TO: ALL HOLDERS OF 737 THRUST REVERSER ASSEMBLY OVERHAUL MANUAL, 78-30-12

REVISION NO. 55, DATED NOV 1/06

HIGHLIGHTS

DESCRIPTION OF CHANGE	TOPICS AFFECTED												
	D & O	D / Assy	Cleaning	Insp/Chk	Repair	Assy	F/C	Test	T/Shooting	S/Tools	Storage	IPL	L/Overhaul
Updated to the latest information												X	

78-30-12 737 THRUST REVERSER ASSEMBLY

ROHR P/N 173-1010-1, 173-1010-2, 173-1010-501, 173-1010-503, 173-1010-505, 173-1010-507, 173-1010-508, 173-1010-509, 173-1010-511, 173-1010-513, 173-1010-515, 173-1010-516, 173-1010-517, 173-1010-519, 173-1010-521, 173-1010-523, 173-1010-525, 173-1010-526, 173-1010-527, 173-1010-528

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AIRLINE P/N

THE FOLLOWING DIRECTIVES APPLY TO THIS SUBJECT:

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVES	DATE DIRECTIVE INCORPORATED INTO TEXT
78-1008			Mar 10/70
78-1011			Mar 10/70
78-1009			Jun 10/70
78-1013, Rev 1			Dec 10/70
78-1016			Sep 10/70
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78-1018			Dec 10/70
78-1019			Dec 10/70
	78-1		Dec 10/71
71-1041			Jun 25/76
71-1055			Dec 15/78
	78-2		Jan 5/80
	78-3		Jul 5/83
	78-4		Dec 5/87
78-1054, Rev 1			Sep 1/95

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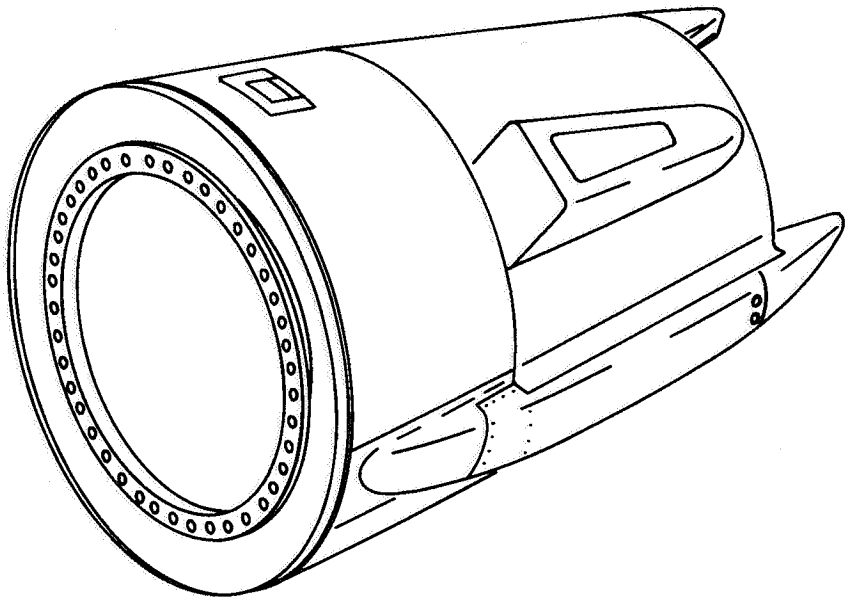
BOEING

OVERHAUL MANUAL

JT8D ENGINE THRUST REVERSER ASSEMBLY

Rohr Part Nos. 173-1010-1 (Boeing 10-61813-1), 173-1010-2 (Boeing 10-61813-2), 173-1010-501 (Boeing 10-61813-7), 173-1010-503 (Boeing 10-61813-8), 173-1010-505 (Boeing 10-61813-9), 173-1010-507 (Boeing 10-61813-21), 173-1010-508 (Boeing 10-61813-22), 173-1010-509 (Boeing 10-61813-27), 173-1010-511 (Boeing 10-61813-28), 173-1010-513 (Boeing 10-61813-29), 173-1010-515 (Boeing 10-61813-31), 173-1010-516 (Boeing 10-61813-32), 173-1010-517 (Boeing 10-61813-33), 173-1010-519 (Boeing 10-61813-34), 173-1010-521 (Boeing 10-61813-30), 173-1010-523 (Boeing 10-61813-59), 173-1010-525 (Boeing 10-61813-55), 173-1010-526 (Boeing 10-61813-56), 173-1010-527 (Boeing 10-61813-57), 173-1010-528 (Boeing 10-61813-58).



737-22

JT8D Engine Thrust Reverser Assembly
Figure 1

DESCRIPTION AND OPERATION

1. Description

   A. The thrust reverser assembly is located on the aft end of each engine nacelle. It is of the target type, providing thrust reversal by blocking the engine exhaust gas and deflecting it forward and overboard with one set of deflector doors.

   B. The major components of the thrust reverser are the shroud assembly, two deflector doors, two actuator assemblies, and two deflector door linkages. The hydraulic plumbing, door latch assemblies, and the electrical installations are contained within the shroud assembly.

C. Upon installation of the thrust reverser on the aircraft an adjustable fairing is mounted on the upper deflector door. This fairing continues the aft wing-to-nacelle fairing.

2. Operation

A. The thrust reverser assembly serves as the aft fairing of the engine nacelle and controls the direction of flow of the exhaust. In the flight position, the deflector doors are stowed and the engine exhaust flows aft.

B. During the landing roll, the thrust reverser deflector doors may be deployed (opened) to deflect the engine exhaust forward and aid in slowing the aircraft.

C. The thrust reverser deflector doors are actuated by hydraulic pressure and are controlled from the flight compartment.

3. Leading Particulars

A. Size

(1)	Overall Length	74 inches (187.96 CM)
(2)	Overall diameter	
	(a) Over actuator fairings	47 inches (119.38 CM)
	(b) Over door fairings	60 inches (152.40 CM)
(3)	Exhaust Nozzle Exit Diameter	See Figure 2.
(4)	Weight	
	(a) Overall	392 Pounds (178 Kg) (less hydraulic fluid)
	(b) Deflector door	60 pounds (27.22 Kg)
	(c) Door actuator fairing	12 pounds (5.45 Kg)

NOTE: Dimensions are approximate.

B. Hydraulic Data

(1)	Fluid	BMS 3-11, Type II
(2)	Operating Pressure	
	(a) Normal	3000 psig
	(b) Minimum	2250 psig
	(c) Maximum	3600 psig
(3)	Proof Pressure	5400 psig

C. Temperature Range

(1) Fluid	$-40^{\circ}F$ to $200^{\circ}F$ ($-40^{\circ}C$ to $93^{\circ}C$)
(2) Ambient	$-65^{\circ}F$ to $300^{\circ}F$ ($-54^{\circ}C$ to $149^{\circ}C$)

4. Overhaul of Thrust Reverser Actuators

A. Main Actuators (130, Figure 1101)

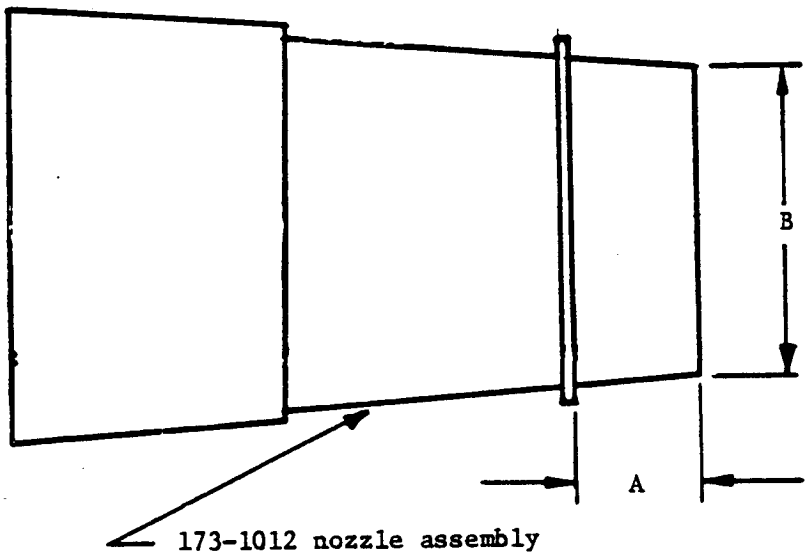
(1) P/N 1U1220-2, refer to Hydraulics Units Corp., Overhaul Manual, 78-32-05.

(2) P/N 60470, refer to Sterer Engineering & Manufacturing Co., Overhaul Manual with IPL, 78-30-05.

B. Unlock Actuators (21, Figure 1103)

(1) P/N 1U1222, refer to Hydraulics Units Corp., Overhaul Manual, 78-32-06.

(2) P/N 58120-1, refer to Sterer Engineering & Manufacturing Co., Overhaul Manual with IPL, 78-32-01.



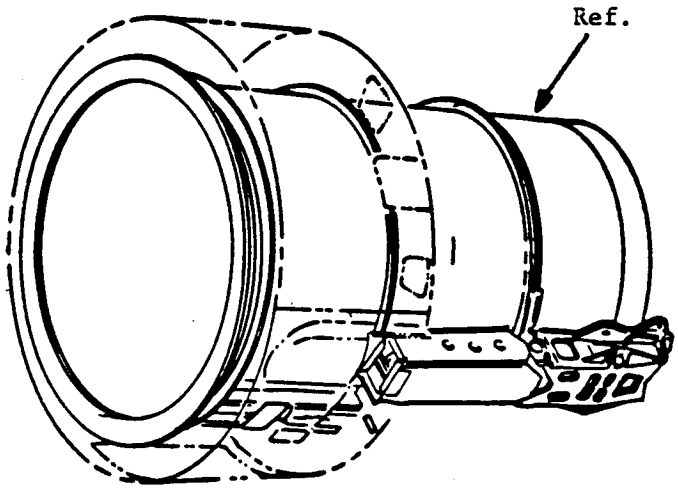


Figure 2 (Sheet 1)

RESULTS

1. Since the nozzle dimensions in the Overhaul Manual are for reference only, they should be used only as a guide to help verify the proper engine exhaust nozzle dimensions and exhaust exit area. The following measurements are recommended.

   A. Thrust Reverser Nozzle Assemblies Used on JT8D-7, -7A, -7B, -9, -9A, -15, and -15A engines:

      Dimension "A" - 14.80 inches (37.59 cm)
      Exit Area "B" - 698.82 to 703.05 sq. Inches
      (4508.5 to 4535.8 sq. cm)

   B. Thrust Reverser Nozzle Assemblies Used on JT8D-17 and -17A engines:

      Dimension "A" - 15.75 inches (40.01 cm)
      Exit Area "B" - 695.59 to 697.93 sq. inches
      (4487.7 to 4502.8 sq. cm)

   C. Thrust Reverser Nozzle Assemblies Used on JT8D-15 and -15A engines with Exhaust Mixers Only:

      Dimension "A" - 13.60 inches (34.54 cm)
      Exit Area "B" - 720.49 to 722.86 sq. inches
      (4648.3 to 4663.6 sq. cm)

Figure 2 (Sheet 2)

WARNING: EXERCISE CARE WHEN DISASSEMBLING THRUST REVERSER TO PREVENT INJURY TO PERSONNEL AND DAMAGE TO PARTS. THE THRUST REVERSER ASSEMBLY WEIGHS APPROXIMATELY 392 POUNDS (178 Kg.).

1. Disassembly

NOTE: During overhaul procedures, the holding fixture should allow access to all areas of thrust reverser to permit disassembly, assembly and final operational checkout. See Figure 1004 for illustration of the holding fixture.

NOTE: Parts should be identified prior to removal, so they will be installed in same location from which removed.

A. Removal of upper and lower deflector door assemblies (22, Figure 1101).

(1) Connect hydraulic test stand hoses to tee fittings at forward bulkhead of shroud assembly NAC STA 145.45 (4, Figure 1101).

NOTE: See schematic diagram hydraulic test stand (Figure 1001).

(a) Connect 3/8 inch supply hose to deploy line tee (29, Figure 1104).

(b) Connect 1/2 inch return hose to stow line tee (28, Figure 1104).

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE CLEAR OF DOORS BEFORE APPLYING HYDRAULIC PRESSURE. MAKE SURE DEFLECTOR DOORS DO NOT CONTACT HOLDING FIXTURE WHEN DEPLOYED.

(2) Slowly apply hydraulic pressure to the deploy system until deflector door assemblies are fully deployed. Release hydraulic pressure and disconnect hydraulic pressure source. Provide a container for hydraulic fluid drainage.

(3) Remove actuator housing assemblies (18, Figure 1101).

NOTE: See Figure 1101 unless otherwise noted.

(a) Remove screws (19) and washers (20), 3 places each assembly.

(b) Remove screws (21), 18 places each assembly.

(4) Remove access panels (156) and (157) from actuator support assembly (148A) by removing bolts (158, 159, 160, and 161) and washers (162 and 163).

NOTE: Do not remove nutplates (165, 168) or rivets (166, 167, 169) from actuator support assembly (148A) unless required by inspection.

(5) Remove access panels (9 and 12) by removing bolts (10, 11, and 13).

(6) Remove fairing assembly (25) from upper deflector door assembly (22).

NOTE: This operation is normally accomplished prior to removal of thrust reverser from the aircraft; the fairing assembly remaining with the aircraft.

(a) Detach access panel (26) by removing screws (27), 28 places.

(b) Remove nuts (48), washers (49), and serrated plates (50), 4 places.

(c) Lift off fairing assembly (25) from deflector door (22).

(d) Remove spacers (53).

(e) Detach forward studs (51) and aft studs (52) by removing nut (58) and washer (57), 4 places, from under side of deflector door (22).

(f) Detach spacer (56), 4 places, from outer side deflector door (22), by removing screws (54) and washers (55).

(g) Detach retainer (37) from aft end of fairing assembly (25) by removing screws (39) and washers (40), 6 places.

(h) Detach retainers (32, 33, 34, 35, 36), seals (30 and 31) and two rubber filler plugs (38) from fairing assembly (25) by removing screws (39), washers (40), and nuts (41), 27 places.

(7) Remove latch fittings (70) from upper and lower deflector door assemblies (22) by removing nuts (77), washers (76 and 72), and bolts (71).

(8) Remove upper and lower deflector door assemblies (22).

CAUTION: WEIGHT OF EACH DEFLECTOR DOOR ASSEMBLY IS 60 POUNDS (27.22 Kg). ASSURE ASSEMBLY IS ADEQUATELY SUPPORTED DURING REMOVAL OPERATION.

(a) Disconnect driver links (80) from door assemblies (22) by removing cotter pins (139), nuts (143), washers (137 and 136), and bolts (135).

(b) Disconnect idler links (82) from deflector door assemblies (22) by removing nuts (138), washers (136), and bolts (140).

(c) Place deflector door assemblies (22) in suitable storage rack for further overhaul action.

B. Removal of hydraulic components. (See Figure 1104, unless otherwise noted.)

(1) Remove hoses and unions from top and bottom unlock actuators (21, Figure 1103).

NOTE: Care must be exercised to prevent damage to threaded fittings during removal procedures and handling.

(a) Through unlock actuator access, disconnect hoses (40 and 41), remove unions (27), and packings (19). Discard packings.

(b) Through hydraulic system access opening, disconnect hoses (39 and 40), remove unions (27), and packings (19). Discard packings.

(2) Remove following items from thrust reverser actuators (130, Figure 1101).

(a) From actuator on left side of thrust reverser, disconnect tube assemblies (6 and 8), remove unions (26), and packings (18), 2 places. Discard packings.

(b) From actuator on left side of thrust reverser, disconnect tube assemblies (1 and 3), remove unions (26), and packings (18), 2 places. Discard packings.

(3) Remove tube assemblies (1 and 6).

(a) Disconnect tube assembly (1) from tube assembly (2). Detach clamp (15), remove tube (1) and union (26).

(b) Disconnect tube assembly (6) from tube assembly (7). Detach clamp (15), remove tube (6) and union (26).

(4) Remove tube assemblies (4 and 5).

(a) Disconnect tube assembly (4 and 5) from elbows (24). Remove nuts (34), washers (30), and elbows (24).

(b) Disconnect tube assembly (4) from tube assembly (10). Disconnect tube assembly (5) from tube assembly (11). Detach clamps (16), remove tubes (4 and 5) and unions (27).

(5) Remove tube assemblies (2, 3, 7, 8, 10, and 11).

(a) Detach two clamps (15) and one clamp (16) from each side of thrust reverser assembly.

(b) Disconnect tube assemblies (2, 3, 7, and 8) from two tees (25). Remove tube assemblies through hydraulic panel access.

(c) Disconnect tube assemblies (10 and 11) from two tees (23) and remove tube assemblies.

(6) Remove tube assemblies (13 and 14).

(a) Disconnect tube assembly (13) from tee (29). Remove tee (23), washers (30), and nut (34) from tube (13).

(b) Disconnect tube assembly (14) from tee (28). Remove tee (23), washers (30), and nut (34) from tube (14).

(7) Remove tube assemblies (9 and 12).

(a) Disconnect tube assembly (9) from valve (37) and tube assembly (12) from valve (38).

(b) Remove tube assemblies (9 and 12) by detaching clamps (15).

(c) Remove tees (25) from tube assemblies (9 and 12).

(8) Remove valves (37 and 38) from tees (29 and 28). Discard packing.

(9) Disconnect tees (28 and 29) from forward bulkhead of thrust reverser by removing nuts (32 and 33) and washers (35 and 36).

C. Removal of electrical components. (See Figure 1105 unless otherwise noted.)

NOTE: The two proximity sensors and receptacle are an integral part of wire bundle, and are removed as a single unit.

(1) Disconnect electrical receptacle (17) from bulkhead by removing screws (8), washers (15) and nut (10), 4 places.

(2) Disconnect proximity sensors (19).

(a) Through unlock actuator access opening, detach upper proximity sensor (19) by removing screws (5), washers (14) and spacer (13). Retain spacer (13) with proximity sensor.

(b) Through hydraulic system panel access, detach lower proximity sensor (19) by removing screws (5), washers (14), and spacer (13). Retain spacer (13) with proximity sensor.

(3) Remove electrical harness support clamps.

(a) Through hydraulic system panel access, disconnect forward clamp (2) by removing screw (4), spacer (11), and nut (9).

(b) Through hydraulic system panel access, disconnect aft clamp (2) from bracket (20) at NAC STA 159.72 by removing screw (7) and nut (9).

(c) Through hydraulic system panel access, disconnect two clamps (3) by removing screws (7) and nut (9).

(d) Through hydraulic system panel access, disconnect three clamps (3) by removing screws (7).

(e) Through unlock actuator panel access, disconnect one clamp (3) by removing screw (6) and spacer (12).

(f) Through unlock actuator panel access, disconnect one clamp (3) by removing screw (7) and nut (9).

(g) Through unlock actuator panel access, disconnect three clamps (3) by removing screws (7).

(4) Place wire bundle assembly (16) in suitable protective container pending further overhaul action.

D. Removal of interlock and control system. (See Figure 1102 unless noted)

(1) Remove feedback control installation

(a) Remove feedback control access panel (14, Figure 1101) by unfastening 14 camloc studs (15, Figure 1101).

(b) Disconnect rod end (12) from link (13) by removing pin (2), nut (6), washer (4), bushing (17), and bolt (10).

(c) Remove lockwire then remove rod end (12) and nut (11) from rod assembly (90, Figure 1101).

(d) Disconnect support (14) by removing bolts (9) and washers (4), 4 places.

(e) Disconnect lever (15) from support (14) by removing cotter pin (2), nut (5), washer (3), bushing (7), and bolt (8).

(f) Remove lockwire from nut (11) then disconnect link (13) and nut (11) from rod end (12).

(g) Disconnect rod end (22) from lever (15) by removing cotter pin (2), nut (6), washer (4), bushing (16), and bolt (10).

E. Removal of unlock actuator assemblies. (See Figure 1103 unless noted otherwise.)

(1) Remove upper and lower unlock actuator assemblies (1, Figure 1103) from shroud assembly (4, Figure 1101):

NOTE: Access to upper unlock actuator assembly is through top unlock actuator access. Access to lower unlock actuator assembly is through bottom hydraulic system access.

(a) Disconnect forward end of lock assembly (1) from shroud (4, Figure 1101) by removing screws (29), washers (30), and nuts (31), 4 places.

(b) Disconnect aft end of lock assembly (1) from shroud aft bulkhead by removing screws (26), washers (27), and nuts (28), 12 places.

(c) Remove lock assembly (1) from shroud. Place lock assemblies in a suitable protective container for further overhaul action.

F. Removal of link assemblies. (See Figure 1101 unless otherwise noted.)

(1) Detach idler links (82) and inner bushings (85) from support (94) by removing cotter pin (119), nut (101), washer (128), retainer washers (121A), and bolt (107), 4 places. Discard retainer washers (121A).

(2) Detach driver links (80) from overcenter links (81) by removing cotter pin (120), nut (102), washers (125 and 129), and bolt (110), 4 places.

(3) Detach driver links (80) and inner bushing (84) from support (94) by removing cotter pin (118), nut (100), washer (122), retainer washer (121A), and bolt (106), 4 places. Discard retainer washers (121A).

(4) Detach overcenter links (81) from carriage (93) by removing cotter pin (120), nut (100), washers (113), and bolt (111), 4 places except as noted below.

NOTE: On 173-1029-1 installation, the detaching of lower overcenter link (81) from carriage (93) is as follows: Remove cotter pin (120), nut (102), washer (125), spacer (117), and bolt (109).

G. Removal of control rod assembly (90) on 173-1029-1 only.

(1) Through feedback control access and actuator cylinder access, detach forward guide assembly (89) by removing nuts (104), washers (116 and 114), and bolts (112), 3 places

(2) Through actuator cylinder access, detach aft guide assembly (89) by removing nuts (104), washers (114), and bolts (112), 3 places. Remove rod assembly (90) through aft end of support assembly.

H. Disassembly and removal of support assembly (91, Figure 1101).

(1) Disconnect actuator assembly (130) from carriage (93) by removing nut (138), washers (137 and 136), and bolt (142).

(2) Disconnect two rod assemblies (92) from support assembly (91) by removing nuts (105) and washers (125). Supporting carriage (93), remove rod assemblies (92) through aft end of support (94).

CAUTION: RESTRAIN ROD ASSEMBLY (92) AT AFT END TO PREVENT ROTATION.

(3) Detach support assembly (91) from box section of shroud (4) by removing nuts (103), washers (115 and 124), and bolts (108), 4 places.

(4) Remove deflector door actuator cylinders (130) by removing nuts (134), washers (133 and 132), and bolt (131) from thrust reverser shroud (4).

(5) Secure the STOW and DEPLOY ports of the actuator cylinders (130) using AN814 type plugs. Overhaul of the thrust reverser actuators (130), P/N 1U1220-2, is covered by Hydraulic Units Corp., Overhaul Manual 78-32-05.

I (6) Remove forward stop (164), bolts (145), and washers (146 and 147) from actuator support assembly (148A) on shroud (4) by removing bolts (158) and washers (162), 8 places.

NOTE: Do not remove nutplates (165, 168) or rivets (167, 169) from forward stop (164) unless required by inspection.

(7) Remove aft stops (95) from support (94) by removing bolts (99), plate (97), and shim (98), 2 places.

(8) Remove support assembly (174) by removing pins (172), collars (173), bolts (159), washers (170), and nuts (171).

NOTE: Further disassembly of the actuator support assembly (148A) or removal of nutplates (165) and rivets (166) is not recommended unless required by inspection.

I. Disassemble lock actuator assembly (See Figure 1103).

(1) Disconnect and remove spring (15) from support assembly (2) and arm (6).

(2) Disconnect clevis end of actuator (21) by removing cotter pin (20), nut (19), washer (18), and screw (16). Bushing (17) should be removed from latch (4) at this time.

(3) Remove unlock actuator (21) from support assembly (2) by removing cotter pin (25), nut (24), washer (23), and screw (22). Overhaul of the unlock actuator P/N 1U1222, is covered by Hydraulics Units Corp., Overhaul Manual 78-32-06. Cover ports of actuator to prevent contaminants from entering.

WARNING: SPRING (11) IS CONNECTED BETWEEN LATCH (4) AND SUPPORT ASSEMBLY (2) CASTING AND SUDDEN RELEASE COULD CAUSE INJURY TO PERSONNEL.

(4) Remove latch (4) from support assembly (2) by removing cotter pin (14), nut (13), washer (12), bolt (10), and spring (11).

(5) Detach arm (6) and bushings (5) from latch (4). Remove nut (9), washer (8), and pin (7) from latch (4).

J. Insulation Blankets (See Figure 1101).

NOTE: The following disassembly information is for operators of aircraft equipped with JT9D-15 engines with exhaust mixers only.

(1) Remove lockwire (214) releasing blanket assemblies (210 and 212) from inside actuator support (148A).

(2) Remove lockwire(214) releasing blanket assemblies (184 and 192) from each other and thrust reverser shroud.

(3) Remove lockwire (214) releasing blanket assemblies (182 and 190) from each other and thrust reverser shroud.

(4) Remove blanket assemblies (200, 202, and 204) from between upper and lower zees (9, Figure 425) on thrust reverser shroud.

(5) Remove lockwire (214) releasing blanket assemblies (186 and 194) from each other and thrust reverser shroud.

(6) Remove blanket assemblies (206 and 208) from between upper and lower zees (9, Figure 425) on thrust reverser shroud.

(7) Remove lockwire (214) releasing blanket assemblies (180 and 188) from each other and thrust reverser shroud.

(8) Remove blanket assemblies (196 and 198) from between upper and lower zees (9, Figure 425) on thrust reverser shroud.

CLEANING

1. General

All parts must be free of corrosion, dirt, grease, oil, or other contaminants.

A. Cleaning Procedures (See Figure 1101 for item numbers, unless otherwise noted.)

(1) Remove solid-film lubricant from link assemblies (80, 81, and 82) and rod assemblies (90 and 92) per Subject 20-30-03 by grit blasting or immersion in boiling 20 percent chromic acid, as applicable.

(2) Remove carbon, or other foreign deposits/buildups, from components with cleaner and stiff fiber brush.

CAUTION: DO NOT USE WIRE BRUSH. WIRE BRUSH COULD DAMAGE THE SOLID-FILM LUBRICANT ON COMPONENTS.

(3) Steam clean the following parts per Subject 20-30-03.

(a) Support (94).

(b) Nozzle assembly (4A).

(c) Deflector door assemblies (22).

WARNING: USE CLEANING SOLVENTS IN A WELL-VENTILATED AREA. AVOID BREATHING SOLVENT FUMES. KEEP SOLVENT AWAY FROM OPEN FLAMES. DO NOT DIRECT COMPRESSED AIR ON HUMAN SKIN.

(4) The following parts may be cleaned with solvent. Drain and dry parts thoroughly with lint-free wipers, or clean moisture-free air.

(a) Structural components.

(b) Control components.

(c) Exterior surfaces of hydraulic components.

(d) Actuating Mechanism Components and Bearings
(e) Deflector Door Assembly
(f) Shroud and Fairing Assemblies
(g) Access Panels

(5) All component parts that require magnetic or penetrant examination will require solid-film lubricant removed (where applicable), in accordance with the procedure outlined in Step (1) of this Cleaning Procedures Section. Reference figure 301 of Inspection/ Check Section for examination requirements.

(6) If required, recondition exterior aluminum surfaces with Cee-Bee B-4 brightener, and polish with Jet Sheen Polish, or equivalent.

(7) Place cleaned parts in a dust free container until ready for examination and assembly. All hydraulic components should have protective caps or plugs installed on open ports, bosses, tubes and hoses.

2. Materials

Solvent, Stoddard, P-D-680 - commercially available

Cleaner, Cee-Bee, No. 280, Mc Gean Chemical Co., Inc., Downey, CA 90241

Wiper cotton - commercially available

Brush, stiff, fiber bristle - commercially available

Brightener, Cee-Bee B-4, Mc Gean Chemical Co., Inc., Downey, CA 90241

NOTE: Equivalent substitutes may be used for above items.

INSPECTION/CHECK

1. Inspection/Check Requirements (Figure 1101 for item numbers in parentheses unless otherwise noted).

   NOTE: All components must be free of corrosion, dirt, grease, oil, or other contaminants prior to examination. (Reference Cleaning Section.)

   A. Examination Procedures

      (1) Fluorescent-Penetrant examine components as noted on Figure 302, Non-Destructive Examination, per Subject 20-20-02.

      (2) Penetrant examine components as noted on Figure 302, Non-Destructive Examination, per Subject 20-20-02.

      (3) Magnetically examine components as noted on Figure 302, Non-Destructive Examination, per Subject 20-20-01.

   B. Repairable Cracks

      (1) Drive link (80) is repairable if crack can be ground out without reducing flange thickness below 0.095 inch, web thickness below 0.090 inch, or flange width below 98 percent of original width.

      (2) Overcenter link (81) is repairable if crack can be ground out without going 0.020 inch below the surface, or without reducing web thickness below 0.086 inch.

      (3) Idler link (82) is repairable if crack in I-Beam section can be ground out without reducing flange thickness below 0.095 inch, web thickness below 0.090 inch, or flange width below 98 percent of original width. Crack in solid section can be ground out without going more than 0.040 inch below surface. (See Figure 406.)

      (4) Lever (15, Figure 1102) is repairable if crack can be ground out without reducing web thickness 0.086 inch.

      (5) Aft hinge (24) is repairable if cracks can be removed as shown in Figure 417.

C. Non-Repairable Cracks

(1) Bushings (84, 85, 86, and 87).

(2) Bearing (83).

(3) Bearing Race (88).

(4) Carriage Assembly (93).

(5) Forward Hinge (23).

(6) Feedback Lever Support (14, Figure 1102).

(7) Rod Assemblies (90 and 92).

(8) Studs (51 and 52).

(9) Latch (4, Figure 1103).

(10) Arm (6, Figure 1103).

D. Visual Examination

NOTE: All parts should receive a complete visual examination prior to other type inspection procedures to detect obvious defects or excessive wear.

(1) Examine all threaded surfaces for evidence of stripping, cross threading, nicks, burrs, or deterioration.

(2) Examine all tubes, fittings, and hoses for damage, deterioration, and obstructions.

(3) Examine all surfaces which contact o-rings, packing, or cap rings for nicks, scratches, corrosion, and evidence of contamination.

(4) Examine the following parts for nicks, dents, cracks, loose or missing rivets, distortion, or other damage.

(a) Structural skins of fairings (25).

(b) Shroud assembly (4).

(c) Door assemblies (22).

(5) Examine the following parts for damage, distortion, and deterioration. Particular attention should be placed on panel fasteners. Replace damaged fasteners, snap rings, or grommets.

(a) Access panel (9).

(b) Access panel (12).

(c) Access panel (14).

(d) Access panel (26).

(6) Examine all screws, bolts, and studs for excessive wear, cross threading, stripping, or other damage.

(7) Examine guides (89) for excessive wear, deterioration or damage. See Figure 601 for service wear limits.

(8) Examine threads accommodating screws, bolts, and studs for damage.

(9) Examine actuator housing assembly (18) for cracks around the nut plates in the fastener retention lip and cracks in the corner radii of the skin. (Reference Figure 410).

(10) Examine the support assembly (148A) for loose or missing fasteners at the aft bulkhead and nozzle tee and the stop bolts (145) for wear.

(11) Examine the door lock assembly (1, Figure 1103) for wear or damage to the clips and spring attach slot for damage to the frames.

(12) Examine springs (11 and 15, Figure 1103) for distortion, wear, or damage.

(13) Check that the tailpipe exit area is within limits specified in Figure 2.

CAUTION: NOZZLE ASSEMBLIES FOR JT8D-15, -17 ENGINES ARE MADE OF DIFFERENT MATERIALS THAN NOZZLE ASSEMBLIES FOR OTHER ENGINES. REFER TO FIGURE 1101 ASSEMBLY PARTS LIST TO ENSURE THAT NOZZLE AND ENGINE CONFIGURATION IS CORRECT COMBINATION.

NOTE: Aircraft performance and engine operation can be affected by nozzles with exit areas outside specified tolerances. Failure to meet exit area requirements should be reported to a local Boeing representative or the Customer Service Section of the Boeing Commercial Airplane Company.

(a) Obtain the average of four equally spaced diametric measurements at the inside edge of the tailpipe exit. Using the following formula: $A=.7854 \times dia^2$, determine the nozzle exit area.

NOTE: Tailpipes failing to meet requirements by method in step (a) should be remeasured using method in step (b).

(b) Use Periphery Tape (See SPECIAL TOOLS, FIXTURES, AND EQUIPMENT) at nozzle exit outer edge and deduct twice the thickness of the tailpipe material.

(14) Examine the parts listed in Figure 301 for satisfactory solid-film lubricant application. Reference Subject 20-50-08 for solid-film lubricant application and quality control requirements.

NOTE: Parts that require fluorescent-penetrant, dye penetrant, or magnetic examination (Reference Figure 302) were stripped of solid-film lubricant prior to assembly.

(15) Examine items listed on Figure 303 per the noted examination instructions.

NOTE: After examination requirements have been complied with, place parts in a dust free container until ready for assembly. Hydraulic components should have protective caps or plugs installed on open ports, tubes and hoses.

NOMENCLATURE	FIGURE NO.	ITEM NO.	REFERENCE PROCEDURES
Link Assembly	1101	80	Subject 20-50-08
Link Assembly	1101	81	Subject 20-50-08
Link Assembly	1101	82	Subject 20-50-08
Bushing	1101	84A	Subject 20-50-08
Bushing	1101	85A	Subject 20-50-08
Rod Assembly	1101	90	Subject 20-50-08
Rod Assembly	1101	92	Subject 20-50-08
Carriage Assembly	1101	93	Subject 20-50-08
Bolt	1101	145	Subject 20-50-08
Lever	1102	15	Subject 20-50-08
Arm	1103	6	Subject 20-50-08
Latch	1103	4	Subject 20-50-08

SOLID FILM LUBRICANT REQUIREMENT
FIGURE 301

E. Examination of Electrical Components

(1) Visually examine wire bundle assembly (16 Figure 1105) for the following:

(a) Evidence of worn or chaffed areas.

(b) Evidence of bare or broken wires.

(c) Evidence of damage to receptacle (17) or plug seal (18).

(d) Proximity sensors (19) for evidence of damage to unit or connecting wiring.

(e) Wiring clamps (2, 3) for evidence of distortion or damage.

F. Electrical Checkout

(1) Perform ohmmeter check of wire bundle assembly (16, Figure 1105). See Figure 304 for checkout requirements.

(2) After completion of checkout, place protective covers over receptacle and sensors and place in container until ready for assembly.

G. Hydraulic Restrictor Valve Examination/Check

(1) Examine restrictor valves (Figures 1106 and 1107).

(a) Evidence of external damage, threaded areas for stripping, or cross threading, or other thread damage.

(b) Evidence of deterioration, corrosion, and leakage.

(2) Operational Check Requirements (Reference Figure 305 and 306 for examination criteria).

NOTE: If either valve fails to pass any of the examination checks return defective valve to vendor for warranty repair or replacement. Disassembly of the valve voids warranty.

Decca Valves Corporation
1631 Tenth Street
Santa Monica, CA 90404
Attn: Mr. Frank Early

(a) Check restrictor valve, GA7372-1 (Figure 1106) as noted.

(b) Check restrictor valve, GA7396 (Figure 1107) as noted.

(c) No external leakage permitted.

NOTE: Hydraulic test stand, Figure 1001, may be used for this check.
Test fluid - Skydrol 500A or B
Temperature range - 100°F ± 10°F
Filtration - 5 microns nom. 15 microns absolute

NOMENCLATURE AND ITEM NO.	REF FIGURE	TYPE OF EXAMINATION	TESTING PROCEDURE
Bushings Items 84 and 85	1101	Fluorescent Penetrant	Ref. Subject 20-20-02 (MIL-I-6866)
Bearings Item 83	1101	Fluorescent Penetrant	Ref. Subject 20-20-02 (MIL-I-6866)
Rod Assemblies Item 92	1101	Fluorescent Penetrant	Ref. Subject 20-20-02 (MIL-I-6866)
Hinge Fittings Items 23 and 24	1101	Penetrant	Ref. Subject 20-20-02 (MIL-I-6866)
Nozzle Welds Item 4A	1101	Penetrant	Ref. Subject 20-20-02 (MIL-I-6866)
Stop Item 95	1101	Penetrant	Ref. Subject 20-20-02 (MIL-I-6866)
Links Items 80, 81, and 82	1101	Penetrant	Ref. Subject 20-20-02 (MIL-I-6866)
Carriages Item 93	1101	Magnetic Particle	Ref. Subject 20-20-01 (MIL-I-6868)
Supports Item 94 Item 14	1101 1102	Magnetic Particle	Ref. Subject 20-20-01 (MIL-I-6868)
Lever Item 15	1102	Magnetic Particle	Ref. Subject 20-20-01 (MIL-I-6868)
Latch Item 4	1103	Magnetic Particle	Ref. Subject 20-20-01 (MIL-I-6868)
Arm Item 6	1103	Magnetic Particle	Ref. Subject 20-20-01 (MIL-I-6868)

Non-Destructive Examinations
Figure 302 (Sheet 1 of 2)

NOMENCLATURE AND ITEM NO.	REF. FIGURE	TYPE OF EXAMINATION	TESTING PROCEDURE
Studs Items 51 and 52	1101	Magnetic Particle	Ref. Subject 20-20-01 (MIL-I-6868)
Bumpers Items 44, 44A and 46	1101	Penetrant	Ref. Subject 20-20-02 (MIL-I-6866)
Caps Items 45, 46A and 45A	1101	Magnetic Particle	Ref. Subject 20-20-01 (MIL-I-6868)

NON-DESTRUCTIVE EXAMINATIONS
Figure 302 (Sheet 2 of 2)

(d) After completion of checkout operations, cap or plug all open ports in valves and place in a dust free container until ready for assembly.

NOMENCLATURE AND ITEM NO.	METHOD OF EXAMINATION	CHECK	REQUIREMENTS
Tube Assemblies (1 thru 14, Figure 1104)	Visual	Dents, nicks, condition of flares, sleeves, and nuts to assure proper condition.	No defects allowed.
Deflector Doors	Visual	Trailing edge for loose or missing rivets, wear and damage to pads or bumpers.	Replace rivets. No wear allowed on inner or outer skin. Maximum wear of 0.090 inch depth of exposed slug or minimum bumper pad thickness of 0.020 inch.
		Inner and outer skins for cracks.	Repair all cracks.
		Latch attachment for loose fasteners and inner skin cracks around gusset.	Replace fasteners and reapir cracks.
		Loose or missing rivets in fairings.	Replace rivets up to maximum of 7/32 inch diameter permitted.
		Forward bulkhead of bottom doors for an obstructed drain hole.	Clear out clogged hole with a 0.25 inch drill rod or bit. If no hole exists, drill one per Repair and Figure 420A.
Forward Hinge (23, Figure 1101)	Penetrant	Cracks	No cracks allowed.
	Visual	Wear in area next to stop bolt.	See Figure 412 for repair limits.
	Dimensional	Link attach hole wear.	See Figure 601 for wear limits.
Aft Hinge (24, Figure 1101)	Penetrant	Cracks	See Figure 412 for repair limits.
		Link attach hole wear.	See Figure 601 for wear limits.

Examination Requirements
Figure 303 (Sheet 1)

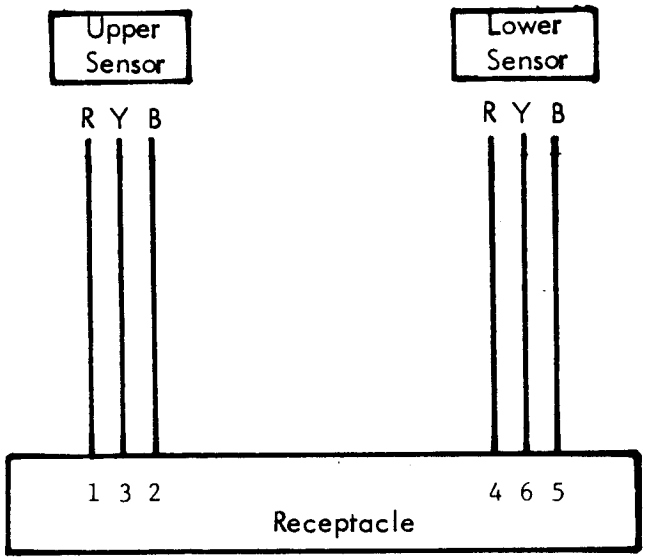
NOMENCLATURE AND ITEM NO.	METHOD OF EXAMINATION	CHECK	REQUIREMENTS
Carriage Assembly (93) Figure 1101	Magnetic Particle	Cracks	No cracks allowed.
	Visual	Bearing and race for cracks, pitting or wear.	No defects allowed.
	Dimensional	Link and rod attach holes for wear.	See Figure 601 for wear limits.
Drive Link Assembly (80) Figure 1101	Penetrant	Nicks, gouges, and cracks.	See Figure 412 for repair limits.
	Visual	Bushings, bearing and race for cracks, pitting, galling or wear.	No defects allowed.
	Dimensional	Straightness and over center link attach hole.	See Figure 412 for repair limits and Figure 601 for wear limits.
Idler Link Assembly (82) Figure 1101	Penetrant	Nick, gouges, and cracks.	See Figure 412 for repair limits.
	Visual	Bushings, bearing, and race for cracks, pitting, galling or wear.	No defects allowed.
	Dimensional	Straightness and wear in solid section next to stop.	See Figure 412 for repair limits.
Overcenter Link Assembly (81) Figure 1101	Penetrant	Nicks, gouges, and cracks.	See Figure 412 for repair limits.
	Visual	Bearings and races for cracks, pitting or wear.	No defects allowed.
Rod Assembly (92) Figure 1101	Fluorescent Penetrant	Cracks	No cracks allowed.
	Dimensional	Straightness and chrome plate wear or damage.	See Figures 412 and 404 for repair limits.

NOMENCLATURE AND ITEM NO.	METHOD OF EXAMINATION	CHECK	REQUIREMENTS
Rod Assembly (90, Figure 1101)	Fluorescent Penetrant	Cracks in rod and stud.	See Figure 412 for repair limits.
	Dimensional	Straightness and chrome plate wear or damage.	See Figure 412 and 404 for repair limits.
	Dimensional	Lug for hole wear.	See Figure 601 for wear limits.
Support (94, Figure 1101)	Magnetic Particle	Cracks	See Figure 412 for repair limits.
	Dimensional	Rod and link attach holes for wear.	See Figure 601 for wear limits.
Support (14, Figure 1102)	Magnetic Particle	Cracks	No cracks allowed.
	Dimensional	Link attach holes for wear	See Figure 601 for wear limits.
Lever (15, Figure 1102)	Magnetic Particle	Cracks	See Figure 412 for repair limits.
	Dimensional	Pivot and clevis holes for wear.	See Figure 601 for wear limits.
Nozzle (4A, Figure 1101)	Penetrant	Cracks	Weld or doubler repair as required. See Figure 412.
	Visual	Nicks and gouges	See Figure 412 for repair limits
	Visual	Trailing edge doubler for cracks or wear	Weld repair as required. See Figure 412.
Stop (95, Figure 1101)	Penetrant	Cracks	Weld repair as required.
Latch (4, Figure 1103)	Magnetic Particle	Cracks	No cracks allowed.
	Dimensional	Pivot hole wear.	See Figure 601 for wear limits.
	Visual	Surface wear.	Maximum 0.03 inch deep wear on surface.

Examination Requirements
Figure 303 (Sheet 3)

NOMENCLATURE AND ITEM NO.	METHOD OF EXAMINATION	CHECK	REQUIREMENTS
Arm (6, Figure 1103)	Magnetic Particle	Cracks	No cracks allowed.
	Dimensional	Pivot hole for wear.	See Figure 601 for wear limits.
	Visual	Surface wear.	Maximum 0.03 inch deep wear on surface.
Spring (15, Figure 1103)	Dimensional	Bend radius at juncture of coils and hooks.	Replace Spring with a bend radius of less than 0.15 to 09.16 inch.
Shim (18, Figure 1102)	Visual	Delamination of shim segments.	Replace 173-1012-13 laminated shim with 173-1012-101 sheet shim.

Examination Requirements
Figure 303 (Sheet 4)

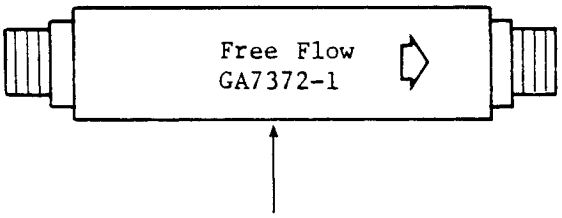


Sensor	Pin	Color Tracer	
Upper	1	Red	
	2	Blue	
	3	Yellow	Ground
LOWER	4	Red	
	5	Blue	
	6	Yellow	Ground

READ : Yellow to Red-- 33 ($\pm$6) ohms
Yellow to Blue- 348 ($\pm$34) ohms

PROXIMITY SENSOR WIRE BUNDLE CHECKOUT
Figure 304

H. Proof Test



Valve (Figure 1106)

Restrictor one-way

Figure 305

1. Cap one end of valve and apply 5400 psi to the opposite end. Hold pressure for three minutes. There shall be no external leakage or deformation.

2. With valve set up as shown on Figure 307, measure flow rate in restricted direction. The unit flow must be 5.0 gpm ± 0.5 gpm at 1818 psid.

3. Cracking pressure:

   Gradually increase pressure applied in the free flow direction until a sudden increase in flow rate occurs, indicating poppet has unseated. This cracking pressure must fall between 2 and 8 psid.

4. Free flow:

   With a flow of 5.0 gpm through the valve in the free flow direction, the pressure drop across the valve shall not exceed 10 psi.

5. Cap both ends of valve until ready to install on thrust reverser.

I. Functional Tests

Valve (Figure 1107)

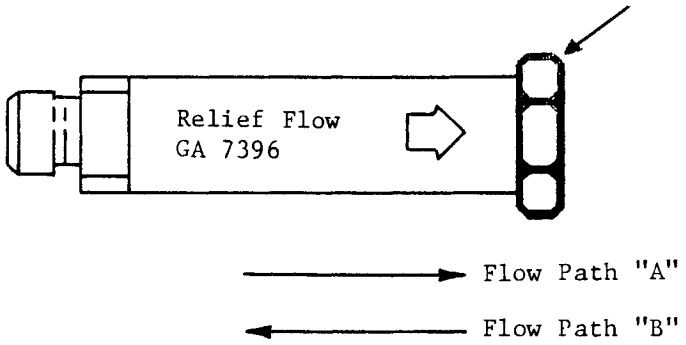


Figure 306

1. Flow rate in direction "A".

   a. With valve set up as shown in Figure 307, measure flow rate at a differential pressure of 1158 psid. Flow rate to be 9.35 to 7.65 gpm. Record actual flow.

   b. Measure flow rate at differential pressure of 3300 psid. Flow rate to be 15.95 to 13.05 gpm. Record actual flow.

   c. Measure flow rate at differential pressure of 3400 psid. Flow rate to be 18.0 gpm minimum. Record actual flow.

      NOTE: Valve will have to be reversed to measure flow rate in direction "B".

2. Flow rate in direction "B".

   a. Measure flow rate at a differential pressure of 1818 psid. Flow rate to be 5.5 to 4.5 gpm. Record actual flow.

3. Cracking pressure check.

   a. With the large hole in poppet plugged with a test pin (See Figure 307 Detail A), apply 2950 ± 150 psig in direction "A" Valve must crack between 2800 and 3100 psig. Cracking pressure is defined as a significant increase in flow rate above the leakage rate of 2cc per minute, not in excess of 1 percent of maximum volume.

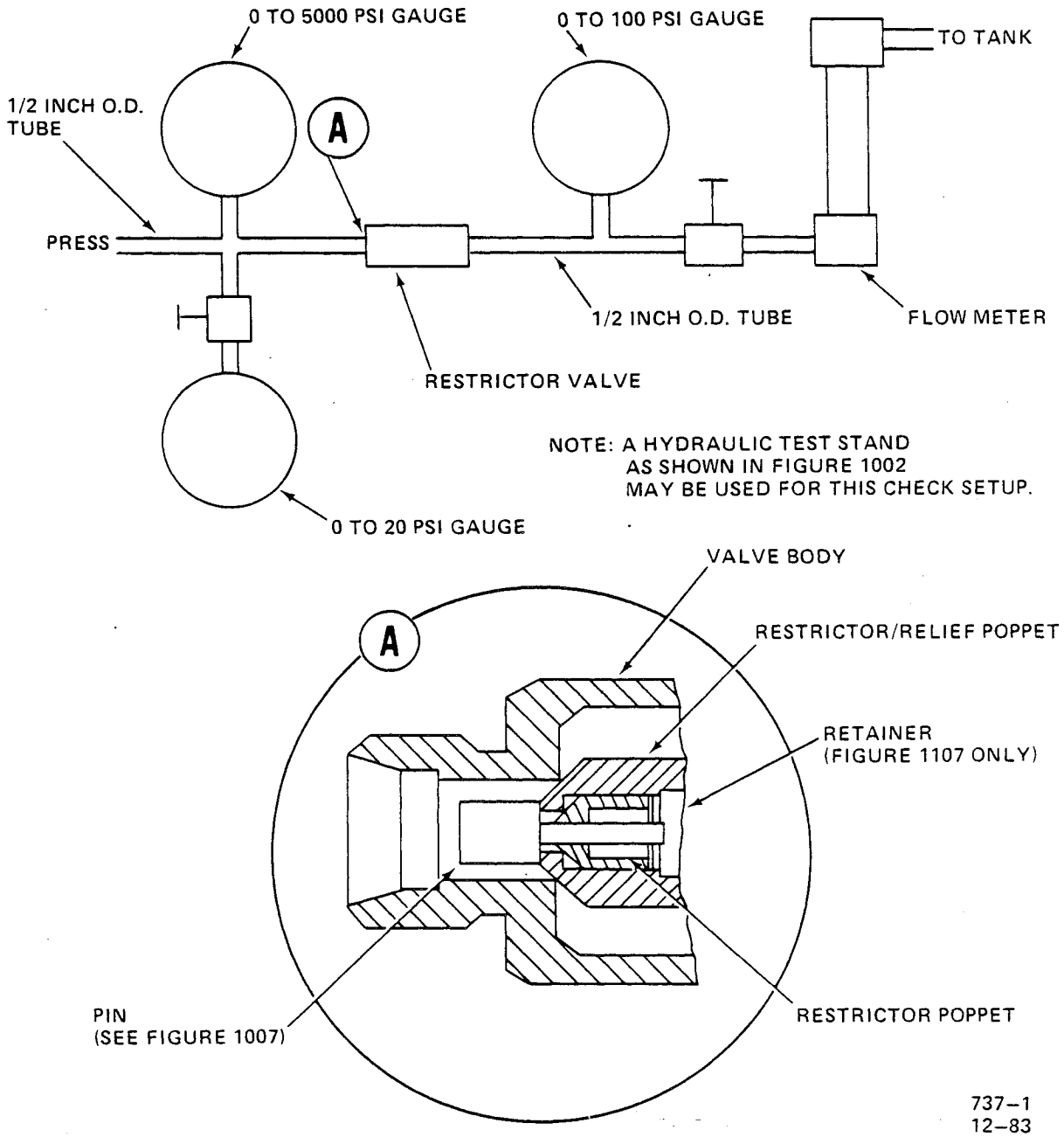
4. Proof test.

   a. Apply 6000 psig to both ports simultaneously and hold pressure for 3 minutes. There shall be no leakage, deformation or damage.

5. Repeat cracking pressure check per Step 3.

6. Purge unit with Skydrol 500 B, fluid to be filtered to 5 micron nom. 15 micron absolute.

7. Cap both ends of valve until ready to install on thrust reverser.



Setup for Check of Restrictor Valves
(Figures 1106 and 1107)

J. Thrust Reverser Actuators

1. Refer to the listed overhaul manual for examination and testing requirements for the thrust reverser actuators (see Figure 308).

Part No.	Manufacturer (See Page 1126)	Nomenclature	Manual ATA No.	Fig. & Item No.
1U1220-2	V99643	Actuator	78-32-05	1101 - 130
1U1222	V99643	Unlock Actuator	78-32-06	1103 - 21
58120-1	V94641	Unlock Actuator	78-32-01	1103 - 21
60470	V94641	Actuator	78-30-05	1101 - 130

Thrust Reverser Actuator Manuals
Figure 308

REPAIR

1. Repair (See Figure 1101 for item numbers in parentheses unless otherwise noted).

CAUTION: FAILURE TO USE PARTS AND MATERIALS SPECIFIED IN THIS REPAIR SECTION MAY RESULT IN MALFUNCTION OR FAILURE OF THRUST REVERSER ASSEMBLY.

A. Repairable Parts

(1) Repairable parts that show evidence of nicks, gouges, cracks, or wear. (Reference Figure 412 for repair limits, unless otherwise noted.)

(a) The following parts are repairable within the noted repair limits:

Nomenclature	Figure No.	Item No.
Link Assembly	1101	80
Link Assembly	1101	81
Link Assembly	1101	82
Carriage	1101	93
Support	1101	94
Support	1101	174
Support	1102	14
Lever	1102	15
Rod Assembly	1101	90
Rod Assembly	1101	92
Aft Hinge	1101	24
Stop	1101	95
Nozzle	1101	4A
Deflector Doors, Inner/Outer Skin	1101	22

NOTE: Reference Figures 601 and 602 for dimensional limits if not otherwise noted.

(2) Repair areas that require grind out must have areas extended 15 times the depth on both sides of each damaged area within a surface finish of 125 microinch unless otherwise noted.

B. Repair of Oversize Holes

(1) Repair of oversize holes or damaged holes in the following parts, normally can be accomplished by cleaning out holes and installing bushings. (See Figure 412 or Figure 601 for bushing repair limits.)

NOTE: Hole "X" of the carriage (Item 93) cannot be repaired if worn beyond the service wear limit of Figure 601 (Sheet 4).

Nomenclature	Figure No.	Item No.
Link Assembly	1101	80
Link Assembly	1101	81
Link Assembly	1101	82
Carriage	1101	93
Support	1102	14
Lever	1102	15
Rod Assembly	1101	90
Support	1101	94
Support	1101	174
Forward Hinge	1101	23
Aft Hinge	1101	24

(2) Damaged holes may be cleaned out to the noted repair limits. Fabricate bushings to the required dimensions as shown on Figure 413.

(3) Install repair bushings in accordance with the instructions of Subject 20-50-03 and as noted for specific parts.

C. Refinish

(1) The following requirements will be accomplished in conjunction with repair procedures.

(a) Insulate dissimilar metals and inside surfaces of the deflector door outer skins (22) with BMS10-11, Type I primer. Apply primer in a continuous coat, and do not extend beyond fairing support edge. Primer may be set back 0.030 inch maximum to ensure that primer removal from aluminum skin will not be required. (Reference Subject 20-41-02 for primer application procedures.)

NOTE: Deflector door assemblies may be air dried after application of BMS10-11, Type I primer. (See Materials in this section.)

(b) Repair attachments will be located two diameter from adjacent structure, edge of parts, or joggles, unless otherwise noted.

(2) Sealant repair on land structures for sealing access doors on the forward shroud (4) assembly.

(a) Remove loose or damaged sealant.

(b) Clean land structure surface.

(c) Apply silicone primer, RTV-1200, to the cleaned surface. Allow primer to dry for 30 minutes. (See Materials in this section.)

(d) Apply sealant, RTV-1016 or DC90-006, to primed surfaces. Apply evenly, with thickness not exceeding 0.020 inch. (See Materials in this section.)

NOTE: Sealant should be completely dry prior to door installation or closing access doors.

(3) Solid Film Lubricant Application

CAUTION: ALL REPAIRS SHOULD BE COMPLETED ON AFFECTED PARTS PRIOR TO APPLICATION OF SOLID FILM LUBRICANT.

(a) The following parts require solid film lubricant application after completion of repairs and examination requirements. See Subject 20-50-08 for solid film lubricant application procedures.

Nomenclature	Figure No.	Item No.	Solid Film Lubricant
Rod Assemblies	1101	90 & 92	MIL-L-8937
Link Assemblies	1101	80,80A,80B,80C (Except bearing race and and identity area)	MIL-L-46010
Link Assemblies	1101	80D, 80E (Except bearing race, ID of bushing, and identity area)	MIL-L-46010
Link Assembly	1101	81	MIL-L-46010
Link Assembly	1101	82 (Except bearing race and identity area)	MIL-L-46010

Nomenclature	Figure No.	Item No.	Solid Film Lubricant
Link Assembly	1101	82A (Except bearing race, ID of bushing, and identity area)	MIL-L-46010
Bushings	1101	84A, 85A	MIL-L-46010
Carriage	1101	93	MIL-L-8937
Arm	1103	6	MIL-L-8937
Latch	1103	4	MIL-L-8937

(4) Thrust Reverser Marking

(a) Refer to Figures 426, 427, and 428 for markings and locations.

D. Replacement Parts

Replace all parts that do not meet examination requirements and cannot be restored to a serviceable condition.

NOTE: See Figure 601, Fits and Clearances, for dimensional limits and service wear limit, unless otherwise noted.

(1) Replace bearings, races, and bushings, as required in links (80, 81, or 82) in accordance with Subject 20-50-03 and as noted for specific parts.

(a) Remove damaged race (88) from link (80, 81, or 82).

(b) Install new bearing race, using 360 degree staking tool. Ball insertion slot of bearing race must be at 90 ± 5 degrees to axis of link. Use Rohr staking tool, P/N 173-1030-1-CISA, (See Figure 1005) or equivalent. Gently apply pressure until anvil of tool bottoms out. Ram pressure on staking tool of five (5) to eight (8) tons is required to swage the bearing race. Damage to the staking tool may result if eight (8) tons pressure is exceeded. After completion of staking, the bearing race must be able to withstand a proof load of 1000 pounds without axial movement of the bearing race.

(2) Replacement of bushings (86 or 87, one piece bushings) or (87C, two piece bushing) as required in driver link (80) or idler link (82). (IPL Figure 1101)

(a) For removal of the one piece bushing proceed as follows:

1) Bore bushing to a wall thickness of approximately 1/64 inch using a drill to a depth of 2 3/4-inch (drive link) or 1-inch (idler link).

