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Federal Aviation Administration

Aviation Maintenance Alerts

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Improve Reliability-Interchange Service Experience

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, DC 20590

AVIATION MAINTENANCE ALERTS

The Aviation Maintenance 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 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 goes 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.

NEWS

CHANGES TO THIS PUBLICATION

To improve the quality of this publication, we have made some changes which reflect the high standards and professionalism of our readers.

The title of the publication has been changed to "AC 43-16A, Aviation Maintenance Alerts." The new title enables us to publish information concerning any aviation product.

We added color to enhance readability and provide clarity to photographs. When possible, we invite you to send color photographs with your report.

We encourage you to submit maintenance information, so we can disseminate it to the aviation public via this publication. In the past, readers have discovered potentially dangerous safety defects because they read about it in this publication. When you submit reports, you are supporting the system and making it better.

We have created a new Internet web site which includes an electronic version of FAA Form 8010-4, Malfunction or Defect (M or D) Report. You may use the electronic version to send M or D reports to us.

The web site also includes a search function for older copies of the Alerts. Currently, we have twelve issues available on the web site. As time permits, we will continue to add more issues.

In the future, we will establish an E-Mail distribution system for the publication. When that system is in place, we will strongly urge you to use this system. The system will save printing and mailing costs associated with delivering paper copies. If you switch to the E-Mail

distribution system, please tell us by using the subscription form in the back of this edition. We will delete your name from the paper copy distribution list. We will continue to print paper copies for those who do not have access to the Internet and E-Mail.

The address for this web site is:

http://www.mmac.jccbi.gov/alerts/

If you like the idea of receiving the Alerts via E-Mail, please let us know so that we can get an idea of how many of our readers will take advantage of this system. You may contact Phil Lomax by mail, telephone, or FAX.

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We value your opinion and welcome any questions, comments, or ideas you may have regarding this publication. If you find something you like, tell us and someone else. If you find something you do not like, tell us—we will fix it.

Thanks to all of you who have supplied information for this publication over the years. By doing so, you make that information, as well as your experience, available to the entire aviation community. Keep up the good work.

AIRPLANES

BEECH

Beech; Model S-35; Bonanza; Fuel Quantity Errors; ATA 2842

A Beech fuel quantity transmitter kit (P/N 55-9018-18) was installed on this aircraft. After installation, several repetitive errors and malfunctions were experienced.

The aircraft fuel system uses two quantity probes in each wing tank. The outboard fuel quantity transmitters had a failure rate of approximately 100 hours of operation. The problems usually occurred with full fuel tanks. The fuel quantity indicator needle began to “flicker,” and within 15 minutes, the needle dropped to a one-quarter tank indication. All four transmitters exhibited these same characteristics. The fuel quantity transmitters were bench checked and were confirmed to be the source of the problem.

Part total time not applicable.

Beech; Model A-36; Bonanza; Nose Landing Gear Retraction Defect; ATA 3230

During a landing approach, the nose landing gear failed to extend. All attempts to lower the nose gear failed, and a landing was made with the nose gear in an intermediate position.

An investigation revealed that the aft extension/retraction tube (P/N 36-820011-3) ends were broken and bent into a "C" shape. The tube had been installed backward which resulted in the incorrect style rod-end being attached to the gear box arm of the landing gear. The rod-ends that were attached to each end of the extension/retraction tube are different types; therefore, they should not be interchanged. The forward rod-end, attached to the idler arm (P/N 35-820094-2), is designed for fore-and-aft movement, and the rod-end attached to the gear box is designed for rotational and fore-and-aft movement.

By installing the extension/retraction tube backward, side pressure cracked the rod-end bearing case which allowed the bearing to separate from the rod-end case.

Part total time-5,343 hours.

Beech; Model A-36; Bonanza; Hydraulic Brake Line Wear; ATA 3242

While installing avionics equipment, the technician noticed the right rudder control cable was chafing on a wheel brake hydraulic line.

This aircraft was manufactured in 1997 and had very low operating time; however, the rudder cable had already cut into a parking brake hydraulic line. The parking brake hydraulic assembly is located beneath the floor boards on the pilot's side. It was necessary to adjust the bend radius of the line where it enters the parking brake block assembly to provide adequate clearance from the rudder cable. Also, the line was wrapped with chafe-protection material.

It was suggested that the manufacturer consider relocating the parking brake assembly 1 inch to the right to prevent interference with other components.

Part total time-26 hours.

Beech; Model A-60; Duke; Defective Instrument Plumbing; ATA 7713

During takeoff, the rated engine manifold pressure (MAP) could not be attained. While climbing, the MAP began to decline at a higher rate than normal. A safe landing was made, and the aircraft was delivered to maintenance.

The technician checked the engine intake and exhaust systems and the controller without finding the cause of the defect. When the manifold pressure hoses were inspected, the hose system failed to hold pressure during a test. The hoses appeared to be in good condition; however, when the fire sleeve was pulled back, the steel braided hose (P/N 96-910004-19) disintegrated.

Research indicated that this hose was installed as original equipment in 1973. These pneumatic hoses should be replaced during each engine change or after 5 years of service.

Part total time-2,360 hours.

Beech; Model B-95; Travel Air; Wing and Nacelle Skin Chafing; ATA 5414

During an annual inspection, it was found that the lower aft nacelle skin was chafing the wing skin. This defect was found on both nacelles.

The nacelle skin had worn completely through the wing skin behind both engines. This area was located just aft of the front wing spar flange. If this condition had not been found and corrected, it could have worn into the spar flange.

It was suggested that the manufacturer design a chafe strip to be installed between these components.

Part total time-6,500 hours.

Beech; Model 200; King Air; Defective Automatic Trim Relay; ATA 2700

After the flight control trim system failed, the aircraft was taken to maintenance for repair.

Tests and inspection of the trim system disclosed that the automatic flight control trim relay assembly (P/N 101-500038-5) was not operating properly. When a new assembly was installed, both the manual and automatic flight control trim systems ran backwards. Evidently, the relay circuit board had been improperly wired. Also, the incorrect gender fasteners had been installed on the relay (female fasteners instead of male fasteners).

Part total time-0 hours.

