CHAPTER 57

WINGS

LEARJET 35/35A/36/36A
MAINTENANCE MANUAL

Chapter Section Subject	Page	Date
* 57-RTR	1	Jan 11/02
* 57-LOEP	1	Jan 11/02
* 57-Contents	1	Jan 11/02
57-00-00	1	Feb 11/00
57-00-00	2	Feb 11/00
57-00-00	3	Feb 11/00
57-00-01	201	Feb 11/00
57-00-01	202	Feb 11/00
57-00-01	203	Feb 11/00
57-00-01	204	Feb 11/00
57-00-01	205	Feb 11/00
57-00-01	206	Feb 11/00
57-00-01	207	Feb 11/00
57-00-01	208	Feb 11/00
57-00-01	209	Feb 11/00
57-00-01	210	Feb 11/00
57-00-01	211	Feb 11/00
57-10-00	1	Nov 4/83
57-10-00	2	Nov 4/83
57-10-00	3	Nov 4/83
57-20-00	1	Jun 12/87
57-20-00	2	Jun 12/87
57-20-01	201	Jun 25/93
57-20-01	202	Jun 25/93
57-20-01	203	Sep 15/89
57-20-01	204	Sep 15/89
57-30-00	1	Jun 12/87
57-30-00	2	Jun 12/87
57-30-01	201	Oct 19/90
57-30-01	202	Oct 19/90
57-30-01	203	Oct 19/90
57-30-01	204	Oct 19/90
57-30-02	201	Nov 4/83
57-30-02	202	Nov 4/83
57-30-02	203	Nov 4/83
57-30-03	201	Feb 11/00
57-30-03	202	Feb 11/00
57-30-03	203	Feb 11/00
57-30-03	204	Feb 11/00
57-30-03	205	Feb 11/00
57-30-03	206	Feb 11/00
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57-30-03	208	Feb 11/00
57-30-03	209	Feb 11/00
57-30-04	201	Feb 11/00
57-30-04	202	Feb 11/00
57-30-04	203	Feb 11/00
57-30-04	204	Feb 11/00
* 57-30-05	201	Jan 11/02
* 57-30-05	202	Jan 11/02
* 57-30-05	203	Jan 11/02
* 57-30-05	204	Jan 11/02
* 57-30-05	205	Jan 11/02
57-30-06	201	Sep 15/89
57-30-06	202	Sep 15/89
57-40-00	1	Jun 12/87
57-40-00	2	Jun 12/87
57-40-00	3	Nov 4/83
57-50-00	1	Nov 4/83
57-50-00	2	Nov 4/83
57-50-01	201	May 3/85
57-50-01	202	May 3/85

Insert latest revised pages; destroy superseded or deleted pages.

* Asterisk indicates pages revised, added, or deleted by the current revision. The portion of the text affected by the current revision is indicated by a vertical line in the outer margin of the page.

Revision Number	Status	Date	Location	Insertion Date	Inserter's Initials	Removal Date	Remover's Initials
57-1	Inactive	Jun 3/85	57-30-01 Page 201	Jun 3/85	LJ	Jan 24/86 Rev #38	LJ
57-2	Inactive	Dec 9/94	57-00-00 Page 206	Dec 9/94	LJ	Feb 11/00 Rev #68	LJ
57-3	Inactive	Jan 12/01	57-30-05 Page 202	Jan 12/01	LJ	TR No. 57-4	LJ
57-4	Inactive	Sep 28/01	57-30-05	Sep 28/01	LJ	Jan 11/02 Rev #71	LJ

WING - DESCRIPTION AND OPERATION

1. Description

A. The single-unit, fully cantilever-constructed wing consists of the leading edge, the wing box section, ailerons, flaps, spoilers, and tip tanks.

B. The multicellular-type wing structure is formed by 8 spars and 15 ribs. A tapered top skin and a uniform bottom skin cover the wing structure.

C. The integral wing fuel tanks are full span except for the main gear wheel well areas, the wing leading edges and the wing trailing edge.

D. Wing sweepback at the 25% cord is 13°.

E. The wing is attached to the fuselage by eight attach fittings which are secured by bolts.

F. Conventional-type ailerons are attached to the rear spar at two hinge points.

G. The single-slotted flaps are attached to the inboard rear spar by tracks, rollers and hinges.

H. The spoilers are installed in the top wing surface immediately forward of the flaps and are hinged to the wing rear spar at two points.

I. The tip tanks are secured to the wing by two attach fittings, one located aft of spar 1 and one located forward of spar 7.

J. Access panels located on the lower wing skin provide access to fuel and fuel vent plumbing, electrical wiring, and flight control components.

K. Attach fittings on the wing are for the main landing gear strut, tip tank, and flight controls.

L. On *Aircraft 35-002 thru 35-278 and 36-002 thru 36-044 not modified per AAK 79-10 or AMK 83-5, "Installation of Wing Fences, Stall Strips and Boundary Layer Energizers,"* two rows of vortex generators are bonded to the upper wing surface forward of the ailerons to improve flight control.

WARNING: CONSULT THE FAA APPROVED AIRPLANE FLIGHT MANUAL AIRSPEED/ MACH LIMITATIONS SECTION FOR FLIGHT OPERATIONS WITH MISSING BOUNDARY LAYER ENERGIZERS (BLE'S).

M. On *Aircraft 35-279 and Subsequent, 36-045 and Subsequent, and prior aircraft modified per AAK 79-10 or AMK 83-5, "Installation of Wing Fences, Stall Strips and Boundary Layer Energizers,"* there are three rows of boundary layer energizers (BLE's) bonded to the upper wing surfaces forward of the ailerons to improve flight control.

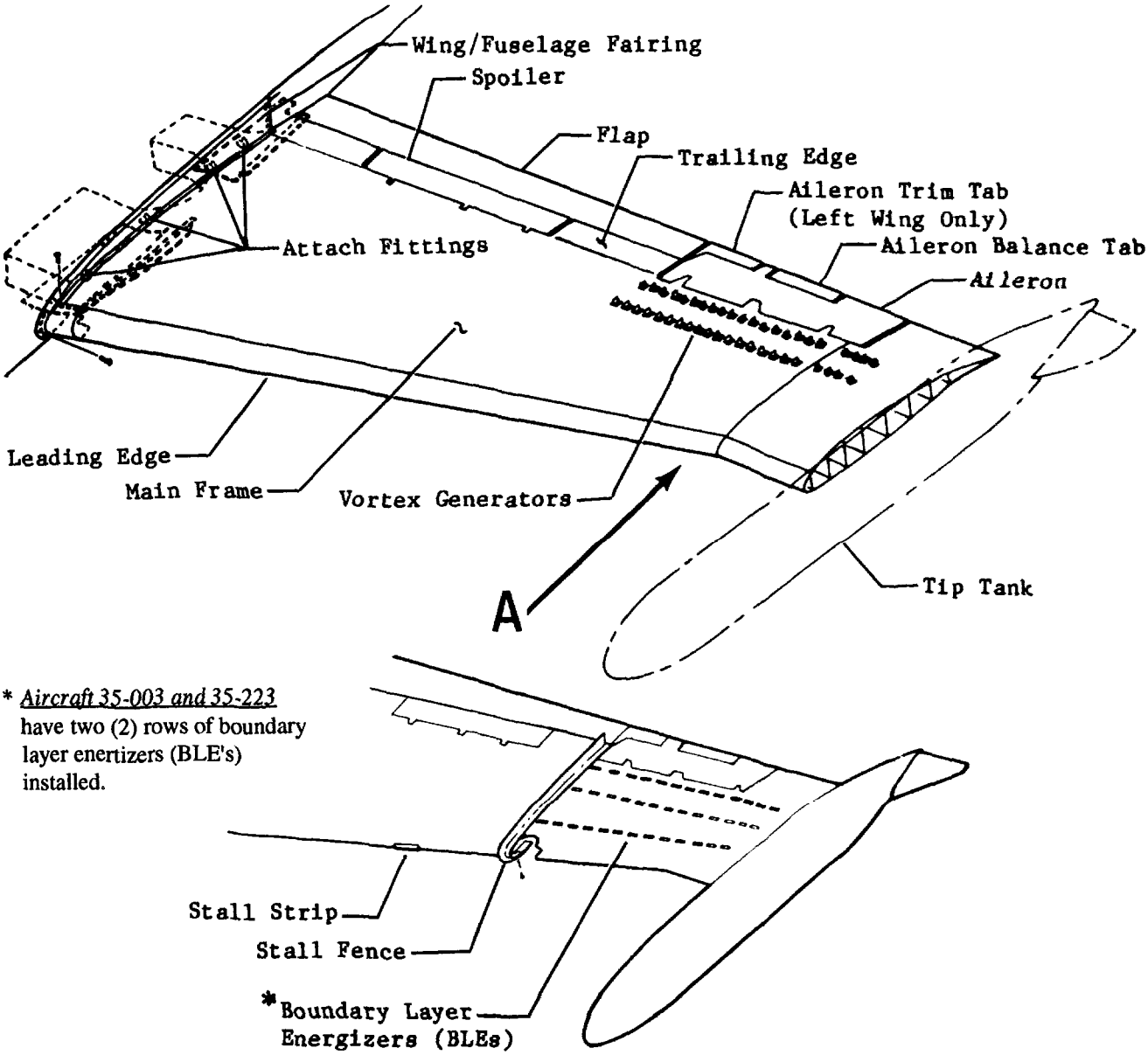
N. On *Aircraft 35-279 and Subsequent, 36-045 and Subsequent, and prior aircraft modified per AAK 79-10 or AMK 83-5, "Installation of Wing Fences, Stall Strips and Boundary Layer Energizers,"* a stall fence is installed on each wing at WS 125. The stall fence is installed in three sections and aids in controlling the air flow over the wing surface.

WARNING: STALL STRIP AND TRIANGLE LOCATIONS ARE CRITICAL IN MAINTAINING THE DESIRED AIRCRAFT FLIGHT CHARACTERISTICS.

THE STALL TRIANGLE EDGES MUST REMAIN SHARP, WITHIN 0.005-INCH (0.127 mm) MAXIMUM RADIUS. POWER BUFFING OR POLISHING OF THE STALL TRIANGLES IS PROHIBITED. A LOSS OF PLATING ON STALL TRIANGLES INDICATE TRIANGLES MAY HAVE BEEN INADVERTENTLY BUFFED AND SHALL BE CHECKED FOR PROPER TOLERANCE. IF OUT OF TOLERANCE, TRIANGLES MUST BE REPLACED. (REFER TO 57-30-05.)

SHOULD A STALL STRIP OR TRIANGLE BECOME LOOSE OR DISLODGED, REPAIR MUST BE PERFORMED AT AN AUTHORIZED LEARJET REPAIR FACILITY.

O. On *Aircraft 35-279 and Subsequent, 36-045 and Subsequent, and prior aircraft modified per AAK 79-10 or AMK 83-5, "Installation of Wing Fences, Stall Strips and Boundary Layer Energizers,"* a stall strip is installed on each wing leading edge inboard of WS 90. Stall strip location is critical to maintain desired flight characteristics. Stall strip replacement is authorized as long as a new strip can be attached exactly where the old strip was located and subsequent flight testing confirms that no position adjustment is necessary. Otherwise, installation of a replacement stall strip must be accomplished at a Learjet Factory Authorized Repair Facility.



Effective on Aircraft 25-279 and Subsequent, 36-045 and Subsequent, and prior aircraft modified per AAK 79-10 or AMK 83-5, "Installation of Wing Fences, Stall Strips, and Boundary Layer Energizers".

Detail A

Wing Locator
Figure 1

1. **Removal/Installation**
   A. Removal of Wing (See Figure 201.)
      (1) Acquire necessary tools and equipment.

NOTE: Equivalent substitutes may be used for the following items.

NAME	PART NUMBER	MANUFACTURER	USE
Spreader Bar	2311600-500	Learjet Inc.	Support fuselage structure.
Wing Mating Dolly	2420000	Learjet Inc.	Raise/lower wing.
Wing Transfer Dolly	2300001	Learjet Inc.	Position wing.
Engine Pylon Jacks (5 ton capacity, collapsed height 64")		Commercially Available	Lift aircraft.
Pylon Jack Pads	3170003-1 (2 each)	Learjet Inc.	Provide safe lifting point for aircraft.
Nose Jack	02-0526-0100	Tronair Holland, OH	Lift aircraft.
Nose Jack Pad	2370102-4	Learjet Inc.	Provide safe lifting point for aircraft.
Drip Pans		Commercially Available	Catch fuel and hydraulic fluid.
Wing Protective Cover	9001617	Learjet Inc.	Protect wing surfaces.
Drive Pins	Fabricate as reqd.		Drive/remove bolts.
9X Rivet Gun with Flush Set		Commercially Available	Installing attaching parts.
Rope		Commercially Available	Securing main landing gear.

(2) Defuel aircraft and purge fuel tanks. (Refer to Chapter 12.)
(3) Preferred method of jacking aircraft.
   (a) Remove engines from aircraft. (Refer to Chapter 71.)
   (b) Install a jack pad and jack at LH and RH end of engine beam. Position jacks to obtain maximum clearance between trailing edge of wing and jacks.
   (c) Install jack pad and jack under nose of aircraft.
   (d) Raise aircraft until main landing gear tires are clear of the ground.

(4) Alternate method of jacking aircraft.
  (a) Install friction jack pads and jacks under engine pylons. Position jacks to obtain maximum clearance between trailing edge of wing and jacks.
  (b) Install jack pad and jack under nose of aircraft.
  (c) Raise aircraft until main landing gear tires are clear of the ground.
(5) Remove wing flaps from aircraft. (Refer to Chapter 27.)
(6) Pressurize hydraulic system to 1500 (±50) psi [10,342([±345) kPa].
(7) Retract spoilers.
(8) Raise landing gear enough to unlock main landing gear down locks. Secure main landing gear with rope so that they cannot be pushed into the locked position during subsequent steps.
(9) Bleed pressure from hydraulic system and drain reservoir.
(10) Disconnect and remove batteries from aircraft.
(11) Lower inboard main landing gear wheel well doors.
(12) Install protective cover on top inboard side of wing and wing leading edge.
(13) Remove wing fillet fairings on top of wing and access doors under wing and fuselage. Tag parts as they are removed and retain for reinstallation.
(14) Drill out rivets from trailing edge of wing-to-fuselage fairing inboard of wing flaps (see Figure 201). Do not remove rivets from fairing attached to wing.
(15) Disconnect ADF antenna, if installed under fuselage, and stow.
(16) Disconnect wing-to-fuselage electrical connectors above each landing gear wheel well. Tag connectors.
(17) Disconnect plumbing fittings and electrical connectors as required at both ends of keel beam. Use drip pans to catch residual fuel and hydraulic fluid from plumbing. Cap fittings and connectors.
(18) Disconnect and cap plumbing fittings and electrical connectors as required at both sides of keel beam.
(19) Disconnect and cap hydraulic fittings on top of the wing between the two center wing attach fittings. Reposition fittings to clear wing.
(20) Disconnect aileron cable turnbuckles at keel beam and forward of flaps. Remove pulleys or cable guard pins as required and pull cables through wing. Stow cables.

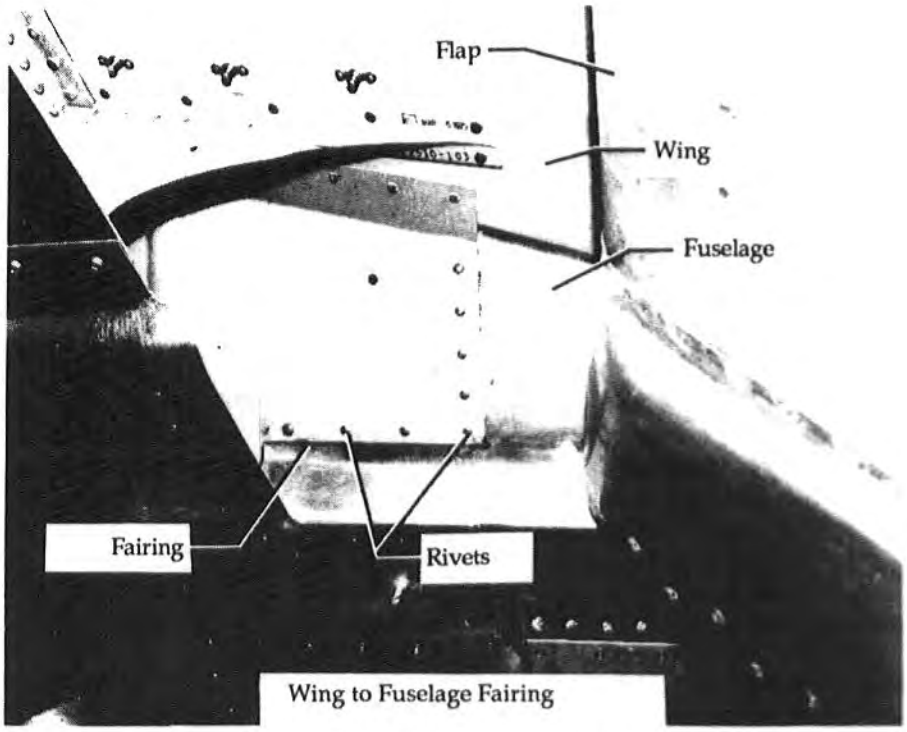
NOTE: Attach string to flight control cable terminals before pulling cables through structure. Pull cables clear of keel beam and secure string to structure. When reinstalling cables, use these strings as a guide to prevent misrouting cables.

(21) Remove seats and divan from aircraft.
(22) Remove cabin floorboards.
(23) Remove interior arm rests on both sides of cabin to allow access to upper wing torsion link bolts.
(24) Remove liner at lower right side of baggage compartment and disconnect shielded connectors for flux valve.
(25) Disconnect elevator control cable turnbuckles. Remove cable fairleads and pressure seals at frame 15. Pull cables through frame 15 into cabin. Stow cables.
(26) Disconnect rudder control cable turnbuckles aft of pilot's pedestal and pull cables through to clear keel beam. Stow cables.

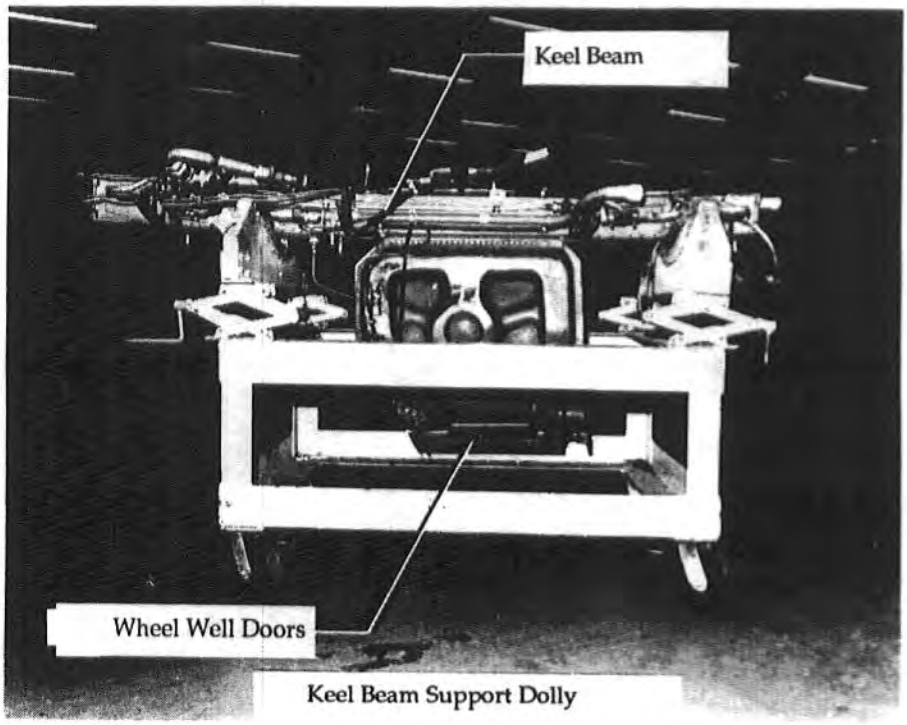
CAUTION: THROTTLE CABLE CAN BE DAMAGED WHEN IMPROPERLY HANDLED OR STORED. REFER TO CHAPTER 76 FOR INSTRUCTIONS ON HANDLING AND STORAGE OF ENGINE THROTTLE CABLES.

(27) Disconnect engine throttle cables and remove from aircraft. Store cables. (Refer to Chapter 76.)
(28) Remove left tip tank tailcone and fin.

