Proper Chock Design and Placement Are Essential to Ramp Safety

by
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The design and proper placement of an aircraft wheel chock can be more complicated than they seem. A chock is a relatively simple device, but if it is not constructed or used properly, substantial aircraft damage and/or personnel injury can result.

Chocks can be constructed from several materials:

- Wood;
- Molded or extruded rubber or plastic; and,
- Steel or aluminum.

Each material has specific advantages, but one type may not be the best for all situations.

Extensive testing by the U.S. Air Force and several major manufacturers has confirmed some basic design standards. The shape of the chock is extremely important. An approximate 45-degree chocking angle to the contact face with the tire is ideal. A more gradual slope may result in "pinching" the chock between the tire and the ramp if the airplane is loaded with additional fuel and/or passengers while chocked. A contact face steeper than 45 degrees may reduce the contact friction with the ramp and allow the chock to skid if the brakes are released.

The length of a chock is determined by type of tire or tires to be chocked. When dual wheels are to be restrained on a large aircraft, a single chock may be unwieldy and heavy, and may pose a back injury hazard to ramp personnel. Welded steel chocks generally "cup" the tire, and therefore can only be used to block a single wheel.

The chock's height is very important and it depends on the size of wheel to be restrained. For heavy transport aircraft, a six-inch (15.2 cm) height for wooden or rubber chocks is effective in general ramp usage. For restraining an aircraft during ground run-up operations, most operators use larger, fabricated steel chocks of greater height, sometimes as much as 12 or 15 inches (30.5 or 38.1 cm).

For smaller wheels and light aircraft, lesser heights may be adequate. However, anything less than four inches is marginal. Little 2-by-2-inch (5.08 cm-by 5.08 cm) blocks frequently seen in use at fueling ramps are ineffective because even small wheels can bounce over the chocks during loading or gusting wind conditions. These small blocks do not provide sufficient friction with the ramp and will easily skid or slip out of place if the wheels roll against them.

On fuel dock locations, some operators specify the use of welded aluminum chocks to ensure that no sparks are created, which can occur with welded steel.

Wooden chocks are used most widely and are the most economical. No. 1 common fir lumber is relatively durable. When selecting lumber, be sure there are no knots or substantial defects that may chip or splinter. Many operators use wood chocks for too long and the chocks become rounded or slippery with the accumulation of oil and grease. Under daily usage, wooden chocks are usable for about 15 months.

In fabricating your own chocks, be sure to use full size rough-sawed lumber with the long diagonal face down for increased ramp contact. The wood should be treated with a suitable preservative and painted bright yellow to enhance visibility. It is advisable to drill the blocks so that a rope can be threaded through them, which helps make carrying them and storing them a bit easier. However, tying wooden chocks together for daily use is not practical because it is impossible to have a proper length for all aircraft.

Wooden chocks work well under most

Photo not available.

Figure 1

conditions, but they will skid on icy or snow-packed ramps. Studs or special skid shoes can be attached to wooden chocks if they are to be used frequently on icy ramps. These studs wear away quickly, however, and must be replaced frequently if they are to be effective in icy conditions.

Rubber or plastic chocks (Figure 1) have an indefinite life. Although they cost more initially, they may prove to be more cost-effective overall. This type of chock provides excellent holding capability on any paved surface, wet or dry. It does, however, skid easily on hard-packed snow or ice. This chock will also skid more easily than others if the ramp is oil-soaked or contaminated with deicer fluid, etc. As with wood, rubber chocks can be fitted with nonskid studs or shoes for use on ice.

A potential disadvantage of rubber or plastic chocks is weight. These chocks tend to be very heavy for their size and are therefore not usually available in sufficient lengths to block dual-wheel landing gear.

Metal chocks (Figure 2) hold better than any other type because of their greater height and increased ramp contact. The one exception to this is ice covered ramps. Unless provided with spikes or special metal gripping surface, metal chocks skid easily on hard-packed snow or ice conditions. Even with this provision, the skid protection wears away easily requiring chock renewal or replacement.

Photo not available.

