

Aero Twin, Inc. Single Place Folding Seat

P/N DFS1-01W

TSO-C127a

INSTALLATION INSTRUCTIONS

Document No. DFS1W-IM1-T

Note: This installation and weight and balance data is identical to that contained within the Instructions for Continued Airworthiness supplied with the seat. For maintenance instructions, required inspection and maintenance intervals, and an illustrated parts list, see the Instructions for Continued Airworthiness.

Original Issue

Date: November 20, 2002

FAA/DAS Approved _____

Aero Twin, Inc. Single Place Folding Seat P/N DFS1-01W

1.0 Aircraft Applicability

NOTE: *The conditions and tests required for TSO approval of this article are minimum performance standards. It is the responsibility of those desiring to install this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within the TSO standards. TSO articles must be approved for installation. The article may be installed only if the installation is performed in accordance with 14 CFR Part 43 or the applicable airworthiness requirements.*

NOTE: This seat is certified for forward-facing installation only.

1.1 Attachment

DFS1-01W seats will fit in standard aircraft track conforming to specification MS33601. The lateral track spacing must be between 12.5 and 12.7 inches from center to center. The track also must not be located any closer than 3.5 inches laterally from a wall, bulkhead or other fixture for the seat to fit in the aircraft. Seat spacing may not be less than 33 inches. The backrest of a seat may not be less than 33 inches from any object in front of it. This will make head impact unlikely.

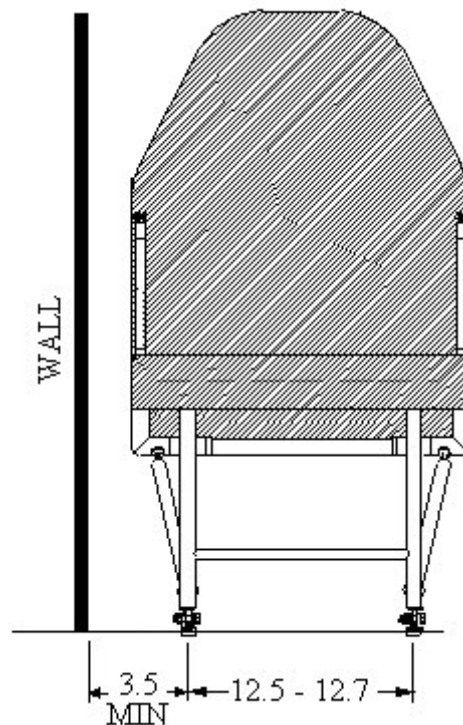


Figure 1.1 Track Spacing

1.2 Floor Loading

Aero Twin Passenger Seat DFS1-01W was dynamically tested per 14 CFR 23.562. Floor reaction data was collected at each of the four feet so the installer can determine if aircraft track and floor assemblies will have adequate strength. The peak forces recorded on the floor from each of the seat legs are listed in the table below. Positive forces in the table are forward, right, and upward for forward, side, and upward loads respectively.

	Left Front	Left Rear	Right Front	Right Rear
Max Forward	2700 lbs	350 lbs	1020 lbs	280 lbs
Max Side	-400 lbs	600 lbs	3300 lbs	-600 lbs
Max Upward	-4500 lbs	3500 lbs	-3100 lbs	4500 lbs

1.3 Other Limitations

Other limitations addressed by SAE AS 8049A Subsection 5.3.10.3 include:

- b.) Head Impact:** Head impact is not likely if seats are installed at the proper spacing listed in section 1.1 above.
- h.) Femur Loads:** Femur loads are not applicable to Type C2 seats.
- j.) Seat Deformation:** The seat deformation was minimal during testing and did not affect seat egress.
- k.) Seat Attachment:** The maximum loads applied to the floor by the seat legs during dynamic testing are listed in the table in section 1.2. The time histories of these forces are attached to this document.
- o.) Post Retrieval of Life Preserver:** These seats are not equipped with life preservers.
- p.) Evaluation of Seat Egress:** The seat has no adjustable features which would effect egress and no under-seat baggage restraint is incorporated.

2.0 Installation / Removal

This section describes general installation procedures; for information on weight and balance data see Section 3.0.

NOTE: Seats with the shoulder harness attached on the left side of the seat back must be installed on the left side of the airplane only. Seats with the shoulder harness attached on the right side of the seat back must be installed on the right side of the airplane only. The following part numbers apply.