Beech; Model 200; King Air; Landing Gear Wheel Defect; ATA 3246

During nondestructive testing, a wheel half (P/N 40-172) was found cracked.

This crack was approximately 1.25 inches long and was unnoticed during the visual check. The crack was located at the inboard tangent of the bead radius. It was speculated that the wheel assembly was in danger of imminent failure.

If this had not been found, it could have resulted in a catastrophic part failure which may have resulted in an accident.

Part total time-5,230 hours.

BELLANCA

Bellanca; Model 8GCBC; Defective Wing Flap Cables; ATA 2750

During an annual inspection, the technician discovered broken strands on the left and right wing flap control cables. The flap cables (P/N 1-9023) were damaged where they passed over a pulley at the left and right wing roots.

Five years earlier, the left flap cable broke and was replaced. The submitter speculated that the broken strands may have been caused by the “stiff cable passing over a small diameter pulley.”

This area should be thoroughly inspected during schedule inspections and maintenance.

Part total time-800 hours.

CESSNA

Cessna; Model 172M; Skyhawk; Electrical System Short Circuit; ATA 2421

While troubleshooting the cause of an electrical short circuit, the alternator wire bundle was found chafed.

The rubber cushion on three “Adel” clamps had been worn through by the metal braiding on the outside of some of the wires in the alternator wire bundle. The wires were then chafed by the metal band of the “Adel” clamp causing the wire insulation to melt and burn. If this defect occurred during flight, the results may have been catastrophic.

The “Adel” clamps should be replaced as soon as they show early signs of deterioration. When safety is concerned, use quality parts.

Part total time-4,207 hours.

Cessna; Model 172P; Skyhawk; Aileron Cable Damage; ATA 2710

While complying with the requirements of Cessna Service Bulletin (SB) 97-1, the right aileron cable was found severely damaged.

The aileron cable (P/N 0510105-260) was frayed at the point where it passes under the right outboard pulley located at the lower aft doorframe. This area is very difficult to see during routine inspections. The frayed area was visible after the pulley was removed. During the initial inspection, eight strands of the cable were found broken.

The submitter recommended that the pulleys be removed, at least, every 5,000 hours to facilitate a close inspection of the aileron cables.

Part total time-11,700 hours.

Cessna; Model 172RG; Cutlass; Main Landing Gear Failure; ATA 3230

While the pilot was practicing landings, the left main landing gear failed to extend. After many emergency extension attempts, the gear was secured in the “down-and-locked” position, and an uneventful landing was made. This aircraft was operated by flight school personnel.

The technician removed the left main landing gear pivot assembly (P/N 2441100-3F) and discovered it was broken. The failure occurred at the drive spline radius. The submitter did not offer a cause for this defect. The right main landing gear pivot assembly was removed and checked for damage. A crack was found at the same location as the left main landing gear pivot assembly.

Both pivot assemblies were replaced in accordance with Cessna Service Bulletin 90-1, Revision 2.

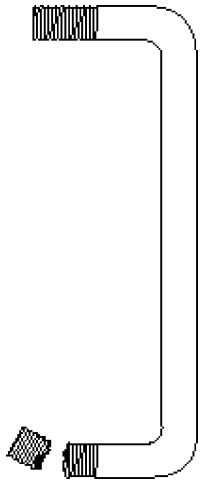
Part total time-4,120 hours.

Cessna; Model 182C; Skylane; Defective Main Landing Gear Attachment; ATA 3211

During a scheduled inspection, maintenance personnel discovered the left main landing gear "U-bolt" attachment (P/N 0541153) was broken.

The "U-bolt" attachment was broken on one side in the threaded area. (Refer to the following illustration.) The submitter believed the failure occurred due to metal fatigue and/or possible overtorque of the nut. It was recommended that special attention be given to this part during scheduled inspections and maintenance.

Part total time-4,450 hours.



Cessna; Model T310R; Engine Turbocharger/Exhaust System Defect; ATA 7810

While complying with the requirements of Airworthiness Directive (AD) 75-23-08, R5, the right engine turbocharger/exhaust system was found unserviceable.

The hot exhaust gases eroded a hole through the header assembly (P/N 0850712-39) in the area of a "V-band" clamp. Further inspection disclosed that the header baffle was warped due to excessive heat. Also, the bottom of the header had a crack that was approximately 1 inch long. The turbocharger mating flange was also eroded at the junction of the exhaust and air inlet.

A Cessna Service Letter, dated April 28, 1997, addresses this problem. It is recommended that special care be given to this part when approaching 1,200 hours operating time.

Part total time-1,200 hours.

Cessna; Models 310 and 421C; Landing Gear Retraction System; ATA 3220

Information for the following article resulted from FAA Safety Recommendation 98.089 and was submitted by the FAA Aircraft Certification Office located in Wichita, Kansas.

These aircraft use an electromechanical extension and retraction system in the nose landing gear. Rigging and lubrication of the nose landing gear, in accordance with the manufacturer's maintenance manual, are critical to proper operation. Close attention to rigging and lubrication will prevent nose gear malfunctions.

Part total time not applicable.

Cessna; Model 320A; Skyknight; Nose Landing Gear Malfunction; ATA 3220

The landing gear was retracted after takeoff without incident. After 40 minutes of flight, the pilot heard a loud bang. All attempts to lower the nose landing gear failed. A landing was made with the main gear extended; however, the nose gear was in a "transit" position.

An inspection of the landing gear system disclosed a broken up-lock torque tube (P/N 0813300-46) end stud. The damaged stud was .25 inch in diameter with 28 threads per inch. The replacement stud is .3125 inch in diameter with 28 threads per inch. The new, heavier stud should prevent this type of defect.

The submitter did not offer a cause for this defect; however, the failure may have been related to the high number of operating hours.

Part total time-12,920 hours.

