TO: ALL HOLDERS OF ENGINE CONTROL DRUM INSTALLATION COMPONENTS OVERHAUL MANUAL, 76-14-22

REVISION NO. 5, DATED NOV 1/00

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 new gasket installation procedure 2.C.(3) and changed Fig. 4C to match installation procedure						X							

ENGINE CONTROL DRUM INSTALLATION COMPONENTS

76-14-22

BOEING P/N (SEE PAGE T/C-1)

AIRLINE P/N

THE FOLLOWING DIRECTIVES APPLY TO THIS SUBJECT:

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVES	DATE DIRECTIVE INCORPORATED INTO TEXT
		PRR 31030	Dec 25/75
		PRR 32704	Jan 5/80
76-1008		PRR 32998	Jul 5/81
		PRR 33118	Jul 5/81

LIST OF EFFECTIVE PAGES

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

	PAGE	DATE	PAGE	DATE	PAGE	DATE
76-14-22						
	T-1	Jul 5/81				
	T-2	BLANK				
*	LEP-1	Nov 1/00				
	LEP-2	BLANK				
	T/C-1	Jul 5/81				
	T/C-2	BLANK				
	1	Dec 25/75				
	2	Dec 25/75				
	3	Dec 25/75				
	4	Dec 25/75				
*	5	Nov 1/00				
	6	Jul 5/81				
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	8C	Jul 5/81				
	8D	Jul 5/81				
*	9	Nov 1/00				
	10	Dec 25/75				
	11	Dec 25/75				
	12	Dec 25/75				
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	14	Dec 25/75				
	15	Dec 25/75				
	16	Dec 25/75				
	17	Dec 25/75				
	18	BLANK				

TABLE OF CONTENTS

NOTE: This manual contains overhaul data for various components of the Engine Control Drum System. Overhaul functions which cannot be performed by use of standard industry practices are included in the individual section for each component.

Drum Instl Components

1. SHAFT ASSY, THRUST CONTROL (65-51296-2)(Fig. 2)

A. Magnetic particle check shaft per 20-20-01.

B. Repair (Fig. 1)

NOTE: Repair consists of restoration of original finish. Refer to 20-30-02 for stripping of protective finish and to 20-41-01 for explanation of F and SRF finish codes.

C. Bearing Replacement (Fig. 1A)

(1) Remove staked pins (5).

(2) Remove nut (10) and bearing (15).

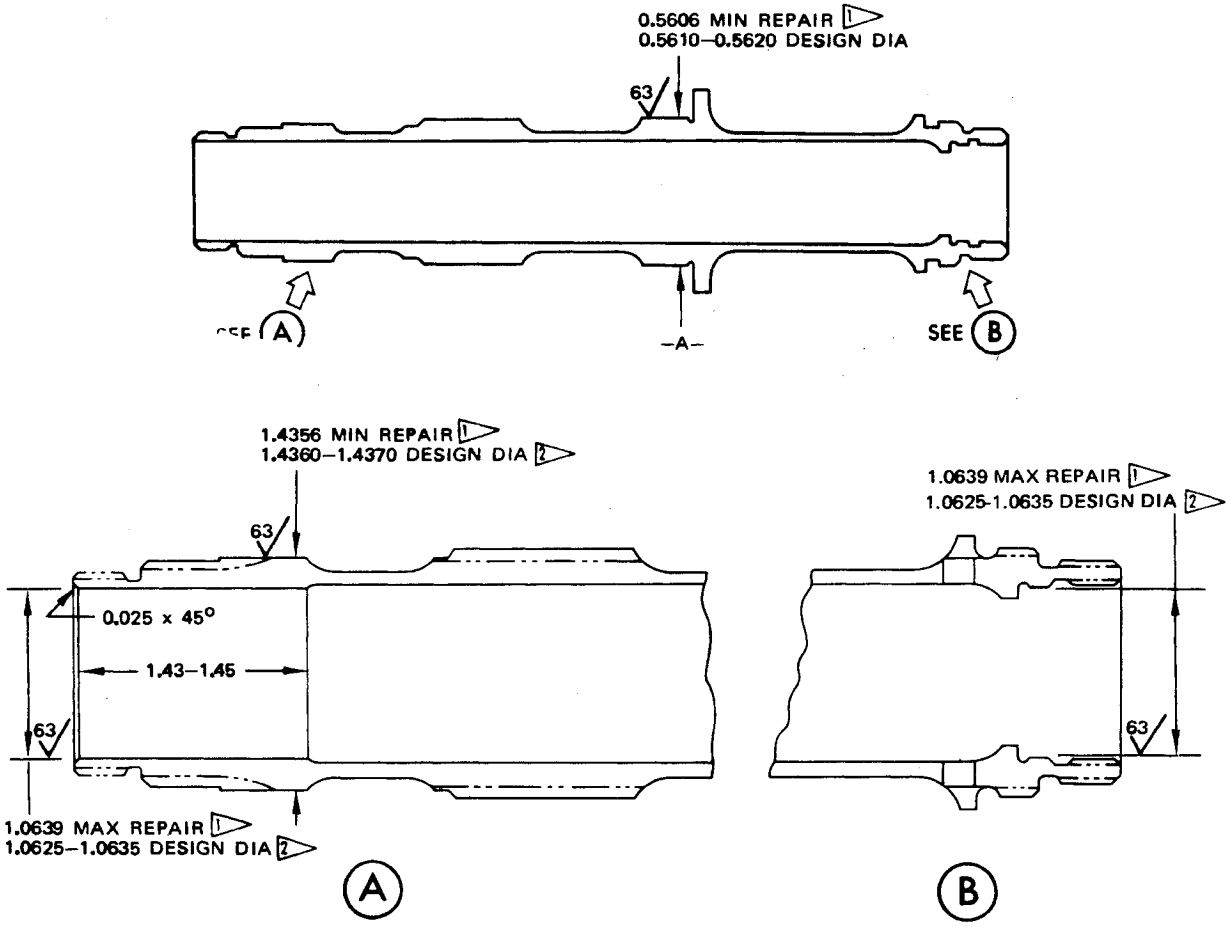
(3) Install replacement bearing with primer, BMS 10-11, type 1 on surfaces which mate with shaft.

(4) Install nut and tighten to 100-250 lb-in.

