PŘÍKAZ K ZACHOVÁNÍ LETOVÉ ZPŮSOBILOSTI

CAA-AD-3-062R1/98

Datum vydání: 31. prosince 1998

LETADLO - KONTROLA VZPĚRY KŘÍDLA

Týká se: letadel vyrobených společností Maule Aerospace Technology Corp. následujících typů, všech výrobních čísel, certifikovaných v kterékoli kategorii, které mají namontovánu zadní vzpěru křídla katalogového čísla (P/N) 2079E (nebo ekvivalentního katalogového čísla schváleného FAA) nebo přední vzpěru křídla P/N 2080E (nebo ekvivalentního katalogového čísla schváleného FAA) :

Bee Dee M-4	M-4	M-4C	M-4S	M-4T	M-4-180C
M-4-180S	M-4-180T	M-4-210	M-4-210C	M-4-210S	M-4-210T
M-4-220	M-4-220C	M-4-220S	M-4-220T	M-5-180C	M-5-200
M-5-210C	M-5-210TC	M-5-220C	M-5-235C	M-6-180	M-6-235
M-7-235	MX-7-235	MX-7-180	MX-7-420	MXT-7-180	MT-7-235
M-8-235	MX-7-160	MXT-7-160	MX-7-180A	MXT-7-180A	MX-7-180B
MXT-7-420	M-7-235B	M-7-235A	M-7-235C		

Důvod vydání:
1) Nesprávný odkaz na servisní bulletin v textu přílohy FAA AD 98-15-18.
2) Tisková chyba v CAA-AD-3-062/98.

Datum účinnosti: 9. září 1998 (zůstává nezměněno)

Provést v termínech: jak je popsáno v části “Compliance” FAA AD 98-15-18.

Postup provedených prací: dle části “Compliance” FAA AD 98-15-18 (příloha tohoto PZZ).

Poznámky - Provedení tohoto PZZ musí být zapsáno do letadlové knihy. Případné dotazy týkající se tohoto PZZ adresujte na ÚCL technický inspektorát - Ing. Fiala Vlastimil. Pokud to vyžaduje povaha tohoto PZZ musí být zapracováno do příslušné části dokumentace pro obsluhu,údržbu a opravy letadla. Tento PZZ byl vypracován na základě FAA AD 98-15-18, které nahrazuje FAA AD 95-26-18.

Ing. Pavel MATOUŠEK
Ředitel technického inspektorátu
Úřad pro civilní letectví

98-15-18 MAULE AEROSPACE TECHNOLOGY CORP.: Amendment 39-10669; Docket No. 98-CE-01-AD; Supersedes AD 95-26-18, Amendment 39-9476.

Applicability: The following airplane models, all serial numbers, certificated in any category, that are equipped with part number (P/N) 2079E (or FAA-approved equivalent part number) rear wing lift struts or P/N 2080E (or FAA-approved equivalent part number) front wing lift struts:

Bee Dee M-4	M-4	M-4C	M-4S	M-4T	M-4-180C
M-4-180S	M-4-180T	M-4-210	M-4-210C	M-4-210S	M-4-210T
M-4-220	M-4-220C	M-4-220S	M-4-220T	M-5-180C	M-5-200
M-5-210C	M-5-210TC	M-5-220C	M-5-235C	M-6-180	M-6-235
M-7-235	MX-7-235	MX-7-180	MX-7-420	MXT-7-180	MT-7-235
M-8-235	MX-7-160	MXT-7-160	MX-7-180A	MXT-7-180A	MX-7-180B
MXT-7-420	M-7-235B	M-7-235A	M-7-235C		

NOTE 1: This AD does not apply to airplanes equipped with four Maule sealed lift struts, P/N 2200E and P/N 2201E. These sealed lift struts are identified by two raised weld spots on the upper end of the strut just below the serial number plate. Removal of the upper cuff is needed to locate the weld spots.

NOTE 2: This AD applies to each airplane identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For airplanes that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (e) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

Compliance: Required as indicated in the body of this AD, unless already accomplished.

