triggering (blocking gate) to approximately three quarters of the distance between the initial pulse and the delay line interface echo. The thickness gate should initiate at the delay line interface echo and terminate at the first backwall echo.

Depending on the instrument and probe, select positive half-wave rectified signal display or negative half-wave rectified signal display. This selection should give the best signal display on the thinnest steel shim. Select the interface synchronization. This selection automatically starts the thickness gate at the delay time corresponding to the tip of the plastic delay line.

7. Couple the probe to the thickest steel shim using couplant. Adjust the range so the A-scan display reads from 0.000 to 0.300 inches. Several multiple backwall echoes will disappear from the

- 8. Adjust the thickness gate to trigger on the first return signal. If instability of the gate trigger occurs, adjust the gain and/or damping to stabilize the thickness reading. A thickness readout should be present on the screen and near the known steel shim thickness.
- 9. Adjust the velocity to 0.231 inches/ microseconds. The thickness reading should be the known steel shim thickness. Couple the transducer to the thinnest steel shim. If the thickness readout does not agree with the known thickness, adjust the fine delay setting to produce the known thickness. Recheck the thickest step. If the readout does not indicate the correct thickness re-adjust the fine delay setting. After this adjustment is made, record the thickness values for each of the steel shims on a set-up sheet.
- 10. Calculate the percent error for each measured steel shim. The maximum allowable percent error should not exceed 3-percent.

Inspection Procedures

1. Add couplant to the outside inspection surface (Refer to Figures 3a,

- 4a and 5a, as applicable). Add the appropriate gain to obtain the backwall echo from the inspection surface. If the gain setting is adjusted, re-check the thickness values on the steel shims. To assure proper coupling to the test sample, twist the probe clockwise and counter-clockwise (with a 45-degree twist) and maintain contact with the test surface. During the articulation of the probe, observe the A-trace on the screen and stop the probe twist at the point of adequate back surface signal amplitude to trigger the thickness gate on the first half-cycle. Measure and record the thickness. Repeat the above process at eight equally-spaced locations around the surface. The weld bead near the spar cluster may be hard to access. Find a suitable location near the weld and measure the thickness.
- 2. Add couplant to the inside inspection surface (Refer to Figures 3a, 4a and 5a, as applicable). Add the appropriate gain to obtain the backwall echo from the inspection surface. To assure proper coupling to the test sample, twist the probe (clockwise and counter-clockwise with a 45-degree twist). During the articulation of the probe, observe the A-trace on the screen and stop the probe twist at the point of adequate back surface signal amplitude to trigger the thickness gate on the first half-cycle. Measure and record the thickness. Repeat the above process at eight equally-spaced locations around the surface.
- 3. If a thickness reading in any one of the eight locations from paragraph 1. of the Inspection Procedures section (outside section surface) is .085-inch or less for the PA25-150 Model or .055inch or less for the PA25-235 and PA25-260 Models, or if a thickness reading in any one of the eight locations from paragraph 2. of the *Inspection* Procedures section (inside section surface) is .055-inch or less for the PA25-150 Model or .085-inch or less for the PA25–235 and PA25–260 Models, prior to further flight, replace the

- forward spar fuselage tubular attach cluster with serviceable parts in accordance with FAA AC No. 43.13–1A, Acceptable Methods, Techniques, Practices—Aircraft Inspection and Repair. This procedure requires the following:
- a. Provide for the alignment of the airframe with an appropriate alignment fixture in accordance with FAA AC No. 43.13–1A, Acceptable Methods, Techniques, Practices—Aircraft Inspection and Repair.
- b. Cut the tubular members as referenced and specified in Figure 2 and either Figures 3a and 3b; Figures 4a and 4b; or Figures 5a and 5b, as applicable.
- c. Fabricate a cluster using all applicable part numbers referenced in Figures 3b, 4b, or 5b, as applicable; and
- d. Splice the new cluster into the fuselage frame.

Dye Penetrant Inspection

Inspect the wing forward spar fuselage attach fitting assembly for cracks using FAA-approved dye penetrant methods. If any cracks are found, prior to further flight, replace the forward spar fuselage tubular attach cluster with serviceable parts in accordance with FAA AC No. 43.13–1A, Acceptable Methods, Techniques, Practices-Aircraft Inspection and Repair. This procedure requires the following:

- 1. Provide for the alignment of the airframe with an appropriate alignment fixture in accordance with FAA AC No. 43.13–1A, Acceptable Methods, Techniques, Practices-Aircraft Inspection and Repair.
- 2. Cut the tubular members as referenced and specified in Figure 2 and either Figures 3a and 3b; Figures 4a and 4b; or Figures 5a and 5b, as applicable.
- 3. Fabricate a cluster using all applicable part numbers referenced in Figures 3b, 4b, or 5b, as applicable; and
- 4. Splice the new cluster into the fuselage frame.

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