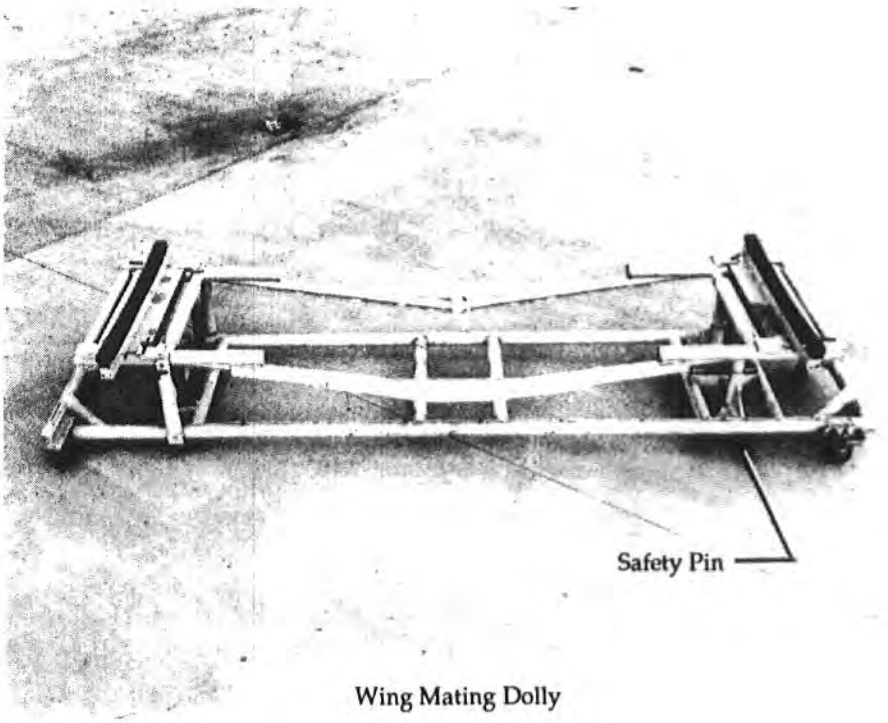
NOTE: Remove the right tip tank tailcone and fin when removing the wing from the left side of fuselage.



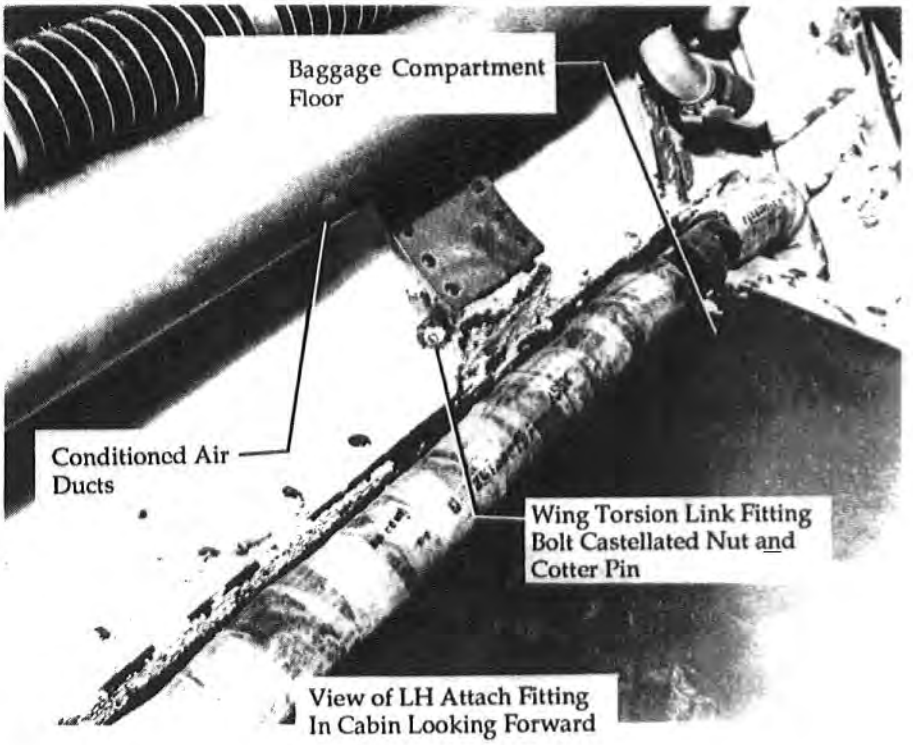
VIEW OF LEFT WING LOOKING INBOARD



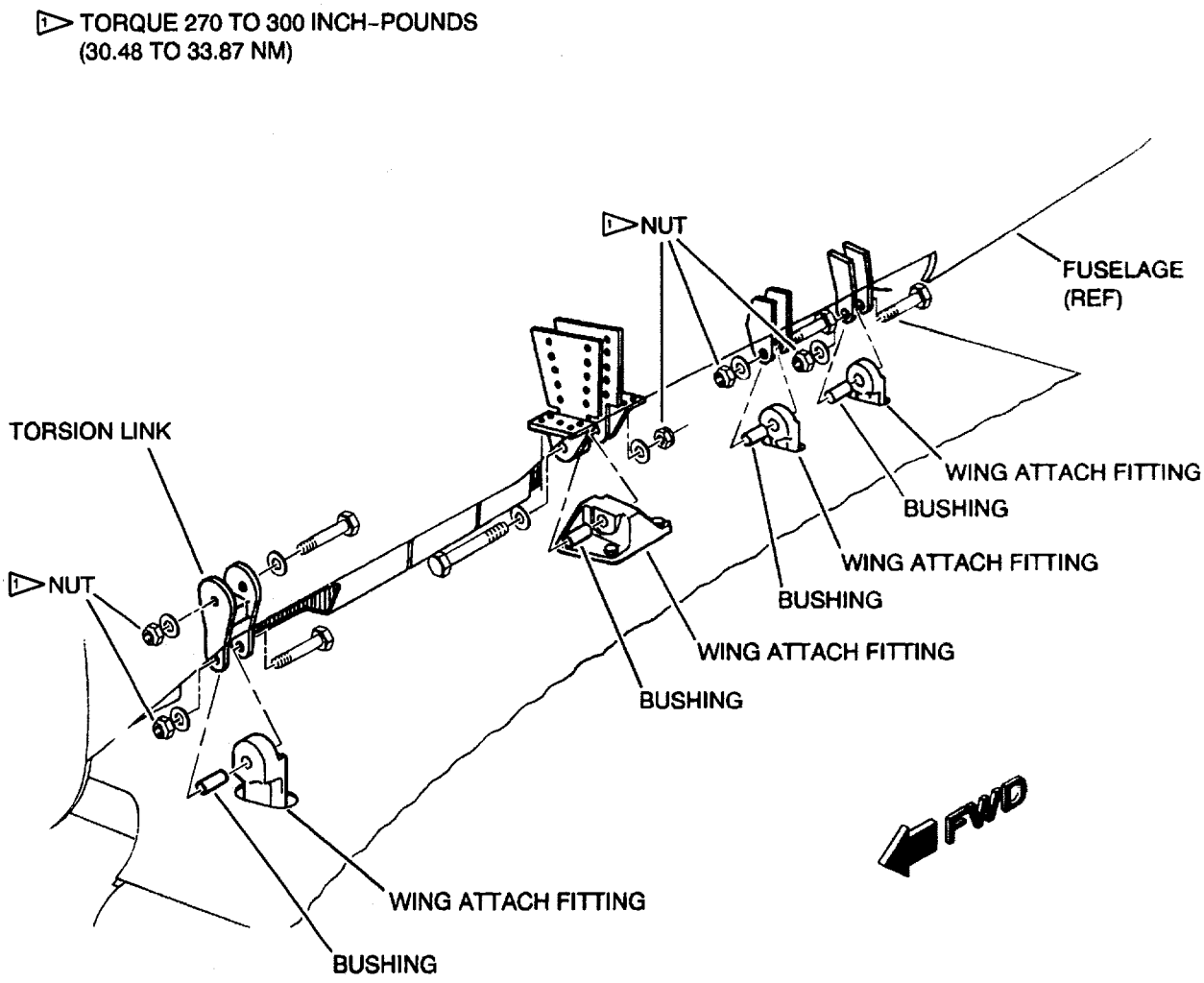
Wing Removal and Installation
Figure 201 (Sheet 1 of 4)



Wing Mating Dolly

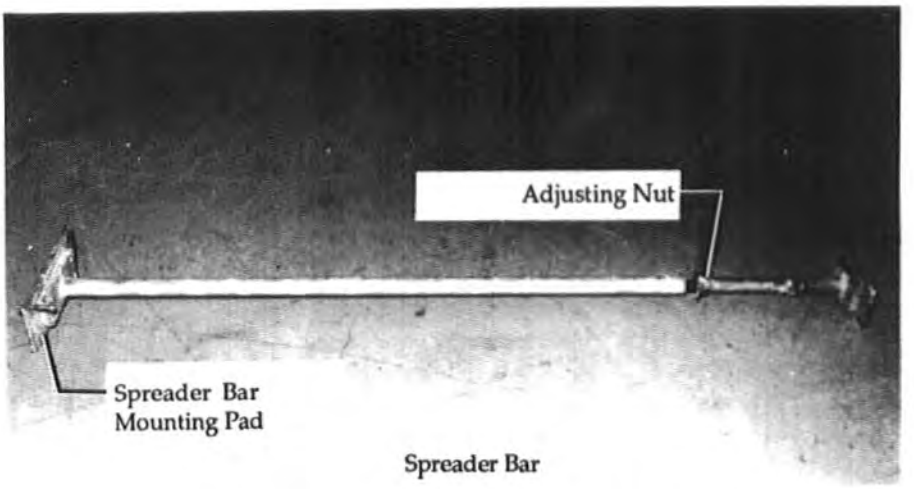


Wing Removal and Installation
Figure 201 (Sheet 2 of 4)



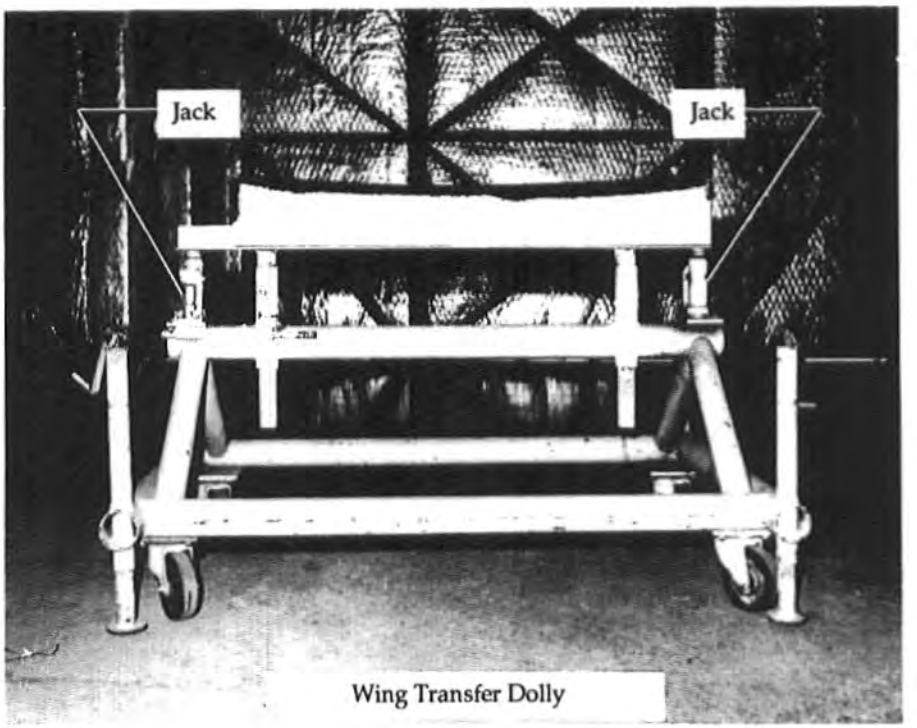
WING TO FUSELAGE ATTACH FITTINGS

Wing Removal and Installation
Figure 201 (Sheet 3 of 4)



Spreader Bar

Install spreader bar between keel beam mounting pads on fuselage



Wing Removal and Installation
Figure 201 (Sheet 4 of 4)

(29) Disconnect wing leading edge anti-ice hoses and temperature sensor wiring at inboard leading edge of wing.
(30) Check that all plumbing and electrical wiring is disconnected between keel beam and wing.
(31) Support keel beam and remove four bolts at each end of keel beam.
(32) Remove keel beam vent hoses and sump.
(33) Remove keel beam from aircraft and place on dolly. (See Figure 201.)
(34) Raise main landing gears sufficiently to clear wing mating dolly and tie landing gears in place with ropes.
(35) Center mating dolly under wing and raise dolly until wing is supported. Install safety pins in mating dolly. (See Figure 201.)
(36) Gain access to the upper wing torsion link bolts in both sides of cabin (Frame 16 location). Remove insulation and sealer from bolts and castellated nuts. (See Figure 201.)
(37) Remove cotter pins and remove nuts from torsion link bolts.
(38) Use drive pin and remove upper wing torsion link bolts from Frame 16.
(39) Remove nuts from six remaining wing attach fitting bolts. Use drive pin and remove bolts. (See Figure 201.)
(40) Remove safety pins from mating dolly and slowly lower wing. Check that all lines and wiring are disconnected and clear of obstructions.
(41) Lower left wing as low as the mating dolly will permit.
(42) Raise fuselage with engine pylon jacks and nose jack sufficiently to allow left tip tank to clear fuselage.
(43) Roll mating dolly to the right of the fuselage until left tip tank clears the fuselage. Use care to prevent dents and scratches to wing or tip tank.

CAUTION: THE SPREADER BAR MUST REMAIN INSTALLED AT ALL TIMES WHEN WING IS REMOVED FROM THE AIRPLANE. THIS IS TO PREVENT STRUCTURAL DAMAGE TO FUSELAGE.

(44) After wing is removed from fuselage, install spreader bar between keel beam mounting pads. (See Figure 201.)

CAUTION: THE SPREADER BAR MUST REMAIN INSTALLED AT ALL TIMES WHEN WING IS REMOVED FROM THE AIRPLANE. THIS IS TO PREVENT STRUCTURAL DAMAGE TO FUSELAGE.

B. Installation of Wing

NOTE: Prior to installing wing, perform eddy current inspection of the wing attach fitting and fuselage to wing attach fittings and treat with epoxy primer. (Refer to Part 3, Chapter 57, of the NDI Manual.) The wing attach fitting bushings should be taped to prevent primer from entering bushings.

Apply a coat of VV-P-236 petrolatum to mating surfaces of fittings prior to installation of wing.

Apply sealant in areas as required to replace sealant previously removed.

(1) Acquire necessary tools and equipment.

NOTE: Equivalent substitutes may be used for the following items.

NAME	PART NUMBER	MANUFACTURER	USE
Spreader Bar	2311600-500	Learjet Inc.	Support fuselage structure.
Wing Mating Dolly	2420000	Learjet Inc.	Raise/lower wing.
Wing Transfer Dolly	2300001	Learjet Inc.	Position wing.
Engine Pylon Jacks (5 ton capacity, collapsed height 64")		Commercially Available	Lift aircraft.
Pylon Jack Pads	3170003-1 (2 each)	Learjet Inc.	Provide safe lifting point for aircraft.
Nose Jack	02-0526-0100	Tronair Holland, OH	Lift aircraft.
Nose Jack Pad	2370102-4	Learjet Inc.	Provide safe lifting point for aircraft.
Drip Pans		Commercially Available	Catch fuel and hydraulic fluid.
Wing Protective Cover	9001617	Learjet Inc.	Protect wing surfaces.
Drive Pins	Fabricate as reqd.		Drive/remove bolts.
Centering Pins	Fabricate from old bolts		Align bolt holes.
9X Rivet Gun with Flush Set		Commercially Available	Installing attaching parts.

NAME	PART NUMBER	MANUFACTURER	USE
Petrolatum	VV-P-236	Commercially Available	Lubricate surfaces.
Sealant	Refer to Chapter 20.		Replace previously removed sealant.
Torque Wrench		Commercially Available	Torque attaching parts.

(2) Install front lower attach fitting torsion links to forward wing attach fitting using new bolts, nuts, and washers.
(3) Position both torsion links in the vertical position and assure that the attach fitting bushings are in place. Torque nuts 270 to 300 inch-pounds.
(4) Remove spreader bar from fuselage.
(5) Using wing mating dolly, move wing under fuselage in the reverse order in which wing was removed. Use special care not to damage wing or fuselage.
(6) After wing is positioned under fuselage, raise wing as high as wing mating dolly will permit. Install safety pins in dolly.
(7) Slowly lower fuselage on wing by lowering the two pylon jacks and nose jack. Use special precaution that cables and plumbing are clear of obstructions.
(8) Position front wing attach torsion links to fit in upper fitting of fuselage.
(9) Adjust jacks until the eight fuselage-to-wing attach fitting bolt holes align.

NOTE: Install wing transfer dolly under each wing and adjust transfer dolly to assist in alignment of wing attach fitting holes.

Use centering pins to align wing attach bolt holes. Install centering pins and bolts from the aft side of wing attach fitting except for the spar 5 attach fitting. The spar 5 bolt is installed from the forward side of fitting. Install wing attach bolts starting at the forward fittings and progress aft.

Use a 9X rivet gun or equivalent with a flush set and a drive pin to drive centering pins and wing attach bolts into fittings.

(10) Drive centering pins from aft side of upper wing attach fitting torsion links using drive pin and rivet gun. Use special care to prevent damage to attach fittings. (Upper forward attach fittings are accessible from inside cabin.)
(11) Drive new wing attach bolts in behind centering pins, driving out centering pins from holes.
(12) Install washers and castellated nuts on upper torsion link attach bolts and torque nuts 270 to 300 inch-pounds. Install cotter pin and apply ProSeal 890 Sealant around bolt head and nut. This is to prevent cabin pressure from leaking through fitting.
(13) Check next aft wing attach bolt holes for alignment.
(14) After fittings are aligned, drive centering pins in fittings using rivet gun and drive pin.
(15) Drive new attach fitting bolts in fittings, driving out centering pin.
(16) Install washers and self-locking nuts on attach bolts and torque nuts 270 to 300 inch-pounds.

CAUTION: WHEN DRIVING PINS AND BOLTS FOR THE FOUR REMAINING FITTINGS, USE A BUCKING BAR AND BACK UP WING ATTACH FITTINGS. THIS IS TO PREVENT DAMAGE TO ATTACH FITTING AND TO KEEP IT FROM SPREADING.

(17) Install remaining wing attach bolts and install washers and self-locking nuts. Torque nuts 270 to 300 inch-pounds.
(18) Lower wing mating dolly and transfer dolly and remove from under aircraft.
(19) Visually inspect keel beam attach fittings for general condition.
(20) Apply epoxy primer on keel beam mounting pads as required.
(21) Position keel beam under fuselage. Route vent tubes at aft end of keel beam into fuselage.
(22) Push keel beam in between mounting pads and secure keel beam using existing bolts, nuts and washers. Torque nuts 100 to 140 inch-pounds.

NOTE: Forward keel beam attach bolts must be installed through frame 15. The forward keel beam fitting is accessible forward of frame 15 under floorboard.

(23) Untie rope and lower main landing gear.
(24) Connect plumbing and electrical wiring between keel beam and wing.
(25) Connect plumbing and electrical wiring between fuselage and wing.
(26) Connect wing leading edge anti-ice hoses and temperature sensor wiring.
(27) Install tip tank tailcone and fin using existing hardware.
(28) Install engine throttle cables. (Refer to Chapter 76.)

CAUTION: CAREFULLY CHECK FOR THE CORRECT ROUTING OF FLIGHT CONTROL CABLES; MISROUTING OF CABLES MAY RESULT IN WEAR OF COMPONENTS OR THE BINDING OF CABLES.

(29) Route flight control cables through frame 15 and keel beam and connect turnbuckles. Rig cables. (Refer to Chapter 27.)
(30) Route aileron cables in wing and connect turnbuckles and install pulleys and guide pins. Rig cables. (Refer to Chapter 27.)
(31) Install cable fairleads and pressure seals at frame 15.
(32) Install flux valve connector in baggage compartment and reseal connectors. Replace liner.
(33) Install cabin floorboards.
(34) Install interior arm rests.
(35) Install cabin seats and divan.
(36) Apply sealant between trailing edge of wing-to-fuselage fairing inboard of wing flaps and install rivets that were previously removed.

CAUTION: USE CORRECT LENGTH OF SCREWS WHEN INSTALLING WING FILLET FAIRING. SCREWS THAT ARE TOO LONG MAY CAUSE DAMAGE TO SEALED DOME NUTPLATES IN THE WING FUEL AREA AND CABIN AREA.

(37) Apply aerodynamic sealant around wing fillet fairing and install screws.
(38) Install ADF antenna if necessary under fuselage.
(39) Check that all plumbing and electrical wiring is connected.
(40) Install wing flaps.
(41) Service hydraulic reservoir.
(42) Install and connect aircraft batteries.
(43) Apply pressure to hydraulic system and perform leak check.

CAUTION: CHECK THAT FLAPS, SPOILERS, AND LANDING GEAR ARE CLEAR OF OBSTRUCTIONS PRIOR TO OPERATION.

(44) Cycle flaps, spoilers, and landing gear until air is bled from the hydraulic system.
(45) Perform landing gear operational check. (Refer to Chapter 32.)
(46) Position landing gear to down and locked.

CAUTION: ASSURE THAT GEARS ARE LOCKED PRIOR TO PERFORMING STEP (45).

(47) Lower aircraft and remove jack and jack pads from aircraft.
(48) Install engines, if engines were removed from aircraft. (Refer to Chapter 71.)

CAUTION: CHECK THAT CONTROL CABLES ARE CORRECTLY ROUTED AND ARE NOT RUBBING OR BINDING.

(49) Perform flight controls operational check.
(50) Fuel aircraft and perform leak check and fuel system operational check.
(51) Perform operational checks as required on all systems that were previously disconnected.
(52) Remove wing protective covering and install wing and fuselage access doors.
(53) Perform flux valves and magnetic compass calibration adjustment. (Refer to Chapter 34.)

3. Repairs

NOTE: For upper wing skin fastener replacement, refer to the Structural Repair Manual.