Figure 2

Most accidents or incidents involving inadvertent movement of a parked aircraft are due to improper use or placement of chocks. *Except during airplane loading*, the chocks should be placed snugly against the tires. Chocks should be placed forward and aft of both main wheels to adequately prevent movement (Figure 3). Many aircraft are extremely "light" on the nose gear and the smaller nose wheel can easily bounce over the chock if the aircraft is subjected to wind gusts, prop or jet blasts, or movement due to loading activities.

During fueling or loading operations the footprint of the tire will increase, thus pinching the chock between the tire and the ramp. To avoid this, many operators have adopted a procedure calling for the nose wheel to be snugly chocked (because it is more lightly loaded and less affected by fueling), and the main-wheel chocks inserted snugly on the back side but with two or three inches (5.08 or 7.62 cm) of space forward of the main tires to allow the footprint to expand under loading. After loading, the forward chock(s) should be moved back to a snug position against the main wheels.

For extended storage periods or if stormy conditions are anticipated, the chocks should be secured in place with ropes and tied together so that aircraft movement will not work them out of place.

The parking brake is far more effective in restraining the aircraft than any chocks can be. However, it is only good as long as the brake pressure remains adequate. Many incidents have occurred when the brakes were released inadvertently, or the system pressure leaked down. Parking brakes are not reliable totally and chocks must be used to keep a parked aircraft in place.

Most manufacturers recommend that when parking an airplane set the parking brakes, place chocks in front of and behind at least one wheel on left and right main gears and then release the parking brakes. This

Photo not available.

Figure 3

procedure is particularly important following frequent high-kinetic energy stops, which can elevate greatly brake temperatures. Releasing the parking brakes provides increased cooling to brake surfaces. In brakes utilizing steel disks, leaving the parking brakes engaged under high-temperature conditions can cause disk-to-disk fusion (or welding) or distortion of the disk(s). In addition, less time may be required to move an aircraft in an emergency.

Prior to engine start, it is critical that brake pressure be confirmed and parking brakes be reset before removing the chocks. If chocks are not removed prior to engine start, extreme caution is necessary to ensure that ramp personnel keep clear of propellers or engine intake and exhaust areas during chock removal.

Chocks are intended only to restrain an airplane against inadvertent movement on ramps with little slope and under normal wind velocities. Chocks alone are not intended to restrain an airplane with engines operating at high-power settings. The U.S. Air Force has conducted experiments to determine what sort of chock would be required to restrain a large jet aircraft during engine run operations in the event of a brake failure. The resulting chock consisted of a laminated oak assembly with 1/8-inch (3.18 mm) steel plates at each end with steel tie bolts securing the whole assembly. The unit weighed nearly 400 pounds (180 kilograms) and would have had to be used in a precise location with provisions for securing it to the ramp to be effective. The effort was abandoned as impractical.

Aircraft restraint during high-power run-ups is primarily a function of airplane brake effectiveness and the friction between the tires and the ramp. It is therefore critical that high-power runs be conducted in a clean area with the wheels resting on areas free of oil, grease or other slippery substances and that the tires be clean and free of any oily residue. The main gear wheels should also be chocked securely and gear-down locks installed. Although the chocks cannot be relied on to restrain the aircraft if the brake systems fail, they will provide some restraint and are therefore recommended.

The primary restraint is the friction of the braked wheels on the ramp. Unfortunately, maintenance run-ups are often conducted with the aircraft lightly loaded with fuel and payload. Under these conditions, the wheel-to-pavement friction is low and can be further reduced by wet or slippery conditions. It may be necessary to load the aircraft with additional fuel and/or cargo to provide increased friction to prevent skidding. Aircraft with relatively high thrust-to-weight ratios are particularly susceptible to this problem. Manufacturers' manuals and operating instructions should be consulted to ensure that adequate protection against skidding under high-power run-up conditions is maintained.