To prevent failure of the wing lift struts caused by corrosion damage, which could eventually result in the wing separating from the airplane, accomplish the following:

NOTE 3: The paragraph structure of this AD is as follows:

Level 1: (a), (b), (c), etc.
Level 2: (1), (2), (3), etc.
Level 3: (i), (ii), (iii), etc.

Level 2 and Level 3 structures are designations of the Level 1 paragraph they immediately follow.

(a) Upon accumulating 2 years on a lift strut affected by this AD; within 3 calendar months after the effective date of this AD; or within 2 years after the last inspection accomplished in accordance with AD 95-26-18 (superseded by this action), whichever occurs later, remove the wing lift struts in accordance with the INSTRUCTIONS section of Maule Service Bulletin (SB) No. 11, dated October 30, 1995, and accomplish one of the following (the actions in either paragraph (a)(1), (a)(2), (a)(3), or (a)(4), including all subparagraphs, of this AD):

(1) Inspect the wing lift struts for corrosion in accordance with the INSPECTION PROCEDURE section of Maule SB No. 11, dated October 30, 1995.

(i) If no perceptible dents (as defined in the above SB) are found in the wing lift strut and no corrosion is externally visible, apply corrosion inhibitor to each strut in accordance with Maule SB No. 11, dated October 30, 1995. Re-inspect the wing lift struts at intervals not to exceed 24 calendar months provided no perceptible dents or external corrosion is found.

(ii) If a perceptible dent (as defined in the above SB) is found in the wing lift strut or external corrosion is found, prior to further flight, accomplish one of the installations (and subsequent actions presented in each paragraph) specified in paragraphs (a)(3) and (a)(4) of this AD.

(2) Inspect the wing lift struts for corrosion in accordance with the Appendix to this AD. The inspection procedures in this Appendix must be accomplished by a Level 2 or Level 3 inspector certified using the guidelines established by the American Society for Non-destructive Testing, or MIL-STD-410.

(i) If no external corrosion is found and all requirements in the Appendix to this AD are met, prior to further flight, apply corrosion inhibitor to each strut in accordance with Maule SB No. 11, dated October 30, 1995. Reinspect the lift struts at intervals not to exceed 24 calendar months provided no external corrosion is found and all of the requirements included in the Appendix of this AD are met.

(ii) If external corrosion is found or if any of the requirements in the Appendix of this AD are not met, prior to further flight, accomplish one of the installations (and subsequent actions presented in each paragraph) specified in paragraphs (a)(3) and (a)(4) of this AD.

(3) Install original equipment manufacturer (OEM) part number wing lift struts (or FAA-approved equivalent part numbers) that have been inspected in accordance with the specifications presented in either paragraph (a)(1) or (a)(2) of this AD, and are found to be airworthy according to the inspection requirements included in these paragraphs. Accomplish this installation in accordance with the applicable maintenance manual. Thereafter, inspect these wing lift struts at intervals not to exceed 24 calendar months in accordance with the specifications presented in either paragraph (a)(1) or (a)(2) of this AD.

(4) Install new Maule sealed wing lift struts, P/N 2200E or P/N 2201E, as applicable (or FAA-approved equivalent part numbers) on each wing as specified in the INSTRUCTIONS section in Part II of Maule SB No. 11, dated October 30, 1995.

(b) If holes are drilled into the sealed wing lift strut assemblies installed as specified in paragraph (a)(4) of this AD in order to attach cuffs, door clips, or other hardware, inspect the wing lift struts at intervals not to exceed 24 calendar months using the procedures specified in either paragraph (a)(1) or (a)(2), including all subparagraphs, of this AD.

(c) The repetitive inspections required by this AD may be terminated after installing new wing lift strut assemblies as specified in paragraph (a)(4) of this AD provided no holes are drilled in these strut assemblies as specified in paragraph (b) of this AD.

(d) Special flight permits may be issued in accordance with sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the airplane to a location where the requirements of this AD can be accomplished.