Cessna; Model 525; Citation; Oxygen System Defect; ATA 3500

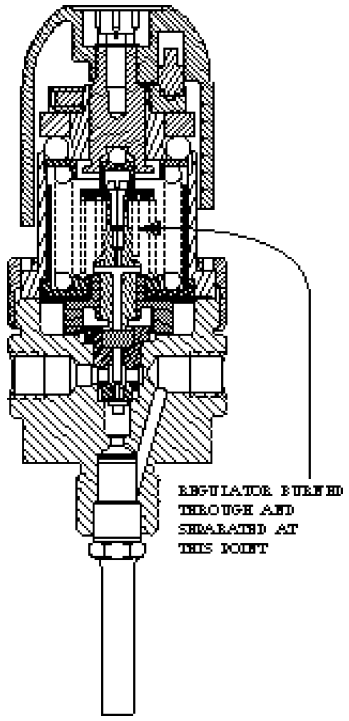
A mechanic reinstalled an oxygen cylinder (P/N 176274-50) after a hydrostatic test. While refilling the cylinder, he heard a noise that sounded like escaping oxygen. He thought that a fitting was loose and went to get a wrench. When he returned, there was a "pinpoint of green light at the regulator body," and sparks began to fly from the regulator. Due to the ensuing fire, he suffered second-degree burns to his left forearm. Even though the aircraft damage was minor, the potential for complete destruction was present.

Witnesses stated there were two separate explosions, and the fire burned through the outer skin on the nose of the aircraft. The fire was extinguished using a portable fire extinguisher. The oxygen regulator (P/N 172270-01) defaulted internally and trapped approximately 1,600 pounds of pressure in the cylinder which stopped the escape of oxygen. The fire burned a dime-sized hole directly below the oxygen regulator. The excessive heat distorted the aircraft skin in approximately a 6-inch diameter around the hole. The oxygen regulator was burned in half. (Refer to the following illustration.)

This mishap was preventable. Attempting to tighten an oxygen system fitting with pressure on the system should never be done. (This applies to all other aircraft systems as well.) After installing the oxygen cylinder, all of the lines and fittings should be double checked for security before any pressure is applied. If a leak is suspected while servicing the system, the oxygen flow should be stopped immediately, and all of the valves should be closed. The pressure should be

relieved before repairing the leak source. Oxygen, in gas or liquid form, is very volatile and poses a serious safety hazard; therefore, it should be handled properly.

Part total time-616 hours.



Cessna; Model 550; Citation; Wing Flap Malfunction; ATA 2750

During flight, the wing flap control circuit breaker opened the circuit when the flaps were selected to the “up” position. The circuit breaker would not reset, and a landing was made with the flaps extended.

An inspection of the system revealed the wing flap limit switch, located on the left actuator, was internally shorted to ground. The cause of the limit switch failure was not given by the submitter; however, considering the high number of operating hours, wear and age may have contributed to this defect.

Part total time-11,262 hours.

Cessna; Model 650; Citation; Defective Electrical System; ATA 2400

During flight, the aft electrical junction box circuit breaker annunciator light illuminated. The pilot made a safe landing and reported the problem to maintenance.

An inspection disclosed that the “baggage heat” and “auxiliary power unit's (APU) auxiliary hydraulic pump control” circuit breakers had opened. These breakers are located in the

auxiliary direct current (dc) junction box. After the technician conducted a thorough inspection and extensive tests on the entire system, the aft junction box annunciator light illuminated, and a fire started in the junction box. All of the systems were shut down, and the fire was extinguished. While removing the aft junction box, the self-locking nut which secures the terminal lug for the main power cable was found loose. The submitter speculated that the extra electrical resistance from the loose terminal nut caused the above mentioned incidents.

The manufacturer's Service Bulletin (SB) 29-9 had been complied with in January 1997. The submitter recommended that a physical check of the junction box terminals and connections be accomplished during scheduled inspections and maintenance.

Part total time-7,009 hours.

LAKE

Lake; Model LA-4-200; Buccaneer; Nose Landing Gear Failure; ATA 3230

When the landing gear was selected to the "retracted" position after takeoff, the nose gear did not retract. The landing gear remained extended, and a safe landing was made.

An inspection revealed that the threaded end of the nose gear actuator rod (P/N 972003-1) had broken. The cause of this failure was improper nose gear rigging.

It appears that the manufacturer's maintenance manual is vague concerning the landing gear rigging instructions. Proper landing gear rigging should be checked as a part of each annual inspection.

Part total time-701 hours.

LUSCOMBE

Luscombe; Model 8A; Silvaire; Rodent, Insect, and Bird Damage; ATA 5700

When the aircraft was "opened up" for an annual inspection, severe damage was found in both wings.

It was very evident that the damage had been caused by an invasion of rodents, insects, and birds. Wasp, mud-dauber, rodent, and bird nests were found inside both wings. Most of the damage was caused by deposits left behind by the rodents. Numerous rat droppings and urine had seriously damaged the components in the rear area of the wings. The mud-dauber nests were mainly attached to spar and flight control cables in the forward section of the wings. There were several bird nests and associated debris throughout both wings. These wings are not accessible for inspection; however, they are accessible to the critters.

The submitter did not mention how long it had been since the aircraft was flown. When an aircraft is not used frequently, there is an open invitation to all sorts of creepy-crawly things to take up residence inside. All possible efforts should be taken to exclude these critters.

Part total time-2,500 hours.

PIPER

Piper; Model J-3; Cub; Fuel System Gascolator Damage; ATA 2821

The problem of damage to the fuel system gascolator may be present on many other make and models of aircraft that incorporate a fuel gascolator which uses a bail for security.

Since the gascolator depends on a bail and thumb screw to retain the settling bowl, it is important to inspect the entire bail during scheduled inspections. Breakage of the bail or gascolator bowl is a common occurrence on many older aircraft. If the gascolator fails during flight, the results may be engine failure and/or fire. The upper end of the bail wears into the gascolator housing bracket and can cause loss of retention of the gascolator bowl. Since the bail can pivot enough to allow removal of the bowl, the upper end of the bail is, many times, overlooked during an inspection. The submitter recommended pulling the bail completely off to inspect for wear of the upper clips. Another problem is that the bails are made in a variety of lengths for different installations, and replacements should be checked for the correct length. The thumb screw threads should be fully engaged in the nut.

Part total time not applicable.

