TO: ALL HOLDERS OF NOSE GEAR SHOCK STRUT ASSEMBLY OVERHAUL MANUAL, 32-21-11

REVISION NO. 79, DATED MAR 1/09

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
Added clarification to repair details at the steering plates					X								

NOSE GEAR SHOCK STRUT ASSEMBLY

32-21-11

BOEING P/N 65-46200-16, -17, -19, -21, -22, -25 thru -30, -32 thru -43, -46 thru -53, -55, -56, -63 thru -67

AIRLINE P/N

THE FOLLOWING DIRECTIVES APPLY TO THIS SUBJECT:

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVES	DATE DIRECTIVE INCORPORATED INTO TEXT
		PRR 30398	Aug 15/67
		PRR 30665	Nov 15/67
		PRR 30613	May 15/69
32-1004		PRR 30803	May 15/69
		PRR 31003	May 15/69
32-1032		PRR 31290	Mar 10/70
		PRR 31909	Mar 10/71
32-1045		PRR 31948	Mar 10/71
		PRR 32010-2	Dec 10/71
		PRR 32119	Dec 10/71
		PRR 32198	Dec 25/72
		PRR 32310	Dec 25/73
		PRR 32397	Dec 25/74

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVES	DATE DIRECTIVE INCORPORATED INTO TEXT
32-1077		PRR 32405	Dec 25/75
		PRR 32411	Dec 25/75
		PRR 32496-23	Jan 5/77
		PRR 32678	Jan 5/77
		PRR 32797	Jul 5/78
		PRR 33100	Jul 5/81
		PRR 33107	Jul 5/81
		PRR 33120	Jul 5/81
		PRR 33194	Jul 5/82
		PRR 33201	Jul 5/82
		PRR 33265	Jan 5/83
32-1132		PRR 33215	Mar 5/84
	32-7		Jun 5/84
32-1132, Rev 1			Sep 5/84
		PRR 33905	Mar 5/86
	32-11		Dec 5/87
32-1191			Jun 5/89
	32-19		Jun 5/91
		SL 32-060	Mar 1/96
		PRR 32678-1	Nov 1/98

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* Indicates pages revised, added or deleted in latest revision
F Indicates foldout pages - print one side only

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	32-21-11		410F	BLANK	702	Nov 1/98
	T-1	Mar 5/86	411	Jul 1/07	703	Nov 1/98
	T-2	Nov 1/98	412	Nov 1/98	704	BLANK
*	LEP-1	Mar 1/09	412A	Nov 1/03	801	May 15/69
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	406E	Dec 1/97	506A	Nov 1/98	1117	Mar 1/07
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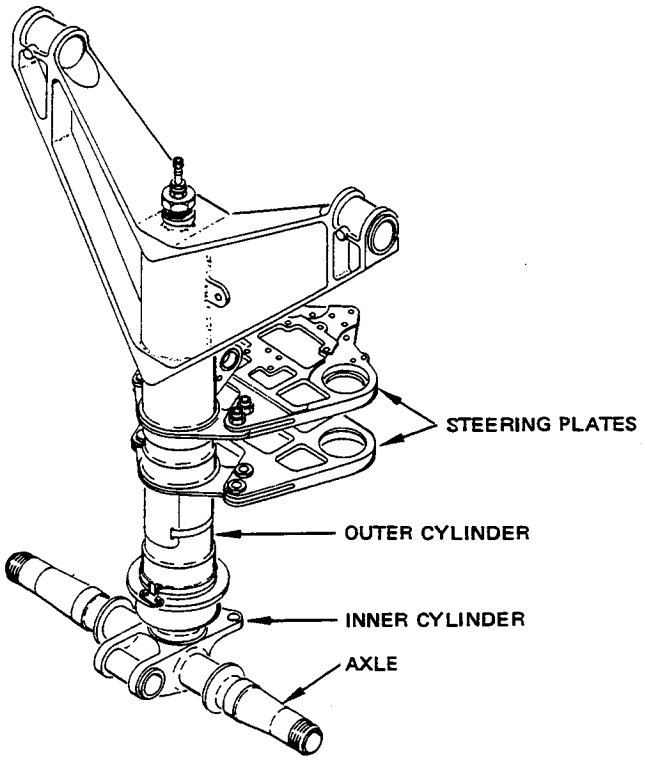
*[1] Special instructions not required. Use standard industry practices and information contained in 20-30-01 and 20-30-03.

NOSE GEAR SHOCK STRUT ASSEMBLY



Nose Gear Shock Strut Assembly
Figure 1

DESCRIPTION AND OPERATION

1. The nose gear shock strut assembly consists of inner and outer cylinders, orifice plate, metering pin, centering cams, bearings, steering cylinder support plates, and wheel axles. The inner cylinder above the bulkhead is partially filled with hydraulic fluid and held under compression pneumatically.

2. The nose gear shock strut uses the air cushion to absorb impact loads, and taxi and landing shocks. The hole in the orifice plate decreases the flow of the hydraulic fluid to slow down the inner cylinder.

3. Leading Particulars (Approximate)

Length -- (Centerline of axle to mounting trunnion holes)
Compressed -- 34 inches
Extended -- 46 inches
Weight -- 127 pounds
Hydraulic Fluid -- (Preferred) BMS 3-32 Type 1 (with corrosion inhibitor) or Type 2 (without corrosion inhibitor)
(Optional) MIL-H-6083 or MIL-H-5606 and Lubrizol 1395 antifriction additive

Fluid Capacity -- 5 pints, 6 ounces (2540 cubic centimeters)

DISASSEMBLY

WARNING: DO NOT START DISASSEMBLY OR UNSCREW THE AIR VALVE BODY (FIG. 101) UNTIL ALL AIR PRESSURE IS RELEASED FROM THE SHOCK STRUT, OR INJURY TO PERSONNEL COULD OCCUR FROM SUDDEN EJECTION OF PARTS.

1. Put the unit in an upright position. To release air pressure, remove the cap from air valve (5, Fig. 1101 or 9, Fig. 1102) and carefully back off the swivel nut one or two turns. (Be sure not to loosen the air valve.) After pressure is released, remove all of the valve assembly.

   NOTE: The air valve, and the NAS509-18 nut and the 66-24147-1 washer under it, could be gone if they were removed in the disassembly procedures of OHM 32-26-11. On shock struts thru 65-46200-53, this nut and washer are items 6, 7, Fig. 1101. On shock struts 65-46200-55, -56, -63 thru -67, the nut and washer are items 91A, 91B, Fig. 1101, OHM 32-26-11.

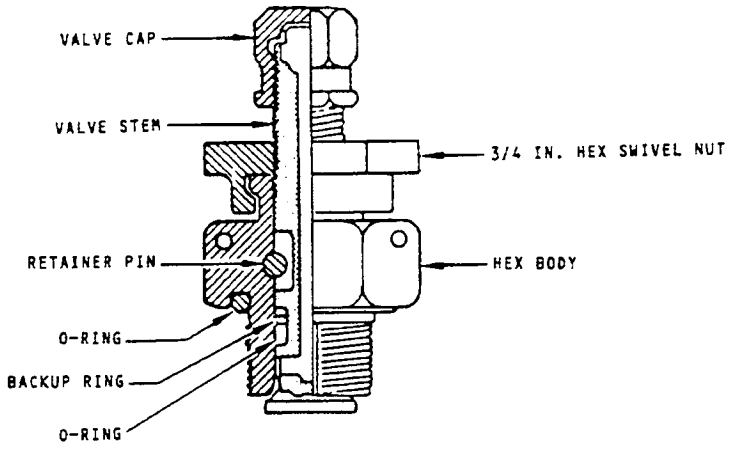
2. Remove all lockwire.

3. Drain the hydraulic fluid from the shock strut. Turn the unit upside down, or remove plug (45D) or check valve (45F) and packing (45E or 45G), to let the fluid out.

4. Put the unit in a stand or fixture for disassembly.

5. Disassembly (Fig. 1101)

   A. Remove the sealant from gland nut (45) and nut (46).



AIR VALVE ASSEMBLY (5, FIG. 1101 OR 9, FIG. 1102)

Air Valve Details
Figure 101

B. Remove the inner cylinder from the outer cylinder.

(1) Remove nuts (1), washers (2), bolts (3) and nut lock (4) from gland nut (45).

(2) Remove items (1 thru 8, 10 thru 19, Fig. 1102) if applicable. Install extension F80160-1 in hole for banjo bolt (6, Fig. 1102).

(3) If installed, remove nut (6), washer (7), or nut (91A), washer (91B) (Fig. 1101, OHM 32-26-11), then remove locknut (8), and lockwasher (9), or straighten tangs of washer (8B), and remove parts (8A, 8B, 9). Install extension F80160-1 in hole for air valve (5).

NOTE: The air valve, and the NAS509-18 nut and the 66-24147-1 washer under it, could be gone if they were removed in the disassembly procedures of OHM 32-26-11. On shock struts thru 65-46200-53, this nut and washer are items 6, 7, Fig. 1101. On shock struts 65-46200-55, -56, -63 thru -67, the nut and washer are items 91A, 91B, Fig. 1101, OHM 32-26-11.

CAUTION: THE GLAND NUT AND THE OUTER CYLINDER COULD HAVE UNDERSIZE THREADS AND BE MATCHED PARTS.

(4) Unscrew gland nut (45) with spanner wrench F80013-1, or equivalent.

CAUTION: KEEP THE INNER AND OUTER CYLINDERS ALIGNED AS YOU PULL THEM APART, OR YOU COULD DAMAGE THE MATING SURFACES. THE INNER CYLINDER COULD HAVE UNDERSIZE AXLE THREADS THAT MUST BE USED WITH SPECIAL UNDERSIZE WHEEL RETAINER NUT 69-77849-SERIES (REF OHM 32-26-11).

(5) Slowly pull out inner cylinder assembly (49) from outer cylinder assembly (10), and push on extension F80160-1 to push support tube (78 or 78A) out of outer cylinder.

CAUTION: STEERING PLATES (14, 15) ARE MATCHED PARTS WITH THE OUTER CYLINDER AND MUST BE KEPT TOGETHER AS A SET.

(6) Remove parts (11, 12, 13) and if used, parts (19 thru 20). Detach steering plates (14 and 15) from outer cylinder.

NOTE: If you find them, make a note of the type and quantity of washers (19A, 19B, 19C) at each spacer (19D) location, to help during reassembly.

(7) Remove seals (22), straps (23), and nameplate (24).

(8) Remove pin (16) from outer cylinder.

C. Remove external parts from inner cylinder.

(1) Remove ring (29). Move bearing (28) against retaining ring (27) and remove spacer halves (30).

(2) Remove retaining ring (27), upper bearing (28), and shim (31).

(3) Remove upper cam (33) from inner cylinder and piston ring (32) from cam.

CAUTION: KEYS (34) COULD FALL OUT DURING REMOVAL OF CAM.

(4) Remove keys (34).

CAUTION: 65-46228-SERIES LOWER CAM (37) COULD HAVE MACHINED TABS TO GO WITH UNDERSIZE OUTER CYLINDER GLAND NUT THREADS.

(5) Remove lower cam (37) and remove O-ring (35) and backup rings (36) from cam.

(6) Remove O-ring (38) and seal (39) from inner cylinder.

(7) Remove lower bearing (42) and remove O-rings (40 and 41) from bearing.

(8) Remove wiper (43), scraper (44), and gland nut (45) from inner cylinder.

D. On shock struts 65-46200-16, -17, -19, -25, -26 and -27 remove internal parts from inner cylinder (49) as follows:

NOTE: For removal of internal parts from inner cylinder of shock struts 65-46200-21, -22, -28, -29, -30, -32 thru -43, -46 thru -53, -55, -56, -63 thru -67, refer to step E.

(1) Bend washer tab (47). Remove nut (46), key washer (47) and washer (48).

(2) Slowly pull assembled support tubes (60 and 78), with attached parts, from inner cylinder assembly (49).

(3) Remove 0-ring (25) and backup rings (26) from upper orifice support tube (78).

(4) Remove 0-ring (70) and backup rings (71) from lower orifice.

(5) Remove lockwire, screws (74) and plate locks (75) from upper orifice plate (76).

(6) Unscrew upper orifice plate (76) with wrench F80012 or equivalent. Remove metering pin (77), and attached parts, from upper orifice support tube (78).

(7) Remove piston ring (73) from lower support tube (78).

(8) Remove lower orifice pins (58) from spacer (59) and lower orifice (72).

(9) Remove cotter pin (55) and pin (56) from locknut (57) and lower support tube (60).

(10) Remove locknut (57).

(11) Remove spacer (59) from lower support tube (60). Remove retainer (53) and filter (54) from support tube.

NOTE: Keep spacer (59) and orifice (72) together as a matched set.

(12) Remove lockwire and remove spring pin (61).

(13) Remove nut (62).

(14) Remove washer (63) and seal lock (64) from metering pin (77).

(15) Remove seal (66) from lower orifice (72) and remove 0-ring (65) from seal.

(16) Separate lower orifice from metering pin (77) and piston (69). Remove backup rings (68) and O-ring (67) from piston.

(17) Remove upper orifice plate (76) from lower orifice (72).

E. On shock struts 65-46200-21, -22, -28, -29, -30, -32 thru -43, -46 thru -53, -55, -56, -63 thru -67, remove internal parts from inner cylinder (49) as follows:

NOTE: For removal of internal parts from inner cylinder of shock struts 65-46200-16, -17, -19, -25, -26, -27, refer to step D.

(1) Bend washer tab (47), remove nut (46) and washers (47 and 48).

(2) Slowly pull support tube (78 or 78A) with attached parts from inner cylinder (49).

(3) Remove O-ring (25) and backup rings (26) from upper end of support tube (78 or 78A).

(4) Remove lockwire, screws (74) and plate locks (75) from orifice plate (76).

(5) Unscrew orifice plate (76) from support tube (78 or 78A) with wrench F80012.

(6) Remove piston ring (73) from support tube (78 or 78A).

(7) Slowly pull metering pin assembly (72A) from inner cylinder (49).

(8) Remove bolt (72B) and unscrew support tube (72C) from metering pin (72D) to release drain tube (72E).

(9) Remove O-rings (72F), backup rings (72G), O-rings (72H) and backup rings (72J).

INSPECTION/CHECK

1. Examine all parts for defects by standard industry practices. Refer to Fits and Clearances for design dimensions and wear limits.

   CAUTION: THE GLAND NUT AND MATING OUTER CYLINDER THREADS COULD BE UNDERSIZE. THEN THE GLAND NUT AND OUTER CYLINDER MUST BE IDENTIFIED TO TELL YOU THIS AND KEPT TOGETHER AS A SET.

2. Examine the threads for the gland nut at the lower end of outer cylinder (21) for corrosion. After removal of defects, threads are acceptable if a minimum of 50% of thread bearing surface remains and defects are not concentrated in any quarter segment across all threads. Refer to Repair for more details.

   CAUTION: THE 65-46228-SERIES LOWER CAM (37) COULD HAVE MACHINED TABS TO GO WITH THE UNDERSIZE OUTER CYLINDER GLAND NUT THREADS.

3. Examine the curved contours of upper and lower cams (33, 37, Fig. 1101), for scored or gouged metal on mating surfaces.

   CAUTION: THE INNER CYLINDER COULD HAVE UNDERSIZE AXLE THREADS THAT MUST BE USED WITH SPECIAL UNDERSIZE WHEEL RETAINER NUT 69-77849-SERIES (REF 32-26-11).

4. Examine the inner cylinder axle threads for nicks, burrs, defects and wear. Measure the thread pitch diameter and the major diameter and compare them with the axle thread diameters shown in Fig. 601 (Sheet 4). A PTG Threadsnap tool is recommended. Be sure to use the correct tool for the thread size.

   NOTE: A Johnson CHF/PD thread measuring system (or equivalent) can be used as an option to measure the thread pitch diameter, but a separate set of pitch diameter rollers and a master thread plug gage is necessary for each size of thread. The plug gage is used to set the dial indicator of the measuring system before you measure the thread pitch diameter. The major diameter can be measured with a micrometer.

5. Magnetic particle examine (SOPM 20-20-01) lock (4), washers (7, 9), nuts (8 or 8A, 57), bolts (13), cam (33), steel 65-46228 - series cam (37), gland nut (45), spacer (59), washer (63), piston (69), lock (75), orifice (76), metering pin (72D, 77), stem (78B), and cylinders (21, 52).

6. Penetrant examine (SOPM 20-20-02) plates (14, 15), pin (16), rings (27, 32, 73), bearing (28), aluminum-nickel-bronze 65C31706-1 cam (37), 69-43201-1 and 69-76508-1 bearings (42), scraper (44), lower support tubes (60, 78 or 78D), seal lock (64), tubes (72C, 72E).

REPAIR

1. Repair (Fig. 1101)

A. General

(1) Repair small defects by standard industry practices. Refer to Fits and Clearances for design dimensions and wear limits.

(2) Refer to SOPM 20-10-01 and CMM 32-00-05 for repair and refinish of high strength steel parts.

B. Pin (13) (Fig. 401)

(1) Machine as required, within repair limits, to remove defects.

(2) Shot peen as indicated.

(3) Build up with chrome plate and grind to design dimensions and finish.

C. Outer Cylinder (21) (Fig. 402).

(1) Barrel surfaces

(a) Machine as required, within repair limits, to remove defects.

(b) Shot peen as indicated.

(c) Unless shown differently, build up with chrome plate and grind to design dimensions and finish. Chrome plate thickness must not be more than 0.015 inch after grinding.

(2) Nick and Dent Repair of Exterior Surfaces

CAUTION: KEEP THE MINIMUM BLEND RADIUS SHOWN. DO NOT GRIND TO BLEND OUT DEFECTS OR TO MAKE SURFACES SMOOTH.

NOTE: Nick and Dent repair limits are the allowable deviation from the design limits. If earlier repairs to this cylinder increased the ID or decreased the OD outside the design limits, you must include that material removal in the calculation of limits for nicks and dents.

Hand filing is preferred. Power driven rotary files are acceptable if low speeds (100 rpm max) and sharp files are used.

(a) Remove nicks, dents and other local defects from exterior surfaces within repair limits, with a file and with 240 grit or finer aluminum oxide or carborundum abrasive cloth.

(b) Shot peen as indicated.

(c) Refinish repaired surfaces as shown. Stylus cadmium plating (Ref SOPM 20-42-10) can be used on local areas.

(3) Threads for Gland Nut

CAUTION: IF YOU CUT THESE THREADS UNDERSIZE, BE SURE TO IDENTIFY THE CYLINDER TO TELL YOU THIS. MAKE SURE YOU USE THE CORRECT UNDERSIZE GLAND NUT.

(a) Blend out defects in the threads if the damage is on not more than 50% of the thread bearing surface and if the blends will be on not more than 50% of threads in any any 3-inch segment circumferentially. You can do this blend repair on original or undersize threads.

(b) For repair of damage more than these limits, if the threads are not the smallest undersize, cut the threads to a smaller size (UNJS-3A) as shown. If applicable, machine 65-46228-series lower bearing (37) tabs per Fig. 404. Use special gland nut (45) with threads to agree. Identify the cylinder, the cam and the nut as matched parts as shown.

(c) If the threads are at the smallest undersize and the damage or necessary repair is more than the limits of step (1), get instructions from Boeing.

(4) Cam Locking Slot

(a) Machine as required, within repair limits, to remove defects.

(b) Shot peen as indicated.

(c) Cadmium-titanium plate. Apply BMS 10-11, Type 1 primer and BMS 10-11, Type 2 enamel.

(d) Get a lower cam (37) or lower bearing (42) and machine the tabs per Fig. 402B.

(e) Identify the outer cylinder and the cam or bearing as a matched set and that they are nonstandard parts.

D. Inner cylinder (52) (Fig. 403 thru 403B)

(1) Barrel surfaces (Fig. 403)

(a) Machine as required, within repair limits, to remove defects.

(b) Shot peen as indicated.

(c) Unless shown differently, build up with chrome plate and grind to design dimensions and finish. Chrome plate thickness must not be more than 0.015 inch after grinding.

(2) Axle threads (Fig. 403A)

(a) Measure the axle thread pitch diameter and major diameter. A PTG Threadsnap tool is recommended. Be sure to use the correct tool for the thread size.

NOTE: A Johnson CHF/PD thread measuring system (or equivalent) can be used as an option to measure the thread pitch diameter, but a separate set of pitch diameter rollers and a master thread plug gage is necessary for each size of thread. The plug gage is used to set the dial indicator of the measuring system before you measure the thread pitch diameter. The major diameter can be measured with a micrometer.

(b) If original threads are worn beyond wear limits, cut the threads to a smaller size as indicated for special matching undersize wheel retainer nut 69-77849-series (Ref OHM 32-26-11, SB 32-1191).

(c) Identify the inner cylinder to tell you this, such as recommended by the procedure shown.

(3) Lugs for Tow Fitting (Fig. 403B)

NOTE: This procedure lets you install a special repair tow fitting when the lug holes cannot be repaired with bushings.

(a) Cut off the damaged lug as shown. Do not cut off more material than is shown, because when you drill holes in the remaining lug area, they must have a minimum edge margin.

(b) Get a 65C36787-2 tow fitting. Put it on the lug.

(c) With the three holes in the tow fitting as a pilot, drill mating holes through the lug in the inner cylinder. Be sure there is a minimum of 0.40 inch edge margin from the center of the holes to the edge of the lug.

(d) Remove the tow fitting from the lug. Keep this tow fitting with this inner cylinder, because they are now matched parts.

(e) If this is the only repair to the inner cylinder, stylus cadmium plate per SOPM 20-42-10 the new holes and the cut surfaces of the lug. Apply primer BMS 10-11, Type 1. If you will do other repairs to the inner cylinder, refinish it as usual after all repairs are complete.

(f) After the inner cylinder repairs are complete, keep this tow fitting with the inner cylinder. The fitting will be installed on the cylinder at the nose gear buildup level (Ref OHM 32-26-11).

E. Lug Faces and Holes (Fig. 402, 403B)

NOTE: For repair of bearing bores in steering plates (14, 15), see Fig. 402A.

Method 2 buildup is optional to Method 1 if material removal is not more than 0.015 inch for lug faces only. No buildup is permitted in lug bores.

(1) Method 1 -- Installation of oversize bushing or repair sleeve.

(a) Machine as required, within repair limits, to remove defects.

(b) Shot peen, cadmium titanium plate, and apply primer BMS 10-11, Type 1.

(c) Make oversize bushings or repair sleeves (Fig. 406, 407), as required, to adjust for material removed in step (1).

(d) Install the bushings or sleeves per par. 3.C.below.

(2) Method 2 -- Chrome Plate or Thermal Spray Buildup (Lug faces only)

(a) Machine as required, within repair limits, to remove defects.

(b) Shot peen.

(c) Build up with chrome plate or thermal spray as indicated.

(d) Grind the buildup to design dimensions and finish.

(e) Install bushings (per parts list) per par. 3.C. below.

F. Steel 65-46228 - Series Lower Cam (37) Inner and Outer Diameters (Fig. 404)

NOTE: Not applicable to 65C31706-1 cam.

(1) Machine as required, within repair limits, to remove corrosion or defects.

(2) Shot peen as indicated.

(3) Restore the machined surface, unless shown differently, with chrome plate and grind to design dimensions and finish.

G. Steel Upper and Lower Cam (33, 37) Cam Profile (Fig. 404, 404B)

NOTE: Not applicable to 65C31706-1 cam.

(1) Machine the cam surface as necessary, within repair limits, to remove defects.

NOTE: We recommend that you machine all of the cam profile.

(2) Build up the cam surface with a thin layer of tungsten carbide thermal spray BMS 10-67, Type 1 (Ref SOPM 20-10-05).

NOTE: This coating is not necessary after material removal per step (1), but we recommend it on one cam (upper or lower) for better wear resistance.

H. Phenolic Lower Bearing (42)

NOTE: This procedure is applicable only to phenolic type lower bearing (69-38182-2) if its fit is too tight.

(1) Bake the bearing at 215-235°F for 4 hours. Cool it to room temperature (65-75°F).

(2) Examine the dimensions per Fig. 408. Machine surfaces as required to get an acceptable fit.

I. Lower Bearing (42), Upper Bearing (28)

(1) Seal groove on 69-76508-series bearing (42) -- Machine as required within repair limits shown in Fig. 409, to remove defects.

(2) Other repair is only replacement of defective bearings. Examine the dimensions and look for defects per Fig. 408, 409, 410, as applicable.

J. Gland Nut (45, 45C)

(1) Blend corrosion areas and dry grit blast.

(2) Shot peen. Refinish as indicated.

K. Metering Pin (72D) Seal Groove (Fig. 405)

(1) Machine as required, within repair limits, to remove defects.

(2) Shot peen the machined surface.

(3) Build up the surface with sulfamate nickel plate and machine to design dimensions and finish. Or build up the surface with chrome plate or thermal spray and grind to design dimensions and finish.

L. Upper Orifice Plate (76)

(1) Repair is only replacement of a worn or defective plate. See Fig. 411 for details.

2. Refinish (Fig. 1101)

NOTE: Refer to SOPM 20-30-02 for stripping of protective finishes and to SOPM 20-41-01 for explanation of F and SRF finish codes. If cadmium-titanium plate is specified, low hydrogen embrittlement cadmium plate (Ref SOPM 20-42-01) can be used as an alternative.

A. Washer (7) -- Cadmium plate (F-15.06). Material: 4340 steel, 150-170 ksi.

B. Nut (8), locknut (57) -- Cadmium plate (F-1.32). Material: 4340 steel, 150-170 ksi.

C. Nut (8A) -- Cadmium plate all over (F-15.06). Material: 4340 steel, 180-200 ksi.

D. Washer (9) -- Cadmium plate (F-1.32). Material: 4340 steel, normalized and tempered to Rc 33 max.

E. Outer cylinder (21) -- Fig. 402.

F. Bolt (13) -- Fig. 401.

G. Plates (14, 15)

(1) 65-46210-3, -4, -6, -11, -12 -- Chemical treat or anodize and apply primer BMS 10-11, Type 1 (SRF-2.30). Apply enamel BMS 10-11, Type 2 (SRF-12.63) all over but not in holes. Material: Al alloy.

(2) 65-46210-17, -18, -19, -20 -- Chemical treat or anodize and apply primer BMS 10-11, Type 1 (F-18.05) and apply enamel BMS 10-60, color 707 (F-14.9813, which replaces SRF-14.9813), but no primer or enamel in holes. Material: Al alloy.

(3) 65-46210-27 -- Chromic acid anodize and apply BMS 10-11, Type 1 primer (F-18.13) and BMS 10-60 enamel (F-14.9813, which replaces SRF-14.9813) but no primer or enamel in holes.

H. Pin (16) -- Passivate (F-17.09). Material: 303 CRES.

I. Nameplate (24) -- Apply primer BMS 10-11, Type 1 (SRF-12.206 or F-20.03) on back only.

J. Upper bearing (28) -- Fig. 410

K. Steel 65-46228 - Series Cam (37) -- Fig. 404. (No finish on aluminum-nickel-bronze 65C31706-1 cam (37).

L. Lower bearing (42) -- Fig. 408, 409

M. Scraper (44), washer (48), support tube (78 or 78D) -- Chromic acid anodize all over (F-2.20 or F-17.04). Material: Al alloy.

N. Gland nut (45, 45C) -- Cadmium plate (F-15.06). Apply primer BMS 10-11, Type 1 (F-20.02) and enamel BMS 10-60 (SRF-14.9813) on exterior surfaces. Material: 4340 steel, 180-200 ksi.

O. Inner cylinder (49, 52) -- Fig. 403.

P. Pin (58) -- Cadmium-titanium plate (F-15.01). Material: 4340M Steel, 270-300 ksi.

Q. Spacer (59) -- Cadmium plate (F-1.32). Material: 17-4PH CRES, solution treated, 180-200 ksi.

R. Tube (60) -- Chromic acid anodize (F-17.04) and apply primer BMS 10-11, Type 1 (F-20.02) on the inside. Material: Al alloy.

S. Washer (63) -- Cadmium plate all over (F-1.32 which replaces F-1.1923). Material: 1020 steel, cold rolled (1018 or 1025 steel optional).

T. Lock seal (64) -- Cadmium plate (F-4.201) but not on the beveled face. Material: Al-Ni-bronze.

U. Piston (69) -- Cadmium plate (F-1.1926) on external surfaces. Material: 4340 Steel, 180-200 ksi.

V. Lower orifice (72) -- Chrome plate (F-15.04) 2.495-2.497 ID, with 0.06 max plating runout at edges and 0.12 max plating runout at radius end. Cadmium-titanium plate (F-15.01) on the OD. Material: 4340M Steel, 270-300 ksi.

W. Support tube (72C) -- Fig. 404C.

X. Metering pin (72D) -- Fig. 405.

Y. Drain tube (72E) – Passivate (F-17.09). Material 304 CRES.

Z. Upper orifice plate (76) -- Fig. 411.

AA. Metering pin (77) -- Cadmium plate (F-1.1926) on the 1/2-20 UNF threads and adjacent relief and end chamfer only. Material: 4340 Steel, 180-200 ksi.

AB. Stem (78B) -- Cadmium plate (F-15.06). Material: 4330M steel, 180-200 ksi.

3. Replacement (Fig. 1101)

A. Replace O-rings (25, 35, 38, 40, 41, 45E or 45G, 65, 67, 70), backup rings (26, 36, 68, 71) and seals (39, 66).

B. Replace bolt (72B), washer (8B).

C. Bushings (17, 18, 50, 51)

(1) Remove the old bushings.

(2) If you find defects on hole surfaces, refer to par. 1.E. above for repair instructions.

(3) Install replacement bushings by the shrink-fit method of SOPM 20-50-03. BMS 3-27 corrosion preventive compound is preferred as installation finish on bushings (51).

(4) Machine the bushings to design dimensions and finish shown in Fig. 402 or 403C.

D. Support tube (78A)

(1) Remove pin (78C) and unscrew stem (78B) from tube (78D).

(2) Replace or repair components as necessary.

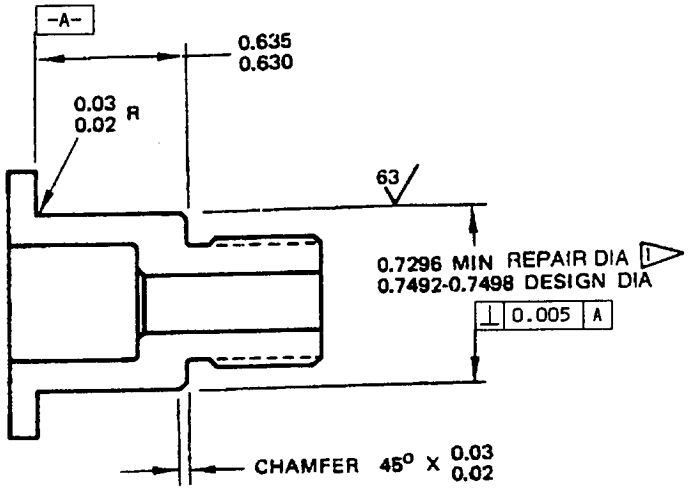
(3) Lubricate external threads on tube (78D) and adjacent end face with hydraulic fluid MIL-H-5606 or MIL-H-6083. Install stem (78B) on tube (78D) and tighten to 1000-1200 lb-in.

(4) With the 0.077-0.081 inch hole in stem (78B) as a guide, drill a 0.077-0.081 hole to 0.67 depth (measured from surface of stem). Install pin (78C).

E. Lube fittings (45A, 50A) -- Replace per CMM 32-00-03. Or, to use the gland nut with BMS 3-27 corrosion preventive compound, fill the lube passages with BMS 5-95 sealant, or install plugs (45A1) per par. F.

F. Pins (45A1) and plugs (45A2) -- Replace per SOPM 20-50-04, with BMS 5-95 sealant on the mating surfaces. We recommend you cadmium plate (F-15.06) the replacement plugs. Or fill the lube holes in the gland nut with BMS 5-95 sealant or BMS 3-27 or BMS 3-38 corrosion preventive compound.

G. Lube fitting (50B) and bushing (50C) -- Unscrew the lube fitting. Remove the bushing. Install a replacement bushing by the shrink fit method per 20-50-03. Fillet seal the flange with BMS 5-95 sealant. Install the lube fitting and tighten it to 25-30 lb-in.