(e) An alternative method of compliance or adjustment of the initial or repetitive compliance times that provides an equivalent level of safety may be approved by the Manager, Atlanta Aircraft Certification Office (ACO), One Crown Center, 1895 Phoenix Boulevard, suite 450, Atlanta, Georgia 30349.

(1) The request shall be forwarded through an appropriate FAA Maintenance Inspector, who may add comments and then send it to the Manager, Atlanta ACO.

(2) Alternative methods of compliance approved in accordance with AD 95-26-18 are considered approved as alternative methods of compliance for this AD.

NOTE 4: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Atlanta ACO.

(f) The removal, the lift strut inspection (in paragraph (a)(1) of this AD), the applications, and the installation required by this AD shall be done in accordance with Maule Service Bulletin No. 11, dated October 30, 1995. This incorporation by reference was previously approved by the Director of the Federal Register as of January 26, 1996 (61 FR 623, January 9, 1996). Copies may be obtained from Maule Aerospace Technology, Inc., 2099 GA Hwy. 133 South, Moultrie, Georgia 31768. Copies may be inspected at the FAA, Central Region, Office of the Regional Counsel, Room 1558, 601 E. 12th Street, Kansas City, Missouri, or at the Office of the Federal Register, 800 North Capitol Street, NW, suite 700, Washington, DC.

(g) This amendment supersedes AD 95-26-18, Amendment 39-9476.

(h) This amendment becomes effective on September 9, 1998.

FOR FURTHER INFORMATION CONTACT: Cindy Lorenzen, Aerospace Engineer, FAA, Atlanta Aircraft Certification Office, One Crown Center, 1895 Phoenix Boulevard, suite 450, Atlanta, Georgia 30349; telephone: (770) 703-6078; facsimile: (770) 703-6097.

APPENDIX TO AD 98-15-18

PROCEDURES AND REQUIREMENTS FOR ULTRASONIC INSPECTION OF MAULE WING LIFT STRUTS

EQUIPMENT REQUIREMENTS

1. A portable ultrasonic thickness gauge or flaw detector with echo-to-echo digital thickness readout capable

   of reading to 0.001 inch and an A-trace waveform display will be needed to accomplish this inspection.

2. An ultrasonic probe with the following specifications will be needed to accomplish this inspection:

   10 MHz (or higher), 0.283 inch (or smaller) diameter dual element or delay line transducer designed for thickness gauging. The transducer and ultrasonic system shall be capable of accurately measuring the thickness of AISI 4340 steel down to 0.020 inch. An accuracy of +/- 0.002 inch throughout a 0.020 inch to 0.050 inch thickness range while calibrating shall be the criteria for acceptance.

3. Either a precision machined step wedge made of 4340 steel (or similar steel with equivalent sound velocity) or at least three shim samples of same material will be needed to accomplish this inspection. One thickness of the step wedge or shim shall be less than or equal to 0.020 inch, one shall be greater than or equal to 0.050 inch and at least one other step or shim shall be between these two values.
4. Glycerin, light oil, or similar non-water based ultrasonic couplants are recommended in the setup and inspection procedures. Water-based couplants, containing appropriate corrosion inhibitors, may be utilized, provided they are removed from both the reference standards and the test item after the inspection procedure is completed and adequate corrosion prevention steps are then taken to protect these items.

- NOTE: Couplant is defined as "a substance used between the face of the transducer and test surface to improve transmission of ultrasonic energy across the transducer/strut interface."
- NOTE: If surface roughness due to paint loss or corrosion is present, the surface should be sanded or polished smooth before testing to assure a consistent and smooth surface for making contact with the transducer. Care shall be taken to remove a minimal amount of structural material. Paint repairs may be necessary after the inspection to prevent further corrosion damage from occurring. Removal of surface irregularities will enhance the accuracy of the inspection technique.

INSTRUMENT SETUP

1. Set up the ultrasonic equipment for thickness measurements as specified in the instrument's user's manual. Because of the variety of equipment available to perform ultrasonic thickness measurements, some modification to this general setup procedure may be necessary. However, the tolerance requirement of step 13 and the record keeping requirement of step 14, must be satisfied.

