COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST

AUXILIARY POWER UNIT MUFFLER ASSEMBLY

PART NUMBER 354A3000–1, –10

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COMPONENT MAINTENANCE MANUAL

Revision No. 7
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To: All holders of AUXILIARY POWER UNIT MUFFLER ASSEMBLY 49-13-02.

Attached is the current revision to this COMPONENT MAINTENANCE MANUAL

The COMPONENT MAINTENANCE MANUAL is furnished either as a printed manual, on microfilm, or digital products, or any combination of the three. This revision replaces all previous microfilm cartridges or digital products. All microfilm and digital products are reissued with all obsolete data deleted and all updated pages added.

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COMPONENT MAINTENANCE MANUAL

A = Added, R = Revised, D = Deleted, O = Overflow

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TEMPORARY REVISION AND SERVICE BULLETIN RECORD

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVE	DATE OF INCORPORATION INTO MANUAL

All revisions to this manual will be accompanied by transmittal sheet bearing the revision number. Enter the revision number in numerical order, together with the revision date, the date filed and the initials of the person filing.

Revision		Filed	
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Temporary Revision		Inserted		Removed	
Number	Date	Date	Initials	Date	Initials

Temporary Revision		Inserted		Removed	
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INTRODUCTION

1. General

A. The instructions in this manual supply the data necessary to do the maintenance functions together with the test, fault isolation, repair, and replacement of the defective parts.

B. This manual is divided into different parts:

(1) Title Page

(2) Transmittal Letter

(3) Highlights

(4) List of Effective Pages

(5) Table of Contents

(6) Temporary Revision & Service Bulletin Record

(7) Record of Revisions

(8) Record of Temporary Revisions

(9) Introduction

(10) Procedures & IPL Sections

C. Components that can be repaired have a different repair number for each specified repair. To find the repair number location of a component, look in the Repair-General procedure at the beginning of the REPAIR section. The Repair-General procedure also has an explanation of the True Position Dimension symbols used.

D. All dimensions, measures, quantities and weights included are in English units. When metric equivalents are given they will be in the parentheses that follow the English units.

E. The introduction to the Illustrated Parts List (IPL) shows how the IPL data is used.

F. Design changes, optional parts, configuration differences and Service Bulletin modifications may cause different part numbers. These part numbers are identified in the IPL with an alphabetical letter which is added to the end of the basic item number. This new item number is referred to as an alpha-variant. Throughout the manual, IPL basic item number references also apply to alpha-variants unless shown differently.

G. The tool reference numbers found in the individual procedures and in the Special Tools, Fixtures, and Equipment section are used to identify if a tool is a standard tool (STD-XXXX), a commercial tool (COM-XXXX), or a Special Tool (SPL-XXXX). This reference number is also used to distinguish between tools with similar names in the same procedure. These reference numbers are for use in the documentation only. They are not to be used for ordering tools.

AUXILIARY POWER UNIT EXHAUST DUCT MUFFLER ASSEMBLY - DESCRIPTION AND OPERATION

1. **Description**

   A. The Auxiliary Power Unit (APU) Exhaust Duct Muffler Assembly has a bellows assembly, an acoustic liner, a support assembly, and insulation blankets.

2. **Operation**

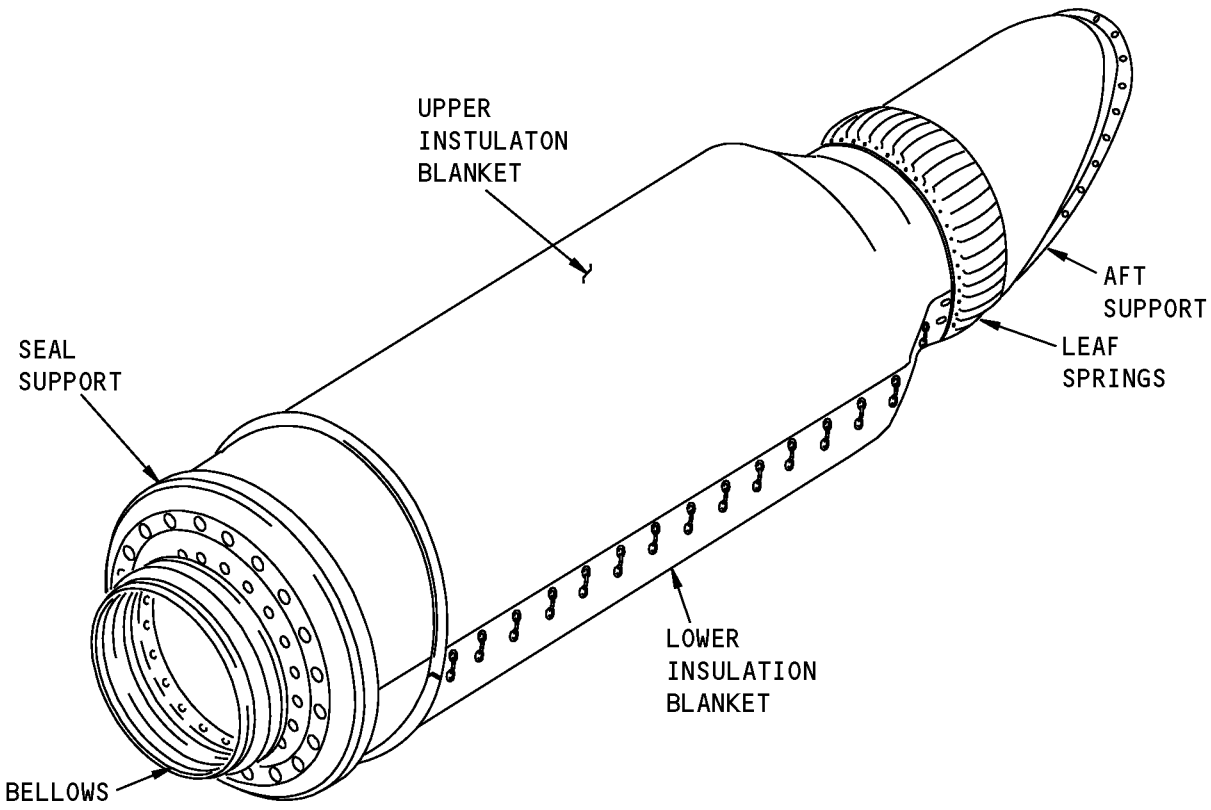
   A. The APU exhaust duct muffler assembly sends the APU turbine exhaust outside the airplane.

3. **Leading Particulars (Approximate)**

   A. Length – 70 inches

   B. Diameter – 18 inches

   C. Weight – 68 pounds



Auxiliary Power Unit Muffler Assembly
Figure 1

(NOT APPLICABLE)

DISASSEMBLY

1. **General**
   A. This procedure tells how to disassemble the APU exhaust duct muffler assembly.
   B. Disassemble this component only sufficiently to find defects, do the necessary repairs, and put the component back into a serviceable condition.
   C. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.
   D. Refer to IPL Figure 1 for item numbers.
2. **Disassembly**
   A. Procedure
      (1) Use standard industry procedures and these steps.
      (2) Remove the acoustic liner (85) from the APU exhaust duct muffler assembly (1A).

      NOTE: If the inner surface of the assembly does not need cleaning or repair, then the following disassembly is not necessary.

      (a) Remove bolts (70) and collars (75) from the APU exhaust duct muffler assembly (1A).
      (b) Remove the bellows assembly (80) and the acoustic liner (85) from the APU exhaust duct muffler assembly (1A).

CLEANING

1. General

A. This procedure tells how to clean the APU exhaust duct muffler assembly.

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to IPL Figure 1 for item numbers.

2. Procedure

NOTE: For cleaning materials, refer to SOPM 20-60-01

A. References

Reference	Title
SOPM 20-30-03	GENERAL CLEANING PROCEDURES
SOPM 20-30-80	SOLVENTS FOR GENERAL CLEANING OF METAL (SERIES 80)
SOPM 20-60-01	CLEANING MATERIALS

B. Cleaning

(1) Use standard industry procedures and the instructions in SOPM 20-30-03 to clean the outer surfaces of the APU exhaust duct muffler assembly (1A).

NOTE: Do not soak the blanket assemblies (5,10,150) with any solvent or detergent solution or they could be damaged.

(2) Clean the acoustic liner (85).

(a) Flush the acoustic liner (85) with approximately 1 gallon of solvent, Series 80 (SOPM 20-30-80), then air dry the part.

(b) Heat caustic alkaline cleaning solution to 175 degrees F and soak the acoustic liner (85) in the solution for 5 minutes.

(c) Shake the solution and use a brush to clean the inner surface of the acoustic liner (85).

(d) Remove the acoustic liner (85) from the alkaline solution.

(e) Heat detergent solution to 175 degrees F and soak the acoustic liner (85) in the solution for 5 minutes.

(f) Shake the solution and use a brush to clean the inner surface of the acoustic liner (85).

(g) Remove the acoustic liner (85) from the detergent solution and put it on one end to drain.

(h) After you drain the acoustic liner (85), dry it at 150 degrees F for 5 hours.

CHECK

1. General

A. This procedure tells how to find defects in the specified parts.

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

2. Procedure

NOTE: For penetrant methods of inspection, refer to SOPM 20-20-02.

A. References

Reference	Title
SOPM 20-20-02	PENETRANT METHODS OF INSPECTION

B. APU exhaust duct muffler assembly check

(1) Visually examine all parts for defects by standard industry practices.

(2) If the visual check finds possible defects, do a penetrant check on those parts with possible defects.

REPAIR

1. General

A. Instructions for repair, refinish, and replacement of the specified subassembly parts are included in each REPAIR when applicable:

Table 601:

PART NUMBER	NAME	REPAIR
—	REFINISH OF OTHER PARTS	1-1
354A3000	APU EXHAUST DUCT MUFFLER ASSEMBLY	2-1, 2-2
S354A00-1,-2	INSULATION BLANKETS	3-1

2. Dimensioning Symbols

A. Standard True Position Dimensioning Symbols used in the applicable repair procedures are shown in REPAIR-GENERAL, Figure 601.