Left Seat P/N: DFS1-01W-L
Right Seat P/N: DFS1-01W-R

2.1 Setup and Installation (see Figure 2.1):

1. Unfold forward leg and lower diagonal arms. On each lower arm quick-release fitting, push in the retaining pin and retract the locking ring (Detail 1, Figure 2.1). Position the diagonal arms to align fittings with studs on forward legs. Push forward leg back to engage studs in fittings, then extend locking rings to close jaws.

Be sure jaws close completely and retaining pins pop out to the extended (locked) position - Failure to properly engage studs and lock fittings could result in seat collapse.

2. Unfold seat back and upper diagonal arms. Position the arms so the quick-release fittings are over the corresponding pins on the seat frame. Retract the spring-loaded collar on one fitting, push the fitting over the pin, then release the collar. Repeat for the opposite side (Detail 3, Figure 2.1)

Be sure the collars extend completely and the pins are properly captured in the fittings - failure to properly engage pins could result in seat collapse.

3. Unfold rear legs and position the seat over the seat tracks at the desired fuselage station. Drop the forward feet into the tracks (locking lugs must be in the retracted position), slide forward or aft 1/2 inch, and push the locking lugs down to lock the forward feet into the track (Detail 2, Figure 2.1).
4. Extend the rear legs aftward to the built-in rotation stop, then move legs forward until aft feet can drop into the tracks. Slide feet aft 1/2 inch and push locking lugs down to lock feet in track. Locking lugs of rear feet should be 17 inches (17 track positions) aft of forward feet locking lugs.
5. The feet are equipped with anti-rattle devices. Use is optional. To use the anti-rattle feature, tighten the screw in the anti-rattle device until the stirrup is drawn snug against the seat track.
6. Connect oxygen lines if installed.

Note: *Aero Twin seats are not supplied with oxygen masks. Initial installation may require new masks to be purchased or the oxygen masks from the OEM seats to be transferred to the Aero Twin Seats.*

7. Update aircraft empty weight and balance to account for seat installation (see Section 3.0).

2.2 Removal / Breakdown:

1. Disconnect the oxygen lines from the receptacle on the side wall (if applicable).
2. Release anti-rattle feature on each of four feet (if feature is utilized).
3. Lift the rear feet locking lugs (a tool designed for this purpose is supplied with the seat; additional tools are available from Aero Twin, Inc.). Slide the feet forward 1/2 inch and lift the feet from the track.
4. Repeat step 3 for the forward feet. Remove seat from tracks.
5. Push in the retaining pins and retract the locking rings of the lower diagonal arm quick-release fittings. Disengage the forward leg studs from the fittings.
6. **Fold the rear legs in first, then the forward legs.** Fold the arms into position alongside the forward legs.

7. Retract the spring-loaded collar on the quick release fitting on one of the upper diagonal arms and disengage the fitting from the pin on the seat frame. Repeat for the other arm.
8. Rotate and fold the upper arms inward across the seat back - note that the eyebolts in the seat back, to which the arms are attached, rotate in their bushings to accomplish this. The seat will fold best when the arms are positioned so that they do not cross each other.
9. Fold the backrest and seat base together.