MAIN FRAME - DESCRIPTION AND OPERATION

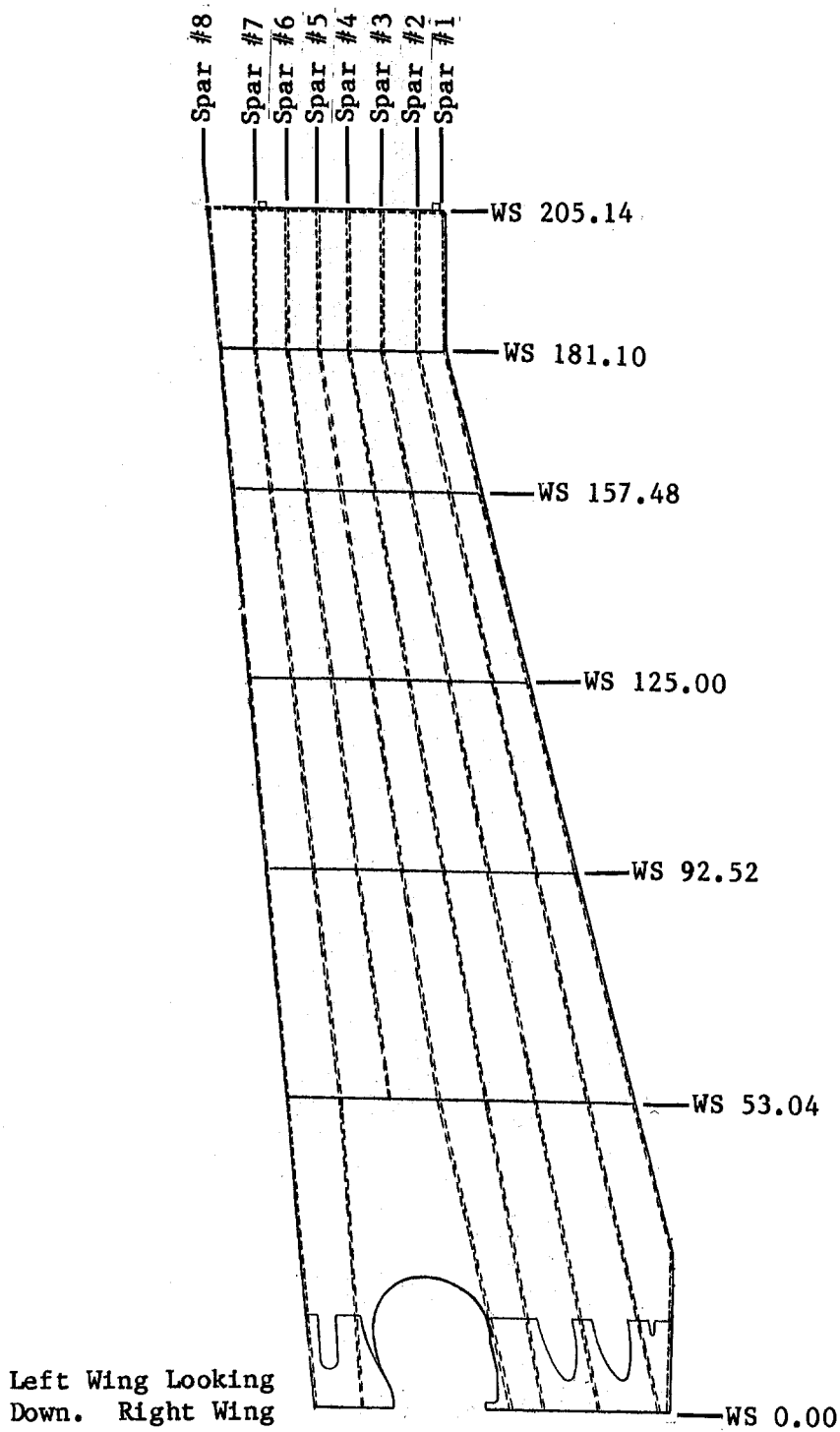
1. DESCRIPTION

A. The wing structure main frame consists of the portion of wing forward of spar 7 and aft of spar 1.

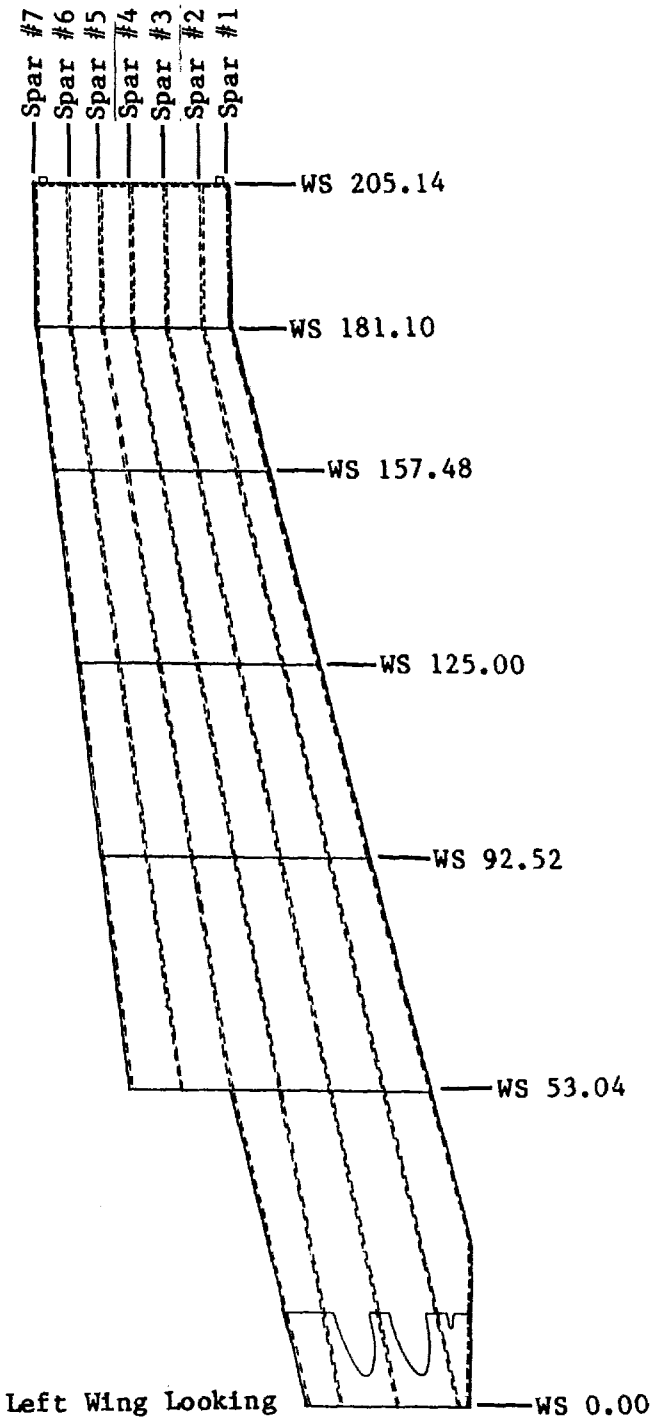
B. The main frame portion of the wing, with the exception of the main gear well, is an integral fuel tank. The outboard rib, spar 7, and spar 1 are sealed liquid tight to retain fuel. The ribs have holes with flapper valves over them to facilitate fuel flow through the wing. Small vent holes are incorporated in the upper and lower portion of each spar and rib. This allows fuel to flow from one compartment to the other.

C. The outboard rib incorporates the attach fittings for the tip tanks. One attach fitting is located aft of spar 1 and one, forward of spar 7.

D. The main gear wheel well incorporates forward and aft attach fittings for the main gear strut and an attach fitting for the main gear actuator.



Wing Main Frame
Figure 1



Wing Integral Fuel Tank
Figure 2

AUXILIARY STRUCTURE - DESCRIPTION AND OPERATION

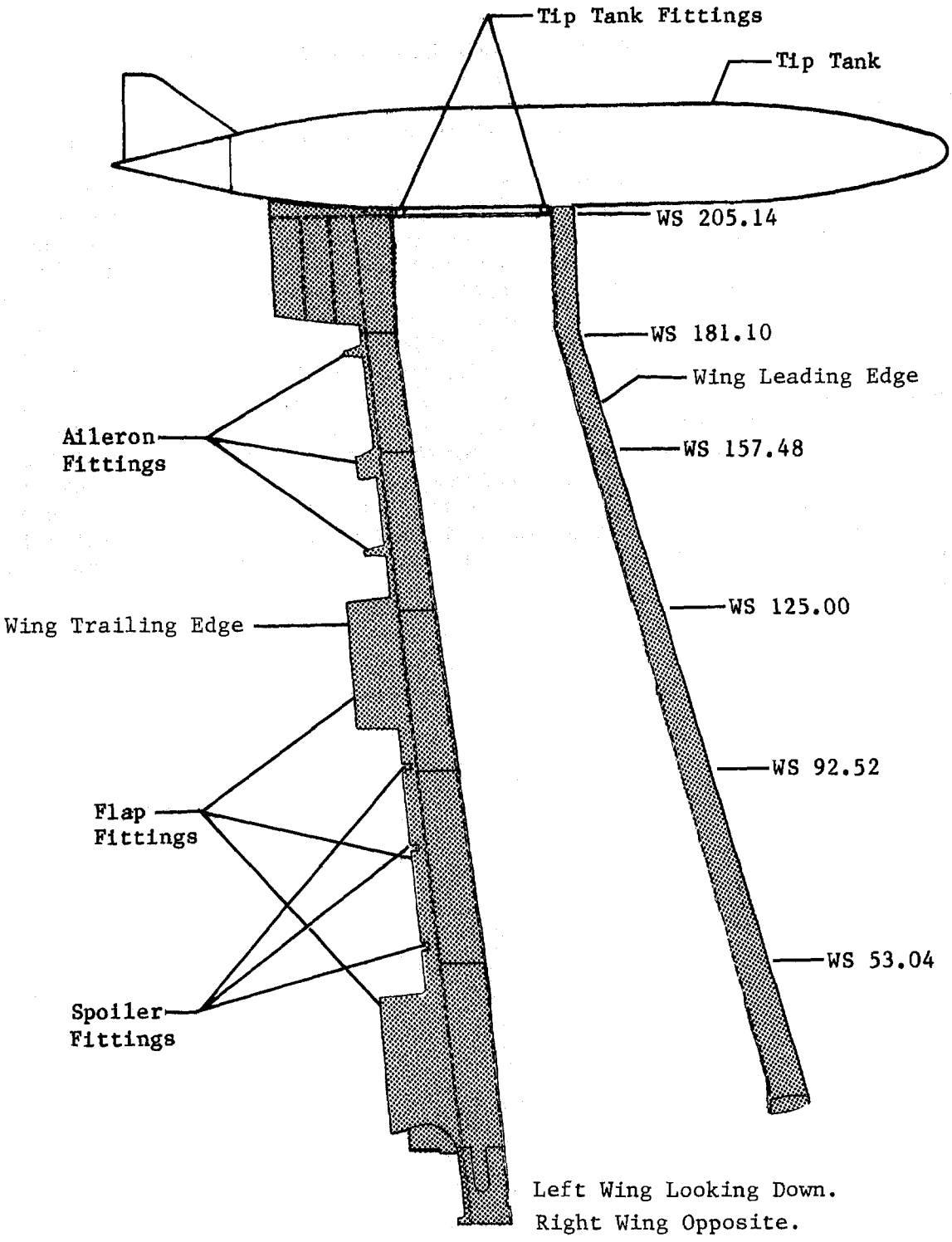
1. DESCRIPTION

A. The wing auxiliary structure consists of the wing leading edge, trailing edge, and tip tank.

B. The wing leading edge is that portion of the wing located forward of spar 1. A diffuser tube, located in the leading edge, provides anti-ice protection by distributing hot engine bleed air. A scupper located on the lower outboard portion of the leading edge provides an exhaust for the bleed air.

C. The wing trailing edge is that portion of the wing located aft of spar 7 excluding control surfaces. The aft wing spar 8 incorporates hinge fittings for the ailerons, flaps, and spoilers.

D. The tip tanks are positioned to the wing at 2° nose down. Two attach points, one aft of wing spar 1 and one forward of wing spar 7, secure the tip tank to the wing. Access covers on the top of the tank provide access for inspection and maintenance. Baffles are installed to minimize fuel slosh and prevent adverse fuel affects on the aircraft center of gravity during extreme flight attitudes. A recognition light is installed in the forward end of the right tip tank. A fuel dump valve is installed in the aft bulkhead of each tip tank. Refer to Chapter 28 for tip tank maintenance practices.



Auxiliary Structure
Figure 1

WING LEADING EDGE - MAINTENANCE PRACTICES

1. Removal/Installation

WARNING:
- AFTER EACH INSTALLATION OF A WING LEADING EDGE, A FLIGHT TEST SHALL BE PERFORMED BY A LEARJET INC. QUALIFIED PILOT TO DETERMINE THAT THE WING LEADING EDGE IS PROPERLY INSTALLED. POSSIBLE ADJUSTMENTS TO THE STALL WARNING SYSTEM MAY BE NECESSARY. REFER TO CHAPTER 27 FOR STALL WARNING FLIGHT TEST PROCEDURES.
- USE EXTREME CARE NOT TO DAMAGE A WING LEADING EDGE WHEN REMOVING OR INSTALLING A STALL STRIP OR STALL FENCE. IF THE WING LEADING EDGE IS DAMAGED, APPROPRIATE ACTION SHALL BE TAKEN TO EFFECT PROPER REPAIRS. FAILURE TO DO SO WILL JEOPARDIZE FLIGHT SAFETY OF THE AIRCRAFT.

NOTE:
- The wing leading edge is installed in two sections on each wing and is connected to the wing with a series of screws.
- The wing leading edge is fit to the contour of the wing and affects the direction of the air flow over the wing surface. If the wing leading edge is not properly positioned, it will have an adverse effect on the desired lift characteristics of the wing, causing the wing stall speed to change.
- The wing leading edge houses the wing anti-ice plumbing, wing anti-ice heat sensor, and thermostat. (Refer to Chapter 30 for heat sensor and thermostat maintenance.)
- Authorized maintenance to the wing leading edge without Learjet factory approval is limited to removal and installation. A new wing leading edge shall be installed at an authorized Learjet repair facility.

A. Remove Wing Leading Edge (See Figure 201.)
   (1) Remove fuselage-to-wing fairing attachment screws and remove fairing.
   (2) Disconnect and identify wing anti-ice plumbing and (right wing only) electrical wiring at inboard end of wing leading edge. Cap all openings and fittings.

CAUTION: SUPPORT WING LEADING EDGE SO THAT THE LEADING EDGE AND ATTACHING SCREWS WILL NOT BE DAMAGED DURING THE REMOVAL PROCEDURE.

   (3) Remove wing leading edge attaching screws and wing leading edge from aircraft.

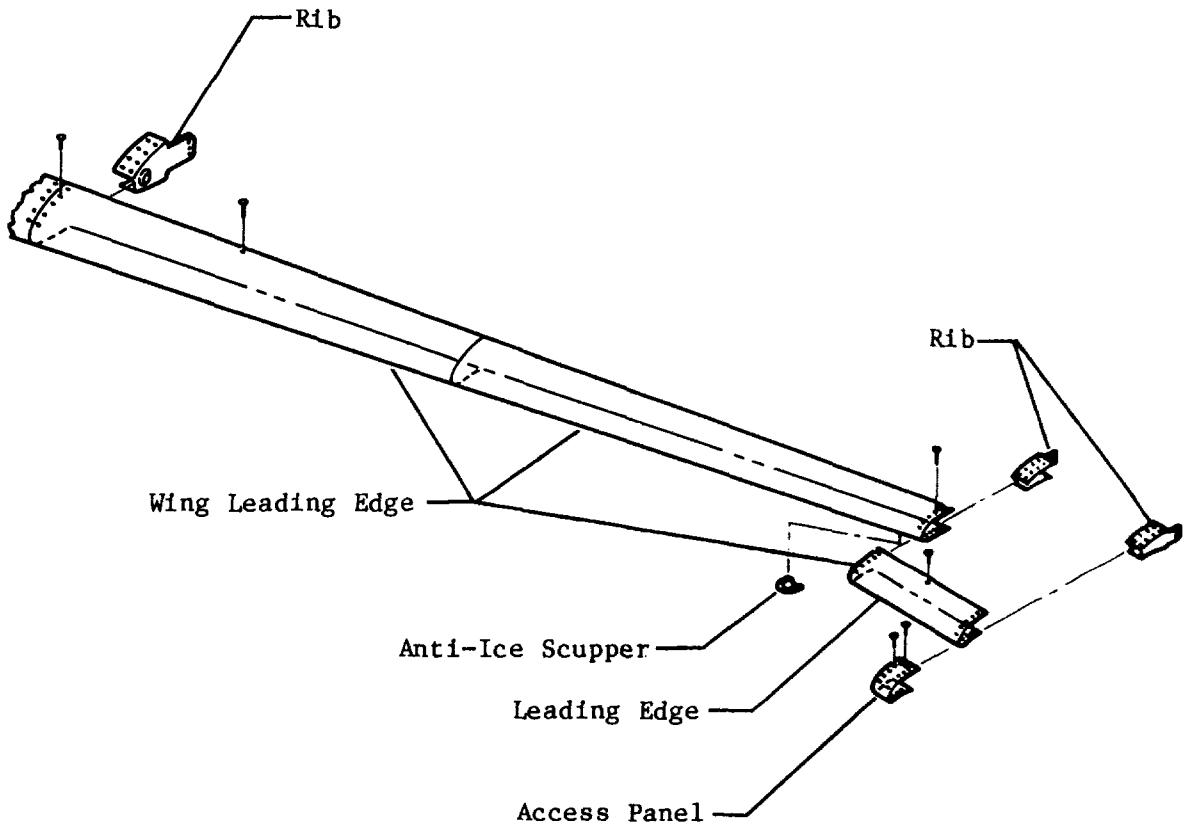
B. Install Wing Leading Edge (See Figure 201.)
   (1) Mechanically remove old filler from skin gap of leading edge and wing and from around fuselage-to-wing fairing installation area.
   (2) Clean skin gap and fairing installation area with MEK. Wipe dry. Do not allow MEK to air dry as a residue will remain on surface.

CAUTION: SUPPORT THE WING LEADING EDGE SO THAT THE LEADING EDGE AND ATTACHING SCREWS WILL NOT BE DAMAGED DURING THE INSTALLATION PROCEDURE.

(3) Position leading edge on wing and secure with attaching screws.
(4) Remove caps and connect anti-ice plumbing. Identify and connect (right wing only) electrical wiring at inboard end of leading edge.
(5) Place the fuselage-to-wing fairing in position and secure with attaching screws.
(6) Mix Pro-Seal 890B in accordance with manufacturer's instructions.
(7) Using Semco Sealing Gun No. 250 or equivalent, fill skin gap between leading edge and wing with sealant prepared in step 1.B.(6).

NOTE: Blend gap sealant with the wing contour. The sealant shall have continuous contact with the bottom and sides of the skin gap.

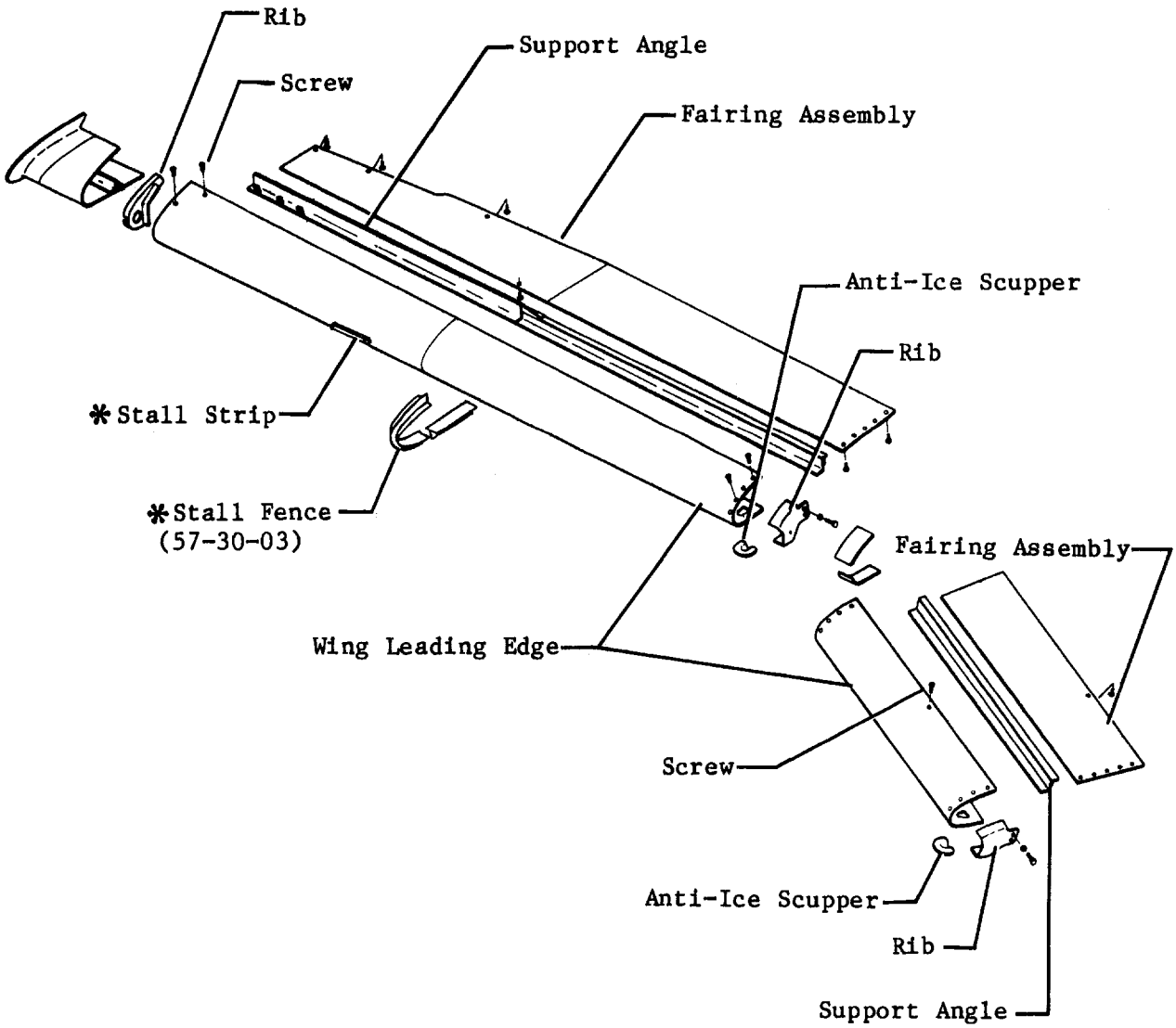
(8) Allow sealant to cure in accordance with manufacturer's instructions.
(9) Using Pro-Seal 890B mixed in step 1.B.(6), apply a fillet seal between fuselage-to-wing fairing and fuselage. Fillet seal to aerodynamically blend with fairing. Allow sealant to cure in accordance with manufacturer's instructions.
(10) Prime and paint as required. (Refer to Chapter 20.)