—	STRAIGHTNESS
▱	FLATNESS
⊥	PERPENDICULARITY (OR SQUARENESS)
//	PARALLELISM
○	ROUNDNESS
⌭	CYLINDRICITY
⌒	PROFILE OF A LINE
⌓	PROFILE OF A SURFACE
◎	CONCENTRICITY
⌯	SYMMETRY
∠	ANGULARITY
↗	RUNOUT
↗↗	TOTAL RUNOUT
⌴	COUNTERBORE OR SPOTFACE
∨	COUNTERSINK
⌖	THEORETICAL EXACT POSITION OF A FEATURE (TRUE POSITION)
Ø	DIAMETER
S Ø	SPHERICAL DIAMETER
R	RADIUS
SR	SPHERICAL RADIUS
()	REFERENCE
BASIC (BSC) OR [DIM]	A THEORETICALLY EXACT DIMENSION USED TO DESCRIBE SIZE, SHAPE OR LOCATION OF A FEATURE. FROM THIS FEATURE PERMISSIBLE VARIATIONS ARE ESTABLISHED BY TOLERANCES ON OTHER DIMENSIONS OR NOTES.
[-A-]	DATUM
(M)	MAXIMUM MATERIAL CONDITION (MMC)
(L)	LEAST MATERIAL CONDITION (LMC)
(S)	REGARDLESS OF FEATURE SIZE (RFS)
(P)	PROJECTED TOLERANCE ZONE
FIM	FULL INDICATOR MOVEMENT

EXAMPLES

— | 0.002	STRAIGHT WITHIN 0.002
⊥ | 0.002 | B	PERPENDICULAR TO DATUM B WITHIN 0.002
// | 0.002 | A	PARALLEL TO DATUM A WITHIN 0.002
○ | 0.002	ROUND WITHIN 0.002
⌭ | 0.010	CYLINDRICAL SURFACE MUST LIE BETWEEN TWO CONCENTRIC CYLINDERS, ONE OF WHICH HAS A RADIUS 0.010 INCH GREATER THAN THE OTHER
⌒ | 0.006 | A	EACH LINE ELEMENT OF THE SURFACE AT ANY CROSS SECTION MUST LIE BETWEEN TWO PROFILE BOUNDARIES 0.006 INCH APART RELATIVE TO DATUM A
⌓ | 0.020 | A	SURFACES MUST LIE WITHIN PARALLEL BOUNDARIES 0.020 INCH APART AND EQUALLY DISPOSED ABOUT TRUE PROFILE
◎ | Ø 0.0005 | C	CONCENTRIC TO DATUM C WITHIN 0.0005 DIAMETER
⌯ | 0.010 | A	SYMMETRICAL WITH DATUM A WITHIN 0.010
∠ | 0.005 | A	ANGULAR TOLERANCE 0.005 WITH DATUM A
⌖ | Ø 0.002 (S) | B	LOCATED AT TRUE POSITION WITHIN 0.002 DIA RELATIVE TO DATUM B, REGARDLESS OF FEATURE SIZE
⊥ | Ø 0.010 (M) | A 0.510 (P)	AXIS IS TOTALLY WITHIN A CYLINDER OF 0.010 INCH DIAMETER, PERPENDICULAR TO DATUM A, AND EXTENDING 0.510 INCH ABOVE DATUM A, MAXIMUM MATERIAL CONDITION
[2.000] OR 2.000 BSC	THEORETICALLY EXACT DIMENSION IS 2.000

True Position Dimensioning Symbols
Figure 601

REFINISH OF OTHER PARTS - REPAIR 1-1

1. General

A. This procedure tells how to refinish the parts which are not in the other repairs.

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to IPL Figure 1 for item numbers.

2. Procedure

NOTE: For the decoding table for Boeing finish codes, refer to SOPM 20-41-01. For general cleaning procedures, refer to SOPM 20-30-03.

A. References

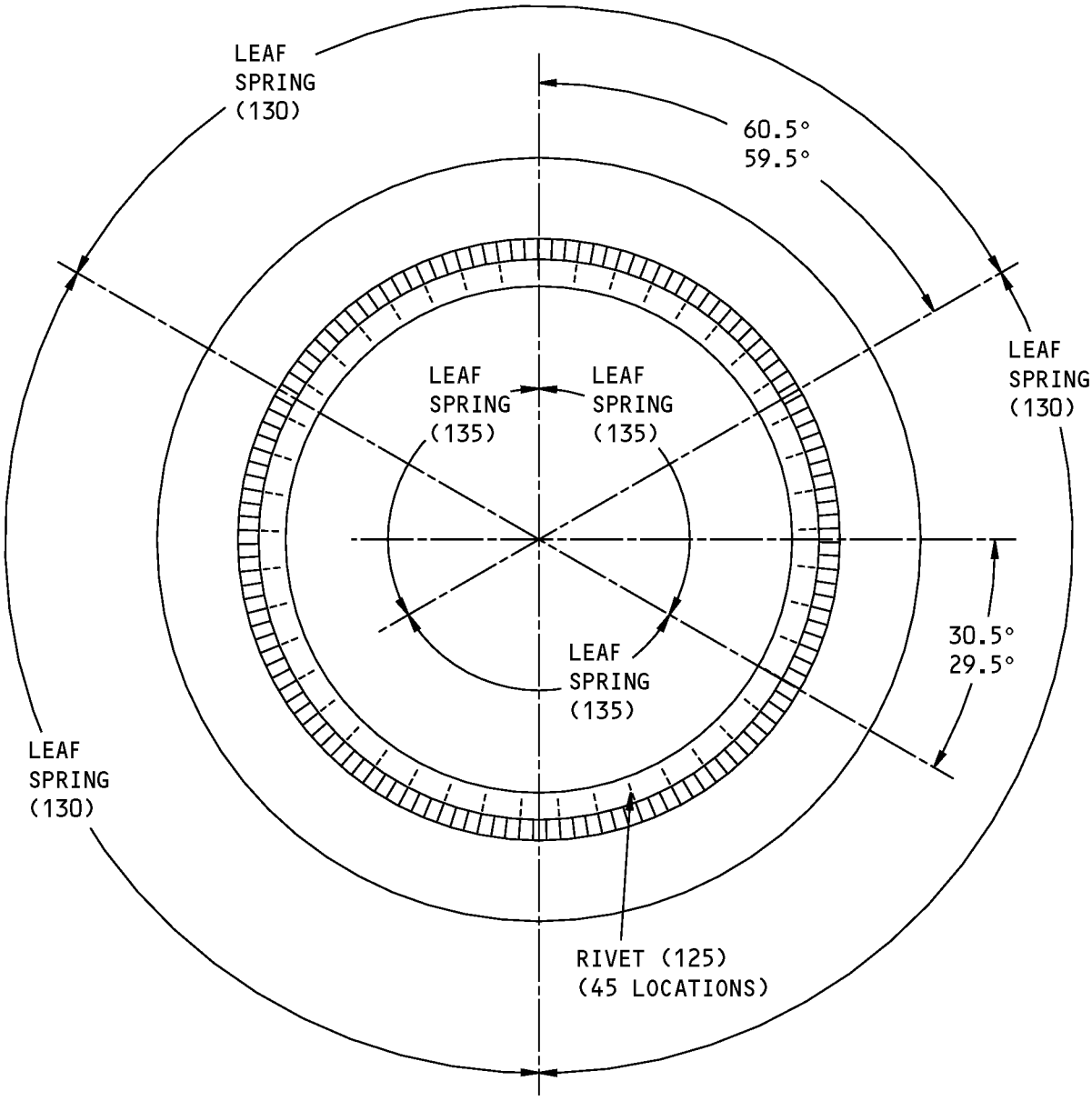
Reference	Title
SOPM 20-30-03	GENERAL CLEANING PROCEDURES
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES

B. Refinish of Other Parts

(1) Instructions for the repair of the parts in REPAIR 1-1, Table 601 is for replacement of the original finish.

Table 601: Refinish of the Other Parts

IPL FIG. & ITEM	MATERIAL	FINISH
Doubler (25, 115)	321 CRES	Passivate (F-17.25)
Support ring (145)	321 CRES	Passivate (F-17.25)
Forward end cap (117)	321 CRES	Passivate (F-17.25)
Leaf springs (130, 135)	17-7PH CRES	Passivate (F-17.25)



ITEM NUMBERS REFER TO IPL FIG. 1

354A3021-1,-2 Exhaust Duct Assembly
Figure 601

APU MUFFLER ASSEMBLY - REPAIR 2-1

354A3000–1

1. General

A. This procedure tells how to repair the APU muffler assembly (1A).

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to the REPAIR - GENERAL (49-13-02/601, REPAIR - GENERAL) for the Standard True Position Dimensioning Symbols shown in the repair.

D. Refer to IPL Figure 1 for item numbers.

2. Procedure

NOTE: For miscellaneous materials, refer to SOPM 20-60-04. For installation of safetying devices, refer to SOPM 20-50-02. For bolt and nut installation, refer to SOPM 20-50-01.

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
G00440	Lockwire - Corrosion Resistant Steel (0.041 inch Dia.)	NASM20995˜ C41

B. References

Reference	Title
SOPM 20-50-01	BOLT AND NUT INSTALLATION
SOPM 20-50-02	INSTALLATION OF SAFETYING DEVICES
SOPM 20-60-04	MISCELLANEOUS MATERIALS

C. Insulation Blanket Replacement

(1) Remove twenty screws (15) with washers (20) then take the seal support assembly (30) and the doubler (25) off of the muffler assembly (1A).

(2) Remove the lockwire from the two insulation blanket assemblies (5, 10) that are around the muffler assembly (1A), then remove the insulation blanket assemblies (5, 10).

(3) If you find defects on the insulation blankets, refer to REPAIR 3-1 for repair instructions.

(4) Install replacement insulation blanket assemblies (5, 10) on the muffler assembly (1A).

NOTE: Make sure the blanket flange on the blankets (5, 10) tilt away from the seal assembly (30), as shown on REPAIR 2-1, Figure 601. Some muffler assemblies (1A) have the word TOP on on the top blanket (5). Make sure the word TOP on the blanket (5) aligns with the word TOP on the aft end cap assembly (155).

(5) Make sure the edges of the insulation blanket assemblies (5, 10) touch on both sides, then lockwire them together with lockwire, G00440. Do not use the lockwire to pull the edges of the insulation blanket assemblies (5, 10) together, because that will pull out the capstans from the blankets.

(6) Install a replacement seal support assembly (30) and doubler (25) with twenty screws (15) and washers (20). It is not necessary to tighten the screws (15).

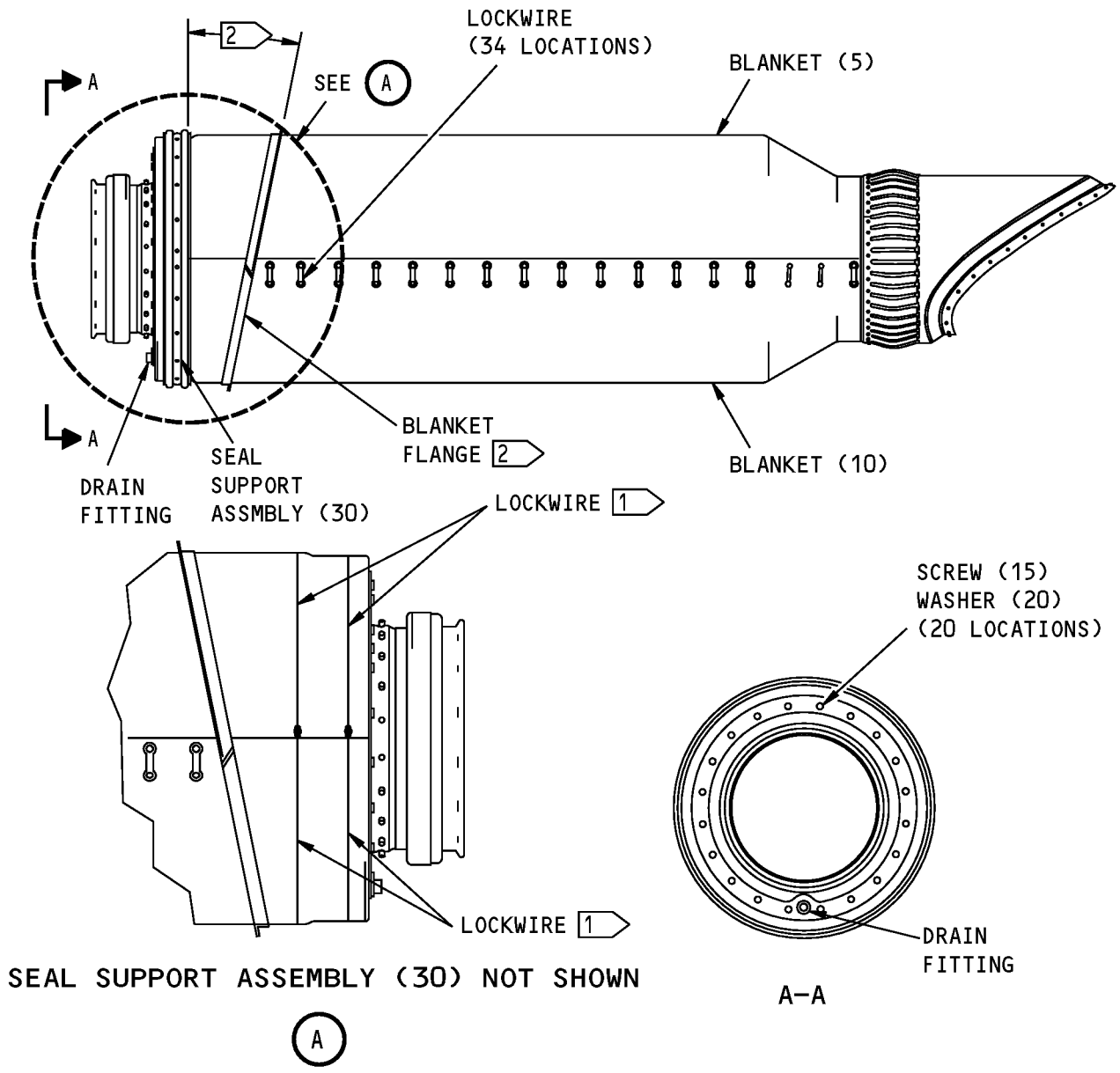
NOTE: Make sure the drain fitting is on the bottom of the muffler assembly (1A) as shown in REPAIR 2-1, Figure 601 before you install the screws (15).