(5) Drill holes for pins thru nut and shaft at 45 degrees from nut slots using existing holes in shaft if possible.

(6) Install pins and stake as shown.

D. Wear limits are same as repair limits shown in Fig. 1.



REFINISH

PASSIVATE (F-8.07) ALL OVER
CADMIUM PLATE SURFACES AS NOTED 1

BREAK SHARP EDGES 0.02–0.03R

1 CADMIUM PLATE (F-1.1926)

2 CONCENTRIC WITH DIA –A– WITHIN 0.002

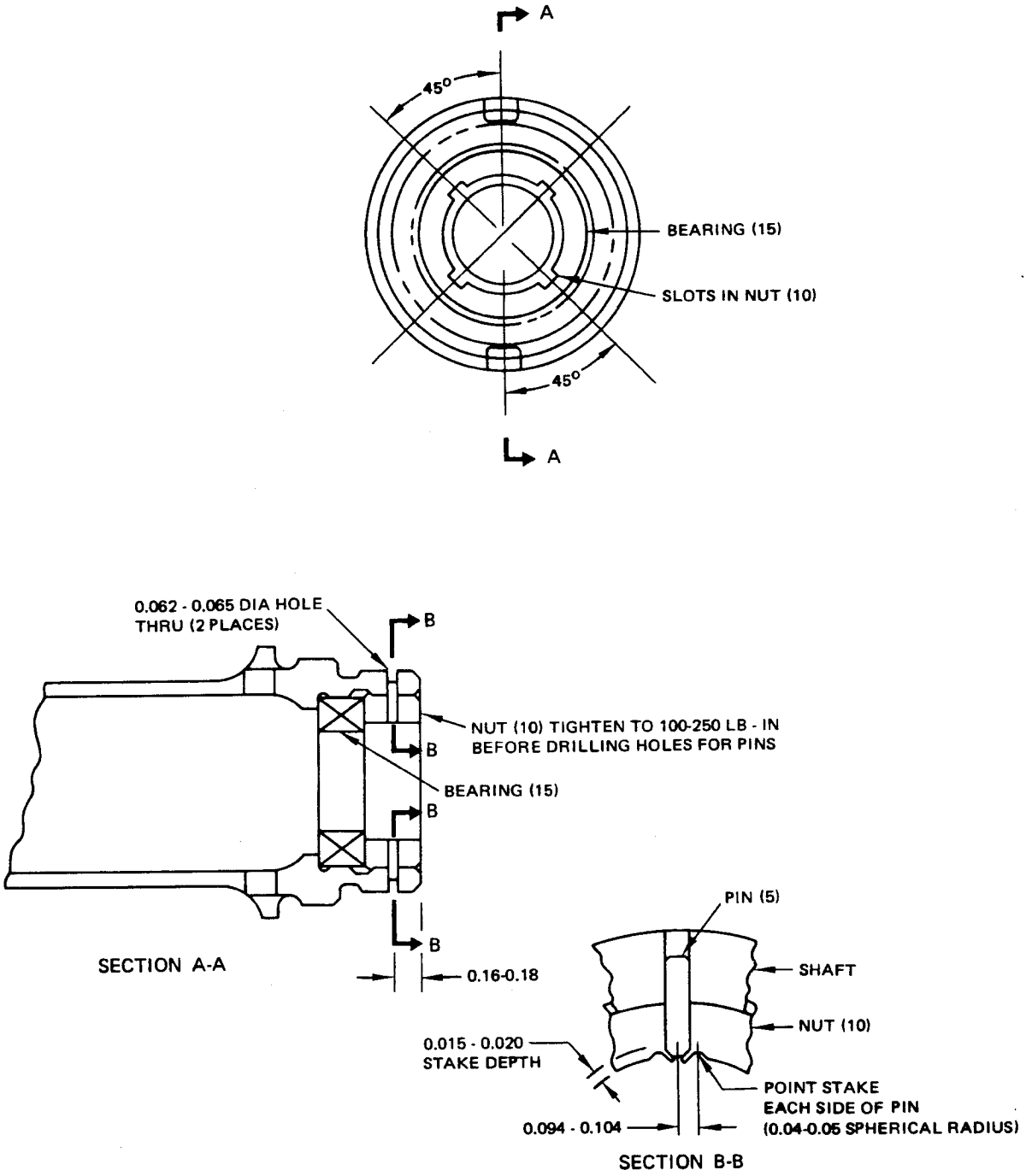
REPAIR

(REFER TO REFINISH)

MATERIAL: CRES 17-4PH (150–170 KSI)
AMS 5643

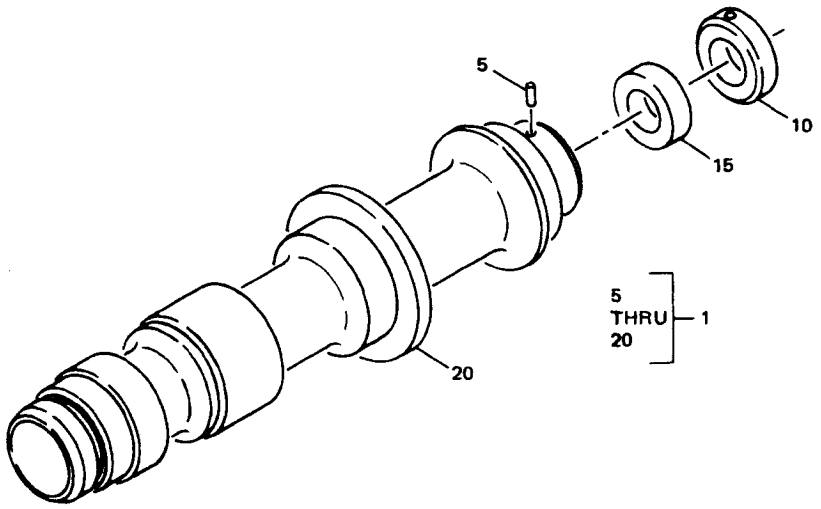
65-51296

Shaft Repair
Figure 1


A
45°
BEARING (15)
SLOTS IN NUT (10)
45°
A
0.062 - 0.065 DIA HOLE
THRU (2 PLACES)
B
NUT (10) TIGHTEN TO 100-250 LB - IN
BEFORE DRILLING HOLES FOR PINS
B
BEARING (15)
B
B
SECTION A-A
0.16-0.18
PIN (5)
SHAFT
NUT (10)
0.015 - 0.020
STAKE DEPTH
POINT STAKE
EACH SIDE OF PIN
(0.04-0.05 SPHERICAL RADIUS)
0.094 - 0.104
SECTION B-B