(TYPICAL)

Wing Leading Edge Installation
Figure 201 (Sheet 1 of 2)

* Aircraft 35-279 and Subsequent, 36-045 and Subsequent and prior aircraft modified by AAK 79-10 or AMK 83-5, "Installation of Wing Fences, Stall Strips and Boundary Layer Energizers"



(TYPICAL)

Wing Leading Edge Installation
Figure 201 (Sheet 2 of 2)

PLATES/SKIN - DESCRIPTION AND OPERATION

1. DESCRIPTION

A. The wing structure is covered with a milled aluminum skin. The lower wing skin incorporates access panels which provide access to the fuel vent plumbing, fuel tanks, flight controls, and electrical connections.

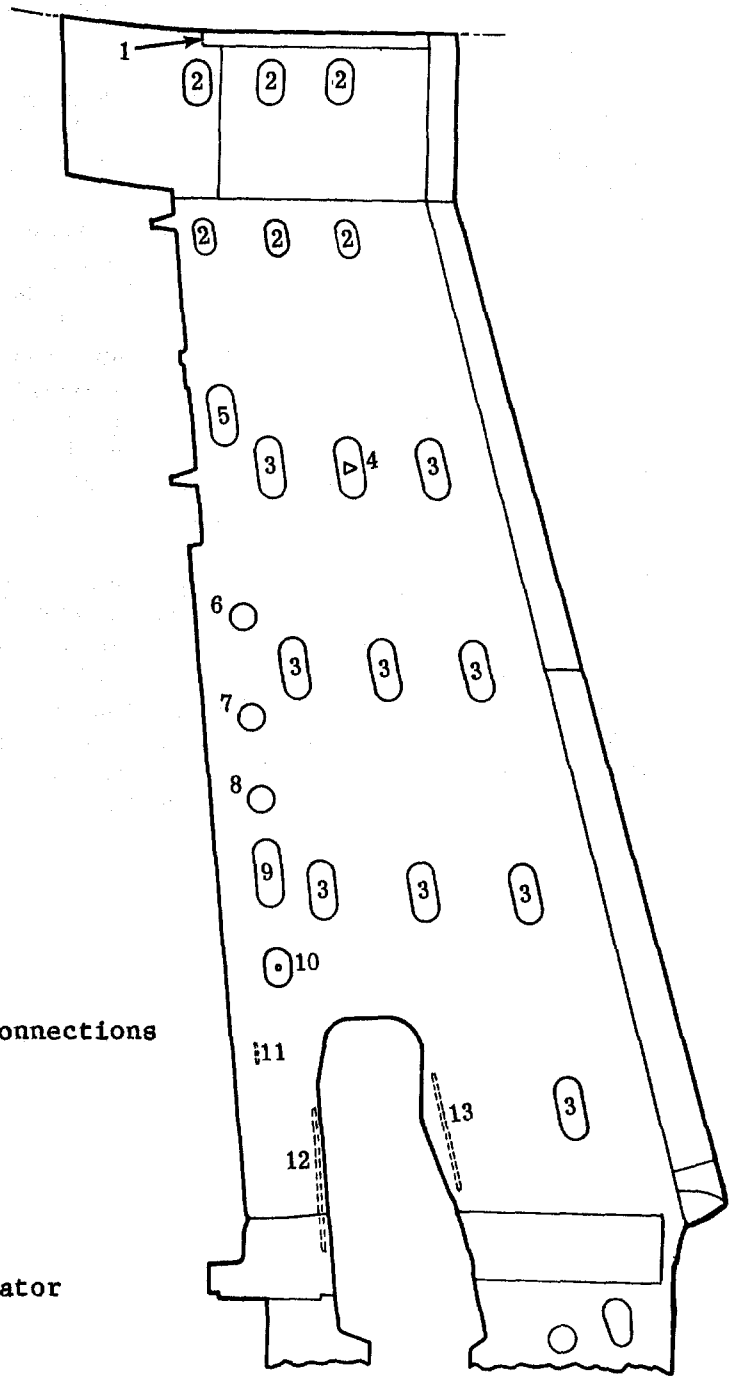
B. Whenever a wing fuel or tip tank access cover is removed, special installation procedures are required to provide lightning strike protection.

C. Access straps cover the gap between the wing and the tip tank and provide access to the tip tank attach fittings. The lower access strap on each wing incorporates a scupper at the aft end which provides a cavity drain.

D. When removing access covers, assure that they are reinstalled in the same place from which removed and are properly resealed.

E. On Aircraft 35-002 thru 35-278 and 36-002 thru 36-044 not modified per AAK 79-10 or AMK 83-5, "Installation of Wing Fences, Stall Strips, and Boundary Layer Energizers," two rows of vortex generators are bonded to the upper wing skin forward of the ailerons. The vortex generators improve flight control.

F. On Aircraft 35-279 and Subsequent, 36-045 and Subsequent, and prior aircraft modified per AAK 79-10 or AMK 83-5, "Installation of Wing Fences, Stall Strips and Boundary Layer Energizers," a stall strip, a stall fence, and boundary layer energizers (BLEs) are installed on each wing. The stall fence is riveted and bonded to the wing at WS 125. The stall strips are installed on the LH wing leading edge at WS 90 and on the RH wing leading edge at WS 93. The BLE's (3 rows of 13 each) are bonded to the upper surface of each wing between WS 125 and 189.



1. Tip Tank Attach Fittings
2. Wing Tip Fuel & Electrical Connections
3. Wing Fuel Tank
4. Fuel Vent Plumbing
5. Aileron Controls and Position Sensors
6. Fuel Probe Connector
7. Wing Access
8. Flap Actuator Attachment
9. Flap Sector and Spoiler Actuator
10. Fuel Vent Lines
11. Main Gear Aft Trunnion Pin
12. Spar #7
13. Spar #5

Wing Access Cover Locator
Figure 1

1. Lightning Strike and Leak Prevention Seal Application

A. Tools and Equipment

NOTE: Equivalent substitutes may be used in lieu of the following:

NAME	PART NUMBER	MANUFACTURER	USE
Hexcel Parting Coat	No. 8300	Hexcel Corp. 20701 Nordhoff St. Chatsworth, CA 91311	Parting agent
Anti-corrosion grease	Aeroshell No. 14	Commercially available	Lightning strike protection
Sealant	Pro-Seal 890 (B1/2)	Products Research & Chemical Co. Glendale, CA	Sealant gasket

B. Install Wing Fuel Access Cover. (See Figure 201.)

(1) Inspect and thoroughly clean wing skin and access cover of all grease and old sealant.

CAUTION: **THE MOLD-IN-PLACE SEALANT GASKETS MUST ADHERE TO THE WING SKIN LEDGE INBOARD OF WS 181 AND TO THE ACCESS COVER LEDGE OUTBOARD OF WS 181. DO NOT APPLY PARTING AGENT TO ACCESS COVER LEDGE OR WING SKIN LEDGE.**

(2) Apply parting agent to wing skin access opening and to access cover.

CAUTION: **WHEN APPLYING SEALANT, PREVENT AN EXCESS OF SEALANT FROM EXTRUDING INTO THE SURFACE BETWEEN THE ACCESS COVER AND WING SKIN.**

(3) Allow parting agent to dry approximately 10 to 15 minutes. Apply an even coat of Pro-Seal 890 sealant to either the access cover ledge (WS 181 to WS 205) or to the wing skin ledge (WS 0.0 to WS 181).

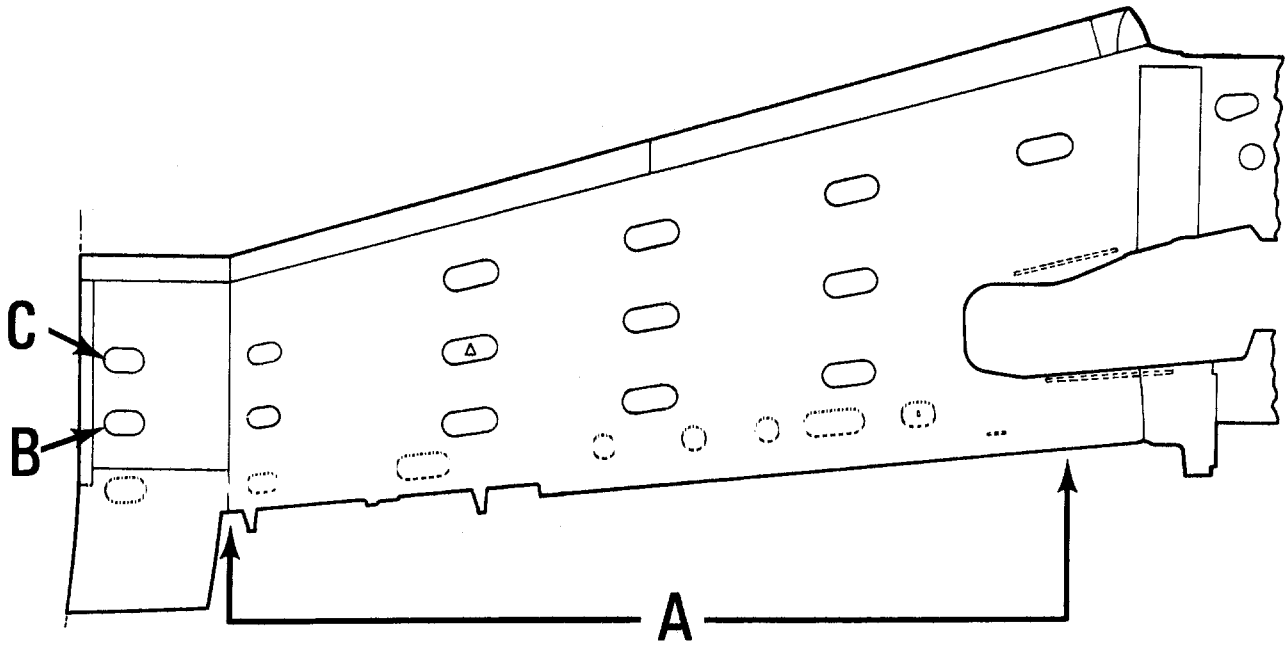
(4) Temporarily install access cover with 6 evenly spaced screws and 0.032 inch thick washers or shims around perimeter of access cover. Tighten screws.

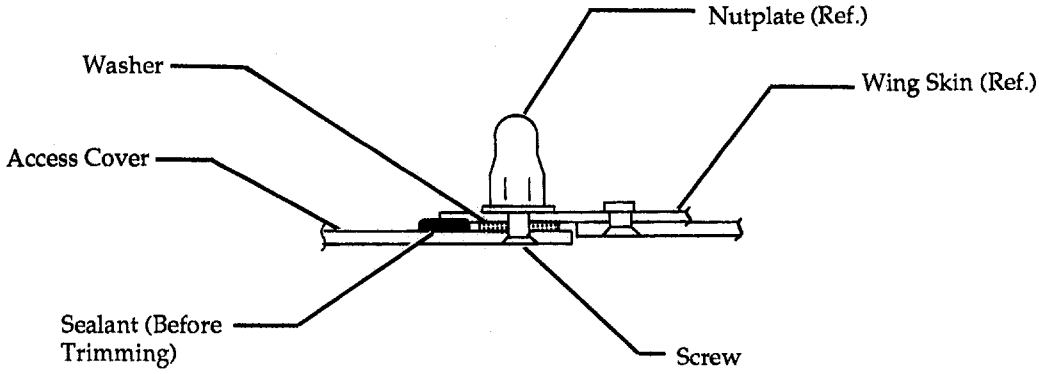
(5) Allow sealant to cure.

(6) Remove access covers and washers. Clean parting agent from mating surfaces of access cover and wing skin.

CAUTION: **DO NOT GOUGE ACCESS PANELS OR WING SKIN WHEN TRIMMING SEALANT. TOOLS MUST BE FABRICATED FROM PLASTIC OR OTHER SUITABLE MATERIAL.**

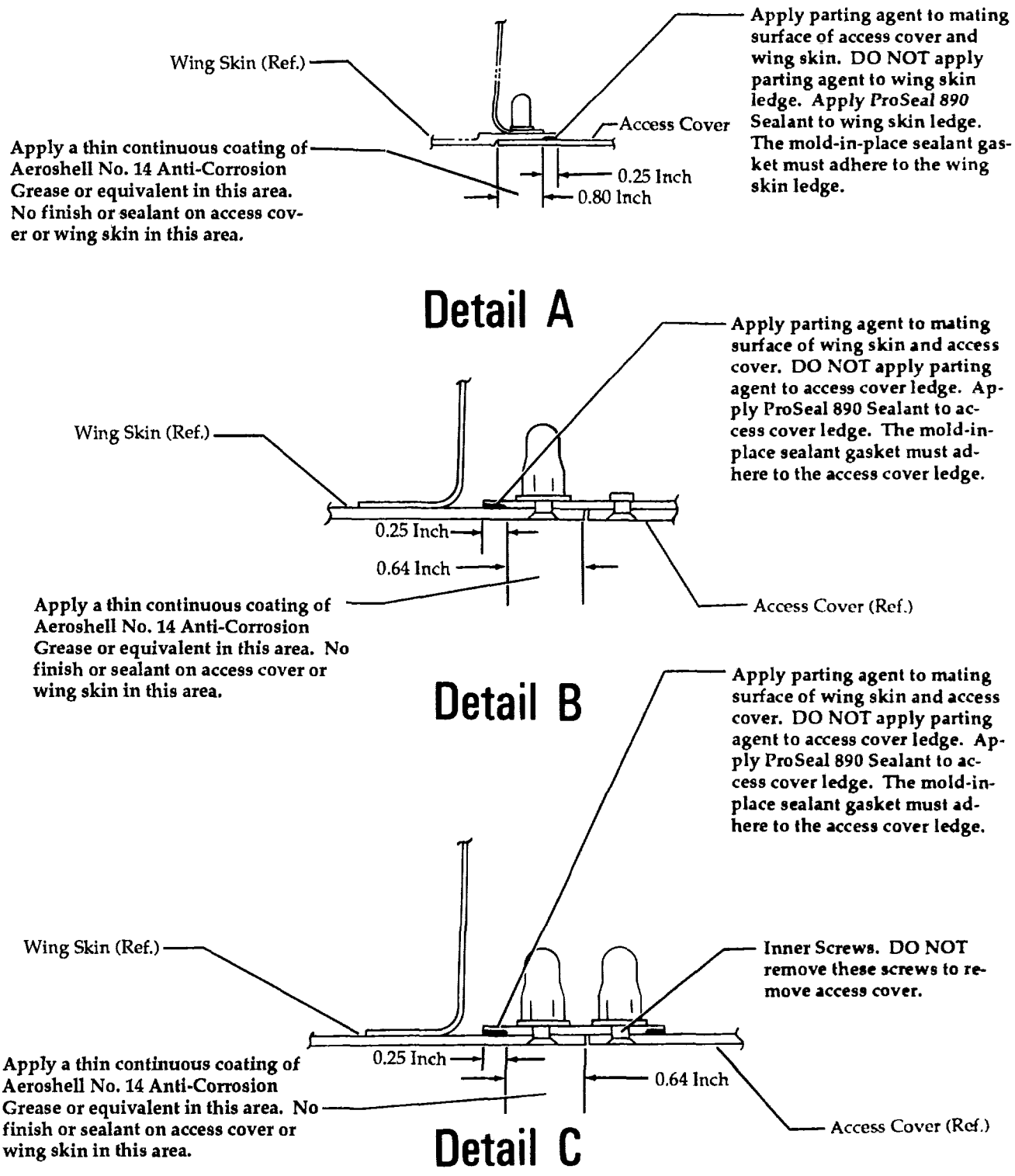
(7) Carefully trim cured sealant to remove excess extruded material to leave a continuous molded-in-place gasket of sealant approximately 0.25 inch wide on the access panel ledge or wing skin ledge. (Refer to Details A, B, or C.)





(TYPICAL VIEW WITH WASHER INSTALLED)

Lightning Strike and Leak Prevention Seal Application
Figure 201 (Sheet 1 of 2)



Lightning Strike and Leak Prevention Seal Application
Figure 201 (Sheet 2 of 2)

CAUTION: THE ANTI-CORROSION GREASE MUST BE INSTALLED TO PROVIDE ADEQUATE LIGHTNING STRIKE PROTECTION.

(8) Apply a thin continuous coat of grease around the outer edge of access door or wing skin opening.

(9) Install access panels and secure with attaching screws. Do not use washers for final installation of access covers.

VORTEX GENERATORS - MAINTENANCE PRACTICES

1. TOOLS AND EQUIPMENT

NAME	NUMBER	MANUFACTURER
Sandpaper	400 grit	Commercially Available
Methyl Ethyl Ketone		Commercially Available
Epoxy Adhesive	EC-2216B and EC 2216A	Minnesota Mining & Manufacturing Co.

2. REMOVAL/INSTALLATION

NOTE: ° Care should be exercised when performing maintenance in the area of the vortex generators to avoid damage or loosening of a generator.

° No more than three (3) generators (any location) may be missing from one surface (six total, both wings). Missing generators should be replaced as soon as possible.

A. Replace Vortex Generator (See figure 201.)

(1) Using methyl ethyl ketone, clean all old cement and foreign matter from area on wing where cement is to be applied.

(2) Sand with 400 grit sandpaper. Again wash the area with methyl ethyl ketone and wipe dry while still wet.

(3) Locate the vortex generator as shown in figure 201 and mark its outline on wing.

(4) Sand mating surface of vortex generator with 400 grit sandpaper, wash with methyl ketone, and wipe dry while still wet.

(5) Mix 100 parts by weight of EC-2216B to 140 parts by weight of EC-2216A. Mix until the two parts blend to a uniform medium gray color.

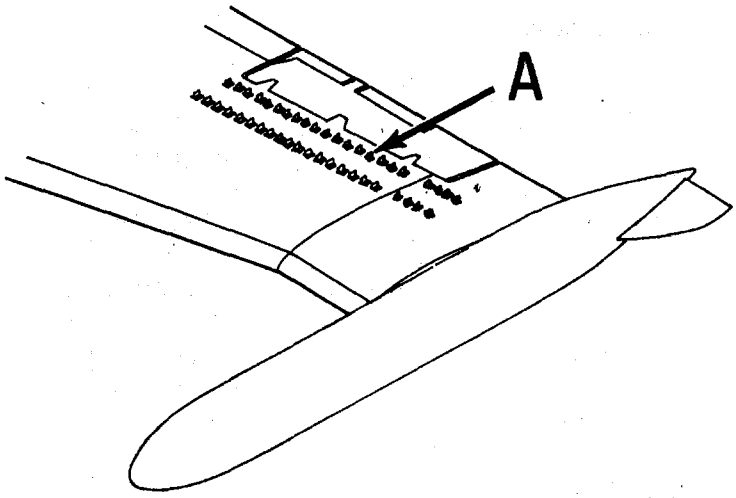
NOTE: The pot life of the mixed adhesive is approximately 2 hours.

(6) Using a spatula, apply mixed adhesive to the cleaned surfaces.