D. Seal Support Assembly Replacement

NOTE: To replace the seal assembly (50) only, see REPAIR 2-2.

(1) Remove twenty screws (15) with washers (20), then remove the seal support assembly (30) and the doubler (25) from the muffler assembly (1A).

(2) Install a replacement seal support assembly (30) and doubler (25) with twenty screws (15) and washers (20). It is not necessary to tighten the screws (15).



1 LOCKWIRE FROM EYELET ON TOP BLANKET ASSEMBLY ON ONE SIDE APPROXIMATELY 180 DEGREES AROUND THE BOTTOM BLANKET ASSEMBLY TO EYELET ON THE OTHER SIDE OF THE TOP BLANKET ASSEMBLY. LOCKWIRE FROM EYELET TO EYELET ACROSS THE TOP BLANKET

2 MAKE SURE THE BLANKET FLANGE ON BLANKETS (5,10) TILT AWAY FROM THE SEAL SUPPORT ASSEMBLY (30).

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

354A3000-1,-10 APU Muffler Assembly Repair
Figure 601

3. **Weld Repairs**

A. Procedure

NOTE: To replace the seal assembly (50) only, see REPAIR 2-2

(1) Remove twenty screws (15) with washers (20), then remove the seal support assembly (30) and the doubler (25) from the muffler assembly (1A).

(2) Install a replacement seal support assembly (30) and doubler (25) with twenty screws (15) and washers (20). It is not necessary to tighten the screws (15).

SEAL SUPPORT ASSEMBLY - REPAIR 2-2

354A3000–6

1. General

A. This procedure tells how to repair the seal support assembly (30).

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to the REPAIR - GENERAL (49-13-02/601, REPAIR - GENERAL) for the Standard True Position Dimensioning Symbols shown in the repair.

2. Procedure

NOTE: For miscellaneous materials, refer to SOPM 20-60-04. For general sealing procedures, refer to SOPM 20-50-19.

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63

B. References

Reference	Title
SOPM 20-50-19	GENERAL SEALING
SOPM 20-60-04	MISCELLANEOUS MATERIALS

C. Seal Assembly Replacement

NOTE: For replacement of the seal support assembly (30) on the muffler assembly, see REPAIR2-1.

(1) Remove the rivets (35) from the seal support assembly (30) at twenty-two locations.

(2) Remove the seal retainer (45), the seal assembly (50), the flame shield (55), and the spacers (40) from the support ring (60).

(3) Clean the old sealant from the flame shield (55), support ring (60), and spacers (40).

(4) Install the flame shild (55), and a new seal assembly (50) onto the support ring (60).

(5) Turn the flame shield (55) around the outside of the support ring (60) until the slot of the flame shield (55) is in the position shown in REPAIR 2-2, Figure 601.

(6) Align the rivet holes in the support ring (60) with the rivet holes in the flame shield (55).

(7) Use the rivet holes in the support ring (60) as a guide to drill 0.156 inch diameter holes thru the new seal assembly (50) at twenty-two locations.

(8) Remove the seal assembly (50) and drill the twenty-two holes to 0.322 inch diameter as shown in REPAIR 2-2, Figure 601.

(9) Install the flame shield (55) and the seal assembly (50) back onto the support ring (60).

(10) Turn the flame shield (55) around the outside of the support ring (60) until the slot of the flame shield (55) is in the position shown in REPAIR 2-2, Figure 601.

(11) Align the holes in the seal assembly (50) with the holes in the support ring (60)and the flame shield (55).

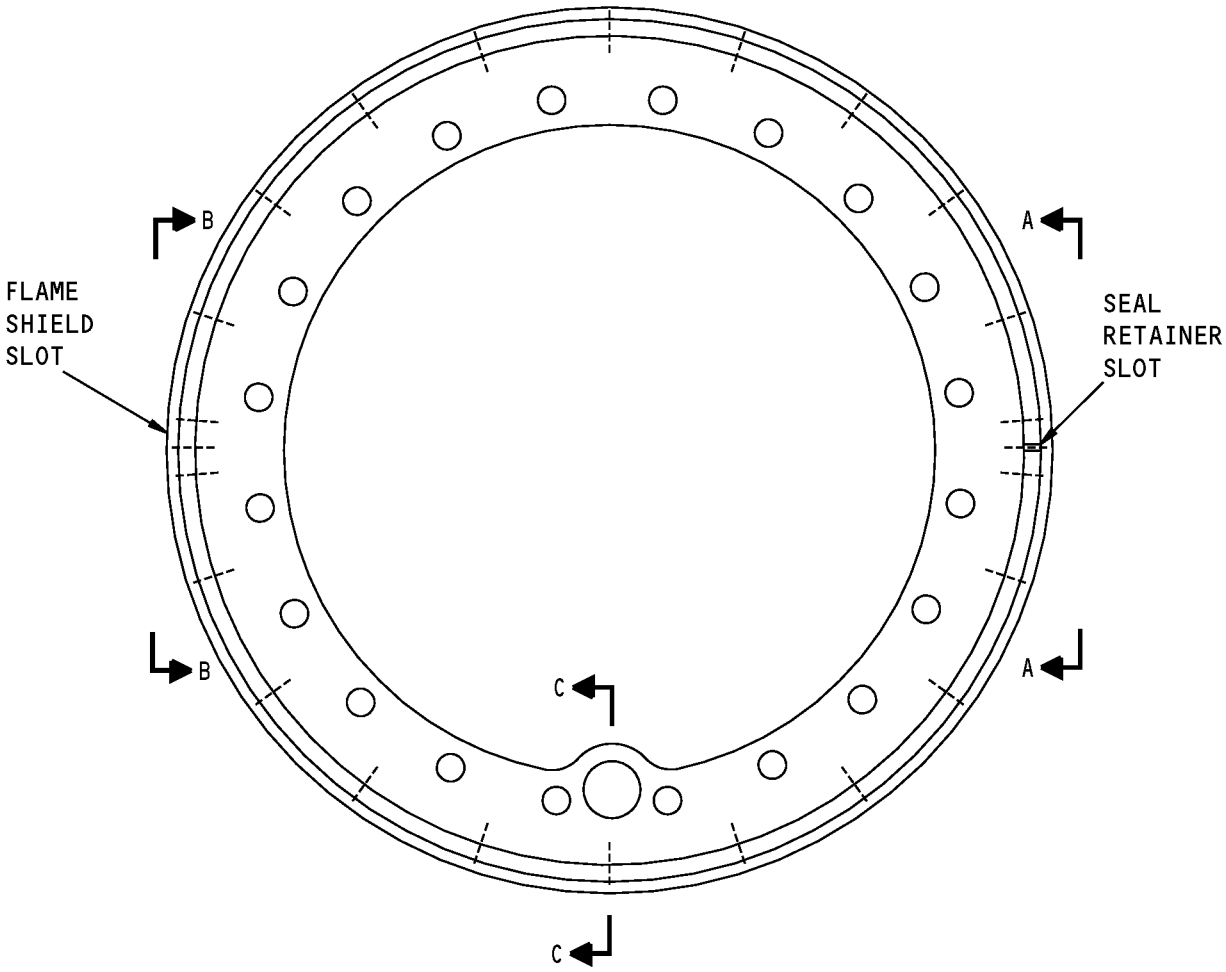
(12) Apply sealant, A00160 to the spacers (40) and install them in the seal assembly (50) at twenty-two locations.

(13) Install the seal retainer (45) onto the seal assembly (50), then turn the seal retainer (45) around the outside of the seal assembly (50) until the slot of the seal retainer (45) is in the position shown in REPAIR 2-2, Figure 601.

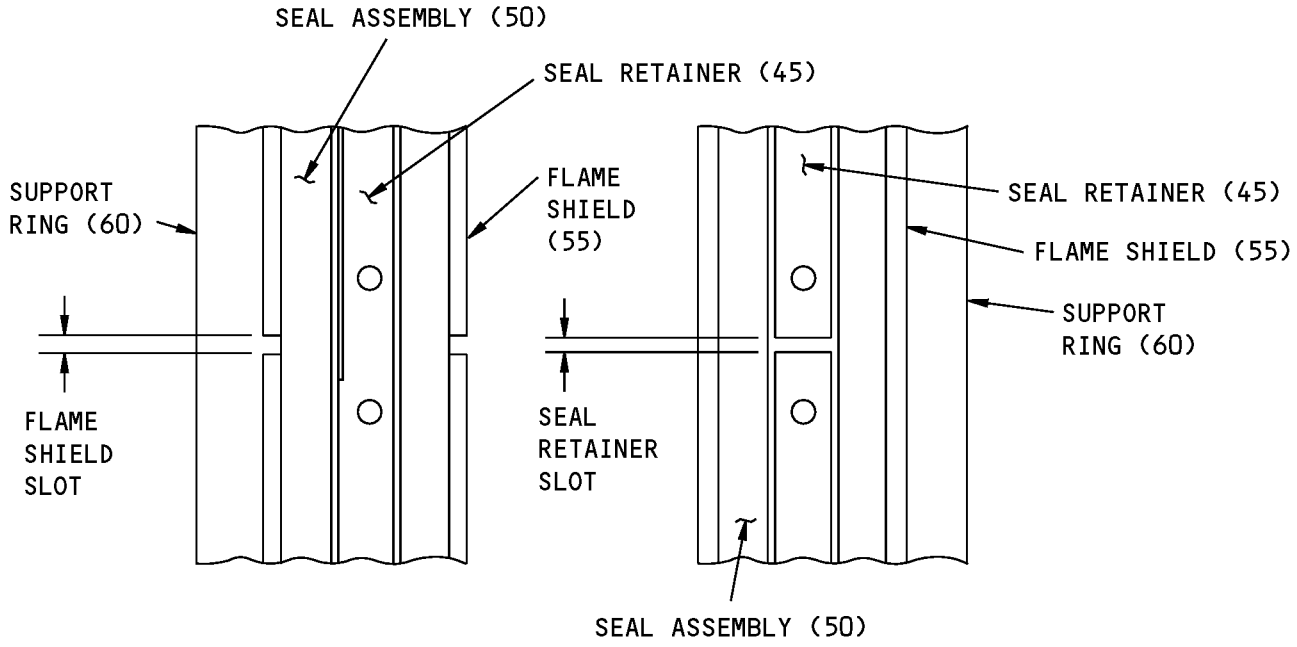
(14) Install rivets (35) at twenty-two locations.