It is a good practice to have an additional technician in the cockpit during high-power runs to monitor brake pressure and to ensure the aircraft does not skid while the other technicians are occupied with the operation and monitoring of engines or other systems. The following are examples of what can occur during run-up:

The four engines were started and ran for 20 minutes at 1.10 EPR [Engine Pressure Ratio] for warm-up. Vibration readings were taken at 1.10 and 1.20 EPR. About one minute after increasing power to 1.30 EPR, the airplane moved, jumped the chocks, and broke the tie-down straps. Engine power was reduced and brakes were applied to stop the airplane.

Damage to the airplane affected the lower fuselage skin and engine inlet and cowl damage to all four engines from striking a ladder and the engine inlet fences. Minor damage was sustained to the entry stair and extensive damage was done to all engine inlet fences.

Investigation did not disclose any system failures, and it was suspected that the parking brakes released because of vibration or had not been properly set.

All personnel in the cockpit were occupied with watching the engine instruments during the run-up, and no one noted the loss of parking-brake pressure or detected the first movement of the airplane.

The airplane was parked on a level apron with parking brakes set and wheels chocked in preparation for engine trim and operational check procedures. The technician was slowly accelerating the engine EPR toward the takeoff target of 1.73. With both engines at 1.70 EPR, the airplane suddenly moved to the right, then skidded forward more than 13 feet (3.9 meters). The technician immediately reduced power and applied full brakes.

The left main gear wheels 1 and 2 and the right main gear wheels 3 and 4 were chocked forward of each wheel with steel chocks. Left wheels 5 and 6 and right wheels 7 and 8 were chocked aft of each wheel using wood chocks. A light mist had begun, accompanied by light and variable winds shortly before starting the run-up. The apron surface was clear with no standing water, except for the presence of a small amount of oil (believed to be hy-

draulic fluid) observed under the left main gear.

The investigation revealed that the wheels did not roll but skidded forward, pushing the chocks ahead of the tires. Both the left and right engines contacted the engine inlet barriers and pushed them forward, denting both of the inlet cowls.

As a result of this incident, the operator adopted procedures calling for:

- *Running only one engine at full EPR, while holding the opposite engine at rated part power;*
- *Increasing the minimum fuel load for engine runs;*
- *Periodically steam cleaning the ramp in the engine run-up area to keep it free of any oil or slippery residue;*
- *Using substantial wooden chocks on the forward side of all main wheels, with the chocks to be placed a few inches forward of the wheels (rather than snug against them); and,*
- *Retraining and recurrent checks of all technicians certified to conduct engine runs.*

After being unhooked from the tug on a slight incline, the aircraft jumped a small chock under the nose wheel and rolled approximately 100 feet into the side of a hangar. The aircraft and the hangar were substantially damaged.

The parking brake had reportedly been set. However, following the incident the brake accumulator showed zero pressure. The airplane brakes had been used five times prior to the final stop and the hydraulic system was not repressurized prior to setting the parking brakes before disconnecting the tug.

While loading the forward cargo hold, the airplane rolled backwards approximately 10 inches (25.4 cm), pinning a freight handler between a container and the door frame cutout. The freight handler suffered chest injuries.

Subsequent investigation disclosed that a refueler had removed the chocks completely to prevent pinching the chocks during refueling, instead of moving them two or three inches (5.08 or 7.62 cm) to account for the tire settling under load. At the same time, someone in the cockpit had released the parking brakes to work on a brake problem. ♦

FAA Establishes a New Primary Aircraft Category

The U.S. Federal Aviation Administration (FAA) has established a new category of small airplanes designed for personal use that will be less expensive to build and maintain than currently possible under existing rules.

While the FAA cannot precisely determine the economic benefits of this rulemaking action, it is estimated that the simpler certification requirement for the new class of airplanes could save manufacturers considerable costs on each new aircraft design. Additional savings could be realized by buyers through lower purchase and maintenance costs.

The new primary aircraft category will provide for small, single-engine aircraft with maximum gross weights of 2,700 pounds. The planes must also have unpressurized cabins and hold no more than four people.

"The new category will simplify the FAA's certification process as well as provide owners with an aircraft that is less costly to buy and maintain than current categories," the FAA said.