2. If battery power will be employed, check to see that the battery has been properly charged. The testing

will take approximately two hours. Screen brightness and contrast should be set to match environmental conditions.

3. Verify that the instrument is set for the type of transducer being used, i.e. single or dual element, and that the frequency setting is compatible with the transducer.

4. If a removable delay line is used, remove it and place a drop of couplant between the transducer face and the delay line to assure good transmission of ultrasonic energy. Reassemble the delay line transducer and continue.

5. Program a velocity of 0.231 inch/microsecond into the ultrasonic unit unless an alternative instrument calibration procedure is used to set the sound velocity.

6. Obtain a step wedge or steel shims per item 3 of the **EQUIPMENT REQUIREMENTS**. Place the probe on the thickest sample using couplant. Rotate the transducer slightly back and forth to "ring" the transducer to the sample. Adjust the delay and range settings to arrive at an A-trace signal display with the first backwall echo from the steel near the left side of the screen and the second backwall echo near the right of the screen. Note that when a single element transducer is used, the initial pulse and the delay line/steel interface will be off of the screen to the left. Adjust the gain to place the amplitude of the first backwall signal at approximately 80% screen height on the A-trace.

7. "Ring" the transducer on the thinnest step or shim using couplant. Select positive half-wave rectified, negative half-wave rectified, or filtered signal display to obtain the cleanest signal. Adjust the pulse voltage, pulse width, and damping to obtain the best signal resolution. These settings can vary from one transducer to another and are also user dependent.

8. Enable the thickness gate, and adjust the gate so that it starts at the first backwall echo and ends at the second backwall echo. (Measuring between the first and second backwall echoes will produce a measurement of the steel thickness that is not affected by the paint layer on the strut). If instability of the gate trigger occurs, adjust the gain, gate level, and/or damping to stabilize the thickness reading.

9. Check the digital display reading and if it does not agree with the known thickness of the thinnest thickness, follow your instrument's calibration recommendations to produce the correct thickness reading. When a single element transducer is used this will usually involve adjusting the fine delay setting.

10. Place the transducer on the thickest step of shim using couplant. Adjust the thickness gate width so that the gate is triggered by the second backwall reflection of the thick section. If the digital display does not agree with the thickest thickness, follow your instruments calibration recommendations to produce the correct thickness reading. A slight adjustment in the velocity may be necessary to get both the thinnest and the thickest reading correct. Document the changed velocity value.

11. Place couplant on an area of the lift strut which is thought to be free of corrosion and "ring" the transducer to surface. Minor adjustments to the signal and gate settings may be required to account for coupling improvements resulting from the paint layer. The thickness gate level should be set just high enough so as not to be triggered by irrelevant signal noise. An area on the upper surface of the lift strut above the inspection area would be a good location to complete this step and should produce a thickness reading between 0.034-inch and 0.041-inch.

12. Repeat steps 8, 9, 10, and 11 until both thick and thin shim measurements are within tolerance and the lift strut measurement is reasonable and steady.

13. Verify that the thickness value shown in the digital display is within +/- 0.002 inch of the correct value for each of the three or more steps of the setup wedge or shims. Make no further adjustments to the instrument settings.

14. Record the ultrasonic versus actual thickness of all wedge steps or steel shims available as a record of setup.

INSPECTION PROCEDURE

1. Clean the lower 18 inches of the wing lift struts using a cleaner that will remove all dirt and grease. Dirt and grease will adversely affect the accuracy of the inspection technique. Light sanding or polishing may also be required to reduce surface roughness as noted in the EQUIPMENT REQUIREMENTS section.

2. Using a flexible ruler, draw a 1/4-inch grid on the surface of the first 11 inches from the lower end of the strut as shown in **Maule Service Bulletin No. 11, dated October 30, 1995**, as applicable. This can be done using a soft (#2) pencil and should be done on both faces of the strut. As an alternative to drawing a complete grid, make two rows of marks spaced every 1/4 inch across the width of the strut. One row of marks should be about 11 inches from the lower end of the strut, and the second row should be several inches away where the strut starts to narrow. Lay the flexible ruler between respective tick marks of the two rows and use tape or a rubber band to keep the ruler in place. See Figure 1.