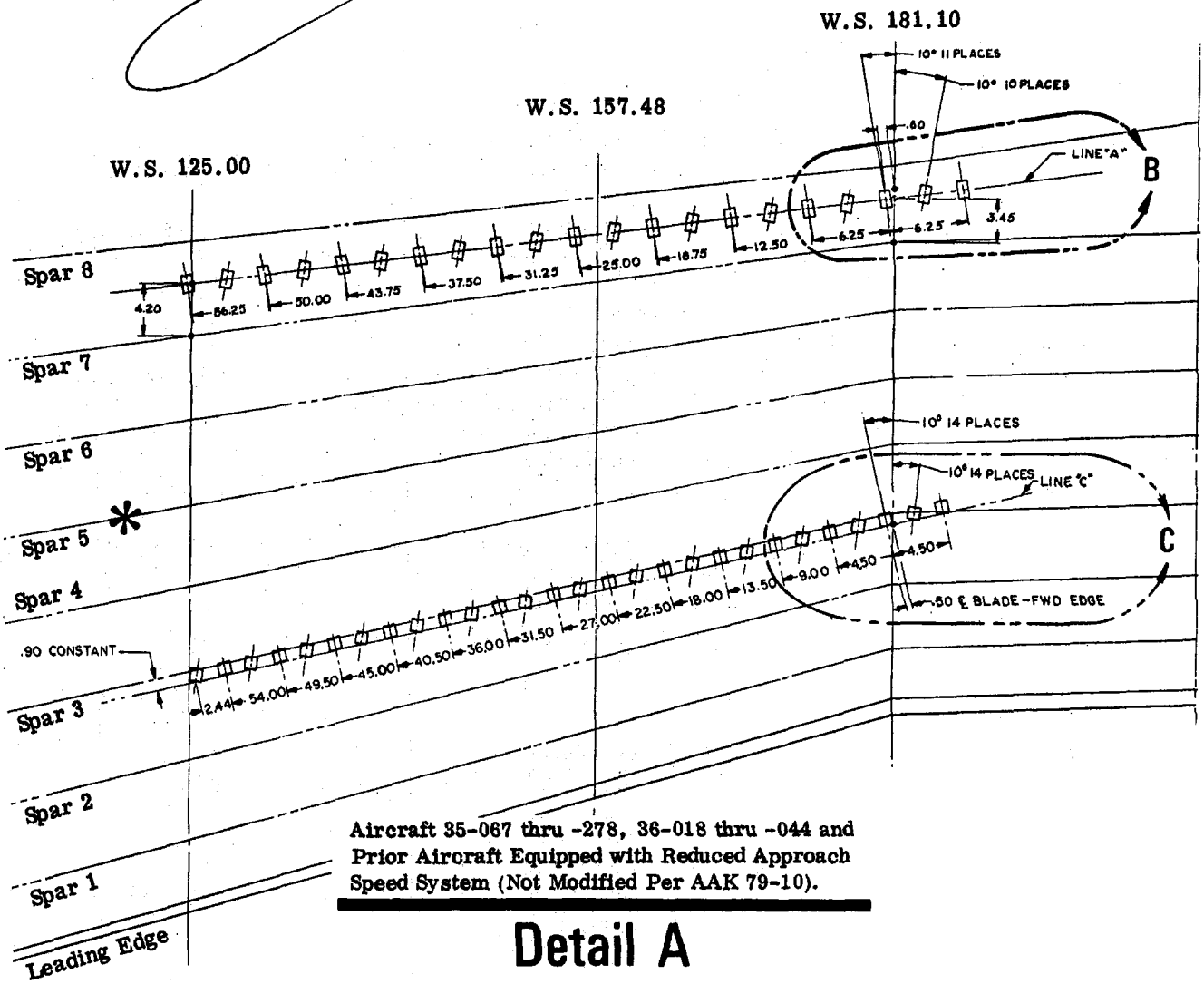
(7) Position vortex generator on marks on wing and press generator to the wing to effect the bond.

NOTE: The only pressure required during the cure of EC-2216 is that necessary to keep parts in alignment and to overcome distortion and thermal expansion.

(8) Allow bond to cure at room temperature for 24 hours. Full cure is achieved in 3 to 7 days at room temperature. Cure may be accelerated by heating for 2 hours at 150°F or 45 minutes at 200°F.



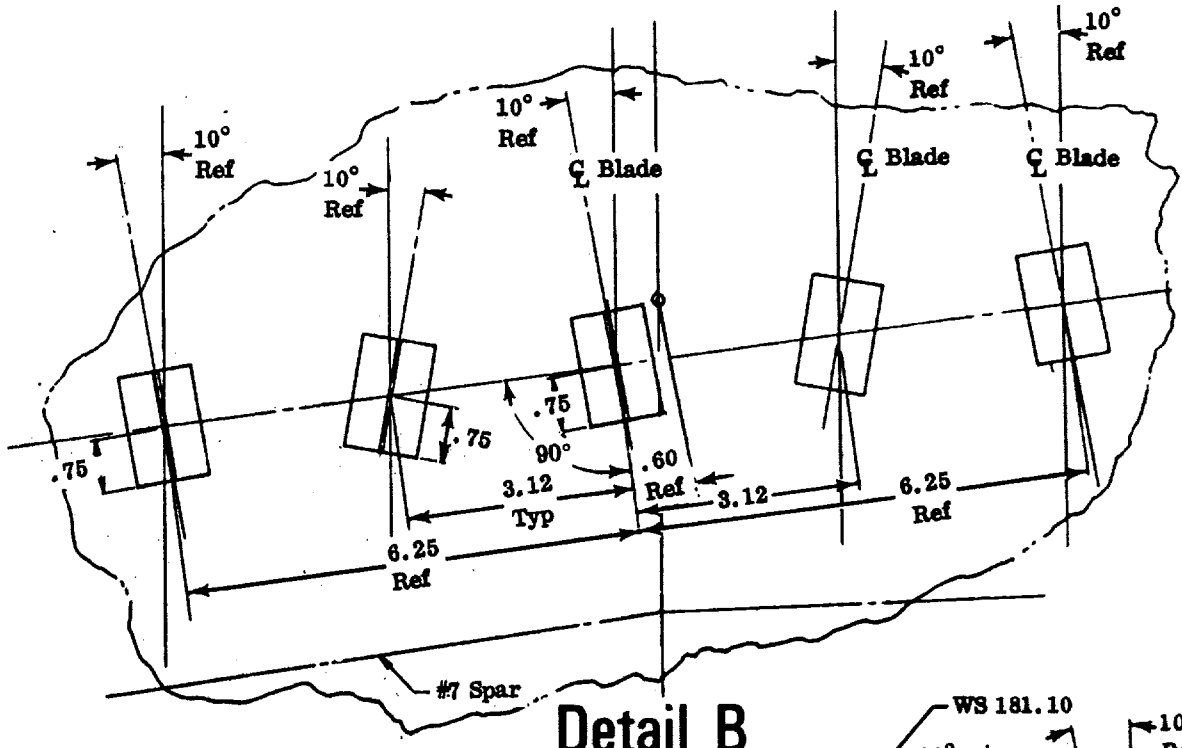
* On Aircraft not equipped with Reduced Approach Speed System, the forward row of vortex generators are located on Spar 5. Dimensions & angles are the same as on spar 3.



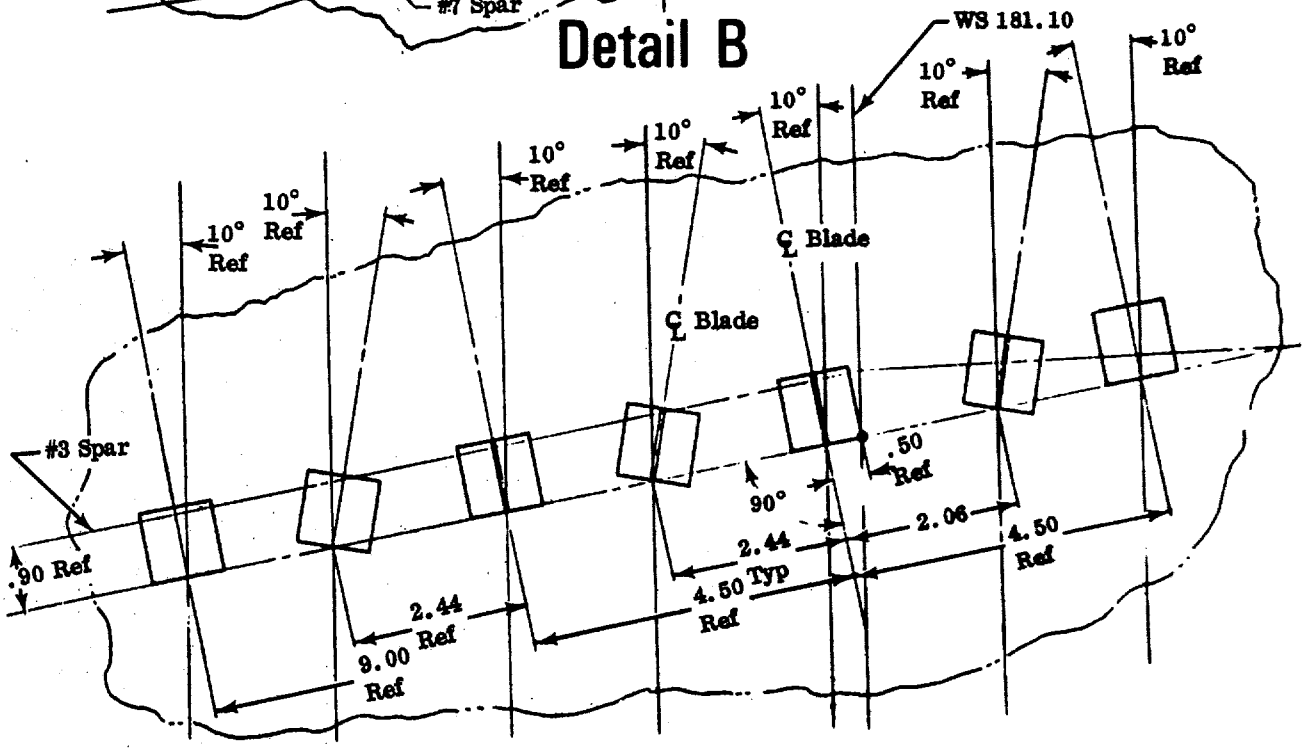
Aircraft 35-067 thru -278, 36-018 thru -044 and Prior Aircraft Equipped with Reduced Approach Speed System (Not Modified Per AAK 79-10).

Detail A

Vortex Generator Installation
Figure 201 (Sheet 1 of 2)



Detail B



Detail C

Vortex Generator Installation
Figure 201 (Sheet 2 of 2)

STALL FENCE - MAINTENANCE PRACTICES

1. Removal/Installation

NOTE: A stall fence is installed at WS 125 on each wing. The stall fences are essential to maintain the proper stall speed as described in the Approved Airplane Flight Manual.

The stall fence is installed in three sections (upper wing, lower wing, and leading edge). Each section may be replaced independently of the others.

It is important, when replacing a segment of the stall fence, that the new stall fence is installed in the same position as the one being removed.

A. Remove Upper Wing Stall Fence
(1) Acquire necessary tools and equipment.

NOTE: Equivalent substitutes may be used in lieu of the following:

NAME	PART NUMBER	MANUFACTURER	USE
Twist Drill (0.156 Inch [3.968 MM])		Commercially Available	Drill out rivets.
Drill Motor		Commercially Available	Drill out rivets.
Awl		Commercially Available	Remove fillet.
Chisel		Commercially Available	Break bond between fence and wing.
Mallet		Commercially Available	Break bond between fence and wing.

CAUTION: USE EXTREME CARE NOT TO DAMAGE THE WING LEADING EDGE WHEN REMOVING OR INSTALLING A STALL FENCE. IF THE WING LEADING EDGE IS DAMAGED, APPROPRIATE ACTION SHALL BE TAKEN TO EFFECT PROPER REPAIRS. FAILURE TO DO SO WILL JEOPARDIZE FLIGHT SAFETY OF THE AIRCRAFT.

(2) Remove wing leading edge section at WS 125. (Refer to 57-20-01.)
(3) Using a 0.156 inch [3.968 mm] drill bit, drill out rivets that attach upper wing stall fence to wing.

CAUTION: DO NOT CUT INTO THE WING SKIN, AS DAMAGE TO THE WING SKIN WILL REQUIRE EXTENSIVE REPAIR.

(4) Using an awl or equivalent, cut into radius of fillet seal at attachment point of stall fence. Exert only enough pressure to break through paint.

CAUTION: USE EXTREME CARE NOT TO DAMAGE THE WING SKIN WHEN REMOVING THE UPPER WING STALL FENCE. DO NOT USE THE CHISEL TO PRY THE STALL FENCE FROM THE WING.

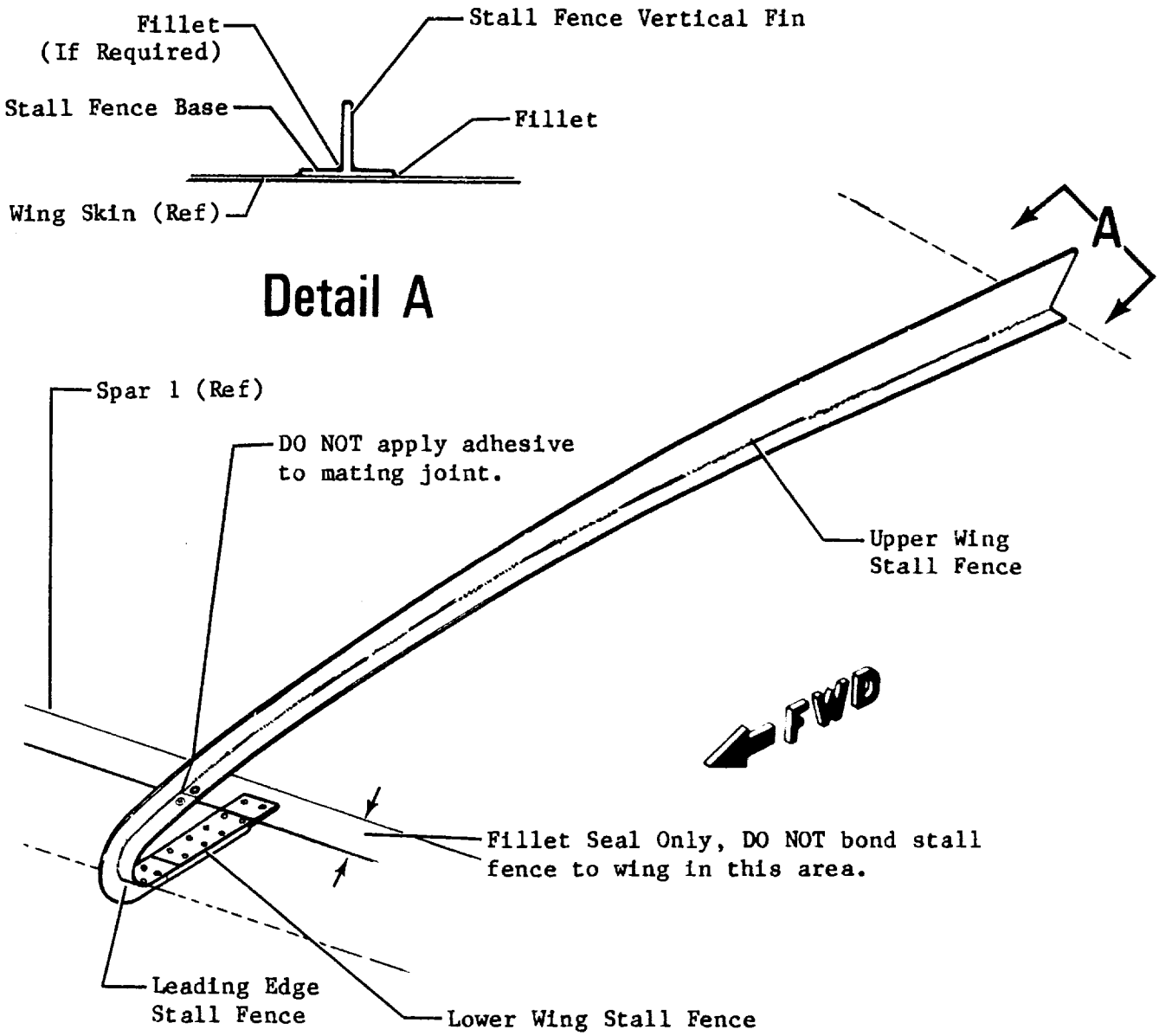
(5) Break upper wing stall fence away from wing. Place blade end of a chisel between upper wing stall fence and wing skin (beveled edge against wing) at forward end of upper wing stall fence. Using a mallet, strike butt end of chisel with enough force to break the bond (force applied to blade end of chisel **shall be away from wing skin**). Once bond is broken at forward end of upper wing stall fence, an upward thrust of upper wing stall fence will free stall fence from wing.

B. Install Upper Wing Stall Fence

(1) Acquire necessary tools and equipment.

NOTE: Equivalent substitutes may be used in lieu of the following:

NAME	PART NUMBER	MANUFACTURER	USE
Abrasive Paper (400 Grit)		Commercially Available	Finish sanding.
Anti-Corrosion Chemical Treatment	Refer to Chapter 20.		Treating area stripped of paint.
Chemical Treatment	Iridite 14-9	Refer to Chapter 20 of Wiring Manual.	Creating a positive electrical bond.
Sealant	Pro-Seal 890	Courtaulds Aerospace Glendale, CA.	Bond and seal wing fence.
Sealant Application Tool Spatula, Roller, or Extrusion Gun		Refer to Chapter 20.	Applying sealant.
Epoxy Primer Accelerator Base	 EC 1945A EC 1945B	Refer to Chapter 20.	Priming installation area.
Methyl Ethyl Ketone (MEK)	Spec. TT-M-261	Commercially Available	Clean wing surface.
Clean Cotton Cloth		Commercially Available	Clean wing surface.
Twist Drill	No. 20	Commercially Available	Drill mounting holes.
Drill Motor		Commercially Available	Drill mounting holes.
Rivet Gun		Commercially Available	Install wing fence.
Shot Bags		Commercially Available	Anchoring stall fence.



Stall Fence Installation
Figure 201

EFFECTIVITY: 35-279 and Sub, 36-045 and Sub and prior Aircraft modified per AAK 79-10 or AMK 83-5, "Installation of Wing Fences, Stall Strips and Boundary Layer Energizers"

(2) Clean installation area with MEK. Wipe dry with a clean white cloth. Do not allow MEK to air dry as a residue will remain on surface.

CAUTION: USE EXTREME CARE NOT TO DAMAGE THE WING SKIN WHEN MECHANICALLY REMOVING THE OLD ADHESIVE.

(3) Mechanically remove old adhesive from installation area.
(4) Finish sand installation area with 400 grit sandpaper.
(5) Clean all residue from installation area using MEK. Wipe dry with a clean, white, lint-free cloth. Do not allow MEK to air dry as a residue will remain on wing surface.
(6) Apply an anti-corrosion chemical treatment to wing area which has been stripped of paint. (Refer to Chapter 20.)

CAUTION: USE EXTREME CARE NOT TO DAMAGE THE WING LEADING EDGE WHEN REMOVING OR INSTALLING A STALL FENCE. IF THE WING LEADING EDGE IS DAMAGED, APPROPRIATE ACTION SHALL BE TAKEN TO EFFECT PROPER REPAIRS. FAILURE TO DO SO WILL JEOPARDIZE FLIGHT SAFETY OF THE AIRCRAFT.

(7) Install wing leading edge section at WS 125. (Refer to 57-20-01.)
(8) Ensure that upper wing stall fence mates properly with leading edge stall fence. Make adjustments to upper wing stall fence male mating surface, as necessary, to ensure that stall fence mates properly.
(9) Position upper wing stall fence on wing, mate forward portion of upper wing stall fence with leading edge stall fence. Any gap between wing and upper wing stall fence shall not be more than 0.10 inch [0.25 cm] at any point along entire length of upper wing stall fence. If gap is greater than 0.10 inch [0.25 cm], remove upper wing stall fence from wing and form-to-fit.
(10) Place formed-to-fit upper wing stall fence in position on wing mated with leading edge stall fence, locate existing holes in wing on upper wing stall fence base and, using a No. 20 bit, drill holes in base of upper wing stall fence to match holes in wing. Countersink holes to correspond with head of MS20426AD5 rivets.
(11) Prepare forward mounting rivet holes and two MS20426AD5 rivets to be installed in forward position for a positive electrical bond by applying Iridite 14-9 chemical treatment as described in Chapter 20 of Wiring Manual.
(12) Mix epoxy primer as follows:
  (a) Mix equal parts by volume of EC 1945A (accelerator) and EC 1945B (base) and stir thoroughly.
  (b) Mixed primer has a room temperature pot life of approximately eight hours.
(13) Apply a thin, uniform coat (0.0002 to 0.0005 inch [0.0005 to 0.0012 cm]) of epoxy primer to installation area. Allow epoxy primer to cure for 24 hours at room temperature. Primer may be force cured at 160°F [71°C] for 60 minutes or at 180°F [82°C] for 30 minutes.
(14) Place upper wing stall fence on wing, properly mated with leading edge stall fence. Anchor upper wing stall fence in proper position by installing Cleco fasteners or equivalent in rivet holes. Using a pencil, mark a line along inboard and outboard edges (entire length) of upper wing stall fence. Remove upper wing stall fence from wing.
(15) Remove wing leading edge section at WS 125.
(16) Mix Pro-Seal 890 according to manufacturers instructions. (Refer to Chapter 20.)

NOTE: Sufficient sealant must be applied to ensure a continuous extrusion on both sides of the joint after assembly of the faying surfaces.

(17) Apply a coating of Pro-Seal 890 to upper wing stall fence except for area forward of spar 1. (See Figure 201.) Adhesive must be applied with a spatula, roller, or extrusion gun in such a manner so as to prevent entrapped air.

(18) Install upper wing stall fence in position, aligning two rivet holes forward of spar 1 and using installation area marked in step 1.B(13) as a guide.

CAUTION: *ENSURE THAT THE POSITION OF THE FENCE IS NOT DISTURBED WHEN ANCHORING IT TO THE WING.*

(19) Anchor upper wing stall fence to wing with shot bags or equivalent method. Form a concave fillet seal between stall fence base and wing skin with adhesive squeeze-out. Clean excess sealant off of wing and fence with a cloth dampened with MEK. Allow sealant to cure according to manufacturers instructions. (Refer to Chapter 20.) Sealant may be force cured by circulating warm air over the sealant and adjacent structure (not to exceed 140°F [60°C] sealant temperature.)