The new regulations will permit pilot owners of primary category aircraft to perform an expanded range of special inspections and preventive maintenance, if they successfully complete an FAA-approved maintenance training program.

The regulation prohibits the carrying of persons or property for hire by primary aircraft, but does permit aircraft rental if they are maintained by an FAA-certificated mechanic or repair station.

The new regulation was published in the *Federal Register* Sept. 9, 1992.

PAMA Symposium and Trade Show Meet This Month

The Professional Aviation Maintenance Association (PAMA) is holding its annual symposium and trade show in New Orleans, Louisiana this year Feb. 16-18. The PAMA convention has long been an important venue for general aviation maintenance technicians, especially those with inspection authorization (IA) ratings. This year's program includes more than 40 technical seminars, 200 trade show exhibitors and IA renewal on-site.

One of the highlights of the PAMA convention is the presentation of the Joe Chase Award by Flight Safety Foundation. This annual award is given to a maintenance technician, selected from a field of nominees submitted by his or her peers, as best exemplifying the high standards of excellence in aviation maintenance that Joe Chase worked to promote during his many years as editor of the FSF *Aviation Mechanics Bulletin*.

For more information on the PAMA symposium and trade show, contact PAMA at (314) 739-2580.

Twin-pack Engine Modification Underway on Cessna 208B Caravan

The Soloy Corp. and Tropical Aviation Distributors Inc. have joined forces to develop a twin-engine single propeller modification for the popular Cessna Caravan airframe. If successful, this will be the first time that a twin-engine single propeller aircraft has been certified, although a similar installation was under development for the LearFan composite aircraft that was canceled prior to certification.

The U.S. Federal Aviation Administration (FAA) has issued a Grant of Exemption to the Soloy Corp. to change the single PT-6 power plant on the C-208B to a dual-engine power pack driving a single-reduction gearbox and propeller. The concept has been proven in a number of helicopter installations such as the Bell 212 series and the Sikorsky S-76 series.

In addition to the benefits of multi-engine centerline thrust, safety and reliability, the 1,329 shaft horsepower Dual Pac utilizing two Pratt & Whitney of Canada PT-6-114A engines is expected to offer significantly improved performance and operational advantages. The modification is intended to be approved under Federal Aviation Regulations (FAR) Part 23 as a Supplemental Type Certificate (STC). Additional airframe modifications are included that will stretch the fuselage about 40 inches (101.6 cm) aft of the wing and increase the maximum gross weight to 10,000 pounds (4,500 kg).

The modification will be done at the Soloy facility in Olympia, Washington, during 1993 with FAA certification expected by mid-1994. Soloy also plans to manufacture the modification as a kit and hopes to establish approved installation centers around the world.

Super Sniffer May Offer Improved Fire Safety

The Australian Commonwealth Scientific and Industrial Research Organization and IEI Australia/Vesda have developed a supersensitive device to detect gases created by overheated objects, the first warning of a potential fire.

According to the manufacturer, the very early smoke detection apparatus (Vesda) has sensors 1,000 times more acute than standard smoke detectors. Unlike current units that use narrow-band-width lasers, Vesda samples the air via a broad-band xenon lamp capable of detecting smoke from a wide spectrum of materials. Ten years in development, the Vesda system can be sensitized to the needs of each installation, including high security areas in embassies, electronic clean rooms, mining areas, gambling casinos and various manufacturing environments.

The manufacturer states that installations have already been specified on Boeing's Seattle, Washington, assembly line and telephone equipment installations by AT&T and Bell South. More information on the Vesda system can be obtained from the Victorian Government Business Office, 611 N. Larchmont Blvd., Los Angeles, CA 90004 U.S. Telephone (213) 467-3532. ♦

This information is intended to provide an awareness of safety problems so that they may be prevented in the future. Maintenance alerts are based upon preliminary information from government agencies, aviation organizations, the press, and other sources. The information may not be entirely accurate.