65-51296

E. Illustrated Parts List



Shaft Assembly
Figure 2

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
2-					
1	65-51296-2		SHAFT ASSY		RF
5	MS16562-190		. PIN		1
10	69-42981-2		. NUT, RETAINER		1
15	BACB10A27DDH		. . BEARING		1
20	65-51296-1		. . SHAFT		1

2. BRACKET ASSY, SUPPORT (65-52459-4, -7, -9, -11, -15) (Fig. 4A) (65-52966-7, -8) (Fig. 4C) (65-52985-1, -5, -6, -8) (Fig. 4B) (65-74536-1, -5) (Fig. 4) (65-74537-1, -5) (Fig. 4)

A. Do a penetrant inspection of the bracket (5, Fig. 4, 4A, 4B) as given in SOPM 20-20-02.

B. Do a magnetic particle inspection of the bracket (5, Fig. 4C) as given in SOPM 20-20-01.

C. Repair (Fig. 3)

(1) Holes 1, 2, 3 (65-52459, 65-52966, 65-52985, 65-74536, 65-74537).

(a) To remove defects, machine holes as necessary, within the repair limits as shown in Fig. 3A.

(b) Chemical treat the machined surfaces as given in SOPM 20-43-03.

(c) Manufacture the repair sleeve as shown in Fig. 3A.

(d) Install the replacement sleeve by the shrink fit method given in SOPM 20-50-03. Apply BMS 10-11, Type 1 primer to mating surfaces.

(e) Machine the replacement sleeve tdesign dimensions and finish as shown in Fig. 3A.

(2) Refinish

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.

(a) Bracket (5, Fig. 4, 4A, 4B) -- Fig. 3.

(b) Bracket (5, Fig. 4C) -- Passivate (F-8.07 or F-17.09) and apply primer, BMS 10-11, type 1 (SRF-12.205 or F-20.02). Material: 17-4PH or 15-5PH CRES, 180-220 ksi.

(3) Gasket Replacement

(a) For Fig. 4, 4A, and 4B gasket replacement.

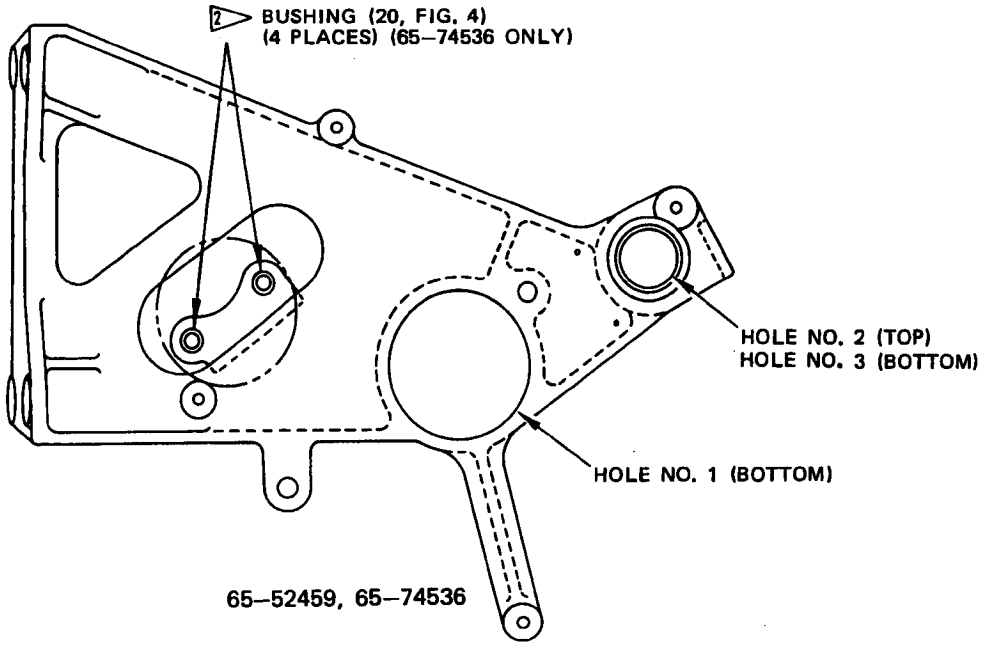
1) Install the replacement gasket (10) flat against the bracket surface.

2) Bond the replacement gasket to the bracket surface with Type 38 adhesive material. Refer to SOPM 20-50-12, Special Method II.

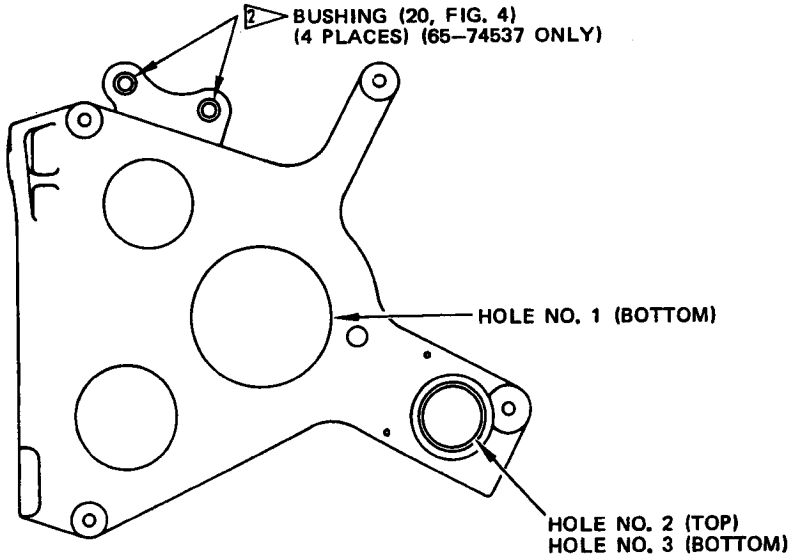
(b) For Fig. 4C gasket replacement

1) Install the replacement gasket (20) with the flat, non-angled side against the bracket surface. See Fig. 4C, Detail A.