3. Apply a generous amount of couplant inside each of the square areas or along the edge of the ruler. Re-application of couplant may be necessary.

4. Place the transducer inside the first square area of the drawn grid or at the first 1/4-inch mark on the ruler and “ring” the transducer to the strut. When using a dual element transducer, be very careful to record the thickness value with the axis of the transducer elements perpendicular to any curvature in the strut. If this is not done, loss of signal or inaccurate readings can result.

5. Take readings inside each square on the grid or at 1/4-inch increments along the ruler and record the results. When taking a thickness reading, rotate the transducer slightly back and forth and experiment with the angle of contact to produce the lowest thickness reading possible. Pay close attention to the A-scan display to assure that the thickness gate is triggering off of maximized backwall echoes.

- NOTE: A reading shall not exceed .041 inch. If a reading exceeds .041 inch, repeat steps 13 and 14 of the INSTRUMENT SETUP section before proceeding further.

6. If the A-trace is unsteady or the thickness reading is clearly wrong, adjust the signal gain and/or gate setting to obtain reasonable and steady readings. If any instrument setting is adjusted, repeat steps 13 and 14 of the INSTRUMENT SETUP section before proceeding further.

7. In areas where obstructions are present, take a data point as close to the correct area as possible.

- NOTE: The strut wall contains a fabrication bead at approximately 40% of the strut chord. The bead may interfere with accurate measurements in that specific location.

8. A measurement of 0.024 inch or less shall require replacement of the strut prior to further flight.

9. If at any time during testing an area is encountered where a valid thickness measurement cannot be obtained due to a loss of signal strength or quality, the area shall be considered suspect. These areas may have a remaining wall thickness of less than 0.020 inch, which is below the range of this setup, or they may have small areas of localized corrosion or pitting present. The latter case will result in a reduction in signal strength due to the sound being scattered from the rough surface and may result in a signal that includes echoes from the pits as well as the backwall. The suspect area(s) shall be tested with a Maule ”Fabric Tester” as specified in **Maule Service Bulletin No. 11, dated October 30, 1995.**

10. Record the lift strut inspection in the aircraft log book.

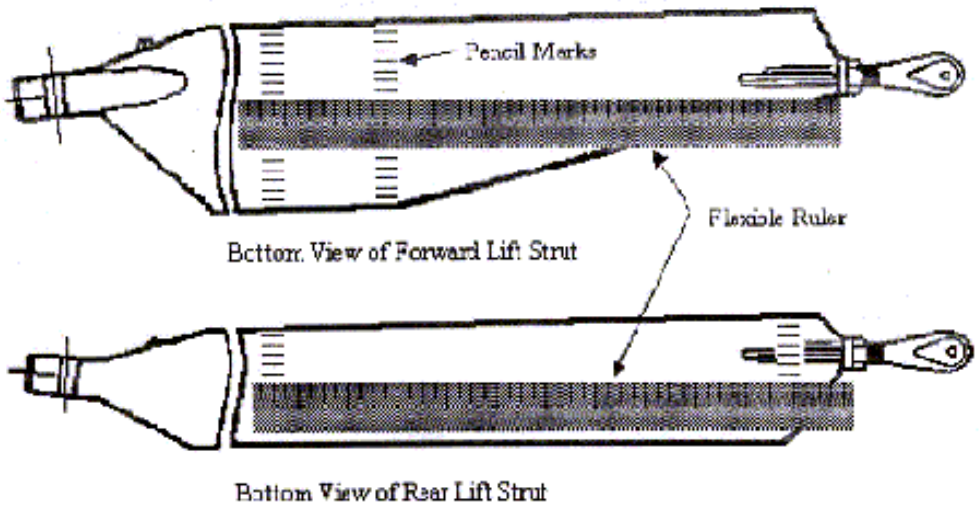
Pencil Marks
Flexible Ruler
Bottom View of Forward Lift Strut
Bottom View of Rear Lift Strut

Figure 1