Mechanic's License Suspended 120 Days For Improper Repair Of Exhaust System Components

In a recent case involving the suspension of a mechanic's license privileges for 120 days, the U.S. National Transportation Safety Board (NTSB) reversed an administrative law judge's initial oral decision and upheld a contention that the individual had not employed acceptable methods, techniques or practices and that the work was not performed in a manner rendering the parts equal to their original condition. The NTSB acts as the appeal judge in cases involving the suspension or revocation of a U.S. Federal Aviation Administration (FAA) certificate holder.

The incident began when the owner of a light twin-engine aircraft brought the aircraft to a repair shop for an annual inspection. In performing the inspection, a mechanic observed that the turbocharger wastegate assemblies were "coming apart and sticking." The parts were removed and sent to a repair station specializing in exhaust system components. The agency reported that it could not repair them, but could send them out to be fixed. The parts were then sent to an individual mechanic for repair.

The mechanic found that replacement parts were unavailable, and after consulting Advisory Circular (AC) 43.13-1A, decided to perform welded repairs on the existing parts. He proceeded to repair the parts " ... based on other wastegates that I have seen and based on what this wastegate looked like. And I did so by duplicating, as best I could, the pieces." The repaired parts were returned to the repair station with certification that the repair was in compliance with the AC.

During the investigation of the incident, the mechanic testified that he did not intend to suggest that the parts could be immediately installed on an aircraft. He asserted that it was the responsibility of the repair station to test the parts and certify their safety.

The NTSB found no merit in the mechanic's arguments and agreed with the FAA administrator that the mechanic was well aware that the parts would be used on an aircraft. The board stated that "although the AC permitted welding when necessary, it did not condone the fabrication of an unauthorized substitute."

As a certified airframe and powerplant (A&P) technician, the individual was "under an obligation to comply with approved repair methods," the NTSB said. If he was unsure about these methods, the individual was obliged to secure authorization from the manufacturer, it said.

Fatigue Crack in DC-10 Pressure Bulkhead Results in Decompression and Emergency Descent

Following a routine takeoff and initial climb, the DC-10 was cleared to FL370 (37,000 feet). Passing through FL350, the crew heard and felt a "thump," which was followed shortly by the sound of the cabin altitude warning horn. The second officer noted that cabin altitude was climbing rapidly, and the captain directed the crew to declare an emergency and begin an emergency descent.

The cabin altitude reached approximately 30,000 feet as the descent continued. The emergency oxygen system was activated and functioned properly. After leveling at 11,000 feet, the flight was diverted and the subsequent landing was uneventful.

Investigation revealed a crack in the right corner of the pressure bulkhead at fuselage station 1156, located in the center accessory compartment. No other aircraft or system damage was found, and the aircraft was ferried to a maintenance base for repairs.

The U.S. National Transportation Safety Board (NTSB) completed an electron microscopic analysis of the failed bulkhead section. The analysis concluded that the cause of the failure was a fatigue crack that originated around the pass-through hole of the automatic direction-finder (ADF) antenna cable. The operator has inspected all other aircraft in its fleet as a precaution. No other aircraft were found to have bulkhead damage of this nature.

Cowling Loss Causes Crash of Piper PA-31

In May 1991, a twin-engine Piper PA-31-310 crashed and burned in a mountainous area of the western United States. The pilot, the only occupant, was killed. The airplane had departed a nearby airport about eight minutes before the accident. Shortly after departure, the pilot declared an emergency, stating that he was returning to the airport because the left engine cowl had separated from the aircraft. Two witnesses observed the airplane pass overhead at a very low altitude and stated that the left engine was not running and that the airplane was rocking back and forth. Shortly thereafter, the airplane was observed to bank sharply to the right, pass over a line of trees and crash.

Both the upper and lower cowl assemblies from the left engine were found about two miles from the accident site. A U.S. National Transportation Safety Board (NTSB) investigation found that the three primary cowl fasteners on the outboard side of the left upper cowl were in the unlocked position. These fasteners and three others on the inboard side of the left upper cowl normally engage eyebolts in the lower cowl assembly. Four studs (screws) are used, two on each side, to attach the upper and lower fiberglass nose cowl assemblies, but the two rear studs were missing. Eight of the 13 studs securing the upper and lower rear portions of the cowls to the firewall-nacelle bulkhead were torn out with sheet metal still attached. Five studs were missing.