Piper; Model PA18; Super Cub; Aileron Center Attach Point Cracks; ATA 5711

During an inspection of both ailerons, a spar crack was found at each “U-channel” cutout which accommodates the aileron center horn and hinge assemblies (P/N 60714-16/17).

Special attention should be given to this area during inspections.

Part total time-3,314 hours.

Piper; Model PA28-140; Cherokee; Rudder Rib Corrosion; ATA 5541

During the course of routine maintenance, after removing the rudder bellcrank, it was noted that the end rib was corroded to the extent that some holes in the metal had begun to appear.

It was noted that the rib had not been primer painted and had come in contact with dissimilar metal which may have contributed to the corrosion.

Pay particularly close attention to this area for similar problems while performing future inspections on this make and model aircraft.

Part total time-3,379 hours.

Piper; Model PA28R-201; Dakota; Erroneous Compass Reading; ATA 3423

During a compass-swinging process, the technician noted that while on a heading of east, the deviation adjustment would not compensate for error any closer than plus 18 degrees.

After an inspection, the technician discovered that the upper right and center engine mount firewall attach points (P/N 67119-57) were magnetized. Apparently, the attach points became magnetized when they were arc welded during a recent repair process.

To demagnetize the mounts, they were passed through a degaussing coil.

Part total time-5,056 hours.

Piper; Model PA30; Twin Comanche; Collapsed Nose Gear; ATA 3230

The nose landing gear collapsed during landing. The aircraft was recovered from the runway, and maintenance personnel investigated the cause of the incident.

The landing gear transmission and motor mounting bolts were not safety wired and had backed out. This allowed a misalignment of the nose gear linkage and prevented it from locking in the "down" position. The gear motor was torn loose from the bulkhead.

The landing gear motor mounting bracket was constructed of .125-inch T-6 aluminum and was attached to the bulkhead which was made of .032-inch aluminum. The submitter suggested that the manufacturer should reinforce the structure of the bulkhead to be at least equal to the motor mount bracket strength.

Part total time-4,300 hours.

Piper; Model PA31T; Cheyenne; Split Flap Condition; ATA 2752

While on final approach to the airport with the flaps fully extended, the right flap suddenly retracted resulting in a severe yaw/roll situation. The left flap was immediately retracted to regain control, and the aircraft was landed without further incident.

During an inspection, the technician discovered that the flap's transmission (P/N 1216-00-01) had failed due to the disintegration of an internally-driven gear.

Transmissions with high time in service should be closely scrutinized and inspected frequently.

Part total time-6,667 hours.

Piper; Model PA31T; Cheyenne II; Bracket Support Crack; ATA 7200

During a routine 100-hour inspection, the technician discovered that the support bracket (P/N 3030523) for the P3 filter housing was cracked.

The manufacturer was notified, and it was suggested that a higher gauge material or a stronger temper treatment be utilized. During inspections, this area should be closely examined.

Part total time-4,021 hours.

Piper; Model PA32R-301; Saratoga SP; Broken Alternator Belt; ATA 2410

While in flight, the aircraft lost all electrical power, and the pilot made a precautionary landing.

An inspection revealed that the idler pulley came in contact with an internal stiffener on the cowling, and this caused the belt to fray and ultimately tear.

Because of the aircraft's low total time, the manufacturer was contacted. A service letter was issued with instructions to relocate the stiffener. It was suggested that this precautionary procedure be accomplished on all similar model aircraft.

Part total time-160 hours.

Piper; Model PA34; Seneca IV; Collapsed Nose Gear; ATA 3230

The nose gear collapsed during landing, and caused a considerable amount of damage to the nose gear doors, the nose, and the propellers.

An inspection revealed that a bolt head separated from the bolt shaft (P/N 400-004) and caused the nose-steering channel to pivot out of position. This, in turn, prevented the gear from extending completely.

Special attention should be given to this area during the preflight inspection and all other inspections. While operating the aircraft, be aware of excessive looseness in the nosewheel steering which may be an indication of broken bolts.

A contributing factor in this incident may have been caused by “exceeding the stops” during ground handling.

Part total time unknown.

Piper; Model PA60; Aerostar; Broken Bolts in Wheel Assembly; ATA 3246

The heads of two bolts (P/N AN5-35A) on the wheel assembly (P/N 551-787) were sheared off at the bolt shafts.

During an investigation, the technician discovered incorrect bolts were used for the Aerostar wheel assembly. The incorrect bolts were dimensionally identical to the correct bolts (P/N 103-21700); however, the incorrect bolts were not given the heat-treatment process which gives the correct bolts a higher tensile strength. The correct bolts have the letters “spec” embossed on the head.

The aircraft wheel assembly should be closely inspected to make sure the correct bolts have been installed.

Part total time unknown.

SOCATA

Socata; Model TB 20; Trinidad; Improper Cabin Door Parts Installed; ATA 5210

While investigating the cause of a reported air leak on the right cabin door, it was found that the forward door latch was not operating.

The latch did not operate because the lower latch guide was broken. While ordering a replacement part, it was discovered that the broken guide (P/N TB1025042100) was constructed of plastic and was not the correct part for this aircraft. The correct latch guide (P/N TB1025042102) is constructed of aluminum and is structurally more substantial. A check of the remaining door latch guides on the left and right doors revealed that they were all the wrong part. The aircraft maintenance records did not indicate the guides had ever been replaced, and there had been no maintenance in this area.

It was recommended that all operators have their aircraft inspected for the proper door latch guide installation. The applicability of replacement parts should be closely checked against the aircraft installation and application to determine that the correct part is used.

Part total time-1,627 hours.

Socata; Model 700; TBM 700; Defective Battery Terminal; ATA 2432

While removing the aircraft battery for maintenance, it was found that the negative post of the battery terminal was burned and displayed signs of electrical arcing. Also, the negative post in the battery receptacle was found damaged.

It was determined that this damage was caused by a worn connector socket. This would not allow proper electrical contact, and the gap between the two contacts caused the arcing and overheat condition. It is recommended that the connectors be checked with a "go/no-go" gauge when battery maintenance is accomplished.

Part total time-801 hours.

HELICOPTERS

AGUSTA

Agusta; Model A109C; Defective Tail Rotor Rigging; ATA 6720

The pilot reported that the right tail rotor control pedal hit the stop during a right descending turn and could not be trimmed. The descent was shallowed and trim was obtained.