REFINISH

CADMIUM PLATE (F-1.32.)
ALL EXTERIOR SURFACES (THROW-IN PERMITTED ON INTERIOR SURFACES), APPLY PRIMER BMS 10-11, TYPE 1 (F-20.03) AND MIL-C-16173, GRADE 1 CORROSION PREVENTIVE COMPOUND (F-14.13) ON INTERIOR SURFACES ONLY

REPAIR

REF 1

125 MACHINE FINISH EXCEPT AS NOTED

SHOT PEEN (REF 20-10-03)
0.016-0.033 SHOT SIZE
0.015 A2 INTENSITY

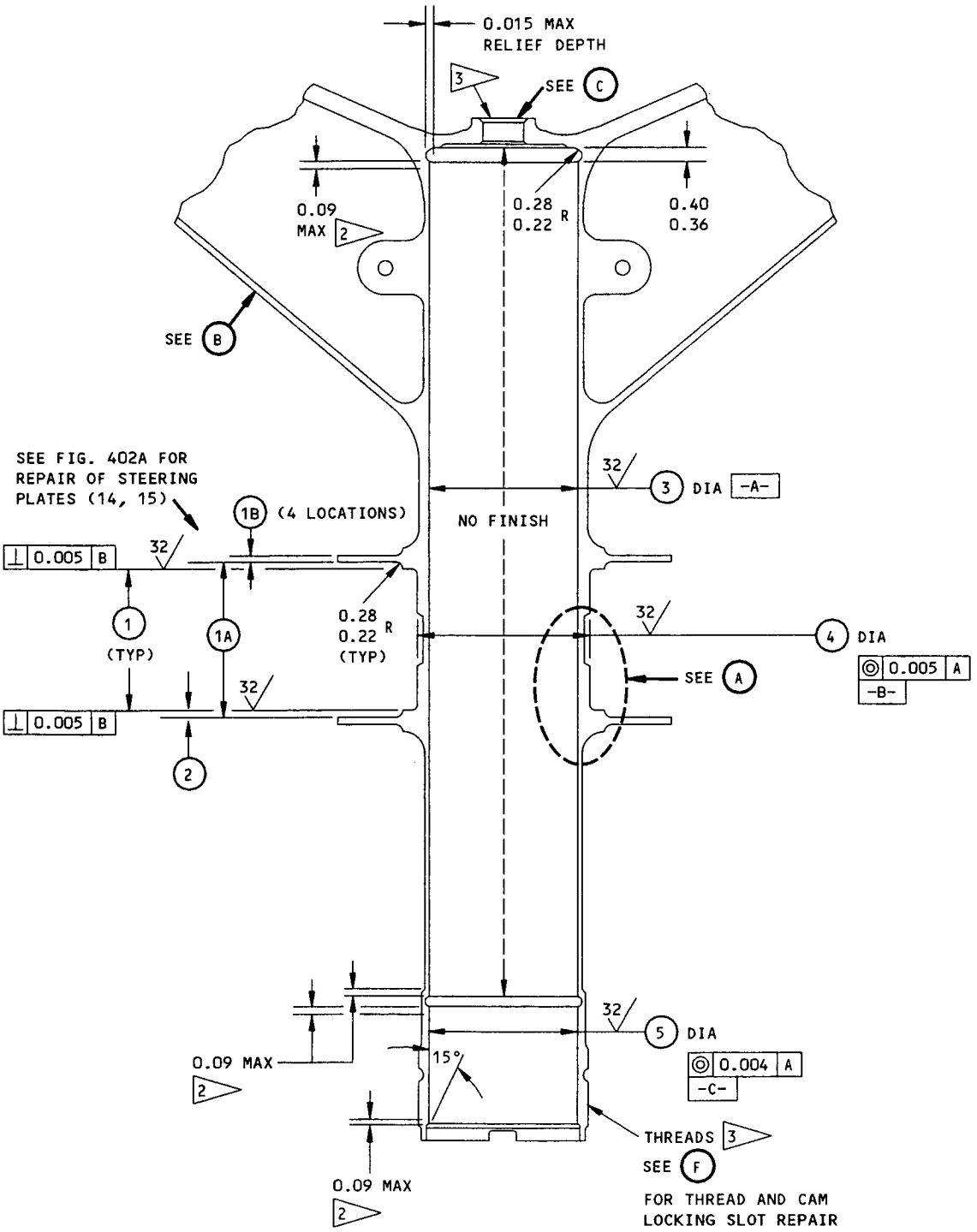
MATERIAL: 4340 STEEL (180-200 KSI)

ALL DIMENSIONS ARE IN INCHES

1 LIMIT FOR CHROME PLATE BUILDUP PER SOPM 20-42-03 AND GRIND TO DESIGN DIMENSIONS AND FINISH, WITH 0.06 MAX PLATING RUNOUT

BOLT (13)

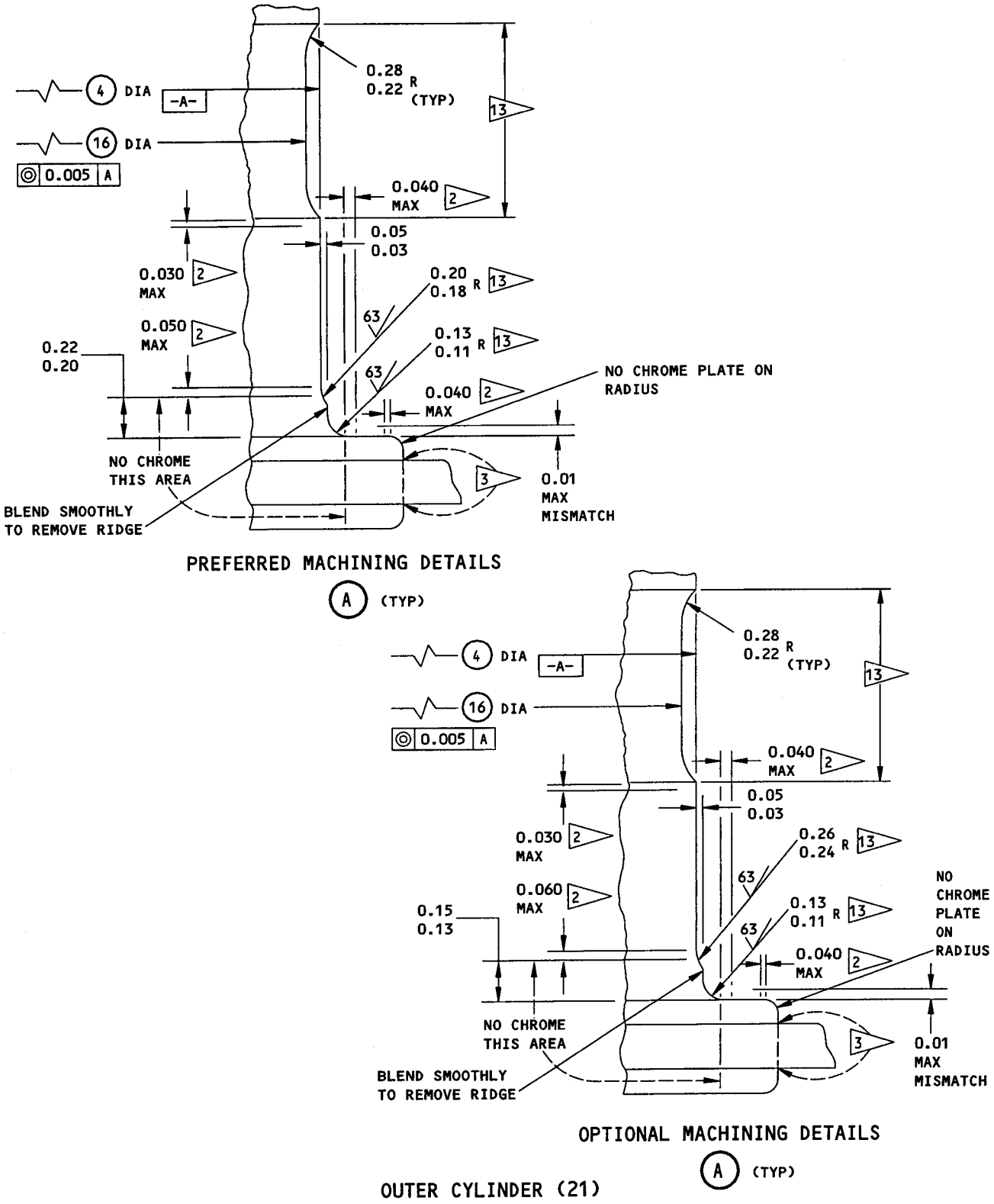
Bolt Repair and Refinsh
Figure 401



OUTER CYLINDER (21)

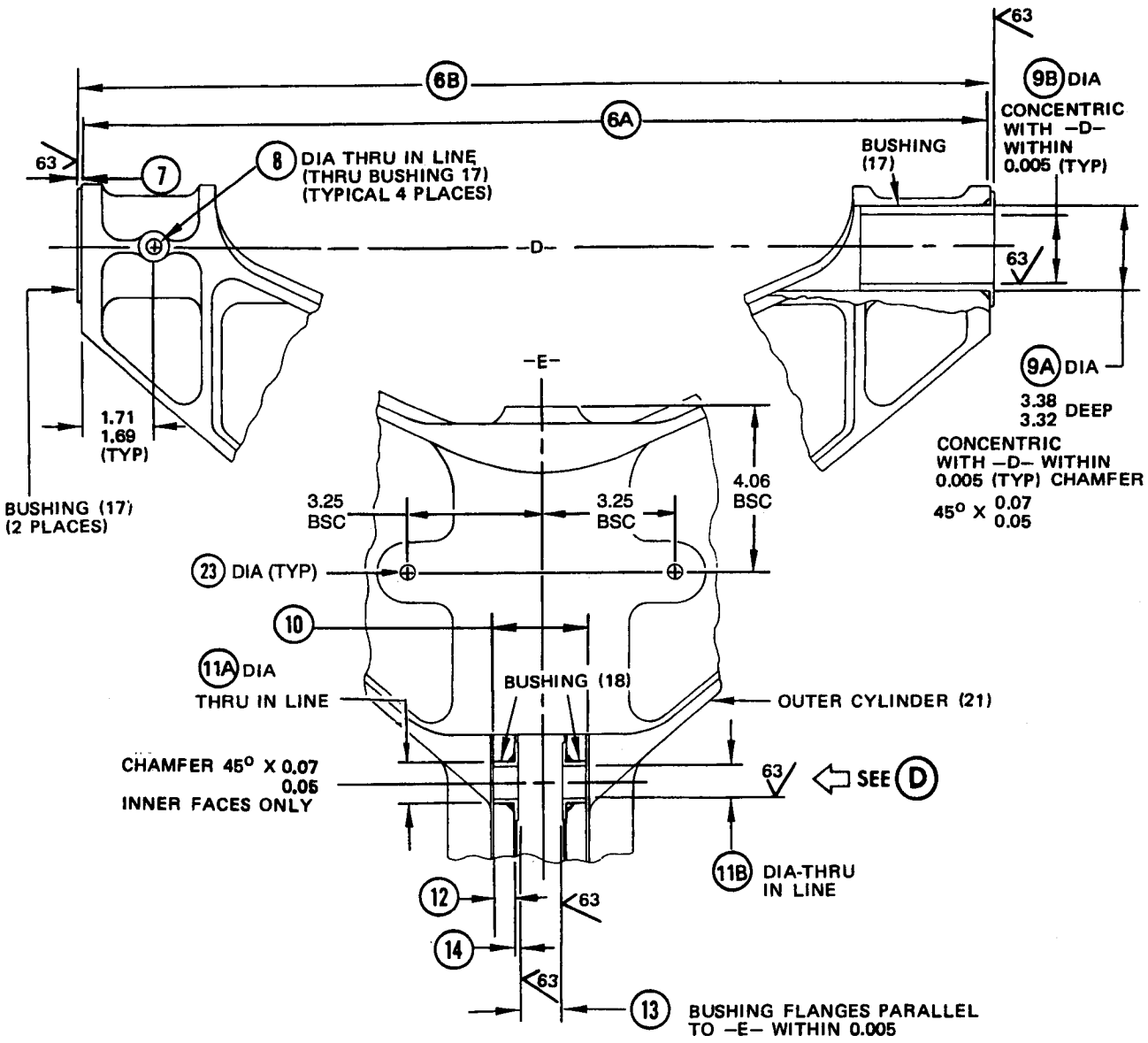
Outer Cylinder Repair and Refinish
Figure 402 (Sheet 1)

L47103



OUTER CYLINDER (21)

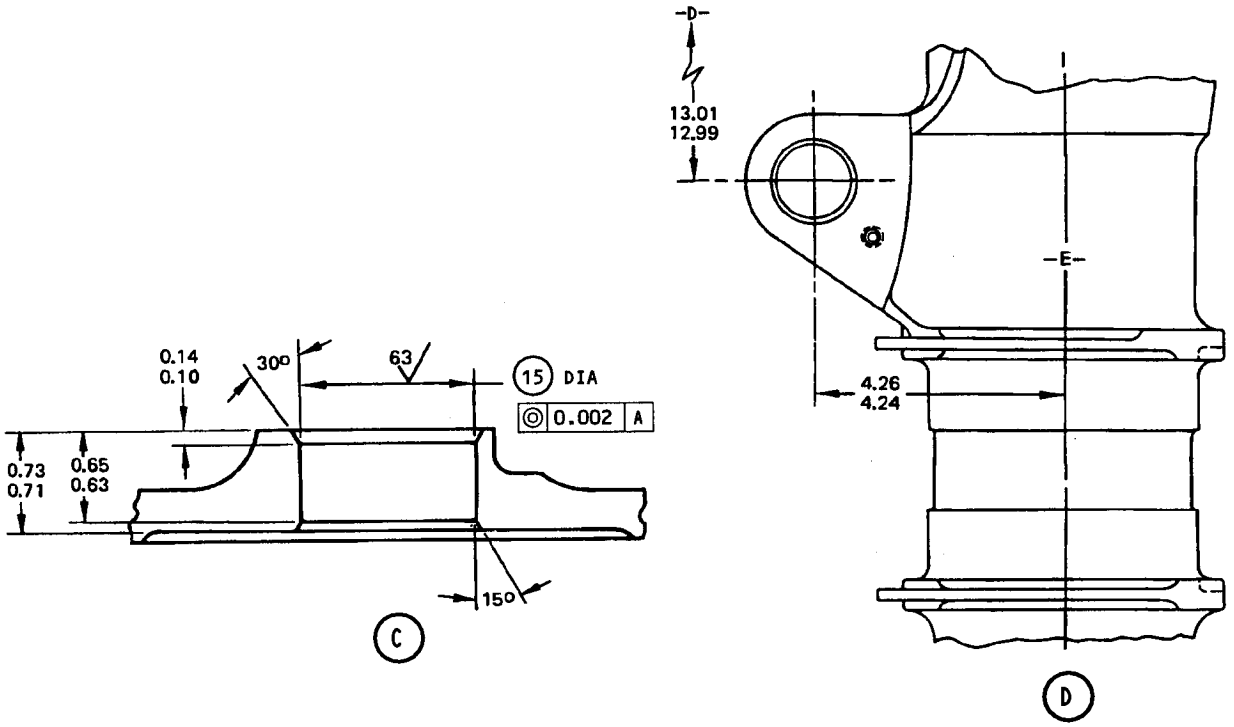
Outer Cylinder Repair and Refinish
Figure 402 (Sheet 2)



B

OUTER CYLINDER (21)

Outer Cylinder Repair and Refinish
Figure 402 (Sheet 3)



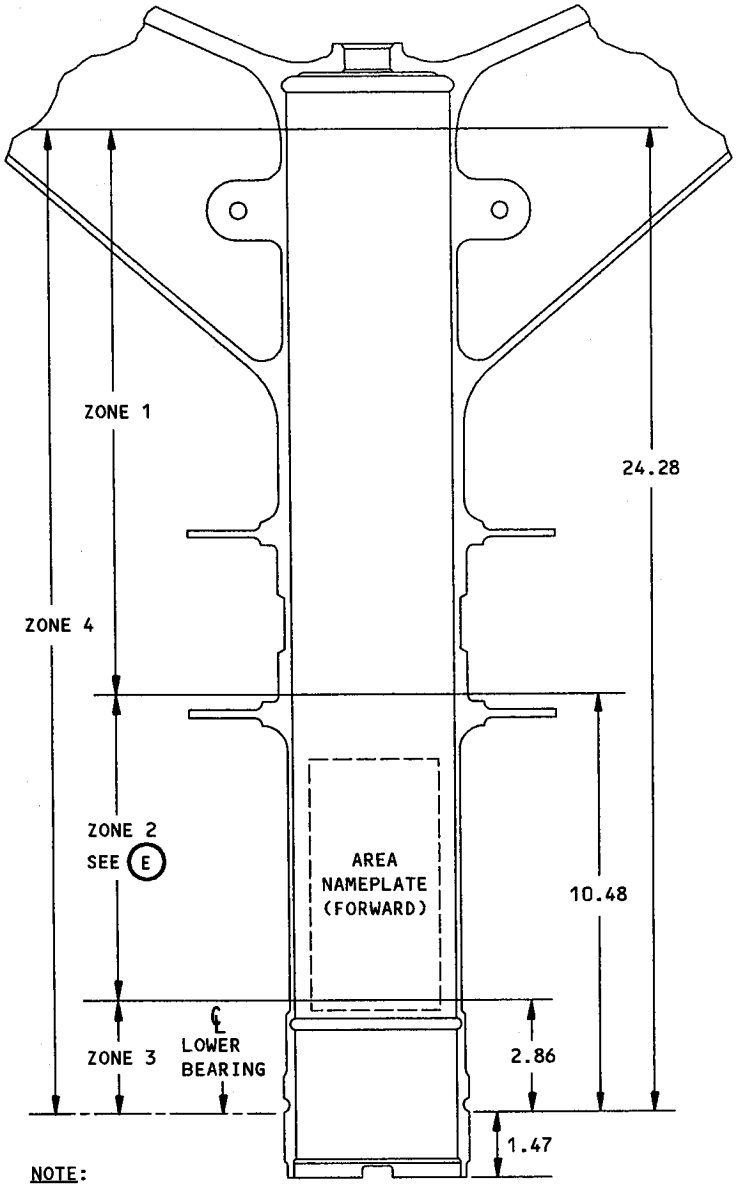
	1	1A	1B	2	3	4 ▷9	4 ▷10	5	5A	6A ▷9
DESIGN DIM	3.902 3.900	4.209 4.199	0.200 0.195	0.155 0.150	4.003 4.000	4.6848 4.6838	4.795 4.794	4.246 4.244	4.256 4.254	29.815 29.805
REPAIR LIMIT	3.930 ▷1 3.9425 ▷21 4.200 ▷5	4.239 ▷1	0.165 ▷1 OR ▷14 0.175 ▷19	0.135 ▷1 OR ▷5 0.010 ▷5	4.023 ▷1	4.660 ▷1 OR ▷5 4.550 ▷5	4.765 ▷1 OR ▷5 4.700 ▷5	4.300 ▷14	4.310 ▷16	29.685 ▷7 ▷12

	6A ▷10	6B	7	8	9A ▷9	9A ▷10	9B	10	11A	11B
DESIGN DIM	29.815 29.805	29.995 29.985	0.092 0.090	0.385 0.382	2.1890 2.1882	2.1890 2.1882	2.001 2.000	2.29 2.28	1.438 1.437	1.2505 1.2495
REPAIR LIMIT	29.705 ▷7 ▷12	—	▷8	0.482 ▷7	2.30 ▷7	2.25 ▷7	—	2.25 ▷6	1.498 ▷7	—

	12	13	14	15	16 ▷9	16 ▷10
DESIGN DIM	0.515 0.505	1.096 1.094	0.095 0.090	1.243 1.241	4.490 4.470	4.530 4.510
REPAIR LIMIT	0.465 ▷6 ▷12 0.465 ▷7 ▷12 0.465 ▷12 ▷22	—	▷8	1.303 ▷14	4.440 ▷17	4.440 ▷17

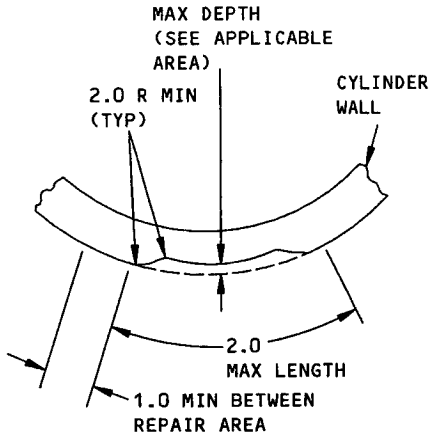
OUTER CYLINDER (21)

Outer Cylinder Repair and Refinish
Figure 402 (Sheet 4)



NOTE:

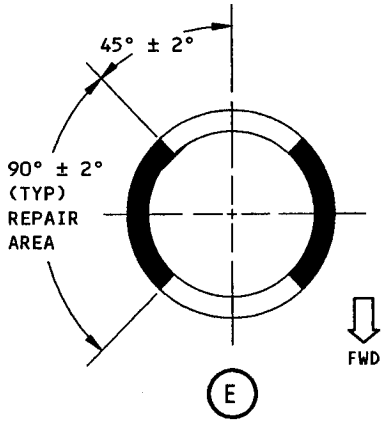
ALL LUGS AND STEERING COLLARS EXCEPTED.



TYPICAL BLEND ALL AREAS

NOTE:

IN THE LONGITUDINAL DIRECTION, THERE IS NO RESTRICTION ON LENGTH OF BLEND, DISTANCE BETWEEN BLENDS, OR NUMBER OF BLENDS.



FORWARD AREA UNDER NAMEPLATE

ADDITIONAL BLENDING IS PERMITTED FOR CORROSION PITTING IN AREA UNDER NAMEPLATE TO 0.030 MAX DEPTH, PROVIDING ID HAS NOT BEEN OVERSIZED (REF SHEET 1)

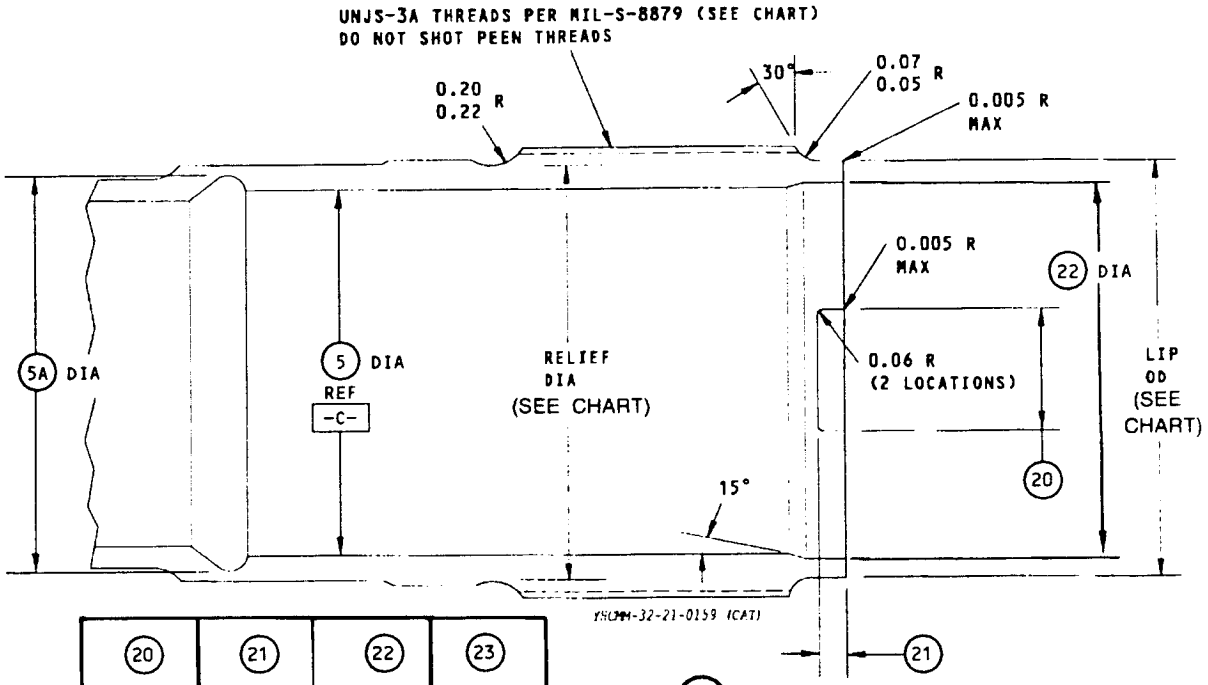
	65-46211-3,-5,-7			65-46211-4,-6,-8,-9
	ZONE 1	ZONE 2	ZONE 3	ZONE 4
MAX REPAIR DEPTH	0.03	0.02	0.03	0.03

OUTER SURFACE DEFECTS
(EXCEPT AS NOTED)

OUTER CYLINDER (21)

Outer Cylinder Repair and Refinish
Figure 402 (Sheet 5)

L47340



	20	21	22	23
DESIGN DIM	0.753 0.750	0.27 0.25	4.30 4.28	0.391 0.385
REPAIR LIMIT	0.900 15	0.30 17	4.33 17 20	0.560 0.445 7

UNJS–3A THREAD SIZE	4.625–12 (DESIGN)	4.5938–12 (1/32 UNDERSIZE)	4.5625–12 (1/16 UNDERSIZE)
MAJOR DIA	4.6250 4.6136	4.5938 4.5824	4.5625 4.5511
THREAD ROOT RADIUS	0.0150 0.0125	0.0150 0.0125	0.0150 0.0125
PITCH DIA	4.5709 4.5659	4.5397 4.5347	4.5084 4.5034
MINOR DIA	4.5288 4.5188	4.4976 4.4875	4.4663 4.4562
RELIEF DIA	4.506 4.486	4.475 4.470	4.443 4.438
LIP OD 20	4.506 4.486	4.475 4.470	4.443 4.438
MATING REPAIR GLAND NUT PART NO.		65–46221–5 65–46221–6 11	65–46221–7 65–46221–8 11

OUTER CYLINDER (21)

Outer Cylinder Repair and Refinish
Figure 402 (Sheet 6)

REFINISH

CHROME PLATE (F-15.34) DIA -C-, 0.003 MIN THICK AFTER GRINDING AND WIPE WITH PRIMER (F-19.45). CADMIUM-TITANIUM OR CHROME PLATE DIA -B- AS NOTED 4. CADMIUM-TITANIUM PLATE ALL OTHER SURFACES UNLESS SHOWN DIFFERENTLY. APPLY BMS 10-11, TYPE 1 PRIMER (SRF-12.205) AND BMS 10-11, TYPE 2 ENAMEL (SRF-12.63) ON ALL EXTERIOR SURFACES EXCEPT AS NOTED 3

ON CYLINDERS WITH UNDERSIZE GLAND NUT THREADS, MARK THE CYLINDER PER 18.

REPAIR

REF 1 5 THRU 8 12 14 THRU 21

125 MACHINE FINISH EXCEPT AS NOTED

BREAK SHARP EDGES 0.05-0.07R

SHOT-PEEN (REF 20-10-03)
0.016-0.033 SHOT SIZE
0.015A2 INTENSITY 20

MATERIAL: 4340M STEEL, 270-300 KSI

ALL DIMENSIONS ARE IN INCHES

1. LIMIT FOR CHROME PLATE BUILDUP (SOPM 20-42-03). GRIND TO DESIGN DIMENSIONS AND FINISH (SOPM 20-10-04), WITH PLATING RUNOUT. MAX PLATING THICKNESS 0.015 AFTER GRINDING. WIPE CHROME PLATE WITH PRIMER (F-19.45)
2. CHROME PLATE RUNOUT
3. DO NOT APPLY PRIMER OR ENAMEL
4. ORIGINAL MANUFACTURED FINISH FOR DIA -B- IS CADMIUM-TITANIUM PLATE (F-1.308, WHICH REPLACED F-1.181) FOR 65-46211-3, -4, -5, -6, AND CHROME PLATE (F-15.03) FOR 65-46211-7, -8. CHROME PLATING IS RECOMMENDED FOR WEAR AND CORROSION PROTECTION IF 65-46211-3, -4, -5, -6 PARTS ARE REFINISHED. WIPE CHROME PLATE WITH PRIMER (F-19.45)
5. LIMIT FOR BUILDUP WITH CHROME PLATE AND INSTALLATION OF A SPECIAL REPAIR BEARING AS FOLLOWS:
   1. MACHINE AS REQUIRED, WITHIN REPAIR LIMIT, TO REMOVE DEFECTS. DO NOT REMOVE MORE THAN 0.149 MATERIAL FROM EACH SURFACE.
   2. APPLY 0.005-0.010 THICK CHROME PLATE. WIPE CHROME PLATE WITH PRIMER (F-19.45)
   3. MAKE SPECIAL REPAIR BEARING (REF, 32-26-01 FIG. 405) WITH DECREASED ID AND THICKER FLANGES AS NECESSARY TO GET 0.001-0.007 AXIAL CLEARANCE AND MINUS 0.001 TO PLUS 0.001 DIAMETRICAL CLEARANCE WITH OUTER CYLINDER.
   4. IDENTIFY PARTS AS A MATCHED SET.
6. LIMIT FOR BUILDUP WITH CHROME PLATE PER 1 AND INSTL OF STD BUSHING PER PARTS LIST.
7. LIMIT FOR INSTL OF OVERSIZE BUSHING OR REPAIR SLEEVE
8. DESIGN DIMENSION PLUS AMOUNT REMOVED FROM SUBSTRATE
9. 65-46211-3, -5, -7
10. 65-46211-4, -6, -8, -9
11. USED ON GRAVEL DEFLECTOR INSTALLATIONS
12. LUG FACE MACHINING REQUIREMENTS:
    1. MATERIAL REMOVED FROM ANY FACE MUST NOT BE MORE THAN HALF THE DIFFERENCE BETWEEN THE DESIGN DIM AND REPAIR LIMIT
    2. BLEND MISMATCH STEPS TO 0.18-0.26 RADIUS, OR IF WITHIN 0.10 OF LUG FILLET RADIUS USE SAME RADIUS AS LUG FILLET. BREAK SHARP EDGES 0.03-0.07R.
13. APPLY BMS 10-11, TYPE 1, PRIMER (SRF-12.206).
14. FOR PLATING REPAIR UP TO 0.015, CHROME PLATE (F-15.34) OR SULFAMATE NICKEL PLATE (SOPM 20-42-09). FOR PLATING REPAIR OVER 0.015, NICKEL PLATE ONLY. GRIND CHROME PLATE, OR MACHINE NICKEL PLATE, TO DESIGN DIMENSIONS AND FINISH, WITH 0.06 PLATING RUNOUT AT EDGES AND RADII. MAXIMUM PLATING THICKNESS AFTER MACHINING 0.040. WIPE CHROME PLATE WITH PRIMER (F-19.45)
15. LIMIT FOR SPECIAL CAM OR BEARING (FIG. 402B). MARK AS A MATCHED SET.

OUTER CYLINDER (21)

Outer Cylinder - Repair and Refinish
Figure 402 (Sheet 7)

16> RELIEF DIAMETER IS TO BE 0.010 LARGER THAN PACKING BORE DIAMETER, BUT MUST STAY WITHIN THE REPAIR LIMIT.

17> RESTORATION TO DESIGN DIMENSIONS NOT REQUIRED.

18> IDENTIFY CYLINDERS WITH UNDERSIZE GLAND NUT THREADS AS FOLLOWS:

1. VIBRO ENGRAVE "SPECIAL GLAND NUT REQUIRED" NEAR THE OUTER CYLINDER PART NUMBER.
2. APPLY A BLACK STENCIL "SPECIAL GLAND NUT _____ REQUIRED" ON A YELLOW BACKGROUND IN A PROMINENT POSITION.
3. APPLY A BLACK STENCIL "CAUTION: SPECIAL GLAND NUT _____ REQUIRED" NEAR THE REWORKED THREAD.

19> LIMIT FOR BUILDUP WITH BMS 10-67, TYPE 1 OR 17, CLASS 2, 3, OR 4 THERMAL SPRAY (SOPM 20-10-05), 0.010 MAX THICK. PUT A 0.080 MAX RUNOUT AT EDGES. GRIND TO DESIGN DIMENSIONS AND 8 MICROINCH FINISH. THEN CADMIUM-TITANIUM PLATE (SOPM 20-42-02) THE RUNOUT AREA.

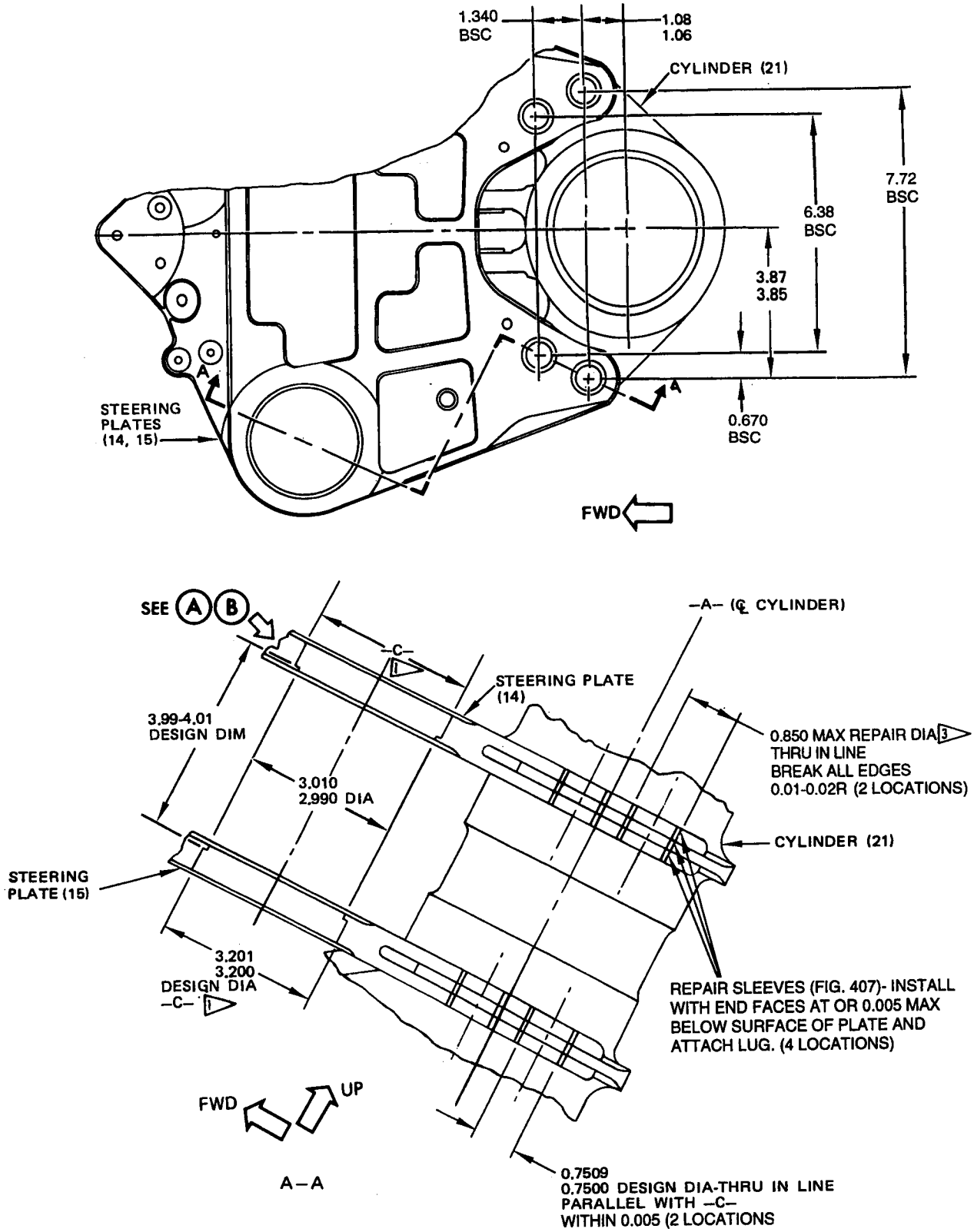
20> IF THE LIP WALL THICKNESS IS 0.08 OR THINNER, USE A SHOT PEEN INTENSITY OF 0.010 A2.

21> LIMIT FOR NICKEL PLATE BUILDUP (SOPM 20-42-09), 0.022 MAX THICK, AND THEN CHROME PLATE BUILDUP (SOPM 20-42-03), 0.010 MAX THICK, TO DESIGN DIMENSIONS AND FINISH.

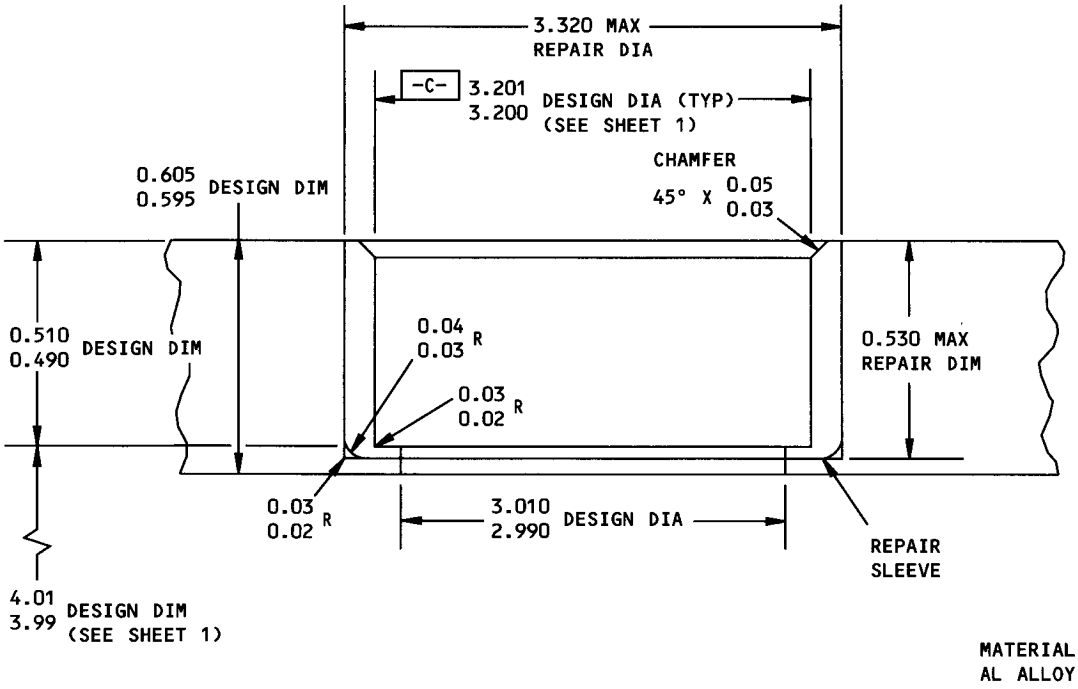
22> LIMIT FOR NICKEL PLATE BUILDUP (SOPM 20-42-09) AND MACHINE TO DESIGN DIMENSIONS AND FINISH, AND INSTALLATION OF STANDARD BUSHING PER PARTS LIST.

OUTER CYLINDER (21)

Outer Cylinder - Repair and Refinish
Figure 402 (Sheet 8)



Outer Cylinder - Steering Plate Repair
Figure 402A (Sheet 1)



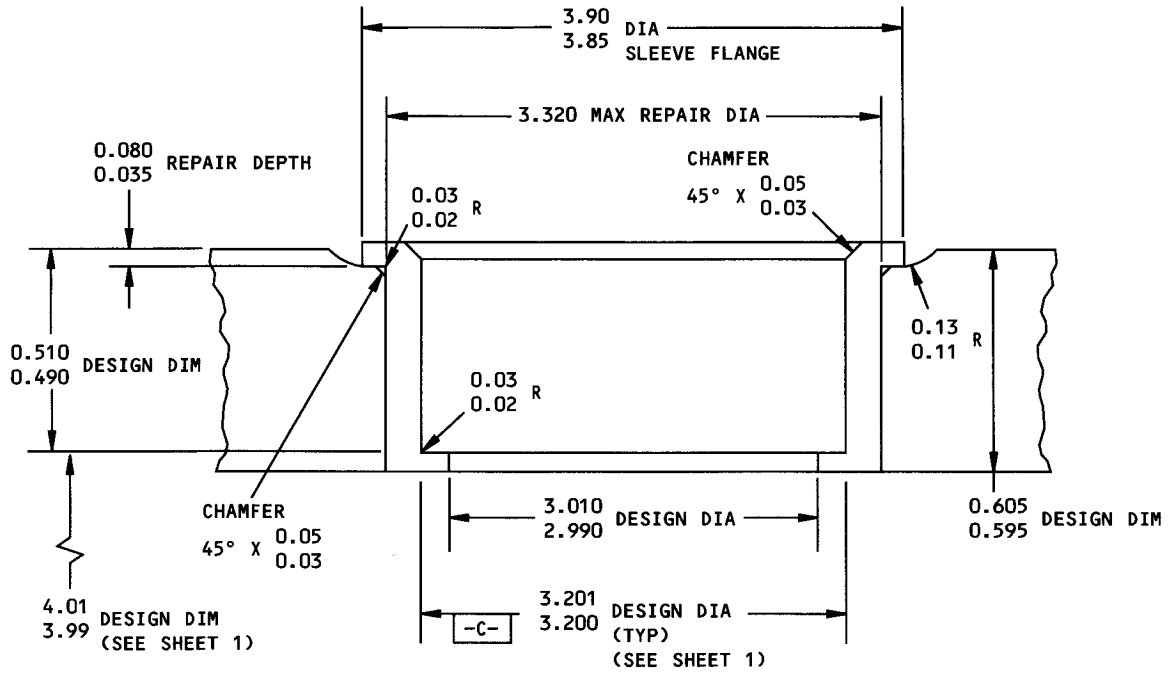
BEARING MOUNTING HOLES
REPAIR METHOD NO. 1

(A)

1. MACHINE DIA -C- OVERSIZE AND INCREASE ITS DEPTH, WITHIN REPAIR LIMITS, AS NECESSARY TO REMOVE DEFECTS. CHEMICAL TREAT THE MACHINED SURFACES.
2. MAKE REPAIR SLEEVES OF 7075T6 AL ALLOY TO GET 0.0004-0.0010 INTERFERENCE FIT WITH THE OVERSIZE BORE AND WITH SUFFICIENT MATERIAL ON THE ID TO MACHINE IT TO DESIGN DIM AFTER INSTALLATION IN PLATE. CHEMICAL TREAT THE OUTER SURFACES.
3. INSTALL THE SLEEVES IN THE PLATES BY THE SHRINK-FIT METHOD (SOPM 20-50-03).
4. INSTALL THE PLATES ON THE OUTER CYLINDER.
5. MACHINE THE SLEEVES TO DESIGN DIMENSIONS.
6. CHEMICAL TREAT THE MACHINED SURFACES.