The evidence indicated that the cowl had not been secured properly prior to takeoff. While the pilot's preflight inspection should have included an inspection of the cowling, the NTSB found that the fasteners and installation were such that a normal visual preflight inspection might not disclose improper installation.

For example, the single-slotted primary side fasteners are normally aligned longitudinally in the locked position, but can be rotated 180 degrees to an unlocked position. As a result, they may provide ambiguous indications because there are no paint stripes or other marks on the cowl to indicate the proper locked position. A very small pin centered within the slotted fastener is forced outward when the fastener is engaged, but the pin does not protrude beyond the surface of the fastener and is not readily visible. It was also noted that this particular type of fastener does not "pop away" from the cowl in the unlocked position as do other types of cowl fasteners.

In addition, the NTSB noted that there is no way to ascertain that the nose cowl studs or the studs attaching the upper and lower cowls to the firewall-nacelle bulkhead are tight and securely fastened without using a screwdriver. These studs may be attached to their corresponding receptacles and appear secured, but could in fact be loose on the cowl (not screwed in completely) and subsequently detach because of vibration. It was reported that loss of these studs had previously been reported on this aircraft.

The NTSB recommended that several maintenance-related aspects of PA-31 cowl installation be addressed to ensure continued in-flight integrity. They included:

- Threaded eyebolts in the lower cowl need to be adjusted properly to ensure that the upper and lower cowlings are snug and securely fastened. Otherwise, engine vibration will tend to loosen the forward and aft cowl fasteners; and,

- Studs securing the nose cowl assemblies are longer than the rear cowl fasteners and should not be interchanged because the longer studs will bottom out in the receptacles before adequately engaging or clamping the cowl in place. Even though there are collars or washers embedded in the cowls to ensure proper clamping action, they are difficult to see and may be obscured by paint.

This is not the first instance of PA-31 engine cowl loss. U.S. Federal Aviation Administration (FAA) service difficulty reports (SDRs) and accident data reported at least 22 incidents of in-flight loosening or loss of engine cowls. In view of this experience, the NTSB recommended that the FAA:

- Issue an airworthiness directive applicable to Piper PA-31 series airplanes requiring at the next annual or 100-hour inspection, whichever occurs first, (1) an inspection of engine cowl-nacelle assemblies to ensure that all fasteners (long and short) and receptacles are present and correctly installed, that all fastener washers/collars are installed, and that the lower cowl eye-bolts are adjusted properly to minimize vibration of the cowl; and (2) application of prominent decals and/or paint stripes on the cowls to indicate the open and locked positions of the primary inboard and outboard fasteners;

- Publish an article in *General Aviation Alerts*, emphasizing the hazards of in-flight engine cowl separation and the importance during preflight of ensuring that cowl assemblies are secured properly. The article should note, in the case of Piper PA-31 series and other airplanes with similar cowl fasteners, that a closer examination and the use of a screwdriver may be necessary to ensure proper closure; and,

- Require the Piper Aircraft Corp.

to amend all applicable *PA-31 Pilot Operating Handbooks* by including under the walk-around preflight inspection procedure a specific means to ascertain and ensure that all engine cowl fasteners are securely fastened.

Sticking Spoiler Brings Glider Down Too Early

In August 1992, a Grob G-103 sailplane crashed during an approach to an airport in the western United States. The pilot and one passenger were completing a sightseeing flight and were on the base leg for landing when the pilot extended the wing spoilers to their full open position. After losing sufficient altitude to continue the approach, he attempted to retract the spoilers to maintain the proper glide path. The control handle jammed and neither the pilot nor his passenger was able to free it to retract the spoilers.

To maintain airspeed, the pilot was forced to lower the nose and, as a result, the craft descended prematurely and collided with an embankment short of the runway. Both the pilot and the passenger suffered serious injuries and the sailplane received substantial damage.

