T-34 MENTOR FATIGUE AND CORROSION INSPECTIONS

Because the T-34 Association is dedicated to the safe operation of the Beech T-34 Mentor, we have put together a list of additional inspection areas that may or may not be on your annual inspection list. We want all operators and maintenance shops to be aware of these areas so that preventive measures can be taken.

A. Fuselage Fatigue Inspections:

1. All airworthy aircraft should be in compliance with AD 2004-25-51. This involves an eddy current inspection of the main wing spar carry through structure. Eventually all T-34 aircraft over 3,800 hours total time will have a reinforcement modification to this area.

2. Visually inspect the belly skins in the forward and aft carry through locations for deformity and undocumented repairs or patches. Any undocumented repairs or patches should be investigated further for the possibility of underlying damage.

3. Visual inspection of the aft wing spar carry through structure for corrosion or obvious damage. This may be accomplished by looking into the aft carry through in the location of the wing bolt cover plates.

4. Visual inspection for main spar carry through web cracking at forward and aft locations on left and right sides.

5. Left and right keel inspection for deformity and possible cracking. Carefully inspect structure at firewall location where keel splices are located. Inspect both sides of keel in engine compartment and nose wheel well.

6. Engine mounting structure distortion and or cracking. Inspect this area in the engine compartment and in the wheel wells. Look for stress cracks in all four engine mounting locations.

7. Cowling deformities and cracking. The T-34, 3-piece cowling structure provides the rigidity necessary to hold the upper nose bowl in place. This structure should be free from cracks and corrosion. Check all hinge locations and attachment points as well as the ribs and stiffeners that make up the cowling structure.

8. Landing gear actuator compartment distortion and cracking. Check the landing gear actuator mount structure in the belly for cracks, looseness or distortion.

9. Fuselage flight control castings. Check flight control mounts and casting for cracks and looseness as well as corrosion and frozen bearings.

B. Wing Fatigue Inspections:

1. All airworthy aircraft should be incompliance with AD2001-13-18R1. This involves the inspections of the forward and aft wing spars and attachment fittings. In most cases one of several AMOCS should be incorporated into the wing spars.

2. Visual inspection of the wing skins should be made for deformity or cracking. Particular attention should be made at the inboard locations where the skin meets the wing spars and bath-tub fittings.

3. Landing gear attachment points should be inspected for cracks and distortion.

4. Check flap actuator mounting points for cracks or frozen bushings.

5. Check flap actuator mount bracket on flap for cracks or damage.

6. Check flap guide tracks for cracks at rear spar mounting locations.

7. Inspect ailerons for distortion or cracking, possibly indicating an overstress condition. Check aileron mounting brackets for cracks.

C. Empennage Fatigue Inspections:

1. All airworthy aircraft should be incompliance with AD2007-06-01R1. This involves the eddy current inspections of the forward and aft horizontal stabilizer spar attachment stubs.

2. Careful attention should be made when inspecting the bulkheads that the vertical and horizontal stabilizers are attached to. Look for stress cracks and abrasion marks indicating loose stabilizer attachments. When stabilizers are removed check for tightness of steel mounting bushings.

3. Check fuselage aft most bulkheads for deformity or cracks around tail skid mounting location.

4. Look for distortion or cracking in stabilizer skins indicating a possible over stress condition.

5. Inspect elevator hinge mounting areas for cracks; look at counter weight area for distortion or cracking.

6. Check elevator inboard hinge bracket mounted to aft bulkhead for cracks or frozen bearings.

7. Inspect rudder hinge mounting areas for cracks or distortion possibly indicating an overstress condition.

8. Ensure the rudder has upper skin doubler installed on both side to reinforce the skin at the counterweight location. This modification should be installed on all aircraft and can be found in the SRM.

9. Check lower rudder skin and bottom rib where control arm attaches for distortion or cracking.

D. Fuselage Corrosion inspections:

1. Check spar carry through attachment fittings and wing bolts.

2. Check belly skins aft of augmenter tubes for exhaust gas corrosion.

3. Carefully inspect battery compartment structure and lower jar compartment for acid corrosion.

4. Unpainted engine compartments should be checked for corrosion from leaking exhaust gases.

5. Original pitot and static hard lines should be checked for pin holes.

6. Cockpit walls, consoles and upper structure should be inspected for corrosion.

7. Control sticks and control stick receivers should be checked for corrosion, particularly where the stick is inserted into the receiver.

8. Inspect all magnesium castings used for flight control mounting throughout fuselage.

9. Inspect main landing gear actuator rods for corrosion and weakening at the transition area between the inboard stamped flat steel and the tubing. This area is prone to failure. Original rods should be considered for replacement.

10. Flight control cables and pulley bearings should be checked for corrosion and replaced when detected.

E. Wing Corrosion inspections:

1. Inspect wing bath-tub fittings for corrosion and pitting; ensure upper bath-tub fitting drain holes are not blocked.

2. Inspect upper and lower wing main spar caps for bubbling, indicating inner-granular corrosion.

3. Check for landing gear corrosion that can lead to frozen bushing and bearings.

4. Nose and main wheels should be replaced when there are signs of corrosion or pitting. These assemblies are made from magnesium and are prone to excessive corrosion.

5. Inspect pitot lines in the wheel wells for pin holes.

6. Inspect inside wheel wells for corrosion on ribs, stringers and skin.

7. Inspect ailerons for corrosion, original aileron skins are made of magnesium and excessive pitting and filiform corrosion can occur. Replace these with aluminum skins.

8. Inspect original A-model magnesium flaps for pitting and filiform corrosion. These can also be replaced with new aluminum.

F. Empennage Corrosion inspections:

1. Inspect all three stabilizers for the same magnesium corrosion problems. If the skins cannot pass a push test then replace with new aluminum.

2. Inspect the elevators and rudder for magnesium corrosion problems. Replace with new aluminum when they no longer pass strength tests.

3. Check the steel tail skid attachment brackets in the aft most bulkheads for corrosion.

Note: Aircraft located in coastal areas, particularly in tropical climates should include some form of corrosion protection application more often than those located in drier climates.