2) Using a drift placed against the shoulder of the bushing obtained in step (1), press bushing from link.

3) Examine the hole in the link for surface finish. Repair any galling or scoring of the bore by enlarging the diameter. A surface finish of 16 micro-inch is required.
Hole may be enlarged to a diameter of:

1.1327 inches maximum - driver link
1.0827 inches maximum - idler link

4) If link hole was enlarged, fabricate replacement bushing for each link per Figure 413. If lubrication fitting(s) have been installed in the link, drill 0.125in to 0.1450 in hole(s) in the bushing that align with the link lubrication fitting(s).

(b) For removal of the two piece bushings proceed as follows:

1) Using a drift placed against the shoulder of the bushing press both bushings from link.

2) Examine the hole in the link for surface finish. Repair any galling or scoring of the bore by enlarging the diameter. A surface finish of 16 micro-inch is required.
Hole may be enlarged to a diameter of:

1.1327 inches maximum - driver link
1.0827 inches maximum - idler link

3) If link hole was enlarged, fabricate two replacement bushings for each link per Figure 413.

(c) Installation of Bushings - Pre Service Bulletin 78-1054

1) Driver Link with One Piece Bushing (80, IPL Figure 1101).

a) Align centerline of one-piece bushing (87) within plus or minus one degree of centerline of driver link. If driver link has lubrication fitting(s), make sure lubrication hole(s) in bushings align with fitting(s).

b) Press bushing into driver link until flush using a hand arbor press.

c) After installation of bushing (87), check or size the bushing ID per Figure 601. For sizing, use either a clean sharp burnishing broach or reamer. Perform the operation on a machine that ensures axial alignment of the finishing tool and the bushing.

d) Clean the reworked surface of the bushing (87) with clean, dry compressed air.

2) Driver Link with Two Piece Bushing (80, IPL Figure 1101)

a) Align centerline of half of two-piece bushing (87C) within plus or minus one degree of centerline of driver link.

b) Press bushing into driver link until flush using a hand arbor press.

c) Turn drive link over and press remaining half of two-piece bushing (87C) into driver link until flush using a hand arbor press..

d) After installation of bushing (87C), check or size bushing ID per Figure 601. For sizing, use either a clean sharp burnishing broach or reamer. Perform the operation on a machine that ensures axial alignment of the finishing tool and the bushing.

e) Clean the reworked surface of the bushing (87C) with clean, dry compressed air.

3) Idler Link (82, IPL Figure 1101)

a) Align centerline of bushing (86) within plus or minus one degree of centerline of hole in idler link.

b) Press bushing into idler link until flush using an arbor press.

c) After installation of bushing (86), check or size the bushing ID per Figure 601. For sizing, use either a clean sharp burnishing broach or reamer. Perform the operation on a machine that ensures axial alignment of the finishing tool and the bushing.

d) Clean the reworked surface of the bushing (85A) with clean, dry compressed air.

(d) Installation of Bushings - Post Service Bulletin 78-1054

1) Driver Link with Two Piece Bushing (80E, IPL Figure 1101)

a) Align centerline of half of two-piece bushing (87C) within plus or minus one degree of centerline of hole in driver link.

b) Press bushing into driver link until flush using a hand arbor press.

c) Turn driver link over and press remaining half of two-piece bushing (87C) into driver link until flush using a hand arbor press.

d) After installation of bushing (87C), check or size bushing ID per Figure 601. For sizing, use either a clean sharp burnishing broach or reamer. Perform the operation on a machine that ensures axial alignment of the finishing tool and the bushing.

e) Clean the reworked surface of the bushing (87C) with clean, dry compressed air.

2) Idler Link (82A, IPL Figure 1101)

a) Align centerline of bushing (86C) within plus or minus one degree of centerline of hole in idler link. Ensure lubrication holes in the bushing are aligned with idler link lubrication fittings.

b) Press bushing into link until flush using a hand arbor press.

c) After installation of bushing (86C), check or size bushing ID per Figure 601. For sizing, use either a clean sharp burnishing broach or reamer. Perform the operation on a machine that ensures axial alignment of the finishing tool and the bushing.

d) Clean the reworked surface of the bushing (86C) with clean, dry compressed air.

(3) Replacement of Hydraulic Packings

(a) All hydraulic packings (17, 18 and 19, Figure 1104) must be replaced during each overhaul and each time the piping is disassembled.

(4) Replacement of Proximity Sensor

NOTE: The electrical wire harness is an integral part of the proximity sensor. Replacement of the sensor unit only may be accomplished as follows:

(a) Cut the electrical harness wires for sensor to be replaced approximately 12 inches from the sensor, in the vicinity of wire harness clamp. Remove the sensor.

(b) Splice the new proximity sensor wires to the remaining wire harness. Use Thomas and Betts Splice BB-2. Crimp with a Thomas and Betts approved crimping tool. Insulate splice using Thermo Fit RNF-100 Shrinkable Sleeving. Install and test new sensor. (See Figures 304 and 706.)

2. Specific Repairs

A. Repair of Thrust Reverser Support (94)

(1) Weld repair of worn or damaged holes which cannot be repaired by installing bushings may be accomplished as follows:

(a) Remove stop (95) from thrust reverser support (94) by drilling out rivets (96).

(b) Weld the hole shut using 17-4 PH CRES wire per AMS5825 using inert arc welding process.

(c) Solution treat the thrust reverser support (94) as follows: heat thrust reverser support (94) to 1900° ± 25°F for one hour. Then cool to 90°F maximum prior to subsequent treatment.

(d) Harden the thrust reverser support (94) as follows: heat the thrust reverser support (94) to 900°F ± 10°F for one hour. Then air cool support to achieve age tempering of 180 KSI minimum.

(e) X-ray examine support per ASTM E1742 and MIL-STD-2219 Class A.

(f) Locate holes per Figure 401 and drill as follows:

Hole A	0.6250 - 0.6259 inch
Hole B	0.5625 - 0.5634 inch
Hole C	0.501 - 0.502 inch
Hole D	0.376 - 0.377 inch

(g) Resurface inner and outer surface of hole lug to clean off all weld flush with parent surface.

(h) Check lug thickness for the following dimensions:

Hole A	0.120 inch minimum
Hole B (inboard)	0.145 inch minimum
Hole B (outboard)	0.155 inch minimum
Hole C	0.250 inch minimum

(i) Surface finish of repair area shall be 125 micro inch.

(j) Magnetic particle examine the repair area per Subject 20-20-01.

(k) Install stop (95) on support (94) and secure with rivets.

(2) Repair elongated or oversize guide rod holes in forward lugs of thrust reverser support (94), using bushings, as follows:

(a) See Figure 413 for the maximum allowable size the holes can be enlarged to and still be repairable. If the holes are larger than the limits shown in Figure 413, contact Boeing Aircraft Co. for disposition.

(b) Make bushings to the dimensions shown in Figure 401, bushing D with the material shown in Figure 413. The inside and outside diameters of the bushings must have a surface finish to RMS16.

(c) Drill out elongated or oversize holes in lugs of support.

(d) Ream drilled holes in lugs to provide a 0.0010 to 0.0015 inch interference fit with bushing. The surface finish of the hole must be to RMS16.

(e) Press bushings into lugs (Figure 401, bushing D). Make sure both ends of each bushing are flush, +0 to -0.010 inch, with both faces of the lugs.

(f) Ream bushing to original lug diameter, 0.3760-0.3770 inch, and chamfer aft side of bushing hole to 0.06-0.09 inch x 45° to provide for 0.06-inch radius on threaded end of rod assembly.

(3) Repair cracks in the support stop (95) as follows:

(a) Weld cracks in the stop (CRES sheet PH 15-7M0, AMS5520) per AMS5812 or AMS5813.

(b) Heat treat to 170,000 psi UTS after welding.

(4) Repair oversize holes in support (94), using bushings, as follows:

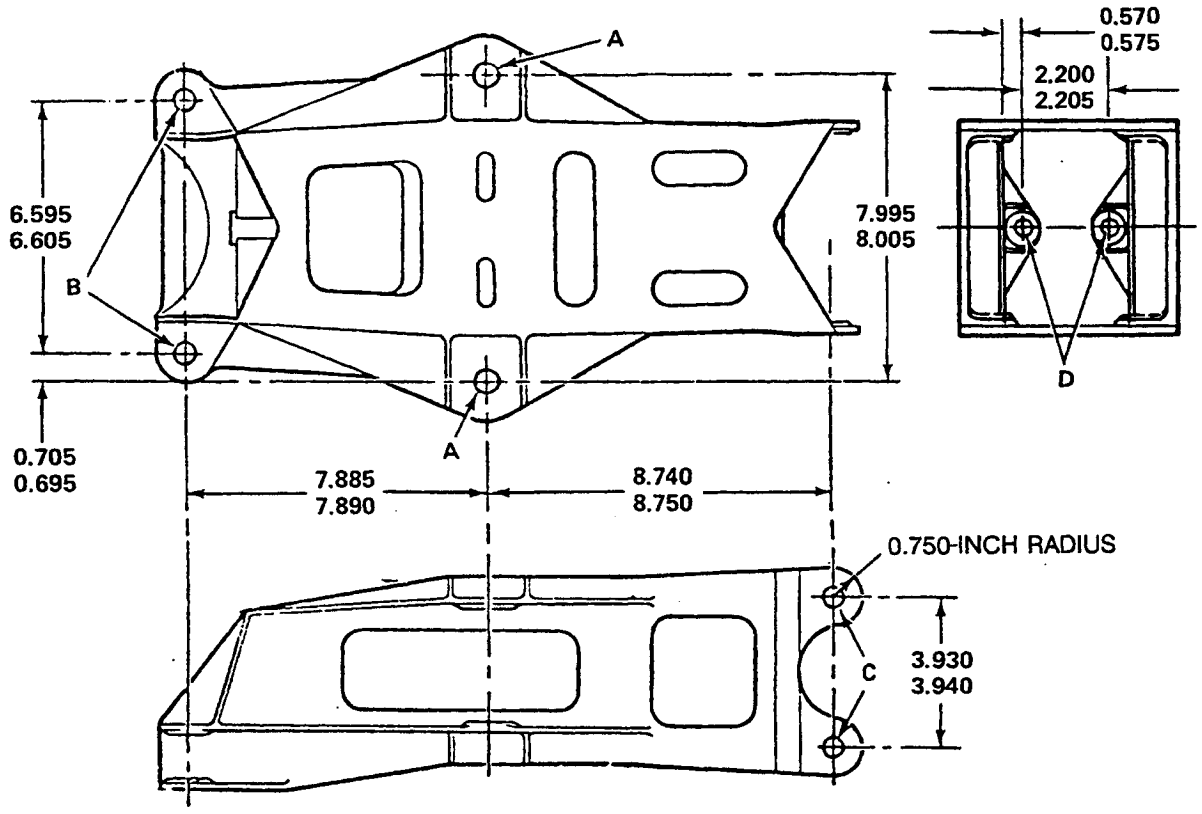
(a) See Figure 413 for the maximum allowable size the holes can be enlarged to and still be repairable. If the holes are larger than the limits shown in Figure 413, contact Boeing Aircraft Co. for disposition.

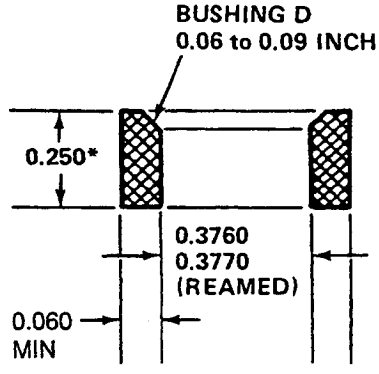
(b) Make bushings for the support (94) from the material and to the dimensions shown in Figure 413. The inside and outside diameters of the bushings must have a surface finish to RMS16.

(c) Enlarge the holes in the support (94). Do not exceed the maximum allowable hole size shown in Figure 413. Ream the holes to provide a 0.0010-0.0015-inch interference fit with the bushings. The surface finish of the enlarged hole must be to RMS16.

(d) Press the bushings into the enlarged holes in the support (94). Make sure both ends of each bushing are flush, +0 to -0.010 inch, with both faces of the support flange.

(e) Ream the bushings to the original support lug diameter as shown in Figure 413.





NOTE: 17-4PH MATERIAL

PRESS FIT BUSHING WITH 0.0010-0.0015 INTERFERENCE FIT

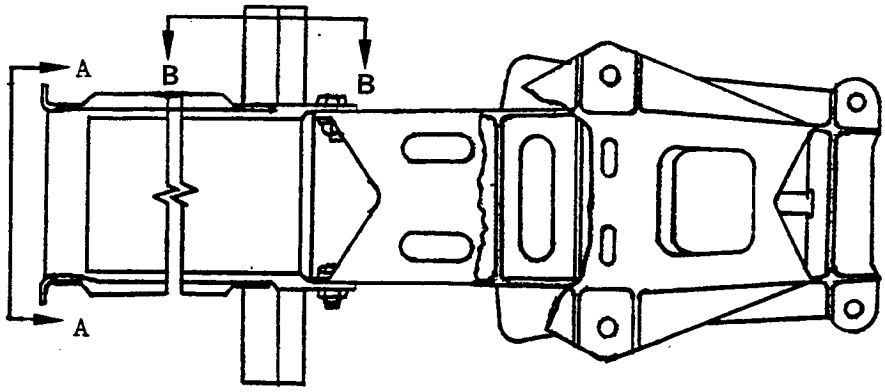
737-31A

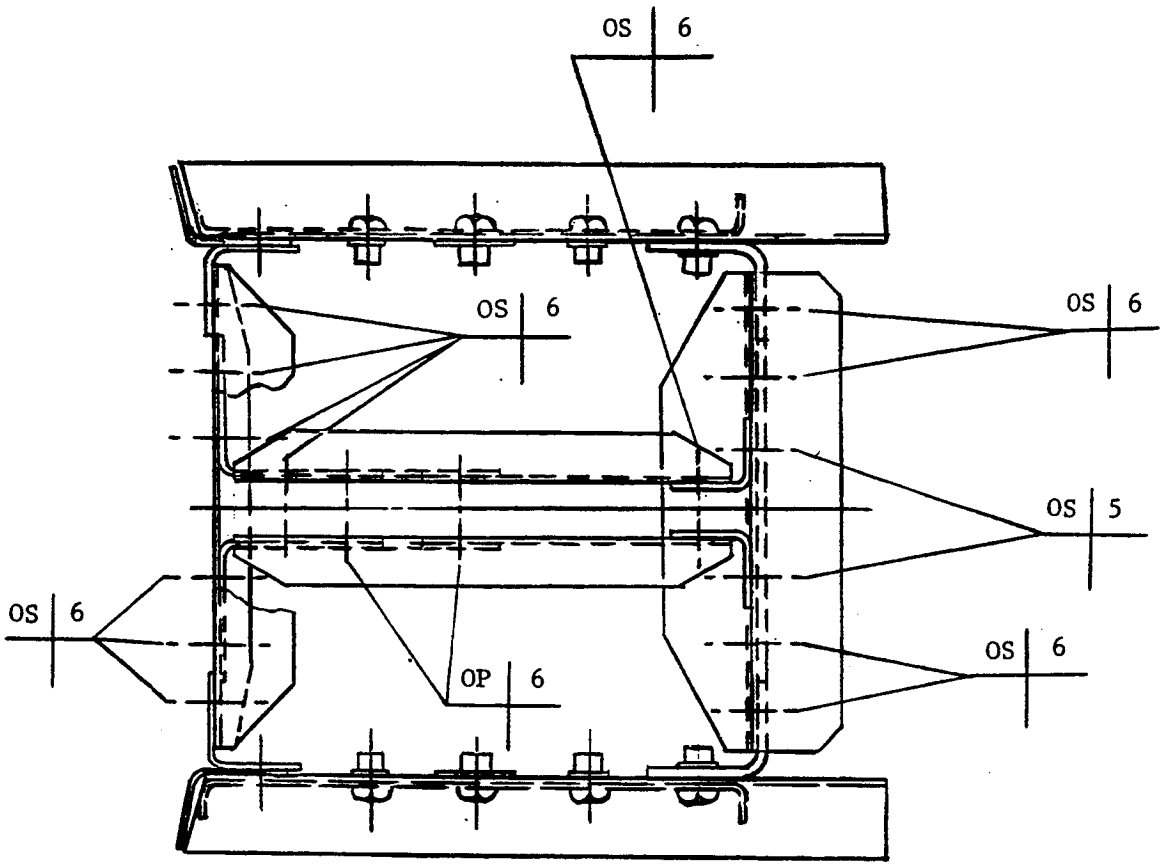
*NOT TO EXCEED THICKNESS OF LUG

Figure 401

B. Repair of support assembly (148A) may be accomplished as follows:

(1) Replace loose or missing lockbolts with lockbolts shown in Figure 402, (View or any of the allowable substitutes shown in Figure 403. Use NAS1200 or NAS1198 rivet only in locations where fastener or tool clearance prohibits installation of other type fasteners.





View A-A

Figure 402 (Sheet 1)
SUPPORT ASSEMBLY REPAIR

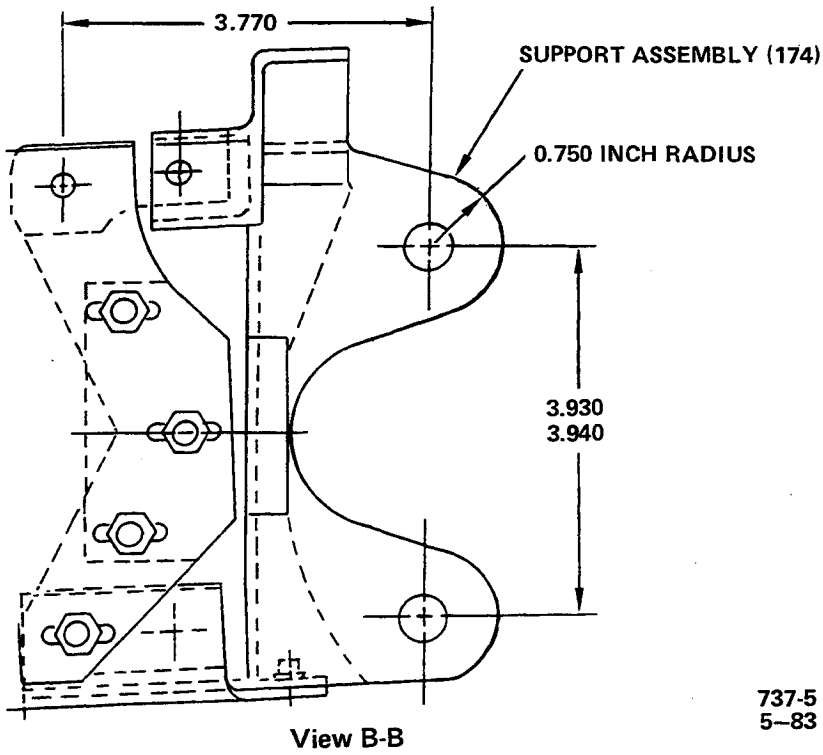


Figure 402 (Sheet 2)
Support Assembly Repair

(2) Weld repair of worn or damaged holes in support assembly (174) may be accomplished as follows:

CAUTION: WELDING OF 4340 STEEL IS VERY DIFFICULT. STRICT WELDING PROCEDURES, ESTABLISHED ON THE BASIS OF THE AIR HARDENING CHARACTERISTICS OF THE ALLOY, MUST BE FOLLOWED.

(a) Ensure part is in the annealed or normalized and tempered condition prior to welding. (If part has been hardened, subcritical anneal by heating to 1250°F ± 25°F, hold for a minimum of 2.5 hours, and air cool.)

(b) Preheat part to 575°F-700°F prior to welding. Under no condition should welding be performed when part is below 575°F. (Recommend 600°F minimum preheat temperature.)

NOTE: Do not severely restrain part during welding. The part should be free to move to permit normal welding contraction.

(c) Using AMS6458B steel wire (TIMKEN 17-22A(SS)), deposit weld using the manual TIG welding process. Weld using relatively small stringer beads. Clean surface of each weld pass prior to disposition of successive passes by use of rotary carbide cutters.

CAUTION: DO NOT ALLOW AIR MOTOR EXHAUST TO IMPINGE UPON THE PART BEING WELDED. HAND BRUSH CIPS FROM WELD JOINT; DO NOT USE AN AIR JET TO BLOW AWAY CHIPS.

(d) After completion of welding, hold part at 600°F-650°F for a minimum of one hour.

(e) Cover part with asbestos blankets and allow to cool to 150°F-200°F.

(f) Stress relieve.

1) Charge part into a furnace not above 500°F.

2) Raise the furnace temperature at a rate of approximately 175°F per hour to 1175°F ± 25°F.

3) Hold at temperature for a minimum of 1.5 hours.

4) Furnace cool to below 500°F at a maximum rate of 200°F per hour.

5) When below 500°F, the part may be removed from the furnace, covered with asbestos blankets and allowed to cool to room temperature.

(g) X-ray examine support (174) per ASTM E1742 and MIL-STD-2219 Class A.

(h) Locate holes per Figure 402 (View B-B) and drill 0.501 - 0.502 inch diameter.

(i) Resurface inner and outer surface of hole lug to clean off all weld flush with parent surface and produce a surface finish of 125 microinch. Countersink outer surface to 0.030 inch x 45°.

(j) Magnetic particle examine the repair area per Subject 20-20-01.

Symbol Code	Part Number & Nomenclature	Allowable Substitute
OS 5	NAS1425 Pin & NAS1080E Collar	(a), (b), (c)
OS 6	NAS1426 Pin & NAS1080E Collar	(a), (b), (c)
OP 6	NAS1416 Pin & NAS1080E Collar	(d), (e), (f)

(a) Hi Lok Pin HL18, HL20, HL30, HL32, HL40, HL48, or HL50 with HL94 or HL97 collar.

(b) NAS1103 screw, AN960C10 washer and MS21042L3 nut in a 0.190/0.194 dia hole.

(c) NAS1198 rivet.

(d) Hi Lok Pin HL19, HL31, HL41 or HL51 with HL94 or HL97 collar.

(e) NAS1203 bolt, AN960C10 washer and MS21042L3 nut in a 0.190/0.194 dia hole where material thickness is 0.090 or greater.

(f) NAS1200 rivet.

Figure 403

(3) Repair of oversize holes in support (174) by installing bushings may be accomplished as follows:

NOTE: See Figure 413 for the maximum allowable hole (00) may be enlarged to and still be repairable. If the diameter of (00) is larger, and beyond allowable limits in Figure 413, contact Boeing Aircraft for disposition.

(a) Material to be used for bushings should annealed 17-4 PH steel bar.

(b) Machine outside diameter of bushing per Figure 413 (Sheet 2).

(c) Length of bushing should be flush with inside and outside support surface, +0.000, -0.001-inch.

C. Repair of Rod Assembly (92)

NOTE: Rod assembly (92) material is 17-7 PH CRES.

(1) Rod Assembly may be straightenable within the following limits:

(a) Maximum straightenable bow is 0.010 inch.

(b) Straighten to within 0.003 inch.

NOTE: Rod assemblies that require straightening will require flourescent-penetrant examination after completion of repair. See Subject 20-20-02 for examination procedure.

(2) Scuffed areas in rod assembly may be repaired by grind out within the following limits:

(a) Maximum depth allowable for grind out is 0.005 inch.

(b) Surface finish of 32 microinch required.

(3) Rod assemblies that require replating (hard chrome) may be refinished. See Subject 20-42-03 and Figure 404 for plating requirements.

ITEM NO.	DIAMETER PRIOR TO PLATING	DIAMETER AFTER PLATING AND GRINDING	PLATE THICKNESS	TYPE OF PLATE	REMARKS
92	0.8620 0.8610	0.8690 0.8700	0.0020 Minimum	Hard Chrome	Plate from unthreaded end of rod 12 5/8 inch.
90	0.6100	0.6150 0.6350	0.0020 Minimum	Hard Chrome	Scuffed area 0.005 deep Max
			0.0000 Minimum	Plasma Spray Coating	Scuffed Area 0.006 to 0.032 deep (Min to Max)

Plating Dimensions
Figure 404

D. Repair of Rod Assembly (90).

NOTE: Rod assembly (90) material is 17-7 PH CRES.

(1) Straighten rod assembly within following limits:

(a) Maximum straightenable bow is 0.250 inch.

(b) Maximum allowable bow is 0.060 inch.

NOTE: Rod assemblies that require straightening will require fluorescent-penetrant examination after completion of repair. See Subject 20-20-02 for examination requirement.

(2) Scuffed areas in rod assembly may be repaired by either of the following methods:

(a) Minor Scuffing (0.005 inch deep maximum):

1) Grind out scuffed area until level.

2) Surface finish of 32 microinch required.

3) Hard chrome plate ground out area in accordance with Subject 20-42-03 and Figure 404.

(b) Major Scuffing (0.006 to 0.032 inch deep):

CAUTION: SCUFFED ROD ASSEMBLIES, REPAIRED BY PLASMA SPRAY DEPOSITION METHOD, ALSO REQUIRING HOLE WEAR REPAIR MUST BE REPAIRED BY MEANS OF BUSHING PER FIGURE 413 AND NOT WELD-DRILL-BAKE METHOD, AS BAKING WILL DESTROY PLASMA COATING.

1) Machine worn area to a uniform depth using a collet next to the worn area for chucking rod into lathe.

NOTE: Machined area should have a minimum order radius of 0.030 inch.

WARNING: 1,1,1 TRICHLOROETHANE HAS TOXIC VAPOR AND CONCENTRATED FUMES CAN REPLACE OXYGEN IN A CONFINED AREA. AVOID ANY BREATHING OF VAPOR OR CONTACT WITH SKIN. EYE PROTECTION IS VERY IMPORTANT. CLEAN PARTS IN WELL-VENTILATED AREA AND USE APPROVED SAFETY EQUIPMENT.

2) Clean machined area with 1,1,1 trichloroethane/methyl chloroform or equivalent.

3) Mask all rod areas not to be grit blasted and sprayed to prevent blast damage or overspray to undamaged rod surface.

4) Roughen area to be sprayed by grit blasting as required to provide adequate adhesion of coating.

5) Apply Metco 505 (P505-10 powder) per AMS2437, Coating Plasma Spray Deposition, except bond strength of coating shall be 3200 psi as determined by ASTM C633.

6) Wet grind repaired areas to within 0.005 inch maximum step allowance of original stock diameter.

7) Apply MIL-L-8937 solid film lubricant, per Subject 20-50-08 to required areas.

(3) Hole wear may be repaired either by a bushing per Figure 413 or as follows:

(a) Weld I.D. of hole in lug using 17-7PH CRES (AMS5824) welding wire.

(b) Drill and ream hole to 0.3745/0.3755 I.D. Locate per Figure 405.

CAUTION: SCUFFED ROD ASSEMBLIES, REPAIRED BY PLASMA SPRAY DEPOSITION METHOD, ALSO REQUIRING HOLE WEAR REPAIR. MUST BE REPAIRED BY MEANS OF BUSHING PER FIGURE 413 AND NOT WELD-BAKE METHOD, AS BAKING WILL DESTROY PLASMA COATING.

(c) Age rod assembly 1050 ± 10°F for 90 minutes.

(d) Penetrant examine per Subject 20-20-02.

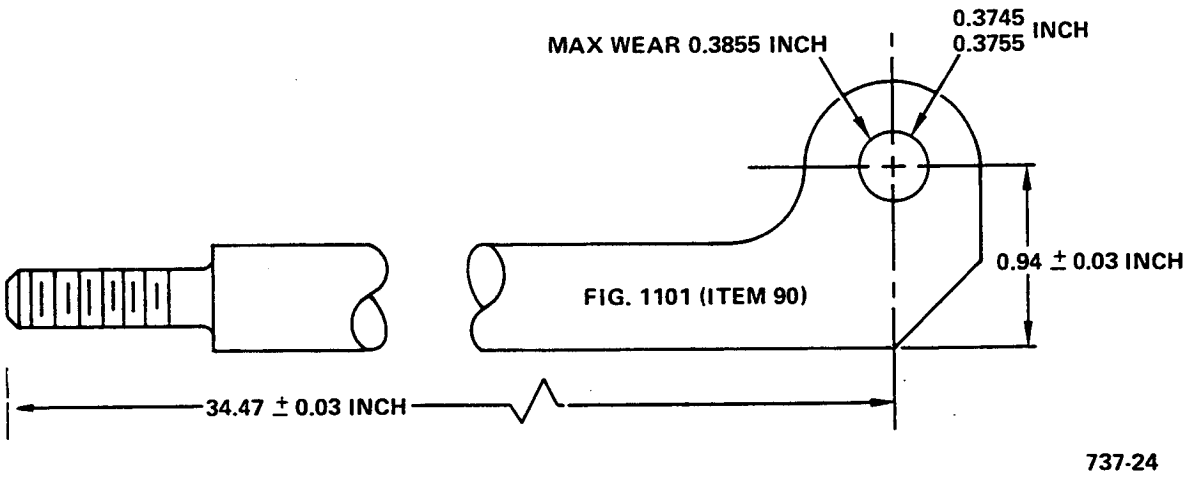


Figure 405

E. Repair of Drive Link Assembly (80)

(1) Repair bowed or worn drive link (80) to within the following limits:

(a) Maximum bow limit is 0.016 inch each 9 lineal inches.

(b) Maximum bow limit overall length of link, 0.048 inch.

(c) Nicks or gouges are repairable if they can be ground out without reducing flange thickness below 0.095 inch, web thickness below 0.09 inch, or flange width below 98 percent of original width.

(2) Repair worn holes, bushing, and race per Figure 413.

F. Repair of Idler Link Assembly (82)

(1) Repair of Idler Link (82).

(a) Maximum allowable wear in any one area (Figure 406) where idler link contacts door stop is 0.040 inch. After this depth is reached, a repair must be made. Worn and repaired idler links (82) may be inverted and cross switched with opposite link.

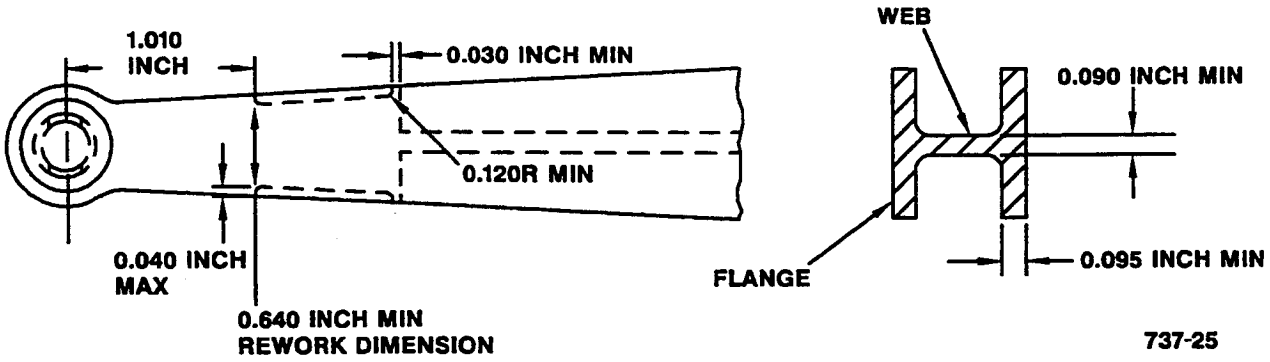


Figure 406

(b) Blend out worn or damaged area as illustrated in Figure 406. Cumulative wear and blending on both sides are not permitted to reduce thickness of the solid section to less than 0.640 inch.

(2) Repair worn bushing (85) or race (88) per Figure 413.

G. Repair of Nozzle Section (4A, IPL Figure 1101).

(1) Nozzle Crack Repair Requirement Criteria.

(a) Nozzle cracks fall into two general catagories:

1) Minor cracks found during maintenance or overhaul examination.

2) Cracks which exceed the maximum allowable dimension for a nozzle still in service.

(b) Minor cracks are defined as follows:

1) No single crack exceeds 10 inches in length.

2) A combination of more than one crack does not exceed 15 inches.

NOTE: If two adjacent cracks are within one inch of each other, they should be regarded as a single crack and their combined length should not exceed 10 inches.

(c) Repair of minor cracks may be accomplished by following specific procedures in this section, while repair of cracks which exceed the maximum allowable dimensions must be referred to Rohr via Boeing Product Support for an engineering evaluation and specific repair procedure.

(d) Repair methods illustrated in Figures 407 and 408 show cracks occurring only under brackets. The repair methods for cracks occurring between brackets is the same as for cracks occurring under brackets and as shown in Figure 409.

NOTE: To identify nozzle material: Inconel 625 is nonmagnetic, 410 CRES is magnetic. Inconel 625 can be repaired by either welding per step (2) or doubler repair per step (3). Repair of cracks in 410 CRES nozzle can only be accomplished by the doubler method in step (5).

(2) Weld Repair of Cracks in Inconel 625 Nozzle.

NOTE: Welded crack repairs may eventually require rewelding and installation of a welded doubler repair (See G. (3)).

(a) Prepare Inconel 625 nozzle to be repaired in accordance with GTA welding practice.

(b) If crack is in area of a bracket, tape bracket and nozzle per Figure 407 to prevent gas leaking out of nozzle.

(c) Penetrant examine crack per Subject 20-20-02 to pin-point crack ends.

(d) Stop drill each end of the crack using a #30 drill.

(e) Grind out crack to depth limit shown in Figure 407.

(f) Clean crack area with acetone.

(g) GTA weld ground-out crack using Inconel 625 filler wire per AMS5837.

(h) Grind welded crack smooth without grinding parent metal.

(i) Penetrant examine weld per Subject 20-20-02.

(j) Polish both sides of repaired crack.

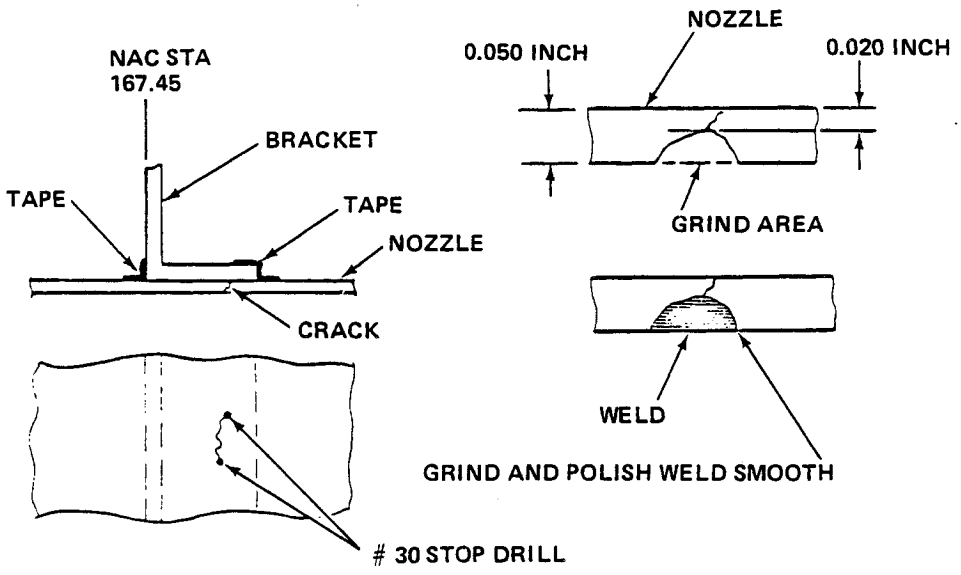


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Figure 407

(3) Welded Doubler Repair of Cracks in Inconel 625 Nozzle.

(a) Weld repair crack in accordance with procedures in G.(2).

(b) Clean sufficient area surrounding welded crack to accommodate installation of a repair doubler, using acetone.

(c) Fabricate an elliptical doubler, half as wide as long, two inches longer than the welded crack, of 0.032-inch thick Inconel 625 per AMS5837 as shown in Figure 407A.

(d) Position doubler on inner skin of nozzle with center row of 0.62-inch diameter holes in doubler aligned over welded crack.

NOTE: Doubler may be adjusted slightly as required to clear existing rivets in the nozzle, or rivets may be drilled out, doubler positioned on nozzle, drilled using rivet hole in nozzle as a pilot hole, and upon completion of welding doubler in place over welded crack, riveted to nozzle. For repairs in CSD oil cooler heatstreak see G.(4).

(e) Clean doubler faying surface with acetone and allow to air dry.

(f) Reposition doubler on inner skin of nozzle and secure with 3/16-inch clamp-up bolts tightened to attain a 0.020 inch maximum doubler to nozzle gap.

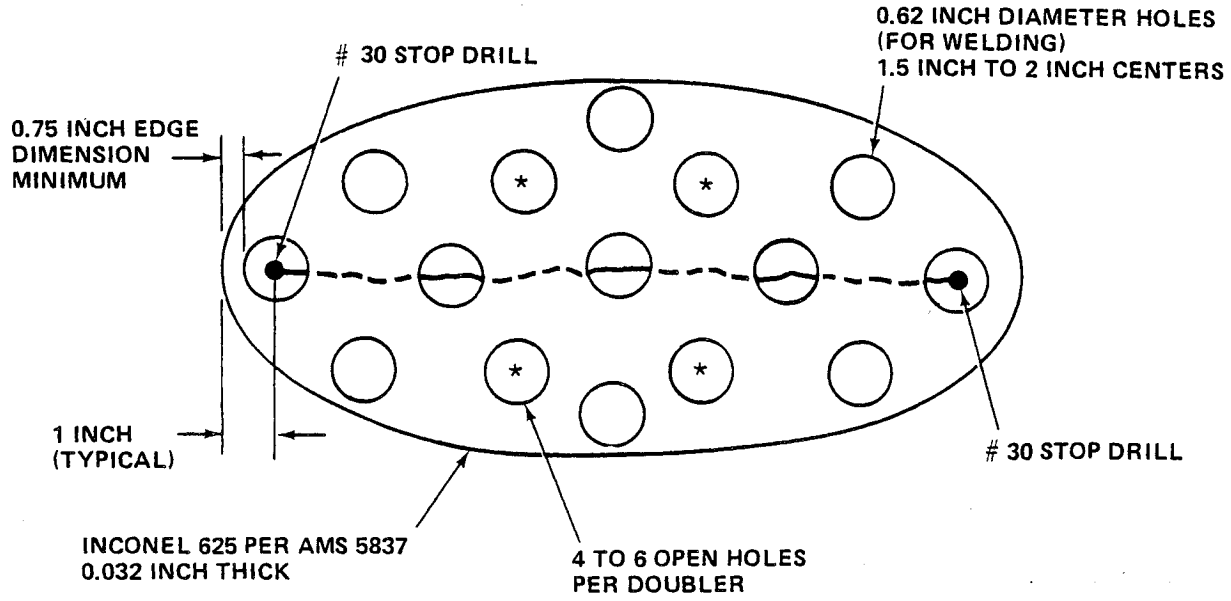

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Figure 407A

(g) Mask doubler to nozzle inner skin, checking to ensure all exposed edges, including holes in doubler are covered.

(h) Establish a continuous purge between doubler and nozzle inner skin using Argon or Helium introduced through both end holes in the center row of doubler holes and through one forward and one aft hole.

(i) GTA weld per BAC5975, Class B, using Argon or Helium and Inconel 625 filler wire per AMS5837, or BMS 7-38, Type VII, as follows:

NOTE: Addition of 3.0% ± 0.10% Hydrogen to the Argon purge gas will reduce the tendancy to form oxide film and will reduce the weld power setting.

1) Tack weld center hole in doubler.

NOTE: Using minimum size weld bead will reduce the possibility of skin distortion and oxide formation.

2) Unmask, tack weld and remask individual holes along the doubler centerline, alternating from side to side to prevent a buildup of heat.

3) Weld center hole.

4) Unmask and weld individual holes along doubler center row, alternating side to side to prevent a buildup of heat.

5) Unmask, tack and remask individual holes beside doubler center row, alternating side to side to prevent a buildup of heat. Start near doubler center. Leave open holes per Figure 407A.

6) Unmask and weld individual holes beside doubler center row, alternating side to side to prevent a buildup of heat. Start near doubler center.

7) Unmask, tack weld and remask the doubler periphery, alternating side to side and forward to aft to prevent a buildup of heat.

8) Unmask and weld short segments of the doubler periphery, again alternating from side to side and forward to aft to prevent a buildup of heat.

9) Remove purge gas supply from one end hole in doubler along center row and weld, repeat for other end hole in doubler.

10) Remove purge gas supply from forward hole in doubler and weld. Repeat for aft hole in doubler.

11) Remove clamp-up bolts, if used, and weld bolt holes in doubler and nozzle inner skin, using a steady flow of purge gas to back side of nozzle skin to prevent a buildup of heat.

NOTE: Stress relief is not required after welding doubler to nozzle inner skin.

(j) Visually examine all welds with 10X magnification.

(k) Penetrant examine all welds per Subject 20-20-02, checking to ensure that no cracks exist and that porosity and inclusions do not exceed 0.020 inch, and do not exhibit a cracklike appearance.

(4) Intercostal Repair for Buckles in Nozzle Inner Skin (Inconel 625 nozzle)

NOTE: Installation of a welded doubler crack repair in the heat streak flowing aft from the CSD oil cooler will increase the chances for future buckles, unless the following intercostal channels installation repair is performed.

(a) Fabricate two channel shaped intercostals and four end clips out of Inconel 625 as shown in Figure 407B.

(b) Hand form nozzle inner skin to its original contour.

(c) Penetrant examine nozzle buckle area Subject 20-20-02 to ensure that no cracks exist in the buckle. If cracks are detected, repair per G.(3).

(d) Install channels and clips on outside of nozzle inner skin using MS20615-5 rivets spaced from 0.75 to 1.00 inch apart as shown in Figure 407B.

NOTE: Where channels on outside of nozzle inner skin are located opposite welded doubler repair, drill each rivet hole in channel, nozzle skin, and doubler, and use next longer MS20615 rivet to accommodate thickness of doubler.

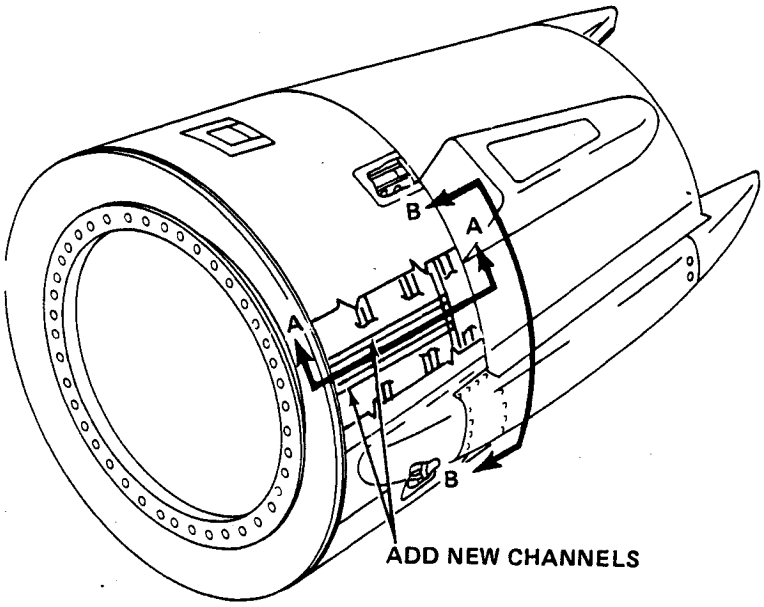
(5) Doubler Repair of Cracks in 410 CRES Nozzle

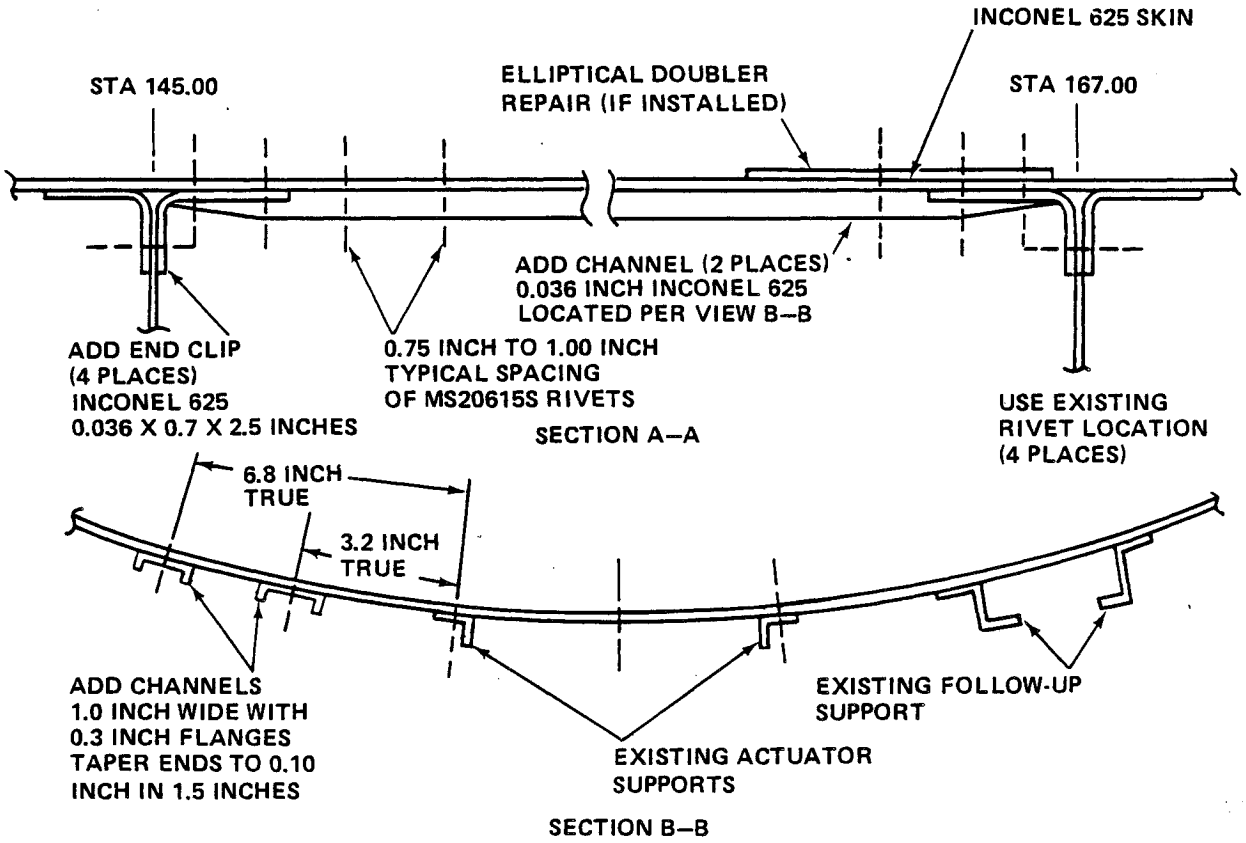
(a) Penetrant examine crack per Subject 20-20-02 to determine actual size of crack.

(b) Drill stop holes at either end of crack using a #30 drill.

(c) Fabricate a 0.050-inch thick doubler (410 CRES), 2.50 inches wide and 2.50 inches longer than crack (L) as shown in both Figures 408 and 409. Heat treat doubler to 110-140 KSI per MIL-H-6875.

(d) Position doubler over crack and install rivets in the approximate pattern and spacing shown in Figures 408 and 409.





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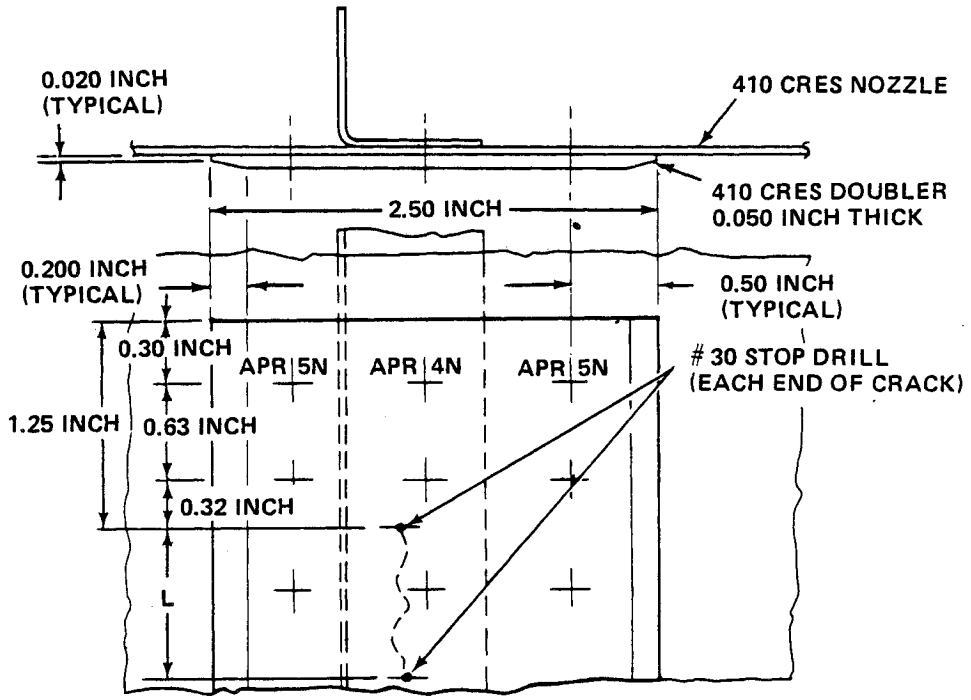
5–83

Figure 407B

(6) Repair of Nicks or Gouges

(a) Blend nicks or gouges until smooth and refinish worked areas.



NOMENCLATURE	PART NUMBER	SYMBOL
RIVET	NAS1200M4	APR 4N
RIVET	NAS1200M5	APR 5N

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Figure 408

(7) Weld Repair of Cracks in 347 Cres Nozzle, Flange.

NOTE: Welded crack repairs may eventually require rewelding.

(a) Prepare 347 Cres nozzle flange to be repaired in accordance with GTA welding practice.

(b) Penetrant examine crack per Subject 20-20-02 to pin-point crack ends.

(c) Stop drill each end of the crack using a No. 30 drill.

(d) Grind out crack as shown in Figure 408A.

(e) Clean crack area with acetone.

(f) GTA weld ground-out crack using 347 Cres filler wire per AMS5680.

(g) Grind welded crack smooth without grinding parent metal.

(h) Penetrant examine weld per Subject 20-20-02.

(1) Polish both sides of repaired crack.

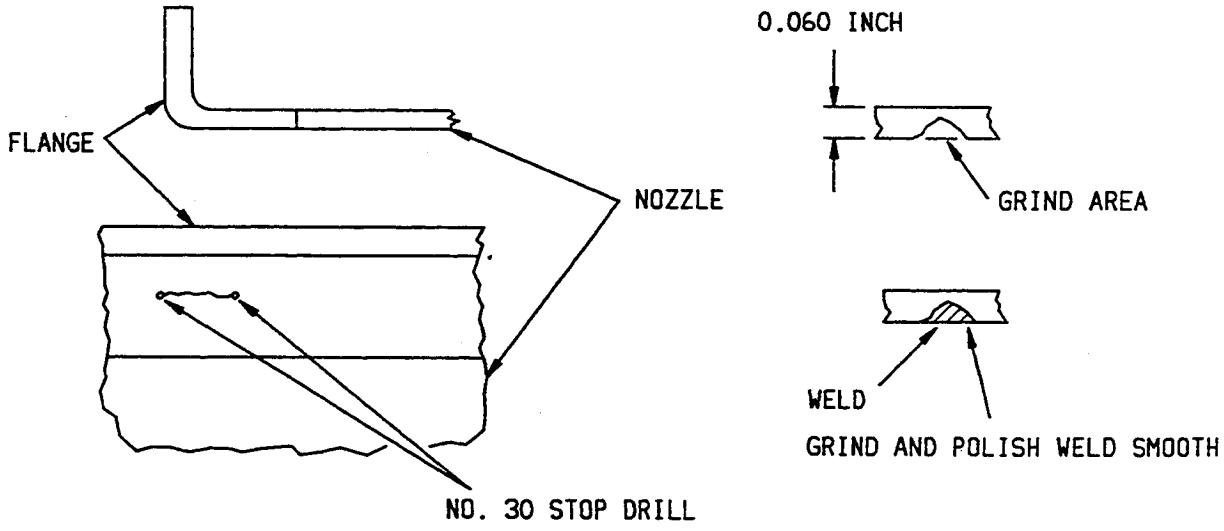


Figure 408A

(8) Weld repair of cracks or wear in 321 CRES aft doubler.

NOTE: To identify doubler material: 321 CRES is nonmagnetic, 410 CRES is magnetic. Doublers made of 321 CRES can be weld repaired per step (8). Doublers made of 410 CRES can be weld repaired per step (9).

(a) Penetrant examine doubler for cracks per Subject 20-20-02. If cracks are detected, go to step (8)(b). If cracks are not detected, go to step (8)(d).

(b) Stop drill ends of crack(s) with No.30 drill bit as shown in Figure 408B.

(c) Grind out the crack(s) with a one-eighth inch Outer Diameter solid carbide bit.

(d) Drill six 0.159-0.171 inch diameter vent holes in the area to be welded.

(e) Burr any sharp edges.

(f) Abrade the area to be welded with 150-250 grit silicon carbide abrasive paper.

WARNING: METHYL ETHYL KETONE (MEK) IS CLASSIFIED AS A HAZARDOUS MATERIAL WHICH MAY CAUSE INJURY OR ILLNESS IF NOT PROPERLY USED. THIS PRODUCT SHOULD BE USED ONLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFIC SAFETY AND HEALTH RECOMMENDATIONS. PRIOR TO THE USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(g) Clean the area to be welded with a clean cotton cloth moistened with MEK. Wipe the area dry before the solvent evaporates.

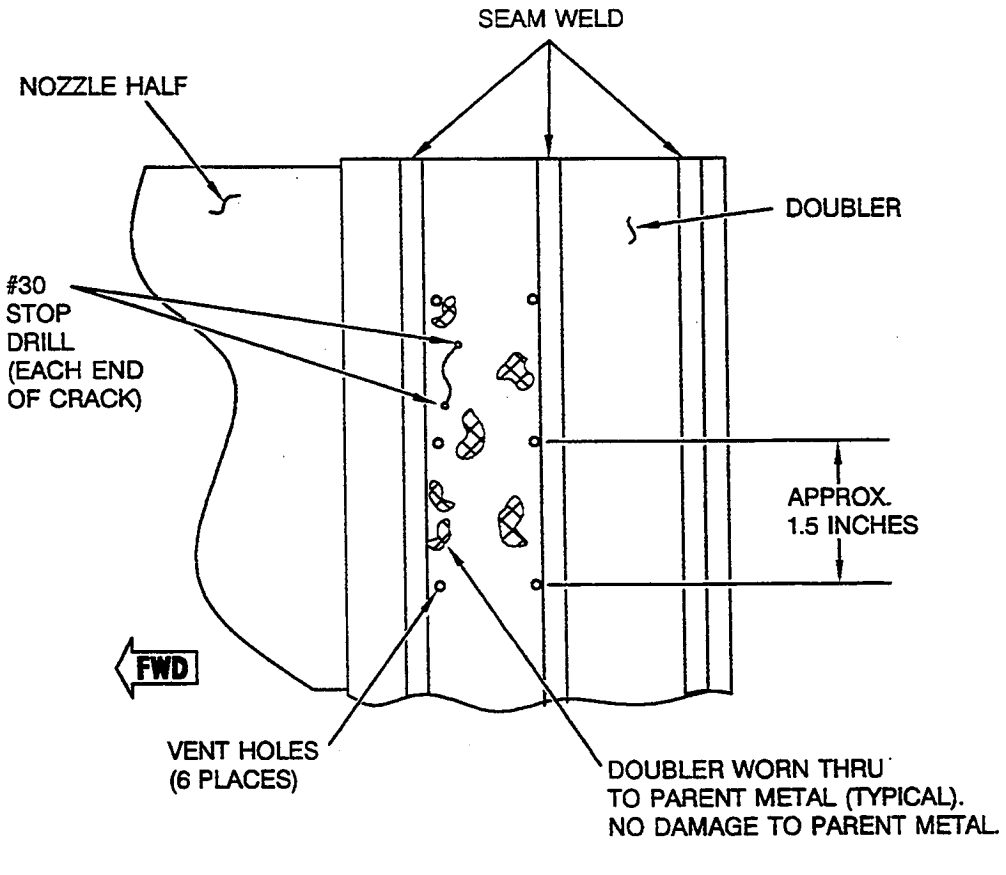


Figure 408B

WARNING: THE TEMPERATURE OF DRY ICE IS -109°F (-73.5°C). DRY ICE RELEASES CARBON DIOXIDE GAS WHICH CAN CAUSE RAPID ASPHYXIATION AND DEATH BY DISPLACING OXYGEN IN CONFINED AREAS THAT DO NOT HAVE ADEQUATE VENTILATION. STORE AND USE THIS MATERIAL IN A WELL-VENTILATED AREA. INSULATED GLOVES SHOULD BE WORN TO PREVENT FROSTBITE. PRIOR TO USE, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(h) Use dry ice and chill bars to prevent overheating of the weld area.

(i) Before welding, purge the area to be welded with Argon gas per MIL-A-18445 or equivalent for a minimum of five minutes. The flow rate of Argon gas should be 5 CFM, to prevent turbulence. Continue to purge during welding until the weld is cool.

CAUTION: DO NOT PERFORM ANY WELDING REPAIRS ON WING. DO NOT OVERHEAT THE METAL DURING WELDING.