Outer Cylinder - Steering Plate Repair
Figure 402A (Sheet 2)

L77800



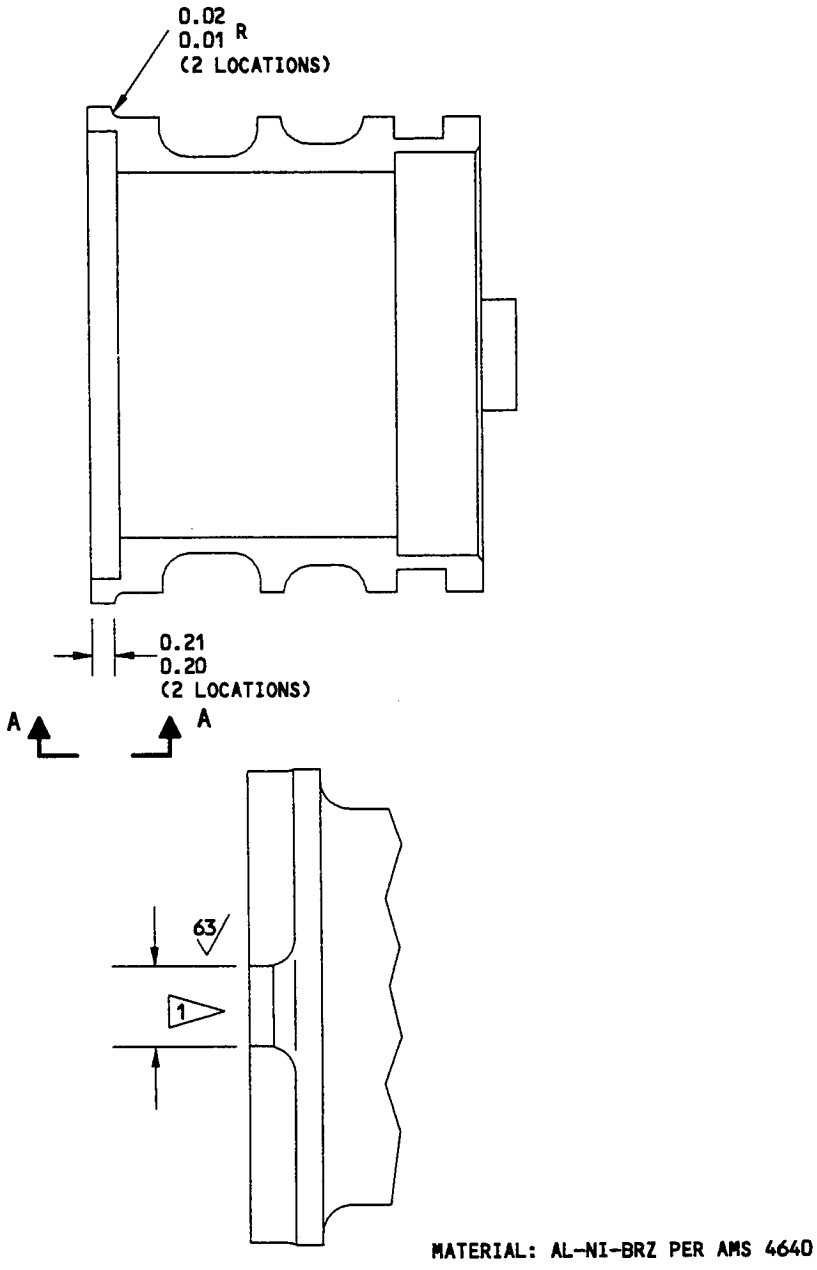
BEARING MOUNTING HOLES
REPAIR METHOD NO. 2

(B)

1. MACHINE DIA -C- OVERSIZE AND COMPLETELY THRU, WITHIN REPAIR LIMITS, AS NECESSARY TO REMOVE DEFECTS. (REMOVE THE RETAINING STEP AT 2.990-3.010 DIA). MACHINE (SPOTFACE) THE OUTER FACE WITHIN REPAIR LIMITS, AS NECESSARY TO REMOVE DEFECTS. CHAMFER THE BORE AT THE OUTER FACE. CHEMICAL TREAT THE MACHINED SURFACES.
2. MAKE FLANGED REPAIR SLEEVES OF 7075T6 AL ALLOY TO GET 0.0004-0.0010 INTERFERENCE FIT WITH THE OVERSIZE BORE AND WITH SUFFICIENT MATERIAL TO MACHINE THE BORES AND OUTER FACE FLANGE TO DESIGN DIM AFTER INSTALLATION IN THE PLATE. CHEMICAL TREAT OUTER SURFACES.
3. INSTALL THE SLEEVES IN THE PLATES BY THE SHRINK FIT METHOD (SOPM 20-50-03).
4. INSTALL THE PLATES ON THE OUTER CYLINDER.
5. MACHINE THE SLEEVES TO DESIGN DIMENSIONS.
6. CHEMICAL TREAT THE MACHINED SURFACES.

Outer Cylinder - Steering Plate Repair
Figure 402A (Sheet 3)

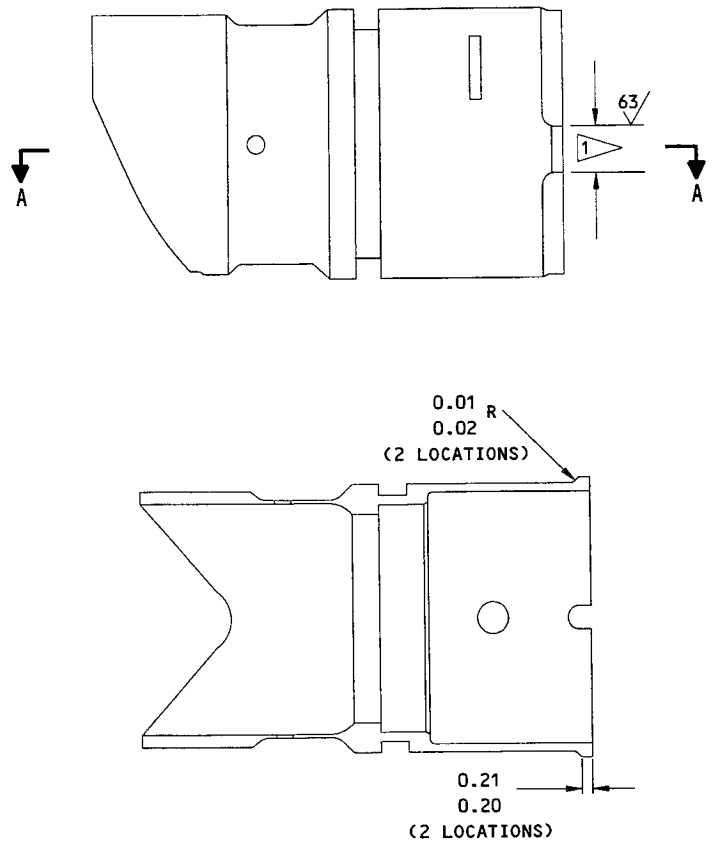
L77841



A-A

69-76508-2

Outer Cylinder - Lower Bearing (42)
Cam Locking Slot Repair
Figure 402B (Sheet 1)



A - A

1 MACHINE TAB TO PRODUCE 0.001/0.003 GAP ON EITHER SIDE OF TAB BETWEEN THE CAM OR BEARING TAB AND THE OUTER CYLINDER LOCKING SLOT (2 LOCATIONS)

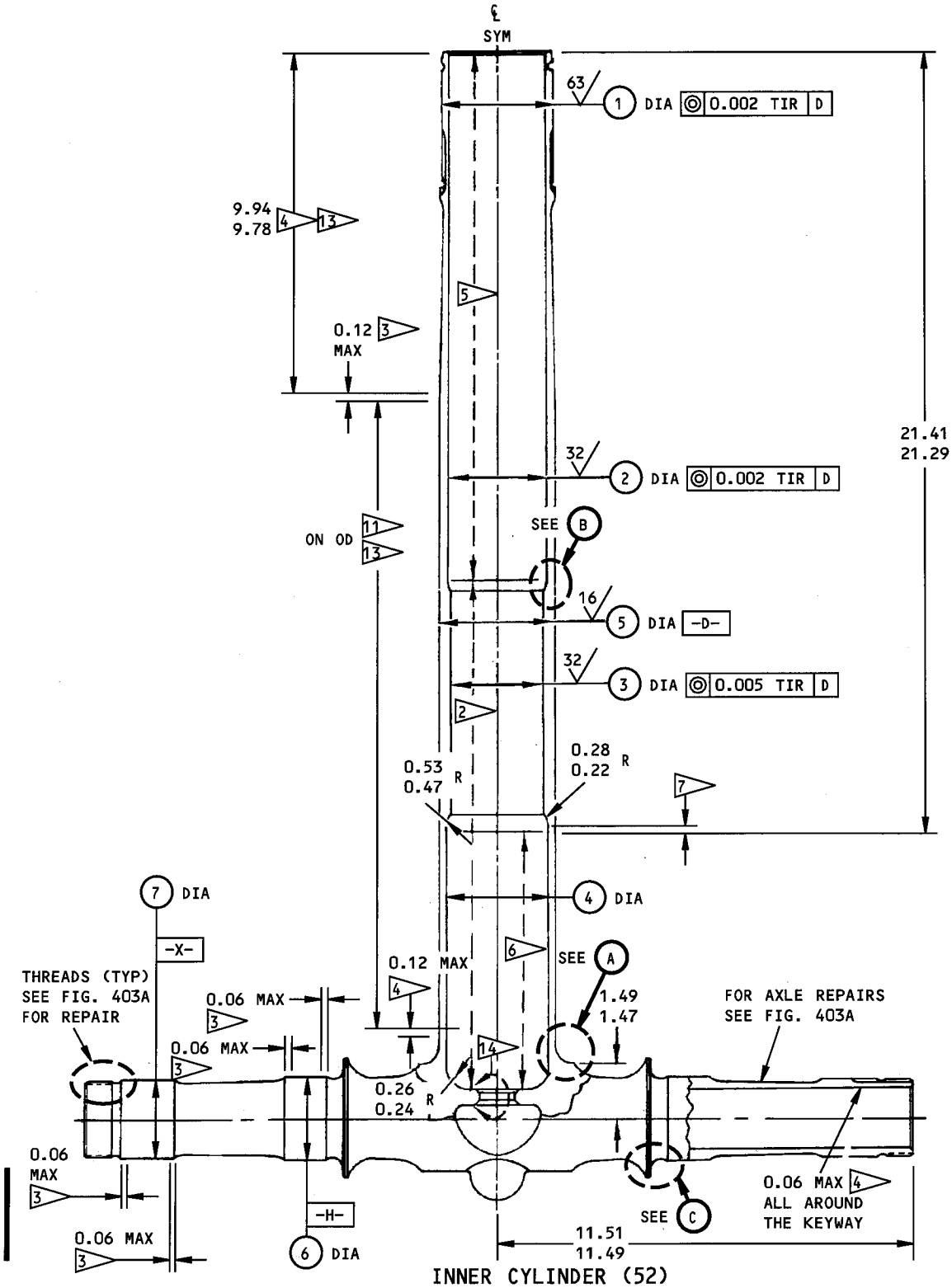
SHOT PEEN:
0.016-0.033 SHOT SIZE
0.015A2 INTENSITY

MATERIAL:
15-5 PH CRES, AMS 5659 (180-200 KSI)

ALL DIMENSIONS ARE IN INCHES

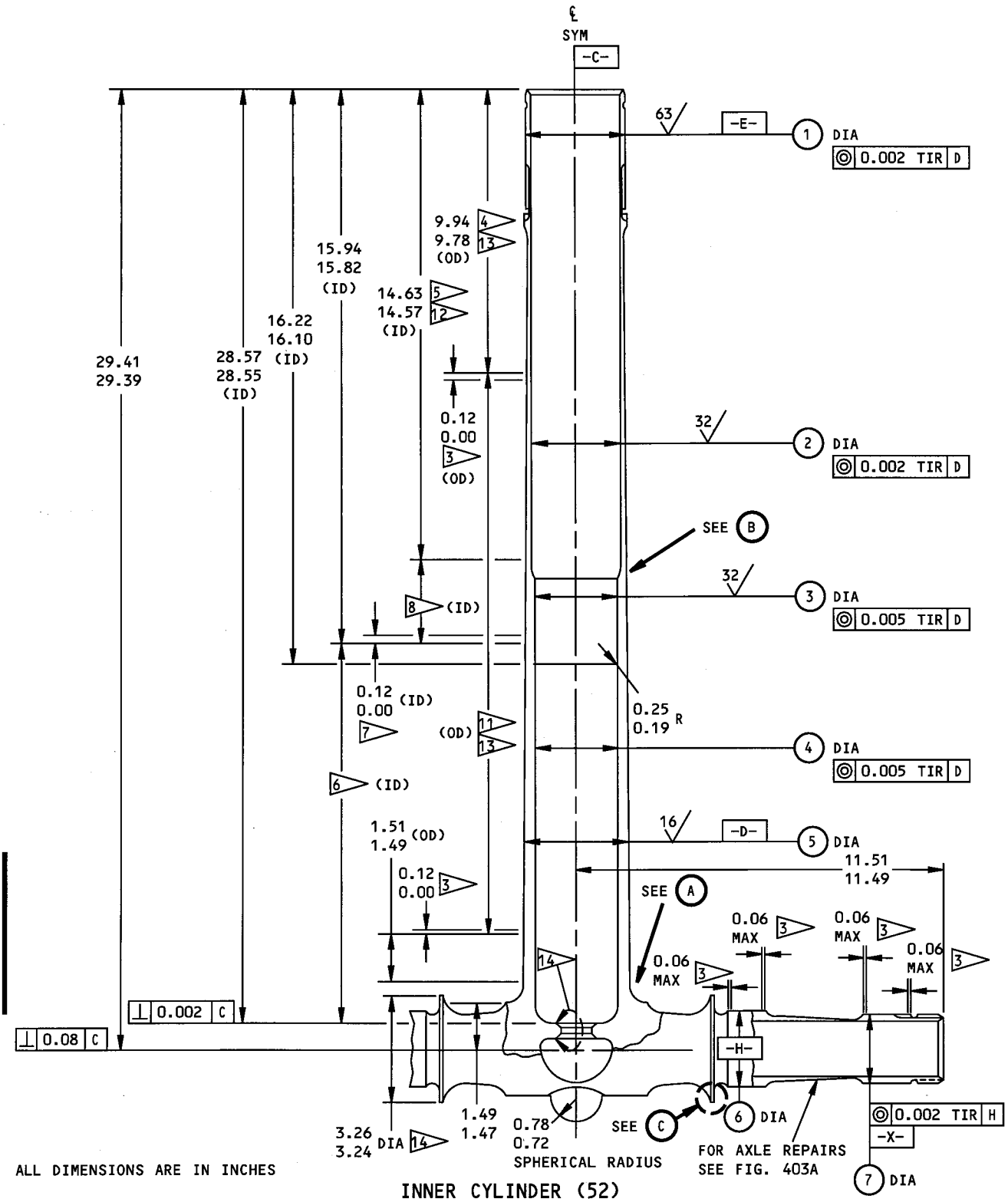
65-46228-4

Outer Cylinder - Lower Cam (42)
Cam Locking Slot Repair
Figure 402B (Sheet 2)



INNER CYLINDER (52)
65-46215-2,-5,-8,-9,-11
Inner Cylinder Barrel Repair
Figure 403 (Sheet 1)

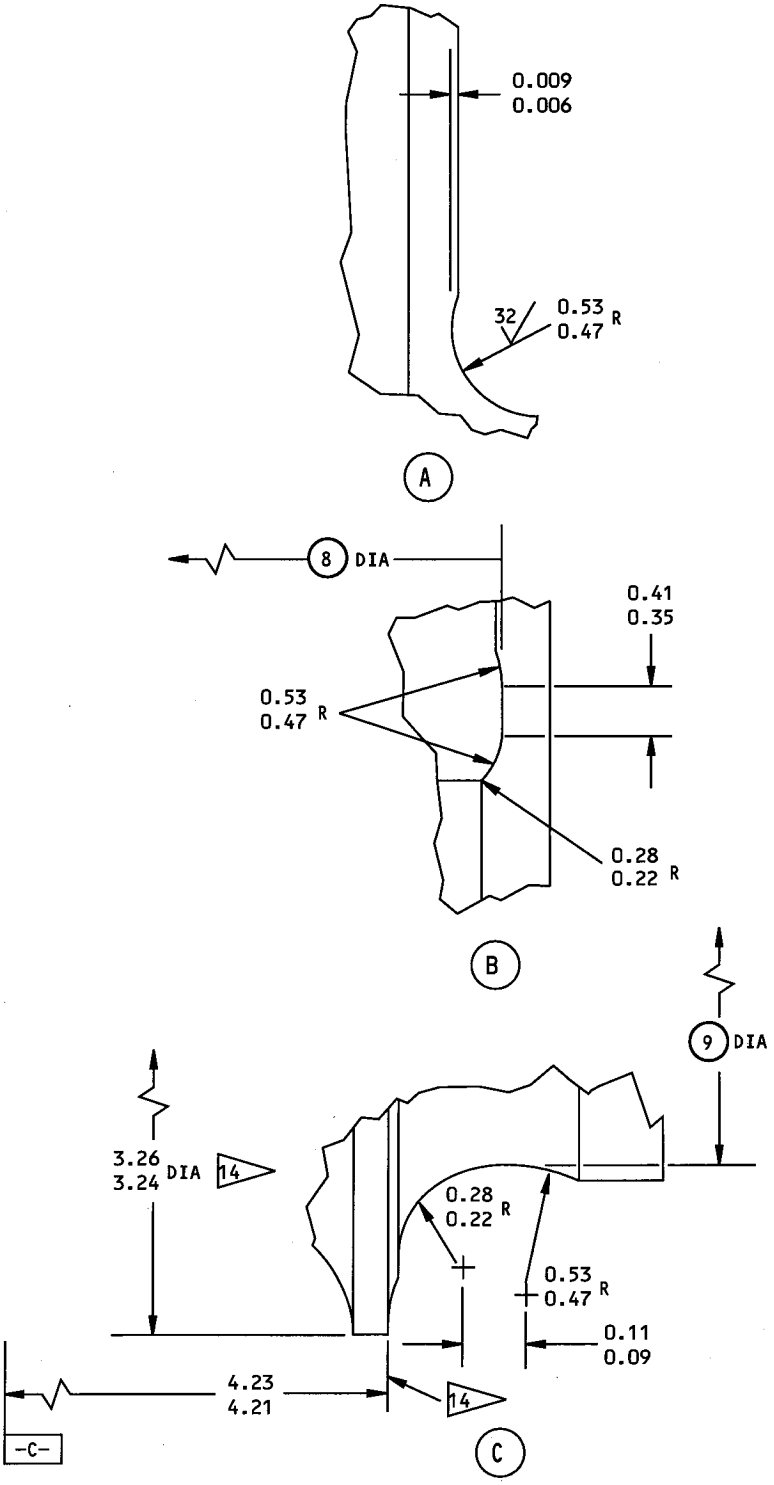
H77020



ALL DIMENSIONS ARE IN INCHES

INNER CYLINDER (52)
65-46215-13,-15
Inner Cylinder Barrel Repair
Figure 403 (Sheet 2)

H77041



INNER CYLINDER (52)

ALL DIMENSIONS ARE IN INCHES

Inner Cylinder Barrel Repair
Figure 403 (Sheet 3)

H77052

LOCATION	①	② 16	② 17	③	④ 18	④ 19	⑤	⑥	⑦	⑧ 16	⑧ 17	⑨ 16	⑨ 17
DESIGN DIM	3.130 3.128	2.760 2.755	2.700 2.695	2.622 2.620	2.830 2.800	2.622 2.590	3.247 3.245	2.2495 2.2485	2.1245 2.1235	2.763 2.760	2.703 2.700	2.21 2.19	2.24 2.22
REPAIR LIMIT	3.108 1	2.780 1	2.720 1	2.640 1 2	—	2.640 9 10	3.225 1 3.227 20	15	15	—	—	—	—

REFINISH

CHROME PLATE (F-15.04, THICKNESS 0.002 MIN AFTER GRINDING) DIA ⑤, ⑥ AND ⑦. WIPE THE CHROME PLATE WITH BMS 10-11, TYPE 1 PRIMER (F-19.45) CADMIUM-TITANIUM PLATE (F-15.01) ALL OTHER SURFACES UNLESS SHOWN DIFFERENTLY. APPLY PRIMER PLUS CORROSION PREVENTIVE COMPOUND TO ID BORE SURFACES AS SHOWN BY 6. AFTER BUSHING INSTALLATION, APPLY BMS 10-11, TYPE 1 PRIMER (F-20.02) FOLLOWED BY BMS 10-11, TYPE 2 ENAMEL (F-21.02) ON EXTERIOR SURFACES UNLESS SHOWN DIFFERENTLY.

REPAIR

REF 1 2 4 5 9 10 15 20

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK SHARP EDGES EQUIV TO 0.06 R UNLESS SHOWN DIFFERENTLY

MATERIAL: 4340M STEEL (270-300 KSI)

SHOT PEEN: 0.016-0.033 SHOT SIZE
0.012-0.015 A2 INTENSITY

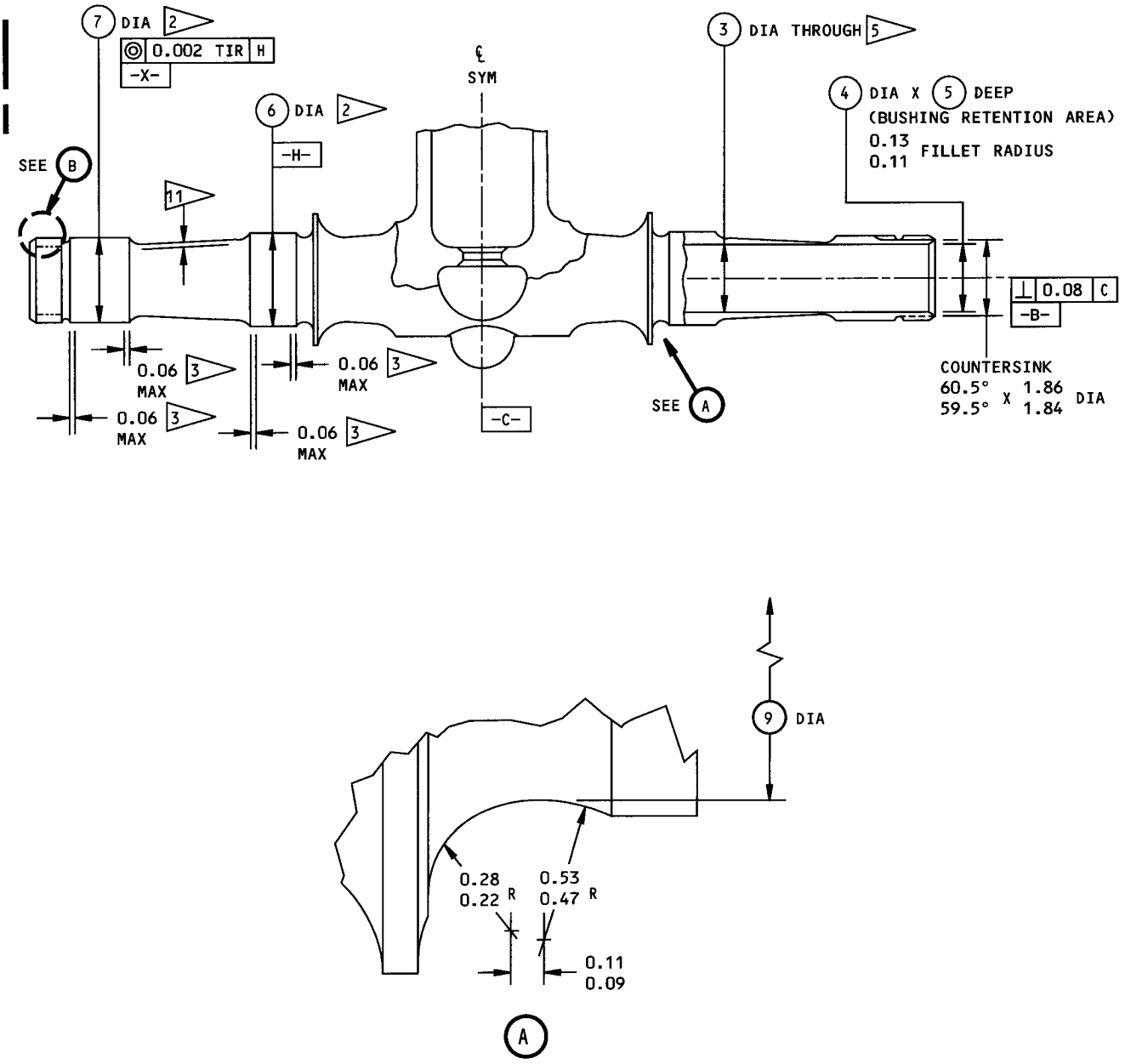
ALL DIMENSIONS ARE IN INCHES

1. LIMIT FOR CHROME PLATE BUILDUP AND GRIND TO DESIGN DIMENSIONS AND FINISH. WIPE THE CHROME PLATE WITH BMS 10-11, TYPE 1 PRIMER (F-19.45)
2. LIMIT FOR NICKEL PLATE BUILDUP AND MACHINE TO DESIGN DIMENSIONS AND FINISH
3. CHROME PLATE RUNOUT
4. NO FINISH ON OD UNLESS AFTER REPAIR OF DIA ①.
5. NO FINISH ON ID THIS LENGTH UNLESS AFTER REPAIR OF DIA ②.
6. AFTER PLATING, APPLY BMS 10-11, TYPE 1 PRIMER (F-20.03) AND CORROSION PREVENTIVE COMPOUND (F-14.13 OR F-19.03) TO ID BORE SURFACE.
7. PRIMER OVERSPRAY PERMITTED THIS AREA
8. FOR REFINISH ONLY, CADMIUM-TITANIUM PLATE (F-15.01) ID AND HAND POLISH TO 32 MICRO-INCH FINISH. THICKNESS OF PLATING TO BE 0.0003-0.0005 AFTER POLISH, BUT 0.0001 MIN IN AREAS WHICH WILL BE COVERED BY HYDRAULIC FLUID.
9. CADMIUM-TITANIUM PLATE (F-15.01).
10. RESTORATION TO DESIGN DIMENSION NOT REQUIRED.
11. CHROME PLATE (F-15.04) OD (0.002 MIN AFTER GRINDING)
12. NO F-20.02 PRIMER OR ENAMEL ON THE ID THIS LENGTH
13. NO F-20.02 PRIMER OR ENAMEL ON THE OD THIS LENGTH
14. NO F-20.02 PRIMER OR ENAMEL
15. SEE FIG. 403A
16. 65-46215-2,-8
17. 65-46215-5,-9,-11,-13,-15
18. 65-46215-2,-5,-8,-9,-11
19. 65-46215-13,-15
20. LIMIT FOR BUILDUP WITH BMS 10-67, TYPE 1 OR 17, CLASS 2, 3, OR 4 TUNGSTEN CARBIDE THERMAL SPRAY (SOPM 20-10-05), 0.010 MAX THICK. PUT A 0.080 MAX RUNOUT AT EDGES. GRIND TO DESIGN DIMENSIONS AND 4 MICROINCH FINISH OR SMOOTHER. THEN CADMIUM-TITANIUM PLATE (SOPM 20-42-02) THE RUNOUT AREA.

INNER CYLINDER (52)
65-46215-2,-5,-8,-9,-11,-13,-15

Inner Cylinder Barrel Repair
Figure 403 (Sheet 4)

H77129



ALL DIMENSIONS ARE IN INCHES

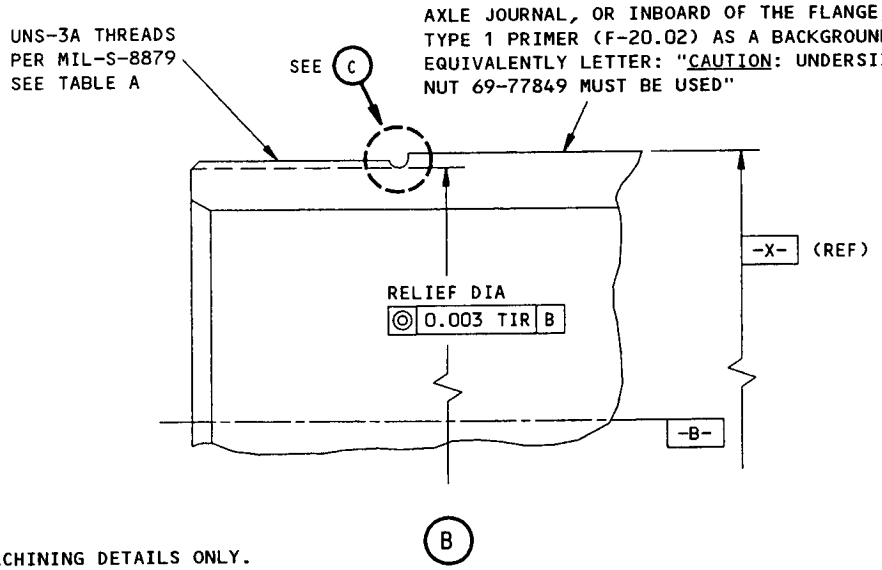
INNER CYLINDER (52)

Inner Cylinder Axle Repair
Figure 403A (Sheet 1)

H77148

RECOMMENDED IDENTIFICATION FOR INNER CYLINDERS WITH UNDERSIZED AXLE THREADS

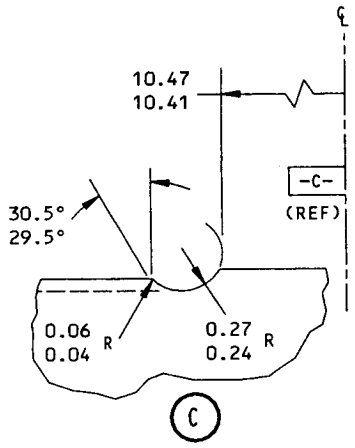
ON A VISIBLE LOCATION SUCH AS ON THE OUTBOARD THIRD OF THE AXLE JOURNAL, OR INBOARD OF THE FLANGE, APPLY BMS 10-11, TYPE 1 PRIMER (F-20.02) AS A BACKGROUND, THEN STENCIL OR EQUIVALENTLY LETTER: "CAUTION: UNDERSIZE THREADS. YELLOW NUT 69-77849 MUST BE USED"



NOTE: MACHINING DETAILS ONLY.
REFINISH NOT SHOWN.

UNJS-3A THREAD SIZE	2-1/16-16 (DESIGN)	2-16 (1/16 UNDERSIZE)
MAJOR DIA	2.0625 2.0595 9	1.9940 1.9910 (MODIFIED)
PITCH DIA	2.0219 2.0189 10	1.9594 1.9564
MINOR DIA	1.9903 1.9825	1.9313 1.9233
RELIEF DIA	1.97 1.96	1.913 1.903
MATING REPAIR WHEEL RETAINER NUT (REF OHM 32-26-11)		69-77849-1,-2

TABLE A



INNER CYLINDER (52)

Inner Cylinder Axle Repair
Figure 403A (Sheet 2)

LOCATION	(3) 13	(3) 15	(3) 16	(3) OPTIONAL	(4) 13	(4) 15	(5) 14	(5) 15 17	(6)	(7)
DESIGN DIM	1.762 1.761	1.750 1.730	1.73 1.71	1.7514 1.7500	1.762 1.761	1.7514 1.7500	1.28 1.22	5.75 5.25	2.2495 2.2485	2.1245 2.1235
REPAIR LIMIT	1.772 4 6	1.777 4 6	1.76 4 6	1.7770 4 6	1.781 7 OR 8 OR 21	1.7810 7 OR 8 OR 21	5.75 5.25 18	---	2.2185 1 22	2.1035 1 2.067 12

LOCATION	(9) 19	(9) 20
DESIGN DIM	2.21 2.19	2.24 2.22
REPAIR LIMIT	---	---

REFINISH

FOR REFINISH INSTRUCTIONS, SEE FIG. 403

1 LIMIT FOR BUILDUP WITH CHROME PLATE AND GRIND TO DESIGN DIMENSIONS AND FINISH WITH PLATING RUNOUT AS SHOWN BY 3

2 32 BEFORE PLATING, 16 AFTER PLATING.

3 CHROME PLATE RUNOUT.

4 RESTORATION TO DESIGN DIMENSIONS NOT REQUIRED. CADMIUM-TITANIUM PLATE (F-15.01).

5 BETWEEN THE (4) DIA BUSHING RETENTION AREAS.

6 AFTER PLATING, APPLY BMS 10-11, TYPE 1, PRIMER (F-20.03) AND CORROSION PREVENTIVE COMPOUND (F-14.13 OR F-19.03) TO ALL ID BORE SURFACES.

7 CHROME PLATE BUILDUP PER 1 OPTIONAL.

8 LIMIT FOR BUILD UP WITH ELECTRODEPOSITED NICKEL PLATE (REF SOPM 20-42-09).

9 2.0531 INCHES MINIMUM MAJOR DIAMETER FOR SOME AIRPLANES.

10 2.0179 INCHES MINIMUM PITCH DIAMETER FOR SOME AIRPLANES.

11 THIS AREA CAN HAVE LOCAL BLENDS:
- 0.005 MAXIMUM DEPTH, AND
- 0.40 INCH AROUND THE CIRCUMFERENCE.

12 LIMIT FOR BUILDUP WITH NICKEL PLATE (REF SOPM 20-42-09) AND THEN CHROME PLATE (REF SOPM 20-42-03). 0.015 MAX CHROME PLATE THICKNESS.