2) Bond the gasket to the bracket surface with Type 38 adhesive material. Refer to SOPM 20-50-12, Special Method II.

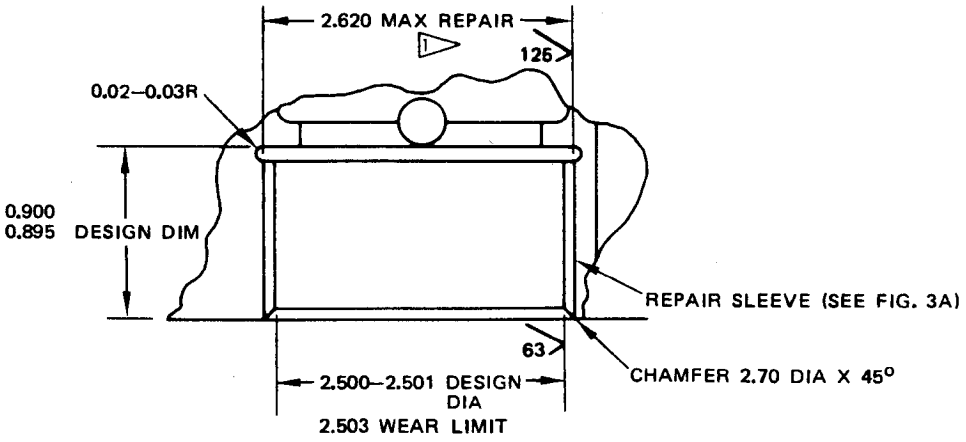


65–52459, 65–74536

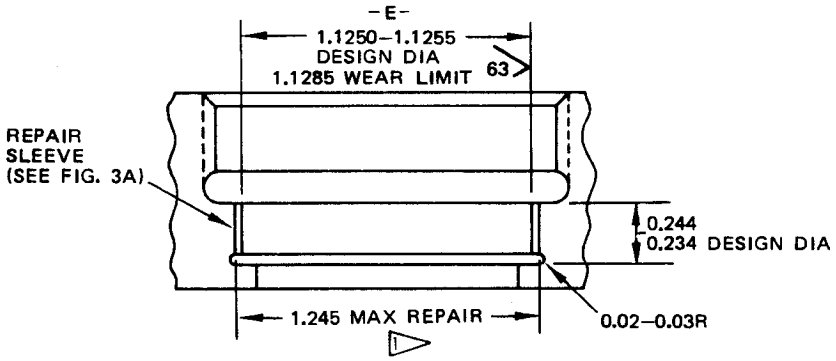


65–52985, 65–74537

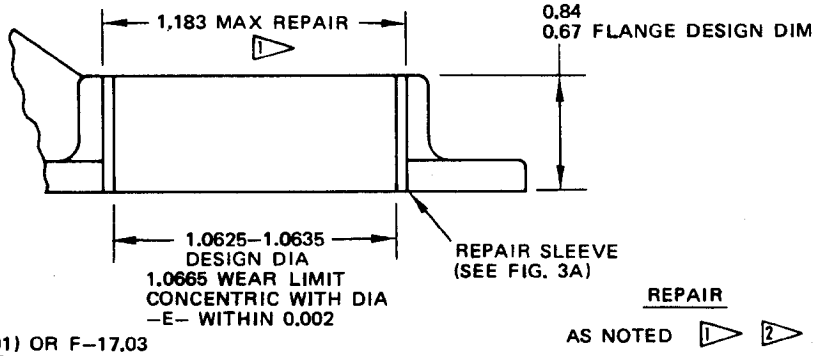
Bracket Repair
Figure 3 (Sheet 1)



HOLE NO. 1



HOLE NO. 2



HOLE NO. 3

REFINISH

SULFURIC ACID ANODIZE (F-2.201) OR F-17.03
ALL OVER FOLLOWED BY PRIMER,
BMS 10-11, TYPE 1 (SRF-12.205 OR F-20.02)
EXCEPT ON SURFACES WHICH MATE WITH BEARINGS