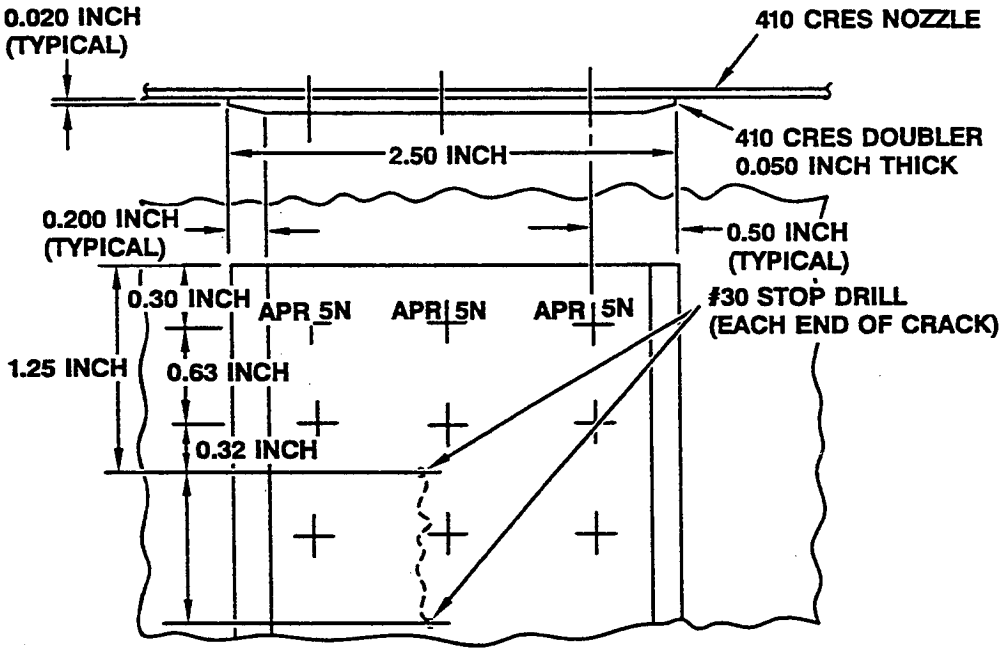
(j) TIG weld crack(s) and/or worn areas using Hastelloy W welding wire per AMS 5786 or equivalent.

(k) Penetrant examine weld per Subject 20-20-02.

(l) Grind weld flush to +0.015 inch high. Do not grind parent material.

(m) Install MS20470M5-10 rivets (6) in the vent holes. Make sure rivets are flush and tight.

(n) Make a visual inspection of the repair area to make sure that the repair has been done in accordance with these procedures.



NOMENCLATURE	PART NUMBER	SYMBOL
RIVET	NAS1200M5	APR 5N

737-15A
3-83

Figure 409

(9) Weld repair of cracks or wear in 410 CRES aft doubler.

NOTE: To identify doubler material: 321 CRES is nonmagnetic, 410 CRES is magnetic. Doublers made of 321 CRES can be weld repaired per step (8). Doublers made of 410 CRES can be weld repaired per step (9).

(a) Penetrant examine doubler for cracks per Subject 20-20-02. If cracks are detected, go to step (9)(b). If cracks are not detected, go to step (9)(d).

(b) Stop drill ends of crack(s) with No.30 drill bit as shown in Figure 408B.

(c) Grind out the crack(s) with a one-eighth inch Outer Diameter solid carbide bit.

(d) Drill six 0.159-0.171 inch diameter vent holes in the area to be welded.

(e) Burr any sharp edges.

(f) Abrade the area to be welded with 150-250 grit silicon carbide abrasive paper.

WARNING: METHYL ETHYL KETONE (MEK) IS CLASSIFIED AS A HAZARDOUS MATERIAL WHICH MAY CAUSE INJURY OR ILLNESS IF NOT PROPERLY USED. THIS PRODUCT SHOULD BE USED ONLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFIC SAFETY AND HEALTH RECOMMENDATIONS. PRIOR TO THE USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(g) Clean the area to be welded with a clean cotton cloth moistened with MEK. Wipe the area dry before the solvent evaporates.

WARNING: THE TEMPERATURE OF DRY ICE IS -109°F (-73.5°C). DRY ICE RELEASES CARBON DIOXIDE GAS WHICH CAN CAUSE RAPID ASPHYXIATION AND DEATH BY DISPLACING OXYGEN IN CONFINED AREAS THAT DO NOT HAVE ADEQUATE VENTILATION. STORE AND USE THIS MATERIAL IN A WELL-VENTILATED AREA. INSULATED GLOVES SHOULD BE WORN TO PREVENT FROSTBITE. PRIOR TO USE, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(h) Use dry ice and chill bars to prevent overheating of the weld area.

(i) Before welding, purge the area to be welded with Argon gas per MIL-A-18445 or equivalent for a minimum of five minutes. The flow rate of Argon gas should be 5 CFM, to prevent turbulence. Continue to purge during welding until the weld is cool.

CAUTION: DO NOT PERFORM ANY WELDING REPAIRS ON WING. DO NOT OVERHEAT THE METAL DURING WELDING.

(j) Use gas tungsten arc welding (GTAW) process per MIL-STD-2219 or equivalent to build up material in crack and in worn area. Use Hastelloy W welding wire per AMS 5786 or equivalent.

(k) Penetrant examine weld per Subject 20-20-02.

(l) Grind weld flush to +0.015 inch high. Do not grind parent material.

(m) Install MS20470M5-10 rivets (6) in the vent holes. Make sure rivets are flush and tight.

(n) Make a visual inspection of the repair area to make sure that the repair has been done in accordance with these procedures.

H. Repair of Door Latch Actuator Support.

(1) If the holes in the door latch actuator support (Figure 1103, Item 2) become oversized or the clips damaged, they may be repaired per Figure 410.

(2) Locally fabricate the required clips and install in support.

(3) Locate holes per asterisk (*) dimensions in Figure 410, and drill.

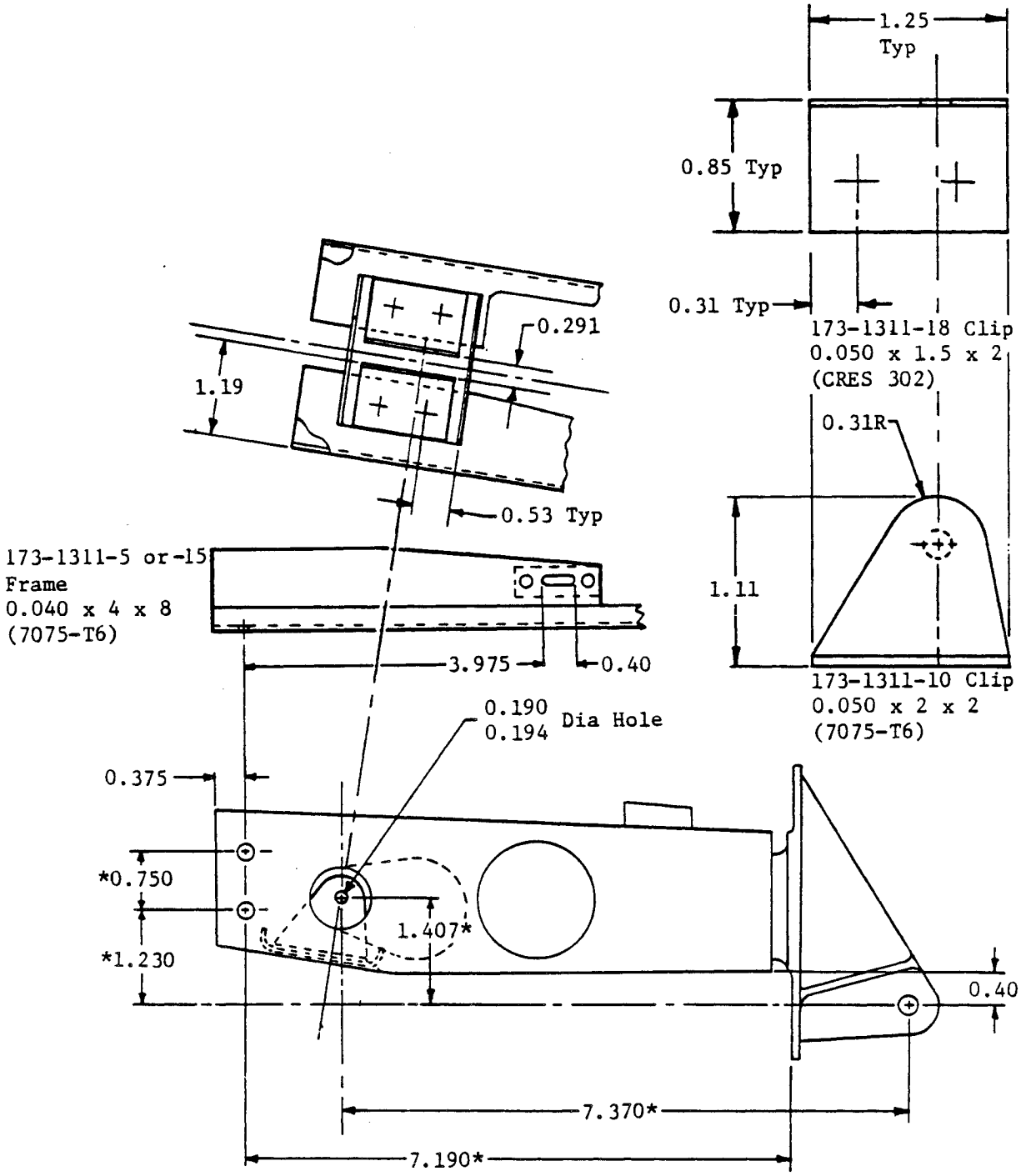

1.25
Typ
0.85 Typ
0.31 Typ
173-1311-18 Clip
0.050 x 1.5 x 2
(CRES 302)
0.31R
1.11
173-1311-10 Clip
0.050 x 2 x 2
(7075-T6)
0.291
1.19
0.53 Typ
173-1311-5 or -15
Frame
0.040 x 4 x 8
(7075-T6)
3.975
0.40
0.190
0.194
Dia Hole
0.375
*0.750
*1.230
1.407*
0.40
7.370*
7.190*

Figure 410

I. Repair of Actuator Housing (18, Figure 1101)

(1) Cracks in Fastener Retention Lip (Figure 411).

(a) Remove three nutplates (18A) and rivets.

(b) Stop drill cracks using a #30 drill.

(c) Weld entire crack, including rivet and nutplate holes if cracks start at or pass through any of the holes, using TIG or MIG weld and 2319 filler rod (per Fed Std QQ-R-566) on the 2219 AL alloy skin.

(d) Mark locations of nutplate holes if filled.

(e) Penetrant examine weld area per Subject 20-20-02.

(f) Grind weld flush within -0.000, +0.005 of parent metal on both sides of weld area.

(g) Repeat step (d).

(h) Drill out nutplate holes if welded.

WARNING: ALODINE TOUCH-UP SOLUTION IS AN ACID. USE CAUTION TO PREVENT CONTACT WITH SKIN. IF POWDER OR MIXED SOLUTION COMES IN CONTACT WITH SKIN, FLUSH OFF WITH CLEAN COLD WATER IMMEDIATELY. INHALATION OF DUST FROM POWDER OR VAPOR FROM SOLUTION SHALL BE AVOIDED. SWABS OR CLOTHS, SATURATED WITH SOLUTION, CONSTITUTE A FIRE HAZARD IF ALLOWED TO DRY. AS SOON AS USE IS FINISHED, RINSE THOROUGHLY WITH CLEAN COLD WATER.

(i) Finish outside weld area using Alodine 1000, per Subject 20-43-03, and inside using adhesive prime.

(j) Fabricate a 0.063 inch thick doubler of 2219 AL alloy as shown in Figure 411.

(k) Install doubler using six NAS1097D4 rivets.

(l) Install three nutplates (18A).

(2) Cracks in Skin (Figure 411)

(a) Stop drill cracks using a #30 drill.

(b) Weld entire crack using TIG or MIG weld and 2319 filler rod on the 2219 AL alloy skin.

(c) Penetrant examine weld area per Subject 20-20-02.

(d) Finish outside weld area using Alodine 1000 per Subject 20-43-03 and inside with primer, if necessary.

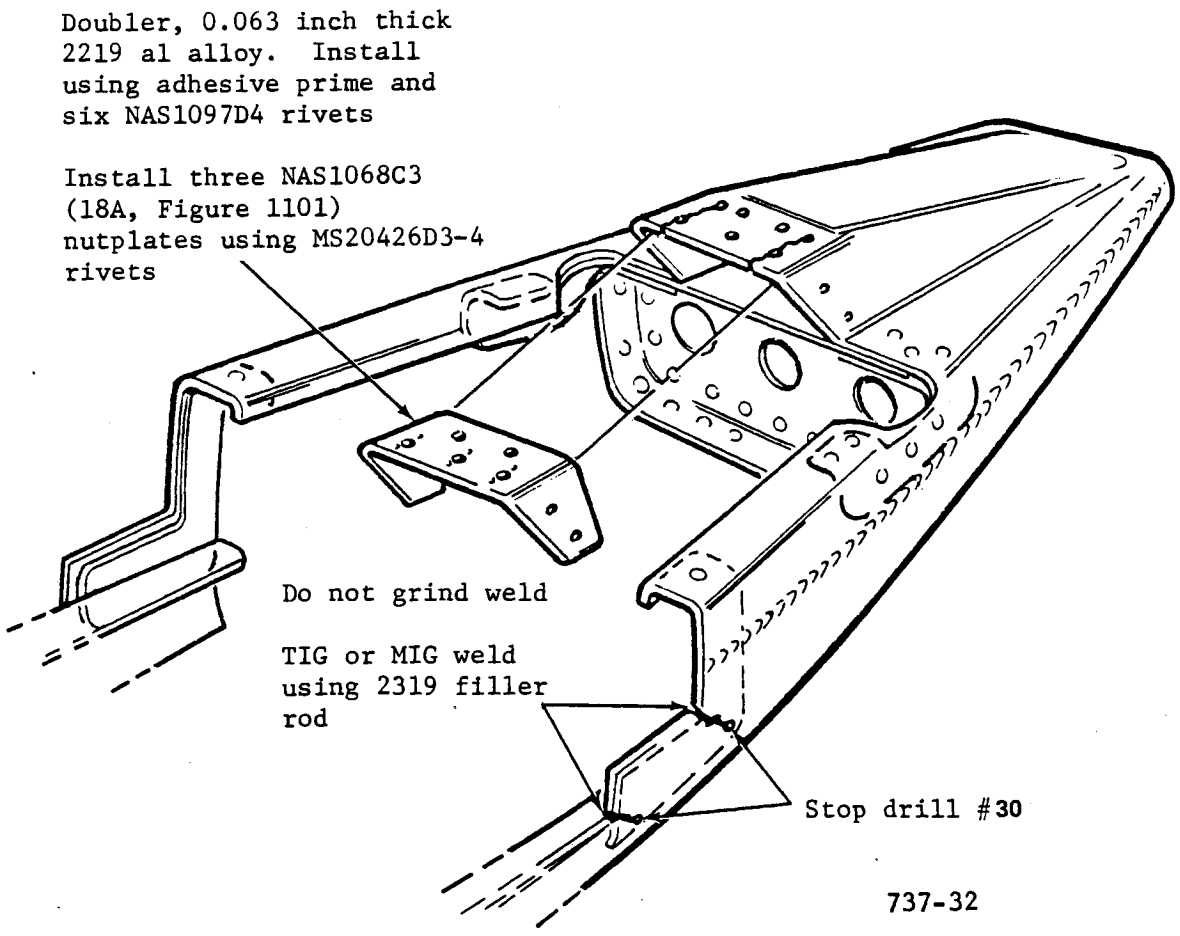


Figure 411

NOMENCLATURE AND ITEM NO.	FIGURE	REPAIR LIMITS (MACHINING AND/OR CRACK REMOVAL)
Support (94)	1101	Bushing repair of worn holes per limits of Figure 601.
		Weld repair permitted if limits of Figure 601 exceeded.

Repair Limits
Figure 412 (Sheet 1 of 3)

NOMENCLATURE AND ITEM NO.	FIGURE	REPAIR LIMITS (MACHINING AND/OR CRACK REMOVAL)
Support (94)	1101	Bushing repair of worn holes per limits of Figure 601.
		Weld repair permitted if limits of Figure 601 exceeded.
		Bushing repair of elongated guide rod holes per Figure 401.
Rod Assembly (92)	1101	Maximum straightenable bow 0.010 inch.
		Maximum bow limit 0.003 inch.
		Maximum surface material removal 0.005 inch.
Rod Assembly (90)	1101	Maximum straightenable bow 0.250 inch.
		Maximum bow limit 0.060 inch.
		Maximum surface material removal 0.005 inch.
		Weld or bushing repair of lug hole per limits of Figure 601.
Drive Link (80)	1101	Maximum bow limit of 0.0160 inch in each 9 lineal inches.
		Maximum bow limit of 0.0480 inches overall.
		Minimum flange thickness 0.0950 inch.
		Minimum web thickness 0.090 inch.
		Minimum flange width 98 percent of original width.
		Bearing and bushing repair per limits of Figure 601.
		Maximum straightenable bow 0.200 inch.

Repair Limits
Figure 412 (Sheet 2 of 3)

NOMENCLATURE AND ITEM NO.	FIGURE	REPAIR LIMITS (MACHINING AND/OR CRACK REMOVAL)
Idler Link (82)	1101	Minimum flange thickness 0.095 inch.
		Minimum web thickness 0.090 inch.
		Minimum flange width 98 percent of original width.
		Minimum solid section dimensional 0.064 inch.
		Bearing and bushing repair per limits of Figure 601.
Nozzle (4A)	1101	Nicks and gouges limited to 4-inch long and 25 percent of material thickness.
		Weld or doubler repair of crack per Figures 407, 408, and 409.
		Weld repair of cracks or wear on doubler per Figure 408B.
Support (14)	1102	Bushing repair of feedback lever attach holes per limits of Figure 602.
Carriage (93)	1101	Bushing repair of overcenter link attach holes per limits of Figure 601.
Aft Hinge Fitting (24)	1101	Crack removal per limits of Figure 601.
		Bushing repair of Idler Link attach holes per limits of Figure 601.
Forward Hinge Fitting (23)	1101	Wear in stop bolt area limited to 0.050 inch depth.
		Bushing repair of drive link holes per limits of Figure 601.
Lever (15)	1102	Minimum web thickness 0.086 inch.
		Bushing repair of pivot hole per limits of Figure 602.
Stop (95)	1101	Weld repair of any length crack permitted.

Repair Limits
Figure 412 (Sheet 3 of 3)

OVERSIZE HOLE REPAIR

HOUSING				BUSHING						
NAME	INDEX FIG. 1101	BORE LOCATION FIG. 601	BORE DIAMETER (INCH)	BORE (INCH)	O.D. (INCH)	WALL THICKNESS	MATERIAL	HEAT TREAT	LGTH	REMARKS
LINK	(80)	L	0.9062 0.9067	- - -	0.9157 0.9162	- - -	- - -	- - -		*(7)
	(81)	S	0.9062 0.9067	- - -	0.9157 0.9162	- - -	- - -	- - -		*(7)
	(82)	N	0.9062 0.9067	- - -	0.9157 0.9162	- - -	- - -	- - -		*(7)
	(80)	H	1.1327 Max	0.9375 0.9390	*(3)	0.060 Min	422 Steel	160-190 KSI	1.51 1.53	*(1)*(8) *(9)*(10)
	(80)	E	*(2)	0.3745 0.3750	0.5625 Max	0.060 Min	422 Steel	160-190 KSI	- -	*(4) *(9)
	(82)	P	1.0827 Max	0.8125 0.8140	*(3)	0.060 Min	422 Steel	160-190 KSI	1.24 1.25	*(1) *(8) *(9)*(10)
CARRIAGE	(93)	T	*(2)	0.3745 0.3750	0.4945 0.4950	0.060 Min	422 Steel	160-190 KSI		*(3) *(8)
SUPPORT	(94)	AA	0.6875 Max	0.5625 0.5634	*(3)	0.060 Min	Annealed 17-4 PH	Age at 925° F 180 KSI		
		BB	0.7500 Max	0.6250 0.6259	*(3)	0.060 Min				
		CC	*(2)	0.5010 0.5020	0.6210 0.6220	0.060 Min				
		HH	0.4960 0.4970	0.3760 0.3770	*(3)	0.060 Min				

Figure 413 (Sheet 1 of 2)

OVERSIZE HOLE REPAIR

HOUSING				BUSHING					
NAME	INDEX	BORE							
		LOCATION	DIAMETER (INCH)	BORE (INCH)	O.D. (INCH)	WALL	MATERIAL	HEAT TREAT	REMARKS
SUPPORT	(14) FIG. 1102	FIG. 602 Q	0.5000 MAX	0.3130 0.3180	*(3)	0.0600 MIN	ANNEALED 17-4PH	AGE AT 900°F 160-190 KSI	*(4)
LEVER	(15) FIG. 1102	FIG. 602 H	0.6254 0.6259	0.4390 0.4400	0.6260 0.6265	- - -	STAINLESS DYFLON	- - -	*(5) *(6)
ROD ASSY	(90) FIG. 1101	FIG. 601 KK	0.501 MAX	0.3745 0.3755	*(3)	0.030 MIN	ANNEALED 17-4PH	AGE AT 925°F 160-190 KSI	
HINGE FITTING	(23),(24) FIG. 1101	FIG. 601 NN	*(2)	0.3745 0.3755	0.500 MAX	0.060 MIN	ANNEALED 17-4PH	AGE AT 900°F 160-190 KSI	
SUPPORT	(174) FIG. 1101	FIG. 601 OO	0.6875 MAX	0.5010 0.5020	*(3)	0.0600 MIN	ANNEALED 17-4PH	AGE AT 925°F 180 KSI	

Figure 413 (Sheet 2 of 2)

*(1) Bushing bore and O.D. and link bore finished to 16 microinch.
*(2) Bore diameter to create 0.0010 to 0.0015 inch interference fit between housing and bushing.
*(3) Machine outside diameter of bushing to create 0.0010 to 0.0015 inch interference fit between housing and bushing. Maintain RMS16 surface finish.
*(4) Holes in both legs of clevis must be in line, ends of bushing must be flush with lug surfaces.
*(5) Housing bore recommended interference 0.0001 to 0.0011. No lubrication required.
*(6) DBSF-7-130 bushing. Southwest Products Co.
*(7) Oversize bearing race available from Valley-Todeco, Inc. (V06710), P/N VTB00612P10.
*(8) Alternate material, CL440, per AMS5630. Heat treat to Rockwell C58 minimum.
*(9) Alternate material, 17-4PH, per AMS5643. Heat treat to 160-190 KSI.
*(10) Nitride inside diameter to 0.002/0.006 inch case depth for CRES422 or 17-4PH.

3. Repairs of Deflector Door Assembly (22)

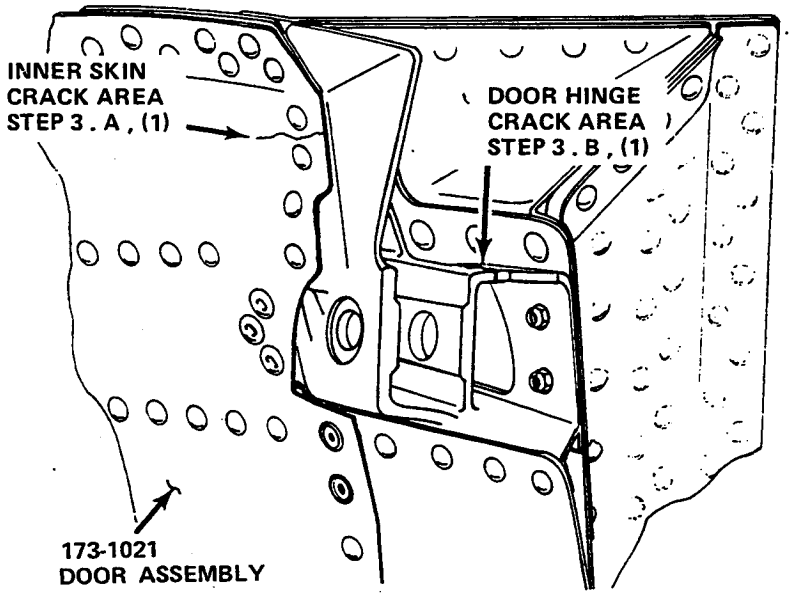


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FIGURE 414

A. Repair Deflector Door Skin Crack, Aft

NOTE: The details of this repair procedure are applicable to either the left or right hand side of deflector door.

(1) When crack in inner door skin (34, Figure 424) is detected in area shown in Figure 414, make repair as follows:

(a) Penetrant examine the crack area per Subject 20-20-02, to determine extent of crack.

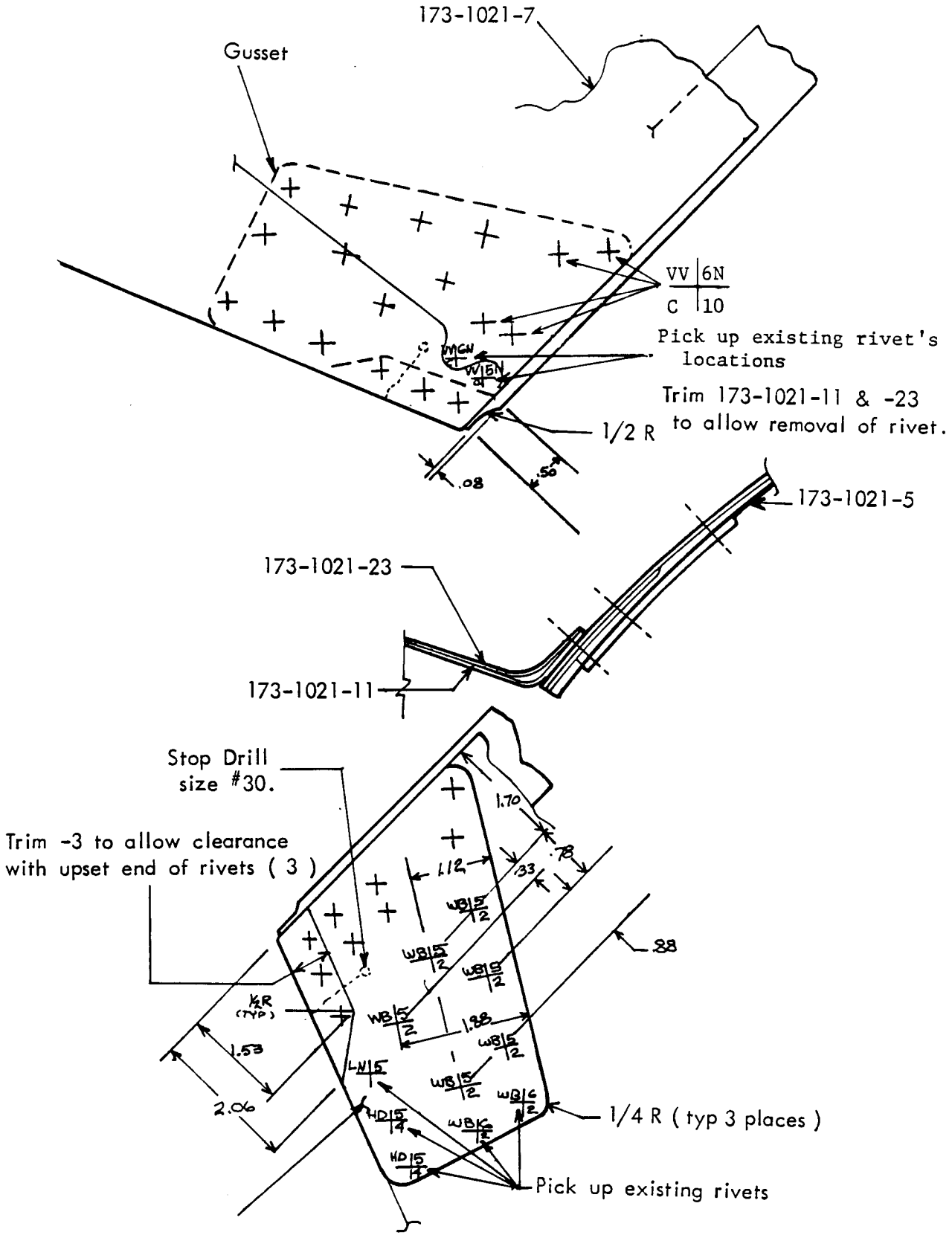
(b) Using a #30 drill, stop crack by drilling a hole 0.030 inch beyond apparent end of crack.

(c) Lay out patch material (gusset) as shown in Figure 415. Gusset size dimensions will be established by using minimum edge distance requirements for gusset layout.

(d) Material required to accomplish repair is listed in Figure 416.

NOTE: If A286 is used, age harden gusset material to minimum requirements by heating to 1325 ± 15°F for 16 hours and air cool.

(e) Maintain an edge distance of 2D and not less than 1.5D (min) with all parts.



Deflector Door Repair
Figure 415

QTY	NOMENCLATURE	CODE	PART NUMBER	SYMBOL
2	Rivet	(a)	BB-352-5-4	HD 5 / 4
6	Rivet	(b)	AF007M-6-10	VV 6 / C 10
7	Rivet		NAS1738M-5-2	AAR 5 / 2
2	Rivet		NAS1738M-6-2	AAR 6 / 2
1	Rivet		MS20615-5M4	LN 5 / 4
1	Gusset	CRES Sheet A286, AMS5525, 0.050 x 5.0 x 5.0 140 KSI Min. or CRES Sheet 19-9DL, AMS5539, 0.063 x 5.0 x 5.0 125 KSI Min. or CRES Sheet 19-9DX, AMS5527, 0.063 x 5.0 x 5.0 125 KSI Min. or CRES Sheet 301 (1/2 hard), AISI 301, 0.063 x 5.0 x 5.0 141 KSI Min.		
AR	Shim	CRES Sheet A286, AMS5525, 0.050 x 5.0 x 5.0 140 KSI Min. or CRES Sheet 19-9DL, AMS5539, 0.063 x 5.0 x 5.0 125 KSI Min. or CRES Sheet 19-9DX, AMS5527, 0.063 x 5.0 x 5.0 125 KSI Min. or CRES Sheet 301 (1/2 hard), AISI 301, 0.063 x 5.0 x 5.0 141 KSI Min.		

Rivets may be purchased from from the following sources:

Code

(a) Hi-Shear Corp. (V73197)
2600 Skypark Drive
Torrance, CA 90509

(b) Allfast Inc. (V53551)
15252 Don Julian Rd.
City of Industry, CA
91744

*NOTE: BB352-5-4 is made up of: (1) Core Bolt BB302-5-4
(1) Sleeve BB322-5-4
(1) Expander BB341-5

See Page 1002 for special tools required.

Figure 416

(f) Should the door undergoing repair have 173-1192 bumpers and caps installed (Ref Figure 420), the 173-1192-3 or 173-1192-4 end bumpers may be trimmed back approximately 2.0 inches to avoid interference with repair gusset.

(2) When crack in outer door skin (35, Figure 424) is detected make repair as follows:

NOTE: Cracks 3.0 inches or less in length and no closer than 5.0 inches to another crack, are considered to be allowable damage and should be stop drilled only then protected by a film of alodine per Subject 20-43-03.

(a) Penetrant examine the crack are per Subject 20-20-02, to determine extent of crack.

(b) Using a #30 drill, stop drill both ends of crack.

(c) Rout entire length of crack using a pin router.

(d) TIG weld crack using 2319 filler wire.

(e) Grind weld flush without grinding parent metal.

(f) Penetrant examine welded crack per Subject 20-20-02.

(g) Polish repaired crack.

WARNING: ALODINE TOUCH-UP SOLUTION IS AN ACID. USE CAUTION TO PREVENT CONTACT WITH SKIN. IF POWDER OR MIXED SOLUTION COMES IN CONTACT WITH SKIN, FLUSH OFF WITH CLEAN COLD WATER IMMEDIATELY. INHALATION OF DUST FROM POWDER OR VAPOR FROM SOLUTION SHALL BE AVOIDED. SWABS OR CLOTHS, SATURATED WITH SOLUTION, CONSTITUTE A FIRE HAZARD IF ALLOWED TO DRY. AS SOON AS USE IS FINISHED, RINSE THOROUGHLY WITH CLEAN COLD WATER.

(h) Apply a film of alodine 1000, 1000L, or 1200, see Subject 20-43-03.

B. Repair Deflector Door Hinge - Aft

NOTE: The details of these repairs are applicable to either the left hand or right hand aft deflector door hinges.

(1) When crack is detected at area illustrated in Figure 414, make repair as follows:

(a) Remove hinge material illustrated by Figure 417. A high speed grinder may be used to make the two cuts necessary. Repair can be accomplished without removing hinge from the deflector door.

(b) Install MS20615MP-5 rivets (2) in deflector door where HL48-5-5 rivets were removed.

(c) Smooth out edges of 173-1048 hinge where cut was made to remove material.

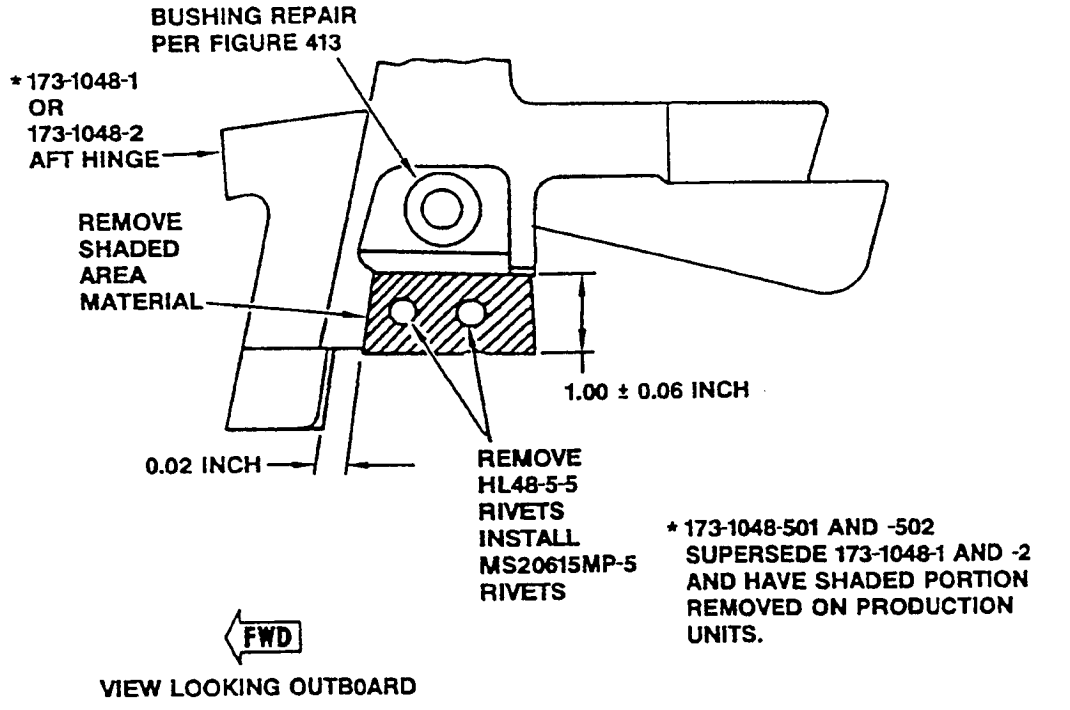
(d) When cracks or material loss in the shaded areas of figure 417A is detected, the hinge must be removed from the deflector door.

CAUTION: IF CRACKS OR MATERIAL LOSS EXCEED THE SHADED AREAS SHOWN IN FIGURE 417 AND FIGURE 417A, THE HINGE MUST BE REPLACED.

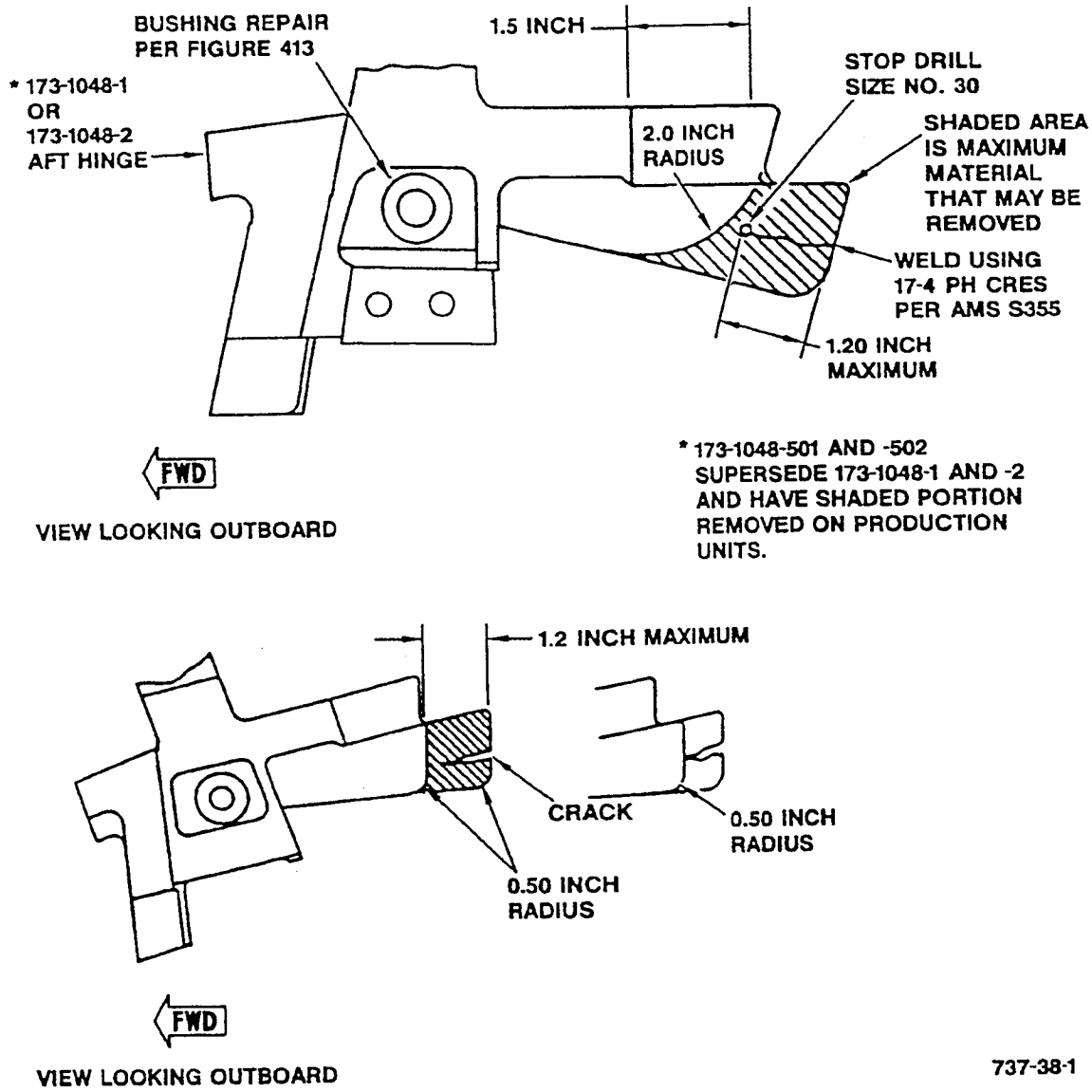
(e) Penetrant examine the entire hinge, per Subject 20-20-02, to determine if shock or damage caused any other cracks outside the shaded areas in Figure 417 and Figure 417A.

(f) Dress up damage area by grinding until crack or damage area is eliminated or weld as shown in Figure 417A.

(g) Smooth out edges of repaired area.



DEFLECTOR DOOR HINGE REPAIR
Figure 417



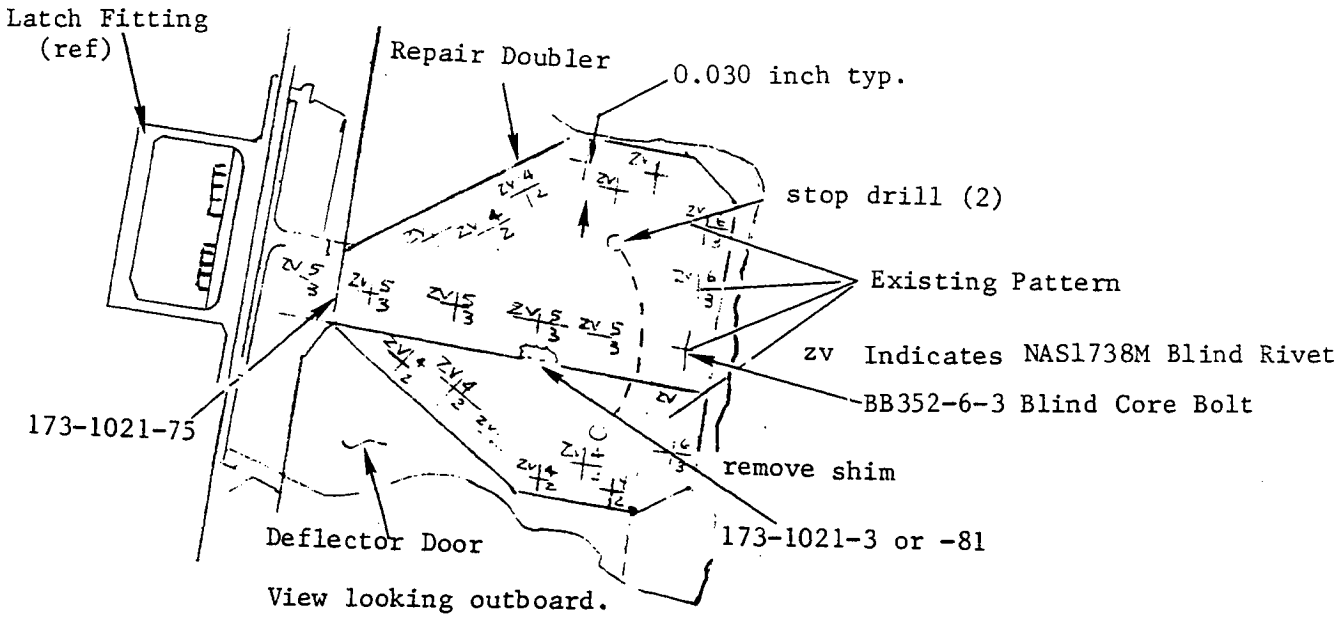
DEFLECTOR DOOR HINGE REPAIR
Figure 417A

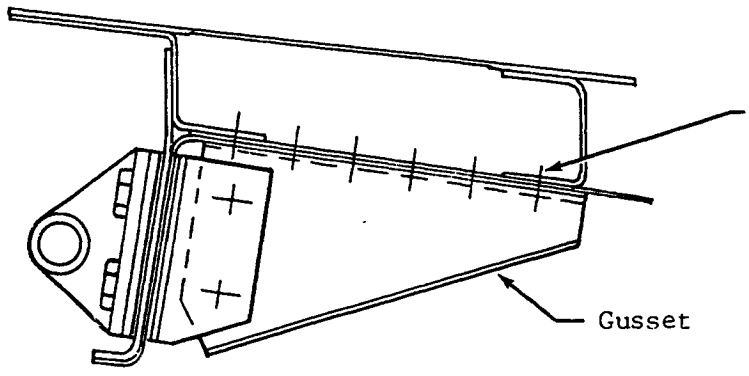
C. Repair Deflector Door Inner Skin Crack, Forward

NOTE: When following repair is made, P/N 173-1021-3, or -81 shim is removed. The repair doubler will replace the shim.

(1) When crack in door inner skin (34, Figure 424) is detected at area illustrated in Figure 418, make repair as follows:

(a) Using a #30 drill, stop crack by drilling a hole 0.030 inch beyond apparent end of crack.





For loose or missing existing blind fastener, replace with blind core bolt. Assy P/N BB352-6-3 (Hi-Shear) as required. Add shim as required. See Figure 416 for material procurement.

Figure 418

(b) Remove existing rivets from rework area. Discard shim, either P/N 173-1021-3 or -81.

(c) Lay out repair doubler per Figure 418. Doubler size dimension will be established by using minimum edge distance requirements for doubler layout. See Figure 416 for material procurement.

(d) Rivet doubler to deflector door, using rivets called for in Figure 418.

D. Repair of Deflector Door Hinge - Forward

CAUTION: HINGE FITTINGS WHICH ARE CRACKED OR EXCEED 0.050 INCH DEPTH MAXIMUM WEAR MUST BE REPLACED.

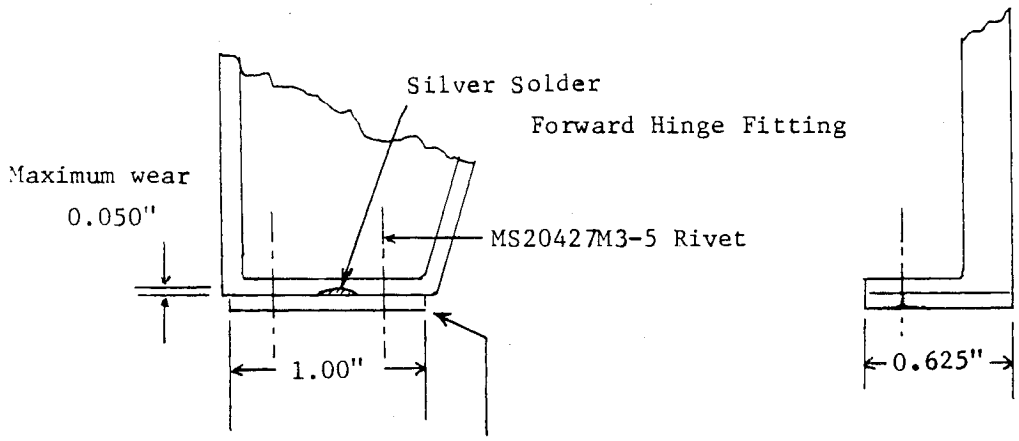
(1) The forward deflector door hinge contact area with the forward stop bolts may be repaired as follows:

(a) Fill wear depression with silver solder, using minimum heat.

(b) Grind solder smooth with surface of hinge fitting.

(c) Install wear strip as shown in Figure 419.

(2) Bushing repair of hinge hole is accomplished per Figure 413.



Material for wear strip repair CRES 301 Condition A Per MIL-S-5059. Size 0.090 x 1.00 x 0.625 inch.

Figure 419

E. Repair of Worn Trailing Edge Slug

(1) A maximum wear of 0.090 inch depth of the exposed slug, 173-1024-1, is allowed. No wear allowed on the inner or outer skin. Repair per Figure 420, Sheets 1 and Sheet 2.

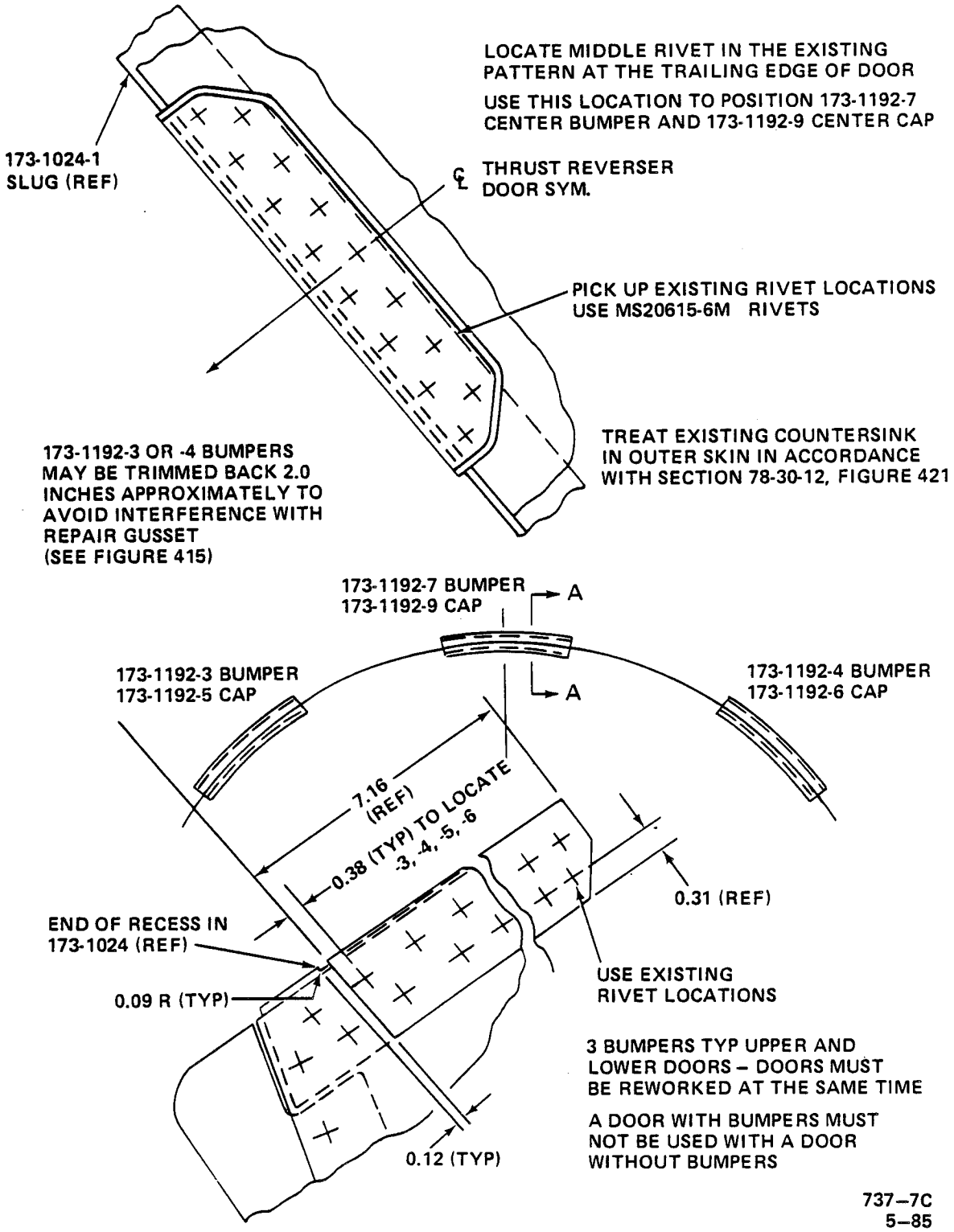


Figure 420 (Sheet 1 of 2)

NOTE

A. HAND FORM 173-1024-1 TRAILING EDGE SLUG AS REQUIRED ADJACENT TO BUMPERS BEND RADII TO ENSURE A MINUMUM OF 80 PERCENT AREA CONTACT.

B. MAXIMUM MISMATCH OF T/R DOOR BUMPERS AND CAPS IS 0.10 INCH IN THE FULL DEPLOYED POSITION.

C. BUMPERS MAY BE GROUND 0.03 INCH TO MAINTAIN A MINIMUM 50 PERCENT CONTACT AREA AT EACH SET OF BUMPER PADS IN FULL DEPLOY POSITION.

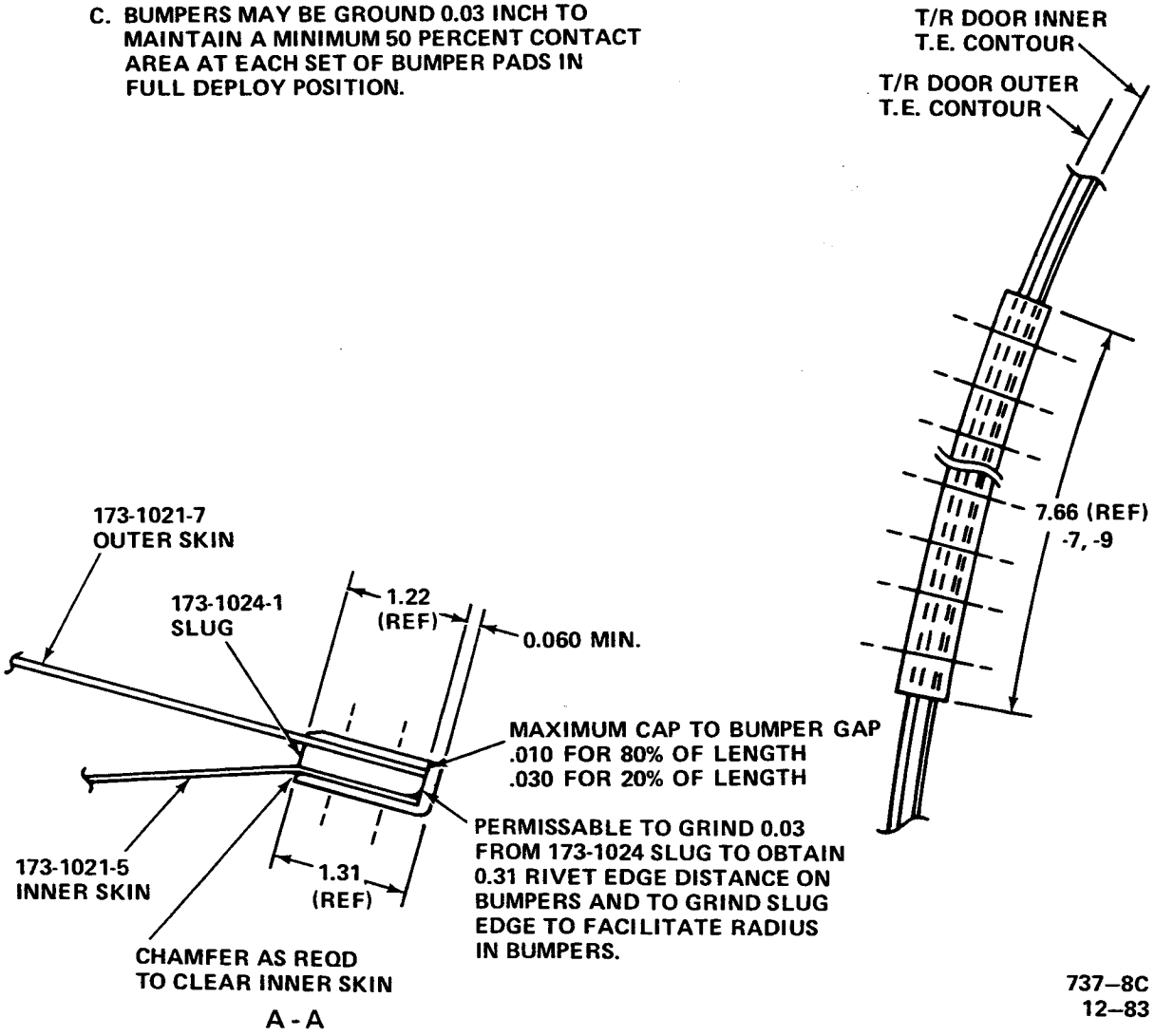


Figure 420 (Sheet 2 of 2)

F. Replacement of Rivets

(1) When loose or missing rivets are detected among the two rows of rivets securing the trailing edge of the thrust reverser door, repair by installing universal head type rivet and tapered spacer, as follows:

(a) Remove loose BR125-C6 or MS20427 type rivet from hole.

(b) Examine hole to determine whether or not the countersunk area has been damaged. If the area is not damaged, install MS20615-6M rivet and tapered spacer in the hole.

NOTE: Fig. 421 illustrates how the area left open by the previously installed countersunk rivet is plugged by the use of the tapered hole.

(c) If the countersunk area, or the hole area, has been damaged, clean the hole to next larger rivet size and install a MS20615-8M rivet and tapered spacer in the hole.

(2) When loose or missing rivets are detected in deflector door fairing skin, or fairing skin to door outer skin (See Fig. 421), secure fairing skins with MS20426D or NAS1241D type rivets, or skin to door using NAS1739M or NAS1738M type rivets. 6/32 inch diameter rivet is the maximum allowable. Recommended rivets are installed after lightly dressing out countersink and shaving rivet head flush to fairing skin.

(3) When fairing skin rivet holes exceed the 6/32 inch maximum, existing holes may be filled with flush rivets and an external doubler (0.040 AL) may be installed with new rivets (AF007M5C) as shown in Fig. 421.

(4) Loose or missing blind rivets attaching the gusset to the door attach point are replaced with blind core bolts, Assembly P/N BB352-6-3, as shown in Fig. 418.

G. Drain Hole in Bottom Deflector Door

(1) Locate the lowest point on the forward bulkhead of the bottom deflector door (22, Fig. 1101) per Fig. 420A.

(2) Drill a 0.250-inch hole through the bulkhead end plate (9, Fig. 424) and forward frame (17A, Fig. 424) toward the outer skin (35, Fig. 424) at a point 0.50 inch from each of the two lowest rivets in the end plate.

(3) Finish circumference of drain hole with Alodine 1000 per Subject SOPM 20-43-03.