REPAIR

REF 1 2 4 7 8 11 12 18 21

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

SHOT PEEN: 0.017-0.046 SHOT SIZE
0.010-0.016 A2 INTENSITY
DO NOT SHOT PEEN THREADS

MATERIAL: 4340M STEEL (270-300 KSI)

ALL DIMENSIONS ARE IN INCHES

13 65-46215-2,-5

14 65-46215-2,-5 (PRE SB 32-1032 CONFIG)

15 65-46215-8,-9,-13,-15

16 65-46215-11

17 CONFIGS POST SB 32-1032.

18 RANGE FOR INSTALLATION OF BUSHING (51) 69-60774-1 (REF SB 32-1032).

19 65-46215-2,-8

20 65-46215-5,-9,-11,-13,-15

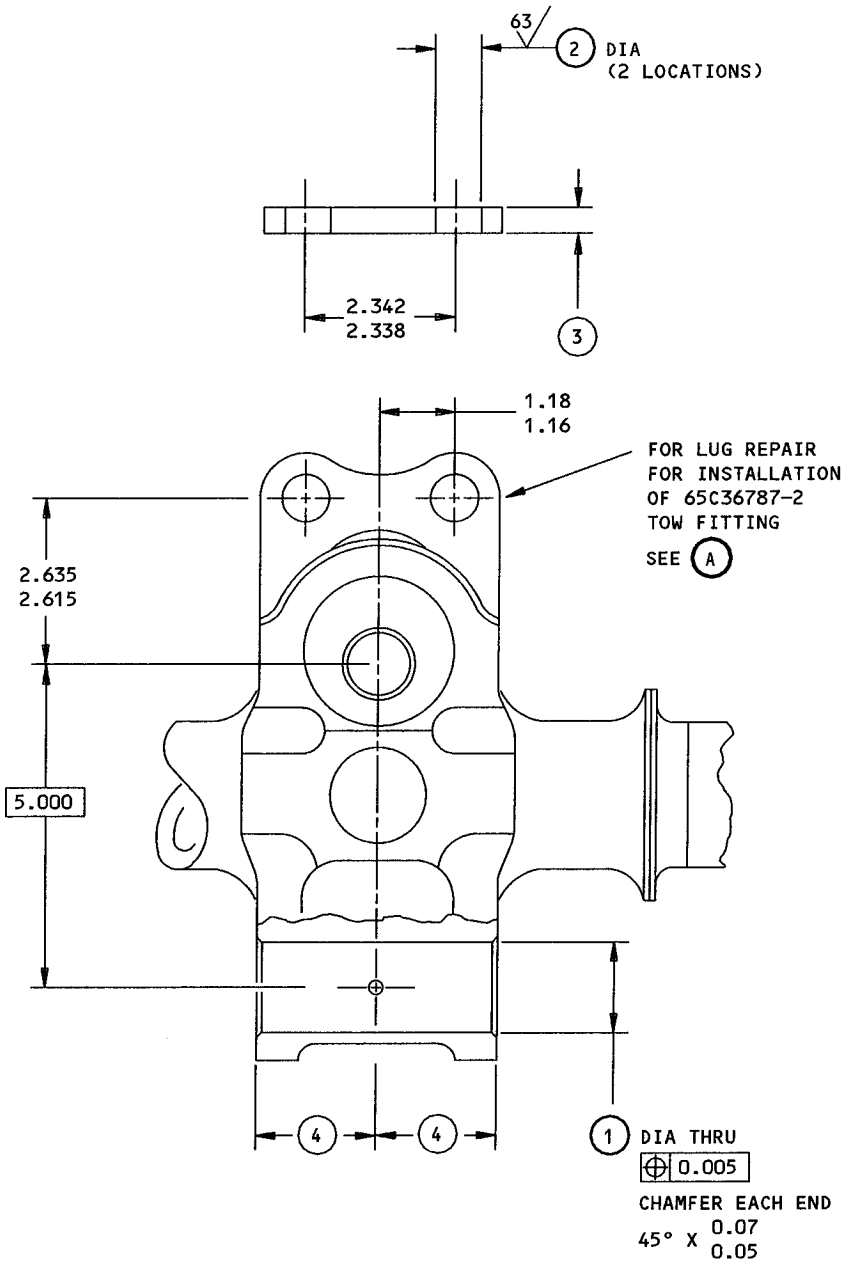
21 LIMIT FOR INSTALLATION OF BUSHING (51)

22 IF MORE MATERIAL THAN THIS MUST BE REMOVED, THE PART MUST BE SCRAPPED.

INNER CYLINDER (52)

Inner Cylinder Axle Repair
Figure 403A (Sheet 3)

H77241

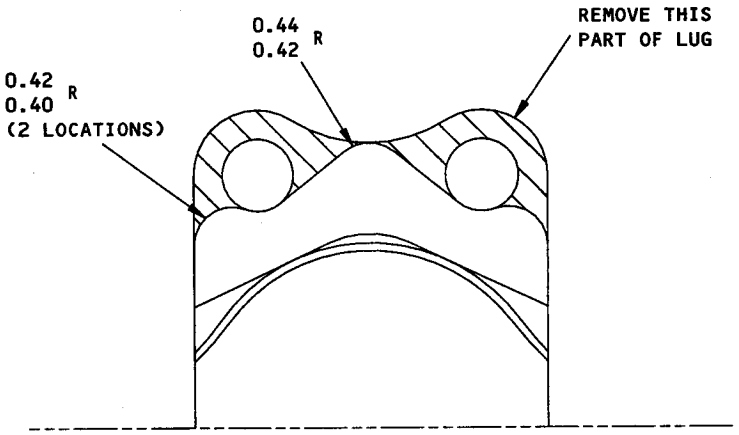


ALL DIMENSIONS ARE IN INCHES

INNER CYLINDER (52)

Inner Cylinder Lug Face and Hole Repair
Figure 403B (Sheet 1)

H77260



LUG REPAIR FOR INSTALLATION OF
TOW FITTING 65C36787-2

(A)

REFERENCE NUMBER	(1)	(2)	(3)	(4)
DESIGN DIMENSION	1.438 1.437	0.7515 0.7500	0.543 0.533	1.8125 1.8075
REPAIR LIMIT	1.560 [1]	0.9000 [2] [7]	0.510 [3] [4] [5] 0.437 [6] [7] 0.523 [8]	1.7975 [1] [3]

INNER CYLINDER (52)

Inner Cylinder Lug Face and Hole Repair
Figure 403B (Sheet 2)

REFINISH

FOR REFINISH INSTRUCTIONS, SEE FIG. 403

1 LIMIT FOR INSTALLATION OF OVERSIZE BUSHING

2 LIMIT FOR INSTALLATION OF REPAIR SLEEVE

3 LUG FACE MACHINING REQUIREMENTS:
1. MATERIAL REMOVED FROM ANY FACE MUST NOT EXCEED HALF THE DIFFERENCE BETWEEN THE DESIGN DIMENSION AND REPAIR LIMIT
2. FLAT SURFACE MUST BE MINIMUM OF 0.02 LARGER THAN FLANGE DIAMETER OF BUSHING TO BE INSTALLED
3. BLEND MISMATCH STEPS TO 0.18-0.26 R, OR IF WITHIN 0.10 OF LUG FILLET RADIUS, USE SAME RADIUS AS LUG FILLET. BREAK SHARP EDGES 0.03-0.07 R.

4 0.015 INCH MAXIMUM MATERIAL CAN BE REMOVED FROM EITHER FACE. BUILDUP TO DESIGN DIMENSION WITH CHROME PLATE (SOPM 20-42-03) OR ELECTROPOSITED NICKEL PLATE (SOPM 20-42-09). GRIND THE CHROME PLATE TO DESIGN DIMENSIONS AND FINISH. MACHINE THE NICKEL PLATE TO DESIGN DIMENSIONS AND FINISH.

5 LIMIT FOR INSTALLATION OF TOW FITTING 65C36787-2.

6 LIMIT FOR INSTALLATION OF 15-5PH OR 17-4PH CRES SHIMS BONDED IN POSITION WITH BMS 5-95 SEALANT.

7 IF DEFECTS ARE MORE THAN THESE LIMITS, THE PART MUST BE DISCARDED.

8 LIMIT FOR BUILDUP WITH BMS 10-67, TYPE 1 OR 17, CLASS 2, 3, OR 4 THERMAL SPRAY (SOPM 20-10-05), 0.010 MAX THICK. PUT A 0.080 MAX RUNOUT AT EDGES. GRIND TO DESIGN DIMENSIONS AND 8 MICROINCH FINISH. THEN CADMIUM-TITANIUM PLATE (SOPM 20-42-02) THE RUNOUT AREA.

REPAIR

REF 1 THRU 8

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK SHARP EDGES EQUIVALENT TO 0.06 R UNLESS SHOWN DIFFERENTLY

MATERIAL: 4340M STEEL (270-300 KSI)

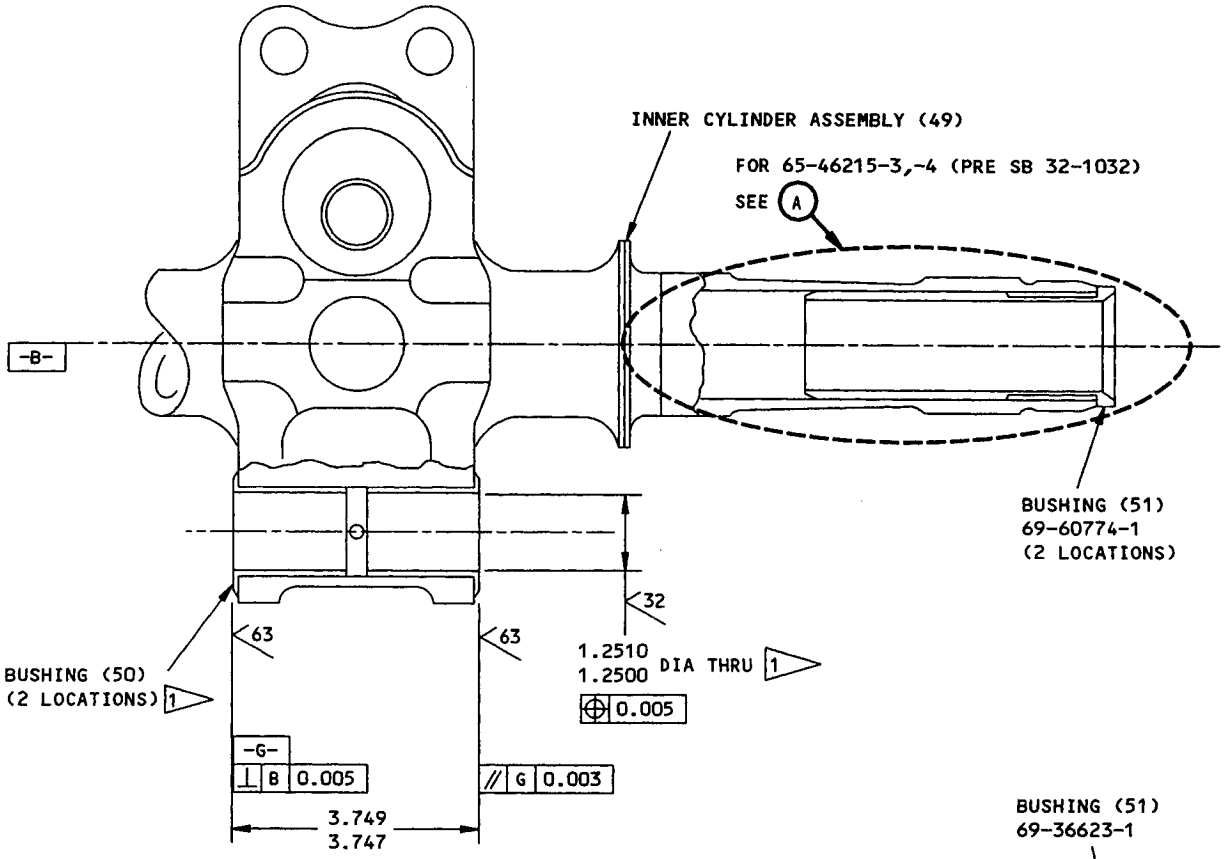
SHOT PEEN: 0.017-0.046 SHOT SIZE
0.010-0.016A2 INTENSITY

ALL DIMENSIONS ARE IN INCHES

INNER CYLINDER (52)

Inner Cylinder Lug Face and Hole Repair
Figure 403B (Sheet 3)

L47412



65-46215-3,-4
(PRE SB 32-1032)
A

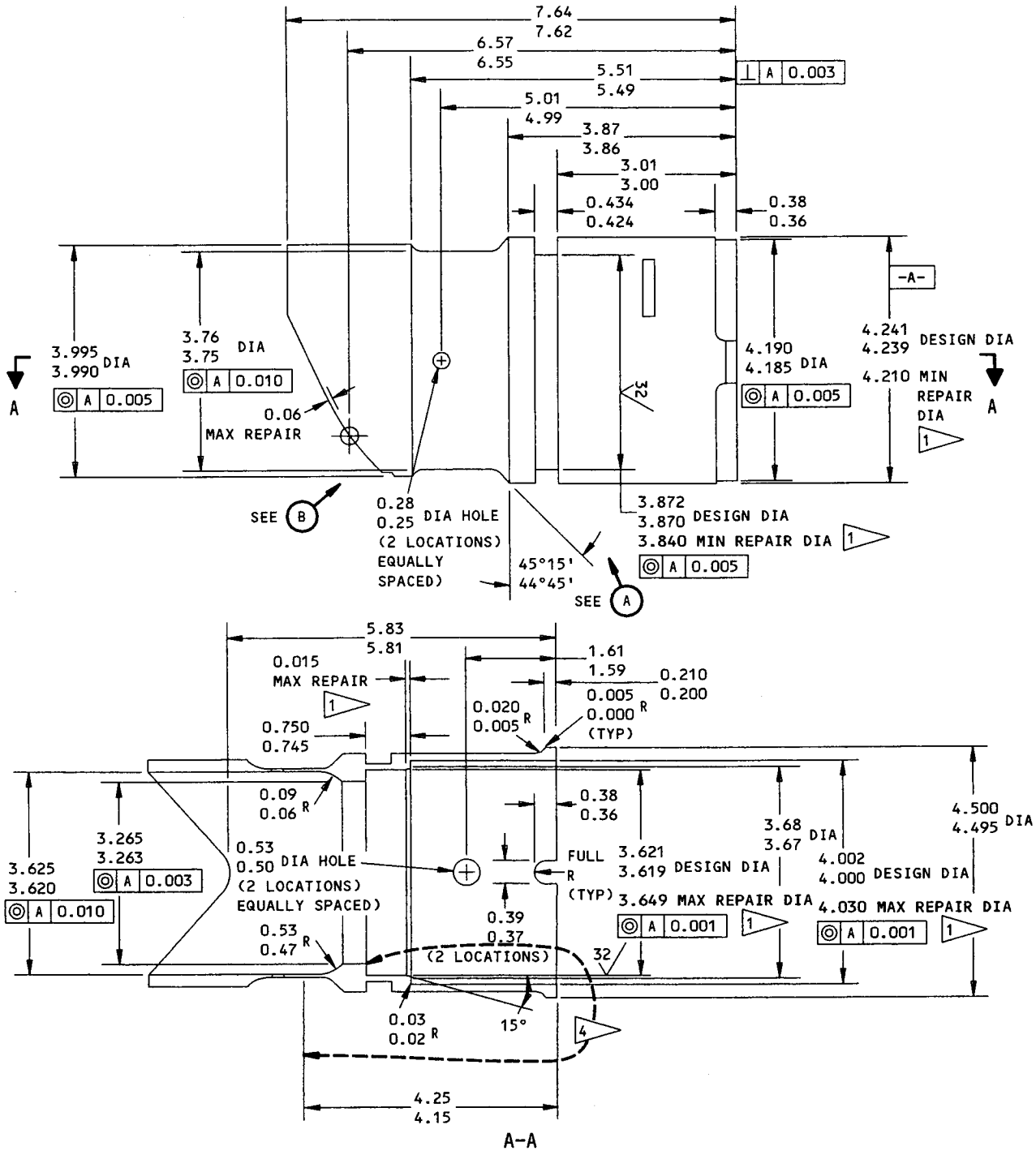
ITEM NUMBERS REFER TO IPL FIG. 1101

ALL DIMENSIONS ARE IN INCHES

1 NO PRIMER OR ENAMEL

INNER CYLINDER ASSEMBLY (49)

Inner Cylinder Bushing Replacement
Figure 403C



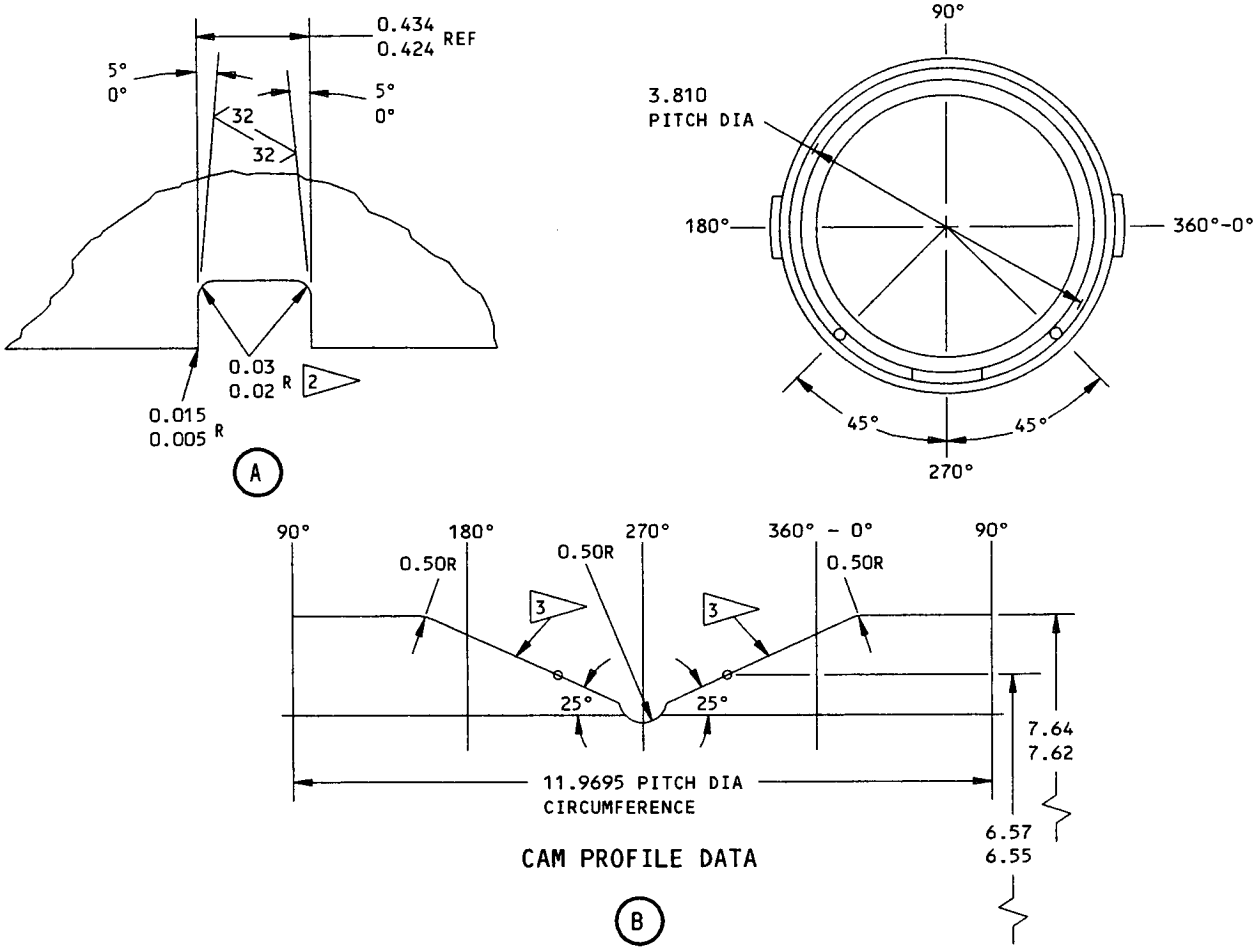
A-A

LOWER CAM (37)
65-46228 SERIES

ALL DIMENSIONS ARE IN INCHES

Lower Cam Repair
Figure 404 (Sheet 1)

L77844



CAM PROFILE DATA

REFINISH

65-46228-1,-2: CADMIUM PLATE SURFACES SHOWN BY 4

65-46228-3: APPLY NO FINISH (F-1.10)

1 LIMIT FOR CHROME PLATE BUILDUP AND GRIND TO DESIGN DIMENSIONS AND FINISH. PUT A 0.08 PLATING RUNOUT AT EDGES, HOLES AND RELIEFS UNLESS SHOWN DIFFERENTLY.

2 NO PLATING IN CORNER OR EDGE RADIUS

3 CAM RAMPS MUST BE TRUE HELICAL SURFACES WITH 63 SURFACE FINISH

4 CADMIUM PLATE (F-15.02) THESE SURFACES. (65-46228-1,-2)

REPAIR

REF 1 2 3

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK SHARP EDGES EQUIV TO 0.03R

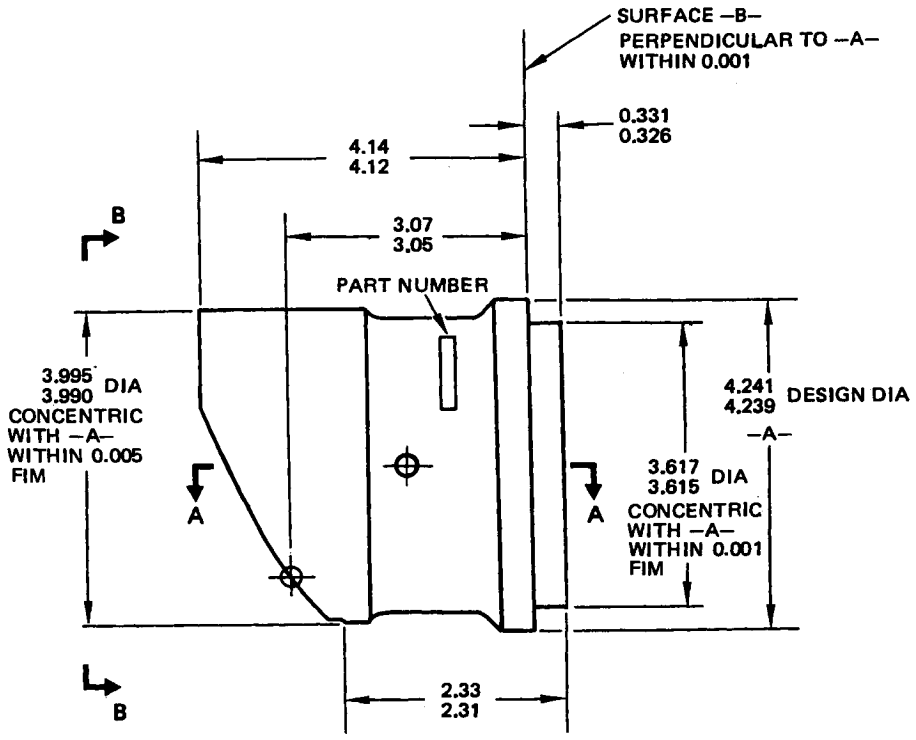
SHOT PEEN: 0.016-0.033 SHOT SIZE
0.015A2 INTENSITY

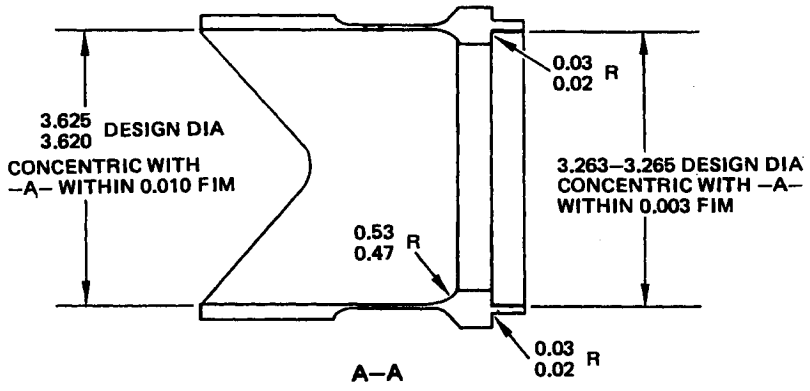
MATERIAL: 15-5PH CRES (180-200 KSI)

ALL DIMENSIONS ARE IN INCHES

LOWER CAM (37)
65-46228 SERIES

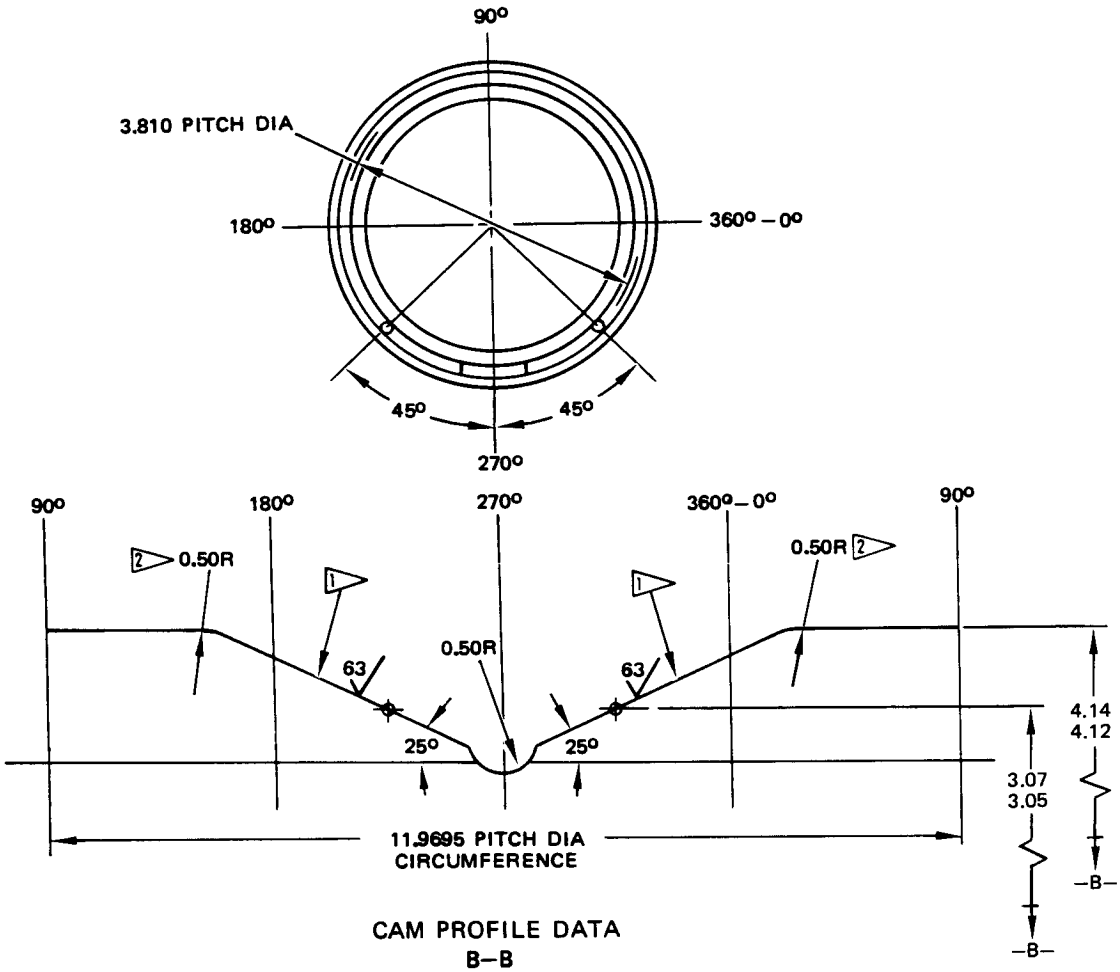
Lower Cam Repair
Figure 404 (Sheet 2)





LOWER CAM (37)
65C31706–1

Lower Cam Details
Figure 404A (Sheet 1)



CAM PROFILE DATA
B–B

REFINISH

NO FINISH

1 RAMPS MUST BE TRUE HELICAL SURFACE

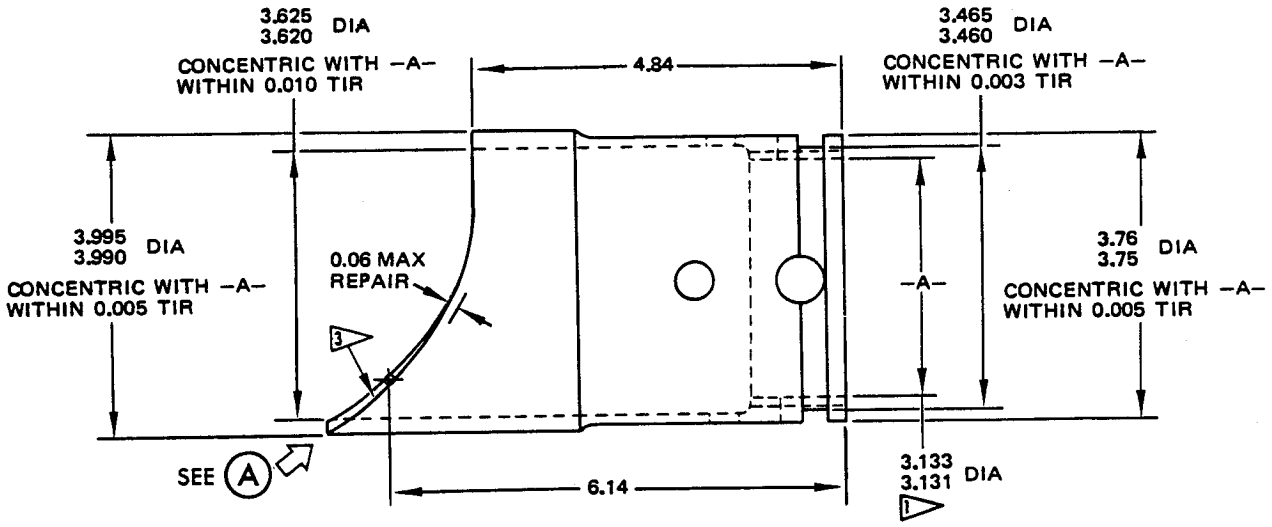
2 SURFACE OF THIS RADIUS SHALL BE CONTINOUSLY RADIAL AND PERPENDICULAR TO DIA –A– ℄

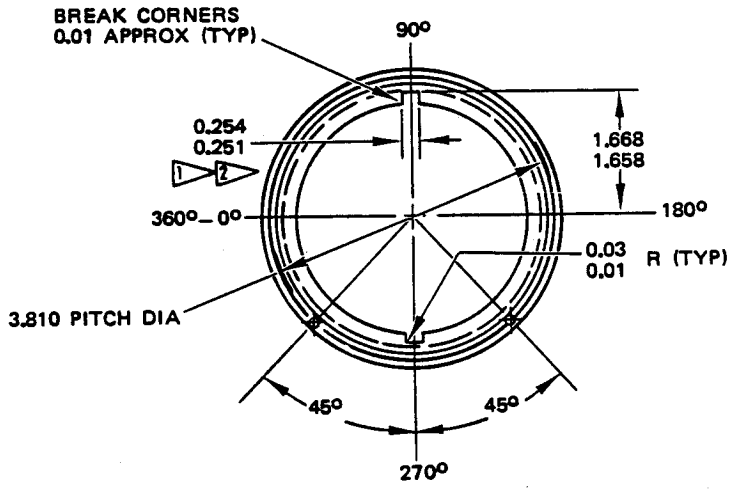
125 MACHINE FINISH EXCEPT AS NOTED

MATERIAL: AL–NI–BRZ PER AMS 4640

ALL DIMENSIONS ARE IN INCHES

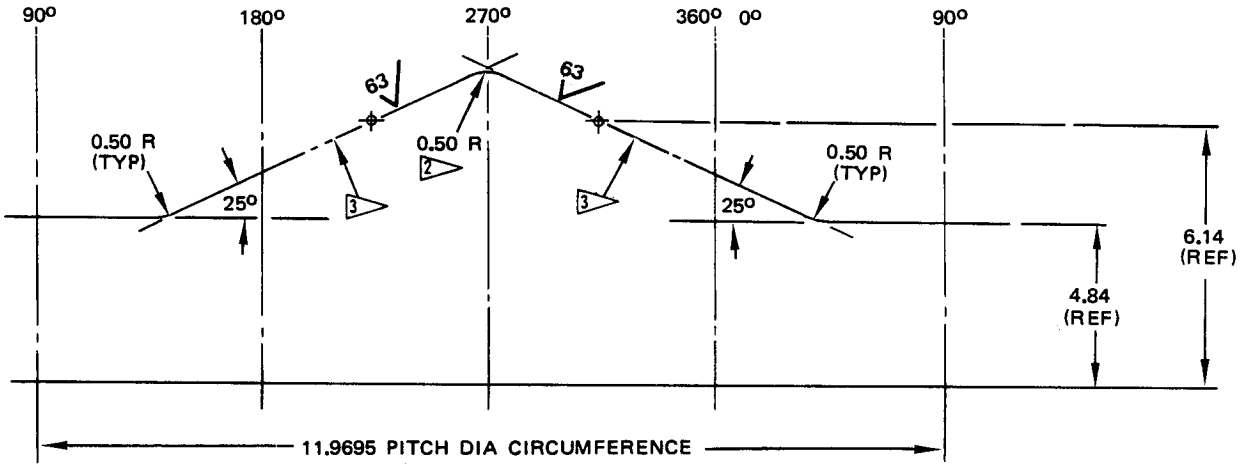
LOWER CAM (37)
65C31706–1





UPPER CAM (33)

Upper Cam Repair and Profile Data
Figure 404B (Sheet 1)



CAM PROFILE DATA

(A)

REFINISH

NO FINISH

125 √ MACHINE FINISH
EXCEPT AS NOTED

BREAK SHARP EDGES 0.02R
EXCEPT AS NOTED

MATERIAL: 4340 STEEL, 180–200 KSI

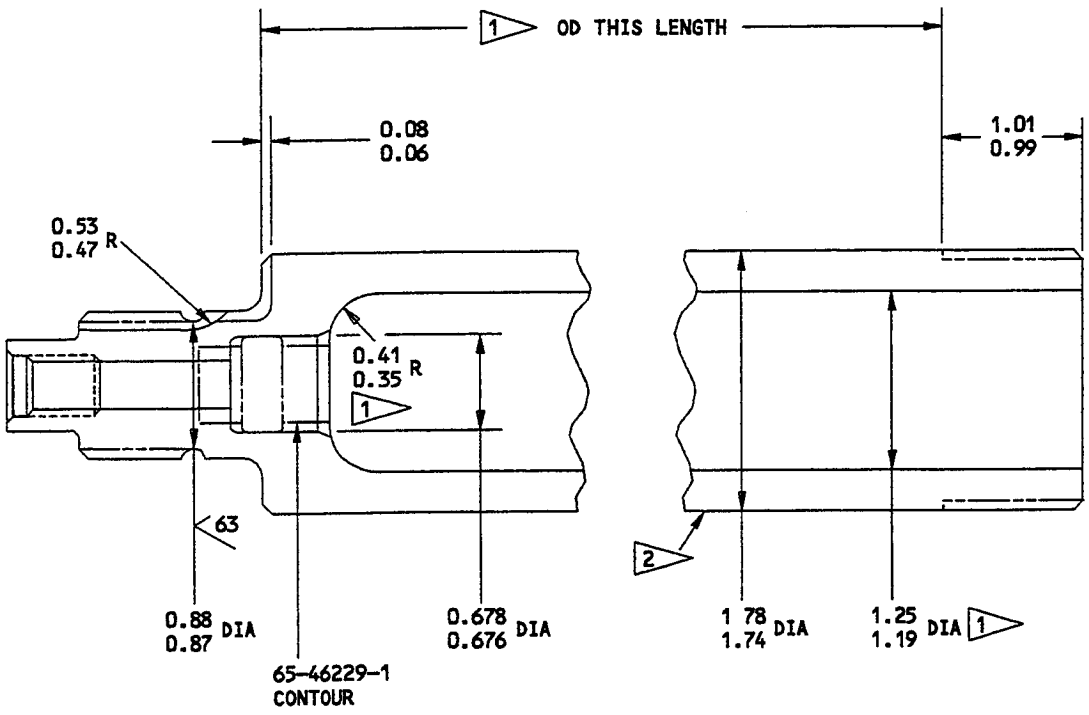
ALL DIMENSIONS ARE IN INCHES

1 ℄ KEYWAY MUST BE ON ℄ OF 3.131–3.133 DIA WITHIN 0.001 (TYP)

2 ℄ CAM LOBE MUST BE ON ℄ KEYWAY WITHIN 0° 5'

3 CAM RAMPS MUST BE TRUE HELICAL SURFACES

UPPER CAM (33)



REFINISH

CHROMIC ACID ANODIZE (F-17.04) ALL OVER.
APPLY PRIMER TO AREAS SHOWN BY 1

1 APPLY BMS 10-11, TYPE 1 PRIMER (F-20.02) TO THIS AREA, AND THE HOLES

2 DEEP ELECTROCHEMICAL ETCH OR VIBRO ENGRAVE PART NUMBER, SERIAL NUMBER AND MANUFACTURER'S IDENTIFICATION IN VENDOR NUMBER THIS AREA. THE MARK MUST BE SEEN AFTER ALL FINISHES ARE APPLIED

REPAIR

(SAME AS REFINISH)

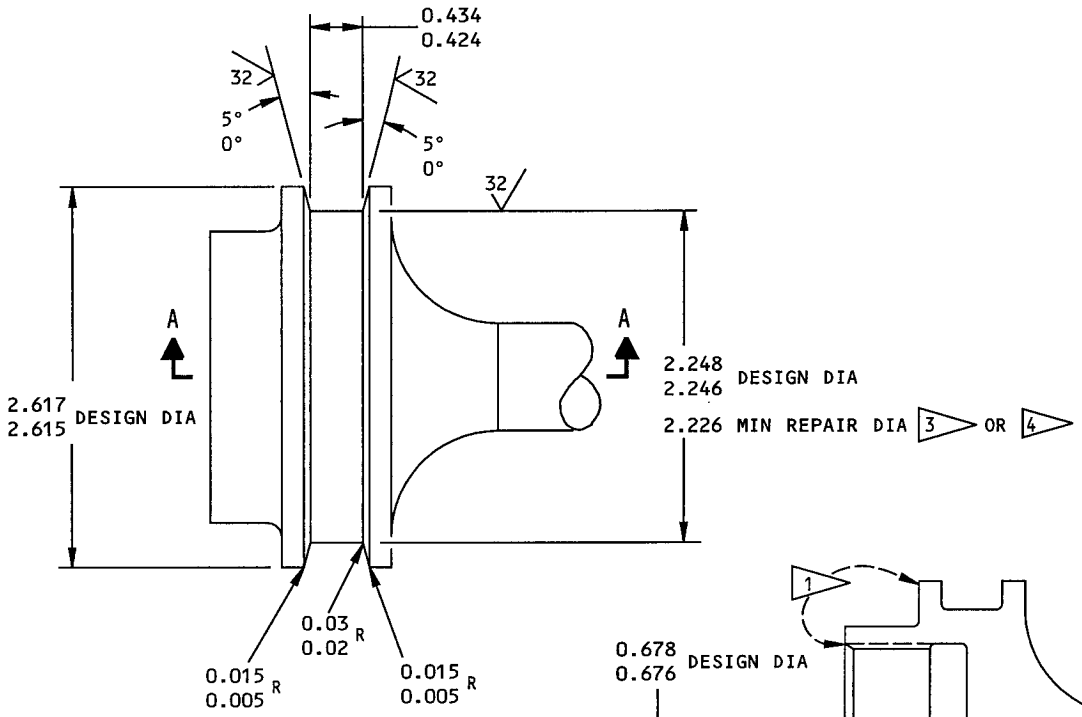
125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

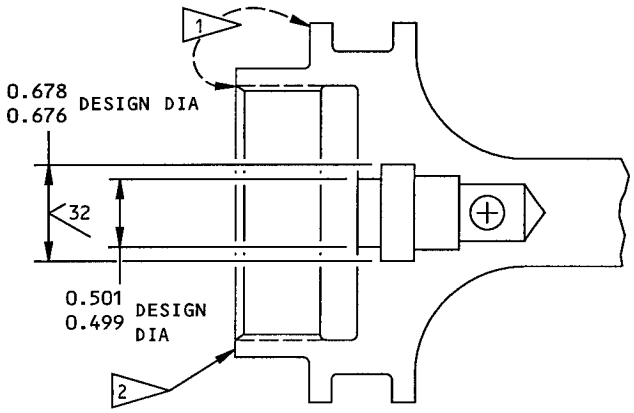
MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

SUPPORT TUBE (72C, FIG. 1101)

Support Tube Refinish
Figure 404C





A-A

REFINISH

CADMIUM PLATE AREA SHOWN BY 1. APPLY NO FINISH ON OTHER AREAS.