REPAIR

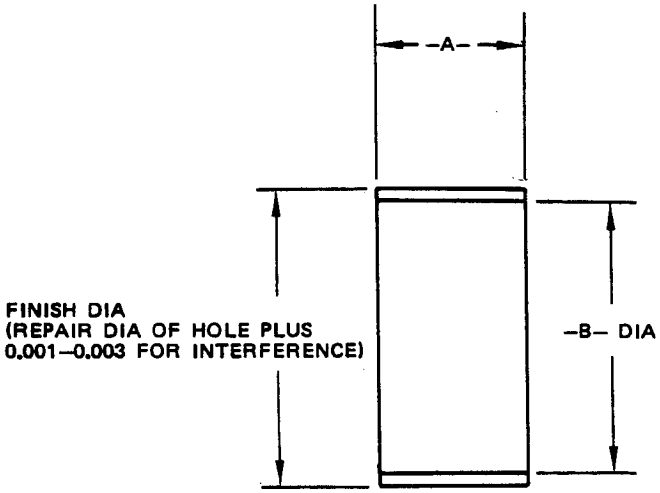
AS NOTED 1 2

MATERIAL: AL ALLOY

1 REPAIR LIMIT FOR INSTALLATION OF REPAIR SLEEVE

2 INSTALL BUSHING 0.00–0.01 BELOW FLANGE SURFACE WITH PRIMER BMS 10-22, TYPE 1

65-52459, 65-52985, 65-74536, 65-74537



HOLE	-A-	-B-
1	1	2.50 2.49
2	1	1.12 1.11
3	1	1.06 1.05

FINISH

ALODIZE PER 20–43–03

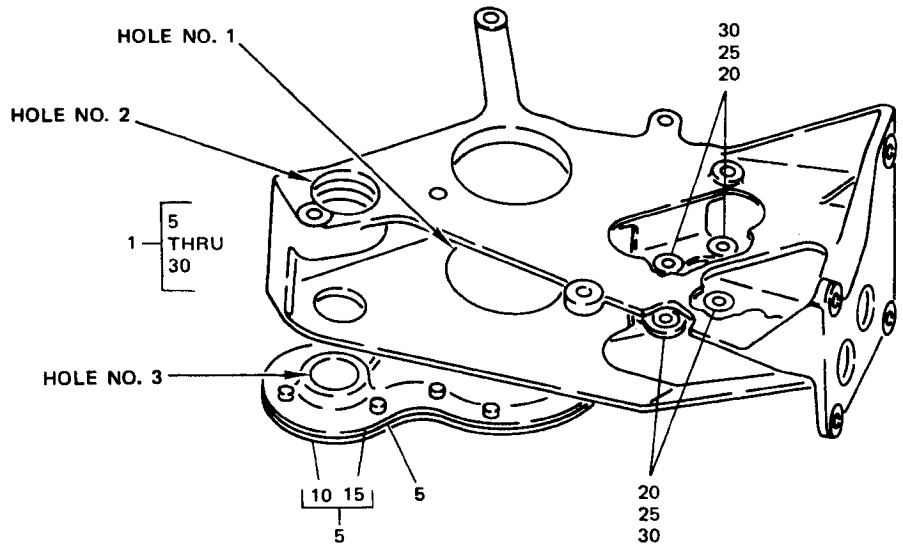
1 LENGTH OF BORE +0.00/–0.001

MATERIAL: 7075–T73 AL ALLOY

ALL DIMENSIONS ARE IN INCHES

Repair Sleeve Details
Figure 3A

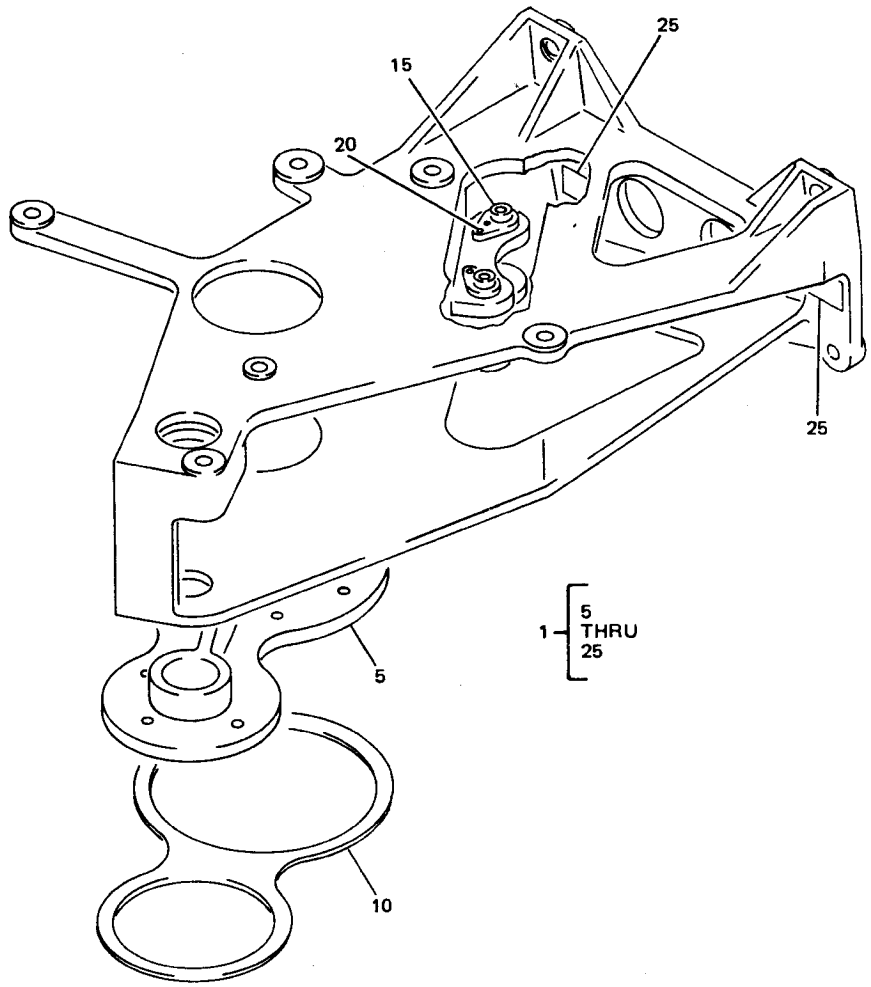
D. Illustrated Parts List



(65-74536 SHOWN)