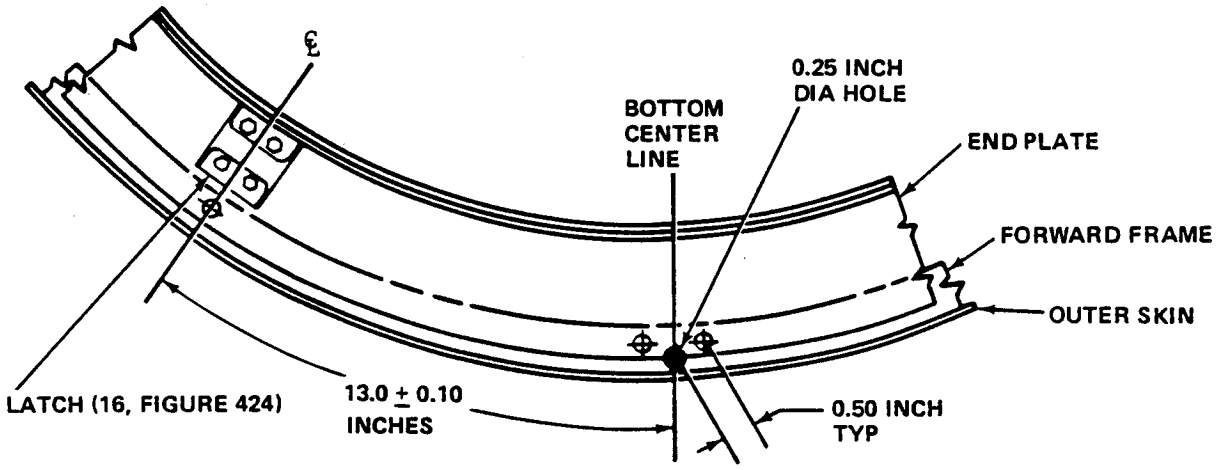

℄
0.25 INCH
DIA HOLE
BOTTOM
CENTER
LINE
END PLATE
FORWARD FRAME
OUTER SKIN
LATCH (16, FIGURE 424)
13.0 ± 0.10
INCHES
0.50 INCH
TYP
737-3

Figure 420A

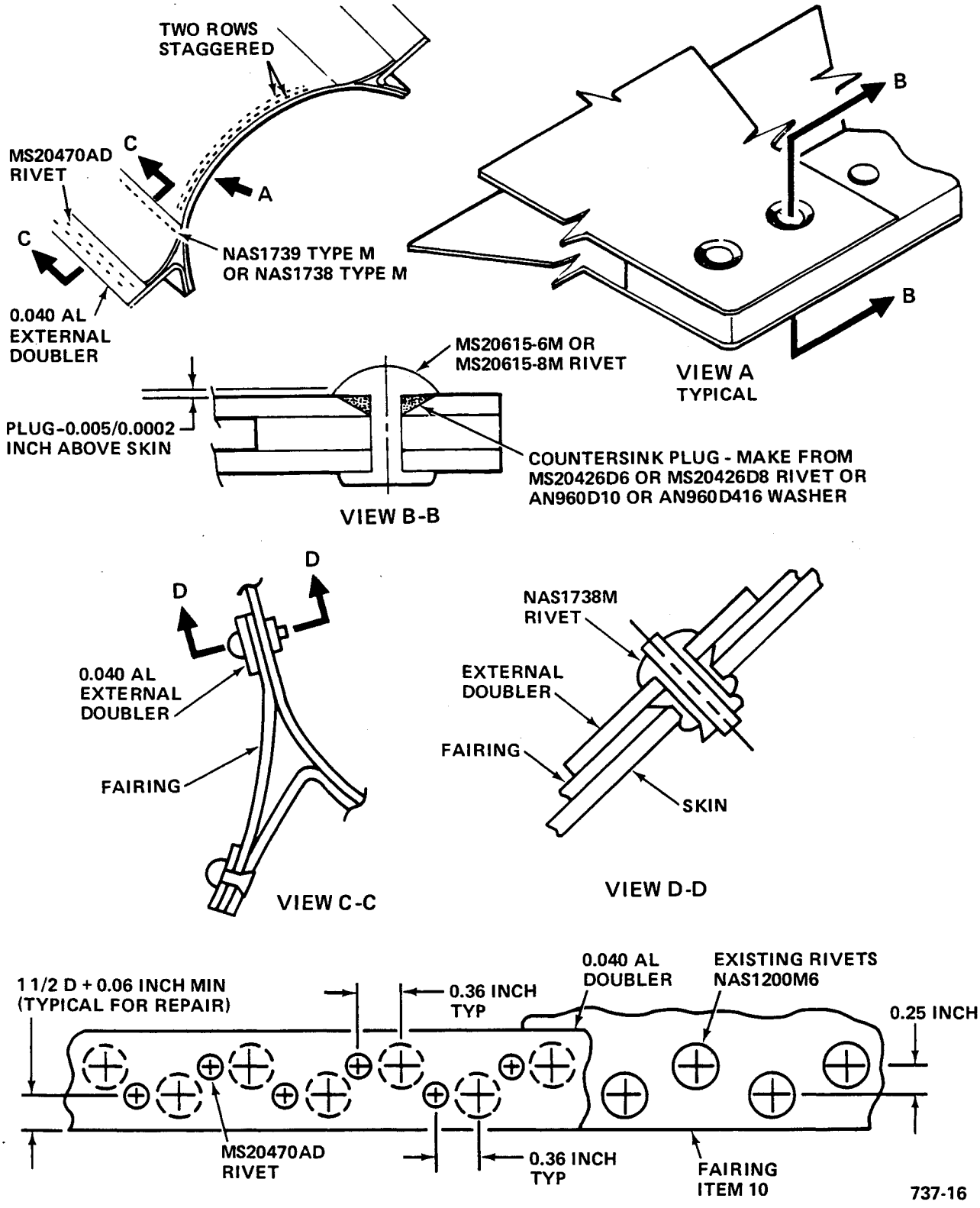

TWO ROWS STAGGERED
MS20470AD RIVET
C
A
C
NAS1739 TYPE M OR NAS1738 TYPE M
0.040 AL EXTERNAL DOUBLER
B
B
VIEW A TYPICAL
MS20615-6M OR MS20615-8M RIVET
PLUG-0.005/0.0002 INCH ABOVE SKIN
COUNTERSINK PLUG - MAKE FROM MS20426D6 OR MS20426D8 RIVET OR AN960D10 OR AN960D416 WASHER
VIEW B-B
D
D
0.040 AL EXTERNAL DOUBLER
FAIRING
VIEW C-C
NAS1738M RIVET
EXTERNAL DOUBLER
FAIRING
SKIN
VIEW D-D
1 1/2 D + 0.06 INCH MIN (TYPICAL FOR REPAIR)
0.36 INCH TYP
0.040 AL DOUBLER
EXISTING RIVETS NAS1200M6
0.25 INCH
MS20470AD RIVET
0.36 INCH TYP
FAIRING ITEM 10
737-16

Figure 421

H. Repair Deflector Door Skin Crack At Bumpers

NOTE: The details of this repair procedure are applicable to either the left or right hand side of deflector door.

(1) Clean area and stop crack (34, Figure 424) as follows:

(a) Use cotton cloth and MEK to clean inner and outer skin in repair area.

(b) Penetrant examine the crack area per Subject 20-20-02, to determine extent of crack.

(c) Using a No. 30 drill, stop crack by drilling a hole 0.030 inch beyond apparent end of crack.

(2) Fabricate Bumper/Doubler (Figure 424) as follows:

(a) Fabricate Bumper/Doubler as shown in Figure 421B.

(b) Material required to accomplish repair is listed in Figure 421A.

(c) Match drill existing holes of original bumper through new Bumper/Doubler. Lay out new additional holes per Detail A then drill to size. Deburr holes.

(d) Locate Bumper/Doubler on door. Hold firmly in place with C-clamps. Drill new holes perpendicular to outer skin. Deburr holes.

(3) Prepare area of repair:

(a) Use EA934NA Potting Compound to fill in between inner and outer skin.

(b) Cure at 190°F ± 10°F for 1 hour with heating lamps.

(c) Redrill holes through the cured potting compound.

(d) Use cotton cloth and MEK to clean inner and outer skin in repair area.

(2) Install Bumper/Doubler as follows:

(a) Hold Bumper/Doubler in place using C-clamps. Wet install MS20165 rivets of various lengths to attach Bumper/Doubler in place.

NOTE: Use EA934NA adhesive as a wetting compound for rivets. Cut rivets to length as required

NOTE: When installing end Bumper/Doublers one rivet will not be covered. Wet-install MS20165-6M10 rivet to plug hole.

(b) Inspect rivets for flushness on Bumper/Doubler side (inner skin).

I. Repair Deflector Door Outer Skin Crack

(1) Clean repair area as follows:

WARNING: METHYL ETHYL KETONE (MEK) IS CLASSIFIED AS A HAZARDOUS MATERIAL WHICH MAY CAUSE INJURY OR ILLNESS IF NOT PROPERLY USED. THIS PRODUCT SHOULD BE USED ONLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFIC SAFETY AND HEALTH RECOMMENDATIONS. PRIOR TO THE USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

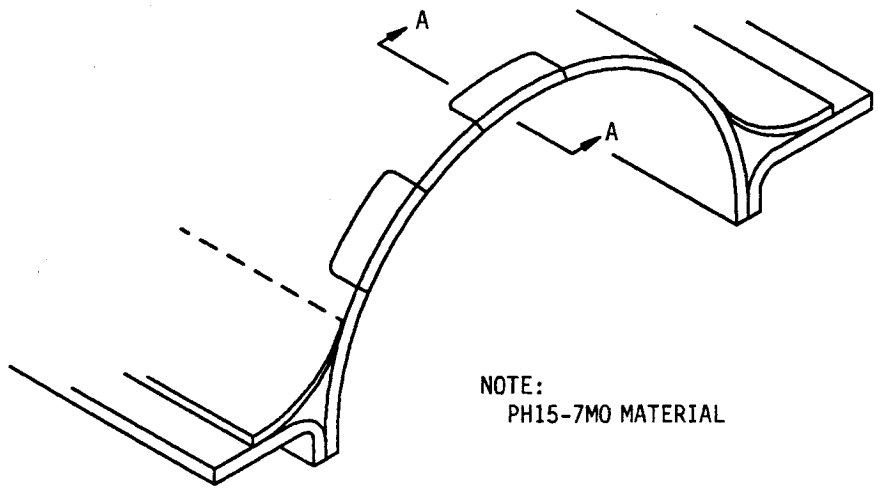
(a) Use cotton cloth and MEK to clean inner and outer skin in repair area. (See Materials in this section.)

(2) Remove damaged material as follows:

(a) Remove minimum material. Break all sharp edges and radius corners 0.5 in. to avoid stress concentration.

(3) Fabricate filler and doubler as follows:

(a) Fabricate filler from 0.063 in. 2219 clad sheet annealed as shown in Figure 421C or 421D. Fabricate filler to size of removed skin and form to match existing contour. Radius corners 0.5 in. to avoid stress concentration. Heat treat finished filler to T62.


A
A
NOTE:
PH15-7MO MATERIAL

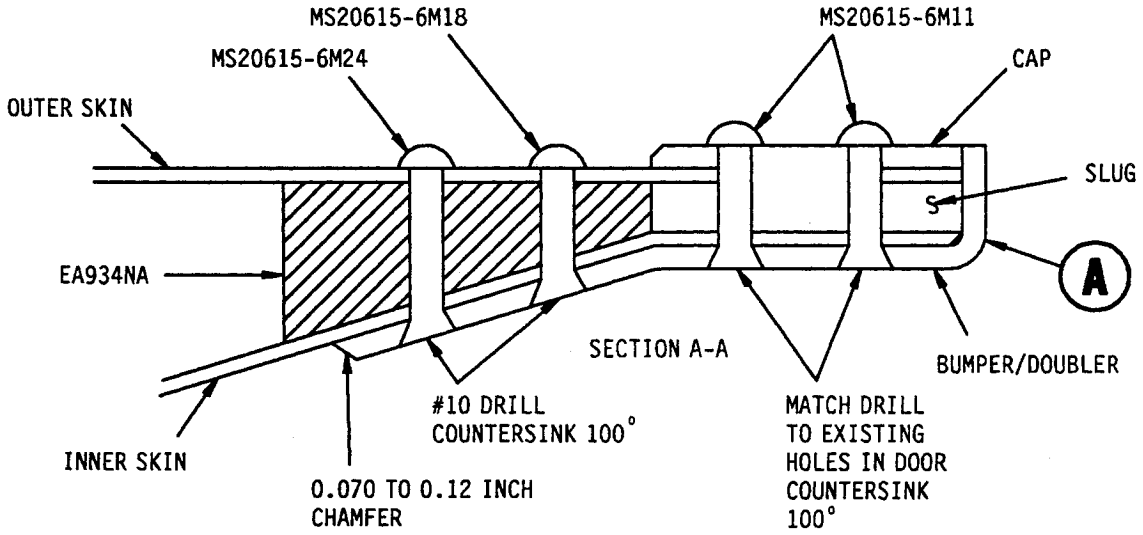

MS20615-6M18
MS20615-6M24
MS20615-6M11
CAP
OUTER SKIN
SLUG
EA934NA
A
SECTION A-A
BUMPER/DOUBLER
#10 DRILL
COUNTERSINK 100°
MATCH DRILL
TO EXISTING
HOLES IN DOOR
COUNTERSINK
100°
INNER SKIN
0.070 TO 0.12 INCH
CHAMFER
737-40A

Figure 421A

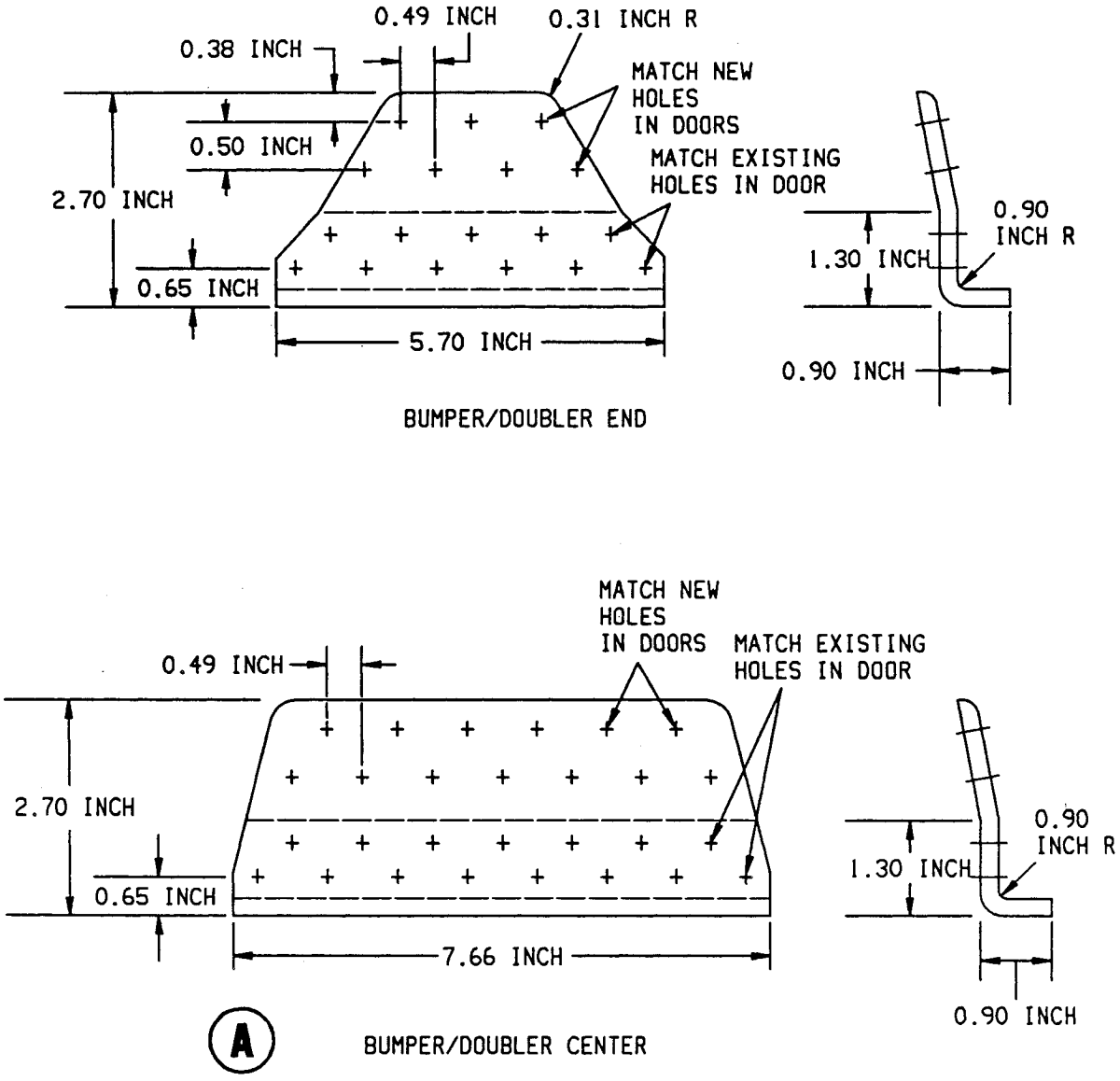

0.49 INCH
0.31 INCH R
0.38 INCH
MATCH NEW HOLES IN DOORS
MATCH EXISTING HOLES IN DOOR
0.50 INCH
2.70 INCH
0.90 INCH R
1.30 INCH
0.65 INCH
5.70 INCH
0.90 INCH
BUMPER/DOUBLER END
MATCH NEW HOLES IN DOORS
MATCH EXISTING HOLES IN DOOR
0.49 INCH
2.70 INCH
0.90 INCH R
1.30 INCH
0.65 INCH
7.66 INCH
0.90 INCH
A
BUMPER/DOUBLER CENTER
737-41

Figure 421B

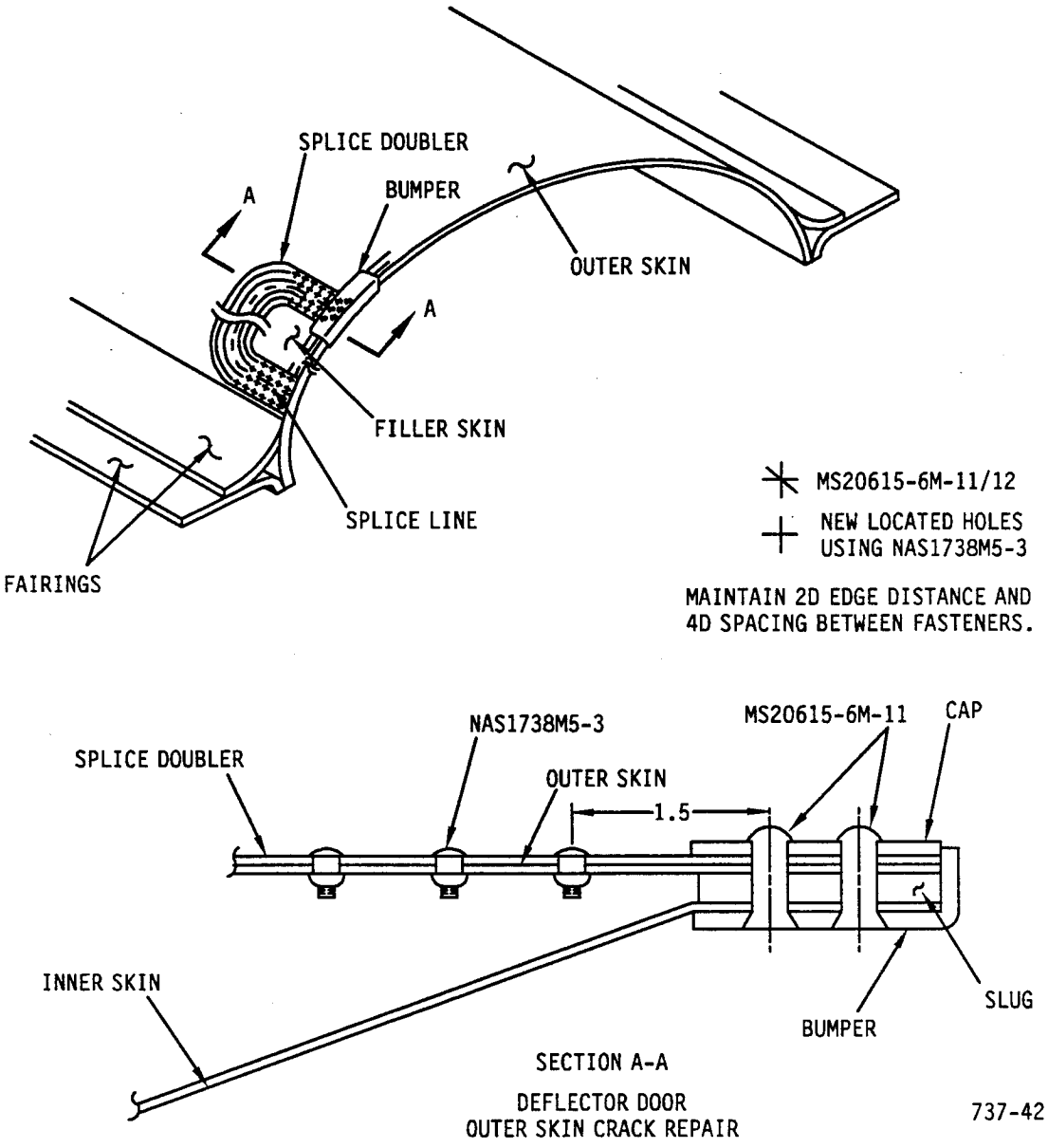
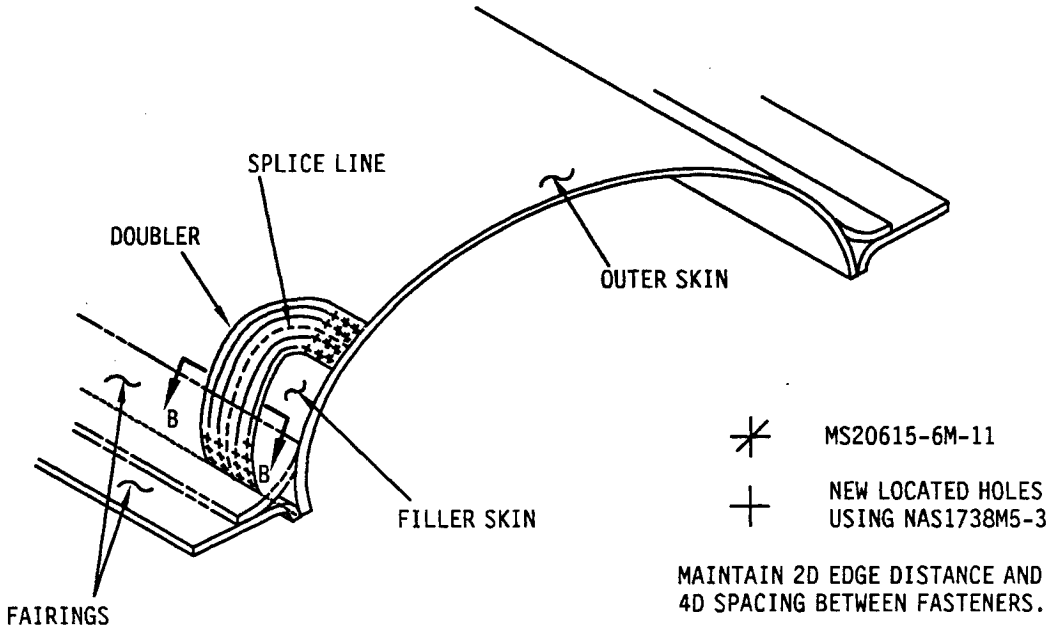
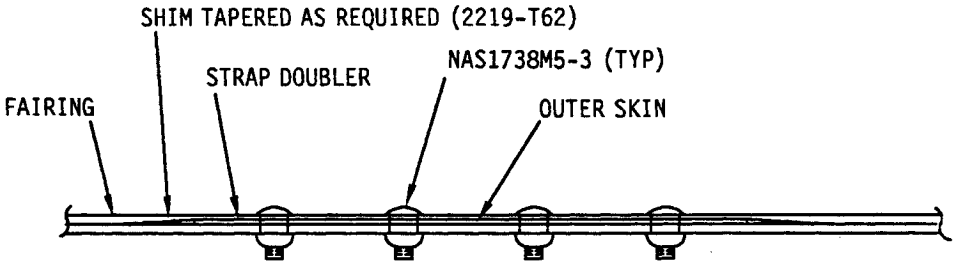

SPLICE DOUBLER
BUMPER
A
A
OUTER SKIN
FILLER SKIN
SPLICE LINE
FAIRINGS
MS20615-6M-11/12
NEW LOCATED HOLES
USING NAS1738M5-3
MAINTAIN 2D EDGE DISTANCE AND
4D SPACING BETWEEN FASTENERS.
NAS1738M5-3
MS20615-6M-11
CAP
SPLICE DOUBLER
OUTER SKIN
1.5
INNER SKIN
SLUG
BUMPER
SECTION A-A
DEFLECTOR DOOR
OUTER SKIN CRACK REPAIR
737-42

Figure 421C





SECTION B-B

ALTERNATE VERSION OF
DEFLECTOR DOOR
OUTER SKIN CRACK REPAIR UNDER FAIRING

737-43

Figure 421D

(b) Fabricate doubler from 0.063 in. 2219 clad sheet annealed as shown in Figure 421C or 421D. Radius corners 0.5 in. to avoid stress concentration and form to match existing contour. Heat treat finished doubler to T62.

(c) Match drill existing holes of door trailing edge through new filler and doubler. Drill new holes in filler and doubler as shown in Figure 421C or 421D. Deburr holes.

WARNING: CHEMICAL CONVERSION COATING IS CLASSIFIED AS A HAZARDOUS MATERIAL WHICH MAY CAUSE INJURY OR ILLNESS IF NOT PROPERLY USED. THIS PRODUCT SHOULD BE USED ONLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFIC SAFETY AND HEALTH RECOMMENDATIONS. PRIOR TO THE USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(d) Apply Alodine chemical conversion coating to repair parts and to bare edges of skin per Subject 20-43-03. (See Materials in this section.)

WARNING: CHEMICAL CONVERSION COATING IS CLASSIFIED AS A HAZARDOUS MATERIAL WHICH MAY CAUSE INJURY OR ILLNESS IF NOT PROPERLY USED. THIS PRODUCT SHOULD BE USED ONLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFIC SAFETY AND HEALTH RECOMMENDATIONS. PRIOR TO THE USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(e) Apply layer of BMS 10-11, Type I primer to mating surfaces of dissimilar metals and to bare edges of skin per Subject 20-41-02. (See Materials in this section.)

WARNING: PRIMER IS CLASSIFIED AS A HAZARDOUS MATERIAL WHICH MAY CAUSE INJURY OR ILLNESS IF NOT PROPERLY USED. THIS PRODUCT SHOULD BE USED ONLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFIC SAFETY AND HEALTH RECOMMENDATIONS. PRIOR TO THE USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(f) Hold filler in place with C-clamps. Use BMS 10-11, Type I primer to wet install MS20165-6M rivets of various lengths to attach filler to trailing edge slug.

(g) Hold doubler in place with C-clamps. Use BMS 10-11, Type I primer to wet install NAS1738M5-3 rivets of various lengths to attach doubler to fill existing outer skin as shown in Figure 421C or 421D.

(h) Inspect rivets for flushness and tightness.

J. Repair Deflector Door Inner Skin Crack

(1) Clean repair area as follows:

WARNING: METHYL ETHYL KETONE (MEK) IS CLASSIFIED AS A HAZARDOUS MATERIAL WHICH MAY CAUSE INJURY OR ILLNESS IF NOT PROPERLY USED. THIS PRODUCT SHOULD BE USED ONLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFIC SAFETY AND HEALTH RECOMMENDATIONS. PRIOR TO THE USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(a) Use cotton cloth and MEK to clean inner and outer skin in repair area. (See Materials in this section.)

(2) Remove damaged material as follows:

(a) Remove minimum material. Break all sharp edges and radius corners 0.5 in. to avoid stress concentrations.

(3) Fabricate filler and doubler as follows:

(a) Fabricate filler from 0.032 in. A286 material as shown in Figure 421E. Fabricate filler to size of removed skin and form to match existing contour. Radius corners 0.5 in. to avoid stress concentration. Heat treat finished filler per AMS5525.

(b) Fabricate doubler from 0.032 in. A286 material as shown in Figure 421E. Radius corners 0.5 in. to avoid stress concentration and form to match existing contour. Heat treat finished doubler per AMS5525.

(c) Match drill existing holes of door trailing edge through new filler and doubler. Drill new holes in filler and doubler as shown in Figure 421E. Deburr holes.

WARNING: CHEMICAL CONVERSION COATING IS CLASSIFIED AS A HAZARDOUS MATERIAL WHICH MAY CAUSE INJURY OR ILLNESS IF NOT PROPERLY USED. THIS PRODUCT SHOULD BE USED ONLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFIC SAFETY AND HEALTH RECOMMENDATIONS. PRIOR TO THE USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(d) Apply Alodine chemical conversion coating to repair parts and bare edges of skin per Subject 20-43-03. (See Materials in this section.)

WARNING: PRIMER IS CLASSIFIED AS A HAZARDOUS MATERIAL WHICH MAY CAUSE INJURY OR ILLNESS IF NOT PROPERLY USED. THIS PRODUCT SHOULD BE USED ONLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFIC SAFETY AND HEALTH RECOMMENDATIONS. PRIOR TO THE USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(e) Apply layer of BMS 10-11, Type I primer to mating surfaces of dissimilar metals and bare edges of skin per Subject 20-41-02. (See Materials in this section.)

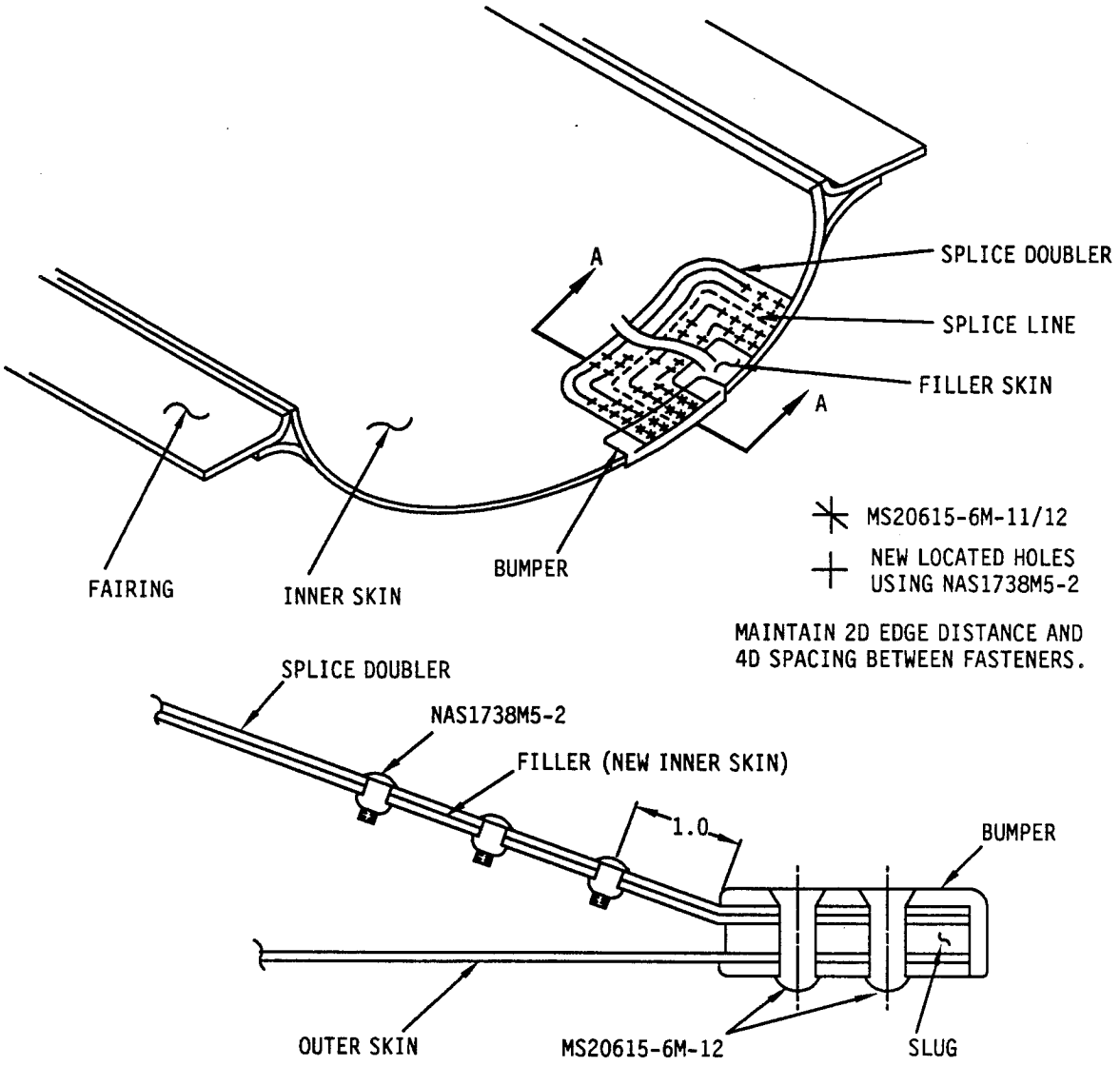


FIGURE 1 SECTION A-A

DEFLECTOR DOOR
INNER SKIN CRACK REPAIR

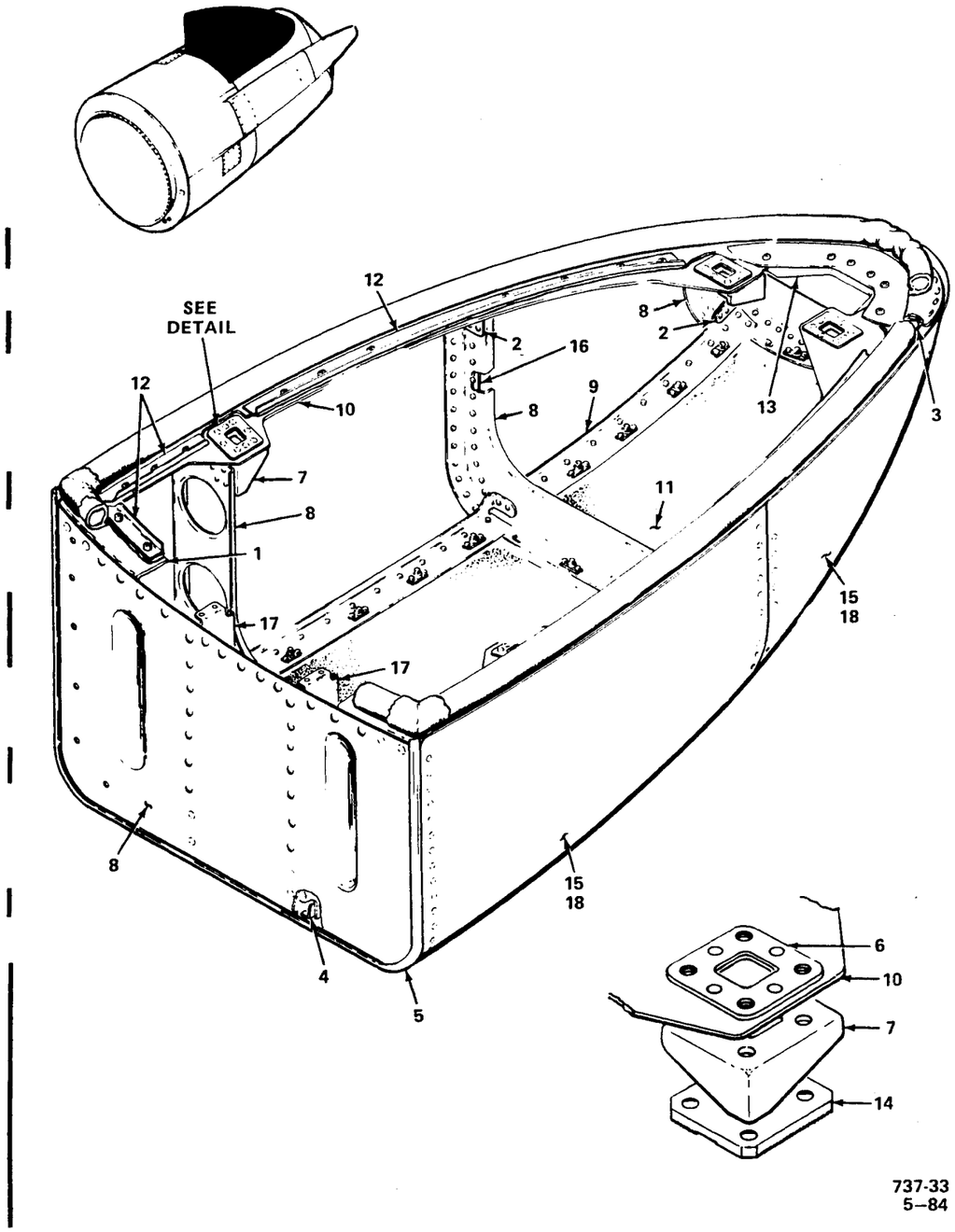
737-44

Figure 421E

(f) Hold filler in place with C-clamps. Use BMS 10-11, Type I primer to wet install MS20165-6M rivets of various lengths to attach filler to trailing edge slug as shown in Figure 421E.

(g) Hold doubler in place with C-clamps. Use BMS 10-11, Type I primer to wet install NAS1738M5-2 rivets of various lengths to attach doubler to fill existing outer skin as shown in Figure 421E.

(h) Inspect rivets for flushness and tightness.



737-33
5-84

DEFLECTOR DOOR FAIRING ASSY MATERIALS

FIGURE 422

ITEM	NOMENCLATURE	GAGE	MATERIAL	HEAT TREAT	REMARKS
1	ANGLE	.040	CLAD 2219-0	△1	
2	CLIP	.040	CLAD 2219-0	△1	
3	CLIP	.050	CLAD 2219-0	△1	
4	CLIP	.050	CLAD 2219-0	△2	
5	DEFLECTOR		AL 2024		△6
6	DOUBLER	.063	CLAD 2219-0	△1	
7	FITTING		AL CASTING		△7
8	FRAME	.040	CLAD 2219-0	△1	
9	FRAME	.050	CLAD 2219-0	△1	
10	LONGERON	.040	CLAD 2219-0	△1	
11	PANEL	.080	CLAD 2219-0	△1	△8
12	RETAINER	.020	CLAD 2024-0	△3	
13	SEAL SUPPORT	.040	CLAD 2219-0	△1	
14	SERRATED PLATE	.160	CLAD 2024-0	△4	
15	SKIN	.040	CLAD 2219-0	△1	△9
16	SPLICE	.040	CLAD 2219-0	△1	
17	STIFFENER	.040	CLAD 2219-0	△1	
18	SKIN	.040	CLAD 2024-0	△5	△10

△1 HEAT TREAT CLAD 2219-0 TO 2219-T62

△2 HEAT TREAT CLAD 2219-0 TO 2219-T31

△3 HEAT TREAT CLAD 2024-0 TO 2024-T3

△4 HEAT TREAT CLAD 2024-0 TO 2024-T351

△5 HEAT TREAT CLAD 2024-0 TO 2024-T62

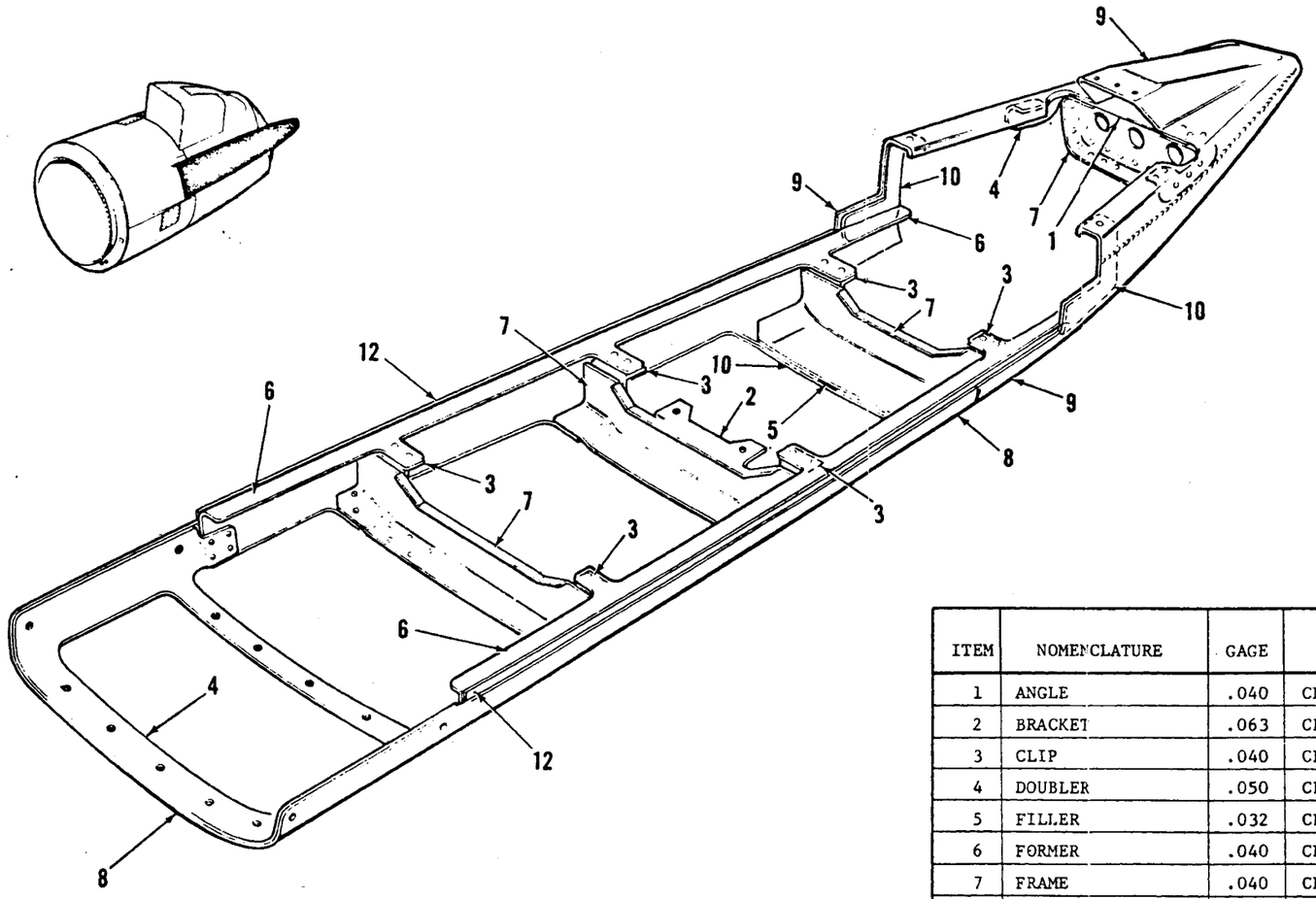
△6 STANDARD EXTRUSION

△7 ALUMINUM ALLOY CASTING PER MIL-A-21180, ALLOY # C355-T61, GRADE C, CLASS 10

△8 CHEM MILL TO .056 ± .006

△9 PART OF 173-1026-1, -2 FAIRING INST.

△10 PART OF 173-1026-517, -518 FAIRING INST.



⚠1 Heat treat 2024-0 to 2024-T42

⚠2 Heat treat 2024-0 to 2024-T3

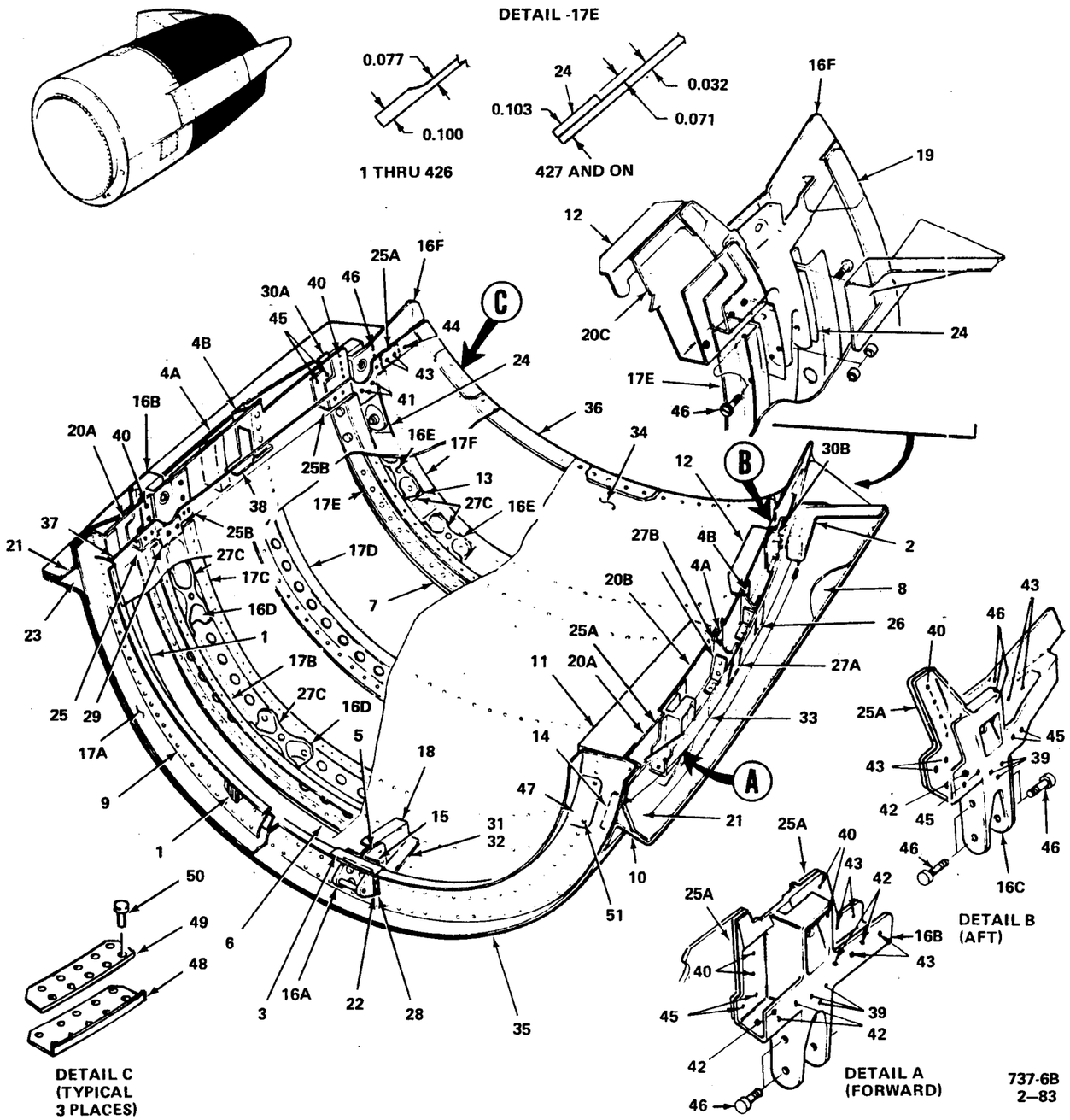
⚠3 Heat treat 2219-0 to 2219-T42 prior to welding and age to T62 after welding

⚠4 Alodine 1000 entire outside surface of skin

ITEM	NOMENCLATURE	GAGE	MATERIAL	HEAT TREAT	REMARKS
1	ANGLE	.040	CLAD 2024-0	⚠1	
2	BRACKET	.063	CLAD 2024-0	⚠1	
3	CLIP	.040	CLAD 2024-0	⚠2	
4	DOUBLER	.050	CLAD 2024-0	⚠1	
5	FILLER	.032	CLAD 2024-0	⚠1	
6	FORMER	.040	CLAD 2024-0	⚠1	
7	FRAME	.040	CLAD 2024-0	⚠1	
8	SKIN	.028	CLAD 2024-0	⚠1	⚠4
9	SKIN	.063	CLAD 2219-0	⚠3	
10	STIFFENER	.050	CLAD 2024-0	⚠1	
11	STRAP	.040	CLAD 2024-0	⚠2	
12	STRIP	.032	321 CRES		

ACTUATOR HOUSING ASSY MATERIALS

FIGURE 423



ITEM	NOMENCLATURE	GAGE	MATERIAL	HEAT TREAT	REMARKS
1	ANGLE	0.050	A286 CRES	1	
2	ANGLE	0.063	321 CRES		
3	BUMPER	0.050	A286 CRES	1	
4	CHANNEL	0.050	A286 CRES	1	
5	CLIP	0.063	A286 CRES	1	
6	DOUBLER	0.015	A286 CRES	1	
7	DOUBLER	0.140	A286 CRES	1	
8	DOUBLER	0.032	AL CLAD 2219-0	2	
9	END PLATE	0.071	A286 CRES	1	
10	FAIRING	0.050	AL CLAD 2219-0	2	
11	FENCE	-	17-4 PH CRES	3	CASTING
12	FENCE	0.050	A286 CRES	1	
13	FILLER	0.050	A286 CRES	1	
14	FILLER	0.063	A286 CRES	1	
15	FILLER	0.071	A286 CRES	1	
16	FITTING	-	17-4 PH CRES	3	CASTING
17	FRAME	0.050	A286 CRES	1	
18	GUSSET	0.050	A286 CRES	1	
19	GUSSET	0.050	A286 CRES	1	
20	LONGERON	0.050	A286 CRES	1	
21	SUPPORT	0.032	321 CRES		
22	PLATE	0.125	17-4 PH CRES	4	
23	SHIELD	0.032	321 CRES		
24	SHIELD	0.063	321 CRES		
25	SHIM	0.020	CRES LAM 2		
26	SHIM	0.032	CRES LAM 2		
27	SHIM	0.063	CRES LAM 2		
28	SHIM	0.093	CRES LAM 2		
29	SHIM	0.125	CRES LAM 2		
30	SHIM	0.032	CRES LAM 2		
31	SHIM	0.040	321 CRES		
32	SHIM	0.050	321 CRES		

DEFLECTOR DOOR ASSY MATERIALS
FIGURE 424 (SHEET 1 OF 3)

ITEM	NOMENCLATURE	GAGE	MATERIAL	HEAT TREAT	REMARKS
33	SHIM	0.063	A286 CRES		
34	SKIN, INNER	0.032	A286 CRES	1	
35	SKIN, OUTER	0.063	AL CLAD 2219-0	2	
36	SLUG	0.150	6AL-4V		TITANIUM BAR
37	TEE	0.063	17-7 PH CRES		
38	TEE	0.063	17-7 PH CRES		
47	NAMEPLATE	---	-----		
48	BUMPER	0.090	PH 15-7 MO CRES SH	5	
49	CAP	0.090	PH 15-7 MO CRES SH	5	

1 Heat treat to 140 KSI
2 Heat treat 2219-0 to 2219-T62
3 Heat treat to 180 KSI
4 Heat treat to 150 KSI
5 Heat treat to 170 KSI

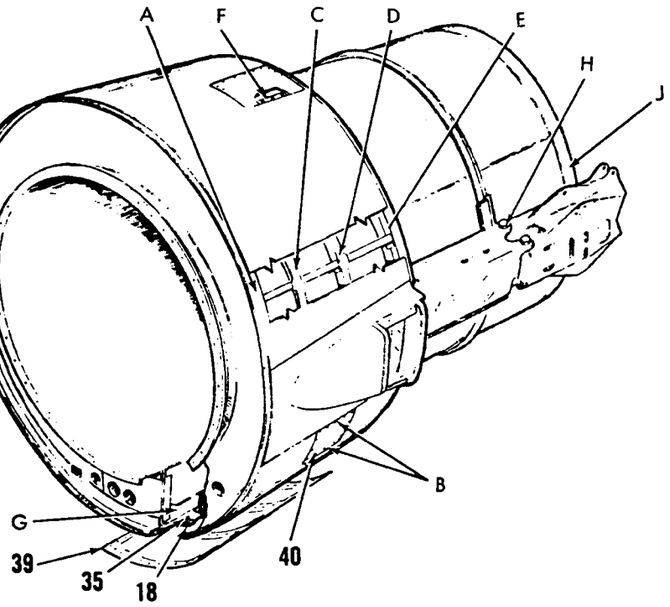
ITEM	NOMENCLATURE	REMARKS
39	RIVET	NAS1739M-5-3
40	RIVET	MS20615-5M
41	RIVET	NAS1738M-5-3
42	HI-LOK	HL48-5-3 PIN & HL78-5 COLLAR, HI-SHEAR CORP.
43	HI-LOK	HL48-5-4 PIN & HL78-5 COLLAR, HI-SHEAR CORP.
44	HI-LOK	HL48-5-7 PIN & HL78-5 COLLAR, HI-SHEAR CORP.
45	HI-LOK	HL49-5-4 PIN & HL78-5 COLLAR, HI-SHEAR CORP.
46	BLIND BOLT	BB352-8-3, HI-SHEAR CORP.
50	RIVET	MS20615-6M
51	RIVET	MS20470D3

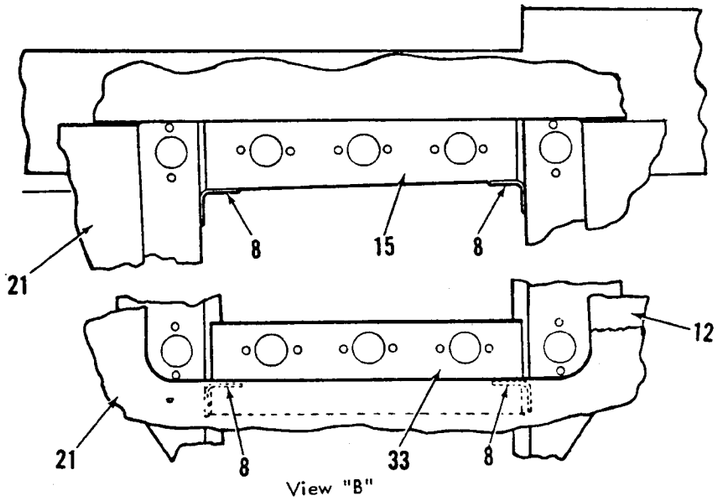
DEFLECTOR DOOR ASSY MATERIALS
FIGURE 424 (Sheet 2 of 3)

ITEM NO.	NOMENCLATURE	PART NO. -1 OR -2	ITEM NO.	NOMENCLATURE	PART NO. -1 OR -2
1	ANGLE	173-1021-19/-20	19	GUSSET	173-1021-35/-36
2	ANGLE	173-1021-29/-30	20A	LONGERON	173-1021-9/-10
3	BUMPER	173-1021-37	20B	LONGERON	173-1021-77/-78
4A	CHANNEL	173-1021-41/-42	20C	LONGERON	173-1021-79/-80
4B	CHANNEL	173-1021-43/-44	21	SUPPORT	173-1021-27/-28
5	CLIP	173-1021-39/-40	22	PLATE	173-1159-1
6	DOUBLER	173-1021-15	23	SHIELD	173-1021-31/-32
7	DOUBLER	173-1021-17	24	SHIELD	173-1021-11/-12
8	DOUBLER	173-1021-25/-26	25A	SHIM*	173-1021-83
9	END PLATE	173-1028-1/-2	25B	SHIM*	173-1021-85
10	FAIRING	173-1021-23/-24	26	SHIM*	173-1021-63
11	FENCE	173-1027-501/-502	27A	SHIM*	173-1021-53
12	FENCE	173-1021-33/-34	27B	SHIM*	173-1021-55
13	FILLER	173-1021-45	27C	SHIM*	173-1021-501
14	FILLER	173-1021-49	28	SHIM*	173-1021-71
15	FILLER	173-1021-47	29	SHIM*	173-1021-61
16A	FITTING	173-1157-1	30A	SHIM*	173-1021-57
16B	FITTING	173-1050-1/-2	30B	SHIM*	173-1021-59
16C	FITTING	173-1048-501/-502	31	SHIM*	173-1021-81
16D	FITTING	173-1063-503	32	SHIM*	173-1021-3
16E	FITTING	173-1063-505	33	SHIM*	173-1021-73
16F	FITTING	173-1025-501	34	SKIN, INNER	173-1021-5
17A	FRAME	173-1022-509	35	SKIN, OUTER	173-1021-7
17B	FRAME	173-1022-507	36	SLUG, T.E.	173-1024-1
17C	FRAME	173-1022-505	37	TEE	173-1018-1
17D	FRAME	173-1022-503	38	TEE	173-1018-501/-502
17E	FRAME	173-1022-516	47	NAMEPLATE	173-1156-1/-2
17F	FRAME	173-1022-515	48	BUMPER	173-1192-3/-4/-7
18	GUSSET	173-1021-75/-76	49	CAP	173-1192-5/-6/-9

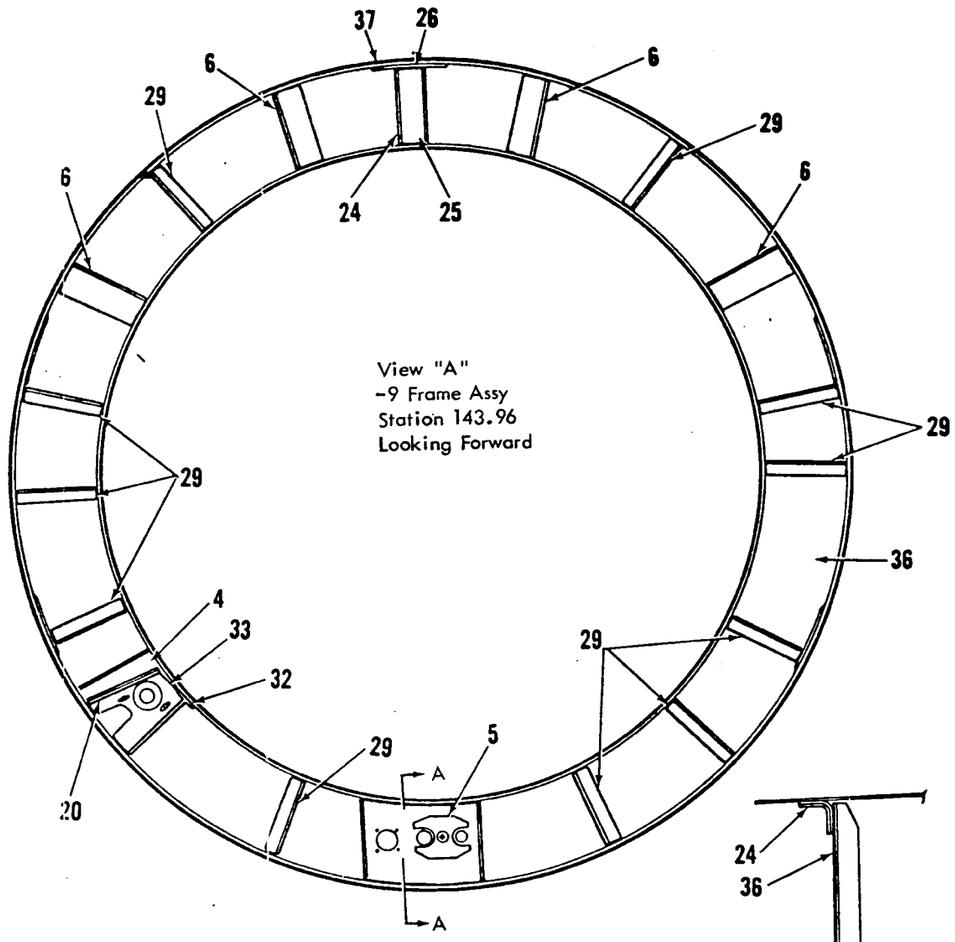
* SHIMS ARE OPTIONAL FOR IF AND AS REQUIRED USAGE.