1 CADMIUM PLATE (F-15.02) THIS AREA.

2 DEEP ELECTROCHEMICAL ETCH OR VIBRO-ENGRAVE THE PART NUMBER, SERIAL NUMBER AND MANUFACTURER IDENTIFICATION IN THIS AREA. THE MARKS MUST BE SEEN AFTER ALL FINISHES ARE APPLIED.

3 REPAIR OPTIONS:

1. LIMIT FOR SULFAMATE NICKEL PLATE BUILDUP (SOPM 20-42-09) PUT A 0.040-0.080 RUNOUT AT EDGES. MACHINE TO DESIGN DIMENSIONS AND FINISH.
2. LIMIT FOR CHROME PLATE BUILDUP (SOPM 20-42-03). PUT A 0.040-0.080 RUNOUT AT EDGES. GRIND TO DESIGN DIMENSIONS AND FINISH.
3. LIMIT FOR BUILDUP WITH BMS 10-67, TYPE 1 OR 17, CLASS 2, 3, OR 4 THERMAL SPRAY (SOPM 20-10-05), 0.010 MAX THICK. PUT A 0.040-0.080 RUNOUT AT EDGES. GRIND TO DESIGN DIMENSIONS AND 32 MICROINCH FINISH.

REPAIR

REF 3

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

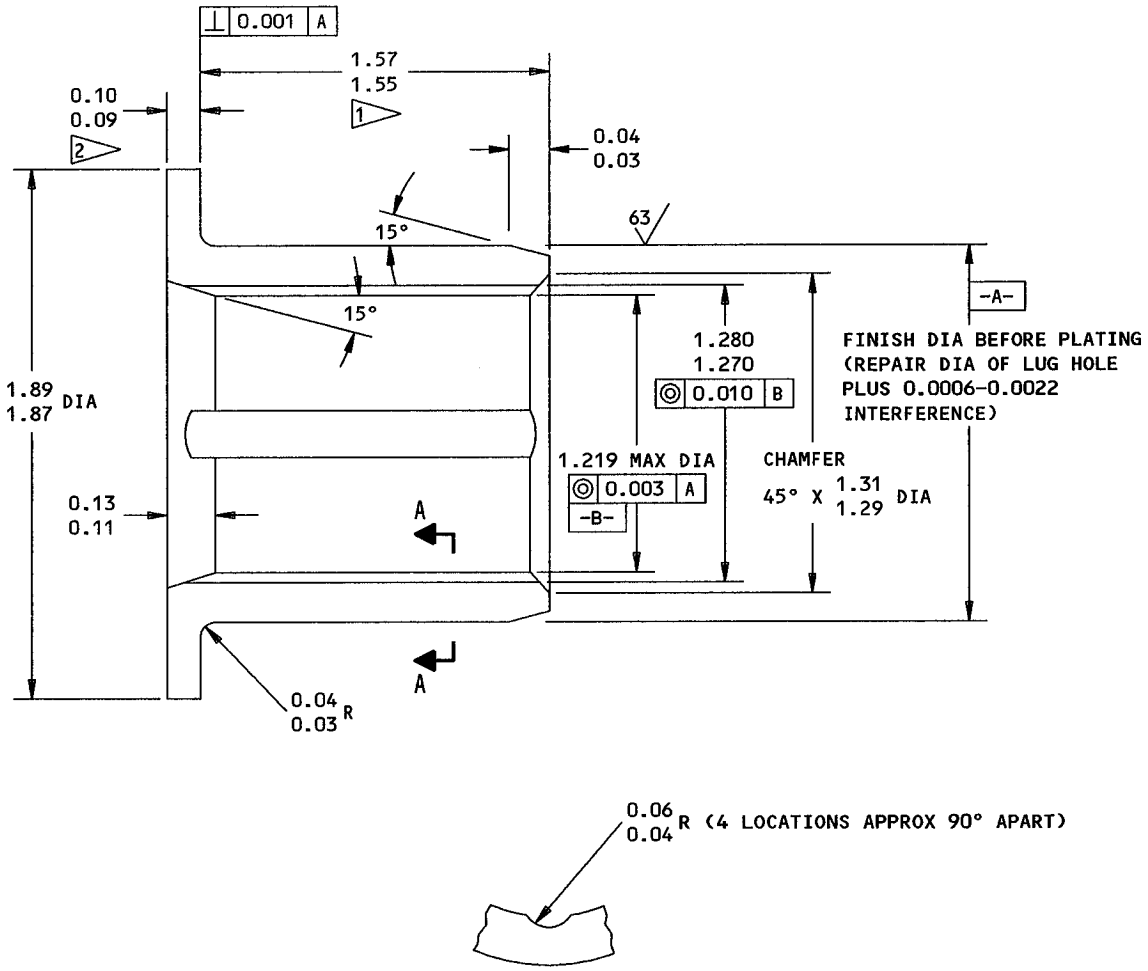
BREAK SHARP EDGES 0.01-0.03 R UNLESS SHOWN DIFFERENTLY

MATERIAL: 4340 STEEL, 180-200 KSI

ALL DIMENSIONS ARE IN INCHES

METERING PIN (72D, FIG. 1101)

Metering Pin Repair and Refinish
Figure 405



A-A

1 MINUS AMOUNT REMOVED FROM LUG FACE
2 PLUS AMOUNT REMOVED FROM LUG FACE

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK SHARP EDGES 0.01-0.02R

FINISH: CADMIUM PLATE (F-15.06)(OPTIONAL ON INTERNAL SURFACES)

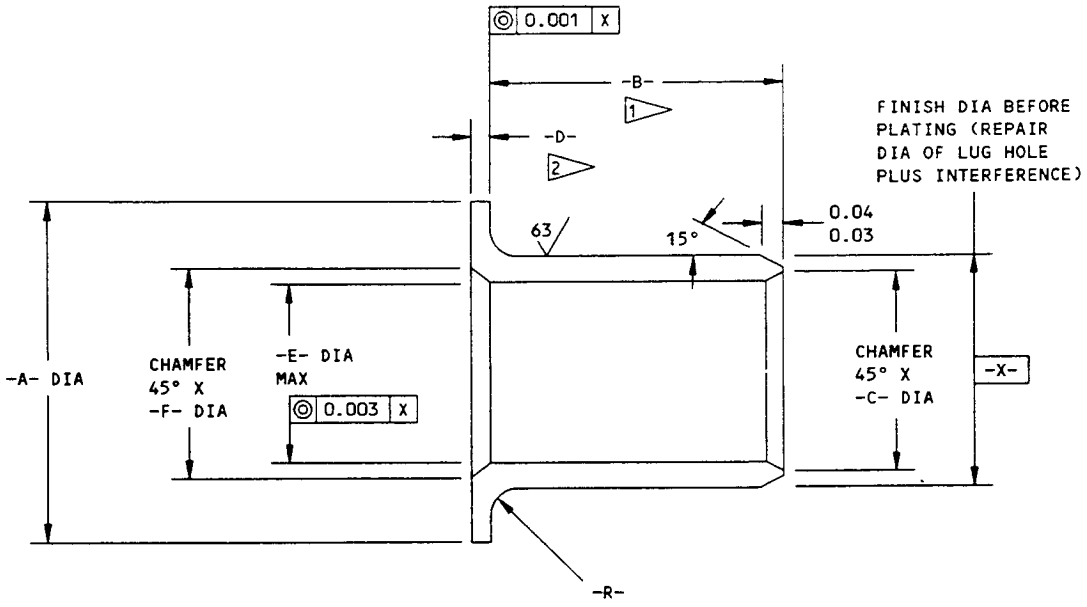
MATERIAL: 17-4PH CRES (180-200 KSI)

ALL DIMENSIONS ARE IN INCHES

HOLE LOCATION (1) FIG. 403B - REPLACES BUSHING (50, FIG. 1101) 65-46150-95

Oversize Bushing Details
Figure 406 (Sheet 1)

F92661



HOLE LOCATION	REPAIR FIG.	REPLACES BUSHING (FIG.1101)	-A-	-B- 1	-C-	-D- 2	-E- (MAX)	-F-	-R-	INTERFERENCE	MATERIAL	FINISH
9A	402	(17) 65-46150-3	2.76 2.74	3.26 3.24	2.06 2.04	0.13 0.12	1.969	2.06 2.04	0.05 0.04	0.0028 0.0010	3	5
11A	402	(18) 65-46150-4	1.89 1.87	0.485 0.480	1.31 1.29	0.13 0.12	1.219	1.31 1.29	0.05 0.04	0.0025 0.0006	3	5
1	403B	(50) 65-46150-1	1.89 1.87	1.57 1.55	1.31 1.29	0.10 0.09	1.219	1.31 1.29	0.04 0.03	0.0025 0.0006	4	6

125 ALL MACHINED SURFACES EXCEPT AS NOTED

BREAK SHARP EDGES 0.02R MAX

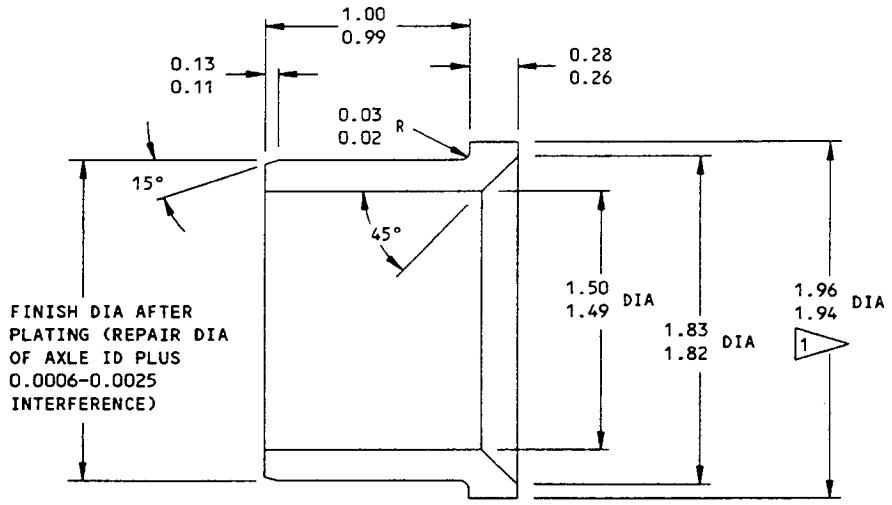
MATERIAL: AS NOTED

FINISH: AS NOTED (OPTIONAL ON ID)

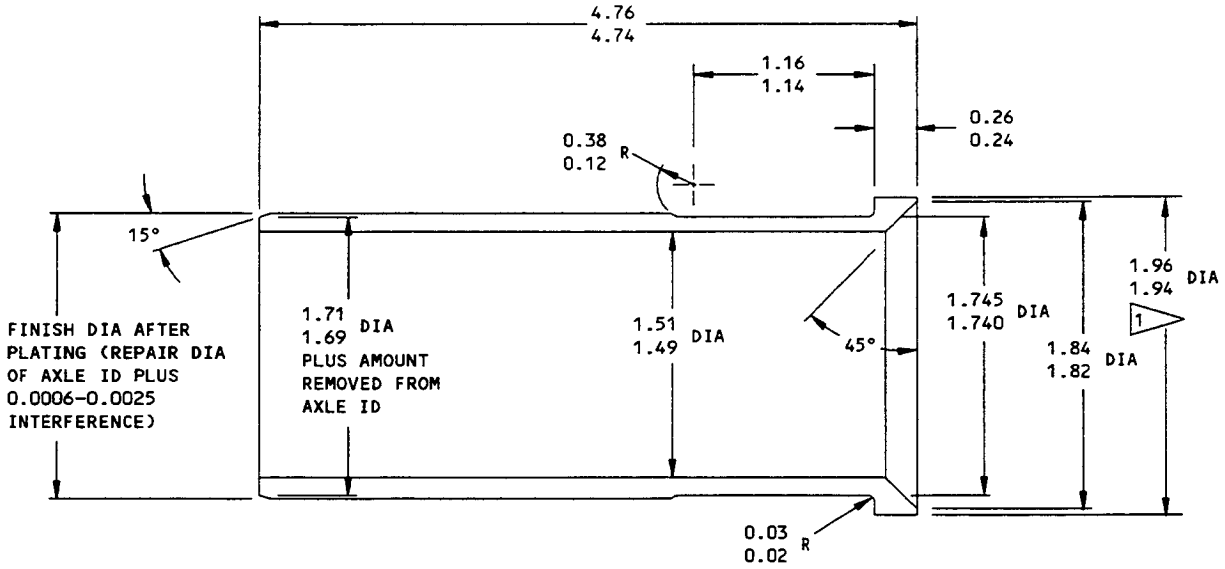
ALL DIMENSIONS ARE IN INCHES

1. MINUS AMOUNT REMOVED FROM LUG FACE
2. PLUS AMOUNT REMOVED FROM LUG FACE
3. AL-NI-BRZ PER AMS 4640
4. 17-4PH CRES PER AMS 5643, 180-200 KSI, SOLUTION TREATED
5. CADMIUM PLATE (F-4.201)
6. CADMIUM PLATE (F-1.32, WHICH REPLACES F-1.1923)

Oversize Bushing Details
Figure 406 (Sheet 2)



HOLE LOCATION (3) FIG. 403A - REPLACES BUSHING (51) 69-36623-1



HOLE LOCATION (3) FIG. 403A - REPLACES BUSHING (51) 69-60774-1

REFINISH

69-36623-1:
PASSIVATE (F-17.09), CADMIUM PLATE (F-15.06)
69-60774-1:
CADMIUM PLATE (F-1.1929) ALL OVER (OPTIONAL IN BORE) (REF SOPM 20-42-05)

1 USE 1.91-1.92 DIA IF THE AXLE THREADS ARE 1/16 UNDERSIZE

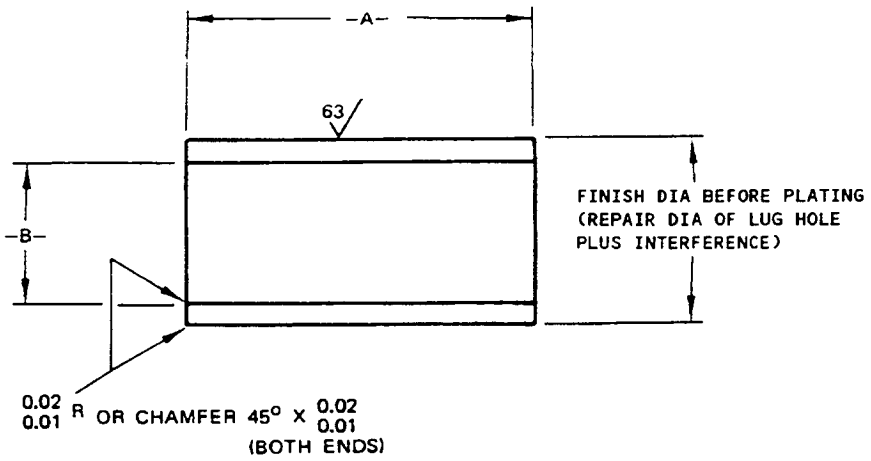
125 ALL MACHINED SURFACES

BREAK SHARP EDGES 0.02-0.03 R

MATERIAL: 17-4PH CRES, AMS 5643 (180-200 KSI)

ALL DIMENSIONS ARE IN INCHES

Oversize Bushing Details
Figure 406A



APPLICATION	REPAIR FIG.	HOLE LOCATION	-A-	-B-	INTER-FERENCE	MATERIAL
OUTER CYLINDER TRUNNION BUSHING LOCK PIN HOLES	402	(8)	1.900 ▷4 1.780	0.38 0.36	0.0015 0.0010	▷1
OUTER CYLINDER HYDRAULIC BRACKET MOUNTING HOLES	402	(23)	0.72 0.71	0.400 0.395	0.0018 0.0005	▷1
STEERING PLATES (ATTACH HOLES)	402A	---	0.235 0.230	0.72 0.70	0.0010 0.0003	▷1
OUTER CYLINDER STEERING PLATE ATTACH LUG	402A	---	0.200 0.195	0.72 0.70	0.0010 0.0003	▷2
INNER CYLINDER TOW FITTING ATTACH LUG	403B	(2)	0.543 ▷3 0.538	0.72 0.70	0.0025 0.0006	▷1 OR ▷2

125/ ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

CADMIUM PLATE (REF SOPM 20-42-05) EXTERIOR SURFACES (OPTIONAL ON ID)

MATERIAL: AS NOTED

ALL DIMENSIONS ARE IN INCHES

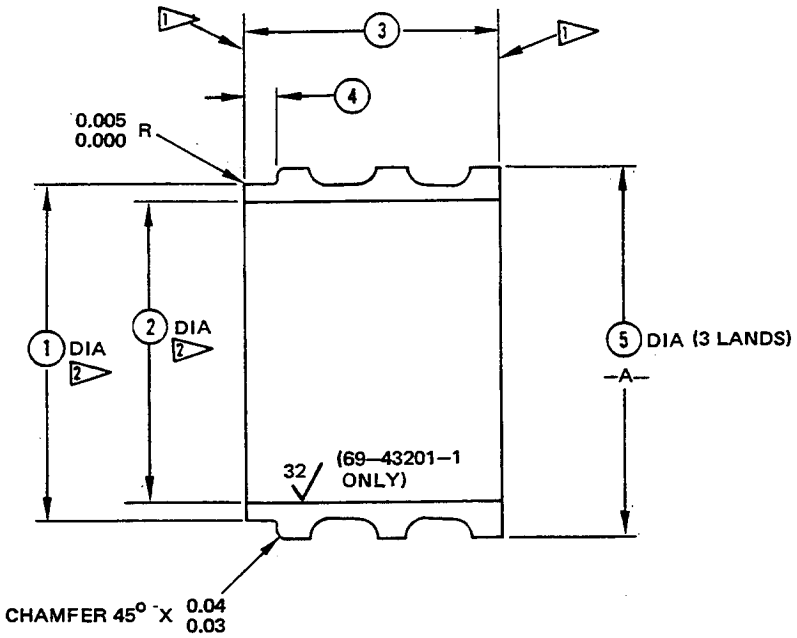
▷1 AL-NI-BRZ PER AMS 4640

▷2 17-4PH CRES PER AMS 5643, 180-200 KSI, SOLUTION TREATED

▷3 MINUS AMOUNT REMOVED FROM LUG THICKNESS

▷4 ADJUST LENGTH AS NECESSARY TO BE AT OR 0.005 MAX BELOW MATING SURFACES

Repair Sleeve Details
Figure 407



	1	2	3	4	5
DESIGN DIM	3.618 3.616	3.254 3.250	2.780 2.778	0.335 0.333	3.998 3.996
REPAIR LIMIT	— —	— —	— —	— —	— —

REFINISH

NO FINISH

1 PERPENDICULAR TO -A- WITHIN 0.002

2 CONCENTRIC WITH -A- WITHIN 0.005 TIR

REPAIR

125 MACHINE FINISH (69-38182-1)

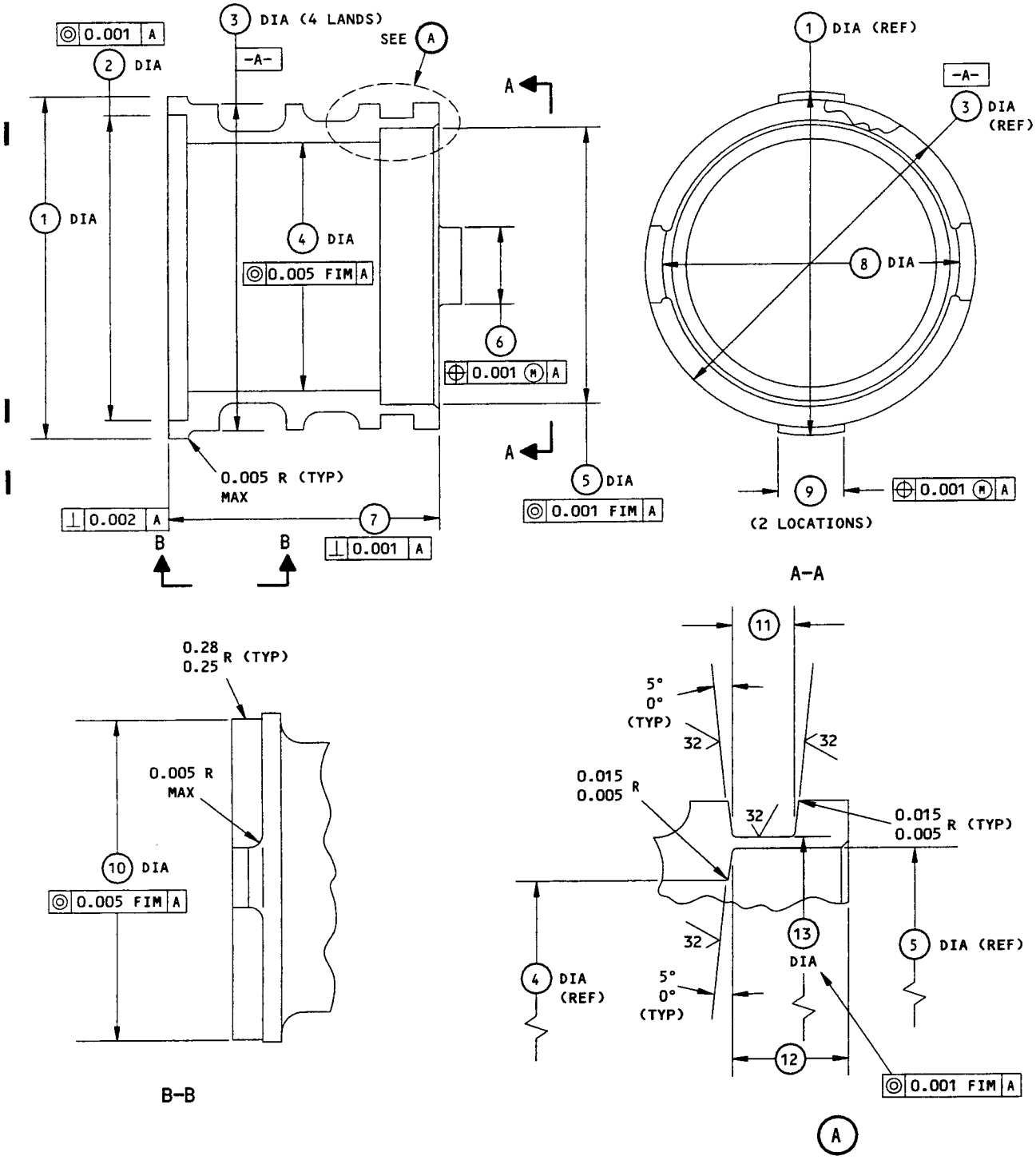
63 MACHINE FINISH EXCEPT AS NOTED (69-43201-1)

MATERIAL:
(69-38182-1) LAMINATED PHENOLIC
(69-43201-1) AL-BRONZE ALLOY

ALL DIMENSIONS ARE IN INCHES

69-38182-1
69-43201-1

Lower Bearing Details
Figure 408



69-76508-1,-2
BEARING (42, FIG. 1101)

Lower Bearing Repair and Refinish
Figure 409 (Sheet 1)

	①	②	③	④	⑤	⑥	⑦	⑧	⑨
DESIGN DIM	4.442 4.440	4.002 4.000	4.241 4.239	3.254 3.250	3.620 3.619	0.995 0.993	3.505 3.500	3.765 3.755	0.749 0.747
REPAIR LIMIT	— —	— —	— —	— —	— —	— —	— —	— —	— —

	⑩	⑪	⑫	⑬
DESIGN DIM	4.190 4.185	0.434 0.424	0.760 0.755	3.872 3.870
REPAIR LIMIT	— —	— —	0.770 1	— —

REFINISH

NO FINISH

1 RESTORATION TO DESIGN DIMENSIONS NOT REQUIRED

REPAIR

REF 1

63 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

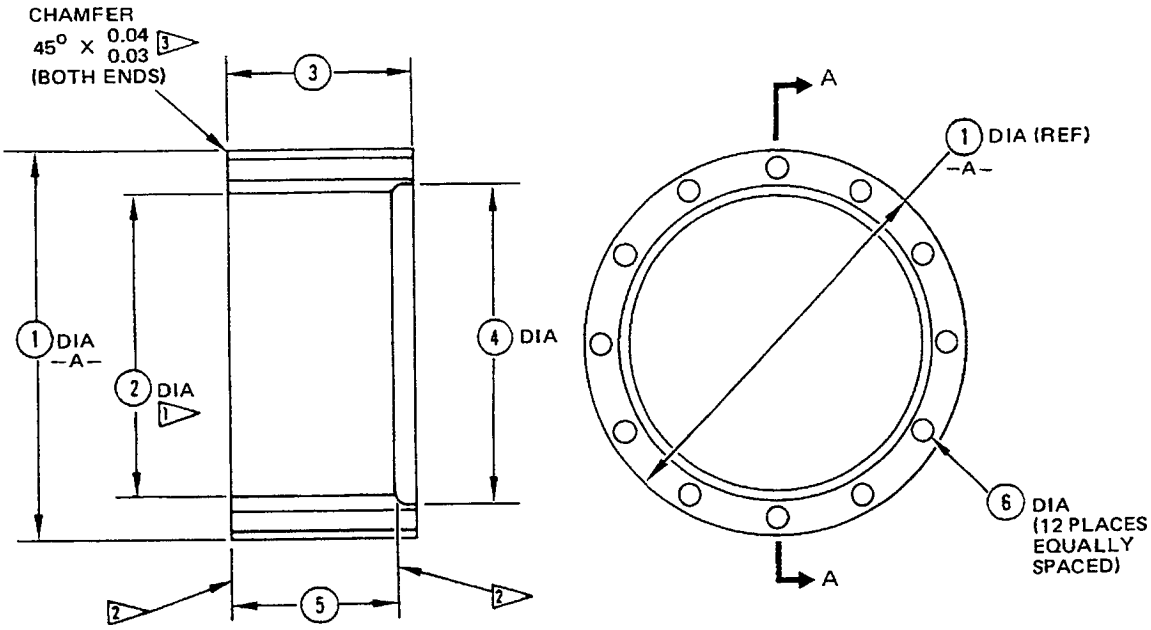
MATERIAL: AL-NI-BRZ PER AMS 4640

ALL DIMENSIONS ARE IN INCHES.

69-76508-1, -2
BEARING (42, FIG. 1101)

Lower Bearing Repair and Refinish
Figure 409 (Sheet 2)

EB9260



A–A

	1	2	3	4 3	4 4	5	6 3	6 4
DESIGN DIM	3.999 3.997	3.133 3.131	1.93 1.91	3.333 3.321	3.330 3.320	1.720 1.715	0.255 0.250	0.221 0.218
REPAIR LIMIT	— —	— —	— —	— —	— —	— —	— —	— —

REFINISH

69-54449-1, -2: PLASMA FLAME SPRAY (F-15.20) DIA -A-, OTHERWISE NO FINISH

69-65393-1: NO FINISH

1 CONCENTRIC WITH -A- WITHIN 0.002 TIR

2 PERPENDICULAR TO -A- WITHIN 0.002

3 69-54449-1, -2

4 69-65393-1

REPAIR

63 MACHINE FINISH EXCEPT AS NOTED

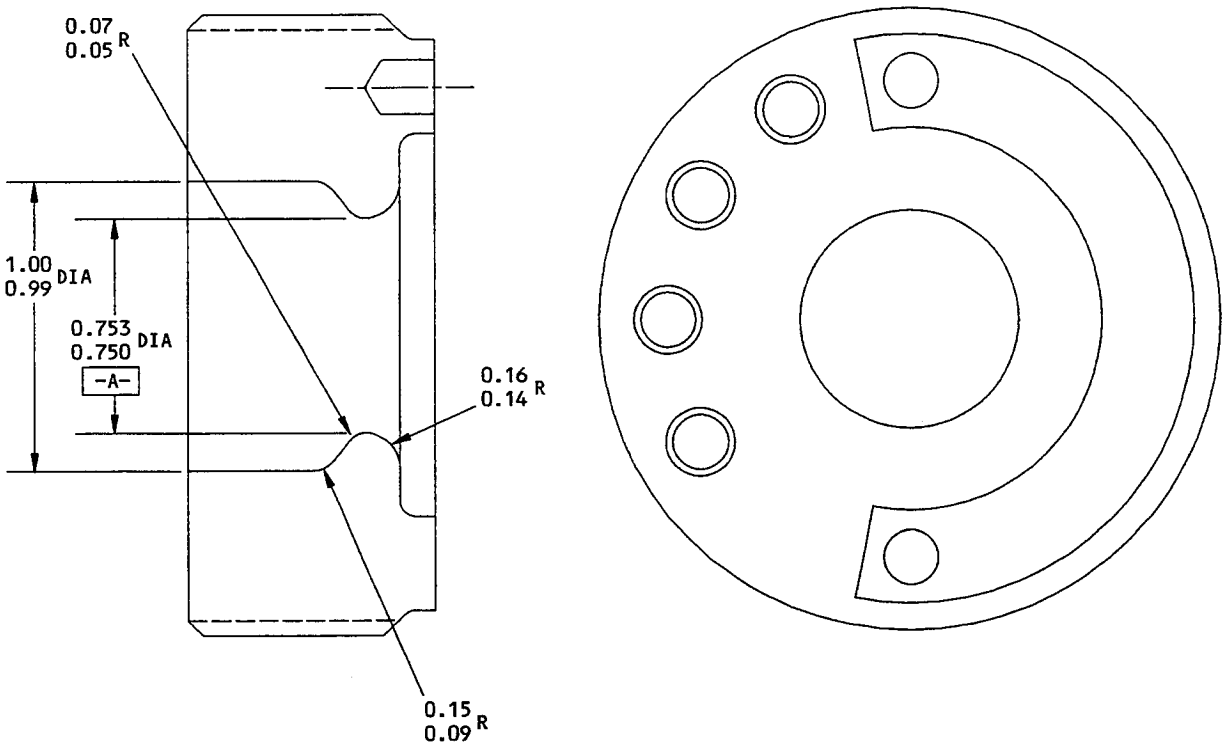
MATERIAL:
(69-54449) AL ALLOY
(69-65393) AL-NI-BRZ PER AMS 4640

ALL DIMENSIONS ARE IN INCHES.

69-54449-1, -2
69-65393-1
UPPER BEARING (28)

Upper Bearing Details
Figure 410

E89262



REFINISH

NO FINISH

REPAIR

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

MATERIAL: 4340 STEEL, 180-200 KSI

ALL DIMENSIONS ARE IN INCHES

69-36622-2,-3

Upper Orifice Plate Details
Figure 411

E89917

ASSEMBLY

1. General

   A. Before you install the 0-rings, put them in hydraulic fluid and install them wet.

   B. O-rings and backup rings can be lubricated with petrolatum but do not use too much.

2. Assembly (Fig. 1101)

   CAUTION: INITIAL TORQUE VALUES ARE APPLICABLE TO MATING THREADED PARTS WHICH ARE NOT LUBRICATED (DRY CONDITION). IF THREADS ARE LUBRICATED, THE TORQUE IS REDUCED 50% AS INDICATED.

   A. On shock struts 65-46200-16, -17, -19, -25, -26 and -27, install internal parts in inner cylinder (49) as follows:

      NOTE: For installation of internal parts in inner cylinder of the other shock struts, refer to par. 2.B.

      (1) Install upper orifice plate (76) and lower orifice (72) on metering pin (77).

      (2) Lubricate and install 0-ring (67) and backup ring (68) in piston (69).

      (3) Assemble piston (69) on metering pin and into orifice (72).

      (4) Lubricate 0-ring (65) with hydraulic fluid and install into seal (66).

         CAUTION: DO NOT SLIDE THE SEAL PAST THE HOLES IN THE ORIFICE WHILE THE SEAL IS IN A ROUND SHAPE, OR THE SHARP EDGES WILL DAMAGE THE SEAL SURFACES AND LEAKAGE COULD OCCUR.

      (5) Squeeze the seal assembly into an oval shape and put it into the lower orifice. Push the seal into position.

      (6) Install seal lock (64) and washer (63) on metering pin (77).

      (7) Install nut (62) and tighten to 290-410 lb-in. (threads dry), or 145-205 lb-in. (threads lubricated) while you align the slots in the nut with the hole in the metering pin.

      (8) Install spring pin (61). Install lockwire.

(9) Apply a thin layer of corrosion preventive compound MIL-C-11796, class 3 to the bore of spacer (59) and install the spacer on lower support tube (60).

NOTE: Spacer (59) and orifice (72) are matched sets.

(10) Install locknut (57) on lower support tube (60). Tighten nut to 2000-2400 lb-in (threads dry) or 1000-1200 lb-in (threads lubricated) while you align the slots in the nut with the hole in the support tube.

(11) Install pin (56) and cotter pin (55).

(12) Install filter (54) in support tube with retainer (53).

(13) Slide lower support tube (60) forward and align the holes in spacer (59) and lower orifice (72). Apply corrosion preventive compound, MIL-C-11796, class 3 to pin (58), and install the pin. Install another pin 180 degrees opposite. Install the remaining six pins in opposite locations, by this procedure.

(14) On upper support tube (78), measure the distance (to the nearest 0.001 inch) from the end of the support tube (at the thread end) to the top of the flange seating surface. This dimension should be 2.83-2.85 inch. Make a note of the dimension you get, to use it in Step D. (2) following. Lubricate piston ring (73) with hydraulic fluid and put the ring on the upper support tube.

(15) Put the metering pin (with the other parts you installed on it) into upper orifice support tube (78). Engage threads of upper orifice plate (76) and tighten to 1000-1200 lb-in. (threads dry) or 500-600 lb-in. (threads lubricated). Align orifice plate (76), within torque limits, to let you install lock (75).

(16) Install plate lock (75) with two cap screws (74). Install lockwire.

(17) Install 0-ring (70) and backup rings (71) on lower orifice (72).

NOTE: Lower orifice is a matched set with spacer (59).

(18) Install 0-ring (25) and backup rings (26) on upper orifice support tube (78).

(19) Install assembled parts into inner cylinder (49).

(20) Install washer (48), key washer (47) and nut (46). Tighten nut to 1000-1500 lb-in. (threads dry) or 500-750 lb-in. (threads lubricated). Bend the washer tab to hold the nut.

B. On shock struts 65-46200-21, -22, -28, -29, -30, -32 thru -43, -46 thru -53, -55, -56, -63 thru -67, install internal parts in inner cylinder (49) as follows:

NOTE: For installation of internal parts in inner cylinder on shock struts 65-46200-16, -17, -18, -25, -26 and -27, refer to par. 2.A.