Maintenance personnel accomplished a tail rotor rigging check and found that the full left pedal reading on the tail rotor blades was 24.5 degrees. The manufacturer's maintenance manual limit is 21 degrees, 10 minutes. The right pedal reading at full travel was -4.75 degrees. The manufacturer's maintenance manual limit is -7 degrees.

An investigation revealed that the manufacturer issued an interchangeable tail rotor short pitch link (P/N 109-0133-04-105) in addition to the original links (P/N 109-0133-04-101). No rigging was required by the maintenance manual and none was accomplished. The -105 pitch links are 3 millimeters (mm) shorter than the -101 links. The Agusta parts manual lists these two part numbers as interchangeable, and the only warning given is, "not to intermix the two part numbered parts."

During the rigging procedure, it was necessary to shorten the aft control torque tube by .5 inch (five turns in on the rod-end) in order to achieve the required rigging specifications. A flight test confirmed that the tail rotor controls functioned properly. The submitter suggests checking the tail rotor rigging each time a pitch link is changed.

Part total time-110 hours.

BELL

Bell; Model 47G-3B-1; Structural Defect; ATA 5313

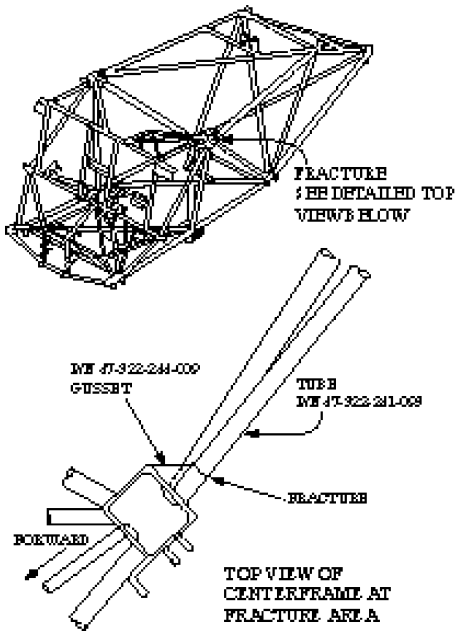
Information for the following article resulted from a National Transportation Safety Board (NTSB) accident investigation.

During a positioning flight, prior to beginning aerial application work, the tail rotor failed to respond to control inputs. As the helicopter rotated rapidly to the right, the pilot maneuvered to clear a power line and entered an autorotation. The helicopter suffered substantial damage, and the pilot was seriously injured.

An initial inspection revealed that the forward tail rotor drive shaft was disconnected from the transmission. After further examination, it was determined that the tail rotor drive shaft had become disconnected due to an increase in the distance between the forward and aft female couplings. This increase in distance was the result of a fracture in the upper left longeron tube (P/N 47-322-241-143) on the center frame. (Refer to the following illustration.) The fracture was the result of “fatigue cracking” that originated on the tube's inboard side at the toe of a weld for a gusset. This fracture would not have been readily visible during inspections of the helicopter due to its position behind the chemical tank which is mounted on the left side of the fuselage. However, the presence of heavy corrosion and corrosion pitting of the fracture surface suggested that the failure had been developing for some time and should have been discovered by maintenance personnel.

The findings of this accident investigation suggest this area should receive particular attention during scheduled inspections and maintenance.

Part total time-5,175 hours. The date of manufacture was 1968.



Bell; Model 407; Shutdown Procedures; ATA 6720

Bell Helicopter issued Information Letter 407-98-15, dated April 29, 1998, to all owners/operators of Model 407 helicopters. The letter was issued to advise owners/operators of a recent incident where a tail rotor contacted the tail boom.

Two separate incidents were reported concerning contact of the tail rotor blades with the tail boom during shutdown procedures. In one report, the pilot checked the tail boom after shutdown and found that one tail rotor blade had contacted the tail boom. The inspection of the damaged area revealed a crease in the tail boom which was approximately 3 inches long and .25 inch deep. An additional inspection confirmed that the tail rotor yield indicators did not display signs of compression.

Reportedly, some pilots use an unofficial technique of applying left pedal pressure to slow the tail rotor during shutdown. Owners/operators are cautioned to follow the procedures stated in the Model 407 flight manual for both startup and shutdown. Specifically, owners/operators are advised to refrain from using the technique of applying left pedal pressure to slow the rotor during shutdown. It must be emphasized that the required flight manual procedure is to center the cyclic and pedals during both startup and shutdown.

The manufacturer is conducting additional testing and a detailed analysis to determine what caused these incidents. Owners/operators will be notified by the manufacturer when the test results are completed.

Bell; Model 407; Slat Separation From the Helicopter; ATA 5551

During a postflight inspection, the technician discovered the left slat for the horizontal stabilizer was missing. The slat was installed on the leading edge of the stabilizer to improve airflow conditions at high angles of attack and slow speeds.

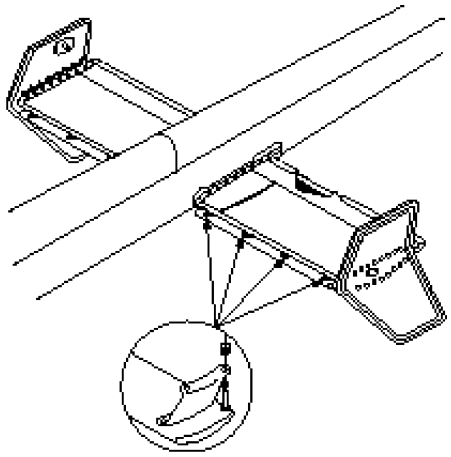
There was evidence that the slat (P/N 407-023-002-117) struck one of the tail rotor blades as it departed the helicopter. The pilot had not noticed any feedback in the controls during the flight that might indicate an impact with the tail rotor had occurred.

It was determined that the four slat supports (P/N 206-023-119-109, three each, and P/N 407-023-801-127, one each) failed due to cracking in the bend radius at the horizontal stabilizer attachment points. (Refer to the following illustration.)