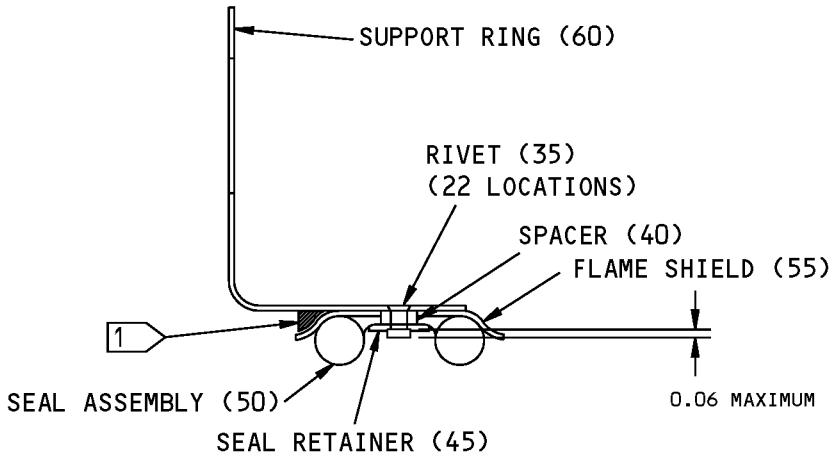
NOTE: Make sure the rivets (35) are not more than 0.06 inch above the seal retainer (45) as shown in REPAIR 2-2, Figure 601.

(15) Fill the space between the support ring (60) and the flame shield (55) with sealant, A00160 as shown in REPAIR 2-2, Figure 601, and as specified in SOPM 20-50-19.



354A3000-6 Seal Support Assembly Repair
Figure 601 (Sheet 1 of 2)





C–C
(TYPICAL FOR 22 LOCATIONS)

1 FILL SPACE WITH BMS 5-63 SEALANT

ITEM NUMBERS REFER TO IPL FIG. 1

354A3000-6 Seal Support Assembly Repair
Figure 601 (Sheet 2 of 2)

INSULATION BLANKET - REPAIR 3-1

1. General

A. This procedure tells how to repair damage to the insulation blankets. It comes from 737-SL-49-077.

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to IPL Figure 1 for item numbers.

2. Blanket Repair

A. References

Reference	Title
SOPM 20-60-01	CLEANING MATERIALS

B. Procedures (REPAIR 3-1, Figure 601 thru REPAIR 3-1, Figure 604)

NOTE: For welding procedures, refer to BAC5975. For cleaners, refer to SOPM 20-60-01.

NOTE: You can use any of these cleaners: BMS 11-7 solvent B00184, acetone B00062, methyl ethyl ketone B00148, toluene B00094, trichloroethane B00070, Dowclene EC, Citra-Safe B00634, methyl propyl ketone B00666, or FCC-55 B01026. For the dimpled repair patches, use Foil, dimpled, stainless steel (AMS 5510), 0.003-0.005 inch thick from V06689 or V70628. For the Capstan Repair Patch, use part number 12059 from V06689 or part number 401159-501 from V70628. For the Multiple Capstan Repair Patch, use part number 12085 from V06689 or part number 401159-503 from V70628.

(1) Spot Weld Repair

(a) Use this procedure for damage to the inside or outside surface of the blanket.

(b) Damage limits:

1) A hole in the face sheet cannot be larger than 1.5 inch (38.1 mm) in diameter.

2) A tear or crack in the face sheet cannot be longer than 23.5 inches (596.9 mm) in the radial direction and cannot be longer than 6.0 inches (152.4 mm) in the longitudinal direction.

3) Around each damaged area, there must be a minimum undamaged surface distance of 1.0 inch (25.4 mm) in all directions.

4) The damaged area must be a minimum of 1.0 inch (25.4 mm) from a capstan.

5) The patch to be applied must not overlap a patch of an older repair.

(c) Cut off the rough edges of the dimpled foil around the area of the damage. If this is a clean crack or tear, make a 0.12-0.16 inch (3-4 mm) diameter stop hole at each end of the crack. If you cannot make these holes, cut the foil to make the crack circle back on itself.

(d) Visually examine the exposed insulation to make sure there are no voids or fluid in the insulation. If there are signs of voids or fluid in the insulation, replace the blanket.

(e) Cut a patch from clean dimpled foil of sufficient size to overlap the area of damaged a minimum of 1.0 inch (25.4 mm) in all directions (REPAIR 3-1, Figure 602). Carefully bend the patch to agree with the contour of the damaged area. Do not bend the foil more than one time, because that will weaken the foil.

(f) Clean the damaged area and the patch with solvent B00184, then dry with a clean, lint-free cloth. Be careful not to let solvent get into the exposed insulation material.

(g) Spot weld the patch on the damaged area (BAC5977 Class C) as follows:

1) Make adjustments to the machine with scrap foil. Get two pieces of foil of the same thickness as that to be used in the repair. Put the two pieces together with either soft insulation or nothing behind them. Touch the grounding electrode to the back scrap piece of foil. With the welding electrode, push the two foils together to make them touch each other. Operate the gun to make a weld, and then try to pull the two foils apart. A good weld will pull a hole in one of the two foils as they come apart. If this does not occur, or if the electrode bonds to the foils, adjust the machine settings and try again until the test weld is good.

2) Put the patch in position on the undamaged foil. If necessary, you can temporarily hold the patch in position with adhesive tape.

3) Tack-weld the patch to the foil as shown in REPAIR 3-1, Figure 604. To do this, hold the grounding electrode on the foil adjacent to the patch, and use the welding electrode to make a weld on the patch approximately 0.125-0.250 inch (3.2-6.4 mm) in from the edge of the patch. Use the same procedure as when you adjusted the machine. Make more of these welds all around the edge of the patch. Make more of these welds all around the edge of the patch at locations approximately 1.0 inch (25.4 mm) apart. Then make more welds in between these welds, approximately 0.125 inch (3.2 mm) apart. Then make a second row of welds approximately 0.5 inch (12.7 mm) in from the first row of welds.

4) Do REPAIR 3-1, Paragraph 2.B.(1)(a) again to make sure the machine settings continue to make a good weld. If the test weld is not good, weld the patch again with the corrected settings.

5) With a blunt tool, make the edges smooth with the adjacent areas.

(2) Capstan Repair

(a) Use this procedure when a capstan is torn out or there is damage to the blanket within 1 inch of a capstan. This procedure applies a plain foil patch in the location where the capstan was.

(b) Damage limits:

1) Around each damaged area, there must be a minimum undamaged surface distance of 1.0 inch (25.4 mm) in all directions

2) The damaged area must be a minimum of 1.0 inch (25.4 mm) from another capstan

3) There cannot be damage to the end capstans of the blanket

4) There must be two good capstan pairs between each damaged pair of capstans

5) A tear or crack in the face sheet cannot be longer than 23.5 inches (596.9 mm) in the radial direction and cannot be longer than 6.0 inches (152.4 mm) in the longitudinal direction

6) The patch to be applied must not overlap a patch of an older repair.

(c) Remove the capstan at the damaged location. Be careful not to damage the insulation under the foil skin.

(d) If necessary, cut off the rough edges of the dimpled foil around the area of the damage. If this is a clean crack or tear, make a 0.12-0.16 inch (3-4 mm) diameter stop hole at each end of the crack. If you cannot make these holes, cut the foil to make the crack circle back on itself.

(e) Visually examine the exposed insulation to make sure there are no voids or fluid in the insulation. If there are signs of voids or fluid in the insulation, replace the blanket.

(f) Cut a patch from clean dimpled foil of sufficient size to overlap the area of damage a minimum of 1.0 inch (25.4 mm) in all directions (REPAIR 3-1, Figure 602). If this is for damage around a capstan on the lower blanket, make sure the patch is of sufficient size to make a minimum ovelap of 0.125 inch (3.2 mm) under the upper blanket when the two are tied together. Carefully bend the patch to agree with the contour of the damaged area. Do not bend the foil more than one time, because that will weaken the foil.

(g) Weld the patch in position as specified in step REPAIR 3-1, Paragraph 2.B.(1)(g).

(3) Capstan Replacement

(a) Use this procedure when one or more capstans are torn out or there is damage to the blanket within 1 inch of a capstan, and when damage is more than the REPAIR 3-1, Paragraph 2.B.(2) limits of the capstan repair procedure. This procedure applies a special repair patch that comes with one or more attached capstans (REPAIR 3-1, Figure 603).

(b) Damage limits:

1) Around each damaged area, there must be a minimum undamaged surface distance of 1.0 inch (25.4 mm) in all directions.

2) The patch to be applied must not overlap a patch of an older repair.

(c) Remove the capstan at the damaged location. Be careful not to damage the insulation under the foil skin. If the damage is within 1.0 inch (25.4 mm) of another capstan, that capstan must also be removed and a multiple capstan repair patch must be used.