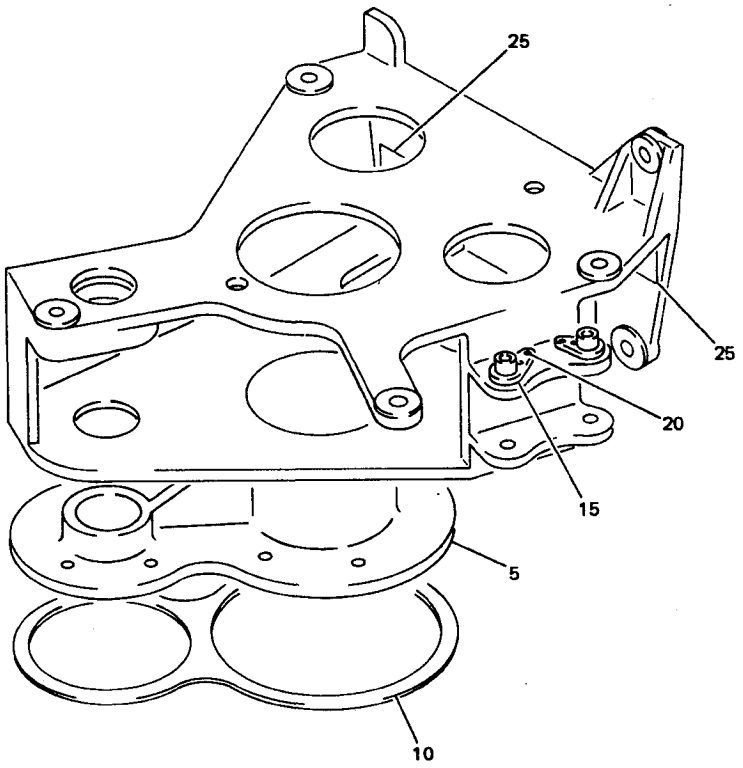
Bracket Assembly
Figure 4

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
4-					
1	65-74536-1		BRACKET ASSY	A	RF
1	65-74536-5		BRACKET ASSY	B	RF
1	65-74537-1		BRACKET ASSY	C	RF
1	65-74537-5		BRACKET ASSY	D	RF
5	65-74536-2		. BRACKET ASSY (OPT TO 65-74536-4)	AB	1
5	65-74536-4		. BRACKET ASSY (MADE FROM 65-52459-4 [FIG. 4A])	AB	1
5	65-74537-2		. BRACKET ASSY (OPT TO 65-74537-4)	CD	1
5	65-74537-4		. BRACKET ASSY (MADE FROM 65-52985-1 [FIG. 4B])	CD	1
10	65-39169-1		. . GASKET (USED ON 65-74536-2, 65-74537-2)		1
15	65-74536-3		. . BRACKET (USED ON 65-74536-2)		1
15	65-74537-3		. . BRACKET (USED ON 65-74537-2)		1
20	69-58399-1		. BUSHING		4
25	NAS696A4		. NUTPLATE	AB	2
25	BACN10JP4B		. NUTPLATE	CD	2
30	MS20426B3		. RIVET		4



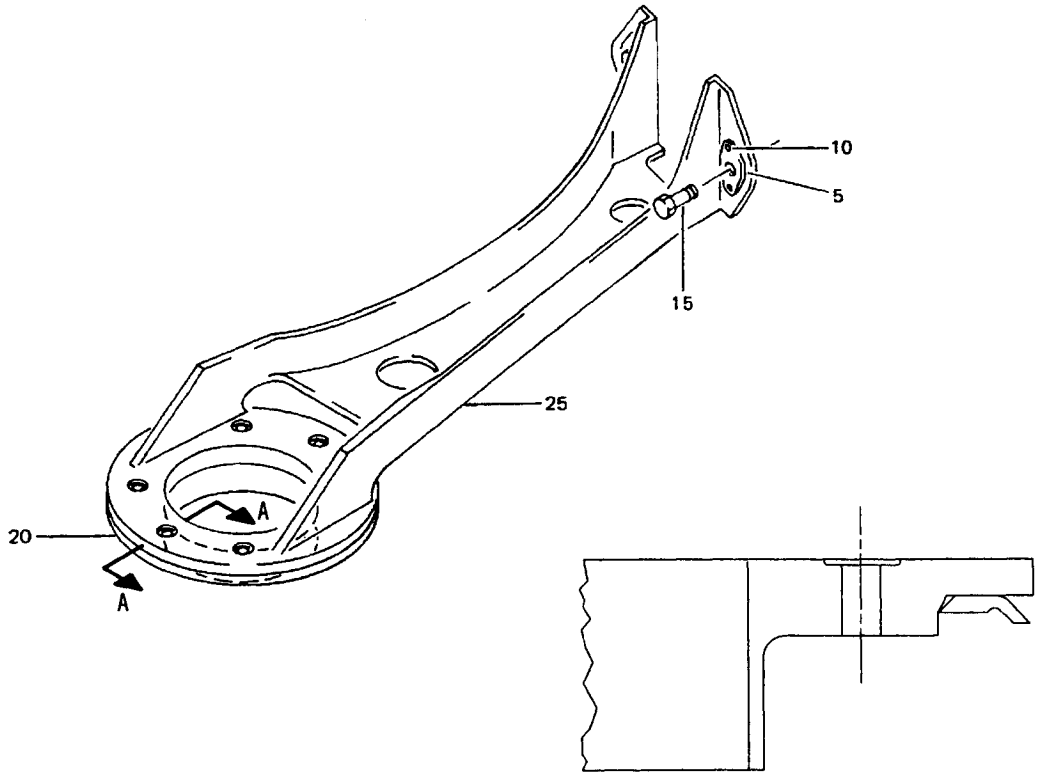
Support Bracket Assembly
Figure 4A

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
4A-					
1	65-52459-4		BRACKET ASSY, SUPPORT	A	RF
1	65-52459-7		BRACKET ASSY, SUPPORT	B	RF
1	65-52459-9		BRACKET ASSY, SUPPORT	C	RF
1	65-52459-11		BRACKET ASSY, SUPPORT	D	RF
1	65-52459-15		BRACKET ASSY, SUPPORT	E	RF
5	65-52459-5		. BRACKET	A	1
5	65-52459-8		. BRACKET	B	1
5	65-52459-10		. BRACKET	C	1
5	65-52459-12		. BRACKET	D	1
5	65-52459-14		. BRACKET (SB 76-1008)	E	1
10	69-39169-1		. GASKET		1
15	NAS696A4		. NUTPLATE	ABC	2
15	BACN10JP4B		. NUTPLATE	DE	2
20	MS20426B3		. RIVET		4
25	BAC27DCT259		. MARKER, FOIL	DE	2



Support Bracket Assembly
Figure 4B

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
4B-					
1	65-52985-1		BRACKET ASSY, SUPPORT	A	RF
1	65-52985-5		BRACKET ASSY, SUPPORT	B	RF
1	65-52985-6		BRACKET ASSY, SUPPORT	C	RF
1	65-52985-8		BRACKET ASSY, SUPPORT	D	RF
5	65-52985-2		. BRACKET	A	1
5	65-52985-4		. BRACKET	B	1
5	65-52985-7		. BRACKET	C	1
5	65-52985-9		. BRACKET	D	1
10	69-39169-1		. GASKET		1
15	BACN10JP4B		. NUTPLATE	BCD	2
20	MS20426B3		. RIVET	BCD	4
25	BAC27DCT259		. MARKER, FOIL	D	2



Support Bracket Assembly
Figure 4C

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
4C-					
1	65-52966-7		BRACKET ASSY, SUPPORT	A	RF
1	65-52966-8		BRACKET ASSY, SUPPORT	B	RF
5	BACR10G42		. RETAINER		2
10	MS20426D3		. RIVET		4
15	NAS1104-6		. BOLT		2
20	69-39169-3		. GASKET		1
25	65-52966-5		. BRACKET	A	1
25	65-52966-9		. BRACKET	B	1