A fleet-wide inspection was conducted, and an additional seven helicopters were found with cracked slat supports. This inspection revealed that the supports on both the left and right slats are cracking. The helicopter flight manual requires an inspection of the horizontal stabilizer for condition and security.

At this time, a total of 19 slat supports have been found cracked. It was recommended that special attention be given to this area during both preflight and postflight inspections to preclude the loss of the slat assembly while in flight.

Part total time average is 2,236 hours. This anomaly has not occurred on helicopters with less than 1,700 hours.



McDONNELL DOUGLAS

McDonnell Douglas; Model 369D; Engine Exhaust System Defect; ATA 7810

During a scheduled inspection, the right engine exhaust stack (P/N 369A8230-504) was found cracked.

A vibration test was accomplished and excessive vibration was detected. Further investigation revealed the vibration was caused by loose engine mounts. The upper engine mount fasteners were worn and did not retain the engine firmly. New “HiLock” fasteners were installed, and another vibration test was conducted with satisfactory results.

Part total time-256 hours.

AMATEUR, EXPERIMENTAL, AND SPORT AIRCRAFT

AVIAT

Aviat (Christen); Model A-1; Husky; Aileron Cable Damage; ATA 2710

During a 100-hour inspection, a “flat spot” was noticed on the right wing aileron cable.

The “flat spot” was adjacent to the inboard fairlead on the wing strut. The area was wiped with a soft cotton cloth which revealed one broken cable strand. When the area was inspected with a magnifying glass, several other cable strands were found to be close to breaking. The same damage was discovered on the left wing aileron cable. It appeared that the aileron cables entered the fairlead at too great an angle. It was suggested that the manufacturer issue a kit to replace this fairlead with a pulley.

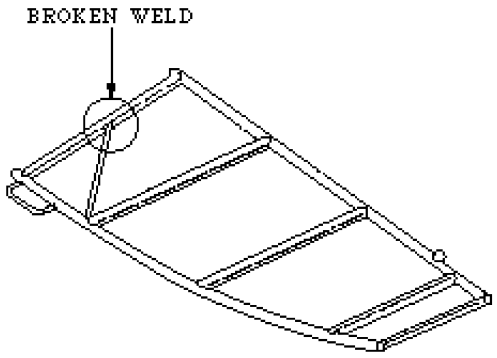
Part total time-392 hours.

Aviat (Christen); Model A-1; Husky; Horizontal Stabilizer Brace Failure; ATA 5510

During an annual inspection, a rattling sound was heard which seemed to come from the horizontal stabilizer.

An investigation revealed that the tack weld securing the diagonal brace to the butt rib had broken. (Refer to the following illustration.) From the available evidence, it was apparent that the weld was inadequate. The diagonal brace is not a structural member; however, it provides support to prevent the butt rib from deforming during the fabric covering process.

Part total time-325 hours.



KIST

Kist; Model R1; Engine Failure; ATA 8530

After approximately 30 minutes of flight, the engine failed, and the pilot was unable to regain engine power. An emergency off-airport landing was made without harm to life or property. A Textron Lycoming Model O-235 engine was installed in this aircraft.

When the engine was disassembled, deep scoring was found on the oil pump gear housing. The oil sump contained pieces of piston ring and aluminum. One engine case halve had a 2-inch long crack, and the number 4 cylinder had disintegrated. Three valve lifters had pieces missing, and the camshaft had impact damage on all of its lobes. All of the connecting rods displayed signs of impact damage. It was speculated that these engine defects were the result of failure of the engine oil pump.

Part total time not reported.

PITTS

Pitts; Model S-2A; Magneto Failure; ATA 7414

An airshow performance was aborted due to sudden loss of a significant amount of engine oil. A landing was made without damage to the aircraft or injury to the pilot. The aircraft had a Textron Lycoming Model IO-360-A1A engine and Slick 4300 series magnetos.

An investigation revealed the magneto had loosened internally. This allowed the magneto drive gear to wobble which caused damage to the engine's accessory drive gear.

It was stated that a similar failure occurred on a Cessna aircraft that used the same engine and magnetos. There was no explanation of how the magneto had loosened internally.

Part total time-300 hours.

THORPE

Thorpe; Model T18; Defective Magneto; ATA 7414

During a routine inspection, the Bendix 1200 series magneto (P/N 10-349305-1) was removed to inspect the impulse coupling. It was noted that the magneto shaft was difficult to turn by hand and exhibited unusual resistance.

The coils in this magneto are held in their proper location by wedges that are somewhat like horseshoe nails. The wedge on the right had become dislodged. Further inspection revealed that the wedge had interfered with the nylon gear. One-half of the width of the gear teeth had been worn away. Since there was still a complete circle of partial teeth on the gear face, the unit continued to operate.

It would be wise to give this area special attention during scheduled inspections and maintenance.

Part total time-1,250 hours and 495 hours since overhaul.

VANS

Vans; Models RV-3 and RV-3A; Wing Spar Modification; ATA 5711

Vans Aircraft Inc., has prepared and distributed Change Notice CN-2 to all known RV-3 and RV-3A owners and builders. CN-2 addresses a wing spar modification deemed necessary for aerobatic flight operations.

On Sunday, March 8, 1998, the seventh recorded RV-3 wing spar failure accident occurred when the right wing of the aircraft folded during an aerobatic flight demonstration. The aircraft had not been modified in accordance with CN-2. The accident investigation revealed that several essential bolts were missing from the wing at the point of failure.

HISTORY: This is a “kit” aircraft which was introduced in 1973. Since its introduction, there have been about seven in-flight structural failure accidents involving wing separation. During

development, the RV-3 wing strength was calculated to be 6G design and 9G design ultimate. Flight testing had been conducted to verify the 6G design strength. Of the first four in-flight wing separations, three involved structural deficiencies due to builder deviations from the construction plans. At that time, 1982, the manufacturer undertook the static testing of a set of RV-3 wings. This test wing failed at a simulated 9G load, which appeared to validate its basic spar design integrity. However, because accident investigations indicated possible failure of secondary structures, the manufacturer issued Change Notice CN-1 to all known RV-3 owners recommending specific modifications be made to the rear spar attachment and root rib structures. Similar alterations were made to the plans and to all subsequent new kits.