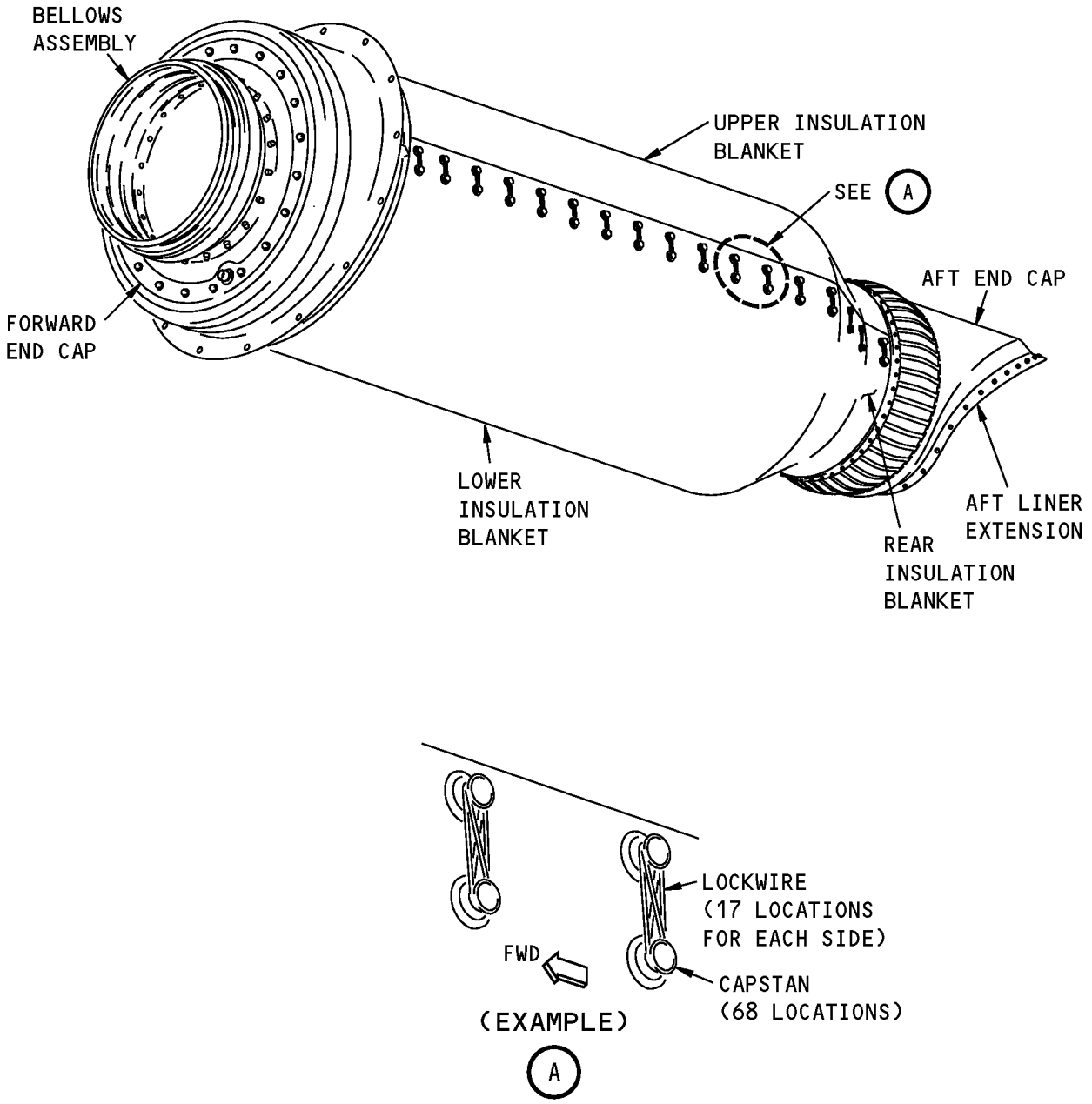
(d) If a row of capstans is ripped out, you must use a multiple-capstan repair patch. Do not weld together one-capstan repair patches to make a multiple-capstan repair patch.

(e) If necessary, cut off the rough edges of the dimpled foil around the area of the damage. If this is a clean crack or tear, make a 0.12-0.16 inch (3-4 mm) diameter stop hole at each end of the crack. If it is not possible to make these holes, cut the foil to make the crack circle back on itself.

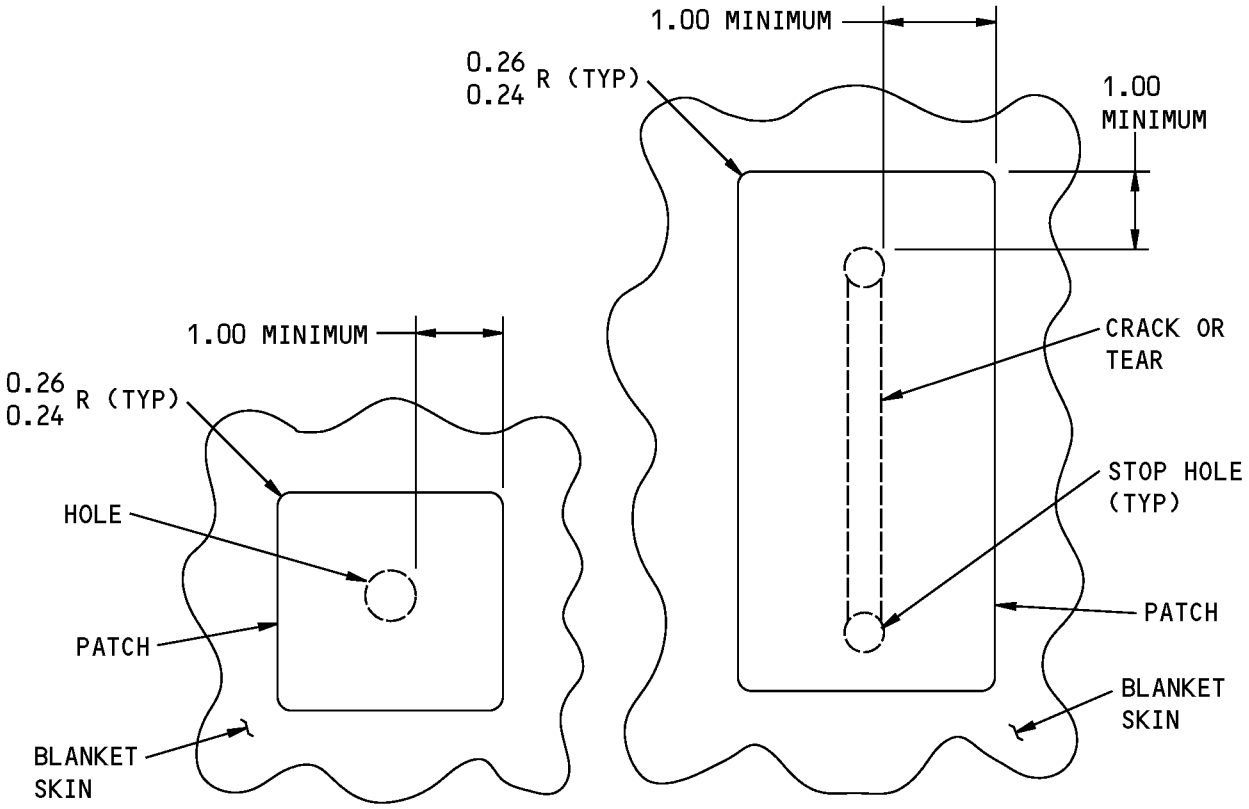
(f) Visually examine the exposed insulation to make sure there are no voids or fluid in the insulation. If there are signs of voids or fluid in the insulation, replace the blanket.

(g) Cut the repair patch to let the capstan be aligned with its mating pair and row within 0.25 inch (6.4 mm) and to the patch be of sufficient size to overlap the damaged area by 1.0 inch (25.4 mm) in all directions. If this is for damage around a capstan on the lower blanket, make sure the patch is of sufficient size to make a minimum overlap of 0.125 inch (3.2 mm) under the upper blanket when the two are tied together. Carefully bend the patch to agree with the contour of the damaged area. Do not bend the foil more than one time, because that will weaken the foil.

(h) Weld the patch in position as specified in REPAIR 3-1, Paragraph 2.B.(1)(g).