L44333

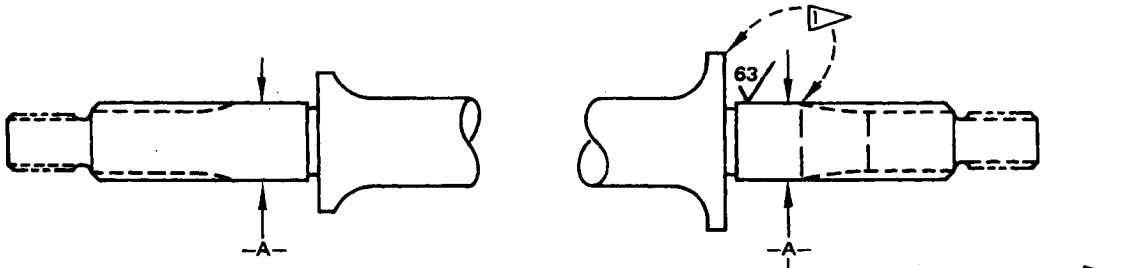
3. SHAFT, ENGINE START (69-38953-1)

A. Magnetic particle check per 20-20-01.

B. Repair (Fig. 5)

NOTE: Repair consists of restoration of original finish. Refer to 20-30-02 for stripping of protective finishes and to 20-41-01 for explanation of F and SRF finish codes.

C. Wear limit for -A- diameters is 0.4348 inches.



BREAK SHARP EDGES 0.02–0.03R

REFINISH

PASSIVATE (F-8.07) ALL OVER
CADMIUM PLATE -A- DIAMETERS (F-1.1926)

REPAIR

(REFER TO REFINISH)

MATERIAL:

CRES 17-4PH (150–170 KSI)
AMS 5643 ANNEALED

Shaft Repair
Figure 5

4. CRANK ASSY, LOCKOUT (65-56645-1) (Fig. 7)

A. Penetrant check crank per 20-20-02.

B. Repair (Fig. 6)

(1) Lug hole -- Installation of Oversize Bushing

(a) Machine hole oversize, within repair limit shown, to remove defects.

(b) Alodize machined surfaces.

(c) Manufacture oversize bushing to compensate for material removed.

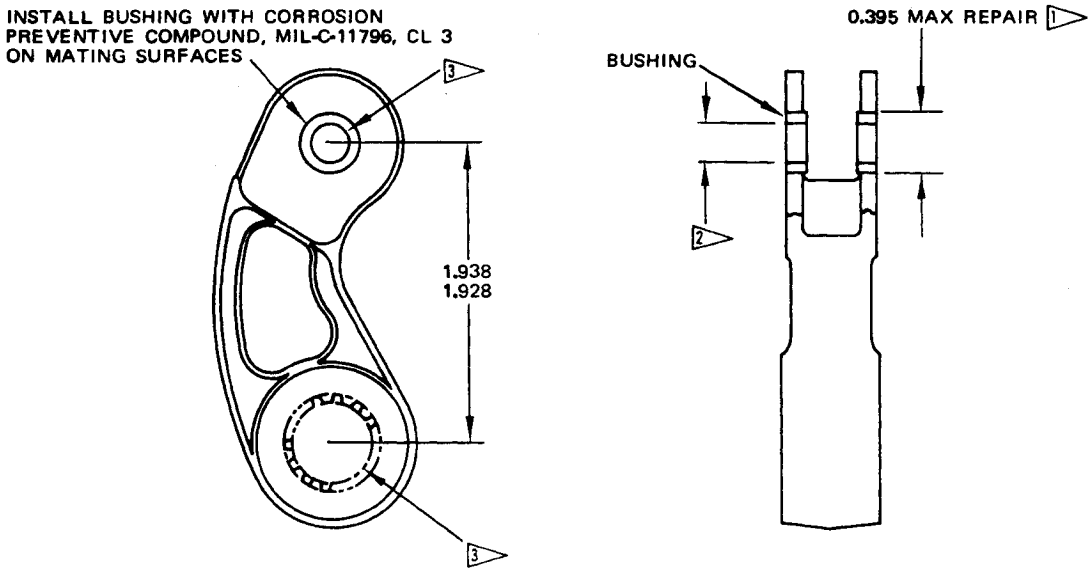
(d) Install bushing per step (3)(a).

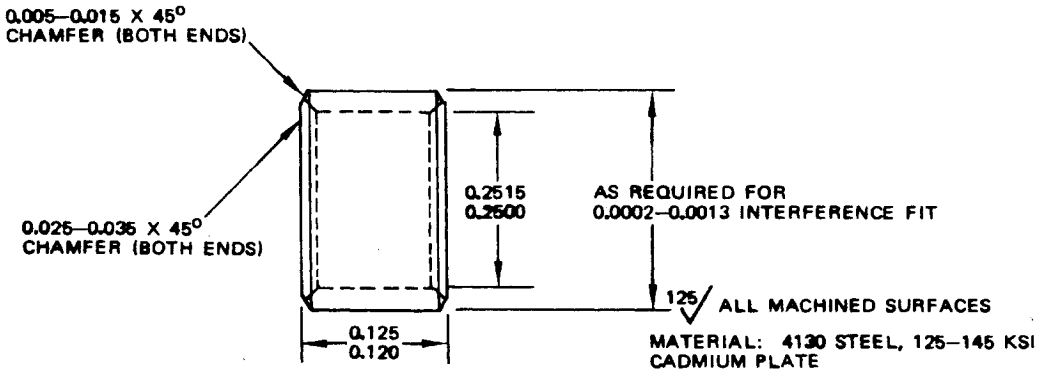
(2) Refinish (Fig. 6)

NOTE: Refer to 20-30-02 for stripping of protective finishes and to 20-41-01 for explanation of F and SRF finish codes.

(3) Bushing replacement -- Install replacement bushing (10) with corrosion preventive compound applied to mating surfaces. No machining is required after installation.

C. Maximum wear limit is 0.2590 for bushing hole.





OVERSIZE BUSHING

REFINISH

CHROMIC ACID ANODIZE ALL OVER FOLLOWED BY PRIMER, BMS 10-11, TYPE 1 EXCEPT AS NOTED BY 3 (SRF 2.19)

REPAIR

AS NOTED 1
MATERIAL: 2014-T6 ALUM ALLOY

1 MAX HOLE SIZE FOR INSTALLATION OF OVERSIZE BUSHING

2 MACHINING NOT REQUIRED AFTER INSTALLATION

3 NO PRIMER

Crank Repair
Figure 6

D. Illustrated Parts List

NOT ILLUSTRATED

Crank Assembly
Figure 7

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
7-					
1	65-56645-1		CRANK ASSY, LOCKOUT		RF
5	65-56645-2		. CRANK		1
10	NAS75-4-004		. BUSHING		1

5. CRANK ASSY, REVERSE THRUST (65-73654-1) (Fig. 9)

A. Penetrant check crank per 20-20-02

B. Repair (Fig. 8)

(1) Bearing Mounting Hole

(a) Machine hole oversize, within repair limits shown, to remove defects. Alodize machined surfaces.