Subsequent investigation disclosed that the left wing spoiler had extended beyond its normal limit, allowing the bottom of the spoiler to contact and jam against the edge of the spoiler cap recess on the upper surface of the wing. As a result, the interconnected left and right wing spoilers were both locked in their fully extended positions.

On the Grob G-103 sailplane, the wing spoilers are attached to and actuated by pivot arms within the wing structure and, when deployed, move both vertically and laterally (from inboard to outboard). A phenolic stop-block attached to the underside of the wing skin normally contacts and restricts the outer pivot arm and limits spoiler extension to preclude such jamming. The stop-block in the accident aircraft was found to be excessively worn, allowing the pivot arm to overextend the spoiler panel.

Although the sailplane had undergone an annual inspection only days before the accident, this condition had gone undetected, and the aircraft was approved for return to service. The manufacturer's maintenance manual and annual inspection checklist currently available for the sailplane provide no details regarding wing spoiler extension limits. Moreover, there is no specific reference to inspection of the spoiler extension stop-blocks. The manufacturer is currently preparing a service bulletin outlining inspection procedures to ensure that the stop-blocks are not worn excessively and that an overlap of a least 0.2 inches (5 mm) exists between the bottom of the spoiler and the upper edge of the recessed spoiler cap area. Maintenance manuals are also to be revised.

The wing spoiler systems in Grob series G-102 and G-104 sailplanes and on the G-109 motorgliders are similar to that of the G-103. The U.S. National Transportation Safety Board (NTSB) has recommended that the U.S. Federal Aviation Administration (FAA) issue an urgent airworthiness directive applicable to all Grob G-102/103/104 and 109 aircraft. In the interim, any technician involved in the maintenance and inspection of such sailplanes should be alert to this condition and ensure that the spoiler stop-blocks are in good condition and are providing adequate protection against overextension of the spoilers.♦

NEW PRODUCTS

Potting Compound Kits Ease Repair of Honeycomb Surfaces

Aircraft potting compound kits are now being offered by the Syon Corp. in two consistencies for the repair of honeycomb surfaces. The two-part resin systems are used to fill honeycomb structures and to bond fiberglass honeycomb inlay repairs of composite surfaces. The normal consistency is intended for horizontal surfaces, and the heavier consistency is to be used on vertical or inverted surfaces where gravity tends to make the compound flow before it cures.

Photo not available.

According to the manufacturer, gel-time is 15 minutes and full-cure time is two hours. Literature and pricing are available from Syon Corp., Aviation Products Group, 280 Eliot Street, Ashland, MA 01721 U.S. Telephone (508) 881-8852.

Unique Packaging Foolproofs Mixing of Two-part Compounds

Zip-Chem Products has introduced recently an innovative packaging concept for use with two-part catalyzed compounds used in adhesives, sealants and coatings. The manufacturer claims that the "Clip-Pak/Jar" combination package solves a number of user problems in ensuring that pre-ratio catalyzed systems are properly mixed and easily used.

Photo not available.

The two-component package allows the products to be mixed inside the package by simply removing the plastic shipping clip that separates the two chambers of the package. After mixing, the pouch is opened and the shipping jar provides a convenient and resealable container for storage or can be used to hold a brush or compound application tools. The company claims that the combination packaging addresses environmental concerns with point-of-use containers and operator safety concerns by enabling products to be mixed precisely without ever exposing users to physical contact or inhalation of vapors. "Clip-Paks" can be manufactured and filled to most specified dimensions or weights with a wide variety of two-part compounds. For more information, contact Zip-Chem Products, 1860 Dobbin Road, San Jose, CA 95133 U.S. Telephone (408) 272-8062.

Electronic Torque Tools Provide Digital Setting Readouts

Consolidated Devices Inc. (CDI) has introduced a number of electronic torque measuring units that provide very close tolerances and digital read-outs of the torque setting. The use of the company's programmable electronic torque wrench is said to be especially beneficial for high-volume use or installations requiring very accurate torque pre-load settings. Available in 1/4-, 3/8- and 1/2-inch drive sizes ranging from 5- to 50-inch/pound up to 200-foot/pound ratings, these wrenches can output directly to a printer to provide positive certification and traceability of the torque applied to each fastener.