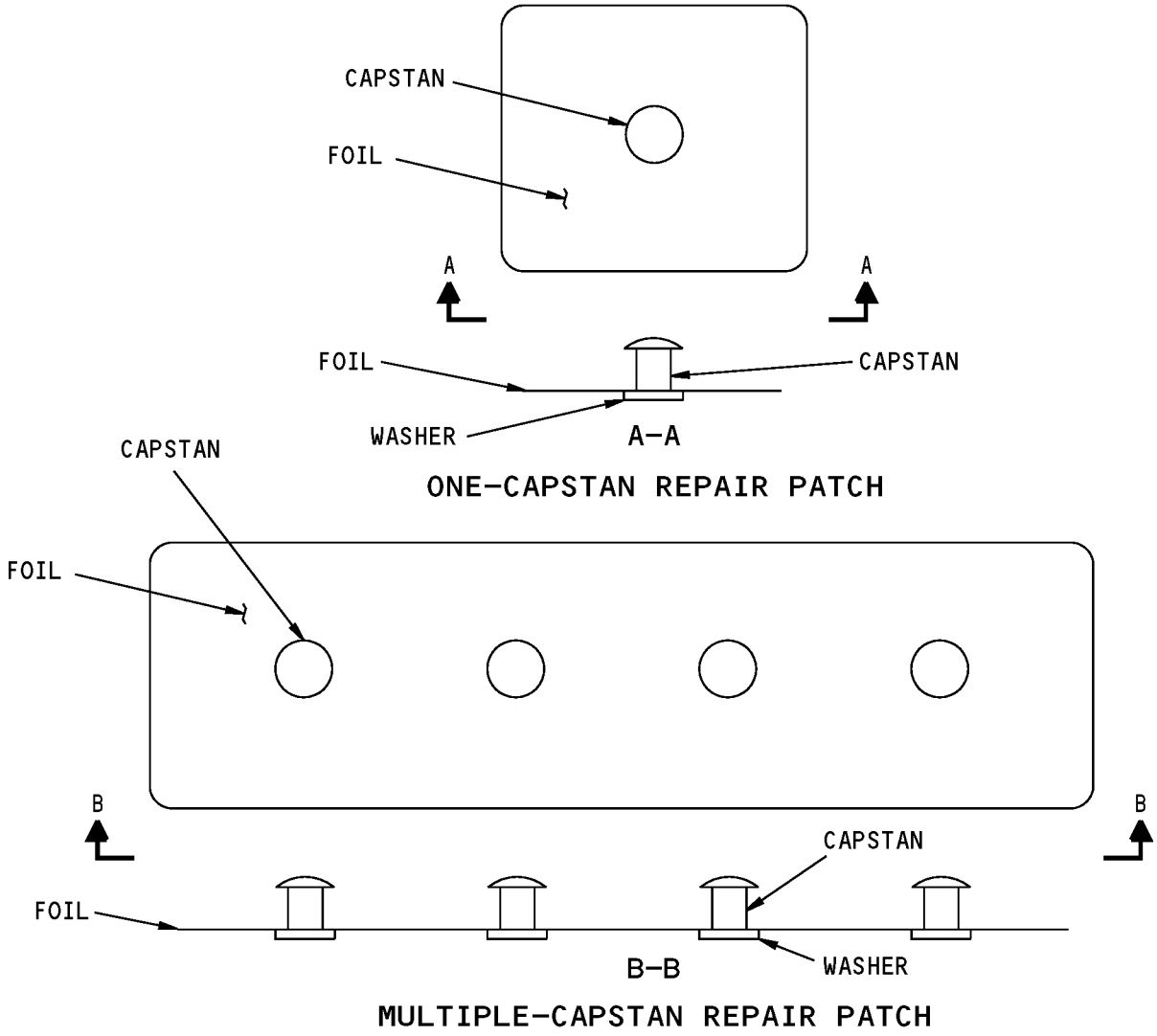


Insulation Blanket Details
Figure 601



ALL DIMENSIONS ARE IN INCHES

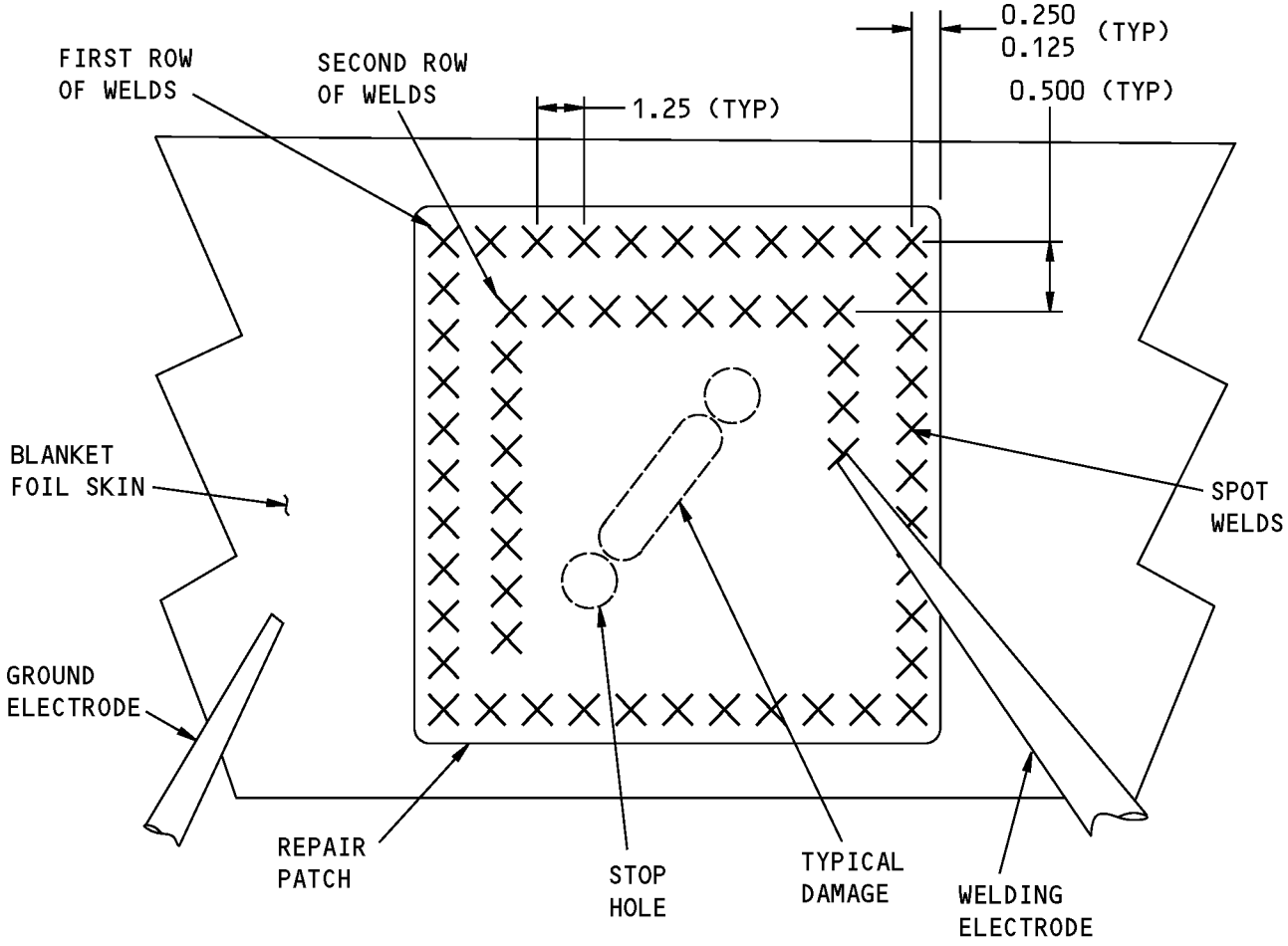
Foil Skin Repair Patches
Figure 602



PATCH TYPE	PART NUMBER	
	ARROWHEAD (V70628)	EXOTIC METALS (V06689)
ONE–CAPSTAN	401159–501	12059
MULTIPLE–CAPSTAN	401159–503	12085

REPAIR PATCH PART NUMBERS
TABLE A

Capstan Repair Patches
Figure 603



Spot Weld Repair Details
Figure 604

ASSEMBLY

1. General

A. This procedure tells how to assemble the APU muffler assembly (1A).

B. Refer to the Standard Overhaul Practices Manual (SOPM) for details of the SOPM subjects identified in this procedure.

C. Refer to IPL Figure 1 for item numbers.

2. Procedure

NOTE: For bolt and nut installation, refer to SOPM 20-50-01. For general sealing, refer to SOPM 20-50-19.

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63

B. References

Reference	Title
SOPM 20-50-01	BOLT AND NUT INSTALLATION
SOPM 20-50-19	GENERAL SEALING

C. Assembly

(1) Use standard industry practices and these steps.

(2) Install the acoustic liner (85) into the APU exhaust duct muffler assembly (1A).

(a) Put the acoustic liner (85) back into the APU exhaust duct muffler assembly (1A).

(b) Install the bellows assembly (80) with new bolts (70) and collars (75). Install the bolts with sealant, A00160 (SOPM 20-50-19).

BOEING®

COMPONENT MAINTENANCE MANUAL

FITS AND CLEARANCES

(NOT APPLICABLE)

(NOT APPLICABLE)

ILLUSTRATED PARTS LIST

1. Introduction

A. The Illustrated Parts List (IPL) contains an illustration and a list of component parts you can repair or replace. The Illustrated Parts Catalog (IPC) shows how to use the Boeing part number system.

B. This shows how parts are related: The relation of each item to its next higher assembly (NHA) is shown in the NOMENCLATURE column. Use the indenture system that follows:

1 2 3 4 5 6 7

. Assembly

. Attaching parts for assembly

. . Detail parts for assembly

. . Subassembly

. . Attaching parts for subassembly

. . . Detail parts for subassembly

. . . Sub-subassembly

. . . Attaching parts for subassembly

. . . . . Details parts for sub-subassembly

Detail Installation Parts (Included only if installation parts may be sent to the shop as part of assembly)

C. Each top assembly is given one use code letter (A, B, C, etc.) in the USAGE CODE column. All subsequent component parts in the list can have one or more of the use code letters to show effectivity to top assemblies. A component part without a use code applies to all top assemblies.

D. An alphabetical letter is added after the item number for optional parts, parts changed by a Service Bulletin, configuration differences (except left-handed and right-handed parts), last engineering releases, and parts added between item numbers in a sequence. The alphabetical letter will not be shown on the illustration for equivalent parts of the same part number.

E. Color-coded parts are identified with a single digit alpha following the dash number or with ''SP'' suffix. If the ''SP'' suffix is used, it represents consolidation of all color codes applicable for a given usage which are not separately listed. Orders for color-coded parts should include the registry number of the airplane for which the parts are ordered.

F. If a part number is 15 characters long but will not fit in the part number column, the part number will be displayed with a ''~'' at the end of the line and will be continued on the next line. The ''~'' denotes that the part number continues on the next line.

G. Parts changed by a Service Bulletin are shown by PRE SB XXXX and POST SB XXXX added to the NOMENCLATURE column.

(1) When a new top assembly is added by a Service Bulletin, PRE SB XXXX and POST SB XXXX will be added at the top assembly level only. The configuration differences at the detail part level are shown by use code letters.

(2) When the top assembly part number is not changed by the Service Bulletin, PRE SB XXXX and POST SB XXXX will be added at the detail level.

H. Interchangeable Parts

Optional (OPT)	The part is optional to and interchangeable with other parts that have the same item number.
Replaces, Replaced by and not interchangeable with (REPLACES, REPLACED BY AND NOT INTCHG/W)	The part replaces and is not interchangeable with the initial part.
Replaces, Replaced by (REPLACES, REPLACED BY)	The part replaces and is interchangeable with, or is an alternative to, the initial part.

VENDOR CODES

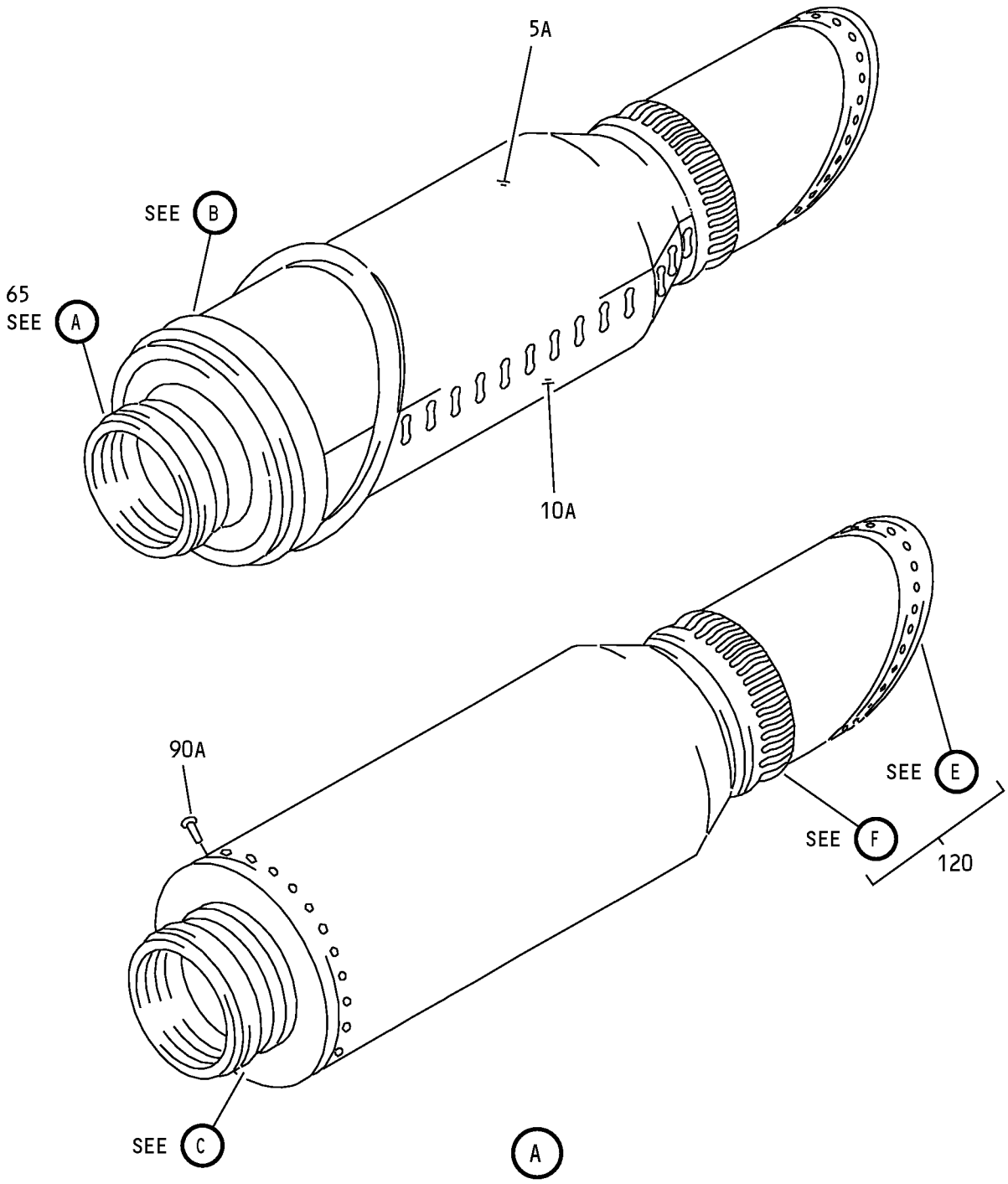
Code	Name
11815	CHERRY AEROSPACE FASTENERS DIV OF TEXTRON 1224 EAST WARNER AVENUE PO BOX 2157 SANTA ANA, CALIFORNIA 92707-0157 FORMERLY IN LOS ANGELES, CALIF , FORMERLY CHERRY FASTENERS TOWNSEND DIV OF TEXTRON INC V71087
11960	KIRKHILL - TA HANKON DIV 336 WEIR ST P. O. BOX 1091 TAUNTON, MASSACHUSETTS 02780 FORMERLY HERCULES INC & HAVEG & BURKE INC HASKON DIV
15653	ALCOA GLOBAL FASTENERS INC DIV KAYNAR PRODUCTS 800 S STATE COLLEGE BLVD FULLERTON, CALIFORNIA 92831-3001 FORMERLY VK6405 MICRODOT AEROSP LTD; FORMERLY KAYNAR TECH FORMERLY FAIRCHILD FASTENERS KAYNAR DIV
52828	REPUBLIC FASTENER MFG CORP 1300 RANCHO CONEJO BLVD NEWBURY PARK, CALIFORNIA 91320-1405 FORMERLY IN SYLMAR, CALIFORNIA
56878	SPS TECHNOLOGIES INC AEROSPACE AND INDUSTRIAL PRODUCTS DIV 301 HIGHLAND AVE JENKINTOWN, PENNSYLVANIA 19046 FORMERLY STANDARD PRESSED STEEL FORMERLY IN SALT LAKE, UTAH