Some builders redesignated their aircraft as RV-3A's when they incorporated these modifications. Thus, both designations appear in the FAA registry for what is basically the same airframe.

Despite the issuance of CN-1, several more in-flight wing separation accidents occurred between 1984 and 1995. The manufacturer conducted another static test of an RV-3 wing, and it failed at a load below the calculated 9G ultimate. The inconsistency between this test and the 1982 test was a mystery until it was discovered that the wing tested in 1982 had used an optional assembly technique. This optional technique simplified the construction process by allowing the individual aluminum bars, which form the spar caps, to be bonded together with epoxy. The epoxy adds nothing directly to the bending strength of the spar. Apparently, the epoxy increases the buckling resistance of the spar caps which indirectly adds to the strength of the wing. The end result was that the RV-3 wing spars were not as strong as calculations and prior tests had indicated.

The manufacturer conducted a series of spar modification attempts and static tests. Finally, a satisfactory spar modification was found, and CN-2 was drafted and sent to all known RV-3 and RV-3A builders and owners. One of the primary emphasis items of CN-2 was that no aerobatic flight should be conducted in any RV-3 or RV-3A aircraft until this modification was satisfactorily performed. Along with CN-2, a wing spar modification kit was offered to all owners at no cost.

All RV-3 and RV-3A owners and builders are cautioned to limit their activities to nonaerobatic flight until compliance with CN-2 is accomplished. Builders and owners with further questions should contact Vans Aircraft Inc.

It is important to remember that an aircraft owner is responsible for being familiar with the limitations of the aircraft, all current manufacturer's modifications, service information, service bulletins, and change notices. This information is also needed by the person performing maintenance and/or the annual-condition inspection.

It is difficult for the manufacturer to provide this important information because many amateur-built aircraft are no longer owned by the original builder and the ownership may be transferred from the original builder to the new owner without notification to the manufacturer. Therefore, when the manufacturer issues pertinent technical data, it is not always possible to get that information to the current owner.

Before performing an annual-condition inspection on an amateur-built aircraft, call the kit manufacturer and/or the Experimental Aircraft Association (EAA) to ask if there is anything special you need to know during the inspection.

POWERPLANTS AND PROPELLERS

ALLISON

Allison; Model 250C-47; Engine Temperature Anomaly; ATA 7200

The pilot reported observing a higher-than-normal measured gas temperature (MGT) indication. This engine was installed in a Bell Model 407 helicopter.

A thorough inspection of the MGT system did not reveal a cause for the anomaly. Further investigation disclosed that the outer combustion chamber (P/N 23030911) was cracked around the fuel nozzle boss seam weld. The crack allowed cooling air to escape and caused the MGT temperature to increase.

Part total time-821 hours.

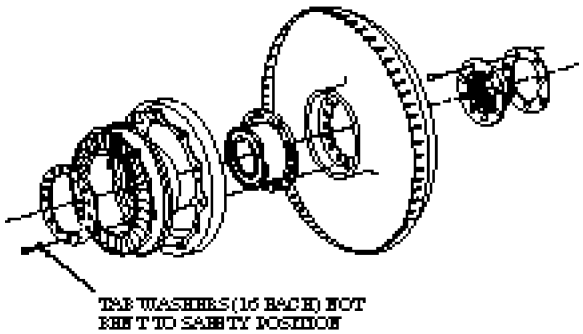
PRATT & WHITNEY

Pratt & Whitney; Model PT 6A-28; Compressor Turbine Vane Security; ATA 7230

The engine power section was removed to accomplish a hot-section inspection. The technician discovered that the tab washers (P/N 3001538) which are used to safety the compressor turbine vane ring and the number 2 bearing housing were not engaged with the bolt heads.

Sixteen bolts with tab washers are used for this installation. The washer tabs had not been bent over to lock the bolts in place. (Refer to the following illustration.) The engine maintenance records did not indicate any maintenance had taken place in this area since the last engine overhaul. It was evident that the washer tabs had been overlooked during overhaul. Thanks to the observant eye of the submitter, this defect was corrected before any damage occurred.

Part total time not reported.



AIR NOTES

AIRWORTHINESS DIRECTIVES (AD'S) ISSUED IN MAY 1998

98-10-06; Burkhart Grob G115 series which requires modifications to prevent excessive speeds or aerobatic maneuvers.

98-11-16; Dornier models 228 series which requires modifying logic in failure detection circuits.

98-11-17; Glaser-Dirks Flugzeugbau models DG-400 gliders which requires replacing Bosch electrical system regulator.

98-11-18; Glaser-Dirks Flugzeugbau model DG-400 gliders which requires replacing upper rubber shock mounts.

98-11-01; Pilatus PC-12 and PC-12/45 airplanes which requires modifications to prevent fuel tank inward vent valve from freezing.

98-11-20; Pilatus PC-12 and PC-12/45 airplanes which requires modifying lavatory wall and passenger seat configurations.

98-10-05; Raytheon (Beech) B200, B200C, and B200T airplanes which requires replacing wiring for engine fire detector system.

98-10-12; REVO Colonial C-2, Lake LA-4 series airplanes which requires measuring for clearances.

98-10-07; Alexander Schleicher ASK21 sailplanes which requires changing flight manual's weight-and-balance information.

98-11-14; Bell 205A-1 helicopters which requires inspecting the yoke assembly.

98-11-15; Bell 212 helicopters which requires inspecting yoke assembly.

98-10-09; Eurocopter France SA.315, SA.316, SA.319, and SA.3160 helicopters which requires inspecting for cracks using a dye-penetrant method.

98-10-04; Eurocopter France SA-365 and SA-366 series helicopters which requires inspections of tail rotor blade Keviar tie-bar for cracks or delaminations.

NEW TEST FOR EXHAUST SYSTEM METAL

The following information resulted from a National Transportation Safety Board (NTSB) aircraft accident investigation.