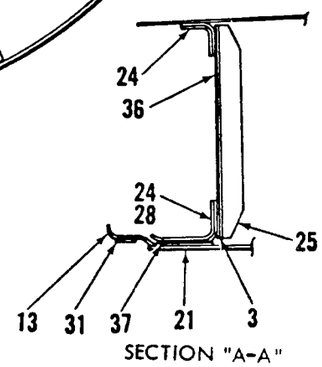
DEFLECTOR DOOR ASSY MATERIALS
FIGURE 424 (SHEET 3 OF 3)





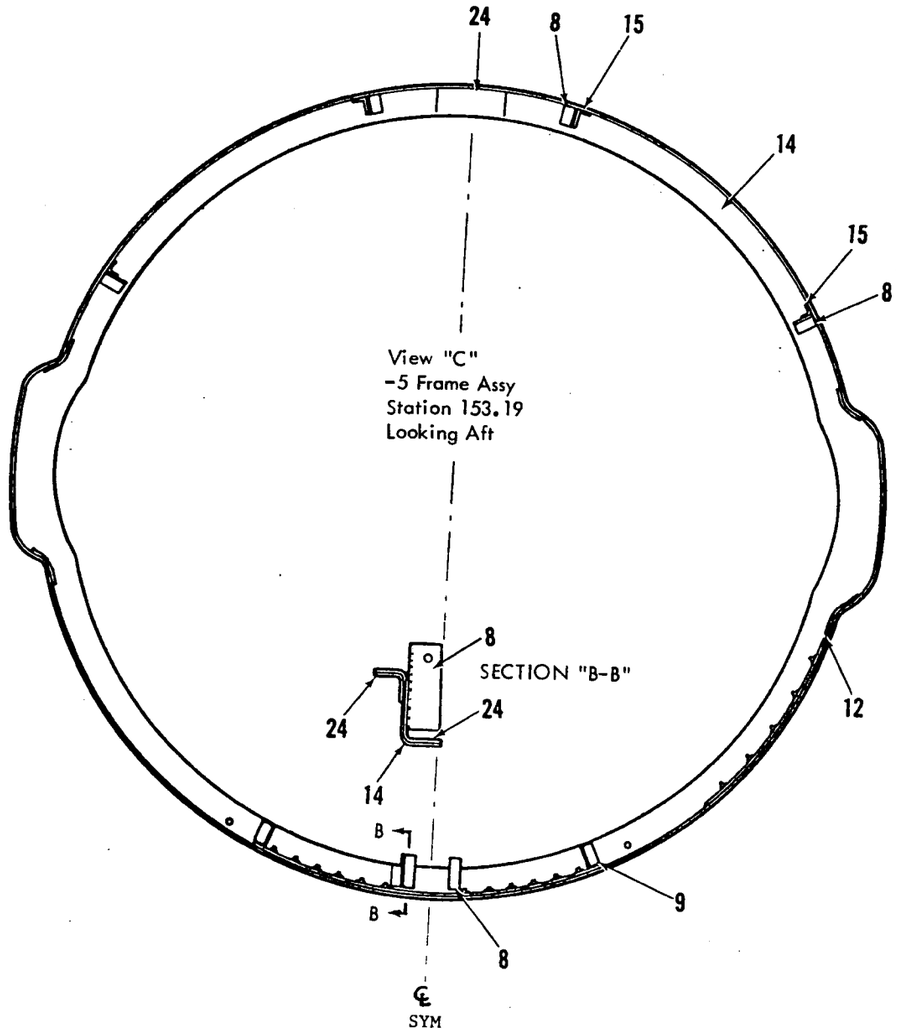
View "B"

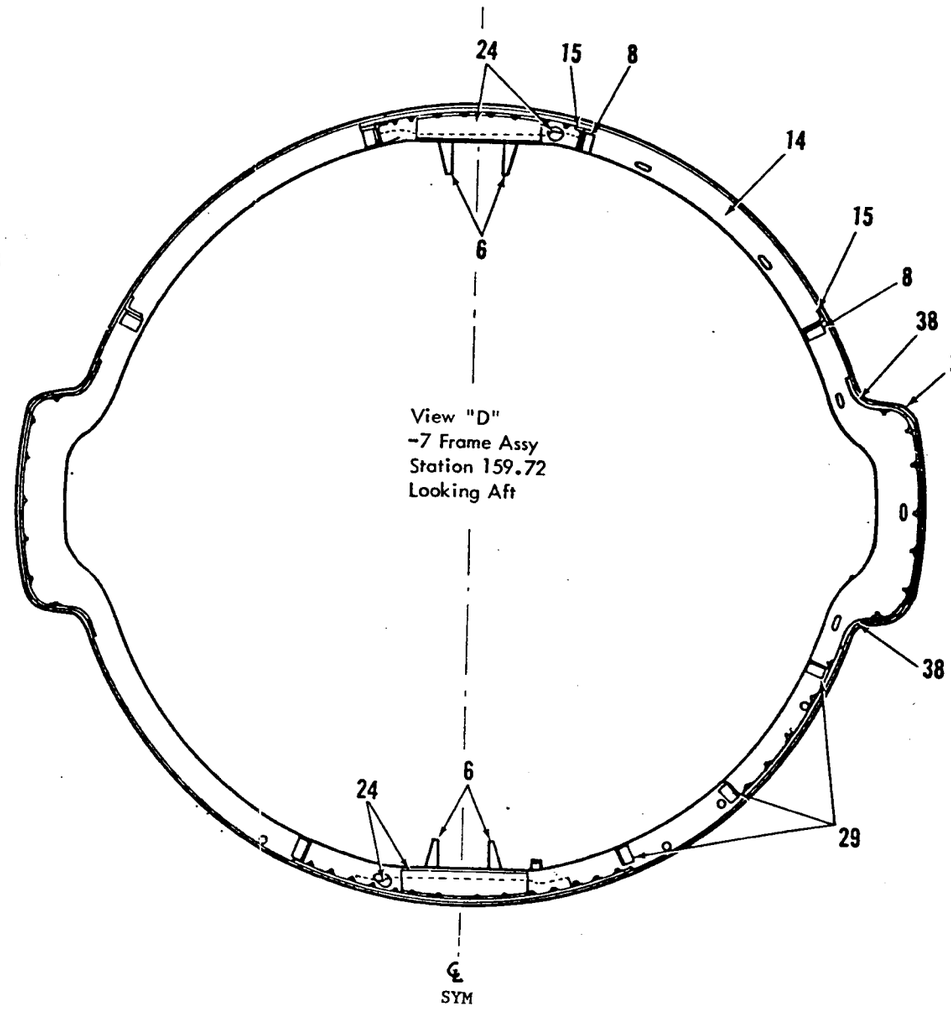




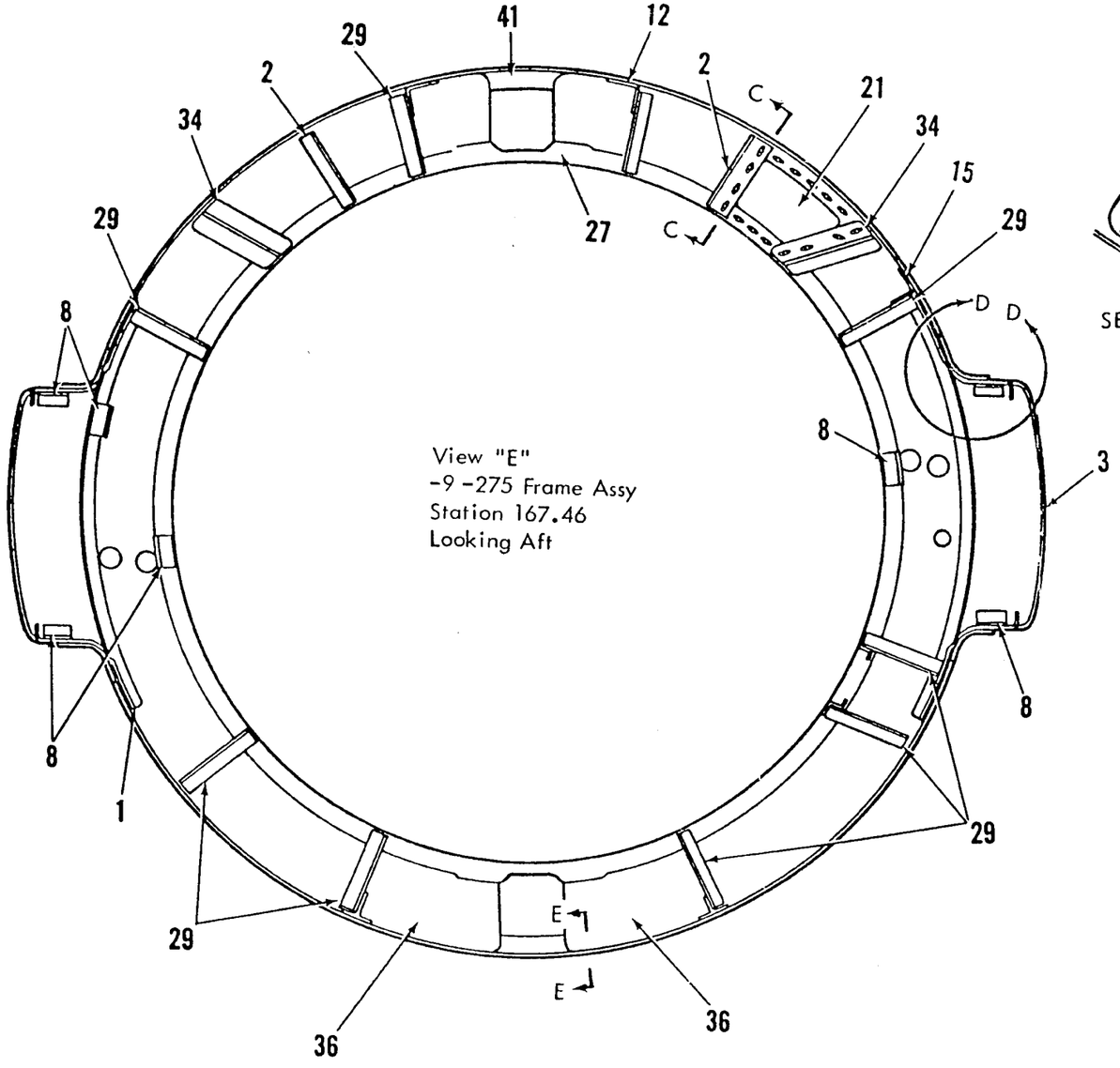
SECTION "A-A"

T/R SHROUD ASSY MATERIALS
FIGURE 425 (SHEET 1 OF 6)

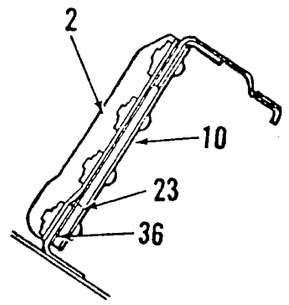




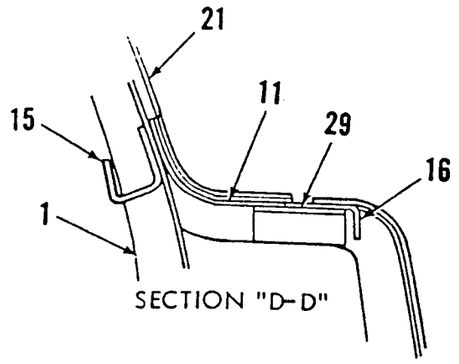
T/R SHROUD ASSY MATERIALS
FIGURE 425 (SHEET 2 OF 6)



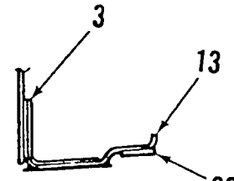
View "E"
-9 -275 Frame Assy
Station 167.46
Looking Aft



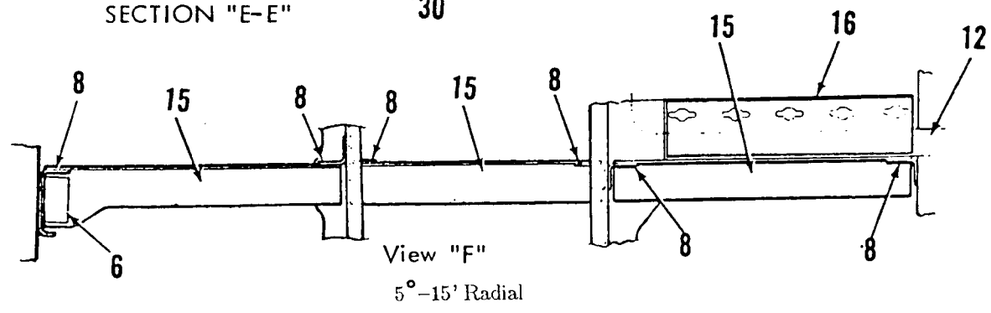
SECTION "C-C"



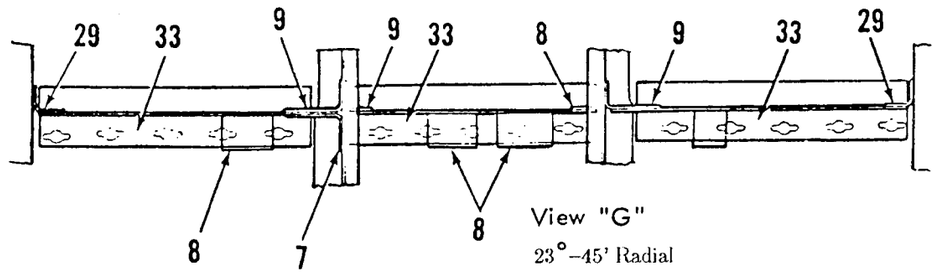
SECTION "D-D"



SECTION "E-E"



View "F"
5°–15' Radial

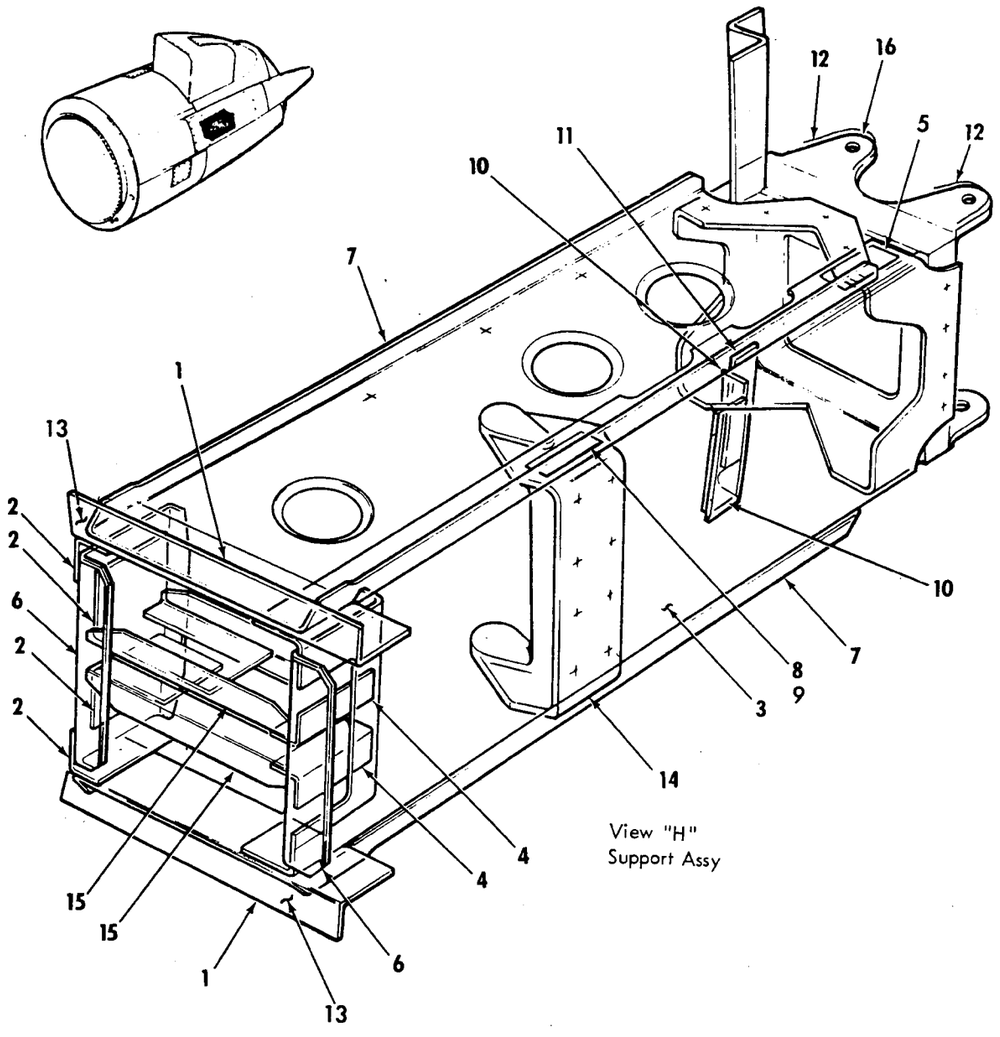


View "G"
23°–45' Radial

ITEM	NOMENCLATURE	GAGE	MATERIAL	HEAT TREAT	REMARKS
1	ANGLE	.040	CLAD 2024-0	1	
2	ANGLE	.050	CLAD 2024-0	1	
3	ANGLE	.032	321 CRES	4	
4	ANGLE	.040	17-7PH	2	
5	BRACKET	.090	17-7PH	2	
6	BRACKET	.040	CLAD 2024-0	1	
7	CLIP	.040	CLAD 2024-0	1	
8	CLIP	.040	CLAD 2024-T3		
9	CLIP	.050	CLAD 2024-T3		
10	COVER	.063	CLAD 2024-T3		
11	DOUBLER	.050	CLAD 2024-0	1	
12	FILLER	.050	CLAD 2024-T3		
13	FORMER	.040	CLAD 2024-0	1	7
14	FRAME	.040	CLAD 2024-0	1	
15	INTERCOSTAL	.040	CLAD 2024-0	1	
16	INTERCOSTAL	.050	CLAD 2024-0	1	
17	INTERCOSTAL	-	7075-0 AL ALLOY	6	
18	PLATE	.040	AL 6061-0	3	
19	PLATE	.040	CLAD 2024-T3		
20	SHIM	.032	CRES LAM 2		
21	SKIN	.028	CLAD 2024-0	1	
22	SPACER	.040	CLAD 2024-T3		
23	SPACER	.071	CLAD 2024-T3		
24	SPLICE	.040	CLAD 2024-0	1	
25	SPLICE	.040	CLAD 2024-T3		
26	SPLICE	.063	CLAD 2024-T3		
27	SPLICE	.063	321 CRES		
28	SPLICE	.040	CLAD 2024-0	1	
29	STIFFENER	.040	CLAD 2024-T3		
30	STRIP, RUB	.071	CLAD 2024-T3		
31	STRIP	.063	NYLATRON		8
32	SUPPORT	.040	CLAD 2024-T3		
33	INTERCOSTAL	-	7075-0 AL ALLOY	6	
34	TEE	-	7075-0 AL ALLOY	6	
35	TUBE	.375	AL 6061-0	3	
36	WEB	.040	CLAD 2024-T3		
37	FILLER	.032	CLAD 2024-T3		
38	FILLER	.050	CLAD 2024-0	1	
ACCESS PANEL INSTL - CONTROLS & HYDRAULICS, T/R					
39	DOOR	.080	CLAD 2024-0	1	5
PANEL INSTL - FEEDBACK, T/R					
40	PANEL	.080	CLAD 2024-0	1	5
41	FORMER	.040	CLAD 2024-0	1	9

1. Heat treat CLAD 2024-0 to T42
2. Heat treat 17-7PH to 180,000 PSI
3. Heat treat AL 6061-0 to T6
4. 321 CRES, COMP T1 annealed
5. Chem milled part
6. Heat treat 7075-0 to 7075 T6
7. P/N 173-1011-523 (Right Hand), 173-1011-527 (Left Hand)
8. P/N 173-1011-239
9. P/N 173-1011-209 (Bottom), 173-1011-225 (Top)

T/R SHROUD ASSY MATERIALS
FIGURE 425 (SHEET 4 OF 6)

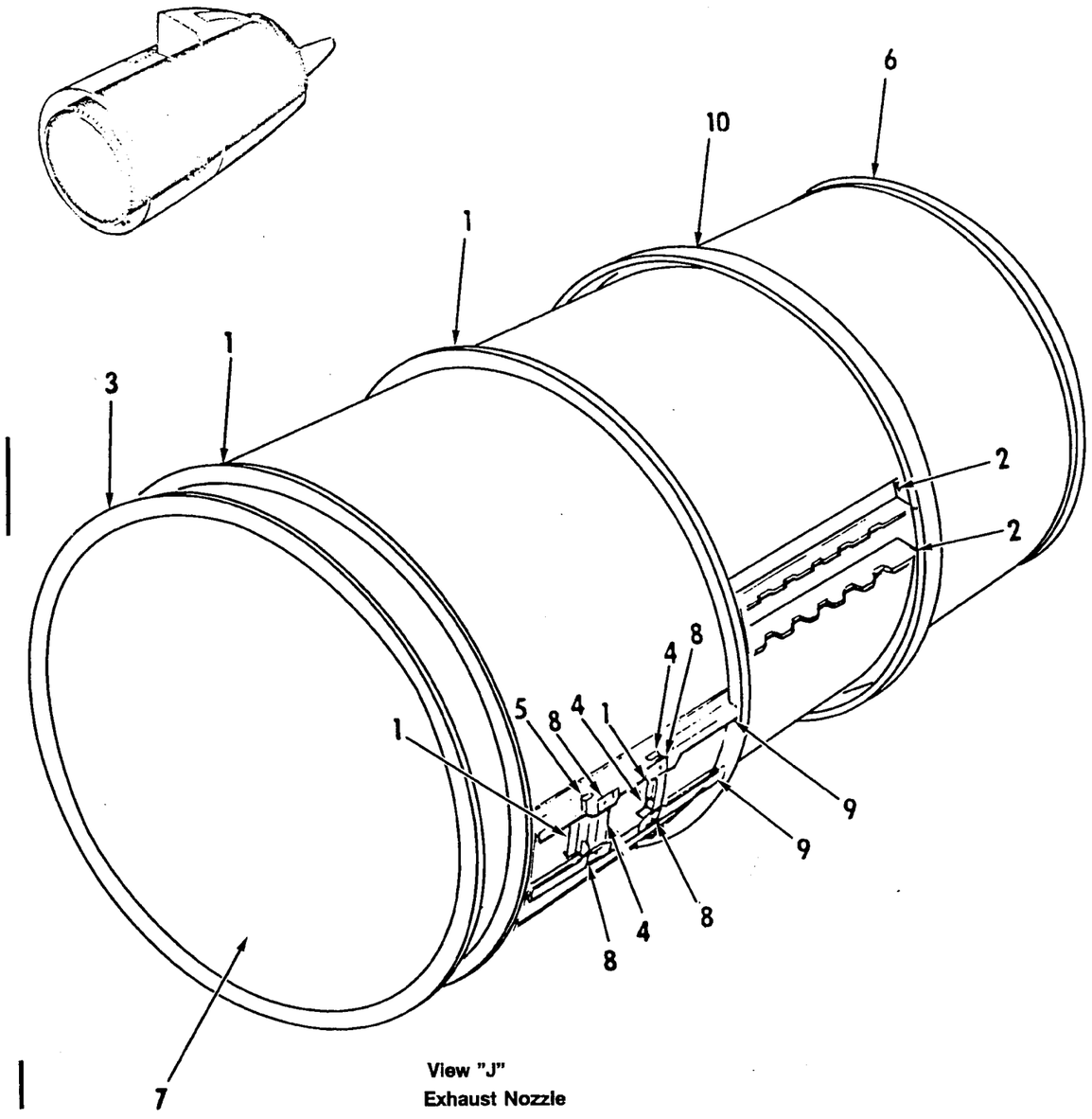


View "H"
Support Assy

ITEM	NOMENCLATURE	GAGE	MATERIAL	HEAT TREAT	REMARKS
1	ANGLE	.063	AL SHEET 2024-0	⚠1	
2	ANGLE	.063	PH15-7 MO CRES	⚠2	
3	CHANNEL	.090	AL SHEET 2024-0	⚠1	
4	CLIP	.063	PH15-7 MO CRES	⚠2	
5	FILLER	.090	AL SHEET 2024-0	⚠1	
6	INTERCOSTAL	.063	PH15-7 MO CRES	⚠2	
7	PANEL	.050	AL SHEET 2024-0	⚠1	
8	SHIM	.10	COMP 3, TYPE 1, CLASS 2		
9	SHIM	.05	COMP 3, TYPE 1, CLASS 2		
10	SHIM	.063	CRES LAM CLASS 2		
11	SHIM	.080	CRES LAM CLASS 2		
12	SHIM	.060	LAM AL		
13	SHIM	.080	LAM AL		
14	STOP	-	17-4 PH CRES	⚠3	CASTING
15	SUPPORT	.063	PH15-7 MO CRES	⚠2	
16	SUPPORT	-	4340 STEEL	⚠3	FORGING

⚠1 Heat treat 2024-0 to 2024-T42
⚠2 Heat treat to 190,000 PSI
⚠3 Heat treat to 180,000 PSI

T/R SHROUD ASSY MATERIALS
FIGURE 425 (SHEET 5 OF 6)



View "J"
Exhaust Nozzle

ITEM	NOMENCLATURE	GAGE	MATERIAL	HEAT TREAT	REMARKS
1	ANGLE	.040	321 CRES		
2	ANGLE	.050	PH15-7 MO CRES	(1)	(5)
3	ATTACH RING	-	347 CRES		(2)
4	BRACKET	.040	321 CRES		
5	CLIP	.040	321 CRES		
6	DOUBLER	.032	321 CRES		(6)
6	DOUBLER	.050	410 CRES		(6)
7	NOZZLE HALF	.050	410 CRES		(3)
7	NOZZLE HALF	.040	INCONEL 625		(3)
8	SHIM	.063	CRES SHEET		(4)
9	ZEE	.040	321 CRES		
10	ZEE	.080	PH15-7 MO CRES	(1)	(5)

(1) Heat treat to 190,000 PSI

(2) QQ-S-763 annealed

(3) To identify nozzle half material: 410 CRES is magnetic; Inconel 625 is non-magnetic

(4) MIL-S-6721, Comp T1 annealed

(5) AMS5520 annealed

(6) To identify doubler material: 410 CRES is magnetic; 321 CRES is non-magnetic

T/R SHROUD ASSY MATERIALS
FIGURE 425 (SHEET 6 OF 6)

4. Thrust Reverser Marking Requirements.

A. Refer to figures 426, 427 and 428 for markings and locations.

Item No.	Marking	Location
1	Thrust Reverser Hyd. Lines and Controls Access	On both inboard and outboard edges of access door - lower T/R Sta. 144 to 169
2	Thrust Reverser Latch Access	Aft edge of access door - lower T/R Sta. 169
3	Thrust Reverser Latch Access	Access door upper center - T/R Sta. 169
4	Controls Access	Access door - lower side - T/R Sta. 156.5
5	WARNING Deactivate Thrust Reverser Hydraulic System Before Servicing NOTE: Letters for warning to be 0.50 inch high in red.	Aft edge of fixed panel both sides - T/R Sta. 169
6	Fairing Installation and Adjustment Access	Center on access panel upper - T/R
7	Rigging Pt.	See Figure 428.
8	Rigging Pt.	See Figure 428.

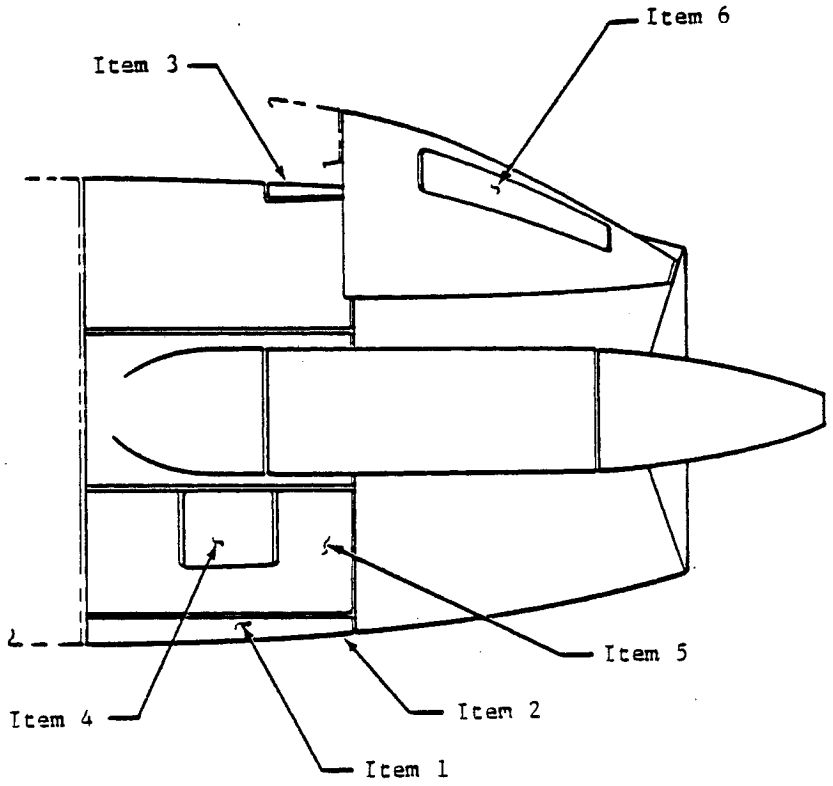
NOTES

a. Color of letters to be contrasting - black or white flat enamel, except as noted.

b. Letter height to be 0.25 inch except as noted. Lines of lettering to be centered under top line.

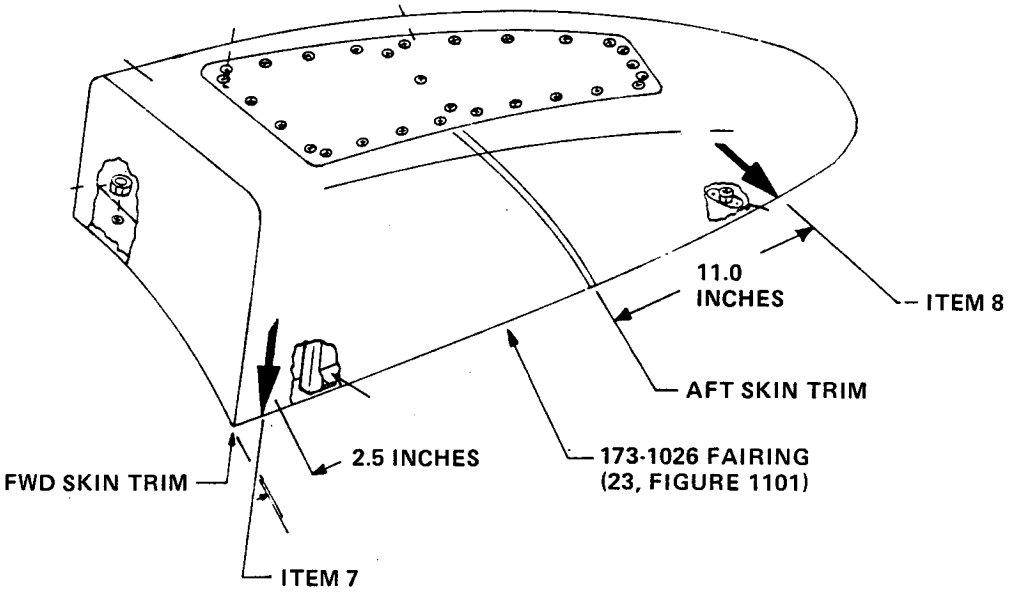
c. Location of markings are approximate.

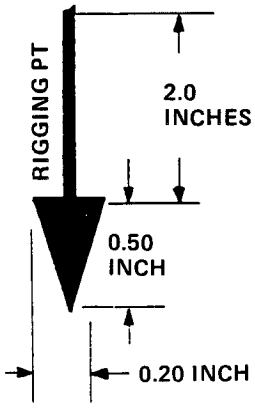
THRUST REVERSER MARKINGS
Figure 426



Left side view of left hand thrust reverser assembly shown. Right hand thrust reverser assembly the same, except item 6 is opposite.

THRUST REVERSER MARKING LOCATIONS
FIGURE 427





(TYPICAL) FOR ITEM 7 AND 8

STENCIL - 0.25 INCH HIGH LETTERS AND ARROW
COLOR FLAT BLACK (TYPICAL)

NOTE: USE A FLEXIBLE TAPE TO
MEASURE SKIN CONTOUR

737-37

THRUST REVERSER FAIRING MARKING LOCATIONS
FIGURE 428

5. Materials

Acetone, commercially available.

Adhesive, EA934NA, Dexter Hysol Aerospace, Inc., The Dexter Corp., 2850 Willow Pass Road, P.O. Box 312, Pittsburg, CA 94565.

Alodine 1000, 1000L, and 1200 Amchem Products Inc., 300 Brookside Avenue, Ambler, PA 19002-3436.

Dry film lubricant, Everlube 620, MIL-L-8937, or Lubribond 220, MIL-L-23398, Type II, Electrofilm Mfg. Co. 27727 Scott Avenue, P.O. Box 55669, Valencia, CA 91355.

Plasma Spray Coating, Metco P505-10, Metco Inc., Subsidiary of the Perkin-Elmer Corp., 1101 Prospect Avenue, Westbury, NY 11590-2724.

Primer, BMS 10-11, Type I, Akzo Coatings America, Inc. Aerospace Finishes Division, 434 West Meats Street, Orange, CA 92661.

Primer, Silastic, RTV-1200, Dow Corning Corp., 3901 South Saginaw Road, P.O. Box 997, Midland, MI 48640.

Sealant, DC90-006, Dow Corning Corp.

Sealant, RTV-1016, General Electric Co., City of Industry, CA 91745.

Solder, Silver, Lo-Temp Solder, Ezy-Flo 45, AMS 4769, commercially available.

Solvent, Acetone, commercially available.

Solvent, Methyl Ethyl Ketone, TT-M-261, commercially available.

Solvent, Trichloroethane, commercially available.

Thermal Shrink Tubing, RNF-100, Raychem Corp., 300 Constitution Drive, Menlo Park, CA 94025-1111.

Topcoat, Dupont, Red gloss No. 82-066, Dupont DeNemours E.I. & Co., Inc. Los Angeles, CA 90022.

ASSEMBLY

Assembly is divided generally into six separate operations: link installation (Figure 1101), interlock and control system installation (Figure 1102), lock assembly installation (Figure 1103), electrical system installation (Figure 1105), hydraulic system installation (Figure 1104), and installation of deflector doors, actuator housings, access panels and fairing assembly (Figure 1101).

1. Assembly of Thrust Reverser

   A. Insulation Blankets (See Figure 1101)

      (1) Install blanket assemblies (180 and 188) on thrust reverser shroud and tie together temporarily so assemblies are free to slide to the shroud forward bulkhead.

      (2) Install lockwire (214) to secure blanket assemblies (180 and 188) to lower zee (9, Figure 425) in shroud. Do not tighten lockwire at this time.

      (3) Install blanket assemblies (186 and 194) on thrust reverser shroud and tie together temporarily so assemblies are free to slide to the shroud aft bulkhead.

      (4) Install blanket assemblies (206 and 208) between upper and lower zees (9, Figure 425) and under lockwire (214) securing blanket assemblies (186 and 194) together at shroud aft bulkhead. Tighten lockwire to secure all blanket assemblies firmly in place on shroud.

      (5) Install blanket assemblies (182 and 190) on thrust reverser shroud and tie together temporarily so assemblies are free to slide against blanket assemblies (180 and 188).

      (6) Install lockwire (214) to secure blanket assemblies (182 and 190) to lower zee (9, Figure 425) in shroud. Do not tighten lockwire at this time.

      (7) Compress previously installed blanket assemblies to allow room for installation of blanket assemblies (184 and 192), then install blanket assemblies (184 and 192) on thrust reverser shroud and tie together temporarily until these assemblies are positioned in the final location.

      (8) Install blanket assemblies (196 and 198) between upper and lower zees (9, Figure 425) and under lockwire (214) securing blanket assemblies (180 and 188) together at shroud forward bulkhead. Tighten lockwire to secure all blanket assemblies firmly in place on shroud.

(9) Install blanket assemblies (200, 202 and 204) between upper and lower zees (9, Figure 425) and under lockwire (214) securing blanket assemblies (182 and 190) and (184 and 192) in middle of shroud. Tighten lockwire to secure all blanket assemblies firmly in place on shroud, starting with blanket assemblies (184 and 192) and work forward to blanket assemblies (180 and 188).

NOTE: The tightening sequence shall be continued until gaps between blanket assemblies have been reduced to no more than 0.187 inch.

(10) Install blanket assemblies (210 and 212) inside actuator support assembly (148A, Figure 1101) and secure with lockwire (214).

B. Buildup of Actuator and Mechanism Support Assemblies (See Figure 1101)

(1) If removed from actuator support assembly (148A) during disassembly, install the following:

(a) Forward stop (164) into actuator support assembly (148A) using bolts (158) and washers (162).

(b) Aft support assembly (174) into actuator support assembly (148A) using pins (172), collars (173), bolts (159), washers (170) and nuts (171).

(2) Install guide rods (92) and carriage (93) in support assembly (94).

(a) Position carriage (93) inside support (94) with actuator attach point forward and bolt head slot on inboard side.

(b) Insert guide rods (92), with threaded ends forward, through aft end of support (94), through carriage (93) and into guide rod holes in forward end of support (94).

(c) Install washer (125) and nut (105) on each guide rod (92). Tighten nuts to standard torque value. (Per Chapter 20-50-01)

(3) Connect overcenter links (81) to carriage (93).

NOTE: Control rod (90) is installed at same time as lower overcenter link on 173-1029-1 link installation. (See Figure 1101)

(a) Install lower overcenter link (on 173-1029-1 installation only) as follows: Position overcenter link assembly (81) on lower side of carriage (93). With bolt head facing inboard, insert bolt through lower bolt hole in carriage and link assembly (81) until bolt head bottoms in bolt hole slot in carriage (93). Install spacer (117), rod (90), washer (125), and nut (102). Tighten nut to standard torque value and install cotter pin (120).

(b) Install overcenter links on all installations except that covered in paragraph (a) as follows: Position overcenter link assembly (81) in carriage (93). Then with bolt head facing inboard, insert bolt (111) through bolt hole in carriage (93), and overcenter link assembly (81) until bolt head bottoms in bolt hole slot in carriage (93). Install washer (125) and nut (102). Tighten nut (102) and install cotter pin (120).

(4) Install driver links (80, Figure 1101). (Two links each support assembly.)

CAUTION: DRIVER LINK (80) MUST BE INSTALLED WITH THE STRAIGHT SIDE TOWARD THE THRUST REVERSER AS SHOWN IN FIGURE 501. IMPROPER INSTALLATION WILL CAUSE PREMATURE WEARING OF THE OVERCENTER LINK.

Note: Post Service Bulletin 78-1054 and for driver links with lubrication fittings, lubricate ID and OD of inner bushing (84), ID of driver link bushing, and shank of bolt (106) with MIL-G-81322 grease.

(a) Position driver link (80) and inner bushing (84) on support (94) (See Figure 501). Install one retainer washer (121A) under head of bolt (106). With bolt head in outboard position, insert bolt (106) through support (94) and driver link (80). Install one washer (122) and nut (100).

CAUTION: IF NUT (100) BOTTOMS ON BOLT (106), REMOVE NUT AND ADD WASHER (122) TO OBTAIN PROPER CLEARANCE. IMPROPER CLEARANCE WILL CAUSE PREMATURE WEARING OF BOLT (106).

(b) Tighten nut to a torque of 660 to 780 lb-in. and install cotter pin (118).

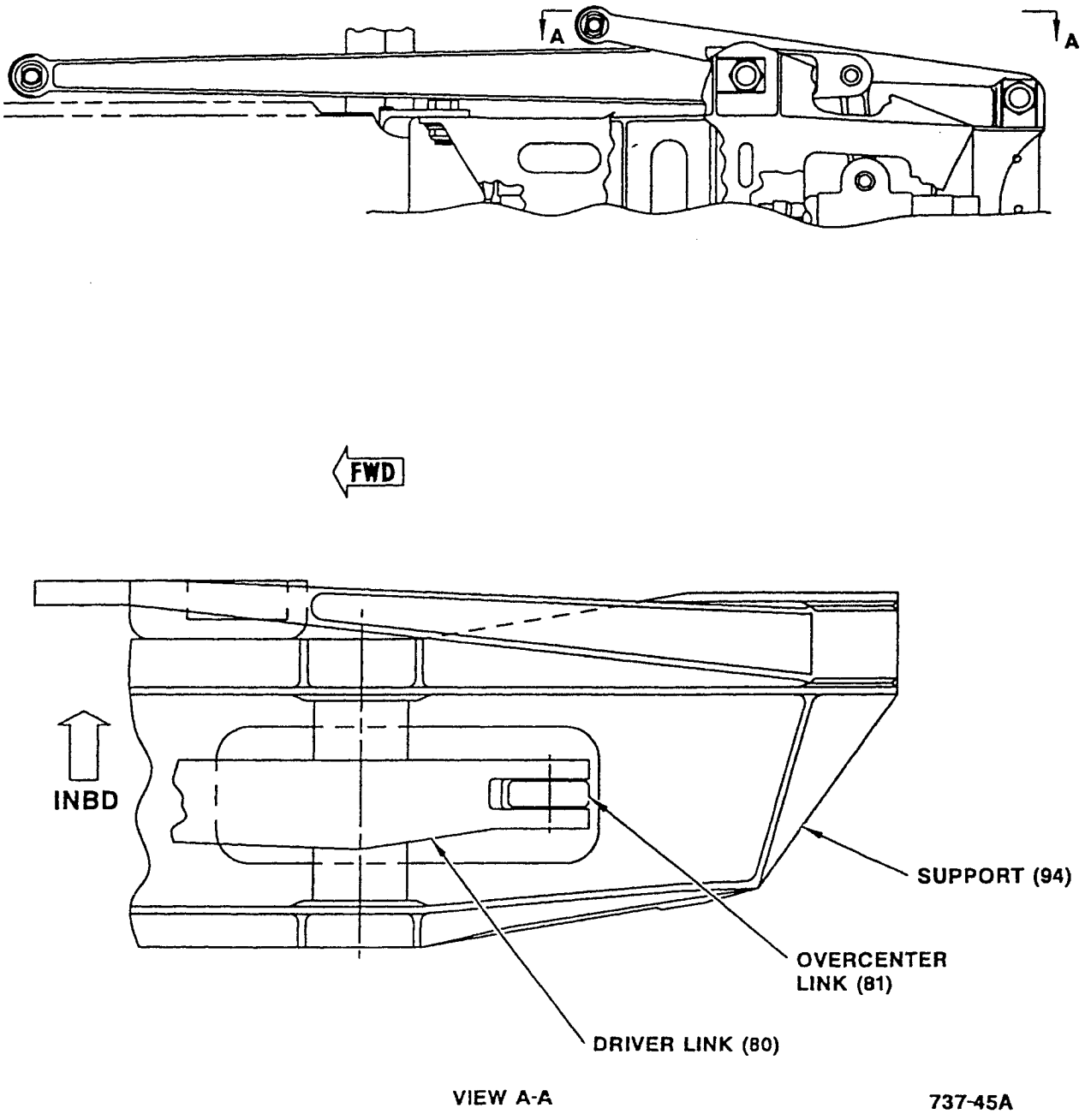
(c) Position free end of overcenter link (81) in clevis end of driver link (80). Install washer (129) under head of bolt (110). With bolt head inboard insert bolt (110) through hole in driver link (80) and overcenter link (81). Install washer (125) and nut (102). Tighten nut to a torque of 95 to 110 lb-in. and install cotter pin (120).

(5) Install idler links (82, Figure 1101). (Two links each support assembly.)

Note: Post Service Bulletin 78-1054 and for idler links with lubrication fittings, lubricate of ID and OD of inner bushing (85), ID of idler link bushing, and shank of bolt (107) with MIL-G-81322 grease.

(a) Position idler link (82) and inner bushing (85) on support (94). Install retainer washer (121A) under head of bolt (107). With bolt head in outboard position insert bolt (107) through linkage holes in support (94) and large end of idler link (82). Install washer (128), and nut (101). Tighten nut (101) to a torque of 480 to 600 lb-in. and install cotter pin (119).

173-1010



Driver Link Installation
Figure 501

C. Buildup of Actuator Support Assembly (148A) on Shroud Assembly (4)

(1) Installation of thrust reverser actuator (130, Figure 1101)

NOTE: Installation procedures are identical for left and right actuators.

(a) Position actuator inside actuator support assembly (148A) on shroud assembly (4).

(b) Position washer (132) under head of bolt (131). Insert bolt through actuator support bracket and actuator bearing from top side. Install washer (133) and nut (134).

NOTE: Do not tighten nut (134) at this time.

(2) Installation of guides (89, Figure 1101)

NOTE: Control rod installs on left side of thrust reverser only and installation is the same for either No. 1 or No. 2 engine.

(a) Position guide (89) against aft side of shroud bulkhead within actuator support assembly (148A) and attach by means of bolt (112), washer (114) under bolt head, washer (116) under nut, and nut (104), (3 places). Both heads face aft.

(b) Position guide (89) against forward side of aft end of actuator support assembly (148A) and attach by means of bolt (112), washers (114) under bolt head and nut, and nut (104), (3 places). Bolt heads face forward.

NOTE: See Chapter 20-50-01 for torque requirements.

D. Installation of Support Assembly (91). (Two places each Thrust Reverser)

NOTE: Support assembly previously built up in paras. 1.B. (2) thru (5).

(1) Using care insert control rod (90) through guides (89), sliding link support assembly (91) forward until it mates with actuator support assembly (148A) on shroud assembly (4). (See Figure 1101.)

NOTE: Rod assembly (90) and guides (89) used on left side of thrust reverser only. Mating of link support to actuator support housing is typical.

(2) Attach support assembly (91) to actuator support assembly (148A) on shroud assembly (4).

(a) Insert bolts (108) through two upper attach holes, bolt heads up, and install washers (115, 124) and nuts (103).

(b) Insert bolts (108) through two lower attach holes, bolt heads down, and install washers (115, 124) and nuts (103).

NOTE: See Subject 20-50-01 for torque requirements.

(3) Position actuator rod clevis (130, Figure 1101) on carriage (93) and install bolt (142). Attach as follows:

(a) Install washer (136) on bolt (142).

(b) With bolt head up insert it through clevis (130) and bearings (83) in carriage (93).

(c) Install washer (137), under nut (138).

(d) Tighten nut (138) to standard torque value.

(e) Tighten nut (134) on bolt (131) connecting forward end of actuator (130) to standard torque value.

NOTE: Bolt (131) and nut (134) previously installed in para 1.C.(1)(c).

E. Installation of Deflector Door Assemblies (22, Figure 1101)

CAUTION: WEIGHT OF EACH DEFLECTOR DOOR ASSEMBLY IS 60 POUNDS (27.22 Kg). ASSURE ASSEMBLY IS ADEQUATELY SUPPORTED DURING INSTALLATION.

NOTE: On thrust reverser for No. 1 engine use 173-1021-1 deflector door on upper side and 173-1021-2 on lower side. On thrust reverser for No. 2 engine use 173-1021-2 deflector door on upper side and 173-1021-1 deflector door on lower side. Installation procedures are identical.

(1) Install latch fittings (70) on deflector doors (22).

(a) Position latch fittings (70), plate (73), shim (74) and two fillers (75) against forward bulkhead of deflector door (22).

(b) Attach latch fittings by means of bolt (71), washer (72) under bolt head, washer (76) under nut, and nut (77), four places.

NOTE: AN960C416L washer (76) may be replaced with one or two AN960C416 washers as required to eliminate bottoming of nut on bolt threads. See Subject 20-50-01 for torque requirements.

(2) Position deflector doors (22) in correct position on thrust reverser assembly and correct driver links (80) as follows:

(a) Position washer (136) under head of bolt (135).

(b) Install bolt connecting driver link (80) to deflector door (22).

(c) Install washer (137) and nut (143). (Second washer optional)

(d) Tighten nut (143) to standard torque value and install cotter pin (139).

NOTE: Direction of bolt head optional. Installation two places each deflector door.

(3) Connect idler links (82) to deflector doors (22) as follows:

(a) Position washer (136) under head of bolt (140).

(b) Install bolt (140) connecting idler link (82) to deflector door (22).

(c) Install nut (138).

(d) Tighten nut (138) to standard torque value.

NOTE: Position bolt head inboard. Installation two places each deflector door.

F. Assemble and Install Deflector Door Safety Locks

(1) Build up lock assembly (1, figure 1103) as follows:

(a) Install bushings (5) in each side of pivot hole in latch (4).

(b) Insert pin (7) through hole located slightly above and forward of pivot hole and install washer (8) and nut (9). (Head of pin positions against flat side of latch (4).)

(c) Install spring (11) on latch (4) so inboard end of spring hooks over pin boss on latch.

(d) Install arm (6) on latch (4) so stop on forward side of arm butts against round shank on head of pin (7).

(e) Position latch assembly (3) in support assembly (2) and attach by means of bolt (10), washer (12), nut (13), and cotter pin (14).

NOTE: Prior to installation of actuator (21) in support assembly (2) check to ensure tab of rod end locking washer next to actuator clevis is on same side of actuator as RET (nearest) port. If not,rotate clevis until alignment is achieved.

(f) Position actuator (21) in support assembly (2) and attach by means of screw (22), washer (23), nut (24) and cotter pin (25).

(g) Position clevis end of actuator (21) over slot in latch assembly (3) and attach by means of screw (16) with washer (18) under head of screw (16), bushing (17), washer (18) under nut (19), nut (19) and cotter pin (20).

(h) Hook short end of spring (15) in hole in flange of support assembly (2), then hook opposite end of spring over stop on arm (6).

(2) Install lock assembly (1) in thrust reverser shroud assembly (4, figure 1101).

NOTE: For dissimilar metal protection apply Phenolic Primer RMS-118, Type I, to mating surfaces.

(a) Position lock assembly (1, figure 1103) in lock openings of aft bulkhead in Thrust Reverser shroud assembly.

(b) Working through lock access opening for upper door latch, or hydraulic access opening for lower door latch, attach forward end of lock assembly (1) with screw (29), washer (30) and nut (31), four places each assembly.

(c) Attach aft end of lock assembly (1) with screw (26), washer (27), and nut (28), 12 places each assembly.

G. Install Interlock and Control System

(1) Buildup and install control lever assembly as follows:

(a) Install bushing (7, figure 1102) in lever (15).

(b) Position lever (15) in support (14) so longer pivot boss is outboard and rig pin holes in lever and support can be aligned.

(c) Install bolt (8) through support (14) and bushing (7) in lever (15) from inboard side. Install washer (3) and nut (5). Tighten nut (5) to standard torque value and install cotter pin (2).

(d) Attach link (13) to one rod end (12) and tighten jam nut (11). Do not lockwire nut (11) until completion of rigging.

(e) Position rod end (12) in long arm of lever (15) and attach by means of bolt (10), bushing (16) from inboard side, washer (4) and nut (6) with nut and washer on outboard side. Tighten nut to standard torque value and install cotter pin (2).

(f) Working through feedback access opening, install support/lever assembly, positioning with long end of lever (15) up. Attach support (14) to shroud assembly by bolts (9) and washers (4), four places. Tighten bolts (9) to 50-70 pound inches torque.

(g) Install jam nut (11) and second rod end (12) on control rod (90, Figure 1101).

(h) Position second rod end (12) in clevis of link assembly (13) and install bolt (10), bushing (17), washer (4), and nut (6). Tighten nut (6) to standard torque value and install cotter pin (2).

NOTE: This operation is performed at time of rigging. See Testing section, Paragraph 3.B.

(i) Install bushing (16) in lower inboard hole in lever (15) and secure with soft copper wire to prevent loss of bushing (16).

H. Install Electrical System

(1) Installation of wire bundle assembly (16, Figure 1105).

(a) Install proximity sensors (19) upper and lower.

(b) Install spacer (13). (Do not cement spacer to casting at this time.)

(c) Install plate (1).

(d) Install screws and washers (5 and 14).

(e) Position clamp (3) on wire bundle (16).

(f) Install clamp with screw and nut (7 and 9).

(2) Route wire bundle. See Figure 1105.

NOTE: Wire bundle clamps should be left loose until the natural lay of the wire bundle has been determined and the routing is complete.

(a) Install clamp (3) on wire bundle with screw (7) and nut (9) three places as noted.

(b) Install clamp (3) on wire bundle with screw (7) six places as noted.

(c) Install clamp (3) on wire bundle with screw (6) and spacer (12).

(d) Install clamp (2) on wire bundle and bracket (20) at NAC STA 159.72 with screw (7) and nut (9) as noted.

(e) Install clamp (2) on wire bundle with screw (4), spacer (11) and nut (9).

(f) Install receptacle (17) and plug seal (18), screws (8), washers (15) and nuts (10).

(g) Tighten all wire bundle clamps.

I. Install Hydraulic Components (See Figure 1104).

NOTE: For ease of installation, the hydraulic tubing and clamps securing the tubing, should not be tightened until the plumbing run has been completed.

(1) Install bulkhead tee (28) in frame at NAC STA 145.45 with washer (36) and nut (32).

(2) Install packing (18) and valve assembly (38).

(3) Install bulkhead tee (29), in frame at NAC STA 145.45, washer (35) and nut (33).

(4) Install packing (17) and valve assembly (37).

(5) Install tee (23) on bracket on aft side of frame at NAC STA 153.19 with washer (30) and nut (34).

(6) Install tube assembly (13) to tee's (23 and 29).

(7) Install tee (23) on bracket on forward side of frame, with washer (30), nut (34).

(8) Install tube assembly (14).

(9) Install tube assembly (9) to valve assembly (37), clamp tube assembly using clamp (15), screw (22), washers (31), and nut (20).

(10) Install tube assembly (12) to valve assembly (38). Clamp tube assembly using clamp (15), screw (22), washers (31) and nut (20).

(11) Install tees (25) on tube assemblies (9 and 12).

(12) Install tube assemblies (3,8) on tee (25) attached to tube (12).

(13) Install tube assemblies (2,7) on tee (25) attached to tube (9).

(14) Clamp tube assemblies (2,3,7,8), using clamps (15), screws (21), and washers (31).

(15) Install unions (26) and packings (18) at the STOW and DEPLOY ports of each door actuator cylinders.

(16) Install tube assemblies (1,6) to the DEPLOY port of each actuator.

(17) Install tube assemblies (1,6) to the DEPLOY port of each actuator.

(18) Install unions (26) to tube assemblies (1,6) and connect tube assemblies (2,7) to the unions.

(19) Clamp tube assemblies (1,6) above unions (26). Install clamps (15), screws (22), washers (31) and nuts (20).

(20) Install elbows (24) on bracket as shown, with washers (30), and nuts (34).

(21) Install tube assemblies (4,5) to elbows (24).

(22) Clamp tube assemblies (4,5), using clamps (16), washers (31), screws (22) and nuts (20).

(23) Install unions (27) on open end of tube assemblies (4,5).

(24) Install and connect tube assemblies (10,11) to unions (27) and tees (23.

(25) Clamp tube assemblies (10,11) as illustrated, next to union (27) using clamps (16), screw (22) and washer (31).

(26) Install unions (27) and packings (19) in EXT (extend) and RET (retract) ports of each latch actuator.

(27) Install hose assembly (39) to the RET port of bottom latch actuator, and to tee (23).

(28) Install hose assembly (40) to the EXT port of bottom latch actuator and to tee (23).

(29) Install hose assembly (41) to the RET port of top latch actuator and elbow (24).

30) Install hose assembly (40) to EXT port of top latch actuator and elbow (24).

31) Tighten all tube, hose and fitting connections.

32) Tighten all clamps securing tubing installation.