(20) Remove anchor device from upper wing stall fence and drill sealant out of rivet holes as necessary to facilitate rivet installation.

(21) Install rivets (MS20426AD5). Ensure that rivets processed in step 1.B(10) are installed forward of spar 1. Ensure that all rivets are flush with base of upper wing stall fence.

NOTE: If the upper wing stall fence is a single piece (not welded) proceed to step 1.B(23).

(22) Clean joint of upper wing stall fence vertical fin and base with a clean cloth dampened with MEK. Wipe dry with a clean, white cloth. Do not allow MEK to air dry as a residue will remain on surface.

(23) Mix Pro-Seal 890 according to manufacturers instructions. (Refer to Chapter 20.) Apply a concave fillet seal, along entire length (on both sides) of upper wing stall fence, at joint of vertical fin and base (blend fillet with weld on the assembly). Allow sealant to cure according to manufacturers instructions. (Refer to Chapter 20.)

(24) Apply an anti-corrosion chemical film treatment to upper wing stall fence in accordance with Chapter 20.

(25) Prime and paint upper wing stall fence and surrounding area where paint has been removed in accordance with Chapter 20.

(26) Install wing leading edge section.

(27) Perform stall warning test and adjustment in accordance with Chapter 27.

C. Remove Leading Edge Stall Fence

(1) Acquire necessary tools and equipment.

NOTE: Equivalent substitutes may be used in lieu of the following:

NAME	PART NUMBER	MANUFACTURER	USE
Twist Drill (0.125 Inch [3.175 MM])		Commercially Available	Drill out rivets.
Drill Motor		Commercially Available	Drill out rivets.
Sharp Knife		Commercially Available	Cut adhesive.

(2) Remove screws which attach leading edge stall fence to wing.

CAUTION: CONTROL THE DEPTH OF THE DRILLING TO PRECLUDE DAMAGING ADJACENT STRUCTURE OR ENLARGING EXISTING HOLE.

(3) Using a 0.125 inch [3.175 mm] drill bit, drill out rivets attaching stall fence to leading edge.

CAUTION: USE EXTREME CARE NOT TO DAMAGE THE LEADING EDGE WHILE REMOVING THE LEADING EDGE STALL FENCE. (REFER TO 57-20-01, WING LEADING EDGE.)

(4) Using a sharp knife or equivalent, cut adhesive which holds stall fence to leading edge. Cut away adhesive until leading edge stall fence is separated from leading edge.

D. Install Leading Edge Stall Fence

(1) Acquire necessary tools and equipment.

NOTE: Equivalent substitutes may be used in lieu of the following:

NAME	PART NUMBER	MANUFACTURER	USE
Abrasive Paper (400 Grit)		Commercially Available	Finish sanding.
Anti-Corrosion Chemical Treatment	Refer to Chapter 20.		Treating area stripped of paint.
Silicone Adhesive	RTV-154 or RTV-157 (Gray)	General Electric, Waterford, N.Y.	Hold stall fence to wing.
Methyl Ethyl Ketone (MEK)	Spec. TT-M-261	Commercially Available	Clean wing surface.
Clean Cotton Cloth		Commercially Available	Clean wing surface.
Twist Drill	No 30	Commercially Available	Drill mounting holes.
Twist Drill	No 19	Commercially Available	Drill mounting holes.
Drill Motor		Commercially Available	Drill mounting holes.
Rivet Gun		Commercially Available	Install wing fence.

(2) Clean installation area with MEK. Wipe dry with a clean, white cloth. Do not allow MEK to dry as a residue will remain on surface.

CAUTION: USE EXTREME CARE NOT TO DAMAGE THE LEADING EDGE WHEN MECHANICALLY REMOVING THE OLD ADHESIVE. (REFER TO 57-20-01, WING LEADING EDGE.)

(3) Mechanically remove old adhesive from installation area.

(4) Sand installation area with 400 grit sandpaper.

CAUTION: USE EXTREME CARE NOT TO DAMAGE THE WING LEADING EDGE WHEN REMOVING OR INSTALLING A STALL FENCE. IF THE WING LEADING EDGE IS DAMAGED, APPROPRIATE ACTION SHALL BE TAKEN TO EFFECT PROPER REPAIRS. FAILURE TO DO SO WILL JEOPARDIZE FLIGHT SAFETY OF THE AIRCRAFT.

(5) Remove wing leading edge section at WS 125. (Refer to 57-20-01.)
(6) Clean all residue from installation area using MEK. Wipe dry with a clean, white, lint-free cloth. Do not allow MEK to air dry as a residue will remain on wing surface.
(7) Apply an anti-corrosion chemical film treatment to leading edge stall fence installation area.

CAUTION: USE EXTREME CARE NOT TO DAMAGE THE WING LEADING EDGE WHEN REMOVING OR INSTALLING A STALL FENCE. IF THE WING LEADING EDGE IS DAMAGED, APPROPRIATE ACTION SHALL BE TAKEN TO EFFECT PROPER REPAIRS. FAILURE TO DO SO WILL JEOPARDIZE FLIGHT SAFETY OF THE AIRCRAFT.

(8) Remove wing leading edge section at WS 125. (Refer to 57-20-01.)
(9) Position new leading edge stall fence on leading edge. Ensure that it mates properly with upper and lower wing stall fence sections. Make adjustments to male mating surfaces as necessary to ensure a proper fit.
(10) Ensure that gap between leading edge and leading edge stall fence is not greater than 0.03 inch [0.08 cm] at any point. If gap is greater than 0.03 inch [0.08 cm], remove leading edge stall fence from leading edge and form to fit contour of leading edge.
(11) Place formed-to-fit leading edge stall fence on wing leading edge mated with upper and lower wing stall fences. Locate existing holes in leading edge on base of leading edge stall fence. Using a No. 30 bit, drill holes in base of leading edge stall fence to match rivet holes in leading edge. Countersink rivet holes to correspond with head of CR 3242-2 rivets. Using a No. 19 bit, drill holes in base of leading edge stall fence to match screw holes in leading edge. Countersink screw holes to correspond with head of MS24694C5 screws (100° x 0.332 inch [100° x 0.843 cm]).
(12) Position leading edge stall fence on leading edge (properly mated with upper and lower wing stall fences). Anchor leading edge stall fence in proper position by installing Cleco fasteners or equivalent in rivet and/or screw holes. Using a pencil, mark a line along inboard and outboard edges (entire length) of leading edge stall fence. Remove Cleco fasteners and remove leading edge stall fence.
(13) Ensure that leading edge and stall fence are clean and free of foreign material (grease, dirt, etc.). Using a clean, white cloth dampened with MEK, clean as required. Wipe dry with a clean, white cloth. Do not allow MEK to air dry as a residue will remain on the surface.

CAUTION: USE EXTREME CARE NOT TO BOND THE LEADING EDGE TO THE WING WHEN INSTALLING THE LEADING EDGE STALL FENCE.

(14) Apply a liberal bead of RTV 154 or RTV 157 to leading edge stall fence. Using area marked in step 1.D.(9) as a guide, place stall fence on leading edge properly mated with upper and lower stall fences. Anchor stall fence to leading edge. Using squeeze-out sealant to form a concave fillet seal between base of stall fence and leading edge (fillet size to blend). Clean excess sealant from stall fence and leading edge. Allow adhesive to cure for 24 hours at room temperature. Cure time may be accelerated by higher temperatures and increased humidity.

NOTE: The application of the RTV adhesive to the stall fence should be thick enough so the adhesive will squeeze out on both sides (the entire length) of the fence when it is installed.

(15) Remove adhesive from rivet and screw holes and install CR 3242-4 rivets and MS24694C5 screws.

CAUTION: IF WING LEADING EDGE WAS REMOVED, A STALL FLIGHT MUST BE PREFORMED.

(16) Perform stall warning test and adjustment in accordance with Chapter 27.

E. Remove Lower Wing Stall Fence

(1) Acquire necessary tools and equipment.

NOTE: Equivalent substitutes may be used in lieu of the following:

NAME	PART NUMBER	MANUFACTURER	USE
Twist Drill (1/8 Inch)		Commercially Available	Drill out rivets.
Drill Motor		Commercially Available	Drill out rivets.
Awl		Commercially Available	Remove fillet.

CAUTION: DO NOT CUT INTO WING SKIN, DAMAGE TO WING SKIN WILL REQUIRE EXTENSIVE REPAIR.

(2) Using an awl or equivalent, cut into radius of fillet seal at attachment point of stall fence.

(3) Using a 1/8 inch drill bit, drill out rivets which attach stall fence to lower wing.

(4) Remove lower wing stall fence.

F. Install Lower Wing Stall Fence

(1) Acquire necessary tools and equipment.

NOTE: Equivalent substitutes may be used in lieu of the following:

NAME	PART NUMBER	MANUFACTURER	USE
Abrasive Paper (400 Grit)		Commercially Available	Finish sanding.
Anti-Corrosion Chemical Treatment	Refer to Chapter 20.		Treating area stripped of paint.
Sealant	Pro-Seal 890	Courtaulds Aerospace Glendale, CA.	Bond and seal wing fence.
Methyl Ethyl Ketone (MEK)	Spec. TT-M-261	Commercially Available	Clean wing surface.
Clean Cotton Cloth		Commercially Available	Clean wing surface.
Twist Drill	No 30	Commercially Available	Drill mounting holes.
Drill Motor		Commercially Available	Drill mounting holes.
Rivet Gun		Commercially Available	Install wing fence.

(2) Clean installation area with MEK. Wipe dry with a clean, white cloth. Do not allow MEK to air dry as a residue will remain on surface.

CAUTION: USE EXTREME CARE NOT TO DAMAGE THE WING SKIN WHEN MECHANICALLY REMOVING THE FILLET ADHESIVE.

(3) Mechanically remove old fillet seal.
(4) Finish sand installation area with 400 grit sandpaper.
(5) Clean all residue from installation area using MEK. Wipe dry with a clean, white, lint-free cloth. Do not allow MEK to air dry as a residue will remain on wing surface.
(6) Apply an anti-corrosion chemical film treatment to wing area which has been stripped of paint. (Refer to Chapter 20.)
(7) Ensure that lower wing stall fence mates properly with leading edge stall fence. Make adjustments to male mating surface, as necessary, to ensure that stall fence mates properly.
(8) Position lower wing stall fence on wing, mate forward portion of lower wing stall fence with leading edge stall fence. Ensure that lower wing stall fence mates to contour of wing. Form-to-fit as necessary.
(9) Place formed-to-fit lower wing stall fence on wing mated with leading edge stall fence. Locate existing holes in lower wing on base of lower wing stall fence. Using a No. 30 bit, drill holes in base of lower wing stall fence base. Countersink two aft holes to match head of MS20426AD4 rivets.
(10) Properly position lower wing stall fence and install two aft rivets (MS20426AD4) and install remaining rivets (CR 3242-4).
(11) Mix Pro-Seal 890 according to manufacturers instructions (Refer to Chapter 20.)

NOTE: If the lower wing stall fence is a single piece (not welded), proceed to step 1.F.(12).

(12) Apply a concave fillet seal the entire length (on both sides) of lower wing stall fence at joint of vertical fin and base (blend fillet seal with weld on assembly). Allow sealant to cure according to manufacturers instructions (Refer to Chapter 20.) Curing of sealant may be accelerated by circulating warm air over the sealant and adjacent structure (not to exceed 140°F [60°C] sealant temperature.)
(13) Apply a concave fillet seal along entire length (on both sides) of lower wing wing stall fence, where base of fence mates with wing (fillet size to blend). Allow sealant to cure according to manufacturers instructions (Refer to Chapter 20.) Curing of sealant may be accelerated by circulating warm air over the sealant and adjacent structure (not to exceed 140°F [60°C] sealant temperature.)
(14) Apply an anti-corrosion chemical film treatment to lower wing stall fence in accordance with Chapter 20.
(15) Prime and paint lower wing stall fence and surrounding area where paint has been removed in accordance with Chapter 20.
(16) Perform stall warning test and adjustment in accordance with Chapter 27.

BOUNDARY LAYER ENERGIZERS - MAINTENANCE PRACTICES

1. Removal/Installation

NOTE: It is not recommended that the Boundary Layer Energizers (BLE's) be removed, however, should the BLE's become dislodged, installation procedures are provided.

There are 39 BLEs, three (3) rows of 13 each (except *Aircraft 35-003 and 35-223*, have two (2) rows of BLEs installed per AAK 79-10) bonded on each wing between WS 124 and the tip tank. All BLEs for each installation are essential to maintain proper flight characteristics.

A. Removal of Boundary Layer Energizers
(1) Acquire necessary tools and equipment.

NOTE: Equivalent substitutes may be used in lieu of the following:

NAME	PART NUMBER	MANUFACTURER	USE
Phenolic Wedge		Commercially Available	Remove BLE.

CAUTION: USE EXTREME CARE NOT TO DAMAGE THE WING SKIN WHEN REMOVING THE BLE.

(2) Using a phenolic wedge or equivalent, pry BLE from wing skin and remove from wing.

B. Prepare Surface for Boundary Layer Energizers Installation
(1) Acquire necessary tools and equipment.

NOTE: Equivalent substitutes may be used in lieu of the following:

NAME	PART NUMBER	MANUFACTURER	USE
Anti-Corrosion Chemical	Refer to Chapter 20		Prevent wing corrosion.
Epoxy Primer	EC 1945A (Accelerator) EC 1945B (Base)	Dexter Crown Metro Greenville, SC	Prime surface.
Cleaning Solvent, MEK		Commercially Available	Cleaning.
400-Grit Sand Paper		Commercially Available	Abrading surfaces.

CAUTION: USE EXTREME CARE NOT TO DAMAGE THE WING SKIN WHEN REMOVING THE OLD ADHESIVE.

(2) Remove old adhesive from installation area.
(3) Sand installation area smooth with 400 grit sand paper.
(4) Clean all residue from installation area using cleaning solvent. Wipe dry with a clean, white, lint free cloth. If cleaning solvent is allowed to air-dry, a residue will remain on wing surface.
(5) Apply an anti-corrosion chemical treatment to wing area which has been stripped of paint. (Refer to Chapter 20.)
(6) Prepare epoxy primer. (Refer to manufacturer's instructions.)

(7) Apply a thin uniform coat of epoxy primer. Allow epoxy primer to cure for 24 hours at room temperature 72°F [22°C].

WARNING: TO ENSURE PROPER FLIGHT CHARACTERISTICS, IT IS IMPORTANT THAT THE REPLACEMENT BLE BE INSTALLED IN EXACTLY THE SAME LOCATION AS THE MISSING BLE WAS INSTALLED.

C. Locate Boundary Layer Energizers (See Figure 201.)
(1) Measure distance A (distance between BLE's).
(2) Compute distance B by using formula: 1/2 A = B.
(3) Measure distance B which was computed in step 1.C.(2) and mark line Y perpendicular to imaginary center line of existing BLE's.
(4) Measure two (2) inches [5.08 cm] inboard and two (2) inches [5.08 cm] outboard and mark lines X and Z parallel to line Y.
(5) Lay a straight edge along forward and aft edges of existing BLE's and mark lines M and N.

NOTE: Extend the line as shown to aid in installation of the BLE.

(6) Measure distance between M and N, distance shall be 0.332 inch [0.843 cm]. Distance between X and Z shall be 4 inches [10.16 cm].
(7) Position replacement BLE in area between X, Z, M, and N to ensure a proper fit.

D. Installation of Boundary Layer Energizers (See Figure 201.)
(1) Acquire necessary tools and equipment.

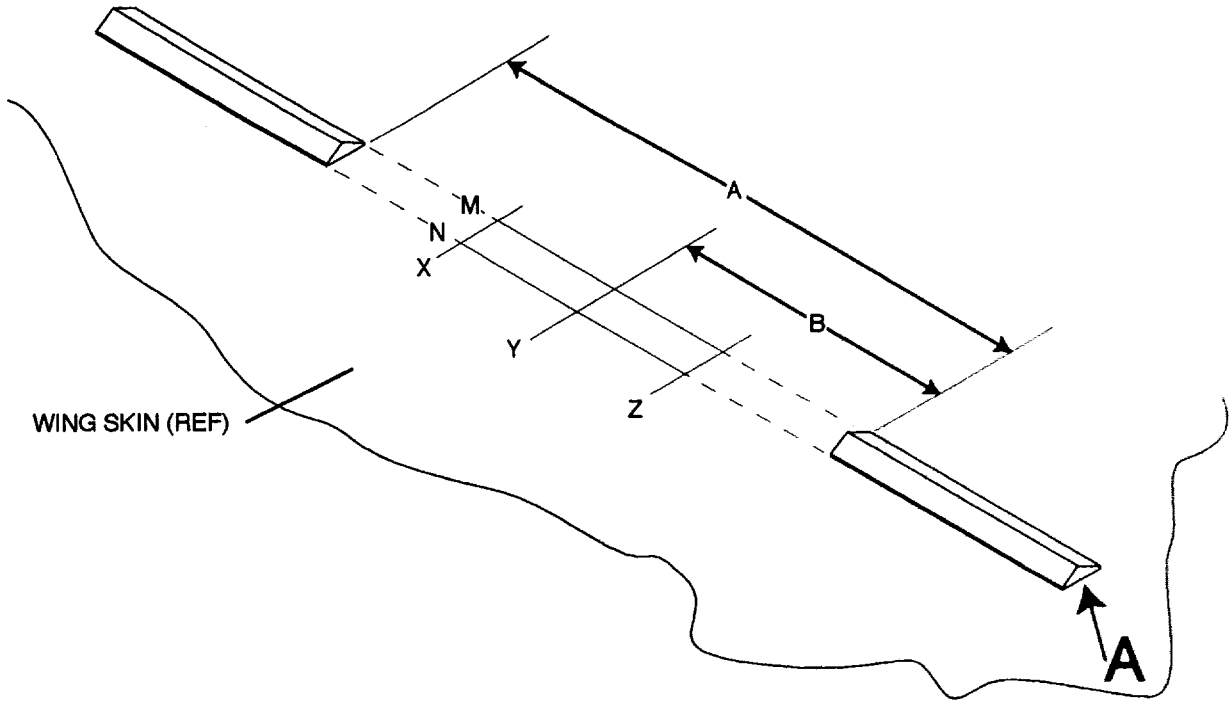
NOTE: Equivalent substitutes may be used in lieu of the following:

NAME	PART NUMBER	MANUFACTURER	USE
Anti-Corrosion Chemical	Refer to Chapter 20		Prevent wing corrosion.
Conductive coating Chemical Treatment	Refer to Chapter 20		Treating wing areas stripped of paint.
Sealant, Class B-1/2, B-2, B-4	Pro-Seal 890	Refer to Chapter 20	Bond BLE to wing.
Masking Tape		Commercially Available	Securing BLE.

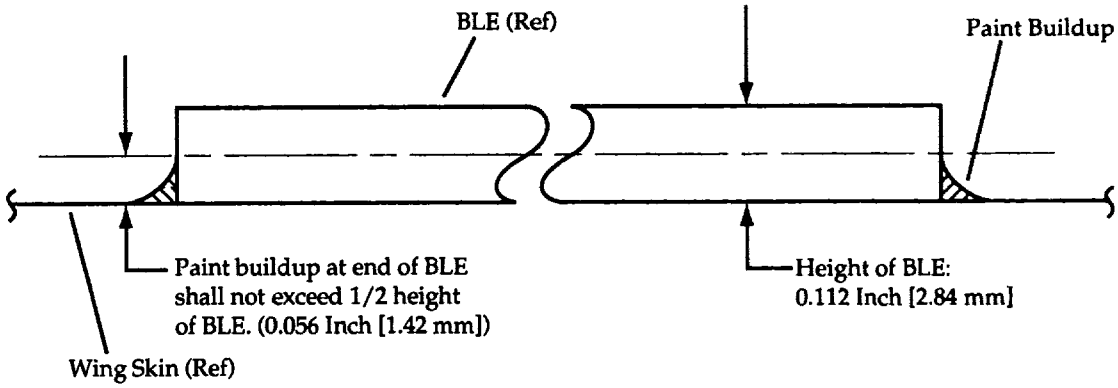
(2) Prepare and apply a thin coat of sealant to installation area as located in steps 1.C.(1) thru 1.C.(7). Use sealant sparingly. (Refer to Chapter 20.)
(3) Position new BLE in position and press into sealant. Remove excess sealant from the BLE and wing to form a smooth surface at bond.

NOTE: Removal of all the excess sealant from the BLE and wing will aid in maintaining paint build up limitations.

(4) Secure BLE to wing with masking tape and allow sealant to cure at room temperature for 24 hours. Remove masking tape.
(5) After sealant has cured, apply an anti-corrosion and conductive coating chemical treatment to replacement BLE and surrounding wing area which has been stripped of paint. (Refer to Chapter 20.)