During the investigation, the NTSB found that the Cessna Model 421C engine exhaust system had failed. A review of the service difficulty reports concerning exhaust system failures on Cessna 300 and 400 series revealed there were 69 reports of stainless steel exhaust system defects. In an attempt to distinguish between inconel and stainless steel, the NTSB used a procedure described on page 197 of Advisory Circular (AC) 65-9A, Airframe and Powerplant Mechanics General Handbook. The results of that procedure proved inconclusive. An NTSB safety recommendation was issued, and a new procedure was developed to discern between inconel and stainless steel.

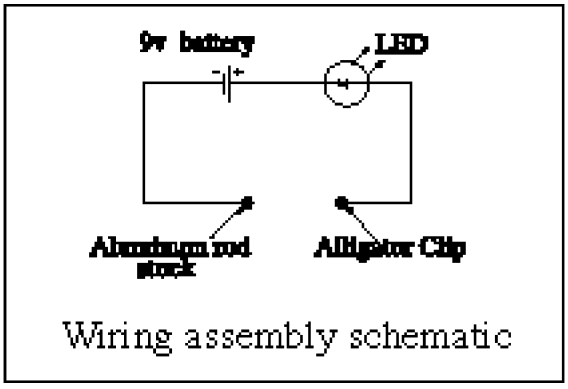
The new procedure is included for your information. Inconel is a nickel-chromium-iron alloy closely resembling stainless steel in appearance. Both alloys are used interchangeably in aircraft exhaust systems. Because the two alloys look very much alike, a distinguishing test is often necessary. Since inconel has a nickel content greater than 50 percent, one method of identification uses an electrochemical technique to identify the nickel content of the alloy.

Prepare a wiring assembly and two reagents (ammonium fluoride and dimethylglyoxime), and place them in separate dedicated dropper solution bottles. Before testing, the metal must be thoroughly cleaned in order for the electrolytic deposition to take place. Nonmetallic hand-scrubbing pads or 320- to 600-grit crocus cloth may be used to remove deposits and corrosion products. (Refer to the following illustration.)

Connect the alligator clip of the wiring assembly to the bare metal being tested. Place one drop of a 0.05 percent reagent grade ammonium fluoride solution in deionized water on the center of a 1- by 1-inch sheet of filter paper. Lay the moistened filter over the bare metal alloy being tested. Firmly press the end of the aluminum rod over the center of the moist paper. Maintain the connection for 10 seconds while rocking the aluminum rod on the filter paper. Ensure that the light emitting diode (LED) remains illuminated during this period. Disconnect the wiring assembly, and set it aside. Remove the filter paper, and examine it to determine that a light spot appears where the connection was made.

Deposit one drop of 1.0 percent solution of reagent grade dimethylglyoxime in ethyl alcohol on the filter paper (same side that was in contact with the test metal). A bright distinct pink spot will appear within seconds on the filter paper if the metal being tested is inconel. A brown spot will appear if the test metal is stainless steel. Some stainless steel alloys may leave a very light pink color. However, the shade and depth of color will be far less than would appear for inconel. For flat test surfaces, the spot will be circular while for curved surfaces, such as the outside of a tube or pipe, the test spot may appear as a streak.

This procedure should not be used in the heat-affected zone of weldments or on nickel-coated surfaces.



Wiring assembly schematic

AVIATION SAFETY PROGRAM MANAGER AIRWORTHINESS

The FAA has established a new position in each Flight Standards District Office (FSDO) and each Regional office titled "Aviation Safety Program Manager (ASPM) Airworthiness (AW)." It should not be confused with the Operational ASPM program which has existed for a long time.

The ASPM AW in each FSDO will conduct public meetings and seminars for the benefit of maintenance personnel. The meetings are designed to educate, to exchange ideas, and to produce a better understanding of why and how the FAA conducts business. An ASPM AW also administers and monitors the FAA Aviation Maintenance Technician Awards Program which was discussed in the April 1998 edition of this publication.

We encourage you to contact your local ASPM AW for information on the benefits and seminar schedule offered by the program. The following is a list of each Regional ASPM AW. The Regional ASPM AW's will be able to provide the name and telephone number of the FSDO ASPM AW located nearest to you.

Ralph Pack, AAL-200
222 W. 7th Ave., Box 14
Anchorage, AK 99513-7587
Telephone: (907) 271-2097

Jerry Tegen, ACE-200
601 E. 12th Street
Kansas City, MO 64106
Telephone: (816) 426-3526

Joe Rachiele, AEA-200
Fitzgerald Federal Bldg. 111
JFK International Airport
Jamaica, NY 11430
Telephone: (718) 553-3248

Rich Mileham, DuPage FSDO
31 W. 775 North Ave.
DuPage Airport
West Chicago, IL 60185-1058
Telephone: (630) 443-3131

Ed Reinecker, ANE-200
12 New England Executive Park
Burlington, MA 01803
Telephone: (617) 238-7211

Greg Young, ANM-200
1601 Lind Ave., S.W.
Renton, WA 98055-4056
Telephone: (206) 227-2254

Phillip D. Randall, INT FSDO
8025 N. Point Blvd., Room 250
Winston-Salem, NC 27106
Telephone: (910) 631-5191, X-44

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2601 Neachum Blvd.
Fort Worth, TX 76137-4298
Telephone: (817) 222-5285

Linda Goodrich, AWP-200
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Worldway Postal Center
Los Angeles, CA 90009
Telephone: (310) 215-2150, X-125

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

Seminar No.	1998	Location
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

An ADDITIONAL SUP seminar will be conducted in 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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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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Please do not hesitate to contact us.

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Enter pertinent data:	MANUFACTURER	MODEL/SERIES	SERIAL NUMBER
2. AIRCRAFT			
3. POWERPLANT			
4. PROPELLER			

5. SPECIFIC PART (of component) CAUSING TROUBLE

Part Name	MFG. Model or Part No.	Serial No.	Part/Defect Location

6. APPLIANCE/COMPONENT (Assembly that includes part)

Comp/Appl Name	Manufacturer	Model or Part No.	Serial Number

Part TT	Part TSO	Part Condition	7. Date Sub.

8. Comments (Describe the malfunction or defect and the circumstances under which it occurred. State probable cause and recommendations to prevent recurrence.)

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Check a box below, if this report is related to an aircraft

☐ Accident; Date _____ ☐ Incident; Date _____

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