(1) Install O-ring (72H), backup rings (72J), O-rings (72F) and backup rings (72G).

(2) Install drain tube (72E) in support tube (72C). Install support tube (72C) into metering pin (72D) as follows:

(a) If the old support tube (72C) and metering pin (72D) are used, turn the support tube into the metering pin until it stops at the bottom. If the bores in the tube and the metering pin for bolt (72B) are not aligned, drill a new 0.164-0.168-inch hole through the support tube with the hole in the metering pin as a guide. If this will make a third hole, or a second hole less than 45° from the first hole, discard this tube and get another tube with no more than one hole in it.

(b) If a replacement support tube (72C) is used with the old metering pin (72D), turn support tube into the metering pin until it stops at the bottom. Then drill a new 0.164-0.168-inch hole through the support tube with the hole in the metering pin as a guide. If this will make a third hole, or a second hole less than 45° from the first hole, discard this tube and get another tube with no more than one hole in it.

(c) If a replacement metering pin (72D) is used with a replacement support tube (72C), turn the support tube into the metering pin until it stops at the bottom. Drill a new 0.164-0.168-inch hole through the metering pin and the support tube, as shown in Fig. 503. If this will make a third hole, or a second hole less than 45° from the first hole, discard this tube and get another tube with no more than one hole in it.

(3) Install new bolt (72B).

(4) Carefully install metering pin assembly (72A) and attached parts into cylinder assembly (49). The plug end of metering pin (72A) must extend through the bottom of the inner cylinder.

(5) On upper support tube (78), measure the distance (to the nearest 0.001 inch) from the end of support tube (at thread end) to the top of the flange seating surface. (This dimension should be 2.83-2.85 inch.) Make a note of the dimension you get, to use it in step D.(2) following. Lubricate piston ring (73) with hydraulic fluid and put the ring on upper orifice support tube (78 or 78A).

(6) Install orifice plate (76) in upper orifice support tube (78 or 78A). Tighten to 1000-1200 lb-in. (threads dry) or 500-600 lb-in (threads lubricated) and align orifice plate (within torque limits) to let you install lock (75).

(7) Install plate lock (75) with bolts (74). Install lockwire.

(8) Install O-ring (25) and backup rings (26).

(9) Install washers (47, 48) and nut (46). Tighten nut (46) to 1000-1500 lb-in. (threads dry) or 500-750 lb-in. (threads lubricated).

WARNING: MAKE SURE CHECK VALVE IS INSTALLED WITH THE ARROW POINTING INTO THE SHOCK STRUT, OR INJURY COULD OCCUR IF THE CAP IS REMOVED WHILE THE SHOCK STRUT IS PRESSURIZED.

(10) Install plug (45D) or valve (45F) with packing (45E or 45G). Make sure the arrow on the check valve points into the shock strut. Tighten the check valve to 8-10 pound-feet.

C. Install external parts on inner cylinder.

(1) Carefully slide gland nut (45), scraper (44), and rod wiper (43) over inner cylinder.

(2) Install spare seals on lower bearing:

(a) Install O-rings (41) or T-ring (41A) in lower groove and O-ring (40) in upper groove of lower bearing (42).

(b) Carefully slide lower bearing over inner cylinder (Fig. 501).

(3) Install active dynamic seal against lower bearing per Fig. 501.

(4) Install 0-ring (35) and backup rings (36) on lower cam (37). Install cam on inner cylinder over seal (39) and lower bearing (42).

(5) Insert keys (34) in keyways of inner cylinder. If the keys are loose, you can punch mark the keys on their sides to make them fit tightly.

(6) Put piston ring (32) on upper cam (33) and align the keyways with the keys. Slide ring and cam on inner cylinder. Make sure the notched valley of the lower cam is aligned with the lobe of the upper cam.

(7) Install upper bearing (28) on inner cylinder. Install retainer ring (27) and put the bearing against the ring.

(8) Install spacer halves (30). With a feeler gage, make a check of the gap between the spacer and upper cam (33). Use shims (31) as necessary to adjust the gap to be zero to 0.002 inch (with shims 69-42151-1), or zero to 0.005 inch (with shims 66-25608-1, -2, or 3).

(9) Remove retainer ring (27), upper bearing (28), and spacer halves (30).

(10) Install shim(s) (31), upper bearing (28) and retainer ring (27).

CAUTION: WHEN YOU INSTALL RING (29), BE VERY CAREFUL NOT TO DAMAGE THE SURFACES OF UPPER BEARING (28).

(11) With the bearing positioned against the retaining ring, install spacer halves (30) between shim and bearing. Install with retainer ring (29).

D. Assemble inner and outer cylinders.

CAUTION: SOME GLAND NUTS AND OUTER CYLINDERS COULD HAVE UNDERSIZE THREADS. MAKE SURE THAT SUCH PARTS ARE MATCHED AND IDENTIFIED, AND THAT SUCH PARTS ARE NOT MIXED WITH STANDARD PARTS (FIG. 402, SHEET 6).

SOME INNER CYLINDERS COULD HAVE UNDERSIZE AXLE THREADS, TO BE USED WITH SPECIAL UNDERSIZE WHEEL RETAINER NUT. MAKE SURE THAT SUCH PARTS ARE MATCHED AND IDENTIFIED, AND THAT SUCH PARTS ARE NOT MIXED WITH STANDARD PARTS.

(1) Install orifice tube extension F80160-1 in hole for air valve (5) in tube (78). Apply light film of corrosion preventive compound, MIL-C-11796, class 3 on pin (16) and install in outer cylinder (10).

CAUTION: MAKE SURE TABS ON 65-46228-SERIES LOWER CAM (37) ARE IN POSITION IN OUTER CYLINDER. IF OUTER CYLINDER HAS UNDERSIZE THREADS, MAKE SURE LOWER CAM TABS ARE MACHINED TO PERMIT INSTALLATION OF UNDERSIZE GLAND NUT. AFTER PARTS ARE CORRECTLY PUT TOGETHER, THE LOWER CAM WILL BE OUT PAST END OF OUTER CYLINDER 0.028-0.060 INCH (FIG.\504).

(2) On outer cylinder, measure thickness of boss seating surfaces at upper support tube mounting hole to nearest 0.001 inch. (Dimension should be 0.71-0.73 inch.) Subtract this value from dimension noted in step A.(14) or B.(5). Carefully install inner cylinder in outer cylinder. Use ring compressor tool C32002-1 to compress ring (32) as inner cylinder is installed into outer cylinder. Guide orifice tube extension through hole in upper end of outer cylinder. Lubricate parts with hydraulic fluid. Remove extension tool.

(3) Install gland nut (45) on outer cylinder. If the gland nut has plugs or nothing in it, apply BMS 3-27 corrosion preventive compound to the threads of the nut and of the cylinder. If the gland nut has lube fittings in it, apply grease MIL-G-23827 or MIL-G-21164 to nut to fill the space between the outer cylinder and the nut, but we recommend the BMS 3-27 compound, because grease will not give sufficient corrosion resistance. With wrench F80013-1, tighten nut to 2100-2400 lb-in (threads dry) or 1050-1200 lb-in. (threads lubricated), then back off nut as necessary to align nearest slot for lock (4). Do not install the lock at this time.

(4) Measure dimension from end of support tube (78) to top of mounting boss on outer cylinder. Make sure that this dimension is the same as the value calculated in step (2) within 0.002 inch. If not, this is a sign that the orifice support tube is not seated correctly against inner surface of outer cylinder. Disassemble, examine and assemble these parts as necessary.

(5) Upper support tube

CAUTION: LOCKWASHER (9) MUST STAY AT THE BOTTOM WHILE YOU TIGHTEN THE LOCKNUT OR THREAD DAMAGE COULD OCCUR.

NOTE: The lockwasher key does not fully fit in the bottom of the groove after correct assembly.

(a) Shock struts 65-46200-21 thru -53 (PRE SB 32-1132): Install lockwasher (9) on upper support tube (78). Make sure the lockwasher stays correctly at the bottom. Install locknut (8) and tighten to 500-700 lb-in. (threads dry) or 250-350 lb-in. (threads lubricated).

(b) Shock struts 65-46200-55, -56, -63 thru -67 and units POST SB 32-1132: Install washer (8B) and nut (8A). Tighten nuts (8A) to 500-1500 lb-in. to align the center of washer (8B) tangs with the center of the flats on nut (8A). If the parts cannot be aligned, remove the nut, turn the washer over, and try again. After alignment, bend tangs of washer (8B) against flats of nut (8A).

(6) On shock struts thru 65-46200-53, install washer (7) on upper support tube against nut (8). Install nut (6) and tighten securely. Nut (6) is tightened to the final torque after installation of steering control components (Ref OHM 32-26-11). On shock struts 65-46200-55, -56, -63 thru -67, this nut and washer are items 91A, 91B, Fig. 1101, OHM 32-26-11 and are installed as part of piston position components shown in OHM 32-26-11.

(7) Install air valve (5) hand-tight. Do not tighten to the final torque at this time, because the valve will be removed for the test.

(8) Steering plates and their fasteners

CAUTION: STEERING PLATES (14, 15) ARE MATCHED PARTS WITH OUTER CYLINDER AND MUST BE KEPT TOGETHER AS A SET.

(a) Steering plates (14, 15) and related parts (11, 12, 13, 19 thru 20) are part of the outer cylinder assembly, but do not assemble them now with corrosion preventive compound or tighten them to final torque because they will be removed later to let you install the steering cylinders, collars and bearings of the nose gear assembly (Ref OHM 32-26-01).

(b) On shock struts 65-46200-47 thru -53, -55, -56, -63 thru -67:

1) Temporarily install upper and lower steering plates (14, 15) on outer cylinder with bolts (13), washers (12), nuts (11), eight places. Do not use corrosion preventive compound, because these parts will be removed and installed later. Install the plates with the counterbores in the large holes on the outside. Tighten the nuts hand-tight.

2) Install spacers (19D) with bolts (20) at two locations between the steering plates. Install nuts (19) finger-tight. With feeler gages, measure the gap between steering plates and each spacer. Use washers (19A, 19B, 19C) as necessary to get a 0.015 inch maximum gap before you tighten the nuts more. You can use a maximum of three washers at each spacer.

3) Keep the spacers and related parts (19 thru 20) with this shock strut and include a note that the gap is OK and the gap check will not be necessary at the next higher assembly.

(9) Nameplate

(a) Install nameplate (24) with straps (23) and seals (22).

(b) (Optional) Clean the painted surface of the shock strut with aliphatic naphtha and install one wrap of Mylar tape under each strap. Bond the straps and the nameplate to the strut with BMS 5-95 sealant, and apply this sealant around the edges of nameplate.

(10) Install locking bolts (3) at gland nut, lock (4), washers (2) and nuts (1). Tighten nuts (1) to 20-25 lb-in. (threads dry) or 10-12 lb-in. (threads lubricated).

E. Install Weight and Balance Transducer (Fig. 1102).

(1) Install transducer (19) on shock strut (10, Fig. 1101) with items (13 thru 18). Tighten strap assemblies (13, 15) hand-tight.

(2) Install packing (12) on union (11) and install this unit in block (8). Connect elbow (10) to union.

(3) Install air valve (9) on block (8). Do not tighten this air valve, because it will be removed during the test.

(4) Install packings (7) on block (8). Install this unit on support tube (78, Fig. 1101) with banjo bolt (6).

(5) Connect tube assy (1) to elbow (10) and union on transducer assy (19). Tighten nuts (2, 4).

(6) Tighten the straps.

F. Seal the gland nut (Fig. 502).

NOTE: Apply sealant after assembly and testing are completed (Ref TESTING).

(1) Clean surfaces of outer cylinder (10) and gland nut (45) at flange side mating diameters.

(2) Apply a thin coating of RTV 1200 primer to flange seal area of gland nut. Let it dry a minimum of 30 minutes.

(3) Apply a fillet of silicone sealant around the circumference.

G. Seal nut (46) and bolts (3) with EC 1252 compound as shown in Fig. 502.

H. Lockwire air valve (9, Fig. 1102) to block (8, Fig. 1102).

3. Materials

NOTE: Equivalent substitutes can be used.

A. Hydraulic Fluid -- BMS 3-32 Type 1 or 2, or MIL-H-5606 (MIL-H-6083 optional) (SOPM 20-60-03)

B. Petrolatum -- VV-P-236 (SOPM 20-60-03)

C. Corrosion Preventive Compound -- MIL-C-11796, class 3 (SOPM 20-60-02)

D. Corrosion Preventive Compound -- BMS 3-27 (SOPM 20-60-02)

E. Primer -- Dow Corning RTV 1200 (SOPM 20-60-04)

F. Sealant, Silicone -- General Electric RTV 167 (Replaces Dow Corning 30-121) (SOPM 20-60-04)

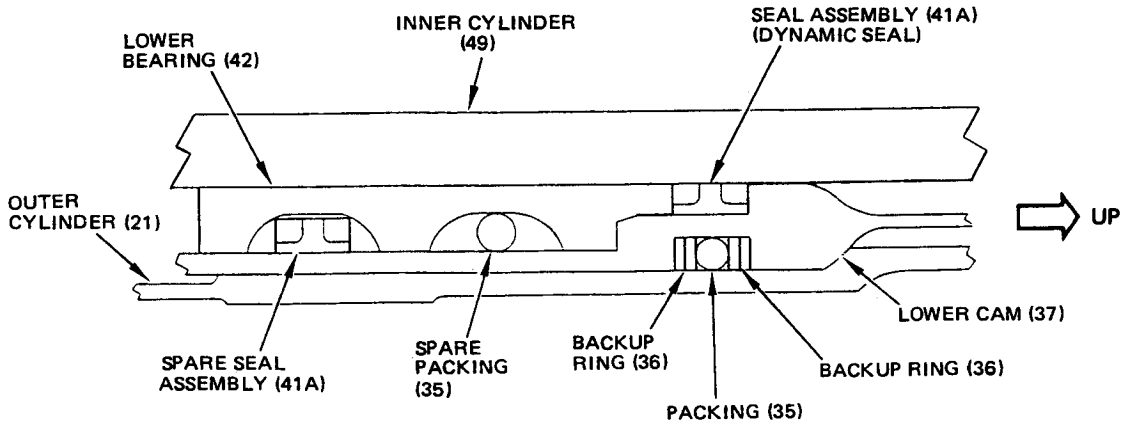
G. Sealant, Silicone -- Types 60, 62, 79, 84, or 119 (SOPM 20-50-12)

H. Sealant -- EC 1252, Minnesota Mining & Manufacturing Co. (SOPM 20-60-04)

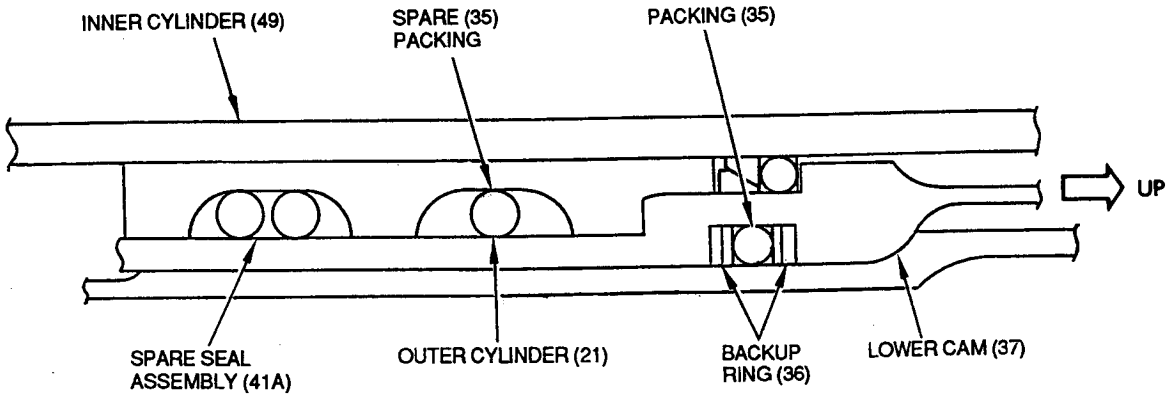
I. Solvent -- Aliphatic Naphtha (Replaces BMS 3-2, Type 1) (SOPM 20-60-01)

J. Sealant -- BMS 5-95 (SOPM 20-60-04)

K. Mylar Tape -- Scotch 8412 (Replaces Mystik 7355) (SOPM 20-60-04)

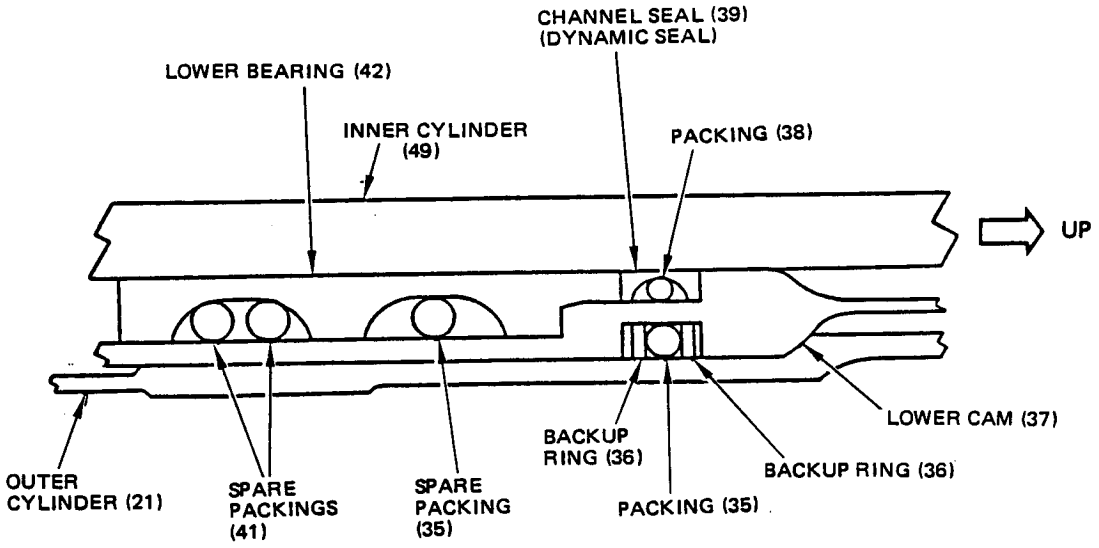


CONFIGURATION USING T-RING SEAL 733B9FT972P3

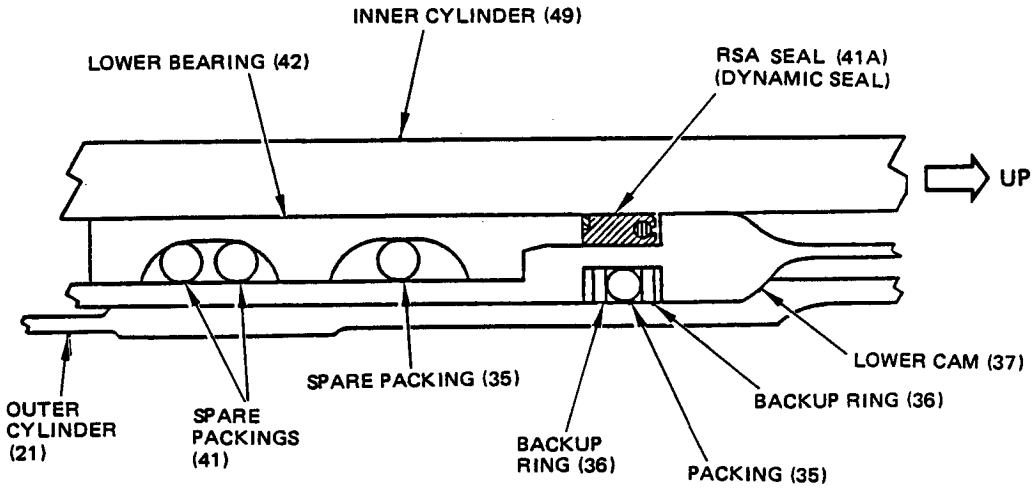


CONFIGURATION USING CAM SEAL S13068-339

Inner Cylinder Seal Configuration Details
Figure 501 (Sheet 1)

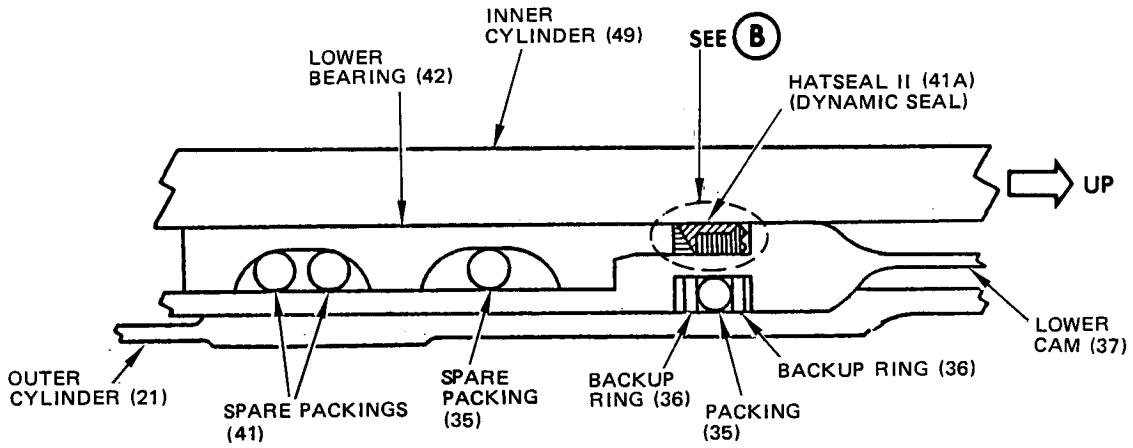


CONFIGURATION USING CHANNEL SEAL S12561–339

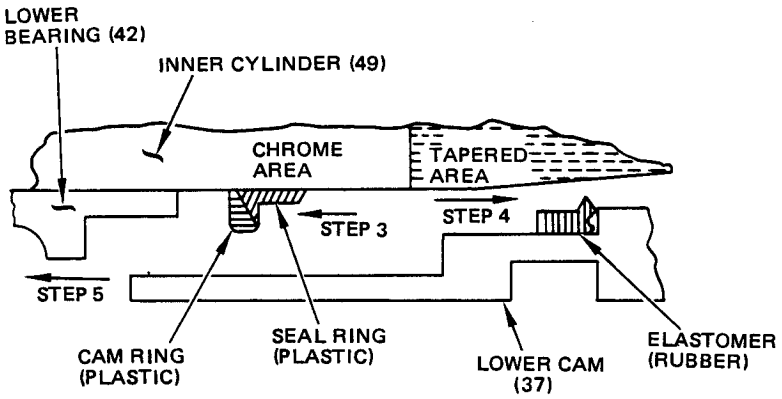


CONFIGURATION USING RSA SEAL 367–34200A312C
(FORMERLY 3654–03247–0187–0408)

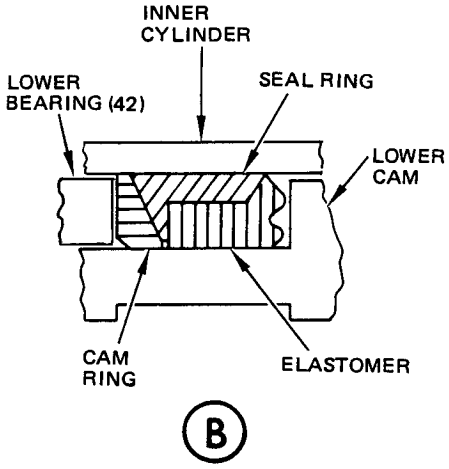
Inner Cylinder Seal Configuration Details
Figure 501 (Sheet 2)



CONFIGURATION USING HATSEAL S33327



PROCEDURE DETAILS

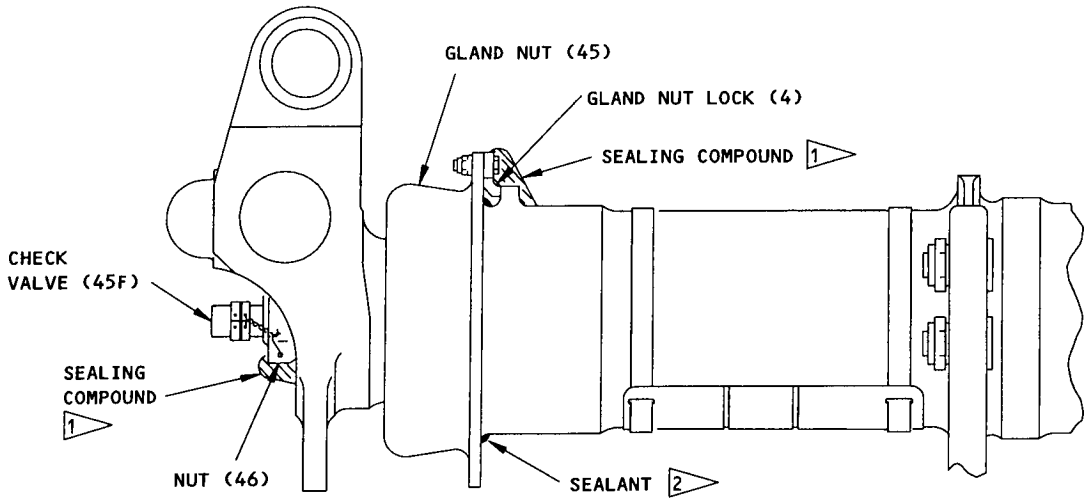


INSTALLATION COMPLETED

HATSEAL S33327 INSTALLATION PROCEDURE

1. CLEAN AND LUBRICATE ELASTOMER, SEAL RING, CAM RING, ID OF LOWER CAM (37), OD OF INNER CYLINDER (49) CHROMED AREA.
2. SECURE CYLINDER HORIZONTALLY, ABOUT WAIST HEIGHT
3. PLACE CAM RING AND SEAL RING ON CHROME AREA OF CYLINDER. PLACE ELASTOMER ON TAPERED AREA OF CYLINDER.
4. PLACE LOWER CAM (37) ON TAPERED AREA OF CYLINDER. USING FINGERS OR BLUNT TOOL, PUSH ELASTOMER INTO LOWER CAM (37) UNTIL POSITIONED AS SHOWN.
5. SIMULTANEOUSLY PUSH AND TWIST LOWER CAM (37) TOWARD SEAL RING AND CAM RING, ONTO CHROME AREA OF CYLINDER, UNTIL POSITIONED AS SHOWN.

Inner Cylinder Seal Configuration Details
Figure 501 (Sheet 3)

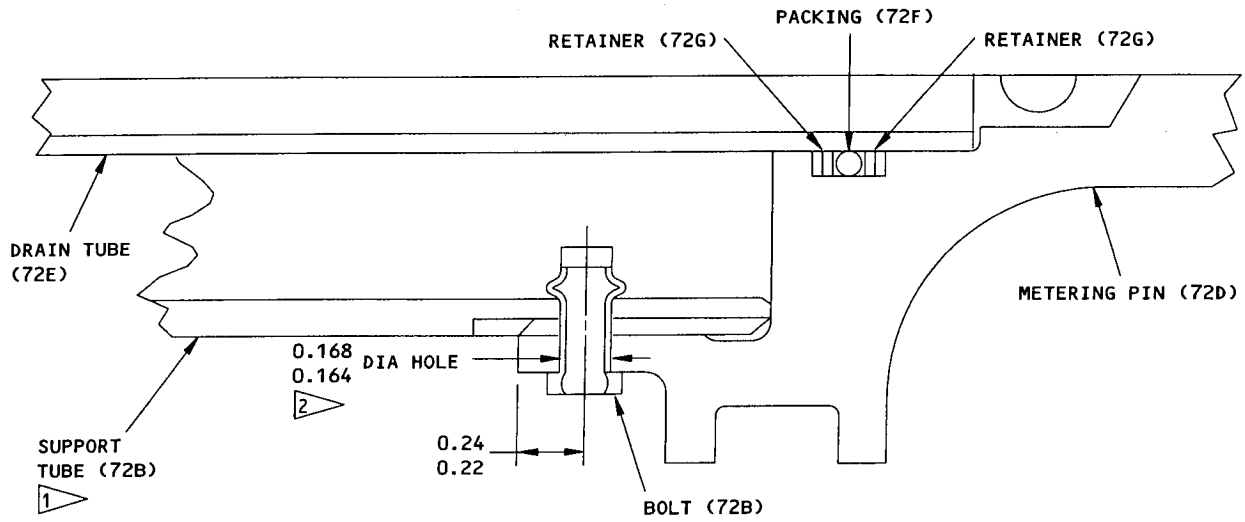


1 APPLY EC1252 SEALANT SO THAT ANY EXTERNAL ADJUSTMENT WILL BREAK SEAL

2 CLEAN SURFACES OF OUTER CYLINDER (10) AND GLAND NUT (45). APPLY THIN BRUSH COAT OF RTV1200 PRIMER TO SEAL AREA OF GLAND NUT AND LET DRY A MINIMUM OF 30 MINUTES. APPLY FILLET OF SILICONE SEALANT AROUND CIRCUMFERENCE

ITEM NUMBERS REFER TO FIG. 1101

Sealing Details
Figure 502



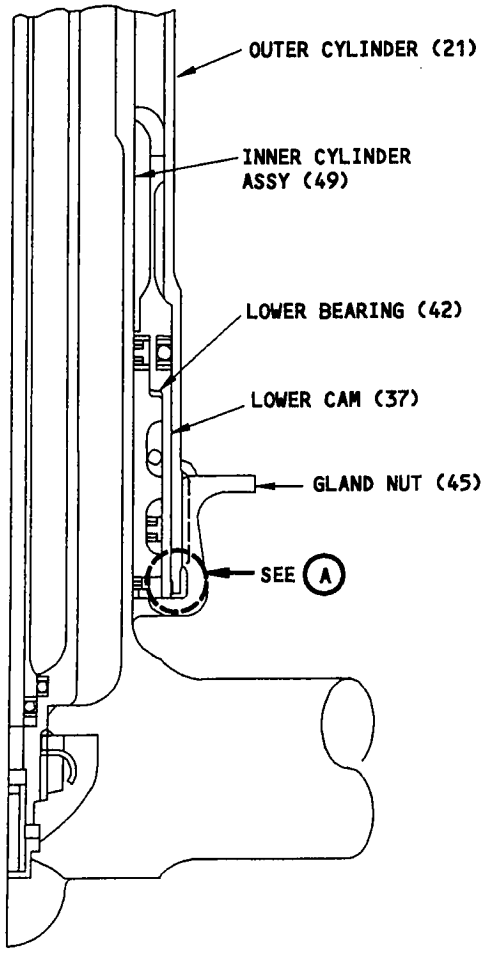
1 BOTTOM AGAINST METERING PIN BEFORE YOU DRILL THE HOLE

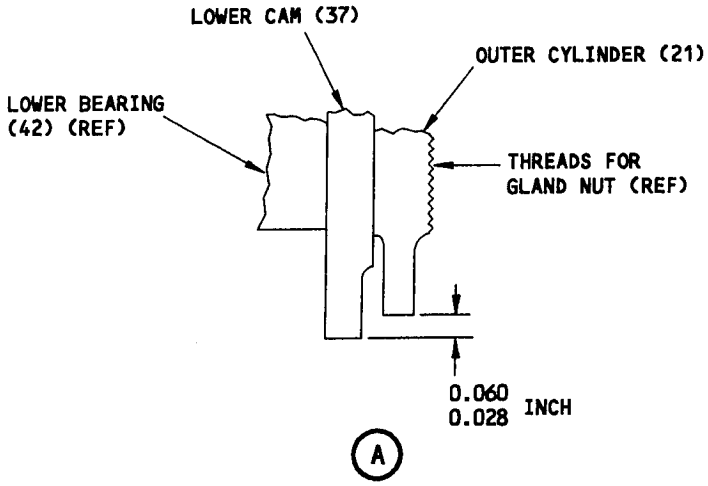
2 DIAMETRAL LOCATION OPTIONAL. IF YOU MUST MAKE A NEW HOLE, IT MUST NOT BE LESS THAN 45° FROM THE OLD HOLE.