NOTE: The BLEs installed on the skin lap at WS 181 are in segments (one is 2.68 inches [6.81 cm] long and one is 1.29 inches [3.28 cm] long). They are to be installed with a maximum gap of 0.03 inch [0.08 cm] at the skin lap (WS 181)



Detail A

Boundary Layer Energizer
Figure 201

EFFECTIVITY: 35-279 and Subsequent, 36-045 and Subsequent, and prior Aircraft modified per AAK 79-10 or AMK 83-5, "Installation of Wing Fences, Stall Strips, and Boundary Layer Energizers"

CAUTION: BLES MUST MAINTAIN SHARP EDGES FOR MAXIMUM EFFECTIVENESS. THEREFORE POLISHING AND BUFFING OF THE WING SURFACE SHALL BE PERFORMED BEFORE BLES ARE INSTALLED. BLES SHALL BE MASKED OFF BEFORE PRIMER AND PAINT ARE APPLIED. IF BLES MUST BE PAINTED, MINIMIZE PRIMER AND PAINT BUILD UP. A SHARP EDGE ON THE BLES SHALL BE MAINTAINED.

PAINT BUILDUP AT ENDS OF BLE's SHALL NOT EXCEED 1/2 THE HEIGHT OF THE BLE. (SEE DETAIL A.)

(6) Prime and paint BLE and installation area. (Refer to Chapter 20.)

AILERON BRUSH SEAL - MAINTENANCE PRACTICES

1. Removal/Installation

NOTE: Perform lubrication of aileron brush seals in accordance with the current inspection interval specified in Chapter 5.

A. Remove Inboard and Outboard Aileron Brush Seals (See Figure 201.)
   (1) Remove aileron. (Refer to 27-10-01.)
   (2) Slide brush seal from mounting bracket.

B. Install Inboard and Outboard Aileron Brush Seal (See Figure 201.)
   (1) Slide brush seal in mounting bracket.
   (2) Lubricate brush seals. (Refer to 12-21-02.)
   (3) Install aileron and ensure proper rigging. (Refer to 27-10-01.)

C. Remove Forward Aileron Brush Seal *(Aircraft 35-002 thru 35-278, 36-002 thru 36-044 modified per AAK 79-10 or AMK 83-5 and 35-279 and Subsequent, and 36-045 and Subsequent)* (See Figure 201.)
   (1) Remove aileron. (Refer to 27-10-01.)
   (2) Using a No. 40 drill bit (0.098 in), drill out rivets securing brush seal in place and remove brush seal assembly.
   (3) When replacing brush seal assembly, save old brush seal and seal retainer to use as a template.
   (4) Clean wing interior, ensuring that all metallic particles are removed.

D. Install Forward Aileron Brush Seal *(Aircraft 35-002 thru 35-278, 36-002 thru 36-044 modified per AAK 79-10 or AMK 83-5 and 35-279 and Subsequent, and 36-045 and Subsequent)* (See Figure 201.)
   (1) Acquire necessary tools and equipment.

NOTE: Equivalent substitutes may be used in lieu of the following:

NAME	PART NUMBER	MANUFACTURER	USE
Pencil Point Soldering Gun		Commercially Available	Making slots in new brush seal.
Cherry Max Rivet Gun/ hand		Commercially Available	Installation of cherry rivets.
Cherry rivets	CR-2663-2	Commercially Available	Fasteners for brush seal retainers.

   (2) If installing new brush seal assembly, perform the following steps:
      (a) Take old brush seal and brush seal retainer and use as a template and back drill holes in new brush seal retainer.

(b) At every rivet hole location, use a pencil point soldering iron to make a slot 0.05 to 0.15 inches [1.27 to 3.81 mm] across width of brush seal.

NOTE: If rivet holes are not present along entire width of brush seal, continue slots at approximately 1.5 inch [3.8 cm] intervals along remaining length of brush seal.

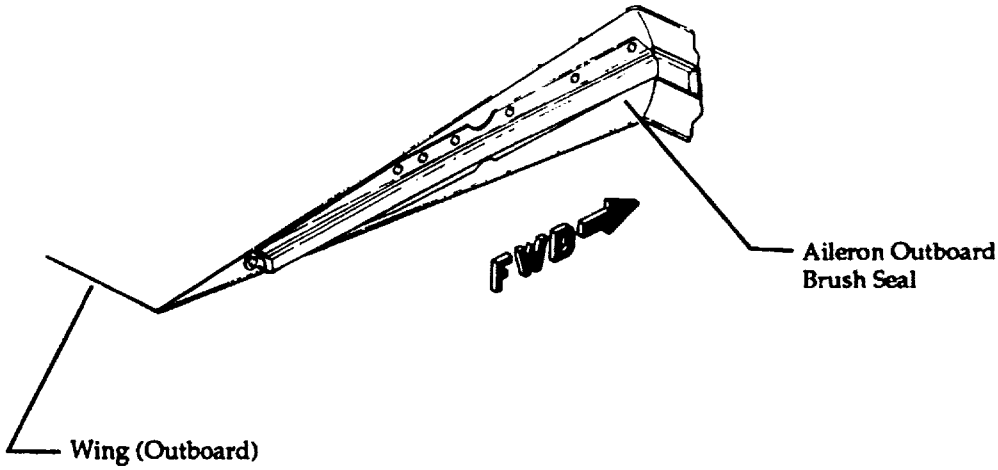
(3) Install brush seal assembly, using cherry rivets.
(4) Lubricate aileron brush seal. (Refer to 12-21-02.)
(5) Install aileron and check aileron rigging. (Refer to 27-10-01.)

2. Inspection/Check

A. Detailed Inspection of the Aileron Brush Seals. (See Figure 202.)

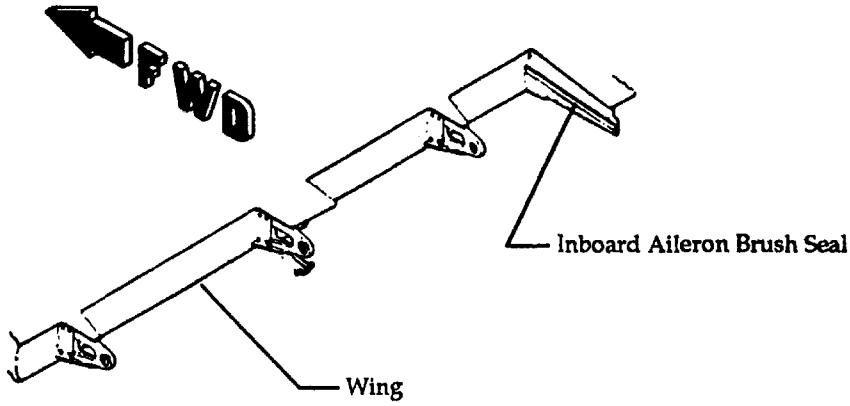
NOTE: Preform the detailed inspection of the aileron brush seals in accordance with the current inspection intervals specified in Chapter 5.

(1) Clean the aileron brush seals. (Refer to 12-21-02.)
(2) *On Aircraft 35-002 thru 35-278, 36-002 thru 36-044 modified per AAK 79-10 or AMK 83-5, 35-279 and Subsequent, and 36-045 and Subsequent*, make sure that the slots in the forward aileron brush seals are clearly defined and clear of any obstructions.
(3) Make sure that the woolpile of the aileron brush seals contacts the aileron.
(4) Visually inspect the aileron brush seals for any signs of damage.
(5) Visually inspect the aileron brush seals for any paint overspray.
(6) Lubricate the aileron brush seals. (Refer to 12-21-02.)

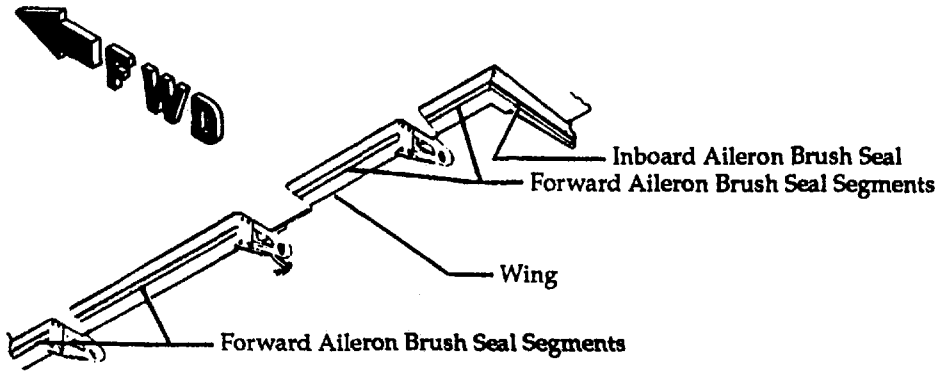


LEFT WING SHOWN
RIGHT WING TYPICAL

Aileron Brush Seal Installation
Figure 201 (Sheet 1 of 2)



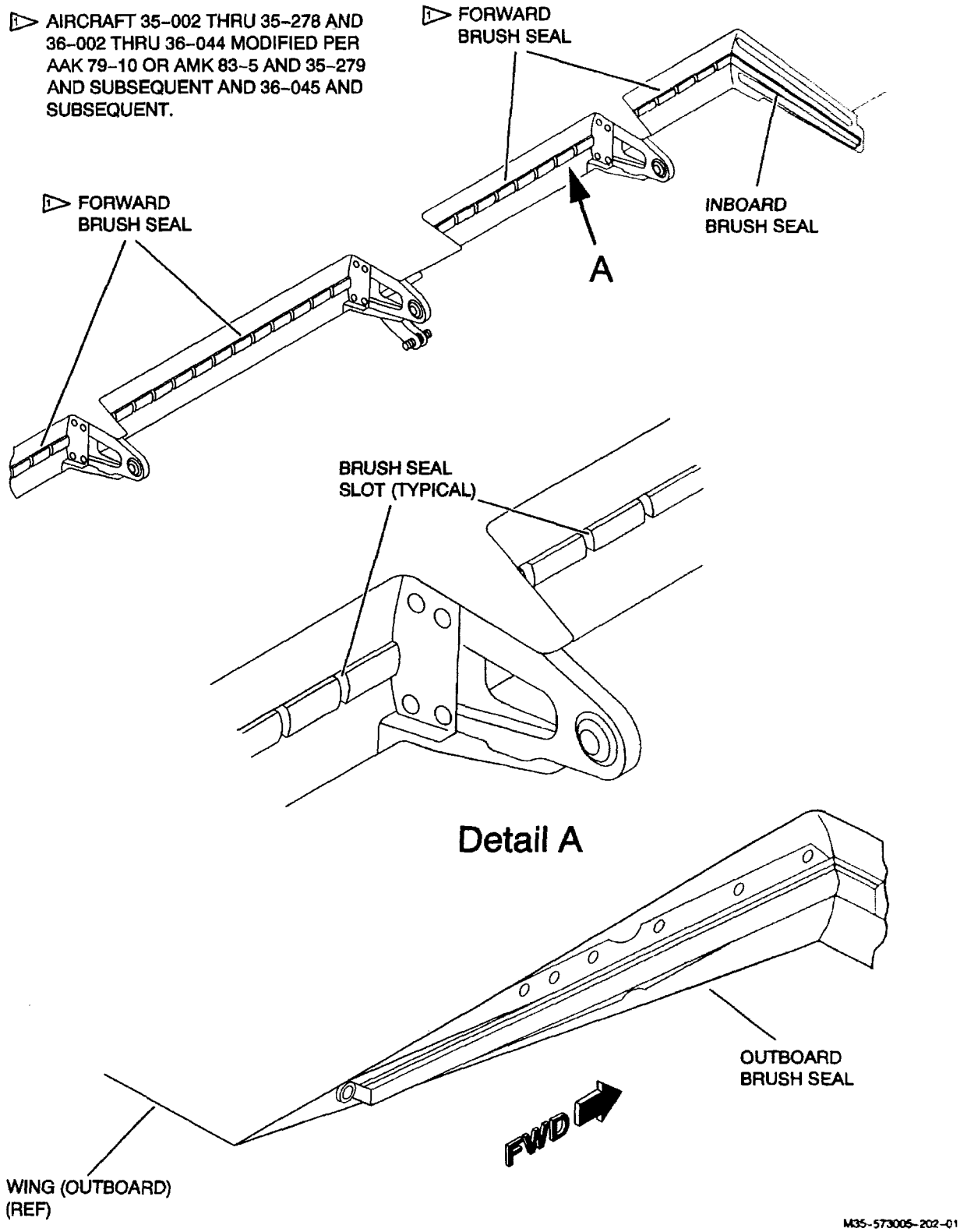
(Aircraft 35-002 thru 35-278; 36-002 thru 36-044, except aircraft modified per AAK 79-10 ,"Installation of Wing Fences, Stall Strips, and Boundary Layer Energizers" or AMK 83-5, "Installation of Wing Fences, Stall Strips, and Boundary Layer Energizers")



(Aircraft 35-279 and Subsequent, 36-045 and Subsequent, and previous aircraft modified by AAK 79-10 "Installation of Wing Fences, Stall Strips, and Boundary Layer Energizers" or AMK 83-5, "Installation of Wing Fences, Stall Strips, and Boundary Layers")

LEFT WING SHOWN
RIGHT WING TYPICAL

Aileron Brush Seal Installation
Figure 201 (Sheet 2 of 2)



Aileron Brush Seal Inspection
Figure 202

1. APPROVED REPAIRS

WARNING:
- TO ENSURE PROPER FLIGHT CHARACTERISTICS, IT IS IMPORTANT THAT THE REPLACEMENT STALL STRIP BE INSTALLED IN EXACTLY THE SAME LOCATION AS THE MISSING STALL STRIP.
- REMOVAL, REPAIR, OR REPLACEMENT OF THE WING LEADING EDGE OR STALL STRIP MAY AFFECT AERODYNAMIC STALL SPEED CHARACTERISTICS. THE AIRCRAFT MUST BE FLIGHT TESTED AND STALL SPEEDS MUST BE VERIFIED FOLLOWING SUCH MAINTENANCE PROCEDURES. THE FLIGHT TEST MUST BE CONDUCTED BY A PILOT APPROVED BY LEARJET CORPORATION FOR STALL FLIGHTS.

CAUTION: USE EXTREME CARE NOT TO DAMAGE WING LEADING EDGE WHEN PREPARING WING LEADING EDGE FOR REATTACHMENT OF STALL STRIP. DAMAGE COULD RESULT IN EXTENSIVE REPAIR.

NOTE: If new stall strip cannot be reattached where missing stall strip was located, or subsequent flight test indicates that adjustment of stall strip is required, such adjustment and/or repair shall be accomplished by an authorized Learjet service center or station.

A. Prepare Surface for Stall Strip Installation (See figure 201.)
   (1) Clean all bonding material and residue from wing leading edge where new stall strip is to be installed.

   CAUTION: AFTER FINAL CLEANSING, ENSURE THAT WING LEADING EDGE IS WIPED DRY AND IS NOT ALLOWED TO AIR DRY. LATENT RESIDUE WILL INHIBIT PROPER BONDING.

   (2) Clean same area of wing leading edge using MEK and a clean, white, lint-free cloth. Wipe wing leading edge dry when area is clean.

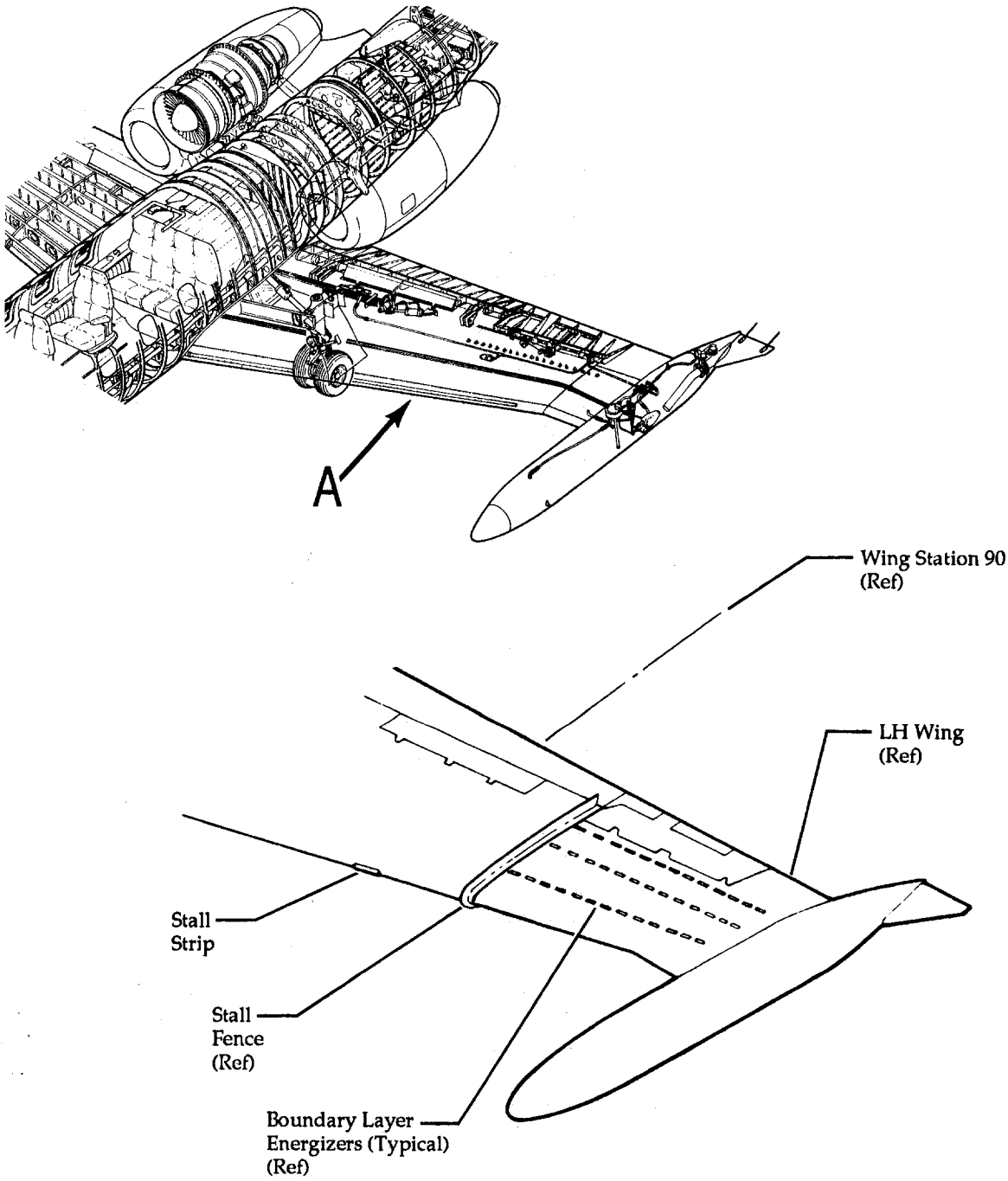
B. Install Replacement Stall Strip (See figure 201.)
   (1) Apply a thin film of RTV-154 or RTV-157 (gray) high-strength silicone adhesive (General Electric, Waterford, NY) to mounting surface of stall strip. Film thickness should be 7 to 15 mils.

   NOTE: Bonding adhesive requires several days to fully cure. However, bonded parts may be handled after bonding adhesive has cured at room temperature for 24 hours. Higher temperatures and humidity may be used to hasten curing time.

   (2) Position stall strip in proper location on wing leading edge, aligning stall strip rivet holes with wing leading edge rivet holes. Apply only enough pressure on stall strip to displace air from between bonding adhesive and wing leading edge.
   (3) Secure stall strip in position on wing leading edge with rivets.

   CAUTION: DO NOT USE MEK OR OTHER SOLVENT TO WIPE EXCESS ADHESIVE FROM AROUND STALL STRIP. SUCH SOLVENTS WILL INHIBIT PROPER BONDING.

   (4) Use a dry, clean, white, lint-free cloth to wipe excess bonding adhesive from around stall strip.
   (5) Perform necessary flight tests to ensure that repairs have not affected aerodynamic stall speed characteristics.



REPRO

(TYPICAL)

Detail A

Stall Strip Installation
Figure 201

ATTACH FITTINGS - DESCRIPTION AND OPERATION

1. DESCRIPTION

A. The wing is attached to the fuselage at eight points. The attach points are located on the left and right wing-fuselage intersections at frames 16, 18, 20, and 21. The attach fittings which are bolted to the wing are forgings containing bearings through which the bolts pass.

