08-27;** SOCATA - Groupe Aerospatiale TBM700 airplanes - requires modifying left-hand front side lower panel.
- 98-08-03;** Stemme KG Models S10 and S10-V sailplanes - requires replacing horizontal stabilizer rear fittings.
- 98-07-17;** Twin Commander series airplanes - requires inspecting flap system cables.
- 98-08-19;** Twin Commander series airplanes - requires installing access holes.
- 98-08-25;** Twin Commander series airplanes - requires replacing nose landing gear.
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## IF YOU WANT TO CONTACT US

If you want to contact the staff of this publication we welcome your comments, suggestions, and questions. Also, you may use any of the following means of communication to submit reports concerning aviation-related occurrences.

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## **SUSPECTED UNAPPROVED PART (SUP) SEMINAR**

As announced in previous editions of the Alerts, the Designee Standardization Branch, AFS-640, is once again presenting the Suspected Unapproved Part (SUP) seminar. A schedule of the seminars and information for requesting a SUP seminar in your area can be found below.

Seminar dates will be announced in the Alerts, the Designee Update newsletter, and on the Internet under FedWorld.gov. You may access the FedWorld BBS directly at (703) 321-3339. You may access the Alerts through the Internet, using the Regulatory Support Division, AFS-600, "HomePage" at the following address.

**<http://www.mmac.jccbi.gov/afs/afs600>**

**The seminar will discuss the following:**

1. Introduction to the policy of the Suspected Unapproved Part Program Office, AVR-20.
2. What is an approved part/unapproved part? How can approved parts be produced?
3. What is a suspected unapproved part?
4. How is a suspected unapproved part reported in accordance with FAA Order 8120.10A, Suspected Unapproved Parts Program, and utilizing FAA Form 8120-11, Suspected Unapproved Parts Notification?
5. How do you determine the status of parts?
6. What is the procurement process?
7. How do you use the Internet and FedWorld to find a list of unapproved parts?

The cost of this 8-hour seminar will be \$60. The seminar may be used for the Inspection Authorization (IA) renewal training requirement specified in Title 14 of the Code of Federal Regulations (14 CFR) part 65, section 65.93(a)(4).

The seminar is open to the aviation industry. Anyone wishing to attend may telephone (405) 954-0138. Payment is required in advance by using VISA, MasterCard, or a check.

**When scheduling attendance, please reference "AFS-75."**

### SCHEDULE FOR SUSPECTED UNAPPROVED PART (SUP) SEMINARS

<b>Seminar No.</b>	<b>1998</b>	<b>Location</b>
759806	Jul 15	Seattle, WA
759807	Jul 8	Anchorage, AK
759808	Aug 5	Ft. Lauderdale, FL
759809	Sep 16	Springfield, IL
759901	Oct 21	Rochester, NY
759902	Nov 18	Wichita, KS

ADDITIONAL SUP seminars will be conducted in Atlantic City, NJ on 6/2/98 and 6/3/98; Minneapolis, MN on 6/16/98 and 6/17/98; and Anniston/Oxford, AL on 8/18/98. You may register for the seminar by calling (405) 954-0138. The additional SUP seminar is a 1-day, 8-hour seminar and can be used to meet IA renewal requirements.

If you require additional or special SUP seminars, please write to: FAA; ATTN: Mr. Elmer Hunter (AFS-640); P.O. Box 25082; Oklahoma City, OK 73125. Depending on manpower and the availability of AFS-640 personnel, the requests for additional SUP seminars may be authorized. The cost for the additional SUP seminars is \$60 per person. We would like a minimum of 40 attendees for a 1-day seminar and no more than 60 attendees. When the number of attendees is greater than 70, we will conduct two 1-day seminars. The registration process is the same as that previously discussed in this article. If you have specific questions regarding an additional SUP seminar, please contact Mr. Elmer Hunter at (405) 954-4099.

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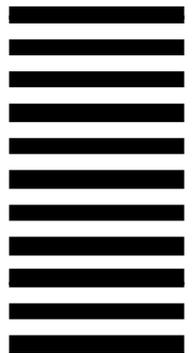
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