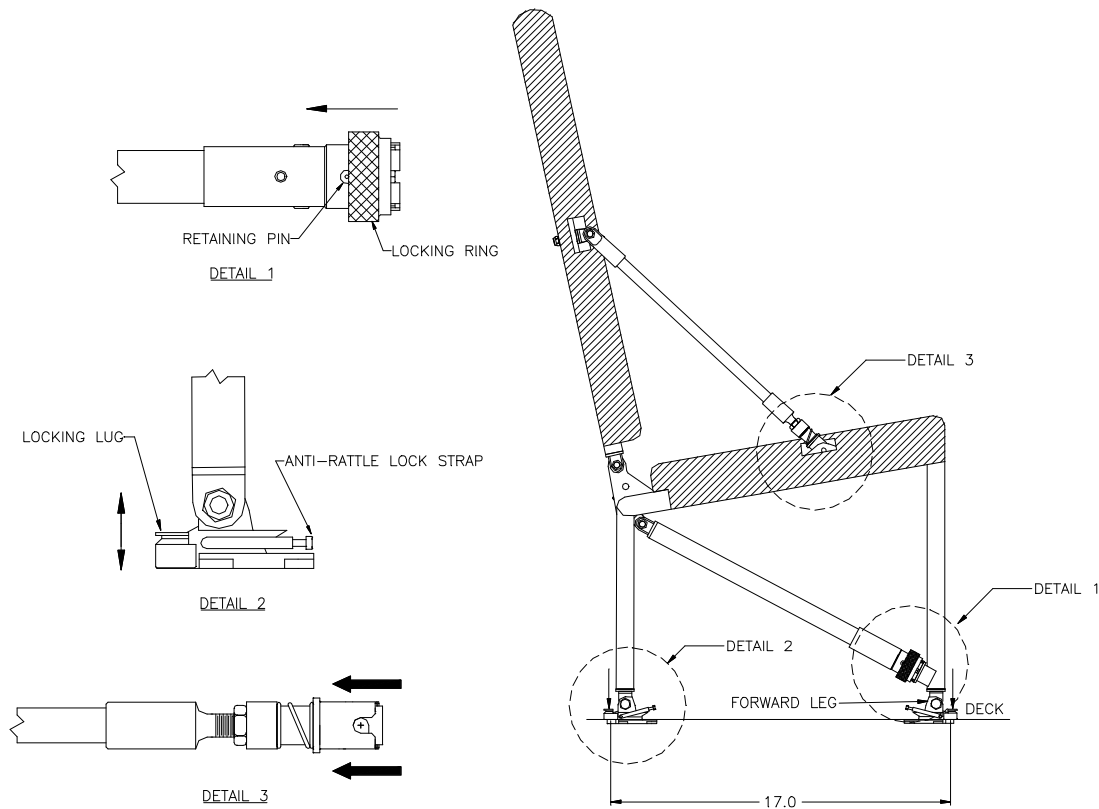


Figure 2.1 Seat Installation

3.0 Weight and Balance

When seats are installed or removed, the aircraft empty weight and balance must be updated to reflect the configuration change.

1. Record the fuselage station where the forward feet locking lugs of each installed seat are located (see sub-section 2.1 above).
2. Add all the recorded fuselage stations then divide the sum by the number of seats. Add 9.5 to the quotient. The result is the arm of the complete seat installation.
3. Multiply the number of seats by the appropriate individual seat weight. The result is the total weight of the seat installation.
4. Multiply the weight by the arm to arrive at the total moment.

Weight of one DFS1-01W seat assembly: 27 pounds

This includes all cushions and upholstery which, must be installed on the seat at all times when the aircraft is in operation.

For calculating weight and balance, individual seat center of gravity location is 9.5 inches aft of the forward feet locking lugs (see Figure 3.2).

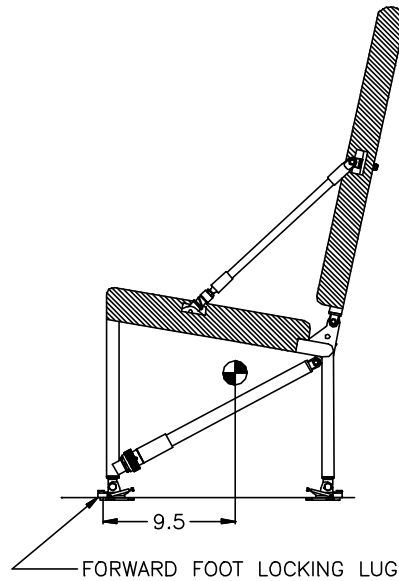


Figure 3.2
Seat Center of Gravity

Note: Seat spacing may not be less than 33 inches. The back rest of a seat may not be less than 33 inches from any object in front of it (see Fig. 3.3).