2. Materials

A. Phenolic Primer, RMS-118, Type I (BMS10-11 Type I)

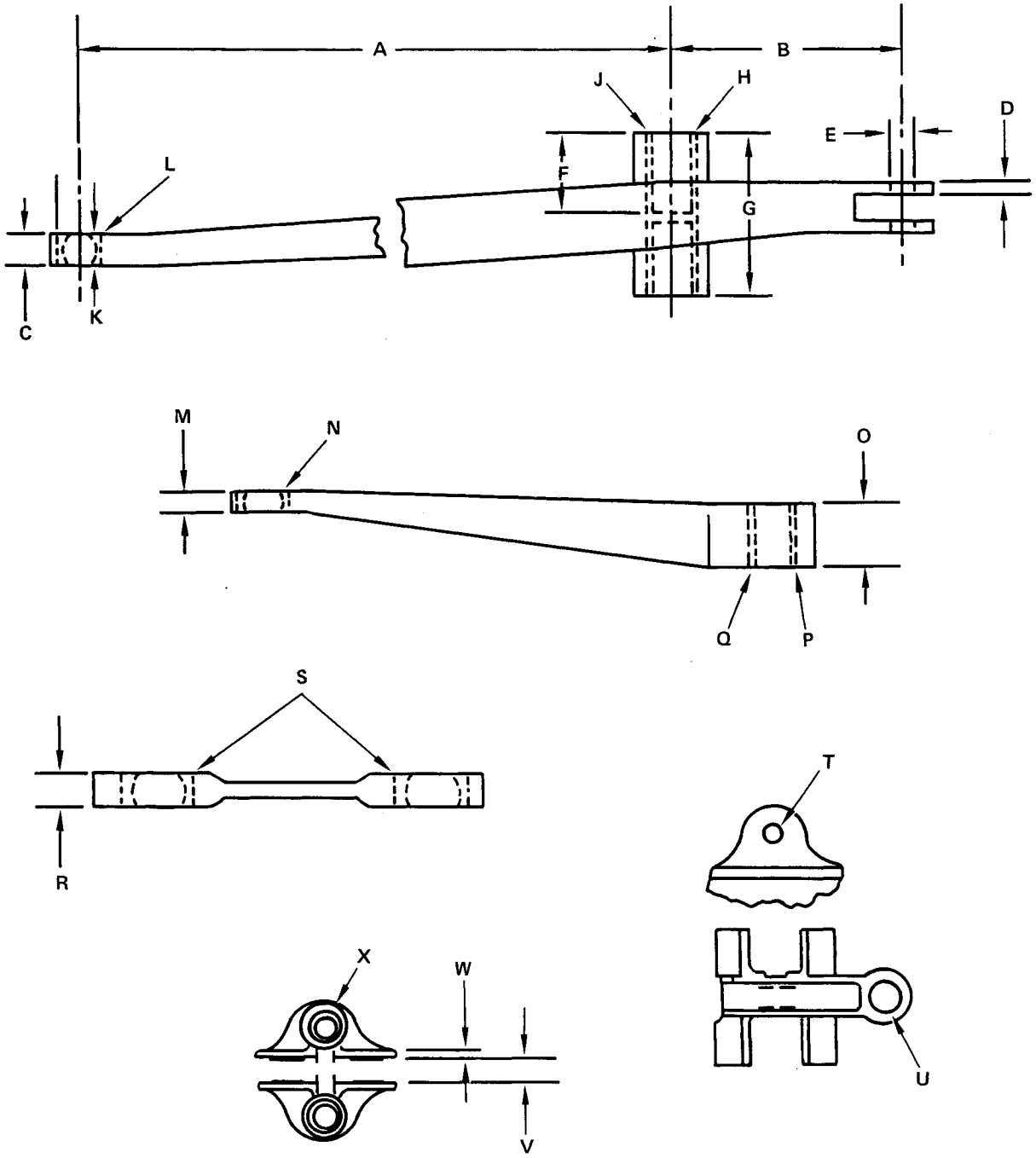
B. Hydraulic Fluid, BMS-3-11, Type II

C. Safety Wire MS20995C32, MS20995C41.

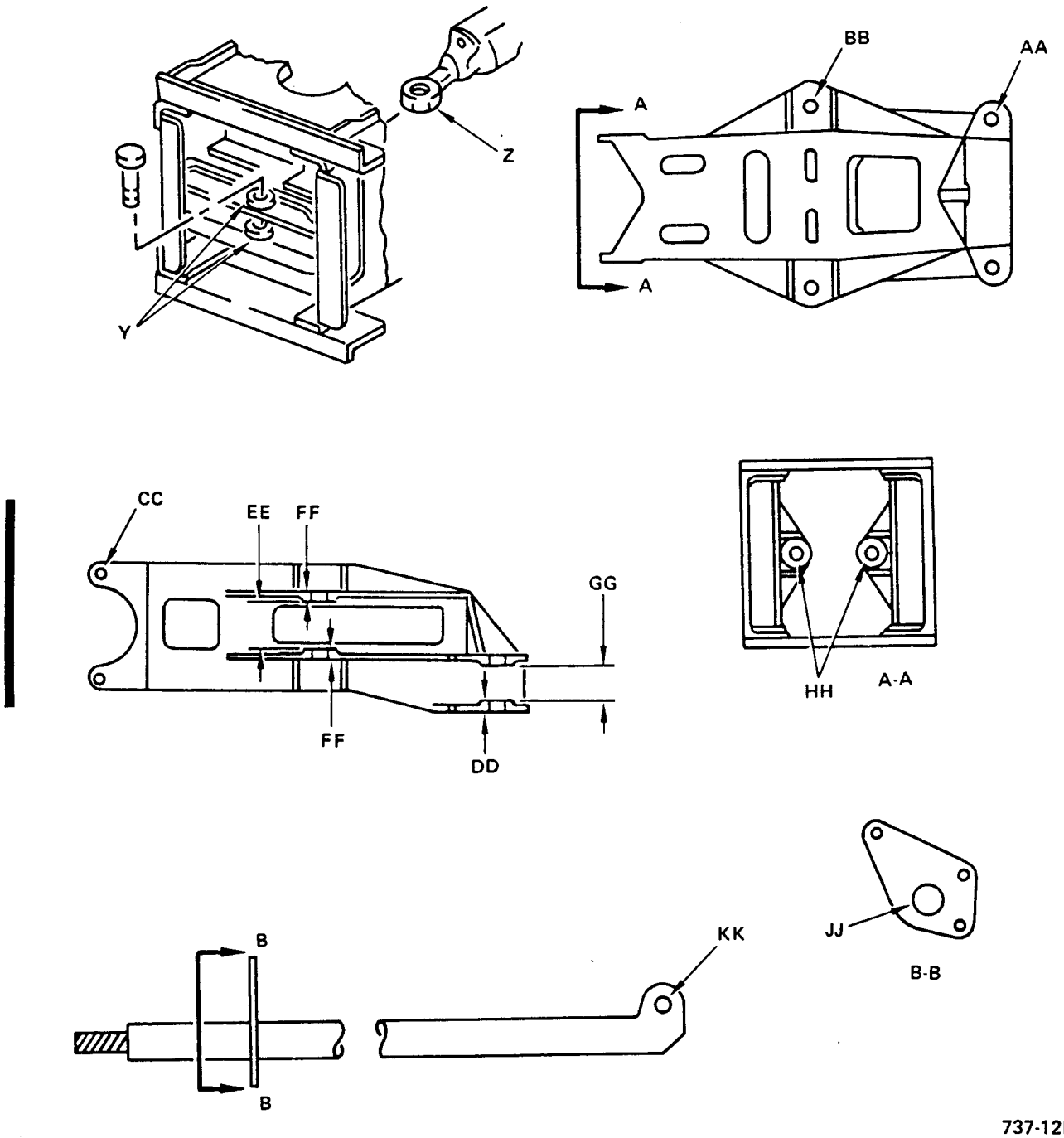
FITS AND CLEARANCES

1. The fits and clearances table lists design dimensions and service wear limits for close tolerance parts of the assembly that are subject to wear or corrosion. Unless otherwise specified, parts should be returned to the design dimensions whenever rework is accomplished.

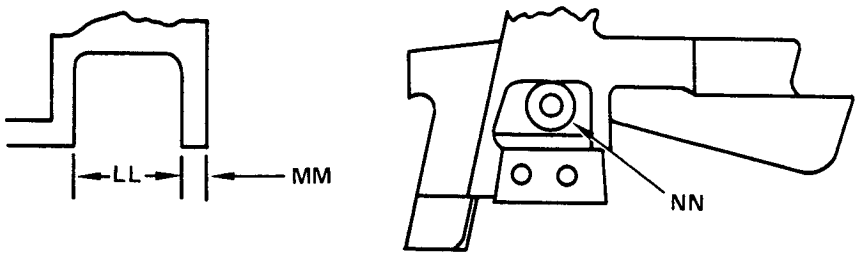
2. Clearances are given to aid assembly of the components. The values given in the Maximum Allowable Clearance column are the maximum permitted to ensure proper functioning of the unit. If assembled parts fail to meet this requirement, one or more of the parts must be rejected. Parts that are rejected should be reworked if within the rework limits given in the Repair procedure; if not within rework limits, the parts should be scrapped. It is recommended that the design clearances be used as the guiding assembly criteria when newly reworked parts are assembled.

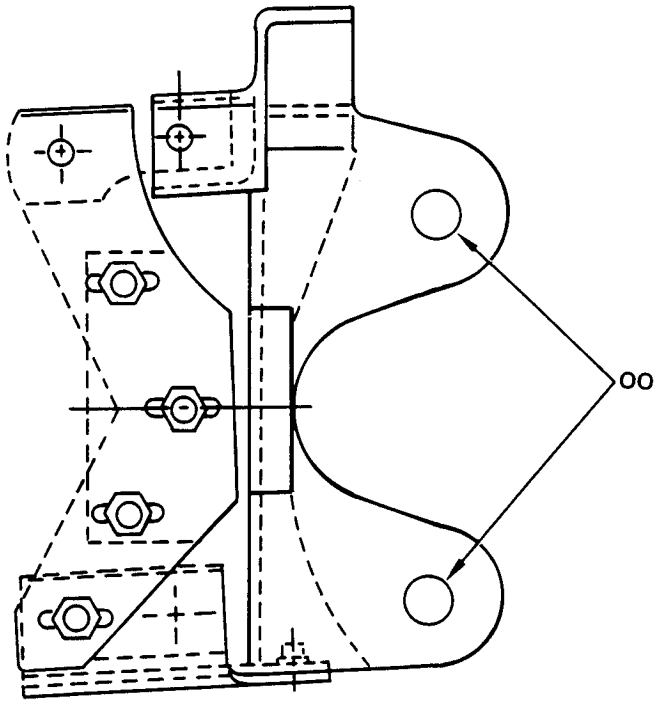


Fits and Clearances
Figure 601 (Sheet 1)



Fits and Clearances
Figure 601 (Sheet 2)





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Fits and Clearances
Figure 601 (Sheet 3)

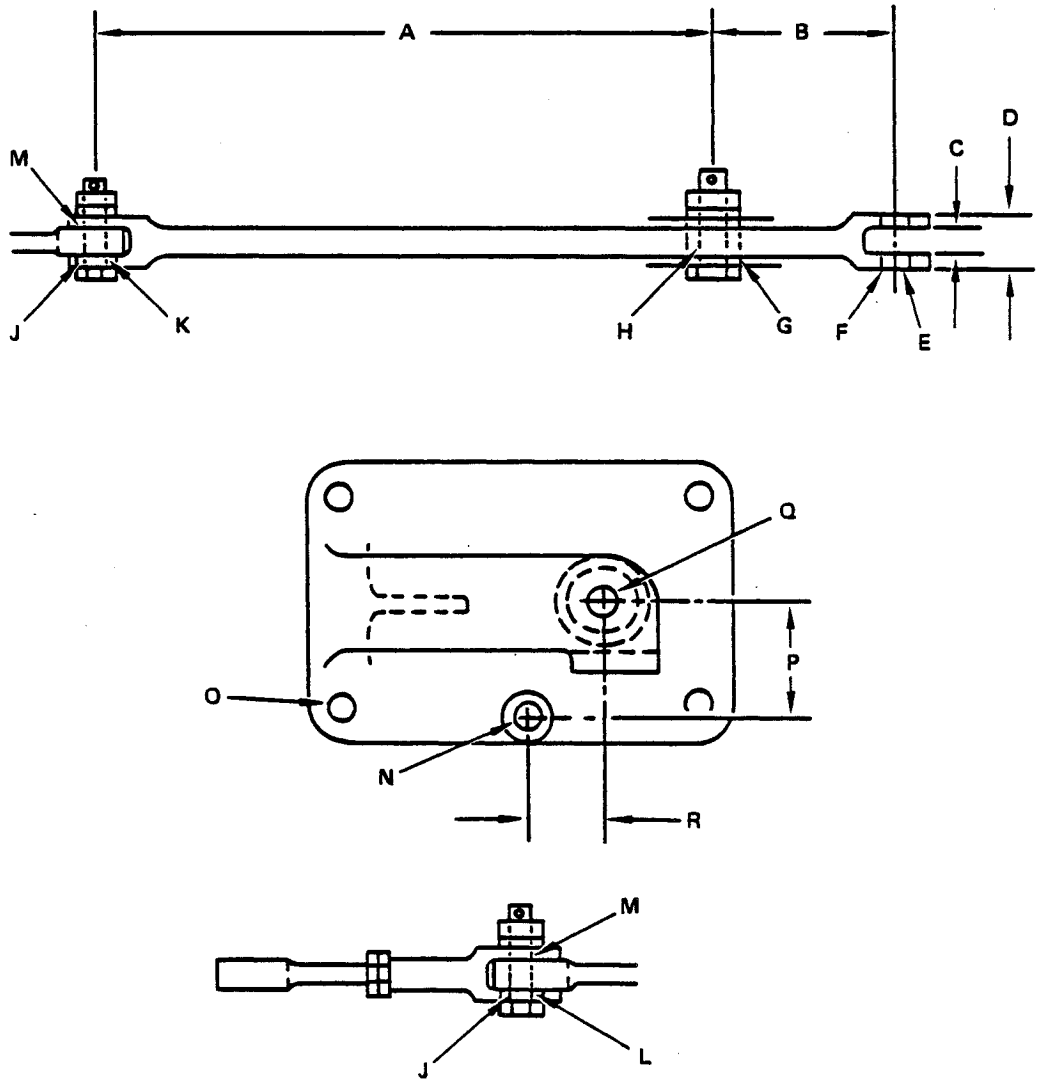
Ref Letter Fig.601	Mating Item No. Fig. 1101	Design Dimensions				Service Wear Limits		Maximum Allowable Clearance (Inches)
		Dimensions (Inches)		Assembly Clearance (Inches)		Dimension Limits (Inches)		
		Min	Max	Min	Max	Min	Max	
A	*(1) 80&80B	20.741	20.751			20.741	20.751	
B	*(2) 80&80B	3.095	3.105			3.095	3.105	
C	*(2) 80,80B &82	0.3900	0.4100			3.3820		
D	*(3) 80&80B	0.2900	0.3100			0.2700		
E	*(8) 80&80B	0.3745	0.3750				0.3760	
F	*(1) 80&80B	1.510	1.530			1.510	1.530	
G	*(4) 80 *(1) 84A	3.150 3.173	3.160 3.175	0.013	0.025	3.050 3.170		
	*(4) 80A *(1) 84A	3.150 3.173	3.160 3.175	0.013	0.025	3.050 3.170		
	*(4) 80B *(1) 84A	3.100 3.173	3.120 3.175	0.053	0.075	3.050 3.170		
	*(4) 80C *(1) 84B	3.125 3.173	3.135 3.175	0.038	0.050	3.050 3.170		
	*(4) 80D *(1) 84B	3.125 3.173	3.135 3.175	0.038	0.050	3.050 3.170		
	*(4) 80E *(1) 84C	3.125 3.173	3.135 3.175	0.038	0.050	3.050 3.170		
H	ID 80&80B OD 87C	1.0606 1.0612	1.0611 1.0617	-0.0011	-0.0001	1.0612	1.0611	-0.0001
J	ID 87C OD 84A	0.9375 0.9340	0.9390 0.9350	0.0025	0.0050	0.9290	0.9410	0.0120
K	*(1) 83	0.4950	0.5000	0.0000	0.0100	0.4950		0.0100
L	ID 80&80B OD 88	0.9062 0.9057	0.9067 0.9062	0.000	0.0010	0.9057	0.9067	0.0010
M	*(3) 82	0.3900	0.4100			0.3820		
N	ID 82 OD 88	0.9062 0.9057	0.9067 0.9062	0.000	0.0010	0.9057	0.9067	0.0100
O	*(4)82 *(1) 85A	1.2400 1.2630	1.2500 1.2650	0.0130	0.0250	1.2200 1.2620		0.0450
P	ID 82 OD 86A	1.0002 1.0008	1.0007 1.0013	-0.0011	-0.0001	1.0008	1.0007	-0.0001
Q	ID 86A OD 85A	0.8125 0.8090	0.8140 0.8100	0.0025	0.0050	0.8040	0.8160	0.0120
R	*(4) 81	0.3900	0.4100			0.3820		
S	ID 81 OD 88	0.9062 0.9057	0.9067 0.9062	0.0000	0.0010	0.9057	0.9067	0.0010
T	*(8) 93	0.3745	0.3750				0.3770	
U	ID 93 OD 83	0.6875 0.6860	0.6880 0.6870	0.0005	0.0020	0.6850	0.6890	0.0040
V	*(4) 93	0.5000	0.5050				0.5050	
W	*(4) 93	0.2000	0.2200			0.2000		
X	ID 93 OD 92	0.8750 0.8690	0.8850 0.8700	0.0050	0.0160	0.8670	0.8920	0.0250
Y	ID 148A OD 131	0.437 0.436	0.441 0.437	0.000	0.005	0.435	0.445	0.010
Z	ID 130 OD 131	0.437 0.436	0.4375 0.437	0.000	0.0015	0.435	0.438	0.0045
	ID 130A OD 131	0.437 0.436	0.438 0.437	0.000	0.0020	0.435	0.4385	0.0050

Fits and Clearances
Figure 601 (Sheet 4)

Ref Letter Fig.601	Mating Item No. Fig. 1101	Design Dimensions				Service Wear Limits		
		Dimensions (Inches)		Assembly Clearance (Inches)		Dimension Limits (Inches)		Maximum Allowable Clearance (Inches)
		Min	Max	Min	Max	Min	Max	
AA	*(8) 94	0.5625	0.5634				0.5644	
BB	*(8) 94	0.6250	0.6259				0.6269	
CC	*(8) 94	0.5010	0.5020				0.5070	
DD	*(3) 94	0.1450				0.1350		
EE	*(4) 94	3.1750	3.1800				3.1800	
FF	*(3) 94	0.1200				0.1100		
GG	*(4) 94	1.2650	1.2700				1.2700	
HH	*(8) 94	0.3760	0.3770				0.3870	
JJ	ID 89 OD 90	0.6390 0.6200	0.6430 0.6300	0.0090	0.0230	0.6150	0.6480	0.0330
KK	*(8) 90	0.3745	0.3755				0.3855	
LL	*(4) 23 or 24	0.5000	0.5050				0.5050	
MM	*(4) 23 or 24	0.1500	0.1700			0.1500		
NN	*(8) 23 or 24	0.3745	0.3755				0.3775	
OO	*(4) 94	0.5010	0.5020				0.5070	

Fits and Clearances
Figure 601 (Sheet 5)

*(1) Length
*(2) Length shoulder to shoulder
*(3) Total thickness of machine boss plus web.
*(4) Shoulder to shoulder thickness of machined bosses that contact mating part
*(8) Diameter

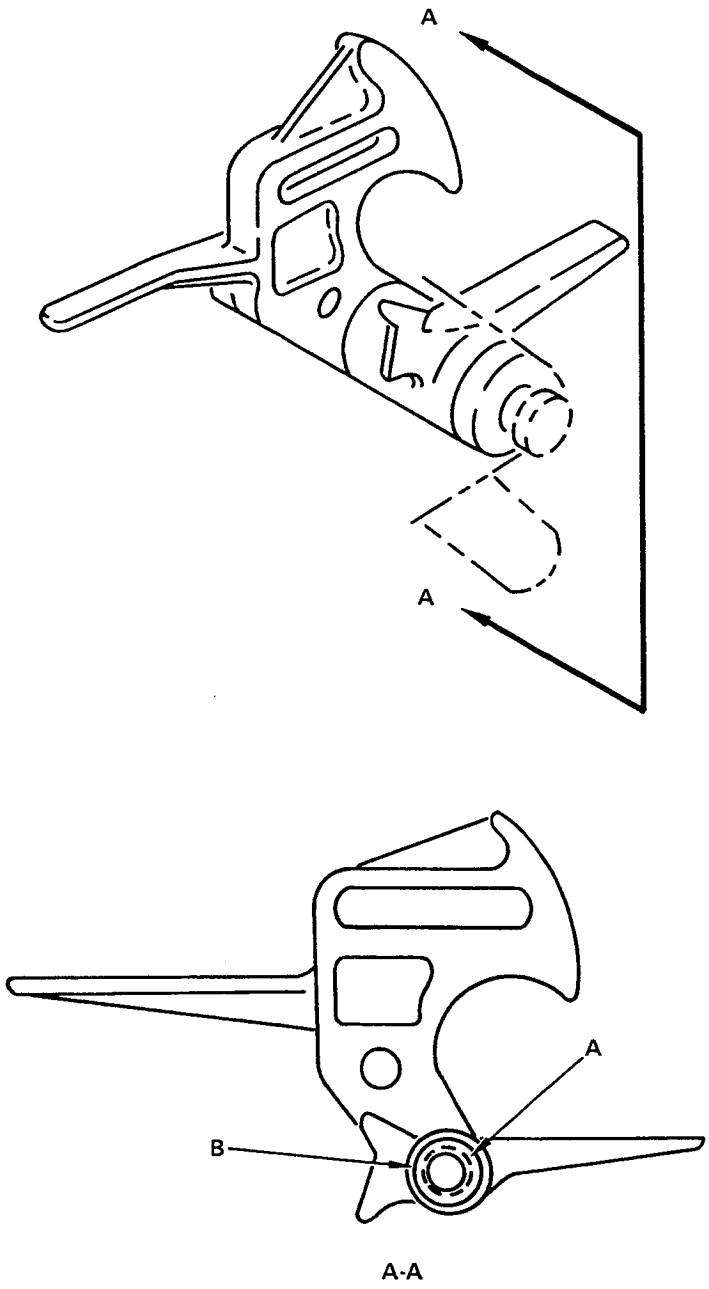


Fits and Clearances
Figure 602 (Sheet 1)

Ref Letter Fig.602	Mating Item No. Fig.1102	Design Dimensions				Service Wear Limits		
		Dimensions (inches)		Assembly Clearance (inch)		Dimension Limits (inches)		Maximum Allowable Clearance (inch)
		Min	Max	Min	Max	Min	Max	
A	*(1) 15	8.5650	8.5750			8.5650	8.5750	
B	*(1) 15	2.7450	2.7550			2.7450	2.7550	
C	*(3) 15	0.4370	0.4470				0.4770	
D	*(4) 15	0.6820	0.6920			0.6820		
E	*(5) 15	0.2500	0.2540				0.2640	
F	*(6) 15	0.3120	0.3160				0.3200	
G	ID 15 OD 7	0.4390 0.4381	0.4400 0.4386	0.0004	0.0019	0.4371	0.4500	0.0129
H	ID 7 OD 8	0.3125 0.3110	0.3140 0.3120	0.0005	0.0030	0.3100	0.3150	0.0050
J	ID 16&17 OD 10	0.2500 0.2460	0.2540 0.2490	0.0010	0.0080	0.2640	0.2640	0.0180
K	ID 15 OD 16	0.3120 0.3080	0.3160 0.3100	0.0020	0.0080	0.3060	0.3200	0.0140
L	ID 13 OD 17	0.3120 0.3080	0.3160 0.3100	0.0020	0.0080	0.3060	0.3200	0.0140
M	ID 13&15 OD 10	0.2500 0.2460	0.2540 0.2490	0.0010	0.0080	0.2460	0.2640	0.0180
N	*(8) 14	0.2600	0.2630			0.2600	0.2630	
O	*(8) 14	0.2570	0.2610			0.2570	0.2610	
P	*(3) 14	1.2510	1.2610			1.2510	1.2610	
Q	*(7) 14	0.3130	0.3180			0.3130	0.3280	
R	*(8) 14	0.7200	0.7300			0.7200	0.7300	

Fits and Clearances
Figure 602 (Sheet 2)

*(1) Length
*(2) Length shoulder to shoulder
*(3) Width
*(4) Width shoulder to shoulder
*(5) Outboard, both ends
*(6) Inboard, both ends
*(7) Holes are concentric
*(8) Diameter



737-36

Fits and Clearances
Figure 603 (Sheet 1)

		Design Dimensions				Service Wear Limits		
Ref Letter Fig.603	Mating Item No. Fig.1103	Dimensions (inches)		Assembly Clearance (inch)		Dimension Limits (inches)		Maximum Allowable Clearance (inch)
		Min	Max	Min	Max	Min	Max	
A	ID 6 OD 4	0.5700 0.5650	0.5730 0.5686	0.0014	0.0080	0.5610	0.5760	0.0150
B	ID 4 OD 5	0.3754 0.3760	0.3759 0.3765	-0.0011	-0.0001	0.3760	0.3759	-0.0001

Fits and Clearances
Figure 603 (Sheet 2)

TESTING

1. Connect hydraulic test stand to STOW and DEPLOY fittings of thrust reverser. (See paragraph on Special Tools, Fixtures, and Equipment, for description of hydraulic test stand.)

2. Connect electrical test set cable to electrical receptacle on thrust reverser. (See paragraph on Special Tools, Fixtures, and Equipment for description of electrical test set.)

3. Rigging and Operation Procedures:

   A. Flushing Procedure

      (1) Disconnect hydraulic lines from STOW and DEPLOY ports of each thrust reverser actuator and EXTEND and RETRACT ports of each latch actuator.

      (2) Connect hydraulic lines together, forming continuous circuit. Locally manufactured hoses may be used as jumpers. (See Figure 1104 for hardware information.)

      (3) With hydraulic stand pressure pump adjusted to provide flow rate of three (3) gallons per minute, circulate hydraulic fluid for maximum of two (2) minutes.

      (4) Examine return filter in hydraulic test stand for contaminates. If contaminates are present, repeat flushing procedure until system is clean. Use clean filter for each flushing cycle.

      (5) Remove all jumper hydraulic lines and fittings used during flushing procedure.

      (6) Reconnect hydraulic lines to STOW and DEPLOY ports of each thrust reverser actuator and to EXTEND and RETRACT port of each latch actuator. Tighten all connections.

   B. Mechanical Adjustment Procedures

      NOTE: Each deflector door has four (4) adjustable stops which must be positioned during rigging operation. See Figures 701 and 702 for location of adjustable devices.

      (1) Adjustment of Idler Link Stops (See Figure 1101)

         (a) Remove the actuator housing assembly (18) and operate the thrust reverser doors to the STOW position.

CAUTION: CHECK TO ENSURE PLATES (97) DO NOT CONTACT 0.120 INCH REWORK RADIUS (SEE FIGURE 406) ON ANY REPAIRED IDLER LINKS (82) AS ANY CONTACT COULD LEAD TO FAILURE OF REPAIRED LINK.

(b) Adjust shims (98) to provide a 0.003 to 0.005 inch maximum interference between plates (97) and idler links (82) and the gap between nozzle (4A) and doors (22) is 0.10 inch minimum with bumpers (44 and 46) installed. (See Figure 701.)

(2) Adjustment of deflector door stops.

(a) Remove washers and turn NAS564-31 bolt (Figure 702) down to allow forward edge of deflector door assembly to achieve faired position within 0.000 $\pm^{0.03}_{0.04}$ inch of the shroud on each side. (See Figure 703.)

(b) Install washers AN960-416 (AN960-416L) under head of each NAS564-31 stop bolt, equal to distance measured from head of bolt to structure assembly. (See Figure 702.) Tighten each bolt and recheck thrust reverser door faired condition. Lockwire both door bolts to lightening hole in structure assembly.

(3) Adjust deflector door latch bracket for engagement with latch. (See Figure 704.)

(a) Operate thrust reverser to the DEPLOY position and remove hydraulic pressure.

(b) Manually move the latch assembly arm (6, Figure 1103) until the latch (4) is in the fully extended position. Then, through the access hole at the proximity sensor location, measure the gap between the sensor and the latch target. (See Figure 706.)

(c) Utilizing hydraulic test stand, operate deflector doors to STOW position. Ascertain that latch (4, Figure 1103) of latch assembly has fully engaged deflector door latch bracket (70, Figure 1101) by obtaining a repeat of the gap measured in step 3.B.(3)(b).

NOTE: Do not proceed to next step unless latch and the deflector door latch bracket are fully engaged in the STOW position. It may be necessary to relocate the deflector door latch bracket (70) to attain the correct engagement.

(d) At centerline of thrust reverser deflector door assembly, measure mismatch (step) between shroud exterior and exterior skin of door assembly, upper and lower door. Record reading.

(e) Operate thrust reverser to DEPLOY position. Slowly apply hydraulic pressure to STOW line until deflector doors have moved approximately 50 percent of way to STOWED position. Remove hydraulic pressure, bleed off hydraulic pressure in lines and assure lines are vented.

(f) Ascertain that both latch actuators are extended. Manually extend if required.

(g) Push both thrust reverser doors to STOW position. Assure both latches are engaged with deflector door latch fittings, but drive link not locked over center.

(h) Remeasure mismatch (step) between shroud exterior and exterior skin of door assemblies in same area as step (d).

(i) Difference between measurements recorded in step (d) and step (h) for each door should be no greater than 0.120 inch. No minimum clearance dimension is required, provided the latch fitting travels freely. Readjust door latch bracket (70, Figure 1101), if required. Three (3) serrations will approximate 0.10 inch.

NOTE: On parts which do not comply with latch to hook gap requirements, the slot length of the door latch bracket (70) may be increased one (1) serration.

(4) Adjust interlock and control system mechanism. (See Figure 705.)

(a) Ascertain that both thrust reverser doors are in STOWED and locked position.

(b) Insert 1/4 inch diameter rigging pin through rigging pin hole in lever (15) and into rigging pin hole in support (14). If rigging pin can be inserted without binding, interlock control system is rigged properly.

(c) If rigging pin does not fit correctly, the following procedure shall be accomplished.

1) Deactivate hydraulic test stand by removing all system pressure.

2) Disconnect rod end (12) from control lever (15) by removing pin (2), nut (6), washer (4) and bolt (10).

3) Position control lever (15) so rigging pin can be inserted through rigging pin hole in control lever into rigging pin hole in support (14).

4) Loosen jam nuts (11) and adjust link assembly (13) so attach bolt (10) can be inserted freely into control lever (15) and bushing (16) in rod end (12). Thread engagement of two rod end bearings (8) should be approximately equal. Adjust if necessary.

5) Remove rigging pin. Deploy thrust reverser doors to approximately mid point of travel. Ensure that link (13) has equal radial clearance about its center line. Adjust when required.

6) Reactivate hydraulic test stand. Cycle thrust reverser through at least one complete cycle, stopping in STOW position. Verify rigging pin can be inserted freely into control bracket lever. Remove rigging pin.

7) Secure all bolts removed during rigging procedure. Tighten all jam nuts (11) on rod ends and lockwire.

(5) Adjust proximity sensors to latch arm gap requirements.

(a) Stow and lock thrust reverser doors.

(b) Deactivate thrust reverser hydraulic system.

(c) Through upper and lower access openings at proximity sensor locations, measure gap between proximity sensor and the target. Reference Figure 706. Gap tolerance is 0.060 to 0.090 inch.

(d) Adjust for gap as required by removing proximity sensor and peeling laminated (shim) spacer, P/N 173-1954-7, under sensor as needed to obtain required gap.

(e) Install spacer and proximity sensor and recheck gap clearance.

(f) After completion of gap adjustments, remove upper and lower proximity sensors. Permanently install laminated spacers to casting, P/N 173-1312-1, with Type III sealant.

(g) Install upper and lower proximity sensors.

C. Operation Test

(1) Perform minimum of six (6) cycles of operation with hydraulic pressure increased to 3000 psig at each extreme position, STOW and DEPLOY.

(2) Observe thrust reverser mechanism for freedom of movement during step C. (1). Binding or interference of any type is not allowed.

(3) Inspect all hydraulic line connections for external leakage. External leakage at cylinder end caps is not allowed. Door actuator cylinder piston leakage shall not exceed 1 drop in 12 1/2 complete cycles. (One cycle is STOW-DEPLOY-STOW sequence.)

(4) Check operation of upper and lower deflector door sensor lights (See Figure 304.) and for operation per following chart:

SEQUENCE	PRESSURE (psig)	OPERATION	LAMP INDICATION ON	LAMP INDICATION OFF
STOW	3000	Doors Closed		X
DEPLOY	95 ± 45	Doors Unlocked	X	
DEPLOY	625 ± 195	Doors Deployed	X	
STOW	365 ± 115	Doors Stowed and Locked Overcenter		X

(5) Verify proper operation of control interlock feedback lever (15). TBC connection point shall move 2.75 inch from STOW to DEPLOY position of thrust reverser. (See Figure 705)

(6) STOW and lock thrust reverser doors.

(7) Remove all hydraulic pressure from hydraulic test stand. Disconnect hydraulic test stand and electrical test box from thrust reverser.

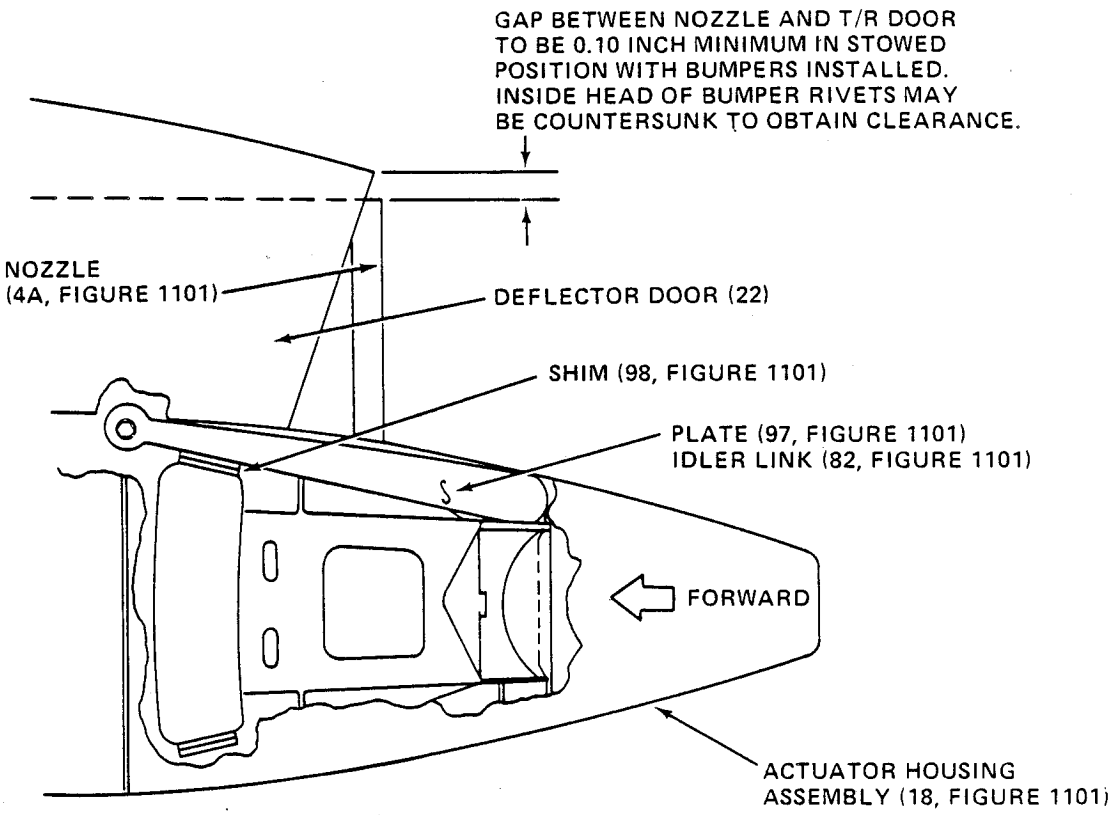
(8) Install protective caps over hydraulic STOW and DEPLOY connectors and on electrical connector.

(9) Install all remaining access panels and actuator covers on thrust reverser.

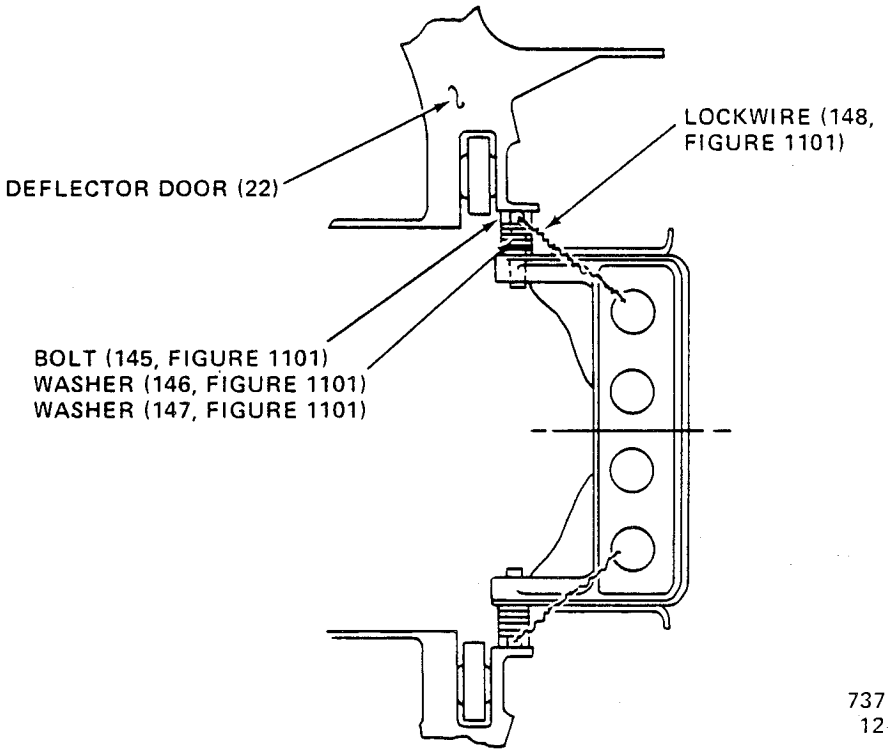
4. Materials

A. Hydraulic Fluid, BMS 3-11, Type II

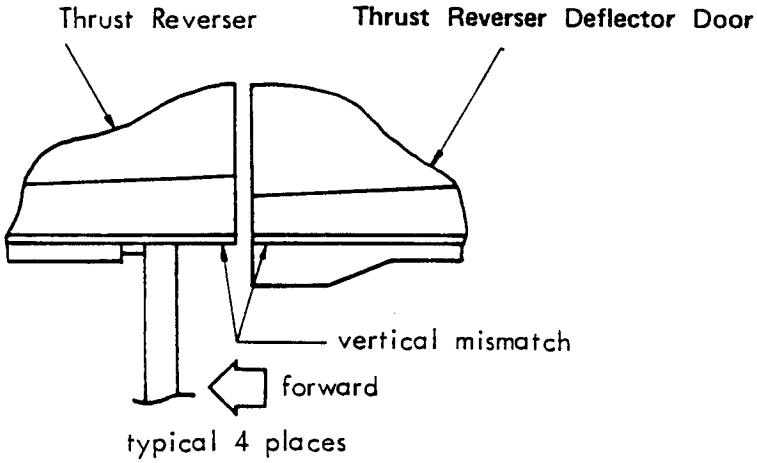
B. Type III Sealant, DC90-006 Aerospace Sealant, Dow Corning Corporation, Midland, MI 48641



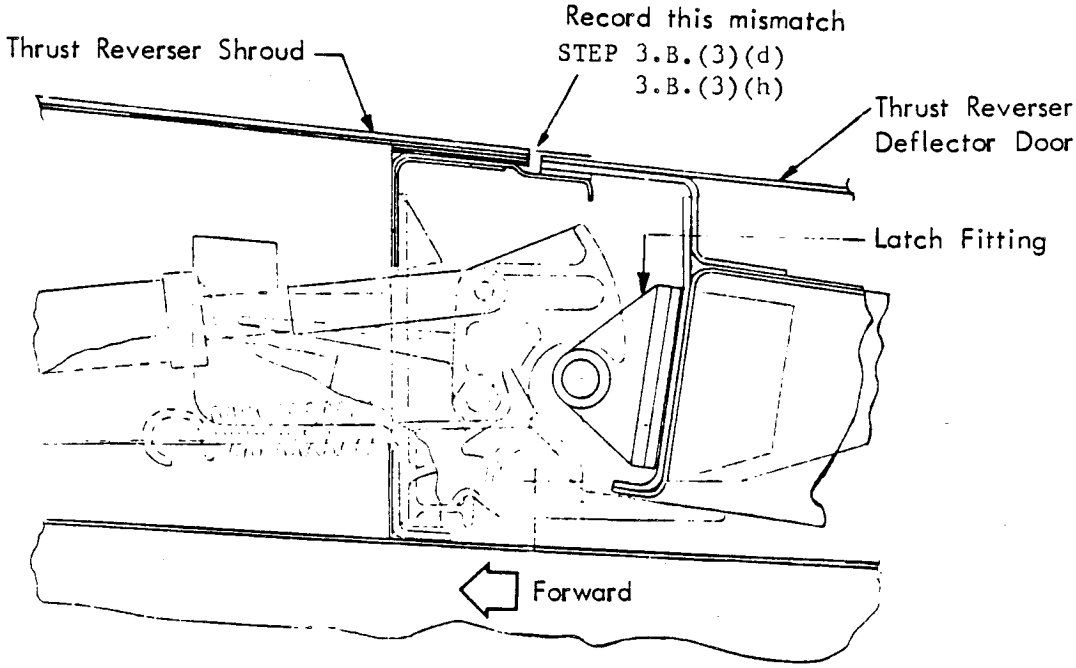
Deflector Door Adjustment
Figure 701



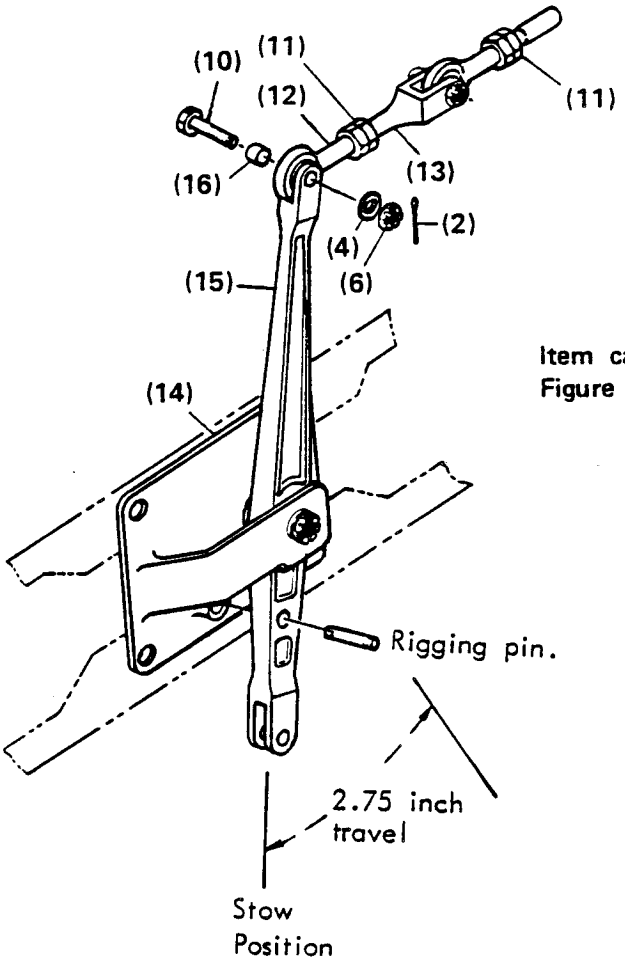
Deflector Door Adjustment
Figure 702



Deflector Door Adjustment
Figure 703

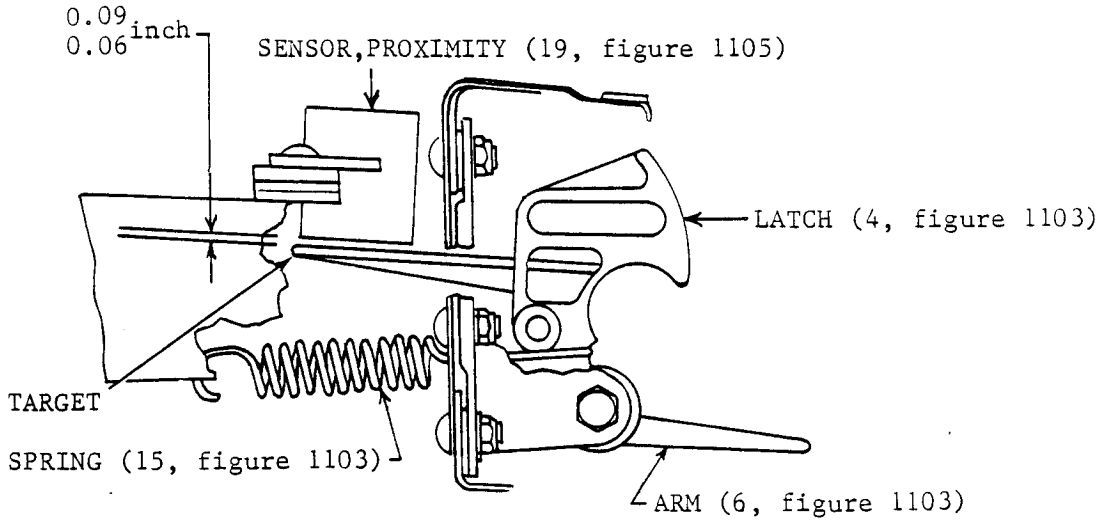


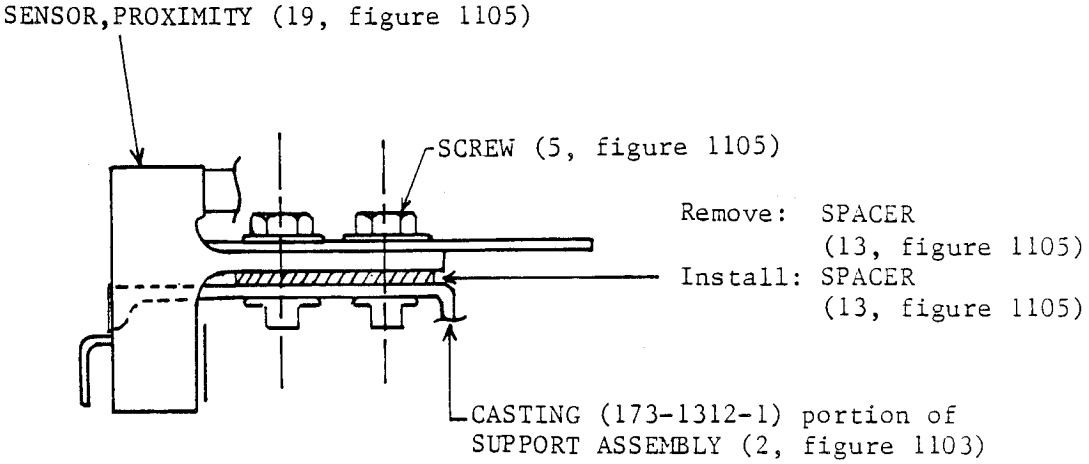
Deflector Door Adjustment
Figure 704

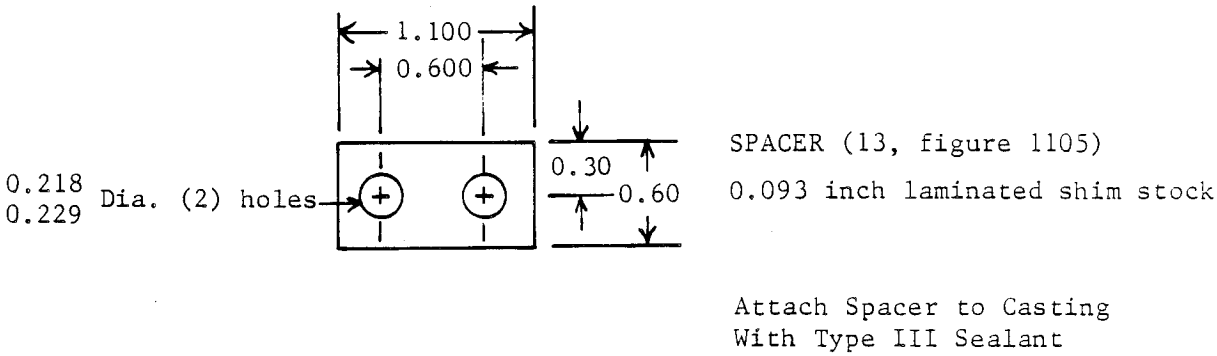


Item callouts are same as Figure 1102.

Interlock Control Mechanism
Figure 705







Sensor, Proximity Installation
Figure 706

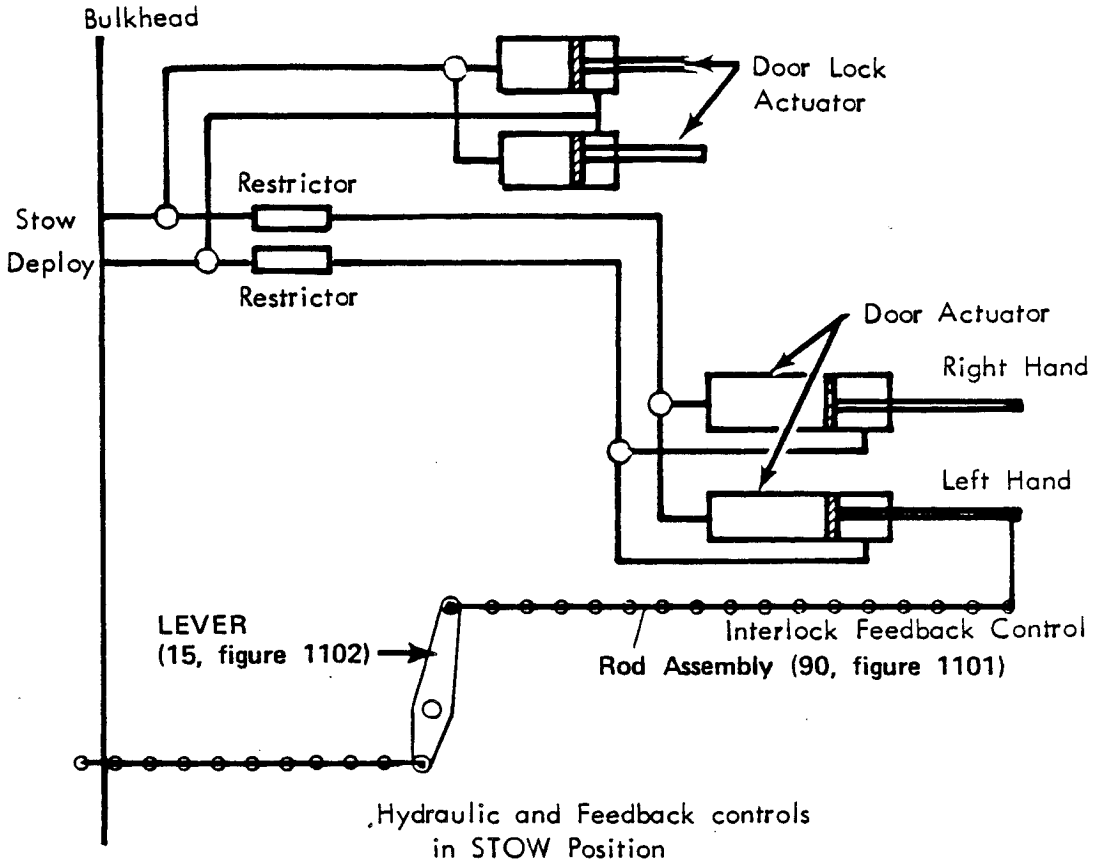
TROUBLE SHOOTING

Problems most likely to be encountered during the functional testing, with their probable causes and remedies, are listed below.

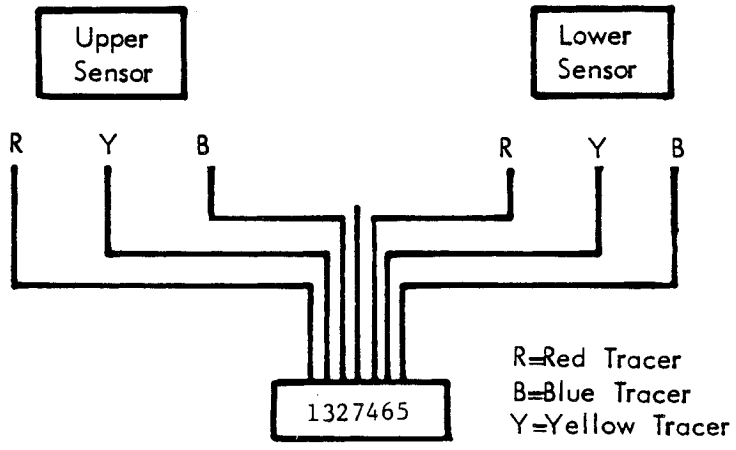
It is assummed the operation of associated items of test equipment used during the functional test is operating normally.

Hydraulic and electrical system schematics are illustrated by figure 801.

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
1 External hydraulic leakage	Defective packings or back-up rings	Replace parts
	Cracked or broken material	Replace material
	Scored actuator piston	Replace or refinish
	Loose connections	Retighten connections
	Foreign matter in connections	Inspect for foreign material, flush connection and retighten connection
	Cracked flange or sleeve	Replace parts
2 Door operation not smooth	Foreign matter in actuator cylinder	Disassemble and clean
	Actuator piston binding	Replace actuating piston
	Misaligned linkage	Realign linkage and rig
	Guide rod damaged	Replace
3 Deflector door travel too short or too long	Clevis on actuating cylinder not adjusted correctly	Readjust
4 Deflector door light operation erratic	Proximity sensors not properly installed	Inspect positioning of sensors
	Loose electrical connection	Correct electrical fault
5 Safety latch of deflector door not locked in STOW position	Latch fitting mis-adjusted	Readjust latch fitting
	Latch lock actuator mis-adjusted	Readjust latch cylinder



Hydraulic and Feedback controls in STOW Position



Electrical Wiring Diagram

THRUST REVERSER SYSTEM SCHEMATICS
Figure 801

STORAGE INSTRUCTIONS

1. The thrust reverser can be stored after an overhaul service, provided certain control functions are satisfied. Cure date data for the hydraulic actuators is marked on each cylinder in accordance with ANA Bulletin 438. This date must be recorded as it establishes the time limit for the storage period.

2. Normally, the maximum storage time for assemblies containing rubber, or rubber like components, is eight (8) quarters from assembly date. Hose assemblies are excepted from this time limit, and have a storage period of fourteen (14) quarters.

3. Any assembly which reaches its expiration date before installation, should be returned to overhaul for complete functional testing.

4. The following listed items or assemblies, on the 737 thrust reverser should have controlled storage dates:

ITEM	PART NUMBER	NOMENCLATURE	QUAN PER T/R
1	1U1222	Unlock Actuator	2
1A	58120-1 (Alt for 1)	Unlock Actuator	2
2	1U1220-2	Door Actuator	2
2A	60470 (Alt for 2)	Door Actuator	2
3	173-1904-1	Hose Assembly	2
4	173-1904-501	Hose Assembly	1
5	173-1904-503	Hose Assembly	1

5. Protective caps should be installed on the "STOW" and "DEPLOY" bulkhead fittings, and the electrical receptacle at the conclusion of functional testing. The thrust reverser should be covered, protected from dust collection, and stored at temperatures which should not exceed 100°F, and must not exceed 125°F.

6. For further storage information, refer to "Temporary Protective Coatings", Subject 20-44-02.

SPECIAL TOOLS, FIXTURES AND EQUIPMENT

1. Special Tools, Fixtures and Equipment

   A. Hydraulic Test Stand, 0-3600 psig (See Figure 1001).

   B. Hydraulic Test Stand, 0-6000 psig (See Figure 1002).

   C. Electrical Test Set, 28 volt dc power source (See Figure 1003).

   D. Flourescent-Penetrant Examination Facilities.

   E. Magnetic Particle Examination Facilities.

   F. Holding Fixture for Complete Thrust Reverser (See Figure 1004).

   G. Assorted Test Fittings and Equipment.

   H. Staking Tool (See Figure 1005).

   I. Restrictor Valve Test Pin (See Figure 1007).

   J. Deflector Door Blind Bolt Installation Tool.

   K. Periphery Tape.

2. Description of Special Tools, Fixtures and Equipment

   A. Hydraulic Test Stand, 0-3600 psig operating range.

      This stand will be used during flushing, rigging, and operational checks. The stand must be suitable for BMS 3-11 hydraulic. Appropriate filters, pumps, gauges, valves, flow-meter, etc. as shown in Figure 1001 should be incorporated.

   B. Hydraulic Test Stand, 0-6000 psig operating range.

      This stand will be used for proof load testing of individual thrust reverser hydraulic components. Appropriate filters, valves, pump, and gauges as shown in Figure 1002 should be incorporated.

   C. Electrical Test Set (Boeing Part No. F-80221-1)

      This test unit shall be used in conjunction with the hydraulic test stand listed in paragraph 1.A. The test set will supply 28 volt dc power to the thrust reverser proximity sensors and will provide proper lamp indication during thrust reverser operation. Appropriate equipment as shown in Figure 1003 will be needed.

   D. Fluorescent Penetrant Examination capabilities as described in Subject 20-20-02 must be available.

   E. Magnetic Particle Examination capabilities as described in Subject 20-20-01 must be available.

F. Holding Fixture

A holding fixture capable of securing the thrust reverser during both disassembly and buildup. The stand should be capable of allowing the thrust reverser assembly to be rotated 360° about its centerline, and locking at 90° increments. This tool is illustrated in Figure 1004.

G. Assorted Test Fittings and Equipment

Assorted flex hoses, connectors, plugs and caps will be needed to make the overhaul easier. This material should be located close to the working area, and should be in sufficient quantity to support the overhaul operation.

H. Staking Tool

A special bearing race staking tool is required when installing the bearing race into the link assemblies. This tool is illustrated in Figure 1005. The tool may be purchased from:

Quality Tool and Mfg. Co.
4647 De Soto Street
San Diego, CA 92104
Phone: (619) 274-7373
P/N 173-1030 PRDA

I. Restrictor Valve Test Pin.

A test pin used to plug the large hole in the restrictor poppet during the cracking pressure check is illustrated in Figure 1007.

J. Deflector Door Blind Bolt Installation Tool.

Special tools are recommended when installing blind bolts in the deflector door hinges. Three types of these tools are available, any one of which will do the job:

(1) Electro-Hydraulic Power Unit - BP7000. This unit contains the power supply, the hand guns and all the necessary fixtures for installing most sizes of blind bolts.

(2) Fix Kit FK110. This kit contains all necessary hand tools for installing all sizes of blind bolts.

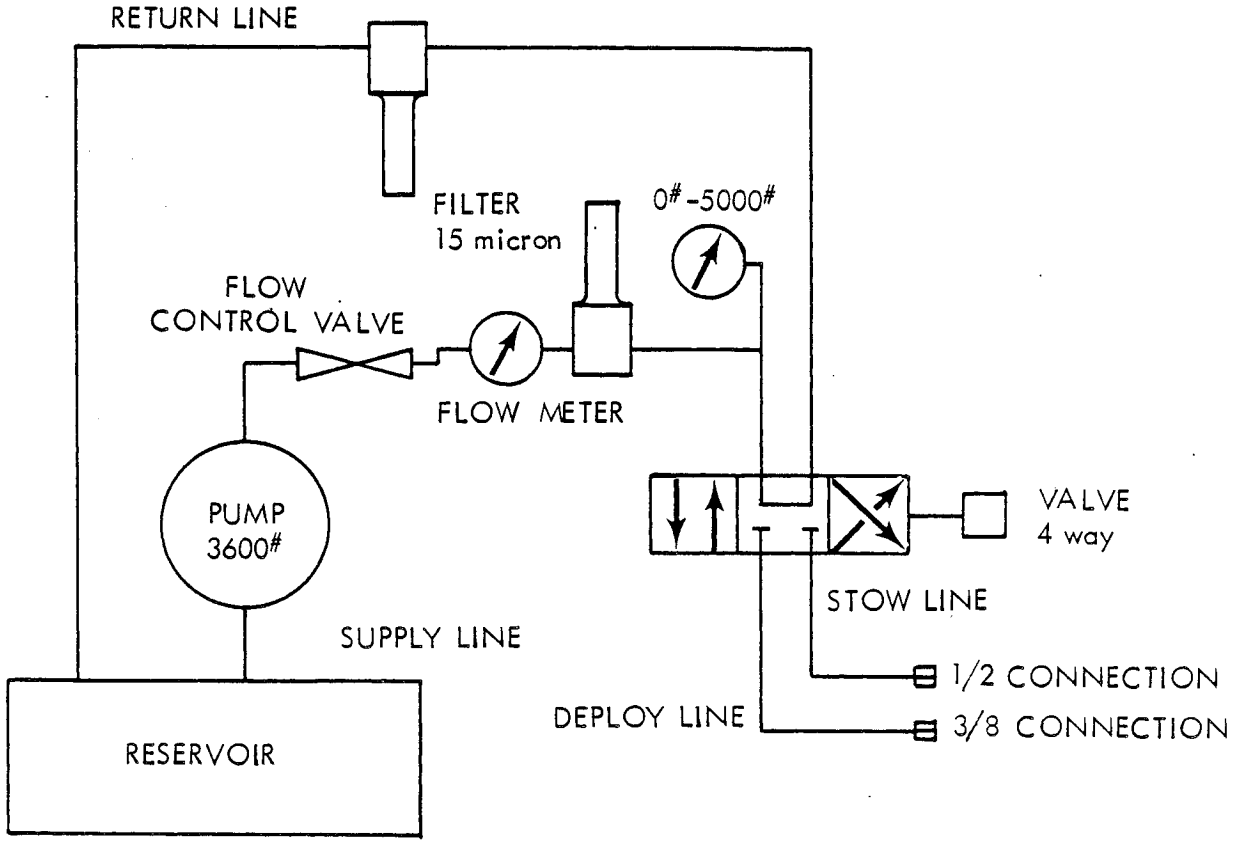
(3) Hand tool consisting of BH100-6M2 Fixture and an M2-6 Mandrel. This tool is required for installation of BB352-5-4 blind bolts.