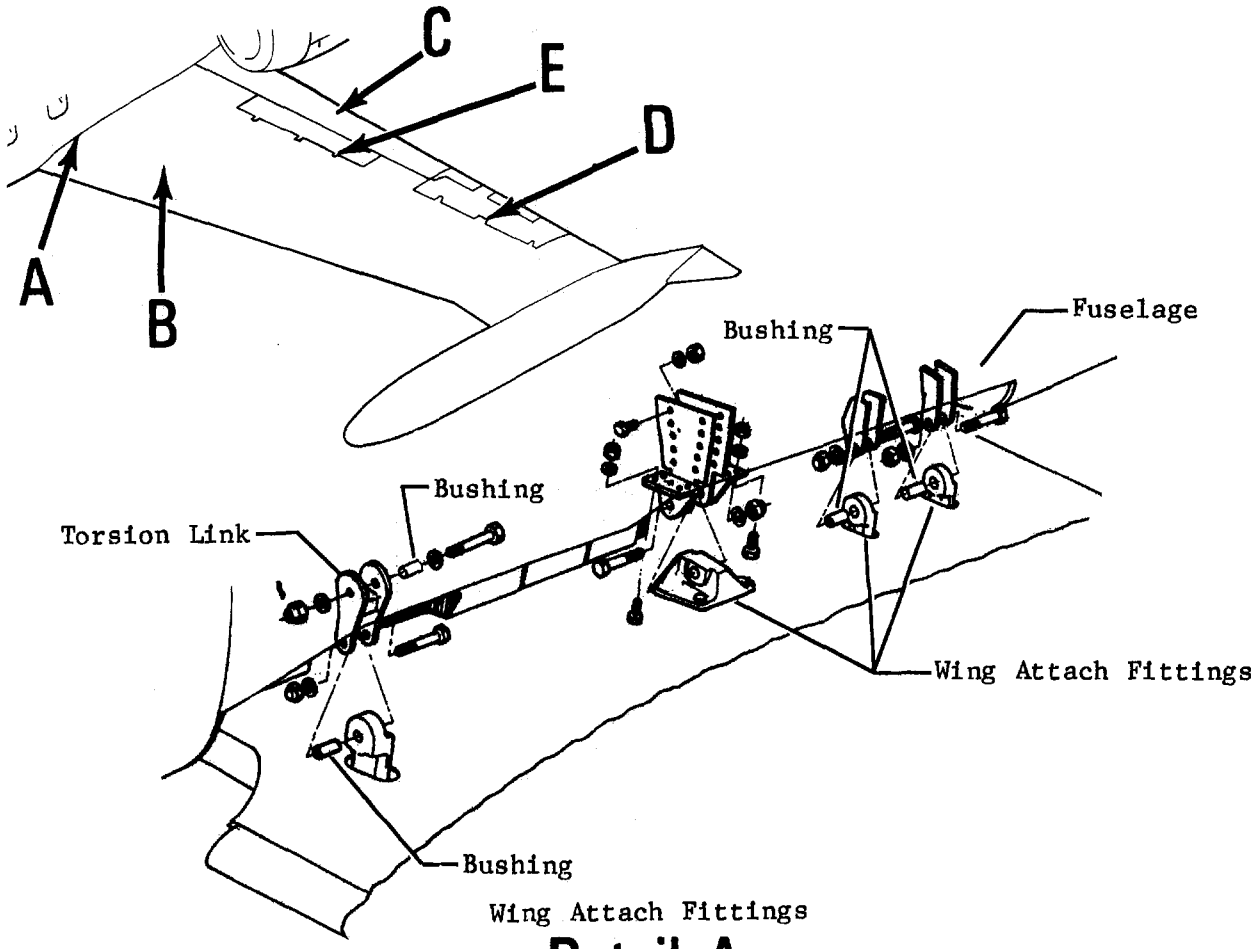
B. The tip tank is attached to the wing at two points, one just aft of spar 1 and one just forward of spar 7. Access to the tip tank attach bolts is through the straps between the wing and tip tank.

C. The ailerons are hinged to wing spar 8 at two points. The bearing support for the aileron drive mechanism is also located on spar 8. Access to the aileron hinge bolts is gained through an access cover on the aileron. The aileron balance tabs are controlled by push-pull tubes which are connected to an attach fitting on the aft lower wing skin.

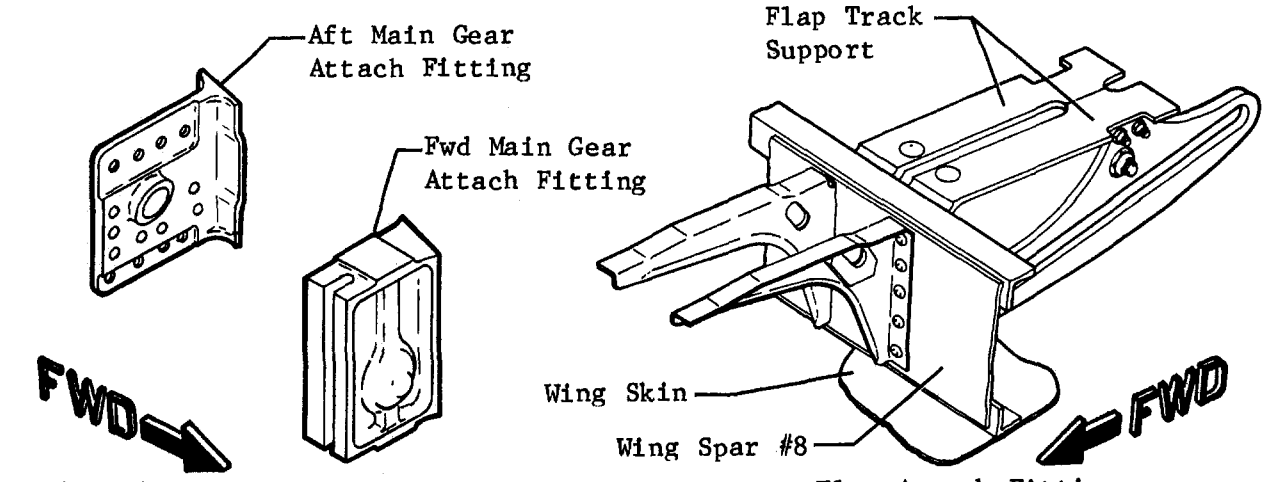
D. The spoilers are hinged to wing spar 8 at two points. The spoiler actuator attach bracket is located on wing spar 7. Access to the spoiler hinge bolts is gained by extending flaps. Access to the spoiler actuator attach bracket is gained through an access cover on the lower wing.

E. The main gear forward and aft trunnion bearings are located in the wing wheel area on spars 7 and 5. The attach pillar for the main gear aatuator is located in the wheel well on spar 7.

F. The flaps are mounted on a track roller assembly which is attached to wing spar 8. Access to the flap actuator and sector is through an access cover located on the wing lower surface.



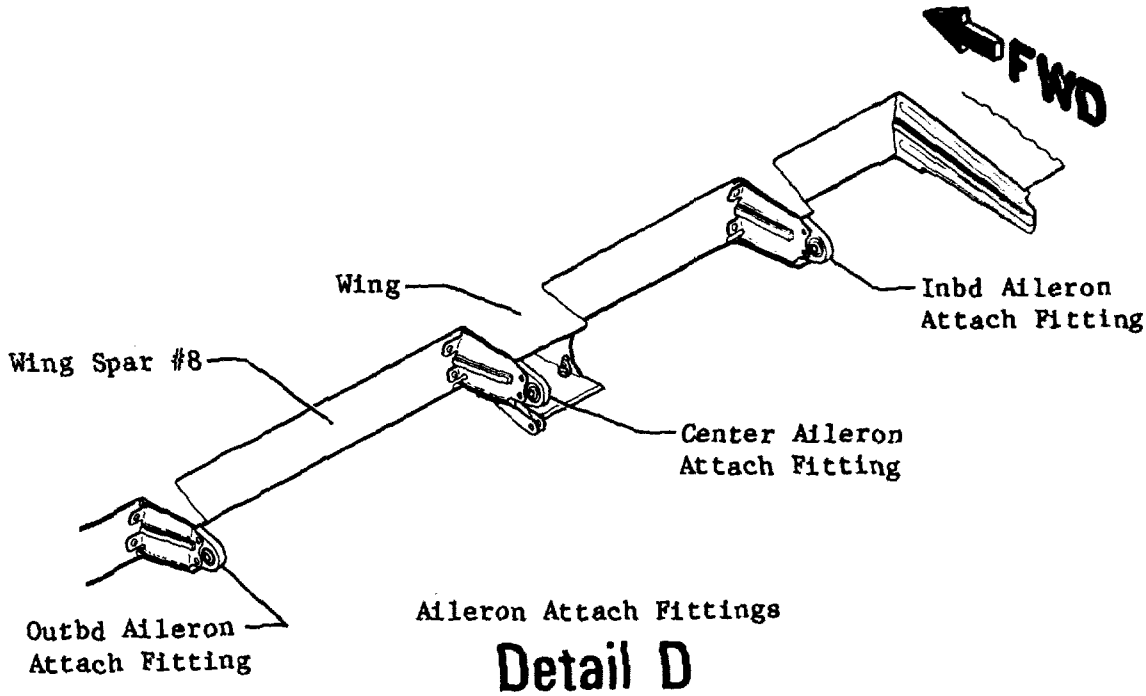
Detail A



Detail B

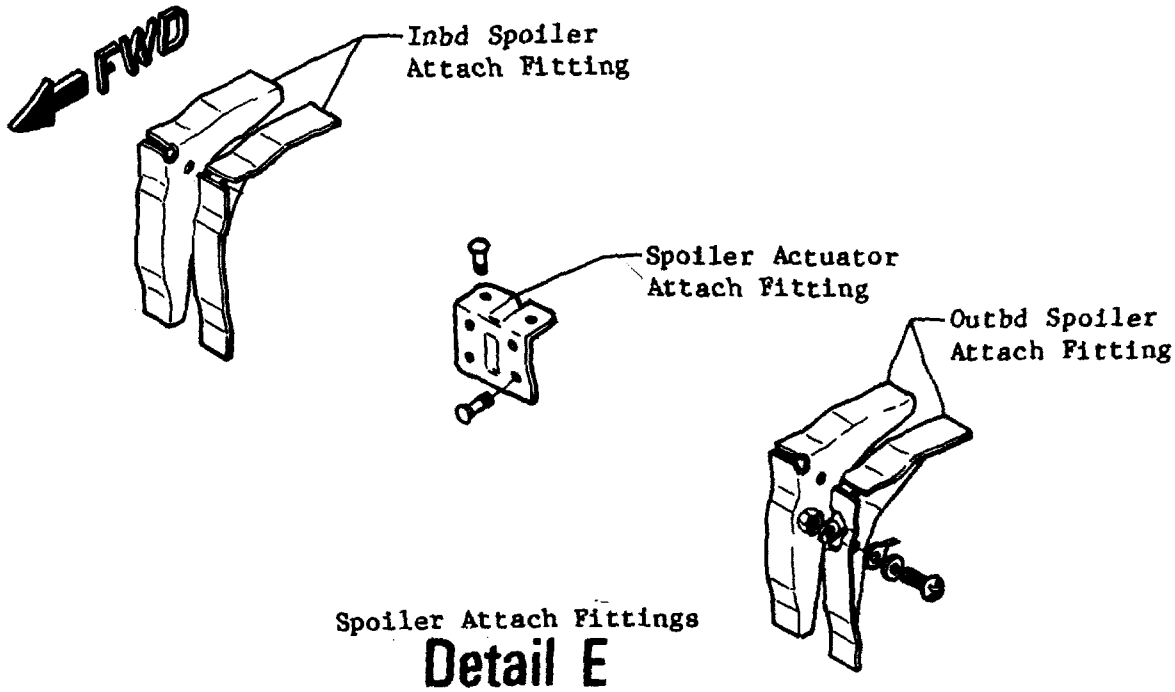
Detail C

Attach Fittings
Figure 1 (Sheet 1 of 2)



Aileron Attach Fittings

Detail D



Spoiler Attach Fittings

Detail E

Attach Fittings
Figure 1 (Sheet 2 of 2)

FLIGHT SURFACES - DESCRIPTION AND OPERATION

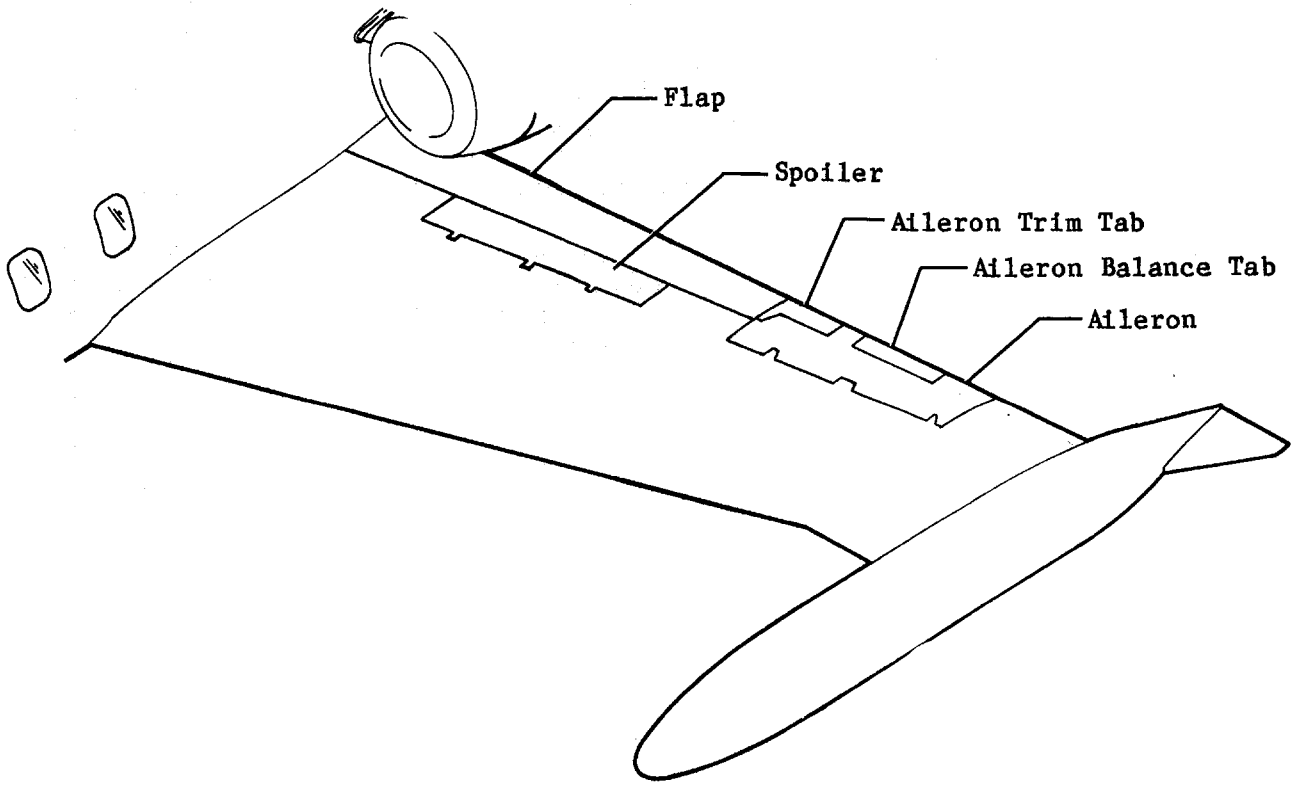
1. DESCRIPTION

A. The flight control surfaces attached to the wing include ailerons, flaps, and spoilers. The flight surfaces are constructed similarly with ribs and spars covered by a skin. Flight control surface maintenance practices are covered in Chapter 27.

B. The ailerons are hinged at three places on wing spar 8. Access to the aileron controls is gained through an access cover located forward of the aileron on the wing lower skin. Both ailerons have a balance tab which is controlled mechanically through push-pull tubes attached to a fitting located on the wing lower skin. A trim tab is located on the inboard trailing edge of the left aileron. For additional information on the ailerons, refer to Chapter 27.

C. Each flap is attached to the wing at two places. The flap track roller assemblies are attached to wing spar 8. Access to the flap sector and actuator is gained through access covers located forward of the flap in the wing lower skin. For additional information on the flaps, refer to Chapter 27.

D. The spoilers are hinged at two places on wing spar 8. The spoiler actuator attaches to wing spar 7. Access to the spoiler actuator is through an access cover located forward of the spoiler in the wing lower skin. For additional information on the spoilers, refer to Chapter 27.



Flight Surfaces
Figure 1

FLAP ATTACHMENT FITTING - MAINTENANCE PRACTICES

1. **REMOVAL/INSTALLATION**

A. Remove Flap Attachment Fitting (See figure 201.)

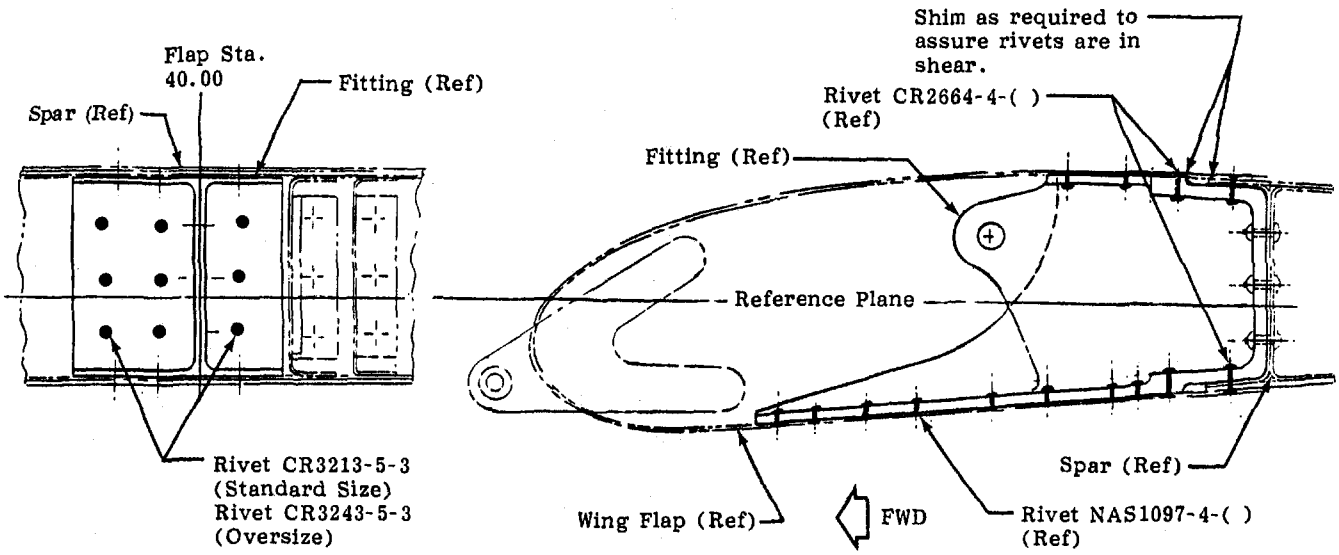
(1) Remove flap from wing. (Refer to Chapter 27.)
(2) Mark attachment fitting outline on flap lower skin.
(3) Drill out rivets and remove fitting from flap.

B. Install Flap Attachment Fitting (See figure 201.)

(1) Fabricate a mylar template and transfer spar fastener holes onto new fitting.
(2) Pilot drill holes in fitting to match holes in template.
(3) Locate and clamp fitting in place.
(4) Drill holes in fitting to match existing holes in flap. Cleco fitting in place as drilling progresses.
(5) Verify rivet grip length.
(6) Remove fitting and deburr holes. Clean mating surfaces.
(7) Tilt and shake flap to work internal rivet butts toward inboard end of flap where they can be removed.
(8) Clean mating surfaces. Apply zinc chromate primer to surface.
(9) Fay seal fitting mating surfaces using Pro Seal 890 sealant.
(10) Cleco fitting in place. Shim between fitting and flap structure, as noted, to ensure that rivets will shear when installed.

CAUTION: INSTALL FITTING WITH SAME TYPE RIVETS AS REMOVED EXCEPT USE BLIND RIVETS WHERE SHOWN TO SECURE THE FITTING TO FLAP SPAR. BLIND RIVETS USED IN THIS LOCATION SHOULD PREVENT CRACKING.

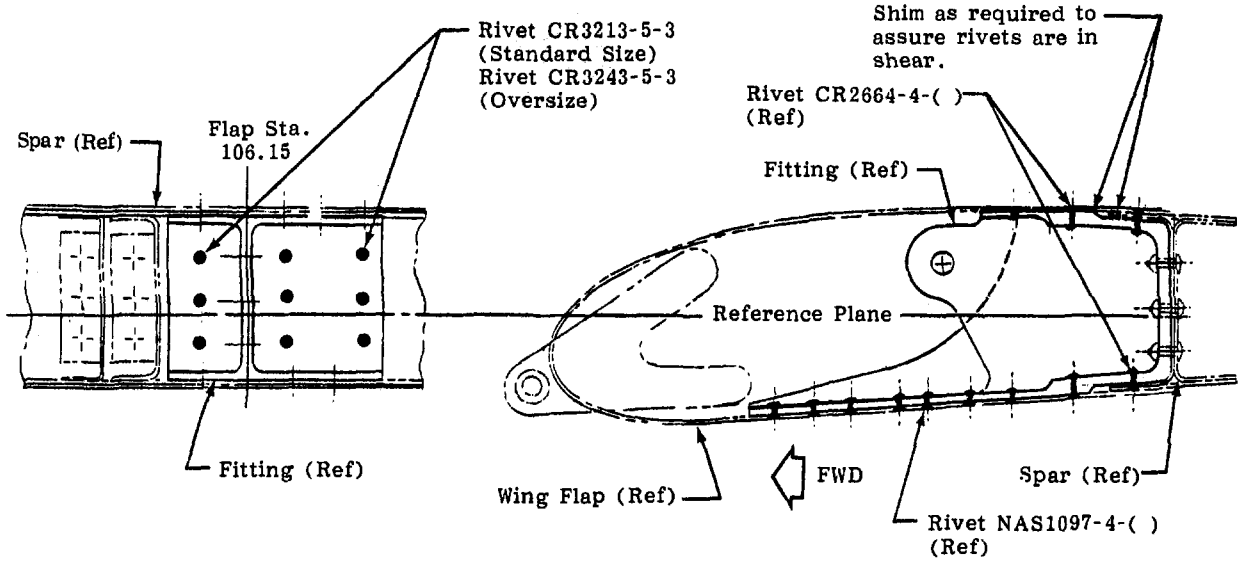
(11) Secure attachment fitting to flap using rivets as shown.
(12) Touch up paint surfaces as required.
(13) Install flap. (Refer to Chapter 27.)



CAUTION

Reinstall fitting with same type rivets removed except for blind rivets securing the fitting to flap spar.

LH INBOARD SHOWN - RH OPPOSITE



LH OUTBOARD SHOWN - RH OPPOSITE

Flap Attachment Fitting Installation
Figure 201