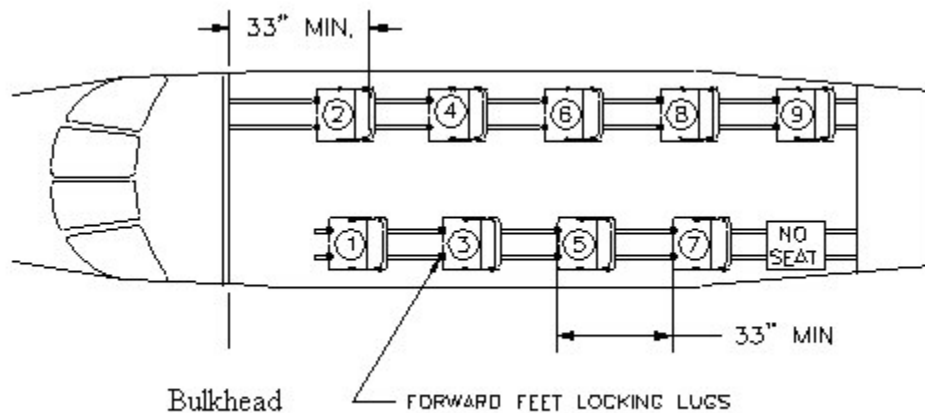
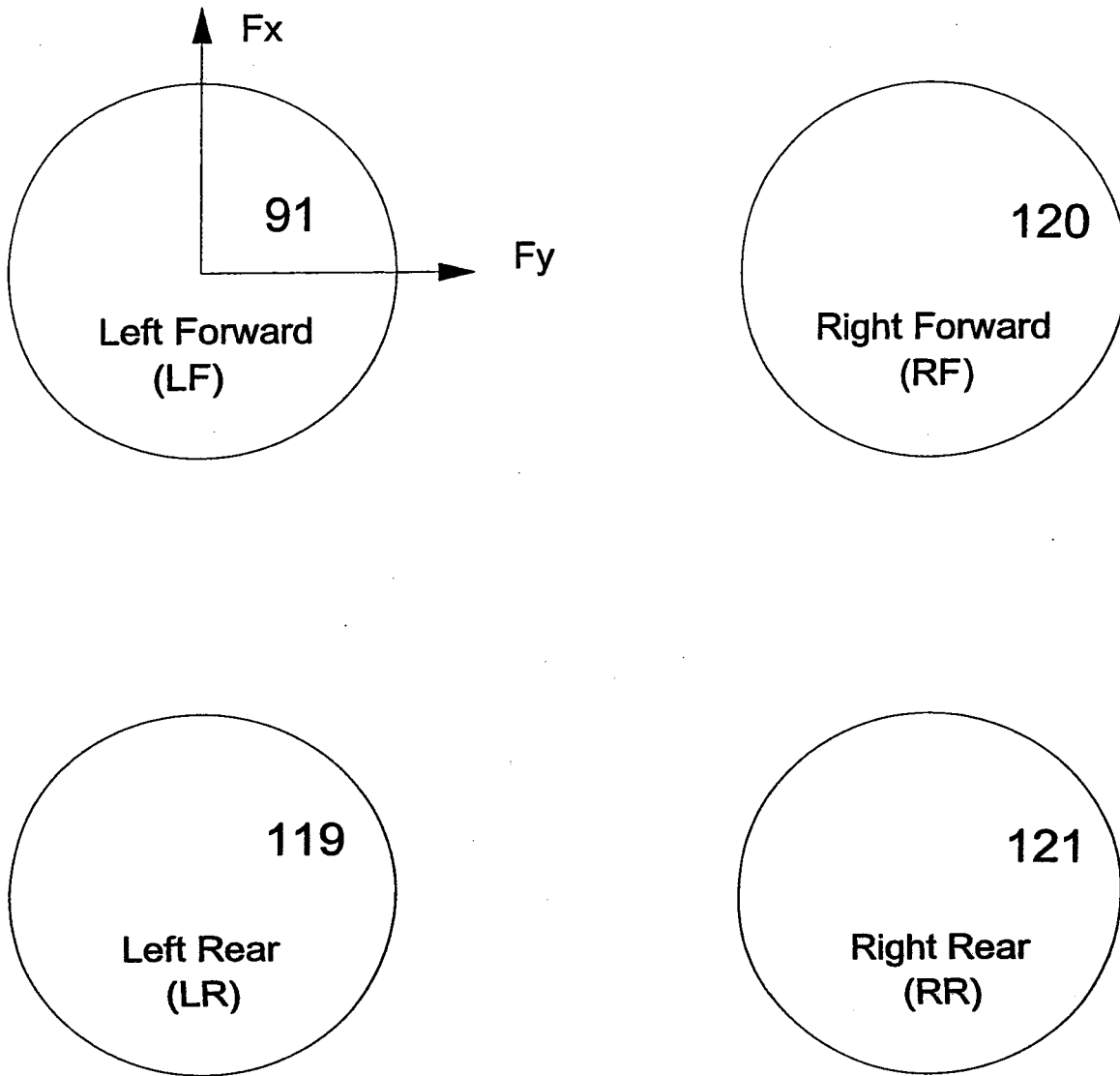


Figure 3.3
Typical Seat Locations and Spacing Requirements

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Attachment

Worst Case Time History of Floor Reactions from Dynamic Testing



1. Orientation of Seat Track / Leg Load Cells in-accordance- with SAE J211, March 1995-03.
2. Direction of x-axis (+ F_x) is sled forward.