ALL DIMENSIONS ARE IN INCHES

ITEM NUMBERS REFER TO FIG. 1101

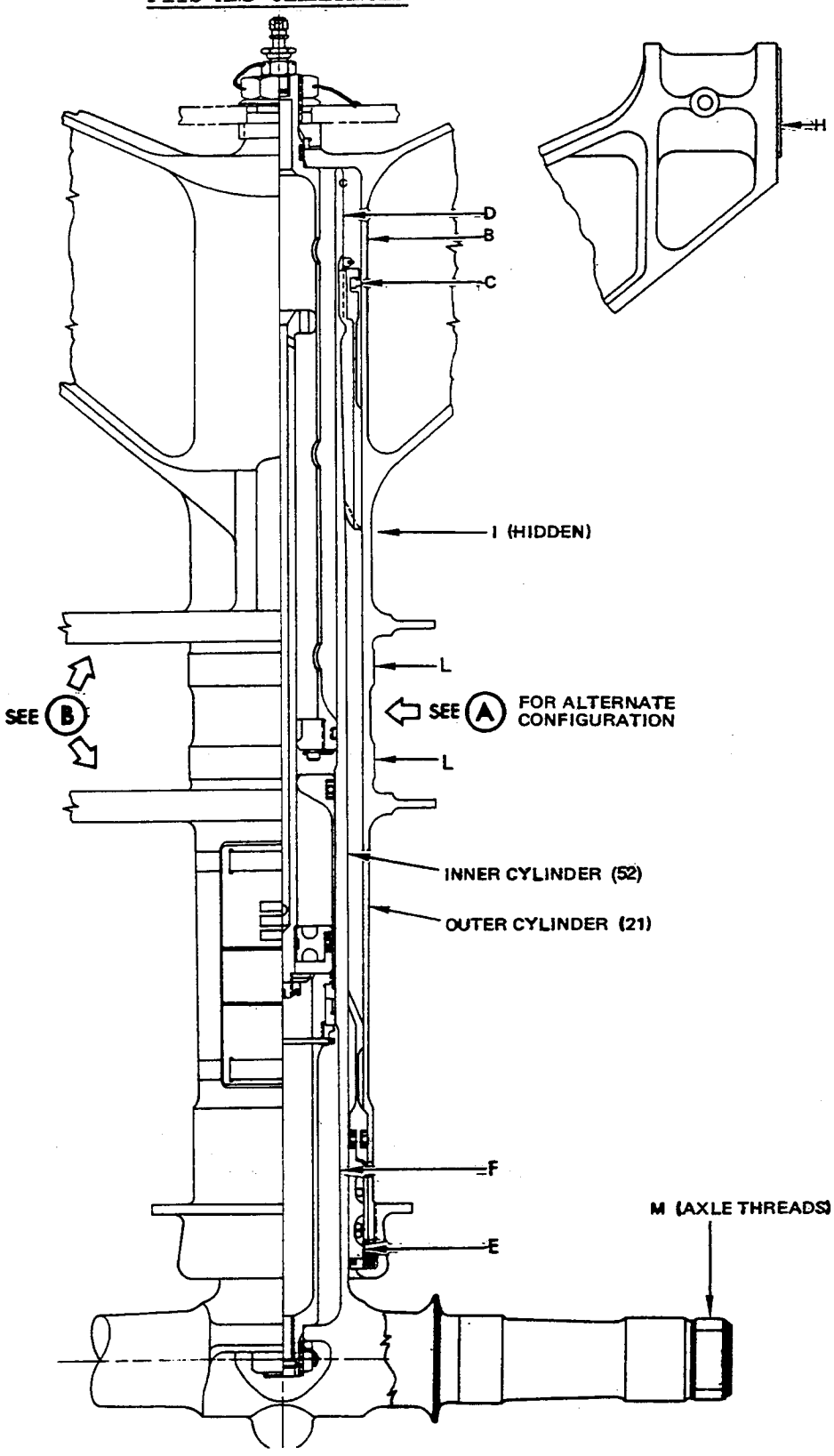
Support Tube/Metering Pin Assembly
Figure 503



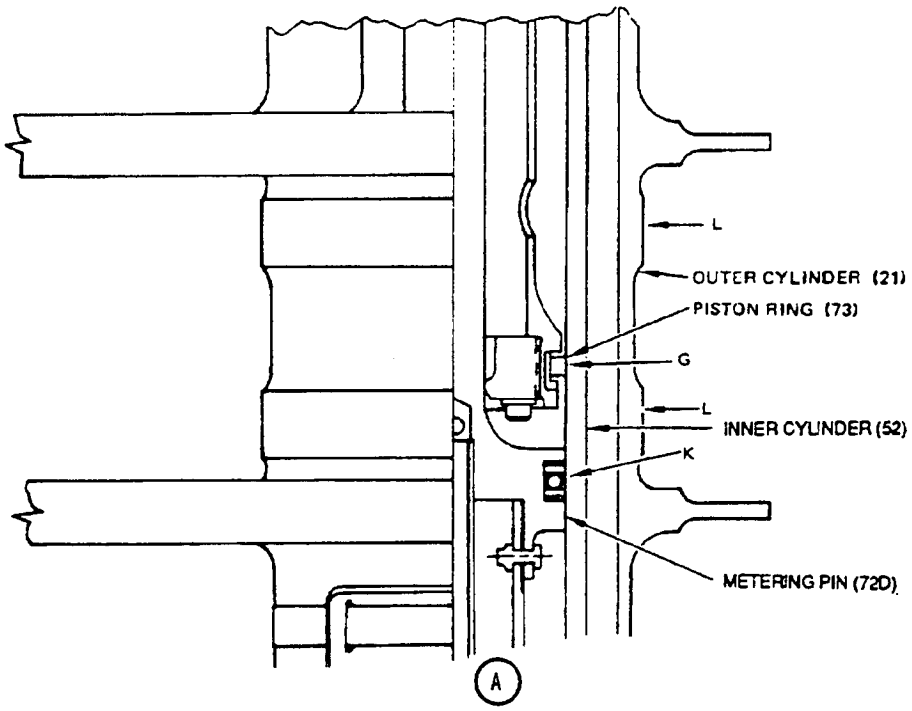


ITEM NUMBERS REFER TO FIG. 1101

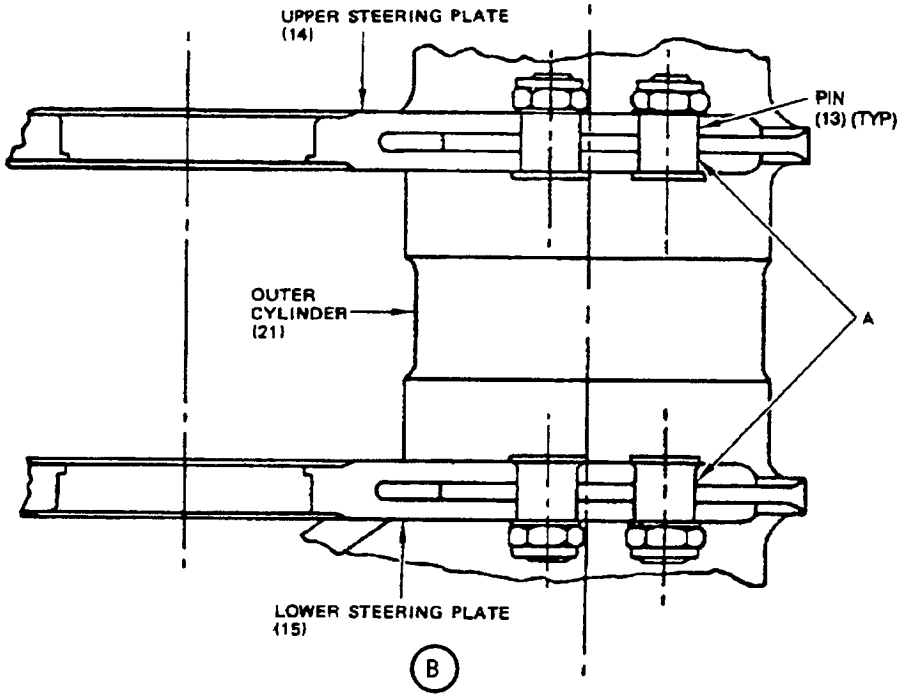
Lower Cam Location Details
Figure 504



Fits and Clearances
Figure 601 (Sheet 1)



ASSEMBLIES 65-46200-21,-22,-28 THRU -30,-32 THRU -43,-46 THRU -53,-55,-56,-63 THRU -67



Fits and Clearances
Figure 601 (Sheet 2)

Ref Letter Fig. 601	Mating Item No. Fig. 1101	Design Dimensions				Service Wear Limits		
		Dimensions (inches)		Assembly Clearance (inch)		Dimension Limits (inch)		Maximum Allowable Clearance (inch)
		Min	Max	Min	Max	Min	Max	
A	ID 14,15,21	0.7500	0.7509	-0.0006	0.0013		0.7550	0.010
	OD 13	0.7496	0.7506			0.7450		
B	ID 21	4.0000	4.0030	0.001	0.006		4.0070	0.010
	OD 28	3.9970	3.9990			3.9900		
C	ID 21	4.0000	4.0030	*[1]	*[1]	*[2]	4.0070	*[1]
	OD 32	4.0000	4.0030					
D	ID 28	3.1310	3.1330	0.001	0.005		3.1360	0.006
	OD 52	3.1280	3.1300			3.1240		
E	ID 37	4.0000	4.0020	0.002	0.006		4.0040	0.010
	OD 42	3.9960	3.9980			3.9940		
F	ID 42	3.2500	3.2540	0.003	0.009		3.2600	0.013
	OD 52	3.2450	3.2470			3.2410		
G	ID 52*[4]	2.7550	2.7600	*[1]	*[1]	*[3]	2.7650	*[1]
	OD 73	2.7550	2.7600					
G	ID 52*[5]	2.6950	2.7000	*[1]	*[1]	*[3]	2.7050	*[1]
	OD 73	2.6950	2.7000					
H	ID 17	2.0000	2.0010				2.0048	
I	ID 18	1.2495	1.2505	0.0005	0.0020		1.25550	0.0060
	OD *[12]	1.2485	1.2490			1.2445		
J	ID 50	1.2500	1.2510				1.2630	

Fits and Clearances
Figure 601 (Sheet 3)

Ref Letter Fig. 601	Mating Item No. Fig. 1101	Design Dimensions				Service Wear Limits		
		Dimensions (inches)		Assembly Clearance (inch)		Dimension Limits (inch)		Maximum Allowable Clearance (inch)
		Min	Max	Min	Max	Min	Max	
K	ID 52 OD 72D	2.620 2.615	2.622 2.617	0.003	0.007	2.612	2.627	0.010
L*[6]	OD 21	4.6838	4.6848			4.6838		
L*[7]	OD 21	4.794	4.795			4.7940		
M (Orig)	OD 52 (Major Dia.)	2.0595 *[8]	2.0625			2.0481 *[10]		
	OD 52 (Pitch Dia.)	2.0189 *[9]	2.0219			2.0089 *[10]		
M (Under size)	OD 52 (Major Dia.)	1.9910	1.9940			1.9860 *[11]		
	OD 52 (Pitch Dia.)	1.9564	1.9594			1.9464 *[11]		

*[1] Piston ring expansion - no clearance
*[2] Replace piston ring if radial thickness is more than 0.225 inch
*[3] Replace piston ring if radial thickness is more than 0.110 inch
*[4] Inner Cylinders 65-46215-3, -6
*[5] Inner Cylinders 65-46215-4, -7, -12, -14
*[6] Outer Cylinders 65-46211-3, -5, -7
*[7] Outer Cylinders 65-46211-4, -6, -8
*[8] 2.0531 inches major diameter for some airplanes
*[9] 2.0179 inches pitch diameter for some airplanes
*[10] Rework the axle per the Repair Procedures, Inner Cylinder, if the pitch diameter or major diameter is smaller than this value.
*[11] No repair permitted. Replace the axle when the actual pitch diameter or major diameter is smaller than this value.
*[12] Bolt 69-35396 (installation part)

Fits and Clearances
Figure 601 (Sheet 4)

FOR TORQUE VALUES OF STANDARD FASTENERS REFER TO SOPM 20-50-01			
Item Number Fig. 1101	Name	Torque	
		Pound-Inches (Threads Dry)	Pound-Inches (Threads Lubricated)
1	Nut	20-25	10-12
6	Nut	*[1]	*[1]
8	Nut	500-700	250-350
8A	Nut	500-1500	--
11	Nut	*[1]	*[1]
45	Nut	2100-2400 *[2]	1050-1200 *[2]
45F	Check Valve	96-120	--
46	Nut	1000-1500	500-750
50B	Lube fitting	25-30	--
57	Nut	2000-2400	1000-1200
62	Nut	290-410	145-205
76	Plate	1000-1200	500-600

*[1] Nut will be tightened to final torque upon installation of parts belonging to higher assemblies (OHM 32-26-01, 32-26-11).

*[2] Before you back off to align locking slot.

Torque Table
Figure 602

TESTING

1. Test Equipment and Materials

   A. Compressed air source, controlled pressures 0-600 psi.

   B. Restraining and holding fixture for shock strut assembly.

   C. Operating Fluids (Ref SOPM 20-60-03)

      (1) Preferred: BMS 3-32, Type 1 (with corrosion inhibitor) or Type 2 (without corrosion inhibitor). Use Type 1 fluid to fill a strut for the first time after overhaul. For refills, use Type 1 or Type 2 fluids.

      (2) Optional: As a substitute for BMS 3-32, Type 1, mix MIL-H-6083 fluid with 2.4% by volume Lubrizol 1395 additive. As a substitute for BMS 3-32 Type 2, mix MIL-H-5606 fluid with 2.4% by volume Lubrizol 1395 additive.

2. Preparation for Test

   A. Fluid Servicing

      (1) Put the strut in a vertical position (air valve on top) in a fixture which will let you extend and compress the strut. Remove air valve (5, Fig. 1101) or (9, Fig. 1102).

      (2) Fully extend the strut and fill with minimum of 6 pints of hydraulic fluid.

      (3) If you use the optional hydraulic fluid, be sure to mix the Lubrizol additive with the fluid before you put the fluid in the strut. Do not add pure Lubrizol additive to the strut, because it is thick, and if not mixed it will go to the bottom of the strut and stay there. If you must add Lubrizol additive to the strut, be sure to first mix it with 10 parts of hydraulic fluid.

      (4) For struts 65-46200-16, -17, -19, -25, -26, -27 (and struts not incorporating SB 32-1004):

         CAUTION: BE CAREFUL NOT TO DAMAGE THE THREADS OF THE HOLES.

         (a) Slowly compress strut 6 inches and then extend it 2 inches. Insert a 3/8-inch rod through tube (78, Fig. 1101) and push the metering pin down until it stops at the bottom. Remove the rod and wait 5 minutes.

(b) Slowly compress the strut until it stops. Discard the hydraulic fluid that comes out.

(5) For struts 65-46200-21, -22, -29, -30, -32 thru -43, -46 thru -53, -55, -63 thru -67, and units POST SB 32-1004:

(a) Compress and extend the strut (unpressurized and vented), through 10 full cycles with 12-inch strokes. Finish with the strut fully compressed.

(b) Fill the strut with hydraulic fluid if necessary.

(6) Install air valve (5, Fig. 1101).

B. Operate the unit.

(1) Slowly pull the outer cylinder to the fully extended position, then let it compress.

(2) Do step (1) five to ten more times. Look for signs of incorrect operation. If leakage occurs, operate the unit 50 more cycles.

3. Leakage Test

A. Fully extend the strut.

WARNING: DO NOT APPLY AIR PRESSURE UNLESS THE STRUT IS FULLY EXTENDED.

B. Slowly apply air pressure of the values given in Fig. 701.

C. During the next 6-hour period, make sure there are no leaks or decrease of air pressure.

NOTE: Pressure changes because of changes in air temperature must be within plus or minus 10 psi.

WARNING: DO NOT RELEASE THE AIR PRESSURE UNLESS THE STRUT ASSEMBLY IS IN A VERTICAL POSITION WITH THE AIR VALVE AT THE TOP.

D. Gradually loosen the air valve to slowly release the air pressure.

E. Tighten the air valve.

NOTE: Valve (5), nut (6), and washer (7) are tightened to final torque values and lockwired after installation of the 65-46399-series steering control components (OHM 32-26-11, Fig. 1101, item 91).

4. Cam Backlash Test

   A. Fully extend the shock strut.

      WARNING: DO NOT APPLY AIR PRESSURE UNLESS THE STRUT IS FULLY EXTENDED.

   B. Slowly apply 100-500 psi air pressure through the valve.

   C. Make a check of the axle rotation as limited by the centering cams. Maximum permitted axle rotation is 2 degrees.

      WARNING: DO NOT RELEASE THE AIR PRESSURE UNLESS THE STRUT ASSEMBLY IS IN A VERTICAL POSITION WITH THE AIR VALVE AT THE TOP.

   D. Gradually loosen the air valve. Slowly release the air pressure.

Shock Strut Part Number	Air Pressure (psi)
65-46200-16, -17, -25 and -26	495
65-46200-19 and -27	590
65-46200-21, -22, -28, -29, -30, -32 thru -43, -46 thru -53, -55, -56, -63 thru -67	215

Leakage Test Pressures
Figure 701

TROUBLE SHOOTING

1. Trouble during test after overhaul. (See figure 1101.)

Trouble	Possible Cause	Correction
A. Air leak at air valve (5)	Wear on valve seal. Damaged packing, or improper assembly	Replace faulty valve or packing
B. Hydraulic oil leak on either cylinder	Cracks in inner or outer cylinder assemblies; defective packings	Disassemble and replace parts as required
C. Inner cylinder sticks or binds	Foreign matter between sliding surfaces. Tight or defective upper or lower bearings (28 and 42)	Disassemble, clean, inspect and repair or replace parts as required
D. Rotation of inner cylinder in outer cylinder in excess of 2 degrees	Worn upper cam or lower cam (33 or 37)	Replace one or both cams

STORAGE INSTRUCTIONS

1. Use the procedures in SOPM 20-44-02 and 20-70-01 and these steps.

2. Fill the shock strut with BMS 3-32 Type 1 preservative hydraulic fluid as follows. Do not inflate the strut with air.

   A. Shock Struts 65-46200-16, -17, -19, -25, -26, -27:

      (1) Put a minimum of 6 pints of hydraulic fluid into the fully extended strut.

      (2) Slowly compress the strut 6 inches, then extend the strut 2 inches.

      (3) Put a rod into support tube (78) and push the metering pin down until it stops at the bottom. Do not damage threads with the rod.

      (4) Remove the rod and wait 5 minutes, then slowly compress the strut until it bottoms. Discard hydraulic fluid that comes out.

   B. Shock Struts 65-46200-21, -22, -28, -30, -32 thru -43, -46 thru -53, -55, -56, -63 thru -67:

      (1) Put a minimum of 6 pints of hydraulic fluid into the fully extended strut.

      (2) Slowly compress the strut until it stops at the bottom. Discard hydraulic fluid that comes out.

3. Wrap the shock strut with vapor barrier paper and tape.

4. Attach a tag with the test date and a note that the unit contains preservative hydraulic fluid.

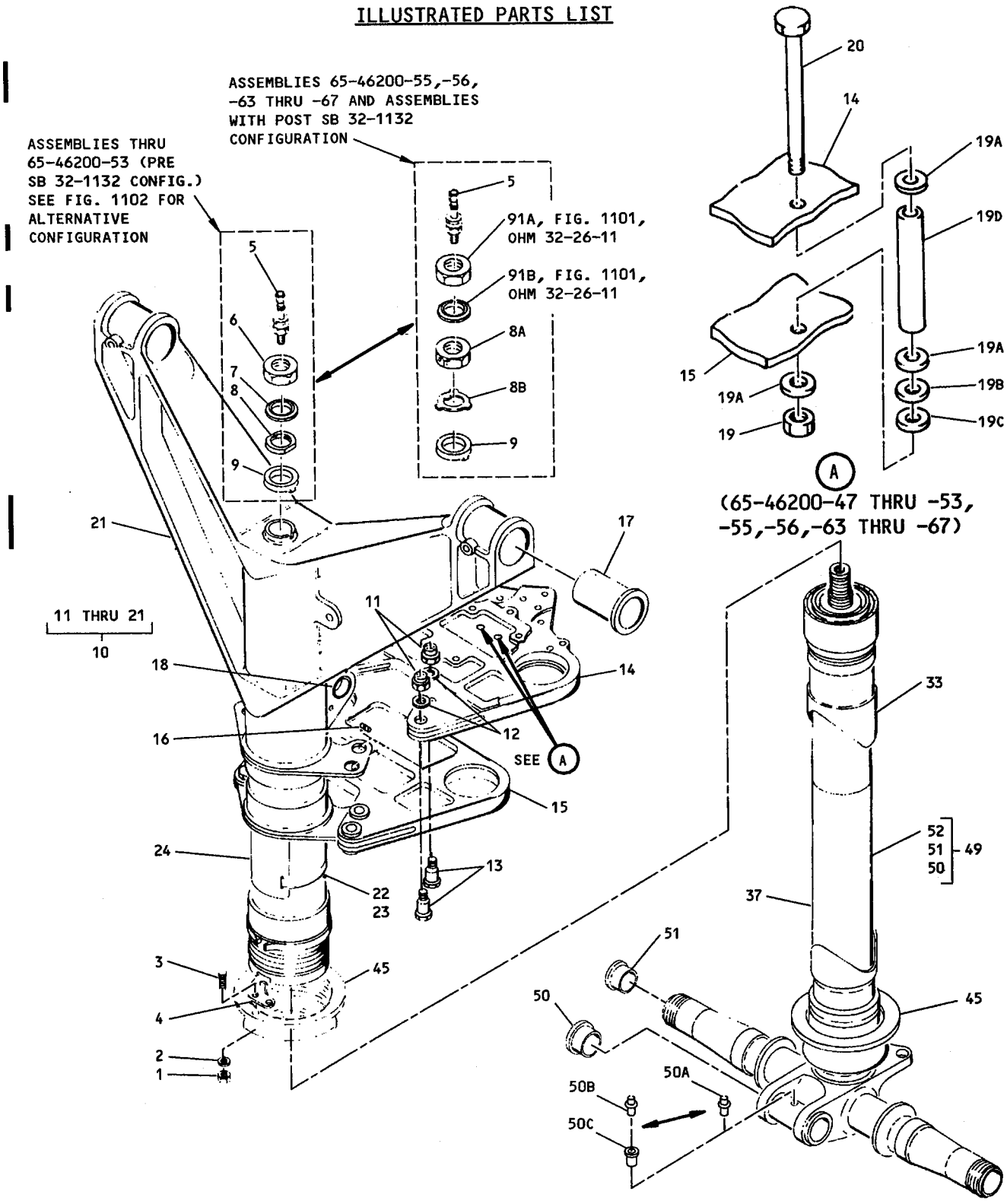
5. Be sure to keep the shock strut in a vertical position to keep hydraulic fluid on the packings.

SPECIAL TOOLS, FIXTURES AND EQUIPMENT

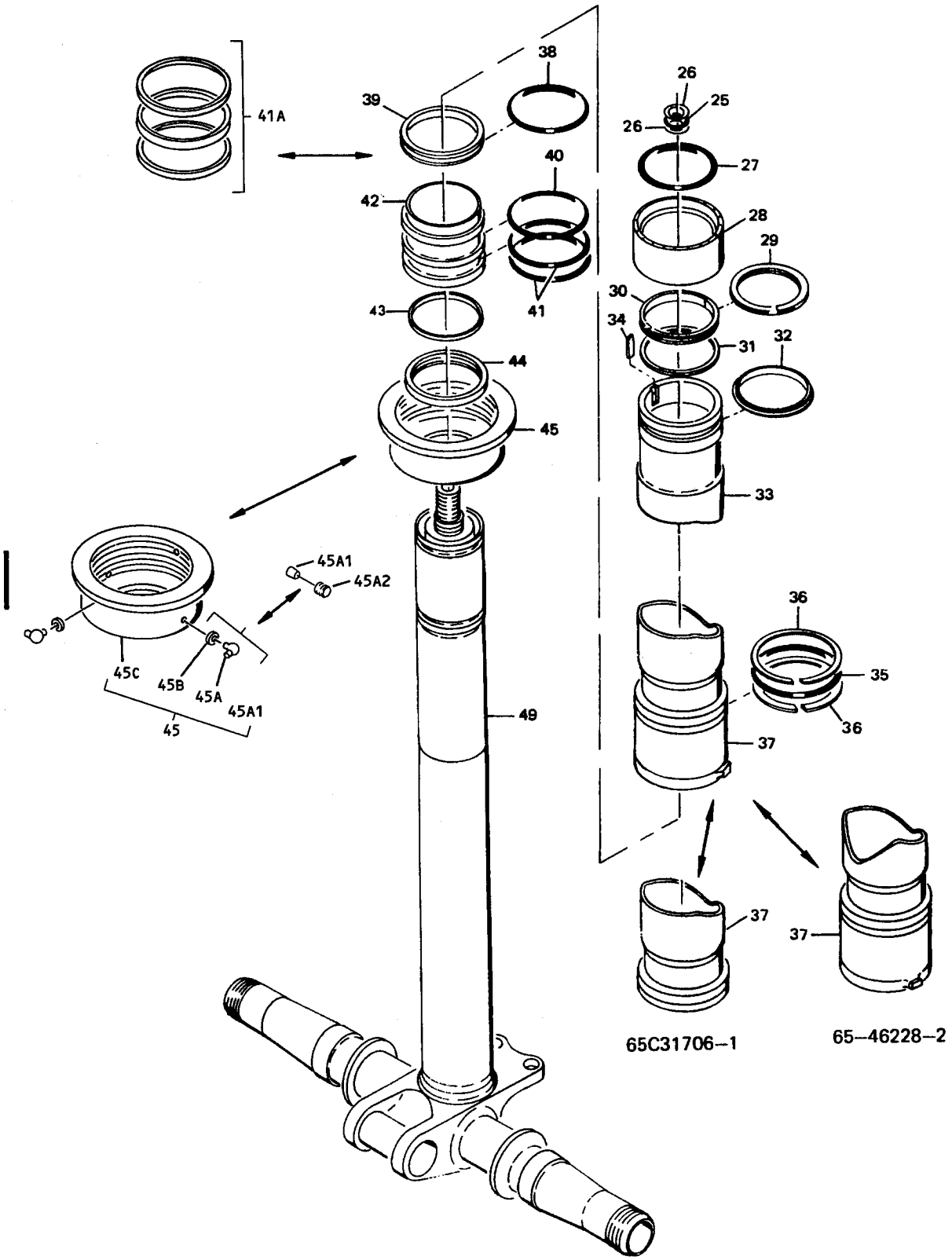
NOTE: Equivalent substitutes can be used.

1. Compressed air source, regulated from zero to 600 psi
2. C32002-1 -- Inner cylinder ring compressor
3. F80013-1 -- Wrench
4. F80160-1 -- Orifice tube extension
5. NG2.0000-16 PTG Threadsnap -- Axle thread gage tool (for undersize threads), Precise Tool & Gage Co. Inc. (V5N084)
6. NG2.0625-16 PTG Threadsnap -- Axle thread gage tool (for standard threads), Precise Tool & Gage Co. (V5N084)
7. CHF/PD -- Axle external thread gage tool, Johnson Gage Co., Inc. (V74979) (Optional)

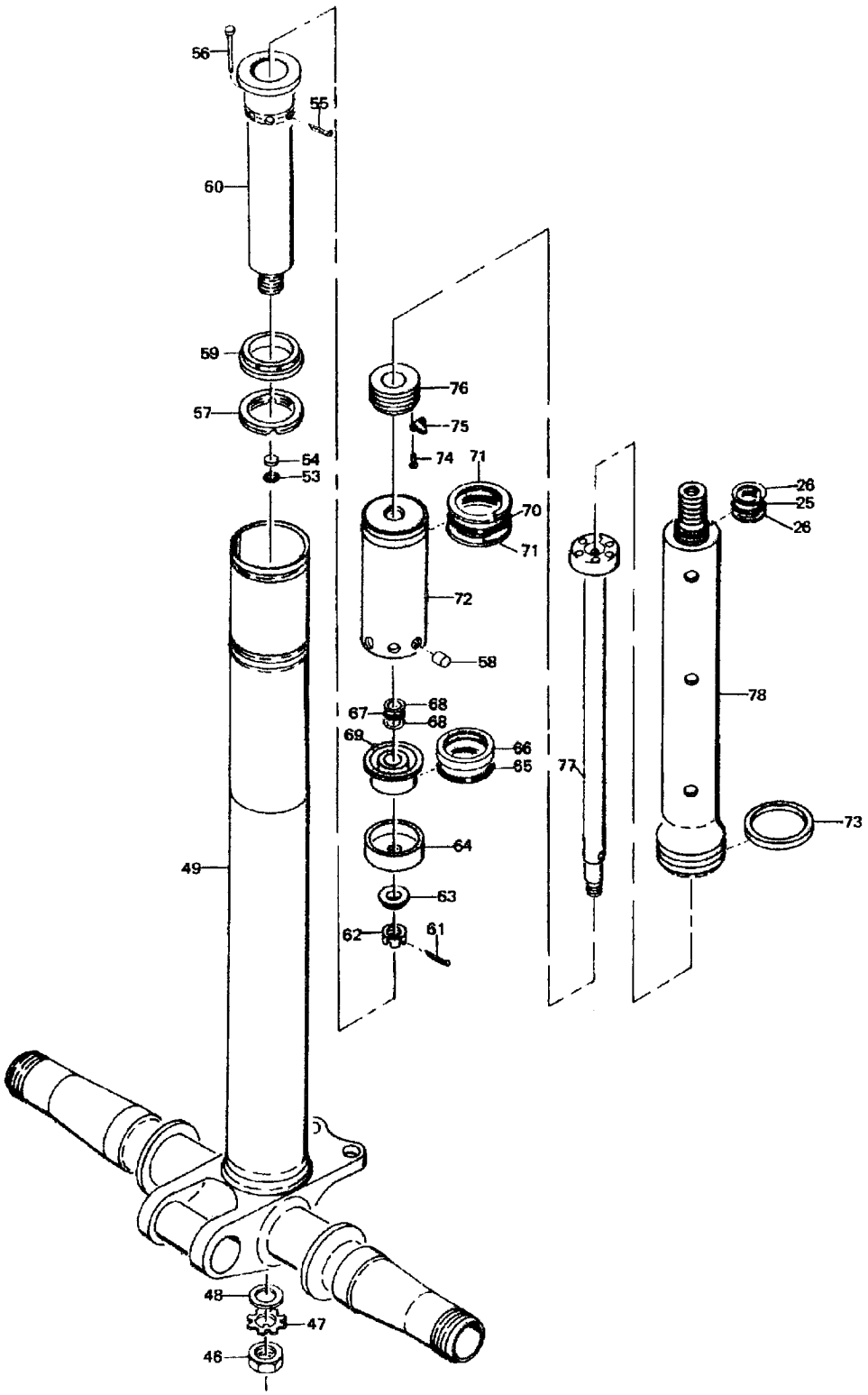
ILLUSTRATED PARTS LIST



Nose Gear Shock Strut Assembly
Figure 1101 (Sheet 1)

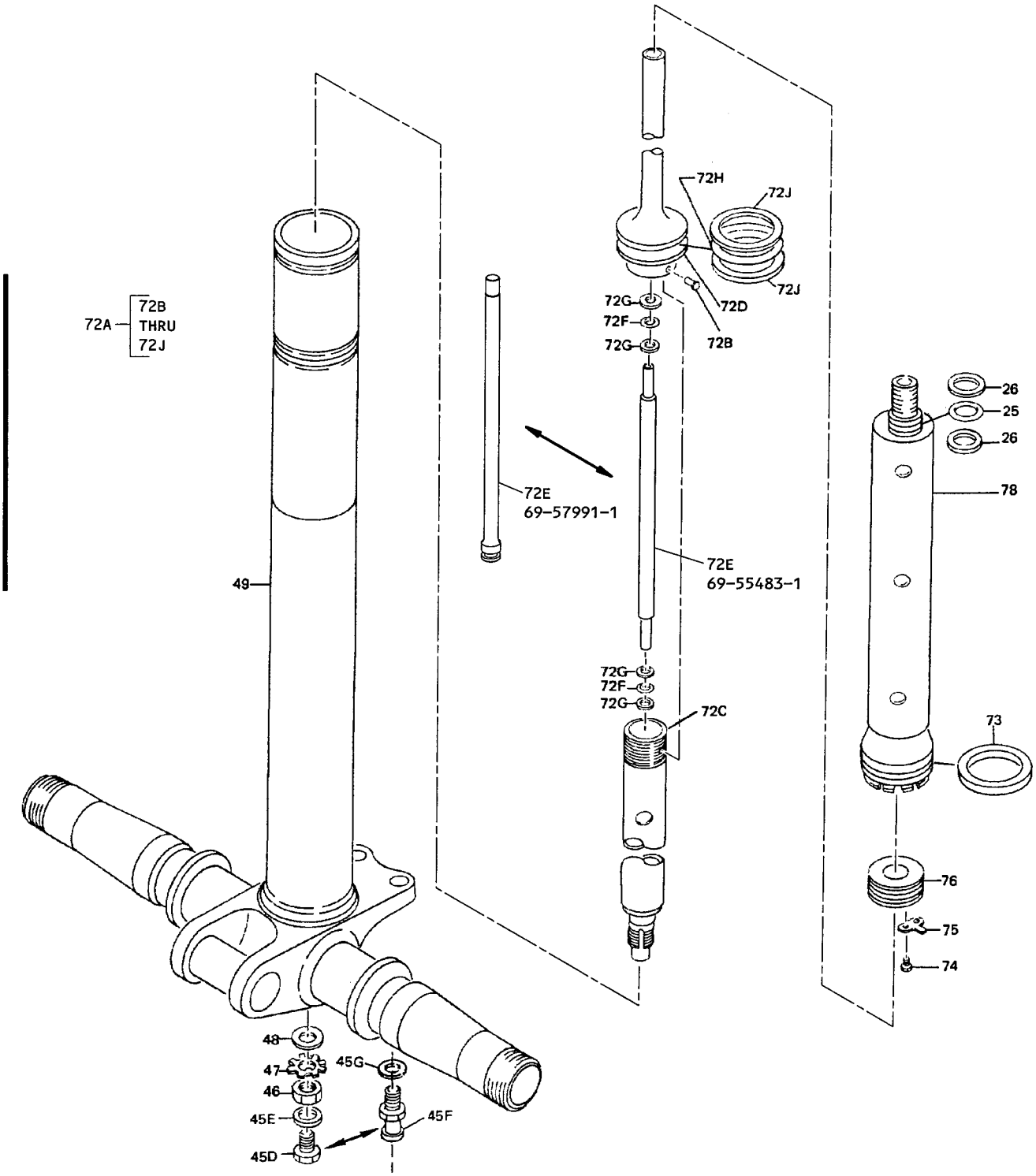


Nose Gear Shock Strut Assembly
Figure 1101 (Sheet 2)



65-46200-16,-17,-19,-25,-26,-27

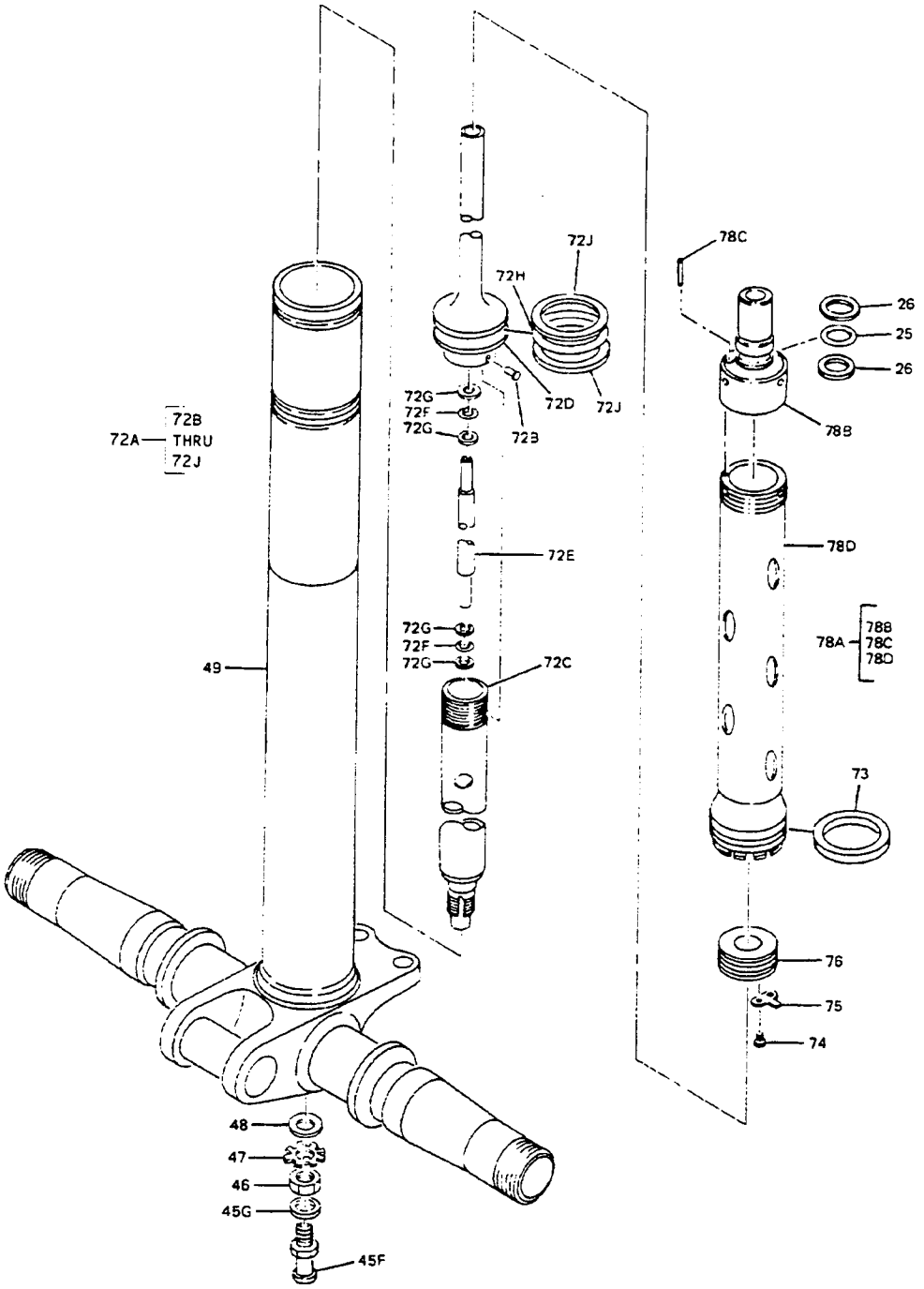
Nose Gear Shock Strut Assembly
Figure 1101 (Sheet 3)



65-46200-21,-22,-28,-29,-30,-32 THRU -43,-46 THRU -53

Nose Gear Shock Strut Assembly
Figure 1101 (Sheet 4)

H77435



65-46200-55,-56,-63 THRU -67

Nose Gear Shock Strut Assembly
Figure 1101 (Sheet 5)

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
	65-46200-16		SHOCK STRUT ASSY, NOSE GEAR	A	RF
	65-46200-17		SHOCK STRUT ASSY, NOSE GEAR	B	RF
	65-46200-19		SHOCK STRUT ASSY, NOSE GEAR	C	RF
	65-46200-20		DELETED		RF
	65-46200-21		SHOCK STRUT ASSY, NOSE GEAR (SB 32-1004)	D	RF
	65-46200-22		SHOCK STRUT ASSY, NOSE GEAR	E	RF
	65-46200-25		SHOCK STRUT ASSY, NOSE GEAR	F	RF
	65-46200-26		SHOCK STRUT ASSY, NOSE GEAR	G	RF
	65-46200-27		SHOCK STRUT ASSY, NOSE GEAR	H	RF
	65-46200-28		SHOCK STRUT ASSY, NOSE GEAR	I	RF
	65-46200-29		SHOCK STRUT ASSY, NOSE GEAR	J	RF
	65-46200-30		SHOCK STRUT ASSY, NOSE GEAR	K	RF
	65-46200-32		SHOCK STRUT ASSY, NOSE GEAR (SB 32-1045)	L	RF
	65-46200-33		SHOCK STRUT ASSY, NOSE GEAR (SB 32-1045)	M	RF
	65-46200-34		SHOCK STRUT ASSY, NOSE GEAR	N	RF
	65-46200-35		SHOCK STRUT ASSY, NOSE GEAR	O	RF
	65-46200-36		SHOCK STRUT ASSY, NOSE GEAR	P	RF
	65-46200-37		SHOCK STRUT ASSY, NOSE GEAR	Q	RF
	65-46200-38		SHOCK STRUT ASSY, NOSE GEAR	R	RF
	65-46200-39		SHOCK STRUT ASSY, NOSE GEAR	S	RF
	65-46200-40		SHOCK STRUT ASSY, NOSE GEAR	T	RF
	65-46200-41		SHOCK STRUT ASSY, NOSE GEAR	U	RF
	65-46200-42		SHOCK STRUT ASSY, NOSE GEAR	V	RF
	65-46200-43		SHOCK STRUT ASSY, NOSE GEAR	W	RF
	65-46200-46		SHOCK STRUT ASSY, NOSE GEAR	X	RF
	65-46200-47		SHOCK STRUT ASSY, NOSE GEAR	Y	RF
	65-46200-48		SHOCK STRUT ASSY, NOSE GEAR	Z	RF
	65-46200-49		SHOCK STRUT ASSY, NOSE GEAR	BA	RF
	65-46200-50		SHOCK STRUT ASSY, NOSE GEAR	CA	RF
	65-46200-51		SHOCK STRUT ASSY, NOSE GEAR	DA	RF
	65-46200-52		SHOCK STRUT ASSY, NOSE GEAR	EA	RF
	65-46200-53		SHOCK STRUT ASSY, NOSE GEAR	FA	RF
	65-46200-55		SHOCK STRUT ASSY, NOSE GEAR (SB 32-1123)	GA	RF
	65-46200-56		SHOCK STRUT ASSY, NOSE GEAR	HA	RF
	65-46200-63		SHOCK STRUT ASSY, NOSE GEAR	IA	RF
	65-46200-64		SHOCK STRUT ASSY, NOSE GEAR	JA	RF
	65-46200-65		SHOCK STRUT ASSY, NOSE GEAR	KA	RF
	65-46200-66		SHOCK STRUT ASSY, NOSE GEAR	LA	RF
	65-46200-67		SHOCK STRUT ASSY, NOSE GEAR	MA	RF
1	BACN10JC3		. NUT (REPLS NAS679A3W)		2
2	AN960-10L		. WASHER		2