(b) Manufacture 7075T alum-alloy sleeve to compensate for material removed in step (a) and to obtain 0.001-0.003 interference fit. Alodize after machining.

(c) Install sleeve using shrink fit method per 20-50-03 and primer, BMS 10-11, type 1 applied to mating surfaces.

(d) Machine to design dimension and finish.

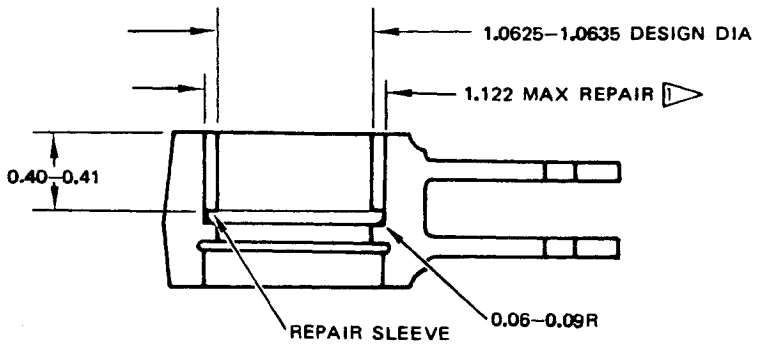
(2) Refinish - as shown in Fig. 8.

NOTE: Refer to 20-30-02 for stripping of protective finishes and to 20-41-01 for explanation of F and SRF finish codes.

(3) Bearing replacement

(a) Install replacement bearing per 20-50-01 with primer, BMS 10-11, type 1 applied to mating surfaces and roller swage into place per 20-50-03

C. Wear limit for bearing mounting hole is 1.0605 inches.



125 ALL MACHINED SURFACES

BREAK SHARP EDGES 0.02–0.03R

REFINISH

ALODIZE OR ANODIZE (SRF-2.30) ALL OVER FOLLOWED BY PRIMER BMS 10–11, TYPE 1 (NO PRIMER IN BEARING HOLE)

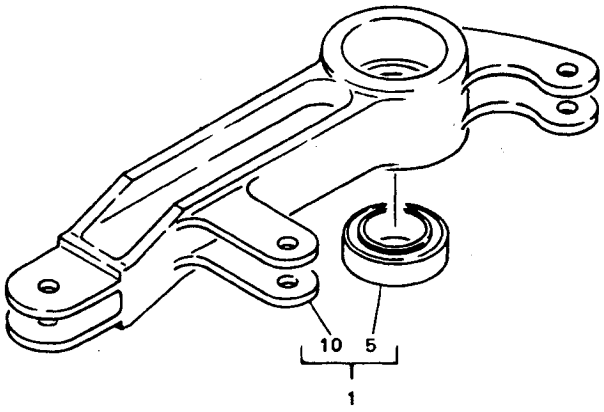
REPAIR

AS NOTED 1

MATERIAL:
CRANK 7075 T73 ALUM ALLOY

1 MAX HOLE DIA FOR INSTALLATION OF SLEEVE. INSTALL SLEEVE & MACHINE TO DESIGN DIM

D. Illustrated Parts List



Crank Assembly
Figure 9

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
9-					
1	65-73654-1		CRANK ASSY, REVERSE THRUST		RF
5	BACB10A27DDH		. BEARING		1
10	65-73654-5		. CRANK		1

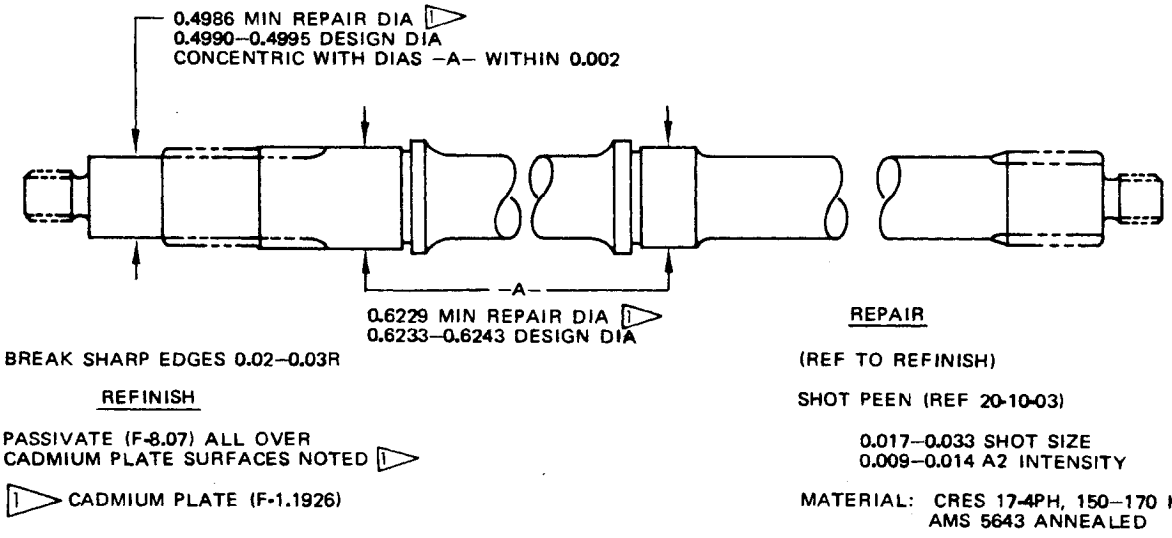
6. SHAFT, FOLLOWUP (69-38971-1, -2)

A. Magnetic particle check per 20-20-01.

B. Repair (Fig. 10)

NOTE: Repair consists of restoration of the original finish. Refer to 20-30-02 for stripping of protective finishes and to 20-41-01 for explanation of F and SRF finish codes.

C. Wear limits are same as repair limits.



Shaft Repair
Figure 10