These tools may be purchased from: Hi-Shear Corp.
2600 Skypark Drive
Torrance, CA 90509
Phone: (213) 326-8110

L. Periphery Tape

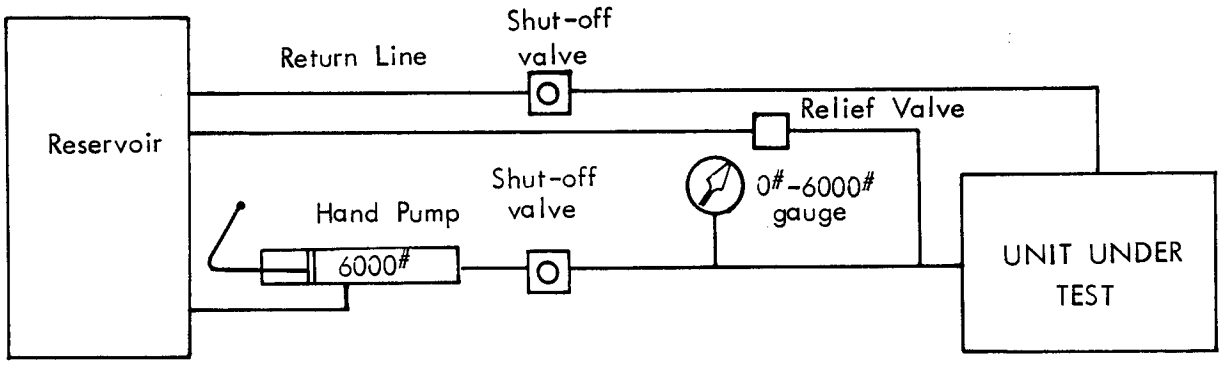
Tape used to measure exit diameter of tailpipe exhaust. This tool may be purchased from:

Collins-Phillips Co.
P.O. Box 646
Escondido, CA 92025
Phone (619) 746-7841
P/N No. 3 (24" - 36")

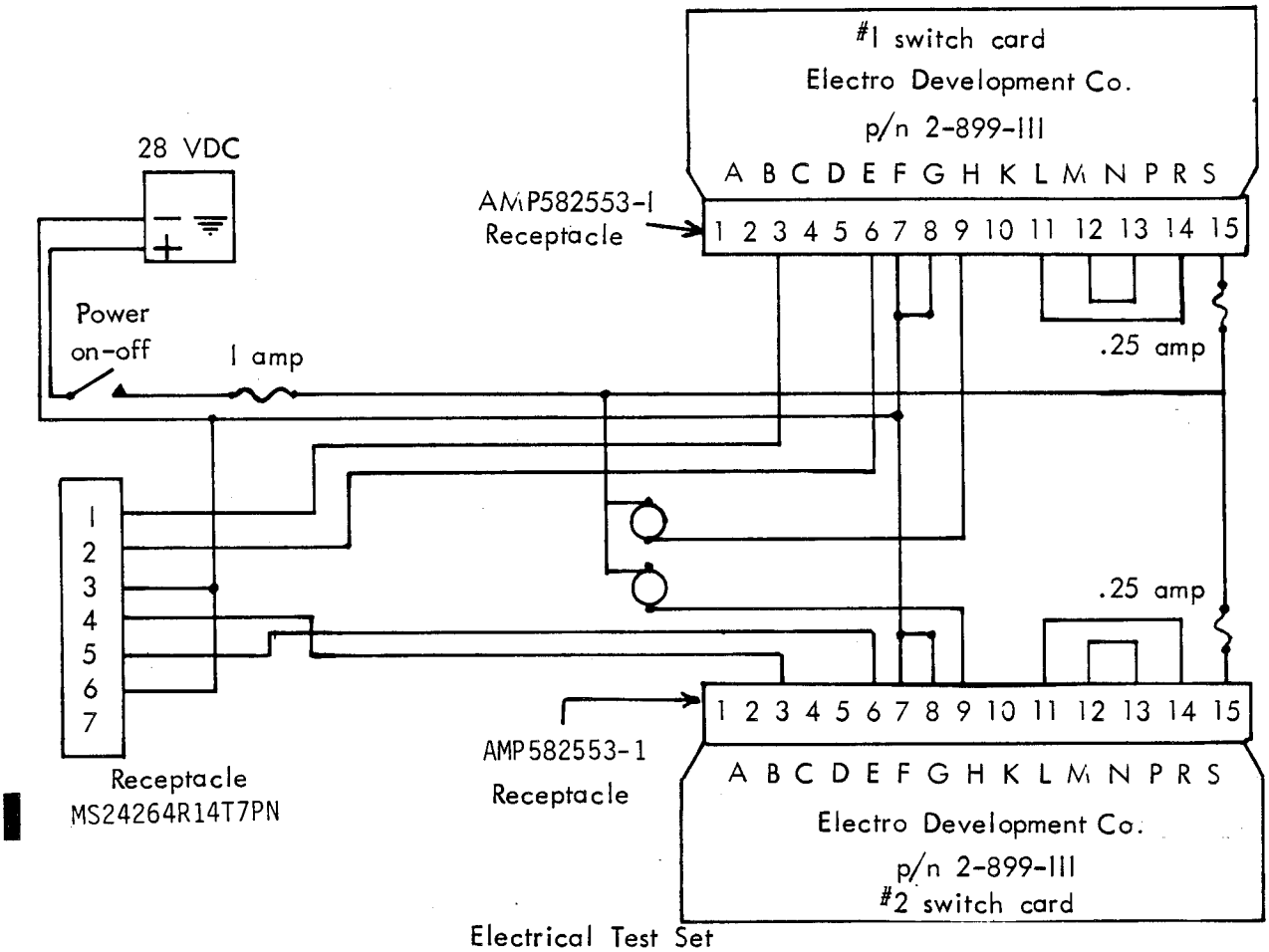


HYDRAULIC TEST STAND
0#-3600# psig

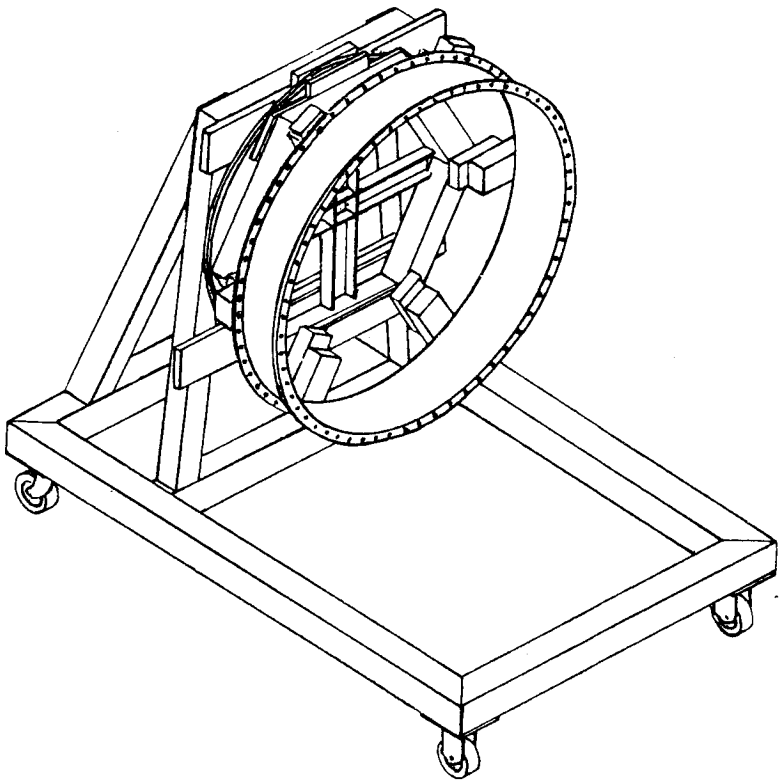
Figure 1001



Hydraulic Test Stand
Figure 1002



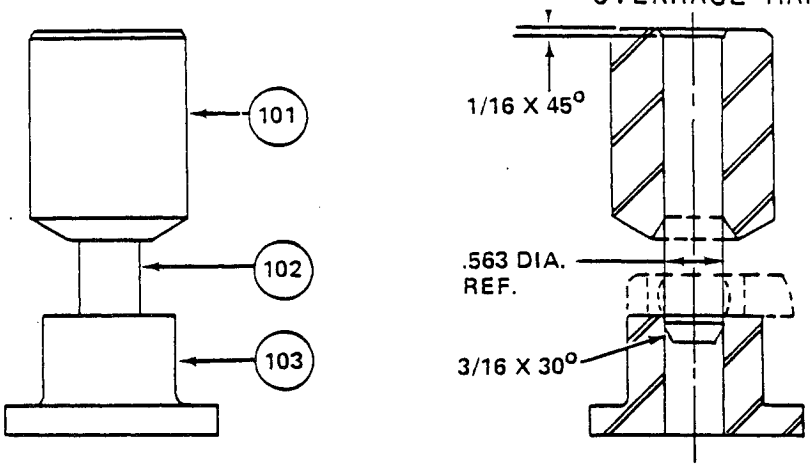
Electrical Test Set
Figure 1003



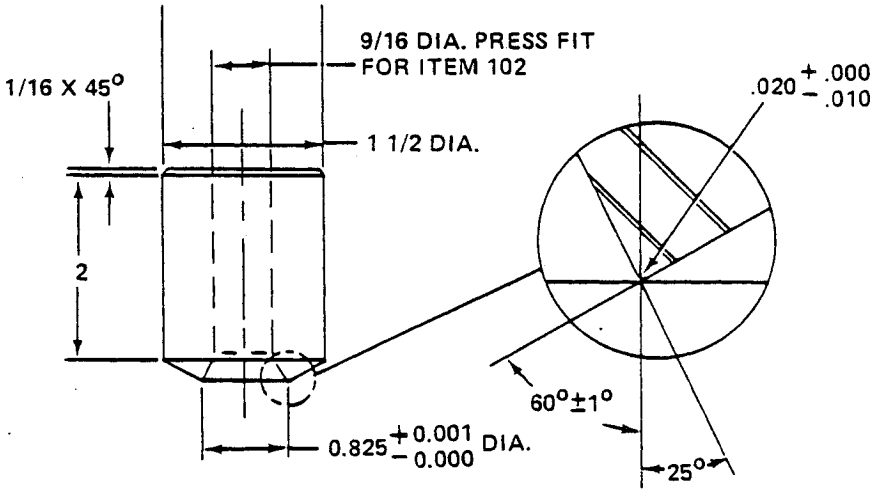
THRUST REVERSER DIMENSIONS		
TOTAL WEIGHT	392 pounds	(178 kgs)
OVERALL LENGTH	74 inches	(188 cm)
OVERALL DIAMETER	47 inches	(119 cm)
OVER DOOR FAIRING	60 inches	(152 cm)

Thrust Reverser Holding Fixture

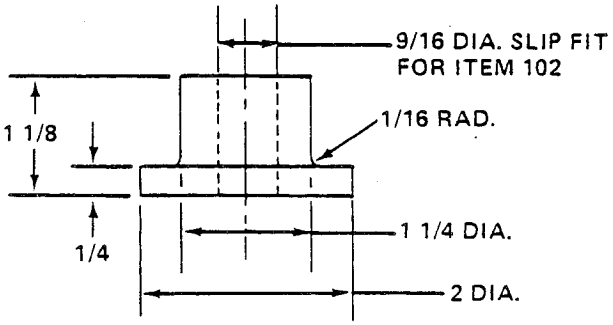
Figure 1004



1) TOOL FUNCTION: TO STAKE AW6SP20 TYPE BEARING RACE.
2) MATERIAL LISTING:
   A) ITEM 101--1 3/4 INCH DIA. X 2 1/4 INCH HIGH. 0–1 TOOL STEEL.
   B) ITEM 102--0.563 INCH DIA. X 3 INCH LONG STANDARD STEEL DOWEL.
   C) ITEM 103--2 INCH DIA. X 1 1/4 INCH HIGH 4340 STEEL.
3) MANUFACTURING NOTE: BREAK ALL SHARP EDGES.



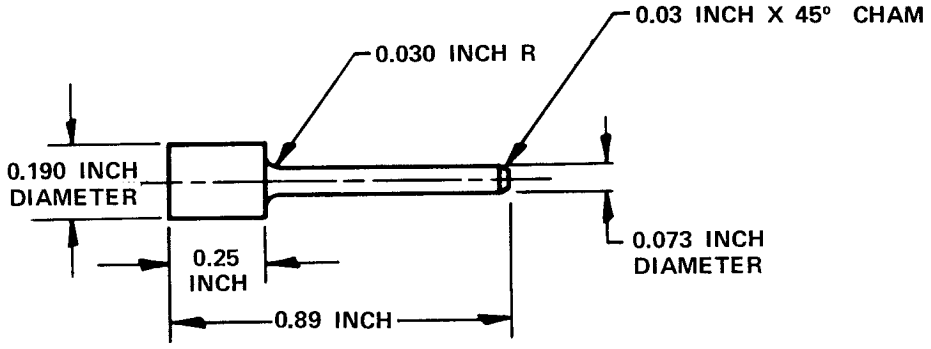
ITEM 101
   A) HEAT TREAT-- R/C 58–62
   B) ALL DIAMETERS CONCENTRIC WITHIN 0.001 T.I.R.



ITEM 103
   A) HEAT TREAT–R/C 34–38 BEFORE MACHINING

737–34
12–83

Staking Tool
Figure 1005

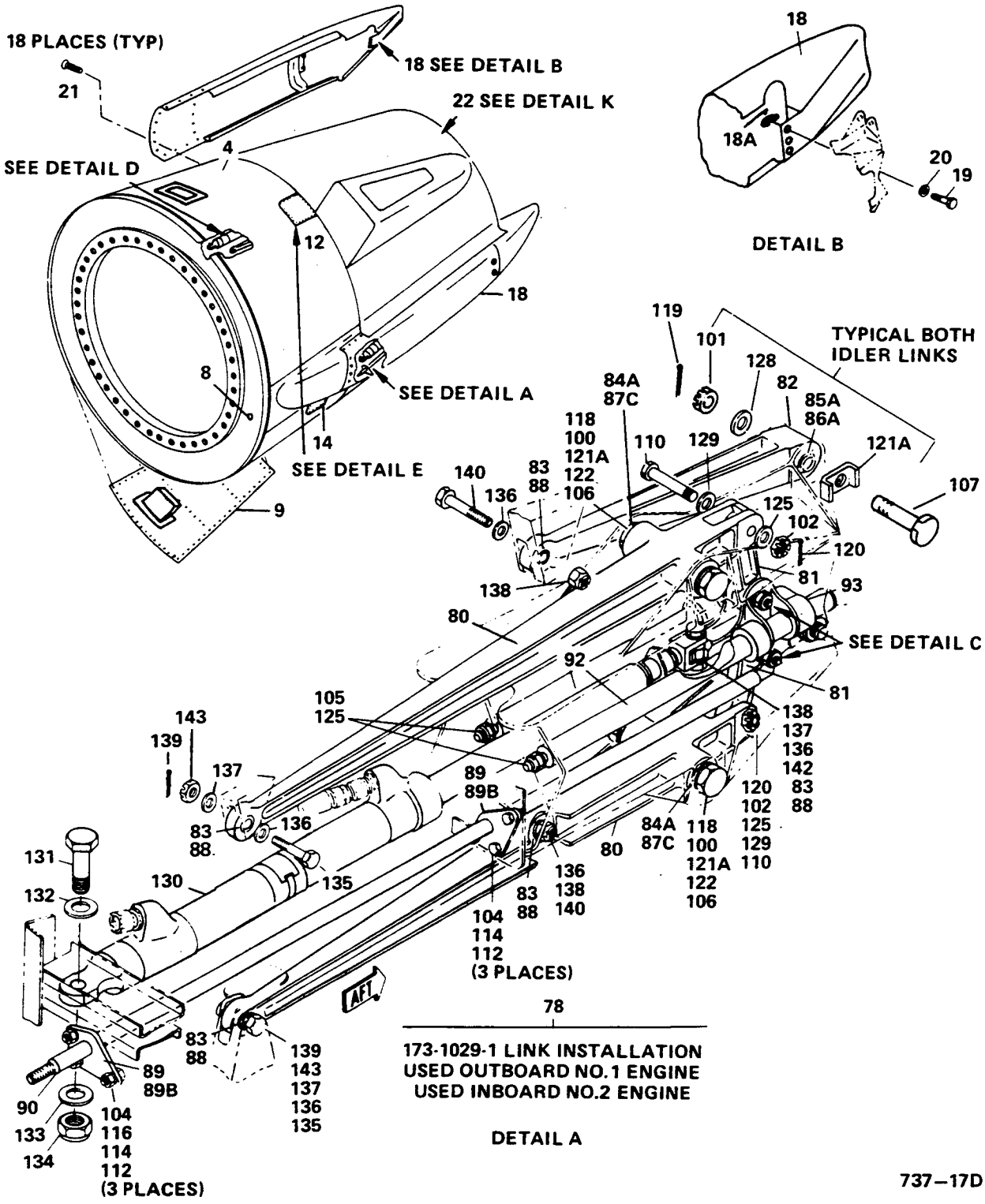


CRACKING PRESSURE CHECK RESTRICTOR VALVE PIN

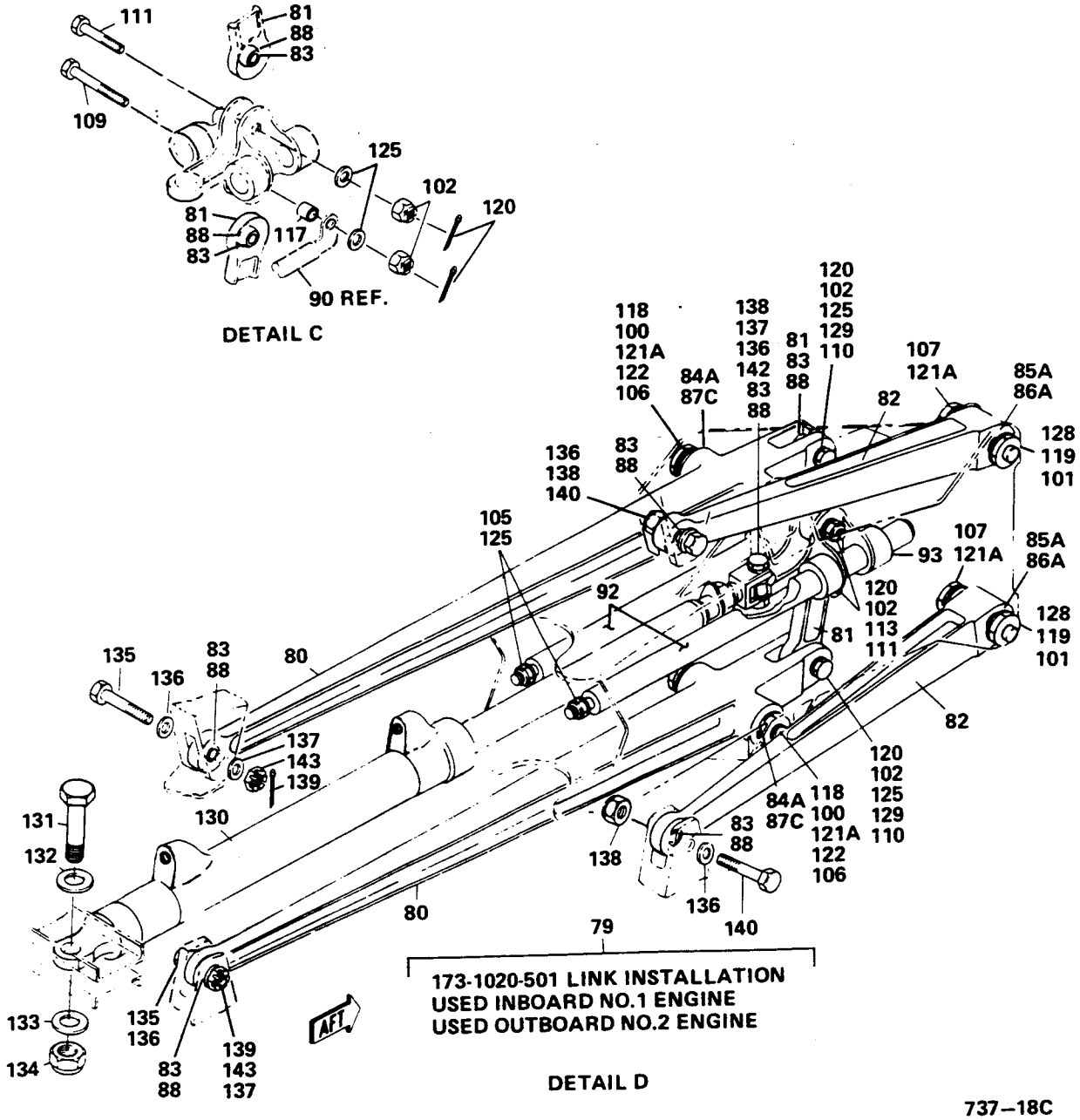
NOTE: MATL: CRES OR BRASS

FIGURE 1007

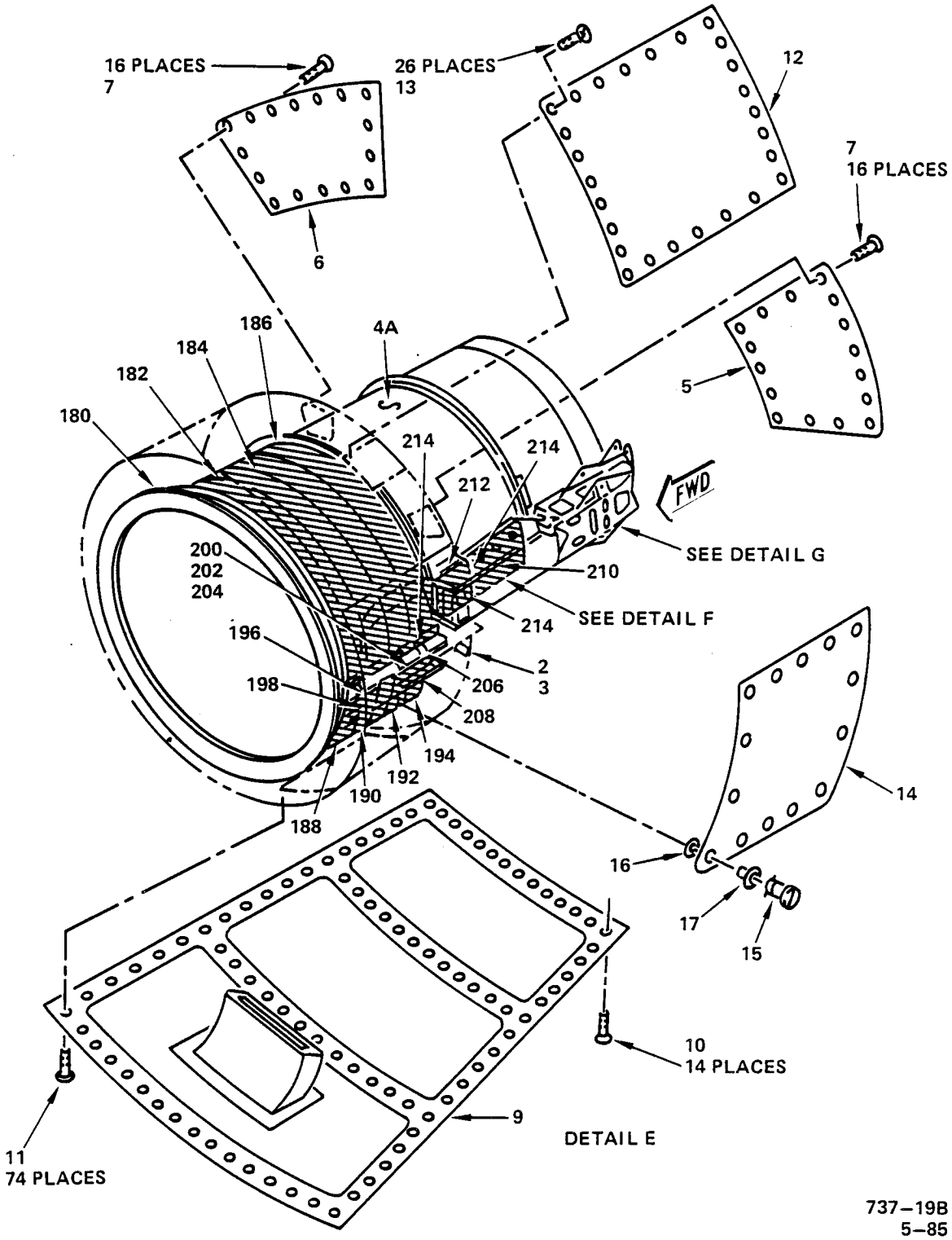
ILLUSTRATED PARTS LIST



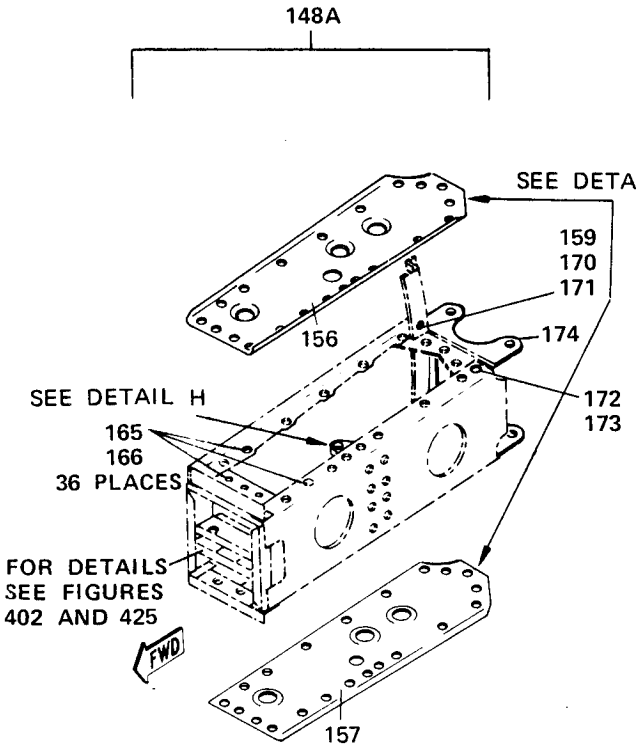
737 Thrust Reverser Assembly
Figure 1101 (Sheet 1)



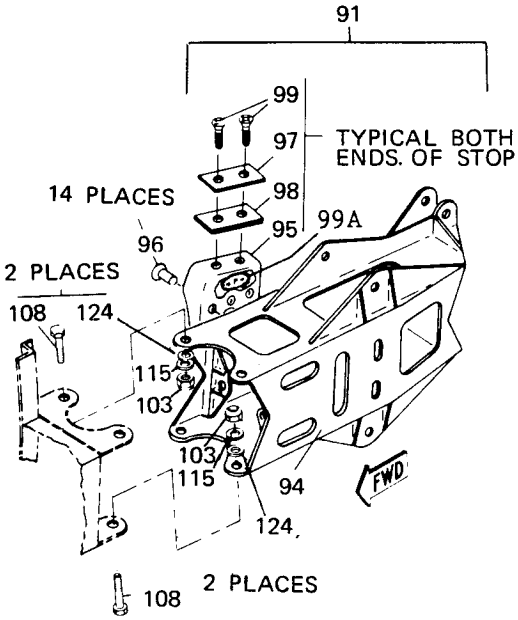
737 Thrust Reverser Assembly
Figure 1101 (Sheet 2)



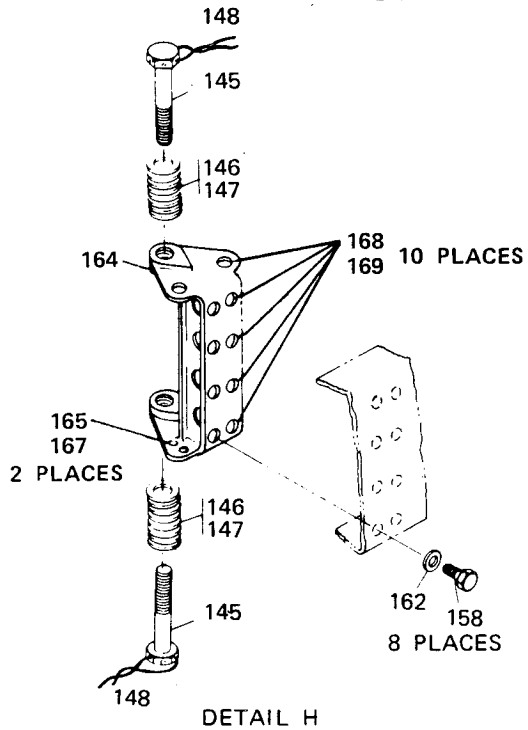
737 Thrust Reverser Assembly
Figure 1101 (Sheet 3)



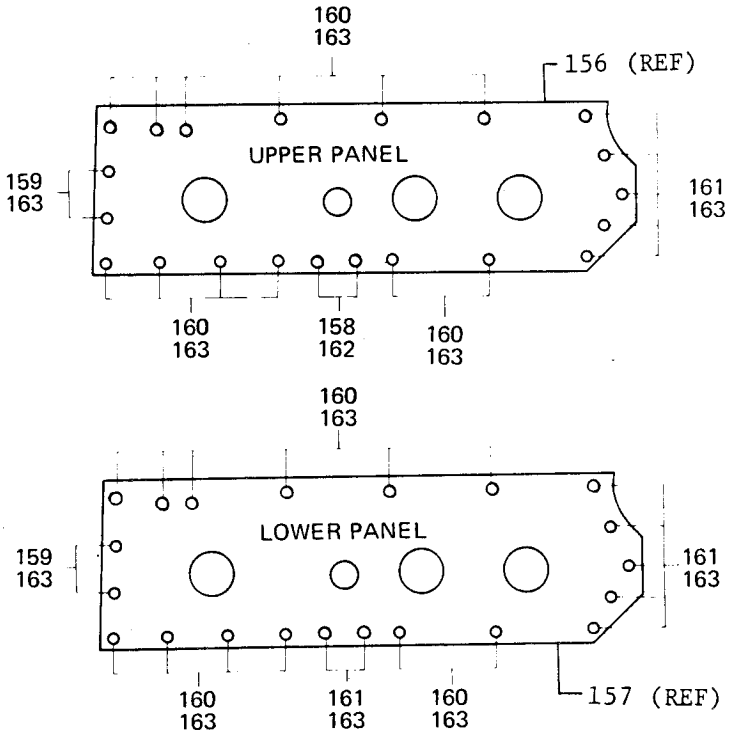
DETAIL F



DETAIL G

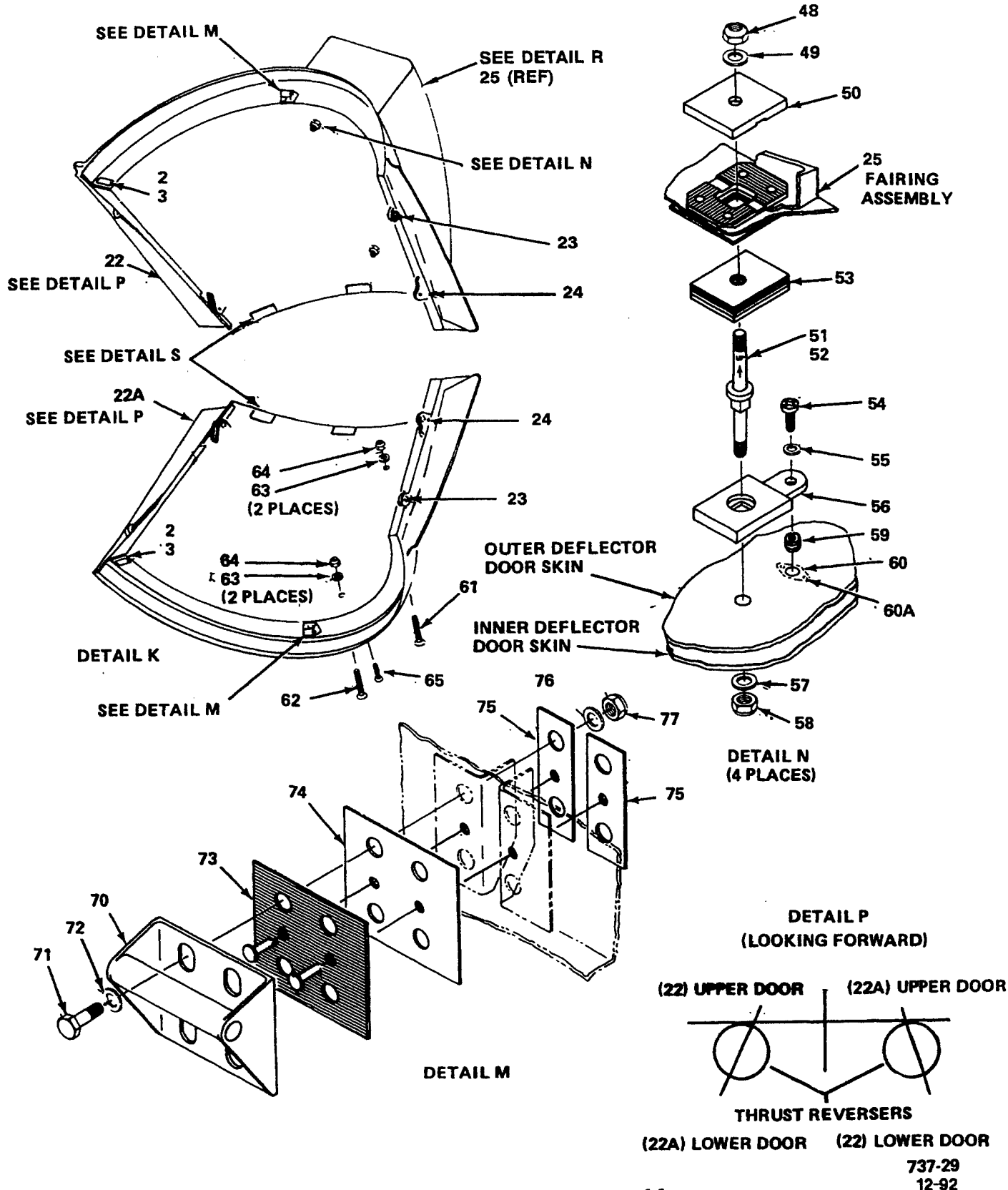


DETAIL H



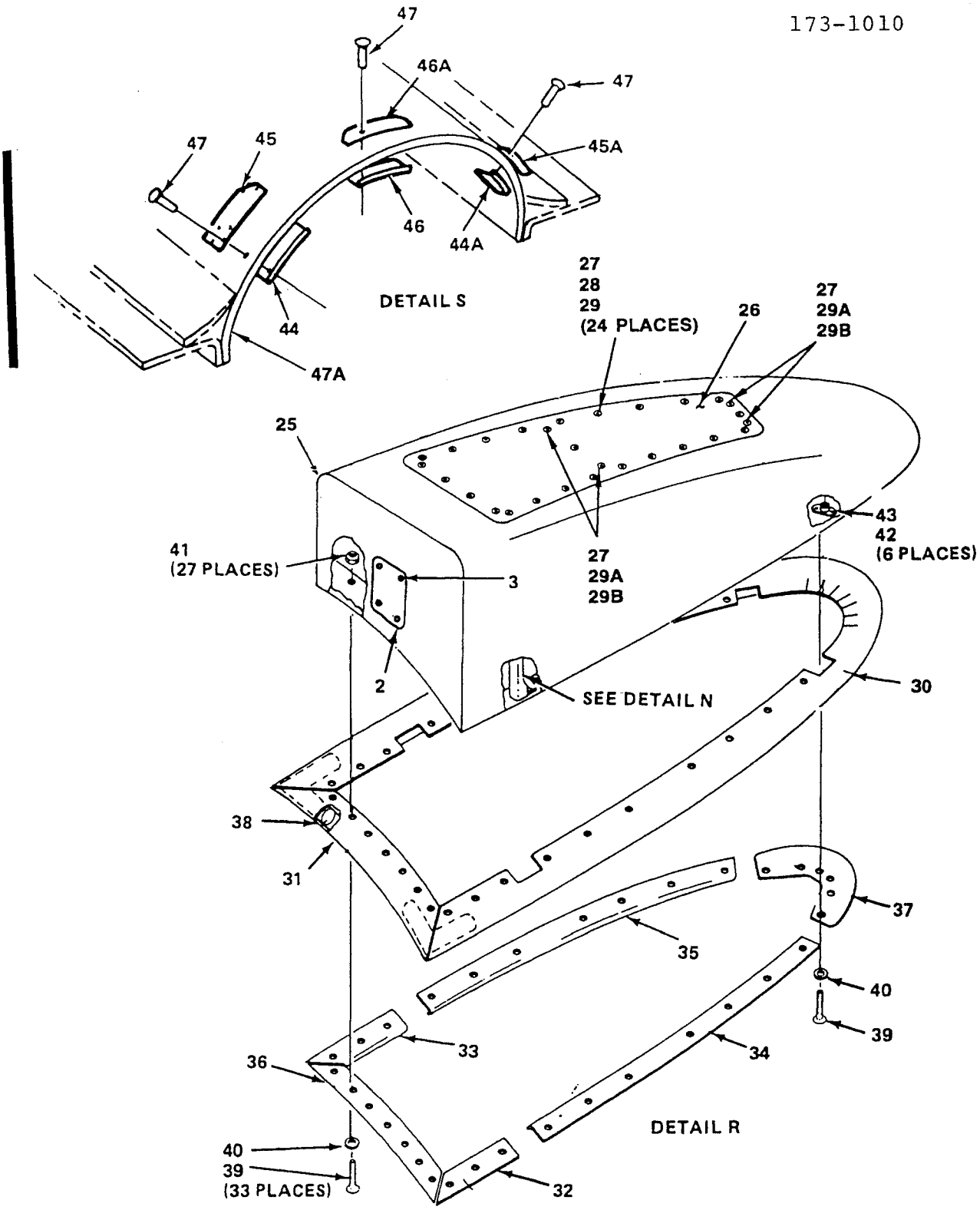
DETAIL J

737 Thrust Reverser Assembly
Figure 1101 (Sheet 4)



737 Thrust Reverser Assembly
Figure 1101 (Sheet 5)

173-1010



737-30A

737 Thrust Reverser Assembly
Figure 1101 (Sheet 6)

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
-1	173-1010-1		THRUST REVERSER ASSY		RF
-1	173-1010-2		THRUST REVERSER ASSY		RF
-1	173-1010-501		. THRUST REVERSER ASSY		RF
-1	173-1010-503		. THRUST REVERSER ASSY		RF
-1	173-1010-505		. THRUST REVERSER ASSY-CORE 1		RF
-1	173-1010-507		THRUST REVERSER ASSY	N	RF
-1	173-1010-508		THRUST REVERSER ASSY	N	RF
-1	173-1010-509		. THRUST REVERSER ASSY	N	RF
-1	173-1010-511		. THRUST REVERSER ASSY	N	RF
-1	173-1010-513		. THRUST REVERSER ASSY-CORE	N	RF
-1	173-1010-515		THRUST REVERSER ASSY	K	RF
-1	173-1010-516		THRUST REVERSER ASSY	K	RF
-1	173-1010-517		. THRUST REVERSER ASSY 4	K	RF
-1	173-1010-519		. THRUST REVERSER ASSY	K	RF
-1	173-1010-521		. THRUST REVERSER ASSY-CORE	K	RF
-1	173-1010-525		THRUST REVERSER ASSY		RF
-1	173-1010-526		THRUST REVERSER ASSY		RF
-1	173-1010-527		. THRUST REVERSER ASSY 5		RF
-1	173-1010-528		. THRUST REVERSER ASSY		RF
-1	173-1010-523		. THRUST REVERSER ASSY-CORE		RF
2	173-1156-1		. NAMEPLATE (USED ON 173-1021-1)		1
2	173-1156-2		. NAMEPLATE (USED ON 173-1021-2)		1
2	173-1156-501		. NAMEPLATE (USED ON 173-1026-1)		1
2	173-1156-502		. NAMEPLATE (USED ON 173-1026-2)		1
2	173-1156-513		. NAMEPLATE (USED ON 173-1010-505)		1
2	S173N1934		. NAMEPLATE	K	1
3	MS20470D3		. RIVET		4
4	173-1011-1		. SHROUD ASSY		1
4	173-1011-543		. SHROUD ASSY		1
4	173-1011-547		. SHROUD ASSY	K	1
4	173-1011-549		. SHROUD ASSY 5		1
4A	173-1012-501		. . NOZZLE ASSY (ON 173-1010-501)		RF
4A	173-1012-507		. . NOZZLE ASSY (ON 173-1010-507)	N	RF
4A	173-1012-509		. . NOZZLE ASSY	K	RF
4A	173-1012-517		. . NOZZLE ASSY 5		RF
5	173-1011-171		. . COVER		1
6	173-1011-173		. . COVER		1
7	NAS1143-4		. . BOLT		32
8	173-1151-1		. . PIN, ALIGNMENT		1
9	173-1019-3		. . PANEL, HYDRAULIC ACCESS		1
9	173-1019-5		. . PANEL, HYDRAULIC ACCESS		1
9	173-1019-503		. . PANEL, HYDRAULIC ACCESS 5		1
10	NAS1203-2		. . BOLT		14
11	NAS1203-3		. . BOLT		74
12	173-1045-3		. . PANEL, LOCK ACCESS		1
13	NAS1203-4		. . BOLT		26
14	173-1058-3		. . PANEL, FEEDBACK ACCESS		1

- ITEM NOT ILLUSTRATED

FIG. ITEM	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
1101-					
15	4002-4		. . . STUD, V71286		14
16	R4G		. . . RING, SNAP, V71286		14
17	40G5		. . . GROMMET, V71286		14
18	173-1044-1		. HOUSING ASSY, ACTUATOR		2
18A	NAS1068C3		. . NUTPLATE		3
19	NAS623-3-4		. . SCREW		3
20	AN960-10		. . WASHER		3
21	NAS1203-3		. . SCREW		18
22	173-1021-1		. DEFLECTOR DOOR ASSEMBLY	a, d	1
-22A	173-1021-2		. DEFLECTOR DOOR ASSEMBLY	b, c	1
23	173-1050-1		. . DOOR HINGE, FWD		2
-23A	173-1050-2		. . DOOR HINGE, FWD		2
24	173-1048-1		. . DOOR HINGE, AFT		2
-24A	173-1048-2		. . DOOR HINGE, AFT		2
-24B	173-1048-501		. . DOOR HINGE, AFT		2
-24C	173-1048-502		. . DOOR HINGE, AFT		2
25	173-1026-1		. . FAIRING ASSEMBLY	a	1
-25A	173-1026-517		. . FAIRING ASSEMBLY	a	1
-25B	173-1026-2		. . FAIRING ASSEMBLY	b	1
-25C	173-1026-518		. . FAIRING ASSEMBLY	b	1
26	173-1026-13		. . . ACCESS PANEL (USED ON 173-1026-1 & -517)		1
-26A	173-1026-57		. . . ACCESS PANEL (USED ON 173-1026-1 & -517)		1
-26B	173-1026-14		. . . ACCESS PANEL (USED ON 173-1026-2 & -518)		1
26C	173-1026-58		. . . ACCESS PANEL (USED ON 173-1026-2 & -518)		1
			ATTACHING PARTS		
27	NAS1203-2		. . . SCREW (USED ON 173-1026-1,-2, -517, & -518)		28
			---*---		
28	NAS1063A		. . . NUTPLATE		24
			ATTACHING PARTS		
29	MS20426D3		. . . RIVET		48
			---*---		3
29A	NAS687A3		. . . NUTPLATE		4
			ATTACHING PARTS		
29B	MS20426D3		. . . RIVET		8
			---*---		
30	173-1166-3		. . . SEAL (USED ON 173-1026-1 & -517)		1

-Items not illustrated

FIG. ITEM	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
1101-					
-30A	173-1166-4		. . . SEAL (USED ON 173-1026-2 & -518)		1
31	173-1166-5		. . . SEAL (USED ON 173-1026-1, -2, -517, & -518)		1
32	173-1166-7		. . . RETAINER (USED ON 173-1026-1 & -517)		1
-32A	173-1166-8		. . . RETAINER (USED ON 173-1026-2 & -518)		1
33	173-1166-9		. . . RETAINER (USED ON 173-1026-1 & -517)		1
-33A	173-1166-10		. . . RETAINER (USED ON 173-1026-2 & -518)		1

-Items not illustrated

FIG. ITEM	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
1101-					
34	173-1166-11		. . . RETAINER (USED ON 173-1026-1 & -517)		1
-34A	173-1166-12		. . . RETAINER (USED ON 173-1026-2 & -518)		1
35	173-1166-13		. . .RETAINER (USED ON 173-1026-1 & -517)		1
-35A	173-1166-14		. . .RETAINER (USED ON 173-1026-2 & -518)		1
36	173-1166-15		. . . RETAINER (USED ON 173-1026-1, -2, -517, & -518)		1
37	173-1166-21		. . . RETAINER (USED ON 173-1026-1, -2, -517, & -518)		1
38	173-1166-19		. . . RUBBER FILLER PLUG, V75345 (USED ON 173-1026-1, -2, -517, & -518)		4
39	NAS603-8		. . . SCREW		33
40	NAS620-10L		. . . WASHER		33
41	NAS679A3		. . . NUT		27
42	NAS1068A3		. . . NUTPLATE		6
43	MS20426D3		. . . RIVET		12
44	173-1192-3		. . BUMPER - END		1
44A	173-1192-4		. . BUMPER - END		1
45	173-1192-5		. . CAP - END		1
45A	173-1192-6		. . CAP - END		1
46	173-1192-7		. . BUMPER - CENTER		1
46A	173-1192-9		. . CAP - CENTER		1
47	MS20615-6M		. . RIVET		AR
47A	173-1024-1		. . SLUG		1
48	NAS679A5		. . NUT		4
49	AN960-516		. . WASHER		4
50	173-1069-1		. . SERRATED PLATE		4
51	173-1160-501		. . STUD, FORWARD	e	2
51	173-1160-505		. . STUD, FORWARD	f	2
52	173-1160-1		. . STUD, AFT	e	2
52	173-1160-503		. . STUD, AFT	f	2
53	173-1162-1		. . SPACER		AR
53	173-1162-501		. . SPACER		AR
53	173-1162-503		. . SPACER (USED ON FWD. STUD ONLY)		AR
53	173-1162-505		. . SPACER		AR
53	173-1162-507		. . SPACER		AR
53	173-1162-509		. . SPACER (USED ON ALL 4 STUDS)		4
54	CFA18-3-14		. . SCREW, V97928		4
55	AN960-10L		. . WASHER		4
56	173-1158-1		. . SPACER	e	4
56	173-1158-501		. . SPACER	f	4
57	TLN1020C5W		. . WASHER, V85495		4

-Items not illustrated

FIG. ITEM	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
1101-					
58	TLN1020C5N		..NUT, V85495		4
59	NS103303-2-02		..INSERT, V80539		4
60	NS103303-02		..NUTPLATE, V80539		4
60A	MS20427M3		..RIVET		8
61	106497-5-19		..BOLT, V80539	p	2
-61A	NAS560HK5-17		..BOLT (SUPERSEDES 10647-5-19)	q	2
62	106497-5-21		..BOLT, V80539	p	2
-62A	NAS560HK5-19		..BOLT (SUPERSEDES 106497-5-21)	q	2
63	TLN1020C5W		..WASHER, V85495		4
64	TLN1020C5N		..NUT, V85495		4
65	CFA18-3-14		..SCREW, V97928		4
70	173-1157-1		..FITTING, LATCH		1
71	VS2667-4P-10		..BOLT, V12733		8
-71A	NAS6704U10		..BOLT (ALT FOR VS2667-4P-10)		8
72	AN960C416		..WASHER		8
73	173-1159-1		..PLATE		2
74	173-1021-71		..SHIM		2
75	173-1021-47		..FILLER		4
76	AN960C416L		..WASHER		8
77	NAS679C4		..NUT		8
78	173-1029-1		.LINK INSTALLATION		
79	173-1029-501		.LINK INSTALLATION		
80	173-1030-1		..LINK ASSEMBLY, DRIVE (PRE SB 78-1054) (REIDENTIFIED AS 173M2047-501 POST SB 78-1054) (SUPERSEDED BY 173-1030-501)	g, h	2
-80A	173-1030-501		..LINK ASSEMBLY, DRIVE (PRE SB 78-1054) (REIDENTIFIED AS 173M2047-501 POST SB 78-1054) (SUPERSEDES 173-1030-1) (SUPERSEDED BY 173-1030-503)	g, h	2
-80B	173-1030-503		..LINK ASSEMBLY, DRIVE (PRE SB 78-1054) (REIDENTIFIED AS 173M2047-501 POST SB 78-1054) (SUPERSEDES 173-1030-501) (SUPERSEDED BY 173-1030-507)	g, h	2
-80C	173-1030-505		..LINK ASSEMBLY, DRIVE (PRE SB 78-1054) (ALTERNATE TO 173-1030-503) (SUPERSEDED BY 173-1030-507)	g, h	RF
-80D	173-1030-507		..LINK ASSEMBLY, DRIVE (PRE SB 78-1054) (SUPERSEDES 173-1030-505) (SUPERSEDED BY 173-1030-509)	g, h	2

-Items not illustrated

FIG. ITEM	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
1101-					
-80E	173-1030-509		.LINK ASSEMBLY, DRIVE (SUPERSEDES 173-1030-507) (POST SB 78-1054)	g, h	2
81	173-1032-1		..LINK ASSEMBLY, OVERCENTER	g, h	2
82	173-1034-1		..LINK ASSEMBLY, IDLER (SUPERSEDED BY 173-1034-501)	g, h	2
-82A	173-1034-501		..LINK ASSEMBLY, IDLER (SUPERSEDES 173-1034-1) (POST SB 78-1054)	g, h	2
83	A022310		..BEARING, SPHERICAL, V06710 (USED ON 173-1030-1 ASSY)		1
83A	A022310		..BEARING, SPHERICAL, V06710 (USED ON 173-1032-1 ASSY)		2
83B	A022310		..BEARING, SPHERICAL, V06710 (USED ON 173-1034-1 ASSY)		1
83C	A022310		..BEARING, SPHERICAL, V06710 (USED ON 173-1036-1 ASSY		1
84	173-1042-1		..BUSHING, INNER, DRIVE LINK (USED ON 173-1030-1 ASSY)		1
-84A	173-1042-3		..BUSHING, INNER, DRIVE LINK (USED ON 173-1030-501, -503, -505) (SUPERSEDES 173-1042-1) (SUPERSEDED BY 173-1042-5)		1
-84B	173-1042-5		..BUSHING, INNER, DRIVE LINK (SUPERSEDES 173-1042-1) (SUPERSEDED BY 173-1042-7) (USED ON 173-1030-507)		1
-84C	173-1042-7		..BUSHING, INNER, DRIVE LINK (SUPERSEDES 173-1042-5) (USED ON 173-1030-509) (POST SB 78-1054)		1
-84D	VTC00750		..BUSHING, INNER, DRIVE LINK, V9U286 (OPTIONAL TO 173-1042-7) (POST SB 78-1054)		RF
85	173-1043-1		BUSHING, INNER IDLER LINK (USED ON 173-1034-1 ASSY)		1
-85A	173-1043-3		BUSHING, INNER, IDLER LINK (USED ON 173-1034-1) (SUPERSEDES 173-1043-1) (SUPERSEDED BY 173-1043-5)		1
-85B	173-1043-5		BUSHING, INNER, IDLER LINK (SUPERSEDES 173-1043-3) (USED ON 173-1034-501) (POST SB 78-1054)		1

-Items not illustrated

FIG. ITEM	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
1101-					
-85C	VTC00770		..BUSHING, INNER, IDLER LINK, V9U286 (OPTIONAL TO 173-1043-5) (POST SB 78-1054)		RF
86	173-1054-1		...BUSHING, IDLER LINK (PART OF 173-1034-1 ASSY) (SUPERSEDED BY 173-1054-5)		1
-86A	173-1054-3		...BUSHING, IDLER LINK (ALTERNATE TO 173-1054-1) (SUPERSEDED BY 173-1054-7)		1
-86B	173-1054-5		...BUSHING, IDLER LINK (SUPERSEDES 173-1054-1) (PART OF 174-1034-501)		1
-86C	173-1054-7		...BUSHING, IDLER LINK (SUPERSEDES 174-1054-3) (ALTERNATE TO 173-1054-5) (POST SB 78-1054)		1
-86D	VTC00820		...BUSHING, IDLER LINK, V9U286 (OPTIONAL TO 173-1054-7) (POST SB 78-1054)		RF
87	173-1056-1		...BUSHING, DRIVER LINK (PART OF 173-1030-1 ASSY)		1
-87A	173-1056-3		...BUSHING, DRIVER LINK (ALTERNATE TO 173-1056-1) (PART OF 173-1030-501 ASSY)		1
-87B	173-1056-5		...BUSHING, DRIVER LINK (PART OF 173-1030-501, -503, AND -505 ASSY)		1
-87C	173-1056-7		...BUSHING, DRIVER LINK (SUPERSEDES 173-1056-1, -3, AND -5) (PART OF 173-1030-507 ASSY) (PART OF 173-1030-509 ASSY)		2
-87D	VTC00760		...BUSHING, DRIVER LINK, V9U286 (OPTIONAL TO 173-1056-7) (POST SB 78-1054)		RF
88	AM1629		...BEARING RACE, V15860 (PART OF 173-1030-1 ASSY)		1
-88A	AM1629		...BEARING RACE, V15860 (PART OF 173-1032-1 ASSY)		2
-88B	AM1629		...BEARING RACE, V15860 (PART OF 173-1034-1 ASSY)		1
-88C	AM1629		...BEARING RACE, V15860 (PART OF 173-1036-1 ASSY)		1

-Items not illustrated

FIG. ITEM	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
1101-					
88	422687		...BEARING RACE, V06710 (OPTIONAL TO AM1629)		AR
88	50068		...BEARING RACE, V09455 (OPTIONAL TO AM1629)		AR
88	PSBS14-1		...BEARING RACE, V21335 (OPTIONAL TO AM1629)		AR
89	173-1040-1		..GUIDE		2
89A	173-1040-7		..GUIDE (ALTERNATE TO 173-1040-1		2
89B	173-1196-1		..DOUBLER		2
90	173-1039-1		..ROD ASSEMBLY		1
91	173-1029-3		..SUPPORT ASSEMBLY	g,h	1
92	173-1038-1		...ROD ASEMBLY	l	2
92	173-1038-7		...ROD ASSEMBLY	m	2
93	173-1036-1		...CARRIAGE ASSEMBLY		1
94	173-1015-1		...SUPPORT		1
95	173-1029-7		...STOP		1
96	MS20615-5M		...RIVET		14
97	173-1029-9		...PLATE		2
98	173-1029-5		...SHIM, LAMINATED		2
99	NAS517-2-3		...BOLT		4
99A	NAS1068A08		...NUTPLATE		4
100	AN320-10		..NUT		2
101	AN320-9		..NUT		2
102	AN320-6		..NUT		4
103	NAS1022A8		..NUT		4
104	NAS679A3		..NUT		6
105	NAS679C6		..NUT		2
106	106492		..BOLT, V80539 (SUPERSEDED BY VPB0002)		2
-106A	VPB0002		..BOLT (SUPERSEDES 106492) (POST SB 78-1054)	h	2
107	NAS1109-27D		..BOLT (SUPERSEDED BY VPB0002)		2
-107A	VPB0003		..BOLT (SUPERSEDES NAS1109-27D) (POST SB 78-1054)	h	2
108	NAS1108-8		..BOLT		4
109	106564-6-23D		..BOLT, V80539	g	1
110	106564-6-19D		..BOLT, V80539		2
111	106564-6-15D		..BOLT, V80539	g	1
111	106564-6-15D		..BOLT, V80539	h	2
112	NAS1103-6		..BOLT		6
113	AN960C616		..WASHER	g,h	4
113	AN960C616		..WASHER	j	2

—Items not illustrated

FIG. ITEM	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
1101-					
114	AN960C10L		..WASHER		9
115	AN960C816L		..WASHER		4
116	AN960C10		..WASHER		3
117	NAS42HT12-24A		..SPACER		1
118	MS24665-374		..PIN-COTTER		AR
119	MS24665-372		..PIN-COTTER		AR
120	MS24665-302		..PIN-COTTER		AR
121	S700W0442		..WASHER (REPLACED BY 121A)		4
121A	173-1105-501		..WASHER-RETAINER (REPLACES 121)		4
122	AN960C1016L		..WASHER		2
123	AN960C916		..WASHER (REPLACED BY 121)		2
124	AN960C816		..WASHER		4
125	AN960C616		..WASHER	g, h	4
125	AN960C616		..WASHER	j	2
126	AN960C-10L		..WASHER		9
127	MS20002C10		..WASHER (REPLACED BY 121)		2
128	MS20002C9		..WASHER		2
129	MS20002C6		..WASHER		2
130	1U1220-2		..ACTUATOR, V94641 (PER ROHR 173-1902-1) SEE SUBJECT 78-32-05		1
130A	60470		..ACTUATOR, V99643 (PER ROHR 173-1902-503) SEE SUBJECT 78-30-05 (ALT FOR 1U1220-2)		1
131	NAS1307-14		..BOLT		2
132	MS20002C7		..WASHER		2
133	AN960-716		..WASHER		2
134	NAS1022A7		..NUT		2
135	106564-6-15D		..BOLT, V80539		2
136	MS20002C6		..WASHER		AR
137	AN960-616		..WASHER		10
138	NAS679A6		..NUT (REPLACED BY 138A)		6
138A	MS21042L6		..NUT (REPLACES 138)		6
139	MS24665-300		..PIN - COTTER		AR
140	106564-6-14		..BOLT, V80539		2
142	NAS1106-15		..BOLT		2
143	AN320-6		..NUT		4
145	NAS564-31		..BOLT		4
146	AN960-416L		..WASHER		AR
147	AN960-416		..WASHER		AR
148	MS20995C32		..LOCKWIRE		AR
148A	173-1013		..SUPPORT ASSEMBLY		RF
156	173-1013-5		..PANEL ASSEMBLY (USED ON TOP LEFT SIDE AND LOWER RIGHT SIDE OF THRUST REVERSER)		1

– Items not illustrated

FIG. ITEM	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
1101-					
157	173-1013-6		..PANEL ASSEMBLY (USED ON TOP RIGHT SIDE AND LOWER LEFT SIDE OF THRUST REVERSER)		1
158	NAS1103-4		..BOLT		10
159	NAS1104-3		..BOLT		6
160	NAS1104-4		..BOLT		12
161	NAS1104-5		..BOLT		10
162	AN960D10L		..WASHER		10
163	AN960D416		..WASHER		AR
164	173-1017-1		..STOP		1
165	NAS1068A4		..NUTPLATE		38
166	MS20426D3		..RIVET		72
167	MS20426D4		..RIVET		4
168	NAS1068A3		..NUTPLATE		10
169	MS20426D5		..RIVET		20
170	AN960C416L		..WASHER		2
171	NAS679A4		..NUT		2
172	NAS1418-4		..PIN		2
173	NAS1080E8		..COLLAR		2
174	173-1014-1		..SUPPORT ASSEMBLY		1
-178	400827-500		.BLANKET SET, SHROUD, V70628		RF
180	400827-501		..BLANKET ASSY, V70628		2
182	400827-503		..BLANKET ASSY, V70628		2
184	400827-505		..BLANKET ASSY, V70629		2
186	400827-507		..BLANKET ASSY, V70628		2
188	400827-511		..BLANKET ASSY, V70628		1
190	400827-513		..BLANKET ASSY, V70628		1
192	400827-515		..BLANKET ASSY, V70628		1
194	400827-517		..BLANKET ASSY, V70628		1
196	400827-319		..BLANKET ASSY, V70628		1
198	400827-321		..BLANKET ASSY, V70628		1
200	400827-323		..BLANKET ASSY, V70628		2
202	400827-325		..BLANKET ASSY, V70628		4
204	400827-327		..BLANKET ASSY, V70628		1
206	400827-329		..BLANKET ASSY, V70628		1
208	400827-331		..BLANKET ASSY, V70628		1
210	400827-333		..BLANKET ASSY, V70628		1
212	400827-337		..BLANKET ASSY, V70628		1
214	MS20995C41		..LOCKWIRE		AR

-Items not illustrated

a used on upper side of 173-1010-1
b used on upper side of 173-1010-2
c used on lower side of 173-1010-1
d used on lower side of 173-1010-2
e used on thrust reverser serial 001 thru 081
f used on thrust reverser serial 082 and subsequent
g used on 173-1029-1
h used on 173-1029-501
j used on 173-1029-3
k used on JT8D-17 engine only
l effective 001491
m effective 492999
n used on JT8D-15 engine only
p effective 001752
q effective 753999

1> 173-1010-1 - Left thrust reverser assembly, complete
173-1010-2 - Right thrust reverser assembly, complete
173-1010-501 - Left thrust reverser with doors, less 173-1026-1 fairing
173-1010-503 - Right thrust reverser with doors, less 173-1026-2 fairing
173-1010-505 - Thrust reverser assembly, Core/Basic
173-1010-507 - Left hand thrust reverser, complete
173-1010-508 - Right thrust reverser assembly, complete
173-1010-509 - Left thrust reverser with doors, less 173-1026-1 fairing
173-1010-511 - Right thrust reverser with doors, less 173-1026-2 fairing
173-1010-513 - Thrust reverser assembly, Core/Basic

2> 173-1160-1 stud and 173-1158-1 spacer should be replaced by 173-1160-503 stud and 173-1158-501 spacer.