Other electronic developments by CDI are the Digitest multirange

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torque tool calibration unit and the electronic torque test unit, which is available in different models covering specific ranges of torque. With a wide range of adapters, these units provide digital calibration of torque wrenches of all sizes, within very close tolerances. The units are battery operated, and the output of the Digitest unit can be directed to a computer printer to create a hard-copy record of the calibration of each wrench.

For more information, contact Consolidated Devices Inc., 19220 San Jose Ave. City of Industry, CA 91748 U.S. Telephone (800) 525-6319.

Biodegradable Parts Cleaner Enhances Safety

The Permatex Corp. now offers a nontoxic product called Natural Blue Cleaner and Degreaser to replace chlorinated solvent-based parts cleaners. According to the manufacturer, the product can be used to clean and degrease machined parts, tools, bearings and other small parts.

The manufacturer has introduced a dip basket container of the product that contains three gallons of the biodegradable concentrate in a five-gallon container, along with the plastic dip basket. A gallon of water is added by the user prior to dipping parts. The dip basket is said to be particularly handy and safe for users because the parts can be immersed in the cleaning solution, soaked and removed for rinsing without the need for protective gloves, etc. The maker states that the solution can be reused for many sessions and, when soiled, safely

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not available.

discarded without toxic waste precautions.

The concentrated formula can be diluted economically with up to 128 parts of water to meet a wide variety of uses, according to Permatex. It is available in 55-gallon, 15-gallon and 5-gallon drums, as well as in smaller containers, including a spray bottle of 24 fluid ounces.

For more information, contact Permatex Industrial Corp., 705 North Mountain Road, Newington, CT 06111 U.S. Telephone (203) 679-9713.

Aerospace Lighting Offers Exchange Program for Power Inverters

Aerospace Lighting Corporation (ALC) has announced a new exchange program for its power inverters used in many aircraft interior lighting installations. ALC said the program will provide for rapid replacement of malfunctioning inverters by exchanging the original unit with a completely reconditioned and certified serviceable unit. The customer will be charged a fixed unit-exchange price for the replacement unit. On receipt of the damaged or unserviceable unit, the customer will be credited for the core value.

ALC said the reconditioned inverters will be subjected to stringent acceptance test procedures and will be certified under the U.S. Federal Aviation Adminstration (FAA).

For more information, contact Marketing and Sales Manager, Aerospace Lighting Corp., 101-8 Colin Drive, Holbrook, NY 11741 U.S. Telephone (516) 563-6400.

Aircraft Interior Material Designed to Meet Fire Standards

The Du Pont Co. has introduced a family of textile materials and fire blockers for aircraft interiors that meet U.S. Federal Aviation Administration (FAA) fire and heat release standards that took effect August 1990. All of the products are part of the Du Pont Thermal Guard Aramid fiber line of materials.

The manufacturer claims that the Aramid fiber is inherently flame-resistant as manufactured and requires no topical treatment that can be degraded by washing or wear. Included in the line of products are the following:

- Nomex textiles that can be used on interior vertical surfaces. The manufacturer states that this fiber meets FAA standards for heat release, smoke and toxicity ratings and can be used in applications ranging from carpets to wall coverings;

- Thermacolor fiber that can be dyed to match any color scheme. Similar to Nomex, this highly flame-resistant fiber can be used in a wide variety of fabrics ranging from protective clothing to upholstery and wall coverings, according to the manufacturer; and,

- Thermablock spun-laced sheets that can be used to cover flammable materials such as the foam in aircraft seats to reduce the spread of flames. The manufacturer claims that this product, made in several types and thicknesses, provides excellent durability while maintaining its fire-blocking characteristics.

For additional information, contact The Du Pont Co., External Affairs Department, Wilmington, DE 19898 U.S. Telephone (302) 892-7100. ♦