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
3	NAS1103-7		. BOLT		2
4	69-35397-1		. LOCK, GLAND NUT		1
5	MS28889-1		. VALVE, AIR		1
6	NAS509-18		. NUT	A-FA	1
7	66-24147-1		. WASHER	A-FA	1
8	66-24148-2		. NUT, LOCK (PRE SB 32-1132)	A-FA	1
8	69-73042-1		. NUT, LOCK (POST SB 32-1132)	A-FA	1
8A	69-73042-1		. NUT, LOCK	GA-MA	1
8B	69-73039-1		. WASHER (POST SB 32-1132)	A-FA	1
8B	69-73039-1		. WASHER	GA-MA	1
9	69-36621-1		. WASHER		1
10	65-46210-1		. CYLINDER ASSY, OUTER	A-D FGH	1
10	65-46210-5		. CYLINDER ASSY, OUTER	EI	1
10	65-46210-7		. CYLINDER ASSY, OUTER	KM	1
10	65-46210-8		. CYLINDER ASSY, OUTER	JL	1
10	65-46210-9		. CYLINDER ASSY, OUTER	OQR	1
10	65-46210-10		. CYLINDER ASSY, OUTER	NP	1
10	65-46210-13		. CYLINDER ASSY, OUTER	U	1
10	65-46210-14		. CYLINDER ASSY, OUTER	STVW X	1
10	65-46210-16		. CYLINDER ASSY, OUTER	Y	1
10	65-46210-21		. CYLINDER ASSY, OUTER	Z-HA	1
10	65-46210-25		. CYLINDER ASSY, OUTER	GA-MA	1
11	BACN10BY59		. . NUT		8
12	AN960C916		. . WASHER		8
13	69-36625-1		. . BOLT		8
14	65-46210-3		. . PLATE (USED ON 65-46210-1, -5, -7, -8)		1
14	65-46210-11		. . PLATE (USED ON 65-46210-9, -10, -13, -14)		1
14	65-46210-17		. . PLATE (USED ON 65-46210-16)		1
14	65-46210-19		. . PLATE (USED ON 65-46210-21)		1
14	65-46210-27		. . PLATE (USED ON 65-46210-25)		1
15	65-46210-4		. . PLATE (USED ON 65-46210-1, -5, -7, -8)		1
15	65-46210-6		. . PLATE (USED ON 65-46210-7) (OPT)		1
15	65-46210-12		. . PLATE (USED ON 65-46210-9, -10, -13, -14)		1
15	65-46210-18		. . PLATE (USED ON 65-46210-16)		1
15	65-46210-20		. . PLATE (USED ON 65-46210-21, -25)		1
16	66-23288-1		. . PIN		1
17	65-46150-3		. . BUSHING		2
18	65-46150-4		. . BUSHING		2

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
19	BACN10GW3		. . NUT (USED ON 65-46210-16, -21, -25)		2
19A	AN960-10L		. . WASHER (USED ON 65-46210-16, -21, -25)		6
19B	AN960-10		. . WASHER (USED ON 65-46210-16, -21, -25)		2
19C	AN960PD10L		. . WASHER (USED ON 65-46210-16, -21, -25)		2
19D	NAS43HT3-268		. . SPACER (USED ON 65-46210-16, -21, -25)		2
20	BACB30NE3-74		. . BOLT (USED ON 65-46210-16, -21, -25)		2
21	65-46211-3		. . CYLINDER (USED ON 65-46210-1, -8, -10) (OPT TO 65-46211-5)		1
21	65-46211-4		. . CYLINDER (USED ON 65-46210-5, -7, -9) (OPT TO 65-46211-6)		1
21	65-46211-5		. . CYLINDER (USED ON 65-46210-8, -10)		1
21	65-46211-6		. . CYLINDER (USED ON 65-46210-7, -9)		1
21	65-46211-7		. . CYLINDER (USED ON 65-46210-13)		1
21	65-46211-8		. . CYLINDER (USED ON 65-46210-14, -16, -21, -25)		1
22	65-46200-7		. SEAL		2
22	BACS11AK2		. SEAL (OPT)		2
23	65-46200-6		. STRAP		2
23	BACS38E8-15		. STRAP (OPT)		2
24	69-39152-1		. NAMEPLATE (LIMITED)	A-JA LA MA	1
24	69-74534-1		. NAMEPLATE (LIMITED)	EA GA KA	1
25	MS28775-214		. PACKING, O-RING		1
26	MS28774-214		. RING, BACKUP		2
27	66-24146-1		. RING, RETAINER		1
28	69-54449-1		. BEARING, UPPER	A-O	1
28	69-54449-2		. BEARING, UPPER (OPT)	A-O	1
28	69-65393-1		. BEARING, UPPER	P-MA	1
29	RS337		. RING, V80756		1
30	66-24107-2		. SPACER, UPPER BEARING	A-U	2
30	66-24107-3		. SPACER, UPPER BEARING	V-MA	2
31	69-42151-1		. SHIM (REPLD BY 66-25608-1, -2, -3)		1
31	66-25608-1		. SHIM (REPLS 69-42151-1)		AR
31	66-25608-2		. SHIM (REPLS 69-42151-1		AR
31	66-25608-3		. SHIM (REPLS 69-42151-1)		AR
32	66-24109-3		. RING, PISTON		1
33	65-46227-1		. CAM, UPPER		1
34	69-56489-1		. KEY		2
35	MS28775-344		. PACKING, O-RING		1
36	MS28774-344		. RING, BACKUP		2

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
37	65-46228-1		. CAM, LOWER	A-SU	1
37	65-46228-2		. CAM, LOWER (OPT)	A-M	1
37	65-46228-3		. CAM, LOWER (REPLS 65-46228-1, -2)	A-HA	1
37	65C31706-1		. CAM, LOWER	IA-MA	1
37	65-46228-4		. CAM, LOWER (OVERSIZED TAB) (REPAIR PART)		1
38	MS28775-339		. PACKING, O-RING *[3]		1
39	S12561-339		. SEAL, CHANNEL, V97820 *[3]		1
40	MS28775-344		. PACKING, O-RING		1
41	MS28775-339		. PACKING, O-RING *[3]		2
41A	733B9FT160A 4780		. SEAL ASSY, T-RING, V72902 *[3]	DEJ-Z	2
41A	733B9FT972P3		. SEAL ASSY, T-RING, V72902 (REPLS 733B9FT160A4780) *[3]	DEJ-Z	2
41A	733B9FT972P3		. SEAL ASSY, V72902 *[3]	A-HA	2
41A	733B9FT972		. SEAL ASSY, V72902	IA-MA	2
41A	733B9FT972P3		. SEAL ASSY, V72902	IA-KA MA	1
41A	S33327		. HATSEAL ASSY, V97820 *[3]	A-HA	1
41A	367-34200A312C		. RSA SEAL, V72902 *[3]	A-HA	1
41A	367-34200A312C		. SEAL ASSY, V72902	LA	1
41A	S13068-339		. SEAL ASSY, CAM SEAL, V97820 *[3]	A-HA	1
41A	3654-03247-0187-0408		DELETED		
41A	S34697-339GLF		. T-RING, V97820 (OPT TO 733B9FT972)		2
41A	S34692-339GLF17		. T-RING, V97820 (OPT TO 733B9FT972P3)		1
42	69-38182-2		. BEARING, LOWER	AF	1
42	69-43201-1		. BEARING, LOWER	B-E G-HA	1
42	69-76508-1		. BEARING, LOWER	IA-MA	1
42	69-76508-2		. BEARING, LOWER (OVERSIZED TAB) (REPAIR PART)		1
43	911065-3010		DELETED		
43	S11065-3010		. RING, SCRAPER, V97820	L-MA	1
43	531000A		. WIPER, ROD, V05695 (OPT)	L-O	1
43	531000A		. WIPER, ROD, V05695	A-K	1
44	69-36629-2		. SCRAPER		1
45	65-46221-1		. NUT, GLAND	A-BA	1
45	65-46221-3		. NUT ASSY, GLAND	CA-FA GA JA	1
45	65-46221-4		. NUT ASSY *[4] (OPT TO 65-46221-3)	GA	1
45	65-46221-4		. NUT ASSY, GLAND *[4]	A-FA HA IA KA-MA	1
45	65-46221-5		. NUT ASSY, GLAND (1/32 UNDERSIZE) (REPAIR PART)		1

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
45	65-46221-6		. NUT ASSY, GLAND (1/32 UNDERSIZE) (REPAIR PART)		1
45	65-46221-7		. NUT ASSY, GLAND (1/16 UNDERSIZE) (REPAIR PART)		1
45	65-46221-8		. NUT ASSY, GLAND (1/16 UNDERSIZE) (REPAIR PART)		1
45A	1646B		. . FITTING, LUBE, V95879 (USED ON 65-46221-3 THRU -8)		4
45A1	BACP20AX15AP		. . PLUG (REPAIR PART)		4
45A2	BACP20AX15A		. . PIN (REPAIR PART)		4
45B	AN960-416L		. . WASHER (USED ON 65-46221-3 THRU -8)		4
45C	65-46221-2		. . NUT (USED ON 65-46221-3, -4)		1
45C	65-46221-9		. . NUT (USED ON 65-46221-5, -6)		1
45C	65-46221-10		. . NUT (USED ON 65-46221-7, -8)		1
45D	AN814-3L		. PLUG	DEIJK	1
45E	MS28778-3		. PACKING, O-RING	DEIJK	1
45F	2C9516		. VALVE, CHECK, V99240	L-MA	1
45G	MS28778-4		. PACKING, O-RING	L-MA	1
46	AN316-18		. NUT	ABCFG H	1
46	AN316C18R		. NUT (OPT)	ABCFG H	1
46	NAS509-17		. NUT	DEI-MA	1
47	69-52228-1		. WASHER		1
48	66-23289-1		. WASHER		1
49	65-46215-3		. CYLINDER ASSY, INNER (OPT TO 65-46215-6)	A-D FGH	1
49	65-46215-4		. CYLINDER ASSY, INNER (OPT TO 65-46215-7)	E	1
49	65-46215-6		. CYLINDER ASSY, INNER	DJLNPU	1
49	65-46215-7		. CYLINDER ASSY, INNER	EIKMO Q-TVW	1
49	65-46215-12		. CYLINDER ASSY, INNER	X-CA	1
49	65-46215-14		. CYLINDER ASSY, INNER	DA-MA	1
50	65-46150-1		. . BUSHING (USED ON 65-46215-3, -4, -6, -7, -12)		2
50	65-46150-95		. . BUSHING (USED ON 65-46215-14)		2
50A	1728B		. . FITTING, LUBE, V95879 (USED ON 65-46215-14)		2
50B	MS15001-1		. . FITTING, LUBE (POST SL 32-060) (USED ON 65-46215-3, -4, -6, -7, -12)		1

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-50C	BUSHING		. . BUSHING, THREADED (POST SL 32-060) (USED ON 65-46215-3, -4, -6, -7, -12)		1
51	69-36623-2		. . BUSHING (USED ON 65-46215-3, -4)		2
51	69-60774-1		. . BUSHING (USED ON 65-46215-3, -4) (REPLS 69-36623-2 PER SB 32-1032)		2
51	69-60774-1		. . BUSHING (USED ON 65-46215-6, -7, -12)		2
52	65-46215-2		. . INNER CYLINDER (USED ON 65-46215-3)		1
52	65-46215-5		. . INNER CYLINDER (USED ON 65-46215-4)		1
52	65-46215-8		. . INNER CYLINDER (USED ON 65-46215-6)		1
52	65-46215-9		. . INNER CYLINDER (USED ON 65-46215-7)		1
52	65-46215-13		. . INNER CYLINDER (USED ON 65-46215-12)		1
52	65-46215-15		. . INNER CYLINDER (USED ON 65-46215-14)		1
53	RRN 62SP		. RING, RETAINER, V80756	ABCFGH	1
54	69-36624-2		. FILTER	ABCFGH	1
55	MS24665-153		. PIN, COTTER	ABCFGH	1
56	MS20392-2C75		. PIN	ABCFGH	1
57	66-24779-1		. LOCKNUT	ABCFGH	1
58	66-24106-1		. PIN, LOWER ORIFICE	ABCFGH	8
59	66-24794-1		. SPACER, LOWER SUPPORT TUBE	ABCFGH	1
60	65-46224-1		. TUBE, LOWER SUPPORT	ABCFGH	1
61	MS39086-142		. PIN	ABCFGH	1
62	AN320-8		. NUT	ABCFGH	1
63	66-24496-2		. WASHER	ABCFGH	1
64	69-39156-1		. SEAL	ABCFGH	1
65	MS28775-330		. PACKING, O-RING	ABCFGH	1
66	S12508-330		. SEAL, CHANNEL, V97820	ABCFGH	1
67	MS28775-114		. PACKING, O-RING	ABCFGH	1

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
68	MS28774-114		. RING, BACKUP	ABCFGH	2
69	69-42192-1		. PISTON	ABC	1
69	69-42192-2		. PISTON	FGH	1
70	MS28775-331		. PACKING, O-RING	ABCFGH	1
71	MS28774-331		. RING, BACKUP	ABCFGH	2
72	69-36630-1		. ORIFICE, LOWER	ABCFGH	1
72A	65-46200-24		. PIN ASSY, METERING (PRE SB 32-1132)	DEIJK	1
72A	65-46200-31		. PIN ASSY, METERING (PRE SB 32-1132)	L-FA	1
72A	65-46200-54		. PIN ASSY, METERING (POST SB 32-1132)	DEIJK L-FA	1
72A	65-46200-54		. PIN ASSY, METERING	GA-MA	1
72B	BACB30LB5-6		. . BOLT, BLIND (SUPSD BY MS90354U0506)		1
72B	MS90354U0506		. . FASTENER, BLIND (SUPSDS BACB30LB5-6)		1
72C	65-46229-1		. . TUBE, SUPPORT (USED ON 65-46200-24) (OPT) *[1]		1
72C	65-46229-2		. . TUBE, SUPPORT (USED ON 65-46200-24 (PREF) *[2]		1
72C	65-46229-4		. . TUBE, SUPPORT (USED ON 65-46200-31)		1
72C	65-46229-5		. . TUBE, SUPPORT (USED ON 65-46200-54)		1
72C	65-46229-8		. . TUBE, SUPPORT (SERIALIZED) (REPLS 65-46229-2) (USED ON 65-46200-24) *[2]		1
72C	65-46229-9		. . TUBE, SUPPORT (SERIALIZED) (REPLS 65-46229-5) (USED ON 65-46200-54)		1
72D	65-46219-1		. . PIN, METERING		1
72E	69-55483-1		. . TUBE, DRAIN (USED ON 65-46200-24) *[1]		1
72E	69-57991-1		. . TUBE, DRAIN *[2]		1
72F	MS28775-112		. . PACKING, O-RING		2
72G	MS28774-112		. . RING, BACKUP		4
72H	MS28775-331		. PACKING, O-RING	DEI-MA	1
72J	MS28774-331		. RING, BACKUP	DEI-MA	2
73	66-24105-1		. RING, PISTON	A-DFG HJLNP	1
73	66-24105-2		. RING, PISTON (PRE SB 32-1132)	EIKMO Q-TV CA EA	1
73	66-24105-3		. RING, PISTON (POST SB 32-1132)	EIKMO Q-T V-FA	1
73	66-24105-3		. RING, PISTON	GA IA-LA	1
73	69-67288-1		. RING, PISTON	U	1

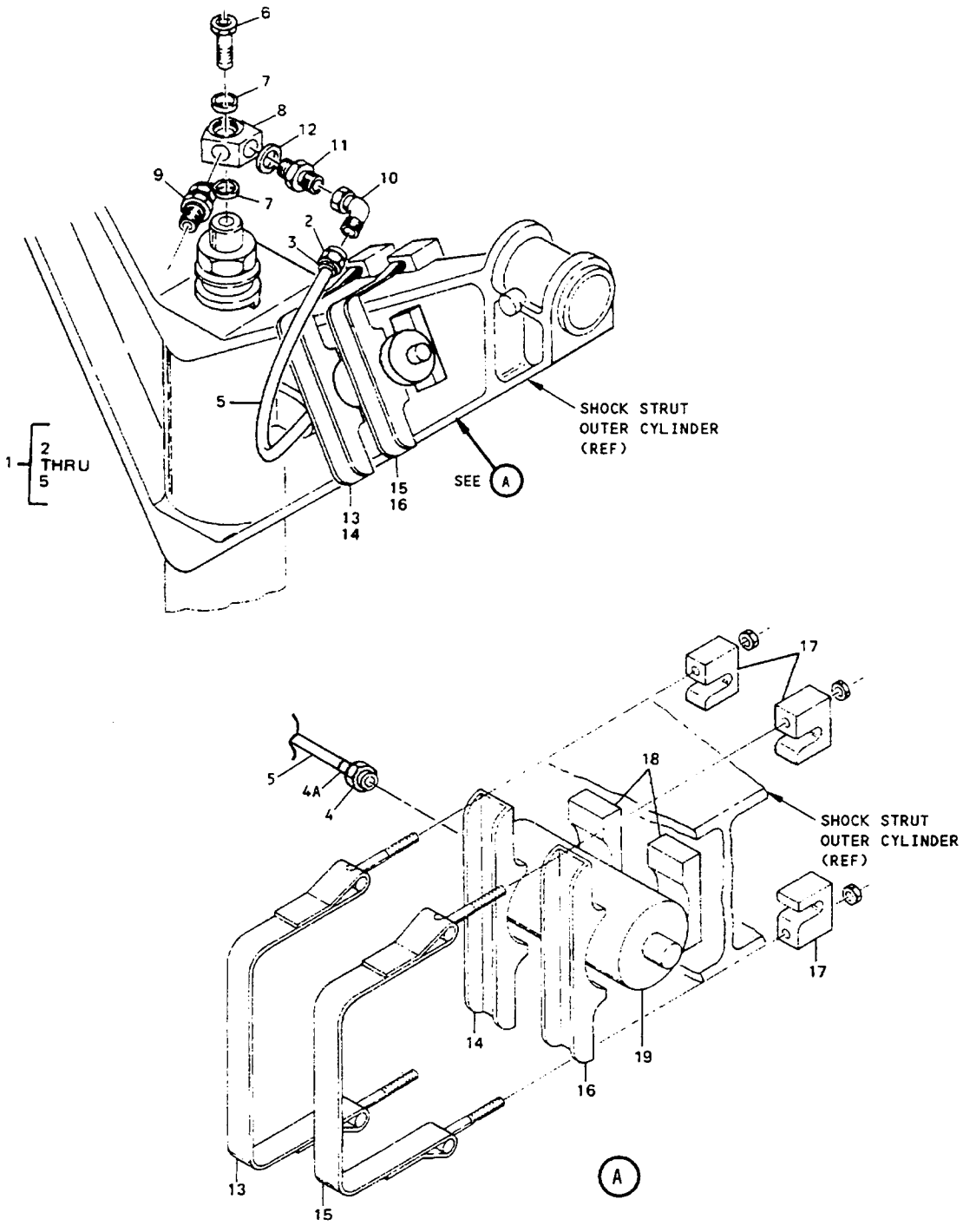
FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
73	69-67288-2		. RING, PISTON (PRE SB 32-1132)	W-BA DA FA	1
73	69-67288-2		. RING, PISTON	HA MA	1
74	MS24678-9		. SCREW, CAP		2
75	66-24104-1		. LOCK, ORIFICE PLATE		1
76	69-36622-2		. PLATE, UPPER ORIFICE		1
77	65-46225-3		. PIN, METERING	AB	1
77	65-46225-4		. PIN, METERING	C	1
77	65-46225-5		. PIN, METERING	FG	1
77	65-46225-6		. PIN, METERING	H	1
78	65-46226-3		. TUBE, SUPPORT (SB 32-1004)	ABCFG	1
78	65-46226-5		. TUBE, SUPPORT (SB 32-1004) (REPLD BY 65-46226-12)	DJLNPU	1
78	65-46226-6		. TUBE, SUPPORT (PRE SB 32-1077, PRE SB 32-1132)	EIKMOQ	1
78	65-46226-7		. TUBE, SUPPORT (POST SB 32-1077, PRE SB 32-1132) (REPLD BY 65-46226-13)	EIKMOQ	1
78	65-46226-7		. TUBE, SUPPORT (PRE SB 32-1132) (REPLD BY 65-46226-13)	RSTV-BA DA FA	1
78	65-46226-8		. TUBE, SUPPORT (PRE SB 32-1132) (REPLD BY 65-46226-14)	CA EA	1
78	65-46226-12		. TUBE, SUPPORT (SERIALIZED) (REPLS 65-46226-5)	DJLNPU	1
78	65-46226-13		. TUBE, SUPPORT (SERIALIZED) (REPLS 65-46226-7)	EIKMO Q-T V-BA DA FA	1
78	65-46226-14		. TUBE, SUPPORT (SERIALIZED) (REPLS 65-46226-8)	CA EA	1
78A	69-73038-1		. TUBE ASSY, SUPPORT (POST SB 32-1132)	EIKMO Q-T V-FA	1
78A	69-73038-1		. TUBE ASSY, SUPPORT	GA IA-LA	1
78A	69-73038-2		. TUBE ASSY, SUPPORT	HA MA	1
78B	65C25707-1		. . STEM		1
78C	MS39086-119		. . PIN		1
78D	65-46226-9		. . TUBE (USED ON 69-73038-1)		1
78D	65-46226-10		. . TUBE (USED ON 69-73038-2)		1

*[1] 65-55483-1 USED WITH 65-46229-1

*[2] 69-57991-1 USED WITH 65-46229-2, -4, -5

*[3] SEAL (41A) REPLACES COMBINATION OF PACKING (38), CHANNEL SEAL (39), AND PACKING (41). CHOICE OF SEAL (41A) IS OPTIONAL AMONG HATSEAL S33357, RSA SEAL 3654-03247-0187-0408, CAM SEAL S13068-339, OR SEAL 733B9FT972P3.

*[4] 65-46221-4, -5, -7 GLAND NUTS SIMILAR TO 65-46221-3, -6, -8, RESPECTIVELY, EXCEPT LUBE FITTINGS (45A) ARE ROTATED 90 DEGREES COUNTERCLOCKWISE



Weight and Balance Transducer Installation
Figure 1102

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1102-	65C15616-3		TRANSDUCER INSTL, WEIGHT AND BALANCE		RF
1	65C15616-7		. TUBE ASSY		1
2	BACS13BD4HP		. . SLEEVE		1
3	MS21921-4		. . NUT		2
4	AN818-4		. . NUT		1
4	MS20819-4		. SLEEVE		1
5	TUBE		. . TUBE, 1/4 OD X 0.028 WALL, 304 CRES, 1/8 HARD		1
6	69-68801-1		. BOLT, BANJO		1
7	MS24690		. PACKING (REPLD BY MS28775-015)		2
7	MS28775-015		. PACKING (REPLS MS24690)		2
8	69-68802-1		. BLOCK		1
9	MS28889-1		. VALVE, AIR		1
10	BACE21AW0404		. ELBOW		1
11	MS21902-4		. UNION		1
12	MS28778-4		. PACKING		1
13	3075CA1		. STRAP ASSY, V94581		1
13	ST1355-15		. STRAP ASSY, V14241 (OPT)		1
14	21226-2		. BLOCK, V94581		1
14	ST1355-1B		. BLOCK, V14242 (OPT)		1
15	3075CA2		. STRAP ASSY, V94581		1
15	ST1355-25		. STRAP ASSY, V14242 (OPT)		1
16	21226-1		. BLOCK, V94581		1
16	ST1355-2B		. BLOCK, V14242 (OPT)		1
17	69-37182-7		. CLAMP		4
18	BACC10X32P		. SADDLE		2
19	968-6000-1		. TRANSDUCER, PRESSURE, V12467		1
20	B968-572		. CHART, AIR VALVE OPERATING, V12467 (INSTALLED ON NOSE GEAR WHEEL WELL SURFACE)		1

VENDORS

V05695	MASTER PNEUMATIC-DETROIT, INC., 6701 18 MILE RD., STERLING HEIGHTS, MICHIGAN 48314-4210
V12467	FAIRCHILD CAMERA AND INSTRUMENT CORP., 75 MALL DR., COMMACK, LONG ISLAND, NEW YORK 11725
V14242	VOSS INDUSTRIES, INC., 2168 W. 25TH ST., CLEVELAND, OHIO 44113-4115
V5N084	PRECISE TOOL AND GAGE CO., INC., 13300 S.E. 30TH ST., SUITE 201, BELLEVUE, WASHINGTON 98005-4417
V72902	PALMETTO, INC., (FORMERLY GREENE TWEED AND CO.), 25 ENGERMAN AVE., DENTON, MARYLAND 21629
V74979	THE JOHNSON GAGE COMPANY, 534 COTTAGE GROVE RD., BLOOMFIELD, CONNECTICUT 06002-3032
V80756	SPIROLOX DIV. OF KAYDON CORP., 29 CASSENS CT., FENTON, MISSOURI 63026-2542
V94581	NATIONAL UTILITIES CO./NUCO, DIV. OF VIJ CORP., 1700 HICKORY DR., FORT WORTH, TEXAS 76117-6020
V95879	STEWART-WARNER ALEMITE CORP., 1826 DIVERSEY PARKWAY, CHICAGO, ILLINOIS 60614-1540
V97820	BUSAK AND SHAMBAN, INC., BEARING DIV., 711 MITCHELL ROAD, NEWBURY PARK, CALIFORNIA 91320-2214
V99240	CRISSAIR, INC., 38905 TENTH ST. E., P.O. BOX 4000, PALMDALE, CALIFORNIA 93550-4000

Part No.	Fig. and Index No.	Qty. per Assy.
AN316-18	1101-46	1
AN316C18R	1101-46	1
AN320-8	1101-62	1
AN814-3L	1101-45D	1
AN818-4	1102-4	1
AN960-10	1101-19B	2
AN960-10L	1101-2	2
AN960-10L	1101-19A	6
AN960-416L	1101-45B	4
AN960C916	1101-12	8
AN960PD10L	1101-19C	2
B968-572	1102-20	1
BACB30LB5-6	1101-72B	1
BACB30NE3-74	1101-20	2
BACC10X32P	1102-18	2
BACE21AW0404	1102-10	1
BACN10BY59	1101-11	8
BACN10GW3	1101-19	2
BACN10JC3	1101-1	2
BACP20AX15A	1101-45A2	4
BACP20AX15AP	1101-45A1	4
BACS11AK2	1101-22	2
BACS13BD4HP	1102-2	1
BACS38E8-15	1101-23	2
BUSHING	1101-50C	1
MS15001-1	1101-50B	1
MS20392-2C75	1101-56	1
MS20819-4	1102-4	1
MS21902-4	1102-11	1
MS21921-4	1102-3	2
MS24665-153	1101-55	1
MS24678-9	1101-74	2
MS24690	1102-7	2
MS28774-112	1101-72G	4
MS28774-114	1101-68	2
MS28774-214	1101-26	2
MS28774-331	1101-71	2
MS28774-331	1101-72J	2
MS28774-344	1101-36	2
MS28775-015	1102-7	2
MS28775-112	1101-72F	2
MS28775-114	1101-67	1
MS28775-214	1101-25	1
MS28775-330	1101-65	1
MS28775-331	1101-70	1
MS28775-331	1101-72H	1
MS28775-339	1101-38	1
MS28775-339	1101-41	2
MS28775-344	1101-35	1

Part No.	Fig. and Index No.	Qty. per Assy.
MS28775-344	1101-40	1
MS28778-3	1101-45E	1
MS28778-4	1101-45G	1
MS28778-4	1102-12	1
MS28889-1	1101-5	1
MS28889-1	1102-9	1
MS39086-119	1101-78C	1
MS39086-142	1101-61	1
MS90354U0506	1101-72B	1
NAS1103-7	1101-3	2
NAS43HT3-268	1101-19D	2
NAS509-17	1101-46	1
NAS509-18	1101-6	1
RRN 62SP	1101-53	1
RS337	1101-29	1
S11065-3010	1101-43	1
S12508-330	1101-66	1
S12561-339	1101-39	1
S13068-339	1101-41A	1
S33327	1101-41A	1
S34692-339GLF17	1101-41A	1
S34697-339GLF	1101-41A	2
ST1355-15	1102-13	1
ST1355-1B	1102-14	1
ST1355-25	1102-15	1
ST1355-2B	1102-16	1
TUBE	1102-5	1
1646B	1101-45A	4
1728B	1101-50A	2
21226-1	1102-16	1
21226-2	1102-14	1
2C9516	1101-45F	1
3075CA1	1102-13	1
3075CA2	1102-15	1
3654-03247-0187-0408	1101-41A	
367-34200A312C	1101-41A	1
367-34200A312C	1101-41A	1
531000A	1101-43	1
531000A	1101-43	1
65-46150-1	1101-50	2
65-46150-3	1101-17	2
65-46150-4	1101-18	2
65-46150-95	1101-50	2
65-46200-16	1101	RF
65-46200-17	1101	RF
65-46200-19	1101	RF
65-46200-20	1101	RF
65-46200-21	1101	RF

Part No.	Fig. and Index No.	Qty. per Assy.
65-46200-22	1101	RF
65-46200-24	1101-72A	1
65-46200-25	1101	RF
65-46200-26	1101	RF
65-46200-27	1101	RF
65-46200-28	1101	RF
65-46200-29	1101	RF
65-46200-30	1101	RF
65-46200-31	1101-72A	1
65-46200-32	1101	RF
65-46200-33	1101	RF
65-46200-34	1101	RF
65-46200-35	1101	RF
65-46200-36	1101	RF
65-46200-37	1101	RF
65-46200-38	1101	RF
65-46200-39	1101	RF
65-46200-40	1101	RF
65-46200-41	1101	RF
65-46200-42	1101	RF
65-46200-43	1101	RF
65-46200-46	1101	RF
65-46200-47	1101	RF
65-46200-48	1101	RF
65-46200-49	1101	RF
65-46200-50	1101	RF
65-46200-51	1101	RF
65-46200-52	1101	RF
65-46200-53	1101	RF
65-46200-54	1101-72A	1
65-46200-54	1101-72A	1
65-46200-55	1101	RF
65-46200-56	1101	RF
65-46200-6	1101-23	2
65-46200-63	1101	RF
65-46200-64	1101	RF
65-46200-65	1101	RF
65-46200-66	1101	RF
65-46200-67	1101	RF
65-46200-7	1101-22	2
65-46210-1	1101-10	1
65-46210-10	1101-10	1
65-46210-11	1101-14	1
65-46210-12	1101-15	1
65-46210-13	1101-10	1
65-46210-14	1101-10	1
65-46210-16	1101-10	1
65-46210-17	1101-14	1

Part No.	Fig. and Index No.	Qty. per Assy.
65-46210-18	1101-15	1
65-46210-19	1101-14	1
65-46210-20	1101-15	1
65-46210-21	1101-10	1
65-46210-25	1101-10	1
65-46210-27	1101-14	1
65-46210-3	1101-14	1
65-46210-4	1101-15	1
65-46210-5	1101-10	1
65-46210-6	1101-15	1
65-46210-7	1101-10	1
65-46210-8	1101-10	1
65-46210-9	1101-10	1
65-46211-3	1101-21	1
65-46211-4	1101-21	1
65-46211-5	1101-21	1
65-46211-6	1101-21	1
65-46211-7	1101-21	1
65-46211-8	1101-21	1
65-46215-12	1101-49	1
65-46215-13	1101-52	1
65-46215-14	1101-49	1
65-46215-15	1101-52	1
65-46215-2	1101-52	1
65-46215-3	1101-49	1
65-46215-4	1101-49	1
65-46215-5	1101-52	1
65-46215-6	1101-49	1
65-46215-7	1101-49	1
65-46215-8	1101-52	1
65-46215-9	1101-52	1
65-46219-1	1101-72D	1
65-46221-1	1101-45	1
65-46221-10	1101-45C	1
65-46221-2	1101-45C	1
65-46221-3	1101-45	1
65-46221-4	1101-45	1
65-46221-4	1101-45	1
65-46221-5	1101-45	1
65-46221-6	1101-45	1
65-46221-7	1101-45	1
65-46221-8	1101-45	1
65-46221-9	1101-45C	1
65-46224-1	1101-60	1
65-46225-3	1101-77	1
65-46225-4	1101-77	1
65-46225-5	1101-77	1
65-46225-6	1101-77	1

Part No.	Fig. and Index No.	Qty. per Assy.
65-46226-10	1101-78D	1
65-46226-12	1101-78	1
65-46226-13	1101-78	1
65-46226-14	1101-78	1
65-46226-3	1101-78	1
65-46226-5	1101-78	1
65-46226-6	1101-78	1
65-46226-7	1101-78	1
65-46226-7	1101-78	1
65-46226-8	1101-78	1
65-46226-9	1101-78D	1
65-46227-1	1101-33	1
65-46228-1	1101-37	1
65-46228-2	1101-37	1
65-46228-3	1101-37	1
65-46228-4	1101-37	1
65-46229-1	1101-72C	1
65-46229-2	1101-72C	1
65-46229-4	1101-72C	1
65-46229-5	1101-72C	1
65-46229-8	1101-72C	1
65-46229-9	1101-72C	1
65C15616-3	1102	RF
65C15616-7	1102-1	1
65C25707-1	1101-78B	1
65C31706-1	1101-37	1
66-23288-1	1101-16	1
66-23289-1	1101-48	1
66-24104-1	1101-75	1
66-24105-1	1101-73	1
66-24105-2	1101-73	1
66-24105-3	1101-73	1
66-24105-3	1101-73	1
66-24106-1	1101-58	8
66-24107-2	1101-30	2
66-24107-3	1101-30	2
66-24109-3	1101-32	1
66-24146-1	1101-27	1
66-24147-1	1101-7	1
66-24148-2	1101-8	1
66-24496-2	1101-63	1
66-24779-1	1101-57	1
66-24794-1	1101-59	1
66-25608-1	1101-31	AR
66-25608-2	1101-31	AR
66-25608-3	1101-31	AR
69-35397-1	1101-4	1

Part No.	Fig. and Index No.	Qty. per Assy.
69-36621-1	1101-9	1
69-36622-2	1101-76	1
69-36623-2	1101-51	2
69-36624-2	1101-54	1
69-36625-1	1101-13	8
69-36629-2	1101-44	1
69-36630-1	1101-72	1
69-37182-7	1102-17	4
69-38182-2	1101-42	1
69-39152-1	1101-24	1
69-39156-1	1101-64	1
69-42151-1	1101-31	1
69-42192-1	1101-69	1
69-42192-2	1101-69	1
69-43201-1	1101-42	1
69-52228-1	1101-47	1
69-54449-1	1101-28	1
69-54449-2	1101-28	1
69-55483-1	1101-72E	1
69-56489-1	1101-34	2
69-57991-1	1101-72E	1
69-60774-1	1101-51	2
69-60774-1	1101-51	2
69-65393-1	1101-28	1
69-67288-1	1101-73	1
69-67288-2	1101-73	1
69-67288-2	1101-73	1
69-68801-1	1102-6	1
69-68802-1	1102-8	1
69-73038-1	1101-78A	1
69-73038-1	1101-78A	1
69-73038-2	1101-78A	1
69-73039-1	1101-8B	1
69-73039-1	1101-8B	1
69-73042-1	1101-8	1
69-73042-1	1101-8A	1
69-74534-1	1101-24	1
69-76508-1	1101-42	1
69-76508-2	1101-42	1
733B9FT160A4780	1101-41A	2
733B9FT972	1101-41A	2
733B9FT972P3	1101-41A	2
733B9FT972P3	1101-41A	2
733B9FT972P3	1101-41A	1
911065-3010	1101-43	1
968-6000-1	1102-19	1