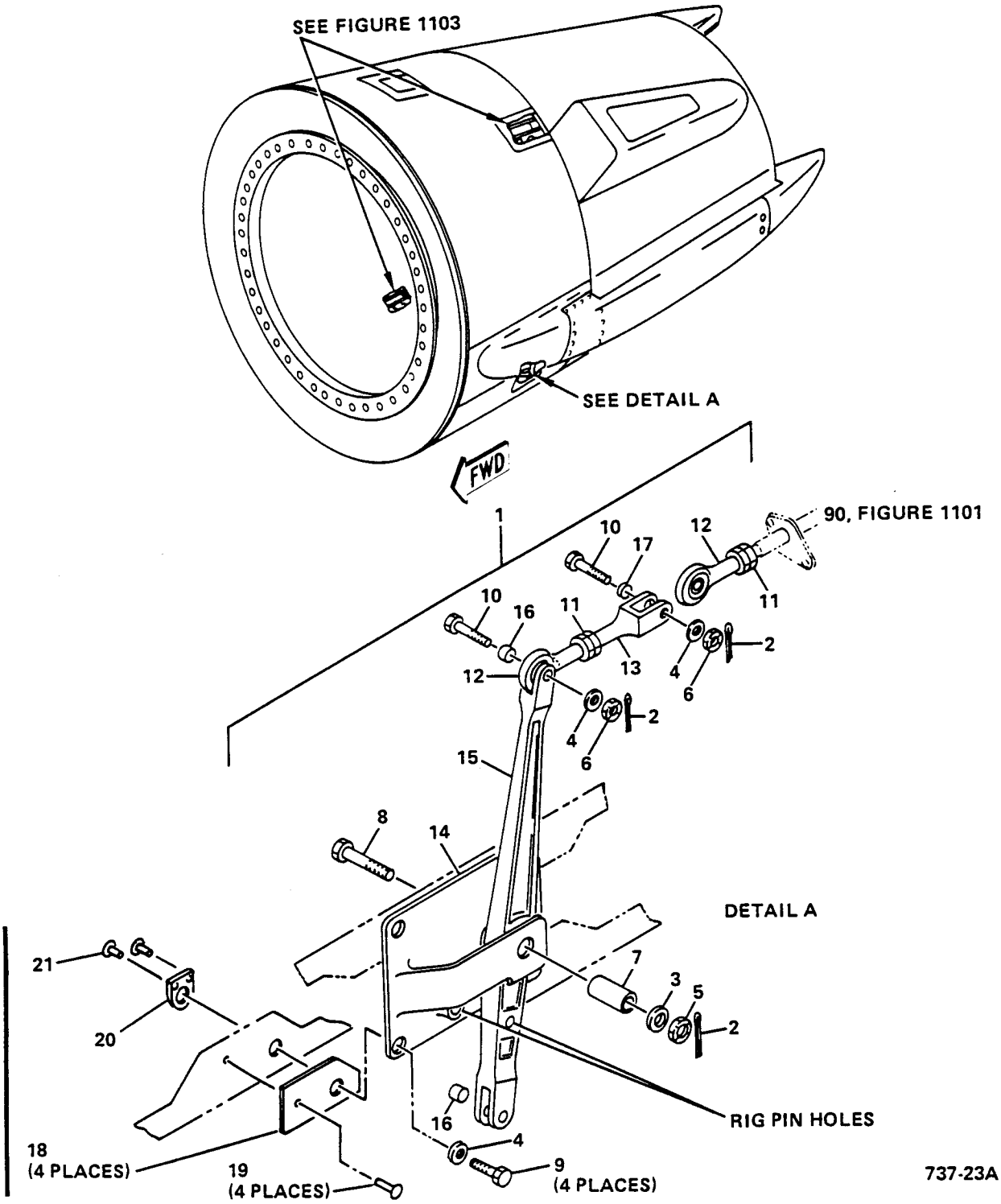
2> 173-1160-501 stud and 173-1158-1 spacer should be replaced by 173-1160-505 stud and 173-1158-501 spacer.

3> 173-1048-501 and -502 hinges are superseding parts for 173-1048-1 and -2.

4> 173-1010-515 - Left thrust reverser assembly, complete
173-1010-516 - Right thrust reverser assembly, complete
173-1010-517 - Left thrust reverser with doors, less 173-1026-1 fairing
173-1010-519 - Right thrust reverser with doors, less 173-1026-2 fairing
173-1010-521 - Thrust reverser assembly, Core/Basic

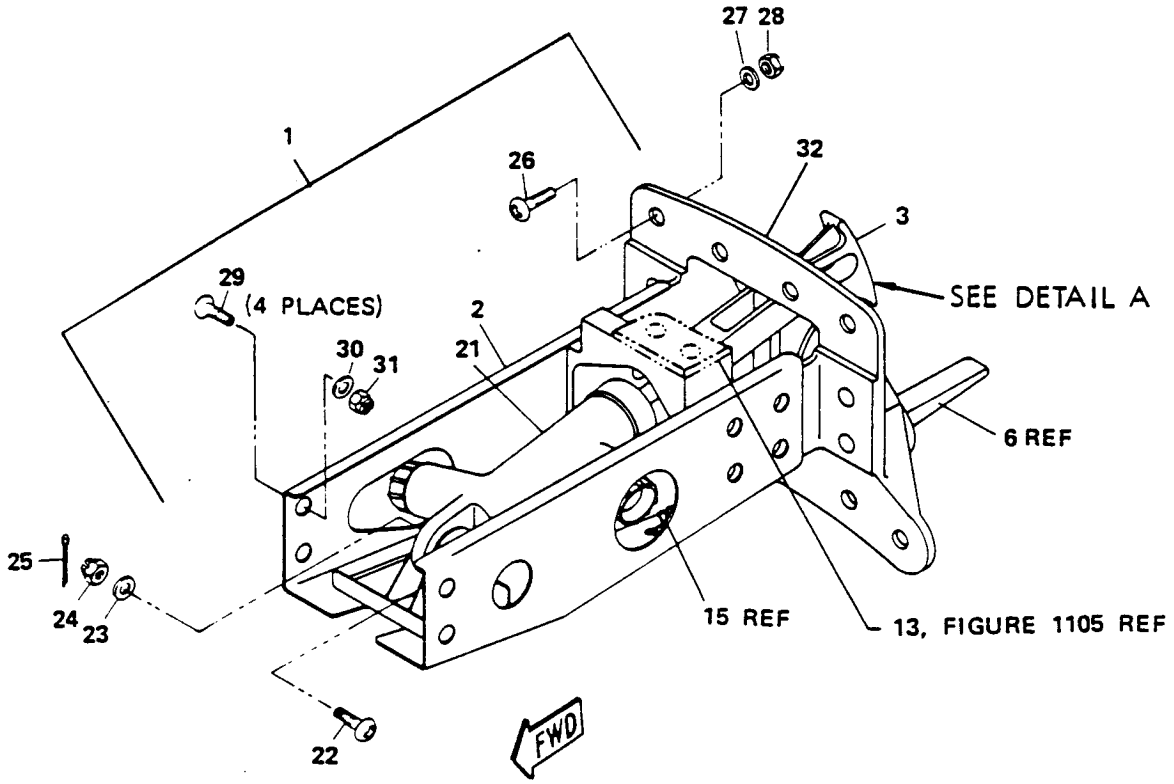
5> 173-1010-525 - Left thrust reverser assembly, complete
173-1010-526 - Right thrust reverser assembly, complete
173-1010-527 - Left thrust reverser less doors or fairings, JT8D-15 engine with mixer tailpipe
173-1010-528 - Right thrust reverser less doors or fairings, JT8D-15 engine with mixer tailpipe.
173-1010-523 - Thrust reverser assembly, Core/Basic

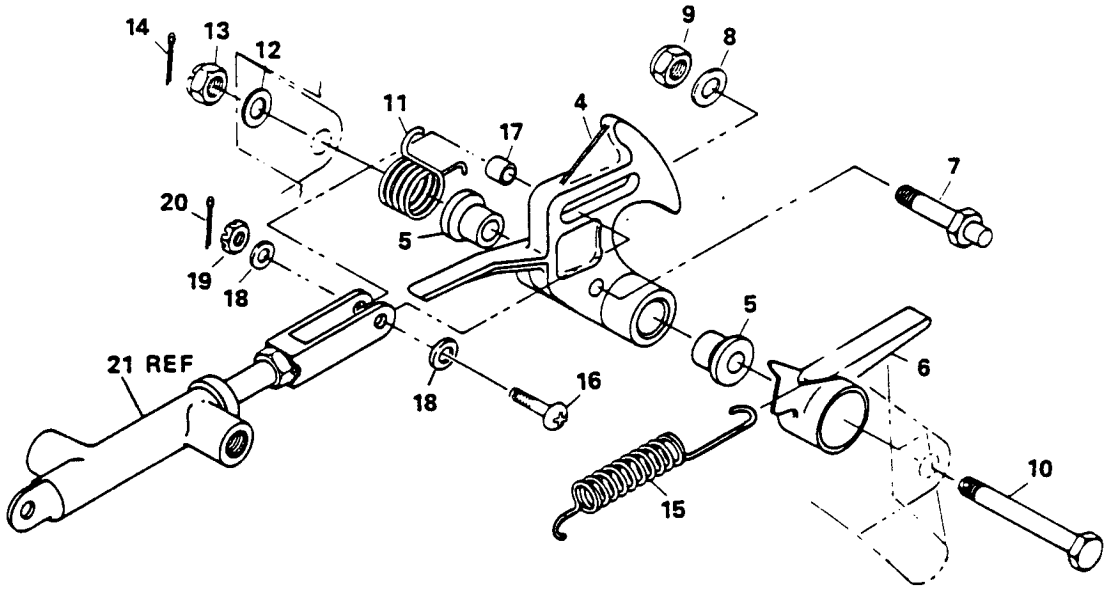
U83891



737 Thrust Reverser
Interlock and Control System
Figure 1102

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1102					
1	173-1300-1		THRUST REVERSER CONTROLS INSTALLATION		
2	MS24665-153		. PIN		3
3	AN960-516		. WASHER		1
4	AN960-416L		. WASHER		6
5	AN320-5		. NUT		1
6	AN320-4		. NUT		2
7	NAS75-5-106		. BUSHING		1
8	NAS1105-23D		. BOLT		1
9	NAS1104-5		. BOLT		4
10	AN4-11		. BOLT		2
11	NAS509-5		. NUT		2
12	02-511-0401DD		. ROD END, V09455		2
12	AR4CR12		. ROD END, V50294 (Optional to 02-511-0401DD)		2
13	173-1303-1		. LINK		1
14	173-1302-1		. SUPPORT		1
15	173-1301-1		. LEVER		1
16	173-1300-3		. BUSHING		2
17	173-1300-5		. BUSHING		1
18	173-1012-13		. SHIM		4
18	173-1012-101		. SHIM (SUPERSEDES 173-1012-13)		4
19	MS20615-5M		. RIVET		4
20	M13640-048		. NUTPLATE, V80539		4
21	MS20427M3		. RIVET		8





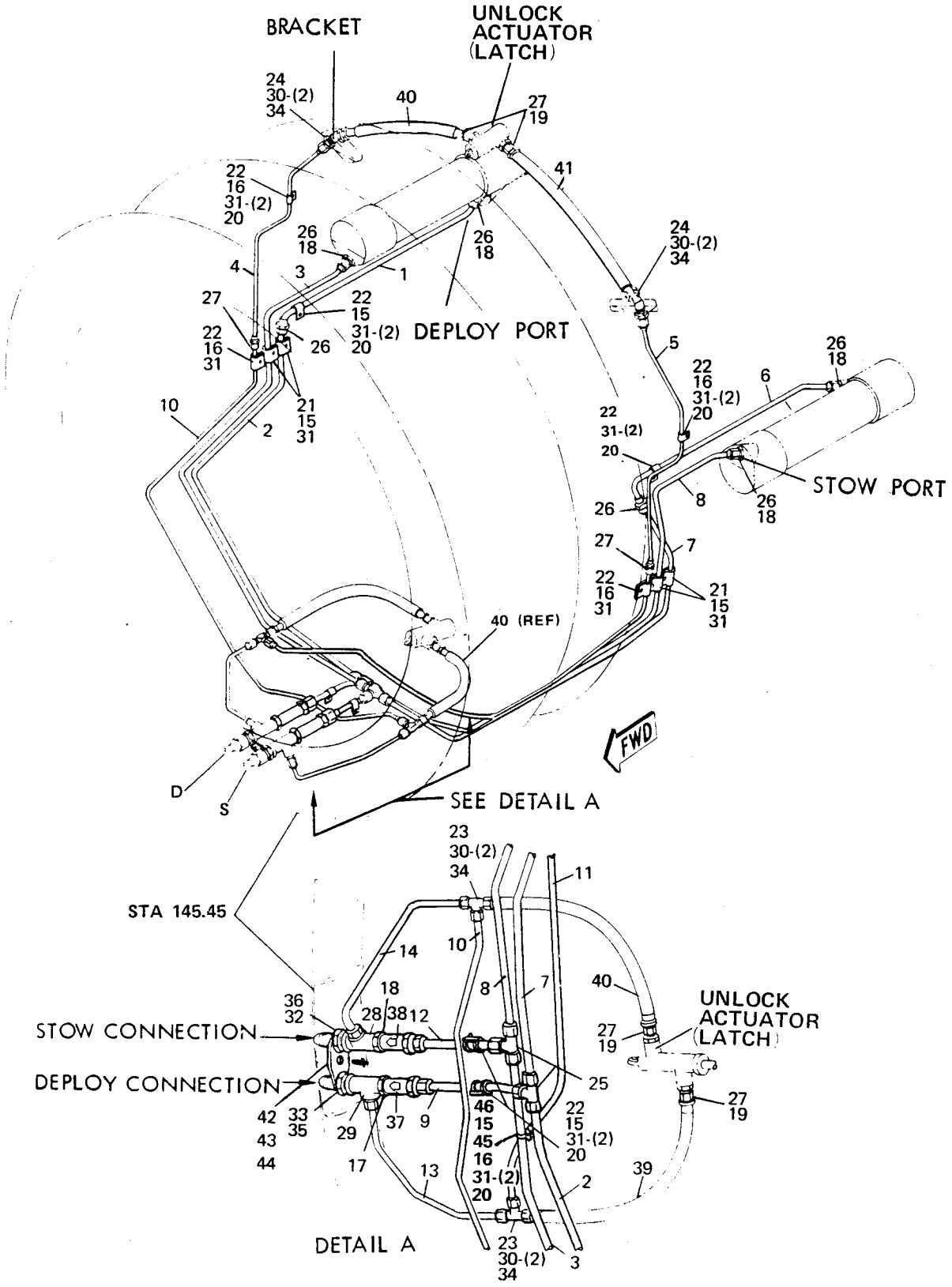
DETAIL A

737-9

737 Thrust Reverser Lock Assembly
Figure 1103

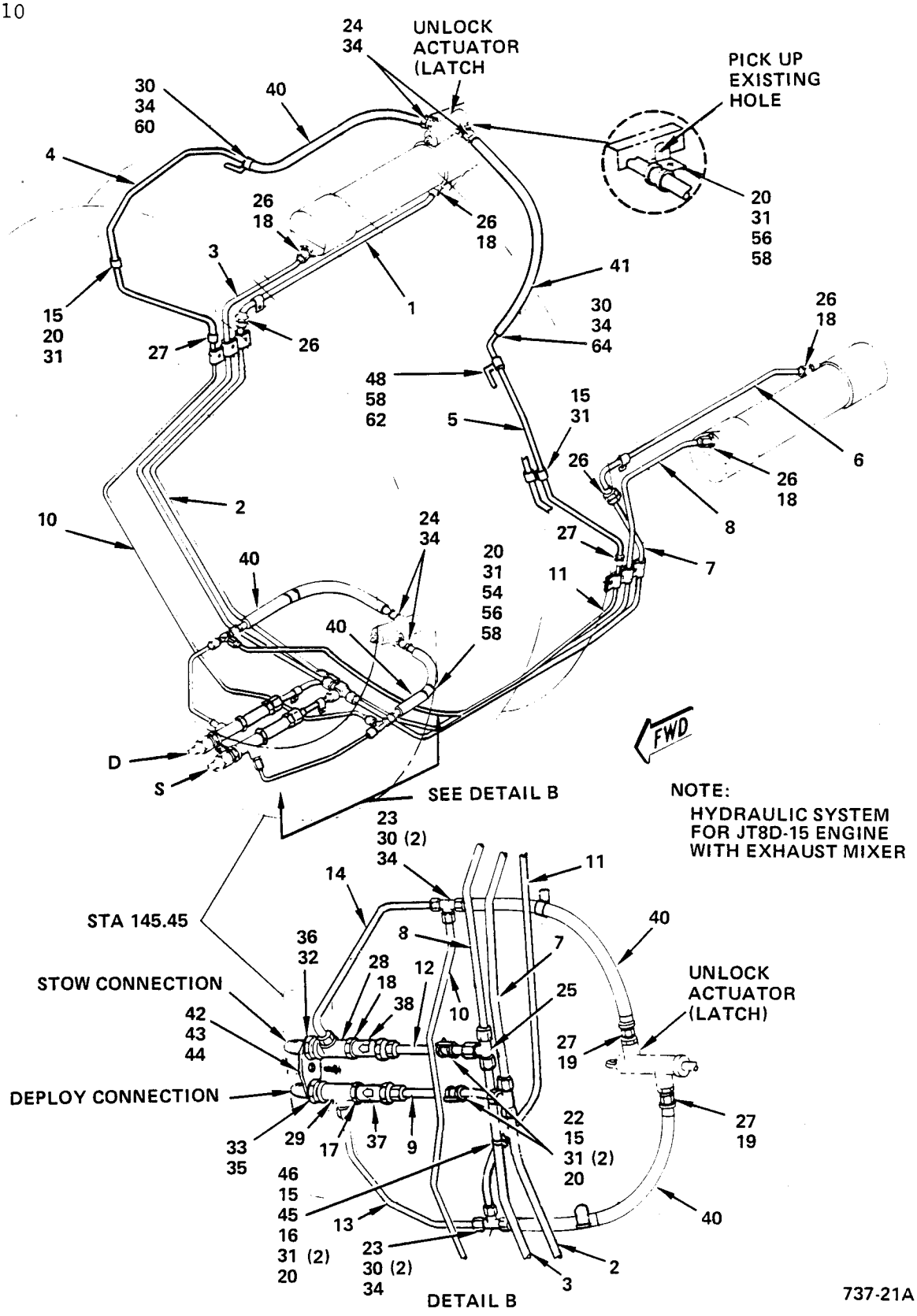
FIG. ITEM	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
1103					
	173-1310-1		THRUST REVERSER DEFLECTOR DOOR LOCK INSTALLATION		RF
1	173-1310-9		.LOCK ASSEMBLY (SPARES ASSY)		2
2	173-1311-1		.SUPPORT ASSEMBLY		1
2	173-1311-21		.SUPPORT ASSEMBLY	001413	1
3	173-1313-1		.LATCH ASSEMBLY	414999	1
4	173-1313-3		..LATCH		1
5	DBSF-4-130-001		..BUSHING, V81376		2
5	90908		..BUSHING, V09455 (OPTIONAL TO DBSF-4-130-001)		2
6	173-1314-1		.ARM		1
7	173-1315-1		.PIN		1
8	AN960-416L		.WASHER		1
9	NAS679A4		.NUT		1
10	NAS1104-42D		.BOLT		1
11	PC238		.SPRING, V04811		1
12	AN960-416		.WASHER		1
13	AN320-4		.NUT		1
14	MS24665-153		.PIN - COTTER		1
15	PC237		.SPRING, V04811		1
16	NAS1633-10D		.SCREW		1
17	NAS75-3-013		.BUSHING		1
18	AN960-10		.WASHER		2
19	AN320-3		.NUT		1
20	MS24665-153		.PIN - COTTER		1
21	1U1222		.ACTUATOR UNLOCK, V94641 (PER ROHR SCD 173-1903-1) SEE SUBJECT 78-32-06		1
21A	58120-1		.ACTUATOR, V99643 (PER ROHR 173-1903-1) SEE SUBJECT 78-32-01 (ALT FOR 1U1222)		1
22	NAS1633-7D		.SCREW		1
23	AN960-10		.WASHER		1
24	AN320-3		.NUT		1
25	MS24665-153		.PIN - COTTER		1
26	NAS623-3-5		.SCREW		12
27	AN960-10L		.WASHER		12
28	NAS679A3		.NUT		12
29	NAS623-3-2		.SCREW		4
30	AN960-10		.WASHER		4
31	NAS679A3		.NUT		4
32	173-1312-1		.SUPPORT		1

—Items not illustrated



737 Thrust Reverser Hydraulic System Piping
Figure 1104 (Sheet 1)

173-1010



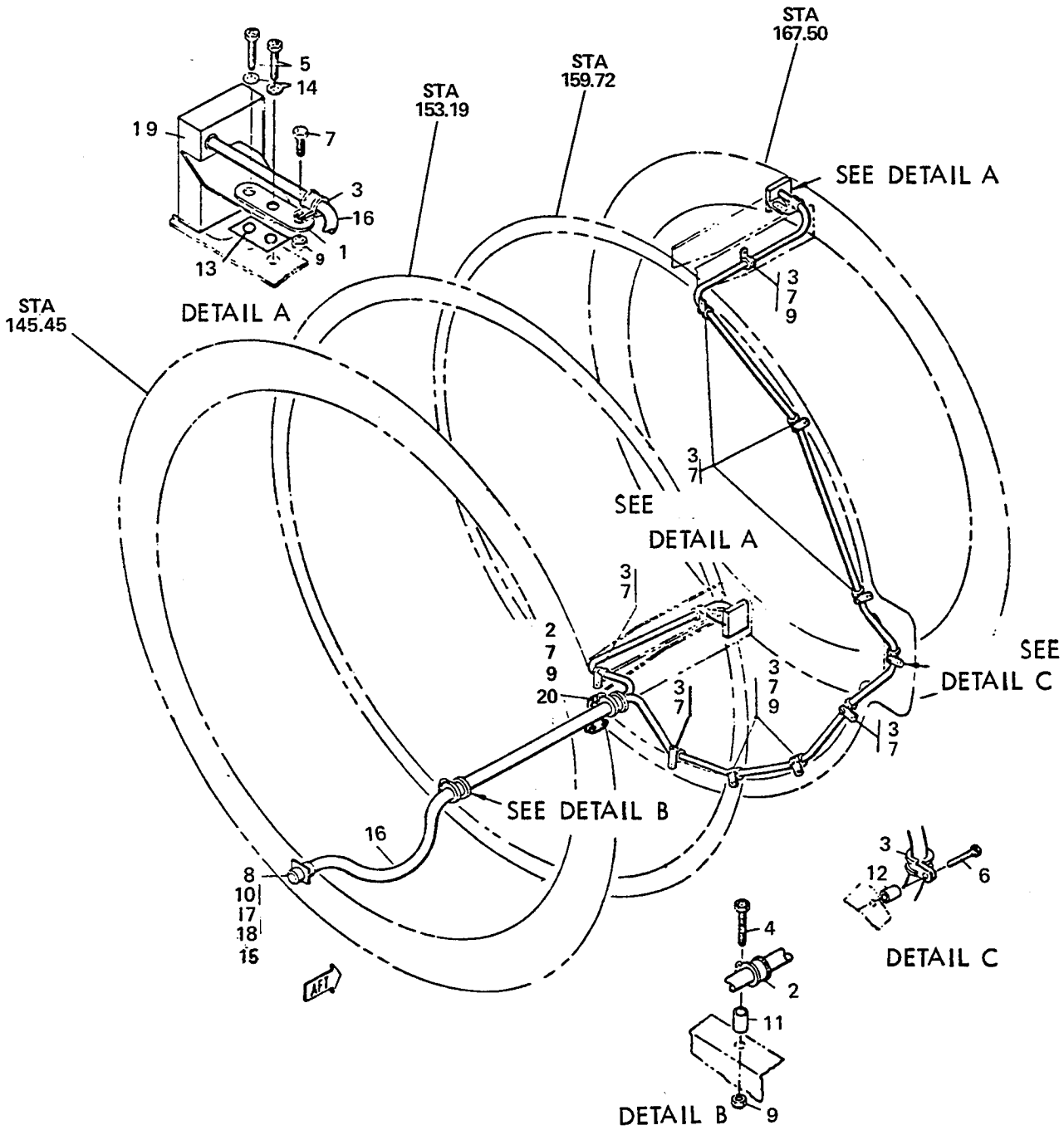
737 Thrust Reverser Hydraulic System Piping
Figure 1104 (Sheet 2)

FIG. ITEM	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
1104-	173-1325-5001		THRUST REVERSER HYDRAULIC INSTALLATION		RF
1	173-1325-5029		.TUBE ASSEMBLY	5	1
1	173-1325-5041		.TUBE ASSEMBLY		1
2	173-1325-5027		.TUBE ASSEMBLY		1
2	173-1325-5043		.TUBE ASSEMBLY	5	1
3	173-1325-5025		.TUBE ASSEMBLY		1
4	173-1325-5023		.TUBE ASSEMBLY	5	1
4	173-1325-5047		.TUBE ASSEMBLY		1
5	173-1325-5021		.TUBE ASSEMBLY		1
5	173-1325-5049		.TUBE ASSEMBLY	5	1
6	173-1325-5019		.TUBE ASSEMBLY		1
6	173-1325-5045		.TUBE ASSEMBLY	5	1
7	173-1325-5017		.TUBE ASSEMBLY		1
8	173-1325-5015		.TUBE ASSEMBLY		1
8	173-1325-5037		.TUBE ASSEMBLY	5	1
9	173-1325-5013		.TUBE ASSEMBLY		1
10	173-1325-5009		.TUBE ASSEMBLY	5	1
10	173-1325-5053		.TUBE ASSEMBLY		1
11	173-1325-5011		.TUBE ASSEMBLY		1
11	173-1325-5051		.TUBE ASSEMBLY	5	1
12	173-1325-5007		.TUBE ASSEMBLY		1
13	173-1325-5005		.TUBE ASSEMBLY	5	1
14	173-1325-5003		.TUBE ASSEMBLY		1
14	173-1325-5035		.TUBE ASSEMBLY		1
15	490-6R		.CLAMP, V81982		14
15	TA11C53H-06-AT		.CLAMP, V84971 (OPTIONAL TO 490-6R)		
16	490-4R		.CLAMP, V81982		8
16	TA11C53H-04-AT		.CLAMP, V84971 (OPTIONAL TO 490-4R)		
17	NAS1612-8		.PACKING		2
18	NAS1612-6		.PACKING		5
19	NAS1612-4		.PACKING		6
20	NAS679A3		.NUT		9
21	NAS1096-3-4		.SCREW		4
22	NAS1096-3-3		.SCREW		10
22	NAS1096-3-12		.SCREW		2
23	MS21912-4C		.TEE		2
24	MS21907-4C		.ELBOW		2
25	MS21905-6C		.TEE		2
26	MS21902-6T		.UNION		6
27	MS21902-4C		.UNION		6
28	173-1325-5033		.TEE (MAKE FROM AS1003J080604)		1
28	173-1325-5039		.TEE		1
29	173-1325-5031		.TEE (MAKE FROM AS1002J060804)		1
30	AN960PD716		.WASHER		8

—Items not illustrated

FIG. ITEM	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
1104-					
31	AN960PD10L		.WASHER		26
32	AN924-8C		.NUT		1
33	AN924-6C		.NUT		4
34	AN924-4C		.NUT		2
35	AN960C916L		.WASHER		1
36	AN960C1216L		.WASHER		1
37	GA7372-1		.VALVE, ONE-WAY, RESTRICTOR, V50276 (FOR DETAILS SEE FIGURE 1106)		1
38	GA7396		.VALVE, ONE-WAY, RESTRICTOR, V50276 (FOR DETAILS SEE FIGURE 1107)		1
39	AE705014-2		.HOSE, V00624 (ROHR SPEC DWG 173-1904-501)		1
40	AE705014-1		.HOSE, V00624 (ROHR SPEC DWG 173-1904-1)		2
40	AE705014-1		.HOSE, V00624 (ROHR SPEC DWG 173-1904-1)	5	3
41	AE705014-3		.HOSE, V00624 (ROHR SPEC DWG 173-1904-503)		1
42	173-1011-541		.BRACKET		1
43	HL22-6-5		.PIN, V73197		1
44	HL77-6		.COLLAR, V73197		1
45	NAS43HT3-32		.SPACER		1
46	NAS1096-3-14		.SCREW		1
48	173-1011-283		.BRACKET ASSEMBLY	5	2
50	NAS43DD3-24		.SPACER		2
52	MS21902-4J		.UNION	5	1
54	MS9592-054		.BRACKET	5	3
56	417SS12		.CLAMP, V83930	5	2
58	NAS1096-3-6		.SCREW	5	5
60	MS21903-4C		.UNION	5	1
62	AN960C10L		.WASHER	5	6
64	MS21907-4C		.ELBOW	5	1
			5 173-1010-527 - LEFT THRUST REVERSER LESS DOORS OR FAIRINGS, JT8D15 ENGINE WITH MIXER TAILPIPE.		
			173-1010-528 - RIGHT THRUST REVERSER LESS DOORS OR FAIRINGS, JT8D15 ENGINE WITH MIXER TAILPIPE.		

-Items not illustrated



737 Thrust Reverser Electrical System
Figure 1105

FIG. ITEM	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
1105-	173-1954-1		THRUST REVERSER ELECTRICAL INSTALLATION		RF
1	173-1954-3		.PLATE		2
2	400WSS6		.CLAMP, V81982		2
2	TA4C27WSS6		.CLAMP, V84971 (OPTIONAL TO 400WSS6)		2
3	400WSS4		.CLAMP, V81982		13
3	TA4C27WSS4		.CLAMP, V84971 (OPTIONAL TO 400WSS4)		13
4	NAS1096-3-22		.SCREW		1
5	NAS1096-3-12		.SCREW		2
6	NAS1096-3-10		.SCREW		3
7	NAS1096-3-7		.SCREW		14
8	MS35265-14		.SCREW		4
9	NAS679A3		.NUT		4
10	NAS679A04		.NUT		10
11	NAS43DD3-64		.SPACER		1
11	NAS43DD3-48		.SPACER	5	1
12	NAS43DD3-16		.SPACER		4
13	173-1954-7		.SPACER		2
14	AN960D10L		.WASHER		4
15	AN960-4		.WASHER		4
16	173-1955-1		.WIRE BUNDLE ASSEMBLY		1
17	MS24264R14T7PN		..RECEPTACLE		1
18	MS27186-1		..PLUG SEAL		1
19	1-899-28		..SENSOR, PROXIMITY, V08748 (ROHR SPEC DWG 173-1906-1)		2
20	TA104		.BRACKET, V84971		1

5 173-1010-527 - LEFT THRUST REVERSER LESS DOORS OR FAIRINGS, JT8D15 ENGINE WITH MIXER TAILPIPE.

173-1010-528 - RIGHT THRUST REVERSER LESS DOORS OR FAIRINGS, JT8D15 ENGINE WITH MIXER TAILPIPE.

—Items not illustrated

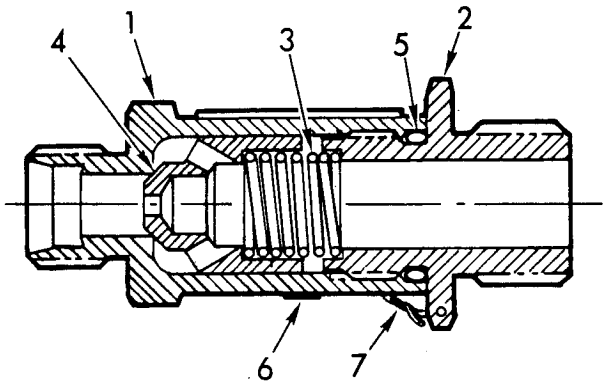


FIG. ITEM	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
1106	GA7372-1		ONE-WAY RESTRICTOR VALVE(V50276) (Rohr Spec Dwg 173-1907-501) (For NHA see Figure 1104)		RF
1	10867		. BODY		1
2	10868		. END FITTING		1
3	10476		. SPRING		1
4	10475		. POPPET		1
5	NAS1611-015		. PACKING		1
6	10869		. NAMEPLATE		1
7	MS20995C32		. LOCKWIRE		AR

737 Thrust Reverser
One Way Restrictor Valve
Figure 1106

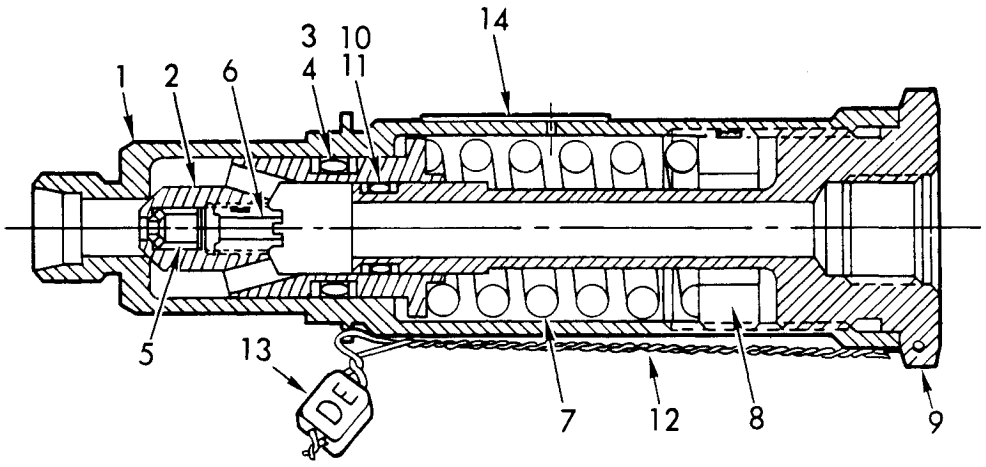


FIG. ITEM	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
1107	GA7396		TWO-WAY RESTRICTION, ONE-WAY RELIEF VALVE (V50276) (Rohr Spec Dwg 173-1908-1)		RF
1	10871		. BODY		1
2	10872		. POPPET		1
3	NAS1611-113		. PACKING		1
4	MS28774-113		. BACKUP		2
5	10873		. RESTRICTOR		1
6	10875		. RETAINER		1
7	10876		. SPRING		1
8	10877		. NUT - ADJUSTING		1
9	10878		. TUBE - FLOW		1
10	NAS1611-012		. PACKING		1
11	MS28774-012		. BACKUP		2
12	MS20995C32		. LOCKWIRE		AR
13	Comml Avail		. SEAL - LOCKWIRE		1
14	10879		. NAMEPLATE		1

737 Thrust Reverser
Two Way Restriction
One Way Relief Valve
Figure 1107

CODE	VENDOR NAME AND ADDRESS
V00624	Aeroquip Corp. 300 So. East Ave. Jackson, MI 49203
V04811	Precision Coil Spring Company 10107 Rose Street El Monte, CA 91734
V06710	Valley-Todeco Inc. 12975 Bradley Ave. Sylmar, CA 91342
V08748	Eldec Corp. 16700 13th St. West Lynnwood, WA 98036
V09455	Transport Dynamics Div. Lear Siegler Inc. Santa Ana, CA 92702
V12733	VSI Corporation 600 N. Rosemead Pasadena, CA 91107
V15860	New Hampshire Ball Bearings, Inc., Astro Div. 155 Lexington Ave. Laconia, NH 03246
V21335	Fafnir Bearing Co. 37 Booth Street New Britain, CT 06050

CODE	VENDOR NAME AND ADDRESS
V50276	Decca Valves Corp 1631-10th St. Santa Monica, CA 90404
V50294	NMB Corp. 9727 DeSoto Avenue Chatsworth, CA 91311
V51563	Rohr Industries Chula Vista, CA 92012
V53551	Allfast Inc. 15252 Don Julian Road City of Industry, CA 91744
V70628	Arrowhead Products 4411 Katella Ave. Los Alamitos, CA 90720
V71286	Rexnord Inc., Specialty Fastener Div. 22 Spring Valley Road Paramus, NJ 07652
V73197	Hi-Shear Corp. 2600 Skypark Drive Torrance, CA 90509
V75345	Kirkhill Rubber Co. 300 E. Cypress St. Brea, CA 92621
V80539	Standard Pressed Steel Co. 2701 South Harbor Boulevard Santa Ana, CA 92702

CODE	VENDOR NAME AND ADDRESS
V81376	Southwest Products Co. 1705 S. Mountain Monrovia, CA 91016
V81982	Hydro-Aire Division of Crane Co. 3000 Winona Ave. Burbank, CA 91503
V83930	Adel Products Division DeLaval Turbine California Inc. Huntington, WV 25704
V84971	TA Mfg. Corporation 375 W. Arden Ave. Glendale, CA 91203
V85495	Briles Manufacturing Company 1415 E. Grand Ave. El Segundo, CA 90245
V94641	Hydraulics Units Inc. 1500 Ronson Road Duarte, CA 91010
V97928	Litton Fastening Systems 3969 Paramount Boulevard Lakewood, CA 92712
V99643	Sterer Engineering & Manufacturing Co. 4690 Colorado Boulevard Los Angeles, CA 90039
V9U286	Arger Enterprise Inc. 3533 Old Conejo Road, Unit 113 Newbury Park, CA 91320

PART NO.	FIG. AND INDEX NO.	TOTAL PER ASSY
AE705014-1	1104-40	2
AE705014-2	1104-39	1
AE705014-3	1104-41	1
AM1629	1101-88	10
AN320-10	1101-100	AR
AN320-3	1103-19	AR
	1103-24	AR
AN320-4	1102-6	AR
	1103-13	AR
AN320-5	1102-5	AR
AN320-6	1101-120	AR
	1101-143	AR
AN320-9	1101-101	AR
AN4-11	1102-10	AR
AN924-4C	1104-34	AR
AN924-6C	1104-33	AR
AN924-8C	1104-32	AR
AN960-10	1101-20	AR
	1103-18	AR
	1103-23	AR
	1103-30	AR
AN960-10L	1101-55	AR
	1103-27	AR
AN960-4	1105-15	AR
AN960-416	1101-147	AR
	1103-12	AR
AN960-416L	1101-146	AR
	1102-4	AR
	1103-8	AR
AN960-516	1101-49	AR
	1102-3	AR
AN960-616	1101-137	AR
AN960-716	1101-133	AR
AN960C10	1101-116	AR
AN960C10L	1101-114	AR
	1101-126	AR

PART NO.	FIG. AND INDEX NO.	TOTAL PER ASSY
AN960C10L	1104-62	AR
AN960C416	1101-72	AR
AN960C416L	1101-76	AR
	1101-170	AR
AN960C616	1101-113	AR
	1101-125	AR
AN960C816	1101-124	AR
AN960C816L	1101-115	AR
AN960C916	1101-123	AR
AN960C916L	1104-35	AR
AN960C1016L	1101-122	AR
AN960C1216L	1104-36	AR
AN960D10L	1101-162	AR
	1105-14	AR
AN960D416	1101-63	AR
AN960PD10L	1104-31	AR
AN960PD716	1104-30	AR
AR4CR12	1102-12	2
AS1002J060804	1104-29	1
AS1003J080604	1104-28	1
AO22310	1101-83	AR
CFA18-3-4	1101-54	4
	1101-65	4
DBSF-4-130-001	1103-5	4
GA7372-1	1104-37	1
	1106	RF
GA7396	1104-38	1
	1107	RF
HL22-6-5	1104-43	AR
HL77-6	1104-44	AR
MS20002C10	1101-127	AR
MS20002C6	1101-129	AR
	1101-136	AR
MS20002C7	1101-132	AR
MS20002C9	1101-128	AR
MS20426D3	1101-43	AR

PART NO.	FIG. AND INDEX NO.	TOTAL PER ASSY
MS20426D3	1101-29	48
	1101-29B	8
	1101-166	AR
MS20426D4	1101-167	AR
MS20426D5	1101-169	AR
MS20427M3	1101-60A	AR
MS20470D3	1101-3	AR
	1102-21	AR
MS20615-5M	1101-96	AR
	1102-19	AR
MS20615-6M	1101-47	AR
MS20995C32	1101-148	AR
	1106-7	AR
	1107-12	AR
MS20995C41	1101-214	AR
MS21042L6	1101-138A	6
MS21902-4C	1104-27	AR
MS21902-4J	1104-52	AR
MS21902-6C	1104-26	AR
MS21903-4C	1104-60	AR
MS21905-6C	1104-25	AR
MS21907-4C	1104-24	AR
	1104-24	
MS21912-4C	1104-23	AR
MS24264R14T7PN	1105-17	AR
MS24665-153	1102-2	AR
	1103-14	AR
	1103-20	AR
	1103-25	AR
MS24665-300	1101-139	AR
MS24665-302	1101-120	AR
MS24665-372	1101-119	AR
MS24665-374	1101-118	AR
MS27186-1	1105-18	AR
MS28774-012	1107-10	AR
MS28774-113	1107-4	AR
MS35265-14	1105-8	AR
MS44DD3-24	1104-50	AR
MS9295-05U	1104-54	AR
NAS1022A7	1101-134	AR
NAS1022A8	1101-103	AR
NAS1068A08	1101-99A	4

PART NO.	FIG. AND INDEX NO.	TOTAL PER ASSY
NAS1068A3	1101-28	24
	1101-42	AR
	1101-168	AR
NAS1068A4	1101-165	AR
NAS1068C3	1101-18A	AR
NAS1080E8	1101-173	AR
NAS1096-3-10	1105-6	AR
NAS1096-3-12	1104-22	AR
	1105-5	AR
NAS1096-3-14	1104-46	AR
NAS1096-3-22	1105-4	AR
NAS1096-3-3	1104-22	AR
NAS1096-3-4	1104-21	AR
NAS1096-3-6	1104-58	AR
NAS1096-3-7	1105-7	AR
NAS1103-4	1101-158	AR
NAS1103-6	1101-112	AR
NAS1104-3	1101-159	AR
NAS1104-4	1101-160	AR
NAS1104-42D	1103-10	AR
NAS1104-5	1101-161	AR
	1102-9	AR
NAS1105-23D	1102-8	AR
NAS1106-15	1101-42	AR
NAS1108-8	1101-108	AR
NAS1109-27D	1101-107	AR
NAS1143-4	1101-7	AR
NAS1203-2	1101-10	AR
	1101-27	28
NAS1203-3	1101-11	AR
	1101-21	AR
NAS1203-4	1101-13	AR
NAS1307-14	1101-131	AR
NAS1418-4	1101-172	AR
NAS1611-012	1107-10	1
NAS1611-015	1106-5	1
NAS1611-113	1107-3	1
NAS1612-4	1104-19	AR
NAS1612-6	1104-18	AR
NAS1612-8	1104-17	AR

PART NO.	FIG. AND INDEX NO.	TOTAL PER ASSY
NAS1633-10D	1103-16	AR
NAS1633-7D	1103-22	AR
NAS42HT12-24A	1011-117	AR
NAS43DD3-16	1105-12	AR
NAS43DD3-48	1105-11	1
NAS43DD3-64	1105-11	1
NAS43HT3-32	1104-45	AR
NAS509-5	1102-11	AR
NAS517-2-3	1101-99	AR
NAS560HK5-17	1101-61	2
NAS560HK5-19	1101-61	2
NAS564-31	1101-145	AR
NAS603-8	1101-39	AR
NAS620-10L	1101-40	AR
NAS623-3-2	1103-29	AR
NAS623-3-4	1101-19	AR
NAS623-3-5	1103-26	AR
NAS6704U10	1101-71A	8
NAS679A04	1105-10	AR
NAS679A3	1101-41	AR
	1103-28	AR
	1103-31	AR
	1104-20	AR
	1105-9	AR
NAS679A4	1101-171	AR
	1103-9	AR
NAS679A5	1101-48	AR
NAS679A6	1101-138	AR
NAS679C4	1101-77	8
NAS687A3	1101-29A	4
NAS697C6	1101-105	AR
NAS75-3-013	1103-17	AR
NAS75-5-106	1102-7	AR
NS103303-2-02	1101-59	AR
NS103303-02	1101-60	AR
PC237	1103-15	2

PART NO.	FIG. AND INDEX NO.	TOTAL PER ASSY
PC238	1103-11	2
PSBS14-1	1101-88	AR
R4G	1101-16	14
S173N1934	1101-2	1
S700W0442	1101-121	4
TA104	1105-20	1
TA11C53H-04-AT	1104-16	AR
TA11C53H-06-AT	1104-15	AR
TA4C27WSS4	1105-3	12
TA4C27WSS6	1105-2	2
TLN1020C5N	1101-58	4
	1101-64	4
TLN1020C5W	1101-57	4
	1101-63	4
VPB0002	1101-106A	4
VPB0003	1101-107A	4
VS2667-4P-10	1101-71	8
02-511-0401DD	1102-12	2
1-899-28	1105-19	2
1U1220-2	1101-130	2
1U1222	1103-21	2
10475-3	1106-4	2
10476	1106-3	1
106492	1101-106	4
106497-5-19	1101-61	2
106497-5-21	1101-62	2
106564-6-14	1101-140	4
106564-6-15D	1101-111	3
	1101-135	4
106564-6-19D	1101-110	4
106564-6-23D	1101-109	1
10867	1106-1	1
10868	1106-2	1
10869	1106-6	1
10871	1107-1	1
10872	1107-2	1
10873	1107-5	1

PART NO.	FIG. AND INDEX NO.	TOTAL PER ASSY
10875	1107-6	1
10876	1107-7	1
10877	1107-8	1
108781	1107-9	1
10879	1107-14	1
173-1010-1	1101-1	RF
173-1010-2	1101-1	RF
173-1010-501	1101-1	RF
173-1010-503	1101-1	RF
173-1010-505	1101-1	RF
173-1010-507	1101-1	RF
173-1010-508	1101-1	RF
173-1010-509	1101-1	RF
173-1010-511	1101-1	RF
173-1010-513	1101-1	RF
173-1010-515	1101-1	RF
173-1010-516	1101-1	RF
173-1010-517	1101-1	RF
173-1010-519	1101-1	RF
173-1010-521	1101-1	RF
173-1010-523	1101-1	RF
173-1010-525	1101-1	RF
173-1010-527	1101-1	RF
173-1010-528	1101-1	RF
173-1011-1	1101-4	1
173-1011-171	1101-5	1
173-1011-173	1101-6	1
173-1011-283	1104-48	2
173-1011-541	1104-42	1
173-1011-543	1101-4	1
173-1011-547	1101-4	1
173-1011-549	1101-4	1
173-1012-101	1102-18	4
173-1012-13	1102-18	4
173-1012-501	1101-4A	RF
173-1012-507	1101-4A	RF
173-1012-509	1101-4A	RF
173-1012-517	1101-4A	RF

PART NO.	FIG. AND INDEX NO.	TOTAL PER ASSY
173-1013	1101-148A	RF
173-1013-5	1101-156	2
173-1013-6	1101-157	2
173-1014-1	1101-174	1
173-1015-1	1101-94	2
173-1017-1	1101-164	2
173-1019-3	1101-9	1
173-1019-5	1101-9	1
173-1019-503	1101-9	1
173-1021-1	1101-22	1
173-1021-2	1101-22A	1
173-1021-47	1101-75	4
173-1021-71	1101-74	2
173-1024-1	1101-47A	2
173-1026-1	1101-25	1
173-1026-13	1101-26	1
173-1026-14	1101-26A	1
173-1026-2	1101-25A	1
173-1029-1	1101-78	1
173-1029-3	1101-91	2
173-1029-5	1101-98	4
173-1029-501	1101-79	1
173-1029-7	1101-95	2
173-1029-9	1101-97	4
173-1030-1	1101-80	4
173-1030-501	1101-80A	4
173-1030-503	1101-80B	4
173-1030-505	1101-80C	4
173-1030-507	1101-80D	4
173-1030-509	1101-80E	4
173-1032-1	1101-81	4
173-1034-1	1101-82	4
173-1034-501	1101-82A	4
173-1036-1	1101-93	2
173-1038-1	1101-92	4
173-1038-7	1101-92	4
173-1039-1	1101-90	1
173-1040-1	1101-89	2
173-1040-7	1101-89A	2
173-1042-1	1101-84	4
173-1042-3	1101-84A	4
173-1042-5	1101-84B	4
173-1042-7	1101-84C	4

PART NO.	FIG. AND INDEX NO.	TOTAL PER ASSY
173-1043-1	1101-85	4
173-1043-3	1101-85A	4
173-1043-5	1101-85B	4
173-1044-1	1101-18	2
173-1045-3	1101-12	1
173-1048-1	1101-24	2
173-1048-2	1101-24A	2
173-1048-501	1101-24B	2
173-1048-502	1101-24C	2
173-1050-1	1101-23	2
173-1050-2	1101-23A	2
173-1054-1	1101-86	4
173-1054-3	1101-86A	4
173-1054-5	1101-86B	4
173-1054-7	1101-86C	4
173-1056-1	1101-87	4
173-1056-3	1101-87A	4
173-1056-5	1101-87B	4
173-1056-7	1101-87C	8
173-1058-3	1101-14	1
173-1069-1	1101-50	4
173-1105-501	1101-121A	4
173-1151-1	1101-8	1
173-1156-1	1101-2	1
173-1156-2	1101-2	1
173-1156-501	1101-2	1
173-1156-502	1101-2	1
173-1156-513	1101-2	1
173-1157-1	1101-70	2
173-1158-1	1101-56	4
173-1158-501	1101-56	4
173-1159-1	1101-73	2
173-1160-1	1101-52	2
173-1160-501	1101-51	2
173-1160-503	1101-52	2
173-1160-505	1101-51	2
173-1162-1	1101-53	AR
173-1162-501	1101-53	AR
173-1162-503	1101-53	AR
173-1162-505	1101-53	AR
173-1162-507	1101-53	AR

PART NO.	FIG. AND INDEX NO.	TOTAL PER ASSY
173-1162-509	1101-53	4
173-1166-10	1101-33A	1
173-1166-11	1101-34	1
173-1166-12	1101-34A	1
173-1166-13	1101-35	1
173-1166-14	1101-35A	1
173-1166-15	1101-36	1
173-1166-19	1101-38	4
173-1166-21	1101-37	1
173-1166-3	1101-30	1
173-1166-4	1101-30A	1
173-1166-5	1101-31	1
173-1166-7	1101-32	1
173-1166-8	1101-32A	1
173-1166-9	1101-33	1
173-1192-3	1101-44	1
173-1192-4	1101-44A	1
173-1192-5	1101-45	1
173-1192-6	1101-45A	1
173-1192-7	1101-46	1
173-1192-9	1101-46A	1
173-1196-1	1101-89B	2
173-1300-1	1102-1	RF
173-1300-3	1102-16	2
173-1300-5	1102-17	1
173-1301-1	1102-15	1
173-1302-1	1102-14	1
173-1303-1	1102-13	1
173-1310-1	1103	RF
173-1310-9	1103-9	2
173-1311-1	1103-2	2
173-1311-21	1103-2	2
173-1312-1	1103-32	1
173-1313-1	1103-3	2
173-1313-3	1103-4	2
173-1314-1	1103-6	2
173-1315-1	1103-7	2

PART NO.	FIG. AND INDEX NO.	TOTAL PER ASSY
173-1325-5001	1104	RF
173-1325-5003	1104-14	1
173-1325-5005	1104-13	1
173-1325-5007	1104-12	1
173-1325-5009	1104-10	1
173-1325-5011	1104-11	1
173-1325-5013	1104-9	1
173-1325-5015	1104-8	1
173-1325-5017	1104-7	1
173-1325-5019	1104-6	1
173-1325-5021	1104-5	1
173-1325-5023	1104-4	1
173-1325-5025	1104-3	1
173-1325-5027	1104-2	1
173-1325-5029	1104-1	1
173-1325-5031	1104-29	1
173-1325-5033	1104-28	1
173-1325-5035	1104-14	1
173-1325-5037	1104-8	1
173-1325-5039	1104-28	1
173-1325-5041	1104-1	1
173-1325-5043	1104-2	1
173-1325-5045	1104-6	1
173-1325-5047	1104-4	1
173-1325-5049	1104-5	1
173-1325-5051	1104-11	1
173-1325-5053	1104-10	1
173-1902-1	1101-130	RF
173-1902-501	1101-130A	RF
173-1903-1	1103-21	RF
173-1904-1	1104-40	2
173-1904-501	1104-39	1
173-1904-503	1104-41	1
173-1906-1	1105-19	RF
173-1906-5	1105-19	2
173-1907-501	1104-37	1
	1106	RF

PART NO.	FIG. AND INDEX NO.	TOTAL PER ASSY
173-1908-1	1104-38	1
	1107	RF
173-1954-1	1105	RF
173-1954-3	1105-1	2
173-1954-7	1105-13	2
173-1955-1	1105-16	14
40G5	1101-17	14
400WSS4	1105-3	12
400WSS6	1105-2	2
4002-4	1101-15	14
400827-319	1101-196	1
400827-321	1101-198	1
400827-323	1101-200	1
400827-325	1101-202	1
400827-327	1101-204	1
400827-329	1101-206	1
400827-331	1101-208	1
400827-333	1101-210	1
400827-337	1101-212	1
400827-500	1101-178	RF
400827-501	1101-180	2
400827-503	1101-182	2
400827-505	1101-184	2
400827-507	1101-186	2
400827-511	1101-188	2
400827-513	1101-190	2
400827-515	1101-192	2
400827-517	1101-194	2
417SS12	1104-56	2
422687	1101-88	AR
490-4R	1104-16	7
490-6R	1104-15	13
50068	1101-88	AR
58120-1	1103-21A	1
60470	1101-130A	1
90908	1103-5	4