Code	Name
70628	VESPER CORP ARROWHEAD PRODUCTS 4411 KATELLA AVENUE LOS ALAMITOS, CALIFORNIA 90720-3514 FORMERLY FEDERAL-MOGUL CORP RUBBER AND PLASTICS GROUP AND ARROWHEAD PRODUCTS DIV OF INDIAN BAR CO
72962	HARVARD INDUSTRIES INC 3 WERNER WAY SUITE 210 LEBANON, NEW JERSEY 08833 FORMERLY ESNA V7A079 FORMERLY ELASTIC STOP NUT IN UNION, NJ
73197	HI-SHEAR TECHNOLOGY CORP 2600 SKYPARK DRIVE TORRANCE, CALIFORNIA 90509
80539	SPS TECHNOLOGIES INC DIV AERPSOACE - SANTA ANA 2701 SOUTH HARBOR BOULEVARD SANTA ANA, CALIFORNIA 92704-5803 FORMERLY NUTT-SHEL DIV OF SPC WESTERN CO V80539 AND STANDARD PRESSED STEEL WESTERN DIV V17279
92215	FAIRCHILD IND INC FAIRCHILD AEROSPACE FASTENER DIV 3010 W LOMITA BLVD TORRANCE, CALIFORNIA 90505-5102 FORMERLY VOI-SHAN IN CULVER CITY, CALIF

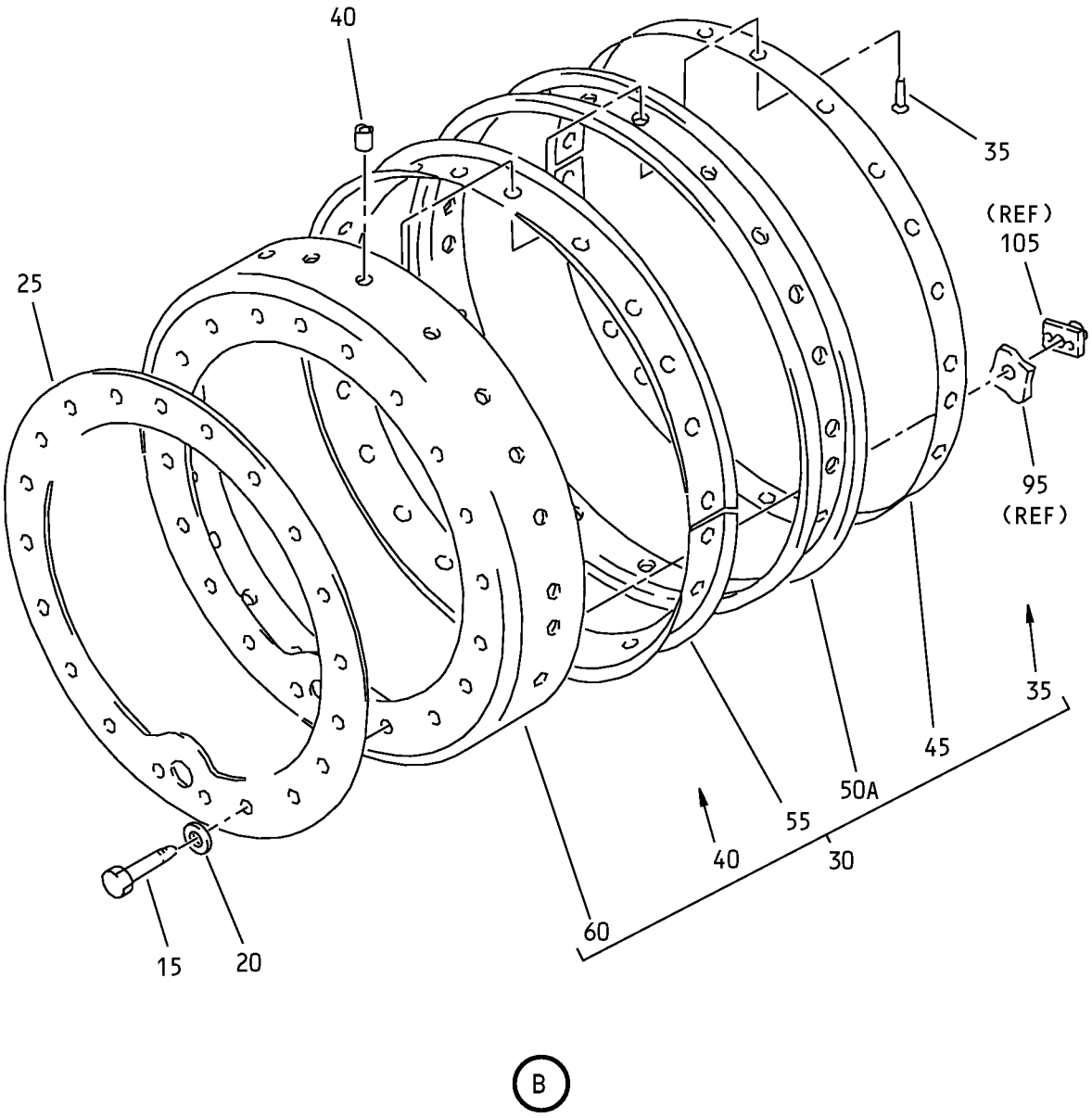
NUMERICAL INDEX

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
101F9201M3		1	105	20
14818-101		1	80A	1
354A3000-1		1	1A	RF
354A3000-2		1	65	1
354A3000-3		1	120	1
354A3000-4		1	155	1
354A3000-5		1	95	1
354A3000-6		1	30	1
354A3020-10		1	45	1
354A3020-11		1	55	1
354A3020-3		1	85	1
354A3020-6		1	145	1
354A3020-7		1	117	1
354A3020-8		1	25	1
		1	115	1
354A3020-9		1	60	1
354A3021-1		1	135	3
354A3021-2		1	130	3
401159-1		1	5A	1
401159-2		1	10A	1
401159-3		1	150A	1
9523-101		1	50A	1
BACB30FM5AU2		1	70	20
BACC30AB5S		1	75	20
BACN10JN3C		1	105	20
BACR15CE3M		1	100	40
BACR15CE4M		1	110	10
		1	125	45
BACR15CE5M		1	35	22
BRFM20C3		1	105	20
HL97DU5		1	75	20
		1	75	20
		1	75	20
MF1031-3BAC		1	105	20

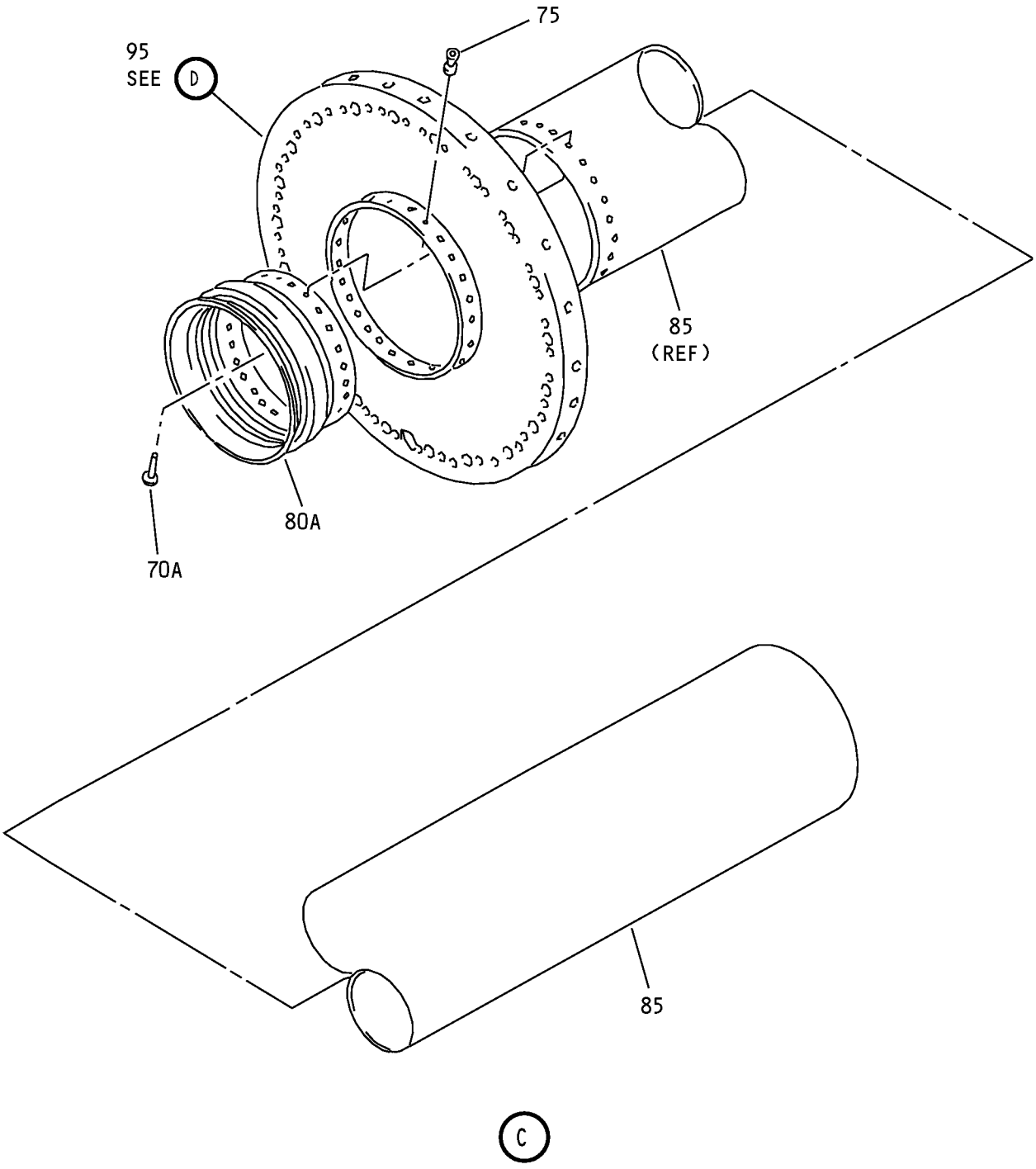
PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
MF53050-3		1	105	20
MS20615-5M		1	140	28
NAS1056C5-009		1	40	22
NAS1149E0332R		1	20	20
NAS1398MS4A1		1	90	24
NAS1802-3-8		1	15	20
NS103218S02		1	105	20
S354A200-1		1	50A	1
S354A300-1		1	5A	1
S354A300-2		1	10A	1
S354A300-3		1	150A	1
S354A301-1		1	80A	1
T8126C3C		1	105	20
VN252B02		1	105	20



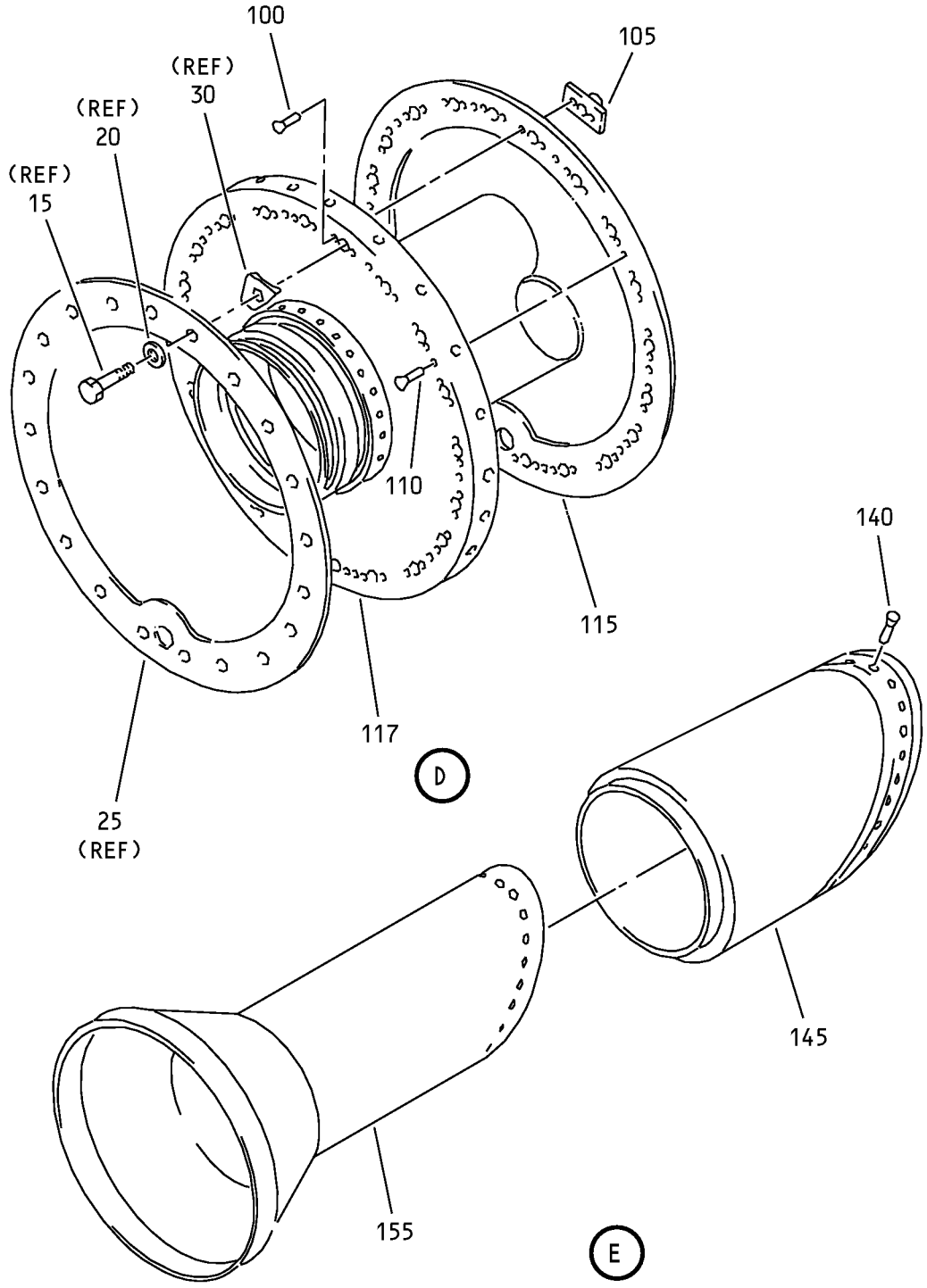
Auxiliary Power Unit Muffler Assembly
IPL Figure 1 (Sheet 1 of 5)



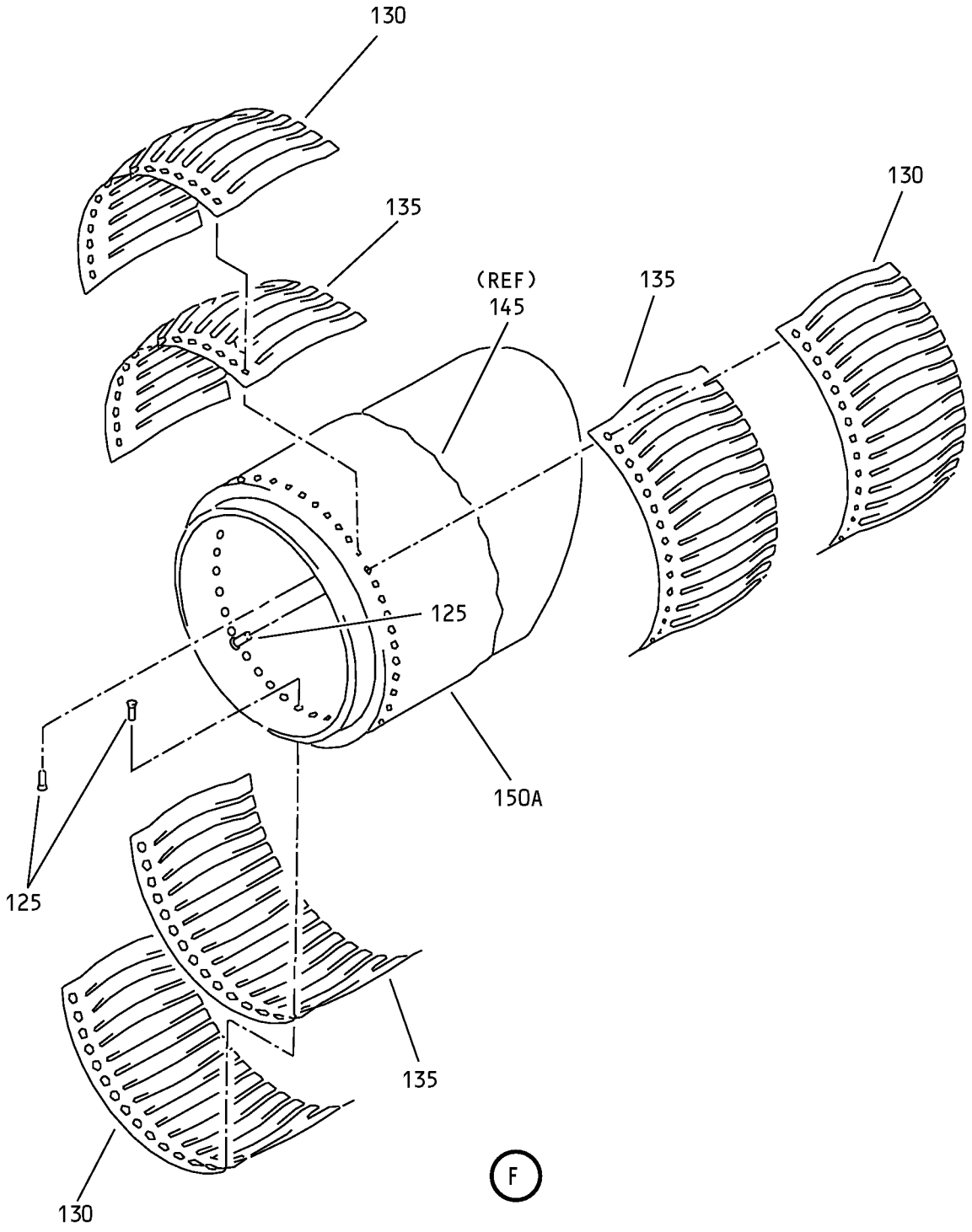
Auxiliary Power Unit Muffler Assembly
IPL Figure 1 (Sheet 2 of 5)



Auxiliary Power Unit Muffler Assembly
IPL Figure 1 (Sheet 3 of 5)



Auxiliary Power Unit Muffler Assembly
IPL Figure 1 (Sheet 4 of 5)



Auxiliary Power Unit Muffler Assembly
IPL Figure 1 (Sheet 5 of 5)

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
–1A	354A3000-1		MUFFLER ASSY		RF
5	S354A300-1		DELETED		
5A	401159-1		. BLANKET ASSY (V70628) (SPEC S354A300-1)		1
10	S354A300-2		DELETED		
10A	401159-2		. BLANKET ASSY (V70628) (SPEC S354A300-2)		1
15	NAS1802-3-8		. SCREW		20
20	NAS1149E0332R		. WASHER		20
25	354A3020-8		. DOUBLER		1
30	354A3000-6		. SUPPORT ASSY-SEAL		1
35	BACR15CE5M		. . RIVET (SIZE DETERMINED ON INST)		22
40	NAS1056C5-009		. . SPACER		22
45	354A3020-10		. . RETAINER-SEAL		1
50	S354A200-1		DELETED		
50A	9523-101		. . SEAL ASSY (V11960) (SPEC S354A200-1)		1
55	354A3020-11		. . SHIELD-FLAME		1
60	354A3020-9		. . RING-SPRT		1
65	354A3000-2		. MUFFLER ASSY		1
70	BACB30FM5AU2		. . BOLT		20
75	HL97DU5		. . COLLAR (V73197) (SPEC BACC30AB5S) (OPT HL97DU5 (V92215)) (OPT HL97DU5 (V56878))		20
80	S354A301-1		DELETED		
80A	14818-101		. . BELLOWS ASSY (V70628) (SPEC S354A301-1)		1
85	354A3020-3		. . LINER-ACOUSTIC		1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
90	NAS1398MS4A1		. . RIVET		24
95	354A3000-5		. . CAP ASSY-FWD END		1
100	BACR15CE3M		. . . RIVET (SIZE DETERMINED ON INST)		40
105	BRFM20C3		. . . NUTPLATE (V52828) (SPEC BACN10JN3C) (OPT MF1031-3BAC (V15653)) (OPT NS103218S02 (V80539)) (OPT VN252B02 (V92215)) (OPT 101F9201M3 (V72962)) (OPT MF53050-3 (V15653)) (OPT T8126C3C (V11815))		20
110	BACR15CE4M		. . . RIVET (SIZE DETERMINED ON INST)		10
115	354A3020-8		. . . DOUBLER		1
117	354A3020-7		. . . CAP-END, FWD		1
120	354A3000-3		. . SUPPORT ASSY-AFT		1
125	BACR15CE4M		. . . RIVET (SIZE DETERMINED ON INST)		45
130	354A3021-2		. . . SPRING-LEAF, OUTER		3
135	354A3021-1		. . . SPRING-LEAF, INNER		3
140	MS20615-5M		. . . RIVET (SIZE DETERMINED ON INST)		28
145	354A3020-6		. . . RING-AFT SPRT		1
150	S354A300-3		DELETED		
150A	401159-3		. . . BLANKET ASSY (V70628) (SPEC S354A300-3)		1
155	354A3000-4		. . . CAP ASSY-AFT END		1

–Item not Illustrated